

GEO - INFORMATICS ASSISTANT

NSQF LEVEL - 4

TRADE PRACTICAL

SECTOR: IT & ITES

(As per revised syllabus July 2022 - 1200 Hrs)



Directorate General of Training

DIRECTORATE GENERAL OF TRAINING
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
GOVERNMENT OF INDIA



**NATIONAL INSTRUCTIONAL
MEDIA INSTITUTE, CHENNAI**

Post Box No. 3142, CTI Campus, Guindy, Chennai - 600 032

Sector : IT & ITES

Duration : 1 - Year

Trade : GEO - Informatics Assistant - Trade Practical - NSQF LEVEL - 4 (Revised 2022)

Developed & Published by



National Instructional Media Institute

Post Box No.3142

Guindy, Chennai - 32

INDIA

Email: chennai-nimi@nic.in

Website: www.nimi.gov.in

Copyright © 2022 National Instructional Media Institute, Chennai

First Edition : June 2023

Copies: 500

Rs.435/-

All rights reserved.

No part of this publication can be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording or any information storage and retrieval system, without permission in writing from the National Instructional Media Institute, Chennai.

FOREWORD

The Government of India has set an ambitious target of imparting skills to 30 crores people, one out of every four Indians, to help them secure jobs as part of the National Skills Development Policy. Industrial Training Institutes (ITIs) play a vital role in this process especially in terms of providing skilled manpower. Keeping this in mind, and for providing the current industry relevant skill training to Trainees, ITI syllabus has been recently updated with the help of Mentor Councils comprising various stakeholder's viz. Industries, Entrepreneurs, Academicians and representatives from ITIs.

The National Instructional Media Institute (NIMI), Chennai has now come up with instructional material to suit the revised curriculum for **GEO - Informatics Assistant - Trade Practical - NSQF Level - 4 (Revised 2022) in IT & ITES Sector under Annual Pattern**. The NSQF Level - 4 (Revised 2022). Trade Theory will help the trainees to get an international equivalency standard where their skill proficiency and competency will be duly recognized across the globe and this will also increase the scope of recognition of prior learning. NSQF Level - 4 (Revised 2022) trainees will also get the opportunities to promote life long learning and skill development. I have no doubt that with NSQF Level - 4 (Revised 2022) the trainers and trainees of ITIs, and all stakeholders will derive maximum benefits from these IMPs and that NIMI's effort will go a long way in improving the quality of Vocational training in the country.

The Executive Director & Staff of NIMI and members of Media Development Committee deserve appreciation for their contribution in bringing out this publication.

Jai Hind

Additional Secretary / Director General of Training
Ministry of Skill Development & Entrepreneurship
Government of India.

New Delhi - 110 001

PREFACE

The National Instructional Media Institute (NIMI) was established in 1986 at Chennai by then Directorate General of Employment and Training (D.G.E & T), Ministry of Labour and Employment, (now under Directorate General of Training, Ministry of Skill Development and Entrepreneurship) Government of India, with technical assistance from the Govt. of the Federal Republic of Germany. The prime objective of this institute is to develop and provide instructional materials for various trades as per the prescribed syllabi (NSQF) under the Craftsman and Apprenticeship Training Schemes.

The instructional materials are created keeping in mind, the main objective of Vocational Training under NCVT/NAC in India, which is to help an individual to master skills to do a job. The instructional materials are generated in the form of Instructional Media Packages (IMPs). An IMP consists of Theory book, Practical book, Test and Assignment book, Instructor Guide, Audio Visual Aid (Wall charts and Transparencies) and other support materials.

The trade practical book consists of series of exercises to be completed by the trainees in the workshop. These exercises are designed to ensure that all the skills in the prescribed syllabus are covered. The trade theory book provides related theoretical knowledge required to enable the trainee to do a job. The test and assignments will enable the instructor to give assignments for the evaluation of the performance of a trainee. The wall charts and transparencies are unique, as they not only help the instructor to effectively present a topic but also help him to assess the trainee's understanding. The instructor guide enables the instructor to plan his schedule of instruction, plan the raw material requirements, day to day lessons and demonstrations.

In order to perform the skills in a productive manner instructional videos are embedded in QR code of the exercise in this instructional material so as to integrate the skill learning with the procedural practical steps given in the exercise. The instructional videos will improve the quality of standard on practical training and will motivate the trainees to focus and perform the skill seamlessly.

IMPs also deals with the complex skills required to be developed for effective team work. Necessary care has also been taken to include important skill areas of allied trades as prescribed in the syllabus.

The availability of a complete Instructional Media Package in an institute helps both the trainer and management to impart effective training.

The IMPs are the outcome of collective efforts of the staff members of NIMI and the members of the Media Development Committees specially drawn from Public and Private sector industries, various training institutes under the Directorate General of Training (DGT), Government and Private ITIs.

NIMI would like to take this opportunity to convey sincere thanks to the Directors of Employment & Training of various State Governments, Training Departments of Industries both in the Public and Private sectors, Officers of DGT and DGT field institutes, proof readers, individual media developers and coordinators, but for whose active support NIMI would not have been able to bring out this materials.

Chennai - 600 032

EXECUTIVE DIRECTOR

ACKNOWLEDGEMENT

National Instructional Media Institute (NIMI) sincerely acknowledges with thanks for the co-operation and contribution extended by the following Media Developers and their sponsoring organisations to bring out this Instructional Material (**Trade Practical**) for the trade of **GEO - Informatics Assistant NSQF Level -4 (Revised 2022)** under **IT & ITES** Sector for ITIs.

MEDIA DEVELOPMENT COMMITTEE MEMBERS

- | | | |
|------------------------|---|---|
| Shri. V. Sathish Kumar | - | Research Scholar
Department of Geo Informatics,
Telangana University,
Nizamabad - 503 322. |
| Shri. V. Janarthanan | - | Assistant Professor (Retd.)
MDC Member, NIMI,
Chennai - 600 032. |

NIMI CO-ORDINATORS

- | | | |
|-------------------------|---|---|
| Shri. Nirmalya Nath | - | Deputy Director,
NIMI, Chennai - 32. |
| Shri. V. Gopalakrishnan | - | Manager,
NIMI, Chennai - 32 |

NIMI records its appreciation for the Data Entry, CAD, DTP operators for their excellent and devoted services in the process of development of this Instructional Material.

NIMI also acknowledges with thanks the invaluable efforts rendered by all other NIMI staff who have contributed towards the development of this Instructional Material.

NIMI is also grateful to everyone who has directly or indirectly helped in developing this Instructional Material.

INTRODUCTION

TRADE PRACTICAL

The trade practical manual is intended to be used in practical workshop. It consists of a series of practical exercises to be completed by the trainees during the Course of the **GEO- Informatics Assistant** Trade supplemented and supported by instructions/ informations to assist in performing the exercises. These exercises are designed to ensure that all the skills in compliance with NSQF LEVEL - 4 (Revised 2022) syllabus are covered.

Module 1	Trade and Orientation
Module 2	Computer Components and Windows Operating System
Module 3	Computer Hardware Basic and Software Installation
Module 4	Word Processing Software
Module 5	Spread Sheet Application & PowerPoint Presentation
Module 6	Image Editing Using Photoshop
Module 7	Database Management Systems and Using MS Access
Module 8	Configuring and Using Networks
Module 9	Internet Concepts
Module 10	Introduction to GIS Software
Module 11	GIS Database / Digitization
Module 12	Principles of Remote Sensing
Module 13	Platforms, Sensors and Data Products
Module 14	Digital Image Processing
Module 15	Image Interpretation and Feature Extraction
Module 16	Digital Cartography
Module 17	Global Positioning System
Module 18	Differential Global Positioning System

The skill training in the shop floor is planned through a series of practical exercises centred around some practical project. However, there are few instances where the individual exercise does not form a part of project.

While developing the practical manual a sincere effort was made to prepare each exercise which will be easy to understand and carry out even by below average trainee. However the development team accept that there is a scope for further improvement. NIMI looks forward to the suggestions from the experienced training faculty for improving the manual.

TRADE THEORY

The manual of trade theory consists of theoretical information for the Course of the **GEO - Informatics Assistant** Trade. The contents are sequenced according to the practical exercise contained in NSQF LEVEL - 4 (Revised 2022) syllabus on Trade practical. Attempt has been made to relate the theoretical aspects with the skill covered in each exercise to the extent possible. This correlation is maintained to help the trainees to develop the perceptual capabilities for performing the skills.

The Trade Theory has to be taught and learnt along with the corresponding exercise contained in the manual on trade practical. The indications about the corresponding practical exercises are given in every sheet of this manual.

It will be preferable to teach/learn the trade theory connected to each exercise atleast one class before performing the related skills in the shop floor. The trade theory is to be treated as an integrated part of each exercise.

The material is not for the purpose of self learning and should be considered as supplementary to class room instruction.

CONTENTS

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
	Module 1 : Trade and Orientation		
1.1.01	Visit to Various Sections of the Institute and Identify Location of Various Installations		1
1.1.02	Identify Safety Signs for Danger, Warning, Caution & Personal Safety Message		3
1.1.03	Use of personal protective equipment (PPE)		5
1.1.04	Practice Elementary First Aid		7
1.1.05	Preventive Measures for Electrical Accidents and Steps to be Taken in Such Accidents		12
1.1.06	Use of Fire Extinguishers		14
	Module 2 : Computer Components and Windows Operating System		
1.2.07	Identify Computer Peripherals and Internal Components of a Disassembled Desktop Computer		17
1.2.08	Assemble Components of Desktop Computer		21
1.2.09	Practice on Windows Interface and Navigating Windows		30
1.2.10	Practice on Managing Files and Folders Using Removable Drives		36
1.2.11	Customize the Desktop Settings and Manage User Accounts		39
1.2.12	View System Properties and Control Panel Details		43
1.2.13	Work with Keyboard Shortcut Commands		47
1.2.14	Print and Scan Document Using Different Commands		49
	Module 3 : Computer Hardware Basic and Software Installation		
1.3.15	View the BIOS Settings and their Modifications		51
1.3.16	Identify and Rectify Common Hardware and Software Issues		53
1.3.17	Install Windows Operating System		54
1.3.18	Format Hard Disk and Create Partition		59
1.3.19	Install Necessary Application Software for Windows i.e. Office Package, PDF Reader, Media Player etc		61
1.3.20	Configure Bluetooth and Wi-Fi Settings		69
1.3.21	Install Drivers for Printer, Scanner, Webcam and DVD etc		76
1.3.22	Burn Data, Video and Audio Files on CD/DVD Using Application Software		82
	Module 4 : Word Processing Software		
1.4.23	Familiarization with the Word Window Components		83
1.4.24	Creating, Saving and Editing Documents Using Word		88
1.4.25	Inserting and Formatting Tables and other Objects		92
1.4.26	Using Templates, Autocorrect Tools, and Mail Merge Tool		111
1.4.27	Working with Page Layout Settings and Printing Documents		121
1.4.28	Typing Practice Using Open Source Typing Tutor Tools		128

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.4.29	Practice of Using Shortcut		130
	Module 5 : Spread Sheet Application & PowerPoint Presentation		
1.5.30	Opening MS Excel and Familiarize with Basic Application Components		135
1.5.31	Creating, Saving and Formatting Excel Spreadsheets		136
1.5.32	Using Absolute and Relative Referencing, Linking Sheets, Conditional Formatting etc		141
1.5.33	Using Excel Functions of all Major Categories		144
1.5.34	Using Various Data types in Excel, Sorting, Filtering and Validating Data		153
1.5.35	Creating and Formatting Charts		157
1.5.36	Importing & Exporting Excel Data		163
1.5.37	Modifying Excel Page setup and Printing		164
1.5.38	Open Powerpoint Presentation and Familiarize with Basic Application Components		166
1.5.39	Creating Slide Shows, Inserting Objects		168
1.5.40	Animating Slide Transitions and Objects		171
1.5.41	Creating a Simple Presentation		176
	Module 6 : Image Editing Using Photoshop		
1.6.42	Practice on Various Tools - Brush Tool. Pencil & Eraser Tools, the Red Eye Tool		177
1.6.43	Zooming and Planning an Image, Working with Multiple Images, Rulers, Guides and Grids, Undoing Steps with History, Adjusting Colour with the New Adjustment Panel, the Image Size Commands		181
1.6.44	Cropping and Straightening an Image, Adjusting Canvas Size and Canvas Rotation, Selecting with the Elliptical Mar Queue Tool, Using the Magic Wand and Free Transformation Tool, Selecting with the Regular and Polygonal Lasso Tools		186
1.6.45	Using the Magnetic Lasso Tool, Using the Quick Selection Tools Refine Edge, Modifying Selections 190		
1.6.46	Understanding the Background Layer, Creating, Selecting, Linking and Deleting layers, Locking and Merging Layers, Copying Layers, Using Perspective and Layers Styles, Filling and Grouping Layers		193
1.6.47	Blending Modes, Opacity and Fill - Creating and Modifying Text		199
1.6.48	Working with Colours and Swatches, Creating and Using Gradients, Creating and Working with Brushes		205
	Module 7 : Database Management Systems and Using MS Access		
1.7.49	Creating Database and Designing a Simple Tables in Access		212
1.7.50	Practice Enforcing Integrity Constrains and Modifying the Properties of Tables and Fields		218
1.7.51	Creation of Relationships and Join Tables		220
1.7.52	Queries with Various Criteria and Calculations		222
1.7.53	Modifying Form Design with Controls, Macros and Events		233
1.7.54	Importing and Exporting Data to and From Access		239

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.7.55	Compressing and Encrypting Database		242
	Module 8 : Configuring and Using Networks		
1.8.56	Viewing Network Connections		245
1.8.57	Connecting a Computer to a Network and Sharing of Devices Files and Folders		250
1.8.59	IP Addressing and Subnet for LPV4 /IPV6, Masking, Pinging to Test Networks		260
1.8.60	Network Basic and Configuration		262
	Module 9 : Internet Concepts		
1.9.61	Browsing the Internet for Information		267
1.9.62	Creating and Using e-Mail for Communication		271
1.9.63	Communication using Text, Video Chatting and Social Networking Sites		278
1.9.64	Identifying Various Threats to the System Connected to the Net		280
1.9.65	Protecting the Computer Against Various Internet Threats		281
	Module 10 : Introduction to GIS Software		
1.10.66	Familiarization with GIS Software Installation, Sample Data, Starting and Stopping QGIS		283
1.10.67	Explore Various Toolbar for Data and Compose Maps, Create, Edit, Manage and View Data		285
1.10.68	Identify Various Toolbars to Analyze Data, Digitizing, Map Composer, Symbolology		286
1.10.69	Familiarization with User Interface, Menu Bar, toolbar, Map Legend, Map View, Status Bar, Keyboard Shortcuts		288
1.10.70	How to Use Context Help Rendering, Measuring, Identifying Features Annotation Tools		292
	Module 11 : GIS Database / Digitization		
1.11.71	Introduction to Creation of a Shape File, Adding Attributes		295
1.11.72	Introduction to Database Creation & Topology		299
1.11.73	Introduction to Linking of Spatial Data with Non Spatial Data Sets		300
1.11.74	Introduction to Spatial Analyze		301
1.11.75	Introduction to Spatial Analysis, GIS Analysis : Proximity Thematic Mapping and Overlay		307
1.11.76	Introduction to Spatial Data Input and Georeferencing Digitization of Maps and Imageries		308
1.11.77	Introduction to Co-ordinate Transformation		310
1.11.78	Attribute Data Generation		314
1.11.79	Introduction to Spatial Data Base Creation		315
1.11.80	Creation of Non Spatial Data Sets into DBF Format		317
1.11.81	Over View of Projection Support		320
1.11.82	Practice of Reprojection of Data		323
1.11.83	Practice of Default Datum Transformation		328

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.11.84	Explore Supported Data Formats		329
1.11.85	Explore the Vector Properties Dialog		330
1.11.86	Explore Editing of Shape Files		336
1.11.87	Explore Query Builder Field Calculator		337
1.11.88	Practice of Various Quires in Query Builder		342
1.11.89	Explore Raster Properties Dialog		344
1.11.90	Practice Use of Raster Calculator Raster		347
	Module 12 : Principles of Remote Sensing		
1.12.91	Familiarization with RS Software ILWIS Installation		348
1.12.92	Introduction to Opening and Saving and Reopening Projects in ILWIS		351
1.12.93	Observing Title Bar, Manu Bar, Standard Tool Bar, Object		353
1.12.94	Identify Various Tool Bar Selection Tool Bar, Command Line Catalog, Status Bar, Navigator Pane		355
1.12.95	Use of Operation Tree, Operation List, Navigator, Output, View Data		358
1.12.96	Explore Data and Compose Maps, Create, Edit Manage and Export Data		359
1.12.97	Analyzing Data Digitizing, Map Composer, Symbology User Interface, MapLegent, Map View		362
1.12.98	Explore Measuring, Identify Features Annotation Tools		365
1.12.99	Identify User Interface with DIP Software (ILWIS)		367
1.12.100	Familiarization with Loading of Digital Data into DIP Software		368
1.12.101	Exploring How to Convert Digital Data into Image Processing Software Format		370
1.12.102	Practice on How to Apply Projection and Datum for Newly Loaded Data		372
1.12.103	Practice on Changing Projection and Datum for Newly Loaded Data		374
	Module 13 : Platforms, Sensors and Data Products		
1.13.104	Identify Different Type of Data Products Available		376
1.13.105	Identify Images From Different Satellites and Sensors Used		378
1.13.106	Identify Features of Digital Images in Hard Copy		379
1.13.107	Identify the Natural Color Composite Satellite Image		381
1.13.108	Identify the False Color Composite Satellite Image		382
	Module 14 : Digital Image Processing		
1.14.109	Practice of How to Import Data in Image Processing Software		383
1.14.110	Practice of Image Georeferencing, Registration /Rectification		384
1.14.111	Practice of Mosaic Creation, Sub Setting, Visualization of Single Band Images		386
1.14.112	Practice of Displaying of Individual Pixel Values		388
1.14.113	Displaying Pixel Values of More than One Band		389
1.14.114	Displaying Color Composites		391

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.14.115 - 117	Introduction to Supervised Classification and Unsupervised Classification		392
1.14.118	Practicing Unsupervised Classification - Defining Classes, Recording, Accuracy Assessment, Area Calculation		399
1.14.119	Understand the Difference of Supervised and Unsupervised Classification		401
1.15.120 - 122	Module 15 : Image Interpretation and Feature Extraction Preparation of Land Use Map from Satellite Imagery		402
1.16.123	Module 16 : Digital Cartography Identification of Composer Items, Manage Items		404
1.16.124	Familiarization with Revert and Restore Tools, Atlas 'Generation'		406
1.16.125	Generation of Output Map, Inserting Let Long		409
1.16.126	Map Composition, Map Projection, Map Generalization and Symbolization		411
1.16.127	Understanding Different Features of Topo Sheets, Numbering System of Topo Sheets		414
1.17.128	Module 17 : Global Positioning System Identification of Different Types of GPS		417
1.17.129	Identification of Various Buttons of GPS		419
1.17.130	Demonstration on Operating GPS		420
1.17.131	Selection of Datum Units and Scale		423
1.17.132	Practice on GPS Measurement		424
1.17.133	Collection of GCPs		425
1.17.134	Introduction to Mobile Mapping		426
1.17.135	Familiarization to various data collecting apps freely available on internet		428
1.17.136	Transferring of GPS Data in to GIS Software		430
1.18.137	Module 18 : Differential Global Positioning System (DGPS) Introduction to Various Components of DGPS		431
1.18.138	Familiarization to Operating Base and Rover		433
1.18.139	Setting up Base and Rover RTK		435
1.18.140	Options and Menu Settings		436
1.18.141	Calculating Position		438
1.18.142	Measuring Distance		440
1.18.143	Triangulation (Geodetic)		442
1.18.144	Data Downloading and Processing in Software		443
1.18.145	Creation of Shape Files in QGIS		446
1.18.146	Importing Data to Post Gres		447
1.18.147	Connecting Post Gres to Geo Server		448
1.18.148	Publishing File on Geo Server		450

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.18.149	Creating Map Services, Feature Services Coverage Services		451
1.18.150	Google earth: Introduction, Digitization-Point, Line, Poly, Converting KML to Shape File and Vice Versa, Calculating Distance		452
1.18.151	Downloading Images from Google Earth and Mosaicing them		454
1.18.152	Demonstration and Use of Bhuvan Portal		457
1.18.153	Downloading Satellite Data from Bhuvan		460
1.18.154	Use of Bhuvan Portal (ISRO) for Activity Planning at Panchayat Level		461

LEARNING / ASSESSABLE OUTCOME

On completion of this book you shall be able to

S.No	Learning Outcome	Ref. Ex.No
1	Identify various components of a desktop computer and familiarise with computer operating system following safety precaution. (NOS: SSC/N3022)	1 - 14
2	Install and set up operating system and related software in a computer. (NOS: SSC/N3022)	15 - 22
3	Create, format and edit document using word processing application software. (NOS: SSC/N3022)	23 - 29
4	Create, format, edit and develop a workbook by using spreadsheet application software & prepare and customize slides for power point presentation. (NOS: SSC/N3022)	30 - 41
5	Design, Create, format and edit images using Photoshop software. (NOS: SSC/N9491)	42 - 48
6	Plan, create and manage database file by using MS Access. (NOS: SSC/N9469)	49 - 55
7	Plan, install setup/ configure, and secure computer network including Internet. (NOS: SSC/N3022)	56 - 65
8	Analyze and manage data using GIS software. (NOS: SSC/N9470)	66 - 70
9	Plan, capture, store, manipulate and present spatial or geographic data by using GIS. (NOS: SSC/N9471)	71 - 90
10	Select, install and operate various remote sensing software and record the data. (NOS: SSC/N9472)	91 - 103
11	Select different platforms & various data products, sensors used in different platforms and their use. (NOS: SSC/N9473)	104 - 108
12	Plan and implement Digital image processing techniques by selecting appropriate procedure, interpret images and feature extraction. (NOS: SSC/N9474)	109 - 122
13	Plan and implement Digital Cartography process for collection of data and produce maps. (NOS: SSC/N9475)	123 - 127
14	Select datum units and scale, identify GPS, Signal, code, Biases and measure the location. (NOS: SSC/N9476)	128 - 136
15	Select and set up DGPS for Calculating position, measuring distance, data downloading and processing in software. (NOS: SSC/N9477)	137 - 144
16	Publish Files on Geo server using Web GIS. (NOS: SSC/N9478)	145 - 154

SYLLABUS FOR - GEO - INFORMATICS ASSISTANT

Duration	Reference Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
Professional Skill 42 Hrs; Professional Knowledge 12 Hrs	Identify various components of a desktop computer and familiarize with computer operating system following safety precaution. (NOS: SSC/N3022)	<ol style="list-style-type: none"> 1. Visit to various sections of the institute and identify location of various installations. (5 hrs.) 2. Identify safety signs for danger, warning, caution & personal safety message. (4 hrs.) 3. Use of personal protective equipment (PPE). (3 hrs.) 4. Practice elementary first aid. (4 hrs.) 5. Preventive measures for electrical accidents & steps to be taken in such accidents. (4 hrs.) 6. Use of Fire extinguishers. (3 hrs.) 	<p>Familiarization with the working of Industrial Training Institute system.</p> <p>Importance of safety and precautions to be taken in the industry/shop floor.</p> <p>Introduction to PPEs. Introduction to First Aid. Response to emergencies e.g. power failure, fire, and system failure.</p> <p>Importance of housekeeping & good shop floor practices.</p> <p>Occupational Safety & Health: Health, Safety and Environment guidelines, legislations & regulations as applicable. (06 hrs)</p>
		<ol style="list-style-type: none"> 7. Identify computer peripherals and internal components of a disassembled desktop computer. (3 hrs.) 8. Assemble components of desktop computer. (3 hrs.) 9. Practice on Windows interface and navigating windows. (3 hrs.) 10. Practice on managing files and folders using removable drives. (4 hrs.) 11. Customize the desktop settings and manage user accounts. (2 hrs.) 12. View system properties and control panel details. (2 hrs.) 13. Work with keyboard shortcut commands. (2 hrs.) 14. Print and scan document using different commands. (2 Hrs.) 	<p>Introduction to computer system. Concepts of Hardware and Software.</p> <ul style="list-style-type: none"> • Function of motherboard components and various processors. • Various Input/ Output devices in use and their features. • Introduction to operating System • Main features of Windows OS • Concept of various shortcut commands. (06 hrs)
Professional Skill 21 Hrs; Professional Knowledge 06 Hrs	Install and set up operating system and related software in a computer. (NOS: SSC/N3022)	<ol style="list-style-type: none"> 15. View the BIOS settings and their modifications. (3 hrs.) 16. Identify and rectify common hardware and software issues. (3 hrs.) 17. Install Windows operating system. (3 hrs.) 18. Format hard disk and create partition. (3 hrs.) 19. Install necessary application software for Windows i.e. Office Package, PDF Reader, Media Player etc. (3 hrs.) 20. Configure Bluetooth and Wi-Fi settings. (2 hrs.) 	<ul style="list-style-type: none"> • Introduction to the booting process. • BIOS settings and their modification, introduction to various types of memories and their features. • Basic hardware and software issues and their solution. • Formatting and loading OS and Application software and antivirus. (06 hrs)

		21. Install Drivers for printer, scanner, webcam and DVD etc. (2 hrs.) 22. Burn data, video and audio files on CD/ DVD using application software. (2 hrs.)	
Professional Skill 21 Hrs; Professional Knowledge 06 Hrs	Create, format and edit document using word processing application software. (NOS: SSC/N3022)	23. Familiarization with the Word Window Components. (2 hrs.) 24. Creating, saving and editing documents using Word. (3 hrs.) 25. Inserting and formatting tables and other objects. (3 hrs.) 26. Using templates, autocorrect tools, and mail merge tool. (3 hrs.) 27. Working with Page layout settings and printing documents. (3 hrs.) 28. Typing practice using open source typing tutor tools. (4 hrs.) 29. Practice of using shortcut keys. (3 hrs.)	<ul style="list-style-type: none"> • Introduction to various applications in MS office. Introduction to Word features, Office button, Toolbars. • Concept of Creating, saving and formatting documents. Concept of inserting objects Macro, mail-merge, templates and other tools in Word. • Page setup and printing documents using Word. (06 hrs)
Professional Skill 21 Hrs; Professional Knowledge 06 Hrs	Create, format, edit and develop a workbook by using spreadsheet application software & prepare and customize slides for power point presentation. (NOS: SSC/N3022,)	30. Opening MS Excel and familiarize with basic application components. (2 hr.) 31. Creating, Saving and Formatting Excel Spreadsheets. (2 hrs.) 32. Using Absolute and Relative referencing, linking sheets, Conditional formatting etc. (2 hrs.) 33. Using Excel functions of all major categories. (3 hrs.) 34. Using various data types in Excel, Sorting, filtering and validating data. (2 hrs.) 35. Creating and formatting charts. (2 hrs.) 36. Importing & Exporting Excel Data. (2 hrs.) 37. Modifying Excel Page setup and printing. (2 hr.) 38. Open power point presentation and familiarize with basic application components. (2 hrs.) 39. Creating Slide shows, Inserting objects. (1 hrs.) 40. Animating Slide transitions and Objects. (1 hrs.) 41. Creating a simple presentation. (1 hrs.)	<ul style="list-style-type: none"> • Introduction to Excel features and Data Types. • Cell referencing. Use of functions of various categories, linking Sheets. Introduction to various functions in a categories of Excel • Concepts of Sorting, Filtering and Validating Data Analyzing data using charts, data tables, pivot tables. • Introduction to Power Point and its advantages • Creating slide shows. • Fine tuning the presentation and good presentation technique. (06 hrs)
Professional Skill 42 Hrs; Professional Knowledge 12Hrs	Design, Create, format and edit images using Photoshop software. (NOS: SSC/N9491)	42. Practice on various tools- Brush Tool. Pencil & Eraser Tools, the Red Eye Tool. (5 hrs.)	<ul style="list-style-type: none"> • Introduction to Photoshop • Introduction to the properties and editing of images. • Navigating Photoshop

		<p>43. Zooming & Panning an Image, Working with Multiple Images, Rulers, Guides & Grids, Undoing Steps with History, Adjusting Colour with the New Adjustments Panel, the Image Size Command. (10 hrs.)</p> <p>44. Cropping & Straightening an Image, Adjusting Canvas Size</p> <p>& Canvas Rotation, Selecting with the Elliptical Marquee Tool, Using the Magic Wand & Free Transform Tool, Selecting with the Regular & Polygonal Lasso Tools. (8 hrs.)</p> <p>45. Using the Magnetic Lasso Tool, Using the Quick Selection Tool's Refine Edge, Modifying Selections. (7 hrs.)</p> <p>46. Understanding the Background Layer, Creating, Selecting, Linking & Deleting Layers, Locking & Merging Layers, Copying Layers, Using Perspective & Layer Styles, Filling & Grouping Layers. (8 hrs.)</p> <p>47. Blending Modes, Opacity & Fill. Creating & Modifying Text. (7 hrs.)</p> <p>48. Working with Colours and Swatches, Creating & Using Gradients, Creating & Working with Brushes. (6 hrs.)</p>	<ul style="list-style-type: none"> • Menus and panels • Opening new files • Opening Existing files. (12hrs)
Professional Skill 63 Hrs; Professional Knowledge 18Hrs	Plan, create and manage database file by using MS Access. (NOS: SSC/N9469)	<p>49. Creating database and designing a simple tables in Access. (10 hrs.)</p> <p>50. Practice enforcing Integrity constraints and modifying the properties of tables and fields. (10 hrs.)</p> <p>51. Creation of Relationships and join Tables. (8 hrs.)</p> <p>52. Queries with various criteria and calculations. (8 hrs.)</p> <p>53. Modifying form design with controls, macros and events. (9 hrs.)</p> <p>54. Importing and exporting data to and from Access. (9 hrs.)</p> <p>55. Compressing and Encrypting database. (9 hrs.)</p> <p>56. Viewing Network connections. (4 hrs.)</p>	<ul style="list-style-type: none"> • Concepts of Data, Information and Databases. • What is database system, purpose of database system, view of data, relational database, database architecture. • Rules for designing good tables. • Integrity rules and constraints in a table. • Introduction to view, data independence, security, updates on views, comparison between tables and views. • Relationships in table. • Introduction to various types of queries and their uses. (18 hrs)
Professional Skill 84 Hrs; Professional Knowledge 24Hrs	Plan, install setup/ configure, and secure computer network including Internet. (NOS: SSC/N3022)	<p>57. Connecting a computer to a network and sharing of Devices files and Folders. (8 hrs.)</p> <p>58. Familiarization with various Network devices, Connectors and Cables. (8 hrs.)</p> <p>59. IP Addressing and Subnet for IPv4 / IPV6, Masking, pinging to test networks. (8 hrs.)</p>	<ul style="list-style-type: none"> • Introduction to Computer Networks Necessity and Advantages. • Client Server and peer to peer networking concepts. • Network topologies. Introduction to LAN, WAN and MAN

		<p>60. Network basic and configuration (14 hrs.)</p> <ul style="list-style-type: none"> • Setting IP addresses. • Sharing files and folders. • Network Troubleshooting. • PING Test, IP configuration Etc. 	<ul style="list-style-type: none"> • Network components, viz. Modem Hub, Switch, Router, Bridge, Gateway etc. • Network Cables, Wireless networks and Blue Tooth technology. • Logical and physical Addresses, Classes of Networks. • Network security & firewall concepts. (12hrs)
		<p>61. Browsing the Internet for information. (8 hrs.)</p> <p>62. Creating and using e-mail for communication. (6 hrs.)</p> <p>63. Communication using text, video chatting and social networking sites. (10 hrs.)</p> <p>64. Identifying various threats to the system connected to the net. (8 hrs.)</p> <p>65. Protecting the computer against various internet threats. (8 hrs.)</p> <p>66. Familiarization with GIS Software Installation, Sample Data, starting and Stopping QGIS. (10 hrs.)</p>	<ul style="list-style-type: none"> • Introduction to WWW, Concept of Internet, Web Browsers, Internet Servers and Search Engines • Concepts of Domain naming Systems and E-mail communication • Introduction to video chatting tools, Social Networking concepts. • Concept of Cloud storage and Open Web Server • Introduction to Internet Security Threats and attacks, Malicious Software types, Internet security products and their advantages. (12hrs)
Professional Skill 42 Hrs; Professional Knowledge 12 Hrs	Analyze and manage data using GIS software. (NOS: SSC/ N9470)	<p>67. Explore various toolbars for data and compose maps, Create, Edit, Manage and View data. (8 hrs.)</p> <p>68. Identify various toolbars to Analyze data, Digitizing, Map Composer, Symbolology. (8 hrs.)</p> <p>69. Familiarization with User Interface, Menu Bar, toolbar, Map Legend, Map View, Status Bar, Keyboard shortcuts. (8 hrs.)</p> <p>70. How to use Context help Rendering, Measuring, Identify features Annotation Tools. (8 hrs.)</p>	<ul style="list-style-type: none"> • Definition and scope of GIS. • Functional requirements of GIS, GIS components. • Cartography-GIS interface. • Recent trends and applications of GIS. • Open source GIS. (12 hrs)
Professional Skill 84 Hrs; Professional Knowledge 24Hrs	Plan, capture, store, manipulate and present spatial or geographic data by using GIS.	<p>71. Introduction to Creation of a shape file, adding attributes. (5 hrs.)</p> <p>72. Introduction to Database Creation (Data Entry, Editing) & Topology Creation. (5 hrs.)</p> <p>73. Introduction to Linking of Spatial data with non- Spatial data sets. (4 hrs.)</p> <p>74. Introduction to Spatial Analysis (Raster & Vector). (4 hrs.)</p> <p>75. Introduction to Spatial Analysis GIS analysis: proximity thematic mapping and Over lay. (5 hrs.)</p>	<ul style="list-style-type: none"> • Geographic data: Spatial and non-spatial. • Data models: Raster and vector. • Database Management System (DBMS). • Data structures: Relational, hierarchical and network. • Data Input: Digitization of maps and imageries. • Coordinate transformation. • Attribute data generation. (24hrs)

		<p>76. Introduction to Spatial data input and Geo referencing Digitization of maps and imageries. (5 hrs.)</p> <p>77. Introduction to coordinate transformation. (4 hrs.)</p> <p>78. Attribute data generation. (5 hrs.)</p> <p>79. Introduction to Spatial data base creation. (4 hrs.)</p> <p>80. Creation of non-spatial data sets into DBF format. (4 hrs.)</p> <p>81. Overview of projection Support. (3 hrs.)</p> <p>82. Practice of Re projection of data. (3 hrs.)</p> <p>83. Practice of Default datum transformations. (5 hrs.)</p> <p>84. Explore Supported Data Formats. (3 hrs.)</p> <p>85. Explore The Vector properties Dialog. (4 hrs.)</p> <p>86. Explore Editing of shape files. (4 hrs.)</p> <p>87. Explore Query Builder, Field Calculator. (4 hrs.)</p> <p>88. Practice of various queries in query builder. (5 hrs.)</p> <p>89. Explore Raster properties Dialog. (4 hrs.)</p> <p>90. Practice use of Raster Calculator. (4 hrs.)</p>	
<p>Professional Skill 63 Hrs;</p> <p>Professional Knowledge 18 Hrs</p>	<p>Select, install and operate various remote sensing software and record the data.</p> <p>(NOS: SSC/N9472)</p>	<p>91. Familiarization with RS Software (Any open source-ILWIS) - installation, Starting and Stopping ILWIS. (4 hrs.)</p> <p>92. Introduction to opening and saving and reopening projects in ILWIS. (4 hrs.)</p> <p>93. Observing Title bar, Menu bar, Standard toolbar, Object. (3 hrs.)</p> <p>94. Identify various toolbars Selection toolbar, Command line catalog, Status bar and operations/Navigator pane. (5 hrs.)</p> <p>95. Use of Operation tree, Operation List, Navigator, Output, View data. (7 hrs.)</p> <p>96. Explore data and compose maps, Create, edit manage and export data. (5 hrs.)</p> <p>97. Analyzing data Digitizing, Map Composer, Symbology User Interface, Map Legend, Map View. (8 hrs.)</p> <p>98. Explore Measuring, identify features Annotation Tools. (3 hrs.)</p> <p>99. Identify user interface with DIP software (ILWIS). (3 hrs.)</p>	<ul style="list-style-type: none"> • Definition, History • Types and scope • Advantages of remote sensing, Disadvantage of remote sensing • Stages in remote sensing data acquisition, Components of a Remote Sensing System Electromagnetic Radiation (ER) and electromagnetic spectrum, Ultraviolet, Visible Range, Infra-red Region, Thermal Region, Microwave Region • Interaction of EMR with atmosphere-Reflection, Refraction, Absorption Scattering • Interaction of EMR with Earth's surface features: Absorption, Transmission, Reflection. • Atmospheric windows. (18 hrs)

		<p>100. Familiarization with loading of digital data into DIP software. (5 hrs.)</p> <p>101. Exploring how to convert digital data into image processing software format. (5 hrs.)</p> <p>102. Practice on how to apply Projection and datum for newly loaded data. (5 hrs.)</p> <p>103. Practice on changing Projection and datum for newly loaded data. (6 hrs.)</p>	
<p>Professional Skill 63 Hrs; Professional Knowledge 18 Hrs</p>	<p>Select different platforms & various data products, sensors used in different platforms and their use. (NOS: SSC/N9473)</p>	<p>104. Identify different type of data products available. (12 hrs.)</p> <p>105. Identify Images from different Satellites and sensors used. (12 hrs.)</p> <p>106. Identify features of Digital images in Hard Copy. (15 hrs.)</p> <p>107. Identify the Natural Color Composite satellite image. (12 hrs.)</p> <p>108. Identify the False Color Composite satellite image. (12 hrs.)</p>	<ul style="list-style-type: none"> • Definition platforms, Sensors • Remote sensing platforms: Ground based, Airborne, Space borne • Types of satellite orbit: Geostationary Orbit, Near polar Orbit, Sun- synchronous orbit • Sensors: Imaging Sensors, Non imaging sensors, Active, passive MSS(Multi Spectral Scanner) TM (Thematic Mapper), ETM+ (Enhanced Thematic Mapper+), LISS (Linear Imaging Self Scanning), PAN (Panchromatic), HRV (High Resolution Visible), SAR (Synthetic Aperture Radar), WiFS(Wide Field Sensor) AWiFS (Advanced Wide Field Sensor) AVHRR (Advanced Very High Resolution Radiometer), OLI (Operational Land Imager) • Remote sensing data products: Hard Copy Maps, Natural Colour Composite (NCC), False Colour Composite (FCC) • Earth Observation Satellites- IRS LANDSAT, SPOT, IKONOS, Quick Bird Types & characteristics of sensors on satellites, resolution, swath etc. (18 hrs)
<p>Professional Skill 126 Hrs; Professional Knowledge 36Hrs</p>	<p>Plan and implement Digital image processing techniques by selecting appropriate procedure, interpret images and feature extraction. (NOS: SSC/N9474)</p>	<p>109. Practice of how to Import Data in image processing software. (6 hrs.)</p> <p>110. Practice of Image Geo- referencing, Registration /Rectification. (8 hrs.)</p> <p>111. Practice of Mosaic creation, Sub Setting, Visualization of single band images. (8 hrs.)</p> <p>112. Practice of displaying of Individual pixel Values. (6 hrs.)</p> <p>113. Displaying pixel values of more than one band. (4 hrs.)</p> <p>114. Displaying Color Composites. (4 hrs.)</p>	<ul style="list-style-type: none"> • Digital Image, Digital Data Format, LUT. Radiometric Correction of Data Geometric Correction of Data • Image Enhancements Techniques. Band Ratios, Vegetation Indices, Resolution Merge Techniques o'r Image Fusion

		<p>115. Introduction to supervised classification. (4 hrs.)</p> <p>116. Practicing the different controls used in supervised classification. Defining clusters, Accuracy assessment. (6 hrs.)</p> <p>117. Introduction to unsupervised classification. (5 hrs.)</p> <p>118. Practicing unsupervised classification Defining, Classes, Recording, Accuracy assessment, Area calculation. (8 hrs.)</p> <p>119. Understand the difference of Supervised and Unsupervised classification. (6 hrs.)</p>	<ul style="list-style-type: none"> Thematic Information Extraction Procedures: Multi-spectral patterns, Spectral Discrimination and Signature Bank, Supervised and Unsupervised Classification Methods, Multi-date Data Analysis and change detection processes. Accuracy assessment.(18 hrs)
		<p>120. Study of Satellite Imagery in Different bands and Visual interpretation. (31 hrs.)</p> <p>121. Preparation of land use map from satellite imagery. (20 hrs.)</p> <p>122. Interpretation of Cultural details from high resolution imagery. (10 hrs.)</p>	<ul style="list-style-type: none"> Factors affecting image interpretation Digital image, Resolution-Spectral Spatial, Radiometric, Temporal True colour image, False colour image Spectral Signature, spectral reflectance curve, Significance of spectral signature in remote sensing Spectral Signature for Vegetation Soil, Water, Snow Image characteristics and preparation of image interpretation keys Elements of Image interpretation Basic Principle of Image Interpretation, Visual image Interpretation: tone, shape, size pattern, texture, shadow and association. Methods and techniques of image interpretation, Methods Visual and DIP, Types of interpretation Qualitative and Quantitative, Visual image interpretation, Digital Image interpretation. (18 hrs)
Professional Skill 42 Hrs; Professional Knowledge 12 Hrs	Plan and implement Digital Cartography process for collection of data and produce maps. (NOS: SSC/N9475)	<p>123. Identification of Composer items, Manage items. (8 hrs.)</p> <p>124. Familiarization with Revert and Restore tools, Atlas 'generation. (10 hrs.)</p> <p>125. Generation of Output Map, Inserting Let Long. (8 hrs.)</p> <p>126. Map composition using Map projection, Map generalization and symbolization. (8 hrs.)</p> <p>127. Understanding different features of topo sheets, Numbering system of topo sheets. (8 hrs.)</p>	<ul style="list-style-type: none"> Essentials of map making: Scale, type of scales coordinate system, map projection, map generalization and symbolization, map designing Types and series of maps, topo sheets numbering system (12 hrs)

Professional Skill 42 Hrs; Professional Knowledge 12 Hrs	Select datum units and scale, identify GPS, Signal, code, Biases and measure the location. (NOS: SSC/N9476)	128. Identification of different types of GPS. (6 hrs.) 129. Identification of various buttons of GPS. (4 hrs.) 130. Demonstration on operating GPS. (4 hrs.) 131. Selection of datum units and scale. (4 hrs.) 132. Practice on GPS measurement. (10 hrs.) 133. Collection of GCPs. (4 hrs.) 134. Introduction to Mobile mapping. (4 hrs.) 135. Familiarization to various data collecting apps freely available on internet. (3 hrs.) 136. Transferring of GPS data in to GIS software. (3 hrs.)	<ul style="list-style-type: none"> • Introduction to Global positioning System GNSS • Coordinate and Time system • Satellite and conversational geodetic system • GPS, Signal, code and Biases • GPS segment organization • GPS Survey Methods. Basic geodetic co-ordinate • Ground Support equipment • GPS receiver Types • Modes of measurements and Post processing of data • Accuracy of GPS measurements and application of GPS. (12 hrs)
Professional Skill 42 Hrs; Professional Knowledge 12 Hrs	Select and set up DGPS for Calculating position, measuring distance, data downloading and processing in software. (NOS: SSC/N9477)	137. Introduction to Various components of DGPS. (8 hrs.) 138. Familiarization to operating base and rover. (6 hrs.) 139. Setting up Base and Rover RTK. (6 hrs.) 140. Options and Menu settings. (4 hrs.) 141. Calculating position. (6 hrs.) 142. Measuring Distance. (4 hrs.) 143. Triangulation (Geodetic). (4 hrs.) 144. Data downloading and processing in software. (4 hrs.)	<ul style="list-style-type: none"> • Introduction to DGPS • Components of DGPS • Types of DGPS • Errors in DGPS • Survey Methods in DGPS: Rapid static method, Traverse method, and Triangulation Method (12 hrs)
Professional Skill 42 Hrs; Professional Knowledge 12Hrs	Publish Files on Geo server using Web GIS.	145. Creation of shape files in QGIS. (4 hrs.) 146. Importing data to post gres. (4 hrs.) 147. Connecting post gres to Geo server. (4 hrs.) 148. Publishing File on Geo server. (4 hrs.) 149. Creating Map services, Feature Services Coverage services. (4 hrs.) 150. Google earth: introduction, digitization-point, line, poly, converting kml to shape file and vice versa, calculating distance. (4 hrs.) 151. Downloading images from google earth and mosaicing them. (4 hrs.) 152. Demonstration and use of Bhuvan portal. (5 hrs.) 153. Downloading satellite data from Bhuvan. (4 hrs.) 154. Use of Bhuvan portal (ISRO) for activity planning at Panchayat Level. (5 hrs.)	<ul style="list-style-type: none"> • Open source Software- QGIS, post gres, Geo server • Services- WMS, WFS, WCS • Introduction to Bhuvan • Introduction to Google Earth (12 hrs)

Visit to Various Sections of the Institute and Identify Location of Various Installations

Objectives: At the end of this exercise you shall be able to

- visit the various sections/trade in your ITI and draw the layout of your ITI
- record the telephone numbers of the ITI office, hospitals, police station and fire station
- draw the layout of your section
- identify the locations that have electrical installations.

PROCEDURE

TASK 1: Visit various sections of the ITI and draw the layout of your ITI

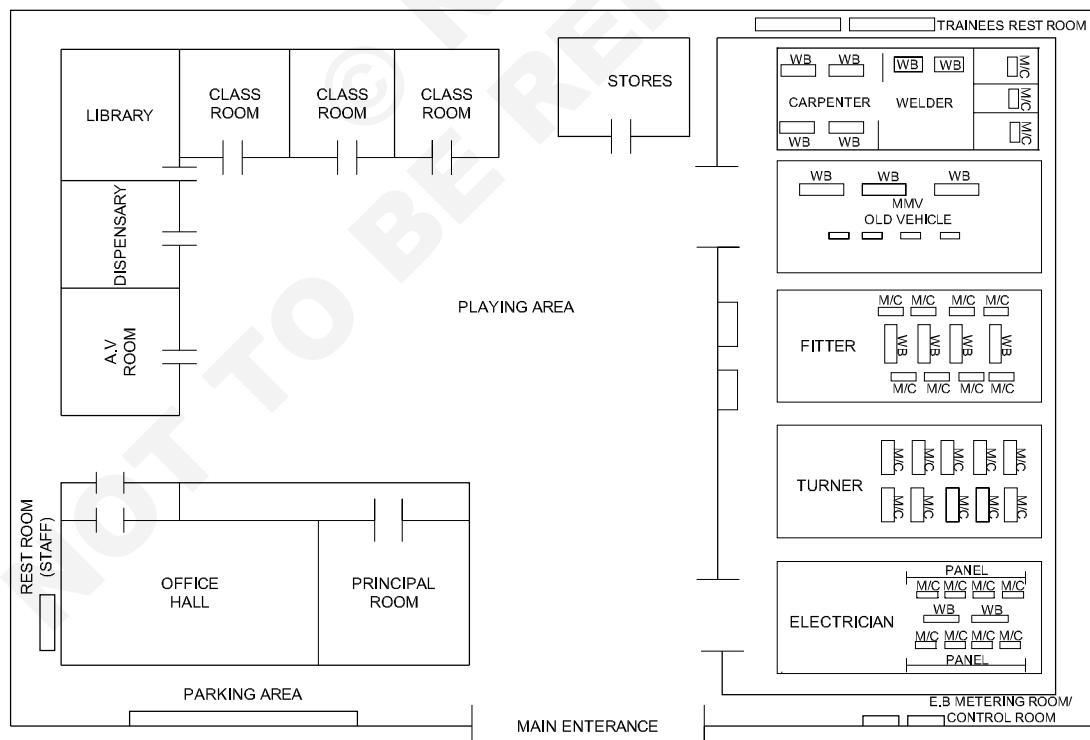
Instructor will lead the new trainees to various sections of the ITI.

- 1 Visit the various sections in your ITI and identify the sections of the ITI. List the trades and record it in your note book.
- 2 Collect the information about the staff members in each trade.

- 3 Identify the location of the ITI with details about the railway and bus stations in the locality and note down the list of bus route numbers which ply near the ITI.
- 4 Collect the telephone numbers of the ITI office, nearest hospitals, nearest police station and the nearest fire station and record.
- 5 Draw the layout of your ITI showing various trades.

Note :A Sample layout of the ITI (Fig 1) is given for your reference. Now draw the new layout of your ITI, with the trades/sections.

Fig 1



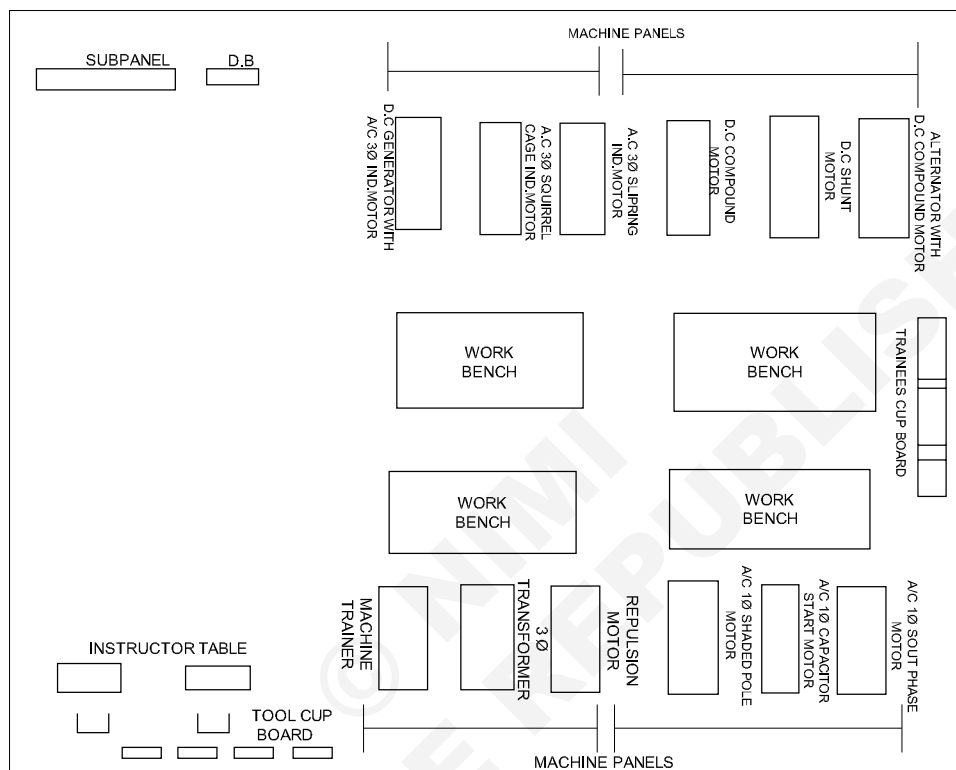
TASK 2: Draw the layout of your section in the ITI

- 1 Draw the plan of your section to a suitable scale in a separate sheet of paper (A4 size).
- 2 Take the length and the breadth measurements of machine foundations, work benches, panels, wiring cubicles, doors, windows, furniture, etc.
- 3 Draw the layout of the machines, work benches, panels and furniture.

The section plan should be in the same scale as in step 1 as per the actual placement of the machine foundations, panels, furniture, work benches etc.

Note : The sample layout of a typical electrician trade section is given for your reference (Fig 2). You have to draw your section's layout using the sample as reference.

Fig 1

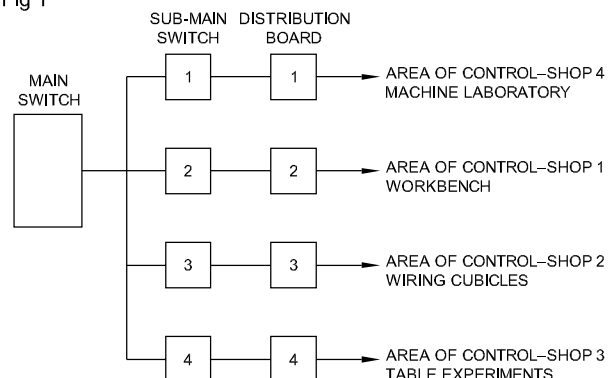


GE20N110111

TASK 3: Identify the locations of electrical installations

- 1 Identify the main switch and mark its position in the layout. (Fig 1)
- 2 Identify each of the sub-main switches, the area of control in the section and mark them on the layout.
- 3 Identify 3 or 4 spots in various locations of the electrician sections layout and identify the respective sub-main switches.
- 4 Practice switching 'off' the control switches, depending upon the area of control, imagining that victim are electrocuted in a specific location/spot.

Fig 1



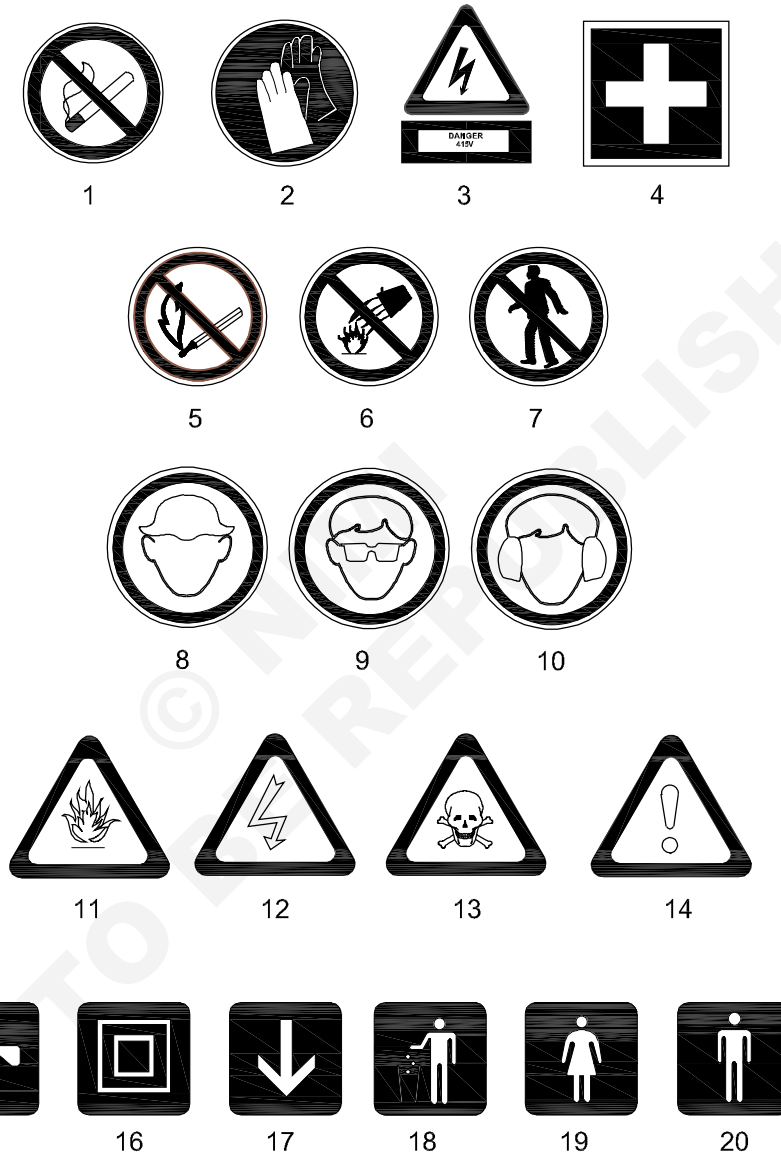
GE20N110111

Identify Safety Signs for Danger, Warning, Caution & Personal Safety Message

Objectives: At the end of this exercise you shall be able to

- identify the basic categories of safety sign
- record the meaning of safety sign in the table given.

Fig 1



GE20N1102-H1

Job Sequence

Instructor shall provide various safety signs, chart categories and explain their meaning, description. Ask the trainee to identify the sign and record in Table 1.

- Identify the safety sign from the chart.
- Record the name of the category in Table 2.
- Mention the meaning description of the safety sign in Table 1.

Table 1

Fig. No.	Basic Categories/Safety sign	Meaning - description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

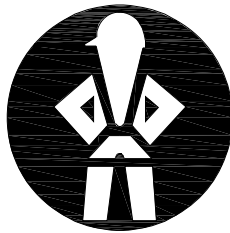
- Get it checked by your instructor.

Use of personal protective equipment (PPE)

Objectives: At the end of this exercise you shall be able to

- identify personal protective devices
- interpret the different types of personal protective devices
- identify occupational hazards and the corresponding potential hazards.

Fig 1



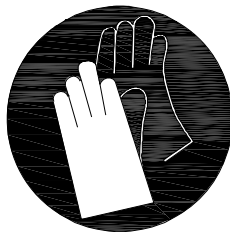
1



2



3



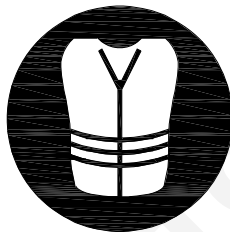
4



5



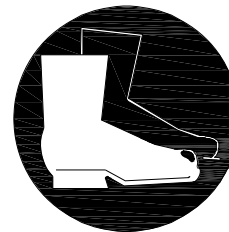
6



7



8



9

GE20N1103H1

Job Sequence

- Read and interpret the visuals of personal protective equipment on real devices or from the charts.
- Identify and select personal protective equipment used for different types of protection.
- Write the name of the PPE and the corresponding type of protection and the hazards in table 1.

The instructor shall display the different types of personal protective equipments or charts and explain how to identify and select the PPE devices suitable for the work and ask the trainees to note down the hazards and type of protection in the Table 1.

TASK 1:

Table 1

S.No.	Name of the PPE	Hazards	Type of protection
1			
2			
3			
4			
5			
6			
7			
8			
9			

- Get it checked by your instructor.

TASK 2:

Instructor may brief the various types of occupational hazards and their causes.

- Identify the occupational hazard and the corresponding situation with the potential harm and record it in Table 2.

Table 2

S.No.	Source or potential harm	Type of occupational hazards
1	Noise	
2	Explosive	
3	Virus	
4	Sickness	
5	Smoking	
6	Non control device	
7	No earthing	
8	Poor house keeping	

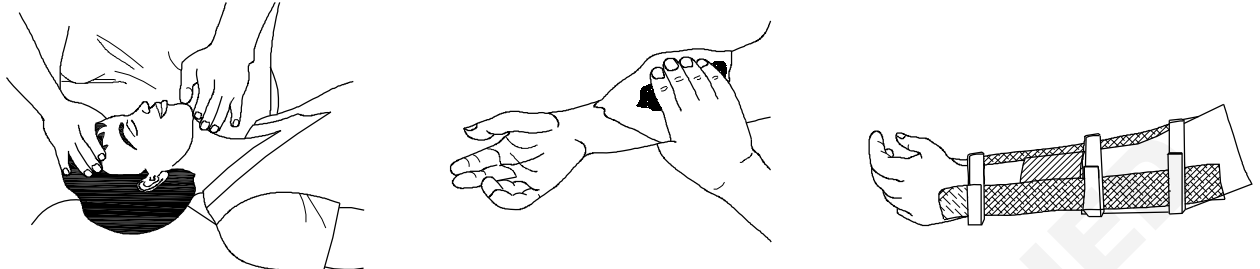
- Fill up and get it checked by your instructor.

Practice Elementary First Aid

Objectives: At the end of this exercise you shall be able to

- rescue breathing for an unconscious victim of different condition
- perform treatment for stopping of bleeding.

Fig 1



GE20N1104:H1

Job Sequence

Assumption - For easy manageability, Instructor may arrange the trainees in group and ask each group to perform one method of resuscitation.

TASK1: Prepare the victim to receive artificial respiration

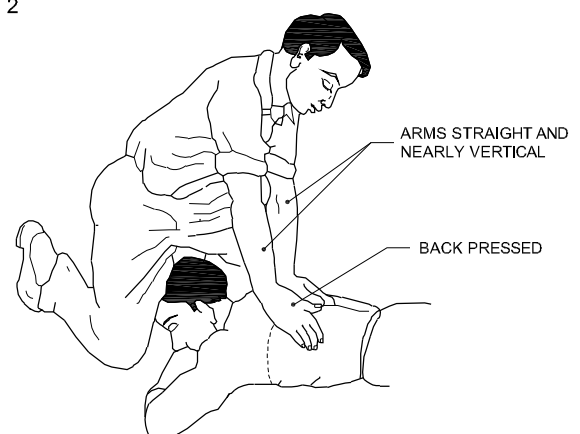
- 1 Loosen the tight clothing which may interfere with the victim's breathing.
- 2 Remove any foreign materials or false teeth from his mouth and keep the victim's mouth open.
- 3 Bring the victim safely to the level ground, taking necessary safety measures.
- 4 Start artificial respiration immediately without delay. Do not waste too much time in loosening the clothes or trying to open the tightly closed mouth.
- 5 Avoid violent operations to prevent injury to the internal parts of the victim.
- 6 Send word for a doctor immediately.

TASK 2: Resuscitate the victim by Nelson's arm - Lift back pressure method

Nelson's arm-lift back pressure method must not be used in case there are injuries to the chest and belly.

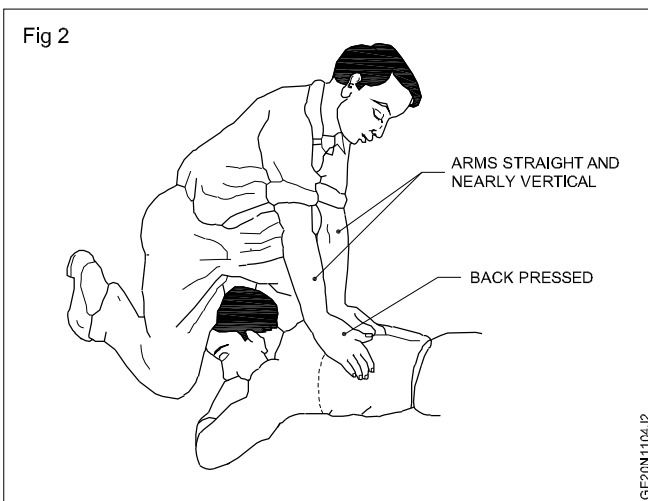
- 1 Place the victim prone (that is face down) with his arms folded with the palms one over the other and the head resting on his cheek over the palms. Kneel on one or both knees near the victim's hand. Place your hands on the victim's back beyond the line of the armpits, with your fingers spread outwards and downwards, thumbs just touching each other as in Fig 1.

Fig 2

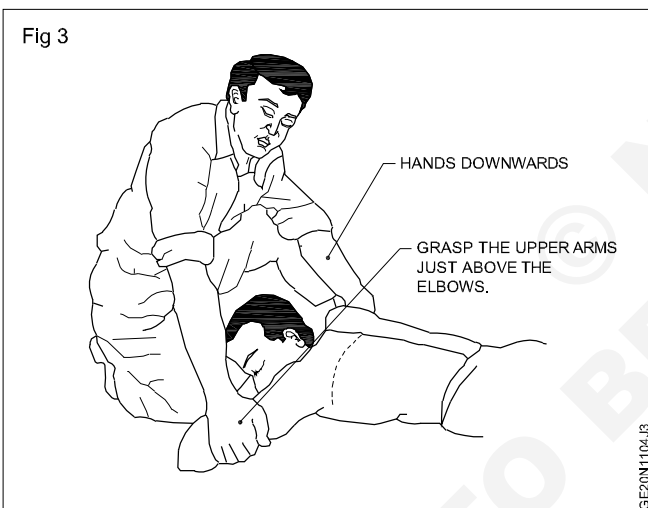


GE20N1104:J2

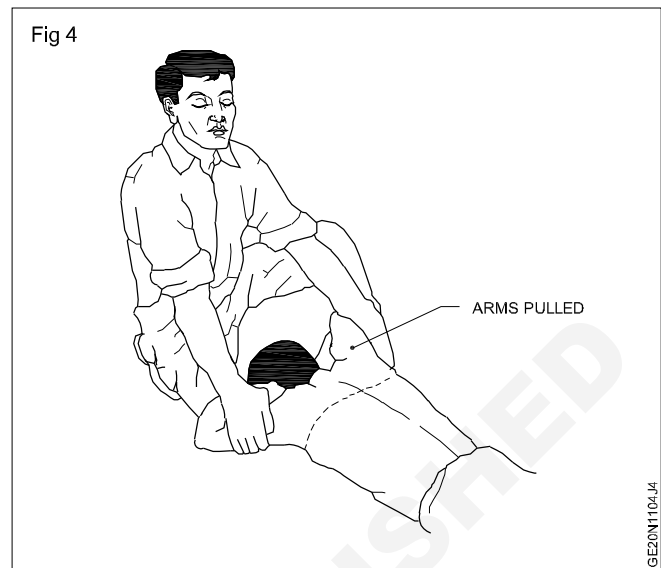
- 2 Gently rock forward keeping your arms straight until they are nearly vertical, and steadily pressing the victim's back as shown in Fig 2 to force the air out of the victim's lungs.



- 3 Synchronise the above movement of rocking backwards with your hands sliding downwards along the victim's arms, and grasp his upper arm just above the elbows as shown in Fig 3. Continue to rock backwards.



- 4 As you rock back, gently raise and pull the victim's arms towards you as shown in Fig 4 until you feel tension in his shoulders. To complete the cycle, lower the victim's arms and move your hands up to the initial position.



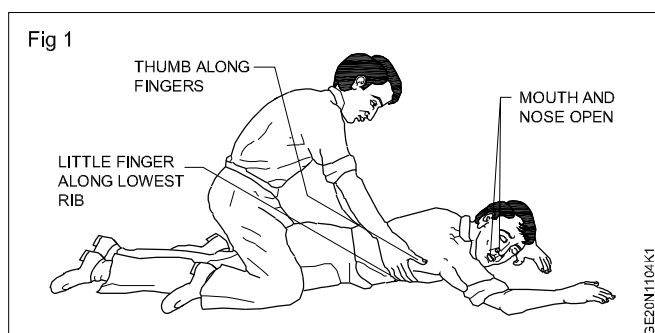
- 5 Continue artificial respiration till the victim begins to breathe naturally. Please note, in some cases, it may take hours.
- 6 When the victim revives, keep the victim warm with a blanket, wrapped up with hot water bottles or warm bricks; stimulate circulation by stroking the insides of the arms and legs towards the heart.
- 7 Keep him in the lying down position and do not let him exert himself.

Do not give him any stimulant until he is fully conscious.

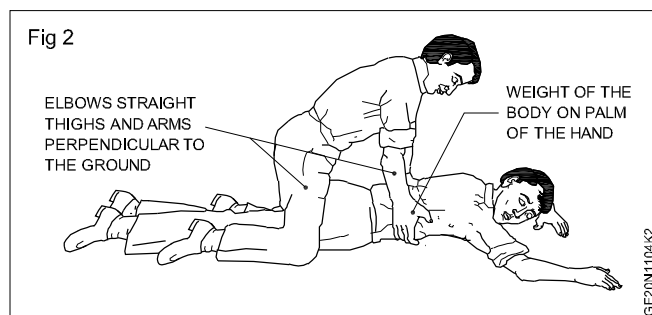
TASK 3: Resuscitate the victim by Schafer's method

Do not use this method in case of injuries to victim on the chest and belly.

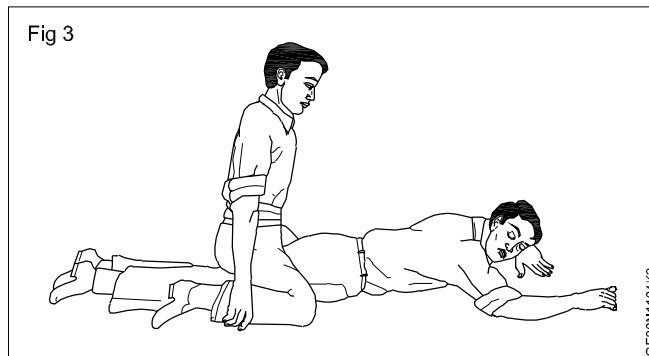
- 1 Lay the victim on his belly, one arm extended direct forward, the other arm bent at the elbow and with the face turned sideward and resting on the hand or forearm as shown in Fig 1.
- 2 Kneel astride the victim, so that his thighs are between your knees and with your fingers and thumbs positioned as in Fig 1.



- 3 With the arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the lower ribs of the victim to force the air out of the victim's lungs as shown in Fig 2.



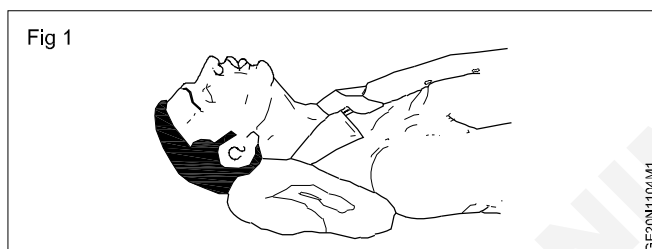
- 4 Now swing backward immediately removing all the pressure from the victim's body as shown in Fig 3, thereby, allowing the lungs to fill with air.



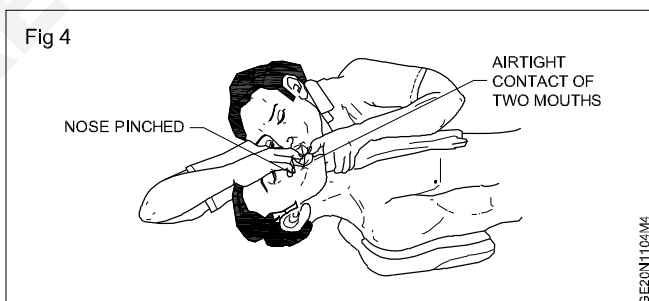
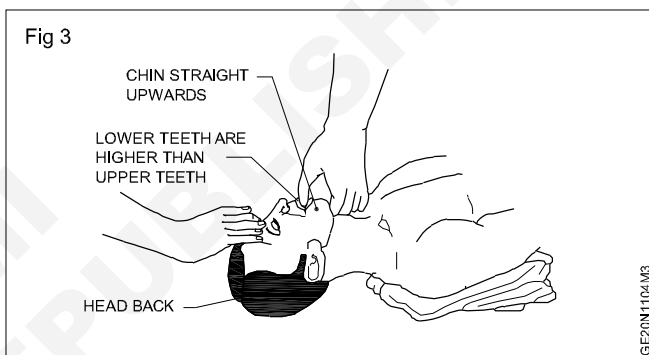
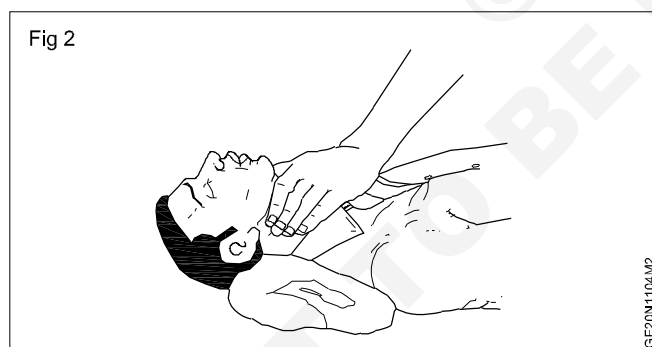
- 5 After two seconds, swing forward again and repeat the cycle twelve to fifteen times a minute.
- 6 Continue artificial respiration till the victim begins to breathe naturally.

TASK 4: Resuscitate the victim by mouth-to-mouth method

- 1 Lay the victim flat on his back and place a roll of clothing under his shoulders to ensure that his head is thrown well back. (Fig 1)



- 2 Tilt the victim's head back so that the chin points straight upward. (Fig 2)



- 3 Grasp the victim's jaw as shown in Fig 3, and raise it upward until the lower teeth are higher than the upper teeth; or place fingers on both sides of the jaw near the ear lobes and pull upward. Maintain the jaw position throughout the artificial respiration to prevent the tongue from blocking the air passage.
- 4 Take a deep breath and place your mouth over the victim's mouth as shown in Fig 4 making airtight contact. Pinch the victim's nose shut with the thumb and forefinger. If you dislike direct contact, place a porous cloth between your mouth and the victim's. For an infant, place your mouth over his mouth and nose.

- 5 Blow into the victim's mouth (gently in the case of an infant) until his chest rises. Remove your mouth and release the hold on the nose, to let him exhale, turning your head to hear the rushing out of air. The first 8 to 10 breathings should be as rapid as the victim responds, thereafter the rate should be slowed to about 12 times a minute (20 times for an infant).

If air cannot be blown in, check the position of the victim's head and jaw and recheck the mouth for obstructions, then try again more forcefully. If the chest still does not rise, turn the victim's face down and strike his back sharply to dislodge obstructions.

Sometimes air enters the victim's stomach as evidenced by a swelling stomach. Expel the air by gently pressing the stomach during the exhalation period.

TASK 5: Resuscitate the victim by Mouth-to-Nose method

Use this method when the victim's mouth will not open, or has a blockage you cannot clear.

- 1 Use the fingers of one hand to keep the victim's lips firmly shut, seal your lips around the victim's nostrils and breathe into him. Check to see if the victim's chest is rising and falling. (Fig 1)
- 2 Repeat this exercise at the rate of 10 - 15 times per minute till the victim responds.
- 3 Continue this exercise till the arrival of the doctor.

Fig 1



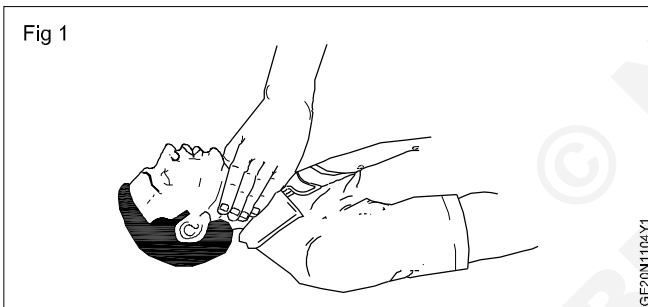
TASK 6: Resuscitate a victim who is under cardiac arrest by (CPR) cardio pulmonary resuscitation

In cases where the heart has stopped beating, you must act immediately.

- 1 Check quickly whether the victim is under cardiac arrest.

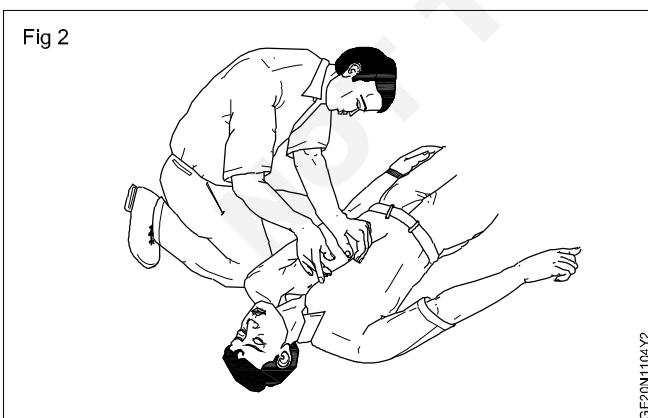
Cardiac arrest could be ascertained by the absence of the cardiac pulse in the neck (Fig 1), blue colour around lips and widely dilated pupil of the eyes.

Fig 1



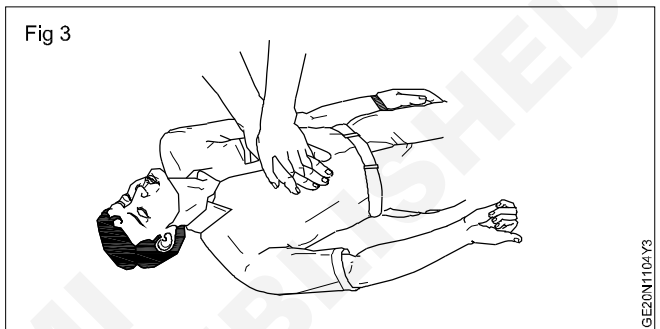
- 2 Lay the victim on his back on a firm surface.
- 3 Kneel alongside facing the chest and locate the lower part of the breastbone. (Fig 2)

Fig 2



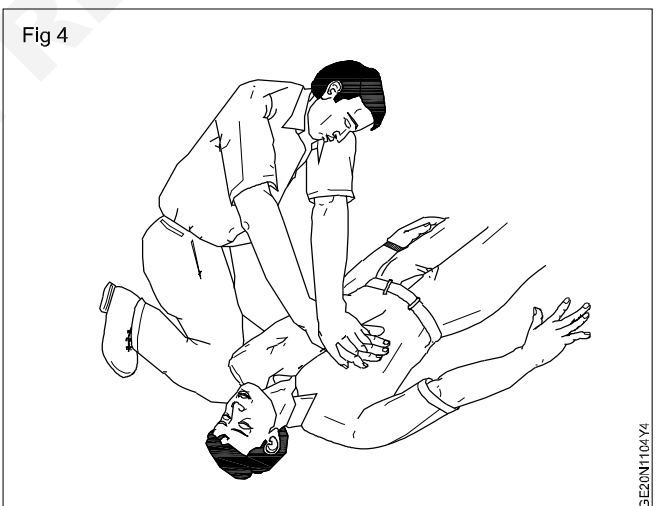
- 4 Place the palm of one hand on the centre of the lower part of the breastbone, keeping your fingers off the ribs. Cover the palm with your other hand and lock your fingers together as shown in Fig 3.

Fig 3



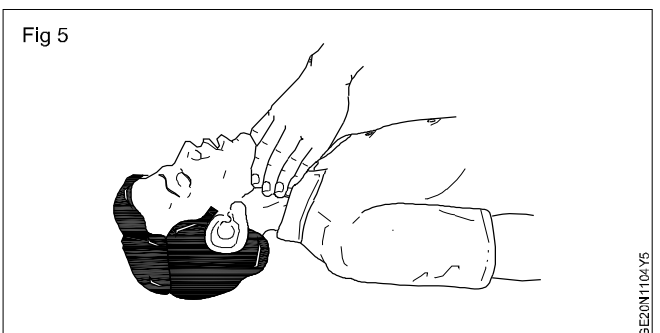
- 5 Keeping your arms straight, press sharply down on the lower part of the breastbone; then release the pressure. (Fig 4)
- 6 Repeat step 5, fifteen times at the rate of at least once per second.

Fig 4



- 7 Check the cardiac pulse. (Fig 5)

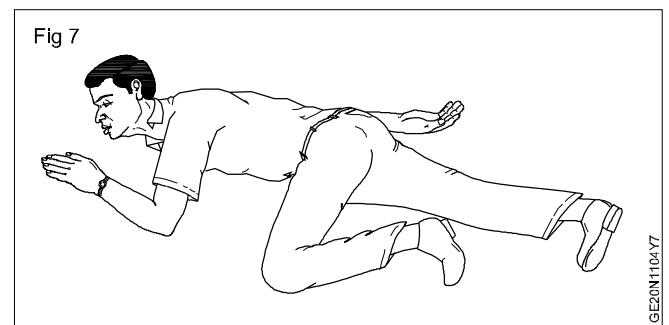
Fig 5



- 8 Move back to the victim's mouth to give two breaths (mouth-to-mouth resuscitation). (Fig 6)



- 11 Place the victim in the recovery position as shown in Fig 7. Keep him warm and get medical help quickly.



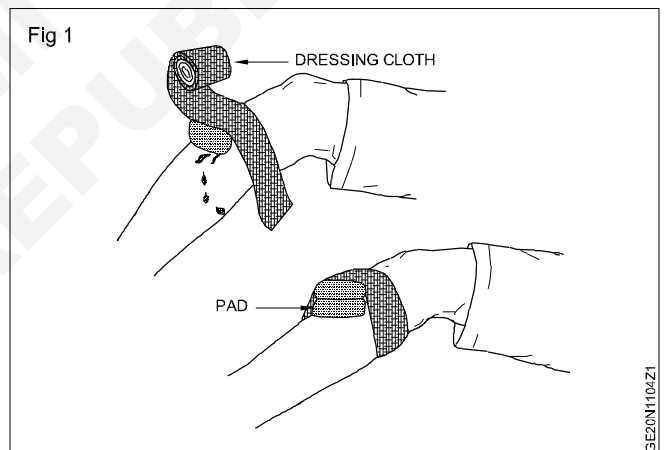
- 9 Continue with another 15 compressions of the heart followed by a further two breaths of mouth-to-mouth resuscitation, and so on, check the pulse at frequent intervals.
- 10 As soon as the heartbeat returns, stop the compressions immediately but continue with mouth-to-mouth resuscitation until natural breathing is fully restored.

Other steps

- 1 Send word for a doctor immediately.
- 2 Keep the victim warm with a blanket, wrapped up with hot water bottles or warm bricks; stimulate circulation by stroking the insides of the arms and legs towards the heart.

TASK 7: Treatment for bleeding victim

- 1 Determine the location of the bleeding.
- 2 Elevate the injured area above the heart if possible.
- 3 Apply direct pressure to the bleeding area with sterile cloth.
- 4 Keep the pressure on for 5 seconds.
- 5 Check to see if the bleeding has stopped if not apply further pressure for 15 minutes.
- 6 Clean the wound.
- 7 Bandage the wound with pad of soft material. (Fig 1)
- 8 Advise victim to take treatment from doctor.

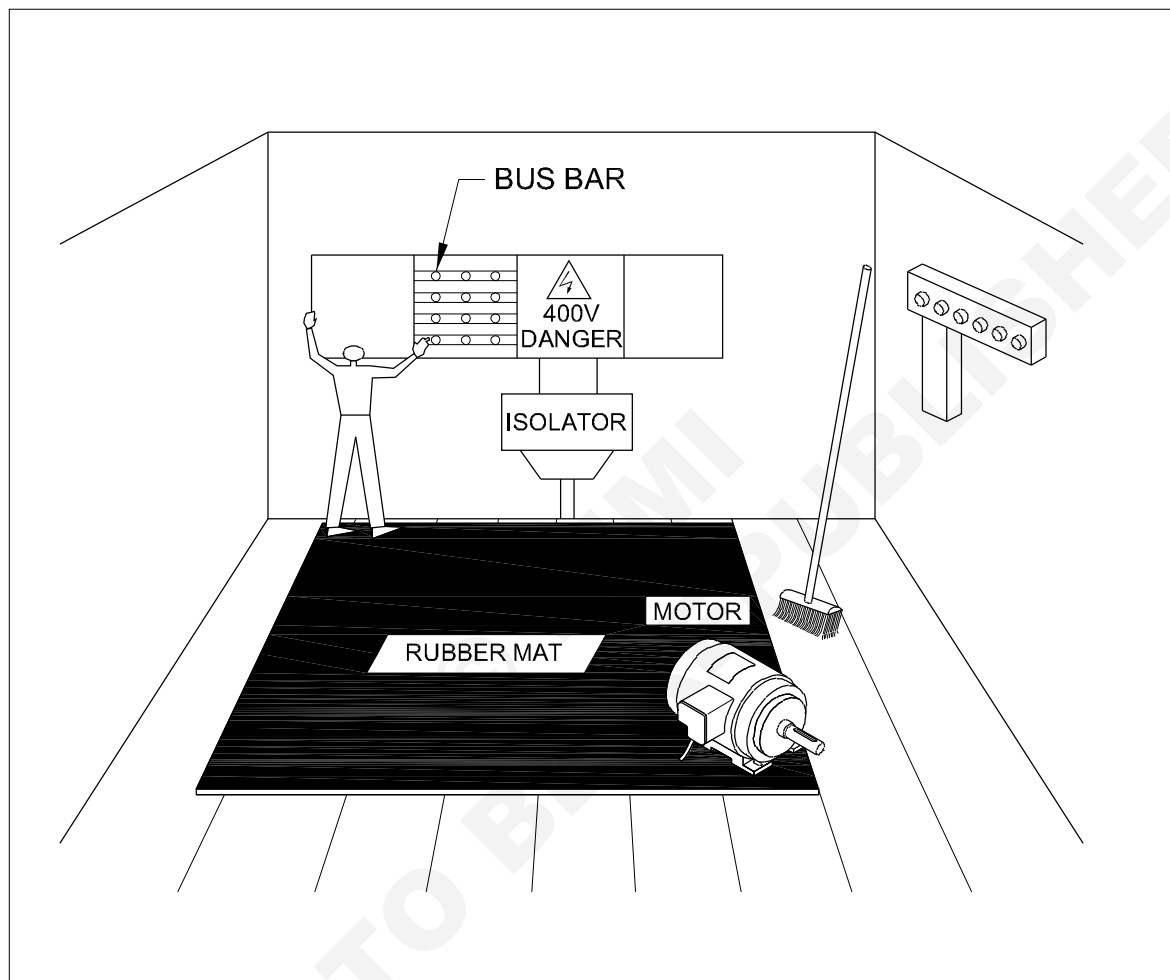


Preventive Measures for Electrical Accidents and Steps to be Taken in Such Accidents

Objective: At the end of this exercise you shall be able to

- rescue a person from live wire.

Fig 1



GE20N1105H1

Job Sequence

Disconnecting a person (mock victim) from a live supply (simulated)

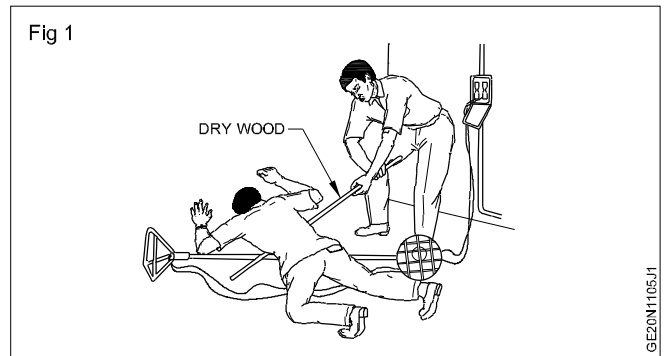
- 1 Observe the person (mock victim) receiving an electric shock. Interpret the situation quickly.
- 2 Remove the victim safely from the 'live' equipment by disconnecting the supply or using one of the items of insulating material.

Do not run to switch off the supply that is far away.

Do not touch the victim with bare hands until the circuit is made dead or the victim is moved away from the equipment.

Push or pull the victim from the point of contact of the live equipment, without causing serious injury to the victim. (Fig.1)

- 3 Move the victim physically to a nearby place.
- 4 Check for the victim's natural breathing and consciousness.
- 5 Take steps to apply respiratory resuscitation if the victim is unconscious and not breathing.

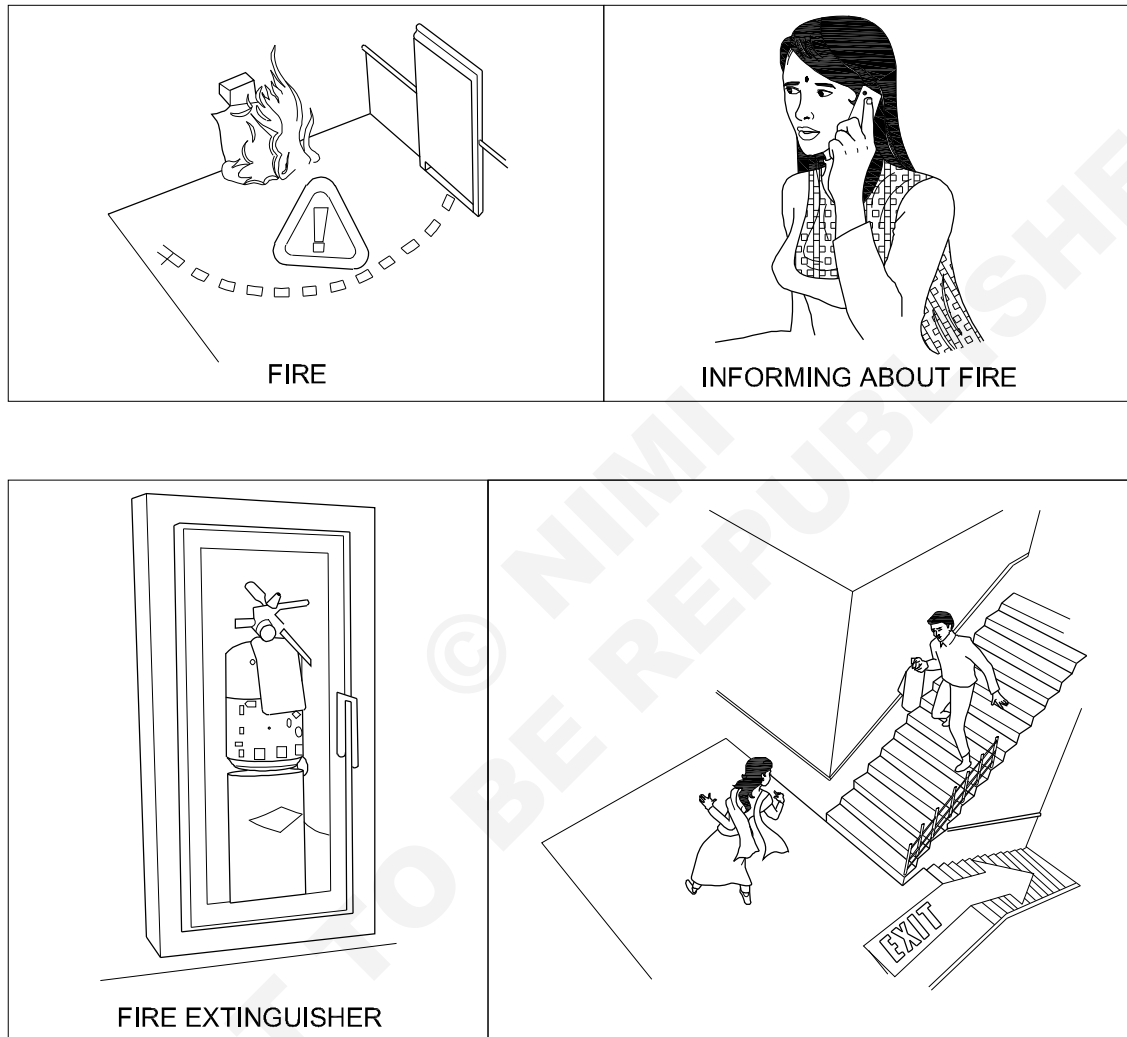


Use of Fire Extinguishers

Objectives: At the end of this exercise you shall be able to

- select the fire extinguisher according to the type of fire
- operate the fire extinguisher
- extinguish the fire.

Fig 1



GE20N1106H1

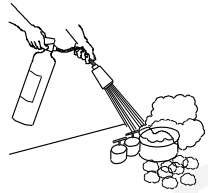
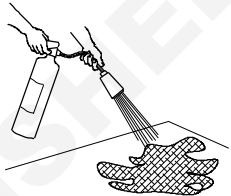

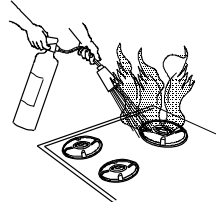
Job Sequence

- Alert people surrounding by shouting fire, fire, fire when observe fire.
- Inform fire service or arrange to inform immediately.
- Open emergency exit and ask them to go away.
- Put "Off" electrical power supply.

Do not allow people to go nearer to the fire

- Analyze and identify the type of fire. Refer Table1.

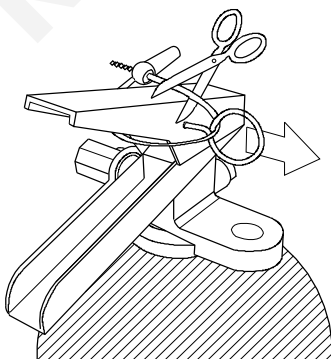
Table 1

Class 'A'	Wood, paper, cloth, solid material	
Class 'B'	Oil based fire (grease, gasoline, oil) & liquefiable solids	
Class 'C'	Gas and liquefied gases	
Class 'D'	Metals and electrical equipment	

Assume the fire is 'B' type (flammable liquefiable solids).

- Select CO₂ (carbon dioxide) fire extinguisher
- Locate and pick up CO₂ fire extinguisher. Check for its expiry date.
- Break the seal. Fig 1.

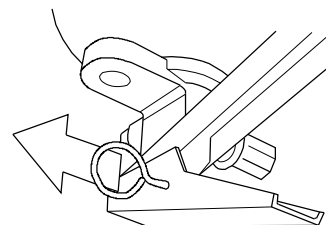
Fig 1



GE20N1106.J1

- Pull the safety pin from the handle (Pin located at the top of the fire extinguisher). (Fig 2)

Fig 2

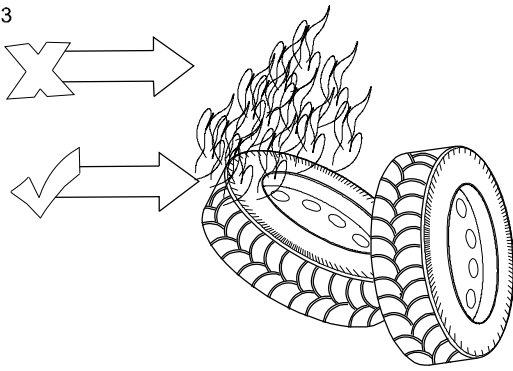


GE20N1106.J2

- Aim the extinguisher nozzle or hose at the base of the fire (this will remove the source of fuel fire) (Fig 3)

Keep your self low

Fig 3



GE20N1106J3

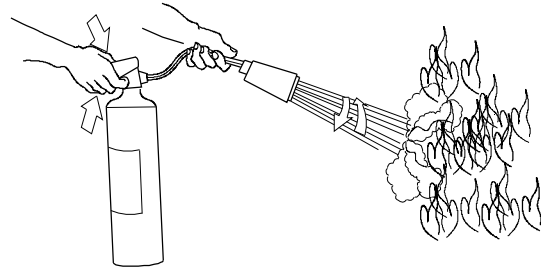
- Squeeze the handle lever slowly to discharge the agent (Fig 4)
- Sweep side to side approximately 15 cm over the fuel fire until the fire is put off. (Fig 4)

Fire extinguishers are manufactured for use from the distance.

Caution

- While putting off fire, the fire may flare up.
- Do not be panic so long as it is put off promptly
- If the fire doesn't respond well after you have used up the fire extinguisher move your self away from the fire point.

Fig 4



GE20N1106J4

- Do not attempt to put out a fire where it is emitting toxic smoke, leave it to the professionals.
- Remember that your life is more important than property. So don't place yourself or others at risk.

In order to remember the simple operation of fire extinguisher

Remember

P.A.S.S. This will help to use fire extinguisher

P for pull

A for aim

S for squeeze

S for sweep

Identify Computer Peripherals and Internal Components of a Disassembled Desktop Computer

Objectives: At the end of this exercise you shall be able to

- identify various input/output device connected to the computer
- identify different controls and ports on the system unit cabinet
- identify the internal parts of a system unit.

Among the three identical PC's, one PC will be used for demonstration by the instructor where as the other two will be used by two groups of trainees.

PROCEDURE

TASK 1 : To identify various input/output devices of connected to the computer

Instructor will show the different input/output devices (available in your lab) connected to the computer and the trainees will make a record of it in Table 1. (Fig 1)

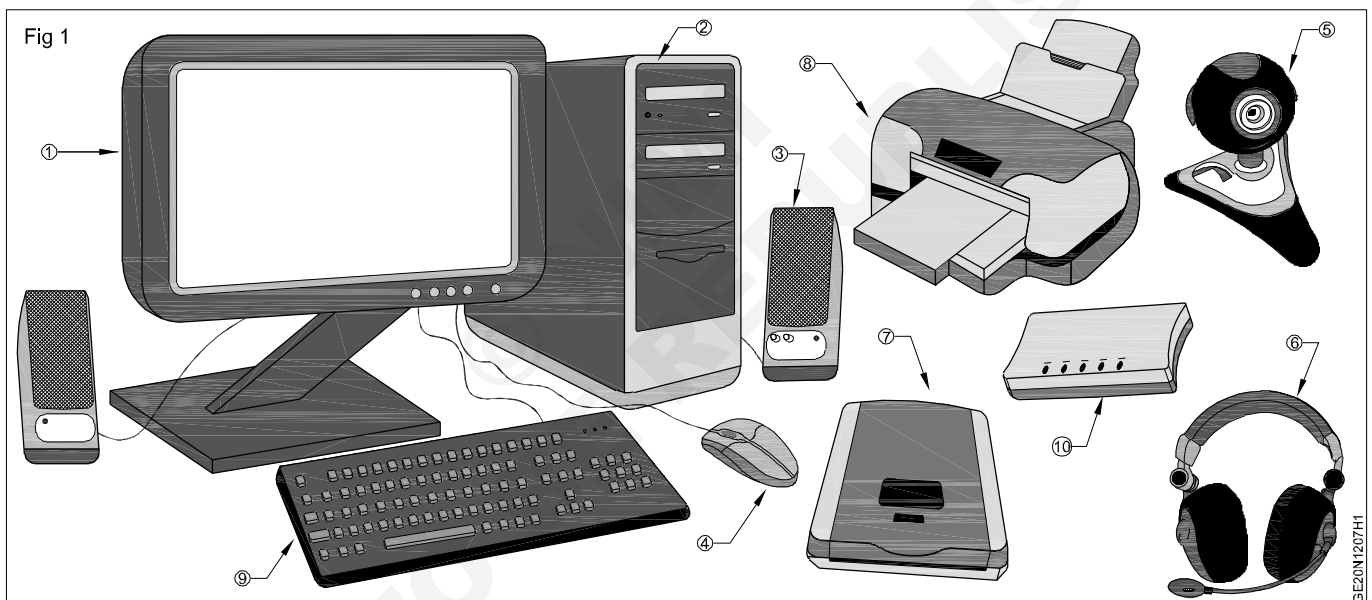


Table 1

Sl. No.	Name of the I/P and O/P devices
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

TASK 2 : Identify different controls, ports and connectors on the system unit cabinet

The instructor will demonstrate the uses of the following indicators ,switches controls in Fig 1 and ports external to the processor found on the system unit shown in and the trainees will make a record of it in Table 2 and Table 3. (Fig 2)

Fig 1



Table 2

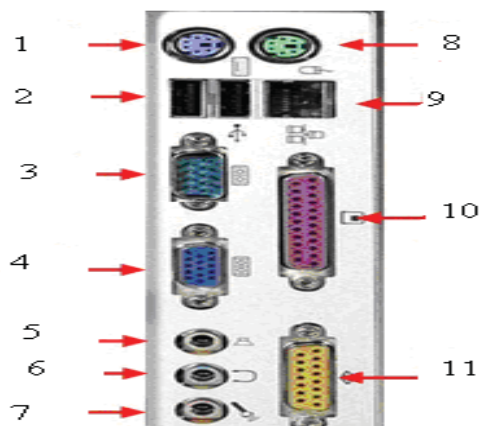
Sl. No.	Name the parts on the CPU Front Panel
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Sl. No.	Name the parts on the CPU Front Panel
13	
14	
15	
16	
17	

Table 3

Sl. No.	Name the Parts on the CPU Rear Panel
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

Fig 2



TASK 3 : Identify the internal parts of a system unit

The instructor will open the system unit (available in your lab)and show the parts of system unit and motherboard components as shown in Fig 1 & Fig 2 and the trainees will make a record of the parts in Table 4 & 5.

Fig 1

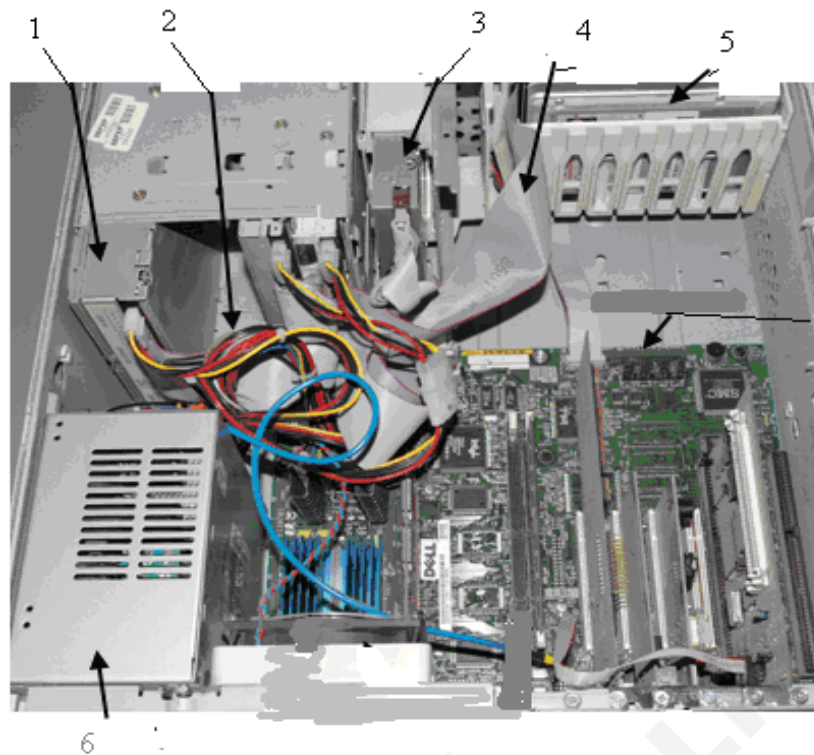


Fig 2

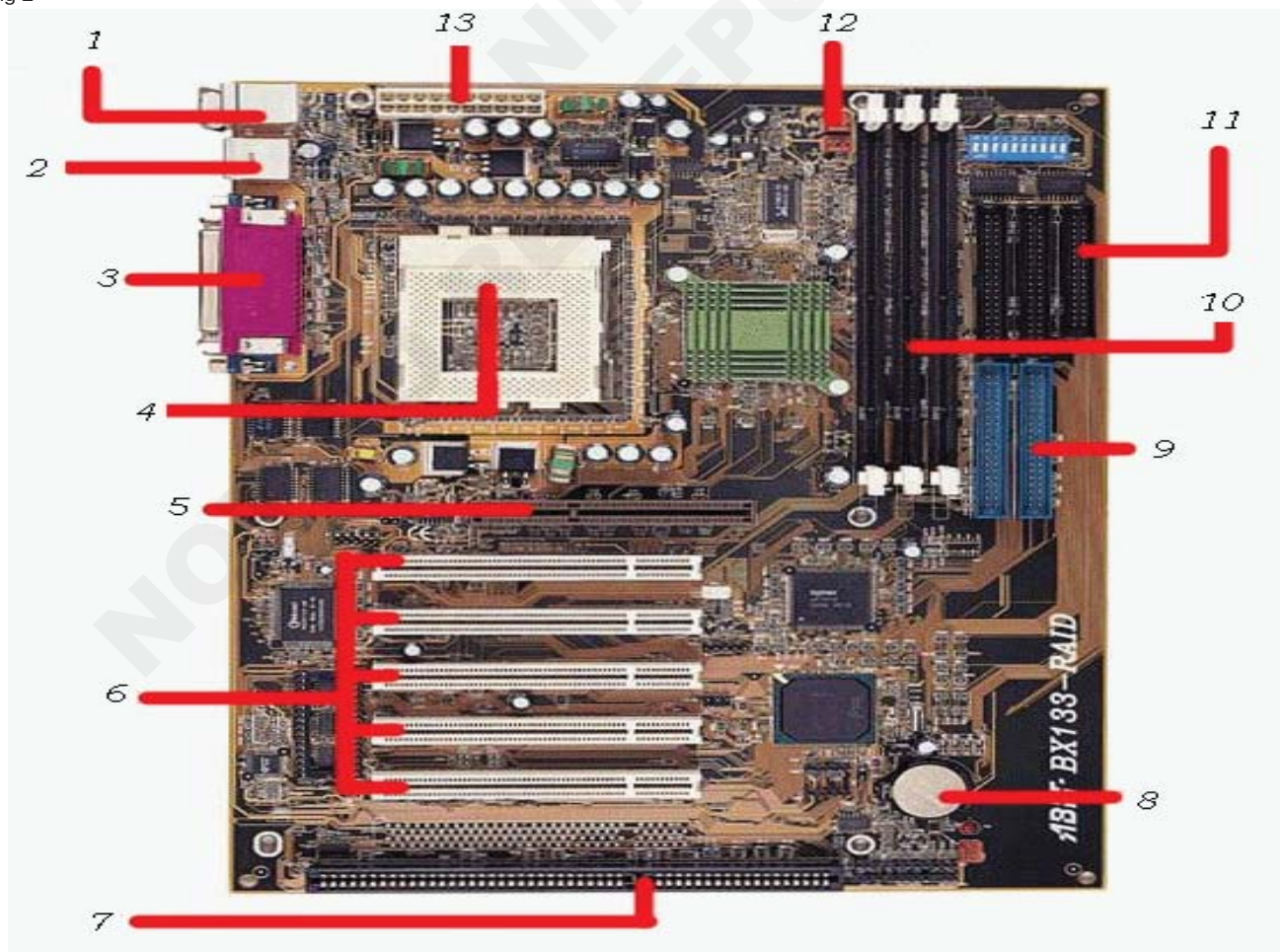


Table 4

Sl.No.	Name the parts of System Unit
1	
2	
3	
4	
5	
6	
7	
8	

Table 5

Sl. No.	Name the parts of Mother board
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	

Assemble Components of Desktop Computer

Objective: At the end of this exercise you shall be able to

- assembling the system hardware components of the personal computer.

Requirements**Tools/Equipments/Instruments**

- CPU (Processor)
- Mother Board
- Floppy Disk Drive
- Hard Disk Drive
- CD or DVD ROM
- Cabinet
- Speakers
- Key Board
- Mouse
- Monitor
- RAM (SD or DR)
- Bus Cables
- Power Cables
- SMPS
- Screw Driver
- Screws
- Printer etc.,

PROCEDURE**1 Mother Board Installation**

- a Open the cabinet on either side

Fig 1



- b The back side of the cabinet has readymade provision for the installation of the I/O shield is used for connecting the input and output devices through it.
- c Check whether the motherboard is placed in such a way that the I/O ports of the motherboard correctly fit in the I/O shields. Ensure all the specified screws for the motherboard are fixed and intact.

Fig 2



Fig 3



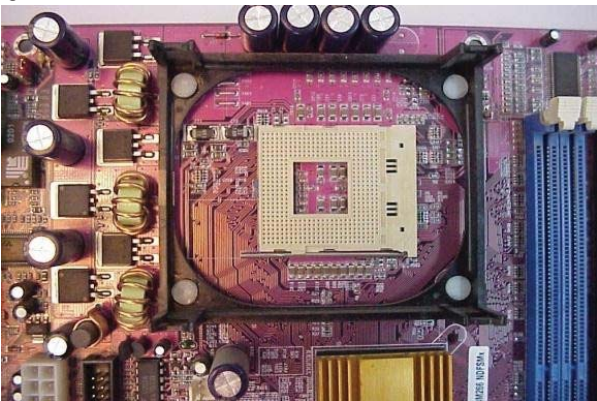
Fig 4



CPU Installations

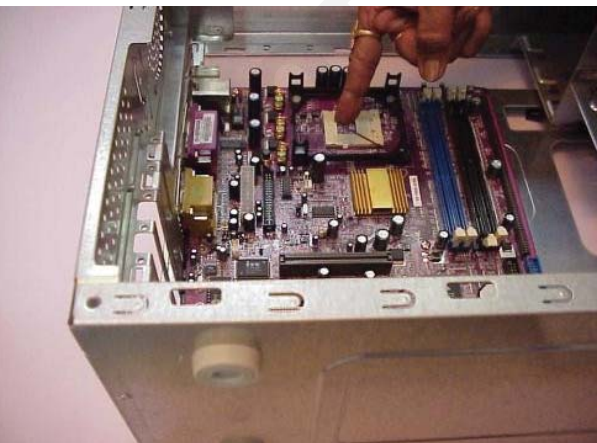
- 1 CPU is one of the most dedicated components of the computer. The CPU pins have to be clearly studied before fixing into the relevant processor space on the motherboard. After the CPU is rightly placed in its position the lever is to be locked.

Fig 5



- 2 As a part of the CPU installation, before the CPU is fixed in the right position a lever is provided, which needs to be unlocked. This lever is perpendicular to the motherboard.

Fig 6



- 3 The CPU, which is a square shaped electronic component, comes with pins below it. One should find for an indication on one of the corners of the CPU on both sides. This arrow mark is also found on the motherboard which guides for the fixation of the CPU. Once match of the pins versus motherboard slot gently push the CPU.

Fig 7



- 4 After the CPU is rightly placed in its position, the lever is to be locked.

Fig 8



CPU heat sink fan installation

- 5 The CPU heat sink fan is to be carefully plugged on to the CPU by pushing down the metal plastic clips.

Fig 9



- 6 The metal / plastic clips provided with heat sink fan found fix on to the CPU socket and have to be locked.

Fig 10



- 7 Once the CPU het sink fan is fixed and locked, it should be connected to the Power supply availabel on the motherboard through the power connector.

Fig 11



RAM Installation

- 8 Next is installing the RAM. Insert the RAM into an availabel expansion socket. Note how the RAM is keyed to the socket. This ensures the RAM can be plugged into the socket one way only. Finally press the RAM firmly into position, making certain the RAM is completely seated in the socket.

SMPS Installation

- 9 Next is installing the SMPS. This is an electronic power supply unit that provides and regulates the power supply to all components of a computer system. As shown inthe diagram the SMPS needs to install into cabinet at the place provided for it.
- 10 After placing the SMPS into the relevant provider space fix the outer screws to it intact.
- 11 Next installing the ATX power connector. It is a 20/24 - pin power connector. This is the primary power supply to the motherboard.

Fig 12

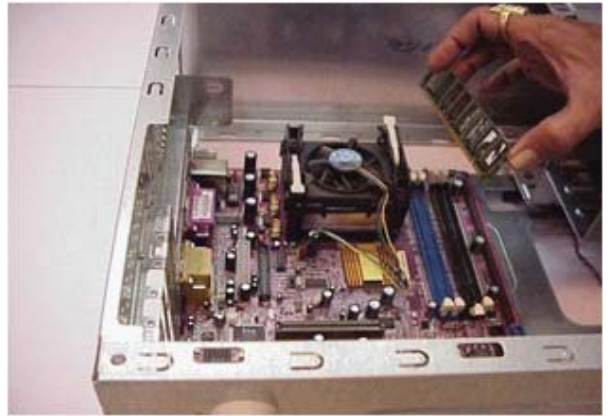


Fig 13



Fig 14



Fig 15



Fig 16

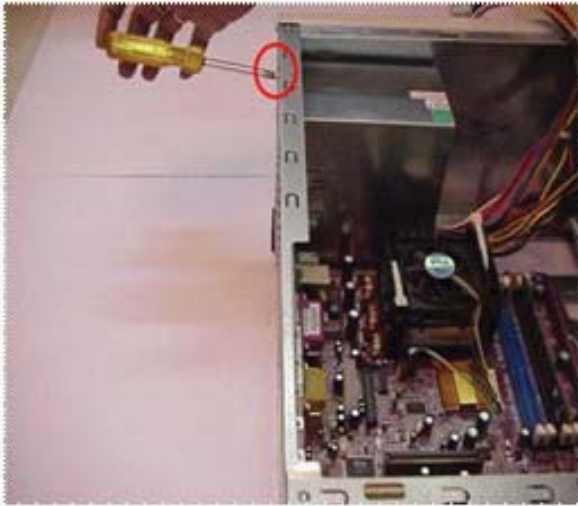


Fig 17



Fig 18



Hard Disk Drive Installation

12 Installing the Hard Disk Drive (HDD) is clearly understood in the following steps. First see the rear of the HDD. It consists of the 3 types of pins. One left side the HDD has multiple pins termed as the IDE connector. In the middle is the jumper setting pins for the HDD. On the extreme right side is the power connector pins. Every device except FDD (Floppy Disk Drive) uses this type of power connector. And

HDD and CDD (Compact Disk Drive) connected by this type of IDE cable.

Fig 19

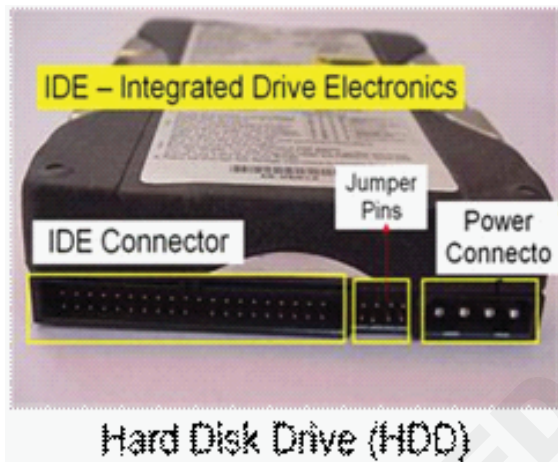


Fig 20

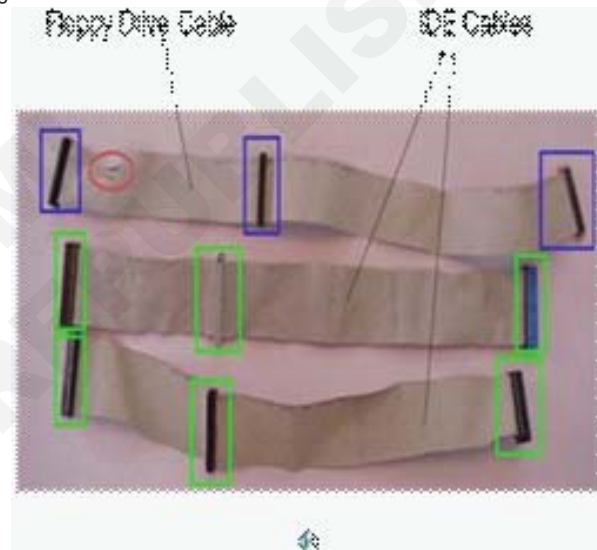


Fig 21



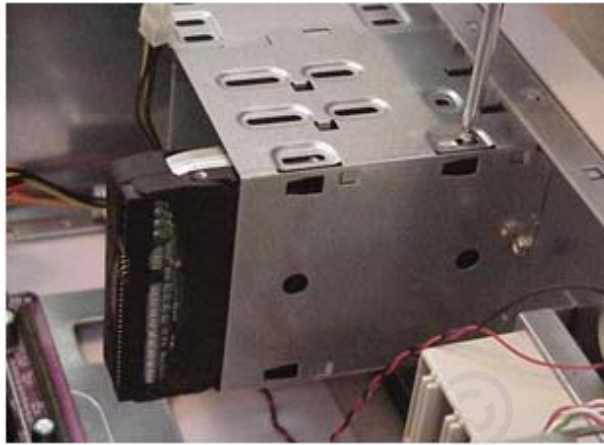
Power Connector

- 13 Mount the HDD into mounting slot meant for the HDD with the rear end facing and secure the inner screws intact.

Fig 22



Fig 23



- 14 Connect the IDE cable to the HDD as well as the motherboard as shown in the Figure.

Fig 24



- 15 Remember for all the power connectors to be plugged in, one needs to align the Red line on the cable Pin-1 of the IDE port. Hence connect the power cable to the HDD rear end by gently pushing the connector.

Floppy Disk Drive Installation

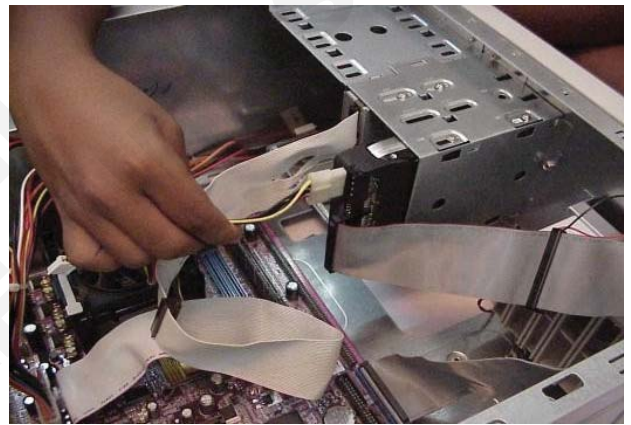
- 16 Installation of a Floppy Disk Drive (FDD) is very similar to the HDD installation. We need to identify the

relevant pins for the motherboard and power supply connectivity. First step in the FDD installation is mounting of the FDD into the FDD mounting slot by removing the cover of front side of the cabinet as shown in the figure below.

Fig 25



Fig 26



- 17 Push the FDD case into opened of the cabinet curtaining of the FDD

Fig 27



- 18 Secure FDD with inner screws.
19 Connect the one end of cable to motherboard and other to end to FDD.
20 Connect the power connector to the FDD.

Fig 28



Fig 31

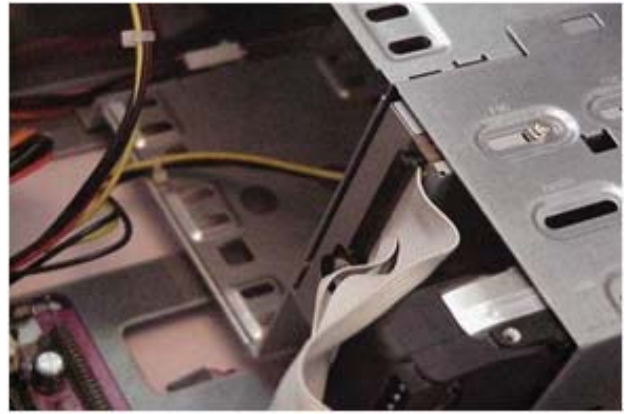


Fig 29



Fig 32



Fig 30



Fig 33



CD ROM Installation

21 Next installing the CD-ROM. Remove the cover of front side of the cabinet curtaining of the CD-ROM.

22 Push CD - ROM case into opened space.

23 Secure CD-ROM with inner screws.

24 Connect the one end of the cable to motherboard and another end to CD-ROM.

Fig 34



Fig 35

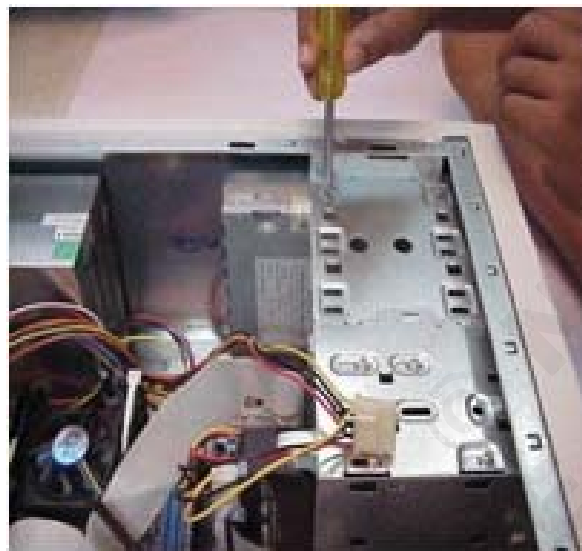


Fig 36



Fig 37



25 Connect the power connector to the CD-ROM.

Fig 38



Switches and LEDs connection

26 Installing the switches and LEDs of front side of the cabinet. Please refer to your motherboard manual to locate where the connectors are. Different motherboards place the connectors in different locations. The connectors for the switches and LEDs are normally grouped together. They should look similar to the figure given below.

Fig 39



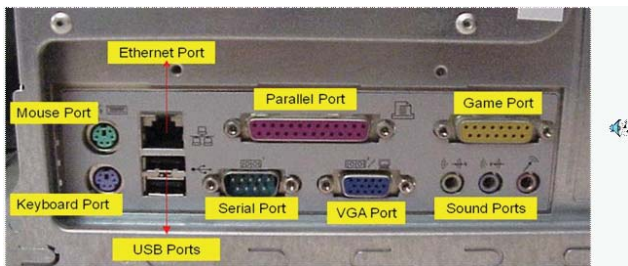
Fig 40



IO Devices Installations

27 Finally connect all peripheral devices like mouse, keyboard, monitor, etc, to the I/O ports shown in the figure below.

Fig 41



a Keyboard

Keyboard has round shape connectors. The male connectors appears at the edge of the keyboard's cable and the female connector appears at the back side of the system unit. We are using the 6 pins round keyboard connector.

b Mouse

The mouse connector is same as the keyboard connector appears at the edge of mouse cable and female connectors appears at the backside of the system. It is also having 6 pins to connect the mouse.

Fig 42



c Monitor

The monitor of computer had 'D' shape connectors. The male Monitor connector has 15 pins and it appears at the edge of monitor's cable. The female monitor connector appears at the back of the system unit.

Fig 43



d Printer

Printer connector is the oldest connector of a computer. The male printer connector has 25 pins and it appears at the edge of the printer cable and the backside of the system unit.

e Audio / Speaker

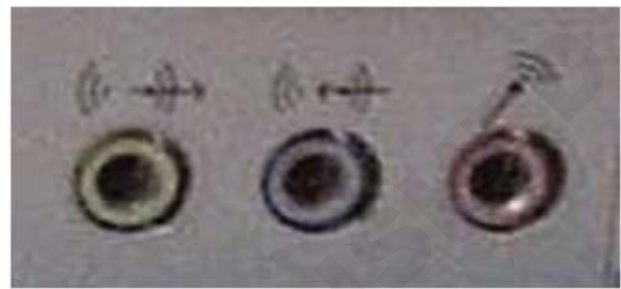
For audio effect we are using speakers. The audio male connector have single thick pin and each male connector of individual speaker is distinguish

with separate color. The male connectors appear at the edge of the speaker cables. The female audio connectors appear in same color at the back side of the system unit. The female audio connectors have some special symbols i.e.

Fig 44



Fig 45



1 The first symbol displays "line-out"

2 The second symbol displays "line-in"

3 The third symbol displays "Mic-in"

Line - out it sends the out put to speakers.

Line - in it takes the input from speakers.

Mic - in it takes the input from microphone.

f Ethernet / Networking

The Ethernet connectors are used when two or more than two computers need to be linked with other over a computer network like LAN (local area network). The shape of male Ethernet connector is quite similar to male modem connector except it is more flat. The female Ethernet connector appears at the back of the system unit.

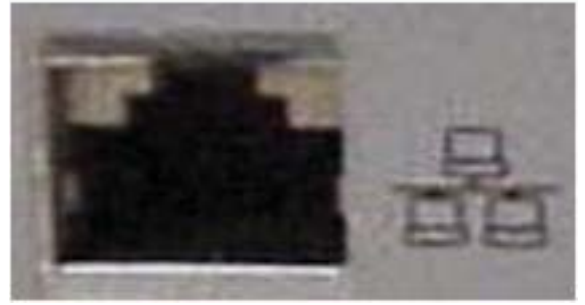
Fig 46



g USB

USB (universal serial bus) is the latest and most popular connector. Using USB connectors, we can connect so many different devices to our computer. Any device equipped with USB has slim male connectors with slim metal coating appearing at the end of the devices cable. For connecting the device, a female USB connector is provided at the back of the system unit. We can identify the USB connector with this symbol

Fig 47



© NIMI
NOT TO BE REPUBLISHED

Geo - Informatics Assistant - Computer Components and Windows Operating System

Practice on Windows Interface and Navigating Windows

Objectives: At the end of this exercise you shall be able to

- identify the files folders and drives in windows 10 desktop
- identify the utilities of Windows10 setting
- advanced search using Cortana
- application setting and pin up to desktop.

Requirements

Tools/Equipments/Instruments

- PC with MS-Office - 1 No. /trainee

PROCEDURE

TASK 1: Identify the files folders and drives in windows 10 desktop

- 1 Open File Explorer  from taskbar or Start Menu.

Another way is by using the shortcut key Windows Logo +E to open File Explorer (Fig 1)

- 2 Select This PC  (Fig 2)

Fig 1

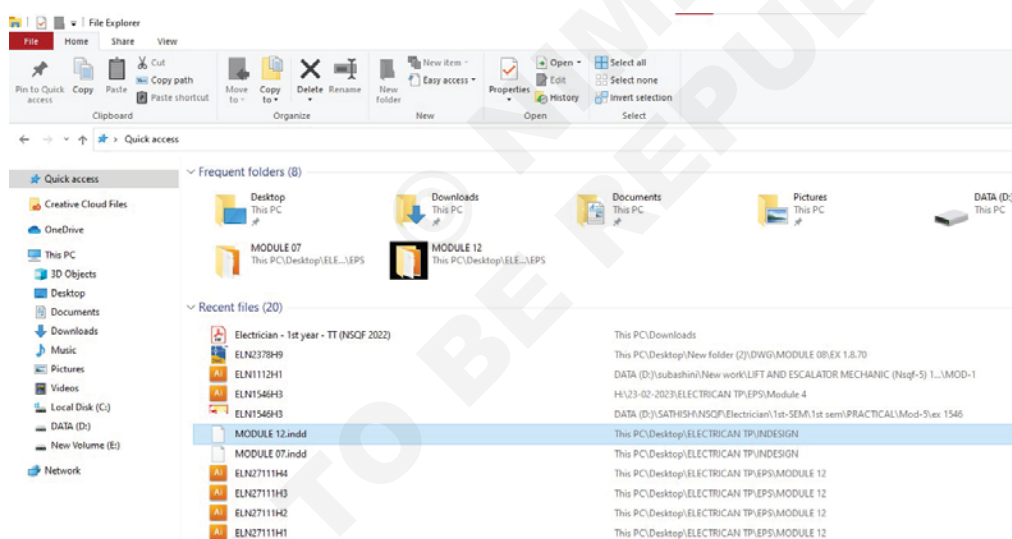
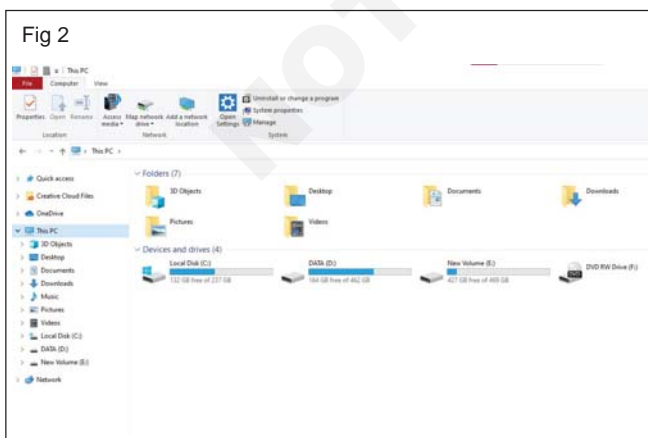


Fig 2



- 4 Select any Drive required and then click the desired file or folder in the drive (Fig 3).

- 5 Record the address of the file chosen (Fig 4).

The address will be displayed in the address bar .Here the location of the selected file is :This PC > Local Disk(D:) > Books

- 6 Close the Window

Fig 3

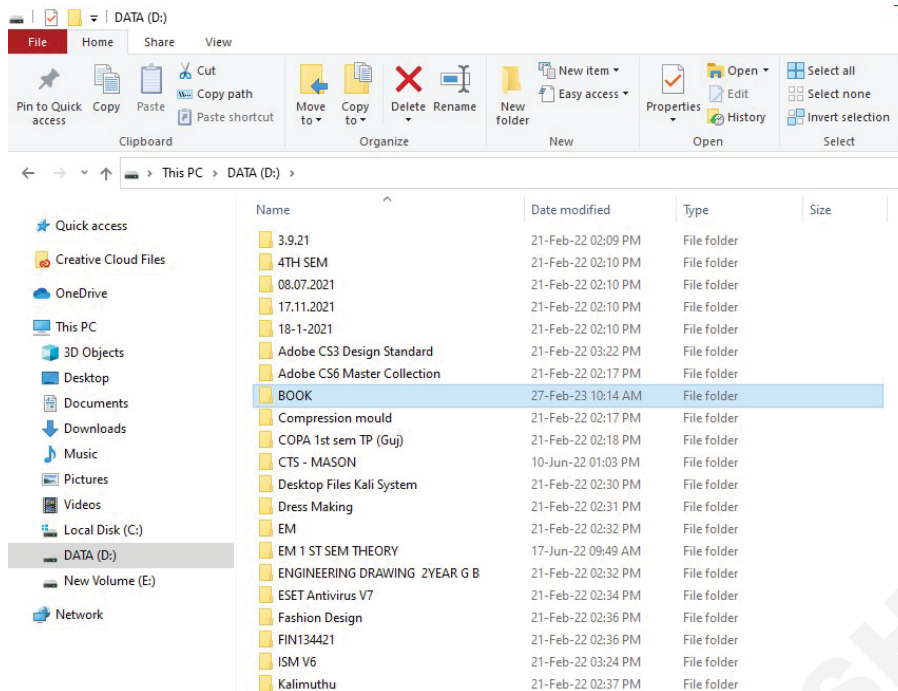
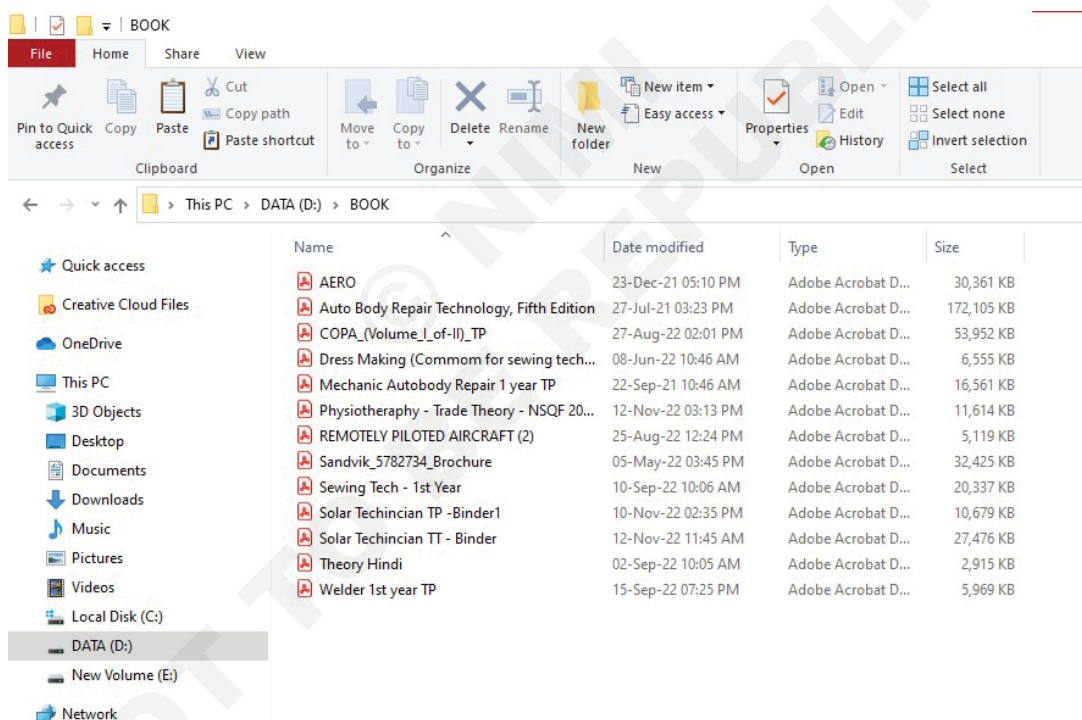


Fig 4



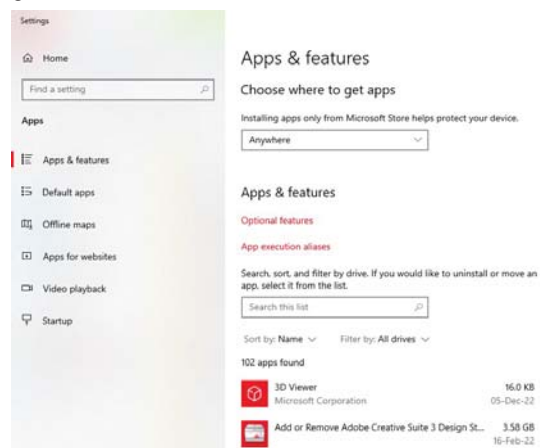
TASK 2: Identify the utilities of Windows10 setting

- 1 Click Windows logo + X to display a menu of Windows tools and utilities (Fig 1).
- 2 Click on Apps and Features to identify the utilities in Window 10 (Fig 2).
- 3 Click on Default apps and note down the apps that are present in your system by default.
- 4 To change the date and time or background, go back to the menu of Windows tools and utilities(Windows logo + X)

Fig 1

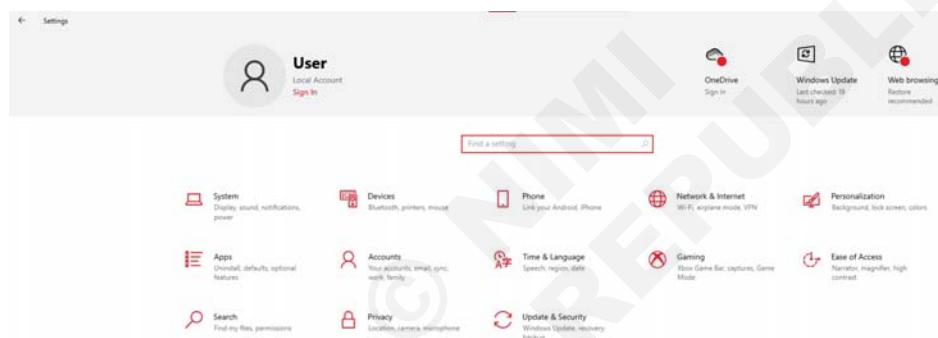


Fig 2



- 5 Select Settings
- 6 Click Personalization or Time & Language to change the settings of the system.
- 7 Click OK to apply the changes and close the Window. (Fig 3).

Fig 3



TASK 3: Advanced search using Cortana

- 1 Click inside the taskbar's Search box.
- 2 Click Next to search with Cortana. (Fig 1).
- 3 Ana, select the Notebook icon and then select Settings
- 4 After the initial set up with setting you can go for advanced search. (Fig 2)

Fig 1

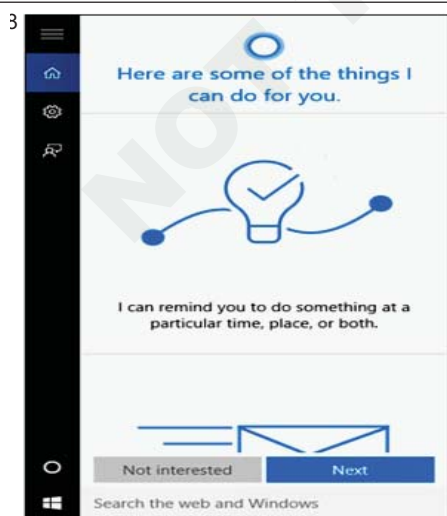
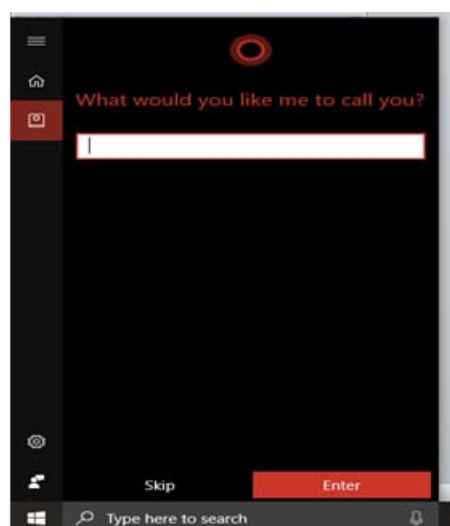
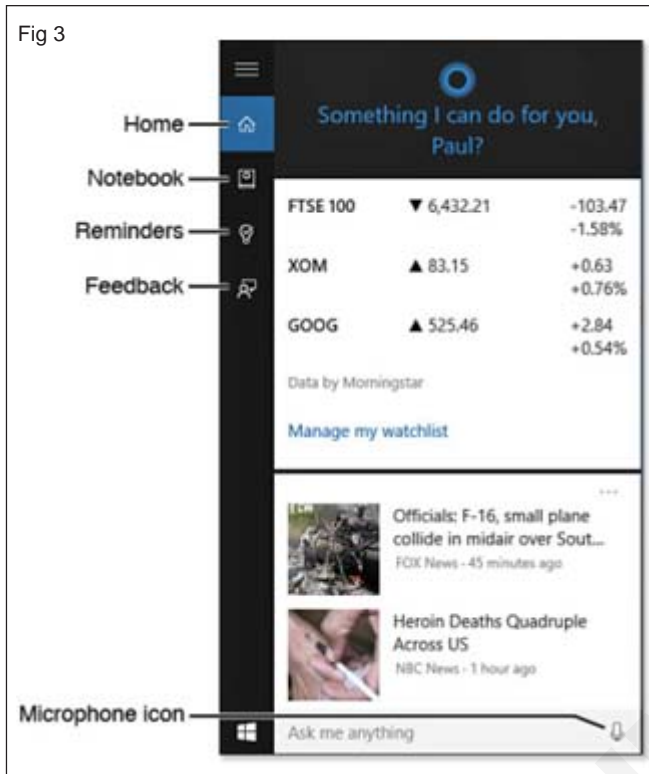


Fig 2



- 5 Search about Window 10 by speaking to Cortana. Press the Microphone icon.
- 6 Say "HeyCortana : Window 10 " to search via voice commands. (Fig 3)

Fig 3



If "Hey Cortana" is not enabled on your device, then use the Windows key + Shift + C keyboard shortcut and say your search term.

- 7 To search for anything in the web , type in the search box and click the title of the category to see more results.

You can also use the command web: search wordsin thesearchbox , to directly search in the web. (Fig 4)

- 9 To search for any files or folders in the computer, type the file/folder name in the search box and click the category as documents (Fig 5)
- 10 To search for topics limited to within the app itself, type the search words and press enter. (Fig 6)
- 11 Record the weather of your place by using Cortana and perform the mathematical calculation of $42+8/23$ and 678×45 .
- 12 Close the window.

Fig 4

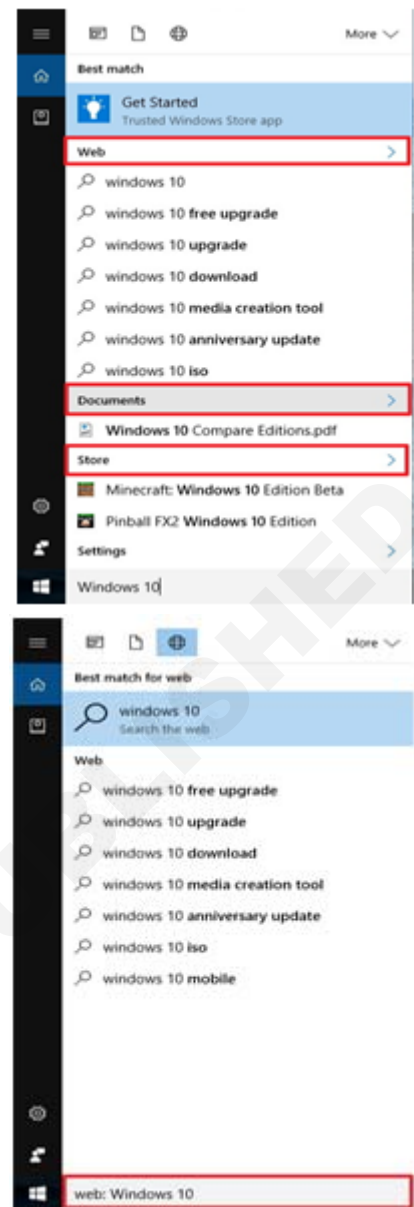


Fig 5

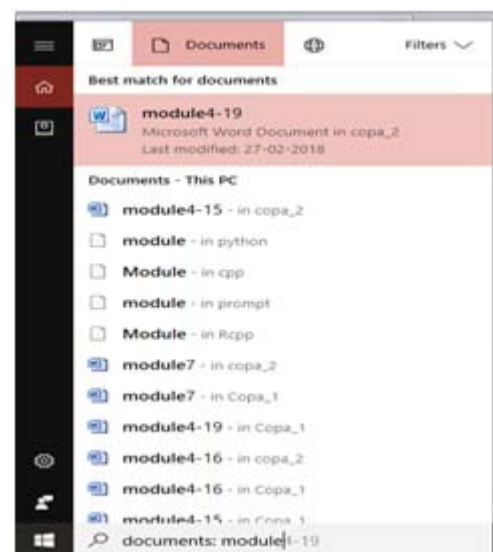
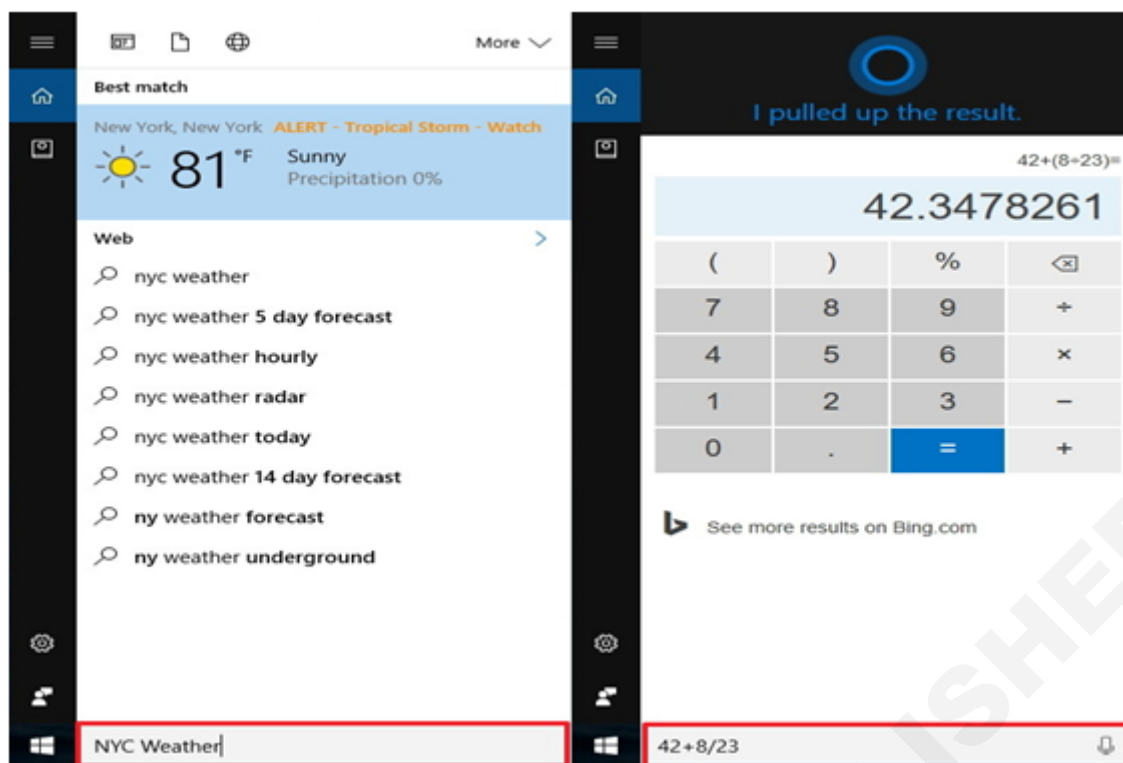


Fig 6

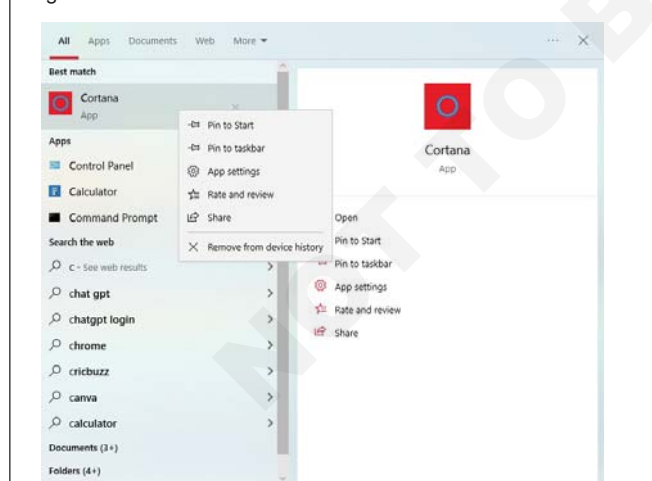


TASK 4: Application setting and pin up to Taskbar and Start menu

You can pin a program to the taskbar either from the Start menu or from the desktop.

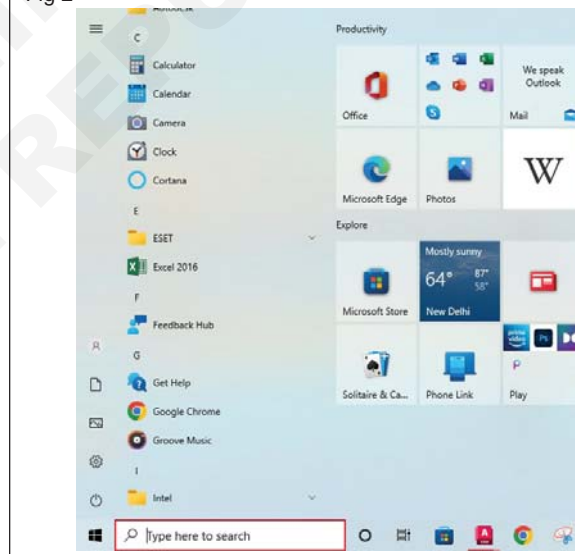
- 1 To pin up using Start menu, Click Start and then locate the app you want to pin.
- 2 Right-click the app.
- 3 Click Pin to taskbar. (Fig 1)

Fig 1



- 4 Windows 10 adds an icon for the program to the taskbar. (Fig 2)
- 5 To pin up using desktop, locate the app on the desktop.
- 6 Right-click the app.
- 7 Click Pin to taskbar.

Fig 2

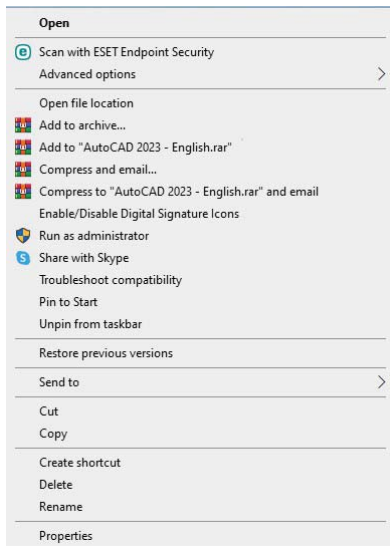


- 8 Windows 10 adds an icon for the program to the taskbar.
- 9 To pin an app in Start menu, locate the app in desktop you want to pin.
 - Right-click the app.
 - Click Pin to Start (Fig 3)

Windows 10 adds an icon for the program to the start menu. (Fig 4)

To unpin an app ,Click Unpin from start/ desktop/taskbar.

Fig 3



To see the application setting of any app in the start menu, first locate the app.(Fig 5)

Fig 5

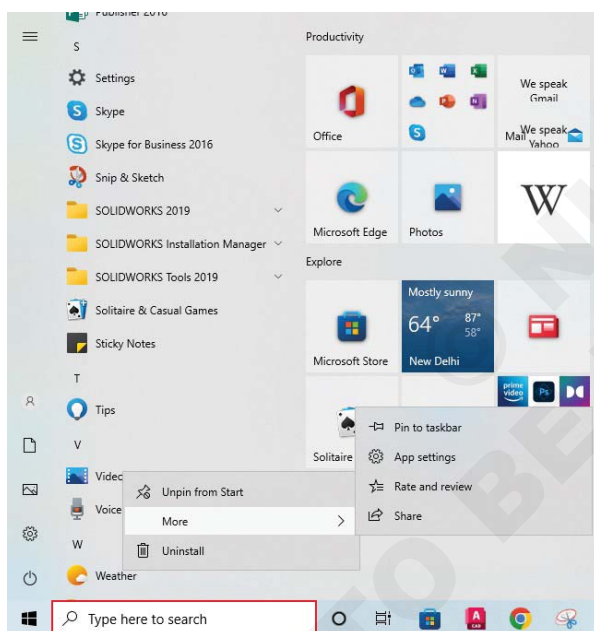
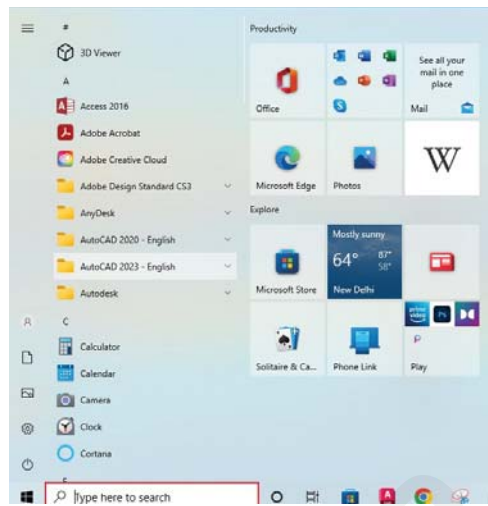


Fig 4



Right click on the app and click on App Settings.

If you want to change any setting (default, uninstall, terminate, reset etc.), make the desired changes. (Fig 6)

Fig 6



Practice on Managing Files and Folders Using Removable Drives

Objectives: At the end of this exercise you shall be able to

- insert and remove the pen drive in proper way
- check the bad sectors and viruses in pen drive using antivirus software
- copy the files and folders from and to the pen drive.

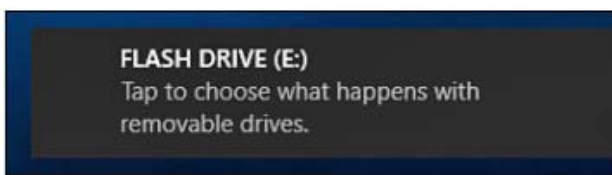
Requirements**Tools/ Equipments/Instruments**

- PC with MS-Office - 1 No. /trainee.

PROCEDURE**TASK 1: Insert and remove the Pen drive in proper way**

- 1 Insert the pen drive in the USB port.
- 2 Click on the notification that appears on the lower right corner of the screen. (Fig 1)

Fig 1



- 3 Click on Open folder to view files. (Fig 2)

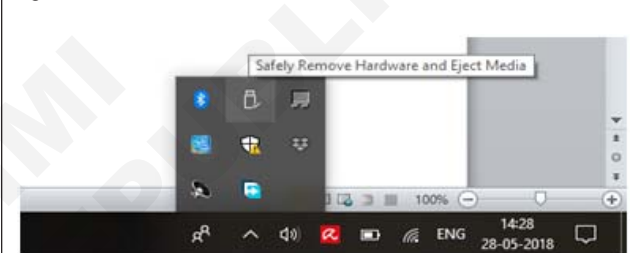
Fig 2



- 3 Choose the file or folder to view from the pen drive
- 4 Close the file or folder

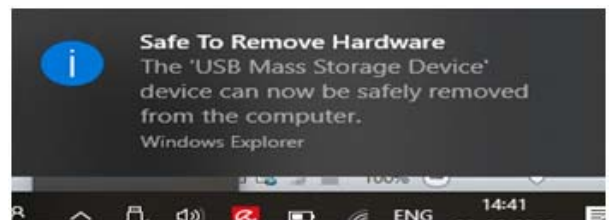
- 5 Click on Show hidden icons (Fig 3)

Fig 3



- 6 Click on Safely Remove Hardware and Eject Media icon
- 7 Click on the Eject Button
- 8 Remove the pen drive when Safe To Remove Hardware message is displayed on the screen (Fig 4)

Fig 4

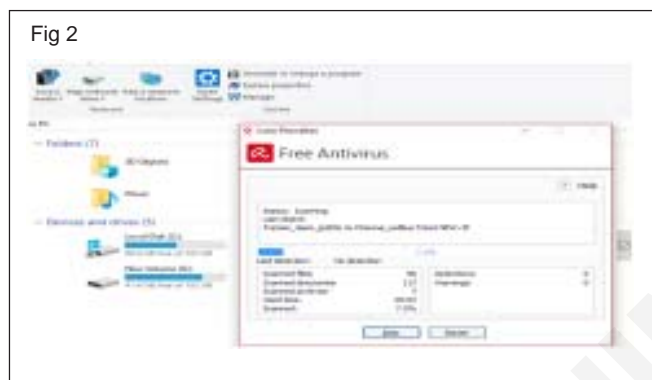


TASK 2: Check the bad sectors and viruses in pen drive using antivirus software

- 1 Insert the pen drive in the USB port
- 2 Go to This PC and right click on the drive for the pendrive (Fig 1)



- 3 Select Scan selected files with Avira or any antivirus software installed in the computer. (Fig 2)



- 4 Click on Report if virus or bad sectors is shown in the summary else press Close. (Fig 3)
- 5 Click on Report if warnings are given else click End. (Fig 4)

Fig 3

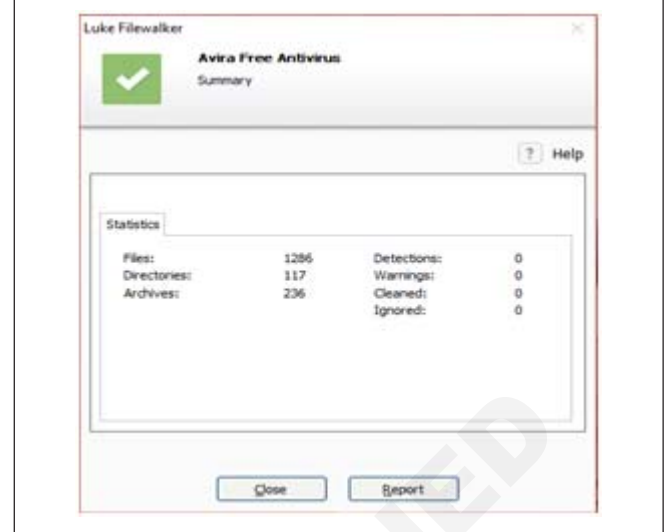
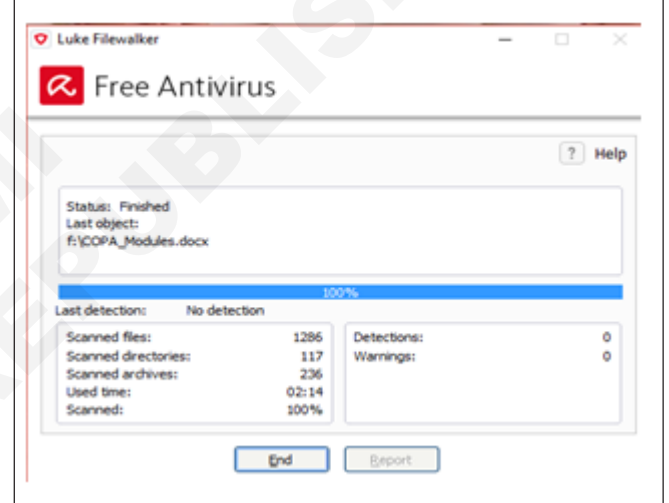


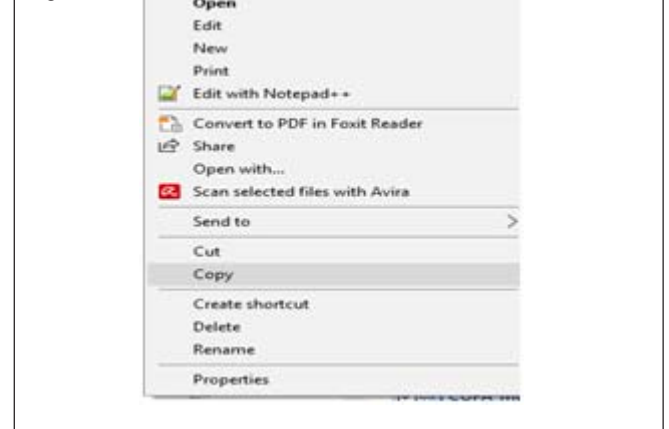
Fig 4



TASK 3: Copy the files and folders from and to the pen drive

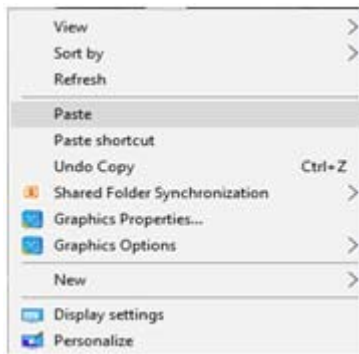
- 1 Insert the pen drive in the USB port
- 2 Click on the notification that appears on the lower right corner of the screen. (Fig 1)
- 3 Click on Open folder to view files. (Fig 2)
- 4 Right click on the file or folder to copy from the pen drive
- 5 Select Copy from the drop down menu. (Fig 3)
- 6 Open the drive or folder to copy the file or folder from the pen drive

Fig 1



- 7 Right click and click on Paste option in the drop down menu. (Fig 2)

Fig 2



Send to option can also be used to copy the file or folder, but it can be copied to only specified drive and not to specified file or folder.

- 8 To copy files or folders from computer to pen drive, select the file or folder to be copied.
- 9 Right click and select Send to from the drop down menu and then select the drive of the pen drive.

Copy option from the drop down menu can also be used to copy the file to the pendrive by right clicking the file. Then open the pen drive and right click. Select Paste option from the menu.

Customize the Desktop Settings and Manage User Accounts

Objectives: At the end of this exercise you shall be able to

- open desktop settings
- modify desktop settings
- create new user
- grant and modify the user rights.

Requirements

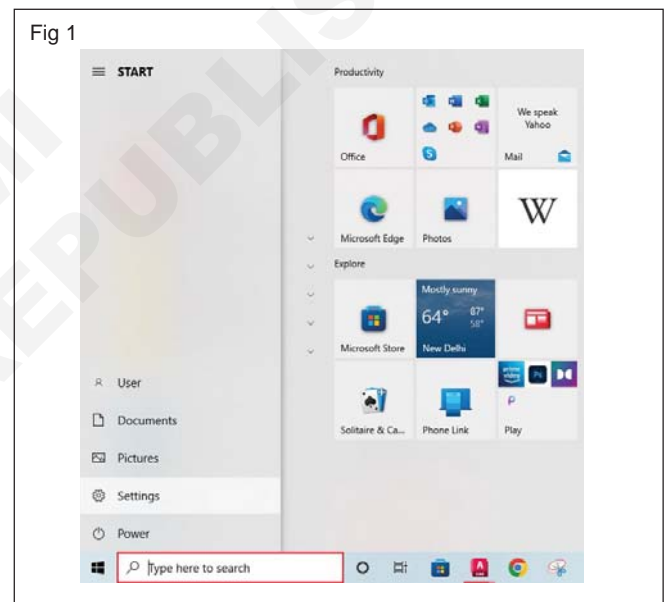
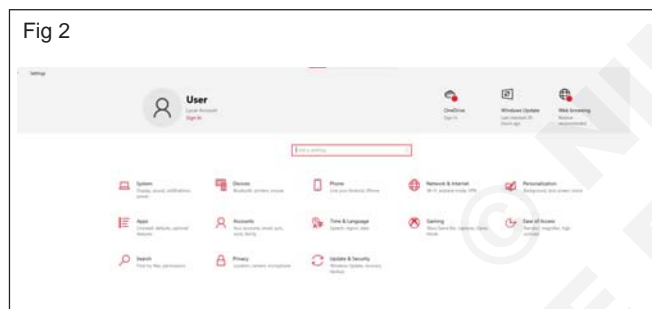
Tools / Equipments/Instruments

- PC with MS-Office - 1 No. /trainee

PROCEDURE

TASK 1: Open desktop settings from control panel.

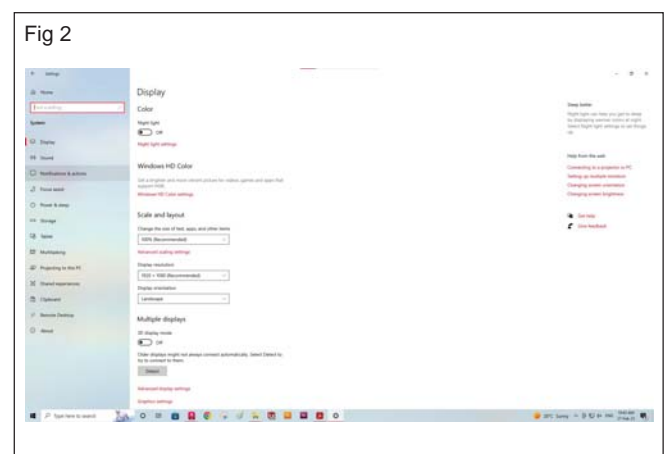
- 1 Click on Start menu.
- 2 Select Settings tab. (Fig 1)
- 3 This will open Settings Window (Fig 2)



TASK 2: Modify the desktop settings

- 1 Open the Settings Window. (Fig 2)
- 2 Click on System in the Settings Window.
- 3 Click Display to change the display settings. (Fig 3)
- 4 Change the brightness of the display by dragging the bar of Change brightness from left or right.
- 5 Record the brightness percentage at the left most and right most end of the Change brightness bar.
- 6 Change the orientation and note the how the display changes.

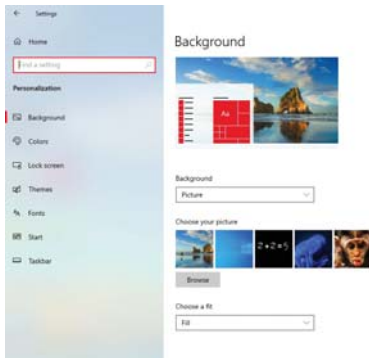
Note: To go back to the initial orientation, press Revert.



7 To change the background, click on the Personalization icon of settings window. (Fig 2)

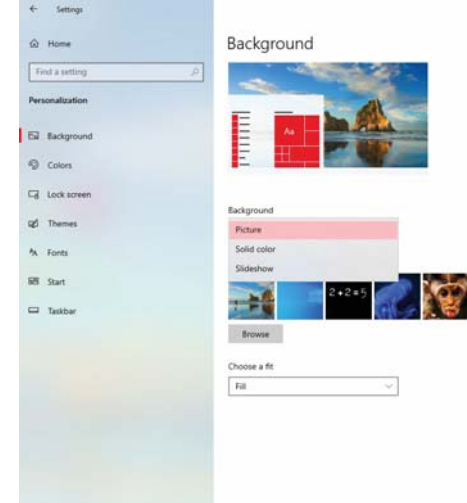
8 Click on the Background tab in the Personalization window. (Fig 4)

Fig 4



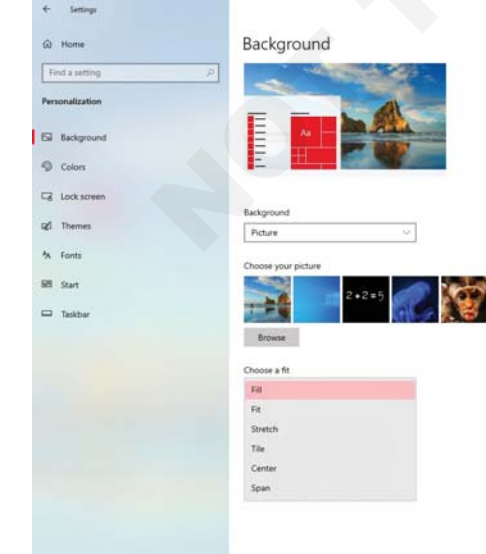
9 Select the Type of Background you want to keep. If it is Picture, choose from picture given or You can browse your desired picture. (Fig 5)

Fig 5



10 Select Fill in Choose a fit. (Fig 6)

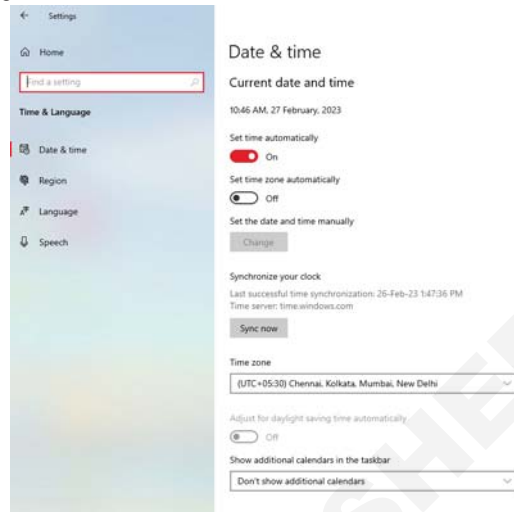
Fig 6



11 To change the date,time and language click on the Time & Language icon of settings window. (Fig 2)

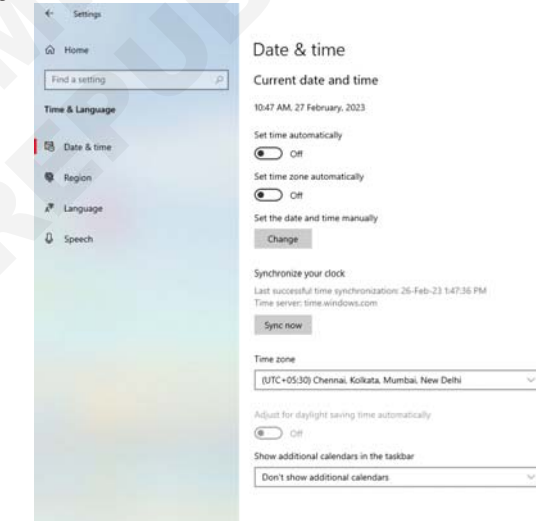
12 Click on Date & time tab. If you want to change the time zone , Select from Time zone menu (Fig 7)

Fig 7



13 To change the date and time, Set time automatically to Off. Click change. (Fig 8)

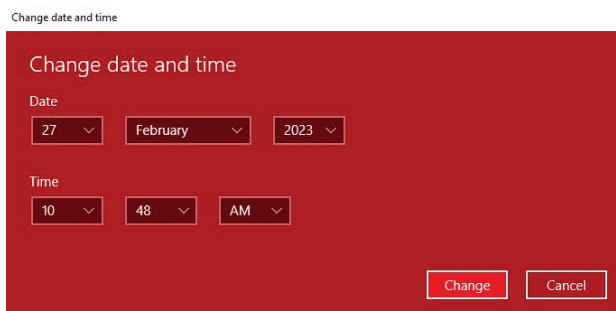
Fig 8



Close the Window.

14 Type in the date and time. Click Change. (Fig 9)

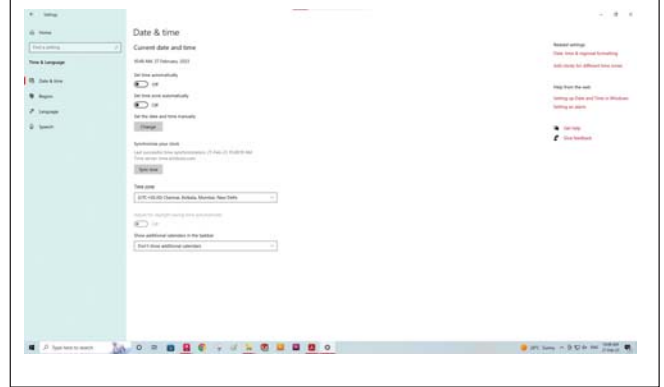
Fig 9



15 The format of date and time can be changed by clicking on the Change date and time formats as shown in Fig 10.

Close Window

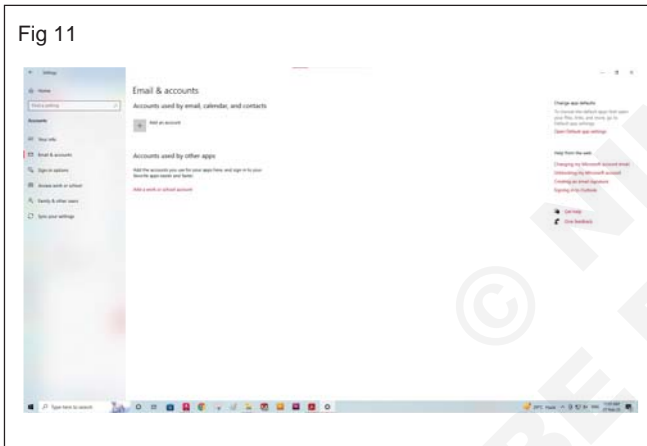
Fig 10



TASK 3: Create new user

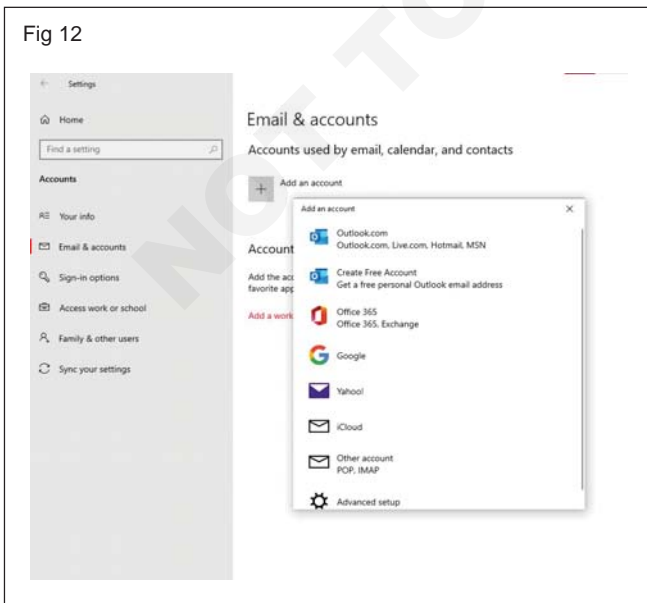
- 1 Open the Settings Window. (Fig 2)
- 2 Click on Accounts in the Settings Window.
- 3 Select E-mail & app accounts in Fig 11.
- 4 Click on Add an account to create a new user. (Fig 11)

Fig 11



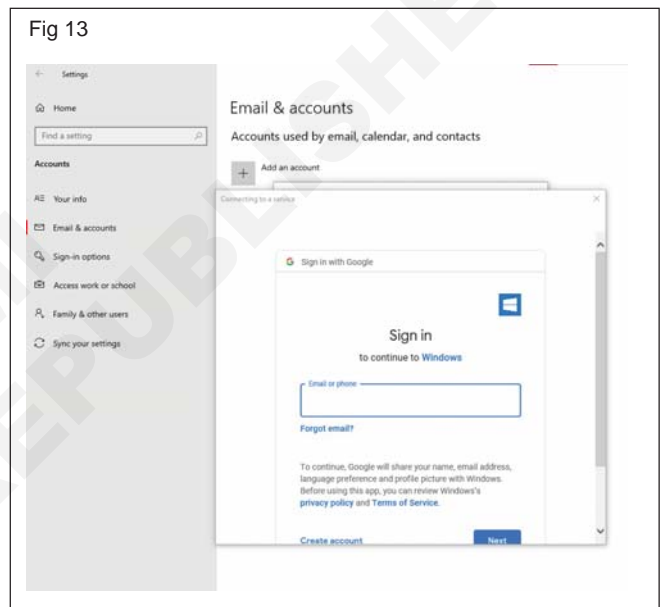
- 5 Select your account in Choose an account drop down menu. Click Close. (Fig 12)

Fig 12



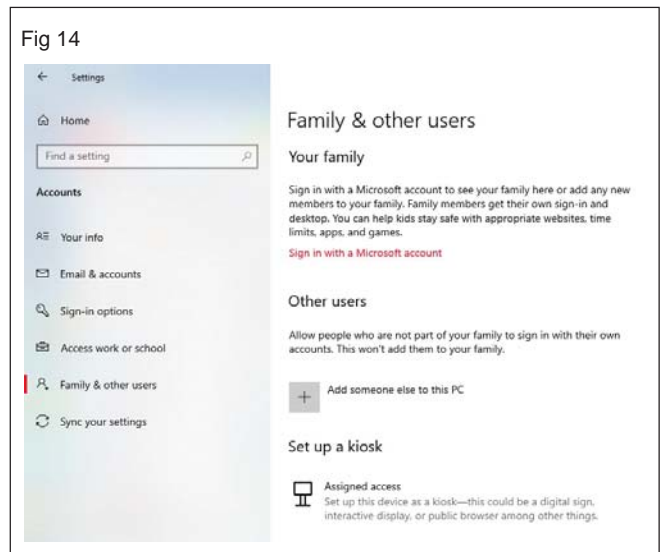
- 6 Type the e-mail or phone in the Sign-in Window and click NEXT. (Fig 13)

Fig 13



- 7 Enter the password in the Password field.
- 8 To create a new user account for family or other people in the system, click on Family & other people tab in Fig 14.

Fig 14

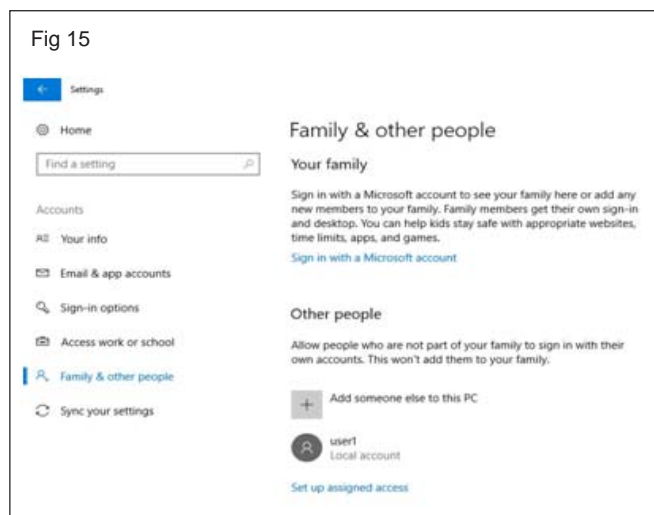


- 9 Click on the + Add someone else to this PC to add a new user.9 Sign-in with a valid e-mail account.
- 10 Sign-in with a valid e-mail account.

- 11 Click NEXT and confirm the password.
- 12 Close Window.

TASK 4: Granting and modify the user rights

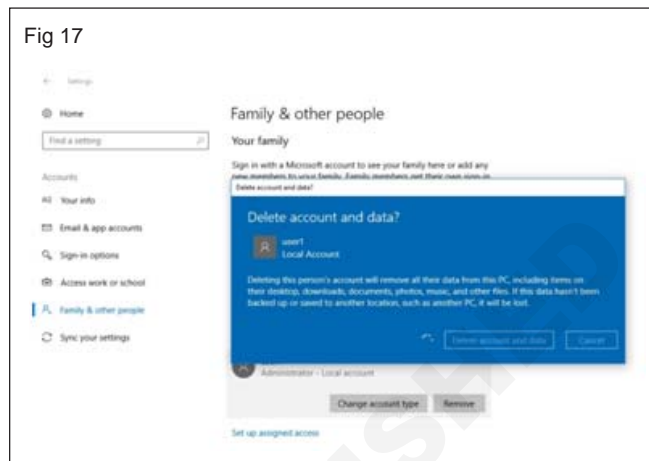
- 1 Open the Settings Window (Fig 2)
- 2 Click on Accounts in the Settings Window.
- 3 Select Family & other people in Fig 14
- 4 Click on the user account whose user rights have to be granted or modified. (Fig 15)



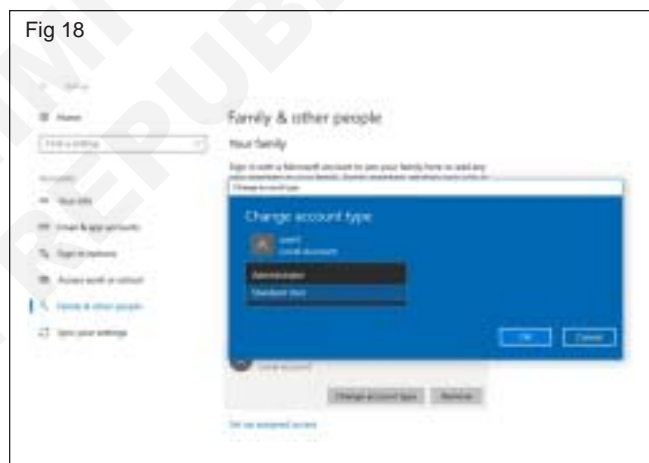
- 5 If you want to delete the account of the user, Click the user account and select Remove. (Fig 16)



- 6 Click on the Delete account and data tab to remove the selected user account from the system. (Fig 17)



- 7 Change the user rights, click on the user account and click on Change account type. (Fig 18)



- 8 Select Administrator to give the user account rights to do major changes in the system .
- 9 Select Standard User to give the user account to do perform common daily tasks.
- 10 Click OK Close the Window.

Geo - Informatics Assistant - Computer Components and Windows Operating System

View System Properties and Control Panel Details

Objectives: At the end of this exercise you shall be able to

- identify the desktop components in device manager
- change clock, date, regional language in control panel
- repair, modify and uninstall the applications in control panel.

Requirements

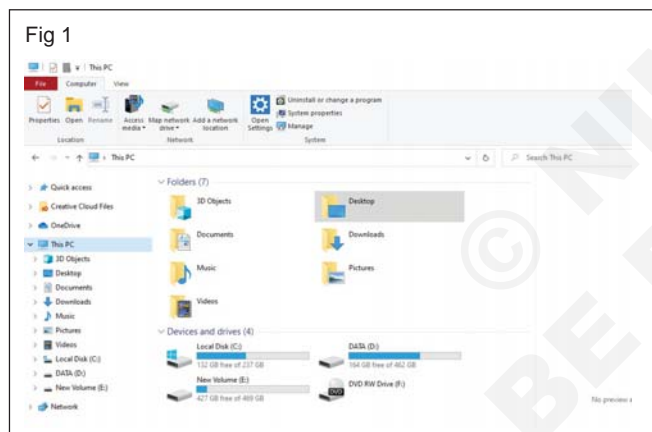
Tools / Equipments/Instruments

- PC with MS-Office - 1 No. /trainee

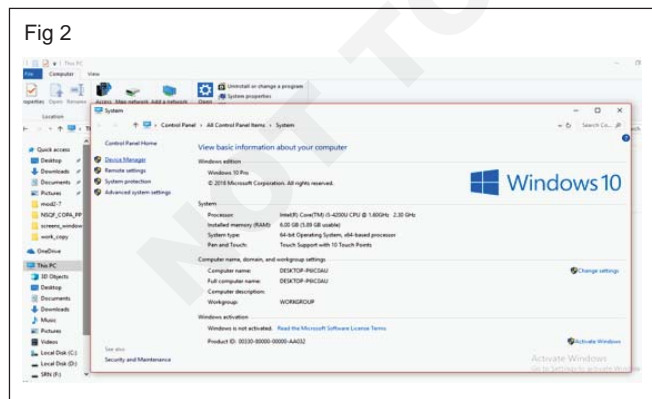
PROCEDURE

TASK 1: Identify the desktop components in device manager

- 1 Click on File manager in the taskbar.
- 2 Select and Right click this PC.
- 3 Right Click on Properties. (Fig 1)



- 4 Click on Device Manager in Fig 2.



- 6 Double click on the Universal Serial Bus controllers in the menu in Fig 3.
- 7 Right click on USB Root Hub and select Disable device (Fig 4)
- 8 Click Yes in the USB Root Hub. (Fig 5)

Fig 3

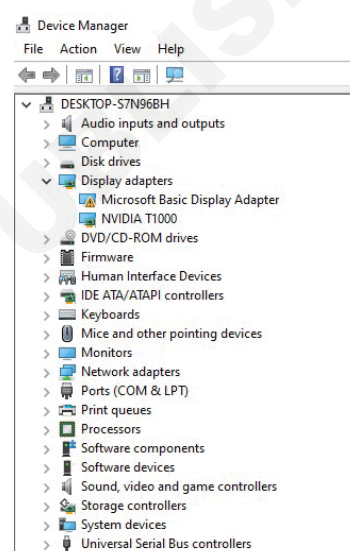
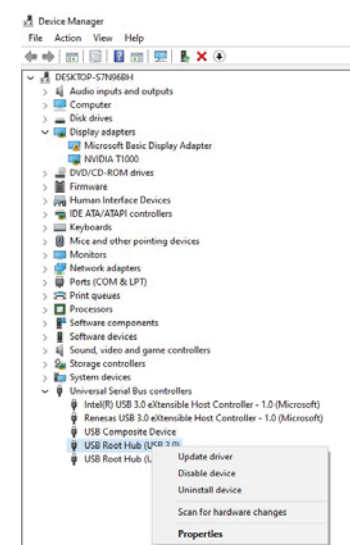
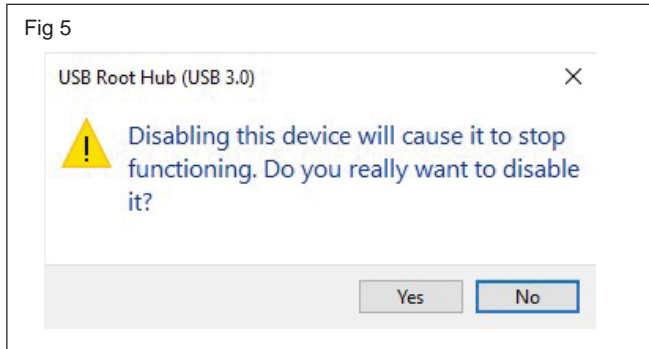


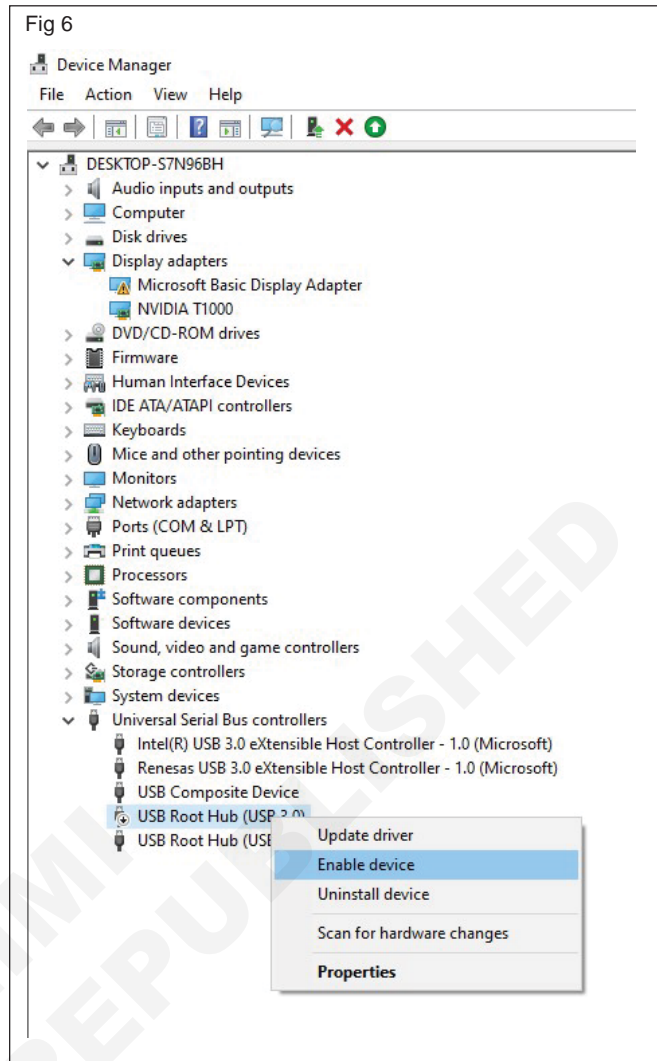
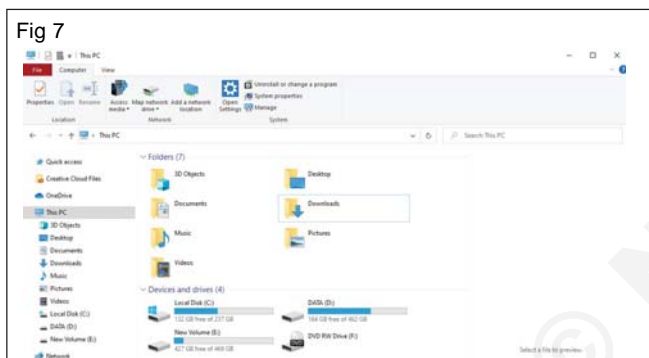
Fig 4



- 9 Insert a Pendrive/ USB in the USB slot



- 10 Check This PC folder to see if any removable device/ USB is shown.
- 11 Go to Device Manager and double click on the Universal Serial Bus controllers.
- 12 Right click on USB Root Hub and select Enable device (Fig 6)
- 13 Insert a Pen drive/ USB in the USB slot
- 14 Check This PC folder to see if any removable device/ USB is shown. (Fig 7)



TASK 2: Change clock, date, regional language in control panel

- 1 Type Control Panel in the Search box
- 2 Select Control Panel app from the menu. (Fig 8)
- 3 Select Date and Time from the Control panel. (Fig 9)
- 4 Click on Change date and time... (Fig 10)
- 5 Change the date and time. Press OK. (Fig 11)
- 6 Close window
- 7 To change language, select Region from the Control panel (Fig 9)
- 8 Click on Language preferences as shown in Fig 12
- 9 Click on + Add a Language(Fig 13)
- 10 Type the name of the language you need the system to work/change .(Fig 14)
- 12 Click Install.
- 13 Close the Window.

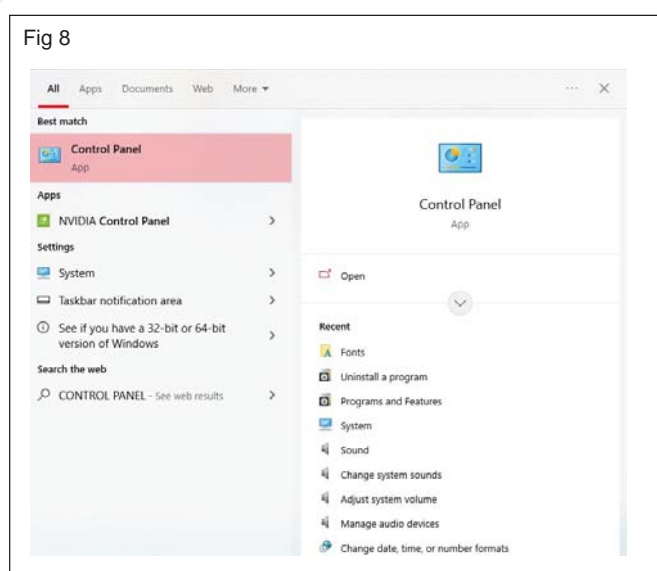


Fig 9

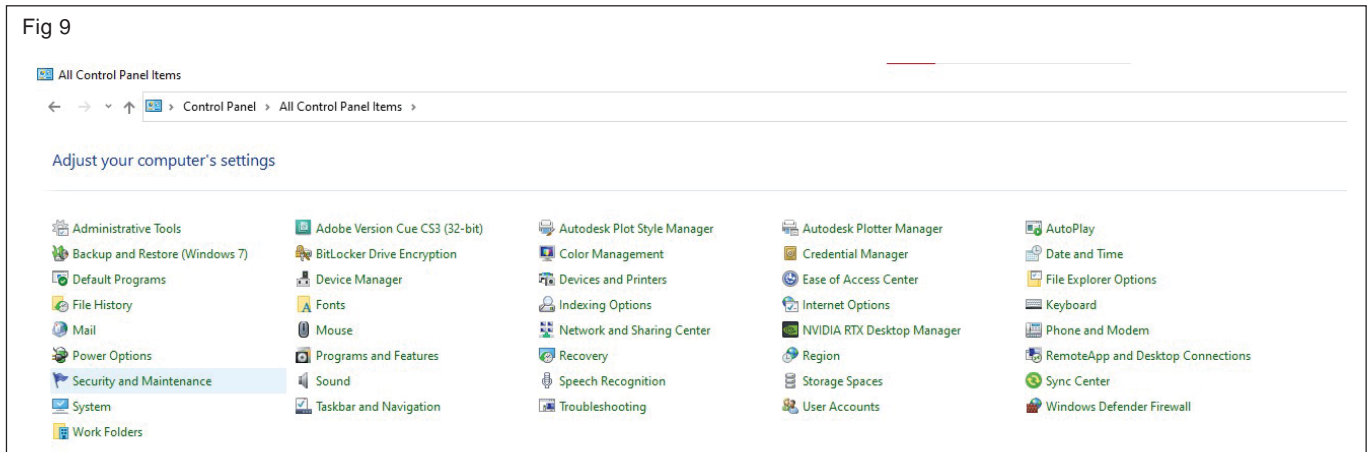


Fig 10

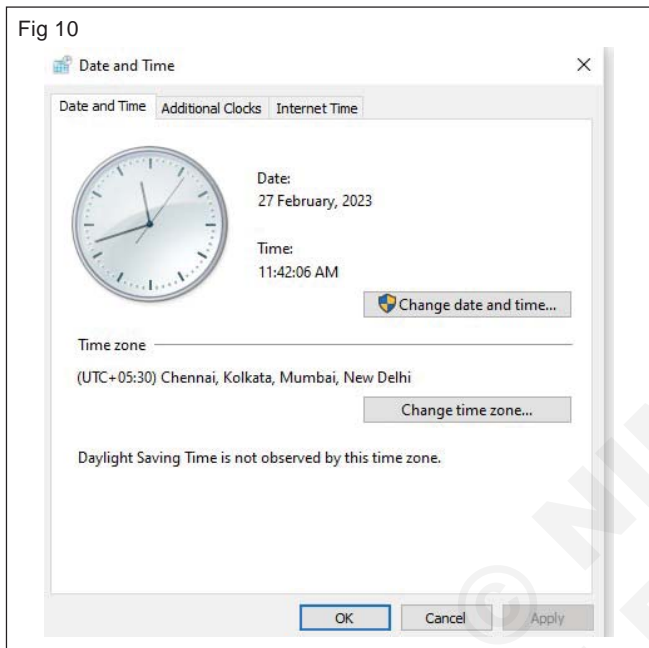


Fig 12

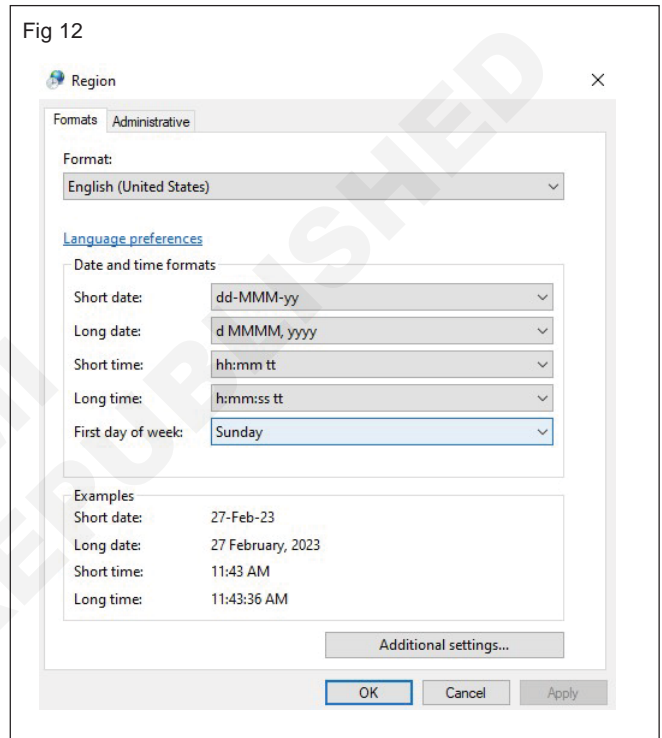


Fig 11

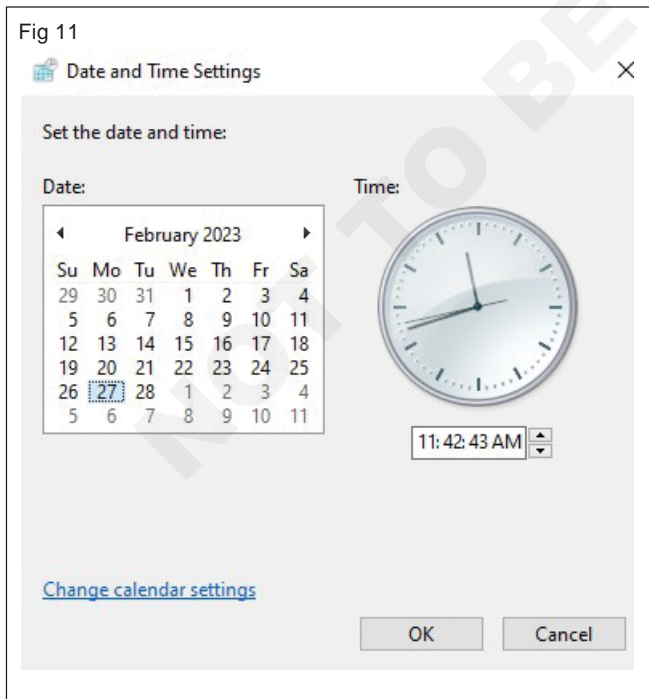


Fig 13

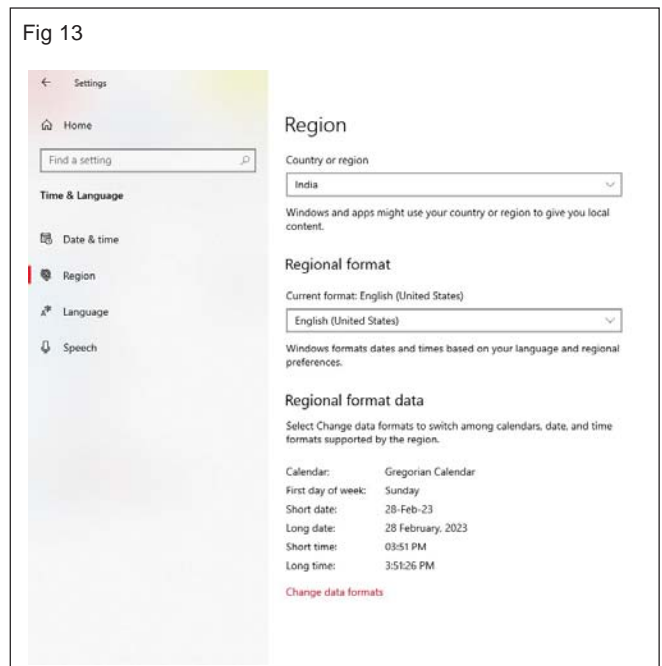
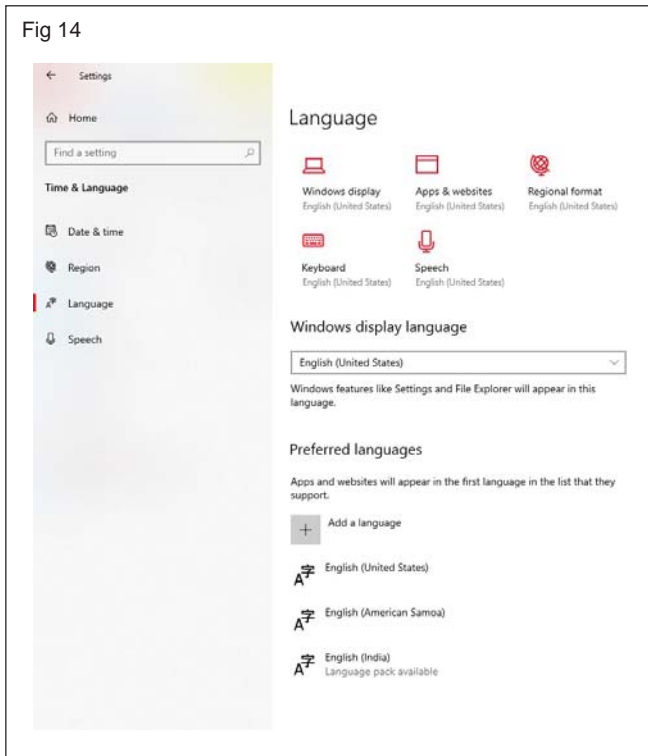


Fig 14



TASK 3: Repair, modify and uninstall the applications in control panel

- 1 Select Programs and Features from the Control panel (Fig 9)
- 2 Select the program from the drop down menu. (Fig 15)
- 3 Click on Uninstall / Change / Repair (Fig 16)
- 4 Click Yes to Uninstall / Change / Repair the application
- 5 Close the window.

Fig 15

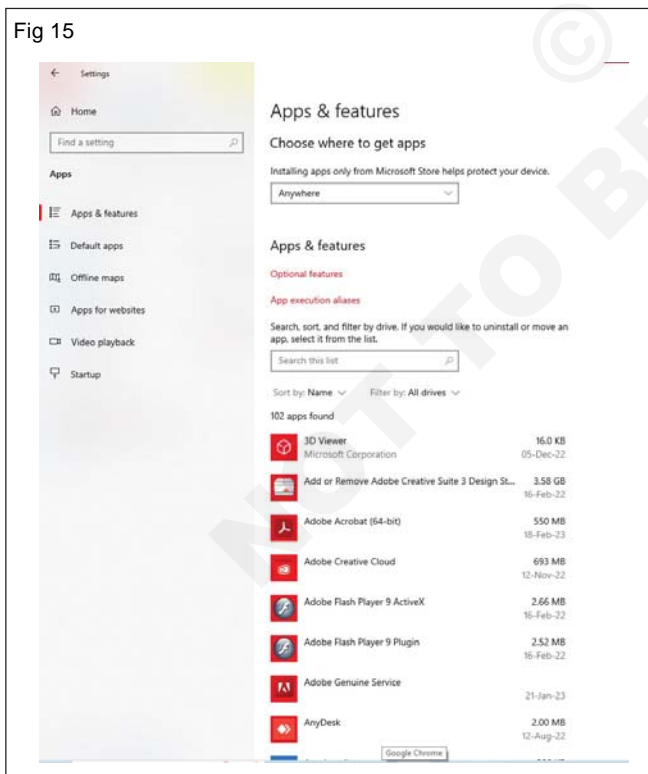
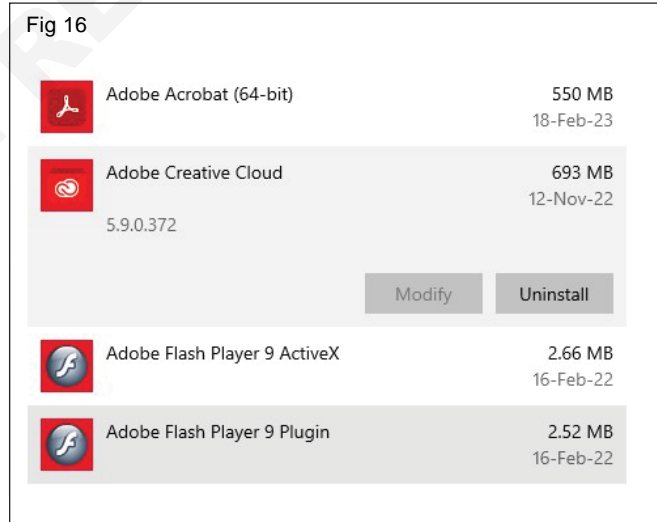


Fig 16



Geo - Informatics Assistant - Computer Components and Windows Operating System

Work with Keyboard Shortcut Commands

Objectives: At the end of this exercise you shall be able to

- read and Observe the Windows Shortcut Keys in the table
- practice all the shortcut keys of windows 10 and write the description in below the table.

Requirements
Tools / Equipments/Instruments <ul style="list-style-type: none"> • PC with MS-Office - 1 No. /trainee

PROCEDURE

TASK 1: Read and Observe the following Windows Shortcut Keys in the table

Press This	To Do This
Windows Logo	Toggle the Start menu
Windows Logo+A	Open the Notifications pane
Windows Logo+B	Activate the notification area's Show Hidden Icons arrow (press Enter to display the hidden icons)
Windows Logo+C	Open Cortana for voice commands
Windows Logo+D	Minimize all open windows to display the desktop
Windows Logo+E	Run File Explorer
Windows Logo+F	Display the Start menu and activate the Search box
Windows Logo+H	Display the Share pane
Windows Logo+I	Run the Settings app
Windows Logo+K	Display the Devices pane
Windows Logo+L	Lock your computer
Windows Logo+M	Minimize all windows
Windows Logo+O	Turn the tablet orientation lock on and off
Windows Logo+P	Display the Project pane to configure a second display
Windows Logo+Q	Open Cortana for voice commands
Windows Logo+R	Open the Run dialog box
Windows Logo+S	Open Cortana for keyboard commands
Windows Logo+T	Activate the taskbar icons (use the arrow keys to navigate the icons)
Windows Logo+U	Open the Ease of Access Center
Windows Logo+W	Activate the Search box
Windows Logo+X	Display a menu of Windows tools and utilities
Windows Logo+Z apps)	Display an app's commands (although this works in only some Modern apps)

Print and Scan Document Using Different Commands

Objectives: At the end of this exercise you shall be able to

- scan and save the image
- print image or document.

Requirements

Tools / Equipments/Instruments

- PC with MS-Office - 1 No. /trainee

PROCEDURE

TASK 1: Scan and save the image.

Save scanned files as PDF using Windows Fax & Scan

- 1 Open Windows "Printers and Scanners".
- 2 Click New Scan button in the toolbar. (Fig 1)

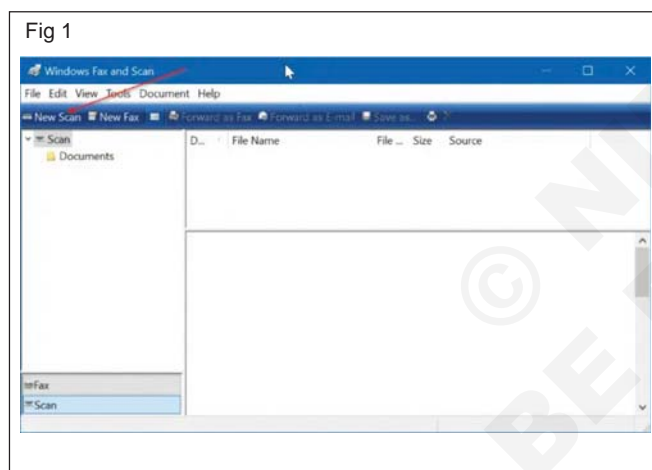
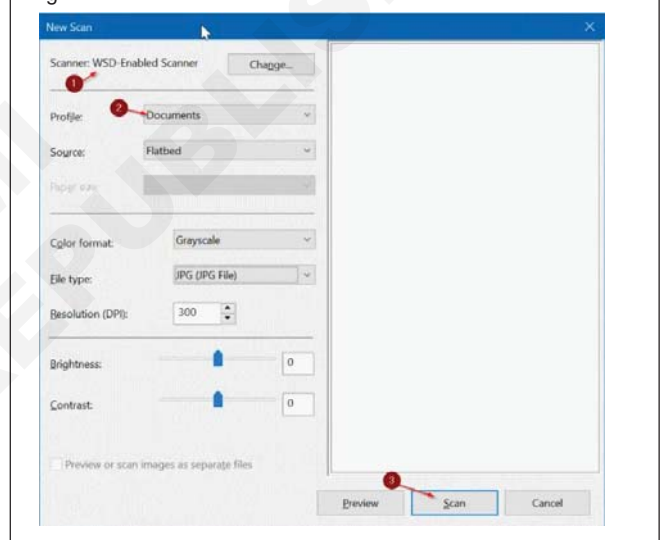


Fig 2



- 3 View or select a different scanner by clicking Change button in the Scanner section. (Fig 2)
- 4 In the Profile section, select the type of the file that you are going to scan as either Photo or Documents.
- 5 Change other default settings, if you want.
- 6 Click the Scan button to begin scanning the hard copy in the scanner.

TASK 2: Print image or document.

- 1 Once the scanning is completed, click the File menu and then click Print option. Yes, we are going to save the file as PDF. (Fig 3)
- 2 select Microsoft Print to PDF from the printer drop-down box, and then click Print button. (Fig 4)
- 3 At the Save Print Output As dialog, enter a name for your scanned file.
- 4 select a location to save the file. (Fig 5)
- 5 Click Save button to save it as PDF file.
- 6 Get it check with your instructor.

Fig 3



Fig 4

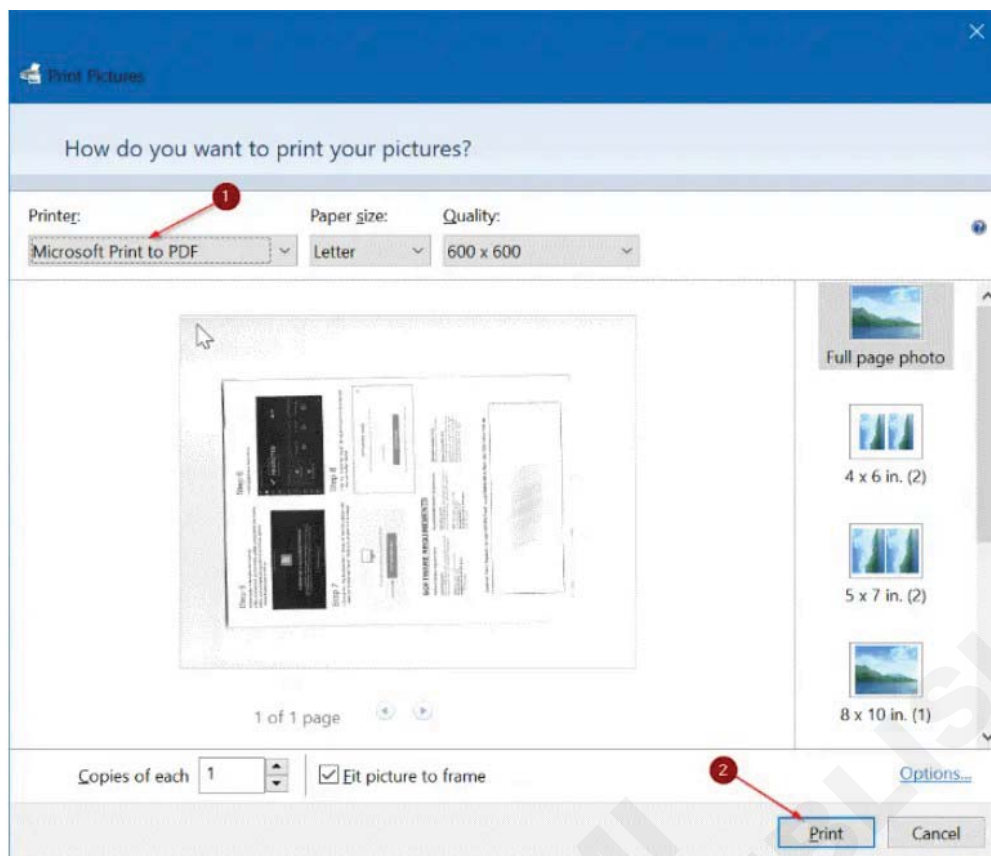
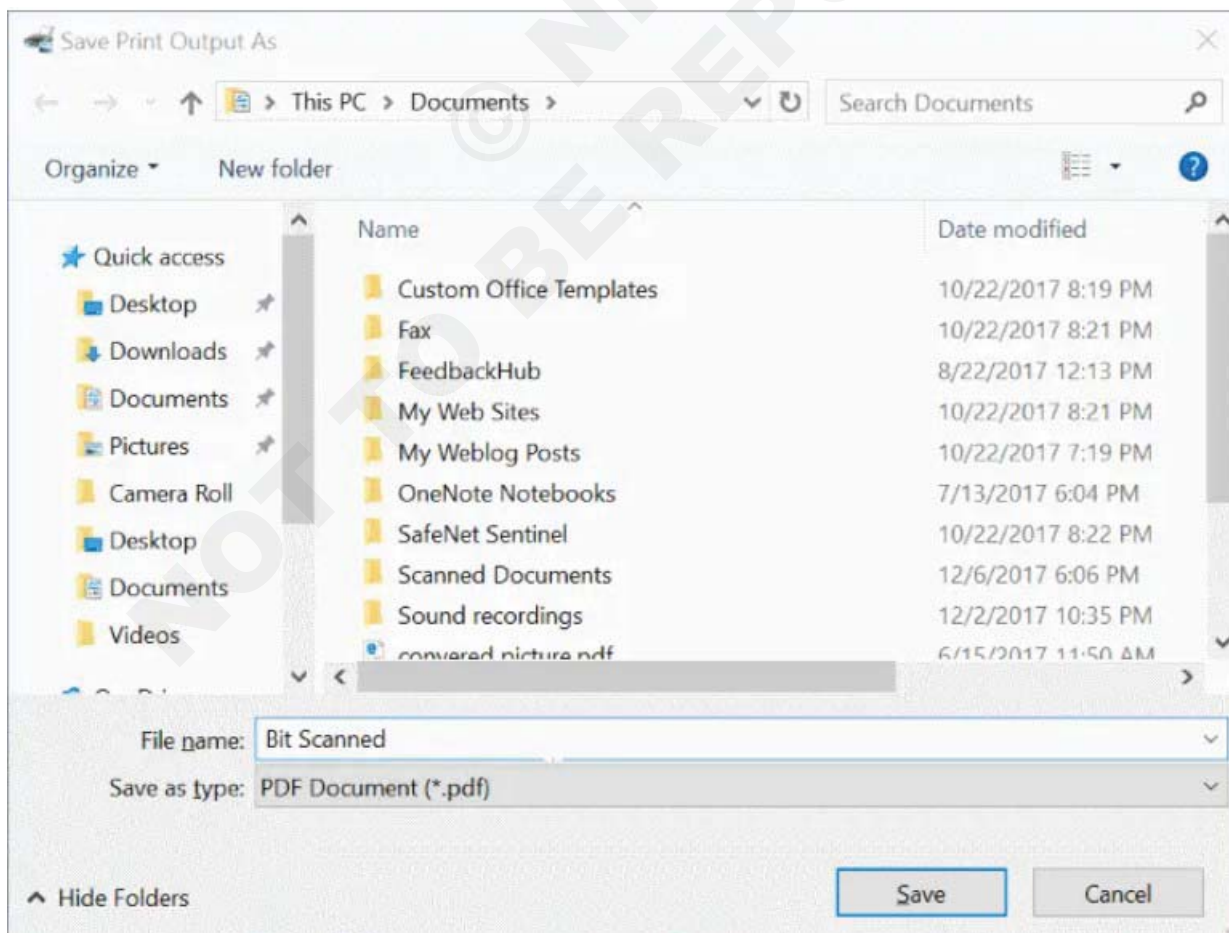


Fig 5



Geo - Informatics Assistant - Computer Hardware Basic and Software Installation

View the BIOS Settings and their Modifications

Objective: At the end of this exercise you shall be able to

- to configure BIOS setup program and troubleshoot the typical problems using BIOS utility.

Requirements

Tools/Equipments/Instruments

- Computer - 1 No.

PROCEDURE

BIOS Setup

The BIOS Setup utility reports system information and can be used to configure the server BIOS settings. BIOS have a Setup utility stored in the BIOS flash memory. The configured data is stored in the system's battery-backed CMOS RAM.

To access BIOS configuration screens and to change the system's parameters complete the following steps:

- 1 Power on or power cycle the server.
- 2 To enter the BIOS Setup utility, press the F2 key while the system is performing the power-on self-test (POST)
- 3 Press F2 to Run Setup Prompt

```

Initializing USB Controllers .. Done.
Press F2 to run Setup (CTRL+E on Remote Keyboard)
Press F8 for BBS POPUP (CTRL+P on Remote Keyboard)
Press F12 to boot from the network (CTRL+N on Remote Keyboard)
  
```

- 4 When BIOS is started, the main BIOS Setup utility top-level screen appears. This screen provides seven menu options across the top of the screen.
- 5 Use the left and right arrow keys to select the different menu options.
- 6 To select an option on a top-level screen, use the up and down arrow keys to scroll up and down the options presented.
- 7 Only options that can be modified are highlighted when you press the up and down arrow keys.
- 8 If a field can be modified, as you select the option, user instructions for modifying the option appear in the right column of the screen.
- 9 If a field is a link to a sub-screen, instructions to press the Enter key to access the sub screen appear in the right column.
- 10 Modify the setup field and press the Esc key to save the changes and exit the screen. Some screens present a confirmation dialog box that enables unwanted changes to be retracted.
- 11 On sub-screens that only provide configuration information and cannot be modified, press the Esc key to exit the screen.
- 12 To continue modifying other setup parameters, repeat Step 3 through Step 6. Otherwise, go to Step 8
- 13 Press and release the right arrow key until the Exit menu screen appears.
- 14 Follow the instructions on the Exit menu screen to save or discard your changes and exit the BIOS Setup utility.
- 15 BIOS Setup Screens Overview: Screen Description.

BIOS setup screens overview

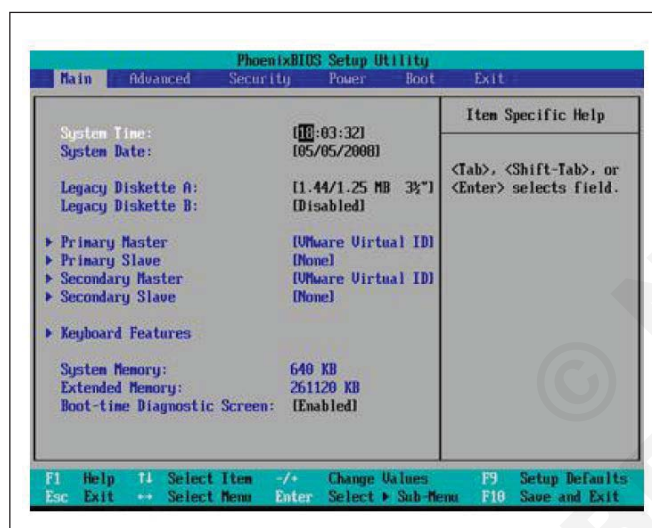
Screen	Description
Main	General product information, including BIOS type, processor, memory and time/date.

Screen	Description
Advanced	Configuration information for the CPU, memory, IDE, super IO, trusted computing, USB, PCI, MPS and other information.
PCI	Configure the server to clear NVRAM during system boot.
Boot	Configure the boot device priority (storage drives and the DVD - ROM drive)
Security	Set or change the user and supervisor passwords.
Chipset	View the configuration of server chipsets.
Exit	Save changes and exit, discard changes and exit, discard changes, or load optimal or fail -safe defaults.

BIOS Setup Utility Menu Screens

The BIOS Main screens provide general product information, including BIOS, processor, system memory, and system time/date.

BIOS Setup Utility : Main



Advanced Setting

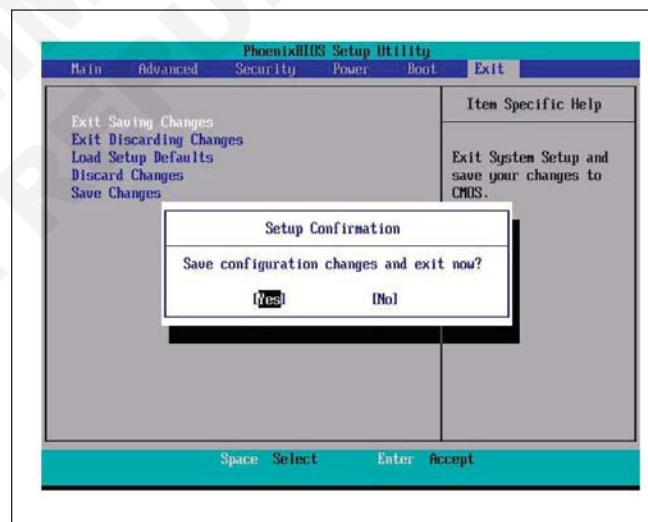
Exit - Save Configuration Changes and Exit Confirmation

BIOS Power-On Self-Test (POST) Events

At system startup, the BIOS perform a power-on self-test that checks the hardware on your server to ensure that all components are present and functioning properly.

Result

Thus the bios setup program and troubleshoot the typical problems using BIOS utility of the pc's are identified.



Geo - Informatics Assistant - Computer Hardware Basic and Software Installation

Identify and Rectify Common Hardware and Software Issues

Objective: At the end of this exercise you shall be able to

- write chart of issues found while installation of OS.

Requirements

Tools / Equipments/Instruments

- A working PC - 1 No.
- MS-windows 10 Software - 1 No.

PROCEDURE

TASK 1 : Write chart of issues found while installation of OS

or

Sl.No.	Problem Found	Instruction from Instructor
	SW HW	
	SW HW	
	SW HW	
	SW HW	
	SW HW	
	SW HW	
	SW HW	

Geo - Informatics Assistant - Computer Hardware Basics and Software Installation

Install Windows Operating System

Objective: At the end of this exercise you shall be able to

- windows XP installation steps.

Requirements

Tools / Equipments/Instruments

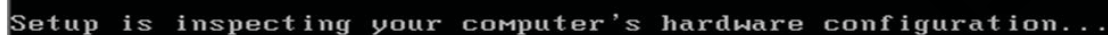
- Operating System CD - 1 No.
- Computer - 1 No.

PROCEDURE

- 1 Insert the Windows XP CD-ROM and reboot the computer. If you see a message about hitting any

key to boot the CD, do so now. Otherwise you will see a message about setup inspecting your system.

Fig 1



- 2 MS-DOS portion of setup begins. In this setup first you will see a series of blue and gray. MS-DOS based screens.

- 3 Welcome to setup. Finally setup begins. In this step you can setup XP, launch the recovery console, or quit. Press ENTER to continue the setup and it will examine your hard drives and removable disks.

Fig 2

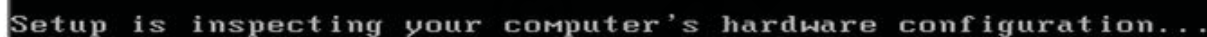
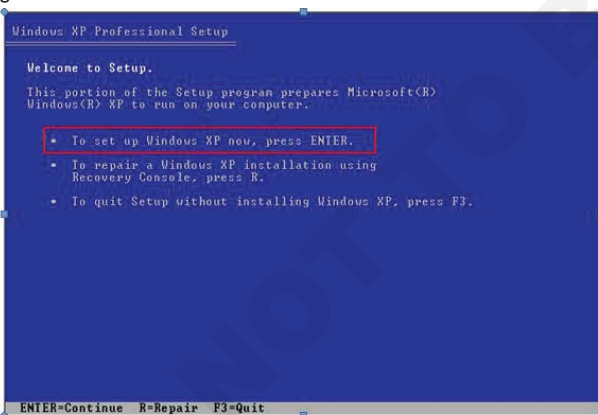


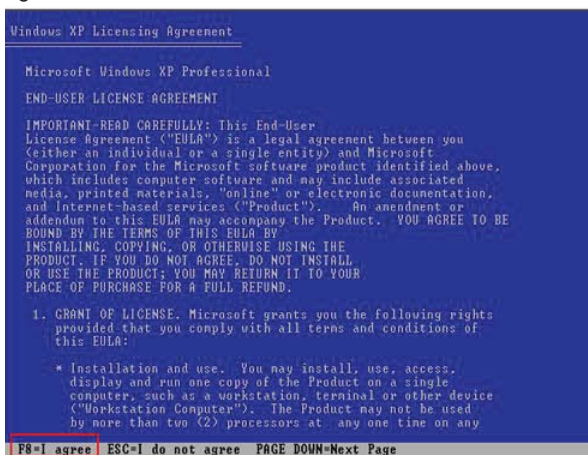
Fig 3



- 4 Read the License agreement. Next you will have to agree to Microsoft license agreement. Then press F8 continue the setup.
- 5 Choose an installation partition. This crucial step lets you choose where to install XP. On a clean installation you will typically install to the C : Drive.
- 6 Select the file system. If you created a new partition of wish to change the file system of an existing

partition you can do so in the next step. Generally speaking it is recommended to go with the NTFS file system.

Fig 4



- 7 Optionally format the partition. If you choose to change or format the file system, this will occur next. First you will be asked to verify the format. Press ENTER to continue and a yellow progress bar will indicate

status of the format. When this complete, setup will again examine your disks and create a list of files to copy.

Fig 5

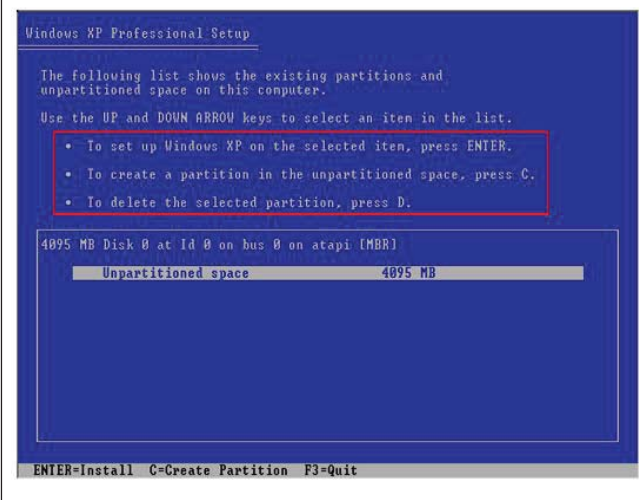


Fig 6

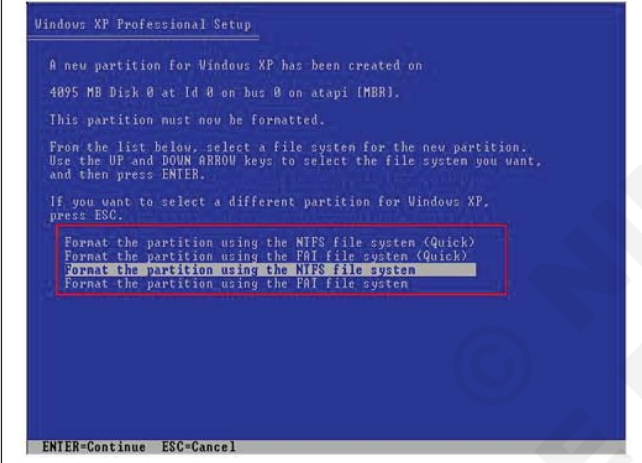
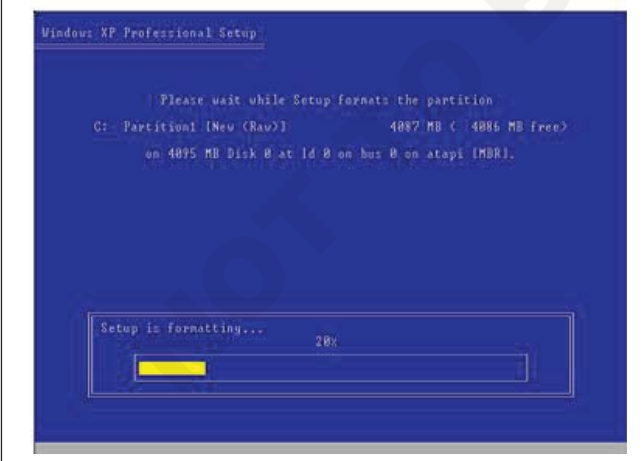


Fig 7



- 8 Setup folder copy phase and reboot. Setup will now copy system files to the system boot partition just you created. This will allow the PC to boot from the C: drive and continue setup in GUI mode. After copying the system will reboot. While rebooting it will show "Press any key to boot from CD" message again. This time do not press any key.

Fig 8



Fig 9

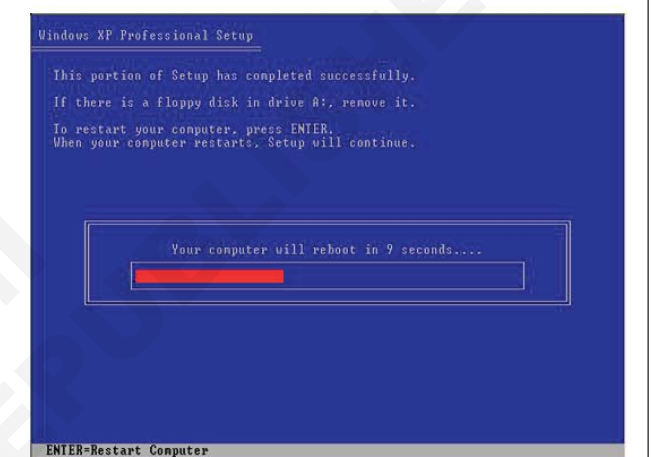


Fig 10

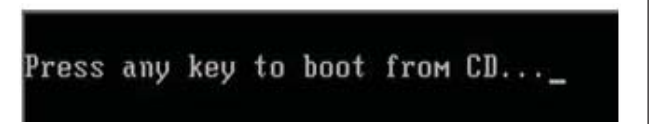
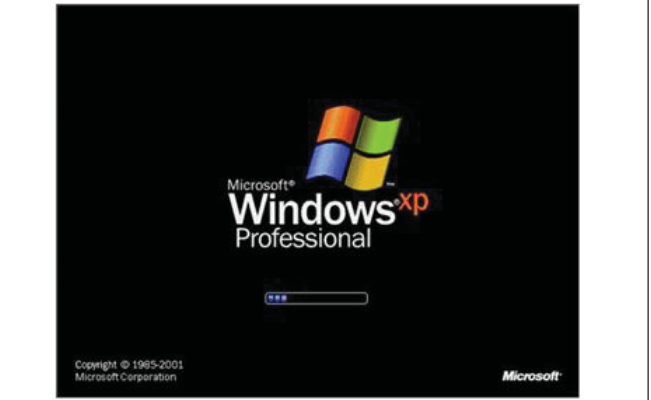


Fig 11

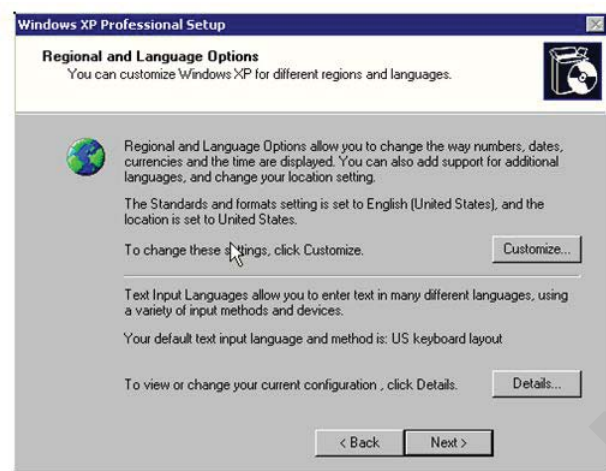


- 9 GUI setup begins. Once the system reboots you will be presented with the GUI setup phase. This could be taking several minutes.
- 10 Regional and language options. In the first interactive portion of GUI setup, you can choose to customize the regional and language settings. Click NEXT to continue.

Fig 12

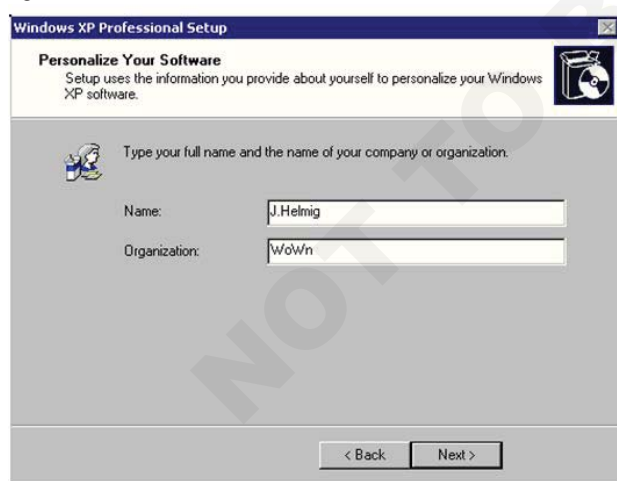


Fig 13



11 Personalize your software. Now enter your name and optionally your company name. Click NEXT to continue.

Fig 14



12 Enter your product key. Now you must enter the 25 character product key. Then click NEXT to continue.

13 Enter a computer name and administrator password. In the next phase of setup you can create a name for your computer. And optionally enter administrator password. The click NEXT to continue.

Fig 15

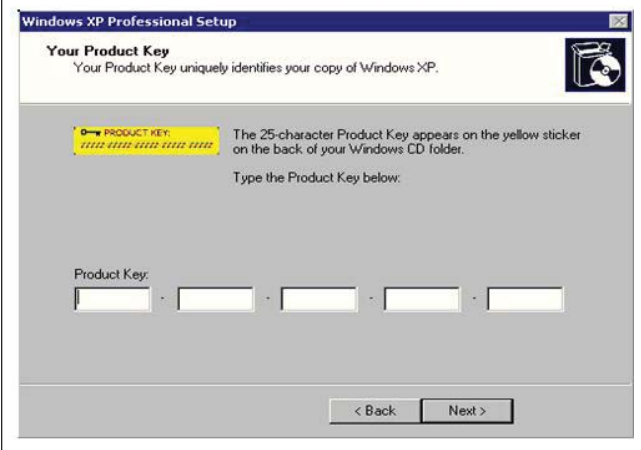
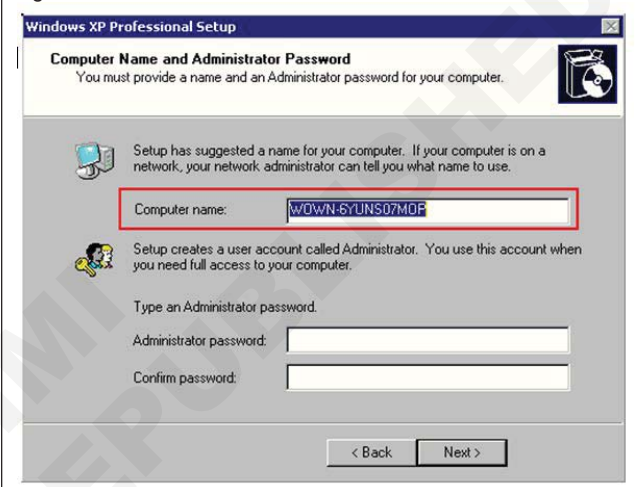


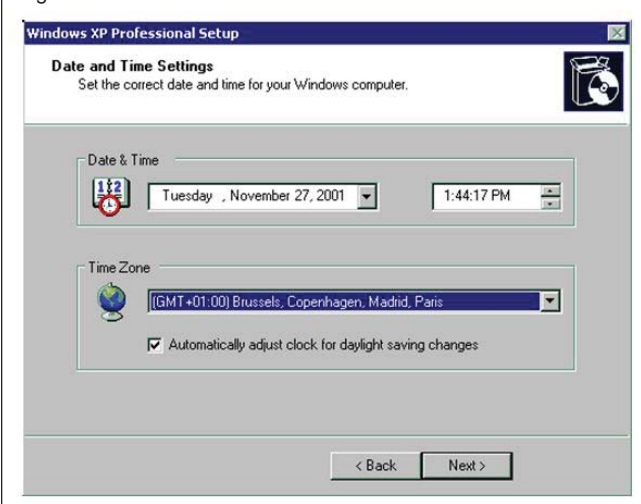
Fig 16



14 Supply your DATE and TIME settings. Next you can supply the date and time, which are auto set based on information in your BIOS. Click NEXT to continue.

15 Network setup. If you have a networking card or modem, setup now installs the networking components.

Fig 17



16 Setup completion. From this point on setup will continue to completion without any further need for interaction. Setup will now copy files, complete installation, install your start menu items, register

system component, save settings, remove any temporary files need to be setup. After system will again reboot. And while rebooting the system it will ask “Press any key to boot from CD” again. At this time also do not press any key.

Fig 18

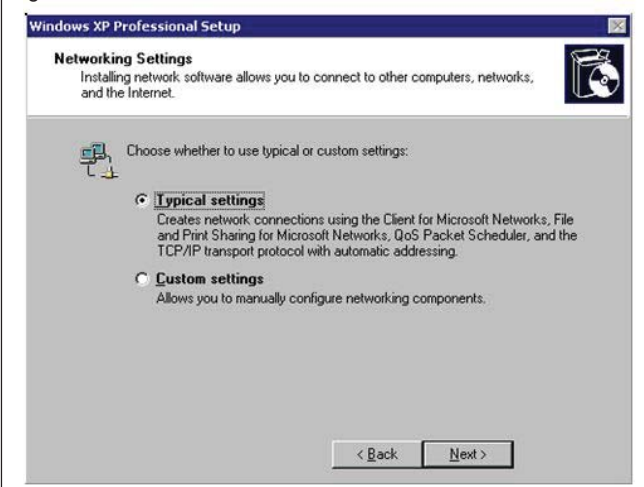


Fig 19

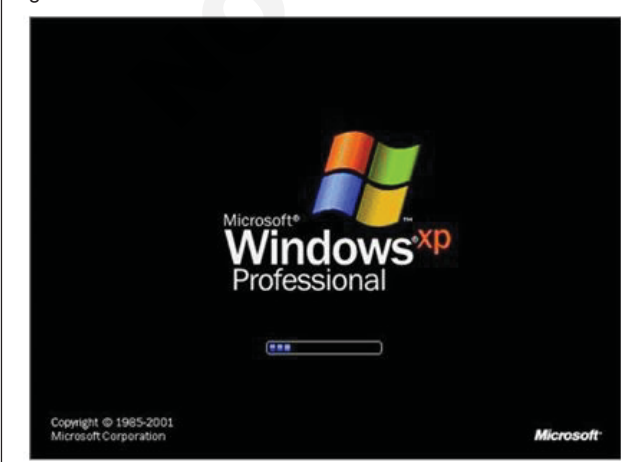


Fig 20



17 First reboot. You will be greeted by the XP splash screen on first boot.

Fig 21



18 Change Display settings. Users with CRT monitors or LCD monitors will see a display setting dialogue appear. It will ask you like to change your display settings automatically. Then click OK and it will shows your screen with modified display settings and ask keep this settings for your computer. Press OK to continue.

Fig 22

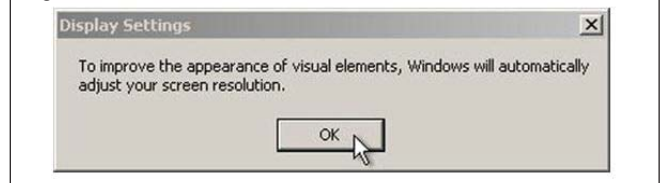


Fig 23



19 Net Work setup

Fig 24



Fig 25



Fig 26



Fig 27



Fig 28



20 Set up users. Now you can enter the atleast one user name, that could be anything. And click NEXT to continue. After creating users it will shows FINISH button. Click that FINISH completing your XP installation.

Fig 29



Fig 30



Fig 31



Format Hard Disk and Create Partition

Objectives: At the end of this exercise you shall be able to

- format Hard Drive in Windows 10 with Disk Management
- format Hard Drive in Windows 10 with AOMEI Partition Assistant Standard.

Requirements

Tools / Equipments/Instruments

- A working PC - 1 No.
- MS-windows 10 Software - 1 No.

PROCEDURE

TASK :1 Format HD Drive in Windows 10 with Disk Management

Disk Management in Windows 10 is a built-in tool which enables to format, create, delete, extend, shrink partition without rebooting system. If you want to use this tool to format Windows 10 hard drive, you should open Disk Management by one of the following ways at first.

- 1 Click start menu and then type Disk Management to search
(or)
- 2 Click start menu and type cmd to open command line and then input compmgmt.msc and then click Enter
(or)
- 3 Press "Windows + R" to open the command line and then enter "diskmgmt.msc" to launch Disk Management
- 4 After open Disk Management, right click the Windows 10 hard drive partition you need to format (partition D) and then choose Format as shown in Fig 1.
- 5 In the pop-up window, and set file system and cluster size and then click OK as shown in Fig 2.
- 6 Get it check with your instructor.

Fig 1

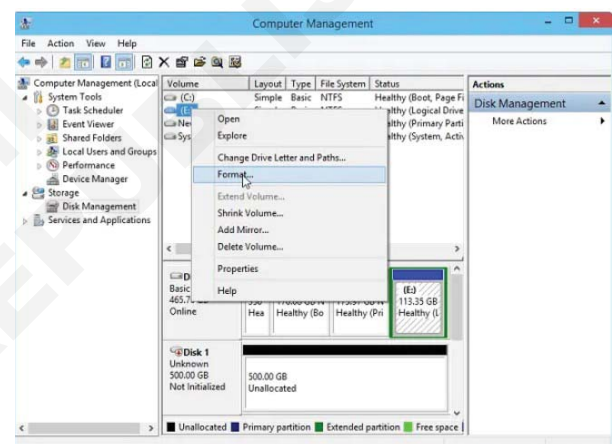
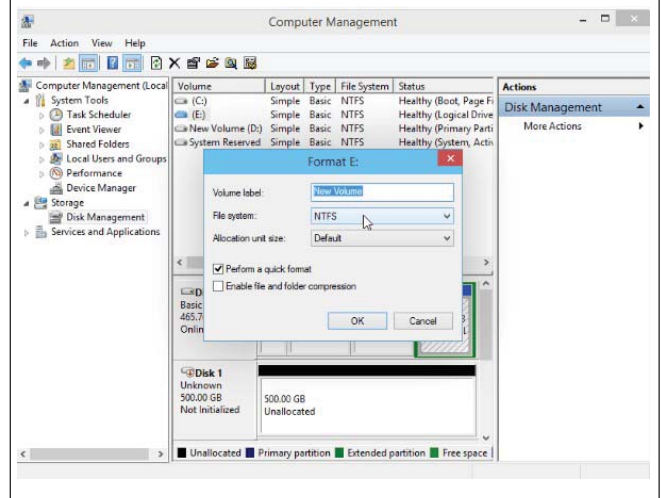


Fig 2



TASK 2: Format HD Drive in Windows 10 with AOMEI Partition Assistant Standard

AOMEI Partition Assistant Standard is a free software which is designed for partition management. It can help to format hard drive in Windows 10 even format partition larger than 32GB from NTFS to FAT32.

Before format, user can use free backup software - AOMEI Backupper Standard to backup data.

In order to make sure OS works properly, AOMEI Partition Assistant will not allow you to format system partition and boot partition. However, if need to format system partition or boot partition, user need to create a bootable media with AOMEI Partition Assistant first, after that, user can format these partitions by entering Bootable Media. In this situation, user should reset the boot order of the computer from the original location to the bootable media created. To do this, sometimes, need to change the BIOS (Basic Input/Output System) settings of your PC.

- 1 Download AOMEI Partition Assistant Free, install, and launch it.
- 2 Choose the Windows 10 hard disk partition.
- 3 Select Format Partition as shown in Fig 3
- 4 In the pop-up window, set the type of file system, the size of cluster. (Fig 4)
- 5 Click OK.
- 6 To execute the operations, please click Apply. Then successfully format hard drive in Windows 10. (Fig 5)
- 7 Get it check with your instructor

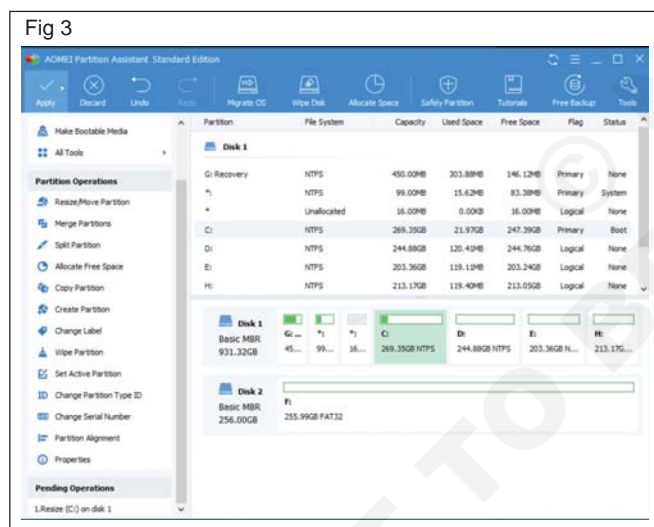


Fig 4

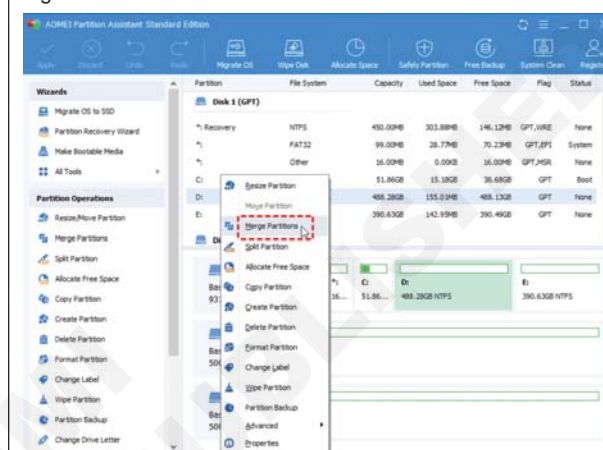
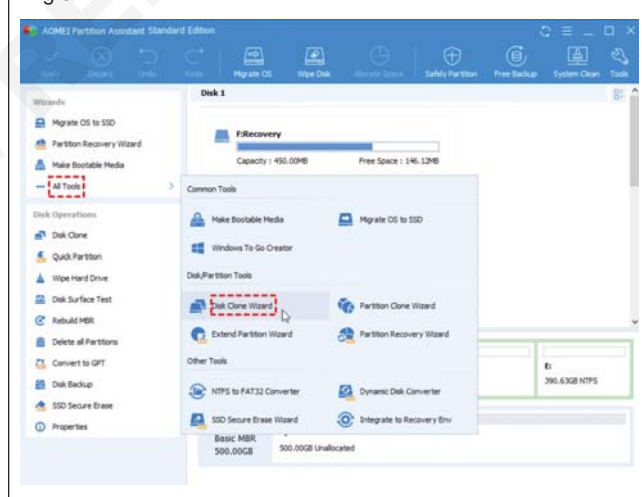


Fig 5



Geo - Informatics Assistant - Computer Hardware Basic and Software Installation

Install Necessary Application Software for Windows i.e. Office Package, PDF Reader, Media Player etc

Objectives: At the end of this exercise you shall be able to

- install MS-Office 2010
- instal Nero software in windows operating system
- instal VLC Media player
- instal Adobe PDF Reader
- download and Install Avira Free Antivirus software in windows operating system.

Requirements

Tools / Equipments/Instruments

- | | | | |
|--------------------------|---------|--------------------------------------|---------|
| • PC with MS-Office | - 1 No. | • Install the free anti -virus Avira | |
| • MS-windows 10 Software | - 1 No. | Free Antivirus | - 1 No. |

PROCEDURE

TASK 1: Installing Ms-Office 2010

Hardware and Software Requirements

Microsoft Office 2010 is available in both 32 and 64-bit versions and will install on the following minimum hardware requirements.

- 500 MHz or faster processor
- 256 MB or more RAM memory
- 3 GB or larger available hard disk space
- 1024x578 display resolution
- Windows XP SP3 32-bit, Windows Vista SP1 32/64-bit, Windows Server 2003 R2 32/64-bit with MSXML 6.0, Windows Server 2008 32/64-bit or later, Windows 7 32/64-bit, Windows 8 32/64-bit, Windows Terminal Server and Windows on Windows applications are supported as well.

When inserting the CD a prompt should show windows explorer

- 1 Confirm whether PC meets the Office 2010 system requirements.
- 2 Check to see if your PC is preloaded with Office 2010.
- 3 Click Run SETUP.EXE as shown in Fig 1.
- 4 Read the Microsoft Software License terms, place a check mark in the box to indicate that agree with them and press the Continue button as shown in Fig 3.
- 5 Enter the 25 character product key on the MSU CD case and then click Continue as shown in Fig 2.

Fig 1

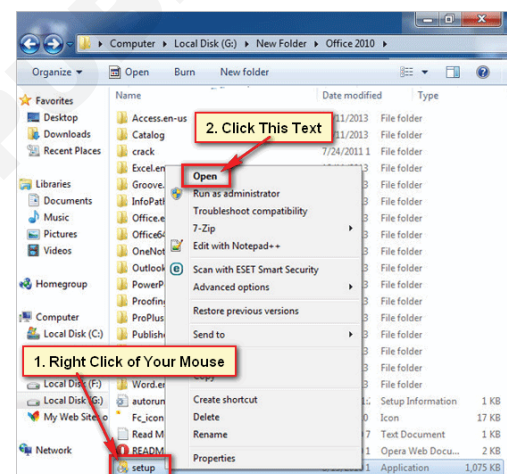
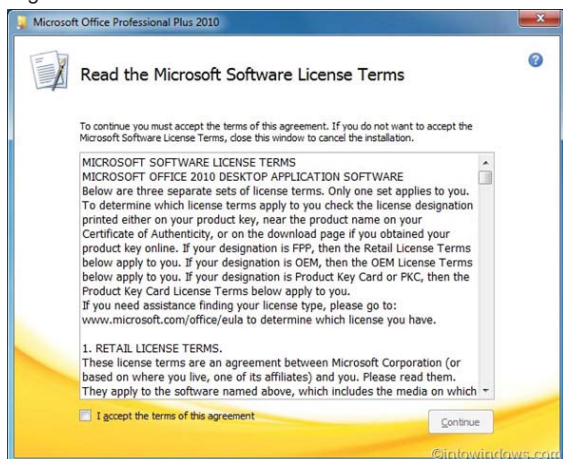


Fig 2

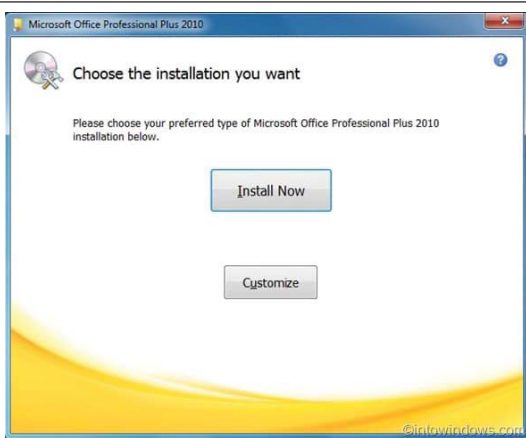


Fig 3



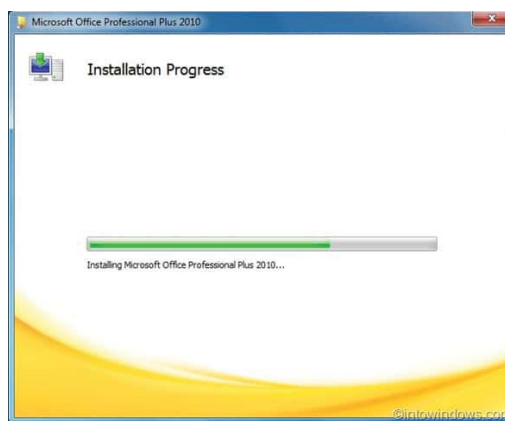
- 6 Press the Install Now button to begin the installation as shown in Fig 4.

Fig 4



The Fig 5 shows the progress bar will indicate how far along the installation has progressed. Depending upon the speed of the computer, this step could take several minutes on older systems.

Fig 5



- 7 Click Close when the installation completes as shown in Fig 6.

Fig 6



TASK: 2 Installing nero software in windows operating system

- 1 Double click the application file of Nero as shown in Fig 7.

Fig 7



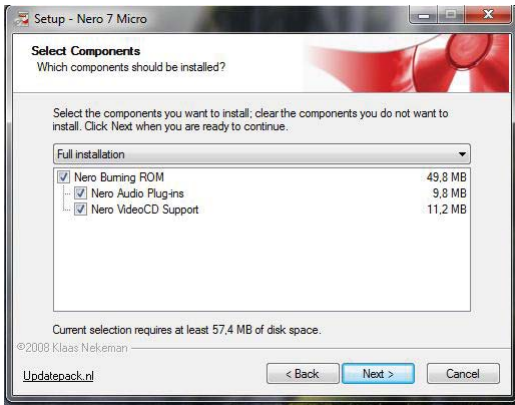
Initial file extracting window will appear as on Fig 8.

Fig 8



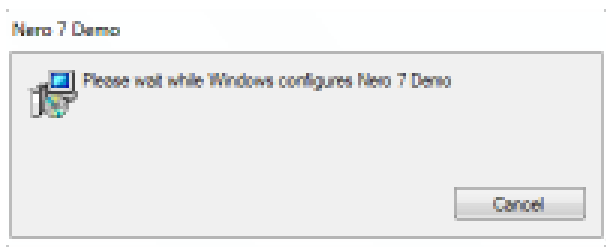
2 Click "Run Program" button as on Fig 9.

Fig 9



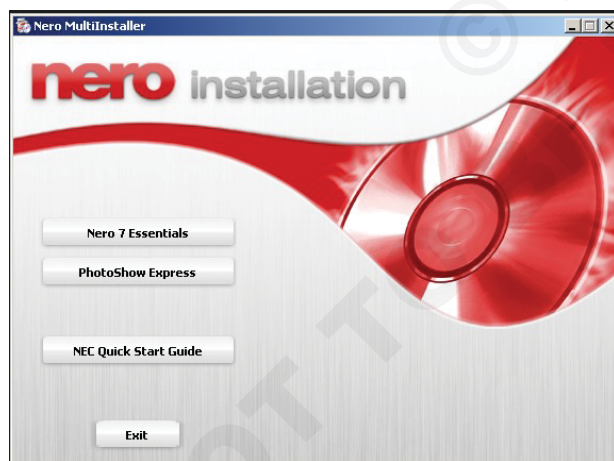
Window files configuring process will appear few seconds as on Fig 10.

Fig 10



3 Click "Next" in the installation wizard as on Fig 11.

Fig 11



4 Type the user name , organization and serial number as on Fig 12.

Serial number look it printed on CD ROM.

5 Select the setup type as "Custom" as on Fig 13.

6 Select "English" and click "Next" in the language selection window as on Fig 14

Fig 12



Fig 13

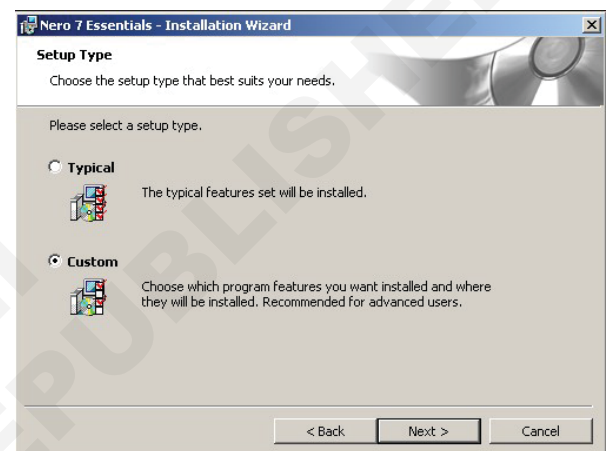
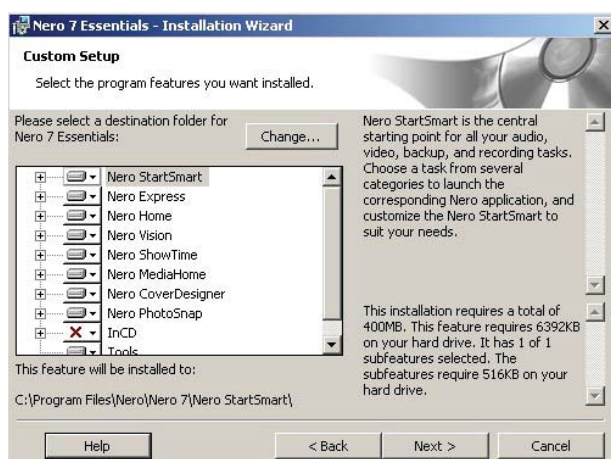


Fig 14



- Click "Next" in the custom setup window as shown in Fig 15.

Fig 15



- Click "Install" in the installation wizard as shown in Fig 16.

Fig 16



The installation process wizard will appear as on Fig 17.

Fig 17



- Click "Finish" button in the installation wizard as on Fig 18.

- Get it checked with your instructor.

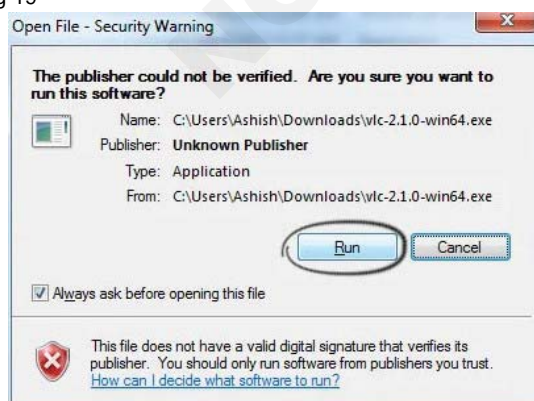
Fig 18



TASK 3: Installing VLC media player

- Double click on the Vlc-3.0.2-win32 exe file as on Fig 19.

Fig 19



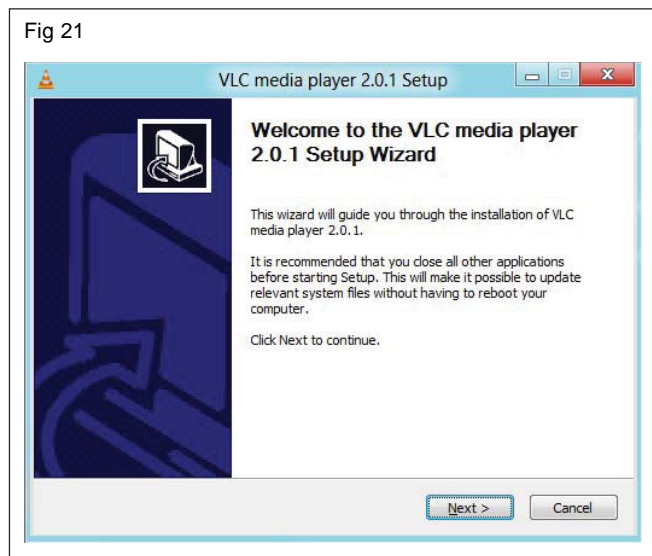
- Click Run button in the window

- Select the language and click ok button as shown in Fig 20.

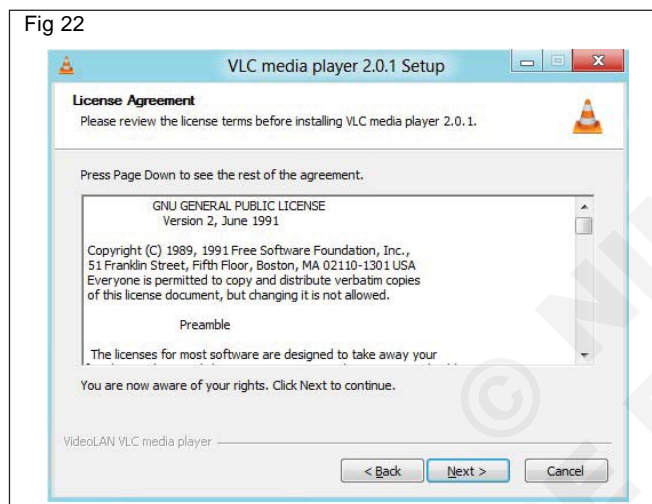
Fig 20



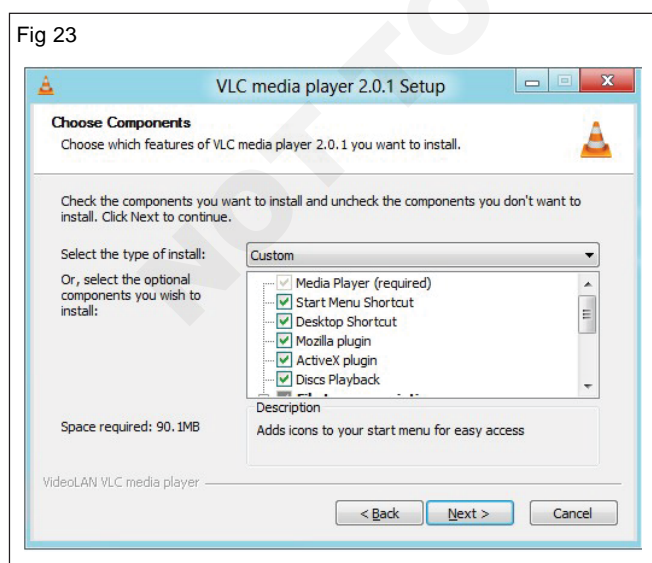
4 Click Next Button as shown in Fig 21.



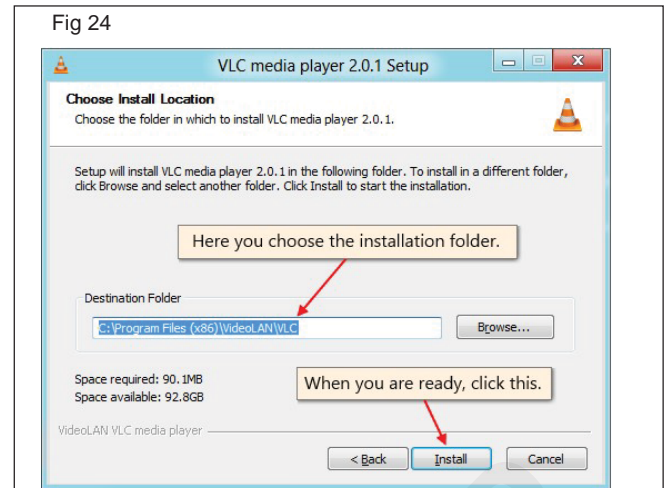
5 Click the Next Button On the License Agreement window as on Fig 22.



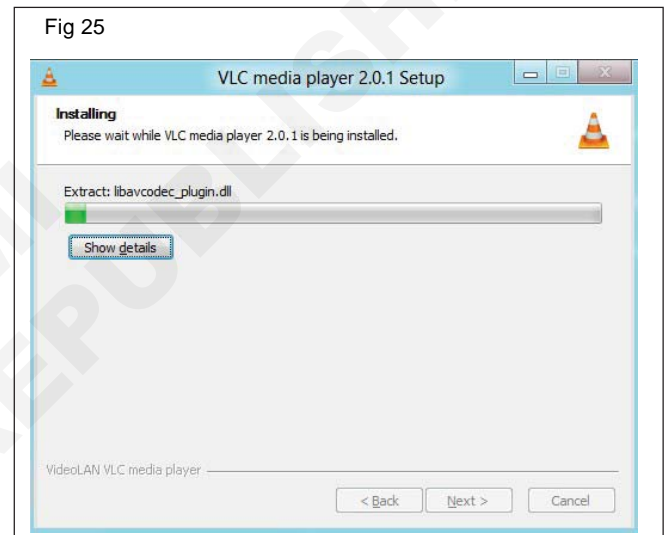
6 Select components of Media player and click Next Button as shown in Fig 23.



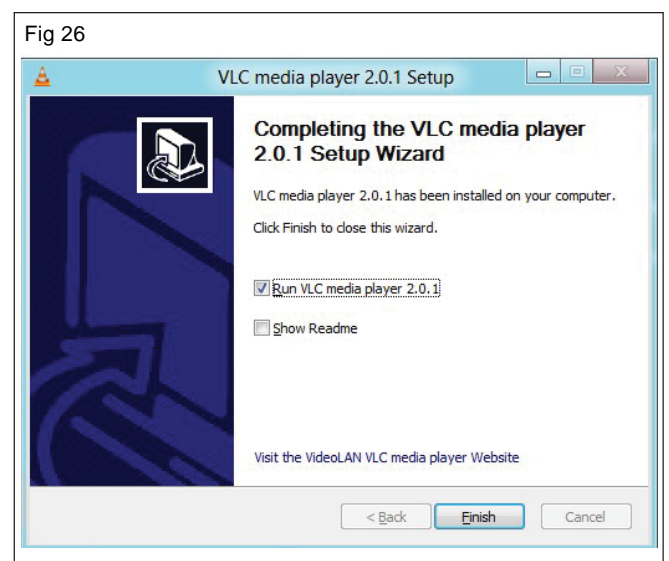
7 Click Install Button as on Fig 24.



The installation process window will display as on Fig 25.



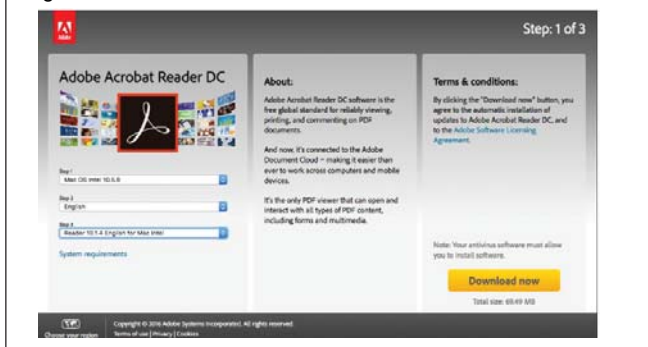
Click Finish Button as on Fig 26.



TASK 4: download and install the adobe Acrobat Reader DC from the Internet

- 1 Open the browser
- 2 Select the corresponding website <https://get.adobe.com/reader/otherversions/> as shown in Fig 27.

Fig 27



- 3 Select "windows version, Language and Reader version"
- 4 Click download button as shown in Fig 28.

Fig 28



The down loading process will start and the EXE file will show bottom of the Browser.

- 5 Click the up arrow and again click show in folder menu as shown in Fig 29

Fig 29



- 6 Double click the file as shown in Fig 30.
- 7 Click Run button as shown in Fig 31.

The down loading process window is shown in Fig 32.

Fig 30

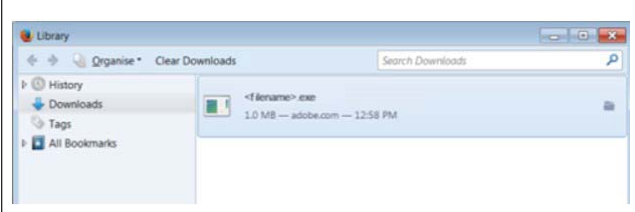
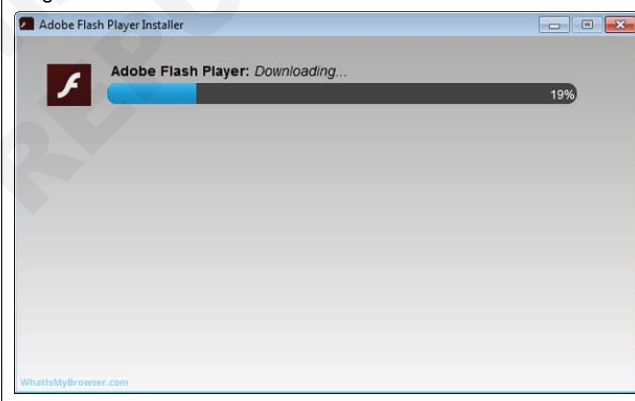


Fig 31

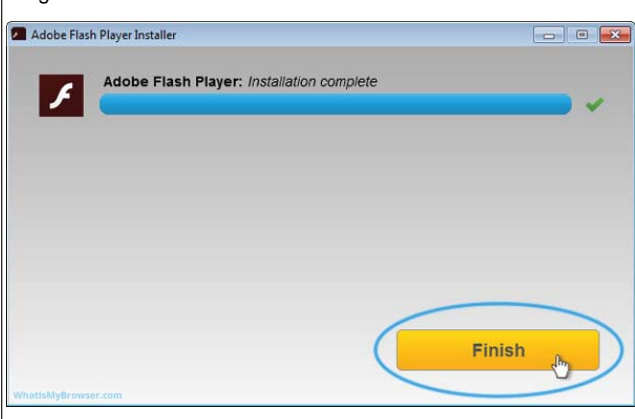


Fig 32

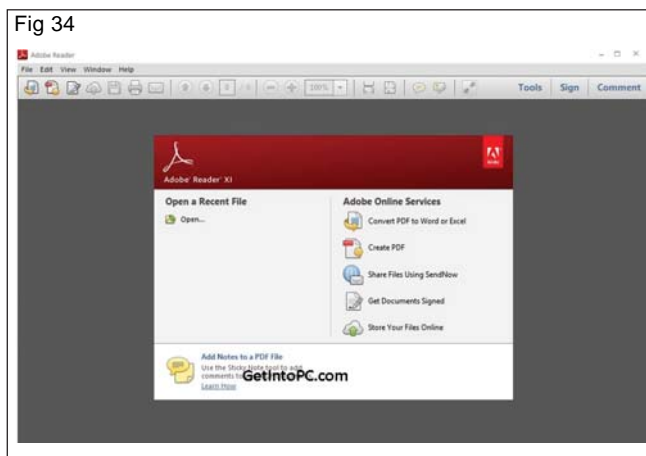


- 8 After complete the installation click Finish Button as shown in Fig 33.

Fig 33



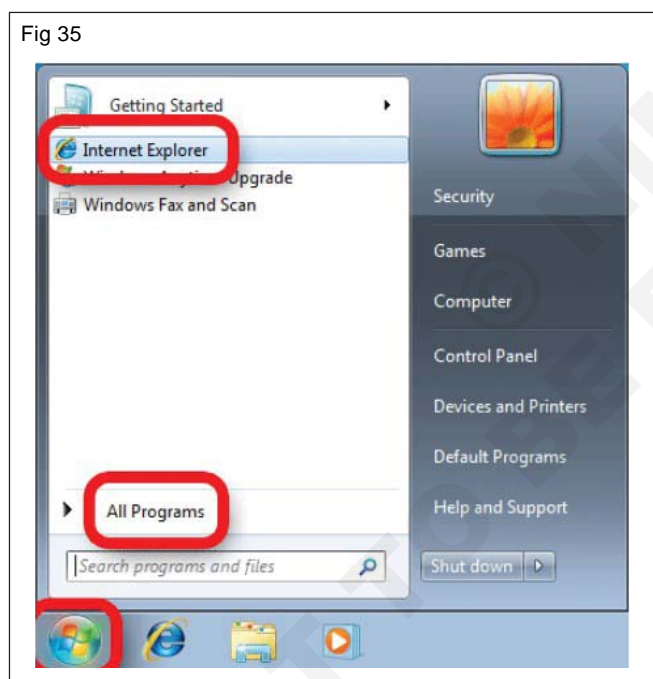
The welcome window is shown in Fig 34



TASK 5: Installing Avira Free Antivirus software

Step 1

Connect your computer to the internet. When you are online, start your internet browser. As an example, here is how it works with internet explorer. Click on <<start>>, click on <<All Programs>> and then on << Internet Explorer>> (Fig 35)



Step 2

Cms Text felt:':DB:testsolutionstep: tss_test (2000101141) @en:mr30'.

Step 3

Look for <<Anti-virus programs>>. As an example of the installation of an anti-virus, these instructions show you how to install the German anti-virus Avira Free Antivirus. This program is free for personal use. Click on <<Avira Free Antivirus>> to use the program. (Fig 36)

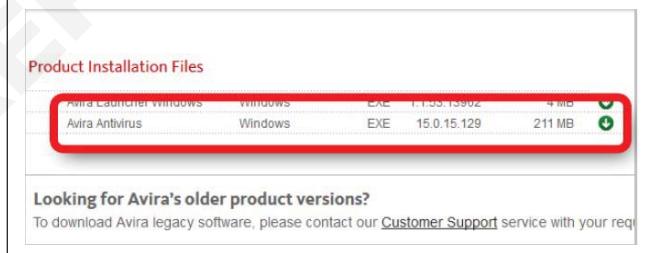
Fig 36



Step 4

You are on the website of the manufacturer of Avira Free Antivirus. Click on <<Avira Antivirus>> to download the product installation file. (Fig 37)

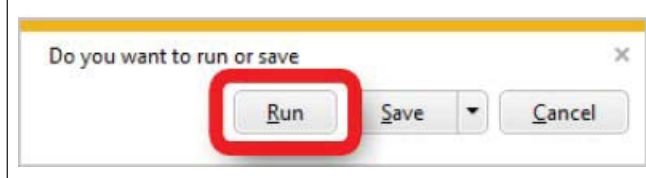
Fig 37



Step 5

If you want to install the program and run it, click on <<Run>>. Please be patient while the program is being downloaded. (Fig 38)

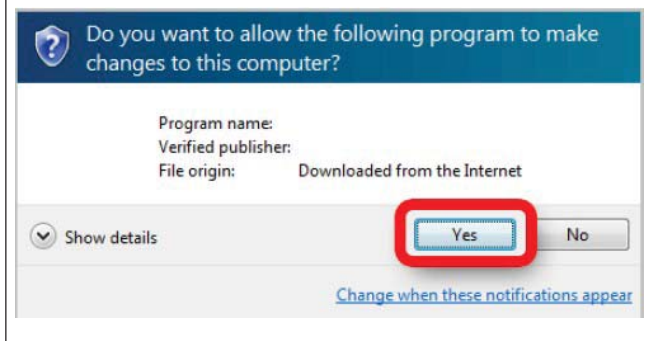
Fig 38



Step 6

To ensure that you have authorized the execution of the file, Windows asks you for a confirmation. Click on <<Yes>> to confirm. (Fig 39)

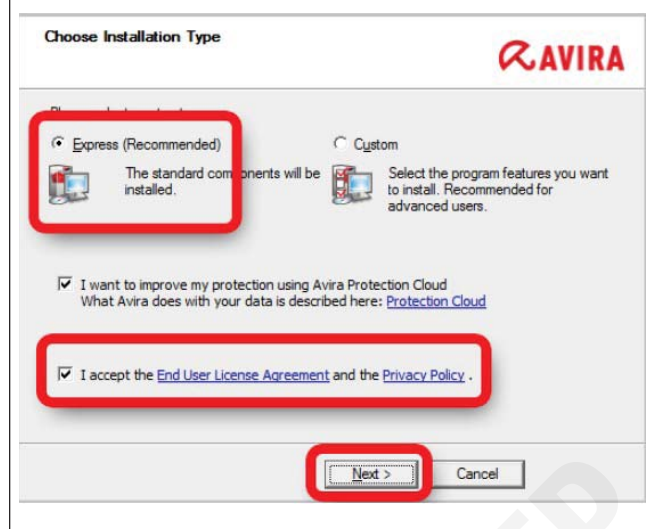
Fig 39



Step 7

Choose the <<Express>> installation type. The free version of Avira is only intended for private use, not for professional use. Confirm that you will be using it for personal use by ticking the appropriate box and then click on <<Next>>. Follow the instructions on the screen. (Fig 40)

Fig 40



Configure Bluetooth and Wi-Fi Settings

Objectives: At the end of this exercise you shall be able to

- connecting Bluetooth devices to Windows 10
- create a wifi connection for a PC.

Requirements

Tools / Equipments/Instruments

- A working PC - 1 No. /trainee
- MS-windows 10 Software - 1 No.

PROCEDURE

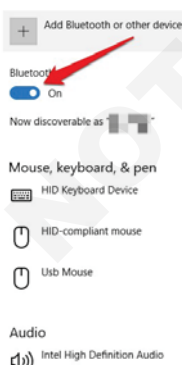
TASK 1: Connecting Bluetooth devices to Windows 10

Connecting Bluetooth devices to Windows 10

- 1 For your computer to see the Bluetooth peripheral, you need to turn it on and set it into pairing mode. It typically involves pressing and holding the Bluetooth button until you see a flashing light that indicates the pairing is ready.
- 2 Then using the Windows key + I keyboard shortcut, open the Settings app.
- 3 Navigate to Devices and go to Bluetooth.
- 4 Make sure the Bluetooth switch is in the On position. (You'll know it is working because you'll notice the message reads "Your PC is searching for and can be discovered by Bluetooth devices.")
- 5 Select the device you want to connect and click Pair. Once you click Pair, you're all done. Windows 10 will take care of the rest. You'll notice the "Connected" label under the device name. (Fig 1)

Fig 1

Bluetooth & other devices

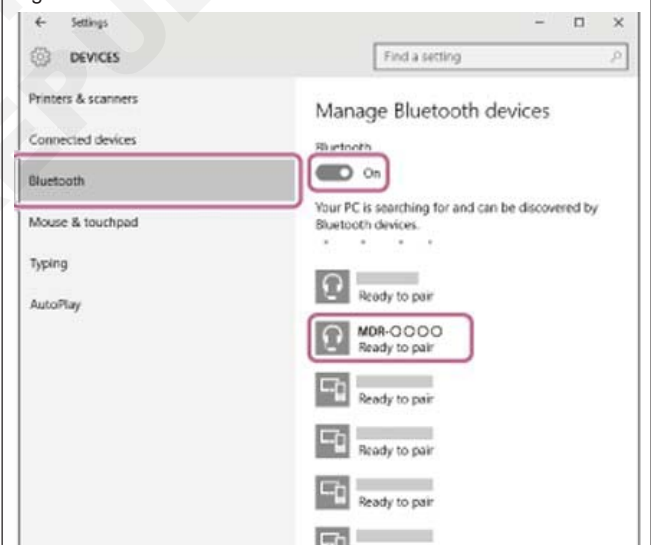


Alternatively, if you're simply trying to connect a Bluetooth audio or wireless display, you can simply do the following:

- 1 In the notification area in the Taskbar, click to open the Action Center button (or use the Windows key + A keyboard shortcut).

- 2 From the Quick actions area, click the Connect button.
- 3 Then all the enabled devices will appear in the list, click on the device, and it should pair automatically. (Fig 2)

Fig 2

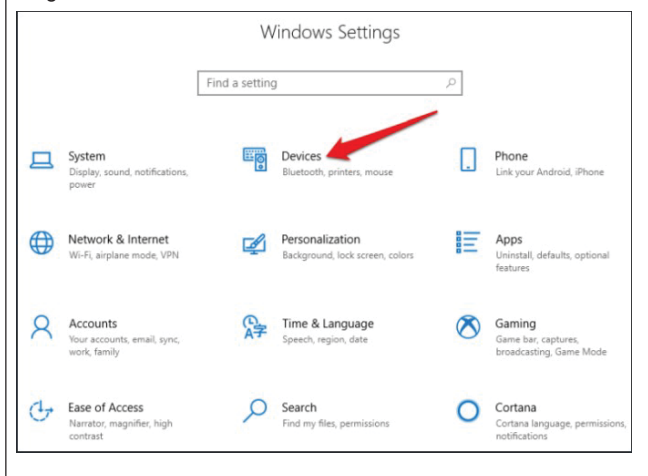


Quick troubleshooting tips

If you don't see the Bluetooth section on Devices, chances are that there are issues with Bluetooth driver. Make sure to right-click the Start button, and go to Device Manager to verify the driver is present and installed correctly. If everything looks alright, but you don't see the option, you may want to download and reinstall the latest Bluetooth driver from your computer's manufacturer support website. (Fig 3)

If the problem is with the speakers, headphones, mouse, or keyboard, make sure to turn the peripheral off, wait a few seconds, and turn it back on to try again.

Fig 3



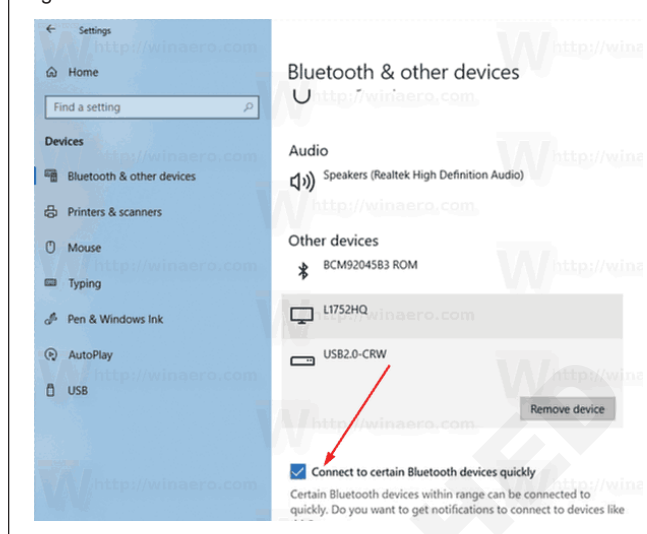
Removing a Bluetooth peripheral from Windows 10

Disconnecting a wireless peripheral is as easy as connecting. Just follow the steps below:

- 1 Use the Windows + I keyboard shortcut to open the Settings app.
- 2 Navigate through Devices and go to Bluetooth.

- 3 Click on the peripheral you want to disconnect, and click the Remove button and then click Yes to confirm. (Fig 4)

Fig 4



That's all there is to it

If you have come across issues using Bluetooth in Windows 10 and found a different work around, make sure to share your solution in the comments below.

TASK 2: Create a wifi connection for a PC

How to connect to a Wi-Fi network

Connecting to a wireless network is an easy process, you only need to know the network you want to connect and the security key to authenticate (sometimes also referred as a Wi-Fi password).

- 1 Click the wireless icon in the notification area.
- 2 Select the network you want to connect.
- 3 Check the Connect automatically option.
- 4 Click the Connect button. (Fig 5)

Fig 5



Fig 6



- 5 Enter the network security key.
- 6 Click the Next button. (Fig 6)

If the network flyout is not reporting any wireless network, you can try the steps shown below to turn off and on again Wi-Fi to see if that fixes the problem.

How to disconnect from a Wi-Fi network

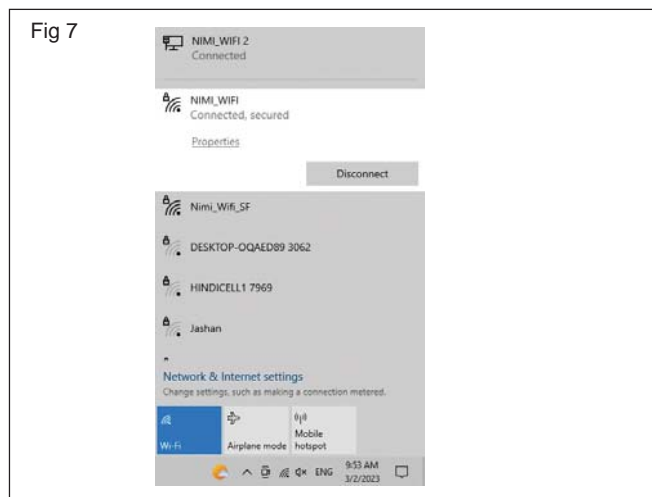
Removing your device from a wireless network is also a straightforward process that can be done in a few different ways.

Disconnecting using the flyout menu

The easiest way to disconnect is using the network flyout menu.

- 1 Click the wireless icon in the notification area.

- 2 Select the network you're currently connected.
- 3 Click the Disconnect button on the network connection. (Fig 7)



Alternatively, you can click the quick action Wi-Fi button at the bottom to turn off the adapter and disconnect from the network using fly out menu.

Quick Tip: The same **Wi-Fi** button can also be found in the Action Centre's Quick Actions section (**Windows key + A**).

If you don't select a schedule, then you'll need to enable the adapter manually by clicking the **Wi-Fi** button again from the fly out menu. Also, note that using the fly out menu, it's possible to turn on or off **Airplane mode** and **Mobile hotspot**.

Disconnecting using the Settings app

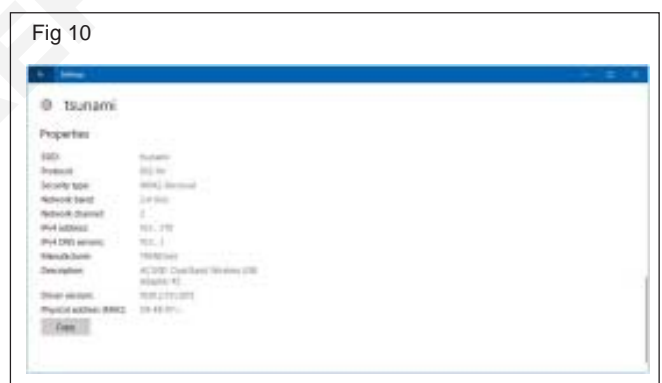
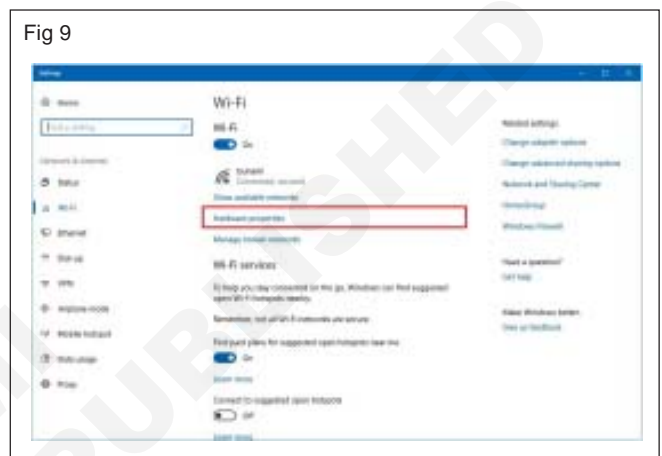
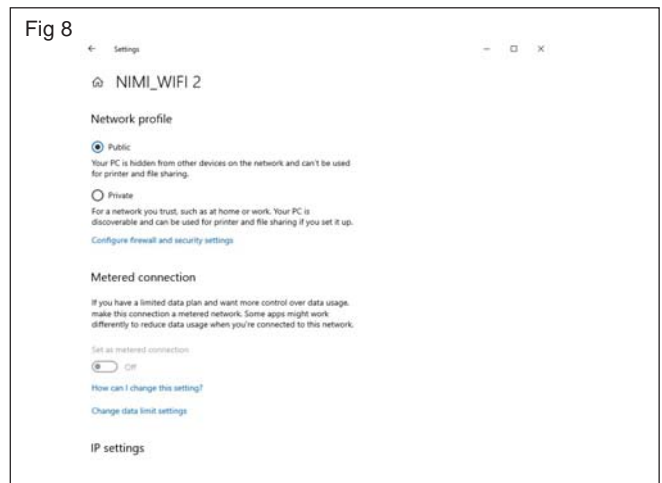
Alternatively, you can enable or disable Wi-Fi using the Settings app.

- 1 Open **Settings**.
- 2 Click on **Network & Security**.
- 3 Click on **Wi-Fi**.
- 4 Turn off the toggle switch for the adapter you want to disconnect.
- 5 Use the drop-down menu to select an option to turn on the wireless adapter on schedule. (Fig 8)

How to view a Wi-Fi connection properties

Sometimes, in order to troubleshoot a problem or set up an application, you'll need to know your network hardware information, such as network band, IP address, the name of the adapter and others. While there are a number of ways to find out this information, you can quickly identify these and other information about your wireless connection using the Settings app.

- 1 Open Settings.
- 2 Click on Network & Security.
- 3 Click on Wi-Fi.
- 4 Under the wireless network, click the Hardware properties link. (Fig 9 & 10)



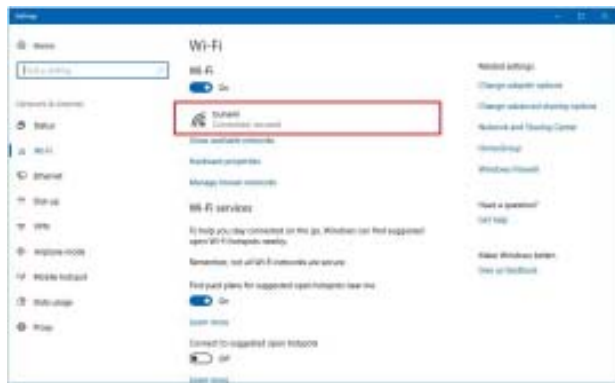
In the properties page, you'll find information, such as SSID, protocol, security type, network band and channel, IP and MAC address.

How to connect to a Wi-Fi network on range automatically

If you didn't select the option to connect to a wireless network automatically while setting up a new connection, or you enabled the option, but you don't need the configuration anymore, it's possible to control this feature using the Settings app.

- 1 Open Settings.
- 2 Click on Network & Security.
- 3 Click on Wi-Fi.
- 4 Click your current Wi-Fi connection. (Fig 11)

Fig 11



- 5 Turn on or off the Connect automatically when in range option. (Fig 12)

Fig 12

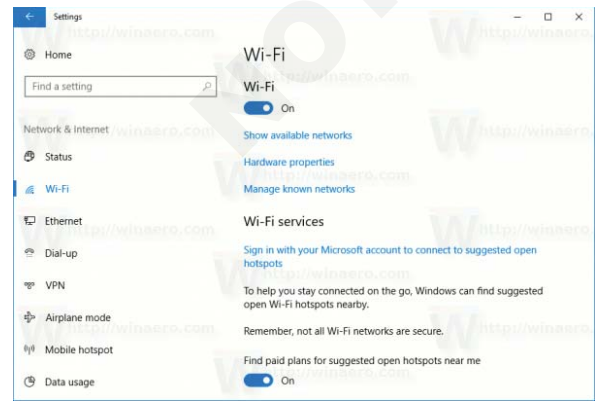


How to change the Wi-Fi connection network profile

In order to increase network security, starting with the Windows 10 Fall Creators Update, you can now more easily set your wireless connection as Private on a network you trust, or Public on the network you don't trust, such as at a coffee shop or airport.

- 1 Open **Settings**.
- 2 Click on **Network & Security**.
- 3 Click on **Wi-Fi**.
- 4 Click your current Wi-Fi connection. (Fig 13)

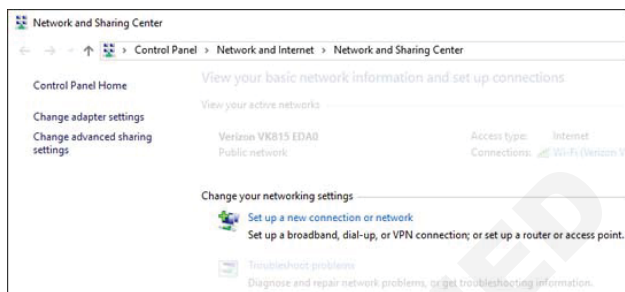
Fig 13



- 5 Under "Network profile," select one of the two options:

- **Public** - makes your PC hidden from other devices on a public network and disables file and printer sharing.
- **Private** - makes your PC discoverable by other devices in a local network and allows them to use printer and file sharing (if it was configured). (Fig 14)

Fig 14



If you're not running the Windows 10 Fall Creators Update, you'll see a **Make this PC discoverable** option, which works in the same way as the options shown in the above steps (toggle switch **off** means **Public**, and toggle switch on means **Private**).

How to set a Wi-Fi connection as metered

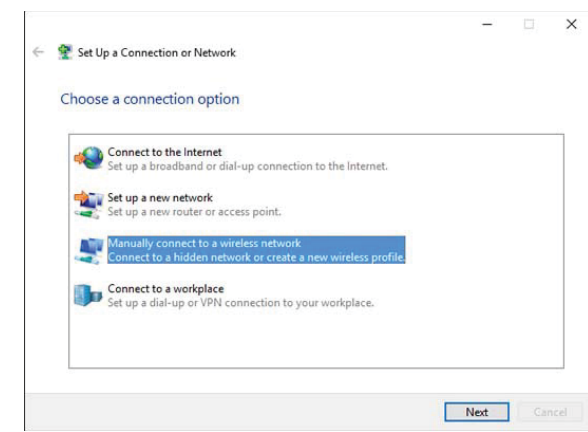
Out of the box, Windows 10 has unlimited access to the internet to download system and app updates, sync settings across your devices, connect to cloud services, and to connect you to the mighty internet.

The problem is that if you're on a limited internet connection, it's possible to go over the data cap very quickly. A metered connection helps to reduce Windows 10's data usage to prevent exceeding your data plan.

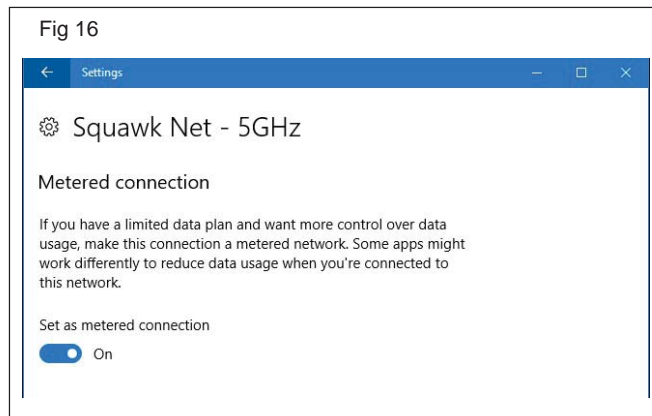
If you're connected to a limited data plan, you can use the Settings app to set your wireless connection as metered.

- 1 Open **Settings**.
- 2 Click on **Network & Security**.
- 3 Click on **Wi-Fi**.
- 4 Click your current Wi-Fi connection. (Fig 15)

Fig 15



- Under "Metered connection," turn on the Set as metered connection toggle switch. (Fig 16)



After completing the steps, Windows 10 will only have restricted access to an internet connection, which also prevents it from downloading updates. However, some critical updates may download over this type of connection.

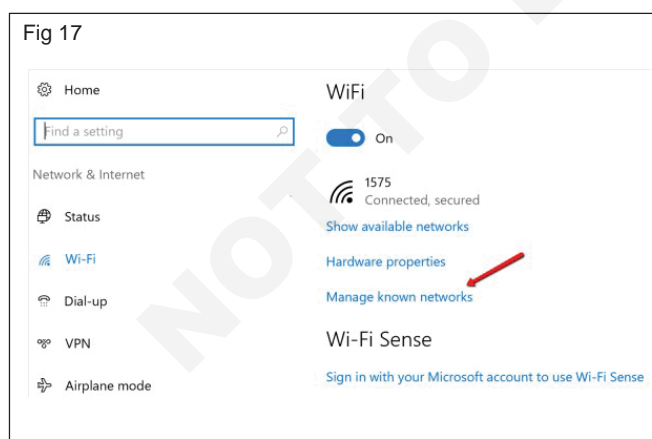
In addition, using a metered connection will prevent the Start menu from downloading Live Tiles updates, and some apps will no longer receive updates automatically.

How to add or remove Wi-Fi connections

Using the Settings app is also possible to add or remove a Wi-Fi network manually in those cases when you may need to connect to a network that doesn't broadcast its SSID (Service Set Identifier), or when you need to set up a wireless connection beforehand to save time.

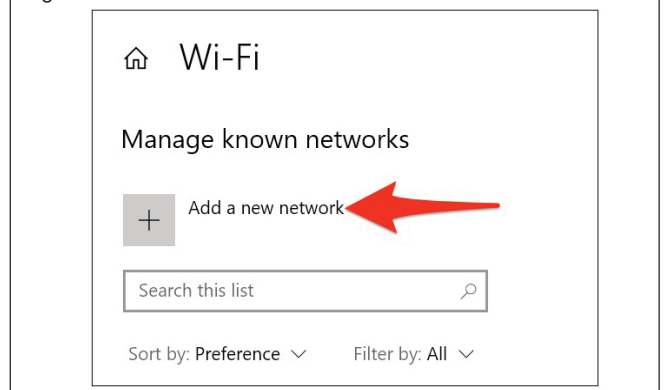
Adding a Wi-Fi network

- Open Settings.
- Click on Network & Security.
- Click on Wi-Fi.
- Click the Manage known networks link. (Fig 17)



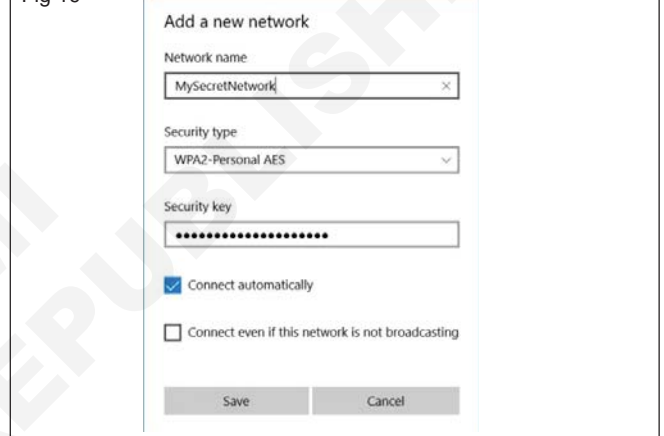
- Click the Add a new network button. (Fig 18)
- Enter the network name.
- Using the drop-down menu, select the network security type.

Fig 18



- Check the Connect automatically option.
- Check the Connect even if the network is not broadcasting option.
- Click Save. (Fig 19)

Fig 19



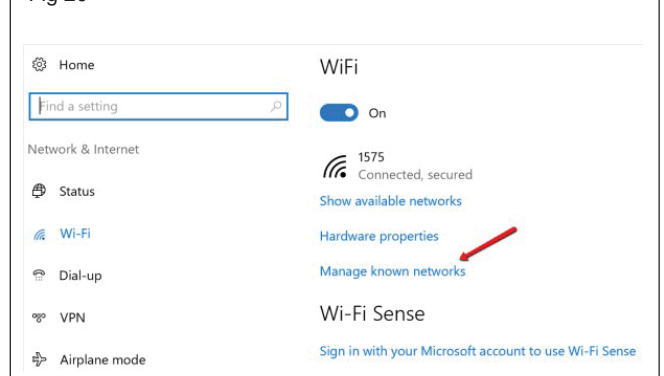
Once you've completed the steps, whenever your device is within range of the network, it'll connect automatically without any further steps.

Removing a Wi-Fi network

If you must remove (forget) a Wi-Fi network, the Settings app makes it a very straightforward process.

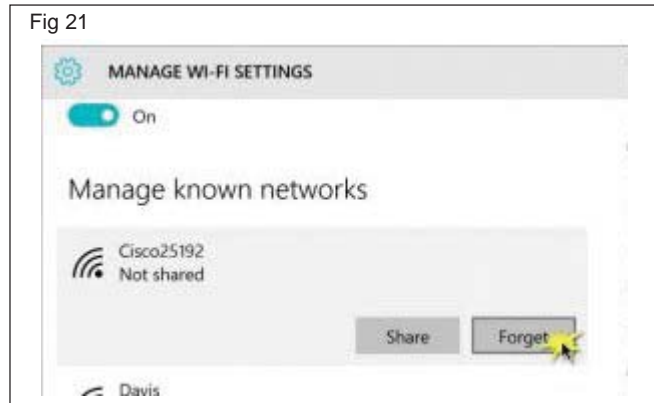
- Open Settings.
- Click on Network & Security.
- Click on Wi-Fi.
- Click the Manage known networks link. (Fig 20)

Fig 20



- 5 Select the Wi-Fi connection you want to remove.
- 6 Click the Forget button (there is no confirmation dialog using this button, so make sure that you really want Windows 10 to forget this connection before clicking the button). (Fig 21)

Fig 21



After completing the steps, your device will no longer try to connect with the network you've removed.

How to manage wireless services

The Wi-Fi settings page also offers a few nifty features for users that are always on the move. (Fig 22)

Wi-Fi services

Windows 10 offers two additional features to help you get connected no matter where you are located. If you turn on the Find paid plans for suggested open hotspots near me toggle switch, then you'll be able to purchase data plans from the Windows Store from affiliated networks.

In addition, you can also turn on the Connect to suggested open hotspots toggle switch, which allows Windows 10 to connect automatically to open wireless networks, even connecting through landing pages thanks to a database of known networks.

While using suggested open hotspots is a good option, remember that some networks can be reliable but not secure.

Hotspot 2.0 networks

Hotspot 2.0 is a relatively new networking standard that makes connecting to public Wi-Fi networks a simple and secure process.

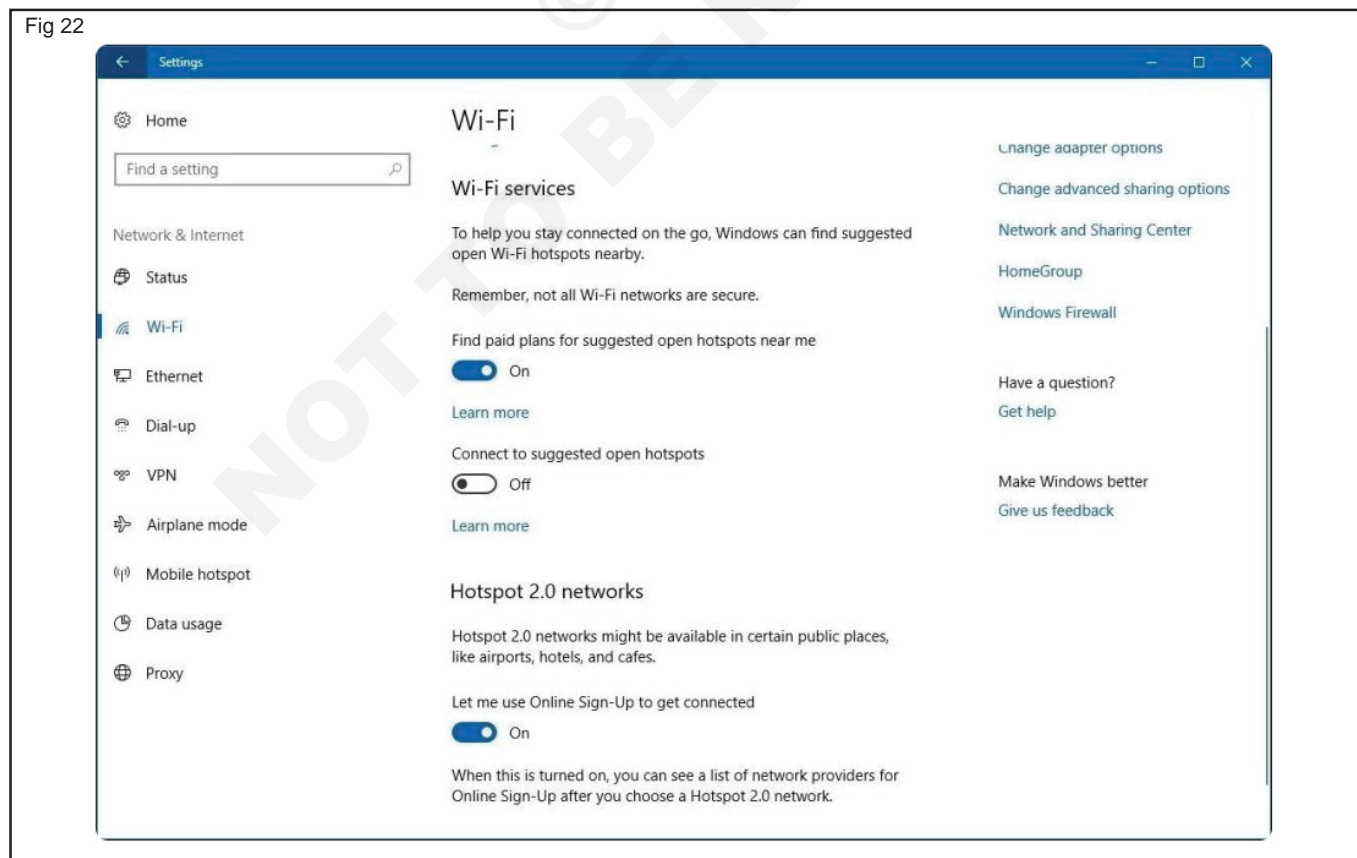
If you're in a public place like at a coffee shop, airport, or hotel, Hotspot 2.0 will identify and connect to the right network automatically without having to go through a list of networks which can be fake or malicious.

Hotspot 2.0 networks is enabled by default on Windows 10, but if you're planning to make use of this feature, you can go to Settings>Update & Security>Wi-Fi to make sure is enabled. You can also check this guide for more details

Wrapping things up

While it's now possible to configure many wireless options using the Settings app, Windows 10 has yet to include every networking feature in this experience. This means that to change some options, such as advanced network adapter settings, power management, and set up specific protocols, you still need to use Control Panel.

Fig 22



Bluetooth module

We're rapidly moving from a wired to a wireless area very quickly as more people are switching to mobile devices, such as laptops, tablets, and phones, and moving away from traditional computers.

In these computing devices, we can connect all sort of accessories from headphones to speakers, mice, keyboards, and other peripherals that can connect wirelessly to virtually any device thanks to Bluetooth.

Bluetooth is now a ubiquitous wireless technology that transmit data back and forth between devices over a short distance. It allows you to get rid of cables around your desk.

Of course, Windows 10 includes support for Bluetooth. However, Microsoft is making it just a little bit easier to connect different peripherals with this wireless technology.

In this guide for beginners, we're going to look at how to connect any Bluetooth peripheral to your Windows 10 devices (of course, if your computer supports this type of wireless connectivity).

— — — — —

© NIMI
NOT TO BE REPUBLISHED

Geo - Informatics Assistant - Computer Hardware Basic and Software Installation

Install Drivers for Printer, Scanner, Webcam and DVD etc

Objectives: At the end of this exercise you shall be able to

- add local printer in windows 10 operating system
- install a wireless printer
- setup the Home group
- connect to a shared printer on the HomeGroup
- add a Scanner to Windows 10 PC.

Requirements

Tools / Equipments/Instruments

- PC with windows 10 OS - 1 No. /trainee
- Printer, scanner, web camera & - 1 No. /trainee
- DVD drive software

PROCEDURE

TASK 1: Add local printer in windows 10 operating system

The most common way to connect a printer to the PC is by USB cable, which makes it a local printer. And also install a wireless printer or add a printer connected to another computer on your network. We'll cover these scenarios below.

- 1 Connect the printer to your computer using the USB cable and turn it on.
- 2 Open the Settings app from the Start menu as shown in Fig 1.

Fig1



- 3 Click Devices as shown in Fig 2.
- 4 Click Add a printer or scanner as on Fig 3.
- 5 If Windows cannot detect the connected printer, click the The printer that I want isn't listed link as shown in Fig 4.
- 6 On the Find a printer with other options window, click to select the Add a local printer or network printer with manual settings radio button.

Fig 2

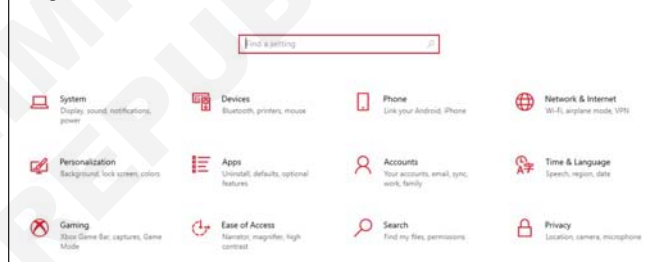


Fig 3

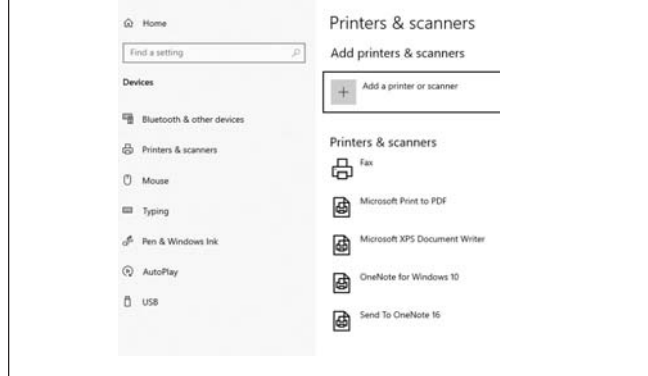
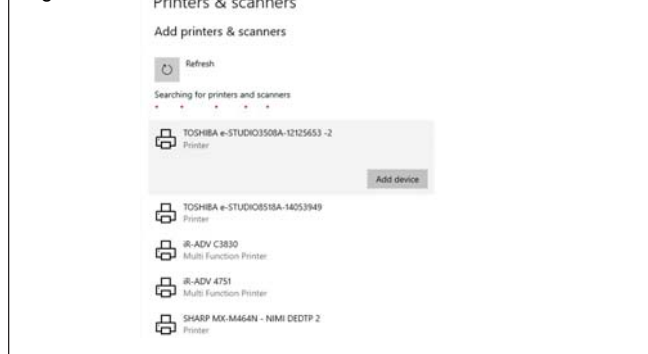
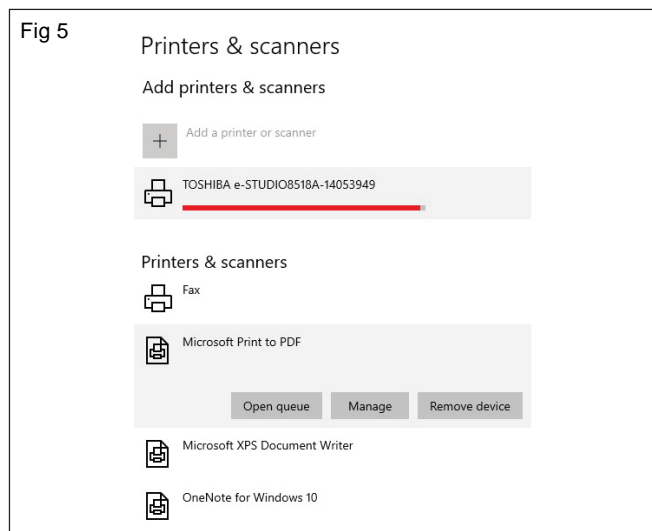


Fig 4

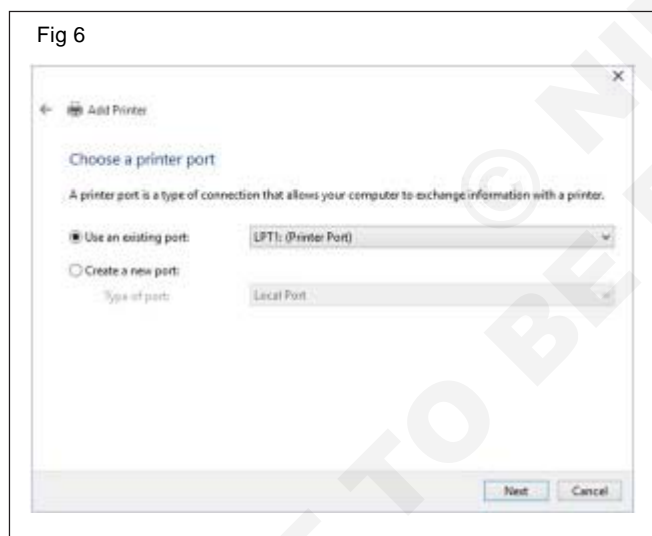


7 Click Next to continue as on Fig 5.



8 On the Choose a printer port window, leave the default options selected and click Next.

If you are an advanced user, you can also choose a different option from the Use an existing port drop-down list, or you can define your own port by selecting the Create a new port radio button and specifying your custom port in the enabled field as on Fig 6.



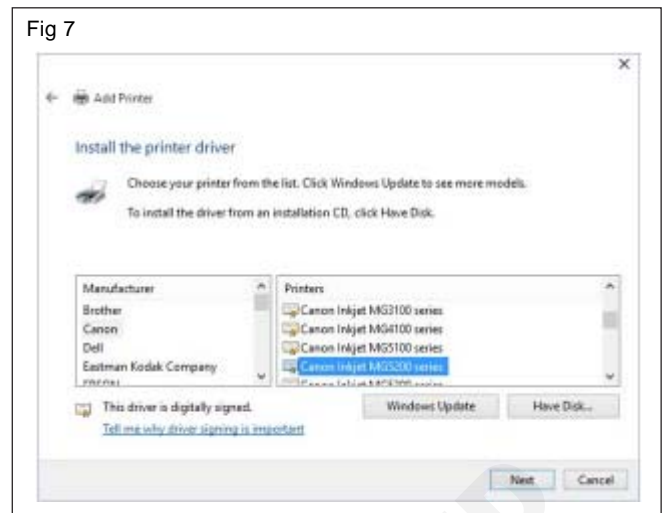
9 Click Next.

10 On the Install the printer driver window, from the displayed list of printer manufacturers in the left section, click to select the one to which the connected printer belongs.

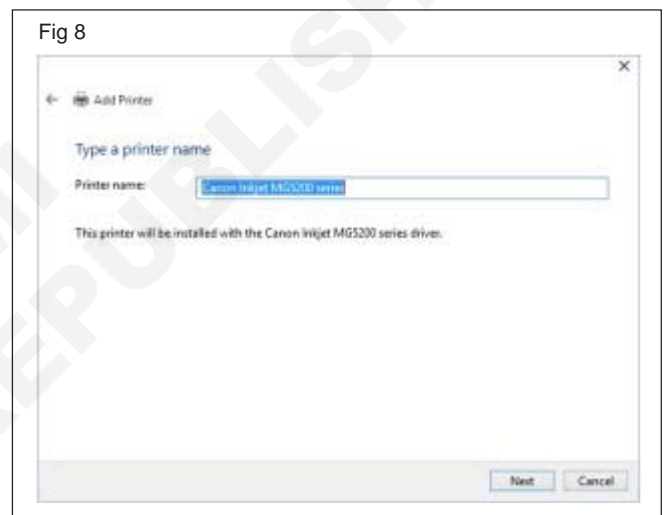
11 From the right section, locate and click to select the specific model of the printer that is connected to the PC.

Note: At this point, you can also click the Have Disk button and browse and locate the driver for the connected printer if you have downloaded it manually from its official website.

12 Click Next to proceed to the next step as on Fig 7.



13 Type a printer name window, in the Printer name field, type an informative name for the printer as shown in Fig 8.



14 Click Next.

15 If you share the printer, select "Share this printer" so that others on the network can find and use it" radio button

Note: If you do not want to share the printer with the network users, you can select the Do not share this printer radio button.

16 In the Share name field, type a short share name for the printer. 17. Optionally populate the Location and Comment fields with your preferred information.

Note: The name you specify here will be displayed to the remote users when they search for this printer over the network.

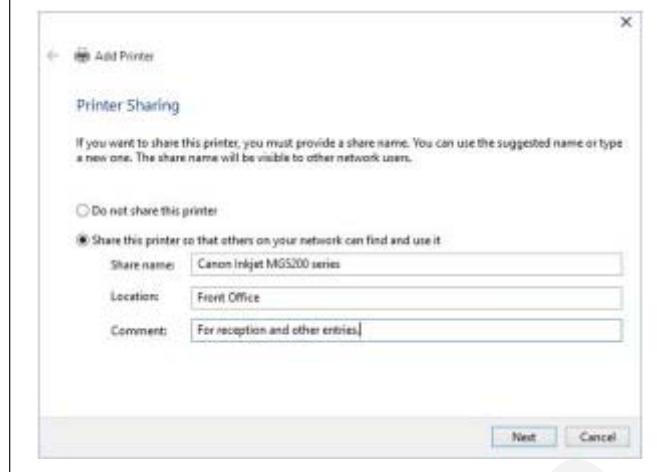
17 populate the Location and Comment fields with your preferred information. Optionally p

18 Click Next to continue as on Fig 9.

19 On the final page of the wizard, click the Print a test page button to check the connectivity and proper functioning of the printer.

20 (Optional) Click Finish to complete the process.

Fig 9



TASK 2: Installing a wireless printer

1 Open Settings as shown in Fig 10.

Fig 10



2 Click on Devices as shown in Fig 11.

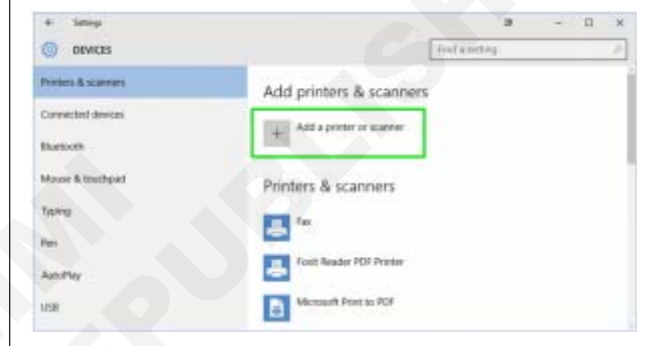
Fig 11



3 Click on Printers & scanners.

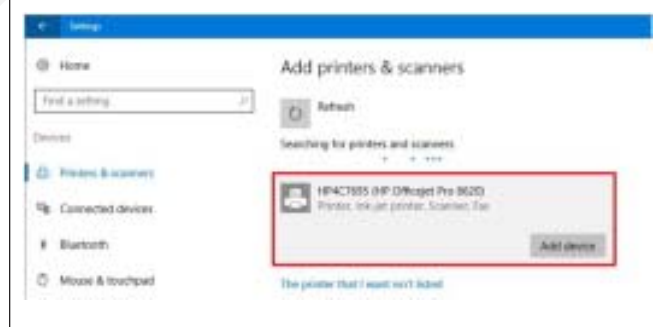
4 Click on the Add a printer or scanner button as on Fig 12.

Fig 12



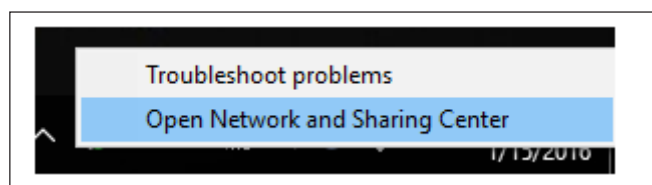
5 Select the printer from the list and click Add device to install the wireless printer to Windows 10 as shown in Fig 13.

Fig 13



TASK 3: Setting Up a HomeGroup

1 Right-click on the wireless icon in the taskbar and select "Open Network and Sharing Center".

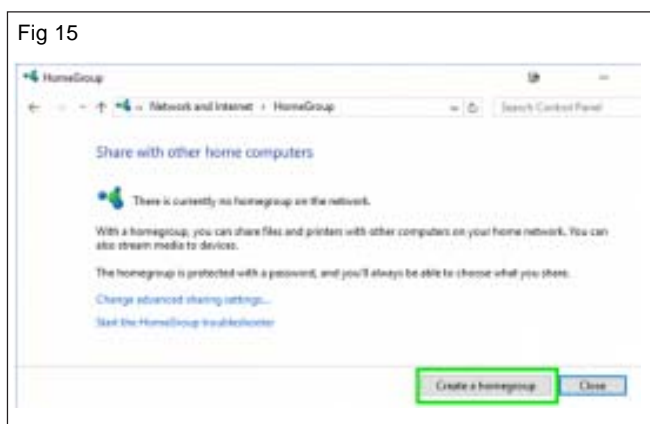
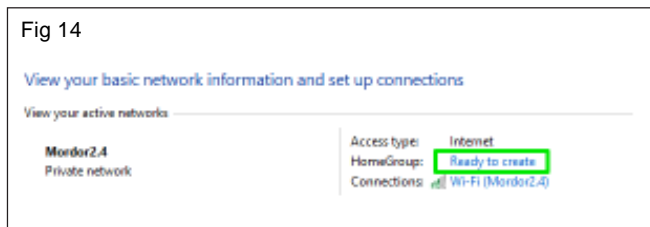


2 Click "Ready to create" next to HomeGroup. If a HomeGroup already exists on the network, it will say "Joined." As on Fig 14.

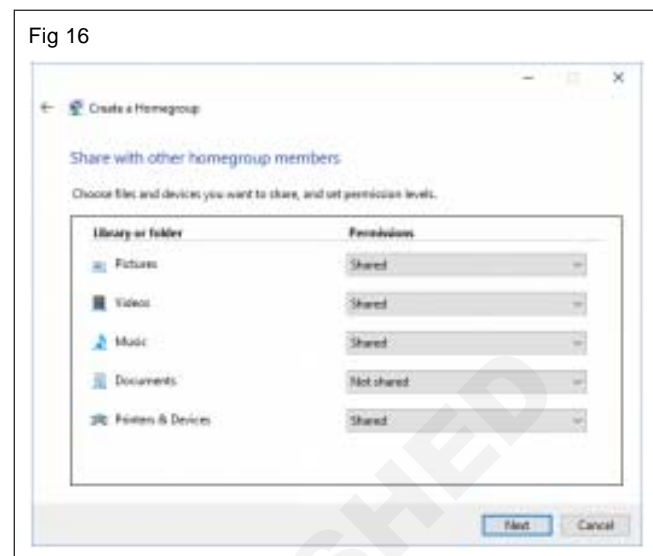
3 Click the "Create a homegroup" button as on Fig 15.

4 Click Next.

5 Select what you want to be shared. Printers & Devices are shared by default as shown in Fig 16.

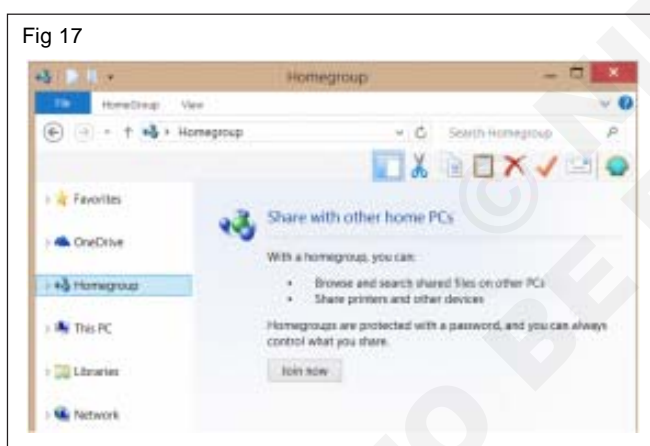


- 6 Write down the HomeGroup password Windows creates for you. user need it for each computer you want to join the HomeGroup.
- 7 Click Finish.

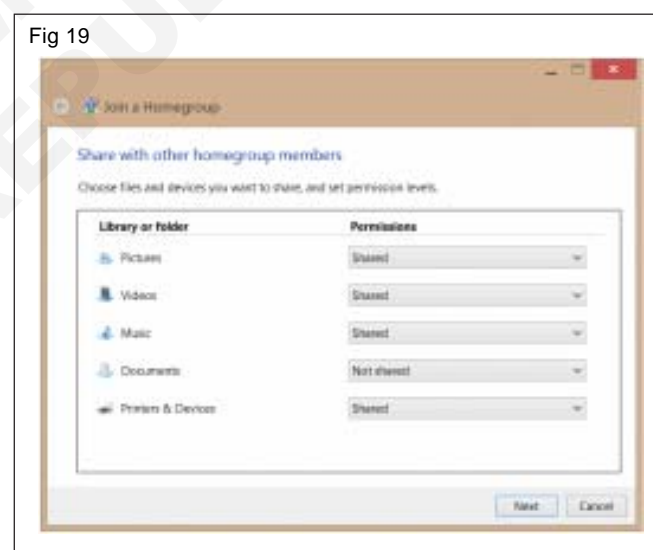
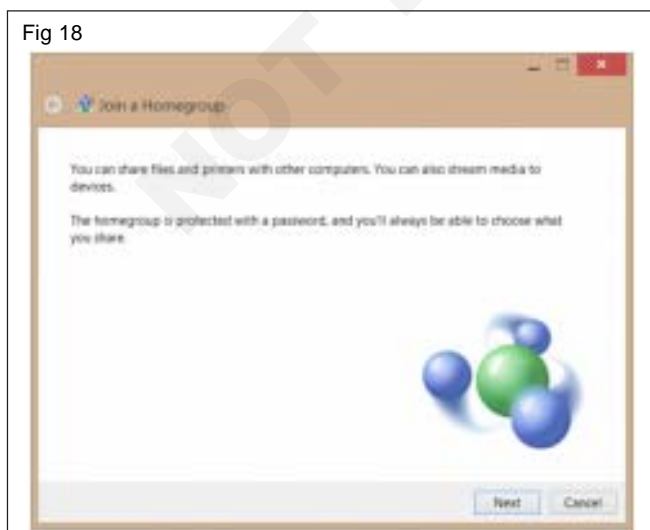


TASK 4: Connecting to a Shared Printer on the HomeGroup

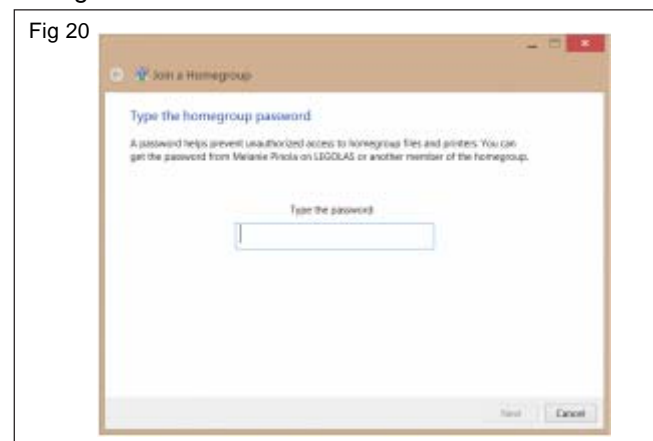
- 1 Click "Homegroup" and then the Join now button in Windows Explorer. (Fig 17)
- 3 Verify what you want to share and click Next as on Fig 19.



- 2 Click Next (Fig 18).

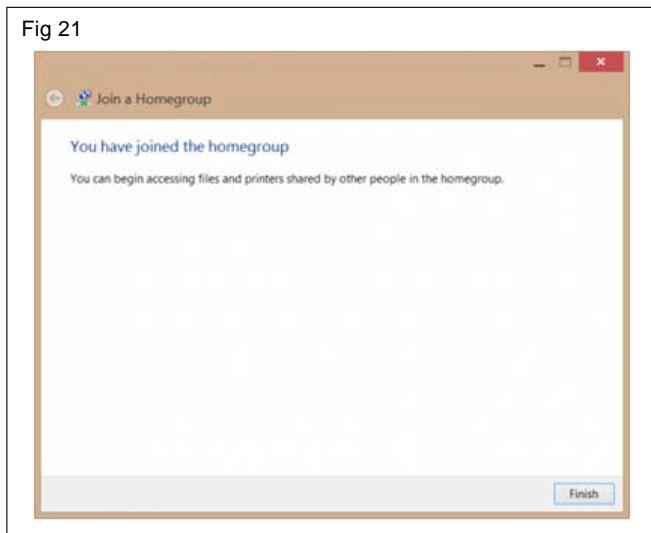


- 4 Enter the password and click Next as shown in Fig 20.



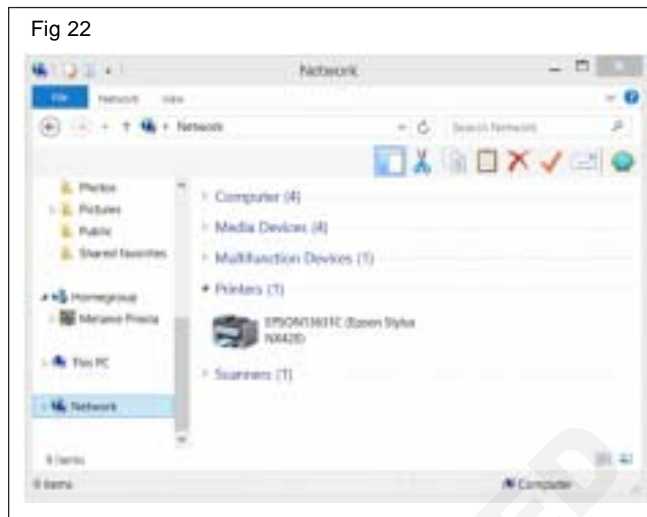
- Click Finish as shown in Fig 21.

Fig 21



- Click Network in Windows Explorer and see the shared printer installed as on Fig 22.

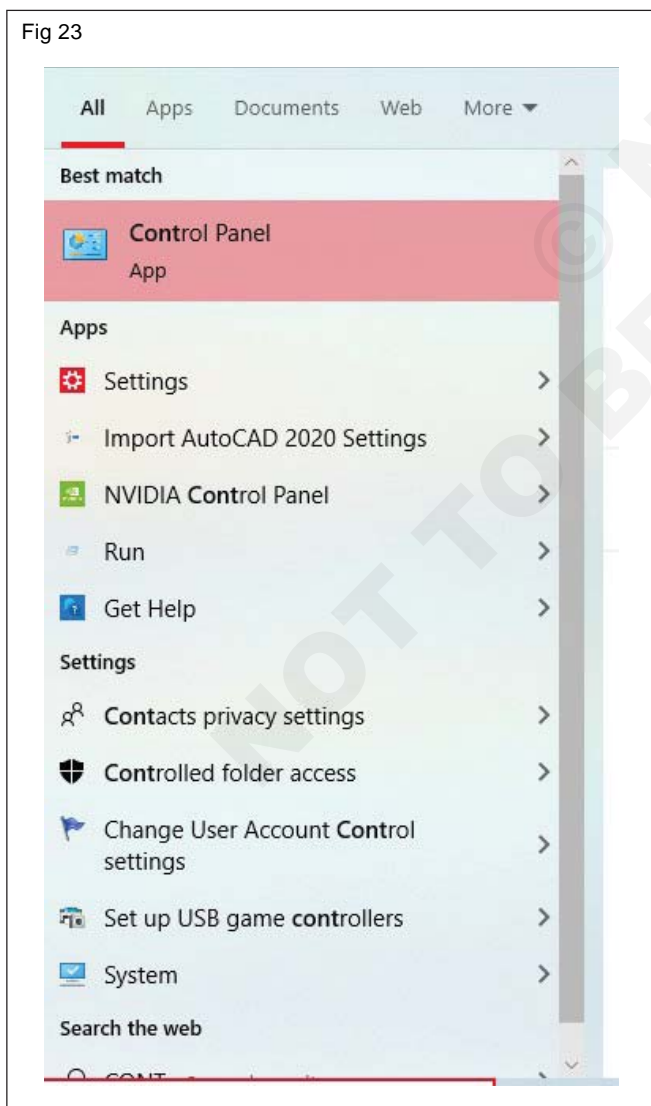
Fig 22



TASK 5: Adding a Scanner to Windows 10 PC

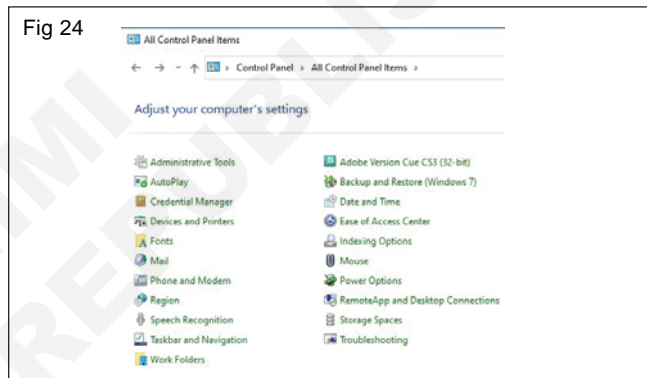
- Go to the search box on the taskbar and type control panel. Cortana will also display the Control Panel and its icon as the Best Match, click on it as shown in Fig 23.

Fig 23



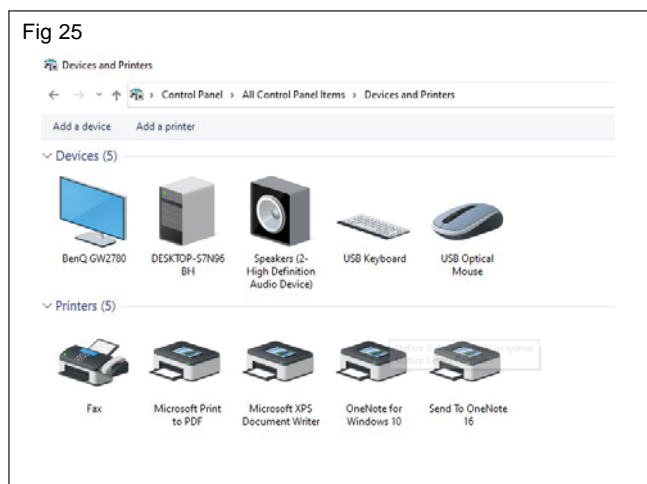
- locate and select Devices and Printers as on Fig 24.

Fig 24

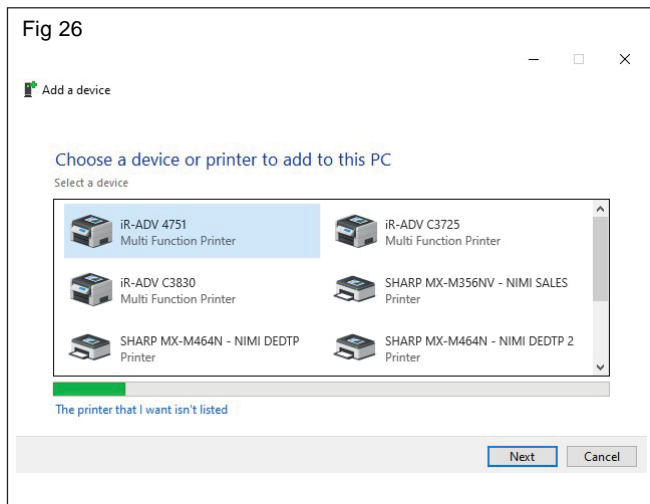


- Inside Devices and Printers, find a blank space and perform a right-click there. Few options will appear, click Add devices and printers as on Fig 25.

Fig 25



- A small box with a title Add a device will be visible on the screen and it will start finding the device.
- After the scan gets over, the scanner name will be displayed on the box. So, select the scanner name and click Next as shown in Fig 26.



- 6 Finally, successfully added the scanner to Windows 10 PC.

Installing Web camera

- 1 Connect your Web camera to your computer.
- 2 Wait for your computer to detect the Web camera. Because you have windows Vista installed on your computer, your computer will automatically detect that

a new peice of hardware was connected to your USB port. A message will appear in the bottom right corner of your screen that reads, "your devices are ready to use" or

- 3 Install the Software to operate the camera, your camera came with software to install on your computer. Simply insert the disk that came with your web camera and follow the instruction.

Installing DVD writer

- 1 Connect your DVD writer to your computer.
- 2 Wait for your computer to detect the DVD writer. Because you have windows Vista installed on your computer, your computer will automatically detect that a new peice of hardware was connected to your USB port. A message will appear in the bottom right corner of your screen that reads, "your devices are ready to use" or
- 3 Install the Software to operate the DVD writer, your DVD writer came with software to install on your computer. Simply insert the disk that came with your DVD writer and follow the instruction.

Burn Data, Video and Audio Files on CD/DVD Using Application Software

Objective: At the end of this exercise you shall be able to

- burn a data CD or DVD.

Requirements**Tools / Equipments/Instruments**

- PC with MS-Office - 1 No.
- Nero software - 1 No.

PROCEDURE**TASK 1: Burn a Data in CD or DVD**

- 1 Put the CD in the CD/DVD writer
- 2 Go to Start > All programs > Nero, then Nero StartSmart
- 3 Scroll over the icons on the top right of the program window, to find the Data icon. See Fig 1.

Fig 1



- 4 Choose Make Data CD. This will launch Nero Express as shown in Fig 2.
- 5 Click Add and browse the hard drive and select the files like included on the CD. When finished adding files click Finished.
- 6 Click Next and name the disk.
- 7 Check Verify data after burning if you want to make sure your burn happened correctly (this will take a little more time).
- 8 Click Burn and insert a blank CD as on Fig 3

Fig 2

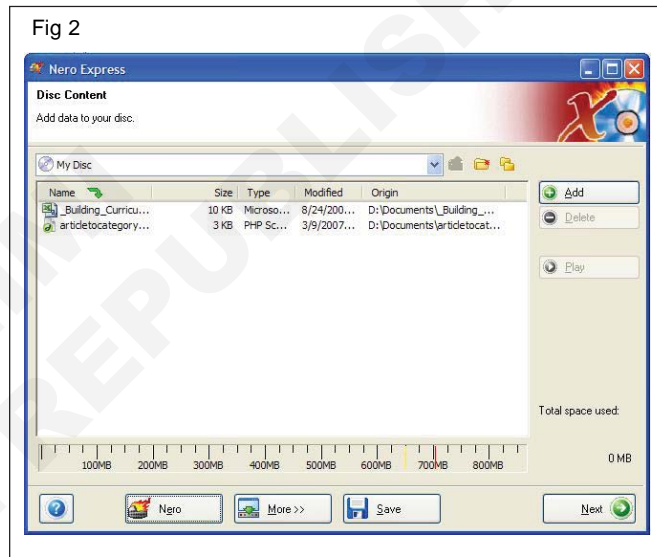
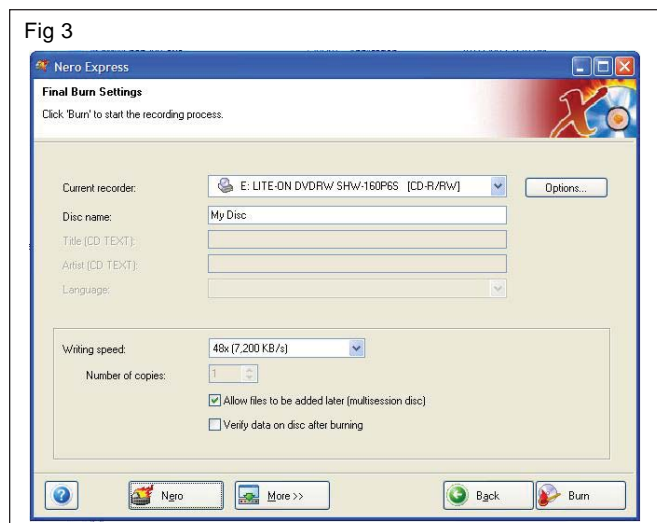


Fig 3



Familiarization with the Word Window Components

Objectives: At the end of this exercise you shall be able to

- open MS Word and create a new document
- identify MS Word screen components and ribbon
- add and format the text
- save a document
- close document and exit from MS word.

Requirements

Tools/Equipments/Instruments

- A working PC with MS Office 2007 - 1 No./batch.

PROCEDURE

TASK 1: Open MS Word and creat a new document

1 Click the 'start' button

A popup menu will appear on the screen as shown in Fig 1.

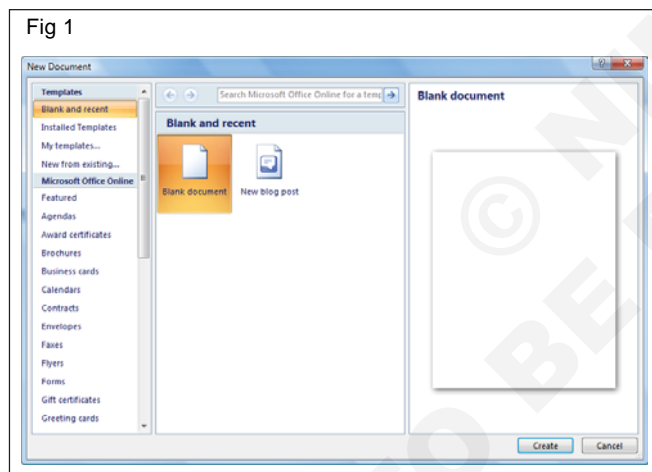


Fig 2

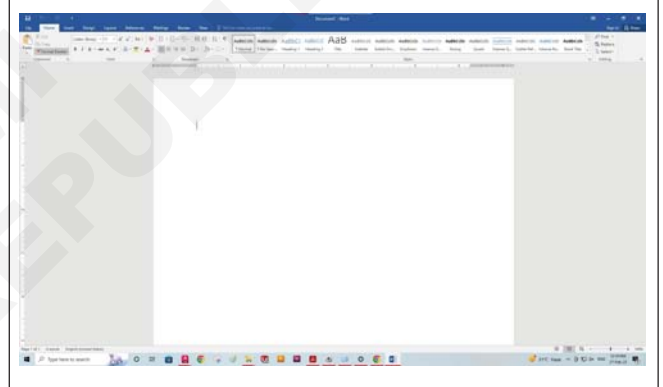
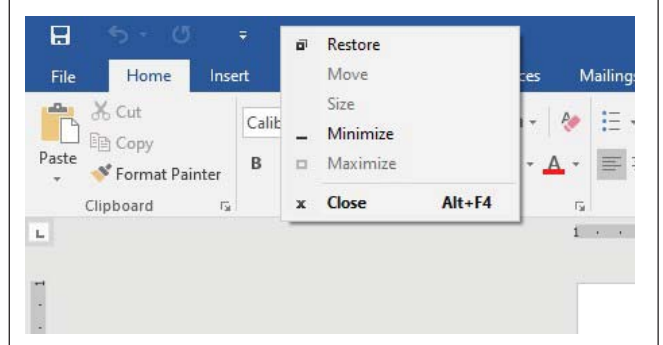


Fig 3



This will toggle the Ribbon on and off.

- 2 Place the cursor on Programs
- 3 click 'on' the Microsoft office.
- 4 Select Microsoft Office word 2007 as shown in Fig 1.

A blank document appears on the screen as shown in Fig 2.

- 5 Right-click anywhere in the main menu as in Fig 3.
- 6 Select **Minimize the Ribbon** in the menu that appears as in Fig 4.

TASK 2: Identify MS Word screen components and Ribbon

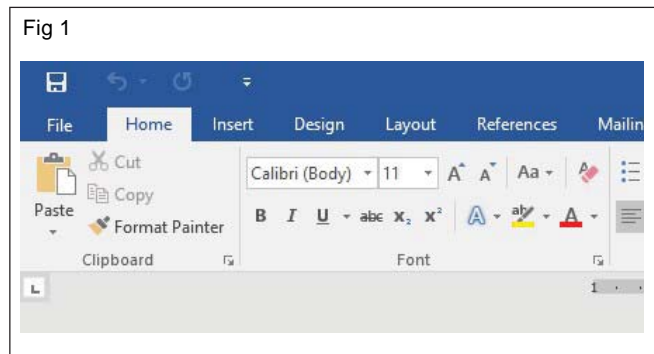
Introducing the new interface

There is a new look for Office Word 2007, the new Office Fluent user interface, which replaces menus, toolbars,

and most of the task panes from earlier versions of Word with a single mechanism that is simple and discoverable.

Office Fluent user interface

The primary replacement for menus and toolbars in Office Word 2007 is the Ribbon, a component of the Office Fluent user interface. (Fig 1)



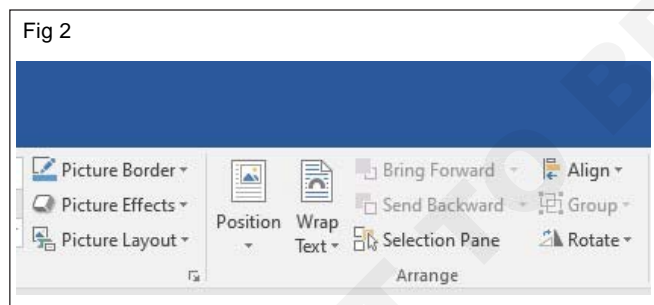
- 1 **Tabs** are designed to be task-oriented.
- 2 **Groups** within each tab break a task into subtasks.
- 3 **Command buttons** in each group carry out a command or display a menu of commands.

Tabs that appear only when you need them

In addition to the standard set of tabs that you see on the Ribbon whenever you start Office Word 2007, there are two other kinds of tabs, which appear in the interface only when they are useful for the type of task that you are currently performing

Contextual tools

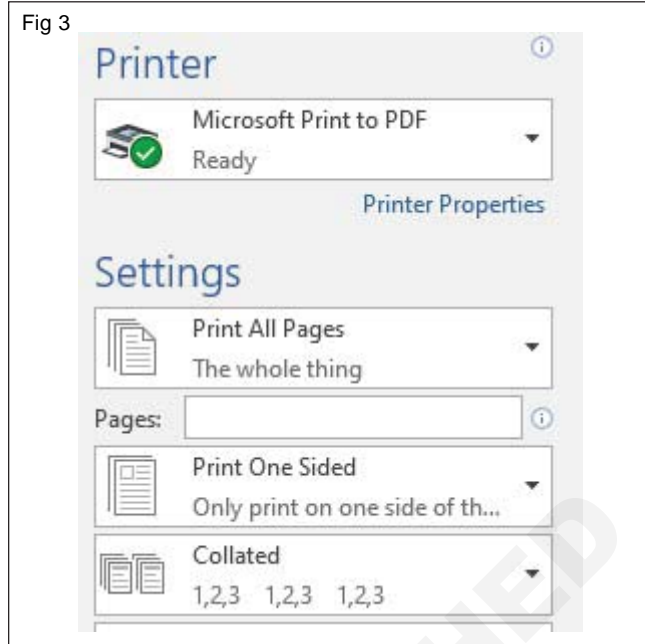
Contextual tools enable you to work with an object that you select on the page, such as a table, picture, or drawing. When you click the object, the pertinent set of contextual tabs appear in an accent color next to the standard tabs. (Fig 2)



- 1 Select an item in your document.
- 2 The name of the contextual tools appears in an accent color, and the contextual tabs appear next to the standard set of tabs.
- 3 The contextual tabs provide controls for working with the selected item.


Program tabs

Program tabs replace the standard set of tabs when you switch to certain authoring modes or views, including Print Preview. (Fig 3)



Menus, toolbars and other familiar elements

In addition to tabs, groups, and commands, Office Word 2007 uses other elements that also provide paths for accomplishing your tasks..

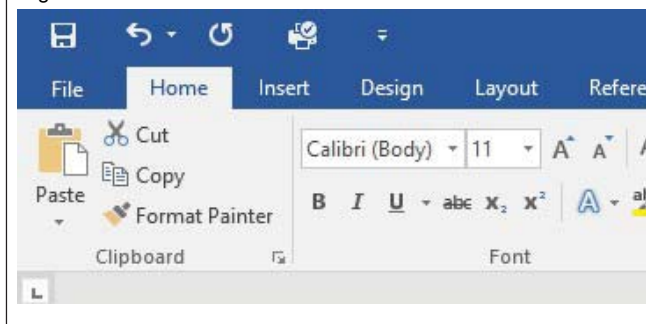
Microsoft Office Button  This button is located in the upper-left corner of the Word window and opens the menu shown Fig 4.



Quick Access Toolbar

The Quick Access Toolbar is located by default at the top of the Word window and provides quick access to tools that you use frequently. (Fig 5)

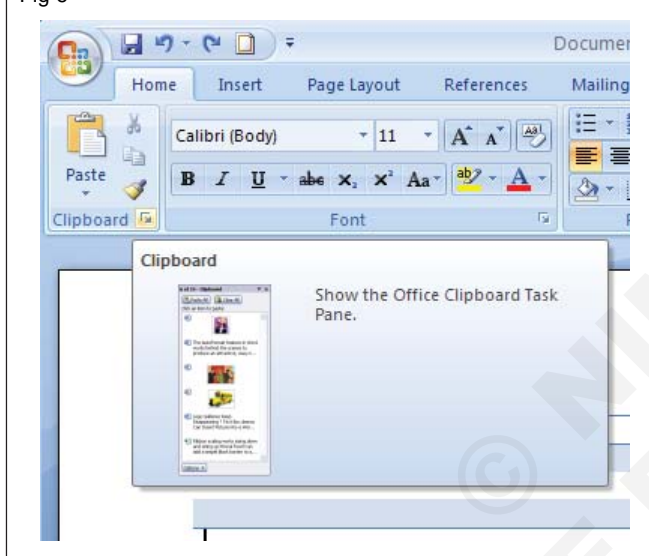
Fig 5



Dialog Box Launchers

Dialog Box Launchers are small icons that appear in some groups. Clicking a Dialog Box Launcher opens a related dialog box or task pane, providing more options related to that group. (Fig 6)

Fig 6

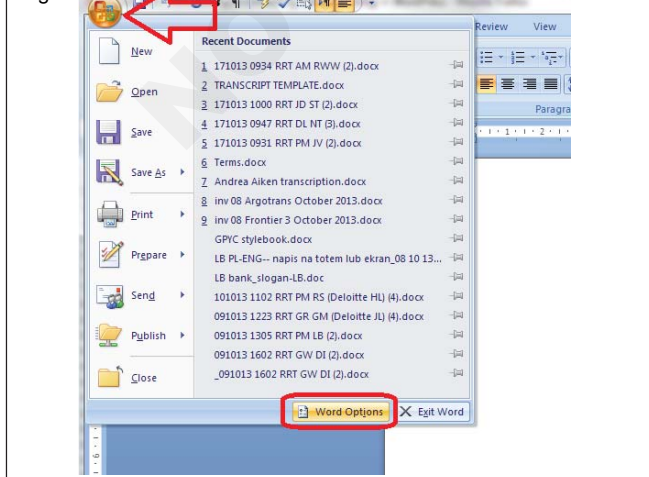


Adding commands to the Quick Access Toolbar

Some Word 2003 commands are available in Office Word 2007 only from the list of all commands in the **Word Options** dialog box.:

- 1 Click the **Microsoft Office Button** , and then click **Word Options**. (Fig 7)

Fig 7

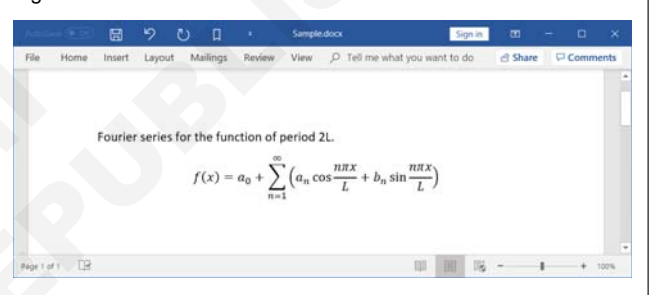


- 2 In the list at the left, click **Customize**.
- 3 In the **Choose commands from** drop-down list box, click **All commands**.
- 4 In the **Customize Quick Access Toolbar** box, select either **For all documents (default)** or a specific document.
- 5 Click the command that you want to add, and then click **Add**.
Repeat for each command that you want to add.
- 5 Click the **Move Up** and **Move Down** arrow buttons to arrange the commands in the order in which you want them to appear on the Quick Access Toolbar.
- 6 Click **OK**.

Do the math

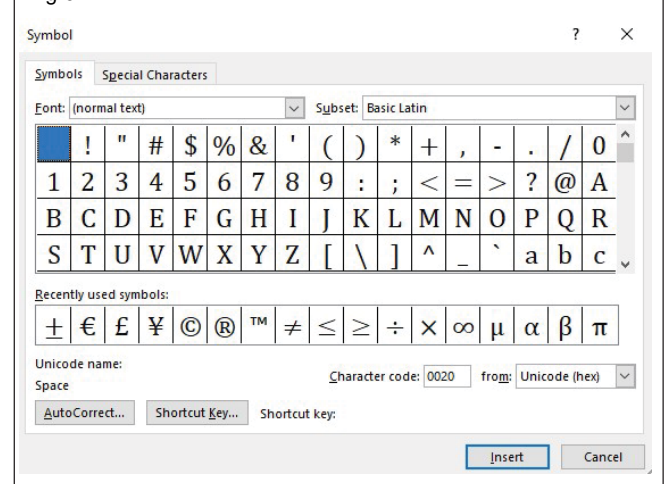
To write papers for your math, science, or engineering class? The new equation writing feature in Office Word 2007 makes it easy to insert professionally formatted formulas and equations into your document. (Fig 8)

Fig 8



You can also easily create your own equations and formulas based on common math structures, such as fractions, radicals, integrals, large operators, and more. Each structure provides a variety of placeholders for inserting mathematical symbols, which are organized in galleries. For example, you can choose from basic math, Greek letters, operators, arrows and more. (Fig 9)

Fig 9

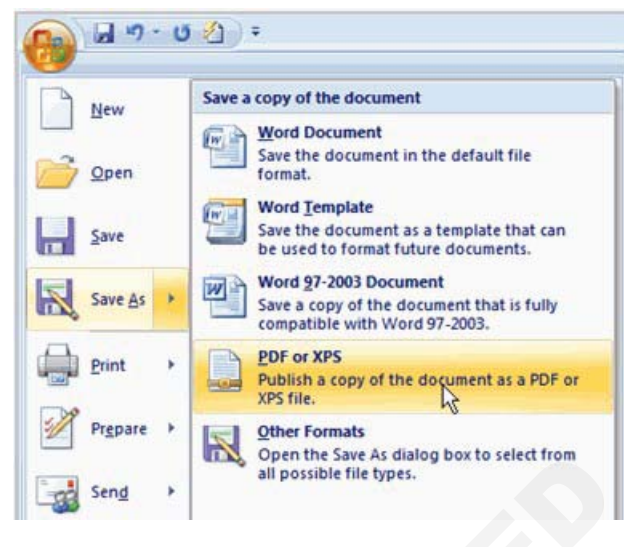


Publish your work

Your paper is done, but everyone in your department posts their papers as PDF files, not Word documents. Office Word 2007 makes it easy to save your document in PDF format. (Fig 10)

The first time that you use a 2007 Microsoft Office system program to save a file in PDF format, you need to install a free add-in. A link to the add-in is available when you click **Save As**. After you install the add-in, choose **PDF** when you use the **Save As** command.

Fig 10





TASK 3: Enter text using keyboard.

- 1 Place cursor in the blank document.
- 2 Enter the following text in the blank document.
- 3 Select the text with mouse or keyboard.
- 4 Change the font and styles from Home tab. (like Font, Size, Bold, Italic, Underline etc.,

Sachin Tendulkar
Murali Vijay
Harbhajan Singh
MS Dhoni
Suresh Raina

Virender Sehwag
Virat Kohli
Gautam Gambhir
Rohit Sharma
Zaheer Khan

TASK 4: Save a document

- 1 Click the Microsoft Office Button  or  save button

A dropped down list appears on the screen as in Fig 1.

- 2 Click 'save' as shown in Fig 1.

A window will appear as shown in Fig 2.

- 3 Type **sample1** as the new file name, in the filename box. Save as type **word Document** as in Fig 2.

Fig 1

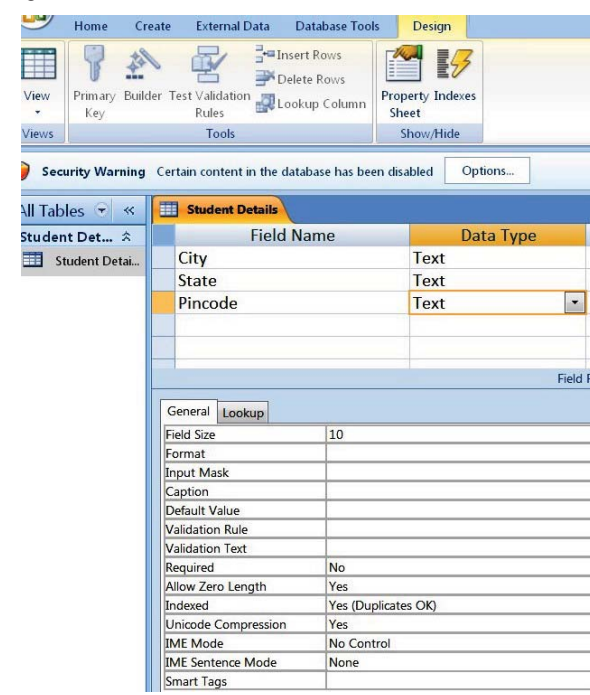
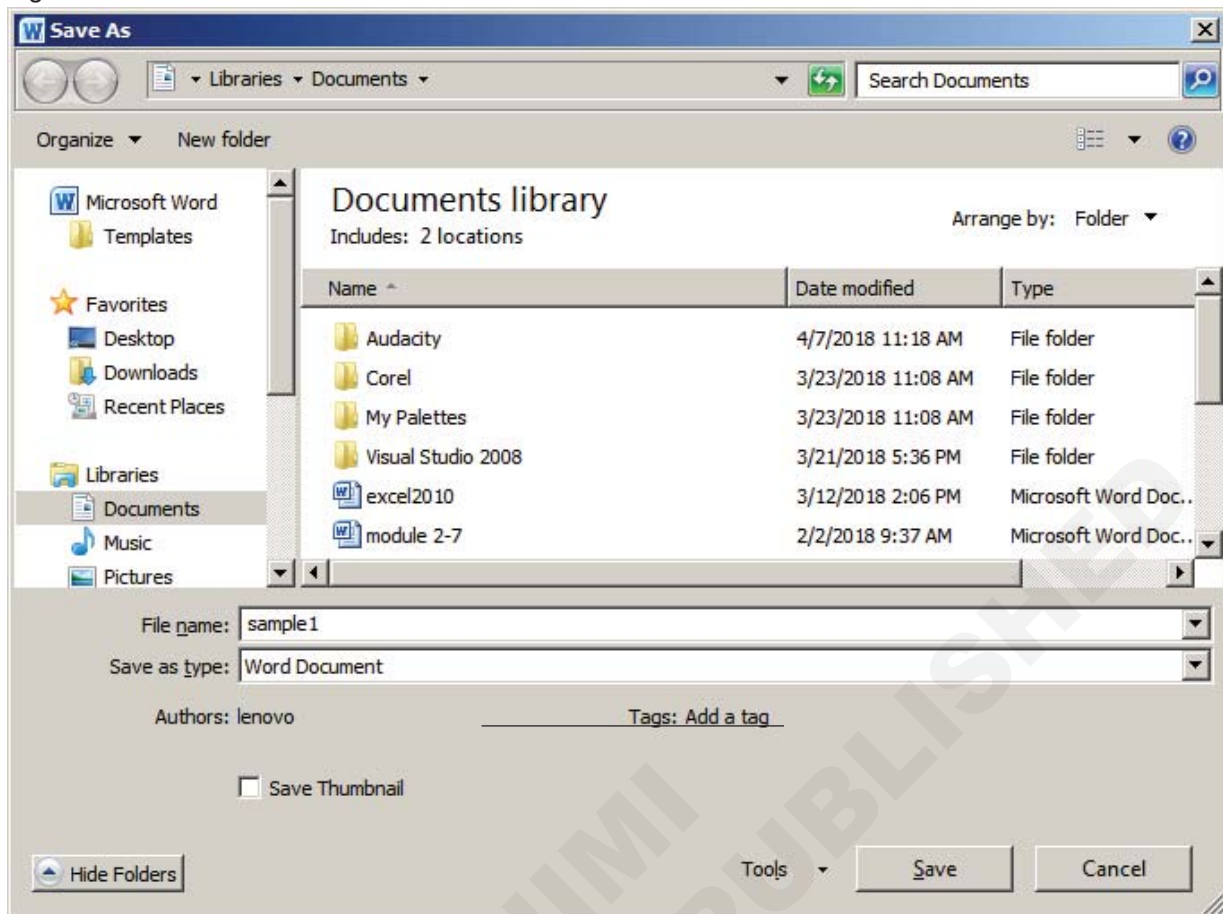


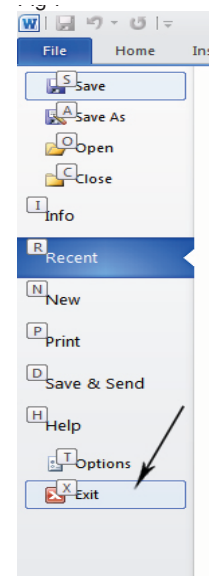
Fig 12



TASK 4: Close document and exit from MS word

- 1 Click Close from the Office Button menu Alt+Space+C.
- 2 Click exit from the MS Word(as shown in Fig 1).

Fig 1



Creating, Saving and Editing Documents Using Word

Objectives: At the end of this exercise you shall be able to

- create and open a document
- edit text by using the keyboard and mouse
- save and rename the file.

Requirements

Tools/Equipments/Instruments

- A working PC with MS Office 2007 - 1 No./batch.

PROCEDURE

TASK 1: Create and open an existing document

Create a document

- 1 Open MS word
- 2 Click the Microsoft office button and then click New.
- 3 Double click, blank document.

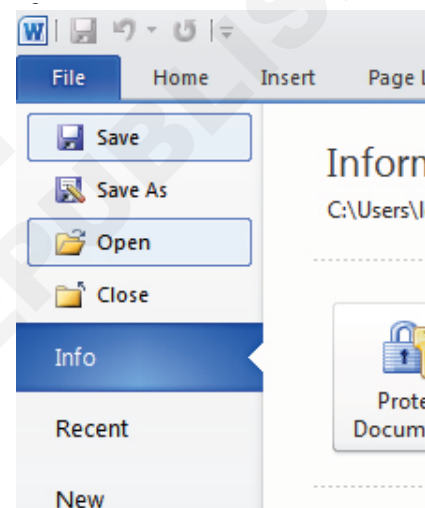
Create a document from template

- 1 Click the Microsoft office button and then click New.
- 2 Select a template that is available on your computer.
- 3 Double click the selected template file.

Open an existing document

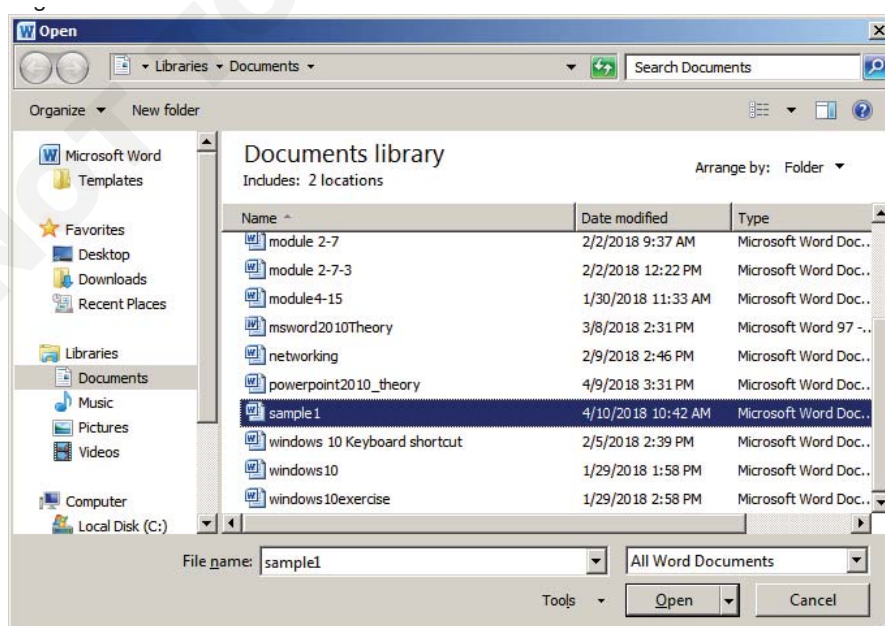
- 1 Open Word.
- 2 Click the Microsoft Office button. A menu appears as in Fig 1.
- 3 Click **Open**.

Fig 1



A dialog box appears as in Fig 2.

Fig 2



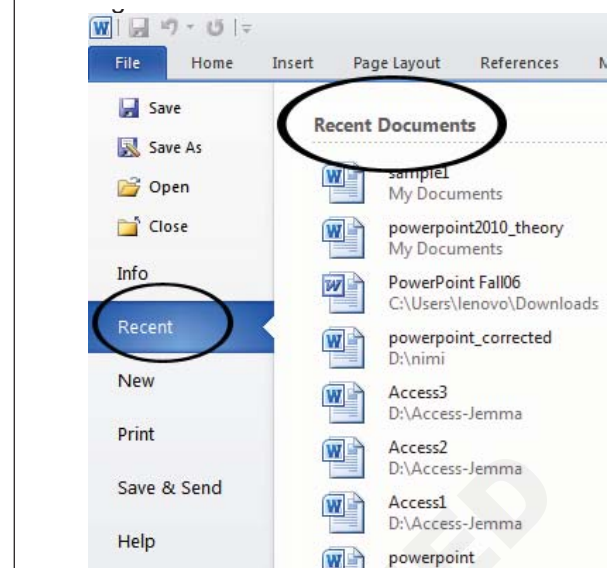
4 Type "sample1. docx" as in Fig. 2

5 Click on the Open button

Sample1.docx is opened for editing.

Recently created or modified word document shall be easily opened from recent documents as in Fig 3.

Fig 3



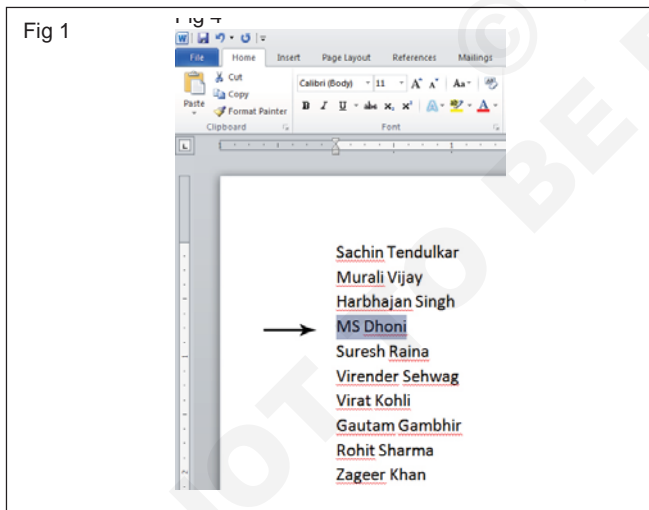
TASK 2: Edit text by using the keyboard and mouse

Select Text

- 1 Place the insertion point | before text 'MS Dhoni' to select.
- 2 Hold down the left mouse button and drag mouse over the text to select it.
- 3 Release the mouse button.

The text is selected as shown in Fig 1.

Fig 1



2 Cut the selected text

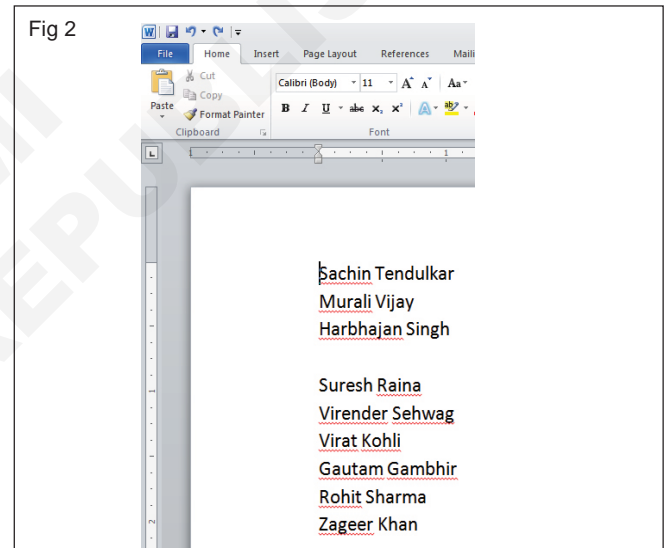
- 4 Select "MS Dhoni "
- 5 Choose the Home menu.
- 6 Click the Cut button in the Clipboard group.

Word cuts the selected text MS Dhoni and places it on the Clipboard as shown in Fig 2.

3 Paste the text which has been cut

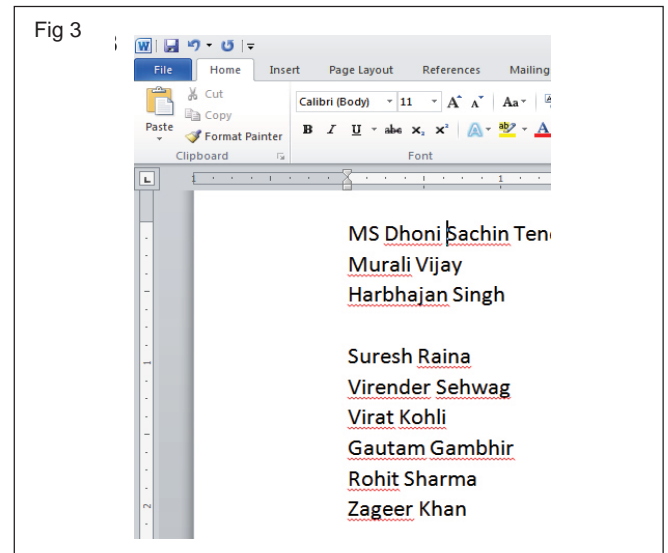
- Place the cursor before "Sachin Tendulkar"
- Choose the Home menu.

Fig 2



- Click the Paste button in the Clipboard group. Word pastes the text MS Dhoni as shown in Fig 3.


Fig 3



Copy and paste the selected text

10 Select "MS Dhoni "

11 Choose the Home menu.

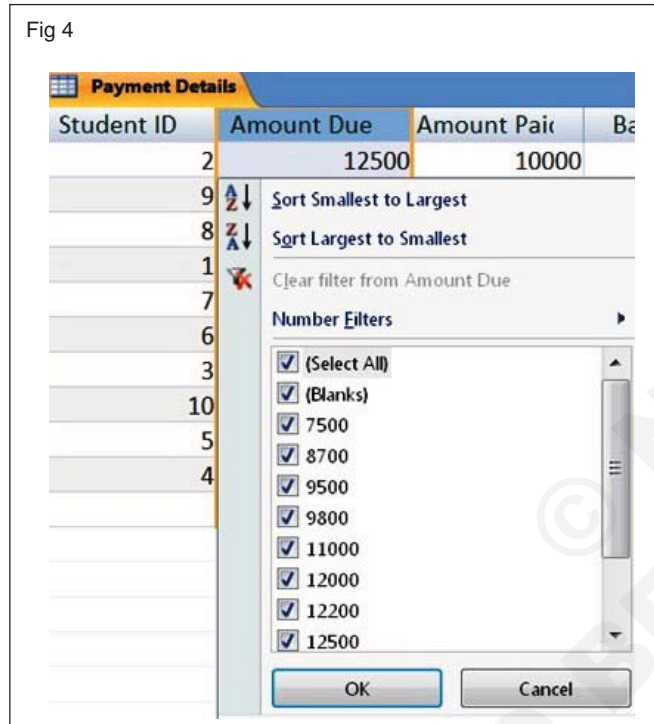
12 Click the **Home**® Copy button  in the Clipboard group.

Word copies the selected text 'Ms Dhoni' and places it on the Clipboard.

13 Place the cursor below the text 'Rohit Sharma' and

click the **Home**® Paste button  in the Clipboard group. Word pastes the copied text Ms Dhoni as shown in Fig 4.

Fig 4



Zoom the document

14 Choose **view menu** as shown in Fig 5.

15 Click

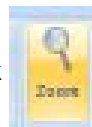
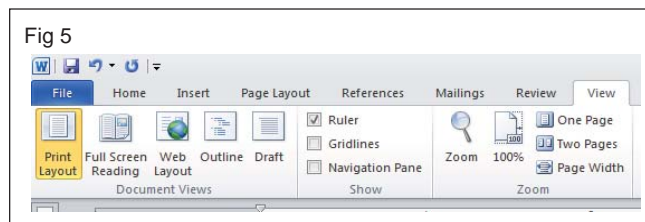


Fig 5

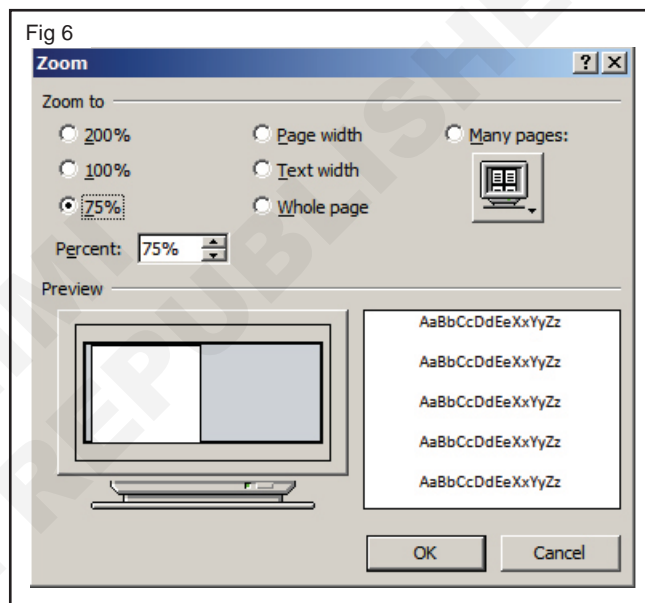


16 window appears as shown in Fig 6

17 Choose zoom to 75% as in Fig 6

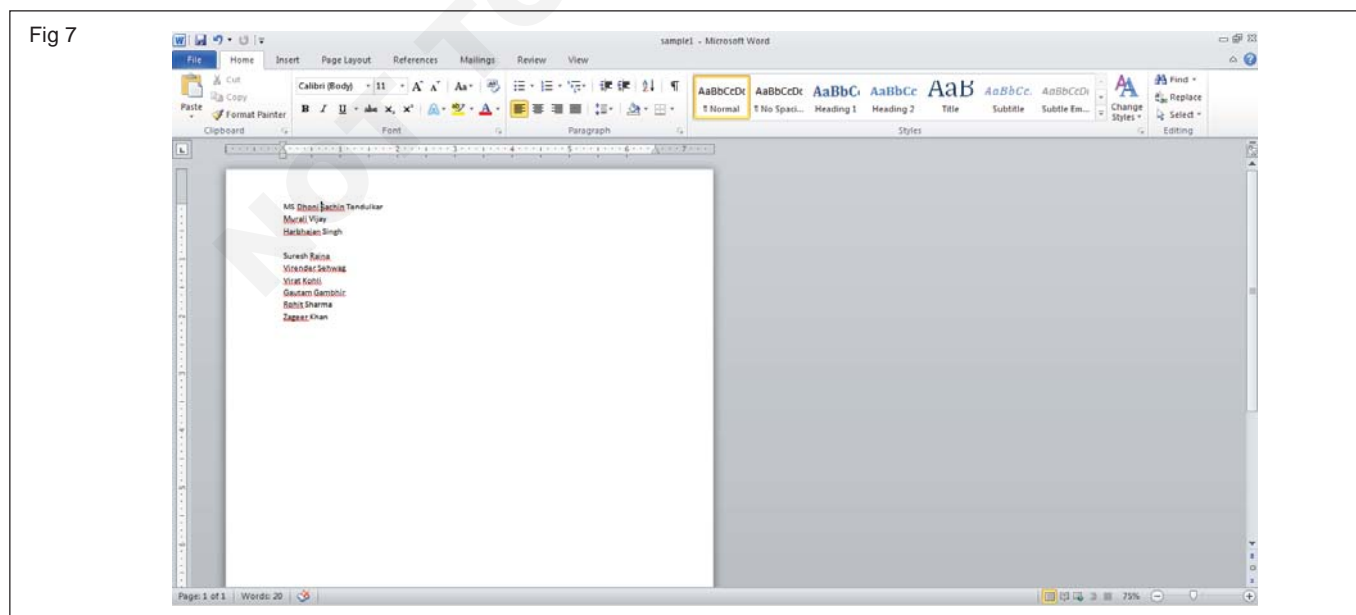
18 Press 'OK'.

Fig 6



Zooms the document to 75% of the normal size as shown in Fig 7.


Fig 7




TASK 3: Save and rename the file

Save a file

By default, the Microsoft Office programs save a file in a default working folder. If you want, you can specify a different location.


- 1 Click the **Microsoft Office Button** , and then click **Save**. Or press CTRL+S.
- 2 If you are saving the file for the first time, you are asked to give it a name.

Note: To save to a CD, or another location, click the **Microsoft Office Button** , select **Save As**, and then **Other Formats**. From the **Folders** list, select a location or the media on which you want to save.

 Top of Page


Save a copy of a file (Save As command)

You can also use the **Save As** command to rename a file or change the location of where you save the file.


- 1 Click the **Microsoft Office Button** , and then click **Save As**. Or press ALT, F, A.
- 2 In the **File name** box, enter a new name for the file.
- 3 Click **Save**.

TIP To save the copy in a different folder, click a different drive in the **Save in** list or a different folder in the folder list. To save the copy in a new folder, click **Create New**


Folder .

 Top of Page

Save a file to another format (Save As command)

- 1 Click the **Microsoft Office Button** , and then click **Save As**. Or press ALT, F, A.
- 2 In the **File name** box, enter a new name for the file.
- 3 In the **Save as type** list, click the file format that you want to save the file in. For example, click Rich Text Format (.rtf), Web Page (.htm or .html), or Comma Delimited (.csv).
- 4 Click **Save**.

Save AutoRecover information automatically

- 1 Click the **Microsoft Office Button** , and then click **Word Options**.
- 2 Click **Save**.
- 3 Select the **Save AutoRecover information every** check box.
- 4 In the **minutes** box, type or select a number to determine how often you want to save files.

Inserting and Formatting Tables and other Objects

Objectives: At the end of this exercise you shall be able to

- insert table in different methods
- format the table
- convert text to a table and convert table to text.
- insert file, clipart, picture and use picture in different options
- insert a check mark and others symbol
- insert header and footer
- insert word art style and shape
- insert drop cap and formate the remove drop cap.

Requirements

Tools/Equipments/Instruments

- A working PC with window, OS and MS Office 2007 - 1 No.

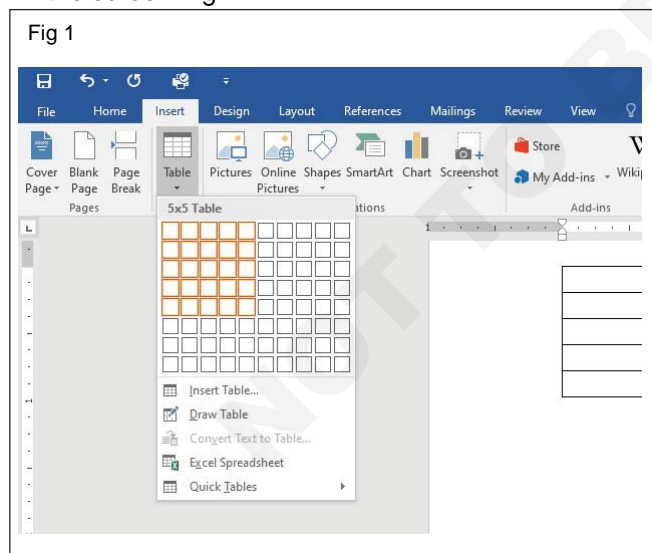
PROCEDURE

TASK 1: Insert table in different methods

Insert a Table

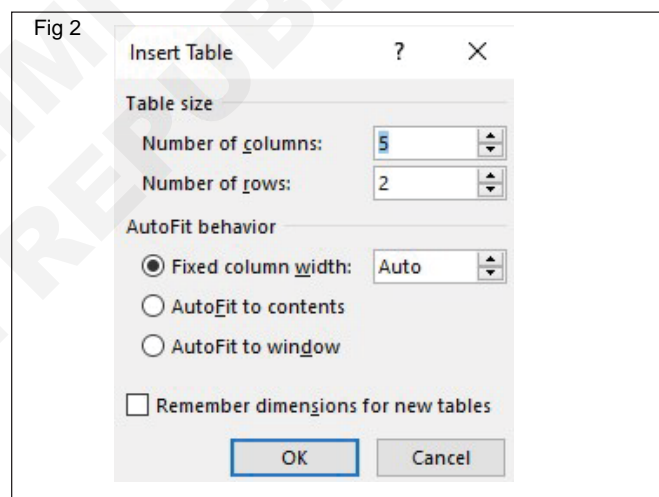
Method 1

- 1 Click Insert tab > Table
- 2 Move the cursor over the grid until you highlight the number of columns and rows
- 3 Click the cursor over the grid after selected the number of columns and rows. The table will appear the screen Fig 1.

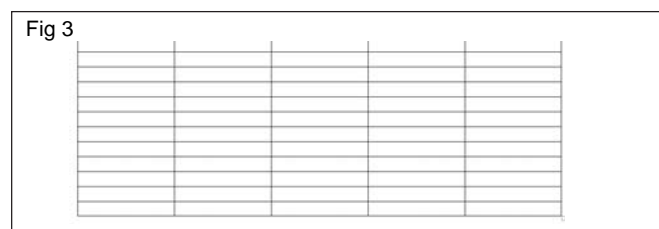


Method 2

- 5 Click Insert tab > Table > Insert Table
- 6 See the fig-2 and type the value to Number Columns 6 and Number of Rows 6 in the Insert Table dialog box. (Fig 2)



Click OK. The screen will show in the following Fig 3.

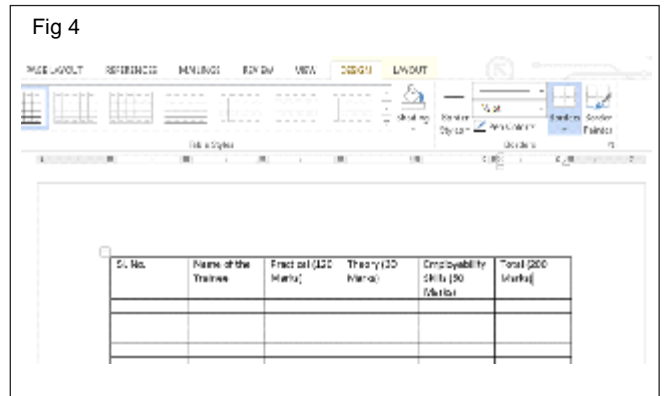


Method 3

- 1 Click Insert tab > Table > Draw Table. The cursor will show in the screen like pencil view
- 2 Drag to draw the cursor left to right side of the page for example rectangle shape
- 3 Draw vertical lines for creating columns and horizontal lines for rows.

Type the text into the table and format the table

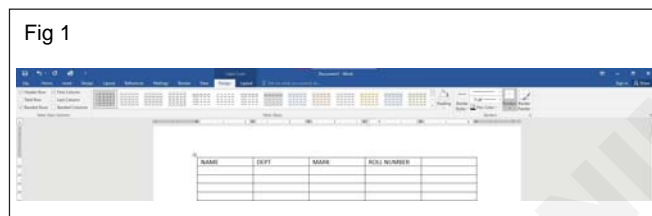
- 1 Insert the Table, Number Columns in 6 and Number Rows in 6
- 2 Place the cursor in the top left side corner of the table
- 3 Type the text "Sl. No."
- 4 Press Tab key on the Keyboard for to type in next column. After the fill the text in this cell again press to Tab key to fill the text in another cell and so on.
- 5 See the Fig 4 and type the text



TASK 2: TypeFormat the table

Use table styles to format an entire table

- 1 Click or select the table
- 2 Click the Design Tab under the Table Tool
- 3 Choose the Table style in the Table Style group. See the Fig 1 and follow.



Add or Remove Borders

Add Borders

- 1 Click the Layout Tab, under the Table Tools
- 2 Click Select button and then select the Table
- 3 Click the Design Tab under the Table Tools
- 4 Click Line Weight button in the border group and select 1½ pt.
- 5 Click Borders button in the border group and Select "Outside Borders". See the Fig 2.

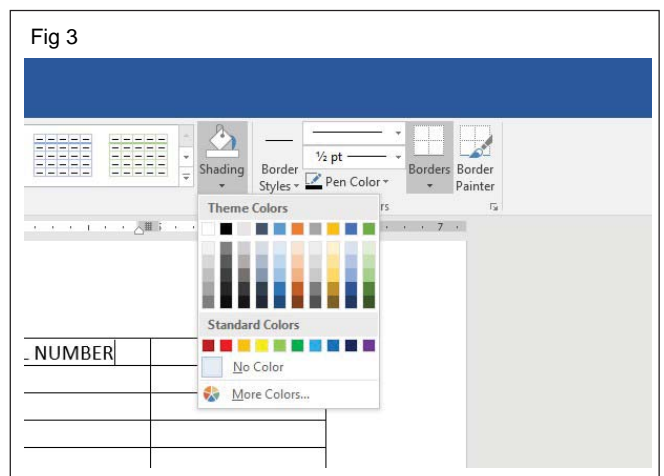
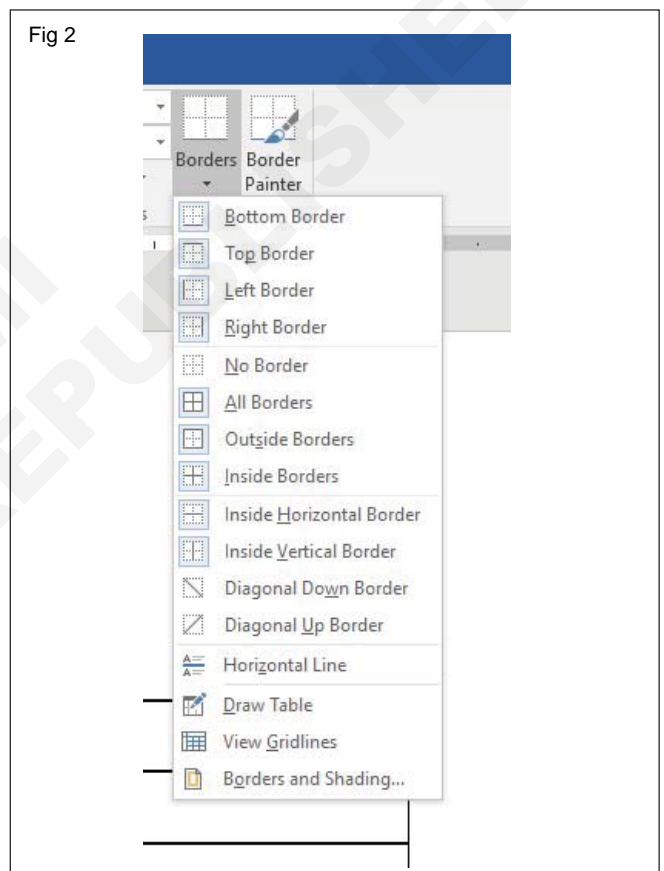
Remove the Table Borders

- 1 Select the table
- 2 Click Design Tab and select the Borders button
- 3 Choose "No Border"

Add or Remove shading in a table

Add shading to a table

- 1 Click in the table, and then click the Table Move Handle in the upper-left corner for to select the table
- 2 Click Shading button in the Table Tools Design Tab
- 3 Under Theme colors, Select the shading color you want apply. See the Fig 3 and follow.



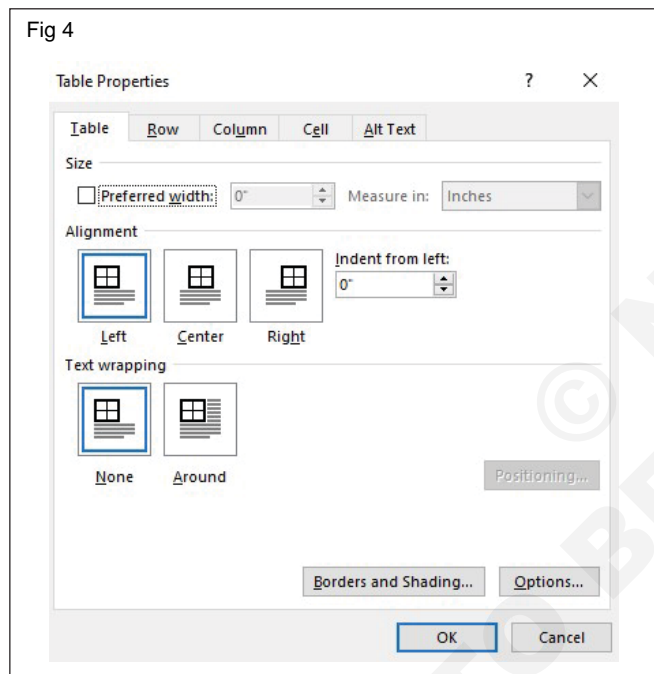
Remove shading from a table

- 1 Click in the table, and then click the Table Move Handle in the upper-left corner for to select the table
- 2 Click Shading button in the Table Tools Design Tab
- 3 Click “No Color”

Set Table properties

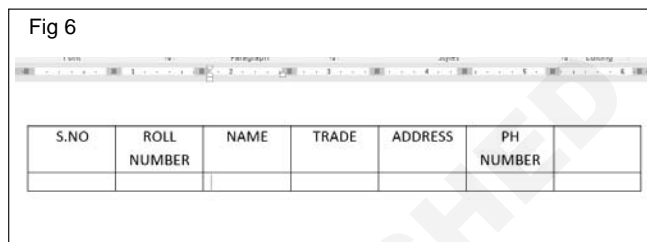
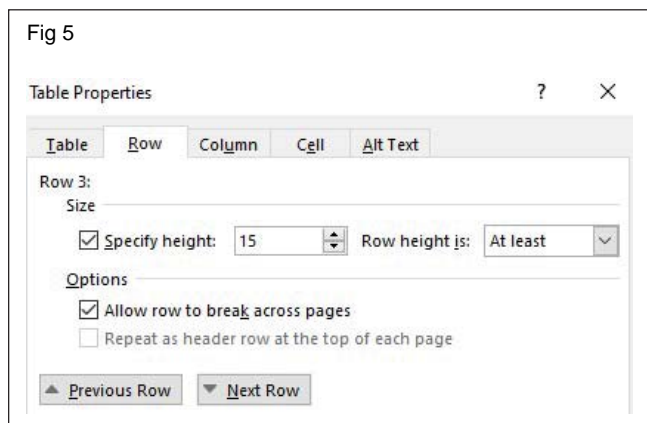
Table

- 1 Select the Table
- 2 Click Layout tab under the Table Tools
- 3 Click, “Table Properties” Button. The “Table Properties” dialog box will appear on the screen
- 4 Click Table Tab, disable the “Preferred Width” in the size option, select center Alignment and to choose Text Wrapping is none.
- 5 Click ‘OK’ Button. The Table will align in center of the pages. (Fig 4)



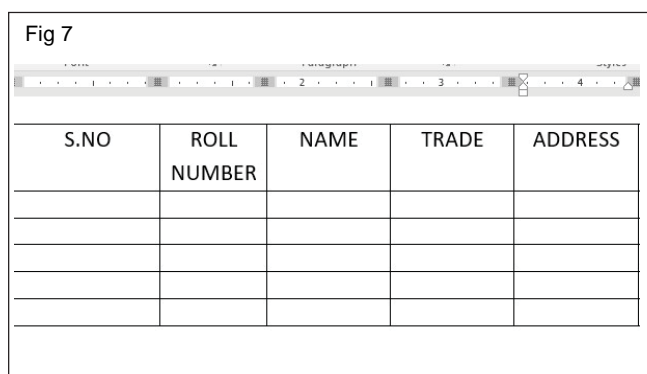
Row

- 1 Select the Rows, Place the cursor left margin side of the table click and drag to down of the particular rows of the table.
- 2 Click Layout tab under the Table Tools.
- 3 Click, “Table Properties” Button. The “Table Properties” dialog box will appear on the screen.
- 4 Click Rows tab, enable the Specific height .
- 5 Type the value 0.36 inch. See the Fig 5 and follow.
- 6 Click ‘OK’ button. The changed rows height will appear on the screen. See the Fig 6.



Columns

- 1 Select the Column, Place the cursor in the Top of the table click the cursor for selecting single column or drag left to right of the particular columns of the table for selecting multiple columns
- 2 Click Layout tab under the Table Tools
- 3 Click, “Table Properties” Button. The “Table Properties” dialog box will appear on the screen
- 4 Click Columns tab, enable Preferred width type value 0.5 inch in first column
- 5 Click Next column button change the values of preferred width 1.5 inches
- 6 Click Next column button change the values for next 3 columns of preferred width 1 inches and the last column change to 1.3 inches
- 7 Click ‘Ok’ button, now the table will appear as shown in Fig 7.



Add a cell, row, or column

Add a cell

- 1 Click in a cell that is located just to the right of or above to insert a cell.

- Under **Table Tools**, on the **Layout** tab, click the **Rows & Columns** Dialog Box Launcher.
- Click one of the following

Shift cells right

Insert a cell and move all other cells in that row to the right.

NOTE: This option may result in a row that has more cells than the other rows.

Shift cells down

Insert a cell and move remaining existing cells in that column down one row each. A new row will be added at the bottom of the table to contain the last existing cell.

Insert entire row

Insert a row just above the cell that you clicked in.

Insert entire column

Insert a column just to the right of the cell that you clicked in.

Add a row

- Click in a cell that is located just below or above to add a row.
- Under **Table Tools**, click the **Layout** tab.
- Do one of the following:
 - To add a row just above the cell clicked in, in the **Rows and Columns** group, click **Insert Above**.
 - To add a row just below the cell clicked in, in the **Rows and Columns** group, click **Insert Below**.


Add a column

- Click in a cell that is located just to the right or left of where you want to add a column.
- Under **Table Tools**, click the **Layout** tab.
- Do one of the following:
 - To add a column just to the left of the cell clicked in, in the **Rows and Columns** group, click **Insert Left**.
 - To add a column just to the right of the cell clicked in, in the **Rows and Columns** group, click **Insert Right**.

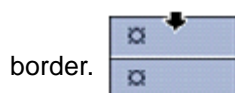
Delete a cell, row, or column

- Do one of the following:

A cell Click the left edge of the cell. 

A row Click to the left of the row. 

A column Click the column's top gridline or top



- Under **Table Tools**, click the **Layout** tab.
- In the **Rows & Columns** group, click **Delete**, and then click **Delete Cells**, **Delete Rows**, or **Delete Columns**, as appropriate.

Merge or split cells

Merge cells

- Select the cells that you want to merge by clicking the left edge of a cell and then dragging across the other cells that you want.
- Under **Table Tools**, on the **Layout** tab, in the **Merge** group, click **Merge Cells**.

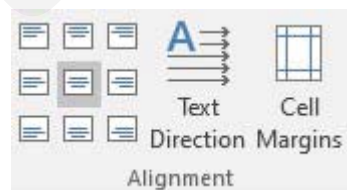
Split cells

- Click in a cell, or select multiple cells that you want to split.
- Under **Table Tools**, on the **Layout** tab, in the **Merge** group, click **Split Cells**.
- Enter the number of columns or rows that you want to split the selected cells into.

Align Text in a Table

- Select the Heading Row
- Click Layout Tab under the Table Tools and Select "Align Center" in the Alignment group. See the fig and follow. (Fig 8).

Fig 8



- The table will appear as shown in following Fig 9.

Fig 9

S.NO	ROLL NUMBER	NAME	TRADE	ADDRESS	PH NUMBER

- Practice to do the remaining text alignment of Align Top Left, Align Top Center, Align Top Right, Align Center Left, Align Center Right, Align Bottom Left, Align Bottom Center, and Align Bottom Right.

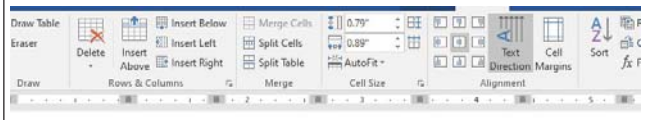
Change the Text Direction in a Table

- Select the particular Cell
- Select Layout Tab under the Table Tools and Double Click "Text Direction" in the Alignment group. See the fig and follow. (Fig 10)

Sort a list Alphabetically

- Create a table and formatting the table same as shown in following Fig 11.

Fig 10



S.NO	ROLL NUMBER	NAME	TRADE	ADDRESS	PH NUMBER

Fig 11

S.NO	ROLL NUMBER	NAME	TRADE	ADDRESS	PH NUMBER
1	10122522	RAJA	R&ACT	CHENNAI	9685742312
2	10122523	KUMAR	R&ACT	MADURAI	8562445562
3	10122524	KALIMUTHU	R&ACT	CHENNAI	9874524155
4	10122525	KARTHIK	R&ACT	SALEM	6357874122

- 2 Select the text in a column of "Name of the Trainees" list.
- 3 Select Layout tab under the Table Tools, click Sort Button. (Fig 12)

Fig 12

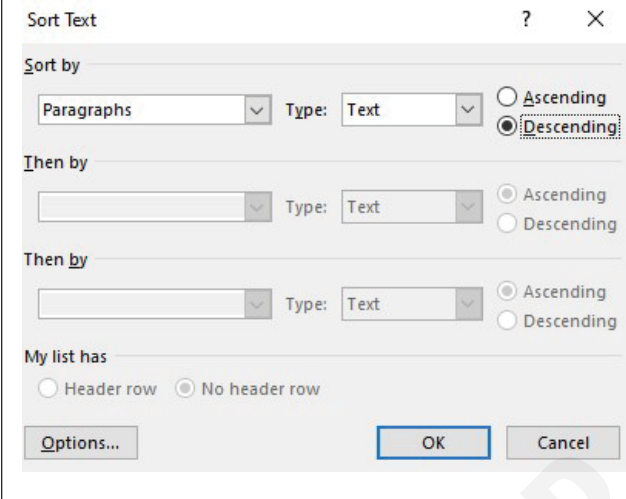


- 4 In the Sort Text box, set Sort by to Paragraphs and Text.
- 5 Click Descending (Z to A). See the fig and follow. (Fig 13)
- 6 Click OK. The Descending sorted table will appear as shown in following Fig 14.

Apply formula to the Table

- 1 Select the particular cell in a Table. See the fig and follow (Fig 15)
- 2 Choose Layout Tab under the Table Tools and click Formula Button. The Formula dialog box will appear on the screen.
- 3 Type "SUM(LEFT)" into the Formula tab. See the fig and follow (Fig 16).
- 4 Click 'OK' button
- 5 The row's value will added in the selected cell. See the Fig 17.
- 6 Practice to use formula in the remaining rows.

Fig 13



Sort Text

Sort by: Paragraphs Type: Text ☐ Ascending ☒ Descending

Then by: Type: Text ☐ Ascending ☐ Descending

Then by: Type: Text ☐ Ascending ☐ Descending

My list has: ☐ Header row ☒ No header row

Options... OK Cancel

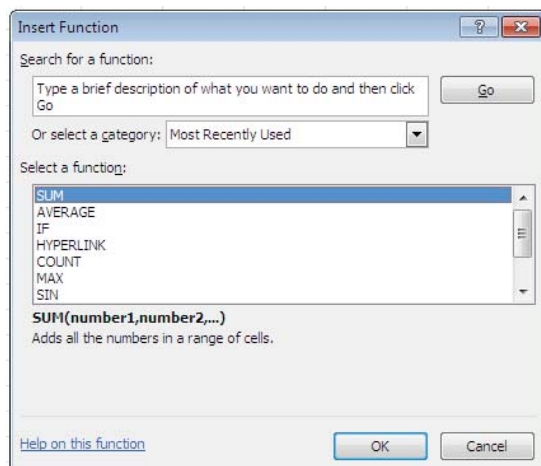
Fig 14

S.NO	ROLL NUMBER	NAME	TRADE	ADDRESS	PH NUMBER
1	10122522	RAJA	R&ACT	CHENNAI	9685742312
2	10122523	KUMAR	R&ACT	MADURAI	8562445562
4	10122525	KARTHIK	R&ACT	SALEM	6357874122
3	10122524	KALIMUTHU	R&ACT	CHENNAI	9874524155

Fig 15

S.NO	ROLL NUMBER	NAME	TRADE	ADDRESS	PH NUMBER
1	10122522	RAJA	R&ACT	CHENNAI	9685742312
2	10122523	KUMAR	R&ACT	MADURAI	8562445562
4	10122525	KARTHIK	R&ACT	SALEM	6357874122
3	10122524	KALIMUTHU	R&ACT	CHENNAI	9874524155

Fig 16



Insert Function

Search for a function: Type a brief description of what you want to do and then click Go

Or select a category: Most Recently Used

Select a function: SUM, AVERAGE, IF, HYPERLINK, COUNT, MAX, MIN, SIN

SUM(number1,number2,...)
Adds all the numbers in a range of cells.

Help on this function OK Cancel

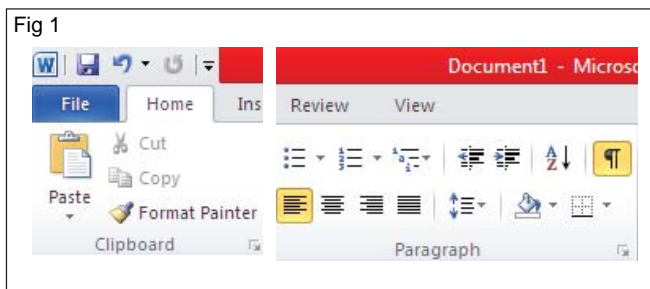
Fig 17

S.NO	ROLL NUMBER	NAME	TRADE	ADDRESS	PH NUMBER
1	10122522	RAJA	R&ACT	CHENNAI	9685742312
2	10122523	KUMAR	R&ACT	MADURAI	8562445562
4	10122525	KARTHIK	R&ACT	SALEM	6357874122
3	10122524	KALIMUTHU	R&ACT	CHENNAI	9874524155

TASK 3 :Convert text to a table or a table to text

To convert text to a table or a table to text, start by clicking the Show/Hide paragraph mark on the Home tab so you can see how text is separated in your document. (Fig 1)

Fig 1



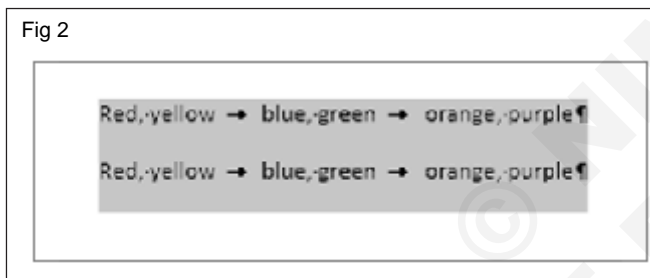
Convert text to a table

- 1 Insert separator characters—such as commas or tabs—to indicate where to divide the text into table columns.

Note: If you have commas in your text, use tabs for your separator characters.

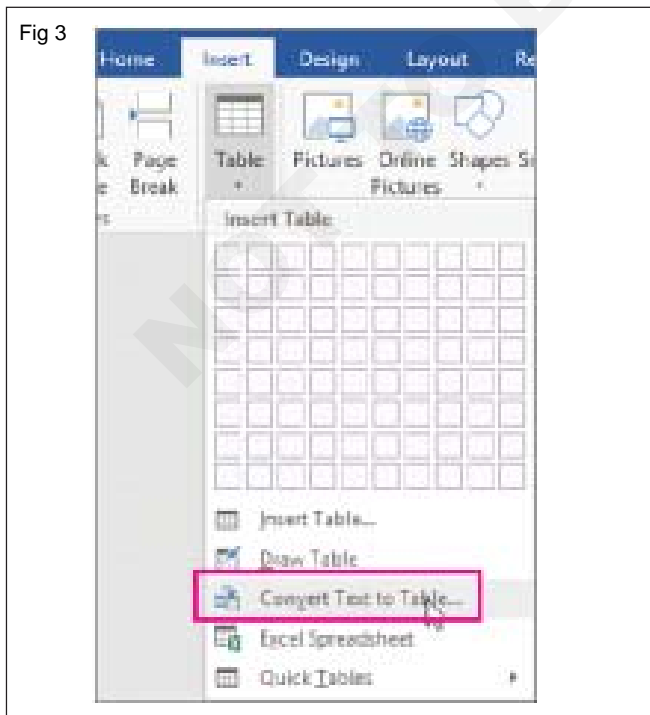
- 2 Use paragraph marks to indicate where you want to begin a new table row. In this example, the tabs and paragraph marks will produce a table with 3 columns and 2 rows: (Fig 2)

Fig 2



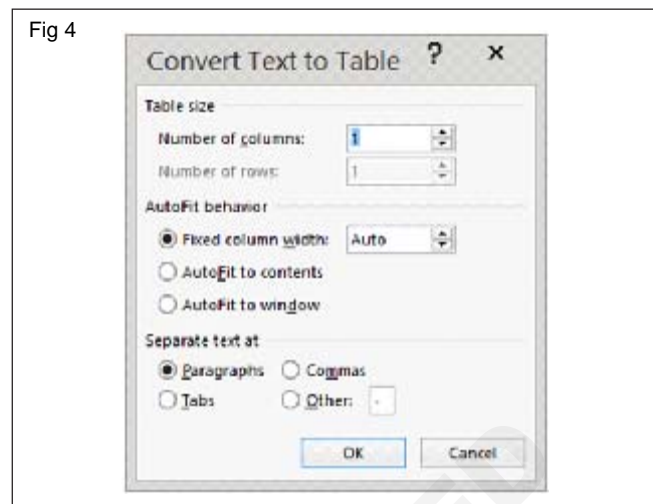
- 3 Select the text that you want to convert, and then click Insert > Table > Convert Text to Table. (Fig 3)

Fig 3



In the Convert Text to Table box, choose the options. (Fig 4)

Fig 4

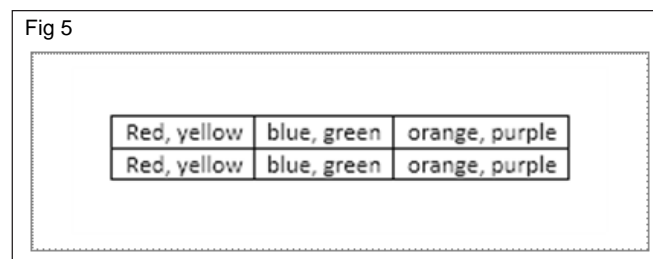


- 5 Under Table size, make sure the numbers match the numbers of columns and rows.
- 6 Under AutoFit behavior, choose how you want your table to look. Word automatically chooses a width for the table columns. If you want a different column width, choose one of these options:

To do this	Choose this option
Specify a width for all the column	In the Fixed column width box, type or select value
Resize the columns to fit the width of the text in each column	AutoFit to contents
Resize the table automatically in case the width of the available space changes (for example, web layout or landscape orientation)	AutoFit to window

- 7 Under Separate text at, choose the separator character you used in the text.
- 8 Click OK. The text converted to a table should look something like this: (Fig 5)

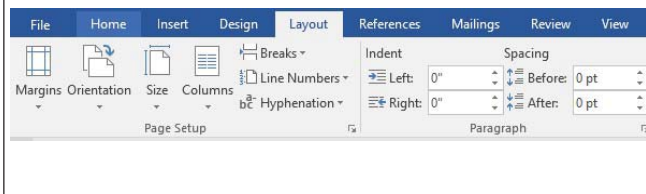
Fig 5



Convert a table to text

- 1 Select the rows or table to convert to text.
- 2 Under Table Tools, on the Layout tab, click Convert to Text. (Fig 6)

Fig 6



- 3 In the Convert to Text box, under Separate text with, click the separator character you want to use in place of the column boundaries. Rows will be separated by paragraph marks.
- 4 Click OK.

TASK 4: Insert file, clipart, picture and use picture in different options

Insert a file

- 1 Open a new document.
- 2 Choose insert tab, in the text group. Click the arrow next to object and then click Text from tab.
- 3 The insert File display box will appear on the screen.
- 4 Choose and select the file from the specific location.
- 5 Click OK button, the entire file inserted in to a new document. (Fig 1)

Fig 1

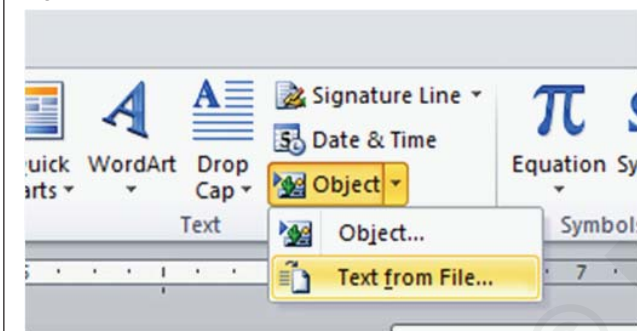


Fig 3

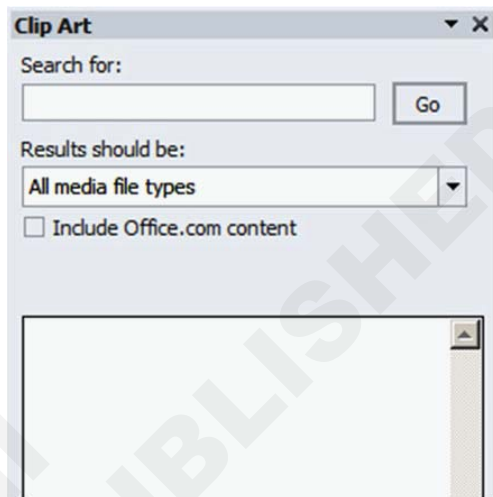
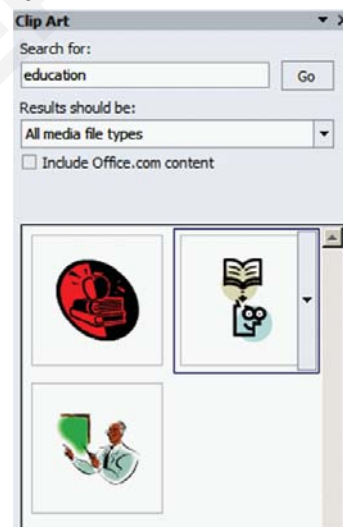


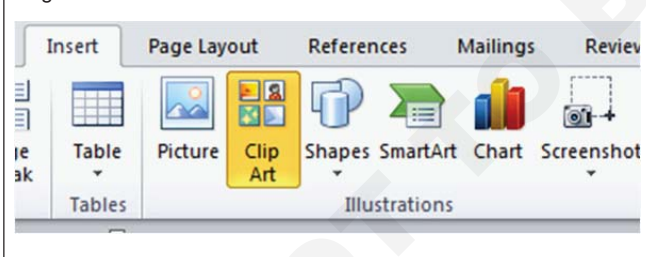
Fig 4



Insert a clipart into word

- 1 Select Insert -> ClipArt option from Ribbon as in Fig 2

Fig 2



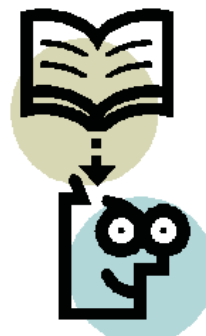
A clipart dialog box appears as in Fig 3.

- 2 Type as "Education" in the search for option which displays cliparts as in Fig 4.
- 3 Select the clipart that need to be inserted into the document which makes the clipart to be on the document. (Fig 5)
- 4 Save the document.

Insert a picture into word document.

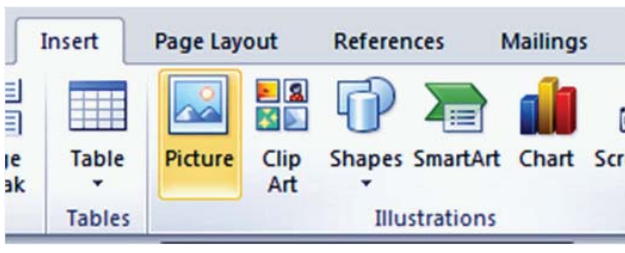
- 1 Insert pagebreak to get a new page.

Fig 5



- 2 Select Insert -> Picture option from illustrations tab and choose a picture to insert Fig 6.

Fig 6



- 3 Select a picture from the pictures library -> Sample Pictures to insert into the document as in Fig 7 (Desert.jpg)

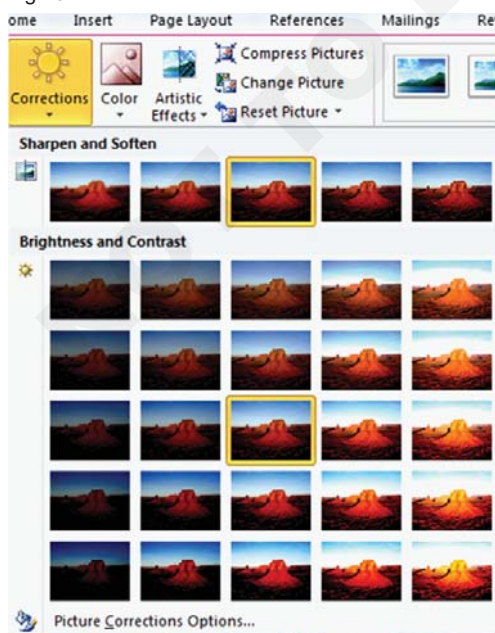
Fig 7



- 4 Choose Picture Tools -> Corrections option (Fig 8)

Adjust picture brightness and contrast as to available options and apply.

Fig 8



- 5 Select Color Option to adjust color settings as in Fig 9.

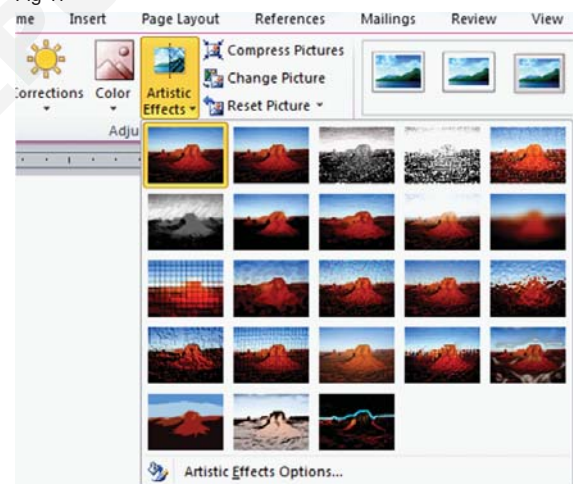
Fig 9



Adjust picture color options and contrast as to available options and apply.

- 6 Select Artistic Effects option and make the image in a different style as in Fig 10.

Fig 10



- 7 Save the file for reference. (Fig 11)

Apply a picture into the document as in Fig 12

- 1 Insert a picture into the document as in Fig 12.
- 2 Choose metal frame option to get an outside frame as in Fig 13.
- 3 Click on Picture Border and apply a border with different color as in Fig 14.
- 4 View the output as in Fig 15.
- 5 Apply a 3D effect using Picturizer Effects -> Picturizer Effect 9 as in Fig 16.
- 6 Check the output of the image as in Fig 17.

Fig 11

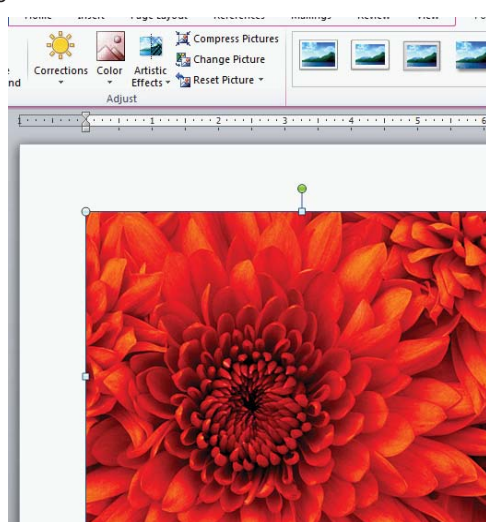


Fig 15

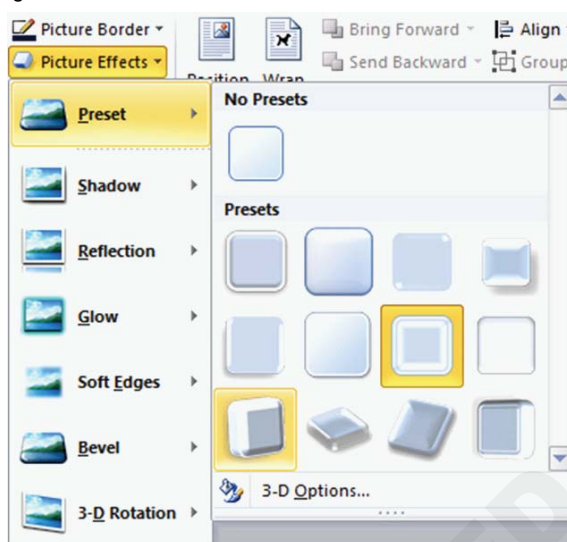


Fig 12



Fig 16



Fig 13

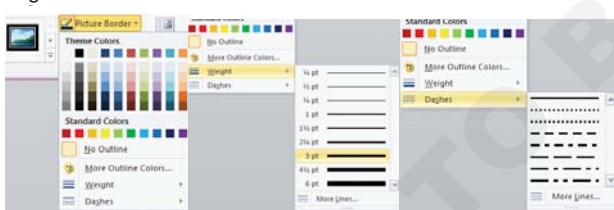
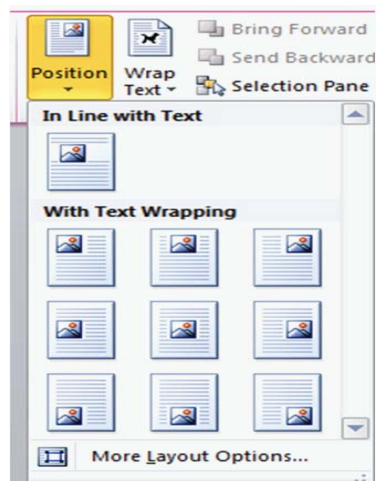


Fig 14



Fig 17

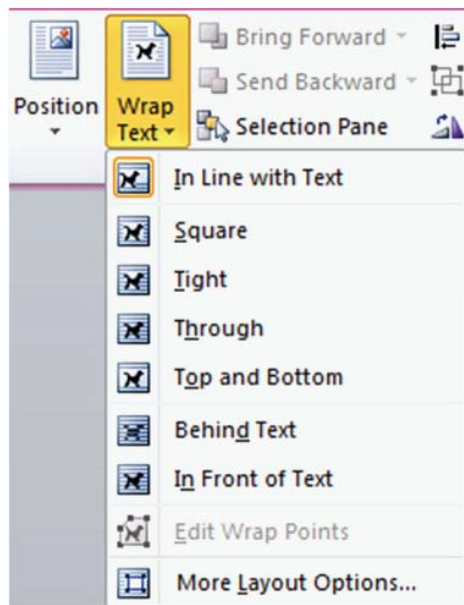


Try with different effect and border styles.

Positioning and Wrapping of Image / Clipart

- 1 Select the picture to position and wrapping.
- 2 Choose position option to place the object on the proper place as from Fig 18.

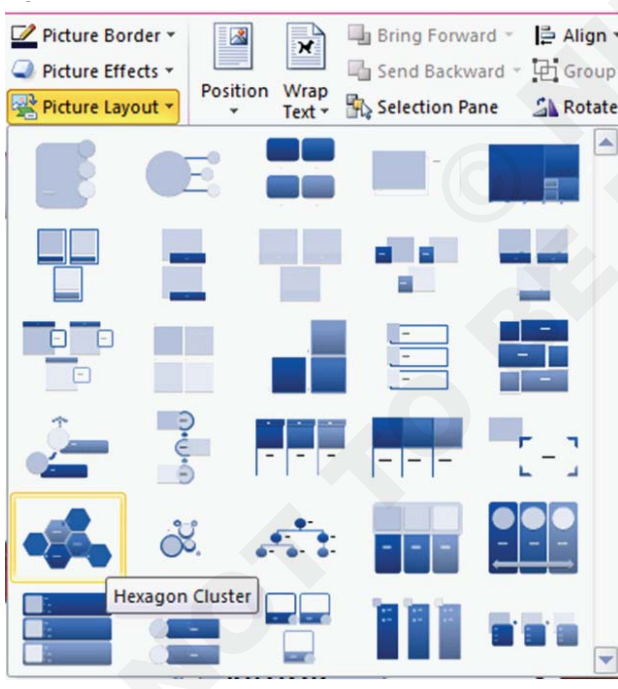
Fig 18



It places the object as we select from the menu option

- 3 Select Wrapping method using Wrap Text option as in Fig 19.

Fig 19



Inserting Picture Layout Smartart

- 1 Select the picture for this option to apply
- 2 Choose Picture Layout to select a layout as in Fig 19.
- 3 Select Hexagon cluster to set the image as smartart and add text as required as in Fig 20.
- 4 Add pictures to other shapes available and as required
- 5 Try with other smart options to get different items. (Fig 21)

Fig 20

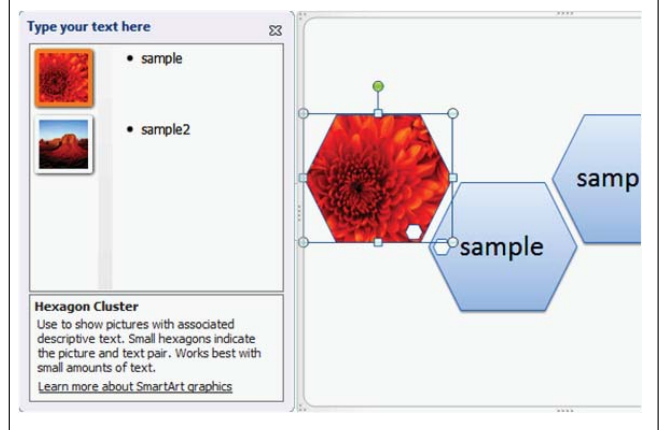


Fig 21

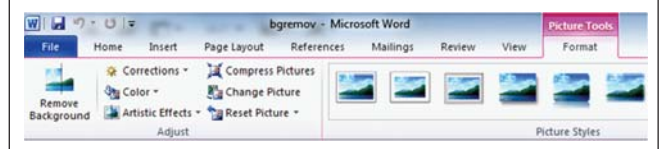


Wrapping makes the text placement around the image, leaves space square, tight, text through the image, even place text behind the image or in front of image.

Remove background of a Picture

- 1 Select and insert a picture (eg. tulips.jpg)
- 2 Select Picture -> Format tool and Remove Background as in Fig 22.

Fig 22



- 3 Choose the background level as displayed in the Fig 23.

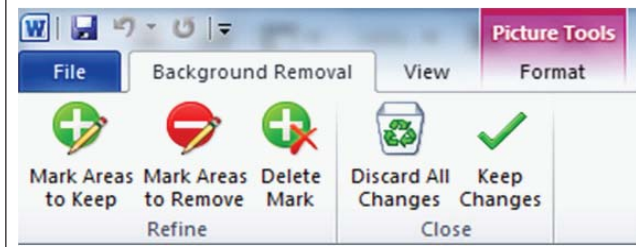
Fig 23



The background is selected by default as to figure. To adjust, just crop its level to get other areas. Even it can be drawn on the pictures to select items to remove area.

- 4 Apply keep changes to remove the background from image as in Fig 24.

Fig 24



Which will give result as in Fig 25.

Fig 25

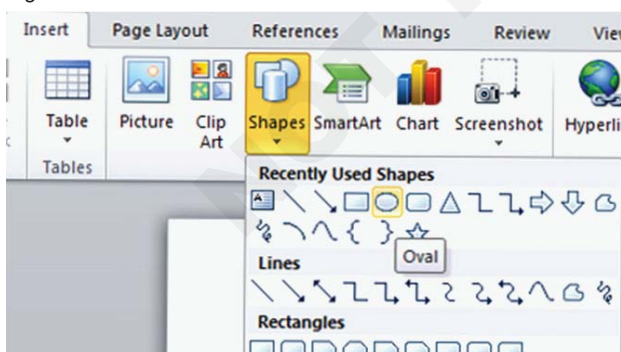


Note: Reset all changes makes the original image to apply again.

Insert Shapes on the images

- 1 Insert an image to the document
- 2 Select Shapes from Insert menu (Fig 26)

Fig 26



- 3 Draw an oval on the image as in Fig 27.
- 4 Select the drawing and apply outline and fill properties (Fig 28)

Fig 27

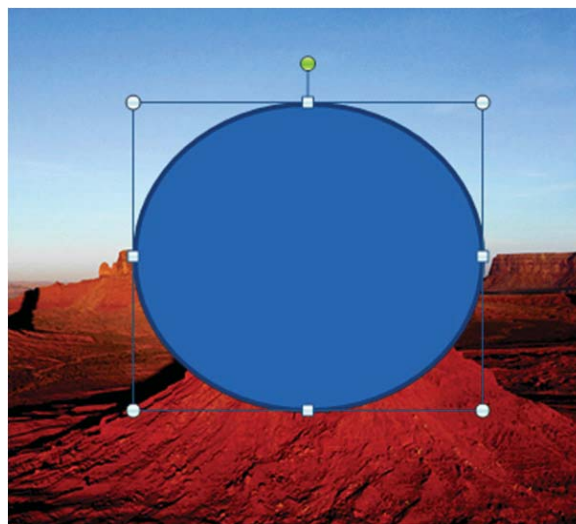
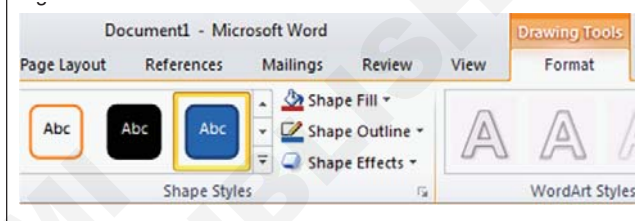
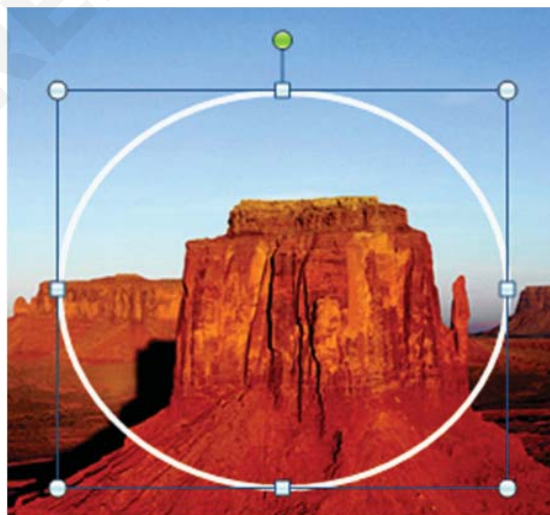


Fig 28



Note: Outline will be as in Fig 29.

Fig 29



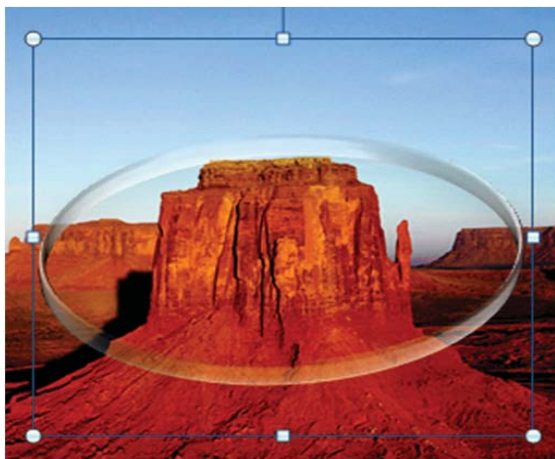
- 5 Apply a shape style as in Fig 30

Save the file and exit.

Grouping & ungrouping of Objects

- 1 Open a new document for working.
- 2 Insert a ClipArt using Insert Clipart as in Fig 31
- 3 Select the clipart and find the bounding box has few objects combined as in Fig 32.
- 4 Ungroup the object using Picture - Format tab -> Group option as in Fig 33.

Fig 30



The clipart now gets ungrouped and separated as different objects. Use the same group option for making the objects a single clipart.

5 Check with instructor for more options.

Fig 32

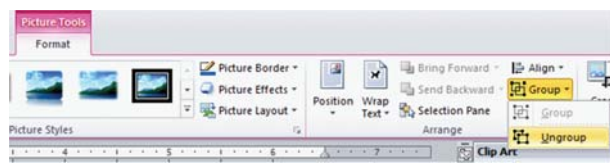


Fig 31

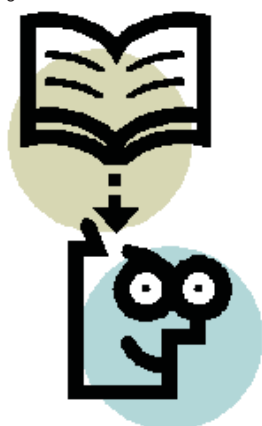
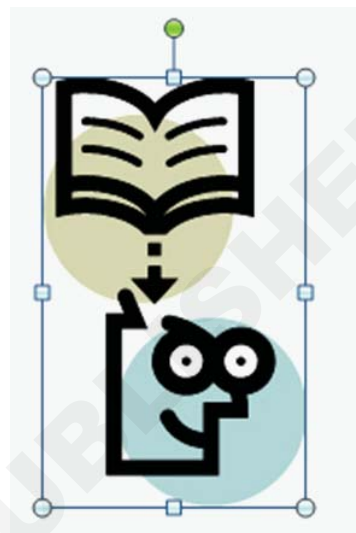


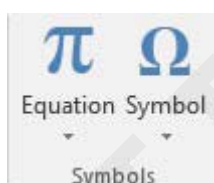
Fig 33



TASK 5 : insert a check mark and others symbol

- 1 Place your cursor in the file at the spot where you want to insert the symbol.
- 2 On the **Insert** tab, click **Symbol**. (Fig 1)

Fig 1

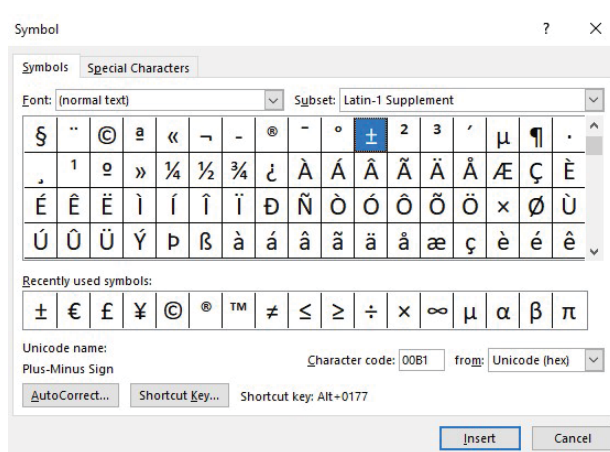


- 3 See the symbol you want listed on that gallery, just click it to insert. Otherwise, click **More Symbols** to open the **Symbol** dialog box. (Fig 2)
- 4 Scroll up or down to find the symbol you want to insert.

Different font sets often have different symbols in them and the most commonly used symbols are in the **Segoe UI Symbol** font set. Use the **Font** selector above the symbol list to pick the font you want to browse through.

- 5 Find the symbol and double-click it. The symbol will be inserted in your file. You can click **Close** now unless you want to insert additional symbols.

Fig 2

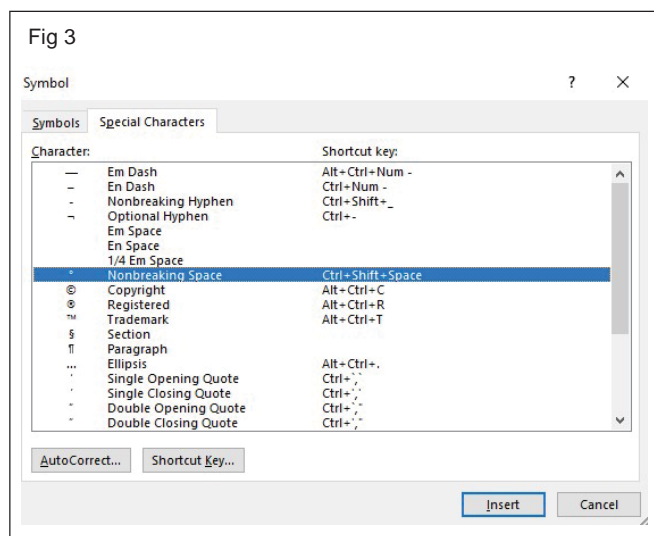


Tip: If you want to make your symbol larger or smaller, select it and use the Font Size setting.

If you're going to insert the same symbol often, consider setting up AutoCorrect to insert it for you. You can find more info about that here: Insert a check mark or other symbol using AutoCorrect.

A special character like em dashes or section marks (§)

- 1 Click where you want to insert the special character.
- 2 Click **Insert>Symbol>More Symbols**.
- 3 In the **Symbol** dialog box, click the **Special Characters** tab. (Fig 3)



- 4 Double-click the character that you want to insert.

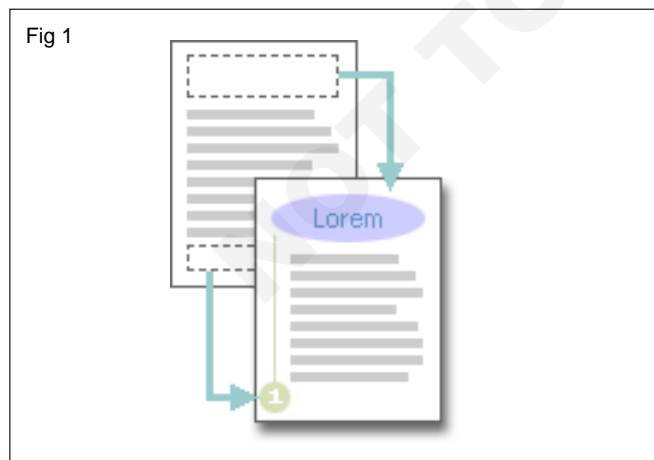
Tip: Many of the special characters have shortcut keys associated with them. If you want to insert that special character again in the future, just press the shortcut key.

ALT+CTRL+C inserts the Copyright symbol (©), for example.

- 5 Click **Close** when you're finished inserting special characters.

TASK 6 : Insert header and footer

Headers and footers are areas in the top, bottom, and side margins of each page in a document. (Fig 1)



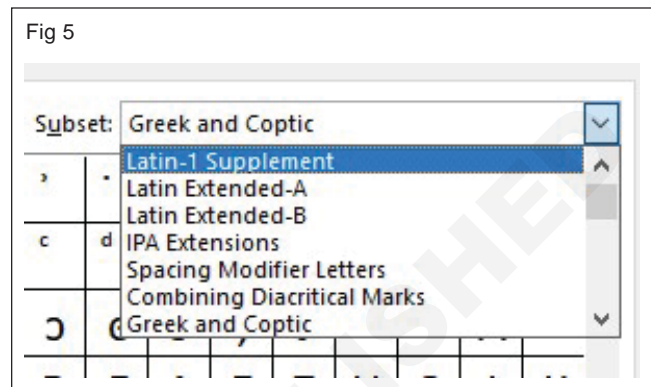
Insert a predefined header or footer

- 1 On the **Insert** tab, in the **Header & Footer** group, click **Header** or **Footer**. (Fig 2)

Fractions (1/3, 2/5)

Some fractions (1/4, 1/2, and 3/4) automatically switch to a fraction character ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$) when you type them. But others do not (1/3, 2/3, 1/5, etc.) so if you want to insert those as symbols you'll need to use the insert symbol process.

- 1 Click where you want to insert the fraction.
- 2 Click **Insert>Symbol>More Symbols**.
- 3 In the **Subset** dropdown, choose **Number Forms**. (Fig 4)



Note: Not all fonts have a number forms subset. If you don't see the number forms subset available for your font you will have to use a different font, such as Calibri, to insert the fraction character.

- 4 Double-click the fraction that you want to insert.
- 5 Click **Close**.

Fig 2



- 2 Click the header or footer design that you want. .

Insert a custom header or footer

- 1 On the **Insert** tab, in the **Header & Footer** group, click **Header** or **Footer**. (Fig 3)

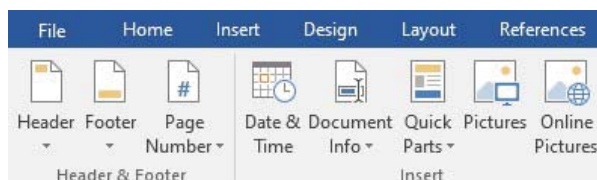
Fig 3



- 2 Click **Edit Header** or **Edit Footer**.
- 3 Type text or insert graphics and other content by using the options in the **Insert** group on the **Design** tab, under the **Header & Footer Tools** tab.

TIP To save the header or footer that you created to the gallery of header or footer options, select the text or graphics in the header or footer, and then click **Save Selection as New Header** or **Save Selection as New Footer**. (Fig 4)

Fig 4



Make the first page header or footer different from the rest of the pages

- 1 On the first page of the document, double click the header or footer area.
- 2 Under **Header & Footer Tools**, on the **Design** tab, in the **Options** group, select the **Different First Page** check box.

NOTE : If your document includes a cover page from the gallery of cover pages in Office Word 2007, the **Different First Page** option is already turned on. Inserting or editing a header or footer on this page does not affect the other pages in the document.

- 3 Create a header or footer, or make changes to the existing header or footer, on the first page.

Use no header or footer on the first page

- 1 On the first page of the document, double click the header or footer area.
- 2 Under **Header & Footer Tools**, on the **Design** tab, in the **Options** group, select the **Different First Page** check box.

Note: If the **Different First Page** check box is already checked, do not clear it. Go on to the next step.

- 3 In the **First Page Header** or **First Page Footer** area, delete the contents of the header or footer.

Make the header or footer different for odd and even pages

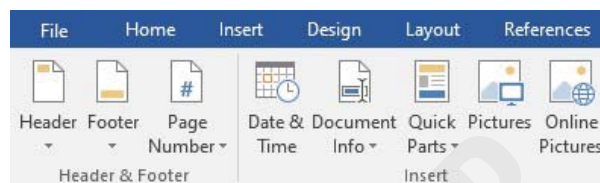
For example, you can use the title of the document on odd-numbered pages, and the chapter title on even-numbered pages. Or, for a booklet, you can place page numbers on odd-numbered pages to be on the right side of the page and page numbers on even-numbered pages to be on the left side of the page. This way, the page

numbers are always on the outside edge when the pages are printed on both sides of the paper.

Create odd and even headers or footers in a document that does not yet use headers or footers

- 1 Click an odd-numbered page, such as the first page of your document.
- 2 On the **Insert** tab, in the **Header & Footer** group, click **Header** or **Footer**. (Fig 5)

Fig 5



- 3 In the gallery of headers or footers, click a design labeled **(Odd Page)**, such as **Austere (Odd Page)**.

Note: If you don't see a gallery of header or footer designs, there might be a problem with the **Building Blocks** template on your computer. See **I don't see galleries of page numbers, headers and footers, cover pages, or equations** for information about how to fix this problem.

- 4 Under **Header & Footer Tools**, on the **Design** tab, in the **Options** group, select the **Different Odd & Even Pages** check box.
- 5 Under **Header & Footer Tools**, on the **Design** tab, in the **Navigation** group, click **Next Section** to advance the cursor to the header or footer for even-numbered pages.
- 6 Under **Header & Footer Tools**, on the **Design** tab, in the **Header & Footer** group, click **Header** or **Footer**.
- 7 In the gallery of headers or footers, click a design labeled **(Even Page)**, such as **Austere (Even Page)**.


NOTES

- If necessary, you can format text in the header or footer by selecting the text and using the formatting options on the Office Fluent Mini toolbar.
- If you want to switch to a different predefined header or footer, repeat these steps, and choose a different header or footer from the gallery.

Create odd and even headers or footers in a document that already has headers or footers

- 1 Double-click in the header or footer area.
- 2 Under **Header & Footer Tools**, on the **Design** tab, in the **Options** group, select the **Different Odd & Even Pages** check box.

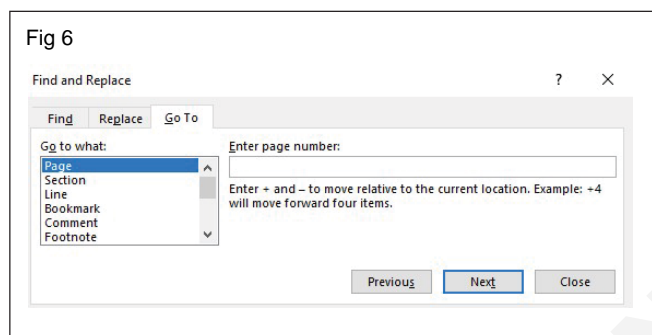
The existing header or footer is now configured for odd-numbered pages only.

- 3 Under **Header & Footer Tools**, on the **Design** tab, in the **Navigation** group, click **Next Section**  to advance the cursor to the header or footer for even-numbered pages, and then create the header or footer for even-numbered pages.

Make the header or footer different in each section or chapter

If your document is divided into sections, you can vary the headers and footers so that they display different content for each section. For example, if your document is divided into chapters by using section breaks, the chapter title can be displayed in the header of each chapter.

TIP If you are unsure whether your document has sections, you can search for them. (Fig 6)



- 1 Click **Drafts** on the status bar.
- 2 On the **Home** tab, in the **Find** group, click **Go To**.
- 3 Click **Section**.
- 4 Click **Next** to find section breaks in the document.
- 5 Draft view makes it easy to see the section breaks in the document.

Add section breaks to a document

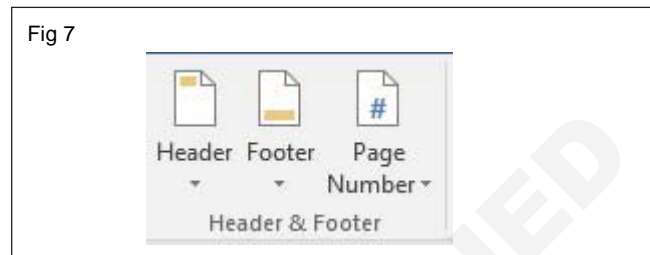
If your document is not divided into sections, you can insert section breaks where you want the header or footer to vary.



- 1 Starting at the beginning of the document, place the cursor at the beginning of the page where you want to start varying the header or footer.
- 2 On the **Page Layout** tab, in the **Page Setup** group, click **Breaks**, and then under **Section Breaks**, click **Next Page**.
- 3 Place the cursor at the beginning of the next page where you want to vary the header or footer, such as the first page of a new chapter.
- 4 On the **Page Layout** tab, in the **Page Setup** group, click **Breaks**, and then under **Section Breaks**, click **Next Page**.
- 5 Repeat steps 3 and 4 for every section break that you want in the document.

Use a document's section breaks to vary the header or footer

If your document is already divided into sections, you can use the section breaks to configure headers and footers.



- 1 Starting at the beginning of the document, click in the first section for which you want to vary the header or footer.
- 2 On the **Insert** tab, in the **Header & Footer** group, click **Header** or **Footer**. (Fig 7)



- 3 Click **Edit Header** or **Edit Footer**.
- 4 On the **Headers & Footers** tab, in the **Navigation** group, click **Link to Previous**  to break the connection between the header or footer in this section and the previous section.
- 5 Change the existing header or footer, or create a new header or footer for this section.
- 6 In the **Navigation** group of the **Design** tab (**Header & Footer** contextual tab), click **Next Section**  to advance the cursor to the header or footer of the next section.
- 7 On the **Headers & Footers** tab, in the **Navigation** group, click **Link to Previous** to break the connection between the header or footer in this section and the previous section.
- 8 Change the existing header or footer, or create a new header or footer for this section.
- 9 Repeat the previous three steps for all of the sections in the document.

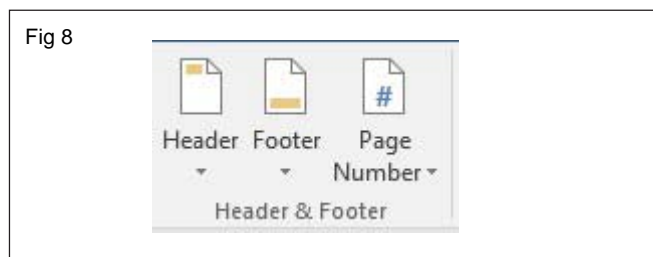
Use the same header or footer across section boundaries

In a document where the header or footer varies by section, you can make the header or footer the same across section boundaries.

- 1 Double-click the header or footer that you want to preserve across section boundaries.
- 2 On the **Headers & Footers** tab, in the **Navigation** group, click **Next Section** .
- 3 Click **Link to Previous** .
- 4 Office Word 2007 will ask if you want to delete the header and footer and connect to the header and footer in the previous section. Click **Yes**.

Change the contents of a header or footer

- 1 On the **Insert** tab, in the **Header & Footer** group, click **Header** or **Footer**. (Fig 8)



- 2 Click **Edit Header** or **Edit Footer**.
- 3 Make your changes to the header or footer by selecting the text and revising it or by using the options on the Fluent Mini toolbar to format the text. For example, you can change the font, apply bold format, or apply different font color.

TIP InPrint Layout view (Print Layout view: A view of a document or other object as it will appear when you print it. For example, items such as headers, footnotes, columns, and text boxes appear in their actual positions.), you can quickly switch between the header or footer and the document text. Just double-click the dimmed header or footer, or the dimmed document text.

Insert a page number

If your document already has content in the header or footer, you can add the page number to the header or footer.

If you want to use one of the preformatted page number designs, but you want more information in the header or footer than just the page number, it is easiest to start with a page number and then add other text or graphics to the header or footer.

Note: Many of the footer designs in the gallery of footers already include the page number as part of the content.

For more information about inserting page numbers, see Insert page numbers.

Add a page number to an existing header or footer

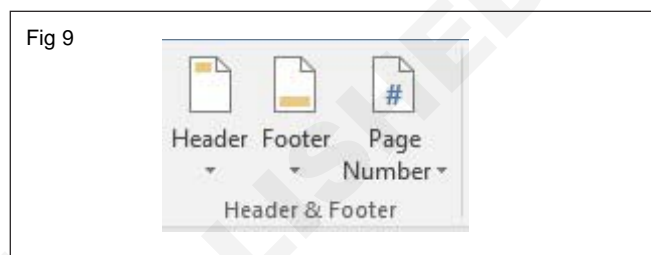
- 1 Double-click the header or footer area.
- 2 Position the cursor where you want to insert the page number.

NOTES

- You may need to press the TAB key, adjust paragraph alignment, or make other changes to the header or footer content to position the cursor where you want it.
- Many header and footer designs are laid out in a table, and pressing TAB moves the cursor without inserting a tab stop. To insert a tab stop within a table cell,

press CTRL+TAB. To determine whether the header or footer that you are working with is laid out in a table, look for the **Table Tools** contextual tab at the top of the Ribbon while the cursor is in the header or footer.

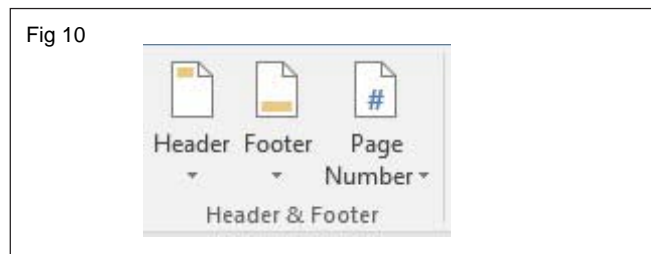
- Many header and footer designs contain content controls for storing content such as the document title and the date. When you click to edit the header or footer, the cursor might automatically select the content control. To move the cursor away from the content control (so that you can insert the page number in the header or footer without deleting the content of the content control), press the LEFT ARROW or RIGHT ARROW key.
- 3 On the **Insert** tab, in the **Header & Footer** group, click **Page Number** (Fig 9)



- 4 Click **Current Position**.
- 5 Choose a page number design from the gallery of designs.

Add header or footer content to a preformatted page number design

- 1 On the **Insert** tab, in the **Header & Footer** group, click **Page Number**. (Fig 10)



- 2 Click **Top of Page**, **Bottom of Page**, or **Page Margins**, depending on where you want page numbers to appear in your document.
- 3 Choose a page number design from the gallery of designs.
- 4 Do one of the following:
 - To insert header or footer content before the page number, press the HOME key, enter the content, and then press TAB to position the content.
 - To insert header or footer content after the page number, press the END key, press TAB, and then enter the content.
 - If you chose a design from the **Page Margins** designs, click in the header or footer, and add the content that you want.

NOTES

- You may need to press TAB, adjust paragraph alignment, or make other changes to the header or footer content to position the cursor where you want it.
- Many header and footer designs are laid out in a table, and pressing TAB moves the cursor without inserting a tab stop. To insert a tab stop within a table cell, press CTRL+TAB. To determine whether the header or footer that you are working with is laid out in a table, look for the **Table Tools** contextual tab at the top of the Ribbon while the cursor is in the header or footer.
- Many header and footer designs contain content controls for storing content, such as the document title and the date. When you click to edit the header or footer, the cursor might automatically select the content control. To move the cursor away from the content control (so that you can insert the page number in the header or footer without deleting the content of the content control), press the LEFT ARROW or RIGHT ARROW key.

Insert the file name of the document

- 1 Place the cursor where you want to insert the file name in the header or footer.
- 2 Under **Header & Footer Tools**, on the **Design** tab, in the **Insert** group, click **Quick Parts**, and then click **Field**.
- 3 In the **Field names** list, click **FileName**. If you want to include the path as part of the file name, select the **Add path to filename** check box.

Security: Because field codes can be visible to anyone reading your document, be sure that the information you place in field codes is not information that you want kept private.

Insert the document title, author's name, or other document property

- 1 Place the cursor where you want to insert the document property in the header or footer.
- 2 Under **Header & Footer Tools**, on the **Design** tab, in the **Insert** group, click **Quick Parts**.
- 3 Point to **Document Property**, and then click the document property that you want.

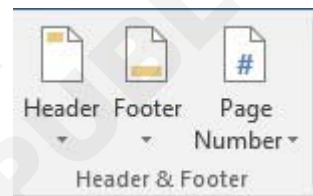
Insert the current date

- 1 Place the cursor where you want to insert the date in the header or footer.
- 2 Under **Header & Footer Tools**, on the **Design** tab, in the **Insert** group, click **Date & Time**.
- 3 In the **Available formats** list, click the format in which you want the date (and time, if you want) to appear.

Remove the header or footer

- 1 Click anywhere in the document.
- 2 On the **Insert** tab, in the **Header & Footer** group, click **Header** or **Footer**. (Fig 11)

Fig 11



- 3 Click **Remove Header** or **Remove Footer**.

The headers or footers are removed from the entire document.

Important: If you created different first-page or odd-and-even headers or footers, or if there are sections that aren't linked, be sure to remove the headers or footers from each different page or section.

TASK 7: Insert WordArt style and shape

- 1 Press control + home key to move to the beginning of the document.
- 2 Invoke WordArt using Insert menu -> WordArt option in ribbon. The WordArt shows available styles as in Fig 1.
- 3 Choose a style to apply on the box, "Your Text Here" block to type the input as in Fig 2.
- 4 Click on shape outline in shape styles option to get outline on the text as in Fig 3.
- 5 Fill color using shape fill option as in Fig 4.
- 6 Create outline using shape outline option as in Fig 5.

Fig 1



Fig 2

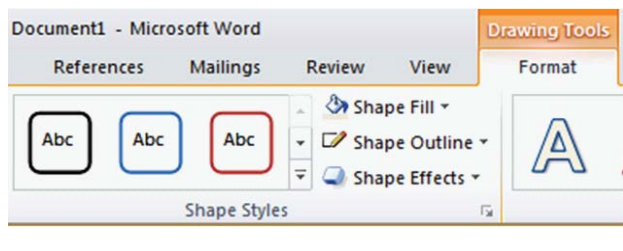


The output after line and fill objects will be as in (Fig 6).

Fig 6



Fig 3



- 7 Apply a shape effect from the presets available, choose Preset -> Preset -> Preset 10 as to Fig 7.

Fig 7

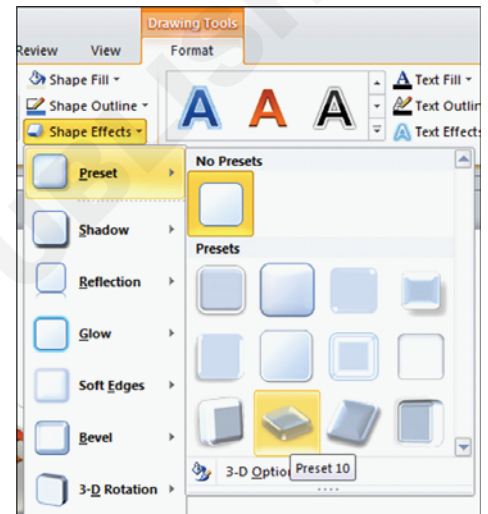


Fig 4



The output will be as in Fig 8.

Fig 8



Note : WordArt can be placed at any place and set for text wrapping as like pictures.

Fig 5

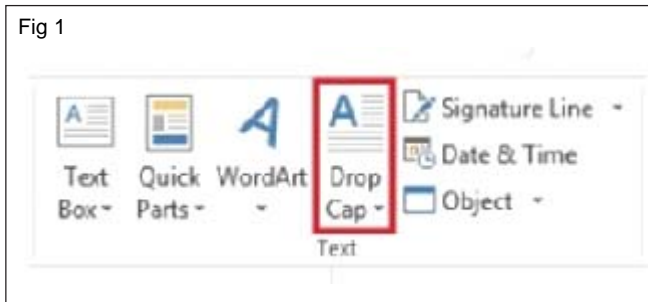


- 8 Save the work for future reference.

TASK 8: Insert and remove Dropcap

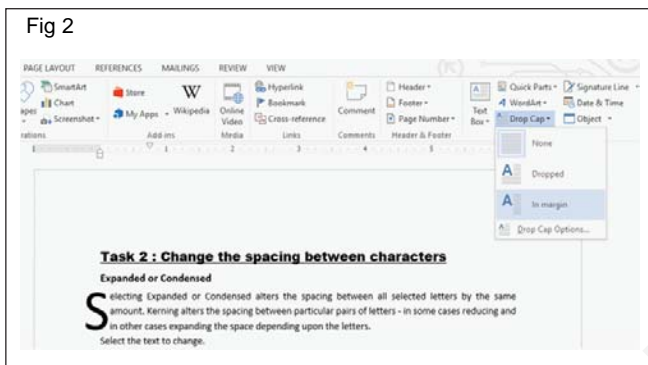
- 1 Select the first character of a paragraph.
- 2 On the **INSERT** tab, in the **Text** group, select **Drop Cap**. (Fig 1)

Fig 1



- 3 Select the drop cap option you want.
- To create a drop cap that fits within your paragraph, select **Dropped**. (Fig 2)

Fig 2



- To create a drop cap that is in the margin, outside of your paragraph, select **In margin**. (Fig 3)

Note: You can change the size and font of the drop cap, as well as its distance from the text. To do so, click **Drop Cap>Drop Cap Options**, and under **Options**, make your selections.

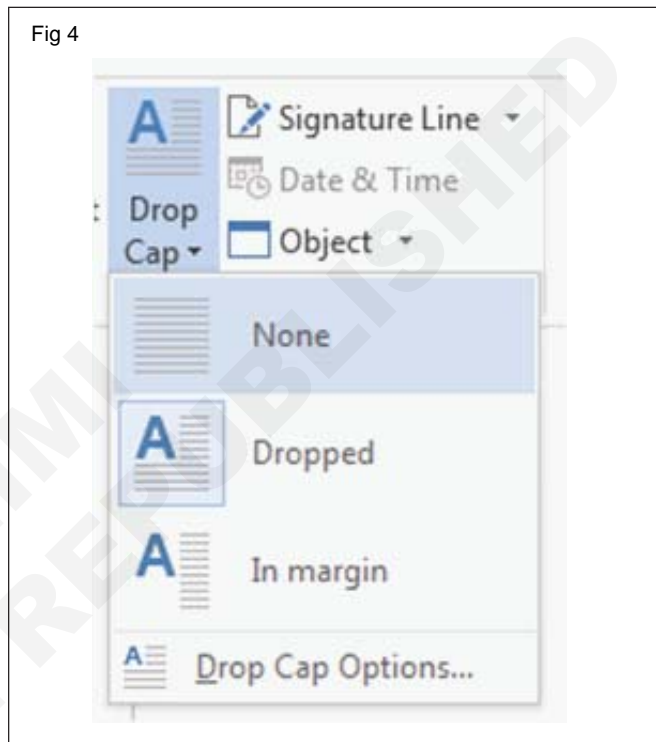
Remove a drop cap

- 1 Highlight the large drop cap letter.

Fig 3



Fig 4



- 2 On the **INSERT** tab, in the **Text** group, click **Drop Cap>None**.

Using Templates, Autocorrect Tools, and Mail Merge Tool

Objectives: At the end of this exercise you shall be able to

- open a template
- choose AutoCorrect options for capitalization, spelling, and symbols
- create and run macros
- create a form letter
- type list of recipients and edit recipients list
- use mail merge to personalize letters for bulk mailings.

Requirements


Tools/Equipments/Instruments

- A working PC - 1 No.
- A working PC with windows OS and MS Office 2007 - 1 No.

PROCEDURE

TASK 1: Open a template

Open a new document and start typing

- 1 In Microsoft Office Word 2010, 2013 or 2016, click **File**, and then click **New**. In Microsoft Office Word 2007, click the **Microsoft Office Button** , and then click **New**.
- 2 Double-click **Blank document**.

Start a document from a template

To use a template as a starting point, do one of the following:

- 1 In Microsoft Office Word 2010, 2013 or 2016, click **File**, and then click **New**. In Microsoft Office Word 2007, click the **Microsoft Office Button**, and then click **New**.
- 2 Under **Templates**, do one of the following:
 - If you are using Microsoft Office Word 2007, click **Installed Templates** to select a template that is available on your computer. If you are using Microsoft Office Word 2010, look in **Available Templates**
 - In Microsoft Office Word 2007, click one of the links under **Microsoft Office Online**. In Microsoft Office Word 2010, click **Office.com Templates**. In Microsoft Office Word 2013 and 2016, all available installed templates are shown when you click **File**, and then click **New** and additional templates can be discovered by using the **Search for online templates** search box.
- 2 Double-click the template that you want.

Save and reuse templates

If you make changes to a template that you download, you can save it on your computer and use it again. It's

easy to find all your customized templates by clicking **My templates** in the **New Document** dialog box. To save a template in the My templates folder, do the following:

- 1 Click the **File** tab.
- 2 Click **Save As**.
- 3 In the **Save As** dialog box, click **Templates**.
- 4 In the **Save as type** list, select **Word Template**.
- 5 Type a name for the template in the **File name** box, and then click **Save**.

Delete a document

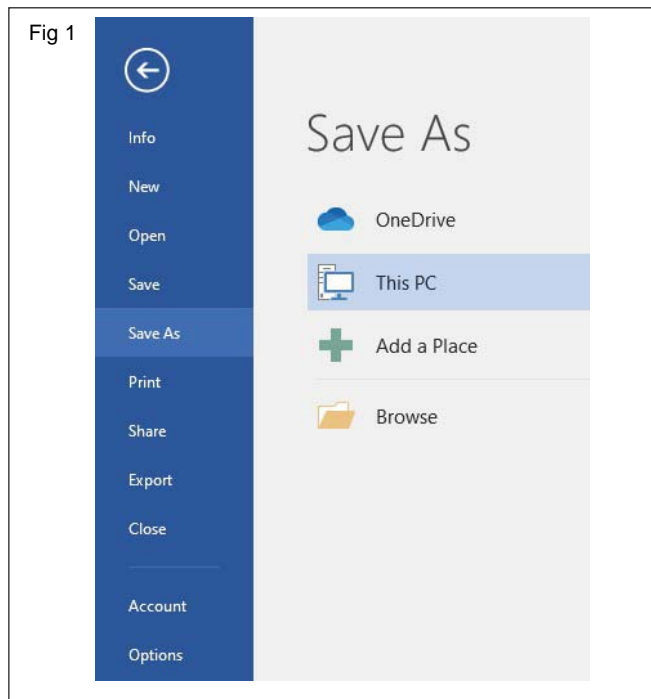
- 1 Click the **File** tab.
- 2 Click **Open**.
- 3 Locate the file that you want to delete.
- 4 Right-click the file, and then click **Delete** on the shortcut menu.

Create a template

If you frequently create a certain type of document, such as a monthly report, a sales forecast, or a presentation with a company logo, save it as a template so you can use that as your starting point instead of recreating the file from scratch each time you need it. Start with a document that you already created, a document you downloaded, or a new template you customized.

Save a template

- 1 To save a file as a template, click **File>Save As**.
- 2 Double-click **Computer** or, in Office 2016 programs, double-click **This PC**. (Fig 1)
- 3 Type a name for your template in the **File name** box.

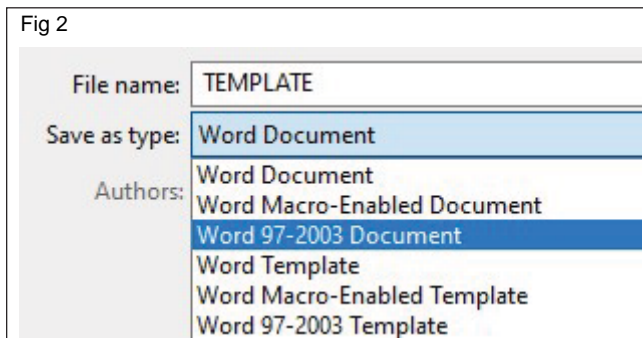


- 4 For a basic template, click the template item in the **Save as type** list. In Word for example, click **Word Template**. (Fig 2)

If your document contains macros, click **Word Macro-Enabled Template**.

Office automatically goes to the Custom Office Templates folder.

- 5 Click **Save**.



Note : To change where your application automatically saves your templates, click **File>Options>Save** and type the folder and path you want to use in the Default personal templates location box. Any new templates you save will be stored in that folder, and when you click **File>New>Personal**, you'll see the templates in that folder.

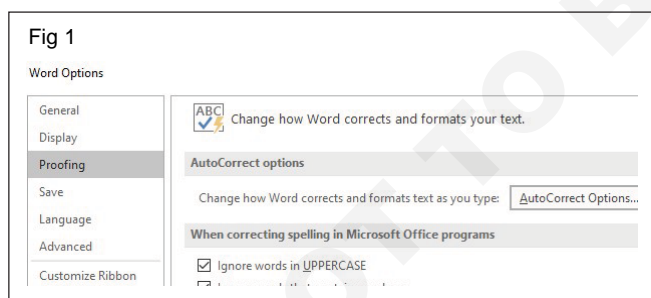
Edit your template

To update your template, open the file, make the changes you want, and then save the template.

- 1 Click **File>Open**.
- 2 Double-click **Computer** or **This PC**.
- 3 Browse to the **Custom Office Templates** folder that's under **My Documents**.
- 4 Click your template, and click **Open**.
- 5 Make the changes you want, then save and close the template.

TASK 2: : Choose AutoCorrect options for capitalization, spelling, and symbols

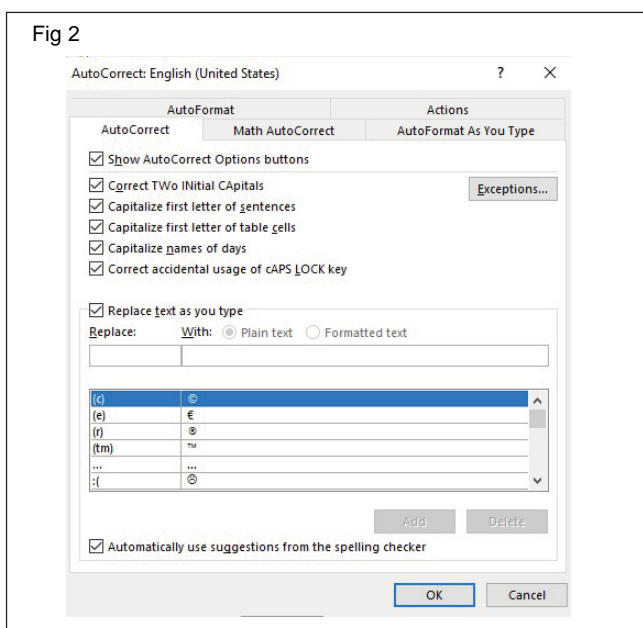
- 1 Click **File>Options>Proofing>AutoCorrect Options** (Fig 1)



Click "Auto Correct Options" button

In the Auto correct tab, select the following boxes

- Correct TWo INitial CAPITALs
- Capitalize first letter of sentences
- Capitalize first letter of table cells(Not in Excel or OneNote)
- Capitalize names of days
- Correct accidental use of cAPS LOCK key (Fig 2)



Add, change, or delete an entry on the AutoCorrect list

To add an entry follow these steps:

- 1 Go to the AutoCorrect tab.

- 2 In the **Replace** box, type a word or phrase that you often mistype or misspell — for example, type **usually**.
- 3 In the **With** box, type the correct spelling of the word — for example, type **usually**.

- 4 Click **Add**.

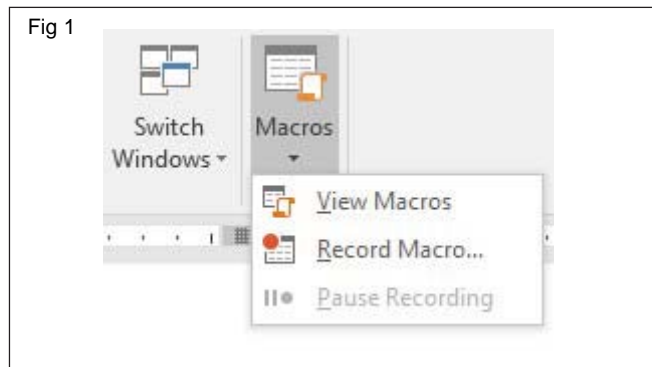
To change the replacement text for an entry, select it in the list of entries and type a new entry in the **With** box.

To delete an entry, select it in the list and click **Delete**.

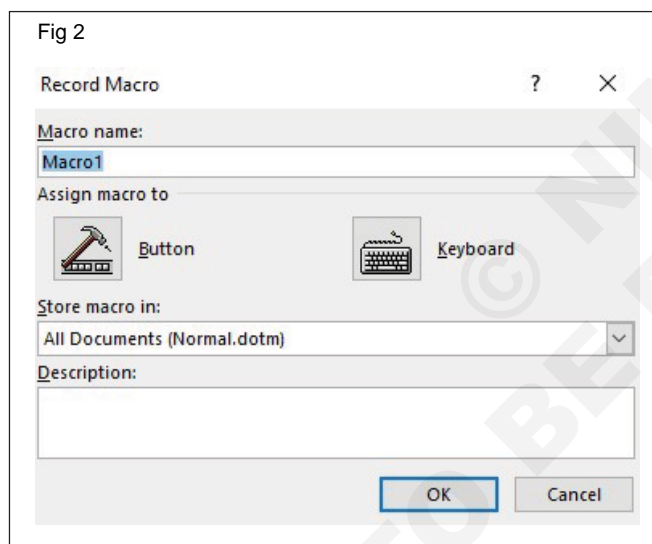
TASK 3: : Create and run macros

Record a macro with a button

- 1 Click **View>Macros>Record Macro**. (Fig 1)



- 2 Type a name for the macro.(Fig 2)

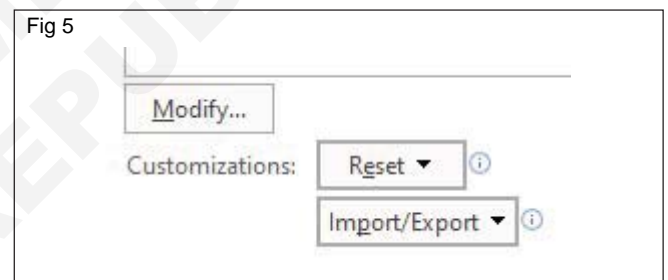
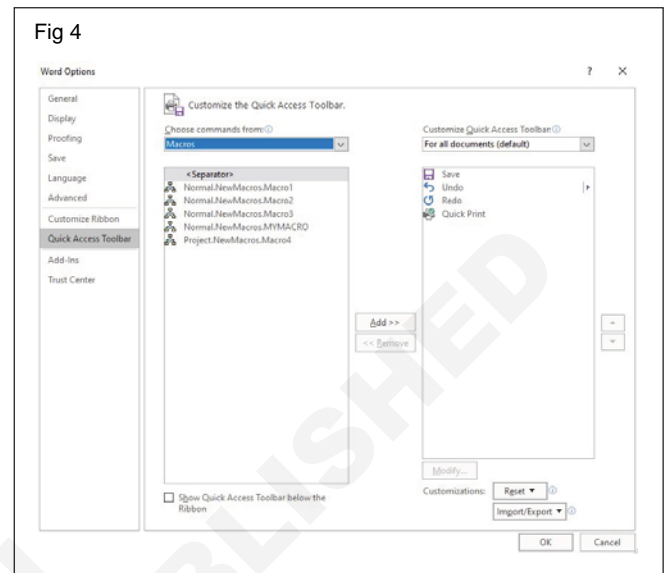


To use this macro in any new documents you make, be sure the Store macro in box says All Documents (Normal.dotm).

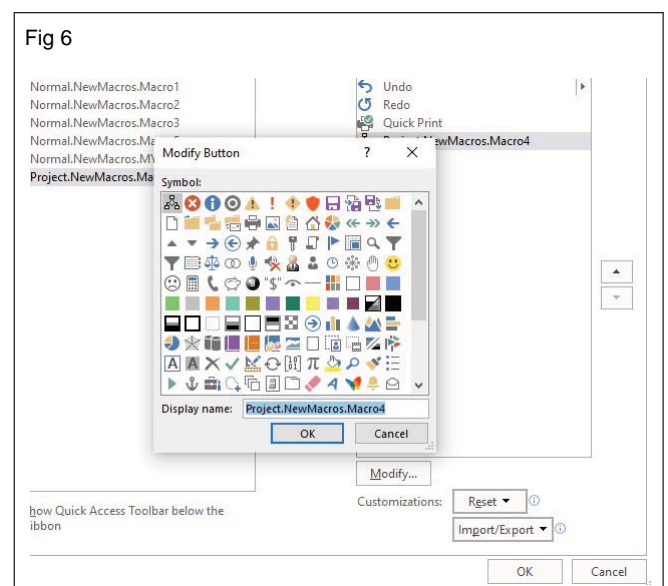
- 3 To run your macro when you click a button, click **Button**. (Fig 3)



- 4 Click the new macro (it's named something like Normal.NewMacros.<your macro name>), and click **Add** (Fig 4)
- 5 Click **Modify**. (Fig 5)



- 6 Choose a button image, type the name you want, and click **OK** twice. (Fig 6)

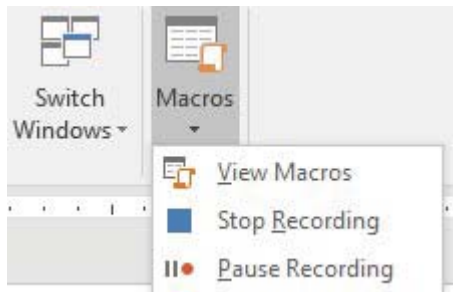


- 7 Now it's time to record the steps. Click the commands or press the keys for each step in the task. Word records your clicks and keystrokes.

Note: Use the keyboard to select text while you're recording your macro. Macros don't record selections made with a mouse.

- 8 To stop recording, click **View>Macros>Stop Recording**. (Fig 7)

Fig 7



- 9 The button for your macro appears on the Quick Access Toolbar. (Fig 8)
- 10 To run the macro, click the button. The recorded text will appear on as shown in the following fig 9.

Fig 8

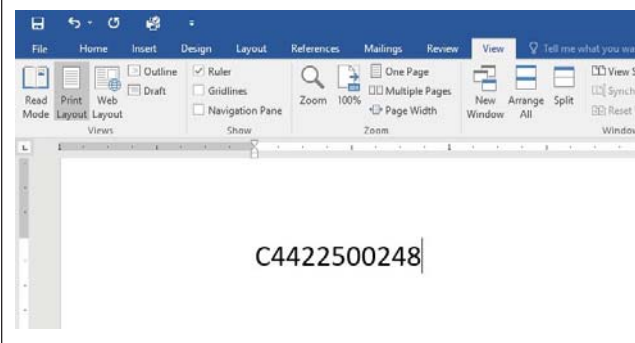
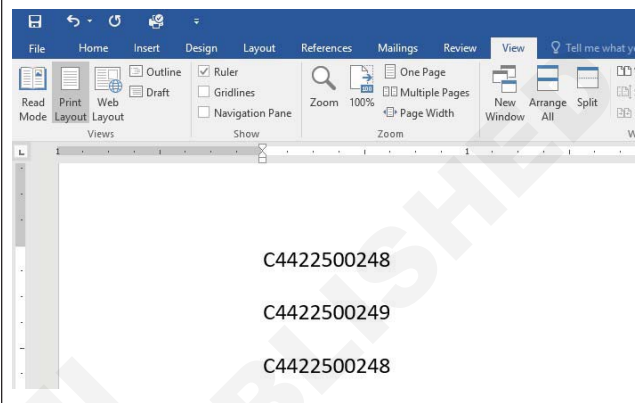


Fig 9



TASK 4 : Create form letter

- 1 Select **Mailing** ®



A drop down menu as shown in Fig.1.

- 2 Select **Letters** a blank word document appears on the screen.

- 3 Type the following letter

FROM

TO

National iNSTRUCTIONAL media institute,
CTI campus, guindy,
Chennai 600 032.

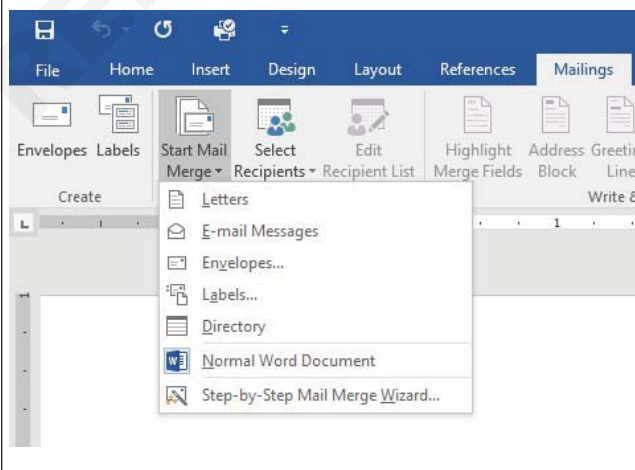
Sir,

We trainees studying in ITI, we need to know the price list of few trades for purchasing course materials like

- 1 COPA

- 2 FITTER

Fig 1



- 3 WELDER

- 4 TURNER

- 5 PPO


- 6 MACHINIST

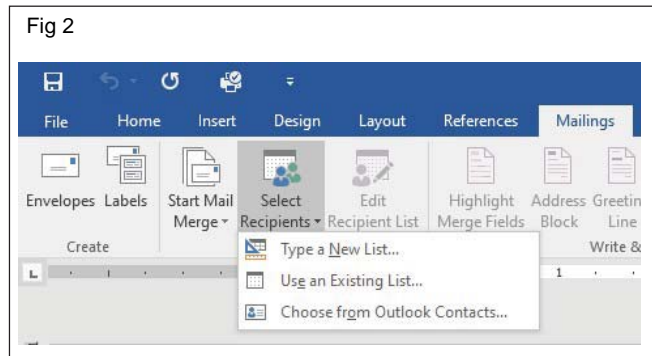
- 7 COE AUTOMOBILE (BBBT & AAT)

Sir Please send us the price details and the discount details, which will enable our friends give bulk orders.

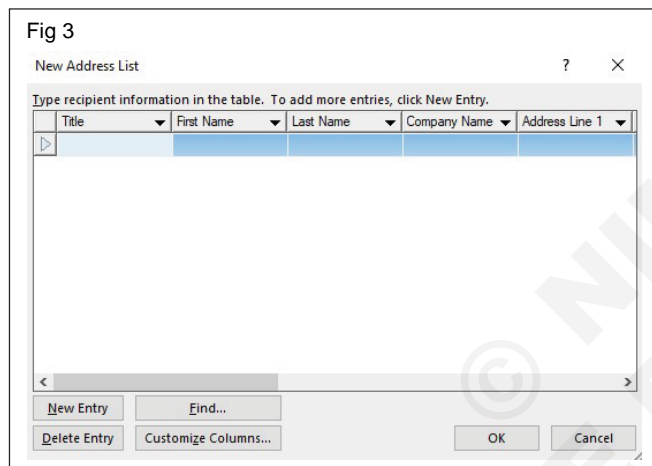
Thanking you

TASK 5: Type the list of recipients and edit recipients list

- 1 Select **Mailing**  choose and click "type new list" as on Fig 2.

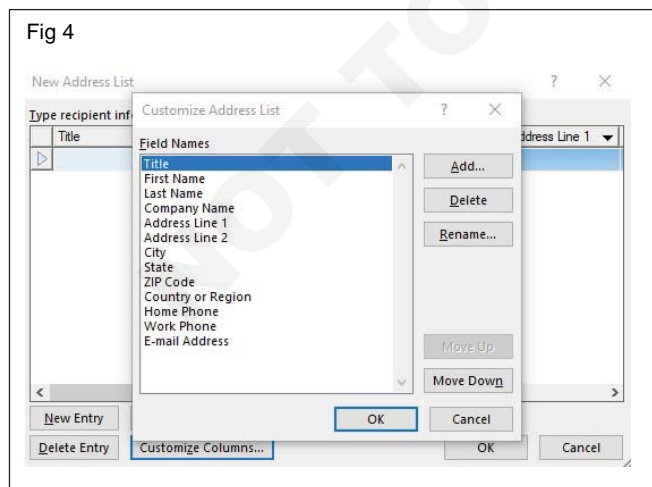


A "New address list" window appears on the screen as on Fig 3.



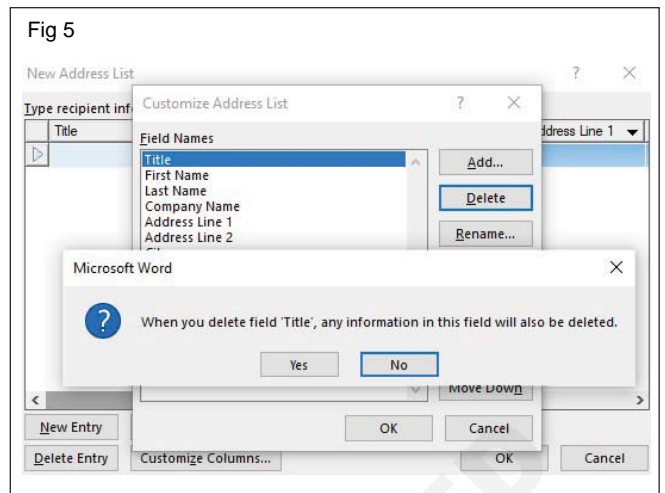
- 2 Select "Customize columns"

A "Customize Address list" window appears on Screen as on Fig 4.



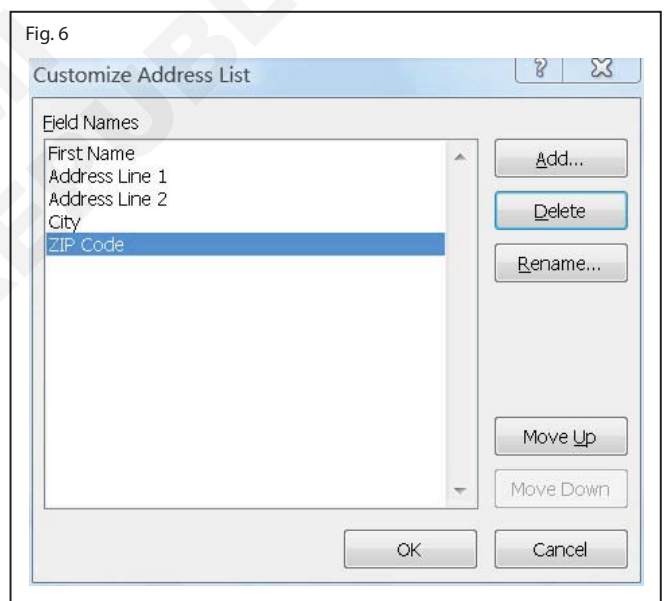
- 3 Select "title" & click "Delete"

The title gets deleted & a screen prompts as "Are you sure you want to delete field "title"?. Click "Yes" as on Fig 5.

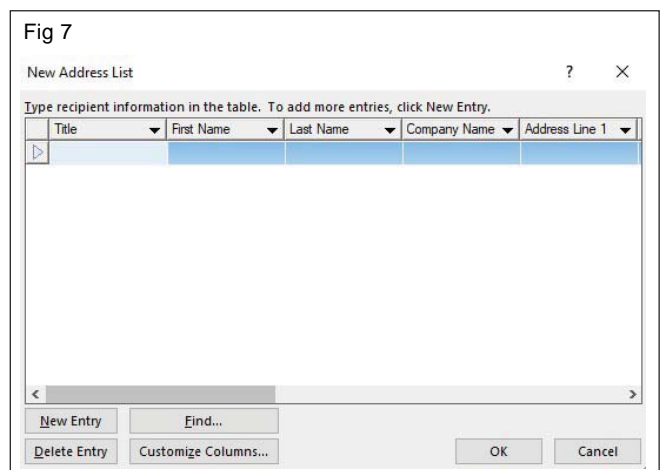


- 1 Use select & delete "Country & region", "Home phone", "Work phone" & "Email address"

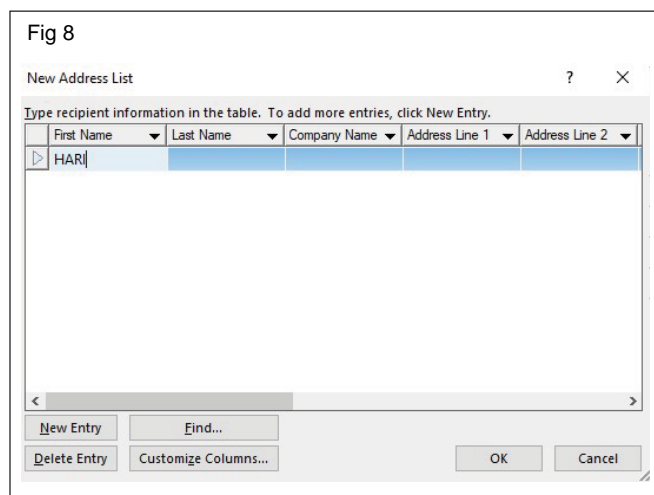
- 2 Fig 6 shows the final customize address list window.



- 4 Press OK the screen displays as shown in Fig 7.

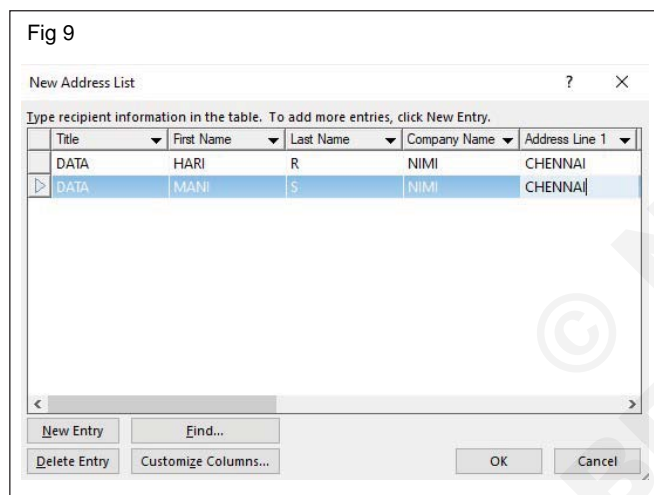


5 Type "HARI" below "First Name " as in Fig 8.



6 Press "TAB" key to move to the next column or position the mouse button on the next column and right click the mouse.

7 Repeat the step 6 to enter the following data as in Fig 9

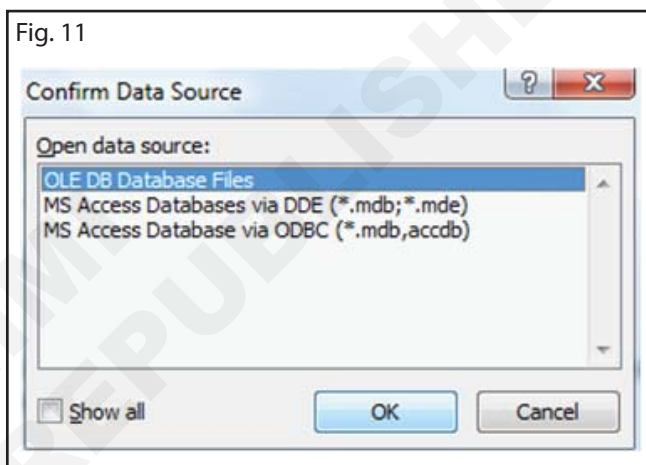
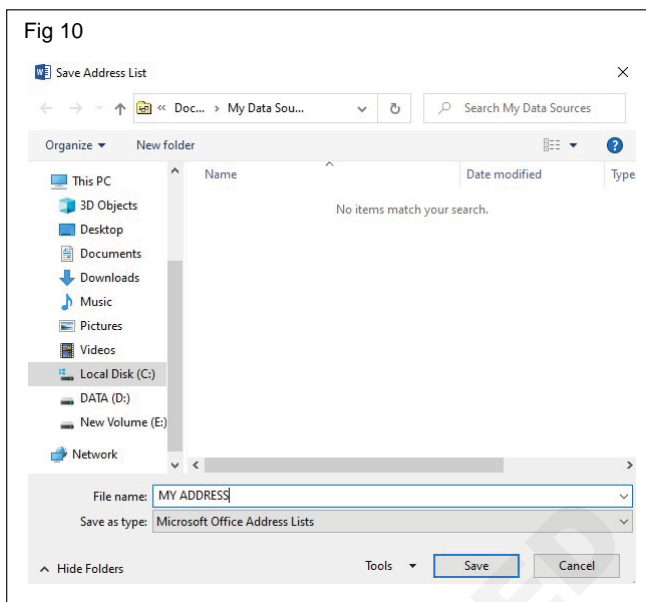


8 Click OK and a "Save Address list" dialog box appears as shown in Fig 10.

9 Type " MAIL ADDRESS" as file name.



10 Click save.


A confirm Data Source dialog box appears as shown in Fig 11.



11 Click OK.

To use the existing list of address saved on your system follow step 12.

12 Select **Mailing**  

 as dialog box appears on the screen.

13 click 

TASK 6: Use mail merge to personalize letters for bulk mailings.

Step 1: Prepare your main document

- On the **Mailings** tab, in the **Start Mail Merge** group, choose **Start Mail Merge>Letters**.(Fig 1)
- In Word, type the body of the letter (example follows) you want to send to everyone. (Fig 2)

Step 2: Set up your mailing list

The mailing list is your data source. It can be an Excel spreadsheet, a directory of Outlook contacts, an Access database, or an Office address list. It contains the records that Word uses to pull information from to build your letter.

Fig 1

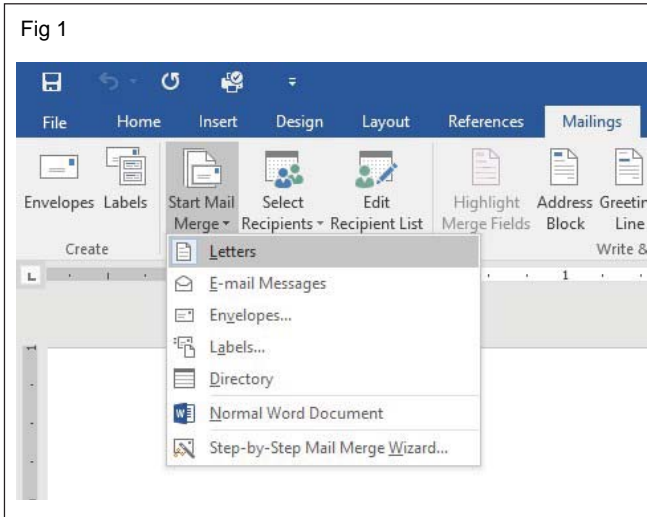
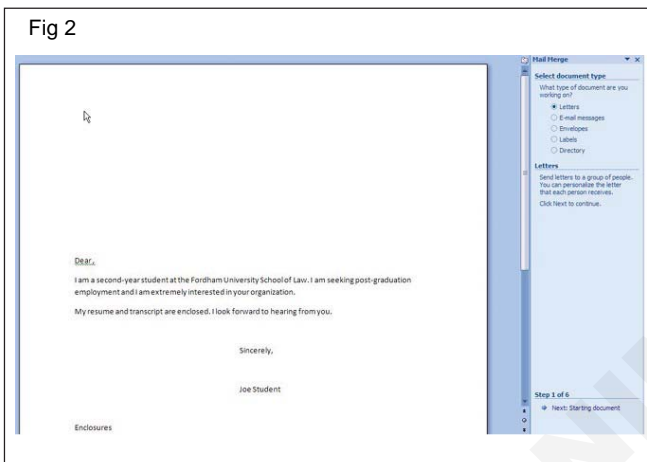


Fig 2



Note

- If you don't have a mailing list, you can create one during mail merge. Before you start the mail merge process, collect all of your data records, and add them to your data source.
- If you're using an Excel spreadsheet, make sure the column for ZIP Codes or postal codes is formatted as text so that you don't lose any zeros.
- If you want to use your Outlook contacts, make sure Outlook is your default email program

Step 3: Link your mailing list to your main document

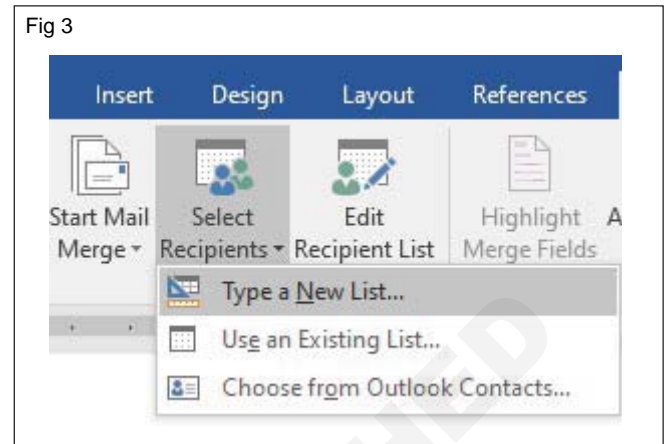
- 1 On the **Mailings** tab, in the **Start Mail Merge** group, choose **Select Recipients**, and then choose an option. (Fig 3)
- 2 Do one of the following:
 - If you don't have a mailing list, choose **Type a New List** and create one.
 - or
 - If your mailing list is in an Excel spreadsheet, an Access database, or another type of data file, choose

Use an Existing List. Then browse to your list and choose **Open**.

or

- If you're using your Outlook contacts, choose **Choose from Outlook Contacts**.

Fig 3



- 3 Choose **File>Save as**.

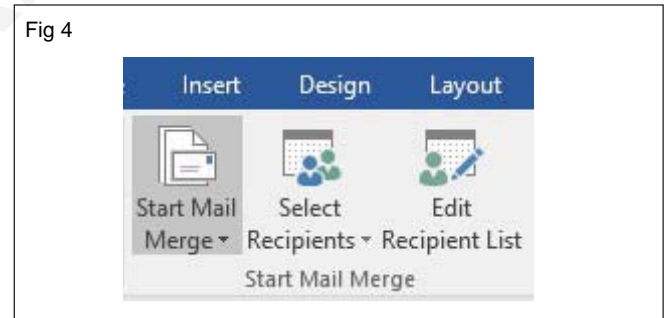
- 4 In the File name box, type a file name, and then choose **Save**

Edit recipient list

If you're creating and printing letters for everyone on your list, go to "Step 4: Add personalized content to your letter." If you want to send letters to people who live, for example, within 20 miles of an event you're hosting, then use a filter like a ZIP Code or a postal code to narrow the list.

Choose **Edit Recipient List** (Fig 4)

Fig 4

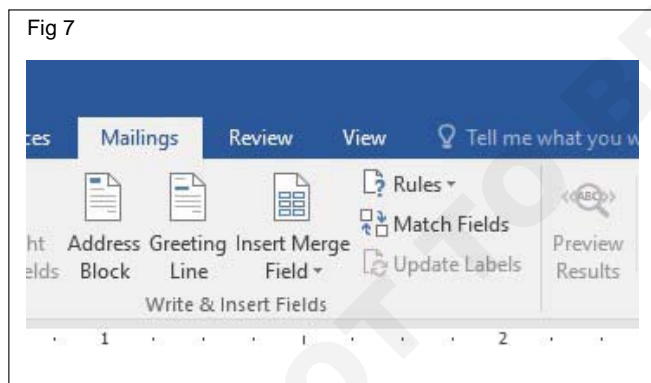
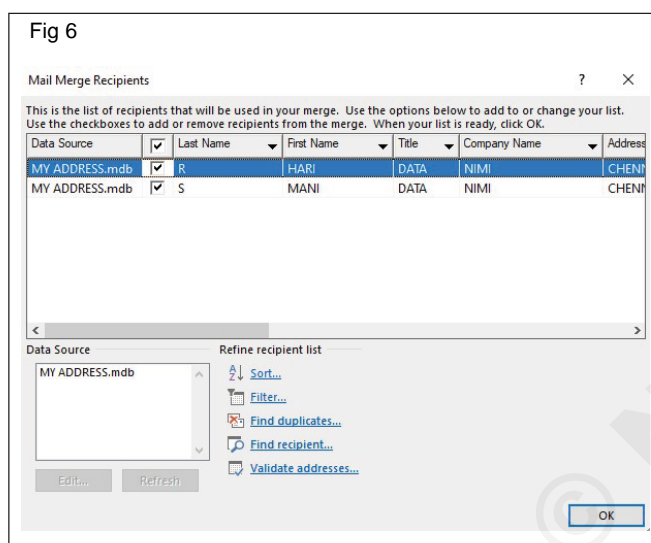
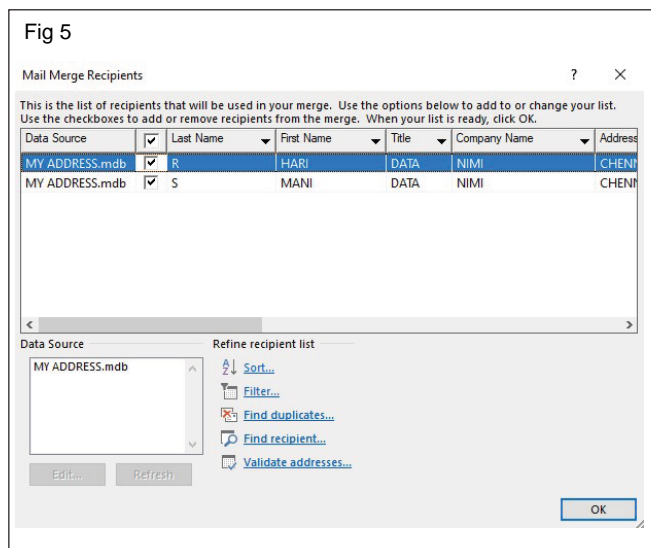


In the **Mail Merge Recipients** dialog box, select the check box next to the name of each person who you want to receive your email message. (Fig 5)

In the **Mail Merge Recipients** dialog box, there are options to refine the recipient list. The two most frequently used options are to sort and to filter the list to make it easier to find names and addresses. (Fig 6)

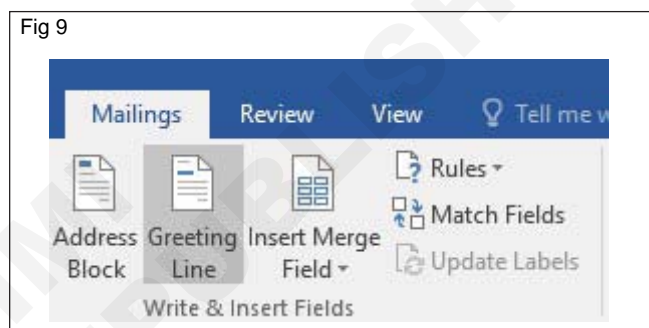
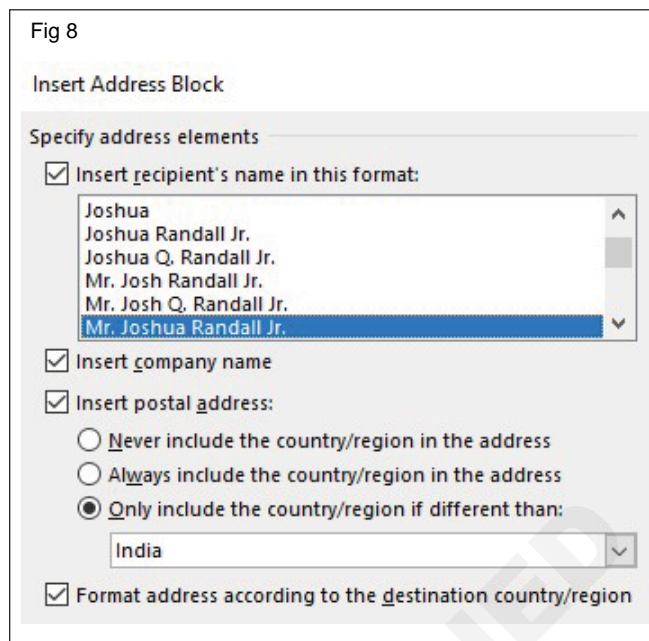
Step 4: Add personalized content to your letter

- 1 On the **Mailings** tab, in the **Write & Insert Fields** group, choose **Address Block**. (Fig 7)
- 2 In the **Insert Address Block** dialog box, choose a format for the recipient's name as it will appear in the letter. (Fig 8)
- 3 Choose **OK**.

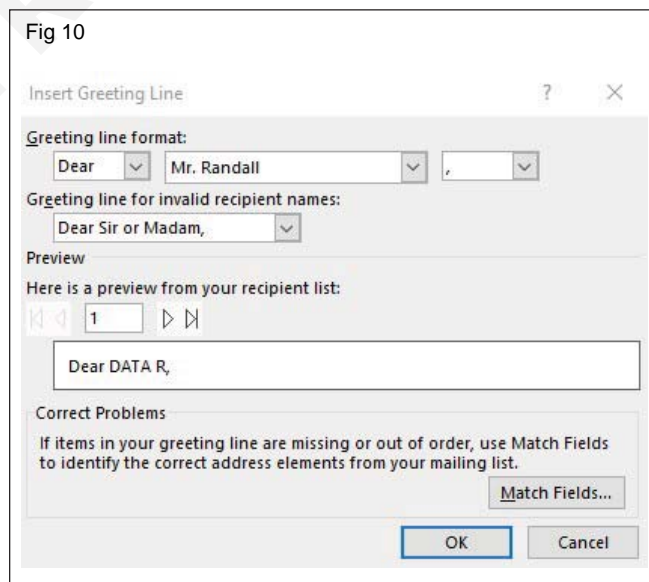


Note: To view how an address will appear in the letter, under Preview, choose Preview Results. Choose the Next or Previous record button to move through records in your data source.

- In the **Write & Insert** group, choose **Greeting Line**. (Fig 9)
- In the **Insert Greeting Line** dialog box, choose the format you want to use.
- Choose **OK** to insert the merge field in the letter.



- Choose **File>Save** to preserve the letter (example follows) you're creating for the mail merge. (Fig 10)



To insert other custom information in the letter from your mailing list, see add mail merge fields one at a time.

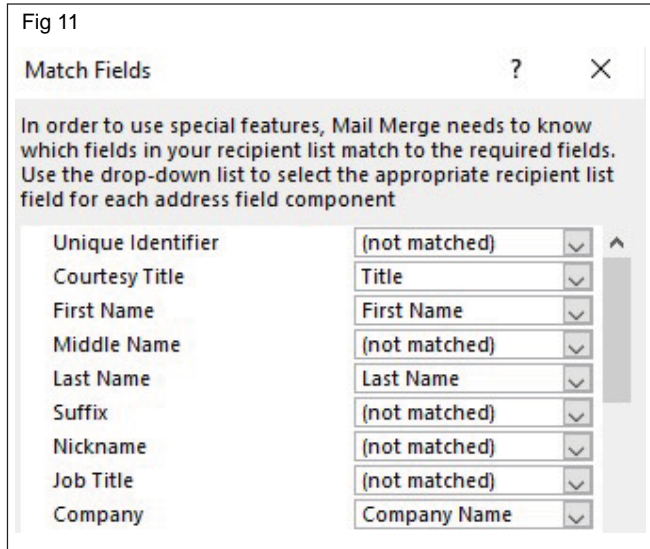
Verify merge field names

Make sure Word finds the names and addresses in your mailing list.

On the Mailings tab, in the Write & Insert Fields group, choose Match Fields.

Note : Merge Fields also can be opened from the Insert Address Block dialog box you used to add an address block to the main document.

- 1 In the Match Fields dialog box, verify that the record fields that appear in the list match the names of column headings for records in your mailing list data source. (Fig 11)



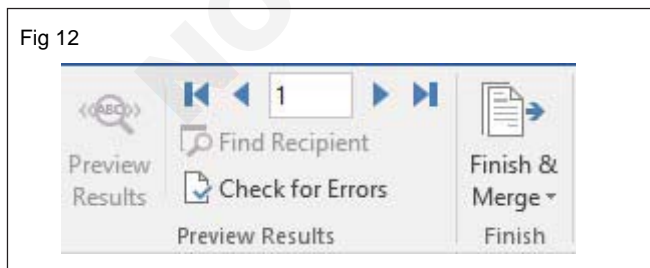
Note: There are two columns in the dialog box. The left column is a list of common names in a business record for example. The right column is the field name for the common name that is mapped to a column heading in your data source file.

- 1 Do one of the following:
 - If the field names shown match column headings you used for records in your mailing list data source, do nothing.

or

 - If **(not matched)** appears in a field name that you expected to match a column heading in your data source, choose the drop-down arrow, and then choose the field name in your mailing list data source. Repeat as necessary.

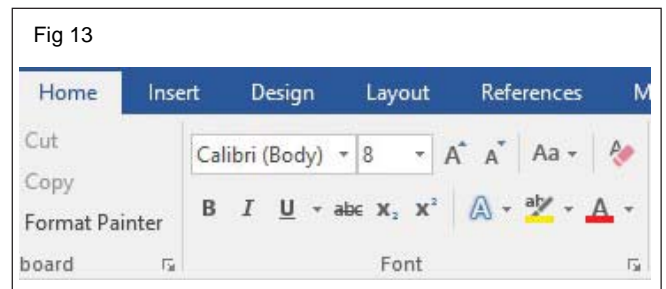
- 2 Choose **OK**.



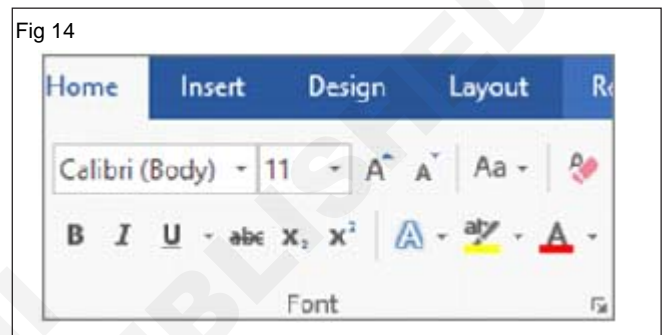
Format mail merge fields

To change the font, size, or spacing of the merged content, select the merge field name and make the changes you want.

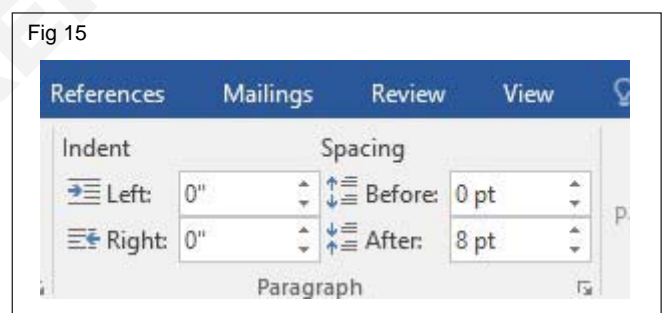
- 1 On the Mailings tab, in the Preview Results group, choose Preview Results to switch from the merged results back to the mail merge fields in your letter.
- 2 Choose the merge field name. (Fig 13)



- 3 On the **Home** tab, choose the font and the font size you want to use. (Fig 14)



- 4 On the **Page Layout** tab (Word 2013) or **Layout** tab (Word 2016), choose the paragraph spacing you want. (Fig 15)



Note: Because Word treats each line in an Address Block as a paragraph, you might want to reduce the spacing between the lines.

Step 5. Preview and print the letters

- 1 Choose **Preview Results**, and then choose the **Next** or **Previous** record button to make sure the names and addresses in the body of your letter look right.

Note : To go to the start of the list, choose the **First record button, and to go to the end of the list, choose the **Last** record button.**

- 2 Choose **Finish & Merge>Print Documents**. (Fig 16)

Step 6: Save your personalized letter

When you save the mail merge document, it stays connected to your mailing list so that you can use it for your next bulk mailing.

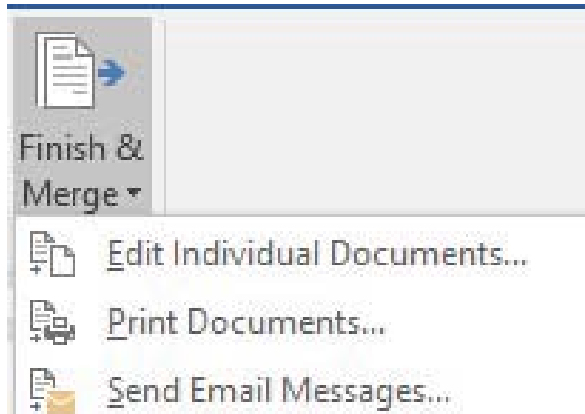
To reuse your mail merge document

- Open the mail merge document and choose Yes when Word prompts you to keep the connection.

To change addresses in mail merge document

- Open the mail merge document and choose Edit Recipient List to sort, filter, and choose specific addresses.

Fig 16



Working with Page Layout Settings and Printing Documents

Objectives: At the end of this exercise you shall be able to

- setting up a page in the document
- print the document.

Requirements

Tools/Equipments/Instruments

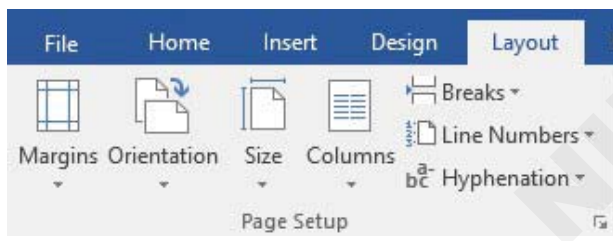
- A working PC with windows OS and MS Office 2007 - 1 No.

PROCEDURE

TASK 1: Setting up a page in the document

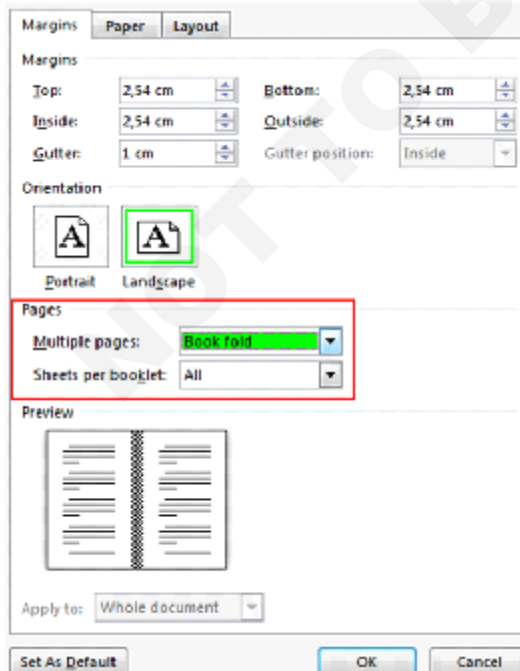
- 1 On the **PAGE LAYOUT** tab, click the icon at the bottom-right corner of the **Page Setup** group to pop out the **Page Setup** window. (Fig 1)

Fig 1



- 2 On the **Margins** tab, under **Pages**, change the setting for **Multiple pages** into **Book fold**. The orientation automatically changes to **Landscape**. (Fig 2)

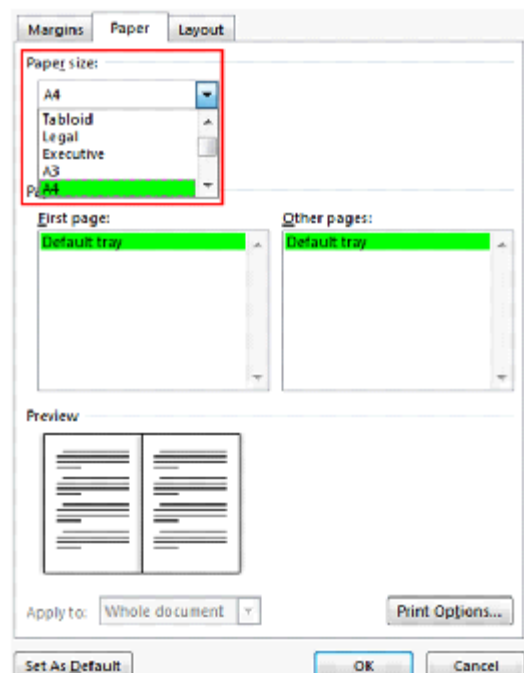
Fig 2



Note : If you have a long document, you might want to split it into multiple booklets, which you can then bind into one book. Under Sheets per booklet, choose how many pages to print per booklet.

- 3 To reserve space on the inside fold for binding, increase the width of the **Gutter**.
- 4 On the **Paper** tab, select the **Paper size**. Keep in mind that the final size of the booklet is one half of the paper size. Make sure your printer is stocked with paper of the right size.

Fig 3



Note : You can add many embellishments to your booklet's appearance. For example, to add borders to every page, on the Layout tab of the Page Setup window, click Borders.

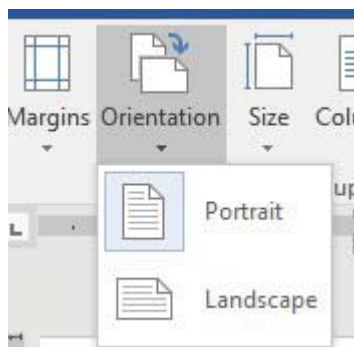
- Click **OK**. If your document already has content, the text is formatted automatically, but you might need to adjust objects like images and tables manually.

Note : An easy way to make sure that a table doesn't flow over the margins is to right-click the handle on the top-left corner of the table, and select **AutoFit>AutoFit to Contents**.

Change page orientation to landscape or portrait

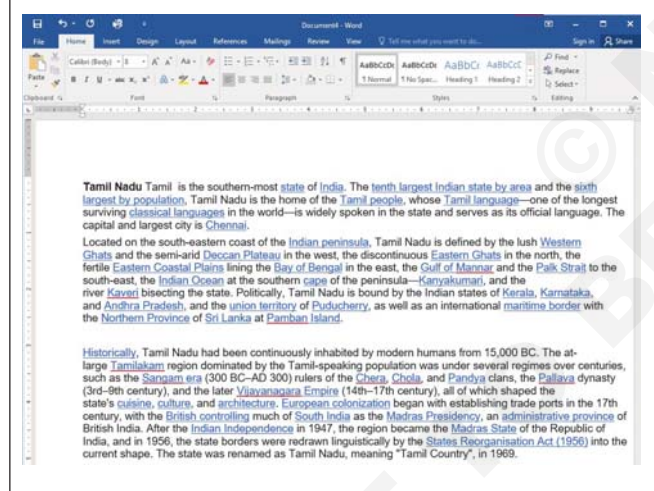
- To change the orientation of the whole document, select **Layout>Orientation**.
- Choose **Portrait** or **Landscape**. (Fig 4)

Fig 4



Change part of a document to landscape. (Fig 5)

Fig 5



- Select the content that you want on a landscape page.
- Go to **Layout**, and open the **Page Setup** dialog box.
- Select **Landscape**, and in the **Apply to** box, choose **Selected text** (Fig 6)

Click **OK**

Change or set page margins

Page margin options

- Add margins for binding** Use a gutter margin to add extra space to the side or top margin of a document that you plan to bind. A gutter margin helps ensure that text isn't obscured by the binding. (Fig 6)

- Gutter margins for binding

Fig 5



- Mirror margins for facing pages

- Set margins for facing pages** Use mirror margins to set up facing pages for double-sided documents, such as books or magazines. In this case, the margins of the left page are a mirror image of those of the right page (that is, the inside margins are the same width, and the outside margins are the same width).

Note: You can set gutter margins for a document that has mirror margins if the document needs extra space for binding.

- Add a book fold** Using the **Book fold** option in the **Page Setup** dialog box, you can create a booklet. You can use the same option to create a menu, invitation, event program, or any other type of document that uses a single center fold. (Fig 7)

Fig 6



Fig 7

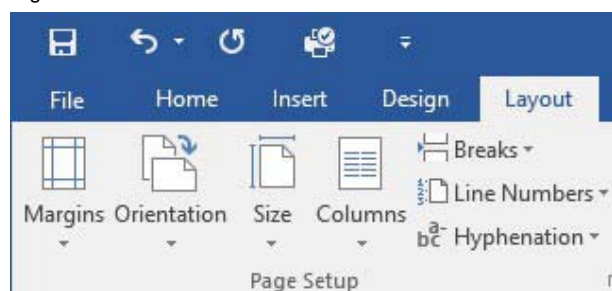


1 Word inserts a single, center book fold

Change or set page margins

- 1 On the **Page Layout** tab, in the **Page Setup** group, click **Margins**. (Fig 8)

Fig 8



- 2 Click the margin type that you want. For the most common margin width, click **Normal**.

When you click the margin type that you want, your entire document automatically changes to the margin type that you have selected.


- 3 You can also specify your own margin settings. Click **Margins**, click **Custom Margins**, and then in the **Top**, **Bottom**, **Left**, and **Right** boxes, enter new values for the margins.

NOTES

- To change the default margins, click **Margins** after you select a new margin, and then click **Custom Margins**. In the **Page Setup** dialog box, click the **Default** button, and then click **Yes**. The new default settings are saved in the template on which the document is based. Each new document based on that template automatically uses the new margin settings.
- To change the margins for part of a document, select the text, and then set the margins that you want by entering the new margins in the **Page Setup** dialog box. In the **Apply to** box, click **Selected text**. Microsoft Word automatically inserts section breaks (section break: A mark you insert to show the end of a section. A section break stores the section formatting elements, such as the margins, page orientation, headers and footers, and sequence of page numbers.) before and after the text that has the new margin settings. If your document is already

divided into sections, you can click in a section or select multiple sections and then change the margins.

View page margins

- 1 Click the **Microsoft Office Button** , and then click **Word Options**.
- 2 Click **Advanced**, and then click the **Show text boundaries** check box under **Show document content**.

The page margins appear in your document as dotted lines.

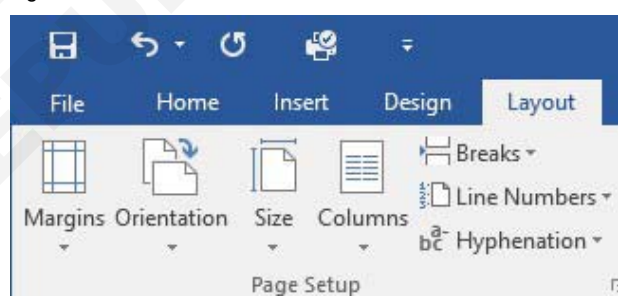
Note: You can view page margins in either **Print Layout** view or **Web Layout** view, and the text boundaries do not appear on the printed page.

Set margins for facing pages

When you choose mirror margins, the margins of the left page are a mirror image of those on the right page. That is, the inside margins are the same width, and the outside margins are the same width.

- 1 On the **Page Layout** tab, in the **Page Setup** group, click **Margins**. (Fig 9)

Fig 9



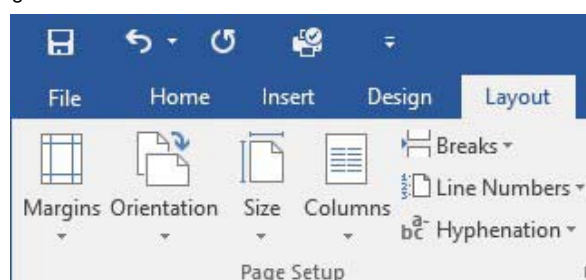
- 2 Click **Mirrored**.
- 3 To change the margin widths, click **Margins**, click **Custom Margins**, and then, in the **Inside** and **Outside** boxes, enter the widths that you want.

Set gutter margins for bound documents

A gutter margin setting adds extra space to the side margin or top margin of a document that you plan to bind. A gutter margin helps ensure that text isn't obscured by the binding.

- 1 On the **Page Layout** tab, in the **Page Setup** group, click **Margins** (Fig 10)

Fig 10



- 1 Click **Custom Margins**.
- 2 In the **Multiple pages** list, click **Normal**.
- 3 In the **Gutter** box, enter a width for the gutter margin.
- 4 In the **Gutter position** box, click **Left** or **Top**.

Note: The Gutter position box is not available when you use the Mirror margins, 2 pages per sheet, or Book fold option. For those options, the gutter position is determined automatically.

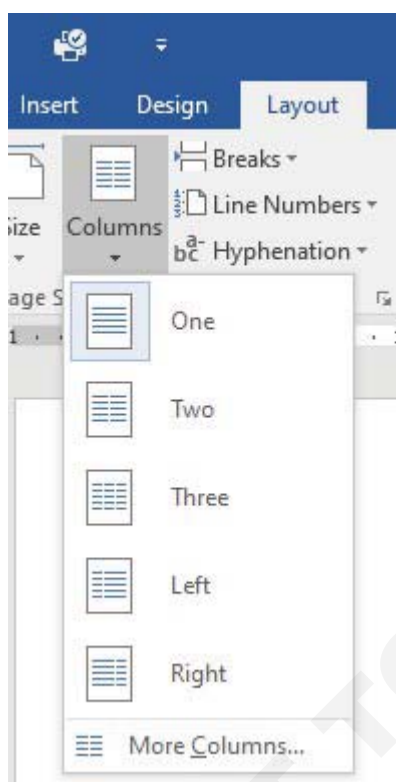
If this article didn't answer your question, you can get assistance from an OmniTech support agent. For a limited time, first-time users can get up to 15 minutes of free support.

Create newsletter-style columns

Apply columns to your document

- 1 On the **Layout** tab, click **Columns**. (Fig 11)

Fig 11



- 2 Click the column layout you want. This applies that layout to the entire document or section.

Notes: To apply columns to part of a document, or to change columns you've already applied:

- a Select the text or click in the section you want to change.
- b Click **Page Layout>Columns**.
- c Click the column layout you want.

Word automatically sets the column widths to fit your page. If the presets don't work for your layout or if you want more than three columns, choose **More Columns** and adjust the settings in the **Columns** dialog box.

Create columnized text

- 1 Select first paragraph for column setting as in Fig 12
2. Select Page Layout -> Columns -> Two to make the paragraph as two column as in Fig 13.

Fig 13

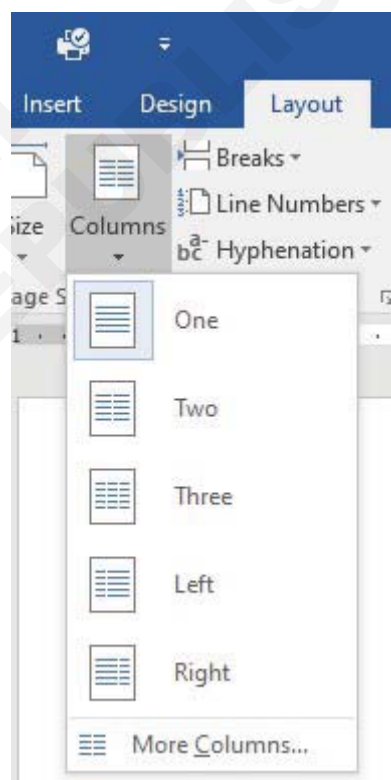


Fig 12

INDIA PHYSICAL FEATURES

Geographical Setup : India takes its standard time from the meridian of 82° 30'E, which is 5 1/2 hours ahead of Greenwich Mean time (0 longitude). Pakistan time is 5 hours ahead of GMT and Bangladesh time is 6 hours ahead of GMT.

Significance of Location : Barring the plateau of Baluchistan (which form part of Pakistan), the two great

The Text is split into two columns and displayed as in Fig 14.

- 3 Select More Columns option opens window for columns options, try with different values for columns as in Fig 15.

Fig 14

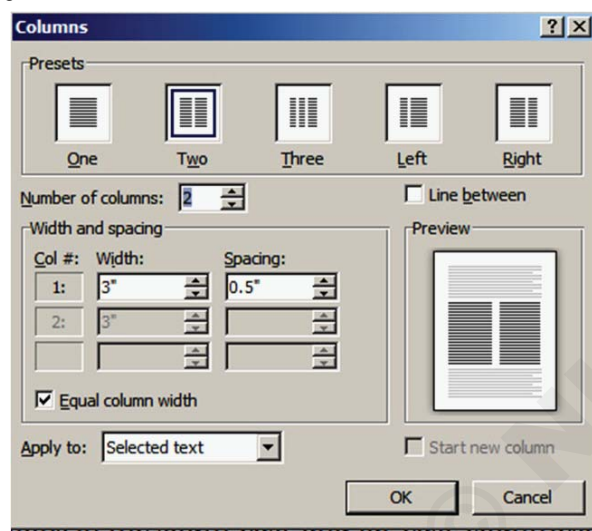
INDIA PHYSICAL FEATURES

Geographical Setup : India takes its standard time from the meridian of 82° 30'E, which is 5 1/2 hours ahead of Greenwich Mean time (0

longitude). Pakistan time is 5 hours ahead of GMT and Bangladesh time is 6 hours ahead of GMT.

Significance of Location : Barring the plateau of Baluchistan (which form part of Pakistan), the two great ranges of Sulaiman and Kirthar cut it off from the west. Along the north, the great mountain wall

Fig 15



Prevent page breaks in the middle of a paragraph

- 1 Select the paragraph that you want to prevent from breaking onto two pages.
- 2 On the **Page Layout** tab, click the **Paragraph** Dialog Box Launcher, and then click the **Line and Page Breaks** tab.
- 3 Select the **Keep lines together** check box.

Prevent page breaks between paragraphs

- 1 Select the paragraphs that you want to keep together on a single page.
- 2 On the **Page Layout** tab, click the **Paragraph** Dialog Box Launcher, and then click the **Line and Page Breaks** tab.
- 3 Select the **Keep with next** check box.

Specify a page break before a paragraph

- 1 Click the paragraph that you want to follow the page break.
- 2 On the **Page Layout** tab, click the **Paragraph** Dialog Box Launcher, and then click the **Line and Page Breaks** tab.
- 3 Select the **Page break before** check box.

Place at least two lines of a paragraph at the top or bottom of a page

- 1 Select the paragraphs in which you want to prevent widows and orphans.
- 2 On the **Page Layout** tab, click the **Paragraph** Dialog Box Launcher, and then click the **Line and Page Breaks** tab.
- 3 Select the **Widow/Orphan control** check box.

Note: This option is turned on by default.

Prevent page breaks in a table row

- 1 Click the row in the table that you don't want to break. Select the entire table if you don't want the table to break across pages.

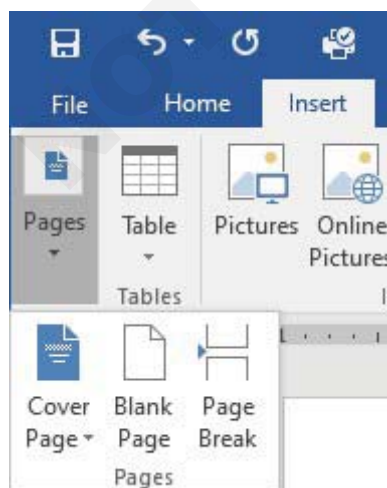
- 4 Check with instructor for more options and workings.

Insert a page break

Insert a manual page break

- 1 Click where you want to start a new page.
- 2 On the **Insert** tab, in the **Pages** group, click **Page Break**. (Fig 16)

Fig 16



Note: A table that is larger than the page must break.

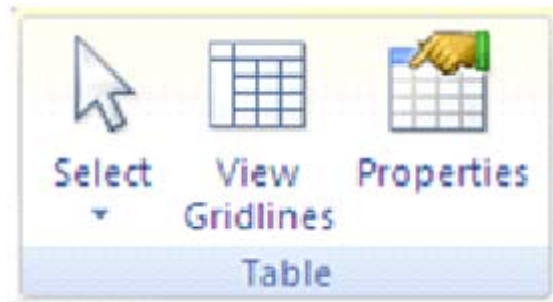
- 2 On the **Table Tools** tab, click **Layout**. (Fig 17)

Fig 17



- 3 In the **Table** group, click **Properties**. (Fig 18)
- 4 Click the **Row** tab, and the clear the **Allow row to break across pages** check box.

Fig 18

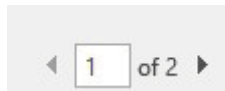


TASK 2: Print the document

Preview your document.

- 1 Click **File > Print**.
- 2 To preview each page, click the forward and backward arrows at the bottom of the page. (Fig 1)

Fig 1



If the text is too small to read, use the zoom slider at the bottom of the page to enlarge it. (Fig 2)

Fig 2



- 3 Choose the number of copies, and any other options you want, and click the **Print** button. (Fig 3)

Print specific pages

- 1 Click **File>Print**.
- 2 To print only certain pages, print some of the document's properties, or print tracked changes and comments, click the arrow under **Settings**, next to **Print All Pages** (the default), to see all of your options.
- 3 To print only certain pages, do one of the following:
 - To print the page shown in preview, select **Print Current Page**.
 - To print consecutive pages like 1 -3, select **Custom Print** and enter the first and last page numbers in the **Pages** box.
 - To print individual pages and a range of pages (like page 3, and pages 4-6) at the same time, select **Custom Print**, and enter the page numbers and ranges separated by commas (e.g. 3, 4-6).

Print settings for booklets

When you print the booklet, check the print settings to make sure you print on both sides of the paper and flip the papers correctly for the printing to work as intended.

Fig 3

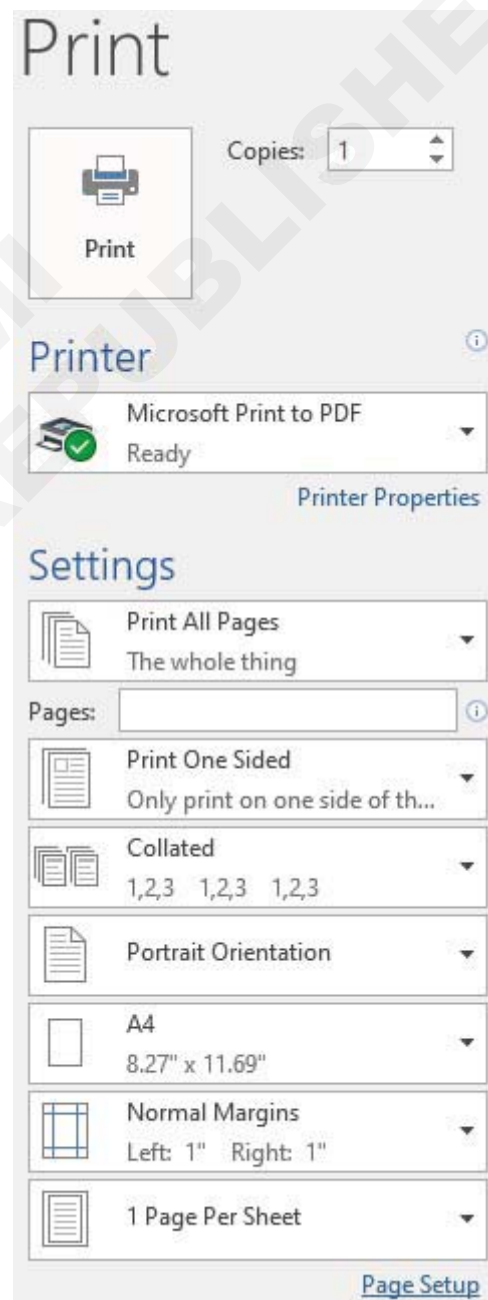
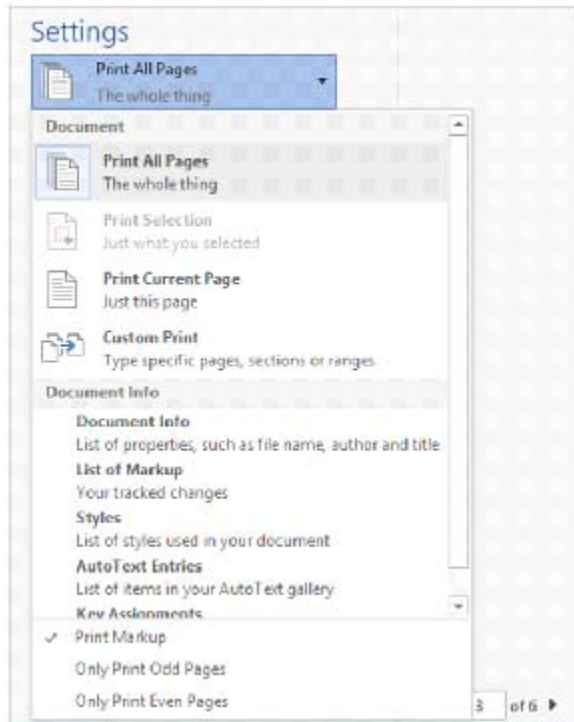


Fig 4

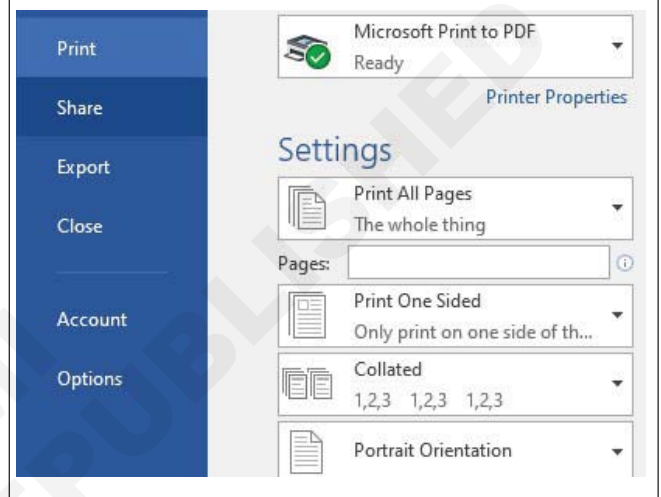


- 1 Click **FILE>Print**.
- 2 If your printer supports automatic printing on both sides, under **Settings**, change **Print One Sided** to **Print on Both Sides**. Choose the option **Flip pages on short edge** to avoid printing the second side of each sheet upside down.

If your printer doesn't support automatic printing on both sides, select **Manually Print on Both Sides**, and feed the pages back to the printer when prompted. To avoid pages from printing upside down, flip the sheets on the short edge of the paper according to your printer's instructions.

Note : For a professional touch, consider adding page numbers in the header or the footer. For example, if you want to have page numbers appearing on the outer bottom corner of each page, set up a different page number format in the footers of odd and even pages.

Fig 5



Typing Practice Using Open Source Typing Tutor Tools

Objectives: At the end of this exercise you shall be able to

- download and install open source typing tutor application
- practice typing.

Requirements

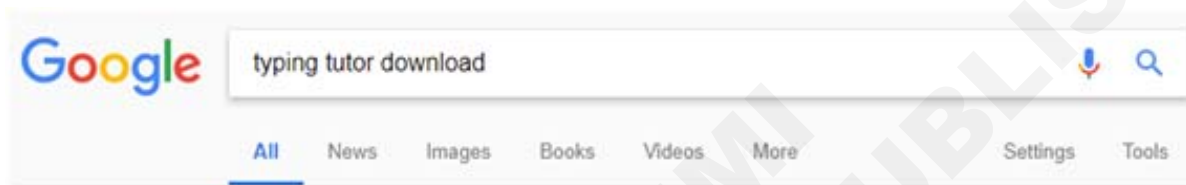
Tools/Equipments/Instruments

- A working PC with windows OS and MS Office 2007 - 1 No.

PROCEDURE

TASK : 1 Download and install open source typing tutor application

Fig 1



1 Type "Typing tutor download" in google page

2 Click "Google Search"

<https://typingmaster.en.softonic.com/redirect-download>

or

https://sourceforge.net/projects/typefaster/?source=typ_redirect

or

Use Any open source typing tutor application

Practice the proper typing format

Increase typing speed.

Improve typing accuracy.

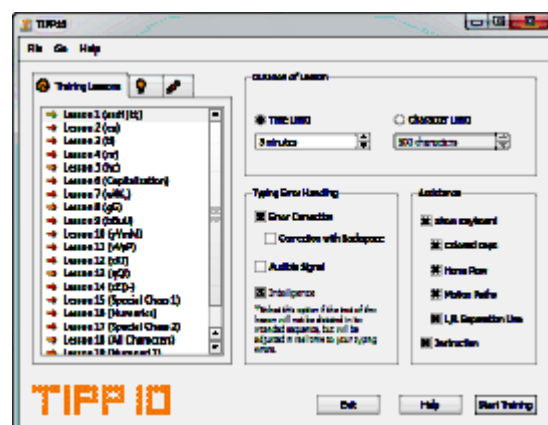
Type different formats and generate the report with the help of your instructor.

TASK 2: Practice typing

T Easy to use and for free

TIPP10 is a free 10-finger touch typing tutor. You can use TIPP10 directly in your browser or you can download the software version for Windows, Mac OS and Linux. TIPP10 is easy to use and features a clear user interface. Beginners will find their way around right away so they can start practicing without a hitch. You will be able to learn touch typing quickly and efficiently with the program's intelligent practice lessons, useful support functions and an extensive progress tracker. You can also play a typing game and expand the program with open lessons or make your own to meet your specific needs. (Fig 1)

Fig 1

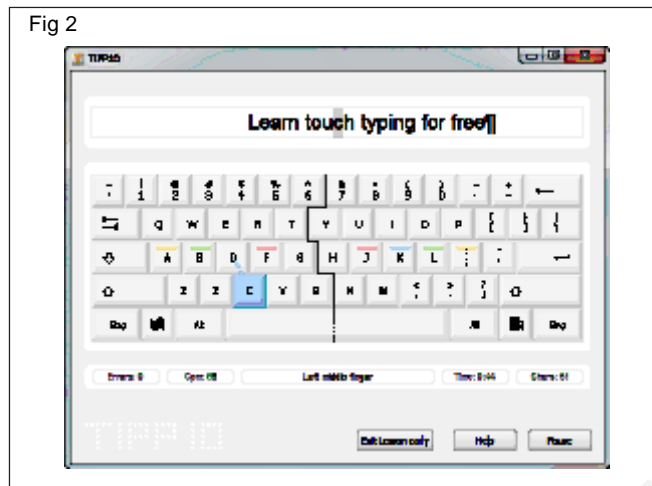


2 Intelligent text selection

The lesson texts react instantly to your typing mistakes by repeating mistyped letters more frequently. The system helps you eliminate typing mistakes and learn touch typing efficiently. A wide range of dictations ensures you'll never get bored. You will become acquainted with all the keys on the keyboard in 20 sequential practice lessons.

Commonly used characters are practiced earlier and more frequently than those that appear less frequently. (Fig 2)

Fig 2



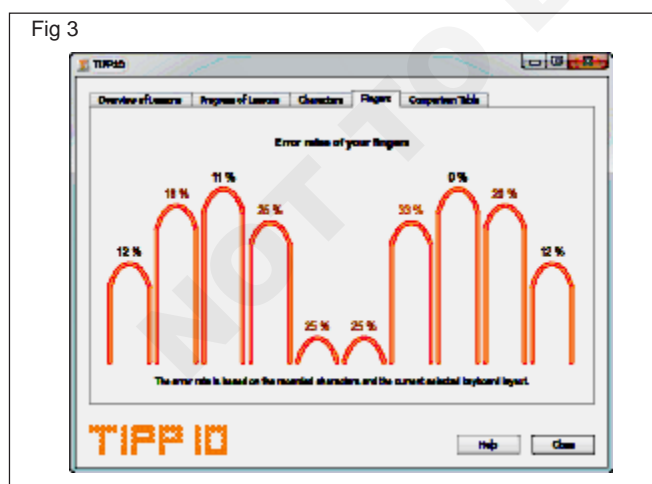
3 Ticker and virtual assistance keyboard

You can change the font, speed and color of the text in the ticker to ensure a steady typing flow. Keys and key paths appearing in color on a virtual keyboard help you to use the right fingers and keep the right starting position. A status bar displays the fingers that should be used and tallies errors and characters per minute.

Checking typing speed

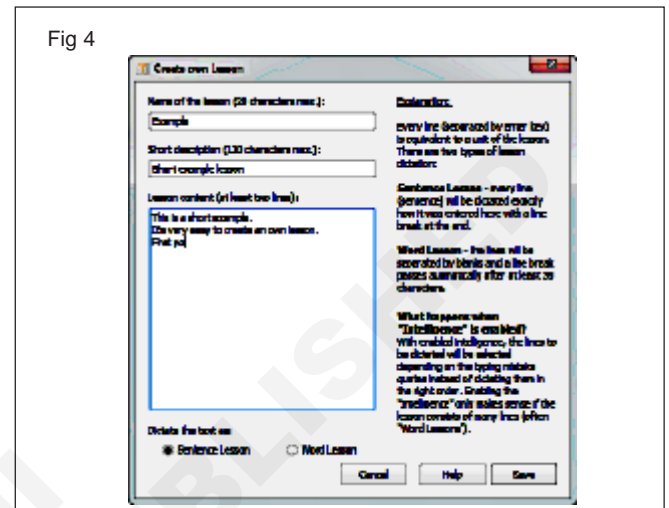
1 Detailed results (Fig 3)

Fig 3



After each typing lesson you will receive a printable comprehensive report that evaluates the lesson. A list of all completed lessons including details about duration, number of errors, characters per minute and an evaluation provide you with an overview of the work you have done. A lesson trend diagram shows your progress and allows you to easily compare your results. TIPP10 also shows you your error rate for all the characters and fingers used in the typing lessons. This way you can see right away which keys and which fingers you still need to work on.

Fig 4

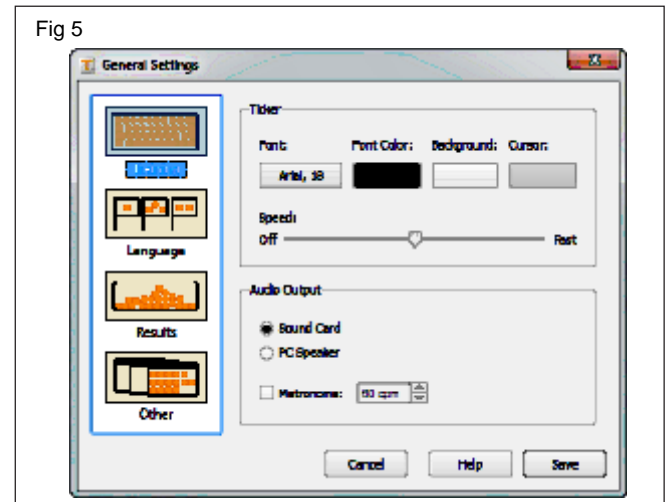


2 Open lessons and create your own texts (Fig 4)

3 Extensive customization (Fig 5)

You can choose how the lesson will run. You can set the duration of the lesson, how the typing tutor reacts to typing mistakes and which visual aids will support you during the lesson. In general settings you can also personalize the software even more. Here, for example, you can select a different speed for the ticker or a larger typeface

Fig 5



Practice of Using Shortcut

Objective: At the end of this exercise you shall be able to

- practice the shortcut keys in word document.

Common tasks in microsoft word	
CTRL+SHIFT+SPACEBAR	Create a nonbreaking space.
CTRL+SHIFT+HYPHEN	Create a nonbreaking hyphen.
CTRL+B	Make letters bold.
CTRL+I	Make letters italic.
CTRL+U	Make letters underline.
CTRL+SHIFT+<	Decrease font size one value.
CTRL+SHIFT+>	Increase font size one value.
CTRL+[Decrease font size 1 point.
CTRL+]	Increase font size 1 point.
CTRL+SPACEBAR	Remove paragraph or character formatting.
CTRL+C	Copy the selected text or object.
CTRL+X	Cut the selected text or object.
CTRL+V	Paste text or an object.
CTRL+ALT+V	Paste special
CTRL+SHIFT+V	Paste formatting only
CTRL+Z	Undo the last action.
CTRL+Y	Redo the last action.
CTRL+SHIFT+G	Open the Word Count dialog box.

Create, view, and save documents	
CTRL+N	Create a new document.
CTRL+O	Open a document.
CTRL+W	Close a document.
ALT+CTRL+S	Split the document window.
ALT+SHIFT+C or ALT+CTRL+S	Remove the document window split.
CTRL+S	Save a document.

Find, replace, and browse through text	
CTRL+F	Open the Navigation task pane (to search document).
ALT+CTRL+Y	Repeat find (after closing Find and Replace window).
CTRL+H	Replace text, specific formatting, and special items.
CTRL+G	Go to a page, bookmark, footnote, table, comment, graphic, or other location.
ALT+CTRL+Z	Switch between the last four places that you have edited.
ALT+CTRL+HOME	Open a list of browse options. Press the arrow keys to select an option, and then press ENTER to browse through a document by using the selected option.
CTRL+PAGE UP	Move to the previous browse object (set in browse options).
CTRL+PAGE DOWN	Move to the next browse object (set in browse options).

Switch to another view	
ALT+CTRL+P	Switch to Print Layout view.
ALT+CTRL+O	Switch to Outline view.
ALT+CTRL+N	Switch to Draft view.

Outline view	
ALT+SHIFT+LEFT ARROW	Promote a paragraph.
ALT+SHIFT+RIGHT ARROW	Demote a paragraph.
CTRL+SHIFT+N	Demote to body text.
ALT+SHIFT+UP ARROW	Move selected paragraphs up.
ALT+SHIFT+DOWN ARROW	Move selected paragraphs down.
ALT+SHIFT+PLUS SIGN	Expand text under a heading.
ALT+SHIFT+MINUS SIGN	Collapse text under a heading.
ALT+SHIFT+A	Expand or collapse all text or headings.
ALT+SHIFT+L	Show the first line of body text or all body text.
ALT+SHIFT+1	Show all headings with the Heading 1 style.
ALT+SHIFT+n	Show all headings up to Heading n.
CTRL+TAB	Insert a tab character.

Print and preview documents	
CTRL+P	Print a document.
ALT+CTRL+I	Switch to print preview.
Arrow keys	Move around the preview page when zoomed in.
PAGE UP or PAGE DOWN	Move by one preview page when zoomed out.
CTRL+HOME	Move to the first preview page when zoomed out.
CTRL+END	Move to the last preview page when zoomed out.

Review documents	
ALT+CTRL+M	Insert a comment.
CTRL+SHFT+E	Turn change tracking on or off.
ALT+SHFT+C	Close the Reviewing Pane if it is open.

Full screen reading view	
HOME	Go to beginning of document.
END	Go to end of document.
n, ENTER	Go to page n.
ESC	Exit reading layout view.

References, footnotes, and endnotes	
ALT+SHFT+O	Mark a table of contents entry.
ALT+SHFT+I	Mark a table of authorities entry (citation).
ALT+SHFT+X	Mark an index entry.
ALT+CTRL+F	Insert a footnote.
ALT+CTRL+D	Insert an endnote.

Move through your document	
LEFT ARROW	One character to the left
RIGHT ARROW	One character to the right
CTRL+LEFT ARROW	One word to the left
CTRL+RIGHT ARROW	One word to the right
CTRL+UP ARROW	One paragraph up
CTRL+DOWN ARROW	One paragraph down
SHFT+TAB	One cell to the left (in a table)
TAB	One cell to the right (in a table)
UP ARROW	Up one line
DOWN ARROW	Down one line
END	To the end of a line
HOME	To the beginning of a line
ALT+CTRL+PAGE UP	To the top of the window
ALT+CTRL+PAGE DOWN	To the end of the window
PAGE UP	Up one screen (scrolling)
PAGE DOWN	Down one screen (scrolling)
CTRL+PAGE DOWN	To the top of the next page
CTRL+PAGE UP	To the top of the previous page

Move through your document	
CTRL+END	To the end of a document
CTRL+HOME	To the beginning of a document
SHFT+F5	To a previous revision
SHFT+F5	After opening a document, to the location you were working in when the document was last closed

Move around in a table	
TAB	To the next cell in a row
SHFT+TAB	To the previous cell in a row
ALT+HOME	To the first cell in a row
ALT+END	To the last cell in a row
ALT+PAGE UP	To the first cell in a column
ALT+PAGE DOWN	To the last cell in a column
UP ARROW	To the previous row
DOWN ARROW	To the next row
ALT+SHFT+UP ARROW	Row up
ALT+SHFT+DOWN ARROW	Row down

Insert paragraphs and tab characters in a table	
ENTER	New paragraphs in a cell
CTRL+TAB	Tab characters in a cell

Copy formatting	
CTRL+SHFT+C	Copy formatting from text.
CTRL+SHFT+V	Apply copied formatting to text.

Change or resize the font	
CTRL+SHFT+F	Open the Font dialog box to change the font.
CTRL+SHFT+>	Increase the font size.
CTRL+SHFT+<	Decrease the font size.
CTRL+]	Increase the font size by 1 point.
CTRL+[Decrease the font size by 1 point.

Apply character formats	
CTRL+D	Open the Font dialog box to change the formatting of characters.
SHFT+F3	Change the case of letters.
CTRL+SHFT+A	Format all letters as capitals.
CTRL+B	Apply bold formatting.
CTRL+U	Apply an underline.
CTRL+SHFT+W	Underline words but not spaces.
CTRL+SHFT+D	Double-underline text.
CTRL+SHFT+H	Apply hidden text formatting.
CTRL+I	Apply italic formatting.
CTRL+SHFT+K	Format letters as small capitals.
CTRL+EQUAL SIGN	Apply subscript formatting (automatic spacing).
CTRL+SHFT+PLUS SIGN	Apply superscript formatting (automatic spacing).
CTRL+SPACEBAR	Remove manual character formatting.
CTRL+SHFT+Q	Change the selection to the Symbol font.

Set the line spacing	
CTRL+1	Single-space lines.
CTRL+2	Double-space lines.
CTRL+5	Set 1.5-line spacing.
CTRL+0 (zero)	Add or remove one line space preceding a paragraph.

Align paragraphs	
CTRL+E	Switch a paragraph between centered and left-aligned.
CTRL+J	Switch a paragraph between justified and left-aligned.
CTRL+R	Switch a paragraph between right-aligned and left-aligned.
CTRL+L	Left align a paragraph.
CTRL+M	Indent a paragraph from the left.
CTRL+SHFT+M	Remove a paragraph indent from the left.
CTRL+T	Create a hanging indent.
CTRL+SHFT+T	Reduce a hanging indent.
CTRL+Q	Remove paragraph formatting.

— — — — —

Opening MS Excel and Familiarize with Basic Application Components

Objectives: At the end of this exercise you shall be able to

- open new microsoft office excel 2010 workbook in windows 10 operating system
- observe the Excel workbook Tabs, Ribbons and its components.


Requirements

Tools / Equipments/Instruments

- PC with MS-Office - 1 No. / trainee

PROCEDURE

TASK 1 : Opening new microsoft office excel 2010 workbook in windows 10 operating system

- 1 Press windows Key  in Keyboard
- 2 Choose Microsoft office 2010 and click Microsoft office excel 2010.
- 3 Click Blank work book. The new Microsoft office excel 2010 workbook will appear on screen.

TASK 2: Observe the Excel workbook Tabs, Ribbons and its components

- 1 Open the New Excel 2010 workbook (Fig 1)
- 2 Observe and write name of the Tabs and Ribbon groups of the corresponding Tab in the below table.

Fig 1



S.No	Tab Name	Ribbon Group

Geo - Informatics Assistant - Spread Sheet Application & PowerPoint Presentation

Creating, Saving and Formatting Excel Spreadsheets

Objectives: At the end of this exercise you shall be able to

- create an excel worksheet
- enter data into the cell
- insert borders to the table
- save and exit excel.

Requirements

Tools / Equipments/Instruments

- A working PC - 1 No./batch.

PROCEDURE

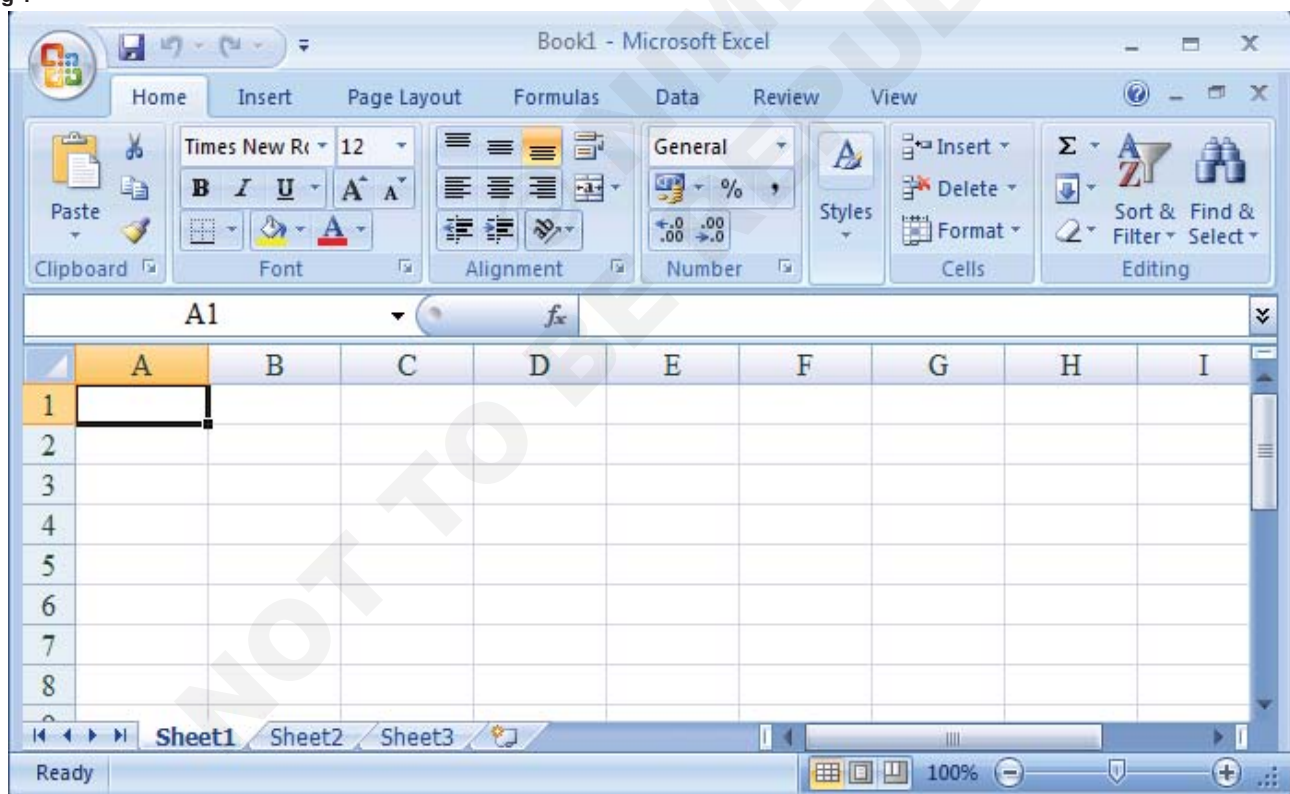
TASK 1 : Create MS-Excel Worksheet

- 1 Invoke Excel application package by following sequence

Click start button -> All Programs -> Microsoft Excel 2010

Microsoft Excel splash screen appears for a moment and a blank Excel Worksheet appears as shown in Fig 1

Fig 1

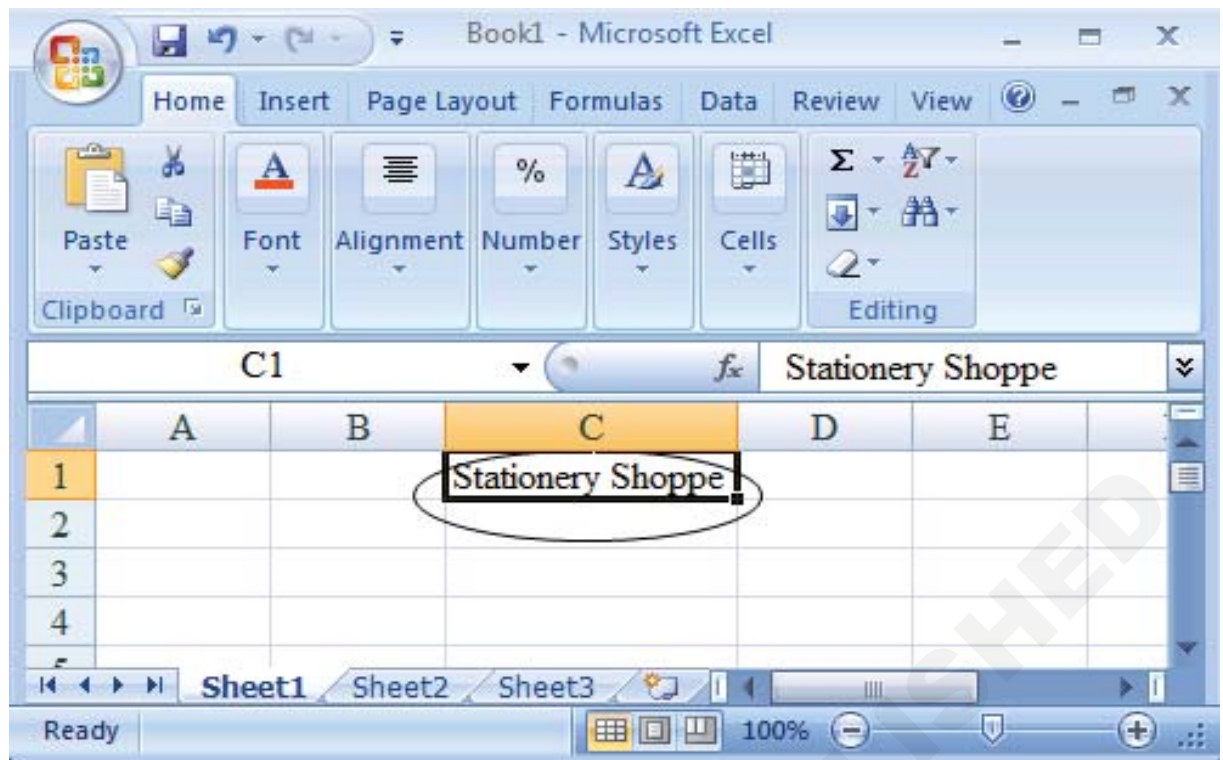


TASK 2: Enter data into the cell

- 1 Click at C1 cell and type the name of a stationery shoppe and press "Enter" key.

The existing cell address will be displayed in Name box and content will be displayed in formula bar/ reference area and in the cell. If the typed text is more than that can be accommodated in the cell it gets displayed over the next cell as shown in Fig 2.

Fig 2




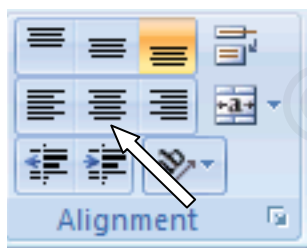
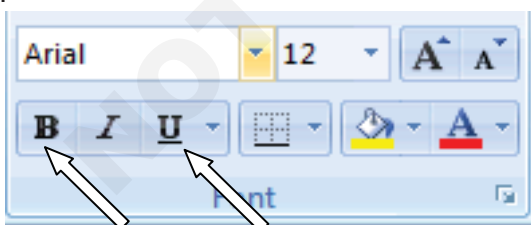
- 2 Click the  Center alignment button from alignment group as shown in Fig 3.

Fig 3



- 3 Click the  Bold and  Underline button from Font group as shown in Fig 4.

Fig 4



The underline style can be changed into single or double by clicking on the drop down arrow next to button.

- 4 Enter the following data in the cells as given below
Click on cell A4. Type "Sl.No." and press "Right Arrow" key.
Type "Item" and press "Right Arrow" key.
Type "Rate" and press "Right Arrow" key.
Type "Quantity" and press "Right Arrow" key.
Type "Amount" and press "Enter" key.

Up /Down arrow keys can be used to move to cells in vertical directions and Left/Right arrow keys can be used to move to cells in horizontal directions

Entering Data using Fill

- 5 Click on cell A5 and type 1 and press "Enter" key.
6 Click on cell A5 and move the pointer to the right bottom of the cell

A black '+' sign will appear

- 7 Click Right button of the mouse and drag till A14

A context will appear as shown in Fig 5.

- 8 Click Fill Series from this menu.
9 Click CENTER ALIGNMENT button from Alignment group.
10 Enter the following data into the cell. (Fig 6)

Fig 5

Sl.No.	Item	Rate	Quantity	Amount
1				

Copy Cells
Fill Series
Fill Formatting Only
Fill Without Formatting
Fill Days
Fill Weekdays
Fill Months
Fill Years
Linear Trend
Growth Trend
Series...

Fig 6

EXCEL.xlsx - Microsoft Excel

Home Insert Page Layout Formulas Data

Paste Clipboard Font Alignment

Times New Roman 12

B I U A A

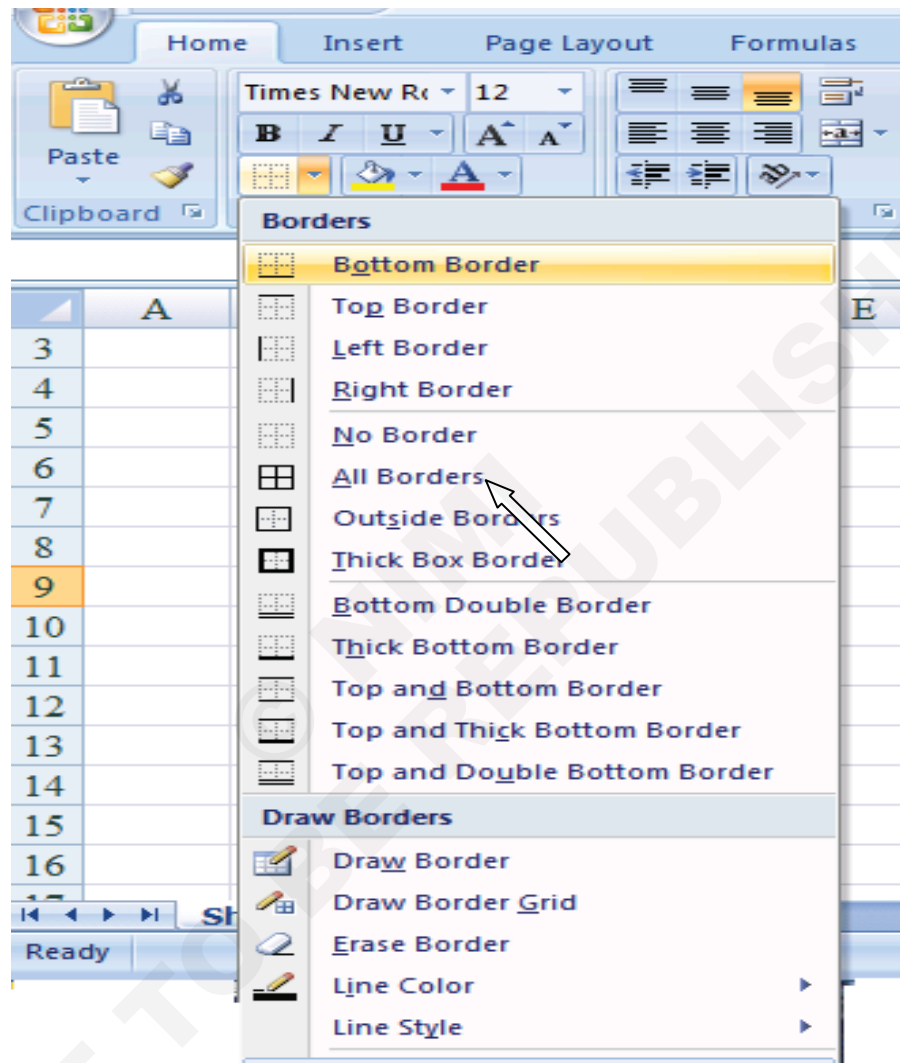
H10 fx

	A	B	C	D	E
3					
4	SI. No.	Item	Rate	Quantity	Amount
5	1	Pencil	10	5	
6	2	Eraser	5	3	
7	3	Scale	10	2	
8	4	Pen	25	4	
9	5	Sharpener	5	3	
10	6	Color Pencil	30	2	
11	7	Sketch	50	1	
12	8	Crayons	15	3	
13	9	Glue	12	4	
14	10	Ink	18	1	
15					

TASK 3: Inserting borders to the table

- 1 Click on the cell A4 and move the Mouse pointer towards to E4 without releasing the mouse button to select the cells
- 2 Click on the Border button from Font group. A Context menu appears as shown in Fig 7.
Choose All Border from this menu.
- 3 Click on the cell A5 and move the Mouse pointer towards to A12 without releasing the mouse button to select the cells
- 4 Click on the Border button from Font group and choose Outside Border.
- 5 Repeat the steps 3 and 4 by selecting the cells B5 to B12, C5 to C12, D5 to D12, E5 to E12. (Fig 7)

Fig 7




TASK 4: Save and Exit Excel

- 1 Click on the  (Office button)

A main pop-up menu will appear as shown in Fig 8.

- 2 Select Save command from the above menu Give you own name to this file. (Here for example "Stationery" is given).

On the Title bar, Microsoft Excel displays the name of the workbook as shown in Fig 9.

- 3 Select Close command from Main menu
- 4 Select  Exit Excel command from Main menu.

F Fig 8



Fig 9



Using Absolute and Relative Referencing, Linking Sheets, Conditional Formatting etc

Objectives: At the end of this exercise you shall be able to

- create relative reference between worksheets
- conditional formatting in excel 2010.

PROCEDURE

TASK 1: Create relative reference between worksheets

- 1 Open new excel work book
- 2 Type the number 1,2,3,4,5 in A1, A2,A3,A4,A5 cells
- 3 Select the cell E1
- 4 Type =A1 in E1 cell as shown in Fig 1.

Fig 1

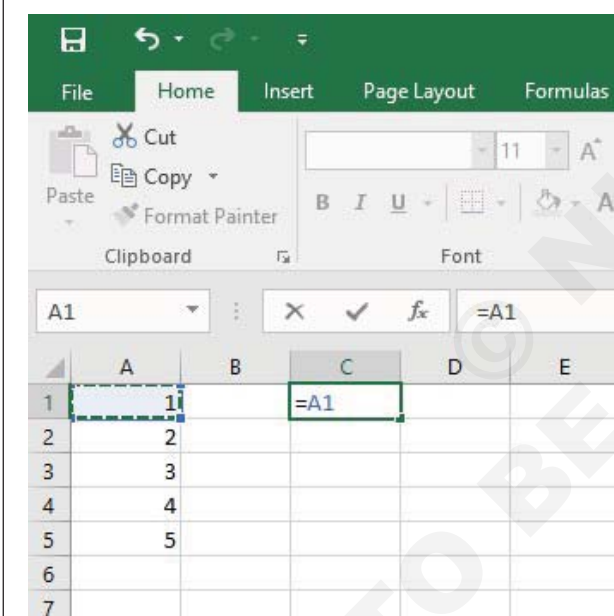
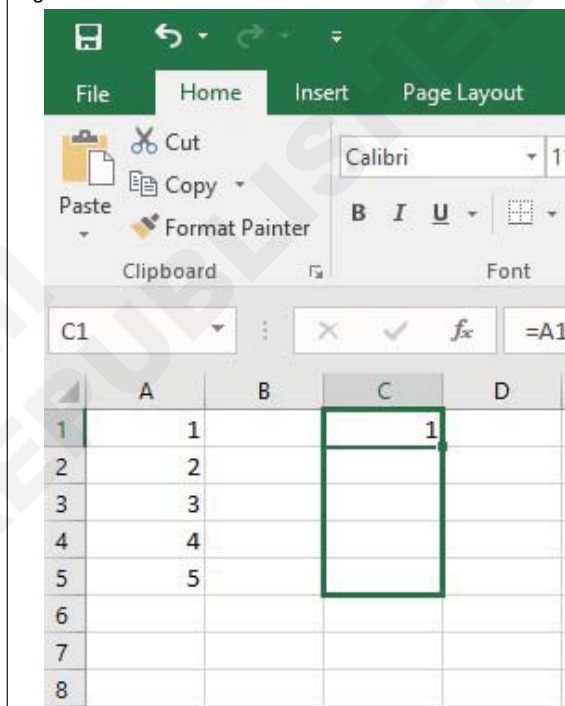


Fig 2



- 5 Drag the selection point up to E5 as shown in Fig 2.

The output window will display as shown in Fig 3

- 6 Select sheet2, type any number in A1 to A5 cells as on Fig 4
- 7 Select any cell for example D1
- 8 Type =A1+sheet1!A1 in D1 cell as shown in Fig 5 and press Enter
- 9 Drag the selection point up to D5 cell.

The output window will display as shown in Fig 6

Fig 3

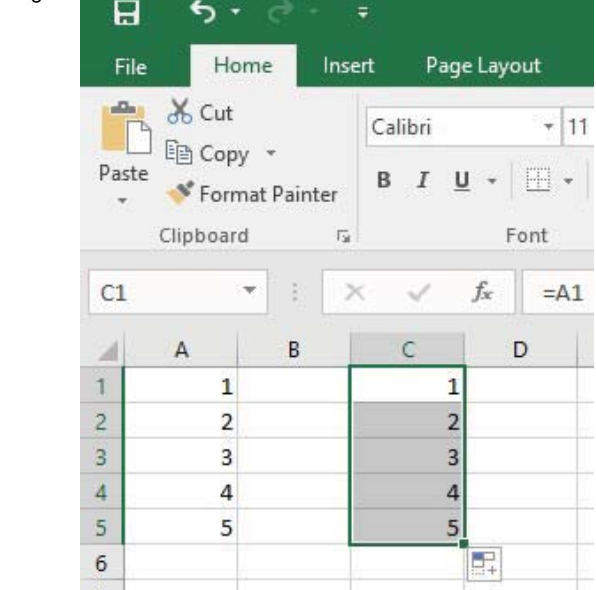


Fig 4

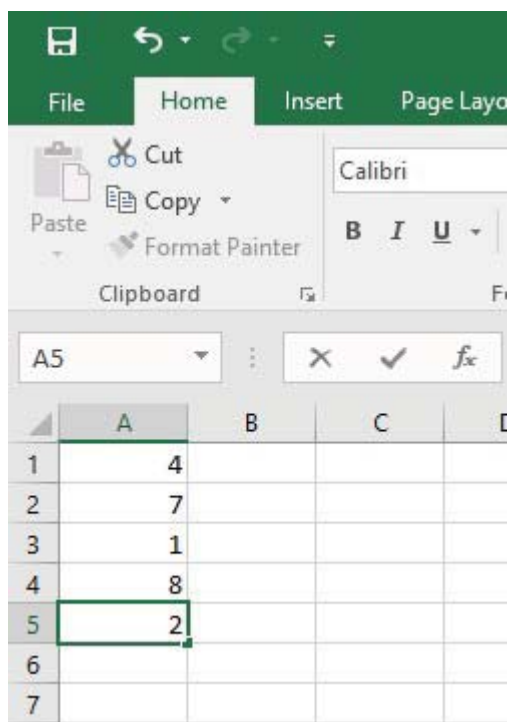


Fig 6

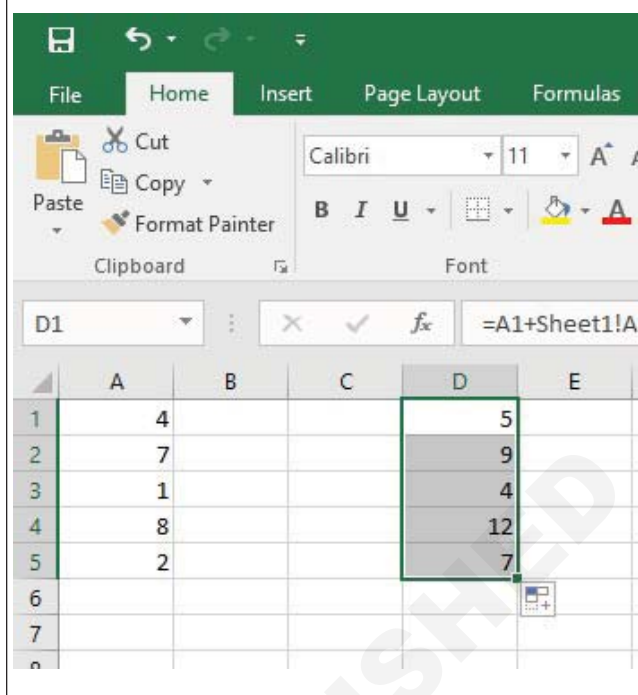
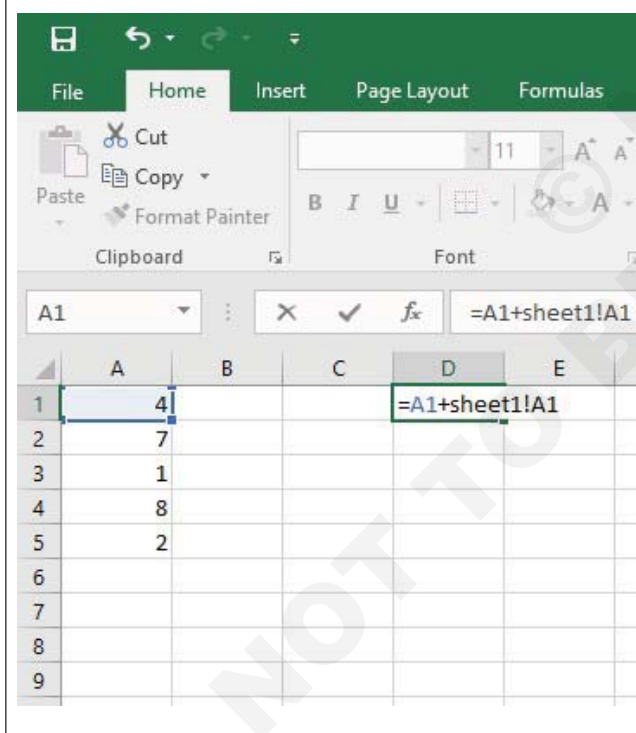


Fig 5



TASK 2: Conditional formatting in excel 2010

- 1 Create a marks sheet as shown below.(Refer table 1) (Fig 1)
- 2 Select cells in the range C3 : G12 for marks of all students in all subjects.
- 3 In the Home ribbon "Conditional Formatting".

- 4 Place the mouse on Highlight Cell Rules. A drop down menu for rules appears.
- 5 Click on "Less Than" rule and then "Less Than ".

A Less Than window appears.

Fig 1

MARK SHEET FOR CLASS X-B							
S.NO	NAME	SUBJECT 1	SUBJECT 2	SUBJECT 3	SUBJECT 4	SUBJECT 5	TOTAL
1	RAJU	52	64	87	25	34	262
2	MANO	44	65	67	91	51	318
3	KARTHIK	34	87	71	84	67	343
4	MANJU	90	67	90	85	98	430
5	LATHA	45	33	24	87	58	247
6	RAM	75	35	32	46	67	255
7	DINESH	46	87	65	58	43	299
8	SUDHA	82	74	97	49	98	400
9	MAHESH	57	63	87	56	58	321
10	TAMIL	56	87	73	25	74	315

- 6 In the "Format cells that are less than" text box type 40. (Refer Fig 2)

Fig 2

- 7 In the adjacent text box indicated as "with" use the drop down menu and select "Custom format".
- 8 The "Format cells" window appears. Select the Font style as bold and the text color as red.
- 9 Click OK.
- 10 All the cells containing values less than 40 appear with the formatting set in step 8.
- 11 Change the values in the marks sheet randomly to values above and below 40 and test the results.

Using Excel Functions of all Major Categories

Objectives: At the end of this exercise you shall be able to

- work with **Mathematical and Statistical** functions
- work with date and time Functions
- practice on **Financial** Functions
- work with Text based Functions
- logical function to arrive a decision.

PROCEDURE

TASK 1: Work with Mathematical functions and Statistical functions

Count

- 1 To count the number of cells that contain numbers, use the **COUNT** function. (Fig 1)

Fig 1

	A	B	C	D	E
1	10				
2	1				
3	7				
4	20				
5	3				
6					
7	5				
8					

Countif

- 2 To count cells based on one criteria (for example, greater than 9), use the following **COUNTIF** function. (Fig 2)

Fig 2

	A	B	C	D	E	F
1	10					
2	1					
3	7					
4	20					
5	3					
6						
7	2					

Note: visit our page about the **COUNTIF** function for many more examples.

Countifs

- 3 To count cells based on multiple criteria (for example, green and greater than 9), use the following **COUNTIFS** function. (Fig 3)

Fig 3

	A	B	C	D	E	F	G	H
1	RED	10						
2	GREEN	1						
3	RED	7						
4	GREEN	20						
5	RED	3						
6								
7		1						

Sum

- 4 To sum a range of cells, use the **SUM** function. (Fig 4)

Fig 4

	A	B	C	D	E
1	10				
2	1				
3	7				
4	20				
5	3				
6					
7	41				

Sumif

- 5 To sum cells based on one criteria (for example, greater than 9), use the following **SUMIF** function (two arguments) (Fig 5).

To sum cells based on one criteria (for example, green), use the following **SUMIF** function (three arguments, last argument is the range to sum). (Fig 6)

Fig 5

	A	B	C	D	E	F
1		10				
2		1				
3		7				
4		20				
5		3				
6						
7		30				
8						

Fig 6

	A	B	C	D	E	F	G
1	RED	10					
2	GREEN	1					
3	RED	7					
4	GREEN	20					
5	RED	3					
6							
7		21					
8							

Sumifs

To sum cells based on multiple criteria (for example, circle and red), use the following **SUMIFS** function (first argument is the range to sum). (Fig 7)

General note: in a similar way, you can use the **AVERAGEIF** and **AVERAGEIFS** function to average cells based on one or multiple criteria.

Fig 7

	A	B	C	D	E	F	G	H
1	CIRCLE	RED	10					
2	TRIANGLE	GREEN	1					
3	CIRCLE	RED	7					
4	CIRCLE	GREEN	20					
5	TRIANGLE	RED	3					
6								
7			17					

Statistical functions

Average

- 6 To calculate the average of a range of cells, use the **AVERAGE** function. (Fig 8)

Averageif

- 7 To average cells based on one criteria, use the **AVERAGEIF** function. For example, to calculate the average excluding zeros. (Fig 9)

Fig 8

	A	B	C	D	E	F	G
1	0	7	8	6	5	7	8
2							
3			5.857143				
4							

Fig 9

	A	B	C	D	E	F	G
1	0	7	8	6	5	7	
2							
3			5				
4							

Median

Note: <> means not equal to. The **AVERAGEIF** function is similar to the **SUMIF** function.

- 8 To find the median (or middle number), use the **MEDIAN** function. (Fig 10)

Fig 10

	A	B	C	D	E
1	4	7	8	6	5
2					
3			6		

Mode

- 9 To find the most frequently occurring number, use the **MODE** function. (Fig 11)

Fig 11

	A	B	C	D	E
1	4	7	4	6	4
2					
3			4		
4					

Standard Deviation

- 10 To calculate the standard deviation, use the **STDEV** function. (Fig 12)

Min

- 11 To find the minimum value, use the **MIN** function. (Fig 13)

Fig 12

C3 : X ✓ fx =STDEV(A1:E1)					
	A	B	C	D	E
1	4	7	4	6	4
2					
3			1.414214		

Fig 13

C3 : X ✓ fx =MIN(A1:E1)					
	A	B	C	D	E
1	4	7	4	6	4
2					
3			4		

Max

12 To find the maximum value, use the MAX function. (Fig 14)

Large

13 To find the third largest number, use the following LARGE function.(Fig 15)

Small

14 To find the second smallest number, use the following SMALL function. (Fig 16)

Fig 14

C3 : X ✓ fx =MAX(A1:E1)					
	A	B	C	D	E
1	4	7	4	6	4
2					
3			7		
4					

Fig 15

C3 : X ✓ fx =LARGE(A1:E1,2)					
	A	B	C	D	E
1	4	7	4	6	4
2					
3			6		
4					

Fig 16

C3 : X ✓ fx =LARGE(A1:E1,2)					
	A	B	C	D	E
1	4	7	4	6	4
2					
3			6		
4					

TASK 2: Practice on Date/Time Functions

1 Enter a date in Excel, use the "/" or "-" characters. To enter a time, use the ":" (colon). You can also enter a date and a time in one cell. (Fig 17)

Fig 17

C3 : X ✓ fx =SMALL(A1:E1,5)					
	A	B	C	D	E
1	4	7	4	6	4
2					
3			7		

Note: Dates are in US Format. Months first, Days second. This type of format depends on your windows regional settings. Learn more about Date and Time formats.

Year, Month, Day

2 Get the year of a date, use the YEAR function. (Fig 18)

Note: use the MONTH and DAY function to get the month and day of a date.

Fig 18

A1 : X ✓ fx 20-05-2022					
	A	B	C	D	E
1	5-20-2022				
2					

Date Function

3 Add a number of days to a date, use the following simple formula. (Fig 19)

Fig 19

B3 : X ✓ fx =YEAR(A1)					
	A	B	C	D	E
1	5-20-2022				
2					
3		2022			
4					

- 4 Add a number of years, months and/or days, use the DATE function. (Fig 20)

Fig 20

B2					=A1+5				
	A	B	C	D					
1	5-20-2022								
2		5-25-2022							
3									

Note: the DATE function accepts three arguments: year, month and day. Excel knows that 6 + 2 = 8 = August has 31 days and rolls over to the next month (23 August + 9 days = 1 September).

Current Date & Time

- 5 Get the current date and time, use the NOW function. (Fig 21)

Note: use the TODAY function to get the current date only. Use NOW()-TODAY() to get the current time only (and apply a Time format).

Hour, Minute, Second

- 6 Return the hour, use the HOUR function. (Fig 22)

Time Function

- 7 Add a number of hours, minutes and/or seconds, use the TIME function. (Fig 23)

Fig 21

B2										=DATE(YEAR(A1)+5,MONTH(A1)+2,DAY(A1))									
	A	B	C	D	E	F	G												
1	5-20-2022																		
2		7-20-2027																	
3																			

Fig 22

B3						=NOW()					
	A	B	C	D	E						
1											
2											
3		27-02-23 14:43									
4											
5											

Fig 23

B1											=TIME(HOUR(A1)+2,MINUTE(A1)+10,SECOND(A1)+70)										
	A	B	C	D	E	F	G	H	I												
1	6:45:17	8:56:27																			
2																					

Note: Excel adds 2 hours, 10 + 1 = 11 minutes and 70 - 60 = 10 seconds.

TASK 3: Practicing Financial Functions

Pmt

- 1 Select cell A2 and insert the PMT function. (Fig 24)

Fig 24

B1											=TIME(HOUR(A1)+2,MINUTE(A1)+30,SECOND(A1))										
	A	B	C	D	E	F	G	H	I												
1	15:00	5:30 PM																			
2																					

Note: The last two arguments are optional. For loans the Fv can be omitted (the future value of a loan equals 0, however, it's included here for clarification). If Type is omitted, it is assumed that payments are due at the end of the period.

Result. The monthly payment equals \$704.12 (Fig 25)

Tip: when working with financial functions in Excel, always ask yourself the question, am I making a payment (negative) or am I receiving money (positive)? We pay off a loan of \$150,000 (positive, we received that amount) and we make monthly payments of \$704.12 (negative, we pay).

Fig 25

B5						=PMT(B4/12,B3,-B2)					
	A	B	C	D	E						
1	Automobile	Amount									
2	Loan Amt	38,000									
3	Months	60									
4	Int Rate	4.25%									
5		\$704.12									

Rate

- 2 If Rate is the only unknown variable, we can use the RATE function to calculate the interest rate. (Fig 26)

Nper

- 3 Or the NPER function. If we make monthly payments of \$1,074.65 on a 20-year loan, with an annual interest rate of 6%, it takes 240 months to pay off this loan. (Fig 27)
- 4 We can change the monthly payment now to see how this affects the total number of periods. (Fig 28)

Fig 26

B5 : X ✓ f _x =PMT(B4/12,B3,-B2)					
	A	B	C	D	E
1	Automobile	Amount			
2	Loan Amt	38,000			
3	Months	60			
4	Int Rate	4.25%			
5		\$704.12			

Fig 27

B4 : X ✓ f _x 4.25%					
	A	B	C	D	E
1	Automobile	Amount			
2	Loan Amt	38,000			
3	Months	60			
4	Int Rate	4.25%			
5		\$704.12			

Fig 28

B3 : X ✓ f _x 60					
	A	B	C	D	E
1	Automobile	Amount			
2	Loan Amt	38,000			
3	Months	60			
4	Int Rate	4.25%			
5		\$704.12			

Conclusion: if we make monthly payments of \$ 830.65, it takes less than 50 months to pay off this loan.

PV

- 5 Or the PV (Present Value) function. If we make monthly payments of \$1,074.65 on a 20-year loan, with an annual interest rate of 6%. (Fig 29)

Fig 29

B3 : X ✓ f _x 50					
	A	B	C	D	E
1	Automobile	Amount			
2	Loan Amt	38,000			
3	Months	50			
4	Int Rate	4.25%			
5		\$830.62			

Fv

- 6 And the FV (Future Value) function. If we make monthly payments of \$1,074.65 on a 20-year loan, With an annual interest rate of 6%, do we pay off this loan? Yes. (Fig 30)

Fig 30

B5 : X ✓ f _x =PV(B3/12,12*B4,B2,0)					
	A	B	C	D	E
1	Automobile	Amount			
2	Loan Amt	38,000			
3	Months	60			
4	Int Rate	4.25%			
5	PV	(\$4,552.41)			

But, if make monthly payments of only \$1,000.00, we still have debt after 20 years. (Fig 31)

Fig 31

B7 : X ✓ f _x 0					
	A	B	C	D	E
1	Automobile	Amount			
2	Loan Amt	38,000			
3	Months	50			
4	Int Rate	4.25%			
5	PMT	\$830.62			
6	PV	(\$5,173.09)			
7	FV	\$0.00			

TASK 4: Work with Text based functions

Join Strings

- 1 Join strings, use the & operator. (Fig 32)

Note: to insert a space, use " "

Left

- 2 Extract the leftmost characters from a string, use the LEFT function. (Fig 33)

Right

- 3 Extract the rightmost characters from a string, use the RIGHT function. (Fig 34)

Fig 32

B7		✕		✓		fx		=FV(B4,B3/12,B6)	
	A	B	C	D	E				
1	Automobile	Amount							
2	Loan Amt	38,000							
3	Months	60							
4	Int Rate	4.25%							
5	PMT	\$704.12							
6	PV	(\$4,552.41)							
7	FV	\$24,780.82							

Fig 33

D2 X ✓ fx =A2&" "&B2				
	A	B	C	D
1				
2	Hi	Tim		Hi Tim
3				

Fig 34

D2 X ✓ fx =LEFT(A2,4)				
	A	B	C	D
1				
2	Example text			Exam

Mid

- 4 Extract a substring, starting in the middle of a string, use the MID function. (Fig 35)

Fig 35

D2 X ✓ fx =RIGHT(A2,2)				
	A	B	C	D
1				
2	Example text			xt
3				

Note: started at position 5 (p) with length 3.

Len

- 5 Get the length of a string, use the LEN function. (Fig 36)

Fig 36

D2 X ✓ fx =MID(A2,5,3)				
	A	B	C	D
1				
2	Example text			ple
3				

Note: space (position 8) included!

Fig 37

D2 X ✓ fx =LEN(A2)				
	A	B	C	D
1				
2	Example text			12

Find

- 6 Find the position of a substring in a string, use the FIND function. (Fig 37)

Note: string "am" found at position 3.

Substitute

- 7 Replace existing text with new text in a string, use the SUBSTITUTE function. (Fig 38)

Fig 38

D2 X ✓ fx =FIND("am",A2)				
	A	B	C	D
1				
2	Example text			3

Separate Strings

- 8 This example explains how to separate strings in Excel. (Fig 39)

Fig 39

D2 X ✓ fx =SUBSTITUTE(A2,"Tim","Jhon")						
	A	B	C	D	E	F
1						
2	Hi Tim			Hi Jhon		

The problem we are dealing with is that we need to tell Excel where we want to separate the string. In case of Smith, Mike the comma is at position 6 while in case of Williams, Janet the comma is at position 9.

- 9 Get the first name, use the formula below. (Fig 40)

Fig 40

B2					
	A	B	C		
1	FULL NAME	FIRST NAME	LAST NAME		
2	Smith, Mike				
3	Johnson, Matthew				
4	Williams, Janet				
5	Broen, Sandra				
6	Jones, Lisa				
7	Miller, Peter				

Explanation: to find the position of the comma, use the FIND function (position 6). To get the length of a string, use the LEN function (11 characters). =RIGHT(A2,LEN(A2)-FIND(", ",A2)-1) reduces to =RIGHT(A2,11-6-1). =RIGHT(A2,4) extracts the 4 rightmost characters and gives the desired result (Mike).

10 Get the last name, use the following formula. (Fig 41)

Fig 41

B2					
=RIGHT(A2,LEN(A2)-FIND(", ",A2)-1)					
A	B	C	D	E	F
1	FULL NAME	FIRST NAME	LAST NAME		
2	Smith,Mike	Mike			
3	Johnson,Matthew				
4	Williams,Janet				
5	Broen,Sandra				
6	Jones,Lisa				
7	Miller,Peter				

Explanation: to find the position of the comma, use the FIND function (position 6). =LEFT(A2,FIND(", ",A2)-1) reduces to =LEFT(A2,6-1). =LEFT(A2,5) extracts the 5 leftmost characters and gives the desired result (Smith).

11 Select the range B2:C2 and drag it down. (Fig 42)

Fig 42

C2					
=LEFT(A2,FIND(", ",A2)-1)					
A	B	C	D	E	
1	FULL NAME	FIRST NAME	LAST NAME		
2	Smith,Mike	Mike	Smith		
3	Johnson,Matthew				
4	Williams,Janet				
5	Broen,Sandra				
6	Jones,Lisa				
7	Miller,Peter				

Number of Words

This example describes how to count the number of words in a cell.

12 Use the LEN function to get the length of the string (25 characters, including spaces). (Fig 43)

Fig 43

B2					
=RIGHT(A2,LEN(A2)-FIND(", ",A2)-1)					
A	B	C	D	E	
1	FULL NAME	FIRST NAME	LAST NAME		
2	Smith,Mike	Mike	Smith		
3	Johnson,Matthew	Matthew	Johnson		
4	Williams,Janet	Janet	Williams		
5	Broen,Sandra	Sandra	Broen		
6	Jones,Lisa	Lisa	Jones		
7	Miller,Peter	Peter	Miller		

13 The SUBSTITUTE function replaces existing text with new text in a string. =LEN (SUBSTITUTE(A1,B1,"")) equals 13 (the length of the string without the words dog). If we subtract this number from 25, we get the length of the dog instances (25-13=12). (Fig 44)

Dividing this number by the length of the word dog (3), gives us the dog instances (12/3=4)

Fig 44

C1					
=LEN(A1)					
A	B	C	D		
1	dog ,cat ,dog dog cat dog	25			

Number of Words

This example describes how to count the number of words in a cell.

14 The TRIM function returns a string with extra spaces, starting spaces and ending spaces removed. (Fig 45)

Fig 45

C1					
=LEN(SUBSTITUTE(A1,B1,""))					
A	B	C	D	E	
1	dog , cat ,dog dog cat dog dog	13			
2					

15 Get the length of the string with normal spaces, we combine the LEN and TRIM function. (Fig 46)

Fig 46

C1					
=LEN(TRIM(SUBSTITUTE(A1,B1,"")))					
A	B	C	D	E	F
1	dog , cat ,dog dog cat dog dog	11			

16 The SUBSTITUTE function replaces existing text with new text in a text string. We use the SUBSTITUTE function to get the string without spaces. (Fig 47)

Fig 47

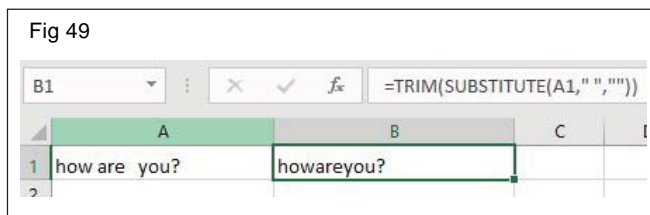
B1					
=TRIM(A1)					
A	B	C			
1	how are you?	how are you?			

17 Get the length of the string without spaces, we combine the LEN and SUBSTITUTE function. (Fig 48)

Fig 48

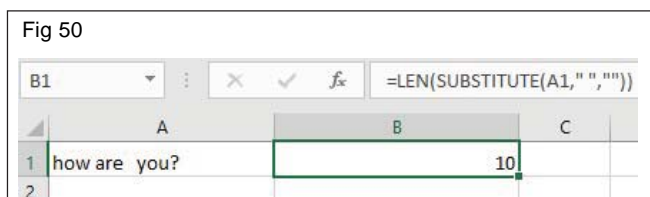
B1					
=LEN(TRIM(A1))					
A	B	C			
1	how are you?	12			

18 Now comes the simple trick. To get the number of words, we subtract the length of the string without spaces (10) from the length of the string with normal spaces (12) and add 1. (Fig 49)

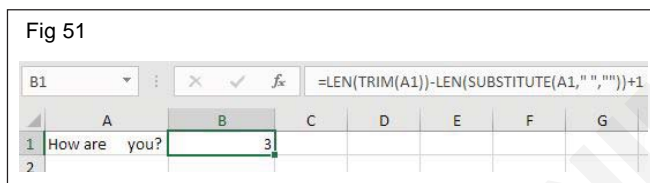


Lower/Upper Case

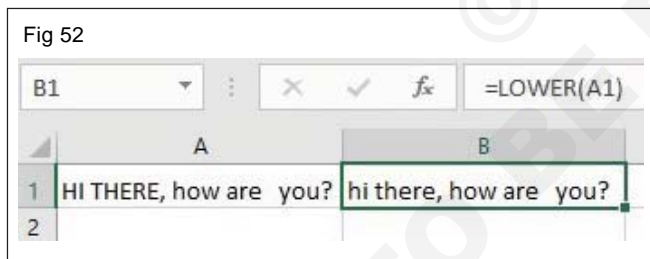
19 This example teaches you how to convert a text string to lower, upper or proper case in Excel. (Fig 50)



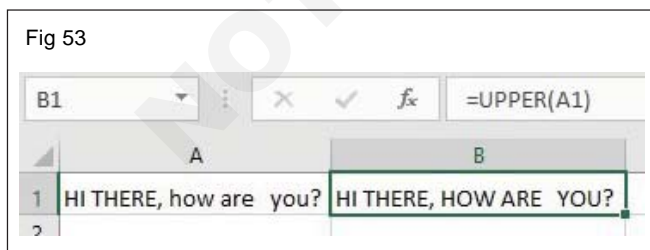
20 Use the LOWER function to convert all letters in a text string to lowercase. (Fig 51)



21 Use the UPPER function to convert all letters in a text string to uppercase. (Fig 52)



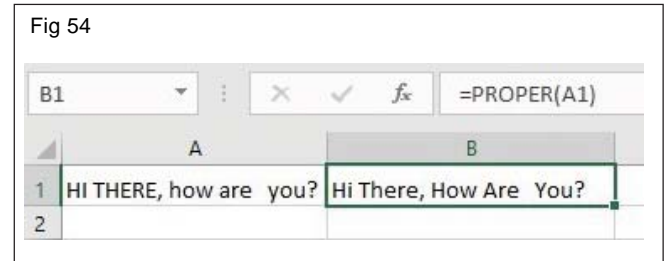
22 Use the PROPER function to convert a text string to proper case. That is, the first letter in each word in uppercase, and all other letters in lowercase. (Fig 53)



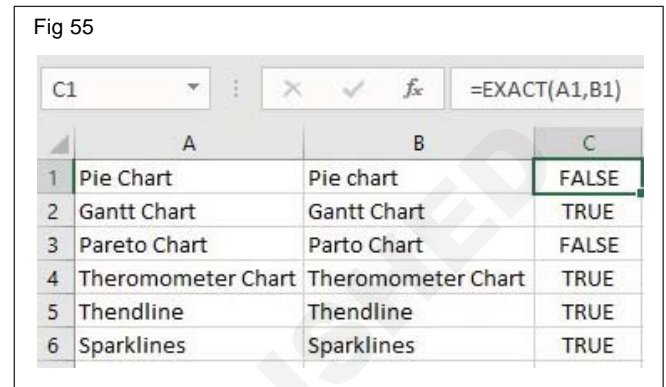
Compare Text

This example shows two ways to compare text in Excel. One is case-sensitive and one is case-insensitive.

23 Use the EXACT function (case-sensitive) (Fig 54)



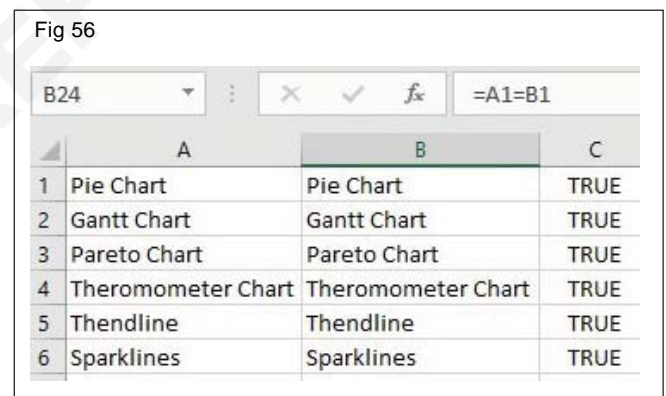
24 Use the formula =A1=B1 (case-insensitive). (Fig 55)



Concatenate Strings

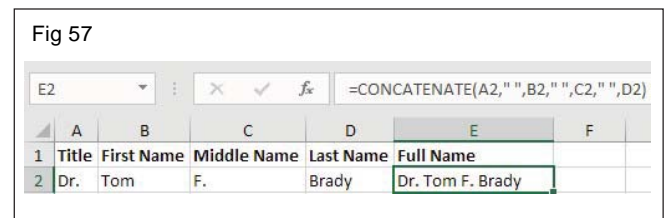
This example illustrates four different ways to concatenate (join) strings in Excel.

25 Simply use the & operator to join strings. (Fig 56)



Note: to insert a space, use " "

26 The CONCATENATE function produces the exact same result. (Fig 57)



27 The CONCAT function in Excel 2016 produces the exact same result. (Fig 58)

28 The CONCAT function can also join a range of strings. If user don't need a delimiter (space, comma, dash, etc.) this can be useful. (Fig 59)

Fig 58

E2					
=CONCATENATE(A2," ",B2," ",C2," ",D2)					
A	B	C	D	E	F
1	Title	First Name	Middle Name	Last Name	Full Name
2	Dr.	Tom	F.	Brady	Dr. Tom F. Brady

Fig 59

F1					
=CONCAT(A1:E1)					
A	B	C	D	E	F
1	+	1	415	648	5703
2					+14156485703

29 The CONCAT function cannot ignore empty cells. Take a look at all the extra spaces in column E below if drag the function in cell E2 down to cell E11. (Fig 60)

30 The TEXTJOIN function in Excel 2016 is that it can ignore empty cells (if the second argument is set to TRUE). (Fig 61)

Note: the TEXTJOIN function joins a range of strings using a delimiter (first argument)

31 Get it check with your instructor.

Fig 60

E2							
=CONCATENATE(A2," ",B2," ",C2," ",D2)							
A	B	C	D	E	F	G	H
1	Title	First Name	Middle Name	Last Name	Full Name		
2	Dr.	Tom	F.	Brady	Dr. Tom F. Brady		
3		Peyton		Manning	Peyton Manning		
4		Adrian	D.	Peterson	Adrian D. Peterson		
5	Mr.	Ray		Lewis	Mr. Ray Lewis		
6		Ed		Reed	Ed Reed		
7		Troy	E.	Polamalu	Troy E. Polamalu		
8		Andre		Johnson	Andre Johnson		
9		Darrelle		Revis	Darrelle Revis		
10	Dr.	Drew	Q.	Brees	Dr. Drew Q. Brees		
11		Julius		Peppers	Julius Peppers		
12							

Fig 61

E2					
=TEXTJOIN(" ",TRUE,A2:D2)					
A	B	C	D	E	F
1	Title	First Name	Middle Name	Last Name	Full Name
2	Dr.	Tom	F.	Brady	Dr. Tom F. Brady
3		Peyton		Manning	Peyton Manning
4		Adrian	D.	Peterson	Adrian D. Peterson
5	Mr.	Ray		Lewis	Mr. Ray Lewis
6		Ed		Reed	Ed Reed
7		Troy	E.	Polamalu	Troy E. Polamalu
8		Andre		Johnson	Andre Johnson
9		Darrelle		Revis	Darrelle Revis
10	Dr.	Drew	Q.	Brees	Dr. Drew Q. Brees
11		Julius		Peppers	Julius Peppers
12					

TASK 5: Logical function to arrive a decision

If Function

The IF function checks whether a condition is met, and returns one value if TRUE and another value if FALSE.

32 Select cell C1 and enter the following function. (Fig 62)

C1					
=IF(A1>10,"CORRECT","INCORRECT")					
A	B	C	D	E	F
1	12	3 CORRECT			
2					

The IF function returns Correct because the value in cell A1 is higher than 10.

And Function

The AND Function returns TRUE if all conditions are true and returns FALSE if any of the conditions are false.

33 Select cell D1 and enter the following formula. (Fig 63)

Fig 63

D1					
=IF(B1>10,"CORRECT","INCORRECT")					
A	B	C	D	E	F
1	12	3 CORRECT	INCORRECT		
2					

The AND function returns FALSE because the value in cell B1 is not higher than 5. As a result the IF function returns Incorrect.

Or Function

The OR function returns TRUE if any of the conditions are TRUE and returns FALSE if all conditions are false.

34 Select cell E1 and enter the following formula. (Fig 64)

Fig 64

E1					
=IF(OR(B1>10,A1>2),"CORRECT","INCORRECT")					
A	B	C	D	E	F
1	12	3 CORRECT	INCORRECT	CORRECT	
2					

Geo - Informatics Assistant - Spread Sheet Application & PowerPoint Presentation

Using Various Data types in Excel, Sorting, Filtering and Validating Data

Objectives: At the end of this exercise you shall be able to

- sort the data in a Table
- filter the data under certain conditions.

Requirements

Tools/Equipments/Instruments

- A working PC with MS Office - 1 No./batch.

PROCEDURE

TASK 1: Sort the data in a Table

- 1 Open a new file and enter the data's in the subsequent cells as shown in Fig 1.
- 2 Select the range from B1 to F21.

Fig 1

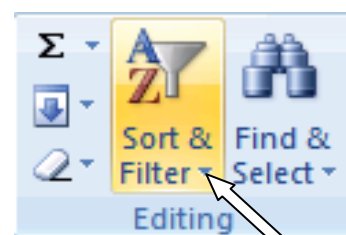
	A	B	C	D	E	F	G
1	Sl.No.	Name	Quali	Trade	DOJ- JTO	DOR	
2	1	Sathya raj D.	NTC	Fitter	21-11-86	31-03-17	
3	2	Tharmaraj L.	PT-Dip	Fitter	12-02-87	31-05-20	
4	3	Muthiah K.	NTC	Fitter	20-02-87	30-09-18	
5	4	Subramanian N.	NTC	Turner	01-02-85	28-02-14	
6	5	Selvaraj K.	NTC	Turner	01-02-85	30-06-14	
7	6	Raghavan V.	NTC	IM	18-12-85	31-01-13	
8	7	Ismath Banu G.	Dip	IM	05-05-86	31-01-24	
9	8	Thirugnanam D.	PT-Dip	IM	11-05-89	30-04-20	
10	9	Rajendran S.	NTC	W/M	23-04-86	28-02-14	
11	10	Nazeer Ahamed	NTC	W/M	11-04-86	31-12-16	
12	11	Mohandass K.A.	NTC	W/M	18-03-87	31-01-19	
13	12	Easwaran V.	Dip	MMV	28-09-88	31-03-25	
14	13	Balamurugan K.	PT-Dip	MMV	01-04-89	30-09-21	
15	14	Thaniyarasu	Dip	MMV	08-08-90	31-03-27	
16	15	Narayana Perumal	NTC	MMV	09-03-90	31-05-13	
17	16	Azhaganantham G	NTC	MMV	07-03-90	31-03-24	
18	17	George Franklin T.	Dip	MMV	02-11-90	31-05-28	
19	18	Ramiza Banu N.	Dip	MRTV	15-02-88	30-06-23	
20	19	Mahalakshmi C	Dip	MRTV	18-02-88	31-05-25	
21	20	Sudhaa Dridhe	Dip	MRTV	22-Feb-88	31-May-25	

- 3 Click on drop down arrow in Sort & Filter button



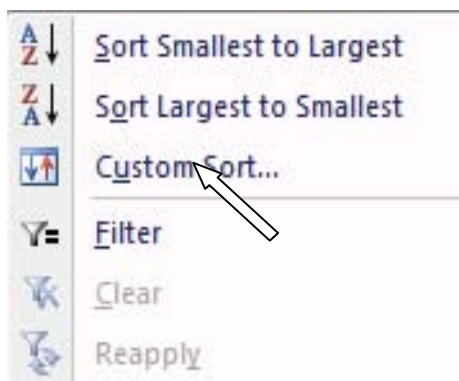
from Editing group as shown in Fig 2.


Fig 2




A Context menu will appear as shown below in Fig 3.

Fig 8



4 Select  **Sort Smallest to Largest** to sort the data in ascending order.

5 Select  **Sort Largest to Smallest** to sort the data in descending order.

6 Select  **Custom Sort...**

A new window will appear as shown in Fig 4.

7 Click on the drop down arrow near the

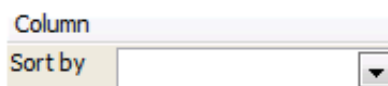
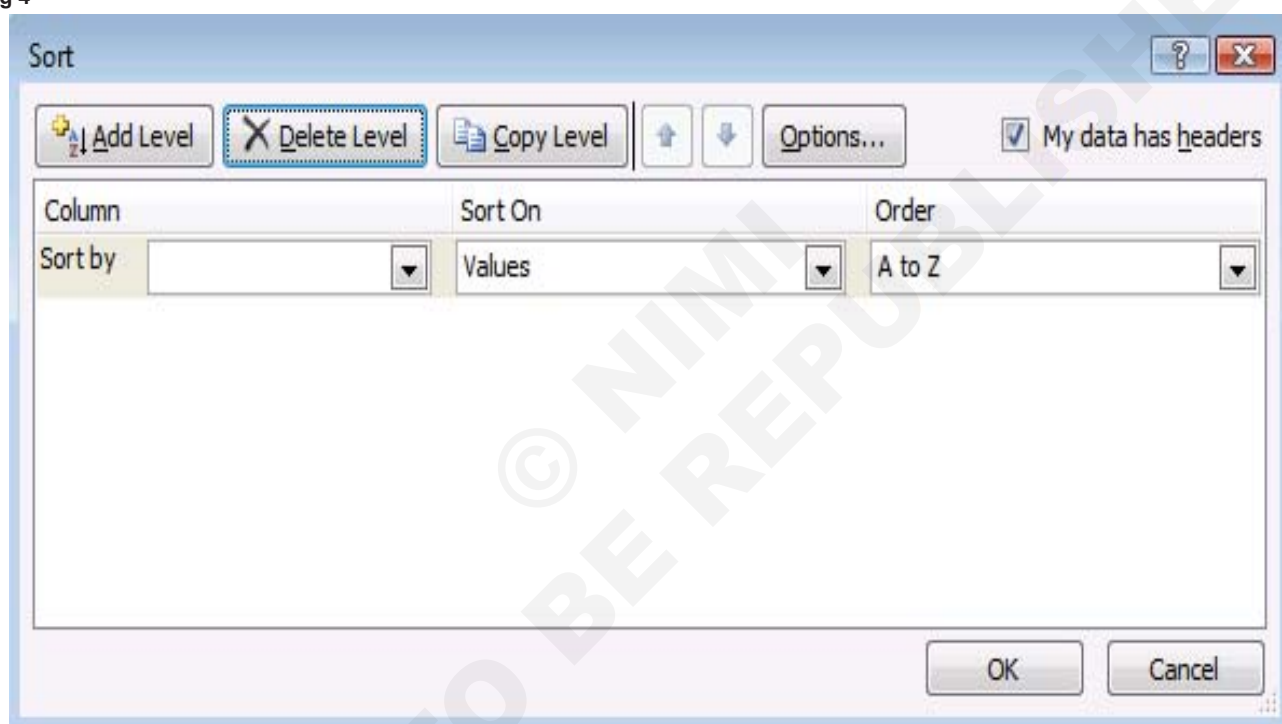
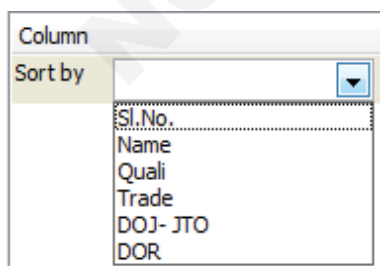


Fig 4



A drop down list will appear with all the field name in the table as shown in Fig 5.

Fig 5



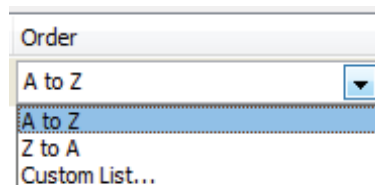
8 Select "Quali" field

9 Click on the drop down arrow near the 

A drop down list will appear with all the field name in the table as shown in Fig 6.

10 Select "A to Z".

Fig 6

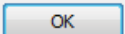


11 Click on 

12 Select "Trade" field.

13 Click on **Sort by** level.

14 Select "Z to A".

15 Click  button.

The data's are now sorted according to our requirement.

16 Select  from **Sort & Filter** option.

17 Click on 

18 Repeat the step 11.

19 Select "Trade" field.

20 Select "A to Z".

21 Repeat the step 11.

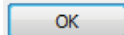
22 Select "Quali" field.

23 Select "Z to A".

24 Repeat the step 11.

25 Select "DOR" field.

26 Select "Oldest to Newest".

27 Click  button.

TASK 2: Filter the data under certain conditions

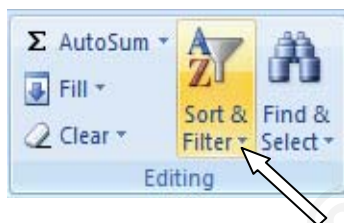
1 Select C1 & D1.

2 Click on drop down arrow in Sort & Filter button



from Editing group as shown in Fig 7.

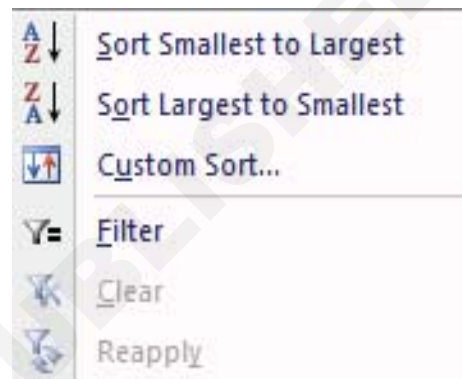
Fig 7



A Context menu will appear as shown below in Fig 8.

3 Click on Filter command. An Drop Down will be displayed near the Heading "Quali" & "Trade" in the Table as shown in Fig 9.

Fig 8



4 Click on the Drop down arrow and a drop down menu related to it will displayed as shown in Fig 10.

5 Deselect some trade name by clicking on the check box near it as shown in Fig 11.

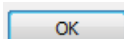
6 Click  button.

Fig 9

	A	B	C	D	E	F	G
1	Sl.No.	Name	Qual	Trade	DOJ- JTO	DOR	
2	1	Azhaganantham G	NTC	MMV	07-03-90	31-03-24	
3	2	Balamurugan K.	PT-Dip	MMV	01-04-89	30-09-21	
4	3	Easwaran V.	Dip	MMV	28-09-88	31-03-25	
5	4	George Franklin T.	Dip	MMV	02-11-90	31-05-28	
6	5	Ismath Banu G.	Dip	IM	05-05-86	31-01-24	
7	6	Mahalakshmi C	Dip	MRTV	18-02-88	31-05-25	

Fig 10

	A	B	C	D	E	F	G
1	Sl.No.	Name	Qual	Trade	DOJ- JTO	DOR	
2	1	Azhagan			07-03-90	31-03-24	
3	2	Balamur			01-04-89	30-09-21	
4	3	Easwara			28-09-88	31-03-25	
5	4	George			02-11-90	31-05-28	
6	5	Ismath B			05-05-86	31-01-24	
7	6	Mahalak			18-02-88	31-05-25	
8	7	Mohand			18-03-87	31-01-19	
9	8	Muthiah			20-02-87	30-09-18	
10	9	Narayan			09-03-90	31-05-13	
11	10	Nazeer A			11-04-86	31-12-16	
12	11	Raghava			18-12-85	31-01-13	
13	12	Rajendra			23-04-86	28-02-14	
14	13	Ramiza B			15-02-88	30-06-23	
15	14	Sathya r			21-11-86	31-03-17	
16	15	Selvaraj			01-02-85	30-06-14	
17	16	Subraman	NTC	Turner	01-03-85	28-03-14	

Fig 11

Name Quantity Trade

Sort A to Z
Sort Z to A
Sort by Color

Clear Filter From "Name"

Filter by Color

Text Filters

☒ (Select All)
☒ Fitter
☐ IM
☒ MMV
☐ MRTV
☒ Turner
☐ W/M

OK Cancel

Creating and Formatting Charts

Objectives: At the end of this exercise you shall be able to

- create a chart using given data
- make a static chart with Fixed values of table
- create a dynamic chart with updatable values of table.

Requirements

Tools/Equipments/Instruments

- A working PC - 1 No./batch.

PROCEDURE

TASK 1: Create a chart using given data

- 1 Open a new file and enter the data's in the subsequent cells as shown in Fig 1.
- 2 Save it with file name "Sales Report".

Fig 1

	A	B	C	D	E	F
5						
6		Sales Report				
7						
8		Date of Sale:	21-03-2012			
9		Total Amount:				
10		Total Discount:				
11						
12						
13	Sl. No.	Name of the Employee	Amount Sold	Discount	Net Total	
14	1	JOBIN	36500	10950		
15	2	HARIS	26500	6625		
16	3	PRANAV	5000	500		
17	4	ASHIQ	2750	Nil		
18	5	MONISH	9500	1900		
19						
20						
21						

- 3 Select the cell D14 and type the formula given below to calculate discount for the condition and press "Enter key".

=IF(C14<3000, "NIL", IF(C14<=5000, C14*10/100, IF(C14<=10000, C14*20/100, IF(C14<=35000, C14*25/100, C14*30/100))))

- 4 Select the cell D14.

- 5 Move the mouse pointer to the right bottom corner of the cell

A '+' sign will appear at the right bottom corner of the cell

- 6 Press the left button and drag till D18.

The formula in D14 will be copied to D15, D16, D17 & D18.

- 7 Select the cell E14 and type the formula given below to calculate "Payable Amount" as Amount - Discount and press "Enter key".

=C14-D14

- 8 Repeat the steps 5 to 6.

- 9 Select Cells C14 to C18


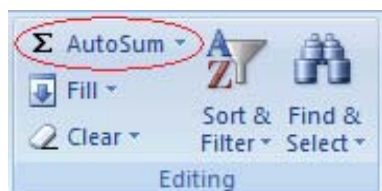
- 10 Click  from Editing group in Home Tab as shown in Fig 2.

Fig 2



The contents in C14 to C18 is added and the result will be displayed in C19.

- 11 Copy the formula in C19 to D19 and E19.

- 12 Select the cell C9

- 13 Type "=C19"

- 14 Select the cell C10

- 15 Type "=D19"

The contents in C19 is also displayed in C9 and the content in D19 is also displayed in C10.

TASK 2: Make a static chart with Fixed values of table

- 1 Select the cells B13 to E18.

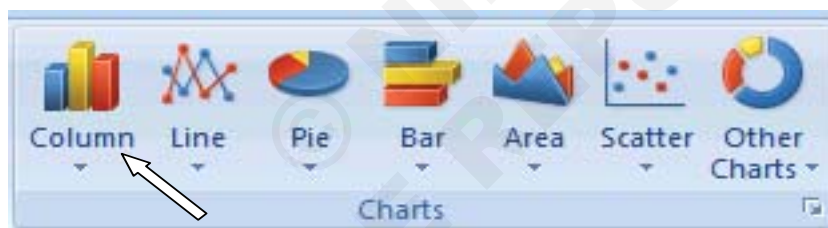
- 2 Click on the  tab.

- 3 Click on the drop down arrow below the column button



from Charts group as shown in Fig 3.

Fig 3



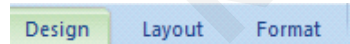
A Context menu will appear as shown below in Fig 4.

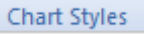
- 4 Select any one of the above chart type.

The chart will be inserted into the Excel worksheet as shown in Fig 5.

Changing chart style and type.

- 1 A new Menu  is insert with sub menus



The colour combination and style of the bar can be change by using  group from Design tab.

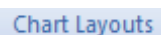
Appearance of the legends and value in the chart can be changed using  from Design tab

Fig 4

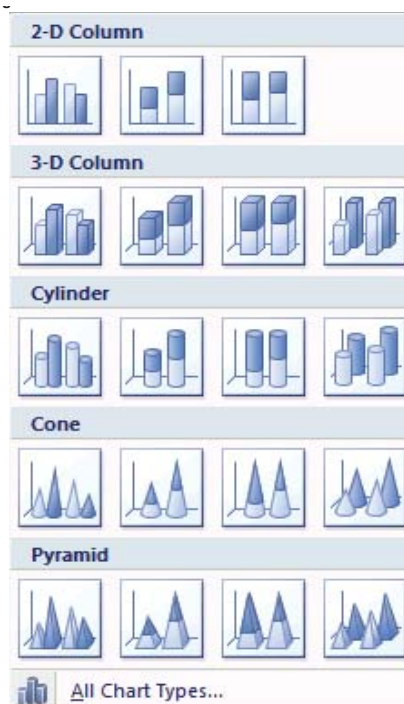
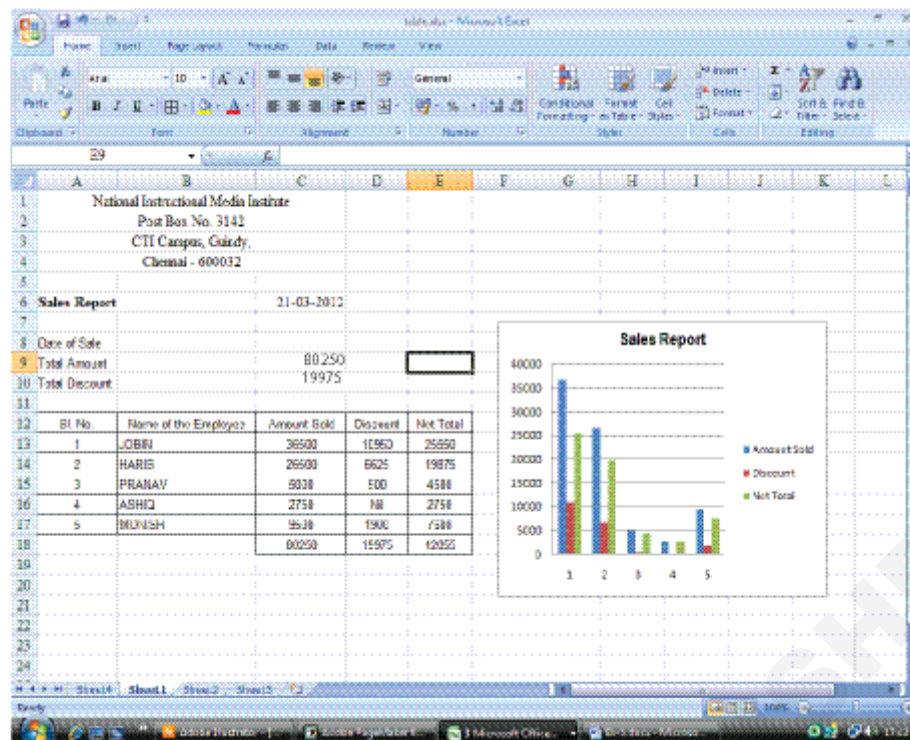


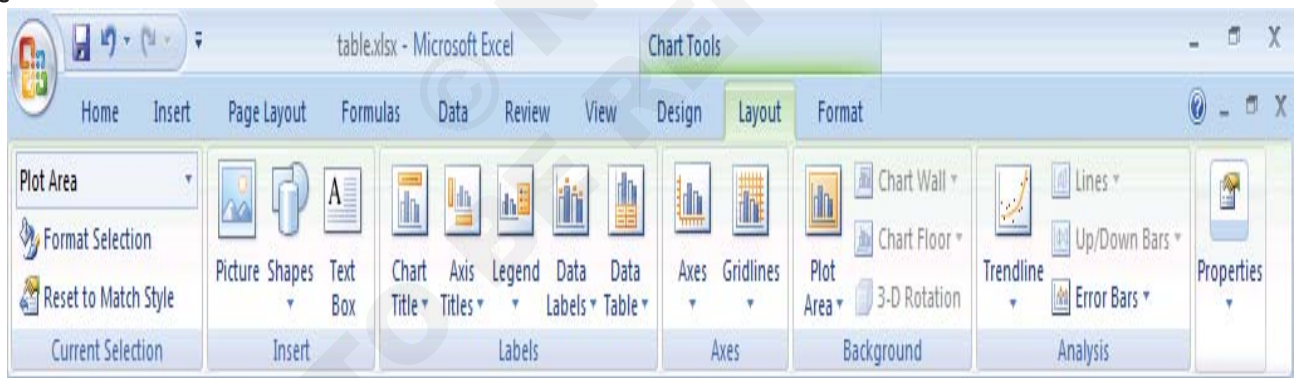
Fig 5



- 2 Select **Chart Tools** → **Layout**

A new sub menu will appear as shown in Fig 6.

Fig 6

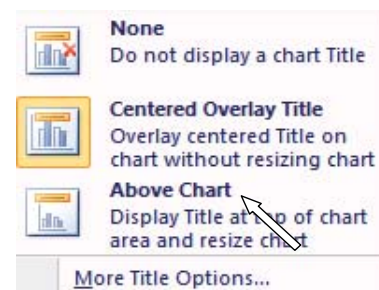


- 3 Select **Chart Title** from **Labels** group.

A Context menu will appear as shown in Fig 7.

- 4 Select **Axis Titles** from the above menu.

Fig 7



5 Type the heading as "SALES REPORT".


6 Select  from **Labels** group.


Axis
Titles ▼

A Context menu will appear as shown in Fig 8.

Fig 8



7 Select  **Primary Horizontal Axis Title** and type "Employees" and press Enter Key.

8 Select  **Primary Vertical Axis Title** and type "Amount" and press Enter Key.

Try with various options in Legend, Data Labels and Data Table and also try with various options in axes and gridlines in Axes group.

9 Select **Chart Tools** → **Format**


'Chart Tools' menu will appear as shown in Fig 9.

This menu is used to change the style, shape and colour of the fonts used in the chart.

Changing row & column, data.

1 Click on the chart.

2 Select **Chart Tools** → **Design**

3 Click on  from **Data** group.

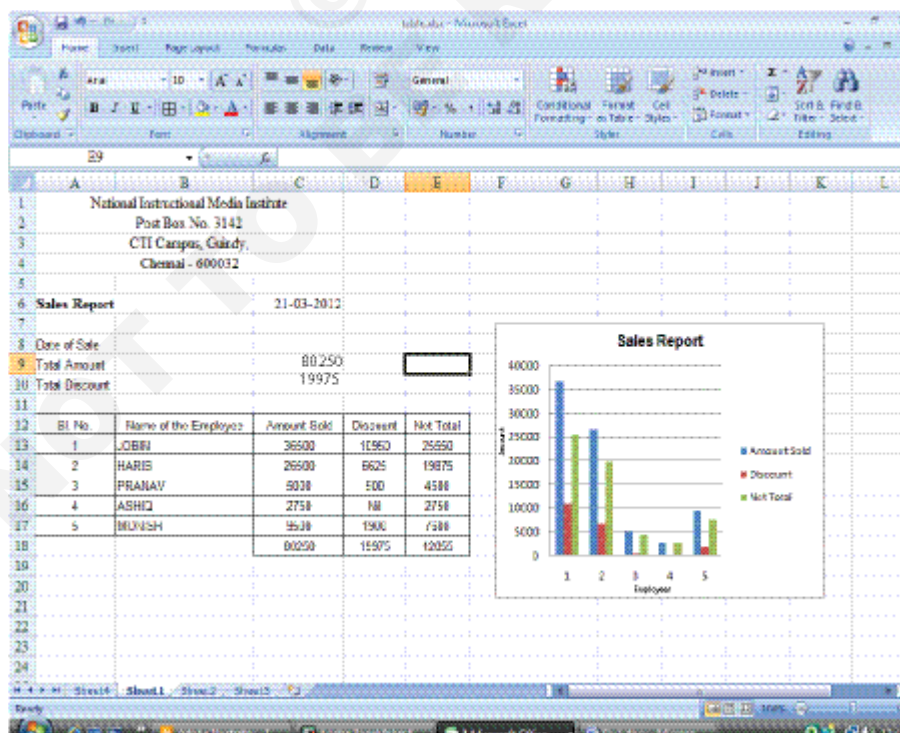
Switch
Row/Column

The row and column data with automatically (Fig 10)

Fig 9



Fig 10



TASK 3: Create a dynamic chart with updatable value of table

- 1 Open a new file and enter the data's in the subsequent cells as shown in Fig 11.
- 2 Save it with file name "Mark Sheet".
- 3 Calculate the Total

Fig 11

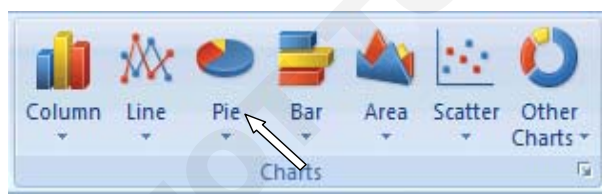
	A	B	C	D
1	Sharada Matriculation Higher Secondary School			
2	Guindy Bye Pass Road, Guindy, Chennai - 600 032.			
3				
4				
5	Name	Nirmala G.		Std: X
6				
7		Subject	Marks	
8				
9		Tamil	85	
10		English	92	
11		Maths	100	
12		Science	98	
13		His & Geo	95	
14		Total		
15				

- 4 Select B9 to C14.
- 5 Click on the **Insert** tab.
- 6 Click on the drop down arrow below the pie button



from Charts group as shown in Fig 12.

Fig 12

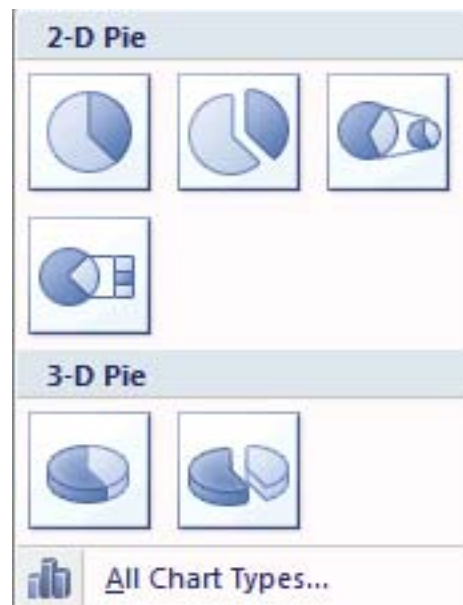


A Context menu will appear as shown below in Fig 13.

- 7 Select any one of the above chart type.

The chart will be inserted into the Excel worksheet as shown in Fig 14.

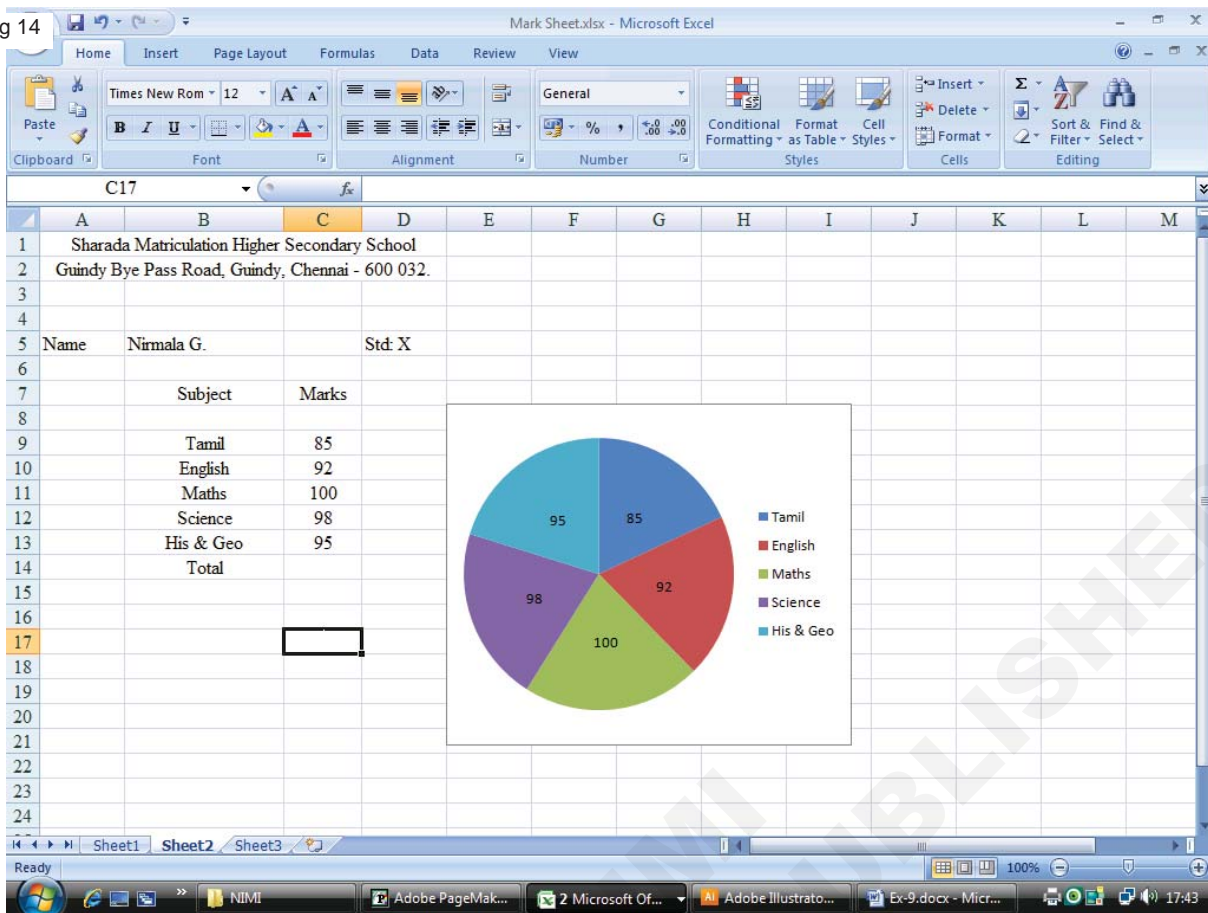
Fig 13



- 8 Insert Chart Name and Other Options using Chart Tool → Layout.
- 9 Get it checked by the instructor.

Fig 4

Fig 14



Importing & Exporting Excel Data

Objective: At the end of this exercise you shall be able to

- importing data into excel from Access database.

PROCEDURE

TASK 1: Importing data into Excel from Access Database

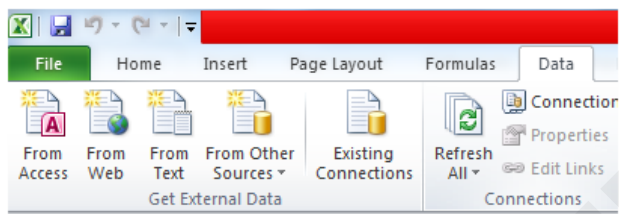
- 1 Click Data Tab

- 2 Click **From Access Icon** in **Get External**



Data Ribbon Group as shown in Fig 1

Fig 1



The select Data Source window will display on the screen

- 3 Select the already saved MS-Access Data base file and click Open.

The Import Data dialog Box will display on the screen

- 4 Select the Table option
- 5 Select the cell where you want to import the Access database as shown in Fig 2
- 6 Click OK button.

The output window will display as on Fig 3.

Fig 2

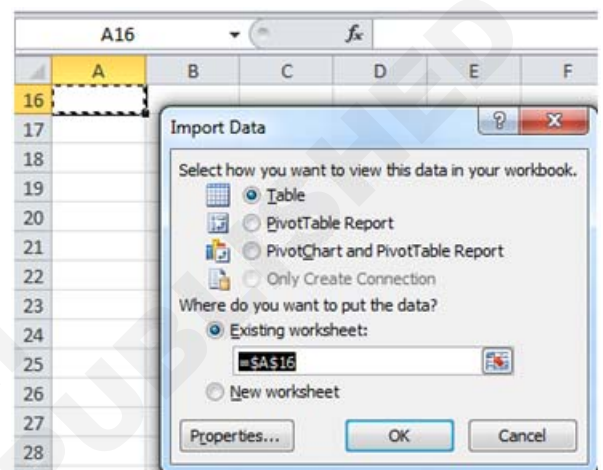


Fig 3

	A	B	C	D	E
10					
11					
12					
13					
14					
15					
16	ID	Ename	age	address	Dept
17	1	ram	34	madurai	sales
18	2	hari	28	chennai	marketing
19	3	babu	46	bangaluru	production
20	4	jp	45	dgl	manager

Geo - Informatics Assistant - Spread Sheet Application & PowerPoint Presentation

Modifying Excel Page setup and Printing

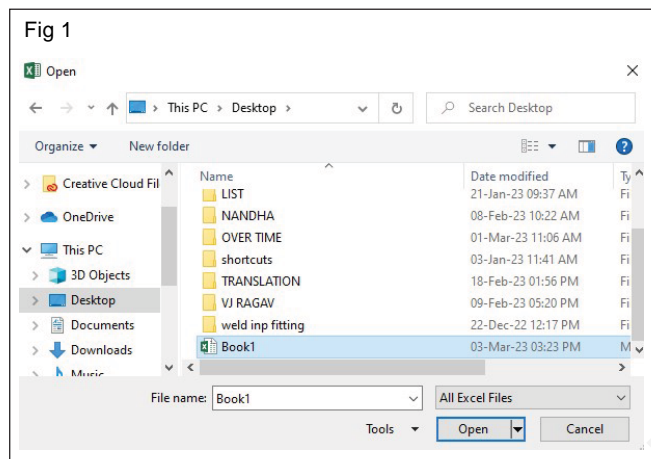
Objectives: At the end of this exercise you shall be able to

- prepare an existing table to printing setup
- working with printing screen options and print the given Excel sheet.

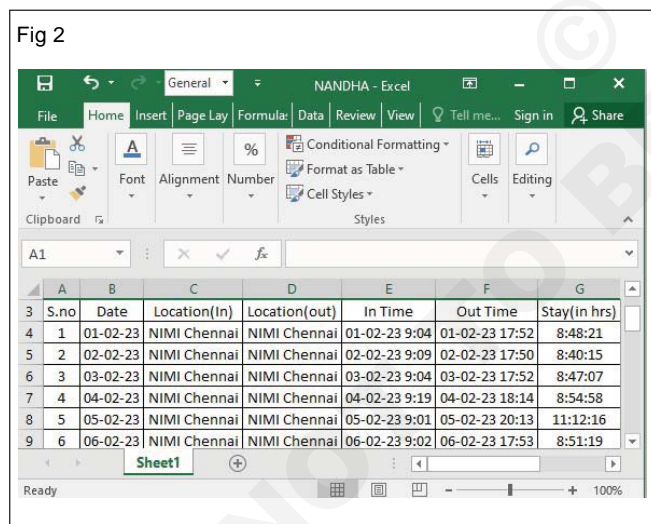
PROCEDURE

TASK 1: Preparing an existing table to printing setup

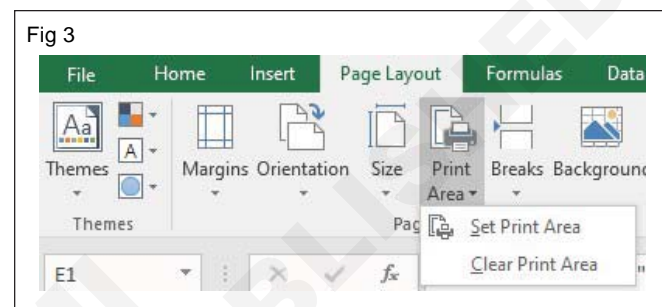
1 Open the existing excel file as on Fig 1.



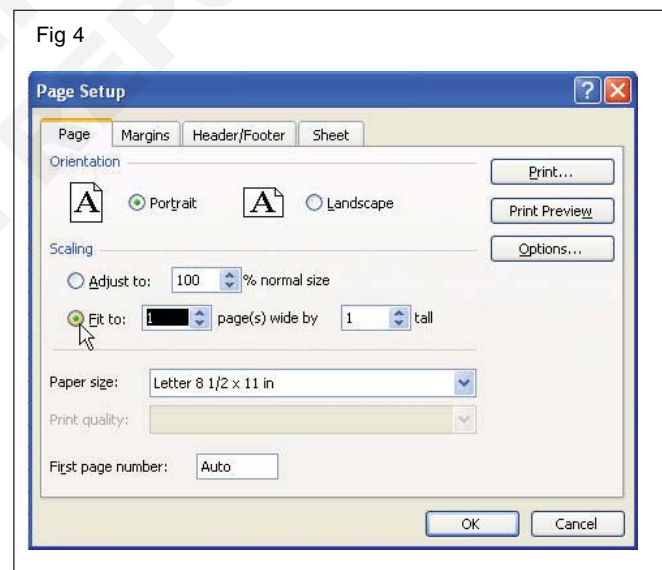
2 Select the table as on Fig 2.



3 Set the print area in Page Layout Tab as shown in Fig 3



4 Set the paper size and fit to 1, and click ok as on Fig 4.



TASK 2: Working with printing screen options and print the given Excel sheet

1 After set the page layouts Click File menu and click Print option as on Fig 5

2 In Fig 6 window select number of copies, printer name, number of pages, page orientation

3 Finally click print button as on Fig 7

When select the print option , simultaneously printing options and preview window will display as on Fig 6

Fig 5



Fig 6

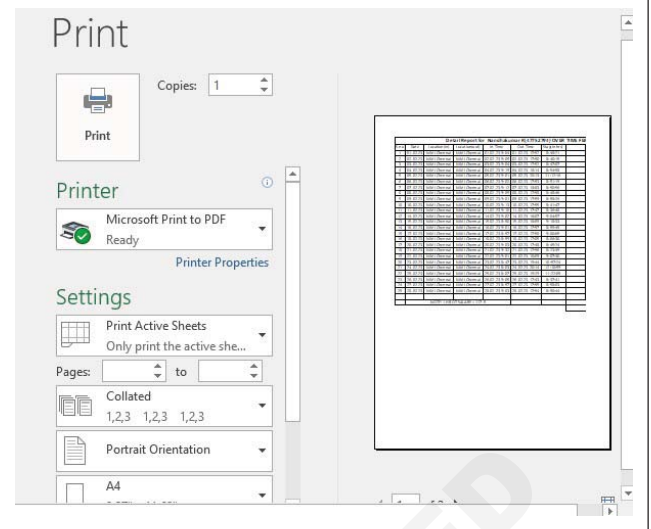
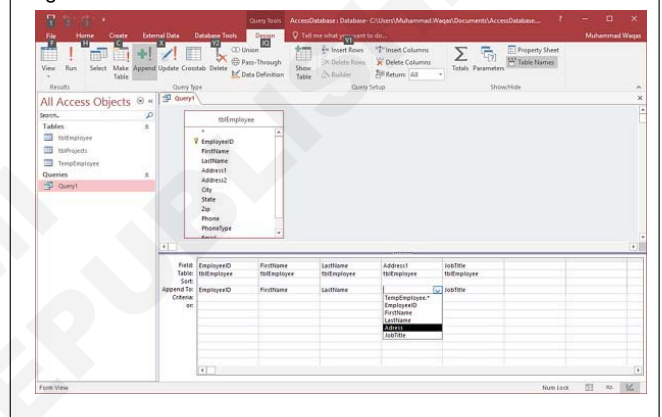


Fig 7



Geo - Informatics Assistant - Spread Sheet Application & PowerPoint Presentation

Open Powerpoint Presentation and Familiarize with Basic Application Components

Objectives: At the end of this exercise you shall be able to

- open a Power point and create a new document
- familiarize different Power point screen components.

Requirements

Tools/Equipments/Instruments

- A working PC with MS Office 2007
- 1 No./batch.

PROCEDURE

TASK 1: Open a Power point and create a new document

- 1 Boot the system, if not booted
- 2 Click Start Button
- 3 Select Programs
- 4 Click Microsoft PowerPoint (Fig 1)

Fig 1

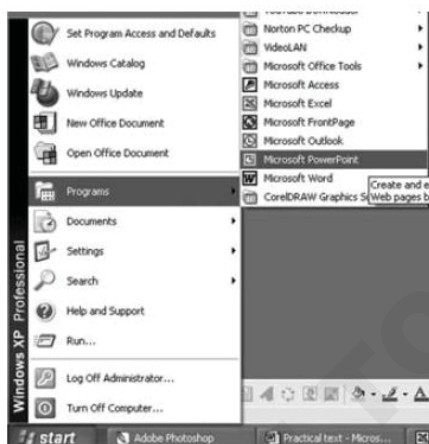


Fig 2

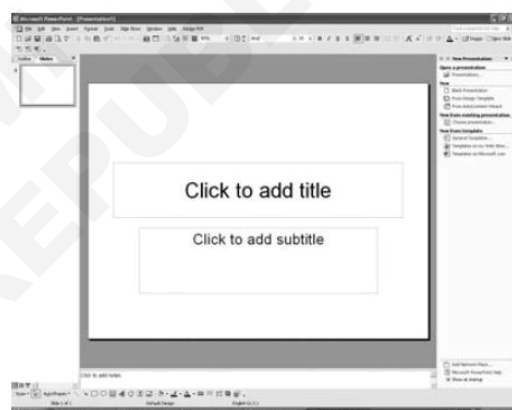
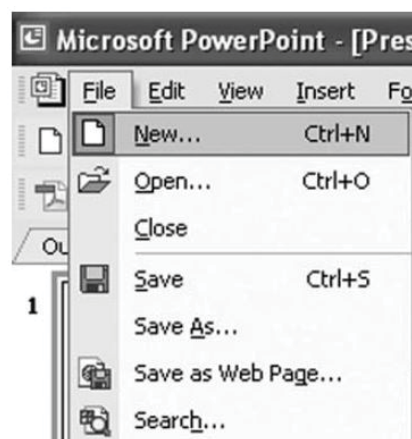


Fig 3



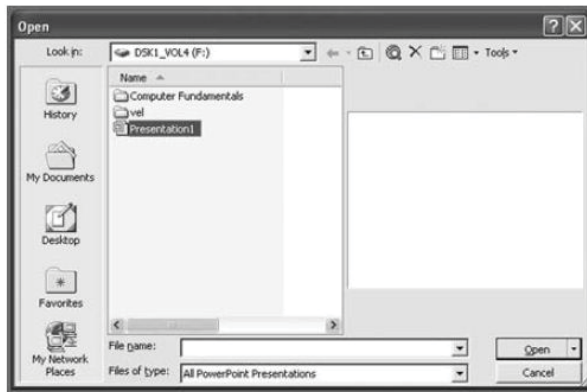
- 5 PowerPoint window will open (Fig 2)

Create a New Presentation (Fig 3)

- 1 Choose File Menu
- 2 Click New option (Short cut key : Ctrl + N)
- 3 Created a New presentation

TASK 2 : Familiarize different Power point screen components (Fig 4)

Fig 4

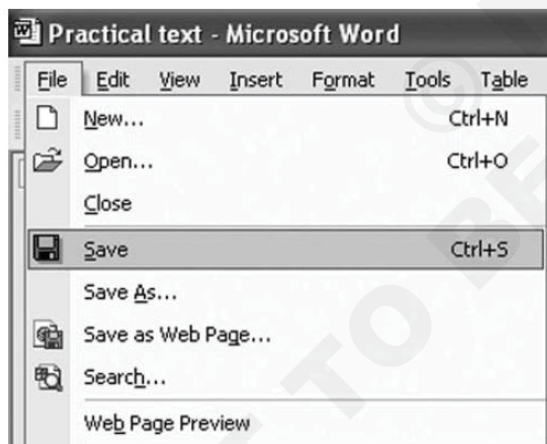


- 1 Choose File Menu
- 2 Click Open option which displays,
- 3 existing presentation.
- 4 Choose any one presentation " presentation1"
- 5 Click Open button to open the presentation 1'

Save a current Presentation

- 1 Choose File menu
- 2 Click Save option (Fig 5)

Fig 5



- 3 Displayed Save as window
- 4 Type the name of the presentation "sample" (Fig 6)
- 5 Choose saving location
- 6 Click save button
- 7 Saved current presentation "sample" (Fig 7)

Close the current presentation:

- 1 Choose file menu
- 2 Click Close option
- 3 Closed current presentation

Fig 6

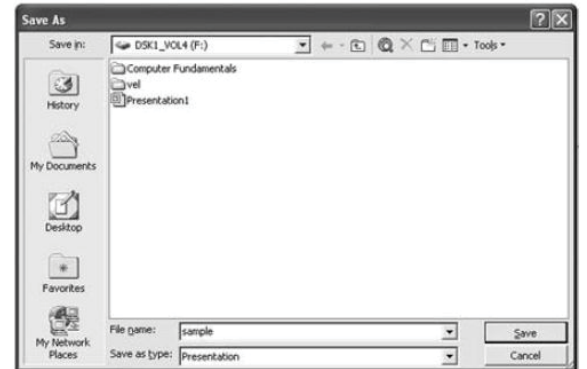
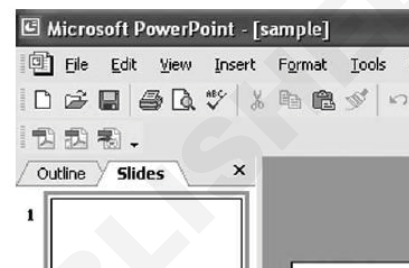


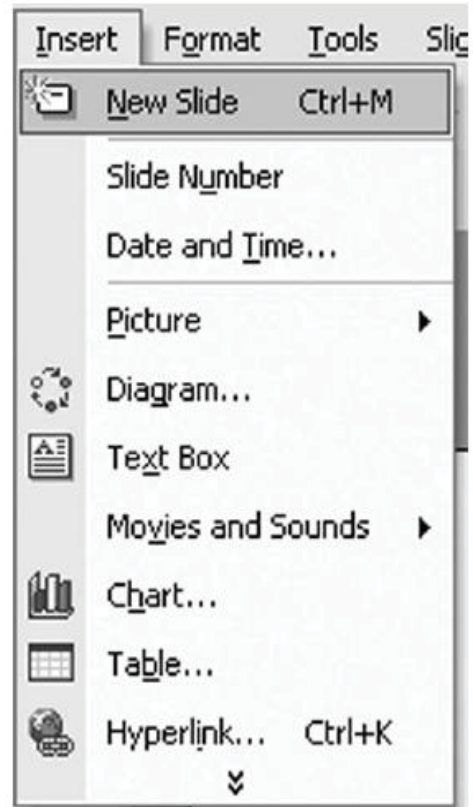
Fig 7



Insert a New Slide

- 1 Choose Insert Menu
- 2 Click New Slide (Short cut key : Ctrl + M) (Fig 8)

Fig 8



Geo - Informatics Assistant - Spread Sheet Application & PowerPoint Presentation

Creating Slide Shows, Inserting Objects

Objectives: At the end of this exercise you shall be able to

- insert a picture from the web on a slide
- change a Theme of a presentation
- show presentation in slide show mode.

Requirements

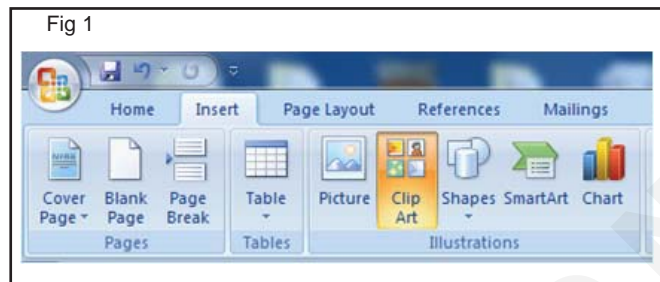
Tools/Equipments/Instruments

- A working Computer with MS Office 2007 - 1 No.

PROCEDURE

TASK 1: Insert a picture or images from the clipart gallery

- 1 Click-on the Insert tab and select the Clip Art image (Fig 1)



Note: An imagesimilar to the one on theleft will appear (Fig 2)

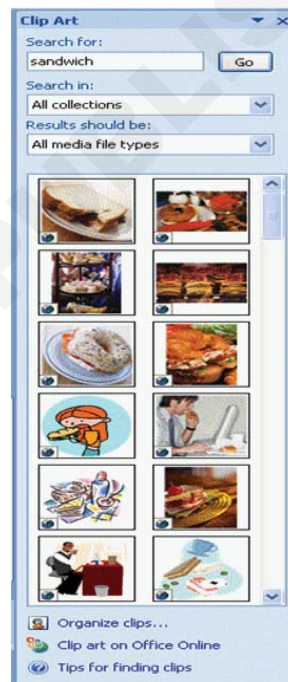
- 2 Since the presentation tells how to make a peanut butter and jelly sandwich, type sandwich in the Search for: box.

Then click the Go button (see left arrows above). A Microsoft Clip Art Task Pane then appeared as on the left. (Fig 3)

Note: That there are a lot of sandwich clip art images available. "run down" the choices by using the "elevator bar" on the right side of the Clip Art Task Pane.

- 3 Move up and down the selections and find one that fite. (Fig 4)
- 4 We moved down the selections until our Clip Art menu screen looked like the one on the right. We chose the "sandwich" on the right. moved our cursorover the above of the image we chose and a blue selection barwith a "V" appeared. We clicked the blue bar and the image and drop down menuyou see on the right appeared. We move our cursor over Insert and clicked.

Fig 2



Note: The menu will disappear and you will see the image you selected on the right side of your slide.

Slide 3 should look similar to the image on the right.

Fig 3

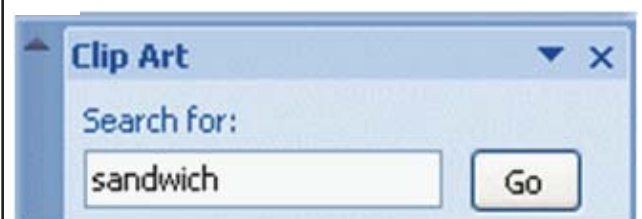
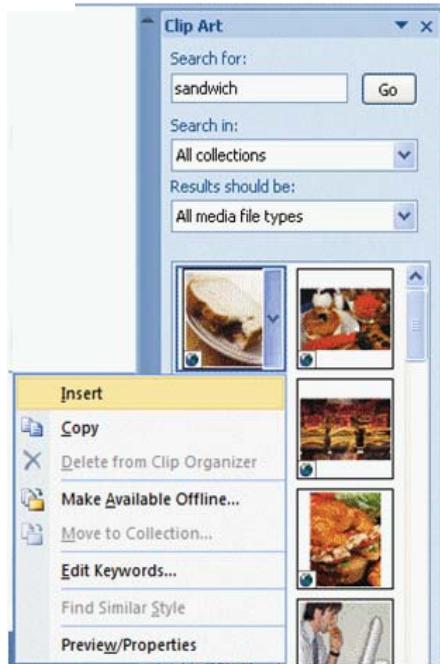
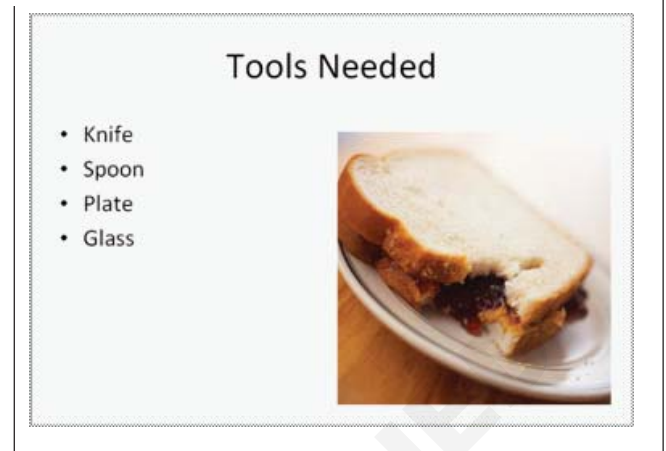


Fig 4



- Before we go to Slide 4, we'll close the Clip Art Task Pane on the right side of the screen. This will give us more room in the center to work on the next slides. (Fig 5)

Fig 5



TASK 2: Change a theme of a presentation

- When click Create New Theme Colors, the image on the right will appear. (Fig 6)

Fig 6



Fig 8 is an image of the Theme Colors drop down menu for Text/Background - Dark 1. As you choose colors - you will see the result in the Sample area.

Fig 8



- Click on the theme color selection - sample area, which applies for each selection. (Fig 7)

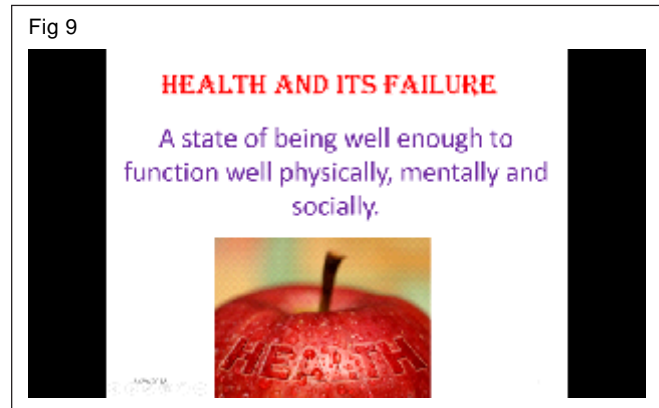
Fig 6



- On finishing color selection, sample is shown as in fig We named our new theme - Your New Theme Color. You can name your Themes anything you desire.
- Name the theme as 'sample' which color be applied letter.

TASK 3: Show presentation in slide show mode

- 1 Click slide show tab.
- 2 Choose from beginning button under start slide show group.
- 3 Presentation display will appear on the screen. (Fig 9)



Animating Slide Transitions and Objects

Objectives: At the end of this exercise you shall be able to

- insert a simple animation to text
- arrange timings for each animation
- set transition between slides.

Requirements

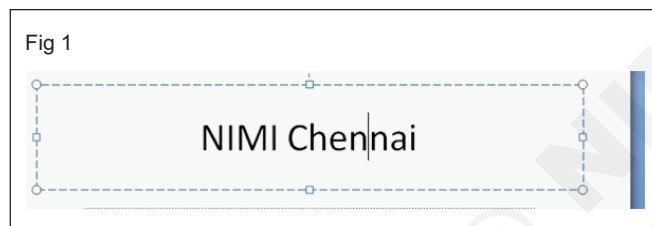
Tools/Equipments/Instruments

- A working Computer with MS Office 2007 - 1 No.

PROCEDURE

TASK 1: Insert a simple animation to text

- 1 When the Slide 1 Normal View screen appears,
- 2 click on the first line of text.
- 3 The first Text Box will appear as below. (Fig 1)



- 4 When you see the above Text Box, highlight the text. When you do, you will again see the Drawing Tools Tab appear.

- 5 Click the Drawing Tools Tab and the Drawing Tools Ribbon will again appear - just like it did for WordArt. (Fig 2)

Arrange timings for each animation

- 1 Click the Animations Tab again,
- 2 Then click the down triangle to the right of Custom Ani...
- 3 When the drop down menu appears click Custom Animation... (Fig 3)
- 4 The following Custom Animation Task Pane will appear on the your screen. When this screen appears, first, click Add Effect, Then click Entrance, and finally click More Effects (because we want ALL of the effects). (Fig 4)

Fig 2



Fig 3

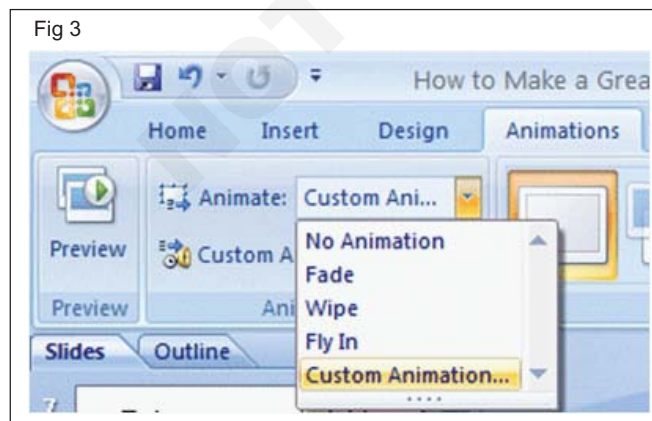
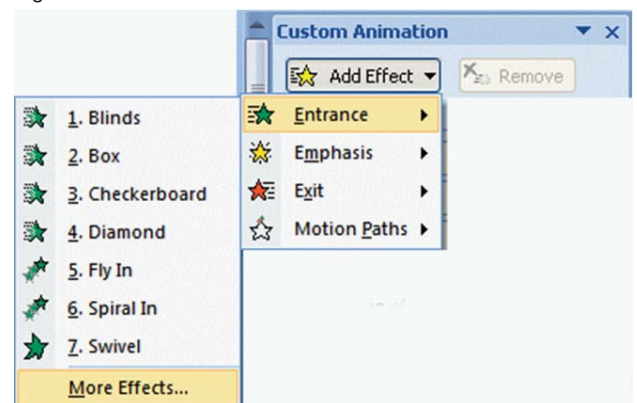
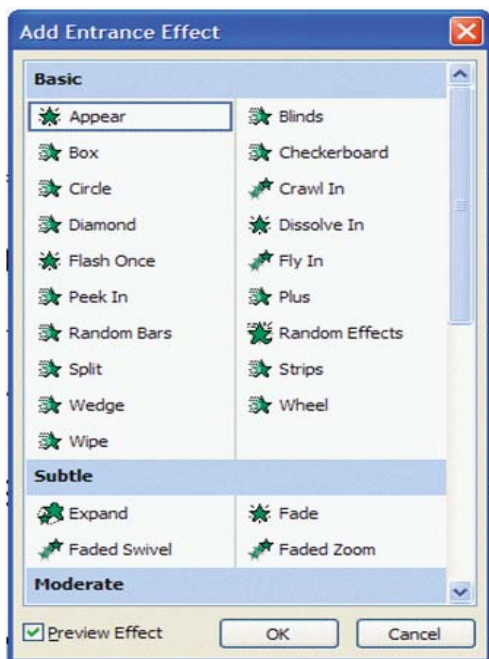


Fig 4



- 5 The Add Entrance Effect menu screen will appear. (Fig 5)

Fig 5



- 6 Move your cursor over the blue Add Entrance Effect "bar" at the top of the menu screen. Click and hold down the left mouse button and drag the menu screen to the right of your screen so that you can see the text in the Title text box. After you have moved this box raise your finger from the left mouse button.

Choose one of the effects by clicking-on it. You will now be able to see the animation effect in the Text box. You may hear a sound that is "part" of your Slide Transition. We'll show you how to add sounds for your text in a moment.

Notice - on the right side of the screen - under Custom Animation - that the Titles (on which we added effects) are shown as a part of this screen (just like when we created our flying bat on Slide 9).

Also notice, on the right side of our second title there is a small, down pointing arrow. If you click-on this arrow it will show you each line of text that you animated in the lower sub-title box. (Fig 6)

Now we'll enhance our text some more. (Fig 7)

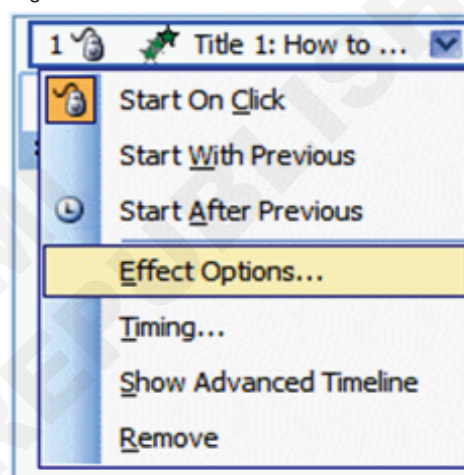
Move your cursor over the first title and click the left mouse button. Next click the small down arrow on the right side of this box. You will see a menu screen appear that will let you enhance your title (just like you did in Slide 9). Choose (click) Effect Options and the menu screen below will appear.

This screen is similar to the one in slide9, but a little different. Notice that we chose magnify for our text effect and then chose laser for our sound.

Fig 6



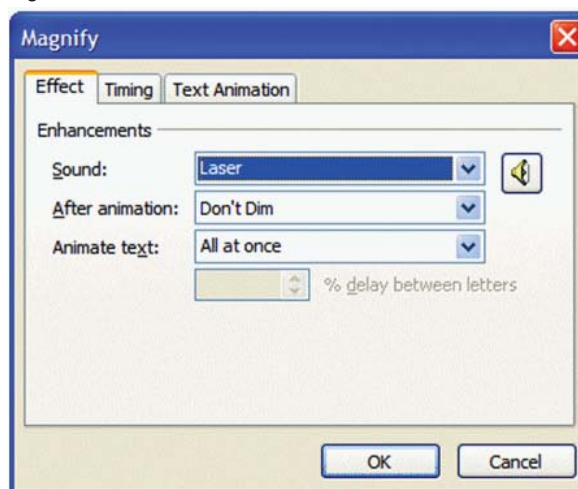
Fig 7



We'll cover dimming and all at once when we animate text in slide2.

Go ahead and experiment with Entrance effects and sounds for your first slide. (Fig 8)

Fig 8



TASK 2: Arrange Timings for each animations

Name: Created set times on the Animations Tab for your slides, and desire to have the show

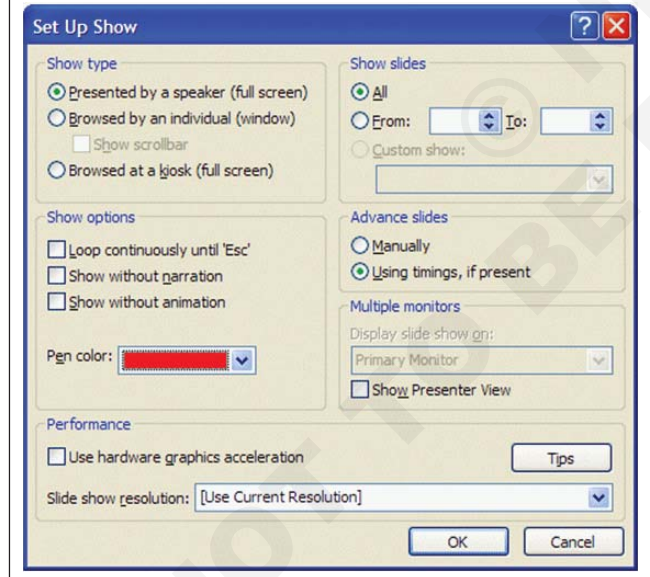
- 1 Run in "automatic," click the Slide Show Tab and then
- 2 Click the Set Up Slide Show button. (Fig 9)

Fig 9



The following Set Up Show menu screen will appear. (Fig 10)

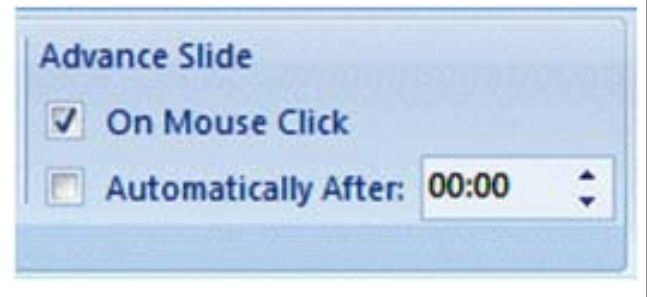
Fig 10



In the Advance slides box (Fig 11)

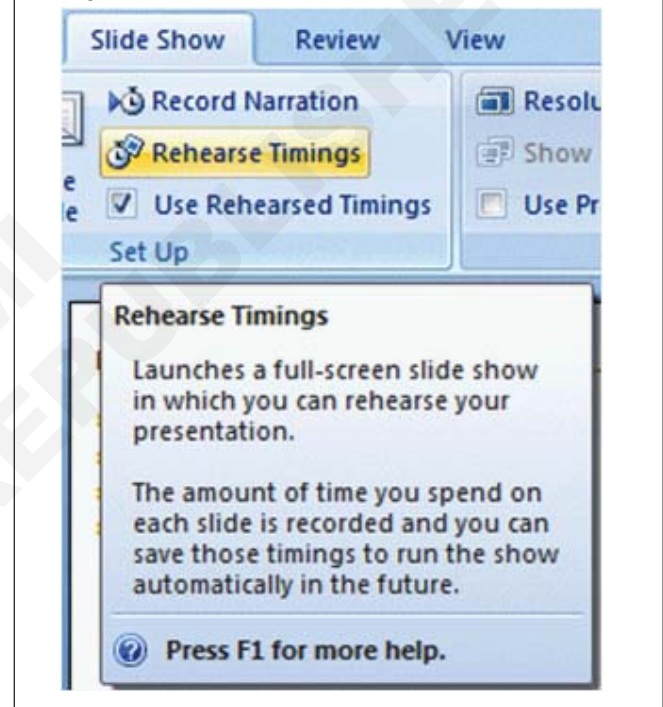
- 3 click the circular area to the left of Using timings, if present. Look over the other choices in this menu screen. Notice that there are a lot of enhancements in this Set Up Show menu screen. Experiment, as you desire.

Fig 11



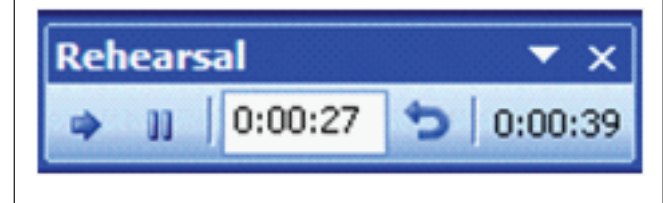
- 4 Click the OK button when you have made your changes.
- 5 if they desire to have the show repeat continuously, is the Loop continuously until 'Esc' selection. This is indicated by an arrow to the Show options area. (Fig 12)

Fig 12



- 6 Click on Slide Show Tab and then select Rehearse Timings. (Fig 13)

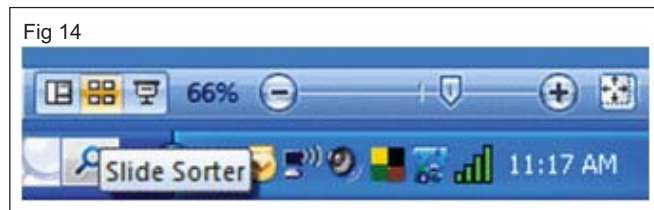
Fig 13



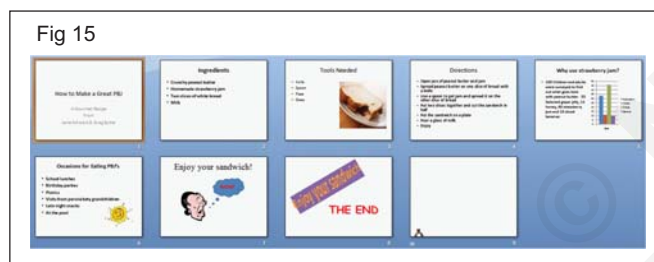
- 7 A small, rehearse timings "box" will appear (image above). It will "show" a running clock on the right side of the menu - that indicates the time for the entire show.

Task 3: Set transition between slides

- 1 Now we'll add some pizzazz to our presentation. When you viewed your slide show, a few moments ago, it was like "flopping down" plastic transparencies on an overhead projector." Now add some motion, animation, sound, and color and really make our presentation something to view. (Fig 14)



- 2 Go to the Slide Sorter button at the bottom right area of the screen.
- 3 Click on the button with four white squares.
- 4 You can now see all nine slides (as shown below). Notice that Slide 9 (the one with the flying bat) does not show the path of the bat. This is because of the motion path - not a big deal. Lightly click once on the first slide to highlight the slide (an orange border will surround the slide - see arrow below). Now point in the MIDDLE of Slide 1 and click on your RIGHT mouse button. (Fig 15)



- 5 If you accidentally click twice on Slide 1, this will take you to the Slide View, again. If this happens, simply click on the Slide Sorter View button at the bottom of the screen, just like you did on the last page. With Slide 1 "marked," click the Animations Tab. The Animations Ribbon will again open. (Fig 16)

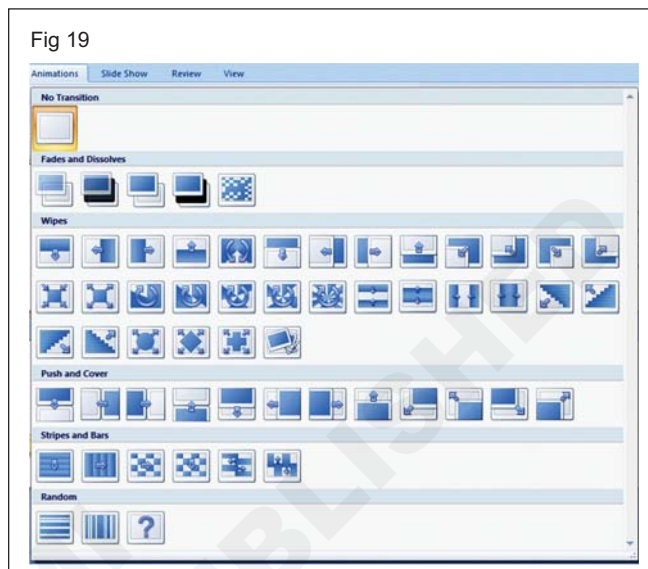


For previous PowerPoint users, this is another "totally new" method. (Fig 17)



Notice in - the Animations Ribbon a Group - Transition to This Slide. (Fig 18)

- 6 Transitions are neat, visual actions, as we move from slide to slide in our show. To get a "feel" for what Transitions do, click the More Arrow in the lower right corner of the Transition to This Slide Group. (Fig 19)



A Transition selection screen similar to the image on the right will appear.

- 7 So, let's get started in creating some movement (transitions) as we enhance our PowerPoint slide show. Remember that we clicked on Slide 1 to begin this process.

We have enlarged the Fades and Dissolves and Wipes sections of the Transitions image on the last page. We moved our cursor over Wipe Up and clicked on it. Immediately our Slide 1 Transitioned with a Wipe Up. (Fig 20)



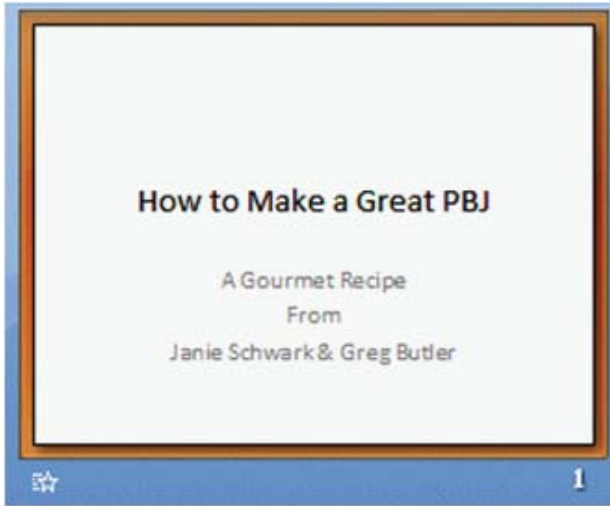
- 8 At the bottom of the Transition to This Slide Group there is a Random area. One of the choices has a Question Mark (?). We chose this selection and then chose Apply to All Slides. So, when we show our slides, each slide will transition with a different effect. (Fig 21)

- 9 Go ahead and try as many Slide Transitions as you desire. When you have one you like, look at the lower left corner of Slide 1. You will see a small "shooting" star. This means that a transition has been applied to this slide. If you click the star, you will see the transition you selected will Play again. (Fig 22)

Fig 21



Fig 22



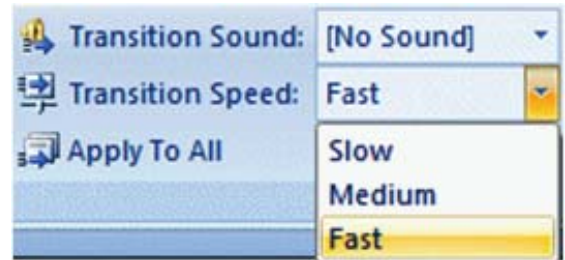
- 10 You can repeat the above process by clicking on each slide and selecting a different transition for each slide. Or - Notice - on the right side of the Transition to This Slide Group - you can select Apply to All. And the transition you choose will be applied to all of your slides. It's up to you on how you want each slide to transition - or not transition. (Fig 23)

Fig 23



Also notice that there is a Transition Speed selection in this same area. You may change your transition from Fast to Medium or Slow. (Fig 24)

Fig 24



- 11 You may also add a Sound to your transition. Click the small down arrow to the right of Transition Sound. A drop down list of sounds will appear. We chose Chime for our Slide 1 Transition.

Notice at the bottom of the "list" it indicates Other Sound.... When we found the bat sound on Microsoft Office Online, it placed the sound in our Clip Art Organizer. To use this sound we had to choose Other Sound. When we did, it was added to our list at the top.

As you get more comfortable with sounds, you can find some really neat sounds all over the internet. (Fig 25)

Fig 25



Creating a Simple Presentation

Objective: At the end of this exercise you shall be able to

- **create simple project for India tourism.**

TASK 1 : Simple project for india tourism

- 1 Create slide show for India Tourism, At least for 5 major cities.
- 2 slide show should cover Description page , Images page and transport facilities page for each place.

© NIMI
NOT TO BE REPUBLISHED

Geo-Informatics Assistant - Image Editing Using Photoshop

Practice on Various Tools - Brush Tool. Pencil & Eraser Tools, the Red Eye Tool

Objective: At the end of this exercise you shall be able to

- to practice on various tool-Brush Tool. Pencil & Eraser Tools, The Red Eye.

Requirements

Tools/Equipments/Instruments

- Brush tool
- Pencil tool
- Eraser tool

- Red-eye tool
- Web graphics
- Personal Computer
- Windows Operating system

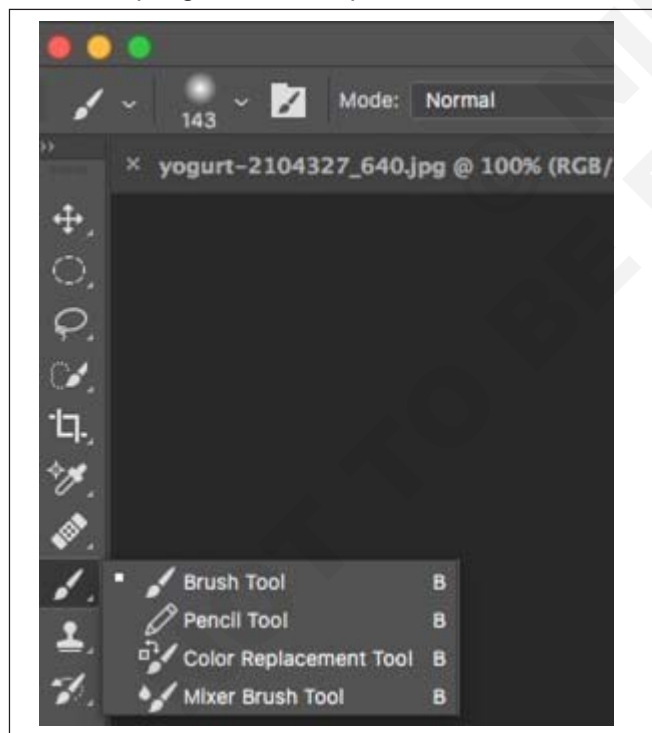
PROCEDURE

How To Use the Brush Tool in Photoshop?

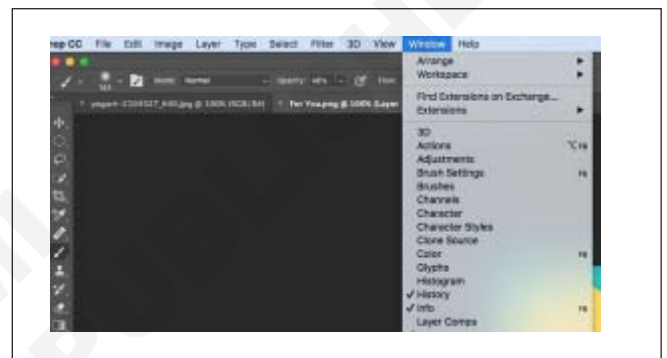
It's easy to use, and is extremely versatile for drawing, designing, creating textures and patterns, and changing or adding colours in your images. A wide array of brushes is available and the customization options are endless.

The Brush Tool in Photoshop

You can find the brush tool in the toolbar. It's the 8th tool from the top, right above the pencil tool.



- If you can't locate the toolbar, go to "Windows" in the menu, and make sure "Tools" is checked.
- The quick command for the brush tool is "B" on the keyboard. You can always find the shortcut key by viewing the letter to the right of each tool.
- The best way to learn is to follow along while I teach you how to use the brush tool.



- Open an image you'd like to edit.
- Below is the image I'll be working on. I want the white sneakers to be purple instead of white.

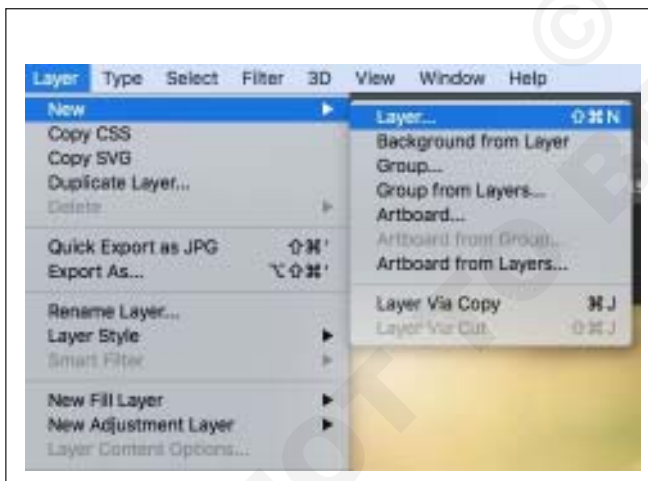
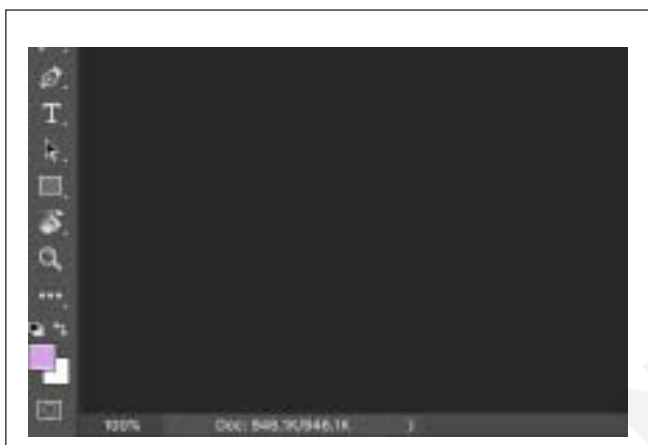


- Hit "Shift" + "B" to bring up the brush tool. First, I need to change the foreground colour in the "Color Picker" to the exact shade I want. Press "OK" after you've selected your color:

Below, you can see how the color changed in the color picker. Instead of the foreground color being black, it's now lavender. I didn't want the shoes to be too bright so I chose a light shade of purple:

Create a new layer by going to "Layer" in the top menu, then "New" and "Layer." Alternatively, you can hit "Command" or "Control" + "N" on your keyboard. You can

see this quick command to the right of "Layer." Making edits on a new layer will preserve your original image.



Working on your new layer, go to the paintbrush icon above the toolbox. Right next to it you'll see a dropdown menu where you can customize the brush controls. Play around with the size and hardness of your brush.

You can also customize your brushes by going to the "Brush Settings" to the right of your image. There are a variety of options you can configure.

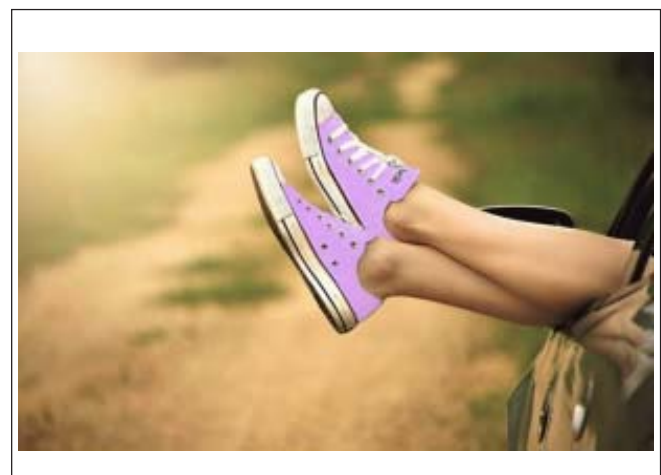
If you go to the top of the dashboard, you'll see a number of controls you can customize to get your brush just how you like it. I typically keep the "Mode" at "Normal," but it will depend on your image, and what you're trying to create.



Opacity is a measure of the transparency of your brush, while the flow determines how much paint your brush will deposit onto any given area. Play around with the "Opacity" and "Flow" to see how your brush behaves. I usually never have them at 100%. Again, it will depend on the look you're trying to achieve. I'll talk about "Smoothing" below.



You'll want to zoom in while you're editing to better control your brush. You may need to change the size and hardness of the brush when you zoom in. You can also change your brush altogether.



Eraser

- 1 Click on the Eraser tool.
- 2 Select the background color you would like to use in place of the existing background or layer with locked transparency.
- 3 Choose between brush, pencil, and block modes according to the effect you want. Brushes are round with soft edges, pencils look more like drawn lines, and blocks are squares with hard edges.
- 4 When using brush or pencil modes, you will need to set the opacity and flow in the options toolbar. Opacity refers to how completely you want to erase the pixels. For example, 100% opacity will completely erase, while lower numbers only partially erase pixels.
- 5 Hold down the cursor and drag it across the areas you want to erase.

The Eraser tool is essentially a brush. You can change the size, hardness and spacing, just like any other brush. It's also possible for you to change the mode from Brush to Pencil or Block. Instead of painting on the pixels of your image, however, the Eraser deletes the unwanted pixels. Those pixels are now permanently erased and can only be brought back to life through "Undo".

It will look like you're actually painting with the background color even though you think you're erasing, unless you remove the lock on the background layer. Remove the lock on your layer so that you can hide it and then you can see the checker pattern underneath. In the image below, I haven't unlocked the layer, so we're seeing white where we're expecting to see the checker pattern.

Now that I've unlocked the layer (by double clicking on it) I can go back and use the eraser to get to the checker pattern.

Also, if you've duplicated the layer you're working on, make sure you've hidden the duplicate layer as well or you won't see the effect of the Eraser. The hot key for the Eraser tool is "E".

Background Eraser

- 1 Go to the Layers panel and choose the layer that contains the areas you want to erase.
- 2 Hold down the Eraser tool and choose Background Eraser when the menu pops up.
- 3 Choose a brush and adjust settings for size, hardness, angle, roundness, and spacing.
- 4 Choose a Limits mode
 - Discontiguous erases sampled color wherever it appears beneath the brush.
 - Contiguous erases sampled color in areas that are connected.
 - Find Edges erases connected areas that contain the sample color and preserves the shape of edges.

- 5 Select Tolerance level by dragging the slider. High tolerance will erase a wider range of colors than low tolerance, which looks for colors very close to the sample color.
- 6 Select Protect Foreground Color to help you avoid erasing the foreground colors by mistake.
- 7 Choose a Sampling Option
 - The Continuous option will sample colors the entire time you are dragging the eraser tool.
 - Once will erase only the color you click on first.
 - Background Swatch will erase any areas containing the background color.

The Background Eraser tool is different from the Eraser tool. As soon as you click, the tool and cursor will change to a circle with a + in the middle. By default, the way the Background Eraser tool works is by sampling the color that's directly under the + in the center of the circle. So Photoshop will erase all of that color that falls within the larger circle. Even if the circle extends to a part of the image where you don't want to erase, Photoshop won't erase it unless the little + touches the different color. In the image below, I've accidentally run over the puppy with the + with the Background Eraser. If the + gets to the puppy, it will erase him since it's constantly sampling the pixels and colors.

Notice how it's erasing pretty well around his ears before the mishap. Remember, since I've been clicking and dragging for what's erased in the image, all that has been erased is only one action. To undo the mistake at the top of the puppy's head I'll have to undo everything I've done so far.

Background Eraser Options

The first option is to change the size of the "brush".

The second option (that starts with two eyedroppers with a gradient below) lets you choose if you want the Background Eraser to work continuously, once, or through a swatch.

- Continuous is what was used in with the picture of the puppy. The continuous option works really well when you're trying to erase a multi-colored background.
- Once will erase the color that you tell it to by clicking. Wherever the + is when you've clicked is the color that Photoshop has saved and knows to erase when you start moving the circle around the image.
- The Background swatch option lets you assign a Background color swatch in the Tools palette and then the Background Eraser will only erase that color.

The next section is Limits, which has three options, Contiguous, Discontiguous and Find Edges.

- Contiguous will only erase pixels that are touching the pixel under the +. If you need to erase something that has barriers, like hair or branches, the Contiguous option can be frustrating.

- The Discontiguous setting will erase any pixels that match the color you're erasing even if they're not in the same area as the +.
- Find Edges works like it sounds it does, it erases up to edges that it finds.
- Tolerance is the next section in the Background Eraser options. All that means is the higher the Tolerance setting, the more variations of the sampled color Photoshop will erase. If your background color is similar to what you don't want to erase then you'll need to have a low Tolerance. It's a good practice to start lower and work your way up anyway.
- Protect Foreground Color lets you select the Foreground color in the Tools palette and then Photoshop will protect that color when you're erasing. If what you're trying to protect is similar to the background, but just a few shades different, then the Protect Foreground Color checkbox should be checked.

Magic Eraser

- 1 Select the Magic Eraser tool in the toolbar.
- 2 Choose a Tolerance value. High tolerance erases a large number of colors and low tolerance erases colors similar to the one you've chosen.
- 3 Select Anti-Aliased for smooth edges.
- 4 Select or deselect Contiguous, depending on whether you want to erase just connecting pixels or all similar pixels.
- 5 Choose Sample All Layers to view a sample of the erased color from visible layers.
- 6 Choose and set Opacity.
- 7 Click the part of the layer you want to be erased.

The Magic Eraser tool works similarly to the Magic Wand tool in that it selects a larger area based around contrast in pixels. Actually, the Magic Eraser works exactly the same way as the Magic Wand tool and then hitting delete. Using the Magic Eraser seems easy enough. All you need to do is click where you want to remove something and Photoshop will remove all the pixels in that area that

are the color of what you've clicked.

In the image above, I've clicked the mouse once on the red background while using the Magic Eraser and this is the result. Notice how it's a choppy selection and still leaves a slight red border around the mug. The image below is an unaltered version of the coffee mug, just so you can see all the red that Photoshop didn't remove.

Something to note is that you can't use the Eraser tool on Smart Object unless the image is converted to raster.

The Red-Eye Tool

If you absolutely must use flash, though, Photoshop and most other major image editing apps have a dedicated Red Eye Tool. It's the simplest way to fix red eye.

Open the image you want to edit in Photoshop, and duplicate the background to a new layer by pressing Control+J on your keyboard (or Command+J on a Mac). You should never modify the pixels in the original image or on the background layer in Photoshop.

Select the Red Eye Tool from the sidebar. It's in the same stack as the other healing tools, so click and hold on the healing tools icon to reveal it in the fly-out or cycle to it using the keyboard shortcut Shift+J.

Leave Pupil Size and Darken Amount set to their default value of 50%; it works for almost every image.

There are two ways to use the Red Eye Tool. The first is to just click on the red pupil and let Photoshop auto-select the affected area. This is the way I prefer to use it.

Depending on the colors in your photo, you might want a bit more control. To tell Photoshop exactly where the problem area is, click and drag a box around the subject's eye with the Red Eye Tool. This will limit the tool to just the area you've selected.

To fully remove red eye from your image, you may need to use a combination of both methods, or use one of them more than once. Just keep applying them until the red eye is gone.

Back in the days of film, red eye could ruin an otherwise great photo. Now, thanks to powerful digital image editors like Photoshop, that just isn't the case. It's simple to fix even the worst red eye with a single click.

Zooming and Planning an Image, Working with Multiple Images, Rulers, Guides and Grids, Undoing Steps with History, Adjusting Colour with the New Adjustment Panel, the Image Size Commands

Objective: At the end of this exercise you shall be able to

- to zoom and plan an image and work out with multiple images, rulers, guides and grides, undoing steps with history, adjusting colour with the new adjustment panel, the image size commands.

Requirements

Tools/Equipments/Instruments

- Zoom tool
- Zoom in tool
- Zoom out tool
- Mac OS

- Brush tool
- Rectangular Mar queue tool
- Hand tool
- Photoshop cc 20.0

PROCEDURE

Photoshop Zoom Shortcuts

So, now you know a whole range of ways in which you can zoom in on, or out of, images, and pan or scroll across your documents. But how can you implement these methods in the most efficient way.

As we mentioned earlier, keyboard shortcuts are often highly effective at maximising the efficiency of your workflow. So, below is a list of all the keyboard shortcuts involved in the processes of zooming and panning in Photoshop:

- **Ctrl + + = Zoom In** Photoshop will zoom in by a specific amount each time this is used, working through the zoom levels of 25%, 33.3%, 50%, 66.7%, 100% etc.
- **Ctrl + - = Zoom Out** Photoshop will zoom out by a specific amount each time this is used.
- **Z = Zoom Tool** Photoshop will make the Zoom Tool active. The tool is represented by a magnifying glass icon in the toolbar.
- **Alt [Win] / Option [Mac] + Zoom Tool = Zoom Out** Pressing and holding the Alt [Win] / Option [Mac] key whilst the Zoom Tool is active will cause the tool to let you zoom out rather than only allowing for the default zoom in.
- **Ctrl + Spacebar [Win] / Cmd + Spacebar [Mac] = Temporarily Switch to the Zoom Tool** This shortcut will let you temporarily switch to the Zoom Tool on 'Zoom In' mode until the keys are released.
- **Ctrl + Alt + Spacebar [Win] / Cmd + Option + Spacebar [Mac] = Temporarily Switch to the Zoom Tool on 'Zoom Out' Mode** This shortcut lets you switch temporarily to the 'Zoom Out' mode of the Zoom Tool until the keys are released.

- **Alt [Win] / Option [Mac] + Scroll Up = Zoom In** This causes Photoshop to zoom into the area over which your cursor is hovering.
- **Alt [Win] / Option [Mac] + Scroll Down = Zoom Out** This shortcut causes Photoshop to zoom out from the point that your cursor is hovering over.

View images in multiple windows

The document window is where your images appear. You can open multiple windows to display different images or different views of the same one. A list of open windows appears in the Window menu. To bring an open image to the front, choose the file name from the bottom of the Window menu. Available memory may limit the number of windows per image.

- 1 Choose Window > Arrange > New Window For [Image File Name].
- 2 If you want to arrange the windows, choose Window > Arrange and then choose one of the following:

Cascade

Displays undocked windows stacked and cascading from the upper-left to the lower right of the screen.

Tile

Displays windows edge to edge. As you close images, the open windows are resized to fill the available space.

Float in Window

Allows image to float freely.

Float All in Windows

Floats all images.

Consolidate All to Tabs

Shows one image in full screen and minimizes the other images to tabs.

Match only zoom

- 1 Open one or more images, or open one image in multiple windows.
- 2 Choose Window > Arrange > Tile to display the images edge to edge.
- 3 Select the Zoom tool, and then do one of the following:
 - Select Zoom All Windows in the options bar, and then click one of the images. The other images zoom in or out the same relative amount.
 - Choose Window > Arrange > Match Zoom. Hold down the Shift key and click one of the images. The other images zoom in or out at the same magnification.

Match only location

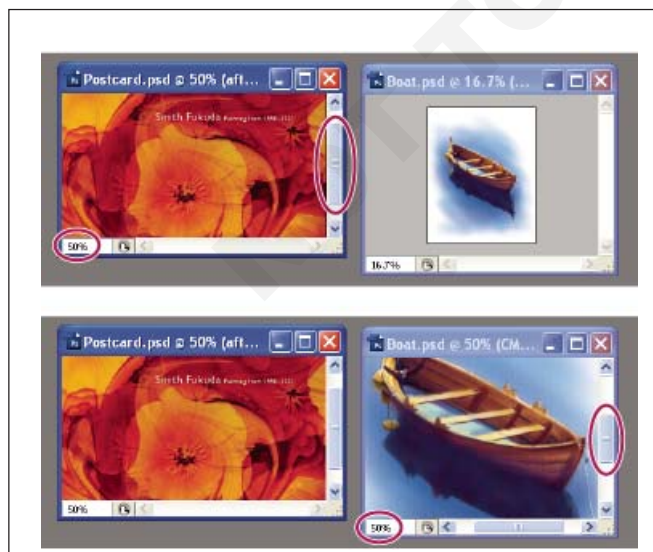
- 1 Open one or more images, or open one image in multiple windows.
- 2 Choose Window > Arrange > Tile.
- 3 Do either of the following:
 - Choose Window > Arrange > Match Location.
 - Select the Hand tool, select Scroll All Windows in the options bar, and then drag to view another area in one of the images. (To temporarily enable this option, hold down the Shift key while dragging with the Hand tool.)

Note

Photoshop automatically scrolls to the same relative location on the horizontal and vertical axes. You may need to manually scroll to reveal the edges of images.

Match zoom and location

- 1 Open one or more images, or open one image in multiple windows.
- 2 Choose Window > Arrange > Tile.
- 3 Choose Window > Arrange > Match All.



Without Match All command (top), and with Match All command (bottom) selected

- 4 Select the Zoom tool or the Hand tool.

- 5 Select one of the images, hold down the Shift key, and click in or drag an area of an image. The other images are magnified to the same percentage and snap to the area you clicked.

About rulers

Rulers help you position images or elements precisely. When visible, rulers appear along the top and left side of the active window. Markers in the ruler display the pointer's position when you move it. Changing the ruler origin (the (0, 0) mark on the top and left rulers) lets you measure from a specific point on the image. The ruler origin also determines the grid's point of origin.

To show or hide rulers, choose View > Rulers.

Change a ruler's zero origin

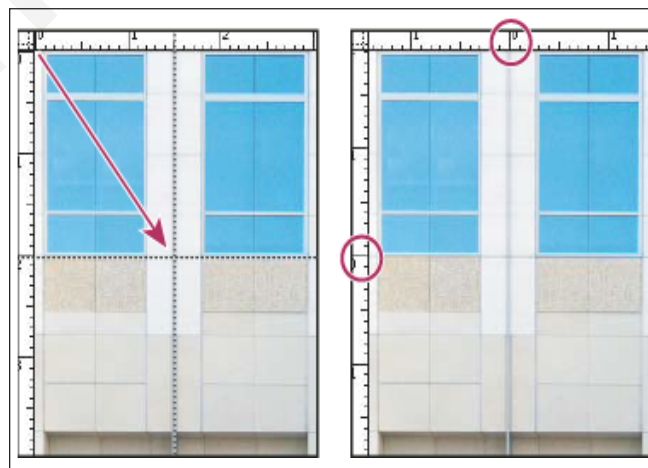
- 1 (Optional) Choose View > Snap To, then choose any combination of options from the submenu. This snaps the ruler origin to guides, slices, or document bounds. You can also snap to the grid.
- 2 Position the pointer over the intersection of the rulers in the upper-left corner of the window, and drag diagonally down onto the image. A set of cross hairs appears, marking the new origin on the rulers.

Note

You can hold down Shift as you drag to make the ruler origin snap to the ruler ticks.

To reset a ruler's origin to its default value, double-click the upper-left corner of the ruler.

Dragging to create new ruler origin



Change the unit of measurement

- 1 Do one of the following:
 - Double-click a ruler.
 - (Windows) Choose Edit > Preferences > Units & Rulers, or right-click the ruler and then choose a new unit from the context menu.
 - (Mac OS) Choose Photoshop > Preferences > Units & Rulers, or Control-click the ruler and then choose a new unit from the context menu.

- 2 For Rulers, choose a unit of measurement.

Note

Changing the units on the Info panel automatically changes the units on the rulers.

- 3 For Point/Pica Size, choose from the following options:

PostScript (72 points per inch)

Sets a unit size compatible for printing to a PostScript device.

Traditional

Uses 72.27 points per inch, as traditionally used in printing.

- 4 Click OK.

More like this

Position with guides and the grid

Guides and the grid help you position images or elements precisely. Guides appear as nonprinting lines that float over the image. You can move and remove guides. You can also lock them so that you don't move them by accident.

Smart Guides help you align shapes, slices, and selections. They appear automatically when you draw a shape or create a selection or slide. You can hide **Smart Guides** if you need to.

The grid is useful for laying out elements symmetrically. The grid appears by default as nonprinting lines but can also be displayed as dots.

Guides and grids behave in similar ways:

- Selections, selection borders, and tools snap to a guide or the grid when dragged within 8 screen (not image) pixels. Guides also snap to the grid when moved. You can turn this feature on and off.
- Guide spacing, along with guide and grid visibility and snapping, is specific to an image.
- Grid spacing, along with guide and grid color and style, is the same for all images.

Show or hide a grid, guides, or Smart Guides

- 1 Do one of the following:
 - Choose **View > Show > Grid**.
 - Choose **View > Show > Guides**.
 - Choose **View > Show > Smart Guides**.
 - Choose **View > Extras**. This command also shows or hides layer edges, selection edges, target paths, and slices.

Place a guide

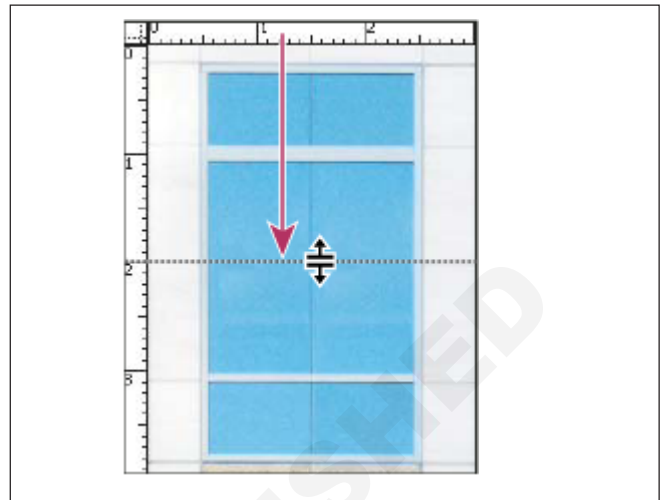
- 1 If the rulers are not visible, choose View > Rulers.

Note

For the most accurate readings, view the image at 100% magnification or use the Info panel.

- 2 Do one of the following to create a guide:

- Choose View > New Guide. In the dialog box, select Horizontal or Vertical orientation, enter a position, and click OK.
- Drag from the horizontal ruler to create a horizontal guide.



Dragging to create a horizontal guide

- Hold down Alt (Windows) or Option (Mac OS), and drag from the vertical ruler to create a horizontal guide.
 - Drag from the vertical ruler to create a vertical guide.
 - Hold down Alt (Windows) or Option (Mac OS), and drag from the horizontal ruler to create a vertical guide.
 - Hold down Shift and drag from the horizontal or vertical ruler to create a guide that snaps to the ruler ticks. The pointer changes to a double-headed arrow when you drag a guide.
- 3 (Optional) If you want to lock all guides, choose View > Lock Guides.

Move a guide

- 1 Select the Move tool , or hold down Ctrl (Windows) or Command (Mac OS) to activate the Move tool.
- 2 Position the pointer over the guide (the pointer turns into a double-headed arrow).
- 3 Move the guide in any of the following ways:
 - Drag the guide to move it.
 - Change the guide from horizontal to vertical, or vice versa, by holding down Alt (Windows) or Option (Mac OS) as you click or drag the guide.
 - Align the guide with the ruler ticks by holding down Shift as you drag the guide. The guide snaps to the grid if the grid is visible and View > Snap To > Grid is selected.

Remove guides from the image

- 1 Do one of the following:
 - To remove a single guide, drag the guide outside the image window.
 - To remove all guides, choose View > Clear Guides.

Set guide and grid preferences

- 1 Do one of the following:
 - (Windows) Choose **Edit > Preferences > Guides, Grid, & Slices**.
 - (Mac OS) Choose **Photoshop > Preferences > Guides, Grid, & Slices**.
- 2 For **Color**, choose a color for the guides, the grid, or both. If you choose Custom, click the color box, choose a color, and click **OK**.
- 3 For **Style**, choose a display option for guides or the grid, or both.
- 4 For Gridline Every, enter a value for the grid spacing. For Subdivisions, enter a value by which to subdivide the grid.

If desired, change the units for this option. The Percent option creates a grid that divides the image into even sections. For example, choosing 25 for the Percent option creates an evenly divided 4 by 4 grid.

- 5 Click **OK**.

Use the Undo or Redo commands

Updated in Photoshop CC 20.0 (October 2018 release)

Beginning with the October 2018 release of Photoshop CC (20.0), you can undo multiple steps in your Photoshop document using Control + Z (Win) / Command + Z (Mac). This new multiple undo mode is enabled by default.

To perform undo or redo operation, do the following:

- **Undo:** Moves one step back in the undo chain. Choose **Edit > Undo** or use the keyboard shortcut Control + Z (Win) / Command + Z (Mac).
- **Redo:** Moves one step forward. Choose Edit > Redo or use the keyboard shortcut Shift + Control + Z (Win) / Shift + Command + Z (Mac).

The Edit menu also displays the name of the step that will be undone next to the Undo and Redo commands. For example, **Edit > Undo Edit Type**.

How do I switch back to the legacy undo shortcuts?

Revert to the last saved version

- 1 Choose File > Revert.

Note

Revert is added as a history state in the History panel and can be undone.

Restore part of an image to its previously saved version

- 1 Do one of the following:

- Use the History Brush tool to paint with the selected state or snapshot on the History panel.
- Use the Eraser tool with the Erase To History option selected.
- Select the area you want to restore, and choose Edit > Fill. For Use, choose History, and click **OK**.

Note

To restore the image with a snapshot of the initial state of the document, choose History Options from the Panel menu and make sure that the Automatically Create First Snapshot option is selected.

Cancel an operation

- 1 Hold down Esc until the operation in progress has stopped. In Mac OS, you can also press Command + period.

Receive notification when an operation is completed

A progress bar indicates that an operation is being performed. You can interrupt the operation or have the program notify you when it has finished the operation.

- 1 Do one of the following: Choose Edit > Preferences > General (Windows) or Photoshop > Preferences > General (Mac OS).
- 2 Select Beep When Done.
- 3 Click **OK**.

Adjusting image color and tone with adjustment layers

- 1 In the Adjustments panel, click the tool icon for the adjustment you want to make:
 - For tonality and color, click Levels or Curves.
 - For adjusting color, click Color Balance or Hue/Saturation.
 - For converting a color image to black and white, click Black & White.
- 2 In the Properties panel, adjust the adjustment layer tool settings.

Adjusting image color and tone in Camera Raw

- 1 Choose File > Open.
- 2 In the Open window, select one or more camera raw files, TIFFs, or JPEGs, and then choose Camera Raw from the Format menu.
- 3 Click **Open**.
- 4 Use the controls in Adobe Camera Raw to adjust the settings. You can use the Adjustment brush to apply edits to specific areas of the image. For more information, see Make color and tonal adjustments in Camera Raw.

Note

You can set preferences to always open JPEGs and TIFFs in Camera Raw.

Tip: For tips on setting your JPGs to open in Adobe Camera Raw, see this tutorial video by Terry White.

Enable editing of JPEGs and TIFFs in Camera Raw

- 1 Choose (Windows) Edit > Preferences > Camera Raw or (Mac OS) Photoshop > Preferences > Camera Raw.
- 2 In the JPEG and TIFF Handling section of the Camera Raw Preferences dialog box, do any of the following:
 - In the JPEG menu, choose Automatically Open All Supported JPEGs.
 - In the TIFF menu, choose Automatically Open All Supported TIFFs from the TIFF menu.
- 1
 - magnification. After clicking, the percentage of magnification briefly appears near the bottom of the preview image.
- 2 To change the unit of measurement for the pixel dimension, click the triangle next to Dimensions and choose from the menu.
- 3 To maintain the original ratio of width to height measurement, make sure that the Constrain Proportions option is enabled. If you want to scale the width and height independently of each other, click the Constrain Proportions icon to unlink them.

Note

You can change the unit of measurement for width and height by choosing from the menus to the right of the Width and Height text boxes.

- 4 Do any of the following:
 - To change the image size or resolution and allow the total number of pixels to adjust proportionately, make sure that Resample is selected, and if necessary, choose an interpolation method from the Resample menu.
 - To change the image size or resolution without changing the total number of pixels in the image, deselect Resample.
- 5 (Optional) From the Fit To menu:
 - Choose a preset to resize the image.
 - Choose Auto Resolution to resize the image for a specific printing output. In the Auto Resolution dialog box, specify the Screen value and select a Quality. You can change the unit of measurement by choosing from the menu to the right of the Screen text box.
- 6 Enter values for Width and Height. To enter values in a different unit of measurement, choose from the menus next to the Width and Height text boxes.

The new image file size appears at the top of the Image Size dialog box, with the old file size in parentheses.
- 7 To change the Resolution, enter a new value. (Optional) You can also choose a different unit of measurement.
- 8 If your image has layers with styles applied to them, select Scale Styles from the gear icon to scale the effects in the resized image. This option is available only if you selected the Constrain Proportions option.
- 9 When you finish setting options, click OK.

Cropping and Straightening an Image, Adjusting Canvas Size and Canvas Rotation, Selecting with the Elliptical Mar Queue Tool, Using the Magic Wand and Free Transformation Tool, Selecting with the Regular and Polygonal Lasso Tools

Objective: At the end of this exercise you shall be able to

- to Cropping and straightening an image, adjusting canvas size and canvas rotation, selecting with the elliptical mar queue tool, using the magic wand and free transformation tool, selecting with the regular and polygonal lasso tools.

Requirements

Tools/Equipments/Instruments

- Crop tool
- Ruler tool
- Mac OS

- Mar queue tool
- Magic wand tool
- Personal computer

PROCEDURE

Crop an image using the Crop command

- 1 Use a selection tool to select the part of the image you want to keep.
- 2 Choose Image > Crop.

Crop an image using the Trim command

The Trim command crops an image by removing unwanted image data in different ways than the Crop command. You can crop an image by trimming surrounding transparent pixels, or background pixels of the color you specify.

- 1 Choose Image > Trim.
- 2 In the Trim dialog box, select an option:
 - Transparent Pixels to trim away transparency at the edges of the image, leaving the smallest image containing nontransparent pixels.
 - Top Left Pixel Color to remove an area the color of the upper-left pixel from the image.
 - Bottom Right Pixel Color to remove an area the color of the lower right pixel from the image.
- 3 Select one or more areas of the image to trim away: Top, Bottom, Left, or Right.

Crop and straighten scanned photos

You can place several photos on your scanner and scan them in one pass, which creates a single image file. The Crop and Straighten Photos command is an automated feature that can create separate image files from the multiple-image scan.

For best results, keep 1/8 inch between the images in your scan, and the background (typically the scanner

bed) should be a uniform color with little noise. The Crop and Straighten Photos command works best on images with clearly delineated outlines. If the Crop and Straighten Photos command cannot properly process the image file, use the Crop tool.

- 1 Open the scanned file that contains the images you want to separate.
- 2 Select the layer that contains the images.
- 3 (Optional) Draw a selection around the images you want to process.
- 4 Choose File > Automate > Crop And Straighten Photos. The scanned images are processed, and then each image opens in its own window.

Straighten an image

The Ruler tool provides a Straighten option that quickly aligns images with horizon lines, building walls, and other key elements.

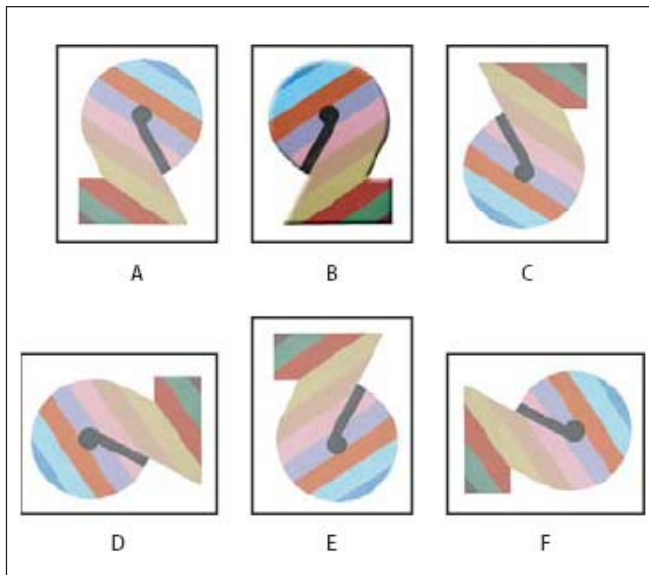
- 1 Select the Ruler tool . (If necessary, click and hold the Eyedropper tool to reveal the Ruler.)
- 2 In the image, drag across a key horizontal or vertical element.
- 3 In the options bar, click Straighten.

Photoshop straightens the image and automatically crops it. To reveal image areas that extend beyond the new document boundaries, choose Edit > Undo.

Note

To entirely avoid automatic cropping, hold down Alt (Windows) or Option (Mac OS) when you click Straighten.

Rotate or flip an entire image



Rotating images

A. Flip Horizontal **B.** Original image **C.** Flip Vertical
D. Rotate 90° CCW **E.** Rotate 180° **F.** Rotate 90° CW

1 Choose Image > Image Rotation, and choose one of the following commands from the submenu:

180°

Rotates the image by a half-turn.

90° CW

Rotates the image clockwise by a quarter-turn.

90° CCW

Rotates the image counterclockwise by a quarter-turn.

Arbitrary

Rotates the image by the angle you specify. If you choose this option, enter an angle between -359.99 and 359.99 in the angle text box. (In Photoshop, you can select °CW or °CCW to rotate clockwise or counterclockwise.) Then click OK.

Flip Canvas Horizontal or Vertical

Flips the image along the corresponding axis.

Change the canvas size

1 Choose Image > Canvas Size.

2 Do one of the following:

- Enter the dimensions for the canvas in the Width and Height boxes. Choose the units of measurement you want from the pop up menus next to the Width and Height boxes.
- Select Relative, and enter the amount you want to add or subtract from the image's current canvas size. Enter a positive number to add to the canvas, and enter a negative number to subtract from the canvas.

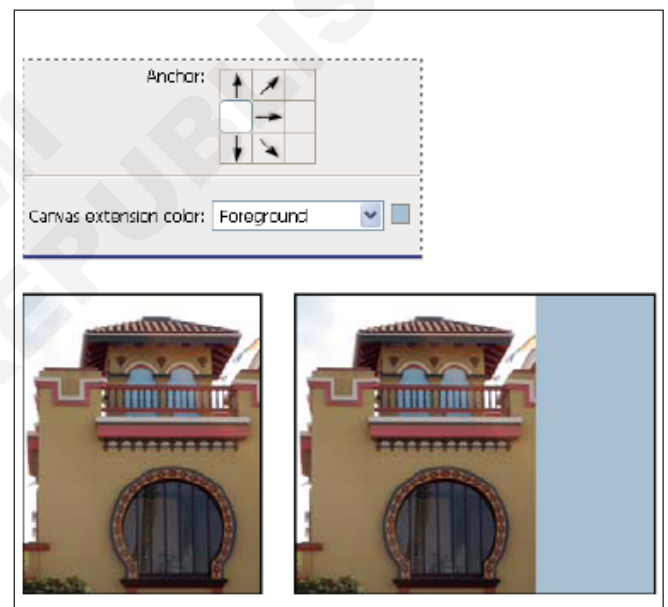
- 3 For Anchor, click a square to indicate where to position the existing image on the new canvas.
- 4 Choose an option from the Canvas Extension Color menu:
 - Foreground to fill the new canvas with the current foreground color
 - Background to fill the new canvas with the current background color
 - White, Black, or Gray to fill the new canvas with that color
 - Other to select a new canvas color using the Color Picker

Note

You can also click the white square to the right of the Canvas Extension Color menu to open the Color Picker.

The Canvas Extension Color menu isn't available if an image doesn't contain a background layer.

5 Click OK.



Original canvas, and canvas added to right side of image using the foreground color

Make a frame by increasing the canvas size

The marquee tools let you select rectangles, ellipses, and 1 pixel rows and columns.

1 Select a marquee tool:

Rectangular Marquee

Makes a rectangular selection (or a square, when used with the Shift key).

Elliptical Marquee

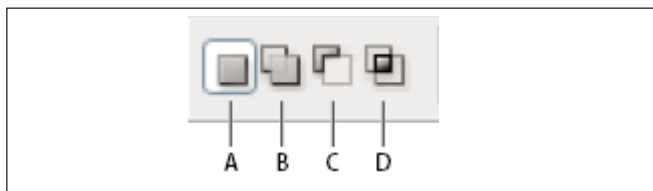
Makes an elliptical selection (or a circle, when used with the Shift key).

Single Row or Single Column Marquee

Defines the border as a 1 pixel wide row or column.

2 Specify one of the selection options in the options bar.

Selection options



A. New B. Add To C. Subtract From D. Intersect With

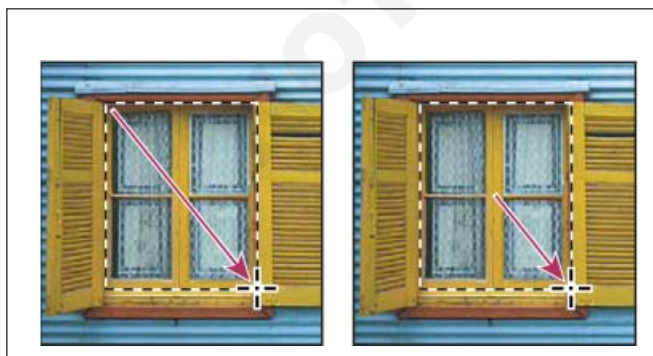
- 3 Specify a feathering setting in the options bar. Turn anti-aliasing on or off for the Elliptical Marquee tool. See Soften the edges of selections.
- 4 For the Rectangular Marquee tool or the Elliptical Marquee tool, choose a style in the options bar:

Note

In addition to pixels (px) you can also use specific units such as inches (in) or centimeters (cm) in height and width values.

- 5 For aligning your selection to guides, a grid, slices, or document bounds, do one of the following to snap your selection:
 - Choose View > Snap, or choose View > Snap To and choose a command from the submenu. The marquee selection can snap to a document boundary or to a variety of Photoshop Extras, controlled in the Snap To submenu.
- 6 Do one of the following to make a selection:
 - With the Rectangular Marquee tool or the Elliptical Marquee tool, drag over the area you want to select.
 - Hold down Shift as you drag to constrain the marquee to a square or circle (release the mouse button before you release Shift to keep the selection shape constrained).
 - To drag a marquee from its center, hold down Alt (Windows) or Option (Mac OS) after you begin dragging.

Dragging a marquee from the corner of an image (left), and from the center of an image (right) by pressing Alt/Option as you drag.



- With the Single Row or Single Column Marquee tool, click near the area you want to select, and then drag the marquee to the exact location. If no

marquee is visible, increase the magnification of your image view.

Note

To reposition a rectangular or elliptical marquee, first drag to create the selection border, keeping the mouse button depressed. Then hold down the spacebar and continue to drag. Release the spacebar, but keep the mouse button depressed, if you need to continue adjusting the selection border.

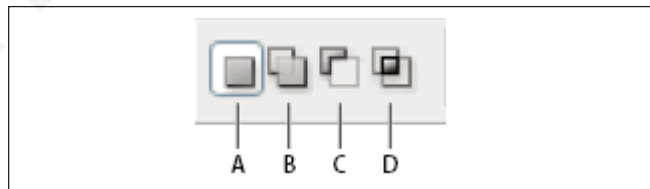
Introduction to Magic Wand Tool in Photoshop

Magic wand tool is very useful features found in Adobe Photoshop that like magic selects the part of an image autonomously based on the tone and color and furthermore, it can also fine-tune the image edges adjusting certain parameters like tolerance, once done correctly the magic wand tool can precisely select the pixels in your image that otherwise would have been extremely difficult and time-consuming to extract using manual effort as magic wand tool can identify and accurately select complex and large pixels based on tone and color within seconds so that you can use the part and replace it with any other image.

Select with the Lasso tool

The Lasso tool is useful for drawing freeform segments of a selection border.

- 1 Select the Lasso tool , and set feathering and anti-aliasing in the options bar. (See Soften the edges of selections.)
- 2 To add to, subtract from, or intersect with an existing selection, click the corresponding button in the options bar.



Selection options

A. New B. Add To C. Subtract From D. Intersect With

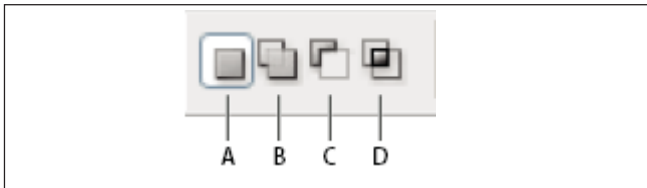
- 3 Do either of the following:
 - Drag to draw a freehand selection border.
 - To switch between freehand and straight-edged segments, press Alt (Windows) or Option (Mac OS), and click where segments should begin and end. (To erase recently drawn straight segments, hold down the Delete key.)
- 4 To close the selection border, release the mouse without holding down Alt or Option.
- 5 (Optional) Click Select and Mask to further adjust the selection boundary.

Select with the Polygonal Lasso tool

The Polygonal Lasso tool is useful for drawing straight-edged segments of a selection border.

- 1 Select the Polygonal Lasso tool , and select options.
- 2 Specify one of the selection options in the options bar.

Selection options



- A. New B. Add To C. Subtract From D. Intersect With**
- 3 (Optional) Set feathering and anti-aliasing in the options bar. See Soften the edges of selections.
 - 4 Click in the image to set the starting point.
 - 5 Do one or more of the following:
 - To draw a straight segment, position the pointer where you want the first straight segment to end, and click. Continue clicking to set endpoints for subsequent segments.
 - To draw a straight line at a multiple of 45°, hold down Shift as you move to click the next segment.
 - To draw a freehand segment, hold down Alt (Windows) or Option (Mac OS), and drag. When you finish, release Alt or Option and the mouse button.
 - To erase recently drawn straight segments, press the Delete key.
 - 6 Close the selection border:
 - Position the Polygonal Lasso tool pointer over the starting point (a closed circle appears next to the pointer), and click.
 - If the pointer is not over the starting point, double-click the Polygonal Lasso tool pointer, or Ctrl-click (Windows) or Command-click (Mac OS).
 - 7 (Optional) Click Select and Mask to further adjust the selection boundary.

Select with the Magnetic Lasso tool

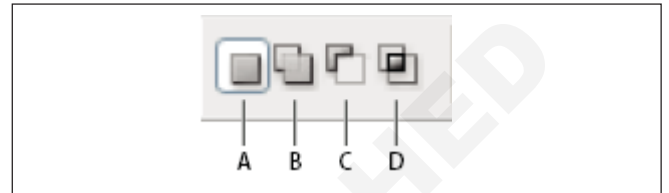
When you use the Magnetic Lasso tool , the border snaps to the edges of defined areas in the image. The Magnetic Lasso tool is not available for 32 bits-per-channel images.

Note

The Magnetic Lasso tool is especially useful for quickly selecting objects with complex edges set against high-contrast backgrounds.

- 1 Select the Magnetic Lasso tool.
- 2 Specify one of the selection options in the options bar.

Selection options



- A. New B. Add To C. Subtract From D. Intersect With**
- 3 (Optional) Set feathering and anti-aliasing in the options bar. See Soften the edges of selections.
 - 4 Set any of these options:

Width

To specify a detection width, enter a pixel value for Width. The Magnetic Lasso tool detects edges only within the specified distance from the pointer.

Note

To change the lasso pointer so that it indicates the lasso width, press the Caps Lock key. You can change the pointer while the tool is selected but not in use. Press the right bracket (]) to increase the Magnetic Lasso edge width by 1 pixel; press the left bracket ([) to decrease the width by 1 pixel.

Using the Magnetic Lasso Tool, Using the Quick Selection Tools Refine Edge, Modifying Selections

Objective: At the end of this exercise you shall be able to

- to use the **Magnetic Lasso tool**, using the quick selection tools refine edge, Modifying selections.

Requirements

Tools/Equipments/Instruments

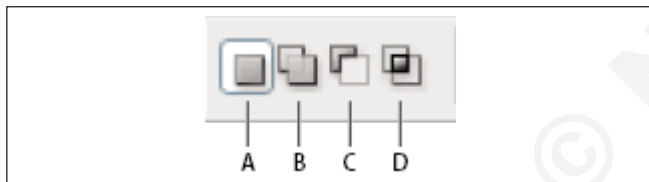
- Magnetic lasso tool
- Quick Selection tool
- Stylus tablet
- Mac OS
- PC

PROCEDURE

Select with the Magnetic Lasso tool

When you use the Magnetic Lasso tool, the border snaps to the edges of defined areas in the image. The Magnetic Lasso tool is not available for 32 bits-per-channel images.

- 1 Select the Magnetic Lasso tool.
- 2 Specify one of the selection options in the options bar.



Selection options

A. New **B.** Add To **C.** Subtract From **D.** Intersect With

- 3 (Optional) Set feathering and anti-aliasing in the options bar. See Soften the edges of selections.
- 4 Set any of these options:

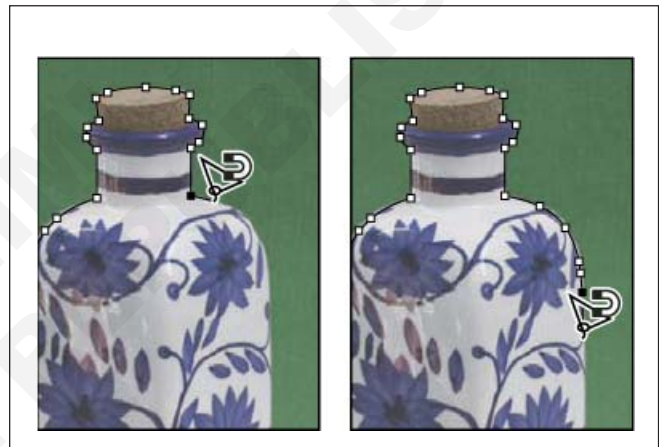
Stylus Pressure

If you are working with a stylus tablet, select or deselect the Stylus Pressure option. When the option is selected, an increase in stylus pressure decreases the edge width.

- 5 Click in the image to set the first fastening point. Fastening points anchor the selection border in place.
- 6 Release the mouse button or keep it pressed, and then move the pointer along the edge you want to trace.

The most recent segment of the selection border remains active. As you move the pointer, the active segment snaps to the strongest edge in the image, based on the detection width set in the options bar. Periodically, the Magnetic Lasso tool adds fastening points to the selection border to anchor previous segments.

- 7 If the border doesn't snap to the desired edge, click once to add a fastening point manually. Continue to trace the edge, and add fastening points as needed.



Fastening points anchor selection border to edges

- 8 To switch temporarily to the other lasso tools, do one of the following:
 - To activate the Lasso tool, hold down Alt (Windows) or Option (Mac OS), and drag while pressing the mouse button.
 - To activate the Polygonal Lasso tool, hold down Alt (Windows) or Option (Mac OS), and click.
- 9 To erase recently drawn segments and fastening points, press the Delete key until you've erased the fastening points for the desired segment.
- 10 Close the selection border:
 - To close the border with a magnetic segment, double-click, or press Enter or Return. (To manually close the border, drag over the starting point and click.)
 - To close the border with a straight segment, hold down Alt (Windows) or Option (Mac OS), and double-click.

11 (Optional) Click Select and Mask to further adjust the selection boundary.

Make selections

1 Cut Out Your Subject with the Quick Selection Tool

Resize your image to a manageable size to keep your computer working efficiently. I resize to between 2500-3000 pixels on the longest side if I'm practising or experimenting with an image.

There are a few different Photoshop selection tools, as we mentioned earlier. But this one is called 'quick' for a good reason.

Click on the Quick Selection tool and drag the cursor in a part of the area you want to select.

You'll see a line of 'marching ants' appear around the shape. Keep adding to it by continuing to drag the cursor within the area. It's okay if it's a bit rough in the beginning.

To deselect large areas, hold down the Alt (Windows) or Option (Mac) key as you drag the cursor around the area you want to remove.

The marching ants will disappear from that area.

2 Use a Layer Mask as Backup

It's best to work with layers to avoid permanently deleting your selection.

That means that you hide parts of your image, then reveal them using the brush tool at any time.

Duplicating a Layer

Unlock the Layer in the Layer menu at the lower right of your screen. Right-click on it and click Duplicate Layer. You'll see another layer appear.

Click on the eye icon on the bottom Layer to hide it (this hidden lower Layer is a back-up in case of Photoshop disasters).

Revealing Your Selection

At the top of your screen, click Layer>Layer Mask>Reveal Selection.

This is the 'aha!' moment when your background will disappear, showing the rough cut-out shape you've selected.

3 Select Tricky Areas with Select and Mask

Now, you must be wondering: How do I make quick selection tool more accurate?

At this point in the process, I tidy up my photograph using the Select and Mask tool. Click on the layer mask on the layer menu (that's the black and white shape outline box).

Click on Select and Mask at the top of your screen. If you can't see the button, make sure you've clicked on the Quick Selection tool button first.

Adjust the size, hardness, and spacing of the tool. Then slowly drag your cursor over the edges of the image.

My settings for the Select and Mask tool change depending on my selection. That's why it takes a bit of trial and error.

I find the Select and Mask tool fantastic for fluffy edges or hair. I use the Brush tool for harder lines (more about that shortly).

4 Create a Background That Fits

Using the Quick Selection tool effectively isn't much use if you don't have a background ready. Sometimes it's enough to create a simple neutral background in Photoshop.

If you're keen to use a different environment, you'll need to pay a little more attention to the process to make sure the final result is cohesive.

It would be best if the lighting in your background matches the selection. That way, it wouldn't look fake.

If your selection has cool lighting, then you'll need to look for a background with the same colour temperature as well.

Furthermore, you should pay attention to the direction of the light. If it's coming from the left side, then the lighting from your background should also be coming from the same direction.

And finally, the camera angle of your image should also match your selection.

You can't use a background shot from a 45-degree angle if your selection was shot at eye-level. Even a small difference in the perspective can throw people off and immediately recognise the image is artificial.

5 Apply the Brush Tool for a Seamless Result

It's pretty unusual for me to use the Quick Selection tool without using the Brush tool too.

When your selection is in their new environment, check to see if you need to do a final tidy up of the edges.

Click on the layer mask on the layer menu, then click on the Brush tool. Zoom in (ALT+, CMD+) and carefully check around the entire edge of your selection.

Carefully brush the cursor over areas that you want to reveal or hide.

Switch between the 'Foreground and Background Colours' to alternate between hiding and revealing parts of the photo.

Use Selection Tool on Photoshop to Make Local Adjustments

Of course, the selection feature on Photoshop isn't just about cutting out objects from photos. You can also use it to isolate objects to make adjustments in specific areas.

After you select the subject in your photo, all you have to do is open an Adjustment Layer.

Within the Adjustment Layer, you can choose the parameters you would like to adjust to fix your selection. It could be anything from White Balance to Hue/Saturation and Brightness/Contrast.

Remember that you don't need to cut out your selection at all if you only need to make local adjustments.

As soon as you pick an adjustment layer, Photoshop automatically turns your selection to a layer mask. That way, any adjustments you make only applies to that particular area.

If you choose Brightness/Contrast, you'll see your selection dim or brighten as you adjust the Brightness slider. But anything outside that selection will not change at all.

Now, what if your selection looks okay, but the rest of the photo needs some adjustment? Then you can right-click and choose Select inverse. Photoshop will then apply your changes to the rest of the picture but not to your selection.

Move a selection border

Moving a selection border repositions just the border without altering the photo.

- 1 Using any selection tool, click New Selection in the options bar, and position the pointer inside an existing selection border. The pointer changes to indicate that you can move the selection .

Note

The New Selection option appears in the options bar when any selection tool is selected-except the Selection Brush tool. Switch to another selection tool temporarily, if necessary, to select this option.

- 2 Do one of the following:

- Drag the border to enclose a different area of the photo. You can drag a selection border beyond the canvas boundaries; however, this makes it hard to get back. You can also drag the selection border to another image window.
- To move the selection in 1 pixel increments, use an arrow key.

- To move the selection in 10 pixel increments, hold down Shift, and use an arrow key.
- To constrain the direction to multiples of 45°, begin dragging, and then hold down Shift as you continue to drag.

Invert a selection

Inverting a selection changes the unselected areas into selected areas, protecting the area you previously selected.

- 1 In a photo with an existing selection border, choose Select > Inverse.

Note

You can use this command to easily select an object that appears against a solid-colored area. Select the solid color using the Magic Wand tool, and then choose Select > Inverse.

Add to or subtract from a selection

You can add to or subtract from an existing selection to fine-tune selection borders. For example, you could make a donut-shaped selection by first making a circular selection and then subtracting a circular selection within it.

- 1 Select a selection tool, and do one of the following:
 - Hold down Shift (a plus sign appears next to the pointer) to add to the selection, or hold down Alt (Option in Mac OS) to subtract (a minus sign appears next to the pointer) from a selection. Then select the area to add or subtract and make another selection.
 - Click Add To Selection or Subtract From Selection in the options bar, and make another selection. (The Add To Selection and Subtract From Selection options appear in the options bar when any selection tool is selected.)

Understanding the Background Layer, Creating, Selecting, Linking and Deleting layers, Locking and Merging Layers, Copying Layers, Using Perspective and Layers Styles, Filling and Grouping Layers

Objective: At the end of this exercise you shall be able to

- to understanding the background layer, creating, selecting, linking and deleting layers, locking and merging layers, copying layers, using perspective and layers styles, filling and grouping layers.

Requirements

Tools/Equipments/Instruments

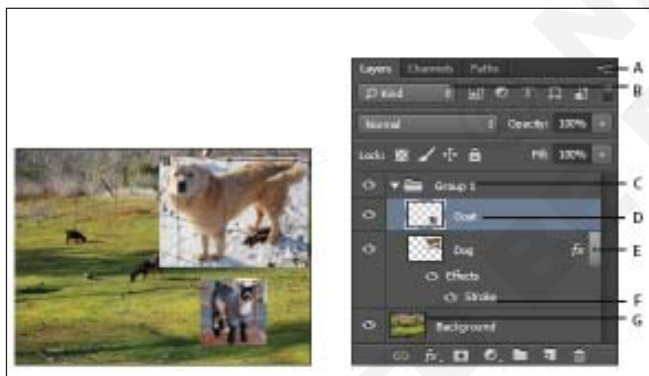
- Move tool
- Chisel soft
- Chisel hard
- Mac OS
- Personal Computer

PROCEDURE

Photoshop Layers panel overview

The Layers panel in Photoshop lists all layers, layer groups, and layer effects in an image. You can use the Layers panel to show and hide layers, create new layers, and work with groups of layers. You can access additional commands and options in the Layers panel menu.

Photoshop Layers panel



A. Layers panel menu B. Filter C. Layer Group D. Layer E. Expand/Collapse Layer effects F. Layer effect G. Layer thumbnail

Display the Photoshop Layers panel

- 1 Choose Window > Layers.

Choose a command from the Photoshop Layers panel menu

- 1 Click the triangle in the upper-right corner of the panel.

Change the size of Photoshop layer thumbnails

- 1 Choose Panel Options from the Layers panel menu, and select a thumbnail size.

Change thumbnail contents

- 1 Choose Panel Options from the Layers panel menu, and select Entire Document to display the contents of

the entire document. Select Layer Bounds to restrict the thumbnail to the object's pixels on the layer.

Note

Turn off thumbnails to improve performance and save monitor space.

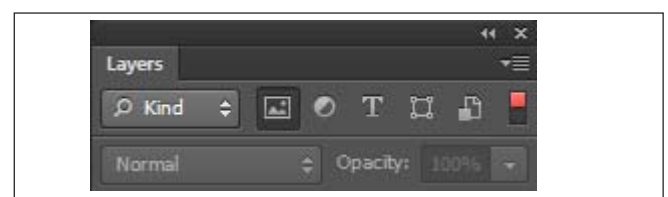
Expand and collapse groups

- 1 Click the triangle to the left of a group folder. See View layers and groups within a group.

Filter Photoshop layers

At the top of the Layers panel, the filtering options help you find key layers in complex documents quickly. You can display a subset of layers based on name, kind, effect, mode, attribute, or color label.

Filter layers options in the Layers panel



- 1 Choose a filter type from the pop-up menu.
- 2 Select or enter the filter criteria.
- 3 Click the toggle switch to switch layer filtering on or off.

Convert a background into a Photoshop layer

- 1 Double-click Background in the Layers panel, or choose Layer > New > Layer from Background.
- 2 Set layer options. (See Create layers and groups.)
- 3 Click OK.

Convert a Photoshop layer into a background

- 1 Select a Photoshop layer in the Layers panel.

2 Choose Layer > New > Background from Layer.

Any transparent pixels in the layer are converted to the background color, and the layer drops to the bottom of the layer stack.

Note

You cannot create a background by giving a regular layer the name, Background-you must use the Background from Layer command.

Video tutorial: Turn the background layer into a regular layer

Scott Kelby

Duplicate Photoshop layers

You can duplicate layers within an image or into another or a new image.

Duplicate a Photoshop layer or group within an image

- 1 Select a layer or group in the Layers panel.
- 2 Do one of the following:
 - Drag the layer or group to the Create a New Layer button .
 - Choose Duplicate Layer or Duplicate Group from the Layers menu or the Layers panel menu. Enter a name for the layer or group, and click OK.

Duplicate a Photoshop layer or group in another image

- 1 Open the source and destination images.
- 2 From the Layers panel of the source image, select one or more layers or a layer group.
- 3 Do one of the following:
 - Drag the layer or group from the Layers panel to the destination image.
 - Select the Move tool , and drag from the source image to the destination image. The duplicate layer or group appears above the active layer in the Layers panel of the destination image. Shift-drag to move the image content to the same location it occupied in the source image (if the source and destination images have the same pixel dimensions) or to the centre of the document window (if the source and destination images have different pixel dimensions).
 - Choose Duplicate Layer or Duplicate Group from the Layers menu or the Layers panel menu. Choose the destination document from the Document pop up menu, and click OK.
 - Choose Select > All to select all the pixels on the layer, and choose Edit > Copy. Then choose Edit > Paste in the destination image. (This method copies only pixels, excluding layer properties such as blending mode.)

Create a new document from a Photoshop layer or group

- 1 Select a layer or group from the Layers panel.
- 2 Choose Duplicate Layer or Duplicate Group from the Layers menu or the Layers panel menu.
- 3 Choose New from the Document pop up menu, and click OK.

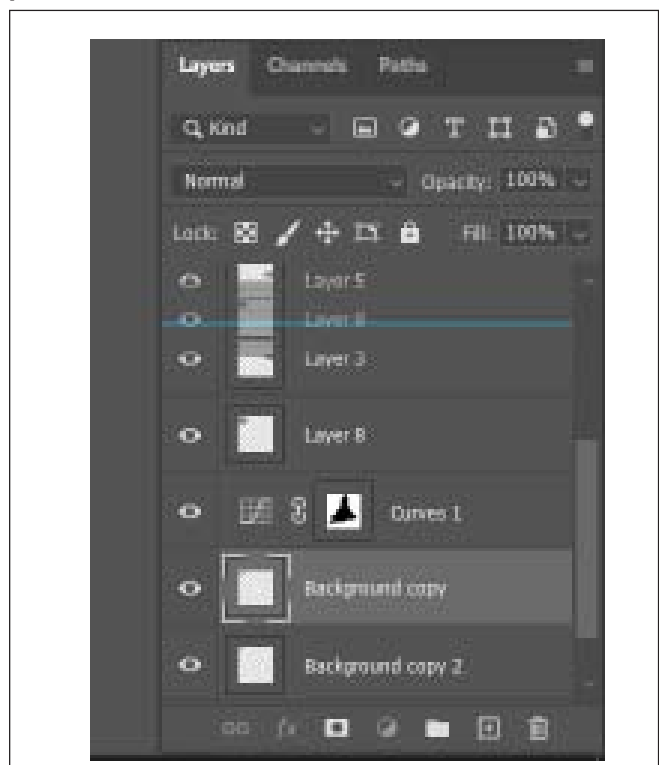
Change the order of layers and layer groups

To change the order of layers and layer groups, do any of the following:

- Drag the layer or group up or down in the Layers panel. Release the mouse button when you see a highlighted line at the position where you want to place the selected layer or group.
- To move a layer into a group, drag a layer to the group folder . If the group is closed, the layer is placed at the bottom of the group.
- Select a layer or group, choose Layer > Arrange, and choose a command from the submenu. If your selected item is in a group, the command applies to the stacking order within the group. If the selected item is not in a group, the command applies to the stacking order within the Layers panel.
- To reverse the order of selected layers, choose Layer > Arrange > Reverse. These options appear dimmed if you do not have at least two layers selected.

By definition, the background layer is always at the bottom of the stacking order. Therefore, the Send To Back command places the selected item directly above the background layer.

Drag a layer or layer group up or down in the Layers panel to move it.



Move the content of layers

- 1 In the Layers panel, click to select the layers containing the objects you want to move.
- 2 Select the Move tool .

You can select the layers that you want to move directly in the document window. In the Move tool's options bar, select Auto Select and then choose Layer from the menu options that show up. Shift-click to select multiple layers. Select Auto Select, then choose Group to select the entire group when you select one layer in the group.

- 3 Do one of the following:
 - In the document window, drag any object onto one of the selected layers. (All objects on the layer will move together.)
 - Press an arrow key on the keyboard to nudge the objects by 1 pixel.
 - Hold down Shift and press an arrow key on the keyboard to nudge the objects by 10 pixels.

Rotate a layer

- 1 From the Layers panel, select the layer you want to rotate.
- 2 If anything is currently selected in the image, choose Select > Deselect.
- 3 Choose Edit > Transform > Rotate. A box defining the boundaries of the layer (called a bounding box) appears.
- 4 Move the pointer outside of the bounding box (the pointer becomes a curved, two-sided arrow), and then drag. Press Shift to constrain the rotation to 15° increments.
- 5 When you're satisfied with the results, press Enter (Windows) or Return (Mac OS), or click the check mark in the options bar. To cancel the rotation, press Esc, or click the Cancel Transform icon on the options bar.

Lock a layer

You can lock layers fully or partially to protect their contents. For example, you may want to lock a layer fully when you finish with it. You can lock a layer partially if it has the correct transparency and styles but you are still deciding on positioning. When a layer is locked, a lock icon appears to the right of the layer name. The lock icon appears solid when the layer is fully locked and hollow when the layer is partially locked.

Lock all properties of a layer or group

- 1 Select a layer or group.
- 2 Click the Lock All option in the Layers panel. Layers in a locked group display a grayed out lock icon .

Partially lock a layer

- 1 Select a layer.
- 2 Click one or more lock options in the Layers panel:

- Lock Transparent Pixels: Confines editing to the opaque portions of the layer. This option is equivalent to the Preserve Transparency option in earlier versions of Photoshop.
- Lock Image Pixels: Prevents modification of the layer's pixels using the painting tools.
- Lock Position: Prevents the layer's pixels from being moved.

For type and shape layers, Lock Transparency and Lock Image are selected by default and cannot be deselected.

Apply lock options to selected layers or a group

- 1 Select multiple layers or a group.
- 2 Choose Lock Layers or Lock All Layers In Group from the Layers menu or the Layers panel menu.
- 3 Select lock options, and click OK.

More like this

- Rotate or flip an entire image
- Scale, rotate, skew, distort, apply perspective, or warp
- Combine images with Auto-Blend Layers

Display the Styles panel

- 1 Choose Window > Styles.

Apply a preset style to a layer

Normally, applying a preset style replaces the current layer style. However, you can add the attributes of a second style to those of the current style.

- 1 Do one of the following:
 - Click a style in the Styles panel to apply it to the currently selected layers.
 - Drag a style from the Styles panel onto a layer in the Layers panel.
 - Drag a style from the Styles panel to the document window, and release the mouse button when the pointer is over the layer content to which you want to apply the style.

Note: Hold down Shift as you click or drag to add (rather than replace) the style to any existing effects on the destination layer.

- Choose Layer > Layer Style > Blending Options, and click the word Styles in the Layer Style dialog box (top item in the list on the left side of the dialog box). Click the style you want to apply, and click OK.
- When using a Shape tool or Pen tool in shape layers mode, select a style from the pop up panel in the options bar before drawing the shape.

Note

Some effects have a + icon, indicating that they can be applied more than once in a layer style.

Apply a style from another layer

- In the Layers panel, Alt-drag (Windows) or Option-drag (Mac OS) the style from a layer's effect list to copy it to another layer.
- In the Layers panel, click-drag the style from a layer's effect list to move it to another layer.

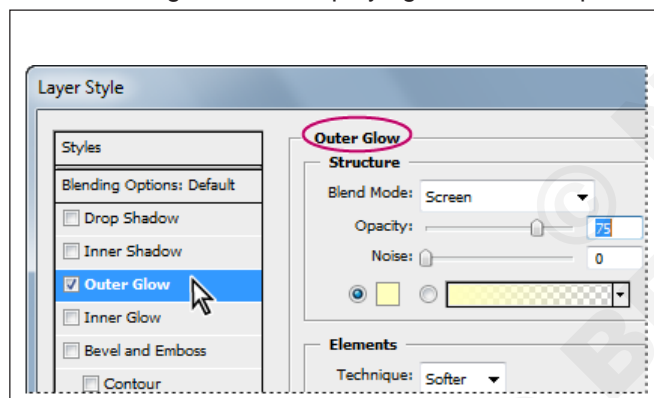
Change how preset styles are displayed

- 1 Click the triangle in the Styles panel, Layer Style dialog box, or Layer Style pop up panel in the options bar.
- 2 Choose a display option from the panel menu:
 - Text Only to view the layer styles as a list.
 - Small Thumbnail or Large Thumbnail to view the layer styles as thumbnails.
 - Small List or Large List to view the layer styles as a list, with a thumbnail of the selected layer style displayed.

Layer Style dialog box overview

You can edit styles applied to a layer or create new styles using the Layer Style dialog box.

Layer Style dialog box. Click a check box to apply the current settings without displaying the effect's options.



Click an effect name to display its options.

You can create custom styles using one or more of the following effects:

- **Drop Shadow:** Adds a shadow that falls behind the contents on the layer.
- **Inner Shadow:** Adds a shadow that falls just inside the edges of the layer's content, giving the layer a recessed appearance.
- **Outer Glow and Inner Glow:** Add glows that emanate from the outside or inside edges of the layer's content.
- **Bevel and Emboss:** Add various combinations of highlights and shadows to a layer.
- **Satin:** Applies interior shading that creates a satiny finish.
- **Color, Gradient, and Pattern Overlay:** Fills the layer's content with a color, gradient, or pattern.

- **Stroke:** Outlines the object on the current layer using color, a gradient, or a pattern. It is particularly useful on hard-edged shapes such as type.

Apply or edit a custom layer style

Note

You cannot apply layer styles to a background layer, a locked layer, or a group. To apply a layer style to a background layer, first convert it into a regular layer.

- 1 Select a single layer from the Layers panel.
- 2 Do one of the following:
 - Double-click the layer, outside the layer name or thumbnail.
 - Click the Add A Layer Style icon at the bottom of the Layers panel and choose an effect from the list.
 - Choose an effect from the Layer > Layer Style submenu.
 - To edit an existing style, double-click an effect displayed below the layer name in the Layers panel. (Click the triangle next to the Add A Layer Style icon to display the effects contained in the style.)
- 3 Set effect options in the Layer Style dialog box. See Layer style options.
- 4 Add other effects to the style, if desired. In the Layer Style dialog box, click the check box to the left of the effect name to add the effect without selecting it.

Note

You can edit multiple effects without closing the Layer Style dialog box. Click the name of an effect on the left side of the dialog box to display its options.

Change style defaults to custom values

- 1 In the Layer Style dialog box, customize settings as desired.
- 2 Click Make Default.

When you next open the dialog box, your custom defaults are automatically applied. If you adjust settings and want to return to your custom defaults, click Reset To Default.

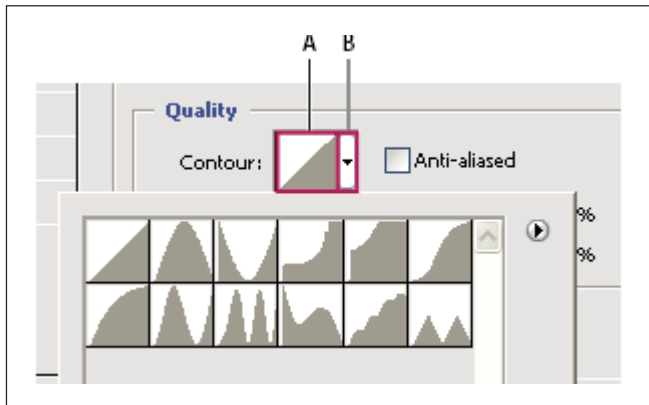
Modify layer effects with contours

When you create custom layer styles, you can use contours to control the shape of Drop Shadow, Inner Shadow, Inner Glow, Outer Glow, Bevel and Emboss, and Satin effects over a given range. For example, a Linear contour on a Drop Shadow causes the opacity to drop off in a linear transition. Use a Custom contour to create a unique shadow transition.

You can select, reset, delete, or change the preview of contours in the Contour pop up panel and Preset Manager.

Detail of Layer Style dialog box for Drop Shadow effect

A. Click to display the Contour Editor dialog box. **B.** Click to display the pop up panel.



Create a custom contour

- 1 Select the Drop Shadow, Inner Shadow, Inner Glow, Outer Glow, Bevel and Emboss, Contour, or Satin effect in the Layer Style dialog box.
- 2 Click the contour thumbnail in the Layer Style dialog box.
- 3 Click the contour to add points, and drag to adjust the contour. Or enter values for Input and Output.
- 4 To create a sharp corner instead of a smooth curve, select a point and click Corner.
- 5 To save the contour to a file, click Save and name the contour.
- 6 To store a contour as a preset, choose New.
- 7 Click OK. New contours are added at the bottom of the pop up panel.

Load a contour

- 1 Click the contour in the Layer Style dialog box, and in the Contour Editor dialog box, and then choose Load. Go to the folder containing the contour library you want to load and click Open.

Delete a contour

- 1 Click the inverted arrow next to the currently selected contour to view the pop up panel. Press Alt (Windows) or Option (Mac OS), and click the contour you want to delete.

Set a global lighting angle for all layers

Using global light gives the appearance of a common light source shining on the image.

- 1 Do one of the following:
 - Choose Layer > Layer Style > Global Light. In the Global Light dialog box, enter a value or drag the angle radius to set the angle and altitude, and click OK.
 - In the Layer Style dialog box for Drop Shadow, Inner Shadow, or Bevel, select Use Global Light. For Angle, enter a value or drag the radius, and click OK.

The global lighting applies to each layer effect that uses the global lighting angle.

Select layers

You can select one or more layers to work on them. For some activities, such as painting or making color and tonal adjustments, you can work on only one layer at a time. A single selected layer is called the active layer. The name of the active layer appears in the title bar of the document window.

For other activities, such as moving, aligning, transforming, or applying styles from the Styles panel, you can select and work on multiple layers at a time. You can select layers in the Layers panel or with the Move tool .

You can also link layers. Unlike multiple layers selected at the same time, linked layers stay linked when you change the selection in the Layers panel. See Link and unlink layers.

Note

If you don't see the desired results when using a tool or applying a command, you may not have the correct layer selected. Check the Layers panel to make sure that you're working on the correct layer.

Select layers in the Layers panel

- 1 Do one of the following:
 - Click a layer in the Layers panel.
 - To select multiple contiguous layers, click the first layer and then Shift-click the last layer.
 - To select multiple non-contiguous layers, Ctrl-click (Windows) or Command-click (Mac OS) them in the Layers panel.

Note

When selecting, Ctrl-click (Windows) or Command-click (Mac OS) the area outside the layer thumbnail. Ctrl-clicking or Command-clicking the layer thumbnail selects the nontransparent areas of the layer.

- To select all layers, choose Select > All Layers.
- To select all layers of a similar type (for example all type layers), select one of the layers, and choose Select > Similar Layers.
- To deselect a layer, Ctrl-click (Windows) or Command-click (Mac OS) the layer.
- To have no layer selected, click in the Layers panel below the background or bottom layer, or choose Select > Deselect Layers.

Select layers in the document window

You can also select a layer or layers directly from the document window.

- 1 Select the Move tool .
- 2 Do one of the following:
 - In the options bar, select Auto Select, then choose Layer from the drop-down menu, and click in the document on the layer you want to select. The top

layer containing pixels under the cursor is selected.

- In the options bar, select Auto Select, then choose Group from the drop-down menu, and click in the document on the content you want to select. The top group containing pixels under the cursor is selected. If you click an ungrouped layer, it becomes selected.
- Right-click (Windows) or Control-click (Mac OS) in the image, and choose a layer from the context menu. The context menu lists all the layers that contain pixels under the current pointer location.

Select a layer in a group

You can open a group and then select an individual layer within that group.

- 1 Click the group in the Layers panel.
- 2 Click the triangle to the left of the folder icon .
- 3 Click the individual layer in the group.

Group and link layers

Grouping layers helps organize your projects and keeps your Layers panel uncluttered. By linking layers, you establish a relationship between them, even if they aren't next to each other in your layer order.

Group and ungroup layers

- 1 Select multiple layers in the Layers panel.
- 2 Do one of the following:
 - Choose Layer > Group Layers.
 - Alt-drag (Windows) or Option-drag (Mac OS) layers to the folder icon at the bottom of the Layers panel to group the layers.
- 3 To Ungroup the layers, select the group and choose Layer > Ungroup Layers.

Add layers to a group

- 1 Do one of the following:
 - Select the group in the Layers panel and click the Create a New Layer button .
 - Drag a layer to the group folder.
 - Drag a group folder into another group folder. The group and all of its layers move.
 - Drag an existing group to the New Group button .

Link and unlink layers

You can link two or more layers or groups. Unlike multiple layers selected at the same time, linked layers retain their relationship until you unlink them. You can move or apply transformations to linked layers.

- 1 Select the layers or groups in the Layers panel.
- 2 Click the link icon at the bottom of the Layers panel.
- 3 To unlink layers do one of the following:
 - Select a linked layer, and click the link icon.
 - To temporarily disable the linked layer, Shift-click the Link icon for the linked layer. A red X appears. Shift-click the link icon to enable the link again.
 - Select the linked layers and click the Link icon. To select all linked layers, select one of the layers and then choose Layer > Select Linked Layers.

Show layer edges and handles

Showing the boundary or edges of the content in a layer can help you move and align the content. You can also display the transform handles for selected layers and groups so that you can resize or rotate them.

Layer content with edges showing (left), and with transform mode selected (right)



Display the edges of content in a selected layer

- 1 Choose View > Show > Layer Edges.

Display transform handles in a selected layer

- 1 Select the Move tool .
- 2 From the options bar, select Show Transform Controls.

You can resize and rotate layer content using the transform handles..

Blending Modes, Opacity and Fill - Creating and Modifying Text

Objectives: At the end of this exercise you shall be able to

- to Blend modes, opacity and fill
- to create and modify text.

Requirements

Tools/Equipments/Instruments

- Vertical type tool
- Horizontal type tool
- Mac OS
- Personal Computer

PROCEDURE

The blending mode specified in the options bar controls how pixels in the image are affected by a painting or editing tool. Think in terms of the following colors when visualizing a blending mode's effect:

- The base color is the original color in the image.
- The blend color is the color being applied with the painting or editing tool.
- The result color is the color resulting from the blend.

Specify overall and fill opacity for selected layers

A layer's overall opacity determines to what degree it obscures or reveals the layer beneath it. A layer with 1% opacity appears nearly transparent, whereas one with 100% opacity appears completely opaque.

In addition to overall opacity, which affects layer styles and blending modes applied to a layer, you can specify fill opacity. Fill opacity affects only pixels, shapes, or text on a layer without affecting the opacity of layer effects such as drop shadows.

Note

You cannot change the opacity of a background layer or a locked layer. To convert a background layer into a regular layer that supports transparency, see Convert background and layers.

- 1 In the Layers panel, select one or more layers or groups.
- 2 Change the Opacity and Fill values. (If you selected a group, only Opacity is available.)

Note

To view all blending options, choose Blending Options from the Add A Layer Style icon at the bottom of the Layers panel.

Specify a blending mode for a layer or group

- 1 Select a layer or group from the Layers panel.
- 2 Choose a blending mode:

- From the Layers panel, choose an option from the Blend Mode pop up menu.
- Choose Layer > Layer Style > Blending Options, and then choose an option from the Blend Mode pop up menu.

Note

In the Blend Mode pop-up menu, scroll over different options to see how they look on your image. Photoshop displays a live preview of blend modes on the canvas.

For descriptions and examples of each mode, see Blending modes.

Group blend effects

By default, layers in a clipping mask are blended with the underlying layers using the blending mode of the bottommost layer in the group. However, you can choose to have the blending mode of the bottommost layer apply only to that layer, allowing you to preserve the original blending appearance of the clipped layers. (See Reveal layers with clipping masks.)

You can also apply the blending mode of a layer to layer effects that modify opaque pixels, such as Inner Glow or Color Overlay, without changing layer effects that modify only transparent pixels, such as Outer Glow or Drop Shadow.

- 1 Select the layer that you want to affect.
- 2 Double-click a layer thumbnail, choose Blending Options from the Layers panel menu, or choose Layer > Layer Style > Blending Options.

Note

Exclude channels from blending

You can restrict blending effects to a specified channel when you blend a layer or group. By default, all channels are included. When using an RGB image, for example, you can choose to exclude the red channel from blending; in the composite image, only the information in the green and blue channels is affected.

1 Do one of the following:

- Double-click a layer thumbnail.
- Choose Layer > Layer Style > Blending Options.
- Choose Blending Options from the Add A Layer Style icon at the bottom of the Layers panel.

Note

To view blending options for a text layer, choose Layer > Layer Style > Blending Options, or choose Blending Options from the Add A Layer Style button at the bottom of the Layers panel menu.

- 2 From the Advanced Blending area of the Layer Style dialog box, deselect any channels you do not want to include when the layer is blended.

Specify a tonal range for blending layers

The sliders in the Blending Options dialog box control which pixels from the active layer and the underlying visible layers appear in the final image. For example, you can drop dark pixels out of the active layer or force bright pixels from the underlying layers to show through. You can also define a range of partially blended pixels to produce a smooth transition between blended and unblended areas.

- 1 Double-click a layer thumbnail, choose Layer > Layer Style > Blending Options, or choose Add A Layer Style > Blending Options from the Layers panel menu.

Note

To view blending options for a text layer, choose Layer > Layer Style > Blending Options, or choose Blending Options from the Add A Layer Style button at the bottom of the Layers panel menu.

- 2 In the Advanced Blending area of the Layer Style dialog box, choose an option from the Blend If pop up menu.

- Choose Gray to specify a blending range for all channels.
- Select an individual color channel (for example, red, green, or blue in an RGB image) to specify blending in that channel.

- 3 Use the This Layer and Underlying Layer sliders to set the brightness range of the blended pixels—measured on a scale from 0 (black) to 255 (white). Drag the white slider to set the high value of the range. Drag the black slider to set the low value of the range.

Note

To define a range of partially blended pixels, hold down Alt (Windows) or Option (Mac OS), and drag one half of a slider triangle. The two values that appear above the divided slider indicate the partial blending range.


Keep the following guidelines in mind when specifying blending ranges:

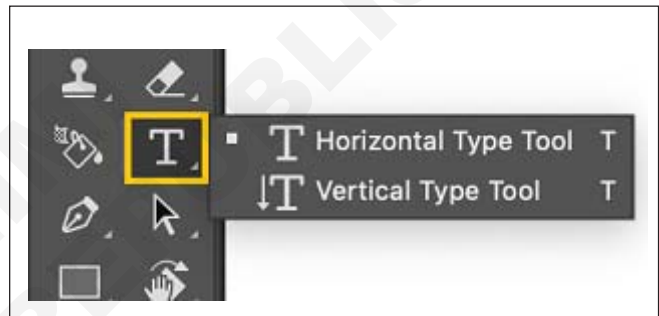
- Use the This Layer sliders to specify the range of pixels on the active layer that will blend, and therefore

appear, in the final image. For example, if you drag the white slider to 235, pixels with brightness values higher than 235 will remain unblended and will be excluded from the final image.

- Use the Underlying Layer sliders to specify the range of pixels in the underlying visible layers that will blend in the final image. Blended pixels are combined with pixels in the active layer to produce composite pixels, whereas unblended pixels show through overlying areas of the active layer. For example, if you drag the black slider to 19, pixels with brightness values lower than 19 will remain unblended and will show through the active layer in the final image.

How to add or place text

- 1 Open a photo or Photoshop document (PSD).
- 2 From the toolbar, select the Type tool  or simply press 'T' to quickly select it. The Horizontal Type Tool with which you can add text horizontally is selected by default. If you want to add text vertically, click the Type tool again and select Vertical Type Tool from the context menu.



- 3 Do you want to add a few words like a heading or title? Click anywhere on the canvas to type it. In Photoshop, this is called point text.

The other type of text in Photoshop is called paragraph text. As the name suggests, this is used when you want to type a paragraph. Click and drag the cursor on the canvas to create a bounding box in which you can type your paragraph. This helps you efficiently edit and align the paragraph later.


Add titles or headings with point text

Add paragraphs with paragraph text

Note

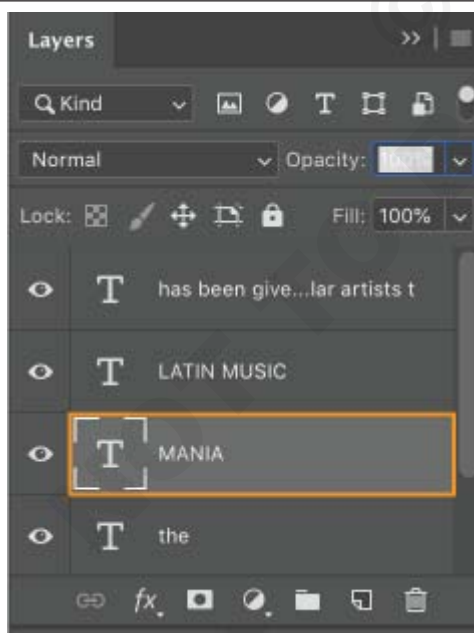
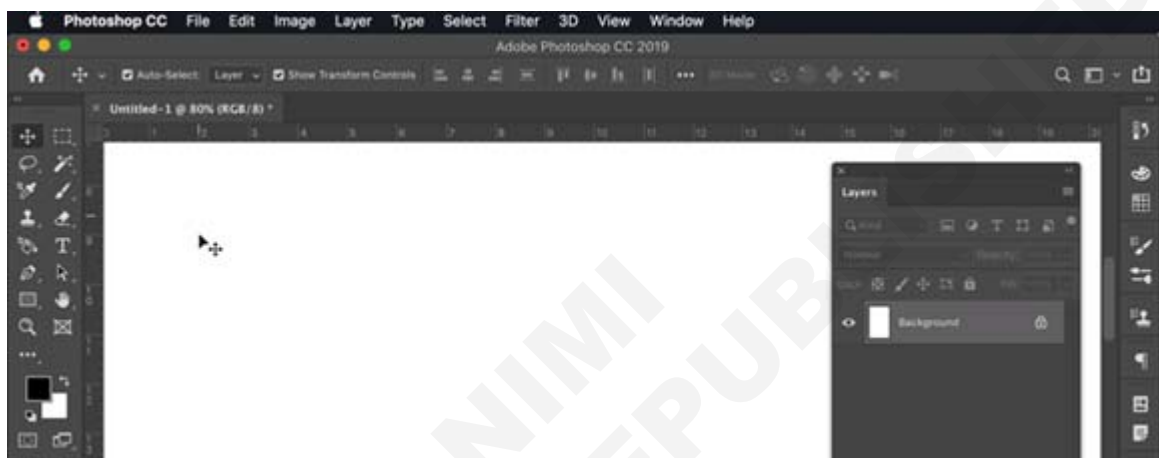
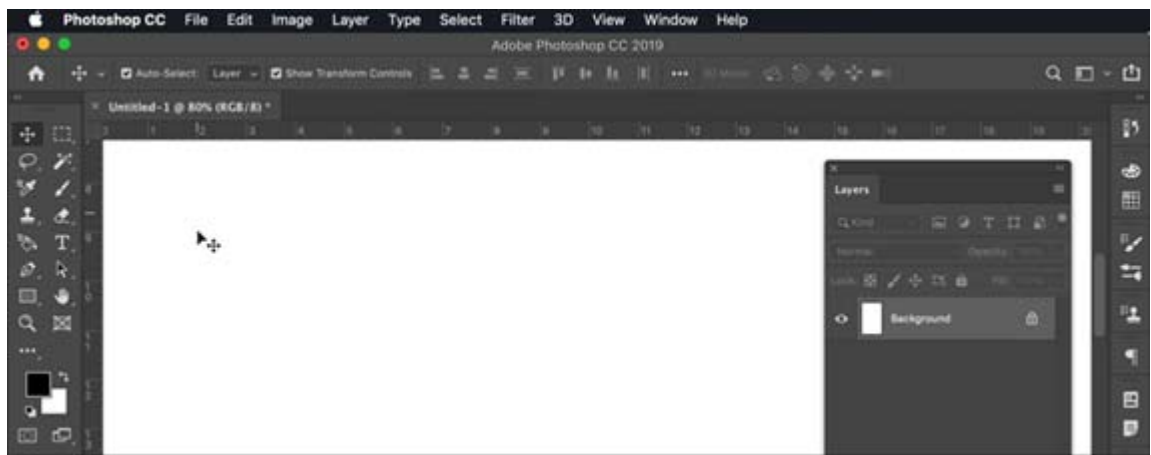
A type layer gets automatically created when you create point or paragraph text and can be identified in the Layers panel with the T icon.

A type layer in the Layers panel

- 4 Type your text. To save your changes, click  in the options bar or press Esc and you're good to go!

Note

- To change the font size and color, see how to resize text and how to change color of text.




- Don't like the Lorem ipsum text while typing? You can turn off the sample text. Simply choose Edit > Preferences > Type, deselect Fill new type layers with placeholder text, and click OK.

How to select text

- 1 Open the Photoshop document with the text you want to edit.

Note

The text must be on a type layer. Don't see type layers in your document? See steps 2 and 3 in how to add text.

- 2 To select the entire text or paragraph on a type layer, select the Move tool  in the toolbar and double-click the text you want to select.

Note

If you are unable to do this step, you may not have the latest version of Photoshop. In this case, select the Type tool in the toolbar, click the text you want to select, and choose Select > All in the menu bar.

- 3 To select one or more characters on a type layer, simply select the Type tool in the toolbar and then click and drag the cursor over the characters you want to select.

Once you have selected your text, you can edit your text, change color of text, resize text, copy and paste text, and more.

How to edit text

- 1 Open the Photoshop document with the text you want to edit.

Note

The text must be on a type layer. Don't see type layers in your document? See steps 2 and 3 in how to add text.

- 2 Select the Type tool in the toolbar.
- 3 Select the text you want to edit.
- 4 The options bar in the top has options to edit your font type, font size, font color, text alignment, and text style. For details, see this video tutorial. You can also use the Character panel and the Paragraph panel to further edit your text.
- 5 Finally, click in the options bar to save your edits.

How to copy and paste text

You can copy and paste text in your Photoshop document (PSD) from other documents. For example, from a Word file, a PDF file, a web page, or another Photoshop file (PSD).

Copy and paste text from a non-Photoshop file

- 1 In your non-Photoshop file such as a Word file, PDF, or web page, click and drag the cursor over the text to select it.
- 2 Press Command+C (on macOS) or Control+C (on Windows) to copy the selected text.
- 3 Open the Photoshop document (PSD) in which you want to paste the copied text and then select the Type tool in the toolbar.
- 4 Select the type layer from the Layers panel in which you want to paste the text. If you don't have type layers or want to add another type layer, see steps 2 and 3 in how to add text.
- 5 Choose Edit > Paste or press Command+V (on macOS) or Control+V (on Windows) to paste your text. To undo, choose Edit > Undo Paste Text.

Copy and paste from another Photoshop document (PSD)

- 1 Open the PSD you want to copy the text from.
- 2 Select the text you want to copy and choose Edit > Copy or simply press Command+C (on macOS) or Control+C (on Windows).
- 3 Open the PSD you want to paste the text in and select a type layer. If you don't have type layers or want to add another type layer, see steps 2 and 3 in how to add text.
- 4 Choose Edit > Paste to paste your text in the center of your canvas. You can also choose Edit > Paste Special > Paste in Place to place the text as it was in the PSD from which you had copied.

How to resize text

Struggling to change the size of your text? Here's how you can easily do it:

Resize the entire text on a type layer

- 1 Open the Photoshop document with the text you want to edit.

Note

The text must be on a type layer. Don't see type layers in your document? See steps 2 and 3 in how to add text.


2. Select the Move tool  in the toolbar.

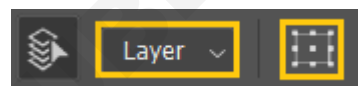
3. In the options bar, do this:

(macOS users) Check that Auto-select: Layer and Show Transform Controls are selected.



Select Auto-Select Layer and Show Transform Controls in macOS

(Windows users) Check that Layer and  icon are selected.



Ensure that the highlighted fields are selected in Windows

- 4 Click to select the text you want to resize.
- 5 In the transform box that appears, drag one of the anchor points to resize your text proportionally. You can also do the following when you drag an anchor point:
 - Hold down the Shift key to resize your text non-proportionally.
 - Hold down the Alt key to keep the center of your text in the same place when you resize text.
 - Hold down the Command (on macOS) or Control (on Windows) to explore skewed angles when you resize your text.

- 6 Finally, click  in the options bar to save your edits.

That's it! Your entire text is now resized.

Resize one or more characters on a type layer

To change the size of specific letters, numbers, or words in your text, you can do this:

- 1 Open the Photoshop document with the text you want to edit.

Note



The text must be on a type layer. Don't see type layers in your document? See steps 2 and 3 in how to add text.

- 2 Select the Type tool in the toolbar.
- 3 Select text that you want to resize.

- 4 In the **T** field of the options bar, select the text size option you want. You can see the changes in real time.

Note

If you have a paragraph text and are unable to view the entire paragraph after resizing it, drag the corners of the bounding box.

5. Click  in the options bar and you're done! To cancel your changes, click  in the options bar.

Resize text in two ways - use the Move tool or specify a text size value in the options bar

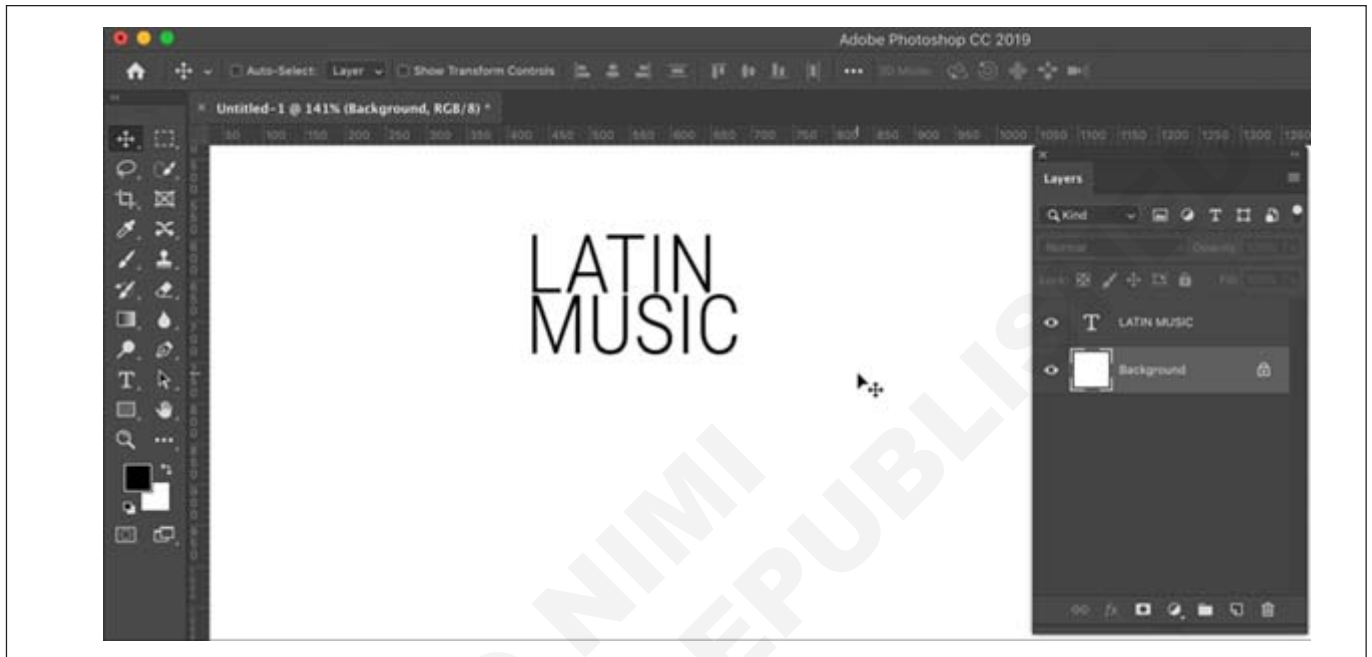
How to move text


To move your text around on the Photoshop canvas:

- 1 Open the Photoshop document with the text you want to edit.

Note

The text must be on a type layer. Don't see type layers in your document? See steps 2 and 3 in how to add text.



- 2 Select the type layer that has the text you want to move.
- 3 Select the Move tool  in the toolbar.
- 4 In the options bar, ensure that Auto Select Layer (on macOS) or Layer (on Windows) is selected and then click the text you want to move. You can then view the transform box with the dark arrow.
- 5 Click and move the transform box and then release it to place the text where you want.

How to change color of text

Change the color of your entire text

- 1 Open the Photoshop document with the text you want to edit.

Note

The text must be on a type layer. Don't see type layers in your document? See steps 2 and 3 in how to add text.

- 2 Select the Type tool in the toolbar and click the text for which you want to change color. The entire text in the type layer is selected.
- 3 Click the Color Picker (Text Color) icon in the options bar.

Click the Color picker icon in the options bar



- 4 Move the color slider as you want and pick your color. You can see your text color change in real time as you pick different colors.
- 5 Once you're happy with your text color, click OK.

Change the color of one or more characters in your text

- 1 Open the Photoshop document with the text you want to edit.

Note

The text must be on a type layer. Don't see type layers in your document? See steps 2 and 3 in how to add text.

- 2 Select the Type tool in the toolbar.
- 3 Click and drag the cursor over the characters you want to select.
- 4 Click the Color Picker (Text Color) icon in the options bar.

Click the Color picker icon in the options bar



- 5 Move the color slider as you want and pick your color. You can see your text color change in real time as you pick different colors.

6 Once you're happy with the text color, click OK.

Voila! You're done.

How to align and justify text

Unable to align your text properly? Here's how you can justify and align your text:

1 Open the Photoshop document with the text you want to edit.

Note

The text must be on a type layer. Don't see type layers in your document? See steps 2 and 3 in how to add text.

2 Select the type layer from the Layers panel that has the paragraph you want to justify. If you want to justify a specific paragraph on a type layer, then select it.

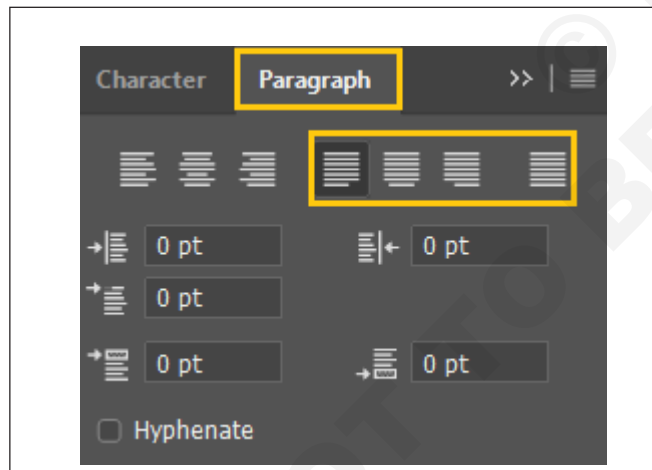
Note

If you have a word or a few words (that is point text), you need to convert it to paragraph text first to justify it. To change point text to paragraph text, select the type layer and choose Type > Convert To Paragraph Text from the menu bar.

3 Choose Window > Paragraph to view the Paragraph panel.

4 In the Paragraph panel, you can view the various Justify options. Select an option to view the changes in real time.

Align your paragraph text with Justify options in the Paragraph panel



5 After you've finalized your Justify option, click ☒ in the options bar and you're set!

How to rotate text


Want to tilt or rotate your text to a certain angle? Here's how you can do it:



1 Open the Photoshop document with the text you want to edit.

Note

The text must be on a type layer. Don't see type layers in your document? See steps 2 and 3 in how to add text.


2 Select the Move tool  in the toolbar.

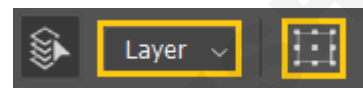
3 In the options bar, do this:

(macOS users) Check that Auto-select: Layer and Show Transform Controls are selected.



Select Auto-Select Layer and Show Transform Controls in macOS

(Windows users) Check that Layer and  icon are selected.



Select Layer and Show transform controls icon in Windows

4 Click the text you want to rotate. You can then view the transform box around your text.

5 Hover near the corners of the transform box. The cursor changes to a two sided arrow.

Double-sided arrow near the transform box



6 Click and drag the curved arrow to rotate the text the way you want. You can also specify values in the options bar to get a more precise rotation.

Enter values to rotate your text in the options bar

7. Click ☒ in the options bar and you're done!

More like this

- Video tutorial: Edit text in an image
- Edit text
- Format characters

[Legal Notices](#) | [Online Privacy Policy](#)

Working with Colours and Swatches, Creating and Using Gradients, Creating and Working with Brushes

Objective: At the end of this exercise you shall be able to

- to work with colours and swatches , to create and use gradients , to create and work with brushes.

Requirements

Tools/Equipments/Instruments



- Colour picker
- Swatches panel
- Legacy switches
- Photoshop 21.0

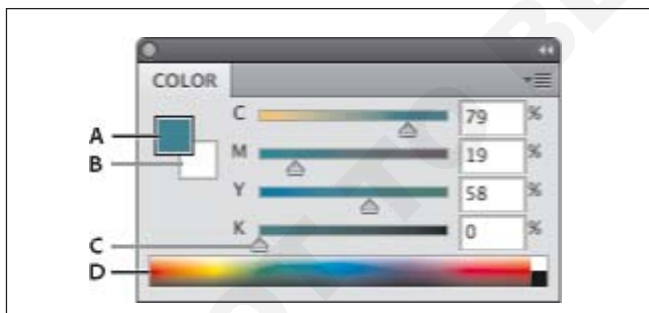
PROCEDURE

Color panel overview

The Color panel (Window > Color) displays the color values for the current foreground and background colors. Using the sliders in the Color panel, you can edit the foreground and background colors using different color models. You can also choose a foreground or background color from the spectrum of colors displayed in the color ramp at the bottom of the panel.

The Color panel may display the following alerts when you select a color:

- An exclamation mark inside a triangle  appears above the left corner of the color ramp when you choose a color that cannot be printed using CMYK inks.
- A square  appears above the left corner of the color ramp when you choose a color that is not web-safe.



Color panel

A. Foreground color **B.** Background color **C.** Slider
D. Color ramp

Change the color model of the Color panel sliders

To change the color model of the color panel sliders, choose the Sliders option from the Color panel menu.

Change the spectrum displayed in the Color panel

Choose an option from the Color panel menu - RGB Spectrum, CMYK Spectrum, or Grayscale Ramp, to display the spectrum of the specified color model. To

change the spectrum displayed in the Color panel, you can select:

- **Current Colors:** To display the spectrum of colors between the current foreground color and the current background color.
- **Make Ramp Web Safe:** To display only web safe colors.

To change the spectrum of the color ramp quickly, shift-click the color ramp until you see the spectrum you want.

Select a color in the Color panel

- 1 In the Color panel, click the foreground or background color box to make it active (outlined in black). When the background color box is active in the Color panel, the Eyedropper tool changes the background color by default.
- 2 Do one of the following:
 - Drag the color sliders. By default, the slider colors change as you drag. To turn off this feature, navigate to Preferences > General and deselect Dynamic Color Sliders.
 - Enter values next to the color sliders.
 - Click the color selection box, choose a color using the Color Picker, and click OK.
 - Position the pointer over the color ramp (the pointer becomes the eyedropper), and click to sample a color. Alt-click to apply the sample to the non-active color selection box.

Select a color in the Swatches panel

Updated in Photoshop 21.0 (November 2019 release)

How to use new Presets in Photoshop

Learn all about applying Photoshop's new and improved Presets panels. Julieanne Kost explores everything from swatches to patterns, from gradients to styles and shapes.

Julieanne Kost

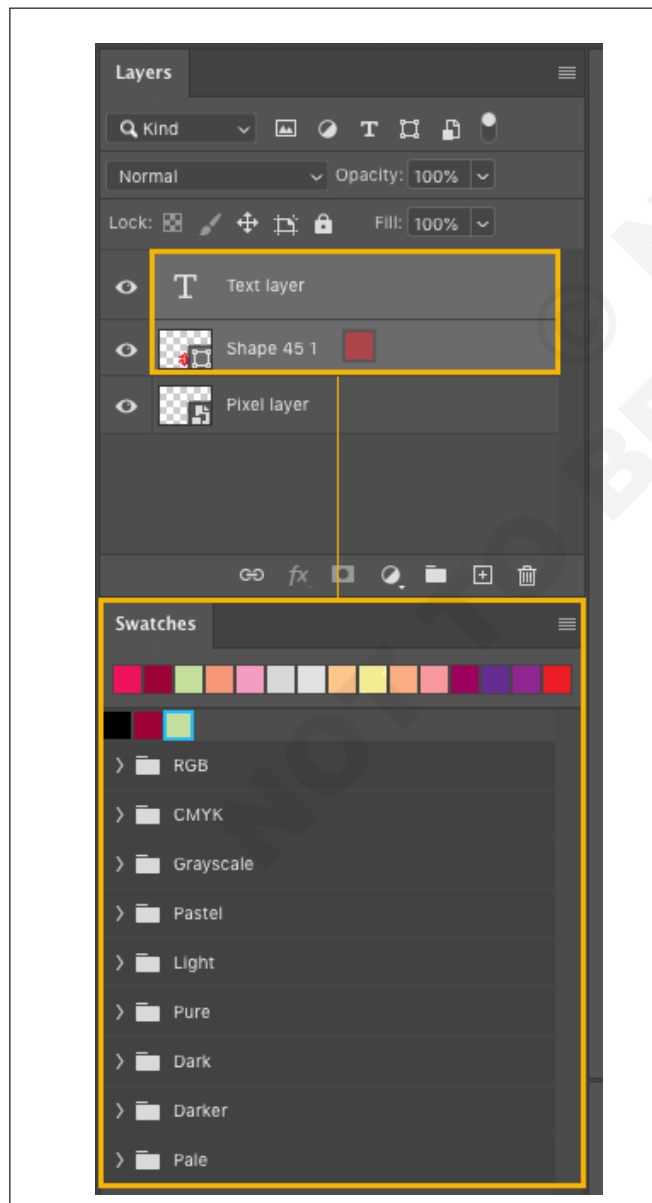
The Swatches panel (Window > Swatches) stores colors that you use often and display a default set of swatches that you can work with. You can add or delete colors from the panel or display different libraries of colors for different projects.

Apply swatches to layers

To apply a color swatch to text layers or shape layers, do any of the following:

- Select one or more layers in the Layers panel and then click any of the swatches in the Swatches panel to apply it.
- Drag a swatch from the Swatches panel onto the layer's content on the canvas area.
- Drag a swatch from the Swatches panel onto a layer in the Layers panel.

To apply a color swatch to pixel layers, drag a swatch from the Swatches panel on a pixel layer in the Layers panel. Photoshop automatically creates a fill layer on top of the pixel layer.



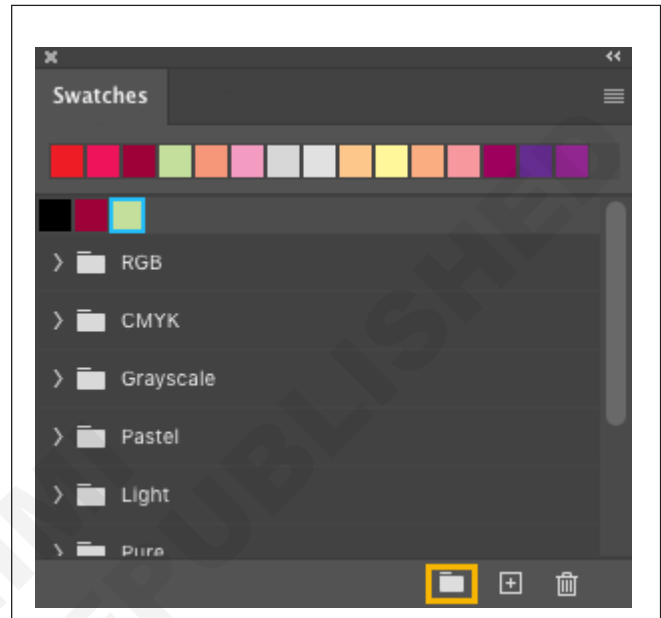
Organize swatches into groups

To organize swatches under a new group

- 1 In the Swatches panel, click the Create New Group icon.
- 2 Specify a group name and click OK.
- 3 Drag a swatch or use the Shift key to select multiple swatches to drag them inside the Group.

To create nested groups:

- 1 Select a group in the Swatches panel.



- 2 Drag the selected group and place it under another group.

Show legacy swatches


To show legacy swatches, open the Swatches panel menu and select Legacy Swatches.

Apply a gradient fill

The Gradient tool creates a gradual blend between multiple colors. You can choose from preset gradient fills or create your own.

Note

You cannot use the Gradient tool with bitmap or indexed-color images.

- 1 To fill part of the image, select the desired area. Otherwise, the gradient fill is applied to the entire active layer.
- 2 Select the Gradient tool  (If the tool isn't visible, hold down the Paint Bucket tool.)
- 3 In the options bar, choose a fill from the wide gradient sample:
 - Click the triangle next to the sample to pick a preset gradient fill.
 - Click inside the sample to view the Gradient Editor. Select a preset gradient fill, or create a new gradient fill. (See Create a smooth gradient.)

Note

The Neutral Density preset provides a helpful photographic filter for sunsets and other high-contrast scenes.

- 4 Select an option to determine how the starting point (where the mouse is pressed) and ending point (where the mouse is released) affect gradient appearance.
 - Specify a blending mode and opacity for the paint. (See Blending modes.)
 - To reverse the order of colors in the gradient fill, select Reverse.
 - To create a smoother blend with less banding, select Dither.
 - To use a transparency mask for the gradient fill, select Transparency. (See Specify the gradient transparency.)
- 5 Position the pointer in the image where you want to set the starting point of the gradient, and drag to define the ending point. To constrain the line angle to a multiple of 45°, hold down Shift as you drag.

Select a gradient in the Gradients panel

Updated in Photoshop 21.0 (November 2019 release)

How to use new Presets in Photoshop

Learn all about applying Photoshop's new and improved Presets panels. Julieanne Kost explores everything from swatches to patterns, from gradients to styles and shapes.

Julieanne Kost

Apply gradients to layers

To apply a gradient to text layers as a layer effect, do any of the following:

- Select one or more text layers in the Layers panel and then click any gradient in the Gradients panel to apply it.
- Drag a gradient from the Gradients panel onto the text content on the canvas area.
- Drag a gradient from the Gradients panel onto a layer in the Layers panel.
- To apply a gradient to a shape layer as shape fill, do any of the following:
 - Select one or more text layers in the Layers panel and then click any gradient in the Gradients panel to apply it.
 - Drag a gradient from the Gradients panel onto the text content on the canvas area.
 - Drag a gradient from the Gradients panel onto a layer in the Layers panel. To apply a gradient to text layers or shape layer as a fill layer, do any of the following:
 - Hold Command (Mac)/ Alt (Win) and drag a gradient from the Gradients panel onto the text content on the

canvas area.

- Hold Command (Mac)/ Alt (Win) and drag a gradient from the Gradients panel onto a layer in the Layers panel.

To apply a gradient to pixel layers, do the following

- 1 Drag a gradient from the Gradients panel onto a pixel layer in the Layers panel.
- 2 Photoshop automatically creates a fill layer on top of the pixel layer.

Organize gradient presets into groups

To organize gradients under a new group:

- 1 In the Gradients panel (Window > Gradients), click the Create New Group icon.
- 2 Specify a group name and click OK.
- 3 Drag a gradient or use the Shift key to select multiple gradients to drag them inside the Group.

To create nested groups

1. Select a group in the Gradients panel.
2. Now, drag and drop that group under another group.

Show legacy gradients

From the Gradients panel menu, choose Legacy Gradients.

Return to the default gradient presets

- 1 Choose Restore Default Gradients from the Gradients panel menu. You can either replace the current list or append the default library to the current list.

Change how preset gradients are displayed

- 1 Choose a display option from the Gradients panel menu:

Text Only

Displays the gradients as a list.

Small or Large Thumbnail

Displays the gradients as thumbnails.

Small or Large List

Displays the gradients as a list with thumbnails.

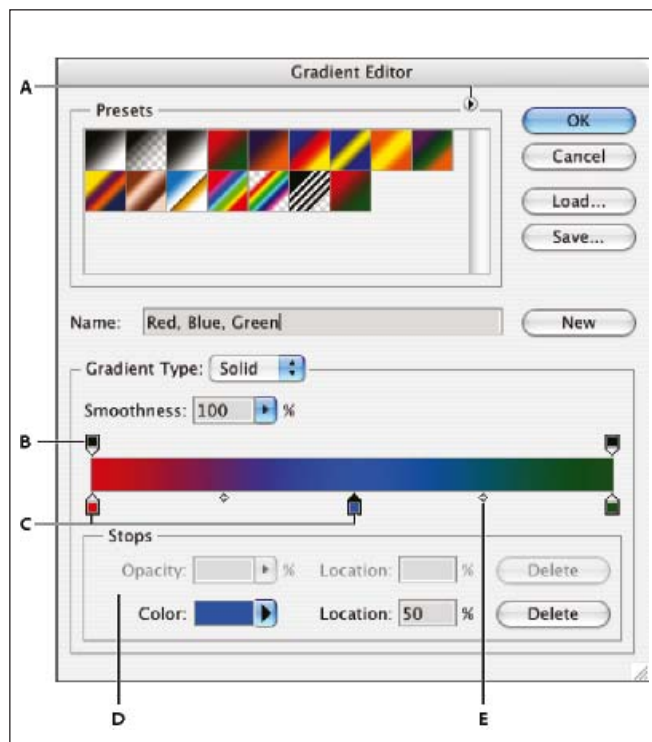
Rename a preset gradient

- If the panel is set to display gradients as thumbnails, double-click a gradient, enter a new name, and click OK.
- If the panel is set to display gradients as a list or text only, double-click a gradient, enter a new name inline, and press Enter (Windows) or Return (Mac OS).

Gradient Editor overview

To display the Gradient Editor dialog box, click the current gradient sample in the options bar. (When you hover over the gradient sample, a tool tip reading "Click to edit gradient" appears.)

The Gradient Editor dialog box lets you define a new gradient by modifying a copy of an existing gradient. You can also add intermediate colors to a gradient, creating a blend between more than two colors.



Gradient Editor dialog box

A. Panel menu **B.** Opacity stop **C.** Color stops **D.** Adjust values or delete the selected opacity or color stop **E.** Midpoint

Save a set of preset gradients as a library

- 1 Click Save in the Gradient Editor dialog box, or choose Save Gradients from the Gradient Picker menu in the options bar.
- 2 Choose a location for the gradient library, enter a file name, and click Save.

You can save the library anywhere. However, if you place the library file in the Presets/Gradients folder in the default preset location, the library name will appear at the bottom of the panel menu after you restart Photoshop.

Load a library of preset gradients

- 1 Do one of the following in the Gradient Editor dialog box:
 - Click Load to add a library to the current list. Select the library file you want to use, and click Load.
 - Choose Replace Gradients from the panel menu to replace the current list with a different library. Select the library file you want to use, and click Load.
 - Choose a library file from the bottom of the panel menu. Click OK to replace the current list, or click Append to append the current list.

Note

You can also choose Load Gradients, Replace Gradients, or choose a library of gradients from the Gradient Picker menu in the options bar.

Create a smooth gradient

- 1 Select the Gradient tool.
- 2 Click inside the gradient sample in the options bar to display the Gradient Editor dialog box.
- 3 To base the new gradient on an existing gradient, select a gradient in the Presets section of the dialog box.
- 4 Choose Solid from the Gradient Type pop up menu.
- 5 To define the starting color of the gradient, click the left color stop under the gradient bar. The triangle above the stop turns black indicating that the starting color is being edited.
- 6 To choose a color, do one of the following:
 - Double-click the color stop, or click the color swatch in the Stops section of the dialog box. Choose a color, and click OK.
 - Choose an option from the Color pop up menu in the Stops section of the dialog box.
 - Position the pointer over the gradient bar (the pointer turns into the eyedropper), and click to sample a color, or click anywhere in the image to sample a color from the image.
- 7 To define the ending color, click the right color stop under the gradient bar. Then choose a color.
- 8 To adjust the location of the starting point or ending point, do one of the following:
 - Drag the corresponding color stop left or right to the location you want.
 - Click the corresponding color stop, and enter a value for Location in the Stops section of the dialog box. A value of 0% places the point at the far left end of the gradient bar; a value of 100%, at the far right end.
- 9 To adjust the location of the midpoint (where the gradient displays an even mix of the starting and ending colors), drag the diamond below the gradient bar to the left or right, or click the diamond, and enter a value for Location.
- 10 To add intermediate colors to a gradient, click below the gradient bar to define another color stop. Specify the color and adjust the location and midpoint for the intermediate point as you would for a starting or ending point.
- 11 To delete the color stop you are editing, click Delete, or drag the stop downwards until it disappears.

- 12 To control how gradual the transitions are between color bands in the gradient, enter a value in the Smoothness text box, or drag the Smoothness pop up slider.
- 13 If desired, set transparency values for the gradient.
- 14 Enter a name for the new gradient.
- 15 To save the gradient as a preset, click New after you have finished creating the gradient.

Note

New presets are saved in a Preferences file. If this file is deleted or damaged, or if you reset presets to the default library, the new presets will be lost. To permanently save new presets, save them in a library.

Specify the gradient transparency

Each gradient fill contains settings that control the opacity of the fill at different locations on the gradient. For example, you can set the starting color to 100% opacity and have the fill gradually blend into an ending color with 50% opacity. The checkerboard pattern indicates the amount of transparency in the gradient preview.

- 1 Create a gradient.
- 2 To adjust the starting opacity, click the left opacity stop above the gradient bar. The triangle below the stop turns black, indicating that the starting transparency is being edited.
- 3 In the Stops section of the dialog box, enter a value in the Opacity text box, or drag the Opacity pop up slider.
- 4 To adjust the opacity of the end point, click the right transparency stop above the gradient bar. Then set the opacity in the Stops section.
- 5 To adjust the location of the starting or ending opacity, do one of the following:
 - Drag the corresponding opacity stop to the left or right.
 - Select the corresponding opacity stop, and enter a value for Location.
- 6 To adjust the location of the midpoint opacity (the point midway between the starting and ending opacities), do one of the following:
 - Drag the diamond above the gradient bar to the left or right.
 - Select the diamond and enter a value for Location.
- 7 To delete the opacity stop you are editing, click Delete.
- 8 To add an intermediate opacity to the mask, click above the gradient bar to define a new opacity stop. You can then adjust and move this opacity as you would for a starting or ending opacity. To remove an intermediate opacity, drag its transparency stop up and off the gradient bar.

- 9 To create a preset gradient, enter a name in the Name text box, and click New. This creates a new gradient preset with the transparency setting you specified.


Create a noise gradient

A noise gradient is a gradient that contains randomly distributed colors within the range of colors that you specify.

Noise gradient with different roughness values



A. 10% roughness B. 50% roughness C. 90% roughness

- 1 Select the Gradient tool. 
- 2 Click in the gradient sample in the options bar to display the Gradient Editor dialog box.
- 3 To base the new gradient on an existing gradient, select a gradient in the Presets section of the dialog box.
- 4 Choose Noise from the Gradient Type pop up menu, and set the following options:

Roughness

Controls how gradual the transitions are between color bands in the gradient.

Color Model

Changes the color components you can adjust. For each component, drag the sliders to define the range of acceptable values. For example, if you choose the HSB model, you can restrict the gradient to blue-green hues, high saturation, and medium brightness.

Restrict Colors

Prevents oversaturated colors.

Add Transparency

Adds transparency to random colors.

Randomize

Randomly creates a gradient that conforms to the settings above. Click the button until you find a setting you like.

- 5 To create a preset gradient with the settings you've specified, enter a name in the Name text box, and click New.

You can create brushes that apply paint to images in a variety of ways. You select an existing preset brush, a brush tip shape, or create a unique brush tip from part of an image. You choose options from the Brush Settings panel to specify how the paint is applied.



Note: Symmetry painting and Pattern Preview do not support Live Tip Brushes. Choose a normal brush for symmetry and pattern painting.

Brush Settings panel overview


The Brush Settings panel lets you modify existing brushes and design new custom brushes. The Brush Settings panel contains the brush tip options that determine how paint is applied to an image. The brush stroke preview

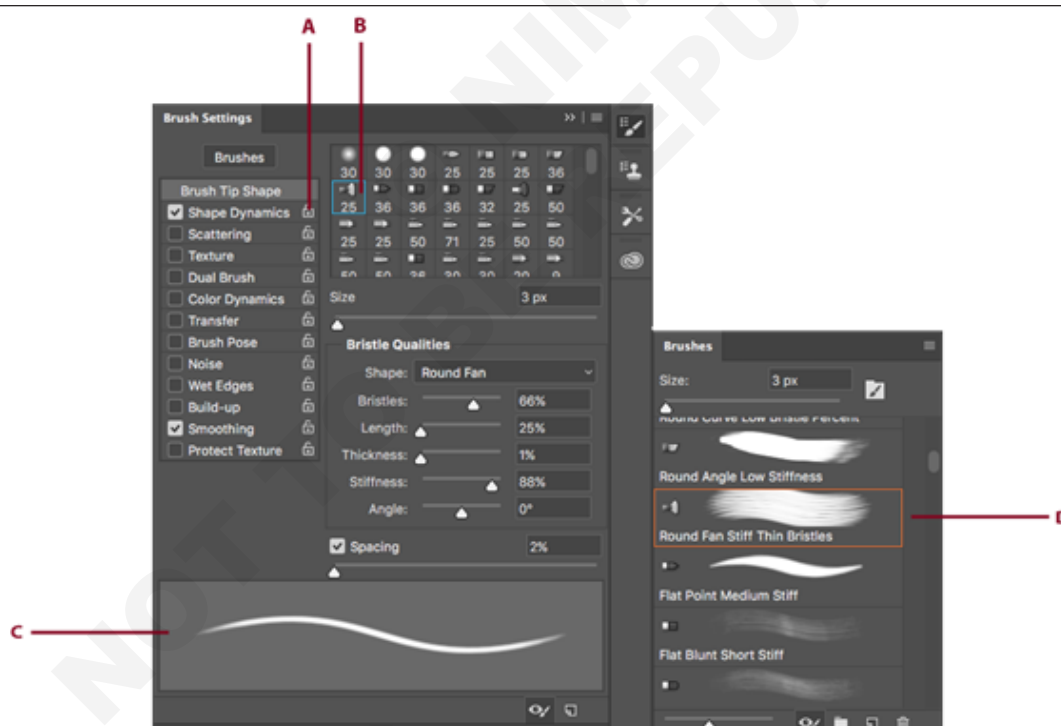
at the bottom of the panel shows how paint strokes look with the current brush options.

Brush Settings panel (Left) and Brushes panel (Right)

A. Locked/Unlocked **B.** Selected brush tip **C.** Brush stroke preview **D.** Brushes panel

Display the Brush panel and brush options

- 1 Choose Window > Brush Settings. Or, select a painting, erasing, toning, or focus tool, and click the panel button  on the left side of the options bar.



- 2 Select an option set on the left side of the panel. The available options for the set appear on the right side of the panel.

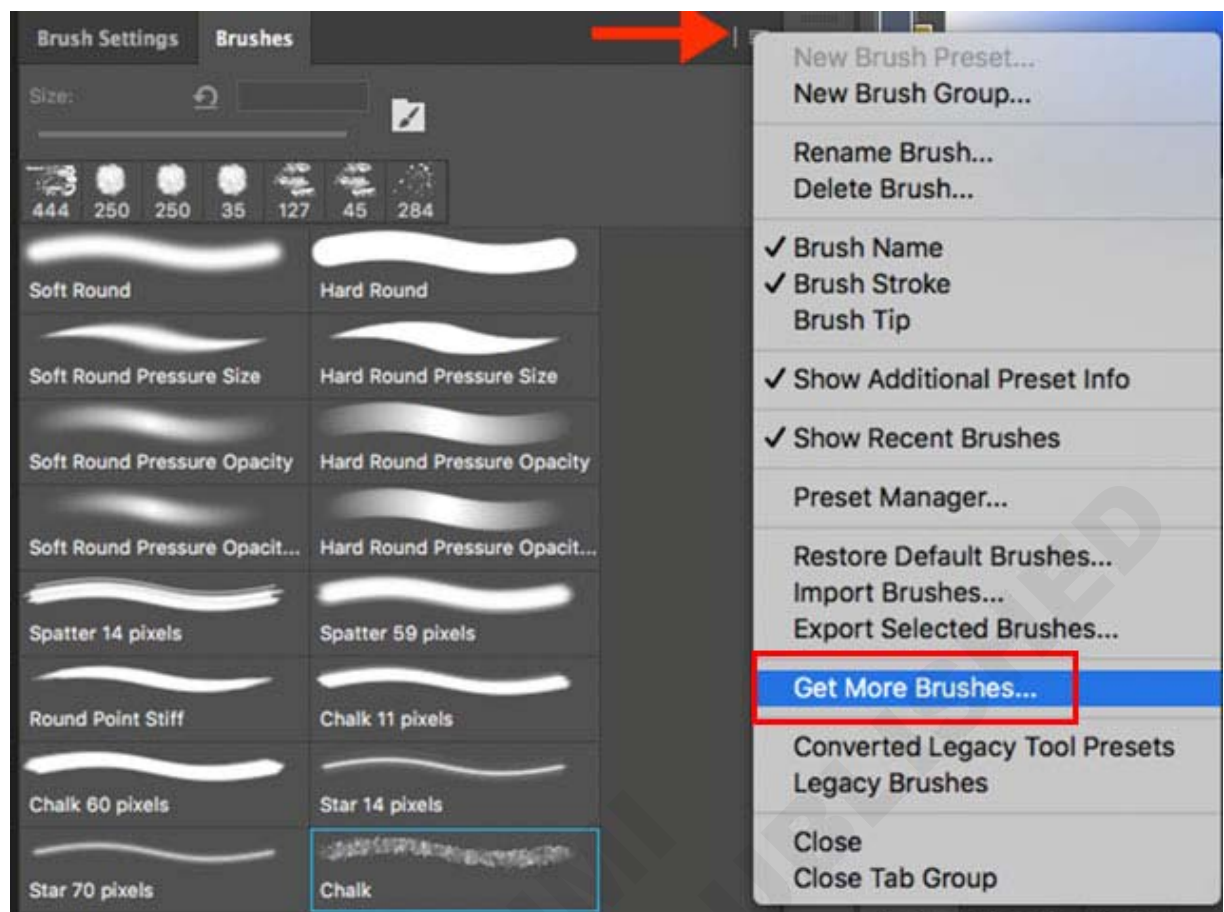
Note

Click the checkbox to the left of the option set to enable or disable the options without viewing them.

Import brushes and brush packs

You can import a wide variety of free and purchased brushes—for example, Kyle's Photoshop brush packs—into Photoshop. Follow these steps:

- 1 In the Brushes panel, from the flyout menu, choose Get More Brushes. Alternatively, right-click a brush listed in the Brushes panel and select Get More Brushes from the contextual menu.



Select Get More Brushes from the Brushes panel flyout menu...

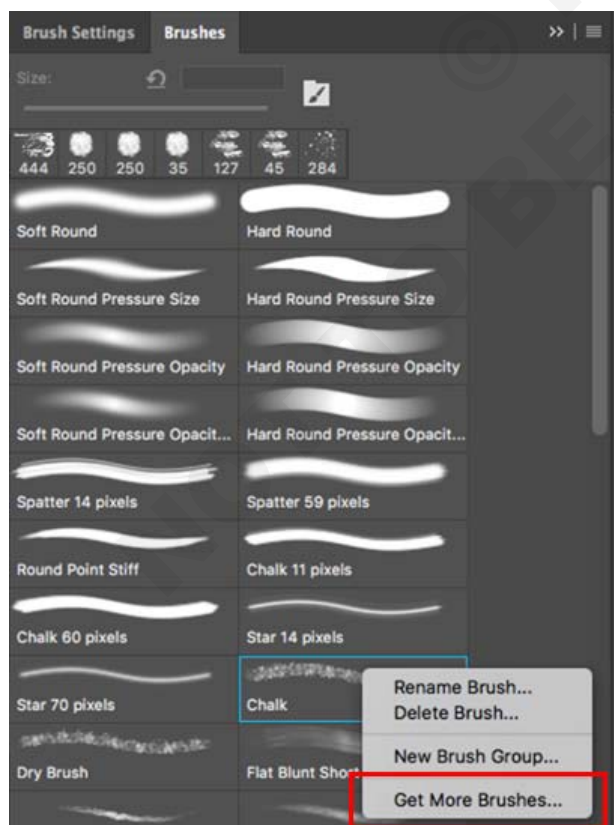
Right-click a brush and select Get More Brushes...

- 2 Download a brush pack. For example, download Kyle's "Megapack".
- 3 With Photoshop running, double-click the downloaded ABR file.

The brushes you added are now displayed in the Brushes panel.

Note

You can also use the Import Brushes option in the Brushes panel flyout menu to locate the downloaded ABR file and open it. Once you do so, the downloaded brushes are added to the Brushes panel.



Creating Database and Designing a Simple Tables in Access

Objectives: At the end of this exercise you shall be able to

- open an Access Database
- create a new Database
- design a simple table in Access
- save and Close Database
- open Existing table
- to add and Save Records
- navigate between table
- edit a Record
- delete a Record
- resizing fields and rows
- hide/unhide Fields.

Requirements

Tools / Equipments/Instruments

- A working PC with MS Office - 1 No. trainee

PROCEDURE

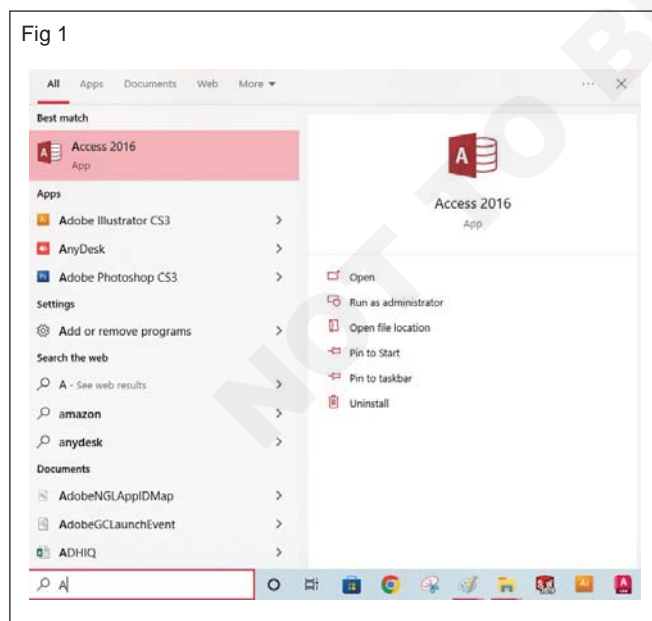
TASK 1 : Open an Access Database

- 1 Invoke Access application package by following sequence.


Microsoft Access splash screen appears for the movement and screen as fig.1 appears.

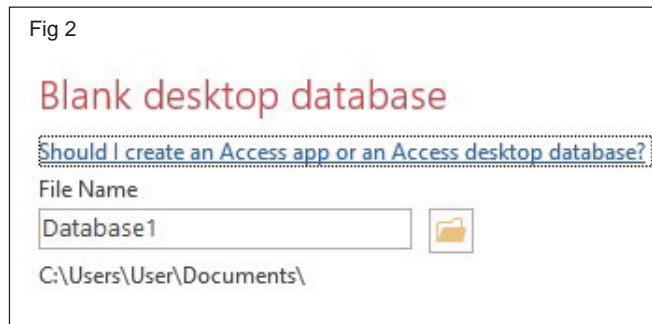


Fig 1



Task 2: Creat a New Database

- 1 Click on 
- 2 Enter the name (give your own name) of the database in the space provided as shown in Fig 2.

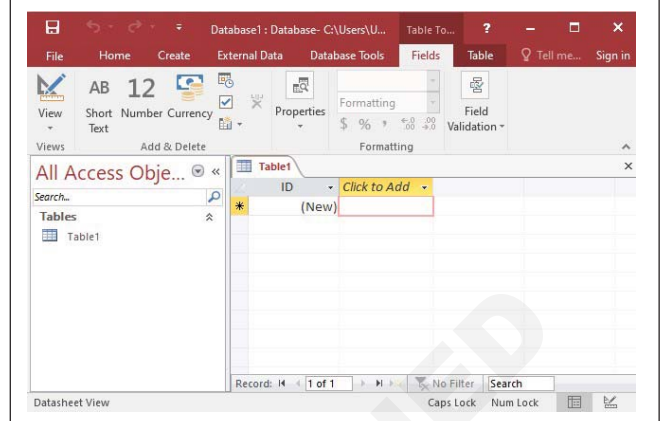


- 3 Click



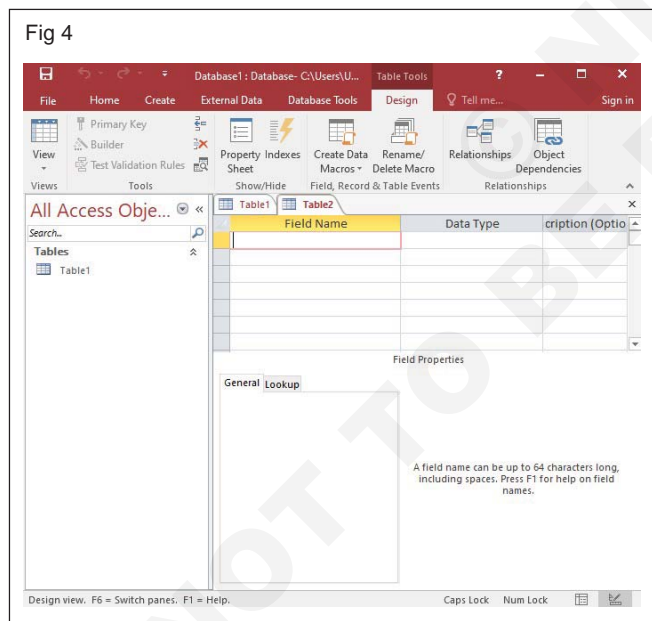
A new database will open with the filename given (Here COPA SEM1 as shown in Fig 3)

Fig 3



TASK 3: Design a simple table in Access

- 1 Click 'Create' tab
- 2 Click 'Table Design' from Table group
- 3 A new table will appear as shown in Fig 4



- 4 Enter the name of the field in 'Field Name' column and type of the field in 'Data Type' column as shown in Fig 5.
- 5 Select a field name to be set as Primary key and click the mouse right button. A pop menu will appear on the screen as shown in Fig 6.

- 6 Select  Primary Key

Fig 5

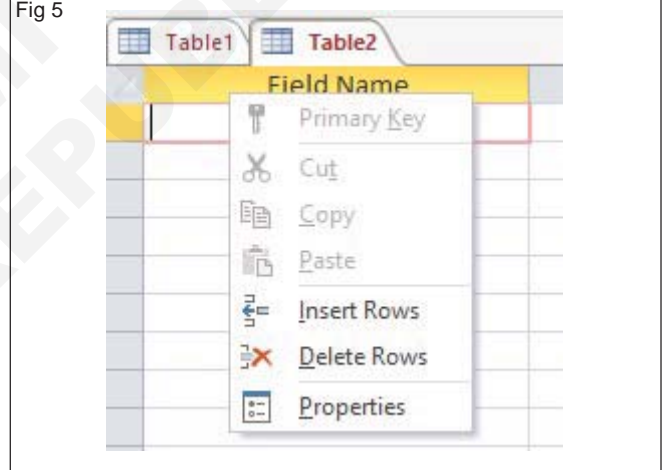
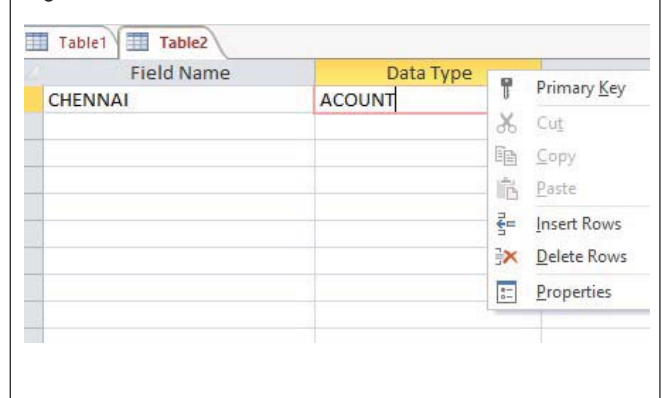


Fig 6




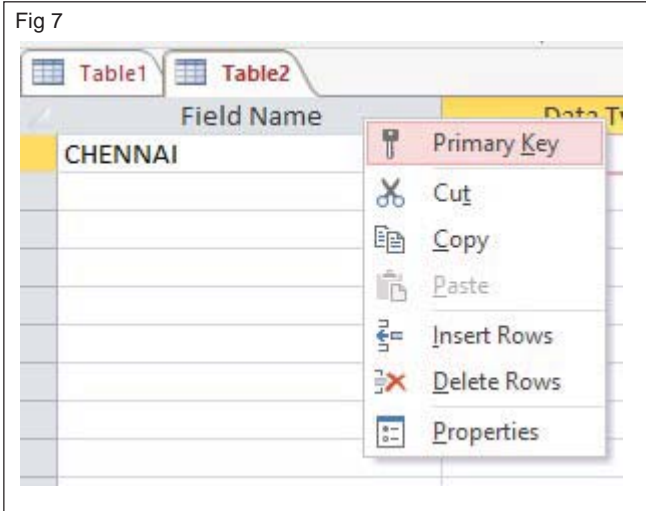
- 7 A  symbol will appear near the field name as shown in Fig 7.

Fig 7



TASK 4: Save and Close database

- 1 Select 'SAVE' option from 'FILE' menu to save the table.

A dialogue box will appear as shown in Fig 8

Fig 8



- 2 Type the Table Name as 'Customers' and press 'OK'.

To close a database:

- 1 Click the File tab to go to Backstage View (Fig 9)
- 2 Select Close Database.
- 3 If any unsaved objects, a dialog box will pop up for each one asking to save it. Select Yes to save the object, No to close it without saving, or Cancel to leave database open (Fig 10)

Fig 9

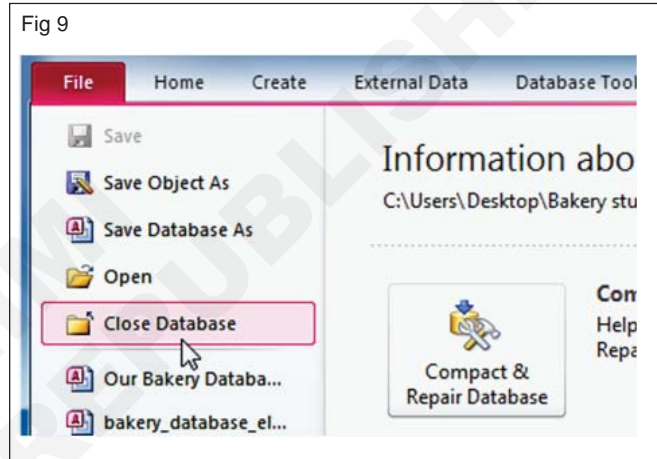
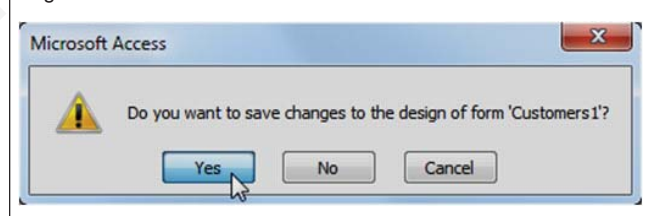


Fig 10

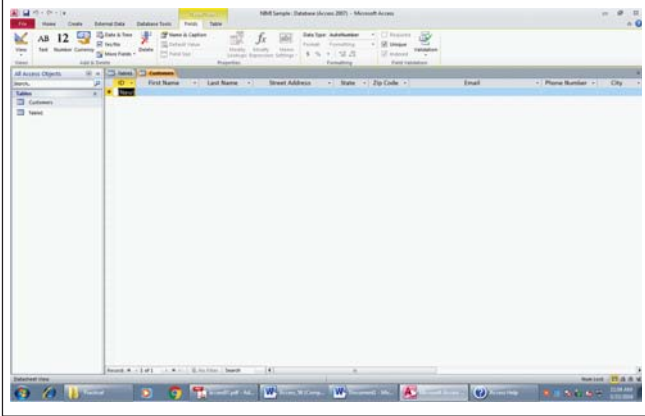


- 4 Select 'Exit' option from 'FILE' menu to close the MS Access.

TASK 5: Opening an Existing table

- 1 Open your database, and locate the Navigation pane.
- 2 In the Navigation pane, locate the table already created to open. Tables are marked with the icon.
- 3 Double-click the name of the table. It will open and appear as a tab in the Document Tabs bar as shown in Fig 11.

Fig 11

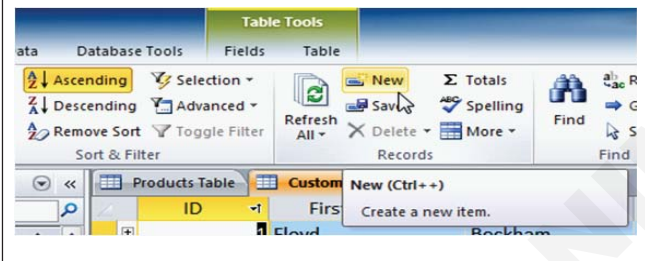


TASK 6: To add a new record

There are three ways to add a new record to a table:

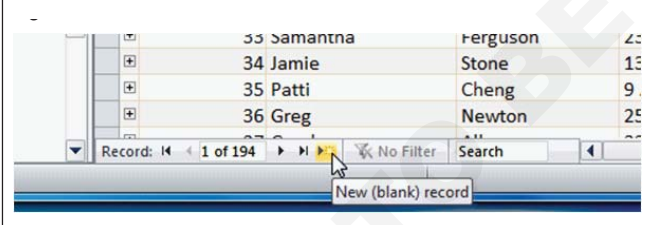
- In the Records group on the Home tab, click the New command. (Fig 12)

Fig 12



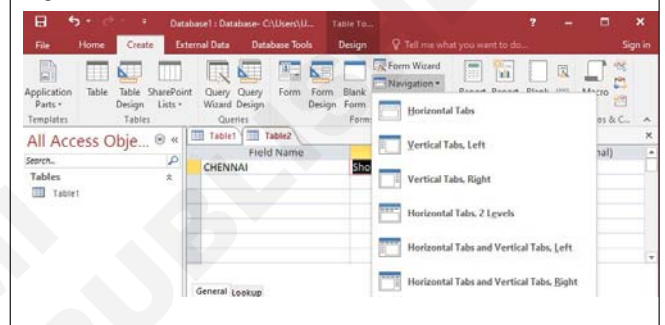
- On the Record Navigation bar at the bottom of the window, click the New Record button. (Fig 13)

Fig 13



- Simply begin typing in the row below last added record. (Fig 14)

Fig 14

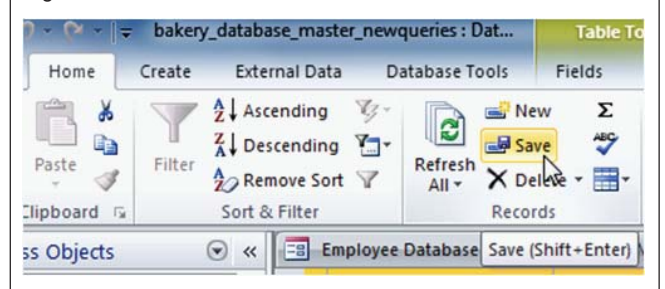


To save a record

- Select the Home tab, and locate the Records group.
- Click the Save command.

Be sure to save any unsaved records before closing a table. Access will not prompt to save them when table is closed. (Fig 15)

Fig 15



TASK 7: Navigating within tables

- To navigate records in a table, use the up and down arrow keys, scroll up and down, or use the arrows in the record navigation bar located at the bottom of table.

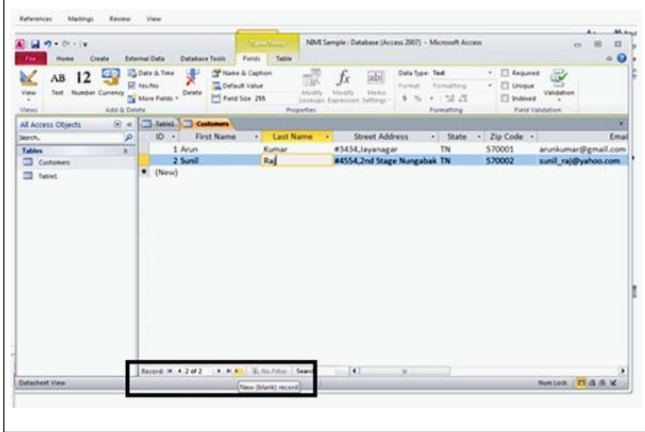
Click on ► to go next record,

click on ◀ 3 symbol to go previous record, click on | ◀ symbol to go to first record,

click on ► | symbol to go to last record, click on ► 3 symbol to Add new record, (Fig 16)

Note: Other method to find any record in the currently open tables by searching for it using the record search box. Simply place cursor in the search box, type any word that appears in the record you want to find, and press Enter. To view additional records that match search criteria, press Enter again.

Fig 16



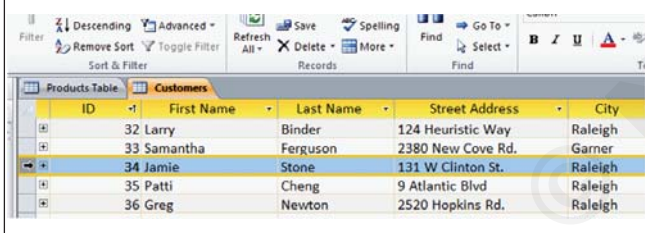
TASK 8: Edit records

- 1 To quickly edit any record within a table, simply click it and type any changes required.
- 2 Access also has the ability to find and replace a word within multiple records, as well as to delete records entirely.

TASK 9: Delete a record

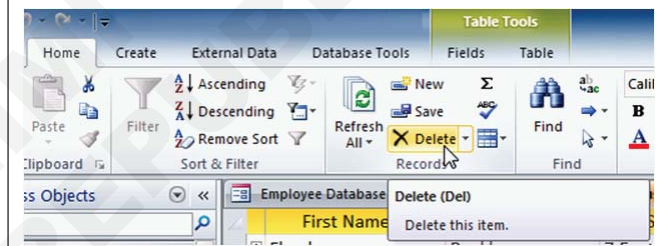
- 1 Select the entire record by clicking the gray border at the left side of the record (Fig 17)

Fig 17



- 2 Select the Home tab, and locate the Records group.
- 3 Click the Delete command. The record will be permanently deleted (Fig 18)

Fig 18



Note : The ID numbers assigned to records stay the same even after you delete a record.

TASK 10 : Resizing fields and rows

To resize a field

- 1 Place cursor over the right gridline in the field title. mouse will become a double arrow \leftrightarrow As shown in Fig 19.
- 2 Click and drag the gridline to the right to increase the field width or to the left to decrease the field width.
- 3 Release the mouse. The field width will be changed. (Fig 20)

Fig 19

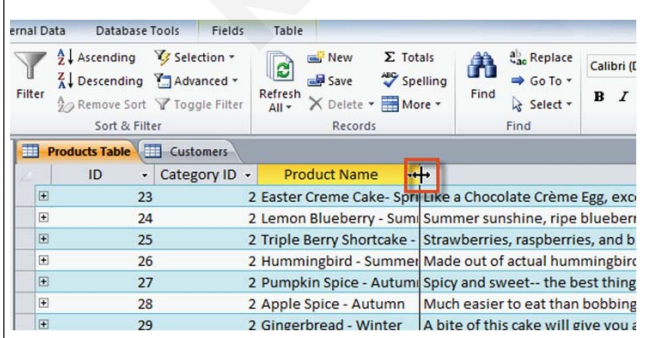


Fig 20



To resize a row:

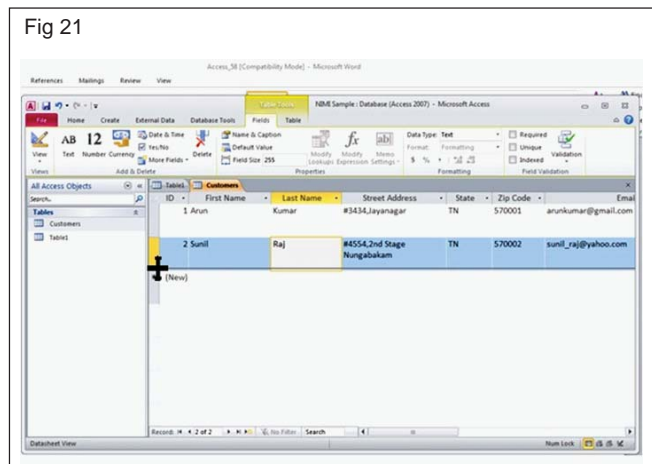
- 1 Place cursor over the bottom gridline in the gray area to the left of the row. Mouse will become a double arrow

- 2 Click and drag the gridline downward to increase the row height or upward to decrease the row height.
- 3 Release the mouse. The row height will be changed.

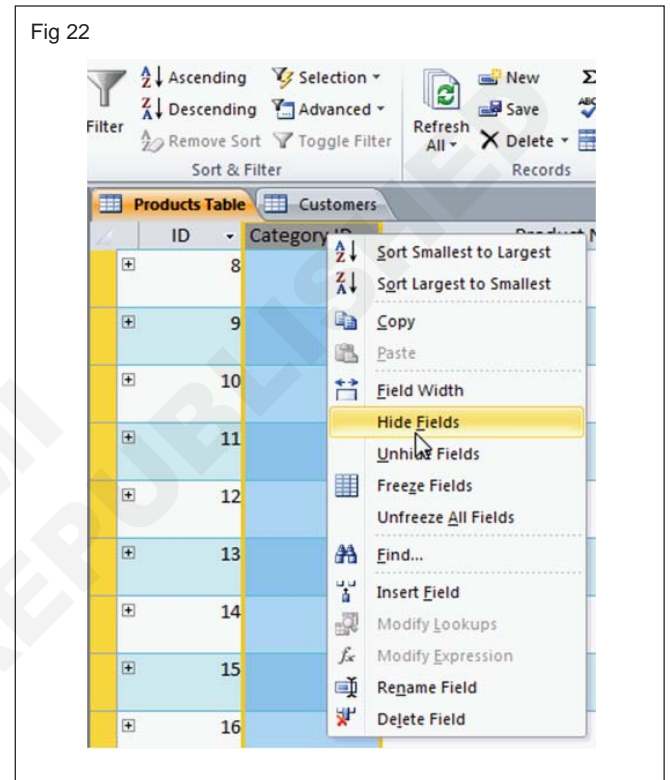
TASK 11: Hiding and Unhiding fields

To hide a field

- 1 Right-click the field title.
- 2 From the drop-down menu, select Hide Fields. (Fig 21)



- 3 The field will be hidden.
- 4 To make Field visible again, Right-click any field title, then select Unhide Fields. In the dialog box, click the check boxes of any fields to be visible again, then click Close. (Fig 22)



Practice Enforcing Integrity Constrains and Modifying the Properties of Tables and Fields

Objectives: At the end of this exercise you shall be able to

- to add a new field to an existing table
- to move a Field
- change data type of Existing Fields.

Requirements

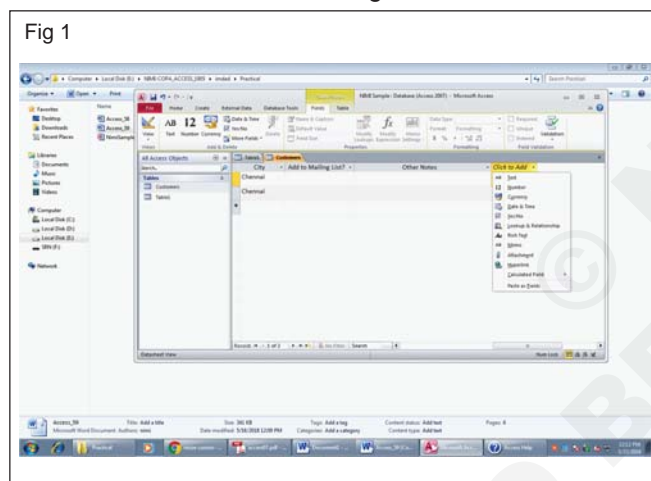
Tools / Equipments/Instruments

- A working PC with Access - 1 No./batch.

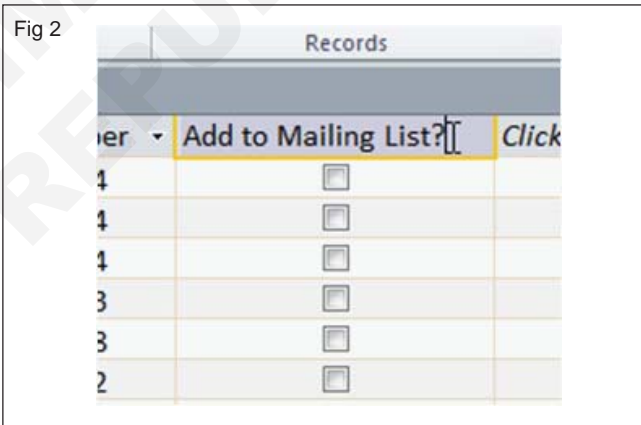
PROCEDURE

TASK 1 : To add a new field to an existing table

- 1 Open the table, then click the header with the text Click to Add as shown in Fig 1.

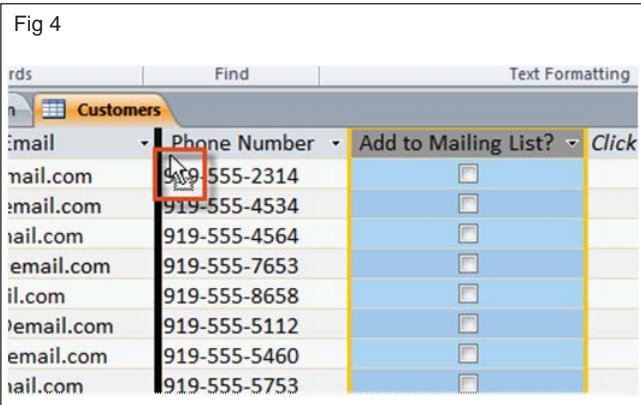
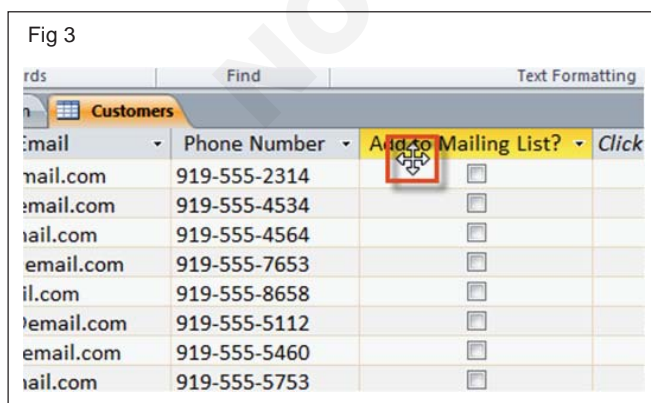


- 2 A drop-down menu will appear. Select the data type for the new field.
- 3 Type a name for your field, then press Enter as Shown in Fig 2.



TASK 2: To move a field

- 1 Locate the field want to move, then move mouse over the bottom border of the field header. cursor will become a four-sided arrow. (Fig 3)



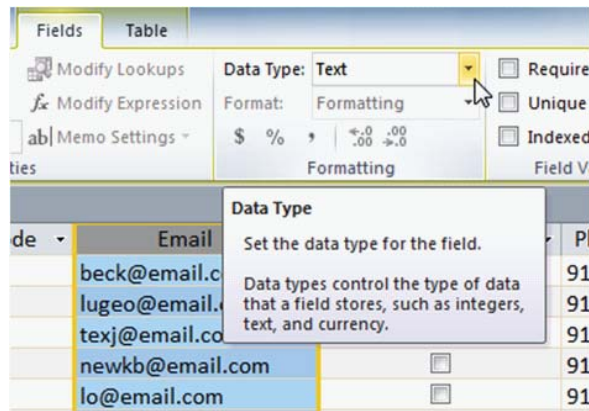
- 3 Release the cursor. The field will appear in the new location.

- 2 Click and drag the field to its new location. (Fig 4)

TASK 3: To change the data type for existing fields

- 1 Select the field which data type to be changed.
- 2 On the Ribbon, select the Fields tab, then locate the Formatting group. Click the Data Type drop-down arrow (Fig 5).

Fig 5



- 3 Select the desired data type (Fig 6).
- 4 The field data type will be changed. Depending on the data type chosen (Fig 7).

Note : Don't change field data type unless you are certain your field data is in the correct format for the new data type. Changing a field containing only text to the Number type, for instance, will delete all of field data. This process is often irreversible.

Fig 6

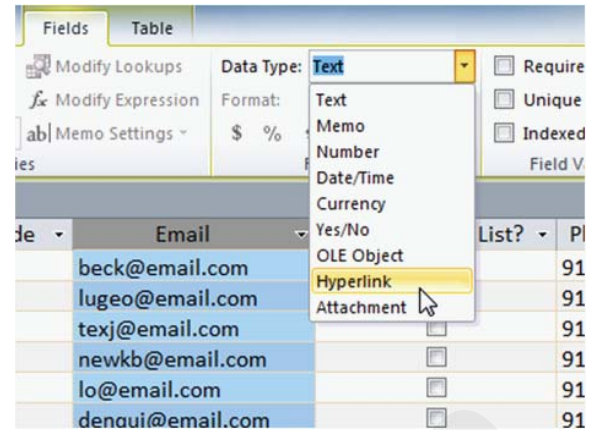
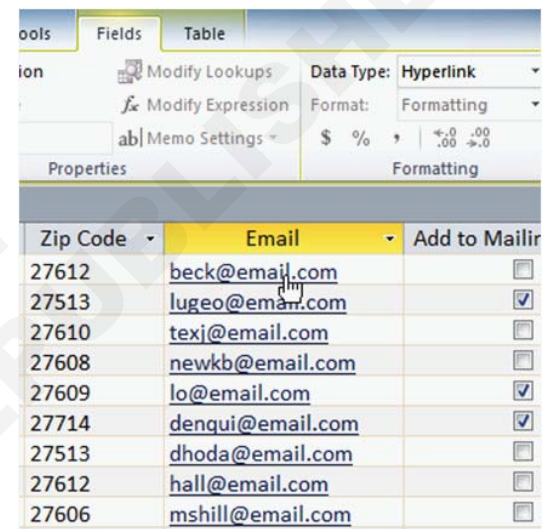


Fig 7



Creation of Relationships and Join Tables

Objectives: At the end of this exercise you shall be able to

- create Multiple Table
- create Relationship.

Requirements

Tools / Equipments/Instruments

- A working PC with MS Office - 1 No./batch.

PROCEDURE

TASK 1 : Create three tables with the following Table Structure and set the primary keys as per the procedure told in earlier Exercises

Fig 1

Field Name	Data Type
Customer ID	AutoNumber
First Name	Text
Last Name	Text
Address	Text
City	Text
State	Text
Zip Code	Text
Email	Text

Fig 3

Field Name	Data Type
Order ID	AutoNumber
Customer ID	Number
Book ID	Number
Order Date	Date/Time

Fig 2

Field Name	Data Type
Book ID	AutoNumber
Book Title	Text
Author Name	Text
Book Price	Text
Order Date	Date/Time

TASK 2: Creating Relationship

- 1 Click the Relationships command in the Show/Hide group on the Database Tools tab in the Ribbon.

NOTE: Tables must be closed in order to establish relationship

2. When the Show Table dialog box appears:
 - Select each table name, then click Add for the tables to relate. close the Show Table dialog box. (Fig 4).

- A relationship map that contains all of the tables that were selected will be shown as Fig 5.

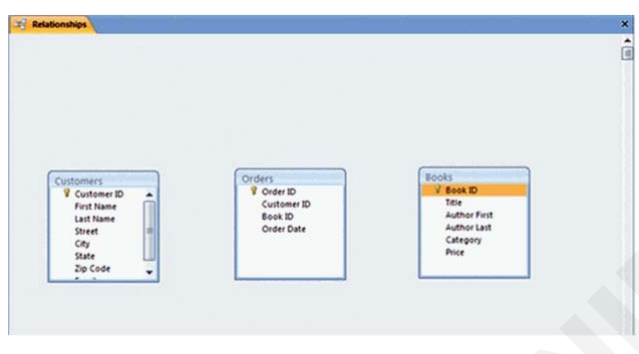
There are a few ways to establish relationships between tables:

- Using the Edit Relationships command located on the Design tab of the Ribbon
 - Using the drag-and-drop method
- 3 To relate tables with the drag-and-drop method:

Fig 4



Fig 5

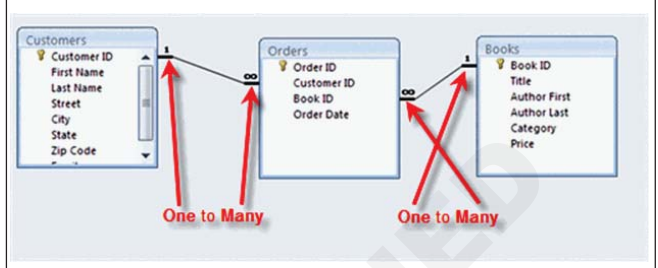


- Select a field name from one table by holding down the left mouse button.
- Drag the field name from one table to the other table in the desired relationship.
- Drop the first field name onto the field name to relate by releasing the left mouse button. As shown

In the example above, selected the Book ID field from the Books table and dragged and dropped it on the Book ID field in the Orders table.

- The Edit Relationships dialog box appears.
- Select Tables and Fields.
- Select the Enforce Referential Integrity option.
- Create one to one and one to many relationship as shown in Fig 6.

Fig 6



Note: To create a one-to-one relationship Both of the common fields (typically the primary key and foreign key fields) must have a unique index. This means that the Indexed property for these fields should be set to Yes (No Duplicates). If both fields have a unique index, Access creates a one-to-one relationship.

To create a one-to-many relationship The field on the one side (typically the primary key) of the relationship must have a unique index. This means that the Indexed property for this field should be set to Yes (No Duplicates). The field on the many side should not have a unique index. It can have an index, but it must allow duplicates. This means that the Indexed property for this field should be set to either No or Yes (Duplicates OK). When one field has a unique index, and the other does not, Access creates a one-to-many relationship.

Queries with Various Criteria and Calculations

Objectives: At the end of this exercise you shall be able to

- Create Form Through Wizard
- Developing Customized Form
- create a single table query and run a query
- run a Query
- Create Make table Query
- Create Append Query.

Requirements

Tools / Equipments/Instruments

- A working PC - 1 No./batch.

PROCEDURE

TASK 1 : Creating a form through wizard.

- 1 In the Navigation pan select the Customer table, then Click on Create tab on the Ribbon, click on Form Wizard. (Fig 1)
- 2 The Form Wizard appears as shown in Fig 2.
- 3 Click the Tables/Queries list arrow and select the table or query you want to use to create your form .
- 4 Add a field to the form by select and click on Right arrow button or double-click the field (Fig 3)

Fig 1

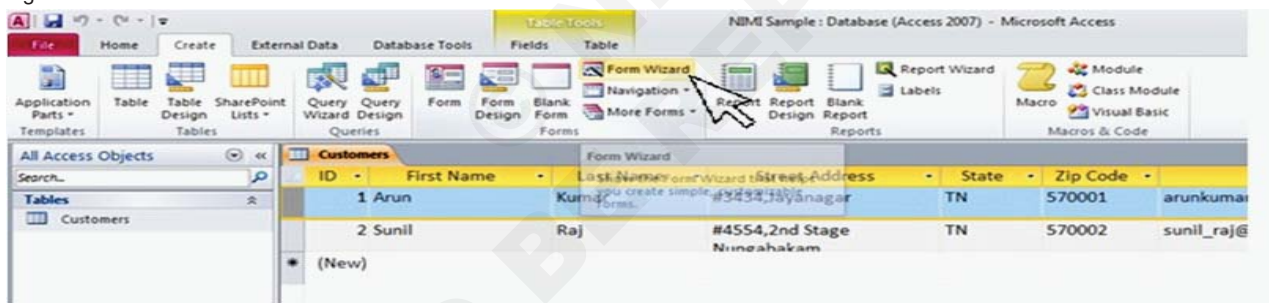
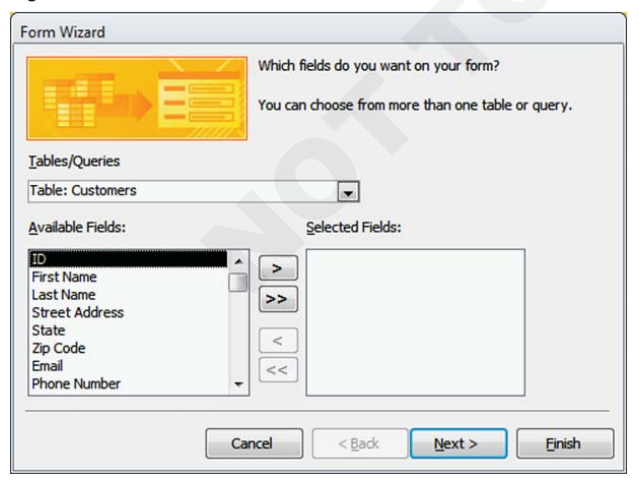


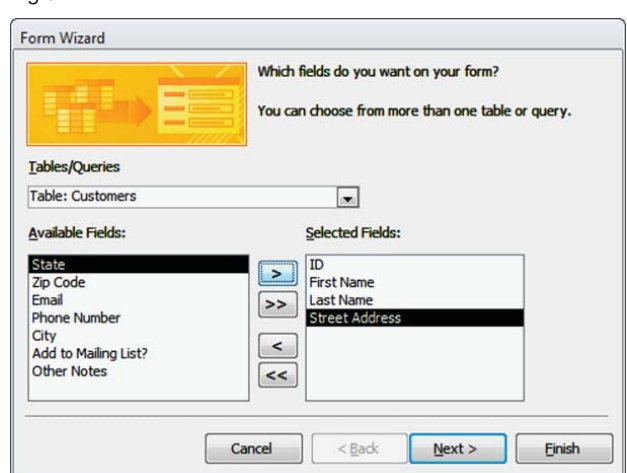
Fig 2



Click Next when you're finished.

- 5 Next the Form Wizard asks how to lay out the data on the form Select the layout you want to use for the form and click Next. (Fig 4)

Fig 3



- 6 Enter a title for your form in the text box and select to either open the form or modify the form's design. Click Finish. The form appears in the window (Fig 5)

Fig 4

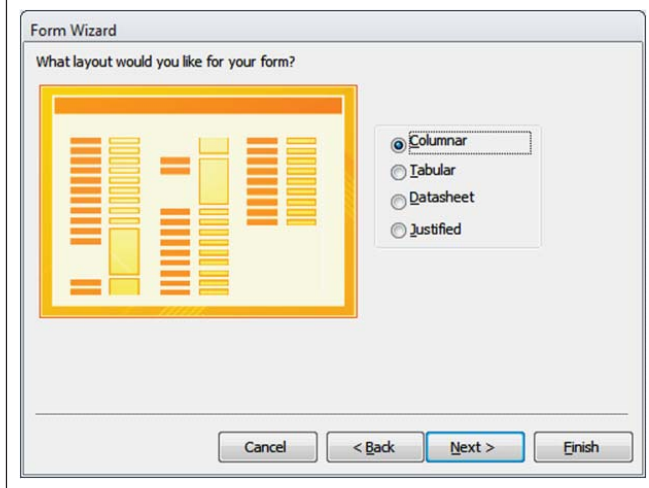
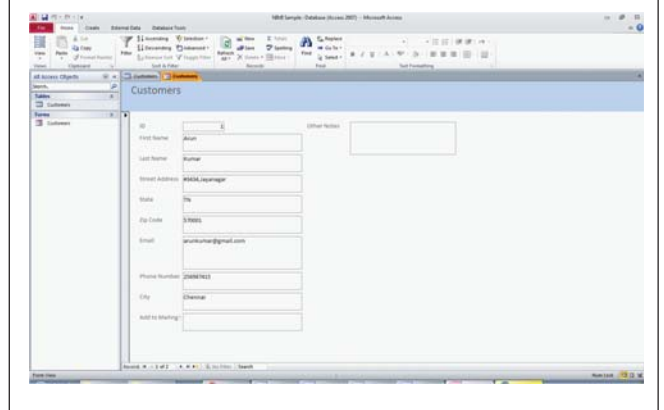


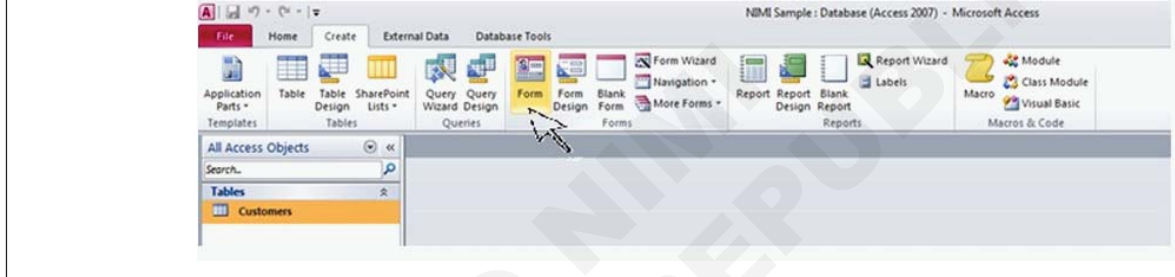
Fig 5



TASK 2: Developing Customized Form

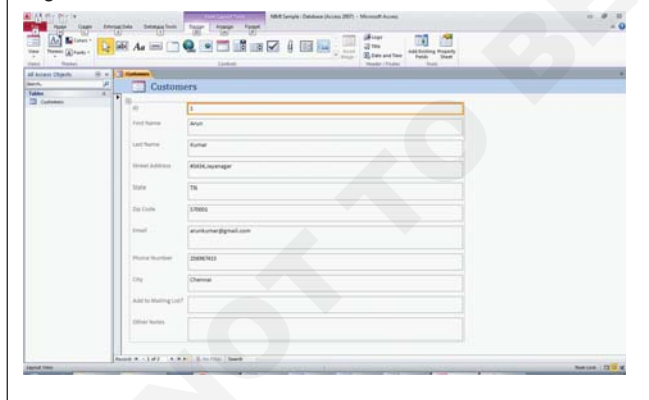
- 1 In the Navigation pane, select the table you want to use to create a form & do not need to open the table.
- 2 Select the Create tab, locate the Forms group, and click The Form command (Fig 6).

Fig 6



- 3 The form will be created and opened in Layout view (Fig 7).

Fig 7

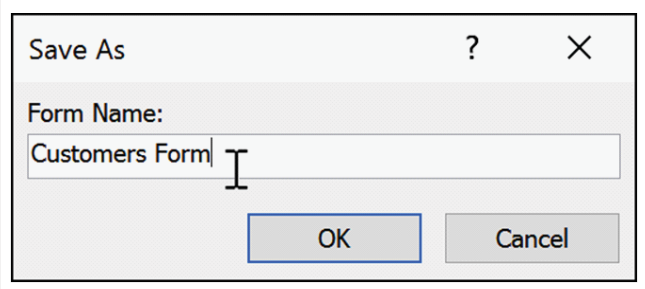


- 4 To save the form, click the Save command on the Quick Access Toolbar. When prompted, type a name for the form, then click OK (Fig 8).

To open an existing form:

- 1 Open your database, and locate the Navigation pane.
- 2 In the Navigation pane, locate the form you want to open. Forms are marked with the icon.
- 3 Double-click the name of the form. It will open and appear as a tab in the Document Tabs bar.

Fig 8



To add a field to a form:

- 1 Select the Design tab, then locate the Tools group on the right side of the Ribbon.
- 2 Click the Add Existing Fields command. (Fig 9)
- 3 The Field List pane will appear. Double-click the desired field(s). (Fig 10)

4 The field will be added.

To add a field from a different table:

- 1 From the Field List pane, click Show All Tables.
- 2 Click the plus sign + next to the table that contains the field you want to add, then double-click the desired field. The new field will be added. (Fig 11)

Fig 9

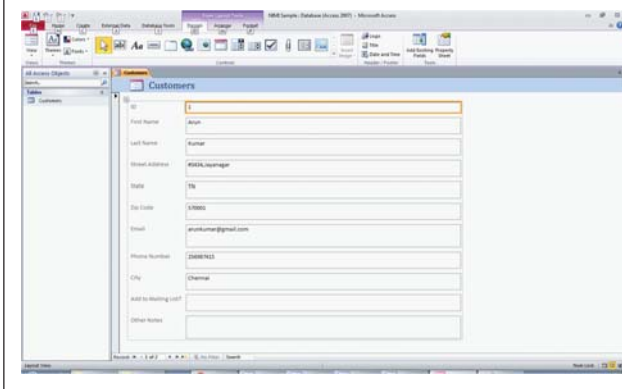
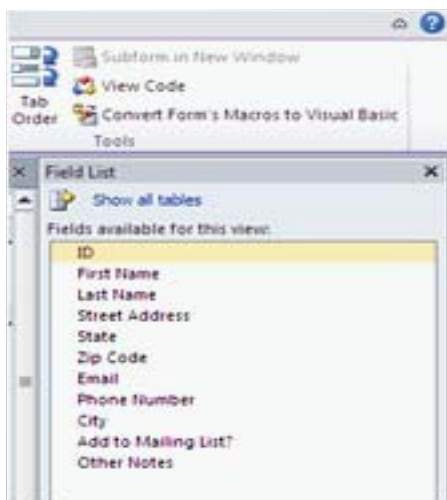


Fig 11



Fig 10

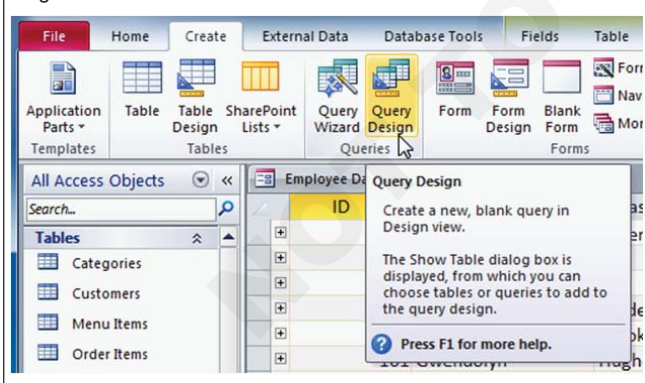


TASK 3: To Create a table query and run a query

- 1 Select the Create tab on the Ribbon, and locate the Queries group.
- 2 Select the Query Design command (Fig 12).

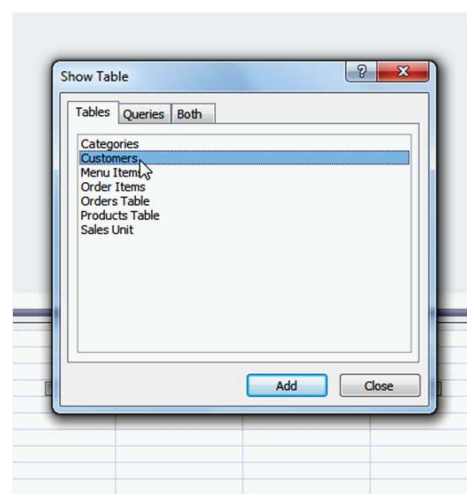
will be added to the design grid in the bottom part of the screen. In above example, if we want to mail invitations to customers who live in a certain area, so we'll include the First Name, Last Name, Street Address, City, State, and Zip Code fields (Fig 14).

Fig 12



- 3 Access will switch to Query Design view. In the Show Table dialog box that appears, select the table you want to run a query on. Click Add, then click Close. To run a query about customers, add the Customers table (Fig 13).
- 4 The selected table will appear as a small window in the Object Relationship pane. In the table window, double-click the field names to include in query. They

Fig 13

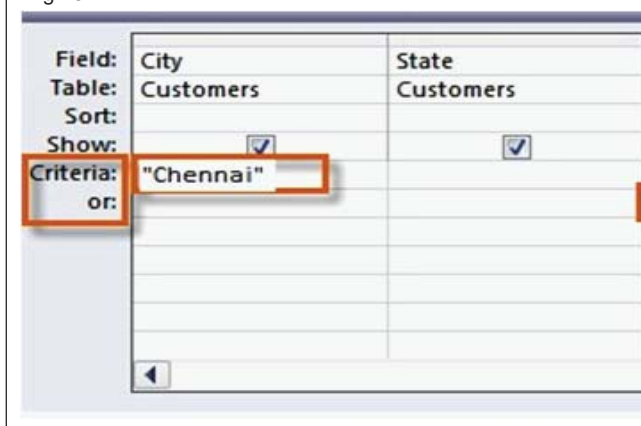


- 5 Set the search criteria by clicking the cell in the Criteria: row of each field you want to filter.

6 Type criteria into more than one field in the Criteria: row will set your query to include only results that meet all of the criteria. If you want to set multiple criteria but don't need the records shown in your results to meet them all, type the first criteria in the Criteria: row and additional criteria in the Or: row and the rows beneath it.

- For this one-table query, we'll use very simple search criteria.
- If We want to find customers who live in a city called Chennai, so in City field, type "Chennai". Typing "Chennai" in quotation marks will retrieve all records with an exact match for Chennai in the City field (Fig 15).

Fig 15



7 After you have set your criteria, run the query by clicking the Run command on the Query Tools Design tab (Fig 16).

8 The query results will be displayed in the query's Datasheet view, which looks like a table. Save query by clicking the Save command in the Quick Access toolbar.

9 When prompted to name it, type the desired name, then click OK (Fig 17).

Fig 16

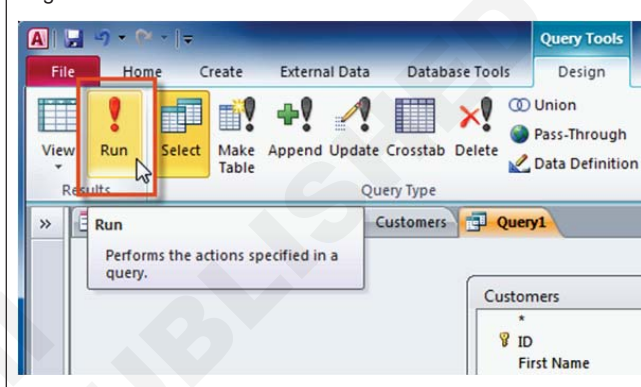


Fig 14

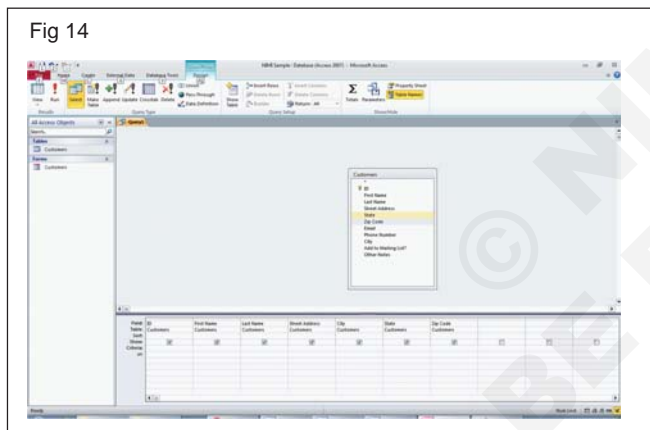
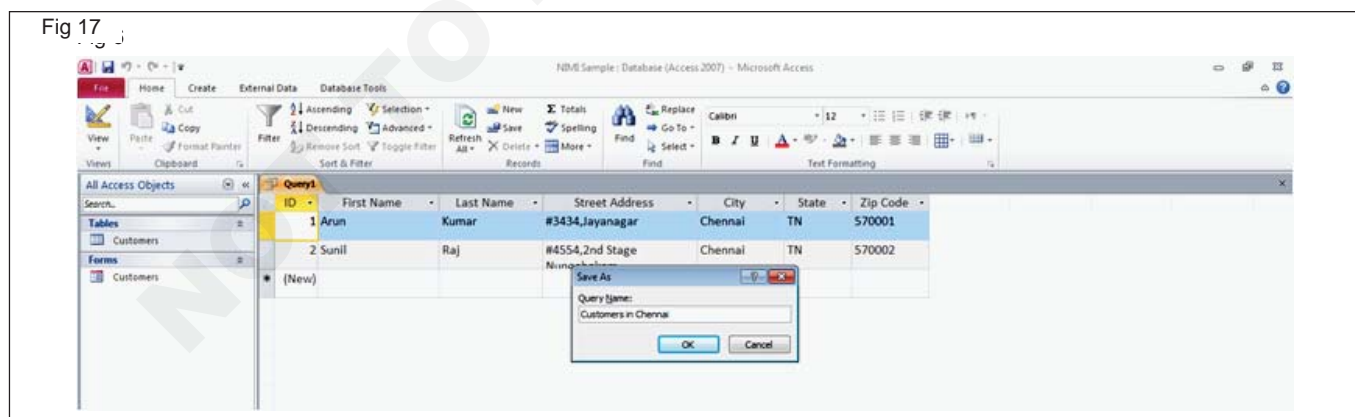


Fig 17



TASK 4 : Creating a multi-table query and run

- 1 Select the Query Design Command from the Create tab on the Ribbon (Fig 18).
- 2 In the Show Table dialog box that appears, select each table to be include in query, then click Add. After adding all of the tables, click Close (Fig 19).
- 3 The tables will appear in the Object Relationship pane, which is linked by a join line. Double-click the thin section of the join line between two tables to edit its join direction (Fig 20)

Fig 18

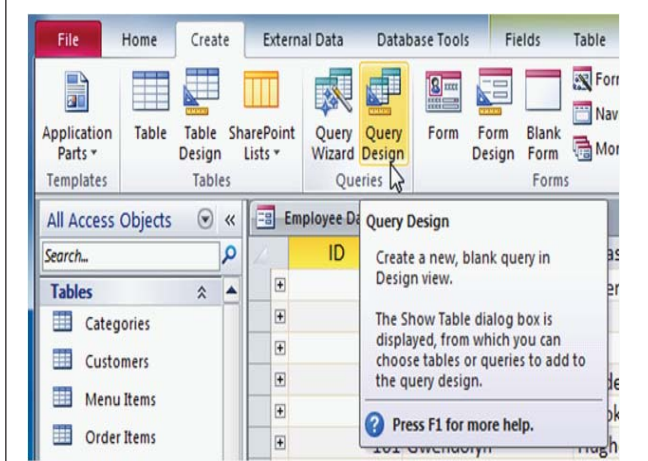


Fig 19

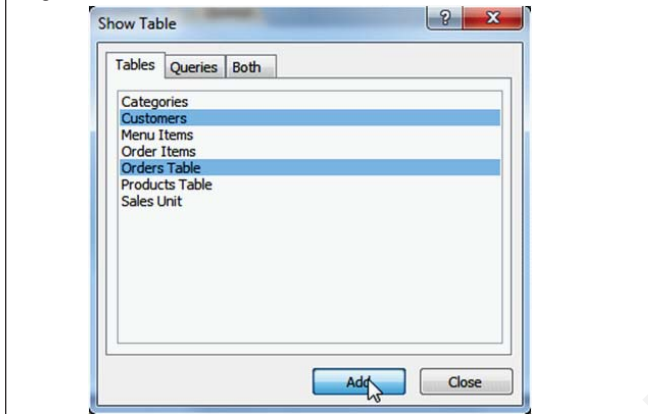
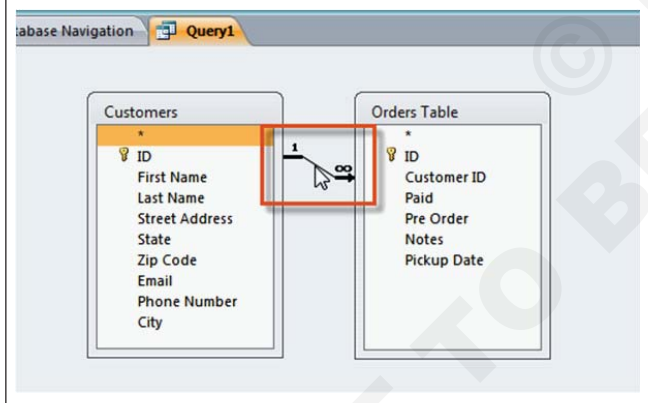


Fig 20

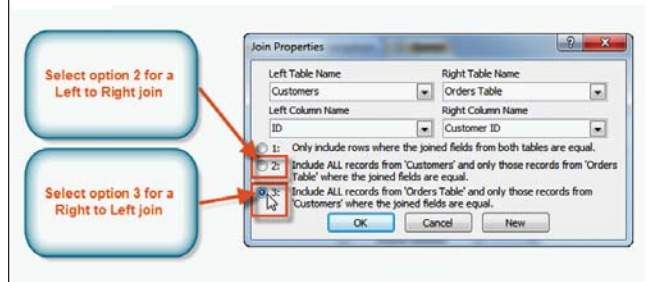


4 The Join Properties dialog box will appear. Select an option to choose the direction of join.

- Choose option 2: for a left-to-right join. In above query, the left table is the Customers table, so choosing this would mean all of the customers who met our location criteria-whether or not they had placed an order-would be included in results. We don't want to choose this option for our query.
- Choose option 3: for a right-to-left query. Because our right table is our Orders table, selecting this option will let us work with records for all of the

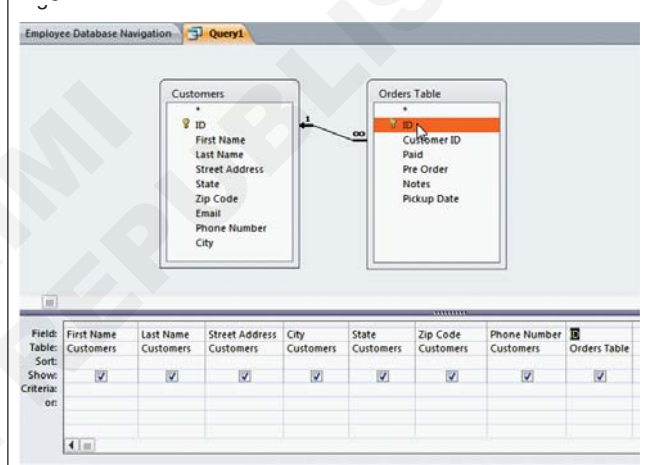
orders and only the customers who've placed orders. choose this option for our query because this is exactly the data we want to see (Fig 21).

Fig 21



5 In the table windows, double-click the field names to include in your query. They will be added to the design grid in the bottom part of the screen. Include most of the fields from the Customers table: First Name, Last Name, Address, City, State, Zip Code, and Phone Number. We'll also include the ID number from the Orders table (Fig 22).

Fig 22



6 Set field criteria by entering the desired criteria in the criteria row of each field. We want to set two criteria:

- First, to find customers who do not live in Chennai, we'll type Not In ("Chennai") in the City field.
- Second, to find customers who have a phone number beginning with the area code 919, we'll type Like ("919*") in the Phone Number field (Fig 23).

7 After you have set your criteria, run the query by clicking the Run command on the Query Tools Design tab (Fig 24).

8 The query results will be displayed in the query's Datasheet view, which looks like a table. If you want, save your query by clicking the Save command on the Quick Access toolbar. When prompted to name it, type the desired name, then click OK (Fig 25).

Fig 23

Field:	First Name	Last Name	Street Address	City	State	Zip Code	Phone Number	ID
Table:	Customers	Customers	Customers	Customers	Customers	Customers	Customers	Customers
Sort:								
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:				Not In "Chennai"			Like ('919*')	
or:								

Fig 24

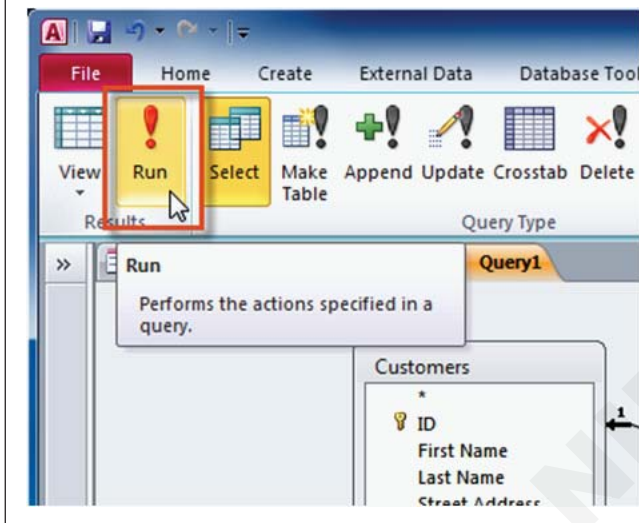


Fig 25

First Name	Last Name	Street Address	City	State	Zip Code	Phone Number
Sigrudsdatter	Yuen	55 Cameron Ct.	Cary	NC	27513	919-555-
MacDonald	Slobodowski			NC	27513	919-555-
Oglesby	Kellerman			NC	27714	919-555-
Olivera	Storey			NC	27714	919-555-
Temple	Emory	12 Spencer Ave.	Chapel Hill	NC	27514	919-555-
Parthasarathy	Williams	99 Hillsborough St.	Garner	NC	27529	919-555-
Daugherty	Olsen	1009 Raleigh Street	Hillsborough	NC	27278	919-555-
		9014 Miller Ln.	Durham	NC	27714	919-555-
		105 Aycove St.	Chapel Hill	NC	27514	919-555-
		4325 W. King St.	Garner	NC	27529	919-555-

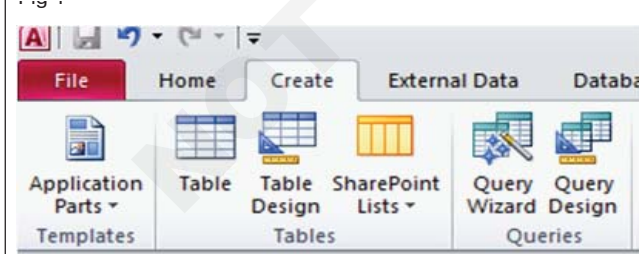
TASK 5: Create a make table query

Step1: To create a make table query first create select query then convert it to a make table Query.

Create the select query

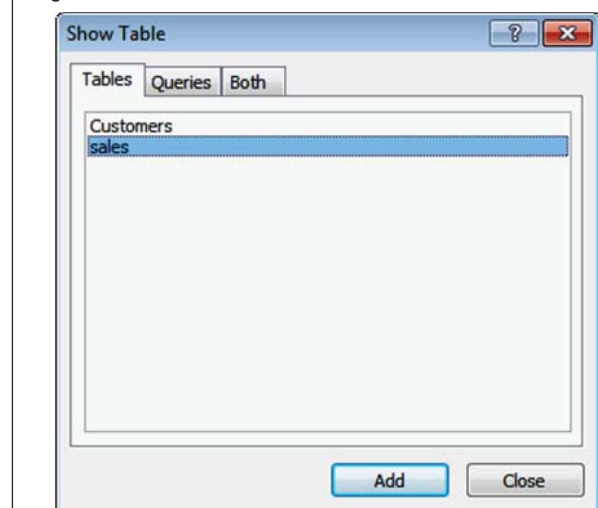
- 1 On the Create tab, in the Query group, click Query Design (Fig 26).

Fig 26



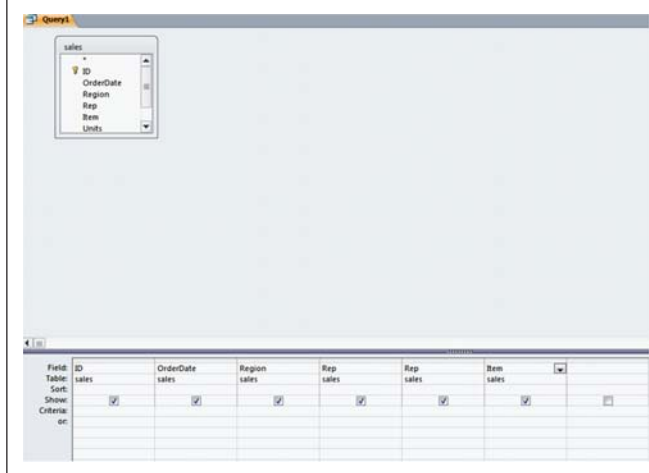
- 2 In the Show Table dialog box, double-click the table Sales created in previous exercise from which to retrieve data. Each table appears as a window in the upper section of the query designer. Click Close when have finished adding the tables (Fig 27).
- 3 In each table, double-click the field or fields that you want to use in your query. Each field appears in a blank cell in the Field row of the design grid (Fig 28).

Fig 27



- 4 Optionally, add any expressions to the Field row.
- 5 Optionally, add any criteria to the Criteria row of the design grid.
- 6 Click Run to run the query and display the results in a datasheet.

Fig 28

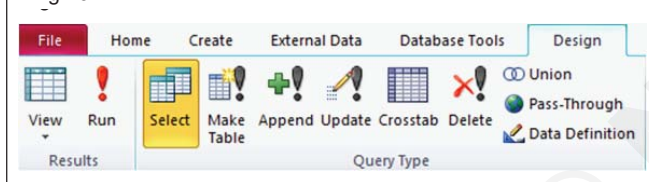


- 7 Optionally, change fields, expressions, or criteria and rerun the query until it returns the data that you want to place in your new table.

Convert the select query

- 1 Open your select query in Design view, or switch to Design view.
- 2 On the Design tab, in the Query Type group, click Make Table (Fig 29).

Fig 29



- a The Make Table dialog box appears (Fig 30).
- 3 In the Table Name box, enter a name for the new table.

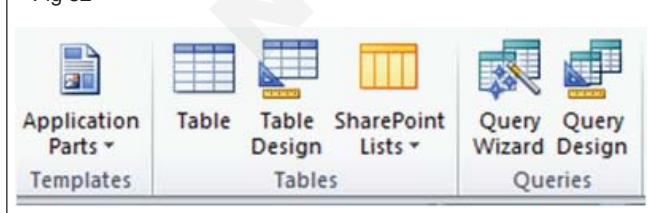
-or-

Click the down-arrow and select an existing table name.

TASK 6: Create a query to select the records to copy

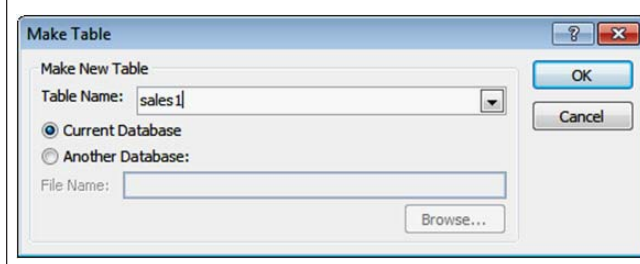
- 1 Open the database and customers table created in earlier exercise that contains the records.
- 2 On the Create tab, in the Queries group, click Query Design (Fig 32).

Fig 32



- a The query designer opens, and the Show Table dialog box appears (Fig 33).
- 3 Double-click the Customers table and then click Close. The tables or queries appear as one or more windows in the query designer. Each window lists the

Fig 30



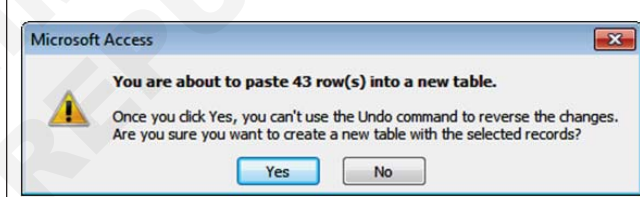
- 4 Do one of the following:
 - a Place the new table in the current database:
 - If it isn't already selected, click Current Database, and then click OK.
 - b Place the new table in another database:
 - Click Another Database.
 - In the File Name box, enter the location and file name of the other database.

-or-

Click Browse, use the new Make Table dialog box to locate the other database, and click OK.

- Click OK to close the first Make Table dialog box.
- Click Run and then click Yes to confirm the operation.

Fig 31



Note: If you replace an existing table, Access first deletes that table and asks you to confirm the deletion. Click Yes, and then click Yes again to create the new table.

fields in a table or query. The figure below shows a typical table in the query designer (Fig 34).

Fig 33

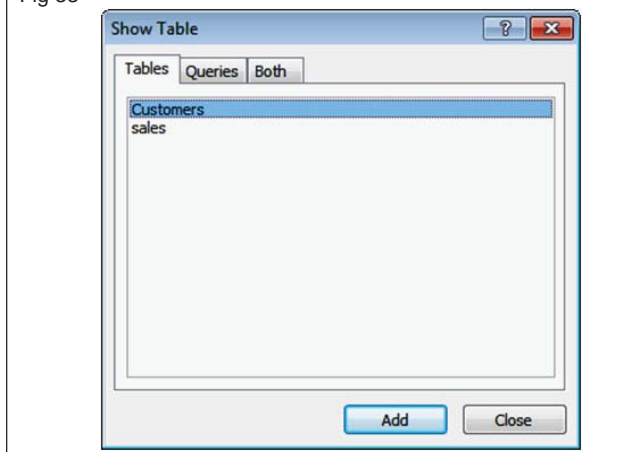
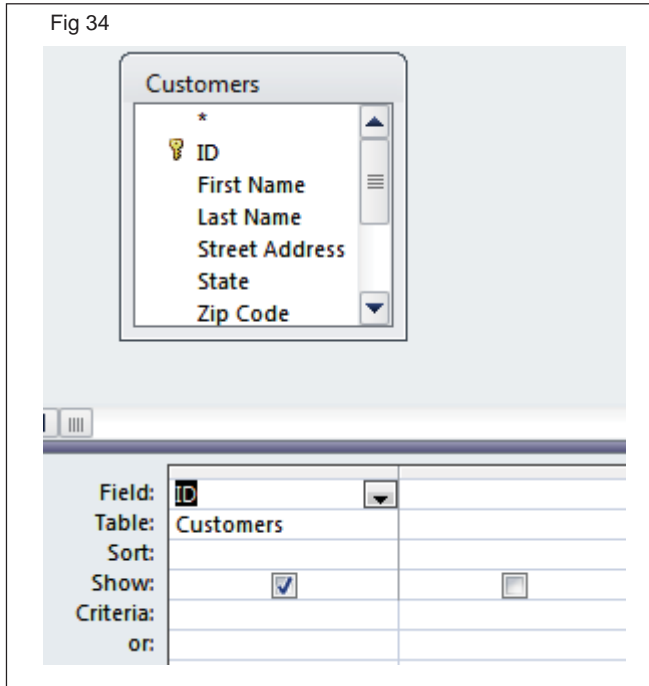


Fig 34



- 4 Double-click each field that you want to append. The selected fields appear in the Field row in the query design grid

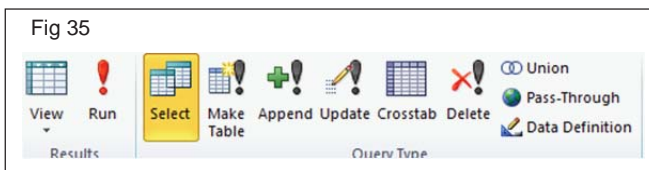
Note: The data types of the fields in the source table must be compatible with the data types of the fields in the destination table. Text fields are compatible with most other types of fields. Number fields are only compatible with other number fields. For example, you can append numbers to a text field, but you cannot append text into a number field

- 5 To quickly add all the fields in a table, double-click the asterisk (*) at the top of the list of table fields. The figure on the right shows the design grid with all fields added.
- 6 On the Design tab, in the Results group, click Run .
- 7 Verify that the query returned the records that you want to copy. If you need to add or remove fields from the query, switch back to Design view and add fields as described in the preceding step, or select the fields that you don't want and press DELETE to remove them from the query.

Step 2: Convert the select query to an append query

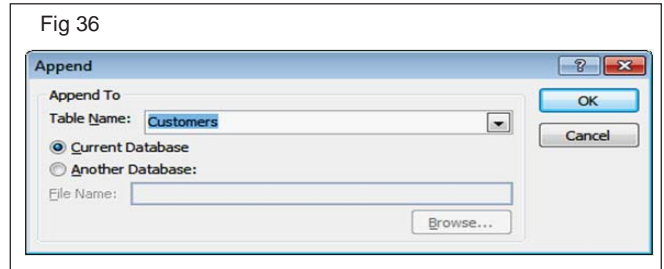
- 1 On the Home tab, in the View group, click View, and then click Design View.
- 2 On the Design tab, in the Query Type group, click Append (Fig 35).

Fig 35



- a The Append dialog box appears (Fig 36).

Fig 36



- 3 Next, specify whether to append records to a table in the current database, or to a table in a different database. Do one of the following:

- a In the Append dialog box, click Current Database, select the destination table from the Table Name combo box, and then click OK.

-or-

- b In the Append dialog box, click Another Database.

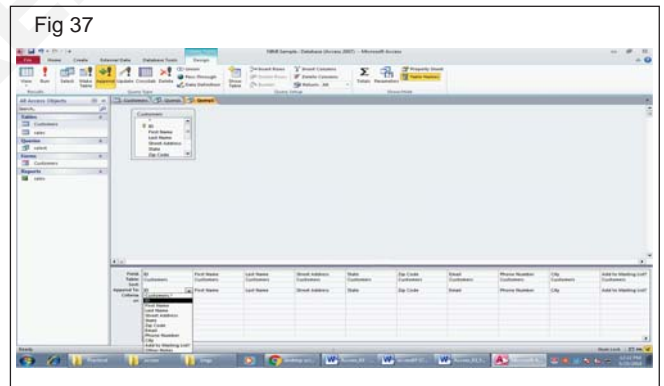
- In the File Name box, enter the location and name of the destination database.
- In the Table Name combo box, enter the name of the destination table, and then click OK.

Step 3: Choose the destination fields

The way that you choose destination fields depends on how create your select query in Step 1.

If Access leaves fields blank, you can click a cell in the Append to row and select a destination field. The figure illustrates how you click a cell in the Append to row and select a destination field (Fig 37).

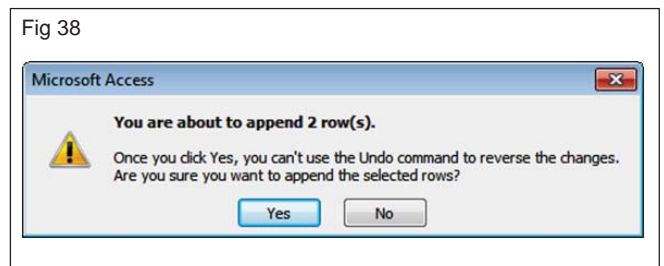
Fig 37



Step 4: Preview and run the append query

- 1 To preview your changes, switch to Datasheet view or right-click the tab at the top of the query, and then click the view that required
- 2 Return to Design view, and then click Run to append the records (Fig 38).

Fig 38



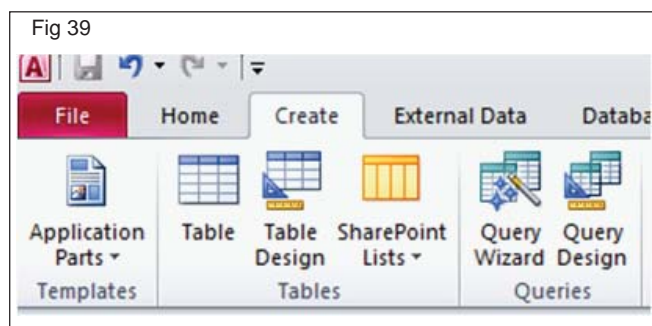
- Click yes to confirm the append, Note that changes cannot be undone.

TASK 7: Create and run an update query

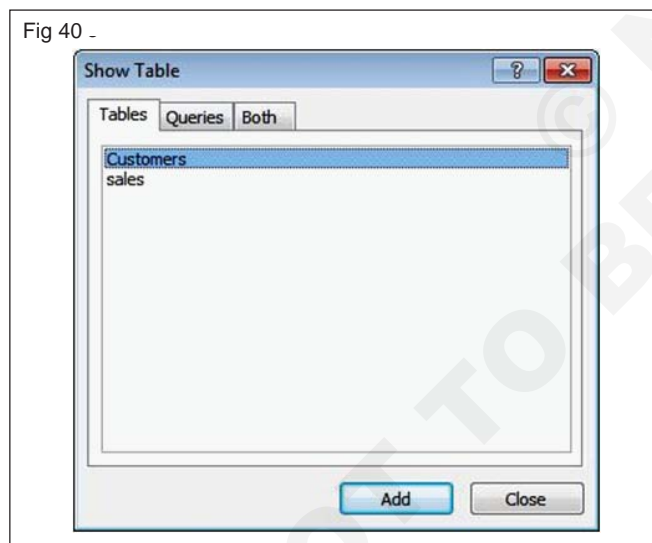
Note: make back up of database before run an update query. Changes cannot be undone after executing an update query

Step 1: Create a select query to identify the records to update

- Open the database that contains the records you want to update.
- On the Create tab, in the Queries group, click Query Design (Fig 39).



- The query designer opens, and the Show Table dialog box opens.
- Click the Tables tab (Fig 40).



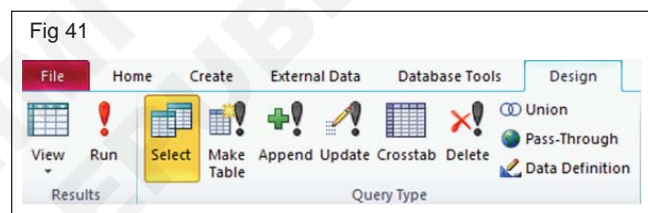
- Select the table Customers created in earlier exercise that contain the records, click Add, and then click Close.
 - The table or tables appear as one or more windows in the query designer, and the windows list all the fields in each table.
- Double-click the fields that you want to update in the table windows.
 - The selected fields appear in the Field row in the query design grid.
 - You can add one table field per column in the query design grid.

- To add all the fields in a table quickly, double-click the asterisk (*) at the top of the list of table fields in the table window.

- To limit the query results based on field values, in the query design grid, in the Criteria row, enter the criteria that you want to use to limit the results.
- On the Design tab, in the Results group, click Run.
- Verify that the query returns the records that you want to update.
 - To remove any fields that you do not want included in the query design, select the fields and then press DELETE.
 - To add any fields that you want to include in the query design, drag the additional fields to the query design grid.

Step 2: Update the records

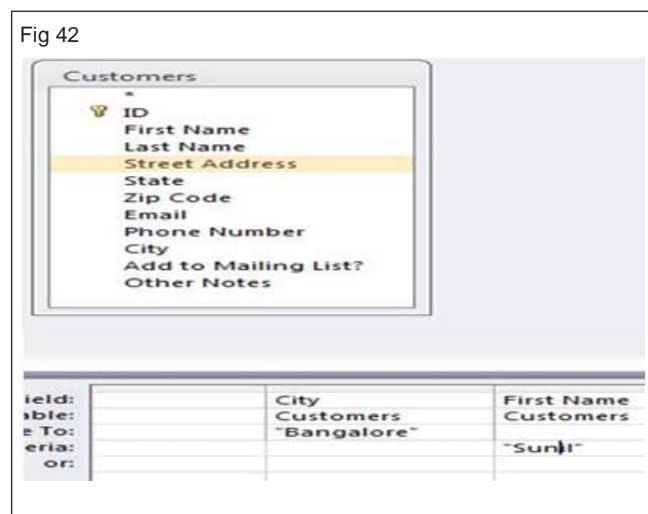
- In Design view, on the Design tab, in the Query Type group, click Update (Fig 41).



- Locate the field that contains the data that you want to change, and then type your expression (your change criteria) in the Update to row for that field.

You can use any valid expression in the Update to row

The illustration shows an update query that update city from "Chennai" to "Bangalore" for customer whose first name is "Sunil" (Figs 42 & 43).



- 3 On the Design tab, in the Results group, click Run.
 - a An alert message appears.
- 4 To run the query and update the data, click Yes

Fig 43



TASK 8: Create and run an Delete query

Important: Make sure that you have a backup of your database before you delete the data.

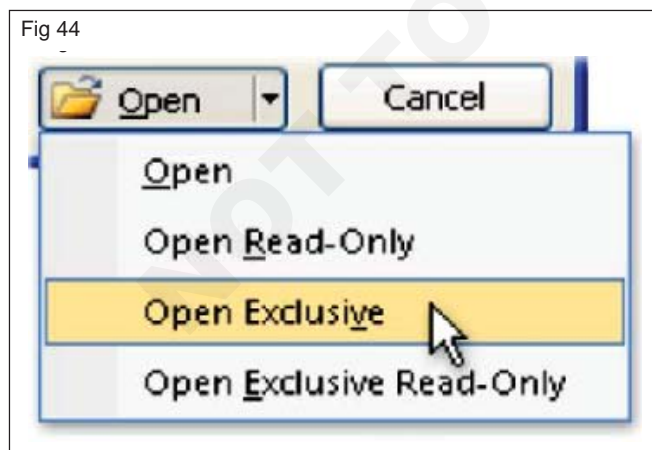
What to verify before using a query to delete data

- Ensure that the database file is not read-only. To do so, in Windows Explorer, right-click the database file and then click Properties.
- Verify that have the necessary permissions to delete records from the database. If not sure, contact your system administrator or the database designer.
- Make sure that you have enabled content in the database. By default, Access blocks all action queries (delete, update, and make-table queries) unless you first trust the database.
- Ask other users of the database to close all tables, forms, queries, and reports that use the data that you want to delete. This helps avoid lock violations.
- Before you edit or delete records, back up the database. You cannot reverse operations that are performed by delete and update queries, so making a backup copy ensures that you can always reverse your changes.

Step1 : To open a database in Exclusive mode

- 1 Click the File tab, and then click Open.
- 2 Browse to and point to select the database,
- 3 click the arrow next to the Open button, and then click Open Exclusive (Fig 44).

Fig 44

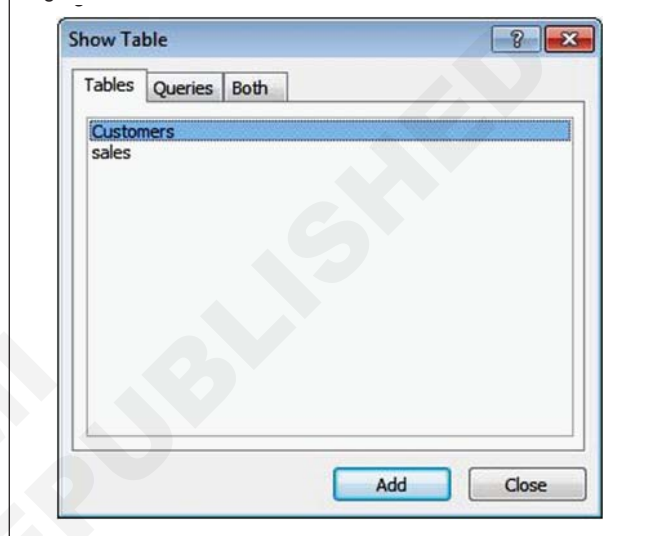


Create and use a delete query

- 1 On the Create tab, in the Queries group, click Query Design.
 - a The Show Table dialog box appears.

- 2 Double-click each table from which you want to delete records, for example use Customers Table created in earlier Exercise. and then click Close (Fig 45).

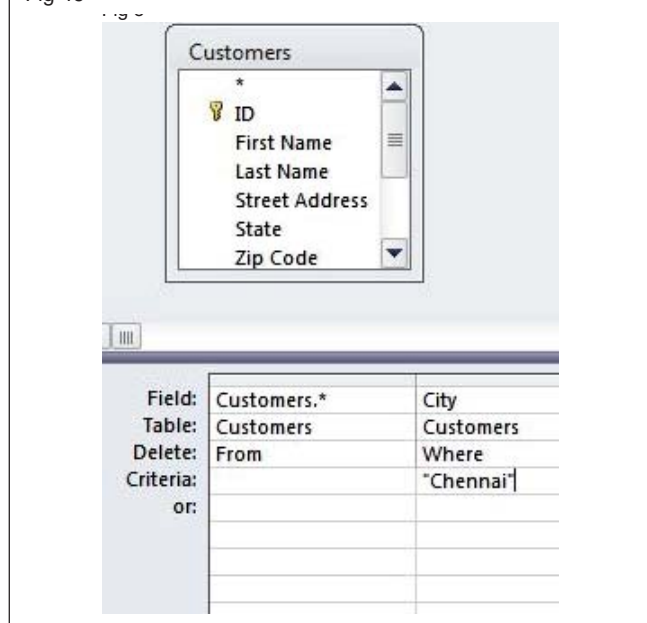
Fig 45



- a The table appears as a window in the upper section of the query design grid. The window lists all of the fields in the selected table.

- 3 Double-click the asterisk (*) to add all of the fields in the table to the design grid.

Fig 46



- 4 Optionally, double-click any field that you want to use to specify criteria for deletion, enter one or more

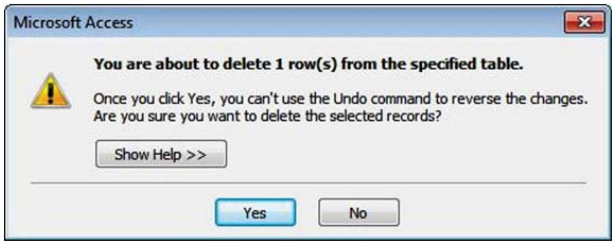
criteria in the Criteria row of the designer, and then clear the Show check box for each criteria field.

Important: Use criteria to return only the records that needs to be deleted. Otherwise, the delete query removes every record in the table. (Fig 46).

- On the Design tab, in the Results group, click View, and then click the Datasheet View.
- Verify that the query returns the records that you want to delete, and then press CTRL+S to save the query.
- To run the query, double-click the Run query in the Navigation Pane.

Confirmation message will appear on the screen as shown below, Click Yes to delete the records (Fig 47).

Fig 47



TASK 9: Create Simple Crosstab Query

- Create Student Records table and Enter Some Records as shown.
- In the table shown below, there are three students in total, secured different marks in the respective courses (Fig 48).

Fig 48

ID	Name	Course	Phone No	Marks	Click to Add
1	Alice Cooper	Software Engineering -1	9999998	70	
2	Alice Cooper	RDBMS	9999998	60	
3	Alice Cooper	Requirement Engineering	9999998	90	
4	Jack Mcfadedn	Software Engineering -1	5534342	23	
5	Jack Mcfadedn	RDBMS	5534342	78	
6	Jack Mcfadedn	Requirement Engineering	5534342	56	
7	Pink Hewman	Software Engineering -1	5656556	80	
8	Pink Hewman	RDBMS	5656556	60	
9	Pink Hewman	Requirement Engineering	5656556	40	
(New)					

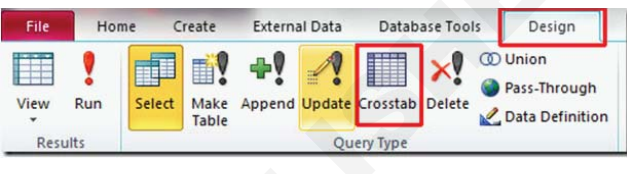
- Navigate to Create tab to create query,
- click Query design for design view.
- Add table to see the contents (Fig 49).

Fig 49

Field:	Course	Name	Marks
Table:	Student Records	Student Records	Student Records

- Now head over to Design tab and hit Crosstab. (Fig 50).

Fig 50



NOTE: Two new rows are added in field pane below by the name of Crosstab and Total. Now in the Crosstab row, click small drop-down button for options and select Row Heading for assigning Course field as row heading. In the next row beneath the Name field, select Column Heading from drop-down options. Select Value for Marks field and in it's corresponding row (above), select Sum from drop-down options. (Fig 51).

Fig 51

Field:	Course	Name	Marks
Table:	Student Records	Student Records	Student Records
Total:	Group By	Group By	Sum
Crosstab:	Row Heading	Column Heading	Value
Sort:			
Criteria:			
or:			

- Click Run to run the query and display the results in a datasheet

Note: Now Course, which was column heading earlier is converted into row heading, and names of the students which was row heading earlier is changed into column headings, resultantly now don't need to scroll down to see the details of any student.

Modifying Form Design with Controls, Macros and Events

Objectives: At the end of this exercise you shall be able to

- modify form design
- add controls to the Form
- adding option Buttons to the Form
- adding Checkboxes to the form.

Requirements

Tools / Equipments/Instruments

- A working PC - 1 No./batch.

PROCEDURE

TASK 1 : Modify form design

To resize form components:

- 1 Switch to Layout view (Fig 1).

Fig 1

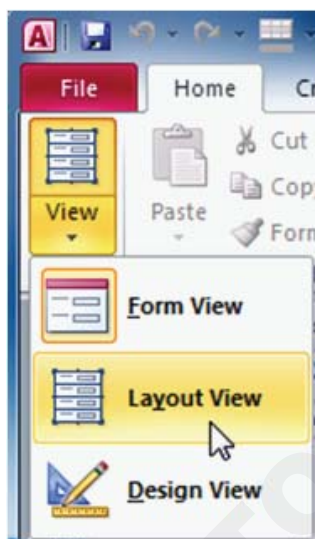


Fig 3

Fig 4

- 2 Select the field or button you want to resize, and hover your mouse over the edge. The cursor will become a double-sided arrow (Fig 2).

Fig 2

- 3 Click and drag the edge to resize, and release when the field or button is the desired size (Fig 3).
- 4 The field or button-as well as every other item in line with it-will be resized (Fig 4 & 5).

Fig 5

Change Form views

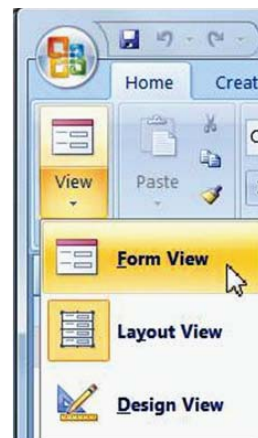
- 1 Click the Design tab on the Ribbon, click the View button list arrow and select a view option (Fig 6).

Form View: The normal view where can view, add, and edit records. Form Structure can't be modified in this view.

Layout View: Layout View allows to apply formatting and rearrange fields while also displaying data.

Design View: Use for in-depth modification and customization of your form. Live data is not visible here only working with the structure of the form.

Fig 6

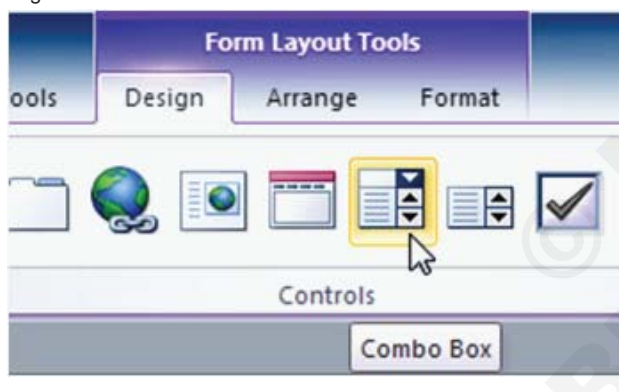


TASK 2: Adding Form Controls

To create a combo box:

- 1 In Form Layout view, select the Form Layout Tools Design tab and locate the Controls group.
- 2 Select the Combo Box command, which looks like a drop-down list as shown in Fig 7.

Fig 7



- 3 Cursor will turn into a tiny crosshairs and drop-down list icon. Move the cursor to the place where to insert the combo box, then click. A yellow line will appear to indicate the location where the combo box will be created. As shown in Fig 8.

Fig 8



- 4 The Combo Box Wizard dialog box will appear. Select the second option, I will type in the values that I want, then click Next (Fig 9).
- 5 Type the choices to appear in your drop-down list. Each choice should be on its own row.

For example, to create a combo box for the Add to Mailing List? field in the form, Enter all of the possible

valid responses for that field. Users will be able to select one of three choices from finished combo box as shown Fig 10.

Fig 9

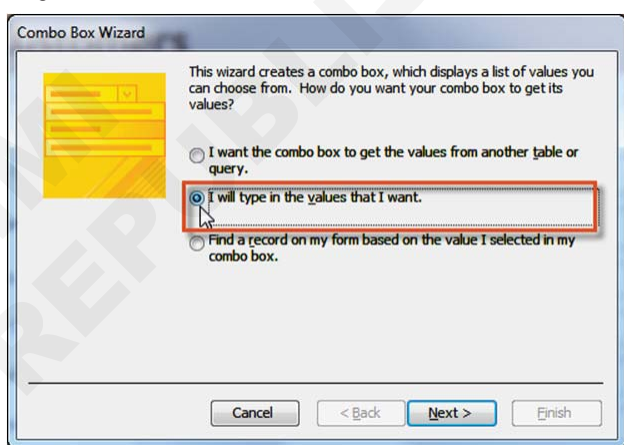
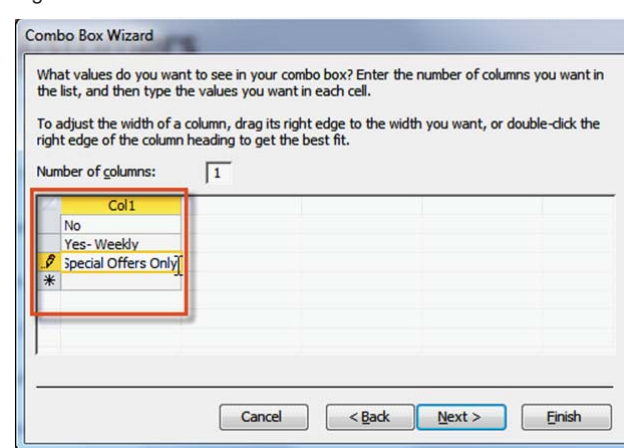


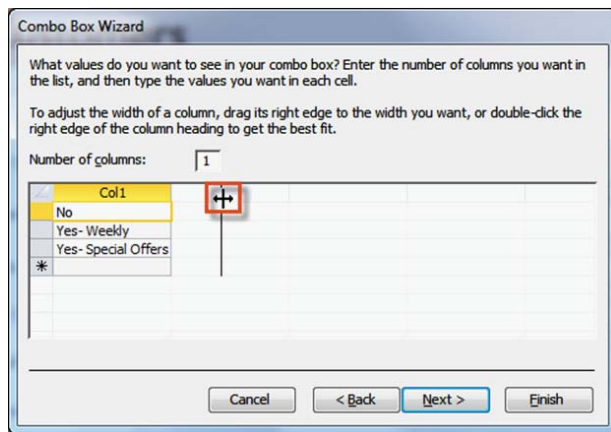
Fig 10



No, Yes-Weekly, and Special Offers Only.

- 6 If necessary, resize the column so all of text is visible. click Next (Fig 11).

Fig 11



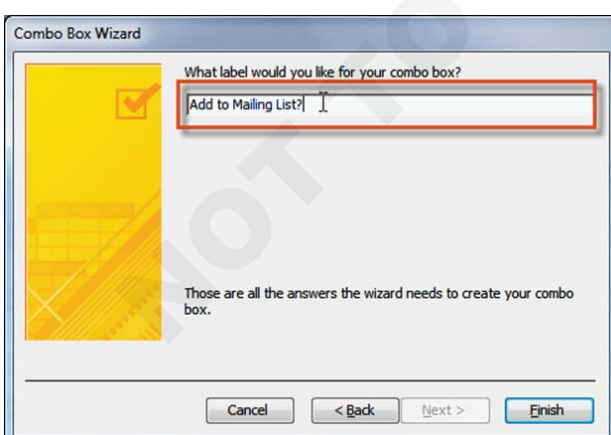
- 7 Select Store that value in this field, then click the drop-down arrow and select the field where you want selections from your combo box to be recorded. After making selection, click Next (Fig 12).

Fig 12



- 8 Enter the label, or the name that will appear next to combo box (Fig 13).

Fig 13



- 9 Click Finish. combo box will appear on the form
- 10 Switch to Form view to test the combo box. Click the drop-down arrow and verify that the list contains the correct choices. The combo box can now be used to enter data as shown in Fig 14.

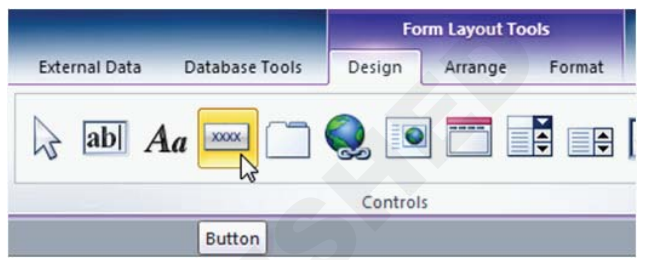
Fig 14



To add a command button to a form:

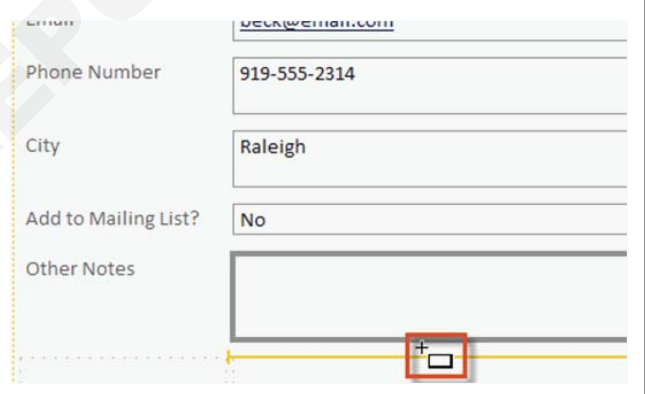
- 1 In Form Layout view, select the Form Layout Tools Design tab and locate the Controls group.
- 2 Select the Button command (Fig 15).

Fig 15



- 3 cursor will turn into a tiny crosshairs with a button icon
+ Place it in the spot where command button to be inserted , then click (Fig 16).

Fig 16

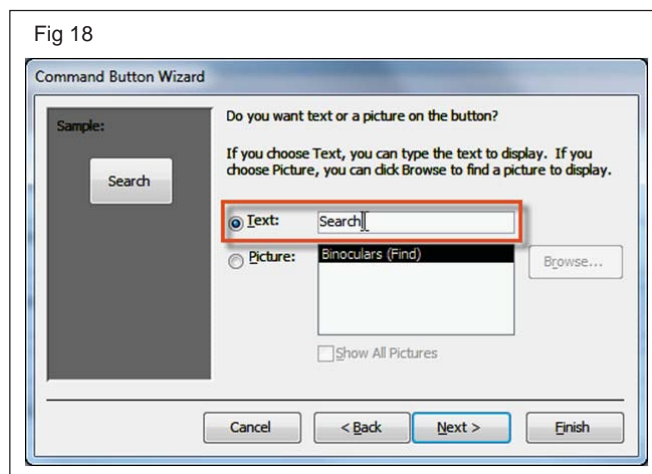


- 4 The Command Button Wizard will appear. In the Categories pane, select the category of button to add. choose the Record Navigation category.
- 5 The list in the Actions pane will update to reflect chosen category. Select the action the button has to perform, then click Next. choose Find Record (Fig 17).

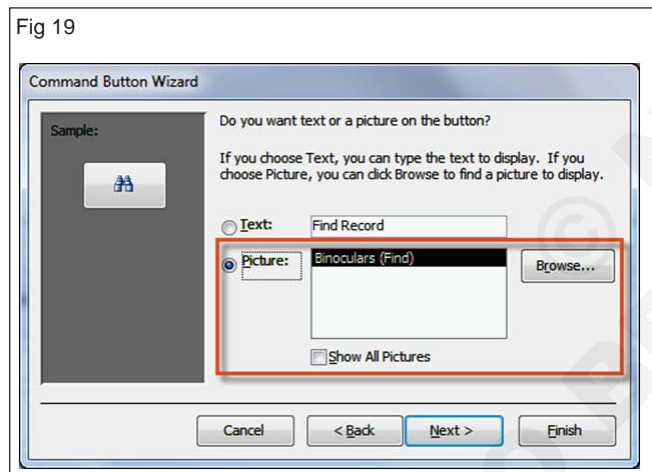
Fig 17



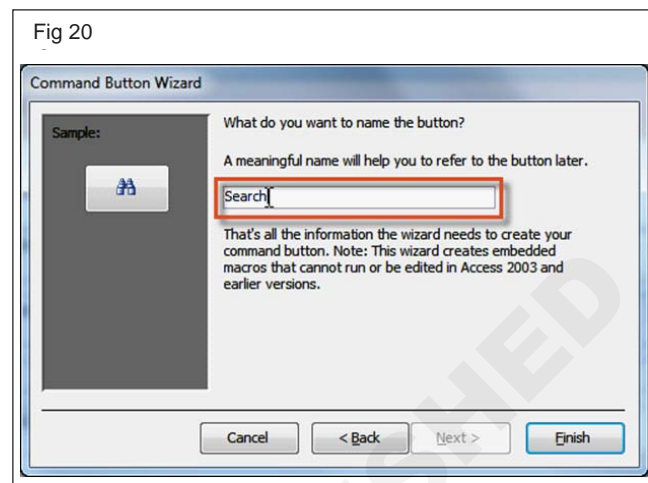
- 6 Now decide whether button to include text or a picture. A live preview of button appears on the left.
- To include text, select the Text option, then type the desired word or phrase into the text box (Fig 18).



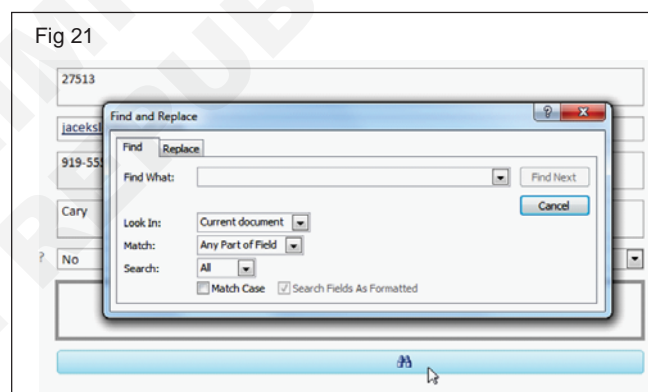
- To include a picture, select the Picture option. To keep the default picture for that command button, or you can select another picture. Click Show All Pictures to choose from another command button icon or Browse... to choose a picture from the computer (Fig 19).



- 7 After selecting appearance of command button, click Next.
- 8 Type a name for the button. This name won't appear on the button, but knowing the name will help to quickly identify the button if ever want to modify it with the Property Sheet. After typing the button name, click Finish (Fig 20).

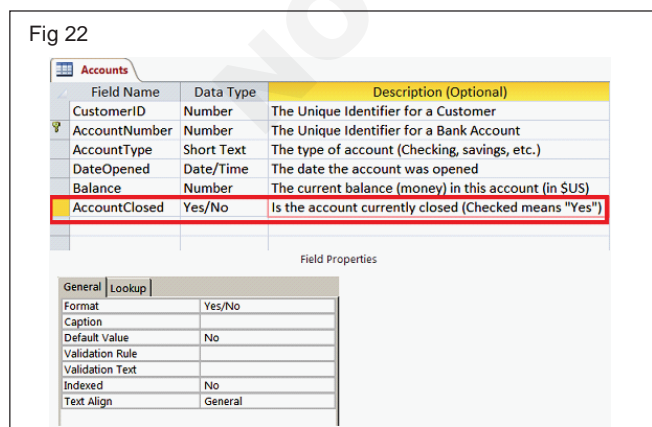


- 9 Switch to Form view to test the new button. Our Find Record button opens the Find and Replace dialog box (Fig 21).

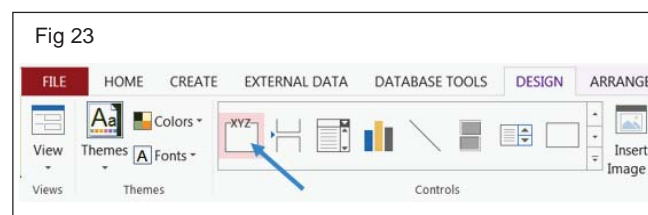


TASK 3 : Adding Option Buttons (Radio Buttons) Bound to a table column (field)

- 1 Make a Accounts table with AccountClosed field as of Yes/No Data type as shown in Fig 22



- 2 Save and close the Accounts table .Create AccountsDataEntry form and open up the form in Design View. With the AccountsDataEntry form opened in Design View, click on the Design item in the ribbon bar and scroll through the controls list until find the Option Group control as shown in Fig 23.



- 3 Click on the Option Group control and then draw the option group on the form (Fig 24).

Fig 24

- 4 As soon as the Option Group is drawn on the form, the Option Group Wizard will launch. The Option Group Wizard takes care of setting up the Option Group and binding it to a column (field) in a table.
- 5 The first step in the Option Group Wizard is to assign labels to each option. For this example assign the following to the labels: Account Open and Account Closed as shown in Fig 25. Click on the Next> button to continue:

Fig 25

- 6 In Option Group Wizard set the default choice for the Option Group. select the Account Open as the default value and click on the Next> button to continue (Fig 26):

Fig 26

- 7 The next step in the Option Group Wizard is to assign a value to each of the option group's options. These values must be an integer. When binding to a table column (field) with the "Yes/No" data type, the values assigned need to be 0 and -1 (Fig 27).

Fig 27

Label Names	Values
Account Open	0
Account Closed	-1

Assign the values as shown in the Fig 28 below and click on the Next> button to continue:

Fig 28

- 8 Once the user select an option and the value from the prior step is assigned, Access can either hold on to the value or pass it along to a specific column (field) in the table. In this case bind the Option Group to the AccountClosed field by selecting the second option and selecting the AccountClosed field from the list. Click on the Next> button to continue:
- 9 Customize the content and appearance of the Option Group or set the defaults of Option Buttons with the Etched style. Click on the Next> button to continue (Fig 29).

Fig 29

- 10 The final step of the Options Group Wizard is to give a Caption for Option Group. This Caption will appear above the option group. For example type in: Account Status and click on the Finish button to complete the wizard (Fig 30).

Fig 30



- 11 Once the Option Group Wizard is completed, the new object will appear on the form. Once in place it can be re-sized and moved. The properties (such as Option Value) can also be changed.

- 12 Save the form and switch to Form View to test the Option Group functionality (Fig 31).

Fig 31

TASK 2: Adding a Check Box Bound to a table column (field)

Note: When bound to a table, check boxes must bind to a field with a special data type. So the first step is to add such a column (field) to the Accounts table. Make sure AccountClosedColumn(field) is added as type Yes/No as shown in previous task while using Option group.

- 1 Save open up the AccountsDataEntry form we used previously in Design View. With the AccountsDataEntry form opened in Design View, click on the Design item in the ribbon bar and then click on the Add Existing Fields button.
- 2 When the list of fields from the Accounts table appears, drag the AccountClosed field from the list to the form as shown below (Fig 32).
- 3 Save the AccountsDataEntry form and open it up in Form View. Note the check box is set up and ready to use (Fig 33).

Fig 32

Fig 33

Geo - Informatics Assistant - Database Management Systems and Using MS Access

Importing and Exporting Data to and From Access

Objectives: At the end of this exercise you shall be able to

- to import the data to access
- to export the data from access.

Requirements

Tools / Equipments/Instruments

- A working PC - 1 No./batch.

PROCEDURE

TASK 1 : To Import data to MS Access

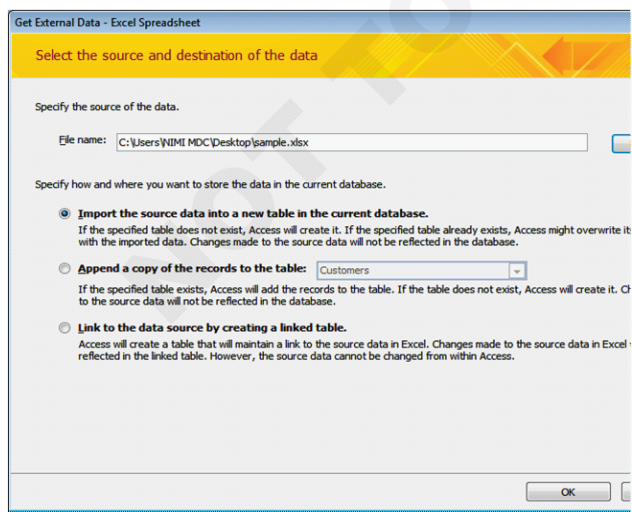
- 1 In Access, on the External Data tab, in the Import group, select the Excel command button (see Fig 1). The Get External Data - Excel Spreadsheet window opens.

Fig 1



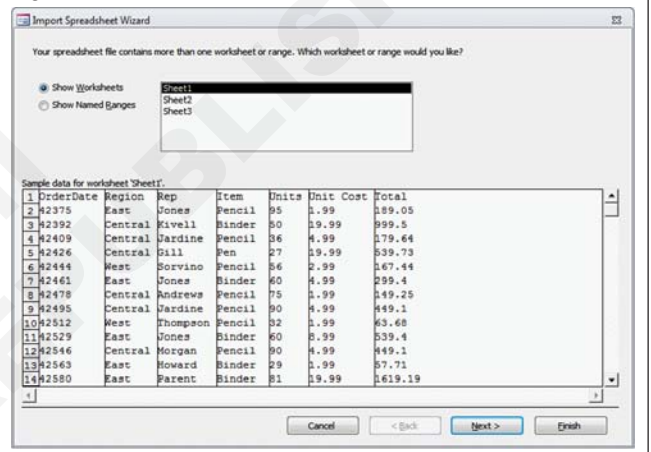
- 2 In the File name box, provide the location (path) and name of Excel workbook (see Figure 2). Select Browse to help locate the file to be imported.

Fig 2



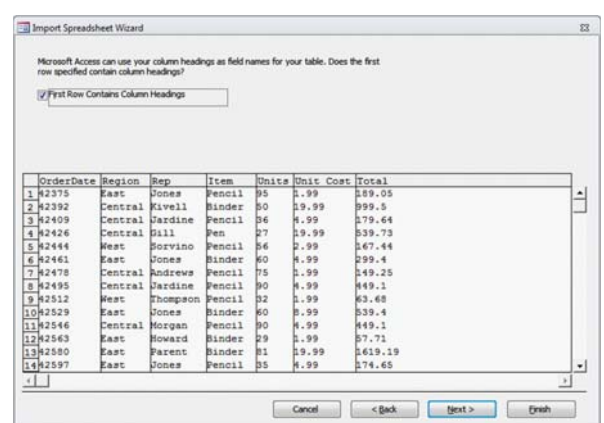
- 3 Select the first option, Import the source data into a new table in the current database (default option) (see Fig 2). Select OK. The Import Spreadsheet Wizard window opens (see Fig 3). This starts the Import Wizard.

Fig 3



- 4 Select the worksheet to import (see Figure 3). This screen only shows if worksheet has multiple sheets. You can also select a range.
- 5 Select Next.
- 6 Always use column headings. Make sure every column has a heading. Check the box for First Row Contains Column Headings (see Fig 4).

Fig 4



- 7 Select Next.

- 8 If required modify each field in the Field Options box (see Figure 5).

Fig 5

Import Spreadsheet Wizard

You can specify information about each of the fields you are importing. Select fields in the area below. You can then modify field information in the Field Options' area.

Field Options

Field Name: Data Type:

Indexed: ☐ Do not import field (Skip)

	OrderDate	Region	Rep	Item	Units	Unit Cost	Total
1	42375	East	Jones	Pencil	95	1.99	189.05
2	42392	Central	Kivell	Binder	50	19.99	999.5
3	42409	Central	Jardine	Pencil	36	4.99	179.64
4	42426	Central	Gill	Pen	27	19.99	539.73
5	42444	West	Sorvino	Pencil	56	2.99	167.44
6	42461	East	Jones	Binder	60	4.99	299.4
7	42478	Central	Andrews	Pencil	75	1.99	149.25
8	42495	Central	Jardine	Pencil	90	4.99	449.1
9	42512	West	Thompson	Pencil	32	1.99	63.68
10	42529	East	Jones	Binder	60	8.99	539.4
11	42546	Central	Morgan	Pencil	90	4.99	449.1
12	42563	East	Howard	Binder	29	1.99	57.71
13	42580	East	Parent	Binder	81	19.99	1619.19
14	42597	East	Jones	Pencil	35	4.99	174.65

Cancel < Back Next >

Note: following while importing Data:

- If column names need to be changed , select the column and enter a new name in the Field Name box.
- If a column is searched frequently and contains a lot of data, select the column. For the Indexed option, select Yes. Indexing a column makes it easier and faster to find data.
- Set a data type for each field if required , though Access will do that. Data types control what data can enter into a field.
- To remove a column, select the Do not import field (Skip) check box.

- 8 Select Next.
- 9 Select Let Access add primary key (default option) (see Figure 6). Primary keys uniquely identify each

record in table. They allow to retrieve data more quickly and help ensure accuracy in data.

Fig 6

Import Spreadsheet Wizard

Microsoft Access recommends that you define a primary key for your new table. A primary key is used uniquely identify each record in your table. It allows you to retrieve data more quickly.

☒ Let Access add primary key.

☐ Choose my own primary key.

☐ No primary key.

	ID	OrderDate	Region	Rep	Item	Units	Unit Cost	Total
1	1	42375	East	Jones	Pencil	95	1.99	189.05
2	2	42392	Central	Kivell	Binder	50	19.99	999.5
3	3	42409	Central	Jardine	Pencil	36	4.99	179.64
4	4	42426	Central	Gill	Pen	27	19.99	539.73
5	5	42444	West	Sorvino	Pencil	56	2.99	167.44
6	6	42461	East	Jones	Binder	60	4.99	299.4
7	7	42478	Central	Andrews	Pencil	75	1.99	149.25
8	8	42495	Central	Jardine	Pencil	90	4.99	449.1
9	9	42512	West	Thompson	Pencil	32	1.99	63.68
10	10	42529	East	Jones	Binder	60	8.99	539.4
11	11	42546	Central	Morgan	Pencil	90	4.99	449.1
12	12	42563	East	Howard	Binder	29	1.99	57.71
13	13	42580	East	Parent	Binder	81	19.99	1619.19
14	14	42597	East	Jones	Pencil	35	4.99	174.65

Cancel < Back Next >

- 11 Select Next.

- 12 Name the table in the Import to Table field (see Fig 7).

Fig 7

Import Spreadsheet Wizard

That's all the information the wizard needs to import your data.

Import to Table:

☐ I would like a wizard to analyze my table after importing the data.

Cancel < Back Next > Finish

- 13 Select Finish.

TASK 2: Exporting data to excel

Note: Here is a list of items to keep in mind before export:

- Must be in Access.
- Can only export one object at a time (i.e. a table, query, or form)
- Cannot export macros or modules to Excel
- If an object contains subobjects, only the main object can be exported at a time. If you need to export the other subobjects, repeat the export process for each subobject.
- Once all subobjects are in Excel, can merge the data in multiple worksheets.

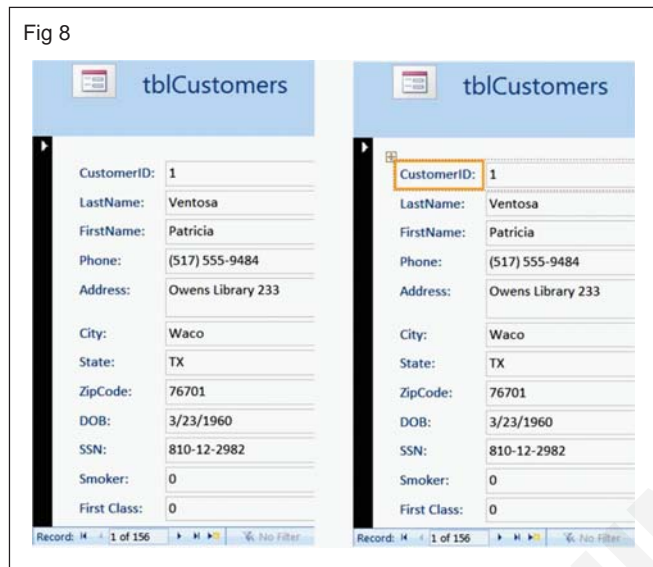
Step 1: PREPARING ACCESS DATA FOR EXPORT

- 1 Open the source database.
- 2 From the Navigation Pane, select the object want to export. It can be a table, query, report, or form.
- 3 Review the source file to make sure it doesn't contain any errors.
- 4 If there are errors, must resolve them before export to Excel, otherwise, errors can occur during the export process and null values might be inserted into fields.
- 5 If the object is a table or query, you can export the data with or without its formatting. The difference affects two aspects - the amount of data that is exported and the display format of the data.

Step 2: RUN THE EXPORT PROCESS

- 1 Close the destination workbook if open.
- 2 In the Navigation Pane of the database, select the object you want to export (remember, only one object at a time).
- 3 If the object is a table, query, or form, and you want to export just a portion of the data, open the object in Datasheet view and select the records you want.
- 4 On the External Data tab, in the Export group, select Excel (see Fig 8).

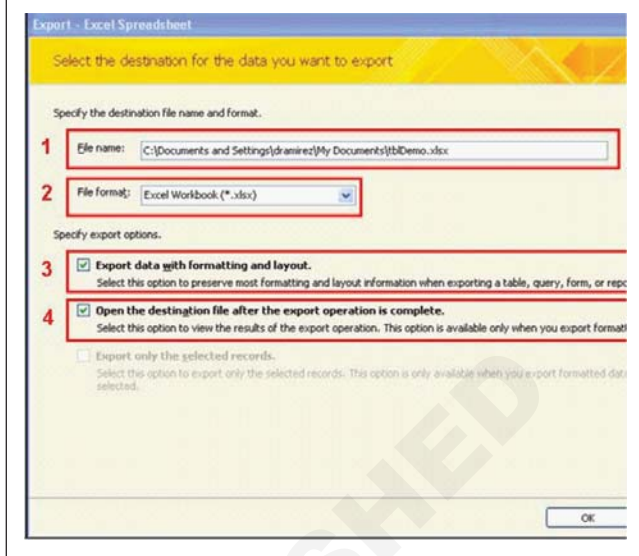
Fig 8



- 5 In the Export - Excel Spreadsheet dialog box, review the suggested file name for the workbook (Access uses the name of the source object). If you like, you can change the file name (see Figure 9).
- 6 In the File Format box, select the file format (see Fig 9).
- 7 If exporting a table or query, and you chose formatted data, select Export data with formatting and layout (see Fig 9).

Note: If exporting a form or report, this option is always selected but unavailable (it's dimmed).

Fig 9



- 8 To view the workbook after the export process is done, Open the destination file after the export operation is complete check box (see Figure 9).
- 9 If the source object is open, and you selected a record(s) in the view before starting the export operation, select Export only the selected records. Do not check this box to export all the records displayed in the view.

Note: The check box is grayed out if no records are selected.

- 10 Select OK.

Note: If the export process fails because of an error, Access displays a message describing the cause of the error.

Compressing and Encrypting Database

Objectives: At the end of this exercise you shall be able to

- Encrypt the Database
- Decrypt the Database
- Compress the Database
- Take backup and restore.

Requirements

Tools / Equipments/Instruments

- A working PC - 1 No./batch.

PROCEDURE

TASK 1 : To Encrypt Access Database File

Note: Before encrypting or decrypting access database, please pay attention to something about encryption/decryption:

Step 1: When access database file is open in Microsoft Access 2010, tab File > Info (Fig 1)



Step 2: Click Encrypt with Password under information about database. Sometimes, maybe you will receive a message to ask you to open access database with Open Exclusive mode at first, otherwise you cannot encrypt database. When this happens, click OK and follow the prompting message to do (Fig 2).

Step 3: In Set Database Password dialog, enter a powerful password in Password box and type it again in Verify box. Click OK to finish access database encryption (Fig 3).

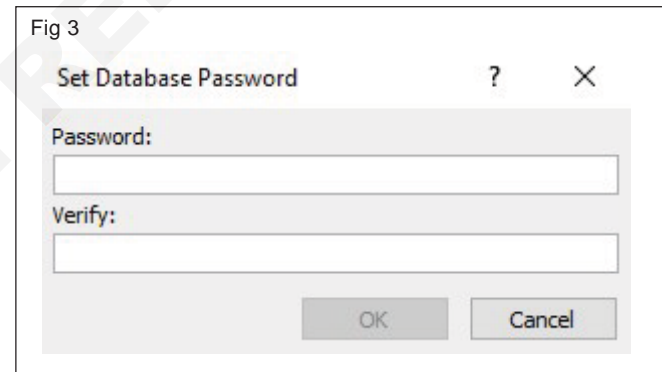
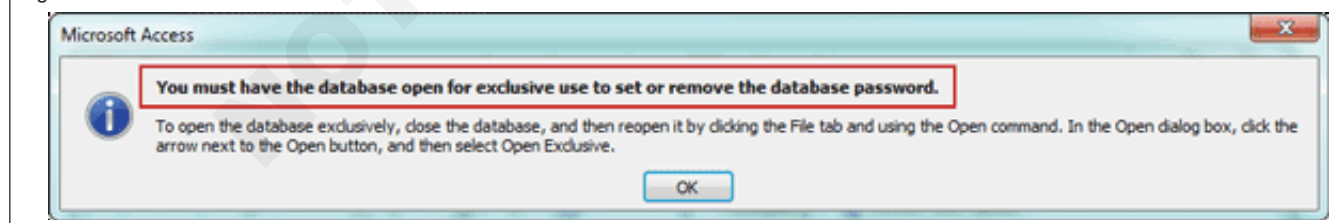


Fig 2

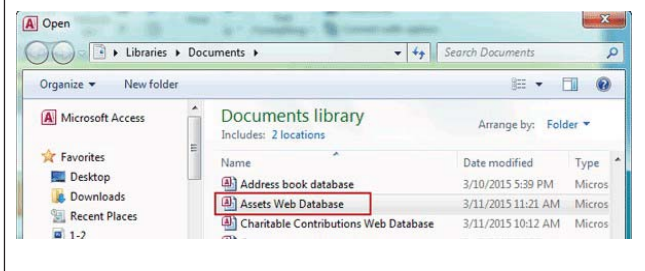


TASK 2 : To Decrypt Access Database File

Step 1: Open Microsoft Access, and select access database directly in the Access database list. Or click Open button to open a dialog, to browse to location of

encrypted access database in computer. Select the database file and choose Open Exclusive in Open mode (Fig 4).

Fig 4



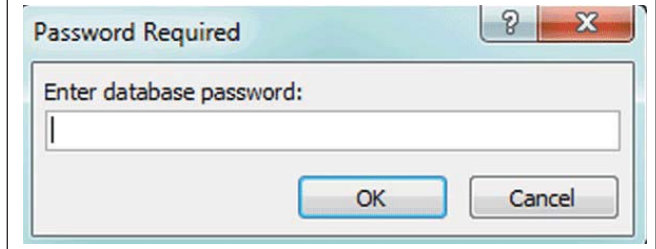
Step 2: Once selected the encrypted access database and are ready to open it in Microsoft Access. A dialog would pop up to ask for database open password.

Step 3: Type database password in Enter database password box. Click OK (Fig 5)

Now encrypted access Database is but not decrypted, To decrypt access database file do.

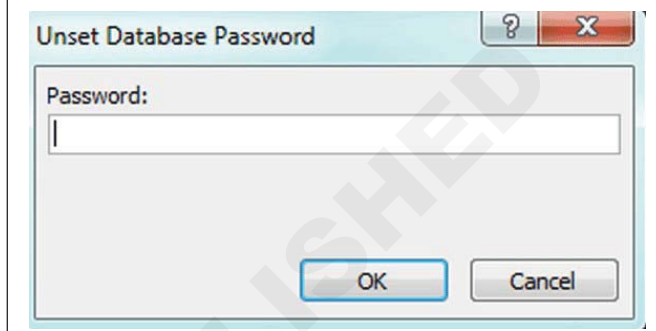
Step 4: Turn to File > Info, click Decrypt Database.

Fig 5



Unset Database Password dialog appears. Enter database password in Password box and click OK (Fig 6).

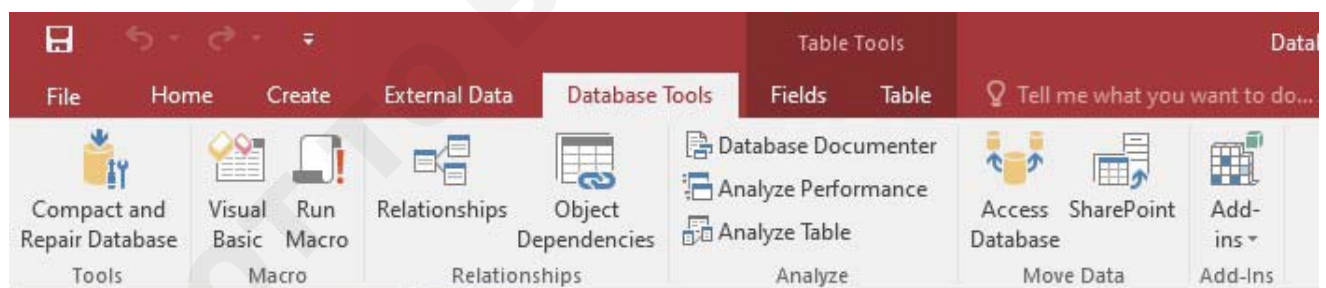
Fig 6



TASK 3: To Compress Database an Access

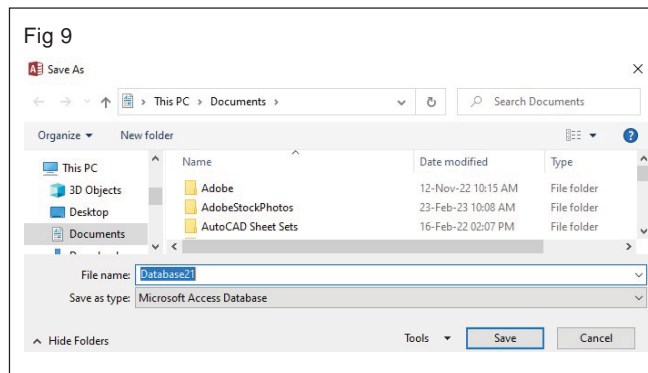
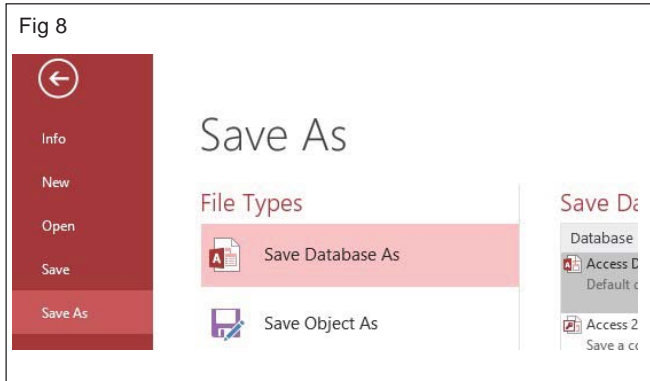
- 1 Close all the database which are open.
- 2 From the Database Tools Ribbon select Compact and Repair Database to open the "Database to Compact From" dialog box.
- 3 Navigate to the database to compact and repair and then click the Compact button.
- 4 Provide a new name for the compacted database in the Compact Database Into dialog box and click the Save button.
- 5 Verify that the compacted database works properly.
- 6 Delete the original database and rename the compacted database with the original database's name. (This step is optional.) (Fig 7)

Fig 7



TASK 4: To make a backup copy of access database

- 1 Open the database for which to create a backup. Now database is open in Access 2010.
- 2 Click File tab, and choose Save & Publish. (Fig 8)
- 3 In the right, under File Types, choose Save Database As.
- 4 Under Save Database As option, move to Advanced, and select Back Up Database. Click Save As.
- 5 In Save As window, specify a location and File name for backup of database. Click Save. (Fig 9)



TASK 5 : To Restore data or objects from Access database backup

To restore data from Access database backup, just choose a known good copy and paste it where Access database saves which you want to replace with backup.

To restore objects from Access database backup, you should make sure whether you want to use objects in backup to replace objects that ones in Access database which contains bad or missing data or has stopped working correctly, or you want to restore missing objects.

To preserve bad objects and restore right objects, do like following.

- Compare it with the restored version after restore,
- Rename the object before restore it. For example, if you want to restore a damaged form named Checking, you can rename the damaged form Checking bad. Delete the object that you want to replace.

Viewing Network Connections

Objectives: At the end of this exercise you shall be able to

- view and change the IP address of your computer
- establish connection between two computers.

Requirements

Tools/Equipments/Instruments

- A working PC with internet connection - 1 No./batch.

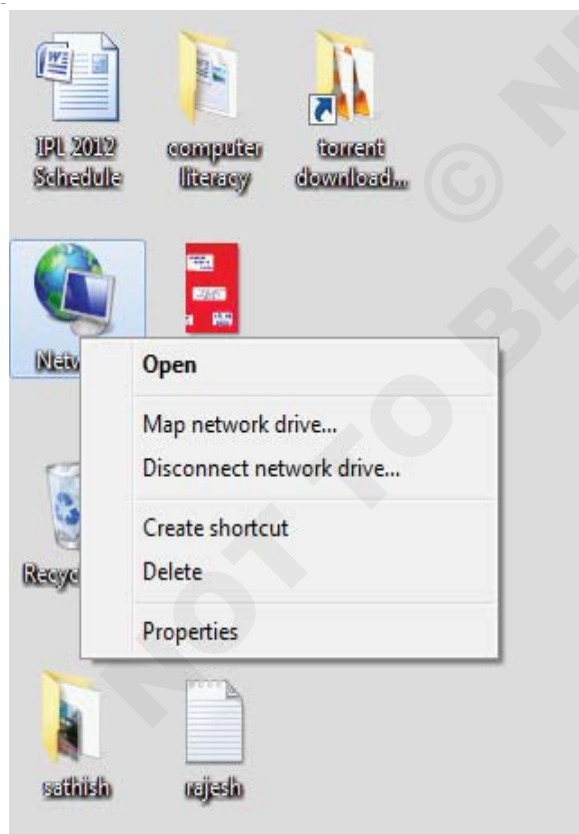
TASK 1 : View and change the IP address of your computer

Note to the instructor: Network icon should be placed on the desktop.

- 1 Choose the network icon and right click from the desktop.

Note : A menu displayed on the screen as on Fig 1.

Fig 1



- 2 Choose "Properties"

Note: A "View your basic network information and setup connection" window appears as on Fig 2.

- 3 Click "Change adapter setting" option as shown in Fig 2.

Note : A menu gets displayed on the screen.

- 4 Choose "Local area connection" and right click it

Note: A "Local area connection properties" window appears on the screen as shown in Fig 3.

- 5 Choose "Internet protocol version4 (TCP/IPv4)"

- 6 Click "Properties"

Note : Internet protocol version 4 (TCP/IPv4) windows appears on the screen as on Fig 3.

- 7 View and note down the IP address and subnet mask and fill the following given table.

IP Address	
Subnet mask	
Class	
Gateway	

Fig 2

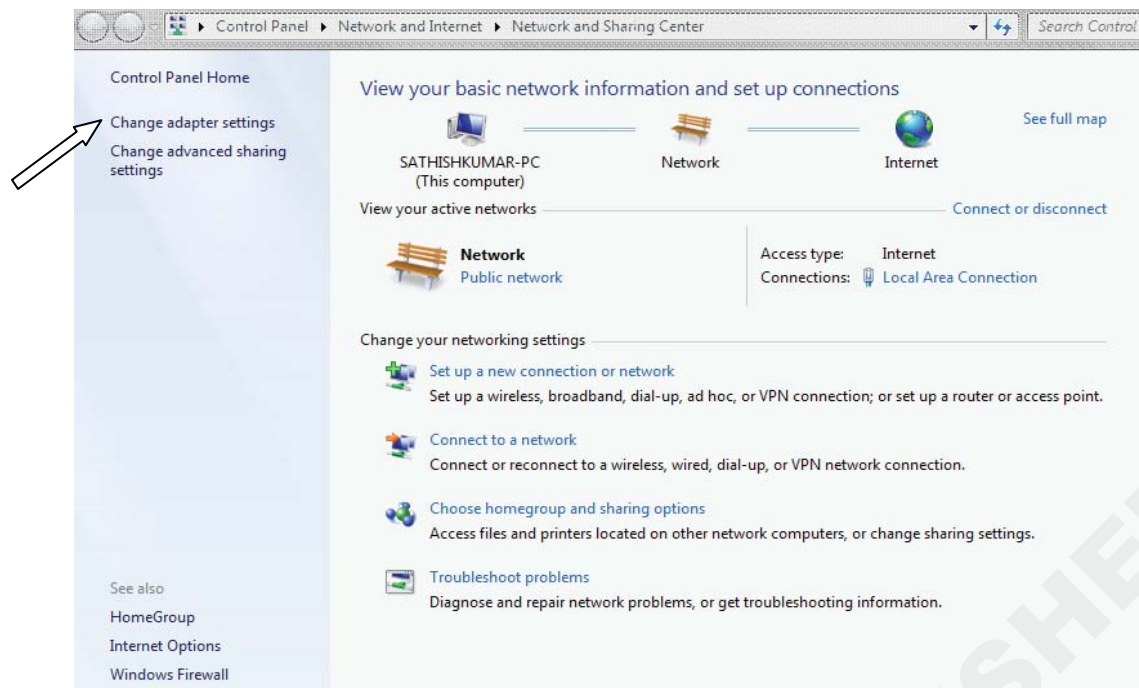
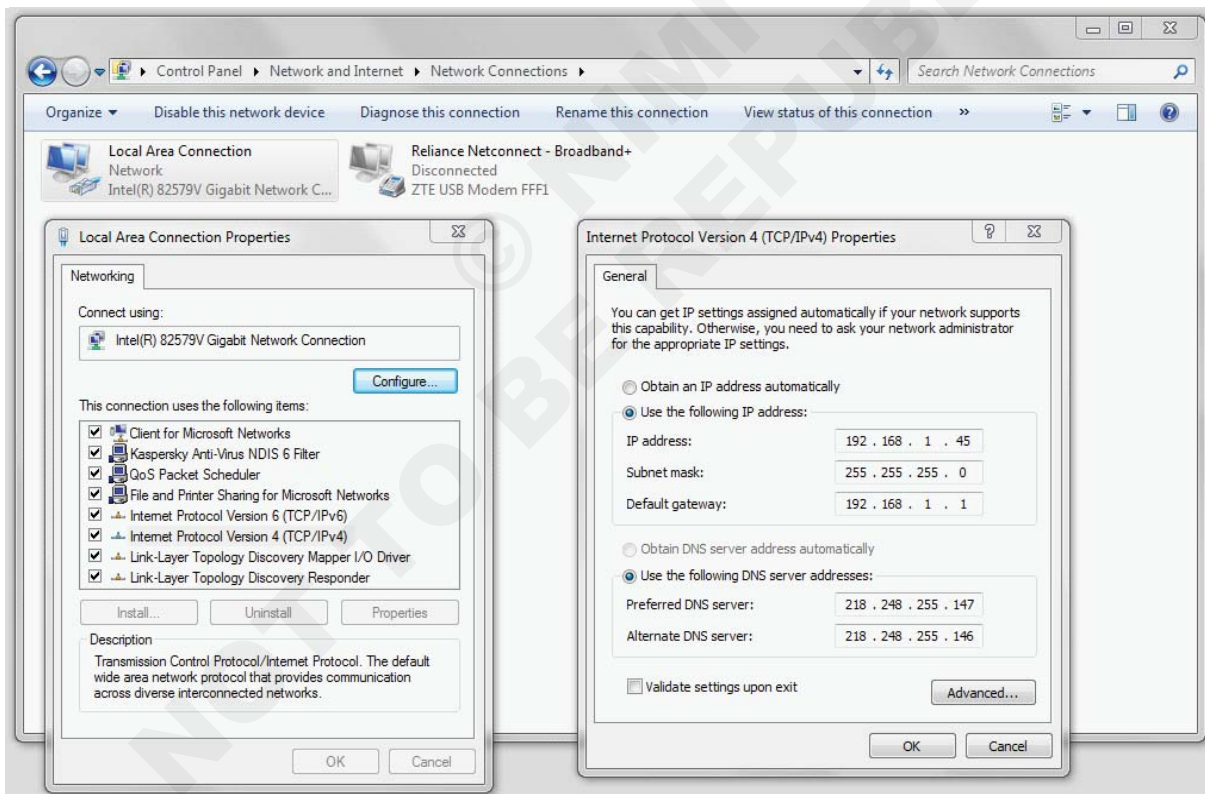


Fig 3



8 Click "Obtain an IP address automatically"

Note: As the radio button is clicked, the IP address gets cleared as on Fig 4.

9 Click "Use the following IP address"

10 Type "10.0.0.1" in the IP address and press tab key as on Fig 5.

Note: The subnet mask gets automatically filled as on Fig 6.

11 Click ok in "Internet protocol version 4 (TCP/IPv4) properties window"

12 Click ok in "Local area connection properties" window.

Fig 4

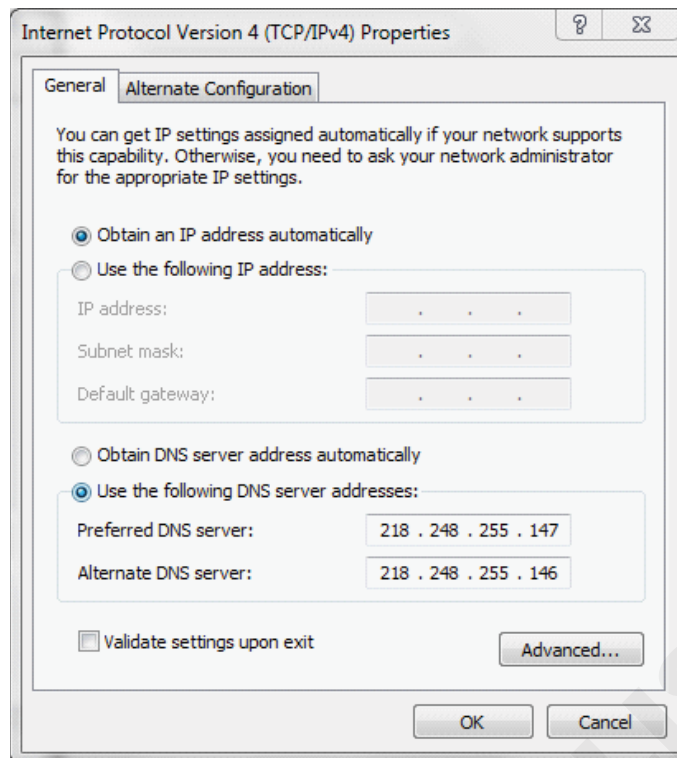


Fig 5

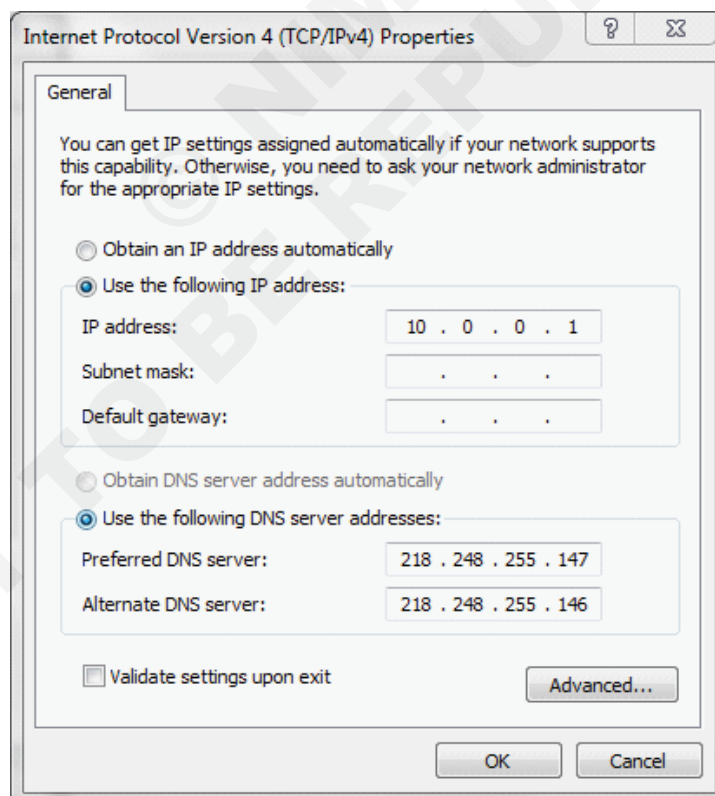
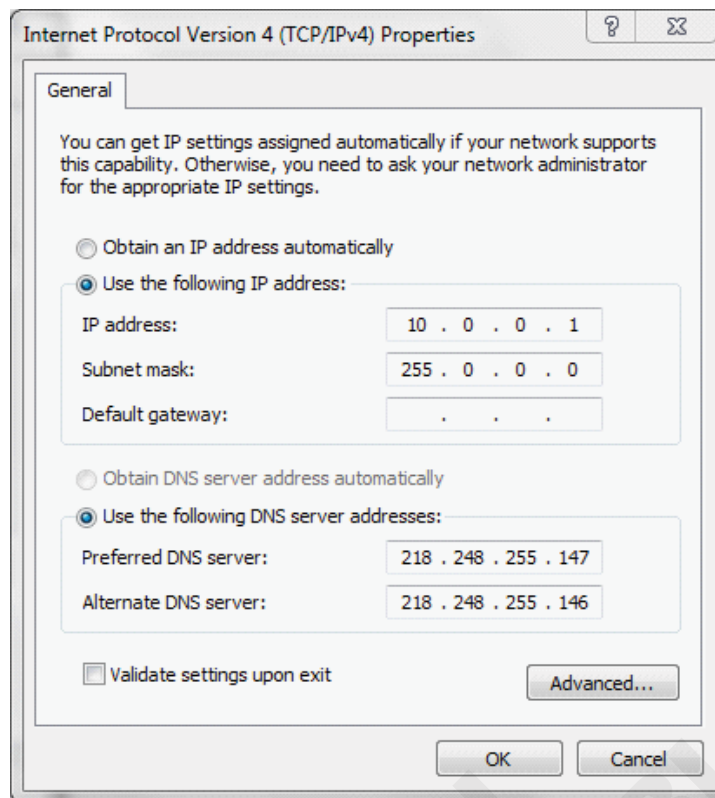


Fig 6



TASK 2 : Establish connection between two computers (P2P)

- 1 View and note the IP address of two computers
- 2 Insert one end of the cross cable in Ethernet port on the rear side of the CPU (First Computer)
- 3 Insert another end of the cross cable (prepared in Task 2) in Ethernet port on the rear side of another CPU (Second Computer)
- 4 In First computer (Check connectivity) Press Windows button and R key simultaneously to invoke Run dialog box
- 5 Type 'cmd' and press Enter key to invoke DOS prompt
- 6 Type "ping <IP address of Second computer>" and press Enter key

Note : If you get a 'Reply' as shown in Fig 7, there is a connectivity between first computer and second computer

Fig 7

```

C:\Administrator: C:\Windows\system32\cmd.exe
Pinging 192.168.0.117 with 32 bytes of data:
Reply from 192.168.0.117: bytes=32 time<1ms TTL=128
Reply from 192.168.0.117: bytes=32 time<1ms TTL=128
Reply from 192.168.0.117: bytes=32 time<1ms TTL=128
Reply from 192.168.0.117: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.0.117:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
  
```


Fig 8

```
C:\Users\Admin>ping 222.111.33.22

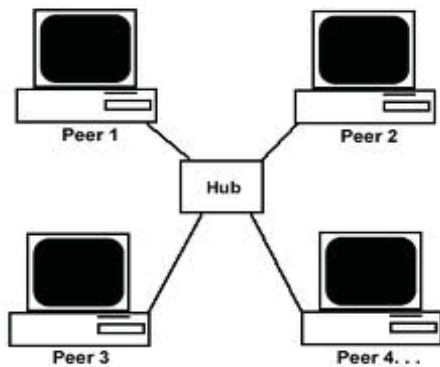
Pinging 222.111.33.22 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 222.111.33.22:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\Admin>
```

Fig 9



Note : If you get the message 'Request Timed out 'as shown in Fig 8, then there is no connectivity between first and second computer.

Note : By repeating steps 4,5 and 6 in second computer you can check the connectivity between second computer and first computer.

7 Get it checked with the instructor

Note : Using cross cable you can connect only two computers in a peer to peer network. To Connect more than two computers in a peer to peer network you need a Hub/Switch as shown in Fig 9.

Connecting a Computer to a Network and Sharing of Devices Files and Folders

Objectives: At the end of this exercise you shall be able to

- install network interface card
- share the printer, folder and drives with the network
- change sharing option for different network profiles
- set sharing option and permissions specific files or folders in local network.

Requirements

Tools/Equipments/Instruments

- A working PC - 1 No./batch.

PROCEDURE

TASK 1 : Install network interface card

- 1 Shut down the system if it is on.
- 2 Remove all cables connecting to the computer.
- 3 Locate the screws holding the case cover in place on the frame.
- 4 Remove the screws attaching the cover to the frame.

Note : Many new systems have tight cases and/or special cases. Removing the casing might require some prying. Use a flat-head screwdriver to push the case open against the front panel. Seek assistance if you cannot open the case alone. If the case seems really peculiar, check your computer's user manual first to see if they instruct you on how to open your computer.

- 5 Place the open computer frame on its side with the motherboard facing up as shown in Fig 1.

Fig 1



Note : This means you can see the motherboard from a bird's eye view. The motherboard is the biggest board you can see within the frame. It usually covers an entire side and has other smaller boards sticking up from it.

- 6 Locate the expansion slots in the motherboard.

Note : Expansion slots are either long black strips or short white strips. ISA slots are black. PCI slots are white. Open slots are those that do not have other boards inserted in them.

- 7 Determine which interface (ISA or PCI) your card uses.

Note : ISA is long and the gold contacts are large. PCI is much shorter and smaller.

- 8 Check to see if the expansion slot opening next to the slot is covered. If it is, remove the cover by unscrewing it from the frame or popping it out.
- 9 Insert your card into the expansion slot on the motherboard as shown in Fig 2. Press firmly so the entire part of the card that has the gold contacts goes completely into the expansion slot on the motherboard and will go no further

Note : Make sure the side of the card resembling the expansion slot cover you just removed is covering most of the open slot.

Fig 2



- 10 Screw the card into place with the screw you removed from the expansion slot cover or a new screw.
- 11 Replace the case and screw it back in place after confirming the proper placement of the card.

Note : Make sure you did not leave any tools or screws within the computer.

- 12 Reconnect all the cables to their proper places.

- 13 Turn on the power.
- 14 Refer to your user's manual to install the proper drivers from the disk(s) that came with the card.
- 15 Check the status of installed card (NIC) in device manager
- 16 Get it checked with the instructor

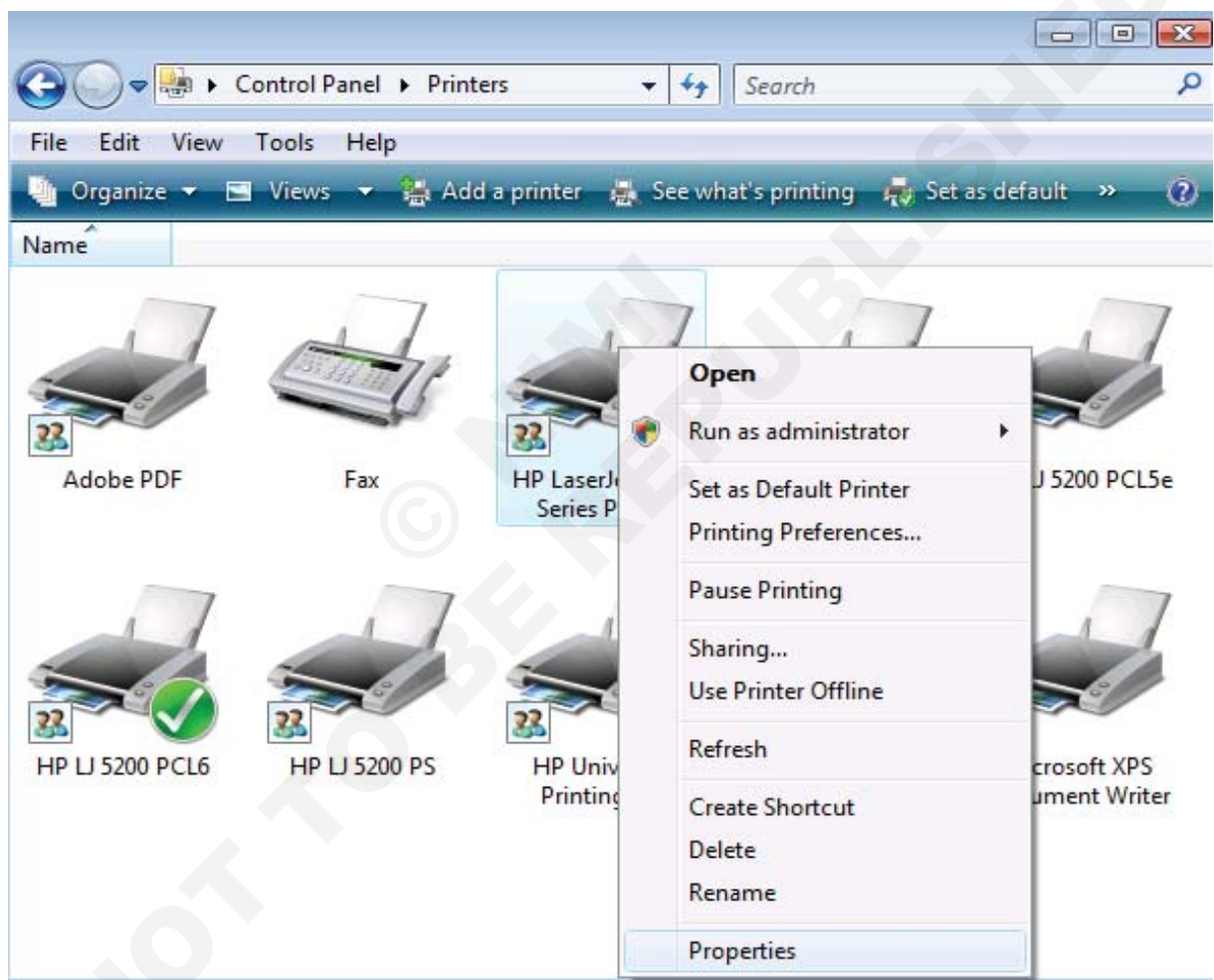
TASK 2 : Share the printer, folders, and drives with the network

- 1 Share the printer panel as follows :

Start ⇒ Control panel ⇒ Hardware and Sound
⇒ Devices and Printers

Note : There you will see a list with all external devices installed on your PC as in Fig 3.

Fig 3



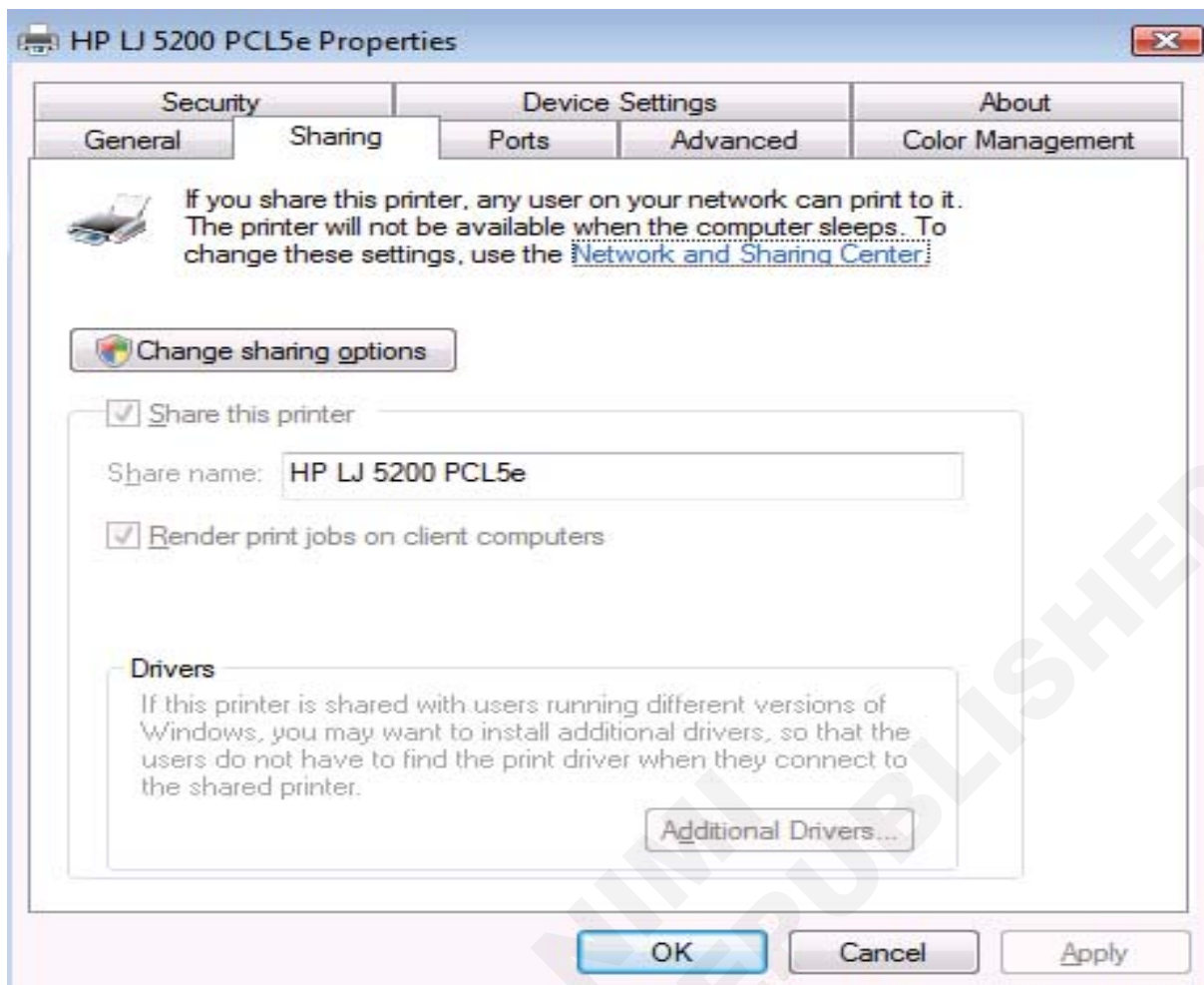
- 2 Select the printer you want to share, right click on it and select Printer properties.

Note: Now you will see a window with all the printer properties. Depending on the model of your printer, and its drivers, you can see different sets of options.

- 3 Click on the Sharing tab.

Note: There, you will have some options similar to the Fig 4.

Fig 4



- 4 Select any check box that says 'Share this printer'.

Note : Then, you can edit the printer share name which, in most cases, is by default completed by Windows with the name of your printer model. If you want to change it, type the name you want to use.

Note : "Render all print jobs on the client computers" can help keep performance levels up on the computer where the printer is plugged in, especially when big printing jobs are ordered. When this option is checked, all the print jobs are rendered on the computers which order the print job, not on the computer on which the printer is plugged.

- 5 Click on OK.

Note : Now the printer will be shared with the computers on your network.

Share the folder or drives

- 1 Open 'File Explorer'.
- 2 Select the folder or drive you want to share the network.
- 3 Right click the mouse button and select properties .
- 4 Select sharing tab and click advance sharing button.
- 5 Choose share this folder and click "OK" button.

TASK 3 : Change sharing option for different network profiles

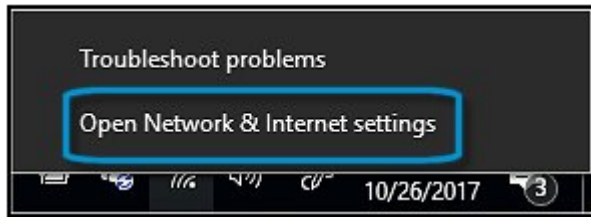
- 1 In Windows, right click the **Network connection** icon in the system tray as shown in Fig 5.

Fig 5



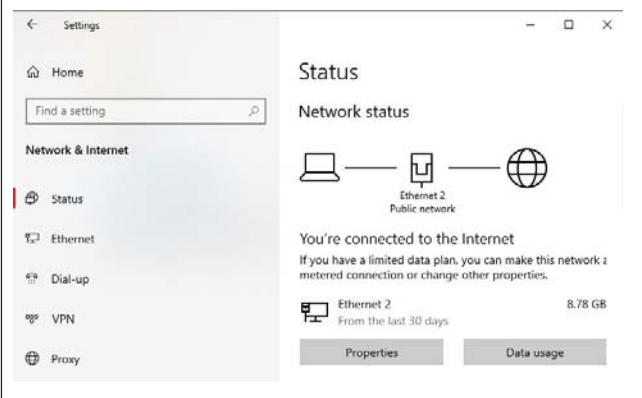
- 2 Click open Network and internet setting as on Fig 6.

Fig 6



- 3 On the network status page, scroll down and click Network and sharing center as on Fig 7.

Fig 7



- 4 In the left pane, click change advanced sharing settings as on Fig 8.
- 5 Select both turn on network discovery and turn on file and printer sharing in the sharing profile need to change as on Fig 9.

Fig 8

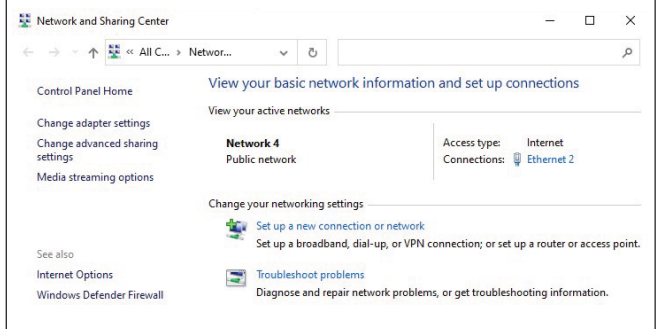
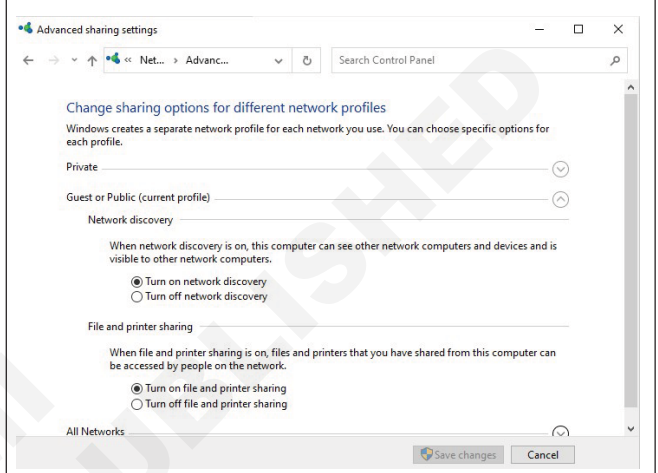


Fig 9



Note: There are sharing settings for your private profile, guest or public profile and all networks.

TASK 4 : Set sharing option and permissions specific files or folders in local network

- 1 In windows, search for and open **File Explore**.
- 2 Browse to the folder you want to share.
- 3 Right - click the folder, select share with and the click Home Group (view), homegroup (view and edit) or specific people as on Fig 10.
- 4 If you choose specific people, the file sharing window is displayed.
- 5 Click the down arrow and select the user you want the share with, if the user is not listed, type the user name and then click add.
- 6 Click an arrow under permission level to set the permission level for each user or group as on Fig 11.

Fig 10

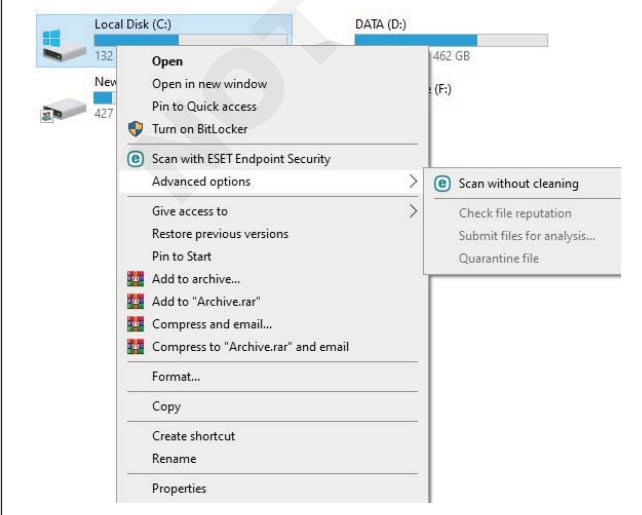
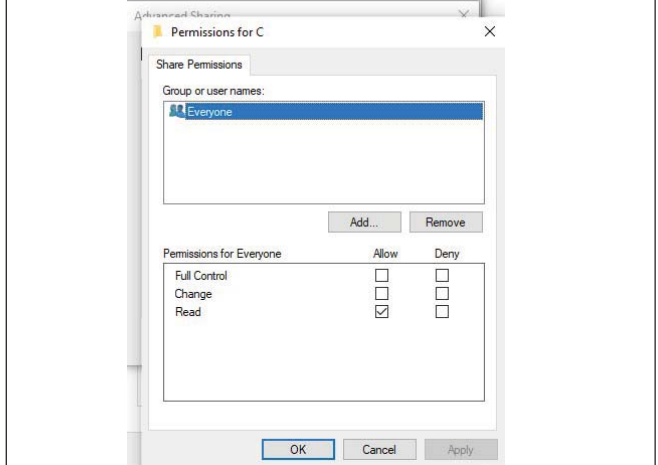


Fig 11



Familiarization with Various Network Devices, Connectors and Cables

Objectives: At the end of this exercise you shall be able to

- identify various network devices, cables and connectors used in networking
- create straight and cross cable and punch a UTP cable in the patch socket
- testing the cable connectivity with the LAN tester
- create workgroup and check the network connections
- create a home group on a local network.

Requirements			
Materials/components		<ul style="list-style-type: none"> • Thin coaxial cable RG48 - 5m. • BNC connector - 1 No. • T connector - 1 No. • Terminator - 1 No. 	
<ul style="list-style-type: none"> • UTP cable (CAT 5) - 5m. • RS232 communication cable - 10 core cable (5 metres). • RS232 9 pin female & 25 pin male connectors -1 No.each. • RJ45 jack -1 No. 		Tools/Equipments/Instruments <ul style="list-style-type: none"> • DMM - 1 No. 	

PROCEDURE

TASK1: Identify cables and connectors

- 1 Identify a labelled component referring to Table 1 and record the details in the Record sheet.
- 2 Repeat step 1 and record the details in the Record Sheet.
- 3 Get the work checked by your instructor.

Record sheet

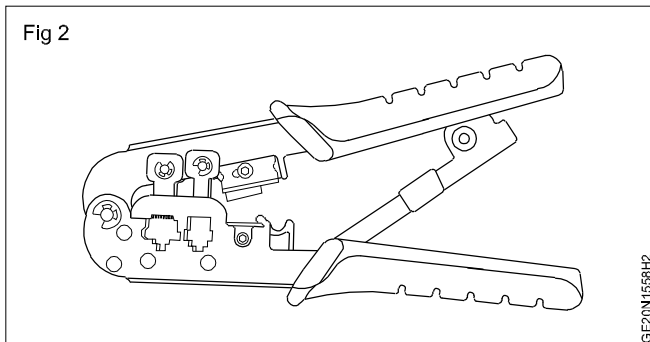
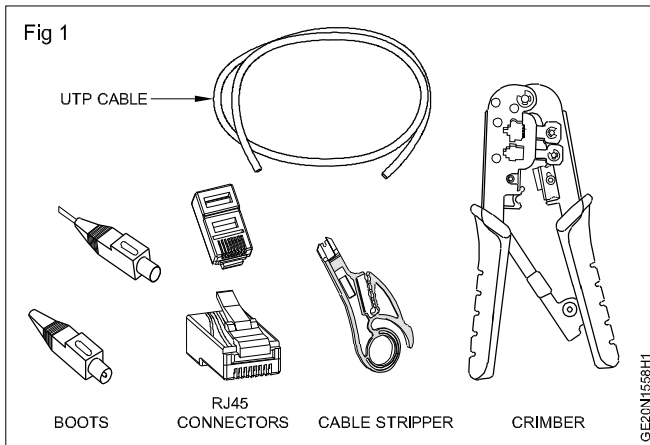
Table 1

Cable/ connector		Label	Brief application
UTP cable	No.of pins colour code Printedmark		
Coaxial cable			
RJ 45 connector	No.of pins		
T connector			
Terminator	Resistance between inner and outercore		
RS232 cable	Thickness No.of cores		
RS232 connector	9 pin type female 25 pin D-type male		

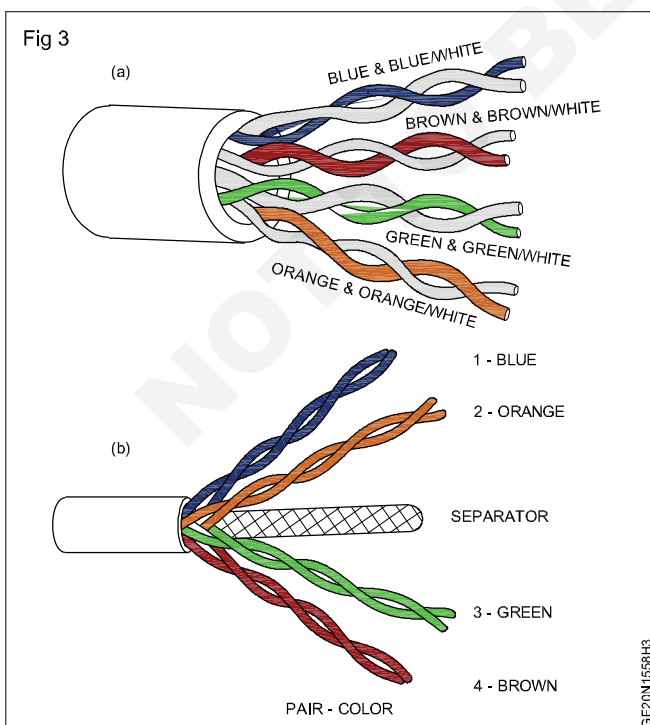
TASK 2 : Create straight and cross cable and punch a UTP cable in the patch socket

Note to instructor : Instructor must arrange the required length of cross cable, the tool for crimping and two computer for making connection as shown in Fig 1.

- 1 Use crimping tool (as shown in Fig 2) to cut through a cable and strip the cable jacket/insulation using cable stripper/ crimping.



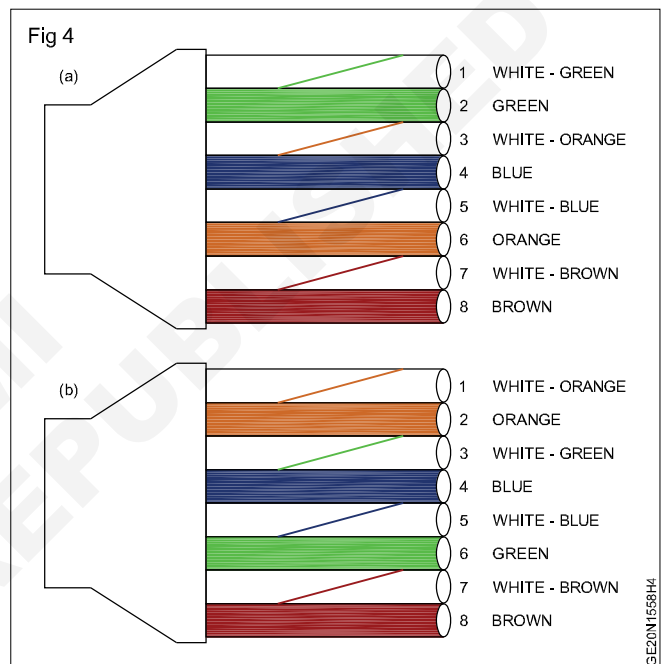
Note : Crimp tools have two blades. One designed to cut the cable and other to strip the jacket. While stripping the cable care should be taken not to cut the internal wires. Remove the jacket insulation about an inch. When the jacket insulation removed you will find eight wires twisted in to four pair (for CAT 5 cable as in Fig 3) and a separator inside the CAT 6 cable as shown in Fig 3a



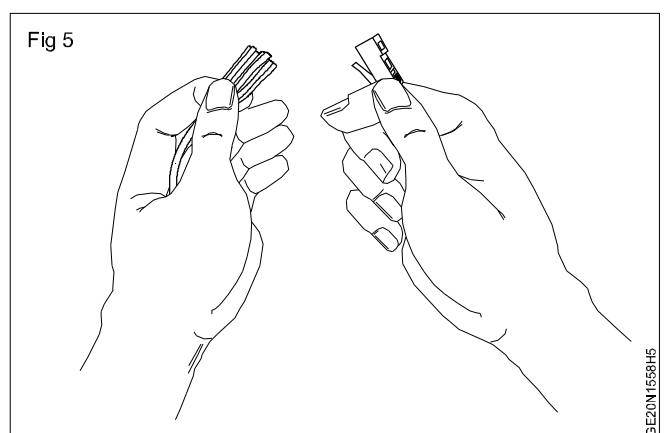
- 2 Cut the separator off and untwist the wires back to within one-eighth inch of the jacket
- 3 Arrange the wires from left to right in the order they are to be crimped. The normal crimping order for cross cable is shown in Fig 4 & Fig 4a.

Note : The color code wiring order is different for both ends in cross cable.

- Cross over cable
 - One end (Fig 4)
 - Other end (Fig 4a)
- 4 Grasp the wires firmly between your fingers and flatten them to remove the curliness

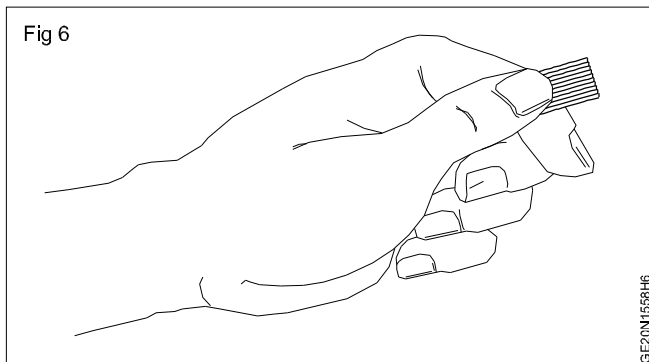


Note : The wires must lay flat and together aligned as closely as possible in order. When finished the cable should look like as shown in Fig 5.



- 5 Cut a few mm while holding them firmly, so they are all of the same length as shown in Fig 6.
- 6 Slide the RJ45 connector on to the wires making sure the wires stay lined up

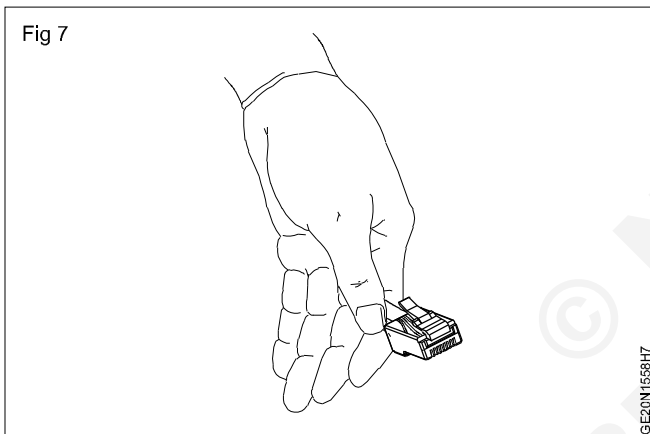
Fig 6



GE20N1558H6

Note : Try to make each wire fits in the slot of the connector and make each wire reach the end of its slot. The cable jacket/insulation should reach just beyond the end of the crimp point as shown in Fig 7.

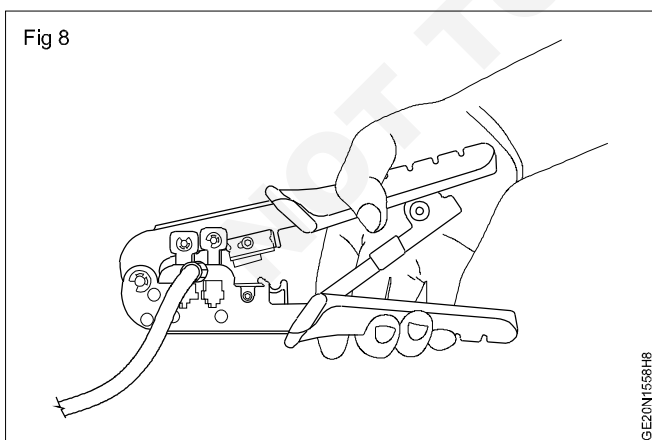
Fig 7



GE20N1558H7

- 7 Verify all the wires are in the correct order, and insert the connector in to the crimping tool and press to crimp as shown in Fig 8.

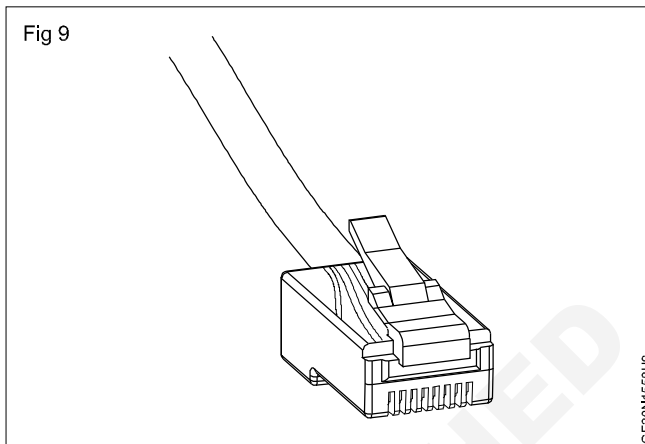
Fig 8



GE20N1558H8

Note : Now half of the work done. The cable should look like as shown in the Fig 9 .The process must be repeated for the other end of the cable. However the color code wiring order changes for cross cable as shown in Fig 10.

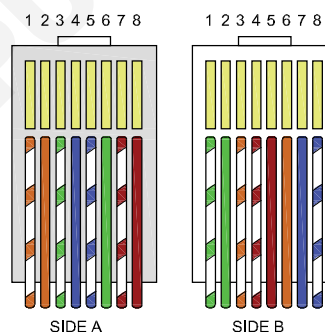
Fig 9



GE20N1558H9

Fig 10

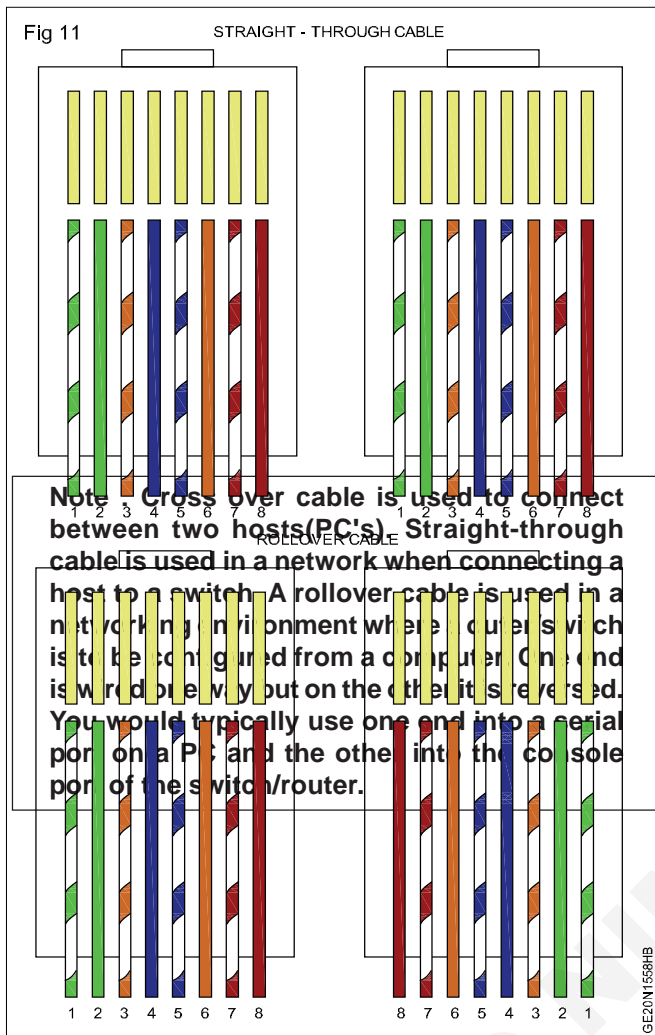
PIN ID	SIDE A	SIDE B
1	ORANGE - WHITE	GREEN - WHITE
2	ORANGE	GREEN
3	GREEN - WHITE	ORANGE - WHITE
4	BLUE	BROWN - WHITE
5	BLUE - WHITE	BROWN
6	GREEN	ORANGE
7	BROWN - WHITE	BLUE
8	BROWN	BLUE - WHITE



GE20N1558HA

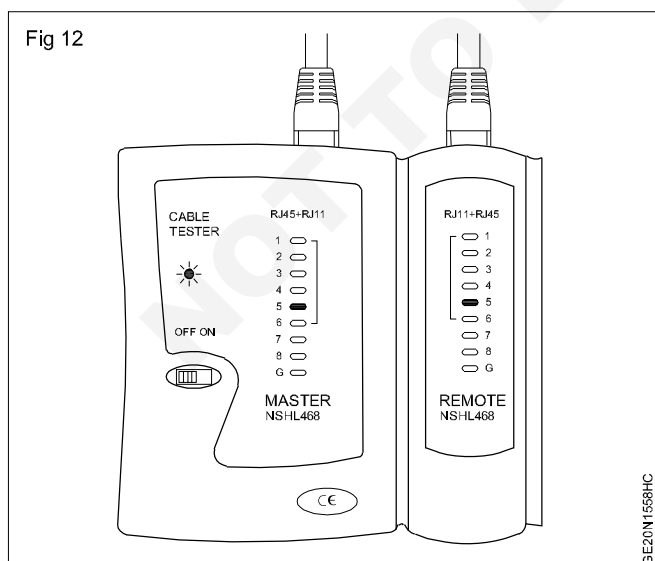
Note : Similarly straight through cable and roll over cable can be prepared with the help of the instructor. The color code wiring order is shown in Fig 11.

- 1 Green White
- 2 Green
- 3 Orange White
- 4 Blue
- 5 Blue White
- 6 Orange
- 7 Brown White
- 8 Brown

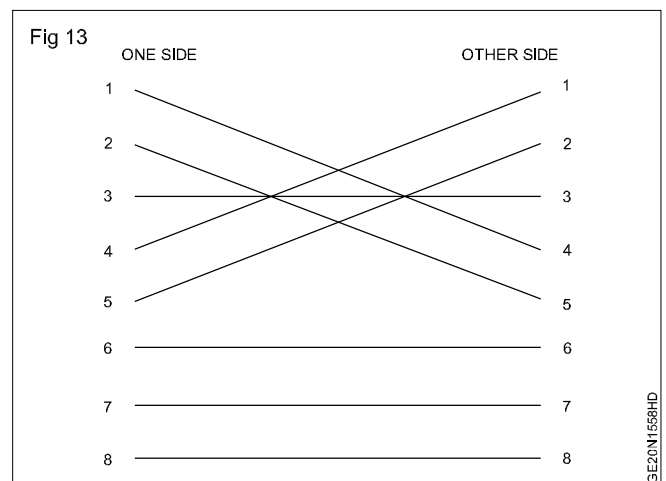


TASK 3 : Testing the cable with the LAN tester

- 1 Insert one end of the cross cable (prepared in Task 1) in to one socket and other end in another plugged in socket of the LAN tester as shown in Fig 12.
- 2 Switch 'ON' the LAN tester.
- 3 Note the order in which LED's glowing in both the panel of the LAN tester should correspond to the order shown in Fig 13.



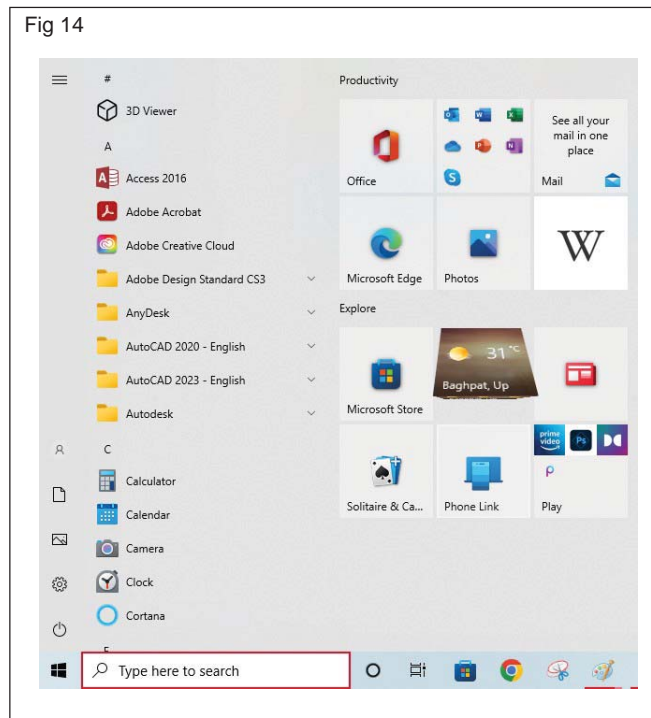
Note : Check for the batteries loaded in cable tester



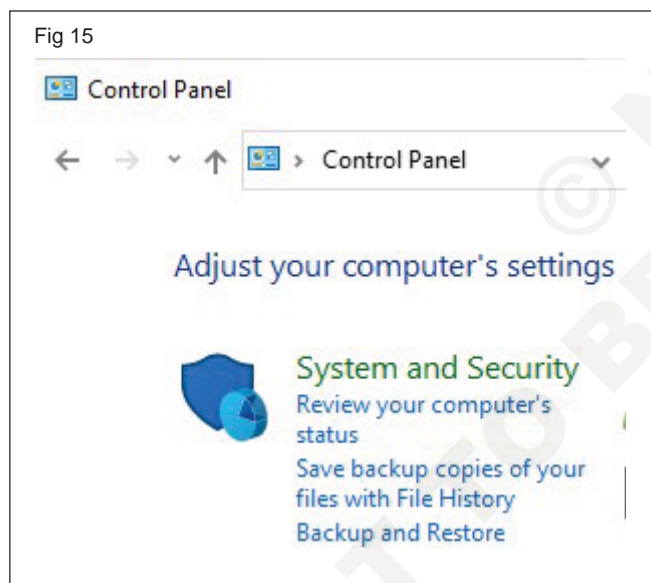
If the LED's doesn't glow , then there is a break in the cable.

TASK 4: Create workgroup and check the network connection

1 Open Control Panel from start menu. (Fig 14)



2 Now select System & Security option. (Fig 15)



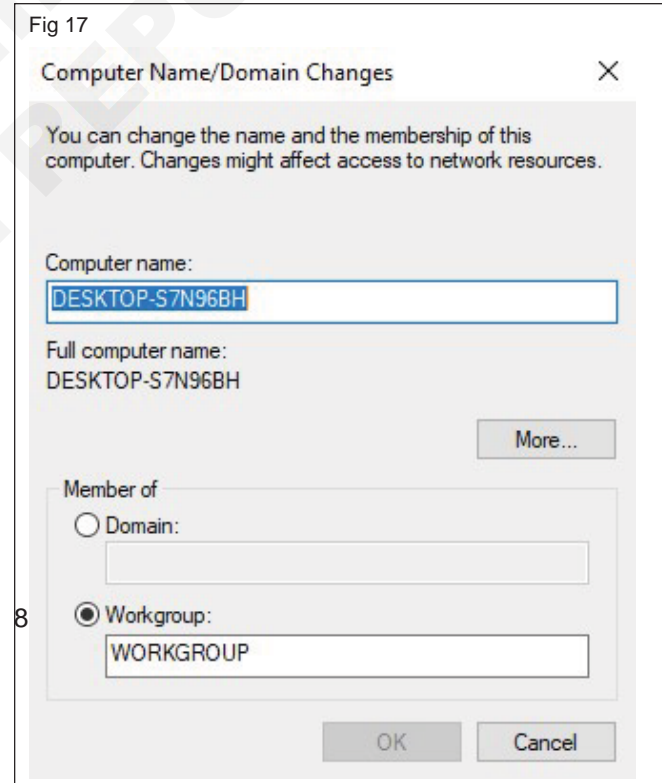
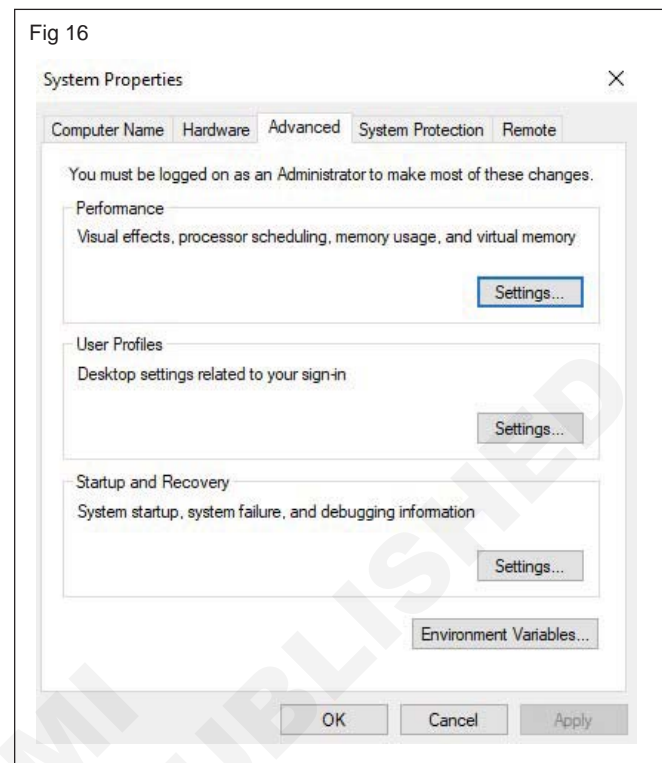
3 Select System.

4 Select advance system setting.

5 Select computer name.

6 Click change. (See Fig 16)

7 Enter Computer Name (refer Fig 4)



TASK 5 : Creating a Home Group on a local network

Create a Home Group to share libraries and devices with other computers on the network. You can also stream media between devices.

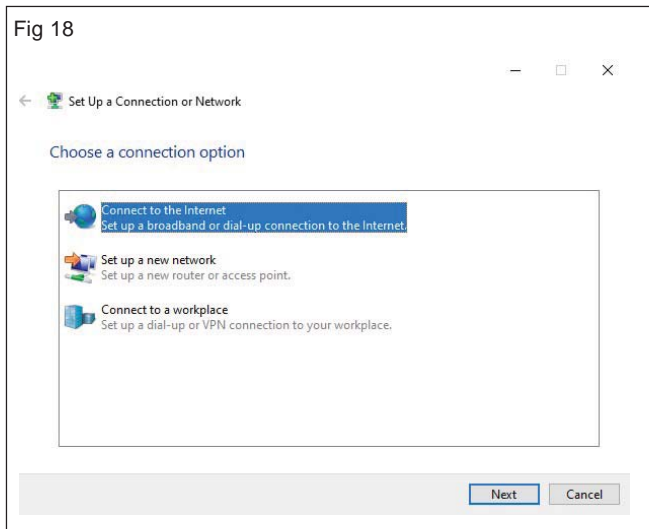
1 In Windows, search for and open Home Group.

2 If a Home Group has been created already, enter the password for it, and then click join.

User can find the password for the Home Group on the computer that created it.

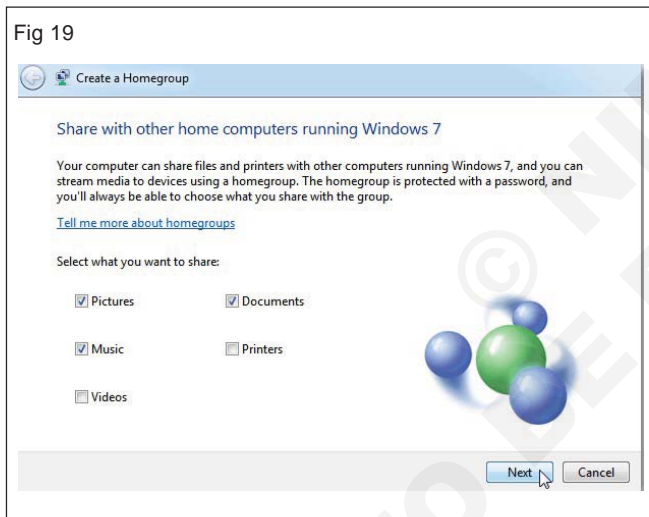
- 3 If a Home Group has not been created, click Create a Home Group in Fig 18.

Fig 18



- 4 In the Create a Home Group window, click Next as shown in Fig 19.

Fig 19



- 5 Select **Shared** in the box next to the folders or devices you want to share, then click **Next** as shown in Fig 20.

Fig 20

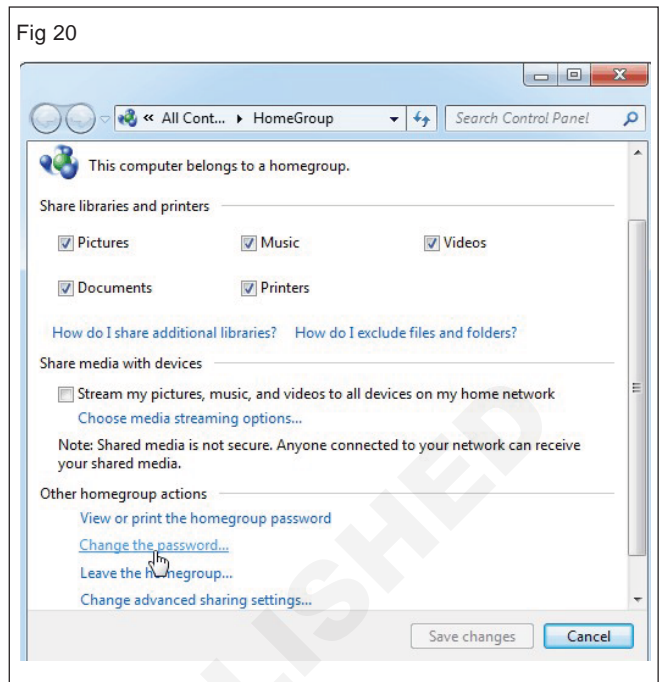
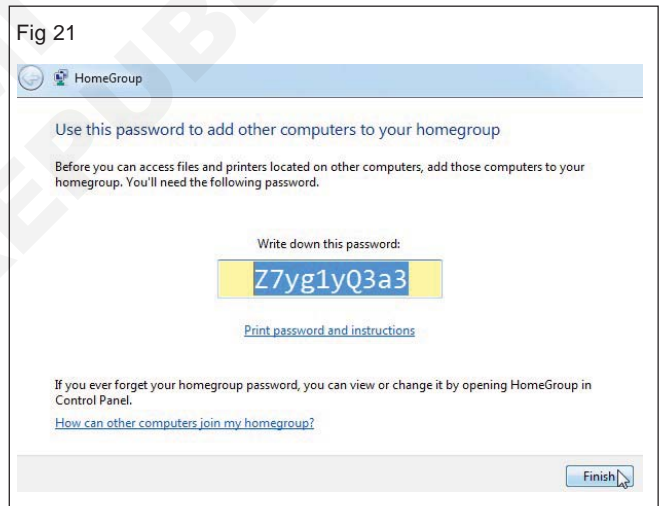


Fig 21



IP Addressing and Subnet for LPV4 /IPV6, Masking, Pinging to Test Networks

Objectives: At the end of this exercise you shall be able to

- create IP address and subnet mask
- ping to test network.

Requirements

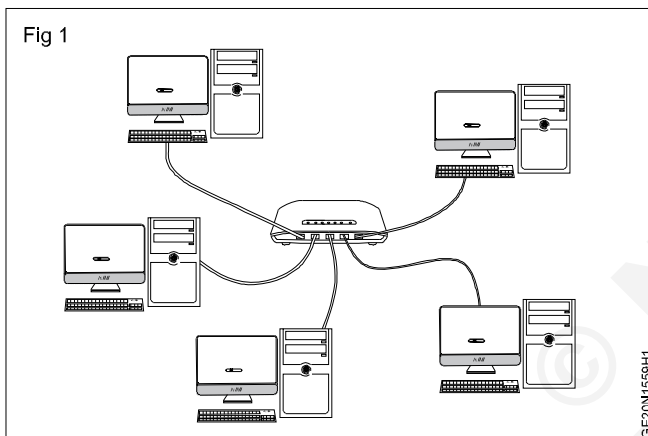
Tools/Equipments/Instruments

- A working PC - 1 No./batch.

PROCEDURE

TASK 1 : Assign different classes of IPv4 addressing

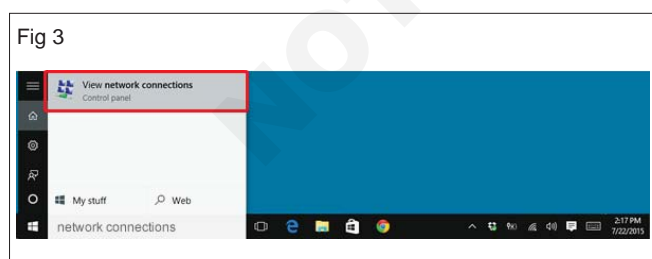
- 1 Connect PCs with switch using RJ45 cable as shown Fig 1.



- 2 Power on the PCs and network switch.
- 3 Type network connections in the search in PC1. (Fig 2)



- 4 Select "View network connections". (Fig 3)



- 5 Right click on Ethernet and select properties. (Fig 4)
- 6 Select Internet protocol version 4 (TCP/IPv4) and click properties as shown Fig 5.

Fig 4

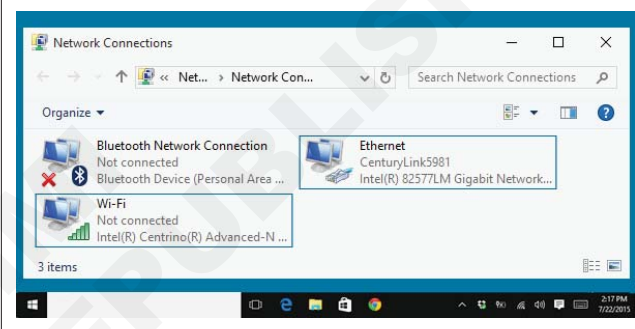
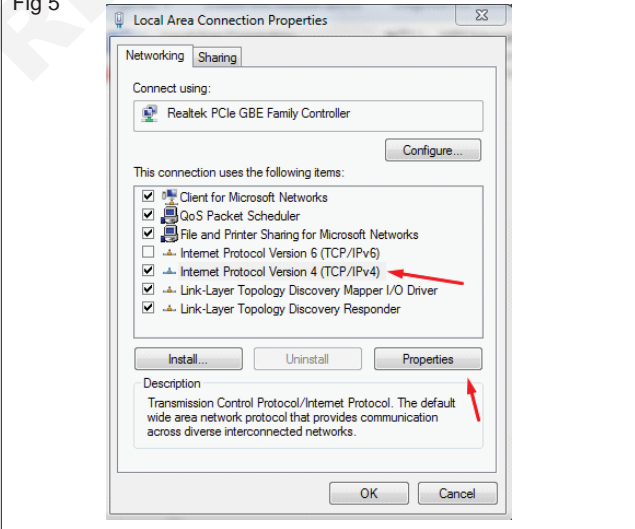


Fig 5

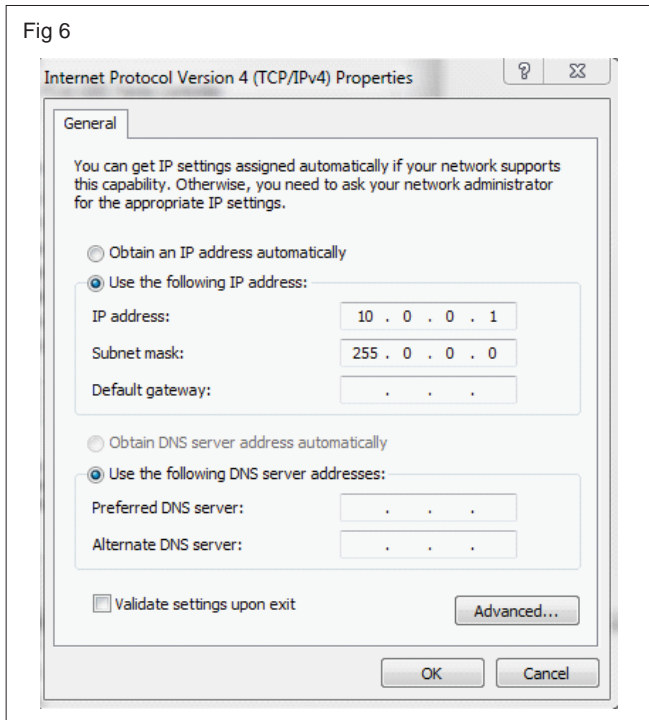


- 7 Select use the following IP address and assign ipv4 class-A IP address and subnet mask.

For example : Class A IP address - 10.0.0.1 and subnet mask 255.0.0.0 (Fig 6)

- 8 Assign IP address to other PCs 10.0.0.2, 10.0.0.3 and 10.0.0.4 etc.
- 9 Assign the same subnet mask to all PCs.

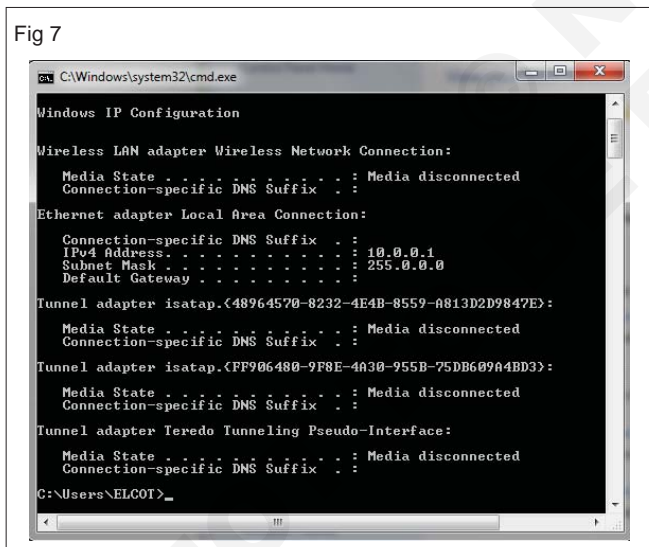
Fig 6



TASK 2: Test connectivity between computers

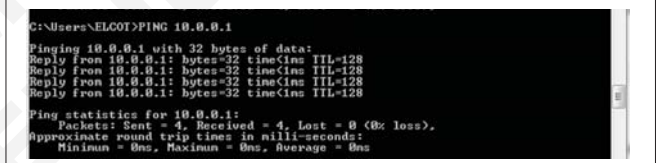
- 1 For testing connectivity between computers using basic network commands.
- 2 Open command prompt and Check IP configuration using the command ipconfig. (Fig 7)

Fig 7



- 3 Note the systems IP configuration.
- 4 Then check connectivity between system using ping command
- 5 Eg: ping 10.0.01 and note the result. (Fig 8)
- 6 Check the connectivity to other systems also using that systems IP address.

Fig 8



- 7 Change ip address and subnet mask of all PCs to class-B.
- 8 Example: 128.0.0.1 to 128.0.0.2 etc and subnet mask 255.255.0.0 to all PCs.
- 9 Repeat the steps 2 to 4 to test the network.
- 10 Change ip address and subnet mask of all PCs to class-C.
- 11 Example: 192.0.0.1 to 192.0.0.2 etc and subnet mask 255.255.255.0 to all PCs.
- 12 Repeat the steps 2 and 4 to test the network.
- 13 Change the IP address of PC1 to class B and keep all other systems in Class A.
- 14 Check the connectivity from PC1 to other system using Ping command.
- 15 Note the result.
- 16 Repeat the steps 13 to 15 by changing IP addresses to different classes.

Network Basic and Configuration

Objectives: At the end of this exercise you shall be able to

- setup wired Ethernet network
- set wireless network for LAN.

PROCEDURE

TASK 1: Setup wired Ethernet Network

- 1 Make sure that your Ethernet cable is plugged into the Ethernet jack on your computer.
- 2 Make sure that the other end is plugged into a router, hub, or switch.
- 3 Make sure that all computers are plugged into a powered electrical outlet and turned on.
- 4 Make sure that the router, hub, or switch is plugged into a powered electrical outlet and turned on.

Most routers, hubs, and switches have lights that indicate they are working.

- 5 Make sure that all computers on your network have the same workgroup name.
- 6 Make sure that all computers are using the same Subnet Mask.

- 7 If assigned IP addresses to the computers, make sure that all computers have different IP addresses.

For home networks, IP addresses should be 192.168.N.N where N is a number you assign between 0 and 254. The first N should be the same for all computers on your network and the second N should be different for all computers on your network.

The computer does not recognize an add-in Ethernet card

- 1 Shut down and restart your computer.
- 2 Make sure that you have installed the required software.
- 3 Reseat the card

TASK 2: Complete the network connection checklist to troubleshoot various network issues

Step : 1 Check all of the network cables and wires

- 1 Check all of the network cables and wires. A loose or disconnected cable or wire prevents a network connection and Internet access.
- 2 Check the following connections:
 - Network cable from the modem to the network hub (or router).
 - Network cable from the network hub to the RJ-45 network port on the computer.



- 3 Network cable between two computers.
- 4 Check the lights on the network hub. The lights can often show the location of a connection problem.
- 5 If you are trying to connect to another computer on the network, make sure that computer is turned on.
- 6 Check the firewall settings on all the computers on the network. The firewall settings may be preventing network access.

- 7 After performing the items in the checklist, try to connect to the network.

If you do not experience problems with the network, you are done.

If you are still experiencing problems with the network, continue with the next step to use the Network and Sharing Center.

Step 2: Using the Network and Sharing Center in Windows 7

The Network and Sharing Center displays the status of the network and allows you to set up network discovery and file sharing across the network. Follow these steps to use the Network and Sharing Center:


- 1 Click Start , Control Panel, and then click Network and Internet as on Fig 1.
- 2 Click Network and Sharing Center as on Fig 2.
- 3 Check the status of the network at the top of the window:
 - A green line between the computer name and the network name indicates a good connection to the network.

Fig 1

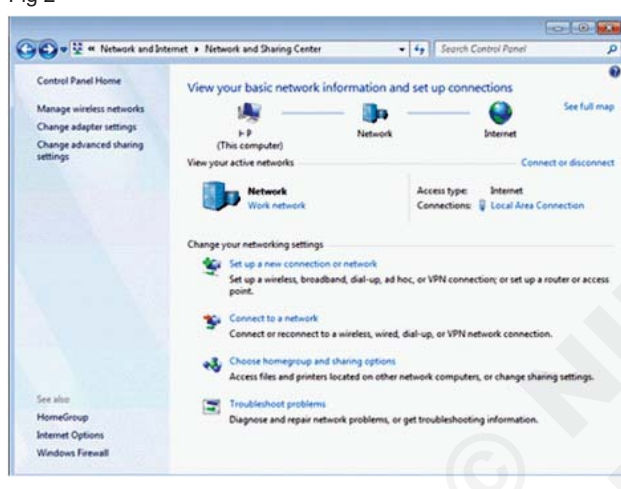


Fig 4



- 6 In the Homegroup settings window, click Change advanced sharing settings as on Fig 5.

Fig 2



- A line with a red X indicates a broken or missing connection as on Fig 3.

Fig 3

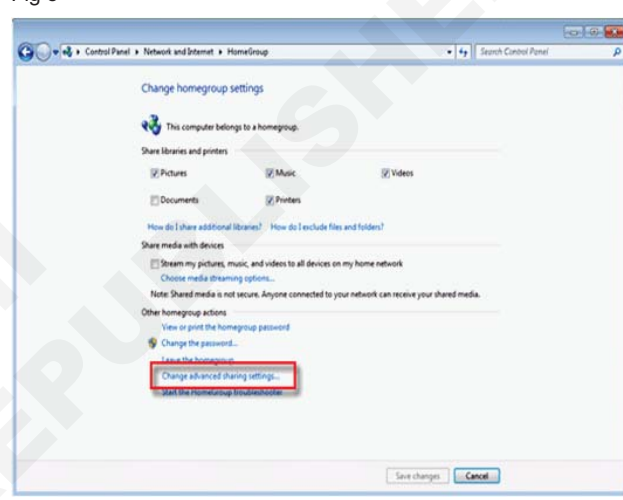


- 4 If the connection is broken or missing, click Connect to a network to attempt a network connection as on Fig 4.

The Network area displays the network access and connection.

- 5 Click Choose Homegroup and sharing options.

Fig 5

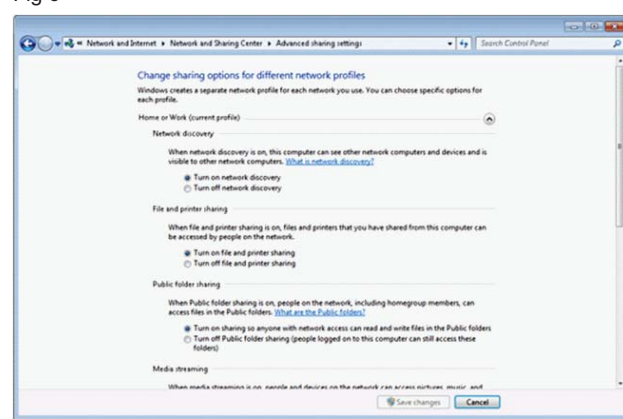


- 7 Turn on network discovery and file and printer sharing.

In addition, now is a good time to review the other settings and turn them on or off as needed.

These settings (Fig 6) must be enabled on all computers in order to share across the network. For example, if File sharing is turned off on one of the computers on the network, you cannot access the files on that computer through the network.

Fig 6



- **Network discovery:** Turn on network discovery to allow the computer to find other network computers and devices.
- **File and printer sharing:** Turn on file sharing to share files and folders with other computers on the network and to allow network users access to the printers connected to this computer. Network users must know the user name and password of a user account on this computer to access the printers.
- **Public folder sharing:** Turn on Public folder sharing to allow other computers access to the Public folder on the computer. You can choose to have users of other computers on the network to be able to open files, open and modify files, or to deny access to network users.
- **Media streaming:** Turn on media streaming to allow network users to access shared music, pictures, and videos on this computer.
- **File sharing connections:** Windows 7 uses 128-bit encryption to protect sharing connections. Some devices cannot support 128-bit encryption. If you are using one of these devices on the network, change the setting to enable 40- or 50-bit encryption.
- **Password protected sharing:** Turn on password protected sharing to require network users to enter a user name and password of a user account on this computer to access files, folders, and printers over the network.
- Turn off password protected sharing to allow everyone on the network access to this computer.
- After configuring the settings in the Network and Sharing Center, try to connect to the network.

If you no longer experience problems with the network, you are done. If you are still experiencing problems with the network, continue with the next step to use Windows 7 diagnostic and troubleshooting tools.

Step 3: Using Windows 7 diagnostic and troubleshooting tools

Windows 7 includes a network diagnostic tool and a network troubleshooter. Both tools help to identify network problems and provide possible solutions.

Running Windows 7 Network Diagnostics

Windows 7 monitors the network and Internet connections. If it detects a problem, Windows 7 displays a no connection or limited connection message, and prompts you for permission to diagnose the problem.

- Click **OK** to allow Windows 7 to diagnose the problem and restore the connection.

To run the diagnostic tool manually, use one of the following options:

- No error message is displayed, but there is no Internet connection:


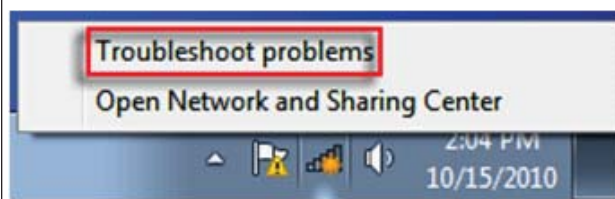
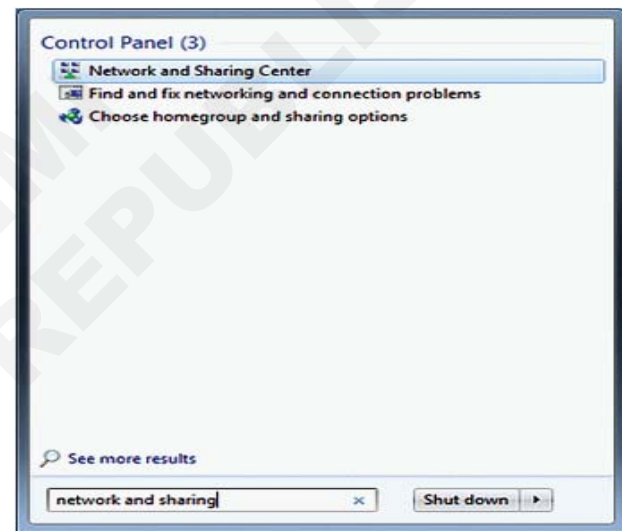
- Right-click the **Network Connection** icon  in the notification area,
- Click **Troubleshoot problems (Fig 7)**. Windows Network Diagnostics checks for problems.

Fig 7



- The Network Connection icon is missing in the notification area.
- Click Start , and then type network and sharing in the Search box.
- Click Network and Sharing Center in the results as on Fig 8.

Fig 8





- In the Network and Sharing Center, click the yellow exclamation symbol  or the red X  in the Network status area to run Windows Network Diagnostics as on Fig 9.

Fig 9

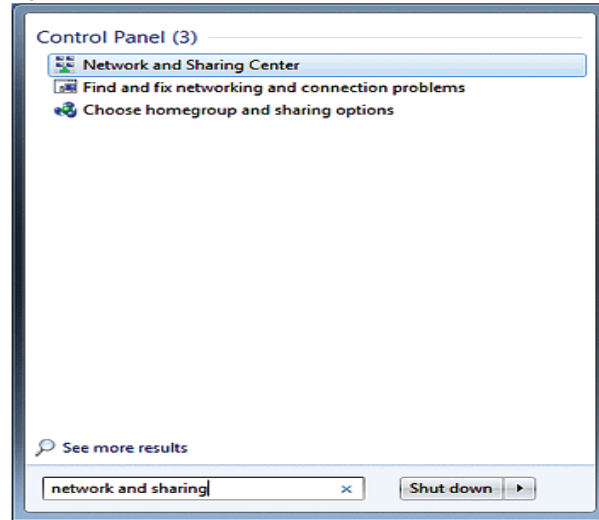


Windows 7 Network and Internet Troubleshooter

The Windows 7 Network and Internet Troubleshooter tests the network for problems and automatically repairs the network connections if applicable. Use this tool to test and repair the connection:

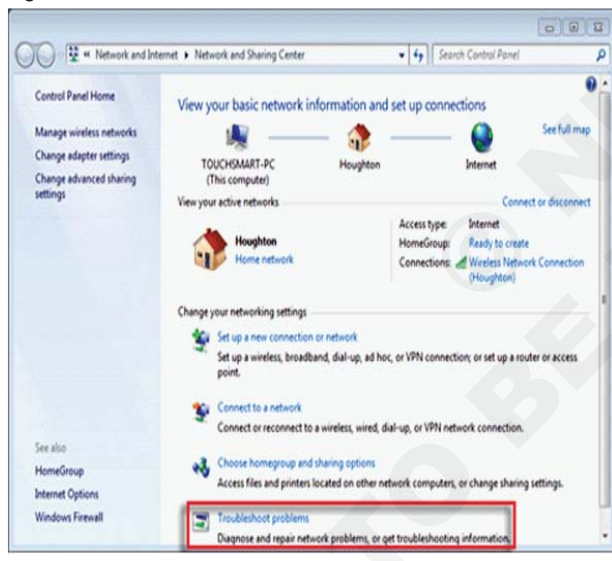
- 1 Click Start , and then type network and sharing in the Search box.
- 2 Click Network and Sharing Center (Fig 10) in the results.

Fig 10



- 3 Click Troubleshoot problems (Fig 11).

Fig 11



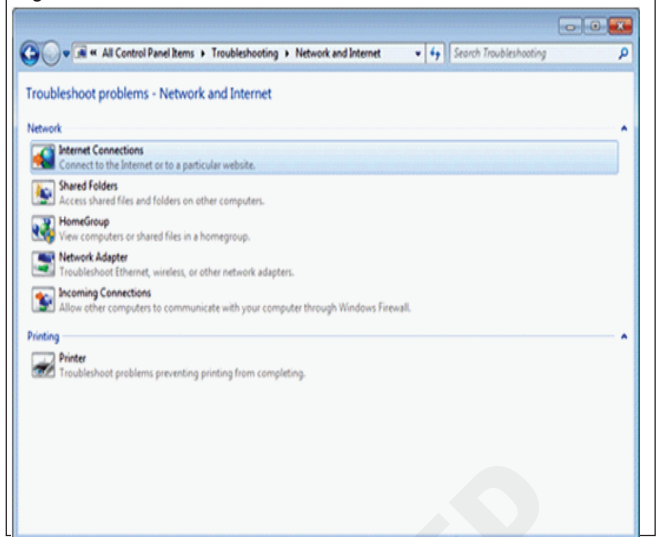
The Network and Internet Troubleshooter opens.

- 4 Click Internet Connections (Fig 12) to test the Internet connection.
- 5 Follow the instructions to check for problems.

If the problem continues, return to the Network and Internet Troubleshooter and click Network Adapter to test the adapter.

- 6 If the problem is resolved, you are done.

Fig 12



Step 4: Uninstalling and reinstalling the network adapter software in Windows 7

If the network is still having problems, there may be an issue with the network adapter. You can check the network adapter using the Network and Internet Troubleshooter in the previous step. Alternatively, follow these steps to uninstall and reinstall the network adapter software in Device Manager:

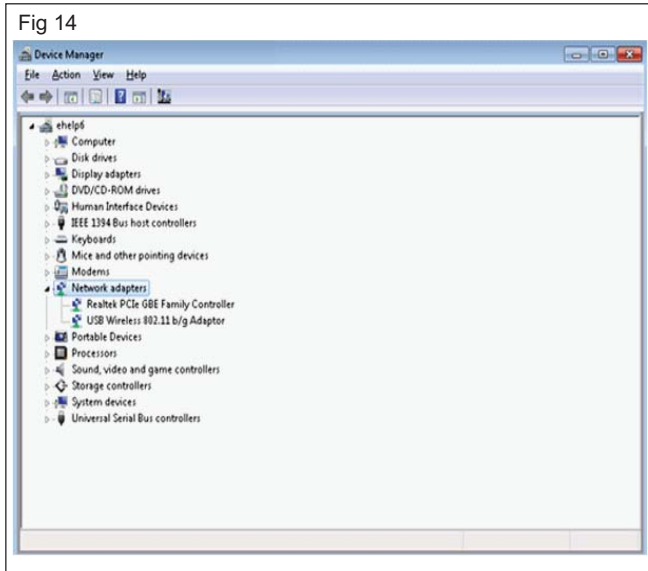
- 1 Click **Start** , and enter Device Manager into the Search field. Click **Device Manager** as on Fig 13.

Fig 13



- 2 Double-click the **Network adapters** (Fig 14) category.
- 3 Right-click the name of the Network Adapter and select Uninstall.
- 4 On the Confirm Device Uninstall window, click 5. When the network adapter drivers have been uninstalled, restart the computer.

Fig 14



- 5 When the network adapter drivers have been uninstalled, restart the computer.
- 6 After the computer restarts and completes the installation of the device driver software, try connecting to the Internet. If the problem still exists, continue with the next step to update the network drivers.

Step 5: Updating the network drivers

From a computer that has Internet access, check the HP Web site for network drivers for your product. If one is available, download and install the latest update for your network hardware. Use the following steps:

- 1 Go to the HP Software download page.
- 2 If you are presented with a page to enter your model number, enter your model number. For example, Pavilion p6230f or TouchSmart 600-1050uk.
- 3 Select the version of Windows the computer is using.
- 4 Click the **Driver - Network** link.
- 5 Select the network or modem driver update. For example, Realtek RTL8139 LAN Driver Update.
- 6 Follow the instructions on the download page to download and install the update.
- 7 When done, restart the computer and connect to the Internet again.

Browsing the Internet for Information

Objectives: At the end of this exercise you shall be able to

- browse a website through web browser
- download file from website.

Requirements

Tools/Equipments/Instruments

- A working PC with Internet Connection - 1 No./batch.

PROCEDURE

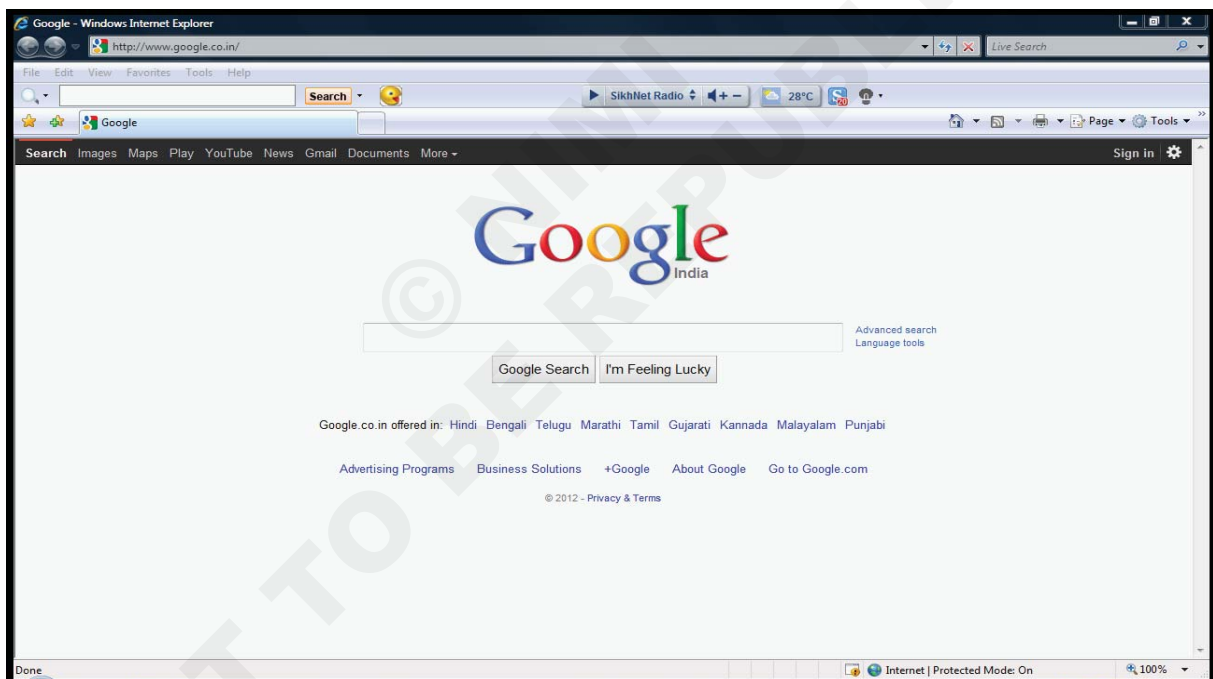
TASK 1 : Browse a website through Web browser

First way to open

- 1 Choose Internet explorer and click it.

Note : A home page Google appears on the screen as on Fig 1.

Fig 1



- 2 Type "www. dget.gov.in".

Note : website of DGET appears on the screen.

Second way to open

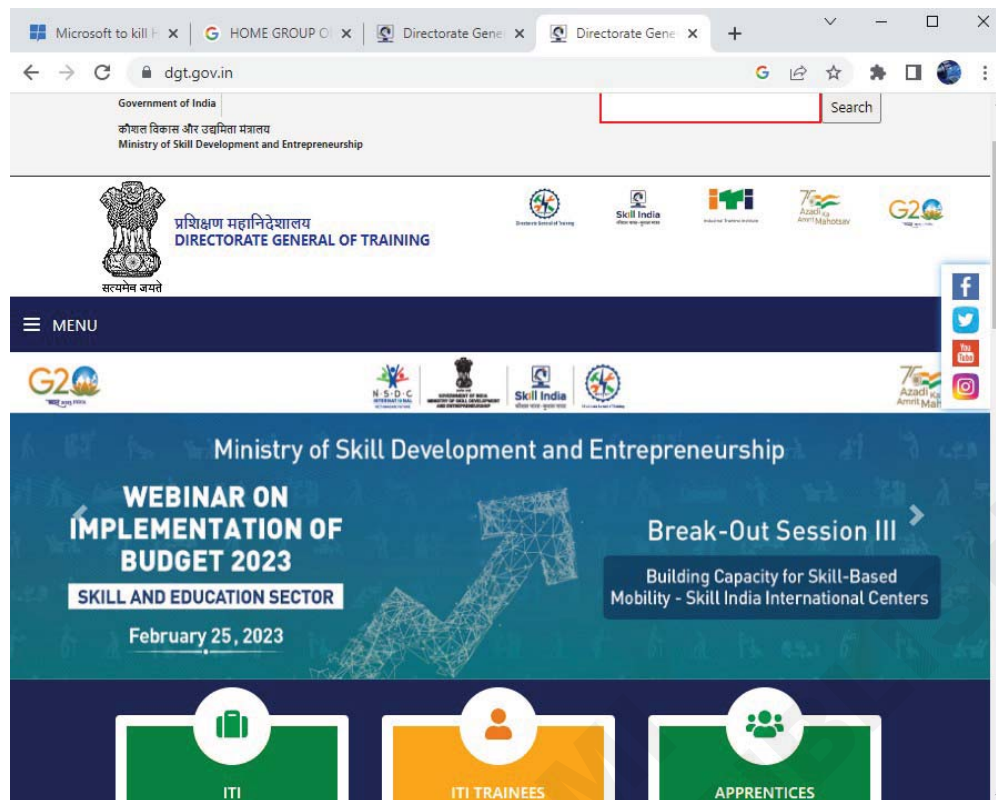
- 1 Type "www. dget.gov.in" on the Address bar and press enter as on Fig 2.

Fig 2



Note :The DGET website appears on the screen as on Fig 3.

Fig 3



TASK 2 : Download File from website

Down loading

- 1 Click Trade syllabus as in Fig 4 on the DGET home page.

Fig 4



Note: The window will appear on the screen as in Fig 5.

- 2 Select and click CRAFTSMAN TRAINING SCHEME (CTS).

Note: List of engineering and non-engineering trades appears on the screen as on Fig 6.

- 3 Scroll down the screen with the mouse and select your trade syllabus.

Example: Trade name "COPA".

- 4 Click the selected trade COPA which is under lined in blue as on Fig 7.

Note: The syllabus of "COPA" appears on the screen as on Fig 7.

- 5 Click "Save a copy" to save or download the syllabus.

Fig 5

Engineering	Non-Engineering	Trades-Visually Impaired
Syllabus for Core Skill		
Engineering Drawing		
Workshop Calculation & Science		
Employability Skill		
<p><u>OLD NSQF COMPLIANT COURSES UNDER CRAFTSMEN TRAINING SCHEME.</u> <u>FOR NEW CTS SYLLABUS PLEASE VISIT NEW CTS SYLLABUS PAGE</u></p> <ol style="list-style-type: none"> 1. CTS - Additive Manufacturing Technician (3D Printing) (NSQF Level - 4) 2. CTS - Advanced CNC Machining Tech.(NSQF Level - 5) 3. CTS - Aeronautical Structure and Equipment Fitter (NSQF Level - 5) 4. CTS - Architectural Draughtsman (NSQF Level - 5) 5. CTS - Artisan Using Advance Tool (NSQF Level - 4) 6. CTS - Attendant Operator (Chemical Plant) (NSQF Level - 5) 7. CTS - Basic Designer and Virtual Verifier (Mechanical) (NSQF Level - 5) 8. CTS - Carpenter (NSQF Level - 4) 9. CTS - Central Air Condition Plant Mechanic (NSQF Level - 5) 10. CTS - Civil Engineering Assistant (NSQF Level - 5) 		

Fig 6

(NON ENGINEERING TRADES)

1. CTS - Agro Processing (NSQF Level - 4)
2. CTS - Baker & Confectioner (NSQF Level - 4)
3. CTS - Bamboo Works (NSQF Level - 3)
4. CTS - Cosmetology (NSQF Level - 4)
5. CTS - Catering and Hospitality Assistant (NSQF Level - 4)
6. CTS - Computer Aided Embroidery and Designing (NSQF Level - 4)
7. CTS - Computer Hardware & Network Maintenance (NSQF Level - 4)
8. CTS - Computer Operator and Programming Assistant (NSQF Level - 4)
9. CTS - Dairying (NSQF Level - 4)
10. CTS - Data Entry Operator (NSQF Level - 4)
11. CTS - Database System Assistant (NSQF Level - 5)
12. CTS - Dental Laboratory Equipment Technician (NSQF Level - 5)
13. CTS - Desktop Publishing Operator (NSQF Level - 4)

Fig 7



Note : A screen appears on the screen to save it as in Fig 8.

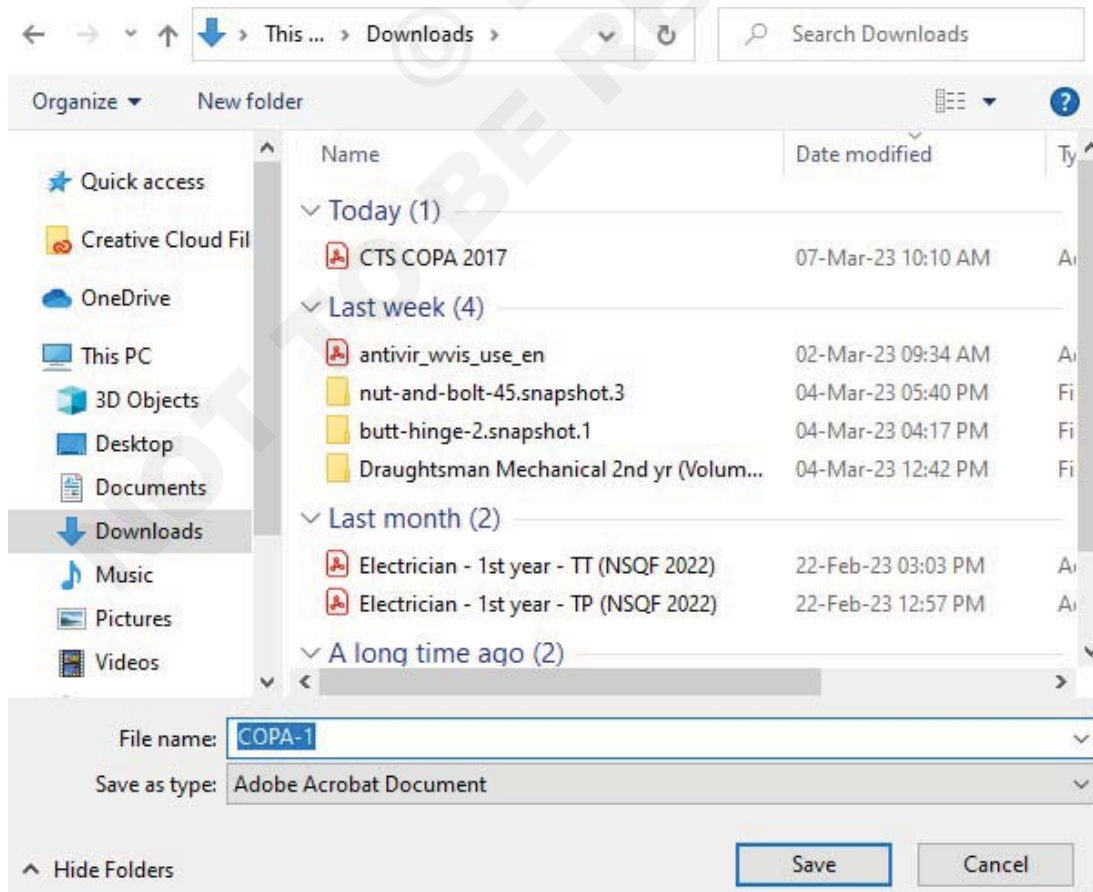
Save the file in c:/document/ COPA[1]. (Fig 9)

- 6 Click the document from c:/ and print the downloaded COPA syllabus.
- 7 Check with the instructor.

Fig 8



Fig 9



Creating and Using e-Mail for Communication

Objectives: At the end of this exercise you shall be able to

- create an e-mail account
- create an export and import contacts
- compose and send e-mail with attach documents
- check the mails and sign out account.

Requirements

Tools/Equipments/Instruments

- A working PC with Internet Connection - 1 No./batch.

PROCEDURE

TASK 1 : Create an Email Account

Note to the instructor: Make the trainees to create accounts as COPATRG as the primary name and secondary in increasing order of number series, in Gmail.

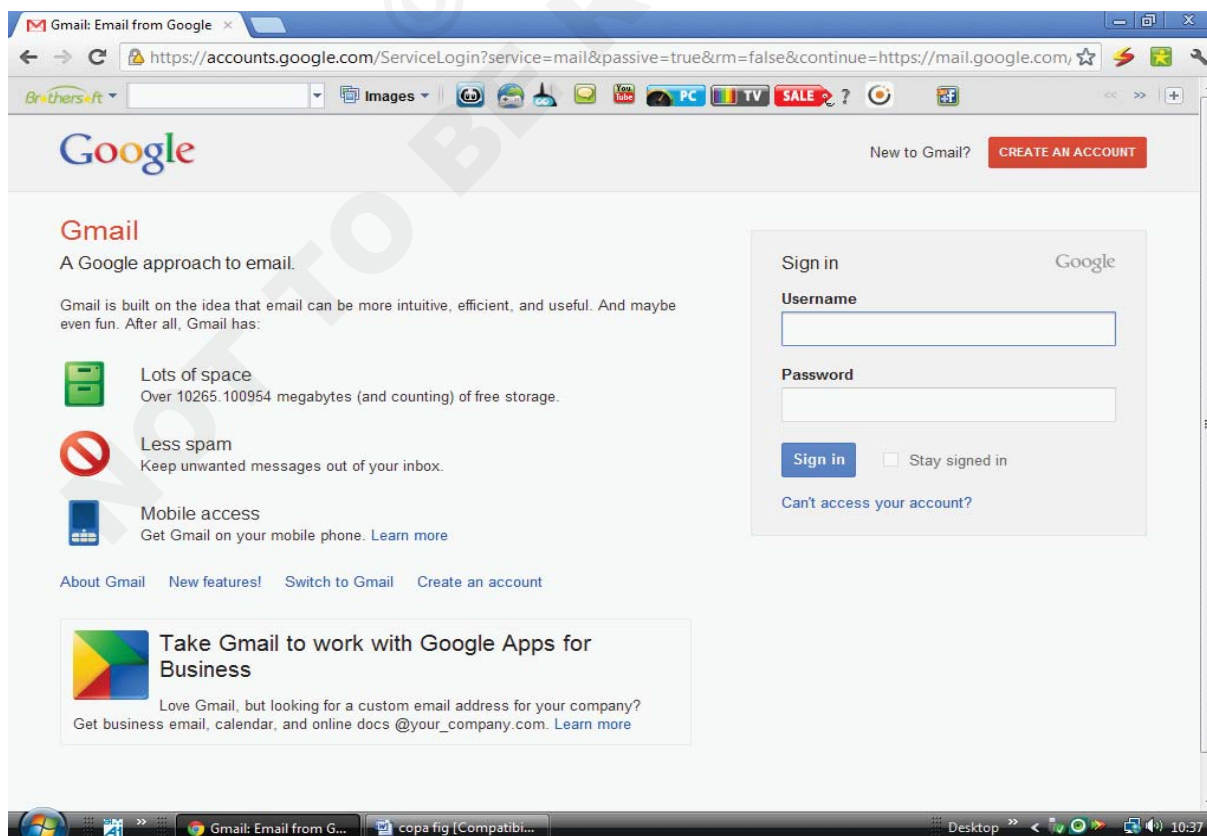
Example: COPATRG2, COPATRG3 etc.

- 1 Create COPATRG2 in yahoo mail simultaneously at the end of Task 1.
- 2 Add contact in "COPATRG2" of yahoo account.

- 1 Choose "internet explorer" and Click to open it
- 2 Click "Gmail" on the "Google" home page

Note: An Account creation screen appears on the screen Fig 1.

Fig 1



3 Click "CREATE AN ACCOUNT "

Note : the following display appears on the screen as on Fig 2.

Note: An account creation screen appears on the screen as shown in Fig 3.

4 Type "COPATR" in First Name box, "1" in Last Name box.

Fig 2

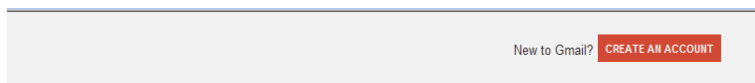


Fig 3

A screenshot of the Gmail account creation form. It includes fields for 'Name' (First and Last), 'Choose your username' (with a placeholder '@gmail.com'), 'Create a password', 'Confirm your password', 'Birthday' (Month, Day, Year), 'Gender' (I am...), 'Mobile phone' (with a country code dropdown and '+91'), and 'Your current email address'. A red error message 'You can't leave this empty.' is visible below the 'Name' field.

Fig 4

A screenshot of the Gmail account creation form, showing the password strength feedback. A green bar indicates 'Password strength: Strong'. A tooltip provides instructions: 'Use at least 8 characters. Don't use a password from another site, or something too obvious like your pet's name. Why?'. The form also shows fields for 'Confirm your password', 'Birthday' (Month, Day, Year), and 'Gender'.

7 Choose Birthday January, 24, 1994, Male in Gender, your mobile number in mobile number, and alternative email id if you have.

8 Type the given quote "Prove your not an robot" box

9 Select the location as "India"

10 Click a the box "I agree to Google" and About personalization box" as shown in Fig 5.

11 Click "Next Step"

Note: A created account of copatrg1@gmail.com is appeared on the screen as on Fig 6.

12 Click "Continue to Gmail"

Note : A new Gmail account mail window appears on the screen with three mails of Google team appears as on Fig 7.

5 Choose your username as "COPATR1"

6 Password as "sachin@12" and retype the same in "confirm your password"

Note : While typing the password the password box has to denote strong as on Fig 4.

Fig 5

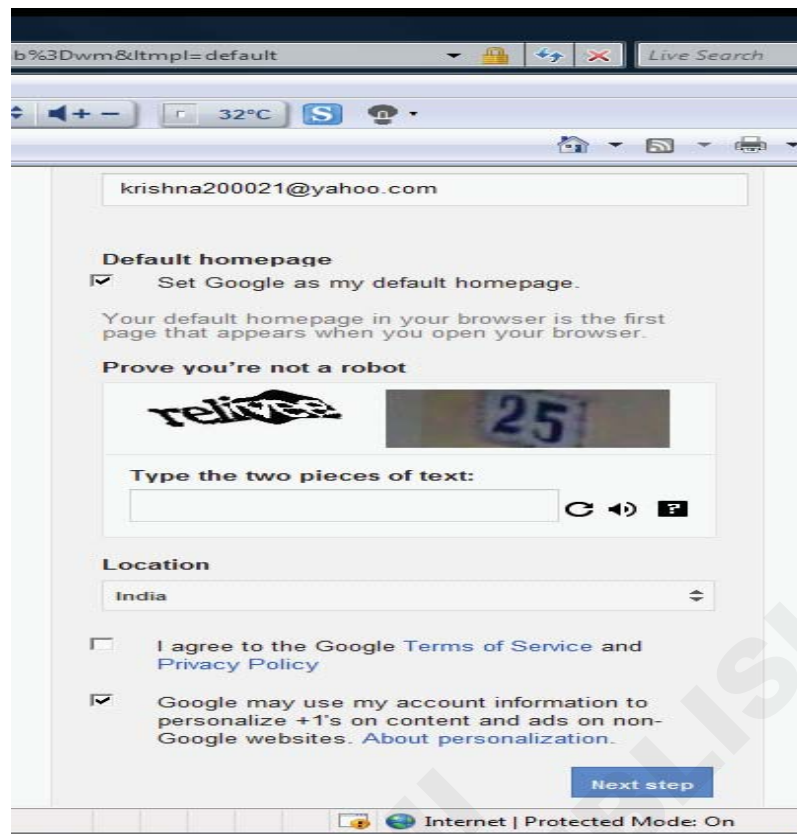


Fig 6

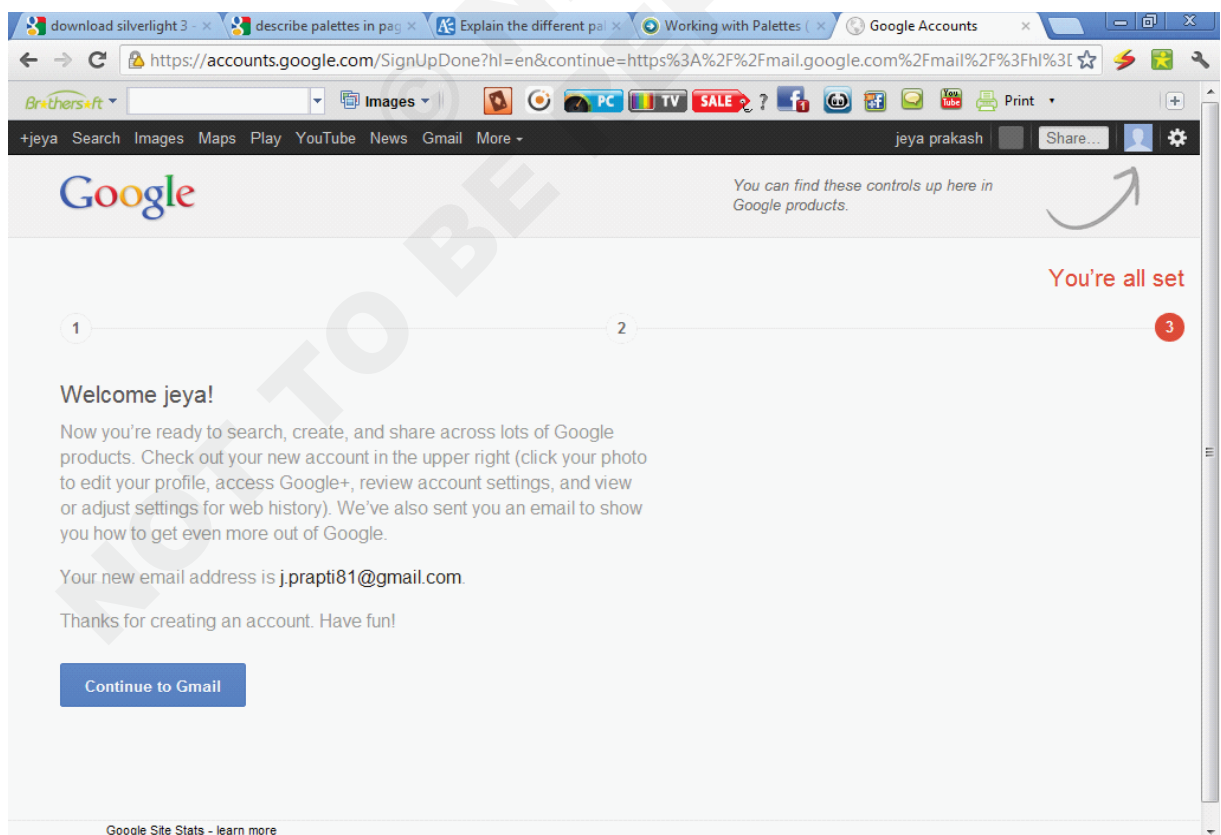
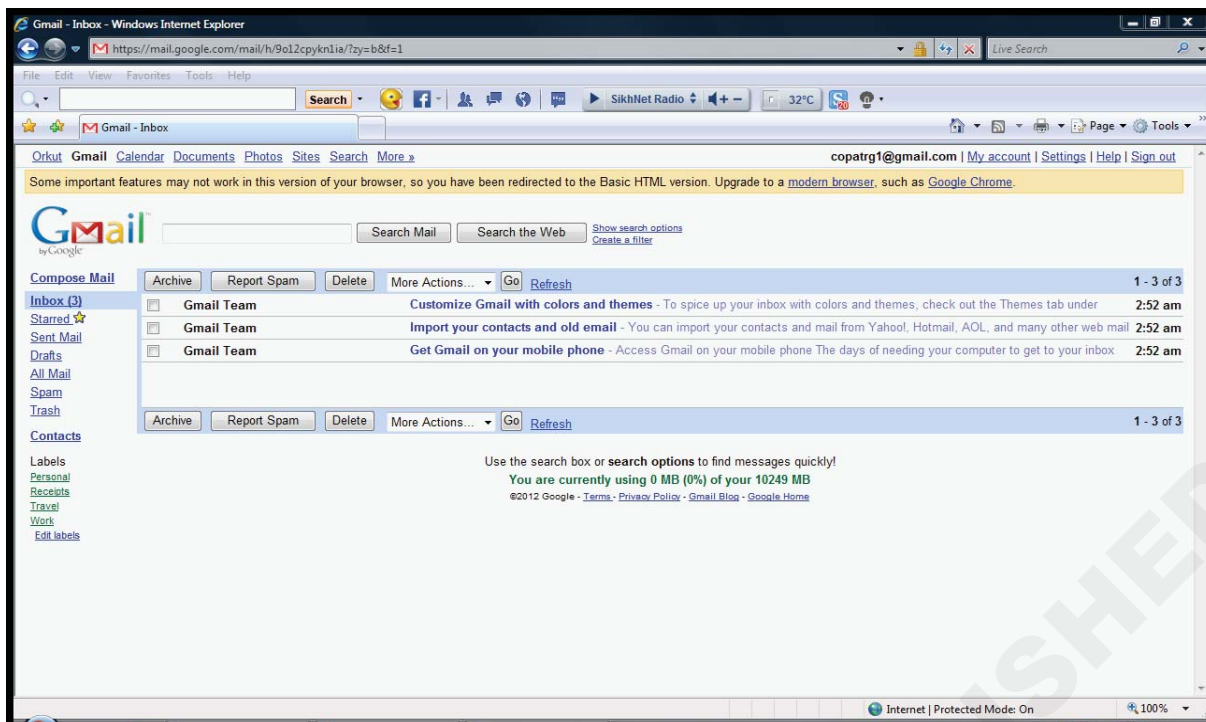


Fig 7



TASK 2 : Create an Export and Import Contacts

- 1 Login to "copatrg2" of Yahoo Mail first.
- 2 Click on "contacts" options and select "Actions" and choose "Export All" as on Fig 8.

Fig 8



Note : An Export window get opened as in Fig 9.

- 3 Choose and click "Yahoo! CSV" option.

Note : The verification codes appears on the screen as in Fig 10.

- 4 Type the given code and click export now button

Note : Fig 11 &12 appears on the top of the export window and appear on the bottom of the export window.

- 5 Click "yahoo_ab(1).csv" file from downloads of hard disk drive to view the address book.

Note : The downloaded file gets opened in excel sheet were contacts can be checked.

- 6 Close the address book

- 7 Signout yahoo mail

Importing Contacts

- 1 Login to your Gmail account "copatrg1"
- 2 Click on "contacts" in Left hand panel of gmail as shown in Fig 13.

Note: A Contact window appears on the screen.

- 3 Click "More" and choose "import" from it as on Fig 14.

Note: A "Import contacts" window appears on the screen as on Fig 15.

Fig 9

Export ?

Choose the program you want to export to and click the corresponding button:

Microsoft Outlook:

Netscape/Thunderbird:

Yahoo! CSV:

vCard Single File:
(recommended for Palm
Desktop users)

vCard, Zip of .VCF files:
(One .VCF file per contact,
Outlook compatible)

Fig 10

Please answer the following to verify you are not a robot

Type the code below

bFCAW5

Fig 11

✓ Your download will start in 5 seconds. If it doesn't please [click here](#)

Fig 12


 yahoo_ab (1).csv

Fig 13

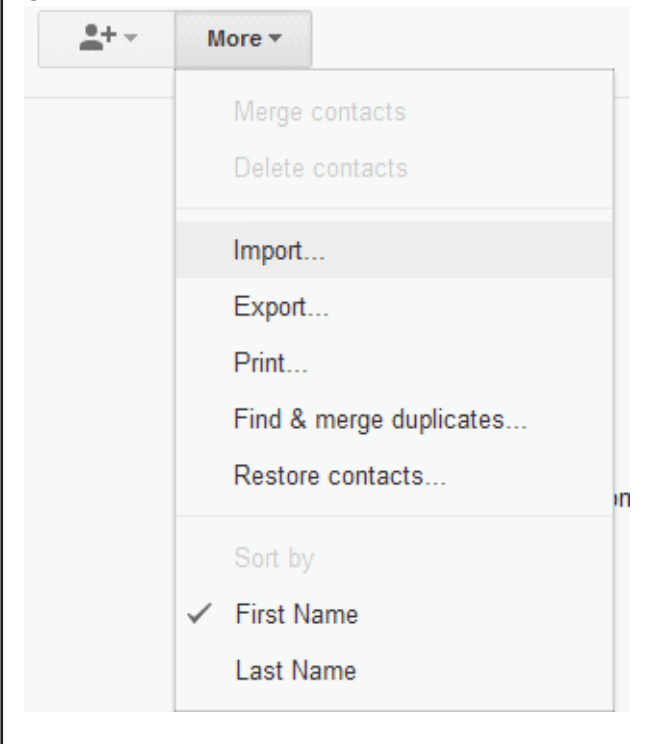
Gmail ▾

Gmail

Contacts

Tasks

Fig 14



- 4 Click "Choose file" option and select "yahoo_ab.csv" the downloaded file of yahoo address book

Note: Fig 16 shows how the selected file is displayed before importing.

- 5 Click "Import" button

Once the Import is complete you will see a confirmation message as on Fig 17.

Fig 15

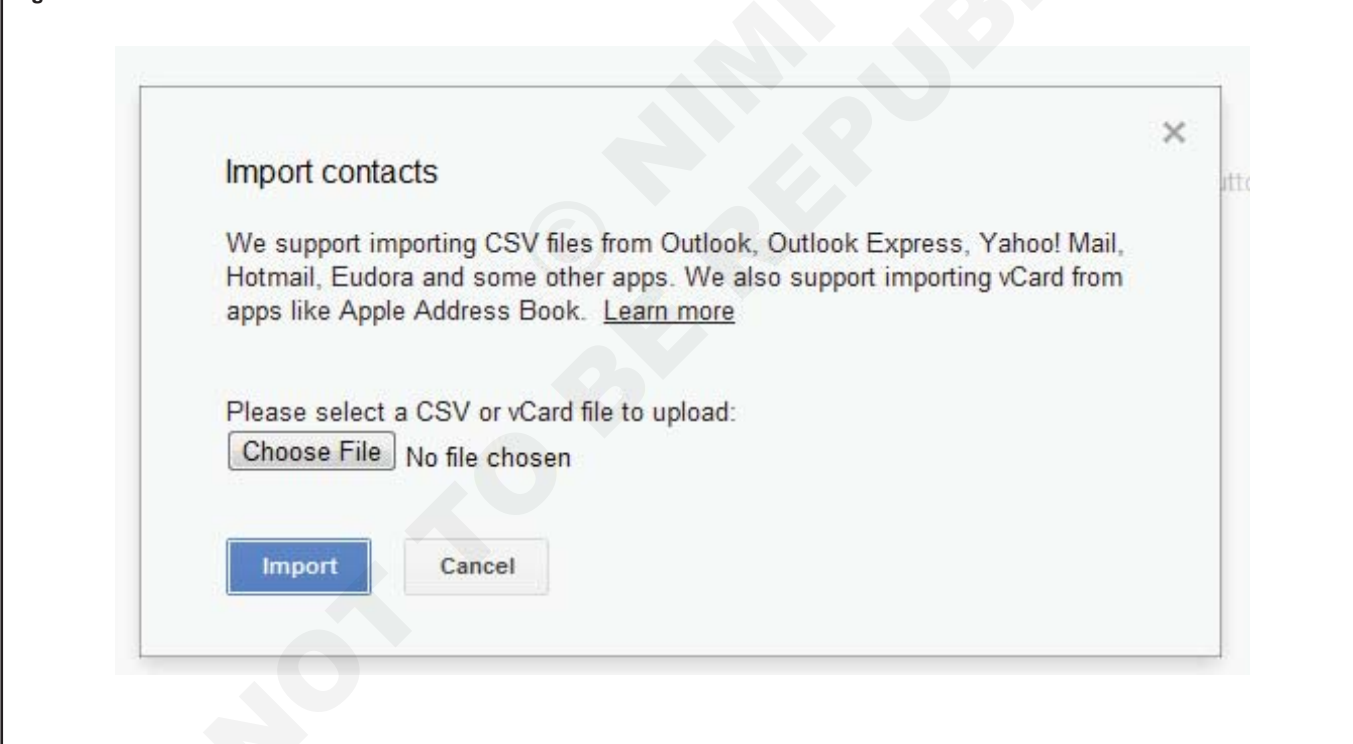


Fig 16

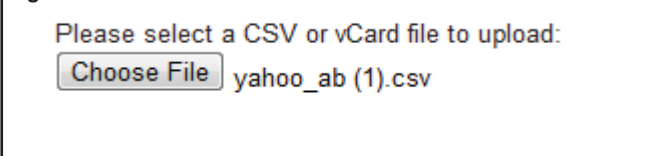


Fig 17



TASK 3 : Composing and Sending mail with attachments

- 1 Choose and click "COMPOSE" button

Note: A compose window appears on the screen.

- 2 Type "copatrg2@yahoo.com" in "TO" box
- 3 Type "Copa syllabus" in "Subject" box
- 4 Attach "copa syllabus" from the downloads of hard disk drive.

Note : wait till the attachments gets completely attached.

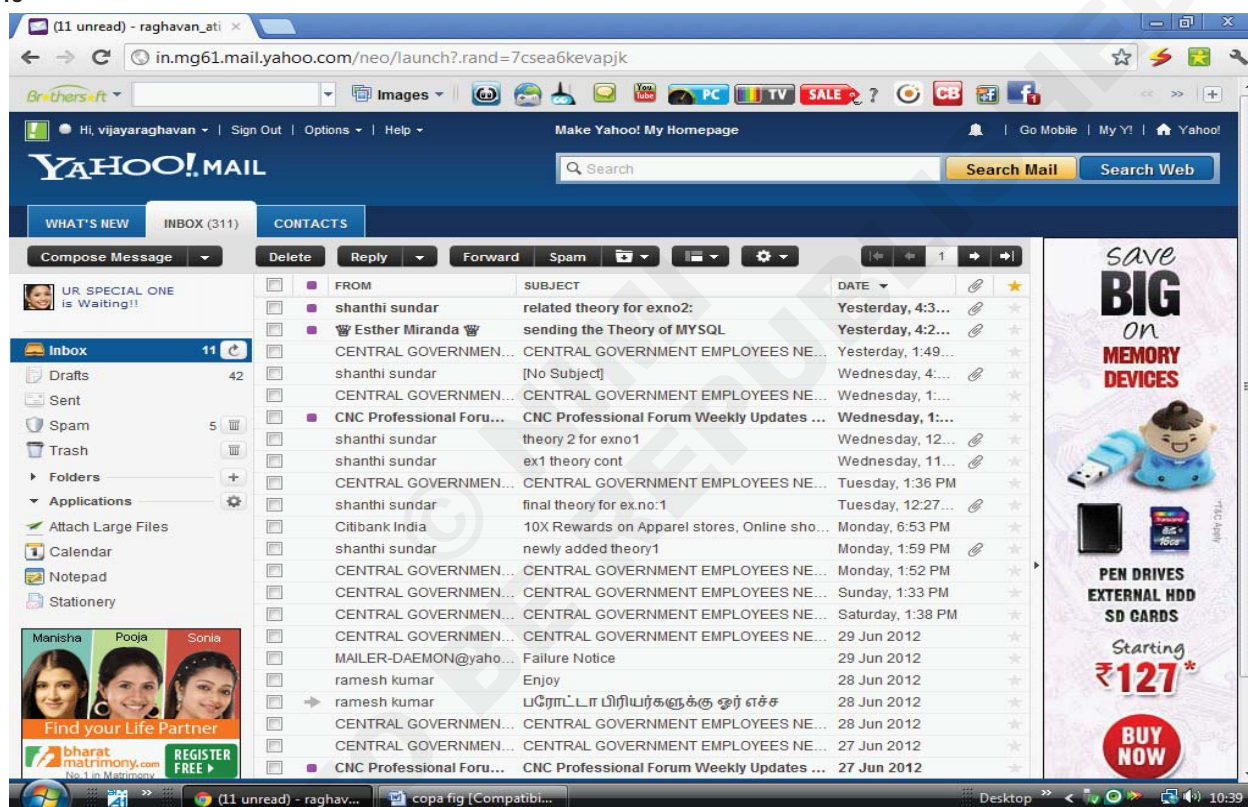
- 5 Click **SEND** button and send the mail
- 6 Signout "copatrg1" gmail account
- 7 Check with your instructor

TASK 4 : Checking mails and Sign Out

- 1 Sign in to "copatrg2" of yahoo mail.
- 2 Click "INBOX"

Note : The unread messages are shown in the inbox as in Fig 18.

Fig 18



Communication using text, video chatting and social networking sites

Objectives: At the end of this exercise you shall be able to

- chat through text message
- video chatting Enable video chatting
- use social network sites.

Requirements

Tools/Equipments/Instruments

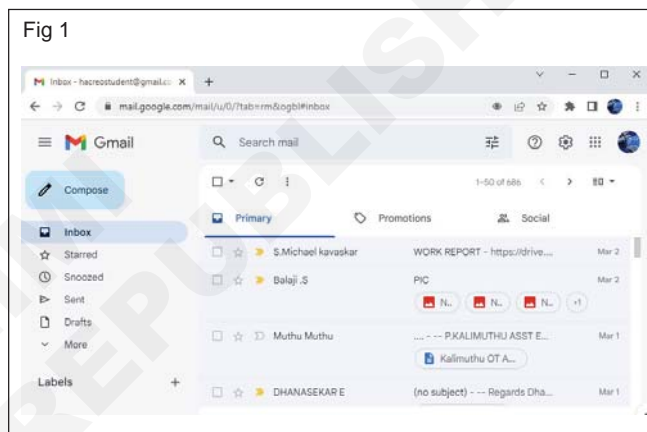
- A working PC with Internet Connection - 1 No./batch.

PROCEDURE

TASK 1: Chat through text message

- 1 Open browser.
- 2 Enter address www.gmail.com
- 3 Enter your gmail Id and Password to login.
- 4 Contact list will be shown below compose.
- 5 Some Contacts would have green dots beside it (See Fig 1) Indicating online people.
- 6 Click on green dot to open chat window.
- 7 Type message to start chat.

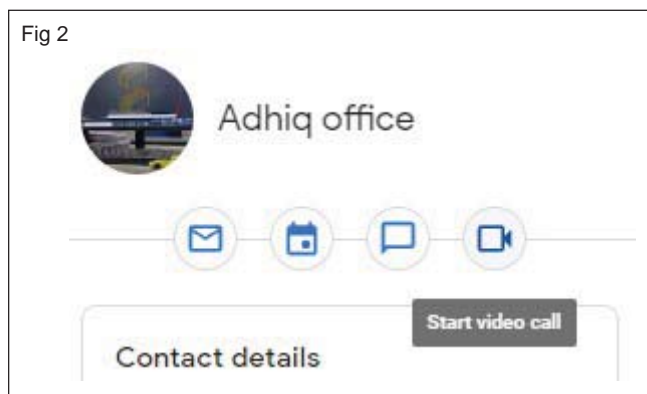
Fig 1



TASK 2 :Enable Video chatting

- 1 Check which contact lists has video chat options enabled by checking green video sign.
- 2 Click video chat by clicking (Fig 2)
- 3 Start video chat.

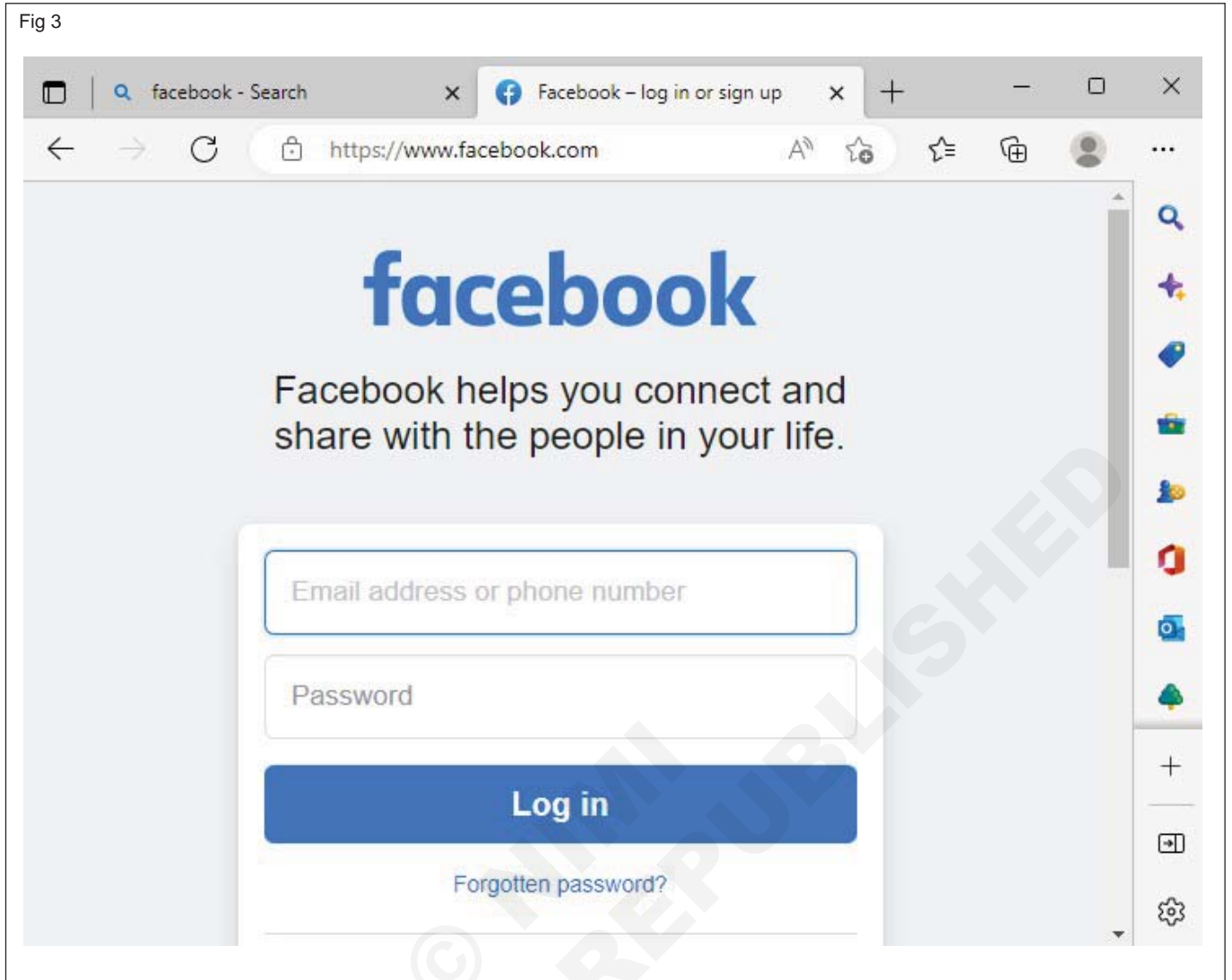
Fig 2



TASK 3: Use social network sites.

- 1 Open browser.
- 2 Enter address www.facebook.com
- 3 Enter your gmail Id and Password to login. (Fig 3)
- 4 In case no login Id, Fill the form and Sign Up.
- 5 Add friends.
- 6 Send friend request.
- 7 Click ok.
- 8 Now post some message with a picture.
- 9 Open friends list.
- 10 Select some friend from the list by clicking.
- 11 Post something in friends facebook.
- 12 Click logout.

Fig 3



Identifying Various Threats to the System Connected to the Net

Objective: At the end of this exercise you shall be able to

- **identify the malwares and other threats by net connection.**
-

PROCEDURE**Common Network Security Issues**

If your company is aware of the threats listed below, you can create more comprehensive strategies and practices to ensure that your organisation will not fall prey to the cyber world's worst.

Internal Security Threats

Over 90% of cyberattacks are caused by human error. This can take the form of phishing attacks, careless decision-making, weak passwords, and more.

Insider actions that negatively impact your business's network and sensitive data can result in downtime, loss of revenue, and disgruntled customers.

Distributed Denial-Of-Service (DDoS) Attacks

A DDoS attack causes websites to crash, malfunction, or experience slow loading times. In these cases, cybercriminals infect internet-connected devices (mobile phones, computers, etc.) and convert them into bots. Hackers send the bots to a victim's IP address.

Malware

Malware are malicious software programs used to gather information about victims through compromised devices. After successful deployments, hackers can mine devices for classified information (email addresses, bank accounts, passwords, etc.) and use them to commit identity theft, blackmail, or other business-damaging actions.

Malware includes

- **Worms** – exploits weaknesses in computer systems to spread to other devices.

- **Rootkits** – grants unauthorised access to systems in the form of fraudulent access privilege without the victim's knowledge.
- **Trojan viruses** – slips under a network's radar by hitchhiking on other software and provides hackers with unprecedented access to systems.
- **Spyware** – gathers information on how devices are used by their owners.

Ransomware

Ransomware is a type of malware that encrypts files within infected systems and holds them for ransom, forcing victims to pay for a decryption key to unlock the data.

RaaS is like software-as-a-service (SaaS), specifically for ransomware.

Phishing Attacks

Phishing attacks are scams where hackers disguise themselves as a trusted entity and attempt to gain access to networks and steal personal information, such as credit card details. Phishing scams take the form of emails, text messages, or phone calls.

Similar to rogue security software, phishing attacks are designed to appear legitimate. This encourages victims to click on malicious links or download malware-laden attachments.

Viruses

Computer viruses are commonly attached to downloadable files from emails or websites. Once you open the file, the virus exploits vulnerabilities in your software to infect your computer with malicious code to disrupt network traffic, steal data, and more.

Protecting the Computer Against Various Internet Threats

Objective: At the end of this exercise you shall be able to

- **prevention of malware entering to the system.**

PROCEDURE

Install Internet Security Software



Strong cybersecurity starts with installing the strongest antivirus software on all of your computing devices.

Internet security software should also protect your devices from dangerous malware as well – which is often used in identity theft crimes.

Furthermore, you must keep your antivirus software up-to-date.

You should also scan your computer for viruses and malware each night before turning it off.

Install a Firewall



The best way to protect your PC from hackers is to prevent them from accessing it to begin with.

You can do that by installing a firewall.

A firewall will block outside attempts to gain access to your computer.

It can also protect your computer from some viruses, malware, and Trojans too. All Windows-based computers/laptops/tablets come with the Windows Firewall already preinstalled. However, most internet

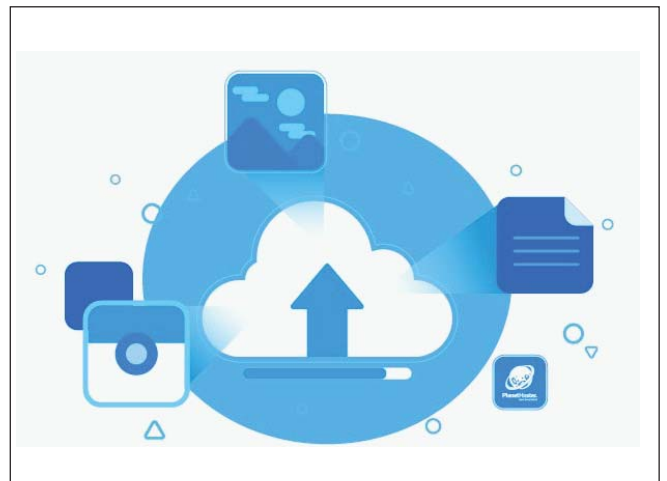
security software programs include the option to install a firewall as well.

Create a Boot Disk



Even with the best internet security precautions, your computer could still be compromised by a malicious cyber attack. Oftentimes, malicious software is so destructive that it can corrupt your computer's operating system – which means you can no longer use it.

Backup Everything



In addition to an emergency boot disk, you need to regularly backup your computer's files to ensure that you never lose them. A growing number of home computer users are being targeted by ransom attacks. Hackers essentially lock their computer which prevents access to their files. You can backup your computer files on a USB flash drive, or by using some type of cloud storage system – like Google Drive.

Install Software Updates

Hackers are often able to exploit security holes that they find in software that runs operating systems and computer programs.

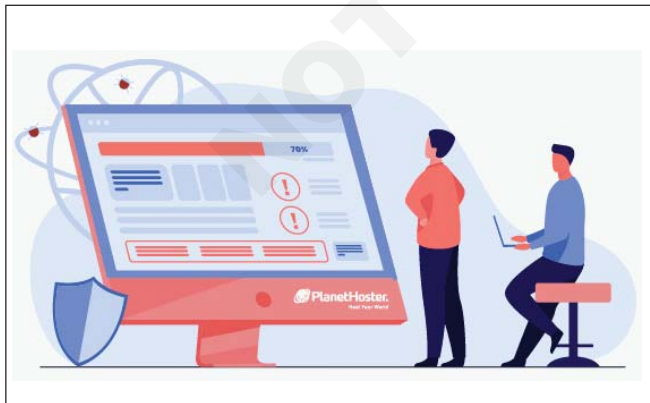


Configure Strict Web Browser and Email Security Settings



You can enhance your cyber security by configuring strict security settings for your web browser and email application.

Don't Install/Run Unknown Programs



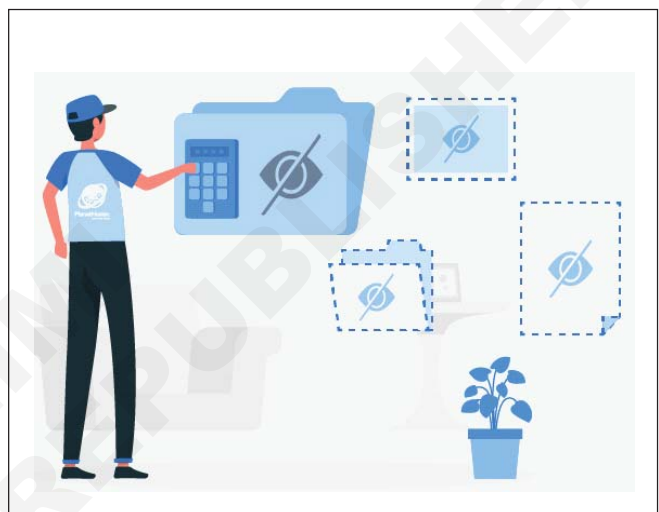
Hackers will often hide a Trojan horse (or other malicious software) inside of a program that otherwise looks completely legit and harmless.

Don't Open Unknown Email Attachments/Links



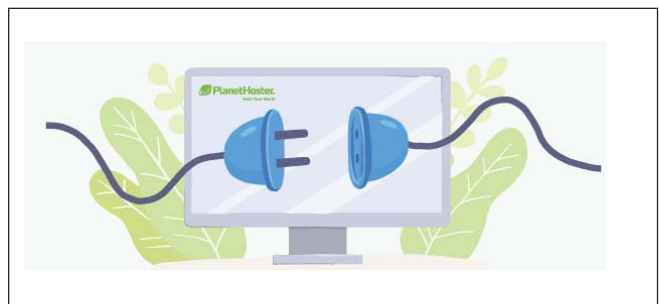
In addition to being a very popular communication medium, email is also a very popular way to spread malicious software.

Disable Hidden Filename Extensions



Windows-based devices have a security flaw that makes them vulnerable to cyber threats. By default, the Windows operating system hides file extensions for all known file types.

Turn Off Computer and Disconnect from the Internet



Last but not least, you don't have to be actively browsing the Internet for your computer to succumb to a cyber attack. If you leave your computer on and connected to the Internet, it's still at risk of cybersecurity threats. Therefore, when you are done using your computing device, you need to completely turn it off. Furthermore, you should go ahead and disconnect it from the Internet to make sure that there is absolutely no way that a cyber criminal could access it.

Familiarization with GIS Software Installation, Sample Data, Starting and Stopping QGIS

Objectives: At the end of this exercise you shall be able to

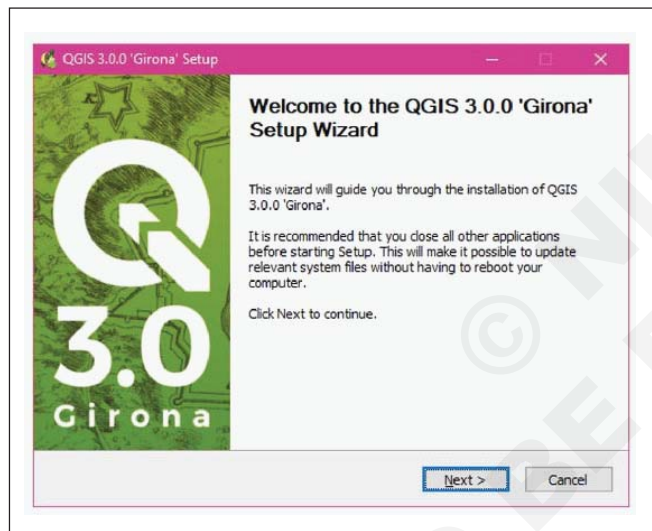
- install GIS software on PCS
- find sample data
- familiar with the use of QGIS software.

Requirements

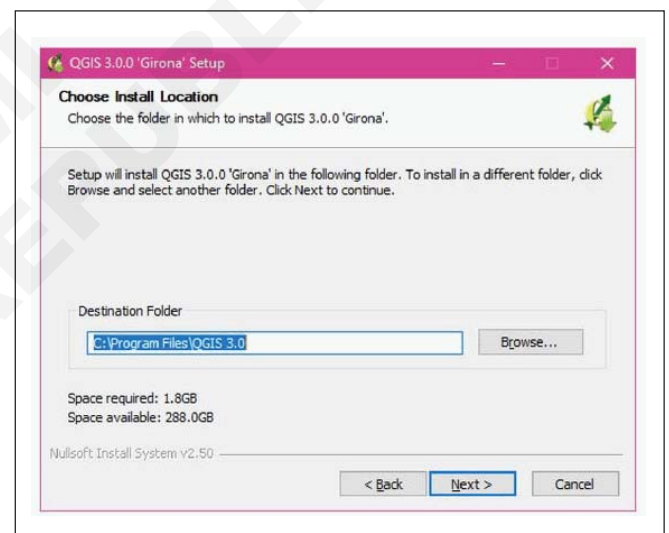
Tools/Equipments/Instruments

- PC installed with windows OS
- Inter connections cables
- GIS Software, Internet connection

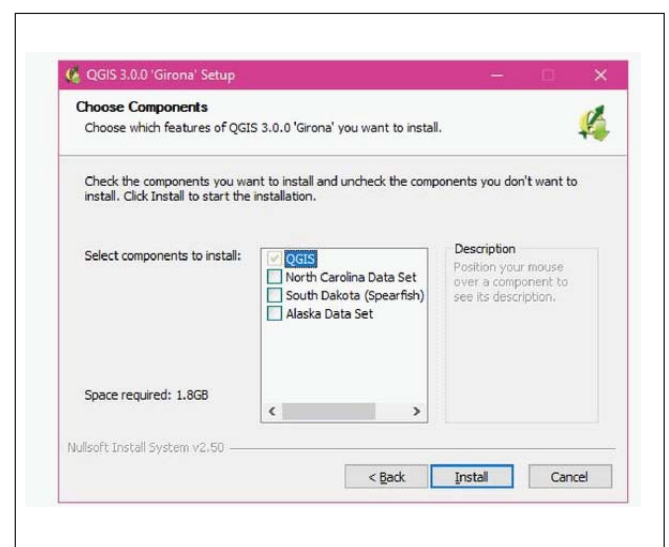
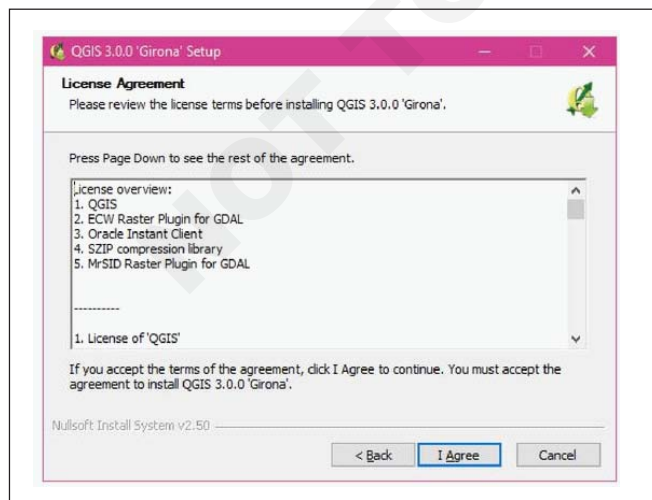
PROCEDURE

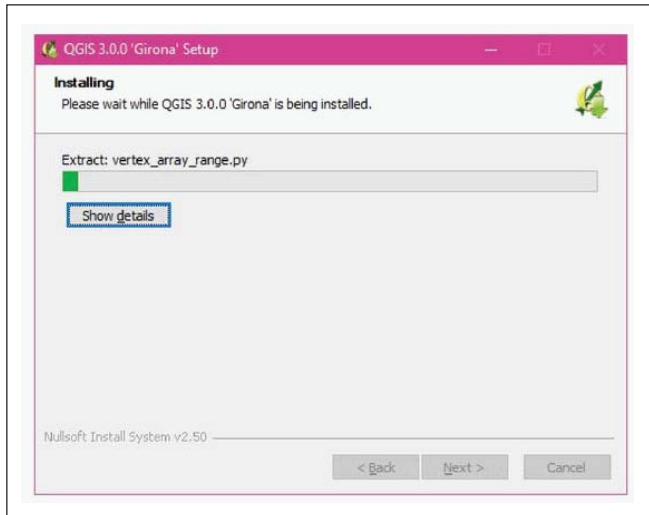


Select I agree

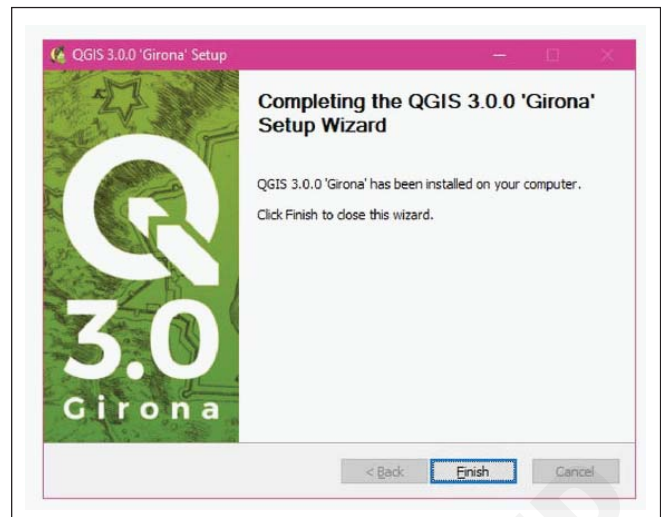


Select next





Select the finish



Explore Various Toolbar for Data and Compose Maps, Create, Edit, Manage and View Data

Objectives: At the end of this exercise you shall be able to

- find various toolbar to analyse data
- practice to complete maps, create, edit, manage and view data.

Requirements

Tools/Equipments/Instruments

- PC installed with windows OS
- Inter connections cables
- GIS Software, Internet connection

PROCEDURE

To start QGIS, click on windows start menu and select the QGIS folder and click the QGIS Desktop

The elements identified in the figure above are:

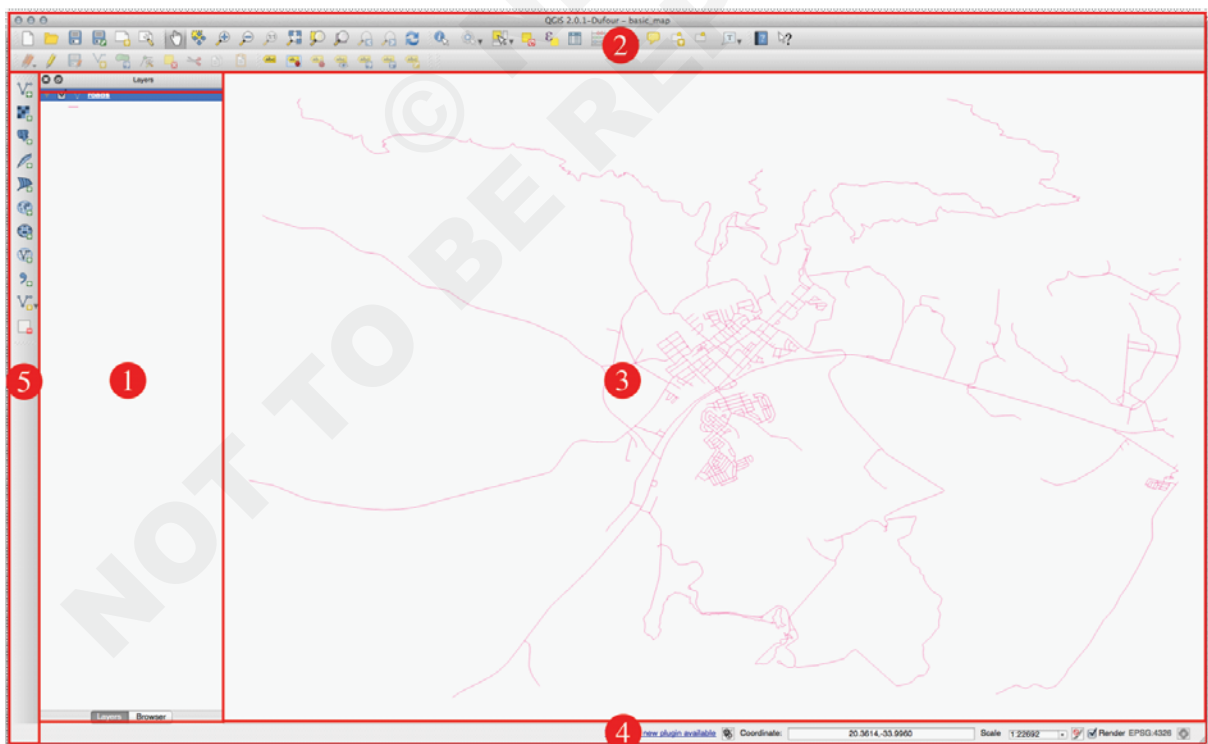
1 Layers List / Browser Panel

2 Toolbars

3 Map area

4 Status bar

5 Side Toolbar



Identify Various Toolbars to Analyze Data, Digitizing, Map Composer, Symbology






















Objective: At the end of this exercise you shall be able to






















- find various toolbar to analyse data, digitization, map , composer and symbology.







Requirements**Tools/Equipments/Instruments**







- PC installed with windows OS
- Inter connections cables
- GIS Software, Internet connection

PROCEDURE

Icon	Purpose	Icon	Purpose
	Save Project		New Composer
	Duplicate Composer		Composer Manager
	Load from template		Save as template
	Print or export as PostScript		Export to an image format
	Export print composition to SVG		Export as PDF
	Revert last change		Restore last change
	Zoom to full extent		Zoom to 100%
	Zoom in		Zoom out
	Refresh View		Pan
	Zoom to specific region		
	Select/Move item in print composition		Move content within an item

Icon	Purpose	Icon	Purpose
	Add new map from QGIS map canvas		Add image to print composition
	Add label to print composition		Add new legend to print composition
	Add scale bar to print composition		Add basic shape to print composition
	Add arrow to print composition		Add attribute table to print composition
	Add an HTML frame		Add nodes shape to print composition
	Edit a nodes shape		
	Group items of print composition		Ungroup items of print composition
	Lock Selected Items		Unlock All items
	Raise selected items		Lower selected items
	Move selected items to top		Move selected items to bottom
	Align selected items left		Align selected items right

Icon	Purpose	Icon	Purpose
	Align selected items center		Align selected items center vertical
	Align selected items top		Align selected items bottom
	Preview Atlas		First Feature

	Previous Feature		Next Feature
	Last feature		Print Atlas
	Export Atlas as Image		Atlas Settings

© NIMI
NOT TO BE REPUBLISHED

Familiarization with User Interface, Menu Bar, toolbar, Map Legend, Map View, Status Bar, Keyboard shortcuts

Objectives: At the end of this exercise you shall be able to

- familiar with various software tools
- practice on various tricks used in software and hardware on PC.











Requirements








Tools/Equipments/Instruments




















- PC installed with windows OS
- Inter connections cables
- GIS Software, Internet connection


PROCEDURE

- The menu bar provides access to various QGIS features using a standard hierarchical menu.
- The top-level menus and a summary of some of the menu options are listed below, together with the associated icons as they appear on the toolbar, and keyboard shortcuts.
- The shortcuts presented in this section are the defaults; however, keyboard shortcuts can also be configured manually using the **Configure shortcuts** dialog, opened from **Settings→ Configure Shortcuts....**
















Menu Option	Shortcut	Toolbar
 Composer manager...		Project
Print Composers→		
 Exit QGIS	Ctrl+Q	
Edit		
 Undo	Ctrl+Z	Advanced Digitizing
 Redo	Ctrl+Shift+Z	Advanced Digitizing
 Cut Features	Ctrl+X	Digitizing
 Copy Features	Ctrl+C	Digitizing
 Paste Features	Ctrl+V	Digitizing
Paste features as→		
 Add Feature	Ctrl+.	Digitizing
Menu Option		
 Add Circular String		Digitizing
 Add Circular String by Radius		Digitizing




Menu Option	Shortcut	Toolbar
 New	Ctrl+N	Project
 Open	Ctrl+O	Project
New from template→		
Open Recent→		
 Save	Ctrl+S	Project
 Save As...	Ctrl+Shift+S	Project
 Save as Image...		
DXF Export...		
DWG/DXF Import...		
 Project Properties...	Ctrl+Shift+P	
 New Print Composer	Ctrl+P	Project

Menu Option	Shortcut	Toolbar
 Move Feature(s)	Digitizing	
 Delete Selected	Digitizing	
 Modify Attributes of Selected Features	Digitizing	
 Rotate Feature(s)	Advanced Digitizing	
 Simplify Feature	Advanced Digitizing	
 Add Ring	Advanced Digitizing	
 Add Part	Advanced Digitizing	
 Fill Ring	Advanced Digitizing	
 Delete Ring	Advanced Digitizing	
 Delete Part	Advanced Digitizing	
 Reshape Features	Advanced Digitizing	
 Offset Curve	Advanced Digitizing	
 Split Features	Advanced Digitizing	
 Split Parts	Advanced Digitizing	
 Merge Selected Features	Advanced Digitizing	
 Merge Attr. of Selected Features	Advanced Digitizing	
 Node Tool	Digitizing	
 Rotate Point Symbols	Advanced Digitizing	
 Offset Point Symbols	Advanced Digitizing	

After activating  Toggle editing mode for a layer, you will enable the **Add Feature** icon in the **Edit** menu depending on the layer type (point, line or polygon).

Edit (extra)

Menu Option	Shortcut	Toolbar
 Add Feature		Digitizing
 Add Feature		Digitizing
 Add Feature		Digitizing
View		
 Pan Map		Map Navigation
 Pan Map to Selection		Map Navigation
 Zoom In	Ctrl+Alt++	Map Navigation
 Zoom Out	Ctrl+Alt+-	Map Navigation
Select →		Attributes
 Identify Features	Ctrl+Shift+I	Attributes
Measure →		Attributes
 Statistical Summary		Attributes
 Zoom Full	Ctrl+Shift+F	Map Navigation
 Zoom To Layer		Map Navigation
 Zoom To Selection	Ctrl+J	Map Navigation
 Zoom Last		Map Navigation
 Zoom Next		Map Navigation
 Zoom To Native Resolution		Map Navigation

Menu Option	Shortcut	Toolbar	Menu Option	Shortcut	Toolbar
Decorations→			Set CRS of Layer(s)	Ctrl+Shift+C	
Preview mode →			Set Project CRS from Layer		
 Map Tips		Attributes	Properties...		
 New Bookmark...	Ctrl+B	Attributes	Filter...	Ctrl+F	
 Show Bookmarks	Ctrl+Shift+B	Attributes	 Labeling		
 Refresh	F5	Map Navigation	 Add to Overview	Ctrl+Shift+O	Manage Layers
Panels→			 Add All To Overview		
Toolbars→			 Remove All From Overview		
Toggle Full Screen Mode	F11		 Show All Layers	Ctrl+Shift+U	Manage Layers
Layer			 Hide All Layers	Ctrl+Shift+H	Manage Layers
Create Layer→		Manage Layers	 Show selected Layers		
Add Layer→		Manage Layers	 Hide selected Layers		
Embed Layers and Groups...			Settings		
Add from Layer Definition File...			 Custom CRS...		
 Copy style			 Style Manager...		
 Paste style			 Configure shortcuts...		
 Open Attribute Table	F6	Attributes	 Customization...		
 Toggle Editing		Digitizing	 Options...		
 Save Layer Edits		Digitizing	Snapping Options...		
 Current Edits →		Digitizing	Plugins		
Save As...			 Manage and Install Plugins...		
Save As Layer Definition File...			Python Console	Ctrl+Alt+P	
 Remove Layer/Group	Ctrl+D				
 Duplicate Layer(s)					
Set Scale Visibility of Layer(s)					

When starting QGIS for the first time not all core plugins are loaded.

Menu Option	Shortcut	Toolbar	Menu Option	Shortcut	Toolbar
Vector			Web		
Open Street Map?			Metasearch	Web	
When starting QGIS for the first time not all core plugins are loaded. Many of the above-mentioned sub-menus require the core plugin Processing to be activated.			When starting QGIS for the first time not all core plugins are loaded.		
Raster			Processing		
Raster calculator...			 Toolbox		
Align Raster...			 Graphical Modeler...		
 Analysis →			 History and log...		
 Projection→			 Options...		
 Conversion→			 Results viewer...		
 Miscellaneous→			 Commander	Ctrl+Alt+M	
 Extraction→			When starting QGIS for the first time not all core plugins are loaded.		
When starting QGIS for the first time not all core plugins are loaded. Many of the above-mentioned sub-menus require the core plugin Processing to be activated.			Help		
Database			 Help Contents	F1	Help
Database→		Database	 What's This?	Shift+F1	Help
When starting QGIS for the first time not all core plugins are loaded.			API Documentation		
			Report an Issue		
			Need commercial support?		
			 QGIS Home Page	Ctrl+H	
			 Check QGIS Version		
			 About		
			 QGIS Sponsors		

How to Use Context Help Rendering, Measuring, Identifying Features Annotation Tools

Objectives: At the end of this exercise you shall be able to

- use to context help rendering
- practice on measuring, identifying the various features of annotation tools.

Requirements

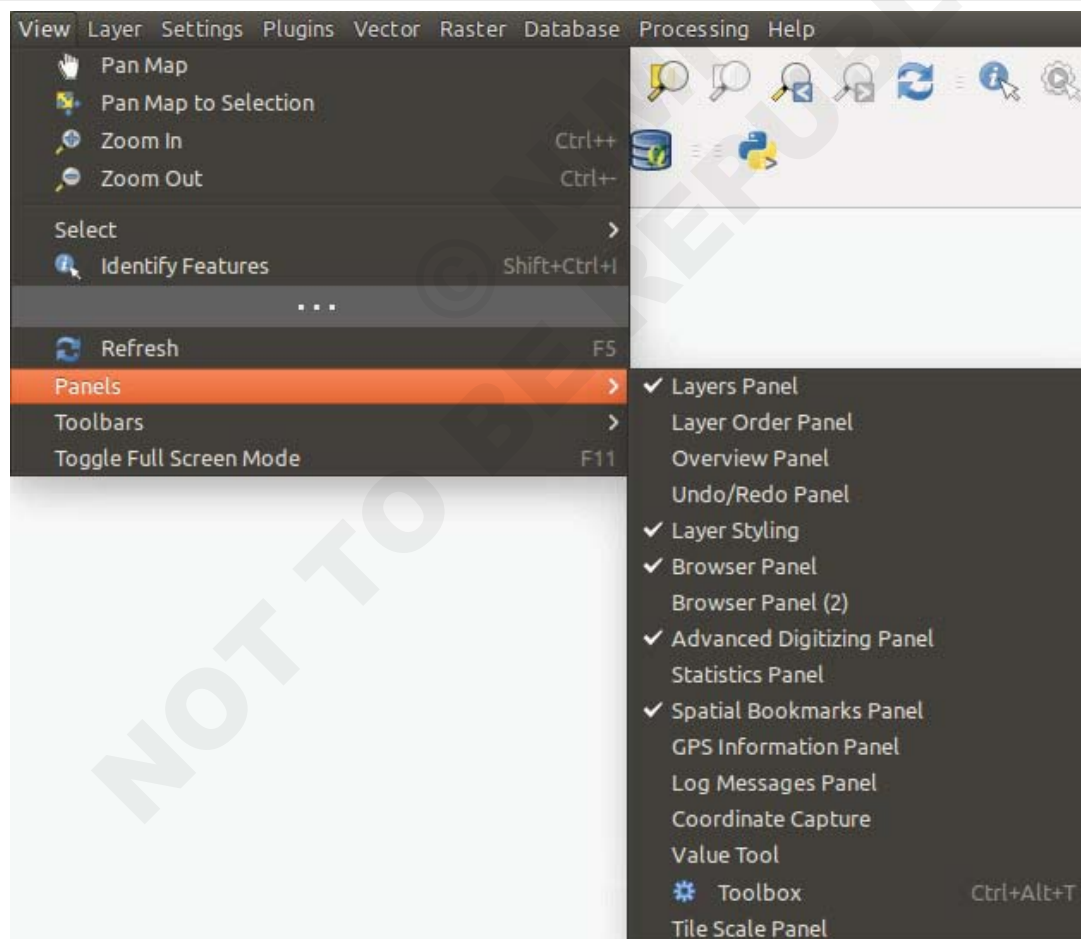
Tools/Equipments/Instruments

- PC installed with windows OS
- Inter connections cables
- GIS Software, Internet connection

PROCEDURE





- QGIS provides by default many panels to work with. Some of these panels are described below. (Fig 1)
- By default, QGIS renders all visible layers whenever the map canvas is refreshed. The events that trigger a refresh of the map canvas include:

Fig 1









The Panels Menu

- Adding a layer
- Panning or zooming
- Resizing the QGIS window
- Changing the visibility of a layer or layers
- Scale-dependent rendering allows you to specify the minimum and maximum scales at which a layer (raster or vector) will be visible.

- To set scale-dependent rendering, open the **Properties** dialog by double-clicking on the layer in the legend. On the **General** tab, tick the  **Scale dependent visibility** checkbox and enter the **Minimum (exclusive)** and **Maximum (inclusive)** scale values.
- Map rendering can be controlled in various ways, as described below.
- To suspend rendering, click the  **Render** checkbox in the lower right corner of the status bar. When the  **Render** checkbox is not checked, QGIS does not redraw the canvas in response to any of the events described in section Rendering. Examples of when you might want to suspend rendering include:
 - Adding many layers and symbolizing them prior to drawing
 - Adding one or more large layers and setting scale dependency before drawing
 - Adding one or more large layers and zooming to a specific view before drawing
 - Any combination of the above
- Checking the  **Render** checkbox enables rendering and causes an immediate refresh of the map canvas.

Setting Layer Add Option

- To set this option, choose menu option **Settings→Options** and click on the **Rendering** tab.
- Uncheck the  **By default new layers added to the map should be displayed** checkbox. Any layer subsequently added to the map will be off (invisible) by default.
- To stop the map drawing, press the **ESC** key.
- It may take a bit of time between pressing ESC and the time the map drawing is halted.
- Choose menu option **Settings→ Options**, click on the **Rendering** tab and select or deselect  **Make lines appear less jagged at the expense of some drawing performance**.
- Open the QGIS options dialog using **Settings → Options**, go to the **Rendering** tab and select or deselect the following checkboxes:
 -  **Use render caching where possible to speed up redraws**
 -  **Render layers in parallel using many CPU cores** and then set the  **Max cores to use**.
 -  **Map Update interval**, the content from this (off-screen) image will be taken to update the visible

screen representation. However, if rendering finishes faster than this duration, it will be shown instantaneously.

-  **Enable Feature simplification by default for newly added layers**.

QGIS provides four means of measuring geometries:








- the interactive measurement tools  ,
- measuring in the  **Field Calculator**,
- derived measures in the **Identify Features** tool,
- and a vector analysis tool: **Vector → Geometry Tools →Export/Add Geometry Columns**
- The default measurement metric is - different from most other GIS - ellipsoidal, using the ellipsoid defined in **File → Project properties → General**.
- Click the  icon in the Attribute toolbar to begin measurements. The downward arrow near the icon helps you switch to the convenient tool to measure  length,  area or  angle. The default unit used in the dialog is the one set in **Project → Project Properties → General**.
- Clicking the **Configuration** button at the bottom of the widget helps you define in menu **Settings → Options → Map Tools** the rubberband color, the precision of the measurements and the unit behavior.
- By default,  **Measure Line**: QGIS measures real distances between given points according to a defined ellipsoid. (Fig 2)

Fig 2




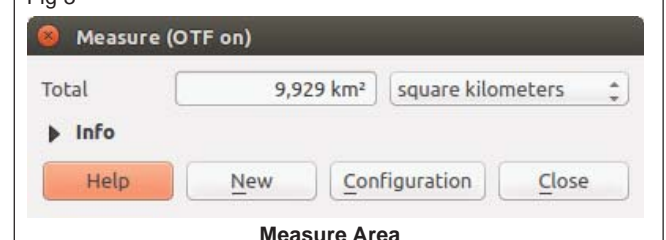


-  **Measure Area**: Areas can also be measured. In the measure window, the accumulated area size appears. Right-click to stop drawing. (Fig 3)

Fig 3










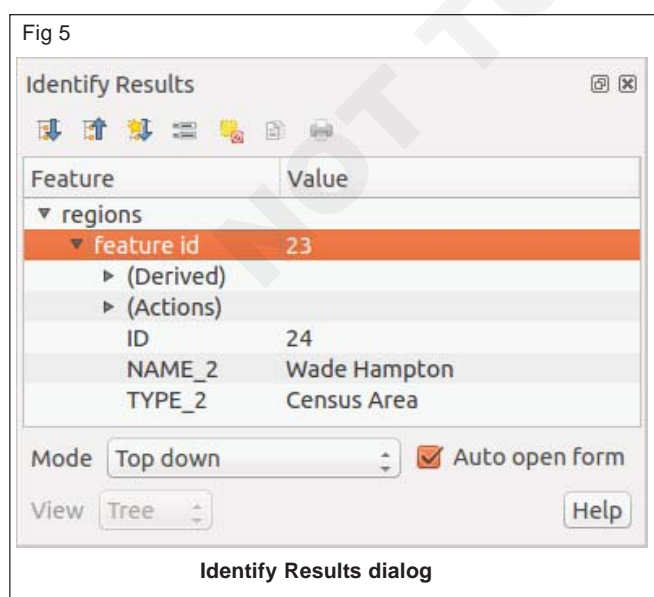
-  **Measure Angle:** You can also measure angles. The cursor becomes cross-shaped. (Fig 4)




- **Left click** will  identify features according to the mode set in the **Identify Results** panel
- **Right click** will fetch all the snapped features from all the visible layers. This will open a context menu, allowing the user to choose more precisely the features to identify.

At the top of the window, you have seven icons:



-  Expand tree
-  Collapse tree
-  Default behavior to define whether next identified features information should be collapsed or expanded
-  View the feature form
-  Clear Results
-  Copy selected feature to clipboard
-  Print selected HTML response (Fig 5)




Annotation Tools

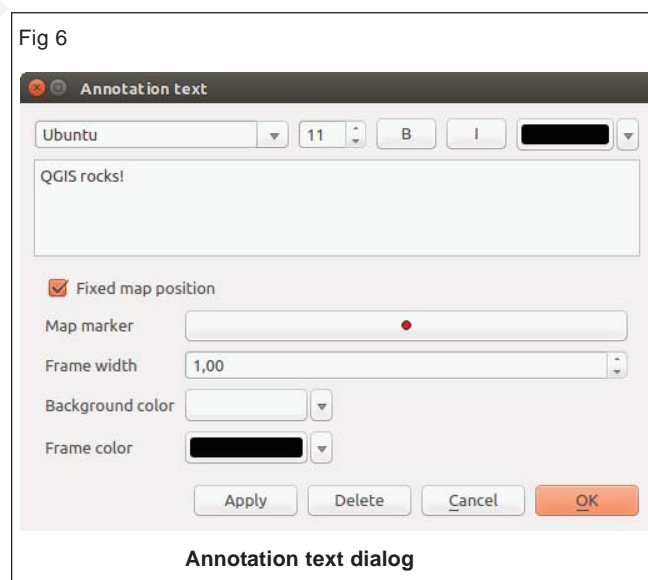
The  Text Annotation tool in the attribute toolbar provides the possibility to place formatted text in a balloon on the QGIS map canvas. Use the **Text Annotation** tool and click into the map canvas.

Double clicking on the item opens a dialog with various options. There is the text editor to enter the formatted text and other item settings. For instance, there is the choice of having the item placed on a map position (displayed by a marker symbol) or to have the item on a screen position (not related to the map). The item can be moved by map position (by dragging the map marker) or by moving only the balloon. The icons are part of the GIS theme, and they are used by default in the other themes, too.

-  HTML Annotation tools in the attribute toolbar provides the possibility to place the content of an html file in a balloon on the QGIS map canvas. Using the **HTML Annotation** tool, click into the map canvas and add the path to the html file into the dialog.
- The  SVG Annotation tool in the attribute toolbar provides the possibility to place an SVG symbol in a balloon on the QGIS map canvas. Using the **SVG Annotation** tool, click into the map canvas and add the path to the SVG file into the dialog.

Form annotations

- Additionally, you can also create your own annotation forms. The  Form Annotation tool is useful to display attributes of a vector layer in a customized Qt Designer form. (Fig 6)



Introduction to Creation of a Shape File, Adding Attributes

Objectives: At the end of this exercise you shall be able to

- creating and editing a new shapefile
- creating the geographic feature (point, line, or polygon)
- creating the attribute table.

First, create a new shape file in **ArcCatalog** by using the **File-New** menu.

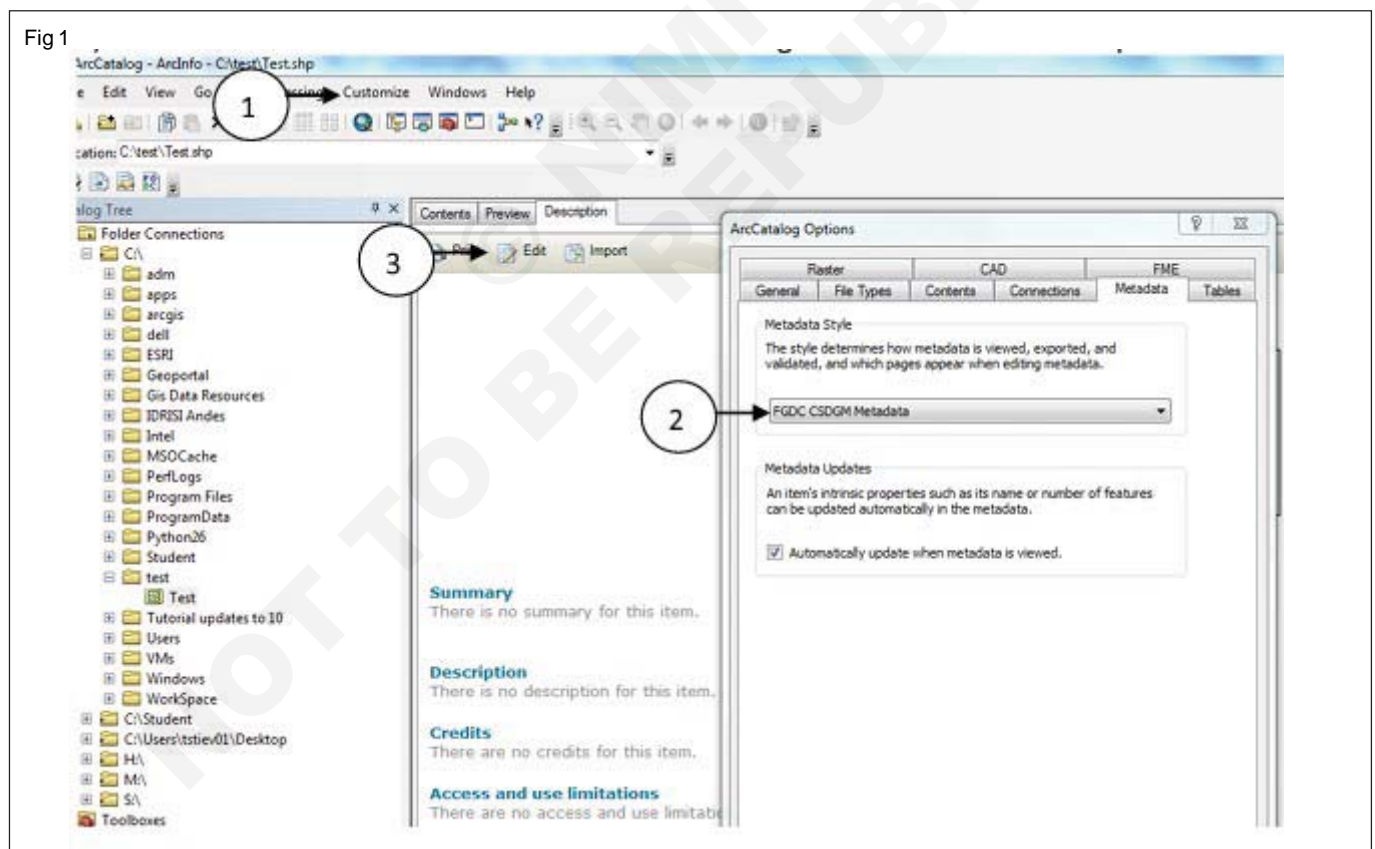
Choose **File-New**, specify a new shapefile name and feature type (point, line, or polygon). Specify a coordinate system by pressing the **Edit...** button pressing **Edit**, then **Select**, then choose **Projected Coordinate Systems**, then navigate to the desired coordinate system. Or you can press **Edit**, then **Import**, then navigate to an existing shape file from MassGIS for which the coordinate system is specified.

In ArcCatalog, **right-click** on the new shapefile and choose **Properties**

Click on the **Fields** tab and add your new fields. For any fields you add, you will need to name the field (maximum of 11 characters, no spaces, or special characters), define the field type, and depending on the type, define the other field properties of that field (e.g., length - make sure the length is long enough to fit your longest value).

- 1 In the **Customize** pull-down, select **ArcCatalog Options**.
- 2 In the Options window, click on the Metadata tab and choose FGDC CSDGM **Metadata** style in the pull-down.
- 3 Left-click onto the **Edit**  **Edit** icon to start creating the metadata for the shapefile.

Fig 1



Use the Table of Contents (TOC) on the left to navigate through the metadata. Start with the **Item Description** and fill in the essential information such as **title, tags (keywords), summary and description**.

Next go to 1) **Fields** in the TOC to give a definition to your new fields and code definitions (domain values). 2) Click

on **Attribute** to populate each variable with needed information, such as label and definition of the variable.

For each attribute, you can define the domain as well.

If you know the data source you are using you can go to **Data Quality** and define the data source. The process steps are also defined under **Data Quality**.

Fig 2

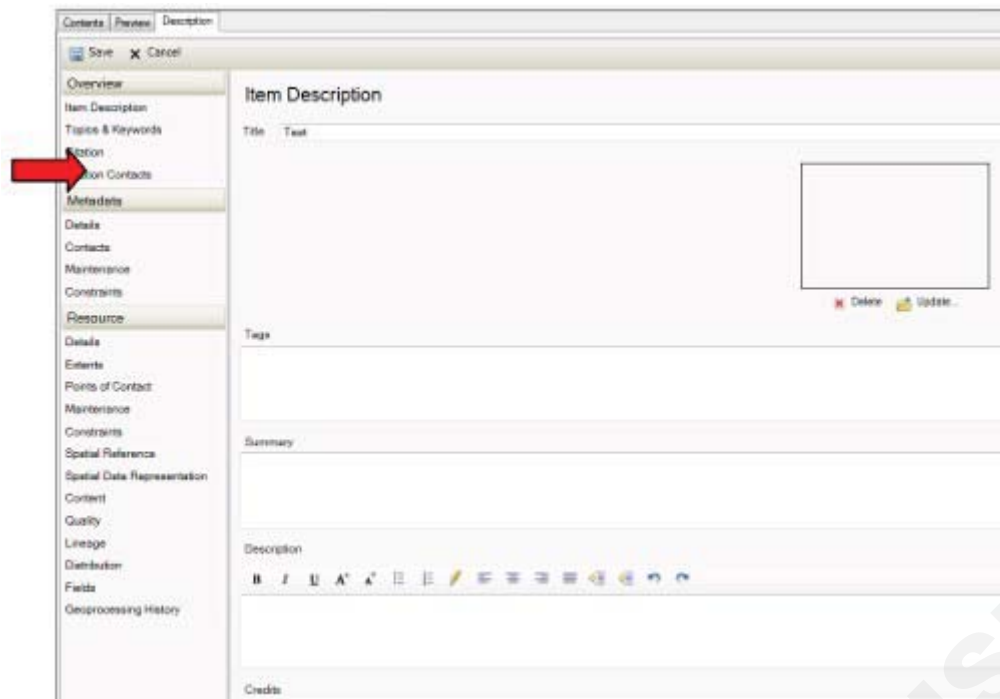
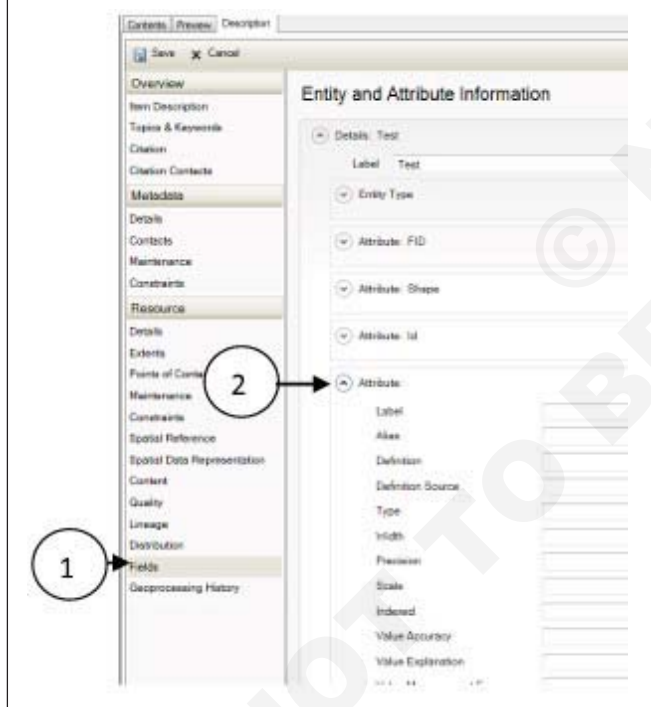


Fig 3



Creating a new geographic feature in ArcMap:


- Open ArcMap
- Add the new shape file you just created
- Bring up the Editor toolbar by choosing **Customize-Toolbar-Editor** or clicking on the editor icon 
- In the Editor toolbar pull-down, choose **Start Editing**. The file you want to edit is your new shapefile. A new window opens on the right appears called **Create Features**.

Fig 4

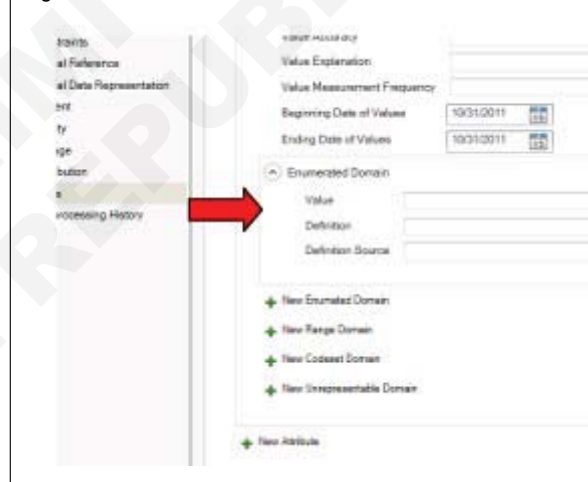


Fig 5



- To do this, 1) select the layer you want to work with in the Create Features window. 2) In the bottom panel **Construction Tools** new options appear. In this case, we are make a **Polygon**, so left-click on that option.
- Place the cursor on the map where you want to begin your new polygon feature - you should see a circle with a cross-hair in it, and click once. Then go to the next point that defines your polygon and click again. Continue doing this until you are almost back to the last point. To close the polygon, double-click on the next-to-last point, or press F2 after the next-to-last point. If you get messed up, you can either double-click to finish, and then press the Delete key on the keyboard, or you can

right-click and choose Delete Sketch. It may take a few attempts to get it right.

Fig 6

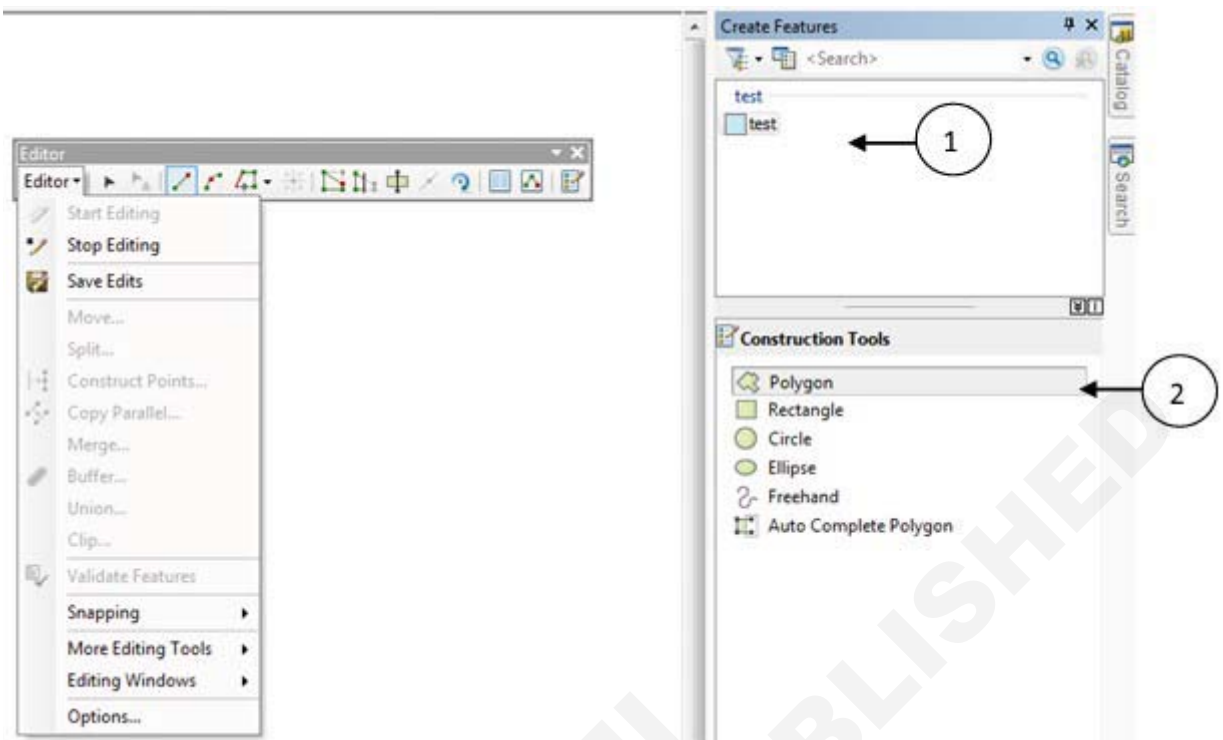
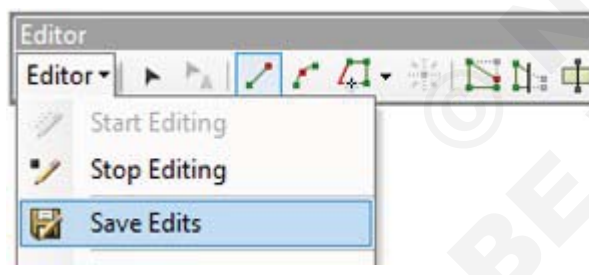


Fig 7



- When you have a boundary polygon complete for your area, Click on the **Editor toolbar's Editor** and choose **Save Edits**.




- You can add attribute information at this point or later. To add it now, click on the **Attributes** icon in the Editor Toolbar : 
- This opens a box on the far right with the selected feature's attributes available for editing ; you can click and type in the added fields.
- Be sure to save your edits again when finished (**Editor-Save Edits**)
- Get out of editing mode by choosing **Editor-Stop Editing**

Fig 8



<p>Adding vertices to a polygon in an edit sketch - add as few points as you need to define the polygon.</p>	<p>A completed polygon in an edit sketch - the blue outline indicates that it is selected, so if you don't like it, you can press the delete key on the keyboard</p>
<p>Fig 9</p> 	

© NIMI
NOT TO BE REPUBLISHED

Introduction to Database Creation & Topology

Objective: At the end of this exercise you shall be able to

- **database creation & topology.**

Manual operations

It is difficult to automate data input and editing because of unremovable noise and incomplete.

Original maps, which result in a large amount of manual work with resultant inefficiencies in time and cost.

Unreliability of input data

As the input involves many kinds of errors, mistakes and misregistration because of the manual input, further effort should be applied to obtain data of high quality and reliability.

Data input and Output

For a GIS to be useful it must be capable of receiving and producing information in an effective manner.

The data input and output functions are the means by

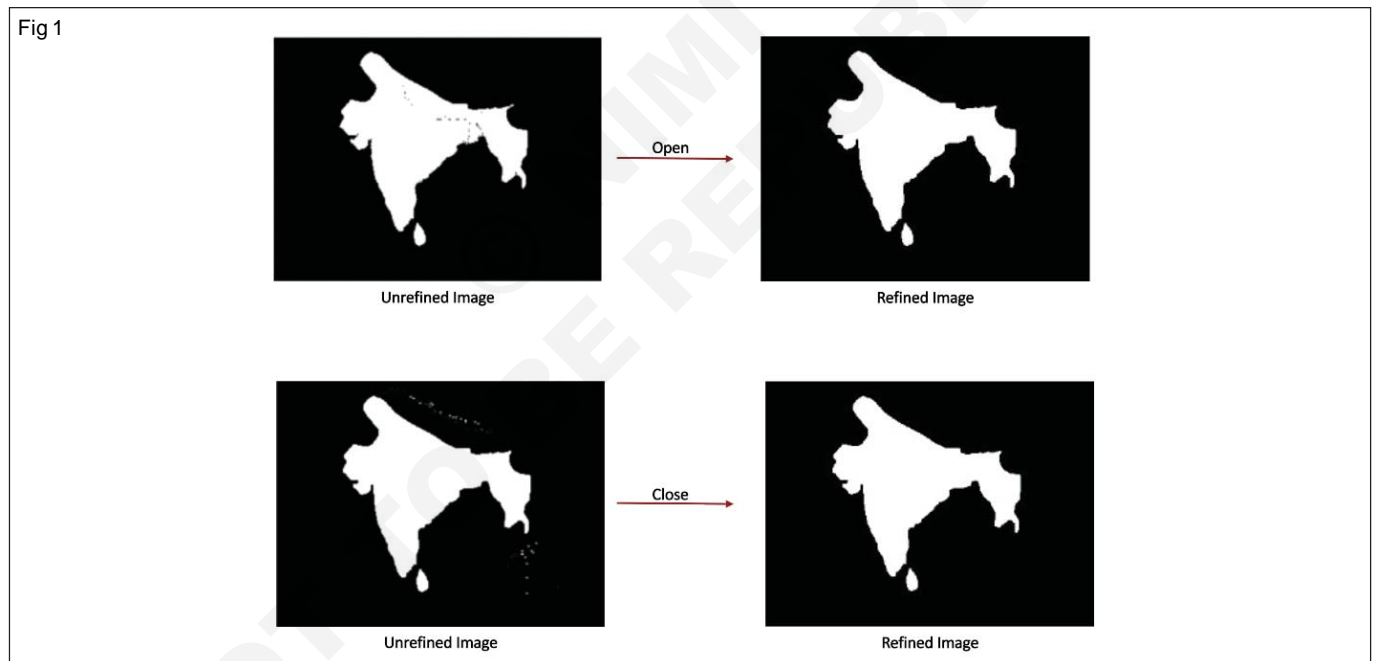
which a GIS communicates with the world outside.

The objective in defining GIS input and output requirements is to identify the mix of equipment and methods needed to meet the required level of performance and quality. No one device or approach is optimum for all situations.

Data Input : The procedure of encoding data into a computer-readable form and writing the data to the GIS database values for both the colors as tuple syntax : (r, g, b), (r1, g1, b1)

Kernel _Size : A list of 2 integers corresponding to size of the morphological filter operation's closing and opening respectively. The default value is None. This indicates that no morphological operations are performed.

Following illustration shows the usage/selection of the appropriate morphological operation.



Kernel_type : A string value defining the type/shape of the kernel. Kernel type can be "rect", "elliptical" or "cross". The default value is rect.

show_result : A Boolean value denoting whether to display results. Set to true to visualize results, set to false otherwise.

The function generates a folder with name "masks" that contains binary masks for all the colors and mask_color_datils. h5 which contains region wise color codes.

Data entry is usually the major bottleneck in implementing a GIS. The initial cost of building the database is commonly 5 to 10 times to cost of the GIS hardware and software.

The creation of an accurate and well-documented database is critical to the operation of the GIS.

Accurate information can only be generated if the data on which it is based were accurate to begin with.

Data quality information includes the data of collection, the positional accuracy, completeness, and the method used to collect and encode the data.

Introduction to Linking of Spatial Data with Non Spatial Data sets

Objective: At the end of this exercise you shall be able to
 • lining of spatial data with non spatial data.

Requirements
Tools/Equipments/Instruments <ul style="list-style-type: none"> Scanned image of topo-graphic sheet of an area PC with a GIS software installed

PROCEDURE

- Take a scanned image topo-sheet of an area.
 - Run the GIS software installed on your PC.
 - Open add the raster image (scanned image/ topo-sheet) of the study area.
 - Create layer 1 by selecting polygon as an option.
- 1 Start tracing the boundary of the area viewing the background toposheet image which is polygon.
 - 2 Create a polygon representing the boundary of the area taken up for the exercise.
 - 3 Open the attribute table of the area and put the one or two non-spatial information available about the area.
 - 4 Name the layer / theme as boundary map

Layer 1 : Polygon (boundary map)

- Add or create layer 2 by selecting line as < U1 option; and

- 1 Draw the 3-4 major roads of the area (with the help of background topo-sheet image)
- 2 Open the attribute table and put the names of the roads shown in the layer.
- 3 Name the layer / theme as road network map.

Layer 2 : Line (Road network map)

- Add or create layer 3 by selecting point as an option.
- 1 Put 3-4 location like schools etc. of the area with the help of background topo-sheet image or through your understanding.
 - 2 Open the attribute table and put the names of the schools shown in the layer.
 - 3 Name the layer /theme as school location map.

Layer 3 : Point (School location mpa)

Introduction to Spatial Analyze

Objectives: At the end of this exercise you shall be able to

- **how to convert vector to raster data reclassification process**
- **analyze zonal statistics.**

- 1 Conversion of vector to raster data
- 2 Extraction of grid values to point shape files
- 3 Conversion of raster to point data
- 4 Reclassification processes
- 5 Overlaying raster data
- 6 Analyzing zonal statistics

The data for these exercises are located on at:
~\MODULE_10\Data

Convert a vector to raster

- 1 Open QGIS Desktop 2.4.0.
- 2 Add the GOLPALGANJ_LANDTYPE vector layer to QGIS Desktop using the Add vectorbutton

Fig 1

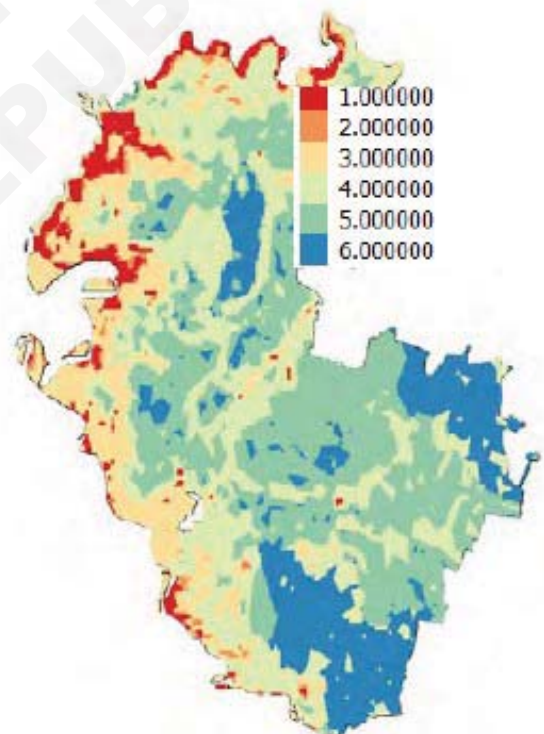


Extract grid values to point shape file

- 1 Open QGIS Desktop 2.4.0.
- 2 Add the GOLPALGANJ_SOIL_DATA_BTMM point layer and GOPAL_DEM and GOPAL_LT raster layers in QGIS Desktop
- 3 Expand SAGA -> Shapes-Grid in Processing Toolbox
- 4 Click on Add grid values to points
- 5 Points: GOLPALGANJ_SOIL_DATA_BTMM

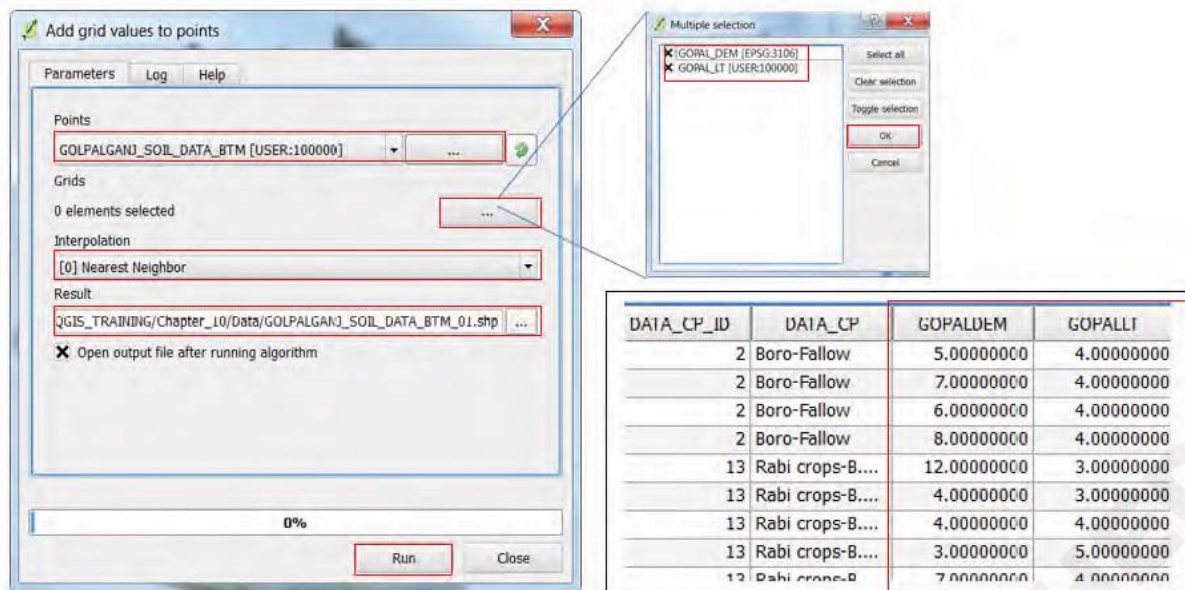
- 3 Expand SAGA ->Grid-Gridding in Processing Toolbox
- 4 Click on Shape to grid
- 5 Shapes: GOLPALGANJ_LANDTYPE
- 6 Attribute: LT_ID
- 7 Method for Lines: [0] first
- 8 Method for Lines: [0] thin
- 9 Preferred Target Grid Type: [2] Integer [4 byte]
- 10 Cell size: 90.000
- 11 Grid: Save to file ~\MODULE_10\Data\GOPAL_LT.tif
- 12 Click Run

Fig2



- 6 Grids: CheckGOPAL_DEM and GOPAL_LT and click OK
- 7 Interpolation: [0] Nearest Neighbor (this is a form of non-parametric pattern recognition used in classification and regression)
- 8 Result: Save to file ~\MODULE_10\Data\GOLPALGANJ_SOIL_DATA_BTMM_01.shp
- 9 Click Run

Fig 3



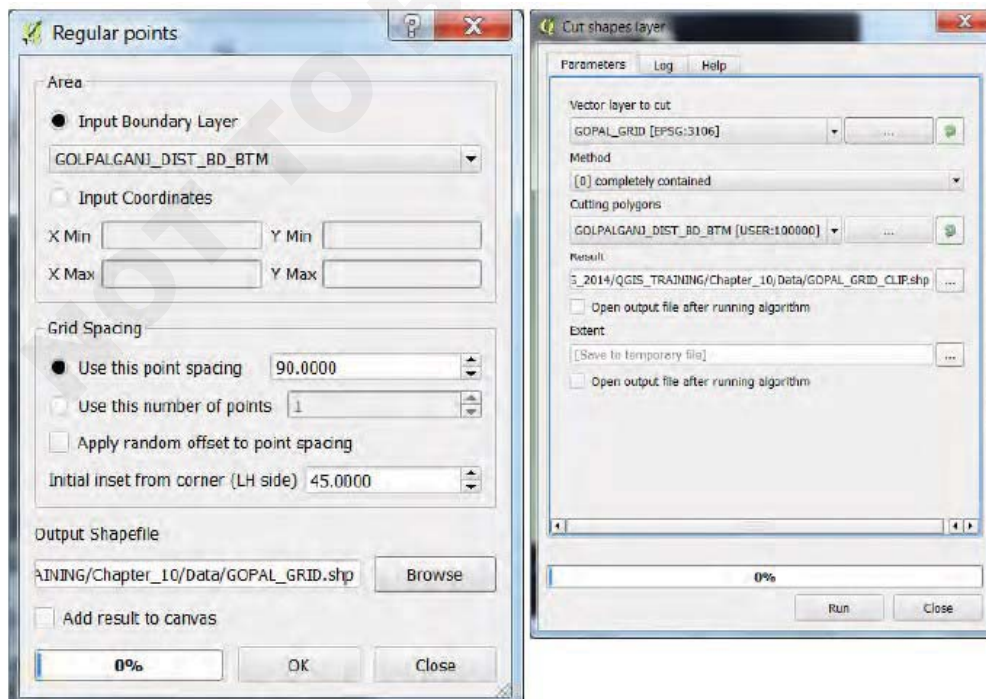
Convert raster to point data

How can a regular grid of points and/or sample a raster dataset manipulated to extract the individual pixel values? This is a very basic form of raster to vector point conversion.

- 1 Open QGIS Desktop 2.4.0.
- 2 Add the GOPAL_DEM raster (.tif file) and GOLPALGANJ_DIST_BD_BTM vector layers to QGIS canvas
- 3 Select Vector > Research Tools > Regular Points
- 4 If necessary, change the Input Boundary Layer set to GOPAL_DEM.

- 5 In the Grid Spacing section set the point spacing value to 90 as that is the size of our raster pixels
- 6 In order to make the regular points fall within the center of each pixel we will add an offset of half our pixel size, i.e. $(90 / 2) = 45$. Set the Initial inset from corner (LH side) value to 15.
- 7 Click the Browse button for Output Shapefile, navigate to ~\MODULE_10\Data\and save the file as GOPAL_GRID.shp click OK or Save
- 8 By clicking OK, we clip GOPAL_GRID with GOLPALGANJ_DIST_BD_BTM and create a new point layer (GOPAL_GRID_CLIP) using SAGA geo-processing tools (SAGA->Shape->Cut shapes layer)

Fig 4

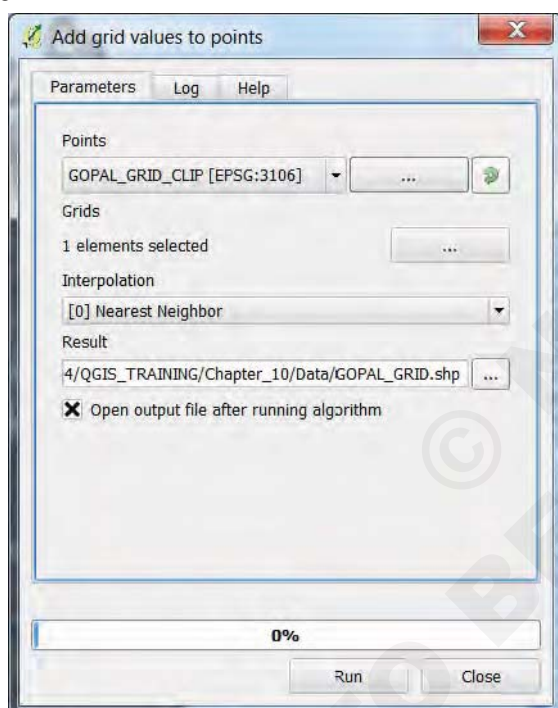


- 9 Expand SAGA -> Shapes-Grid in Processing Toolbox
- 10 Click on Add grid values to points
- 11 Points: GOPAL_GRID_CLIP
- 12 Grids: Check GOPAL_DEM click OK
- 13 Interpolation: [0] Nearest Neighbor
- 14 Result: Save to file ~\MODULE_10\Data\ GOPAL_GRID.shp and overwrite GOPAL_GRID
- 15 Click Run

Reclassification

Based on the analyses above, we will now work with the slope and Topographic Position Index (TPI) data to reclassify them in a way that permits meaningful, clear interpretation. This kind of raster reclassification will aggregate data into useful categories as follows:

Fig 5



TPI Class	TPI Values	Slope Class	Slope	value
1	≤ -8 m	1	< 6°	
2	- 8 to + 8 m	2	≥ 6°	
3	≤ -8 m			

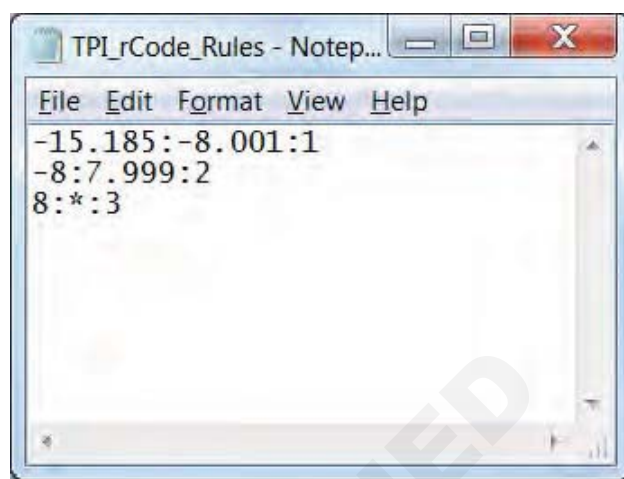
After you have reclassified the slope and TPI data, we will work to recombine them to identify valley bottoms (TPI ≤ 8 m), ridgelines (TPI ≤ -8 m), gentle hill slopes (TPI = - 8 to + 8 m and slope < 6°) and steep hill slopes (TPI = - 8 to + 8 m and slope ≥ 6°).

Reclassify TPI raster

- 1 Load HILLY_TPI raster in QGIS canvas

- 2 Now, we will create a text file that contains a set of classification rules that we use to classify the TPI rasters.

Fig 6

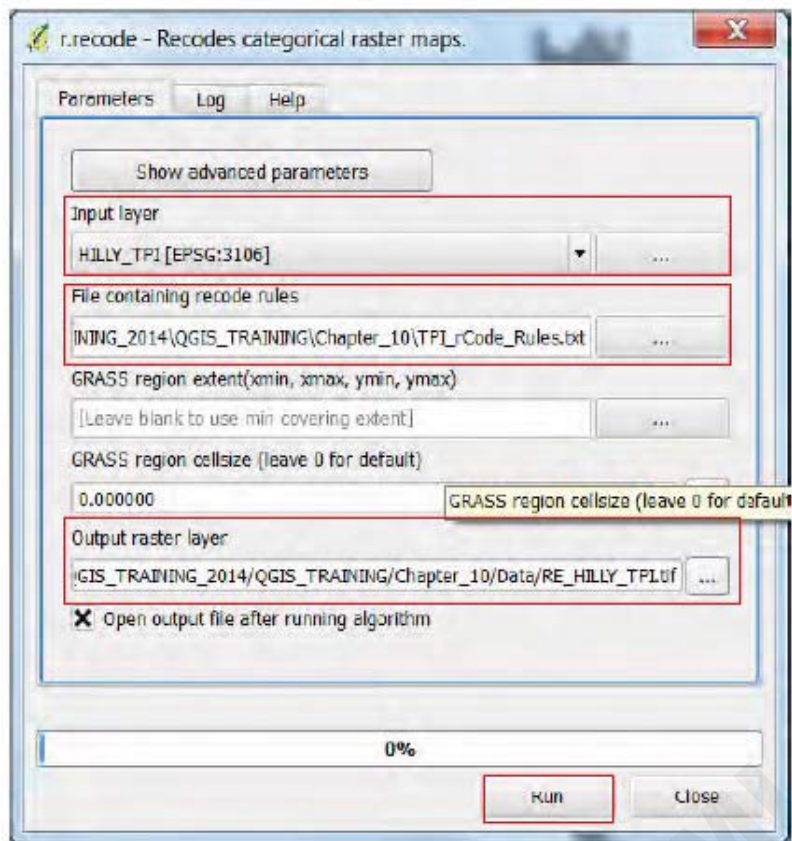


- a Open NotePad or a similar text editor and create a text file in the format below:
- b The first line tells QGIS to recode cells with TPI values < -8.0 m with a new value of 1
- c Cells with TPI values from - 8 and + 8m will receive a new value of 2 and
- d Those cells with values ≥ 8 m will receive a new value for non-range cells (*) of 3
- e Save the text file to the ~MODULE_10 folder and name it TPI_rRecode_Rules.txt.
- 3 From the menu bar choose Processing Toolbox. Expand the GRASS commands toolset Raster (r.*) r.recode - Recodes categorical raster maps.
 - a Set the Input layer to HILLY_TPI.
 - b Navigate to the ~\MODULE_10\DATA and select the TPI_rRecode_Rules.txt as the File containing recode rules.
 - c Name the output file RE_HILLY_TPI.tif
 - d Click Run.

Reclassify Slope raster

- 1 Load the Slope raster into your QGIS canvas
- 2 Like the TPI raster above, we will now create a text file that contains the classification rules that we use to classify Slope rasters
 - a The first line tells QGIS to recode cells with Slope values < 6.0° m with a new value of 1° m
 - b Those cells with values ≥ 6° m will receive a new value of 2° m.
 - c Save the text file to the ~\MODULE_10 folder and name it Slope_rRecode_Rules.txt.
- 3 From the menu bar, next choose Processing Toolbox. Expand the GRASS commands toolset Raster (r.*) r.recode - Recodes categorical raster maps.

Fig 7



a Set the Input layer to HILLY_Slope.

b Navigate to the:

~\MODULE_10\DATA and select the Slope_rRecode_Rules.txt as the File containing recode rules.

c Name the output file RE_HILLY_Slope.tif

d Click Run.

Fig 8

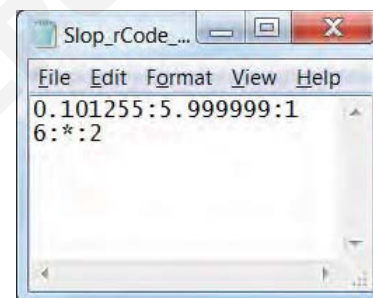
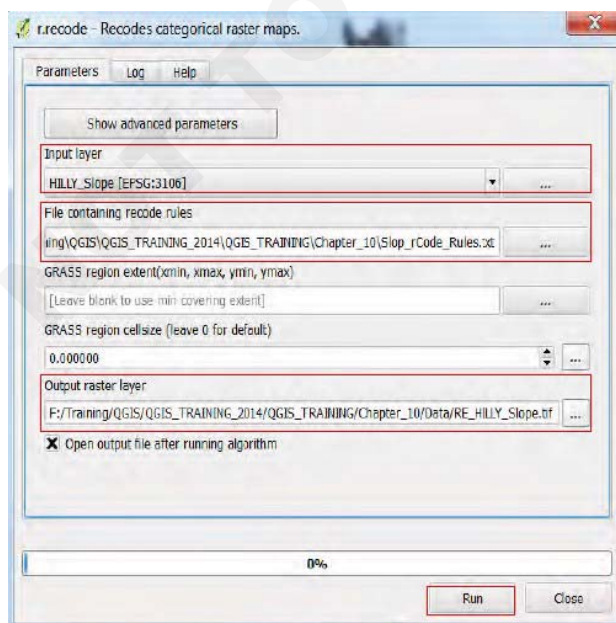


Fig 9



Raster Overlay

After reclassification of the slope and TPI data, we will now work to combine them to identify valley bottoms ($\text{TPI} \leq -8$ m), ridgelines ($\text{TPI} \leq -8$ m), gentle hill slopes ($\text{TPI} = -8^\circ$ to $+8^\circ$ m and slope $< 6^\circ$ m) and steep hill slopes ($\text{TPI} = -8$ to $+8^\circ$ m and slope $\geq 6^\circ$ m).

In this next step, you will learn how to use the Raster Calculator to combine the reclassified slope and TPI data. This tool permits the user to combine raster datasets and produce new outputs for further analysis. Raster datasets can be added, subtracted, multiplied and divided in a process known as raster algebra.

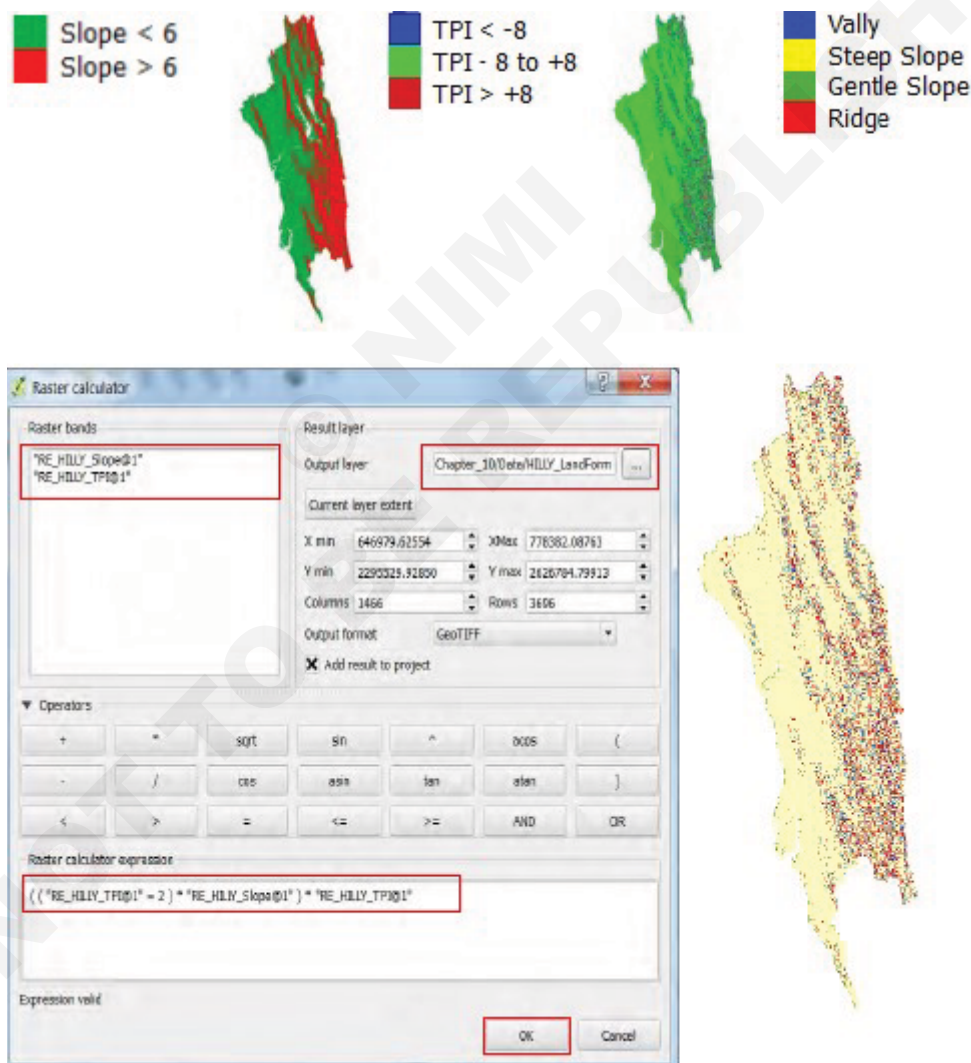
The expression looks like this: $((\text{"RE_HILLY_TPI@1"} = 2) * \text{"RE_HILLY_Slope@1"}) + \text{"RE_HILLY_TPI@1"}$

The above code can be understood as the following set of instructions. For every cell having a TPI class 2 that

indicates a range from -8° to $+8^\circ$ m), reset this value to 1, otherwise reset it to 0, which creates a new mask. The second segment of the code indicates that this raster will be multiplied by the resulting mask values. In the last part of the code, QGIS will add "RE_HILLY_TPI@1" to the corresponding mask layer build a new raster with four selected Land form classes. This process is accomplished as follows:

- 1 Load RE_HILLY_TPI and RE_HILLY_Slope raster in QGIS canvas
- 2 Click on the menu item Raster . Raster Calculator
- 3 Write above expression in Raster calculator expression window
- 4 In the Result layer section, name the output layer ~\MODULE_10\DATA\HILLY_LandForm.tif
- 5 Then click OK

Fig 10



Zonal statistics

The zonal statistics function summarizes values of a selected raster within the zones that can be found in another raster or vector dataset. The function reports the resulting data in tabular form or as a vector layer file. In this exercise, we will calculate descriptive elevation statistics for four districts of hilly areas (zones) in Bangladesh using the Zonal statistics tool in QGIS.

- 1 Open QGIS Desktop 2.4.0.
- 2 Add the HILLY_DEM_BTМ_CORR.tif raster and HILLY_AREA_BTМ.shp polygon layers to QGIS Desktop.

- 3 Expand QGIS geoalgorithms → Raster tools in the Processing Toolbox
- 4 Click on Zonal Statistics
- 5 Raster layers: HILLY_DEM_BTМ_CORR.tif
- 6 Vector layer containing zones: HILLY_AREA_BTМ.shp
- 7 Output column prefix: DIST
- 8 Output layer: Save to file ~\MODULE_10\Data\HILL_DIST_DEM_STAT.shp
9. Click Run

Fig 11

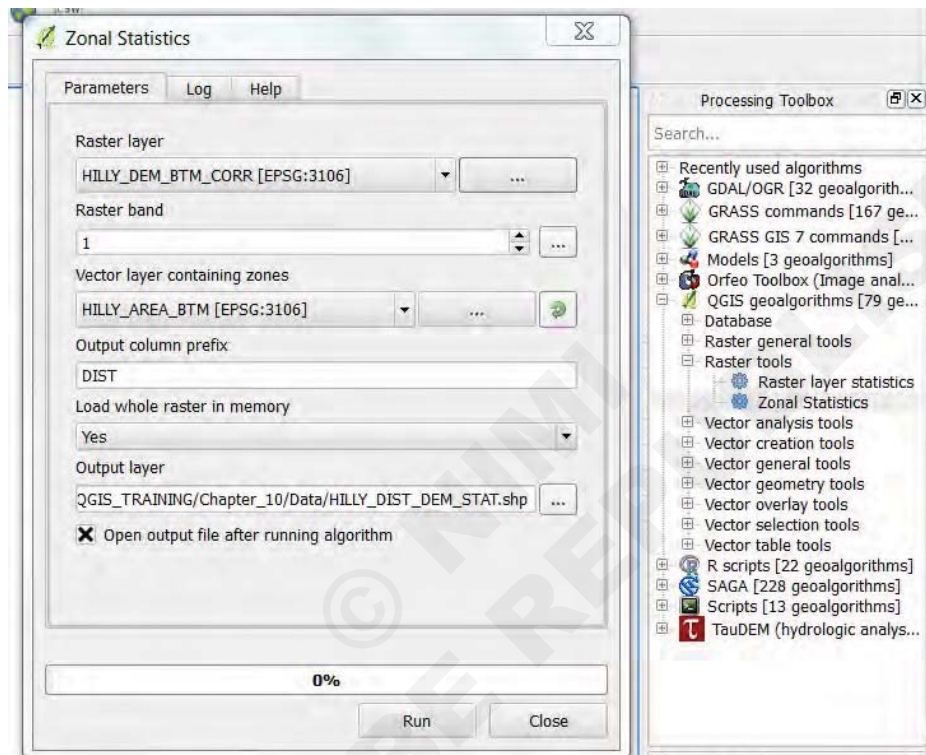


Fig 12

Attribute table - HILLY_DIST_DEM_STAT :: Features total: 5, filtered: 5, selected: 0

	DIST_NAME	Shape_Leng	Shape_Area	Classcount	Classsum	Classmean	DISTmin	DISTmax	DISTsur
0	Bandarban	5.434441	0.401584	543717.000000...	1707629.0000...	3.1406577318...	2.000000	1042.000000	110533840.
1	Chittagong	6.573420	0.392675	510082.000000...	1535944.0000...	3.0111707529...	0.000000	315.000000	12217372.0
2	Cox's Bazar	6.871398	0.188331	249913.000000...	752899.000000...	3.0126444002...	0.000000	259.000000	4536216.00
3	Khagrachhari	3.524531	0.254434	353304.000000...	1078344.0000...	3.0521703688...	12.000000	488.000000	34877140.0
4	Rangamati	6.449390	0.506591	661524.000000...	2053704.0000...	3.1045041449...	5.000000	1008.000000	101714768.

Show All Features

Introduction to Spatial Analysis, GIS Analysis : Proximity Thematic Mapping and Overlay

Objective: At the end of this exercise you shall be able to
• **create thematic maps of given toposheet using arc GISGIS.**

Requirements	
Tools/Equipments/Instruments	
<ul style="list-style-type: none"> Arc GIS software Georeferenced 	<ul style="list-style-type: none"> Projected survey of India toposheet

PROCEDURE

Type of data

To create a thematic map using Arc map you will need to kinds of data.

Spatial data : Displaying boundaries, roads, or some other geographic feature(s). Spatial data is georeferenced in a real world coordinate system and may contain limited attribute information associated with its features. Discrete geographic objects (as opposed to continuously varying variables, like elevation) are generally represented by one or more of three geometrical forms in a GIS.

- Points are used for showing occurrence or relative locations (rather than size or dimension) of features such as trees and fire hydrants, or (form a large scale persepctive) buildings or cities.
- Lines, composed of connected points or nodes, can represent routes, pathways or boundaries, or for uses not requiring detailed polygons, such as rivers or roads.
- Polygons consists of a series of nodes and lines enclosing an area, representing things such as sate boundaries, lakes, and tracts of land.

Attribute data: Descriptive information about a set of features and the information needed to create the "theme" in a thematic map. It can be a statistical data set collected through surveys, Census data, or any other information that describes the features represented in your spatial data set.

- 1 Open new ArcMap and change the data frame Properties WGS_1984_UTM_Zone_44N
- 2 Add the Georeferenced and projected Survey of India Toposheet which we have to digitize for thematic maps creation using Add icon.

- 3 Create point, line and polygon shape files using arc catalog
- 4 Editor -> start editing. Select which layer to edit (your new shape file point, line or polygon). Select the task to perform (Create New Feature),
- 5 Select the editing pencil tool and click on, along, or around the features in a georeferenced and projected map you want to digitize and create point, line and polygon themes.
- 6 hen finished drawing, right click and select Finish Sketch
- 7 To edit the attribute table for the feature you just created click the Attributes icon on the Editor Toolbar.
- 8 All the editable fields for the feature you just created will appear. This way you car label your features as you create them.
- 9 Use the 'symbology' tab of the layer properties to modify the characteristics of the theme
- 10 When you're done creating features click on the Editor button on the Editor toolbar and select Save Edits, and then Stop Editing.

1 Choropleth thematic map: Village theme, water bodies theme, settlements then etc.

- Legend Type : **Graduated Color**
- Classification Field : **Population/village name**
- Normalize by : **<None>**
- Color Ramps: multicolor

2 Isopleths map: Contour, Drainage themes etc

- Categories: **Unique Value**
- Values Field: drainage/contour ID
- Color schemes : **(don't change)**

— — — — —

Introduction to Spatial Data Input and Georeferencing Digitization of Maps and Imageries

Objective: At the end of this exercise you shall be able to

- enable to get digitization of maps and imageries by giving spatial data input.

Requirements
Tools/Equipments/Instruments

PROCEDURE

Object Initialization

This sample guide explains the steps for automatically geo-referencing and digitizing scanned maps. Some of the important terms used in this guide are as follows:

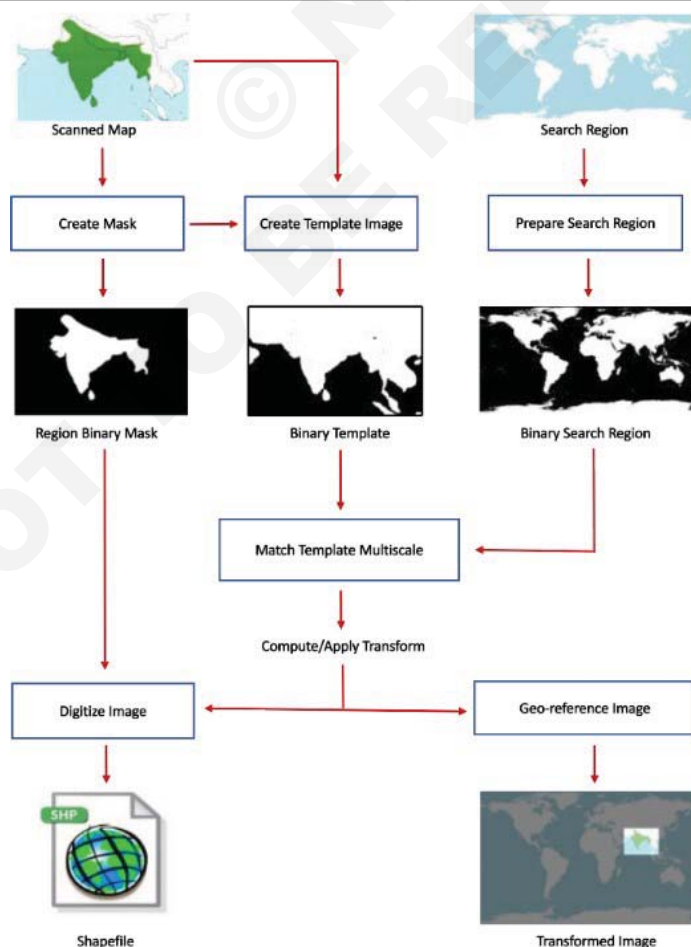
- Scanned Map: Refers to the digital, scanned copy of a scientific paper map.
- Geo-referencing: Refers to the process of assigning real-world coordinates to pixels of the scanned map.

- Digitizing: Refers to the process of converting geo-referenced data to digital format(shape file).

Below are the parameters to be passed into Scanned Map Digitizer:

- input_folder: The path to the folder that contains scanned map images
- output folder: The path to the folder where intermediate results and output should get generated with image name

Fig 1



Create Maks

This method extracts binary mask images using the scanned maps corresponding to color input fed by the user.

- The parameters to be passed are as follows:
- Color_list : A list containing different color inputs (r, g, b). For example, if an image contains two colors to represent two different specie, the list should contain RGB

For a given scanned map image, the method traverses the colors in the color_list and generates a color threshold range using color_delta for each color. The computed ranges help to generate binary masks for each color. The masks are then further processed to remove noise using the kernel_size and kernel_type parameters.

Fig 2



Introduction to Co-ordinate Transformation

Objective: At the end of this exercise you shall be able to

- how to transform geographic coordinate system to a projected coordinate system.

Requirements

Tools/Equipments/Instruments

PROCEDURE

Create a custom CRS

We will learn how to transform geographic Coordinate Systems to a projected coordinate system in QGIS.

- 1 First, launch QGIS Desktop 2.4 from your desktop
- 2 Click Setting -> Custom CRS

3 In Custom Coordinate Reference System Definition window, click Add new CRS

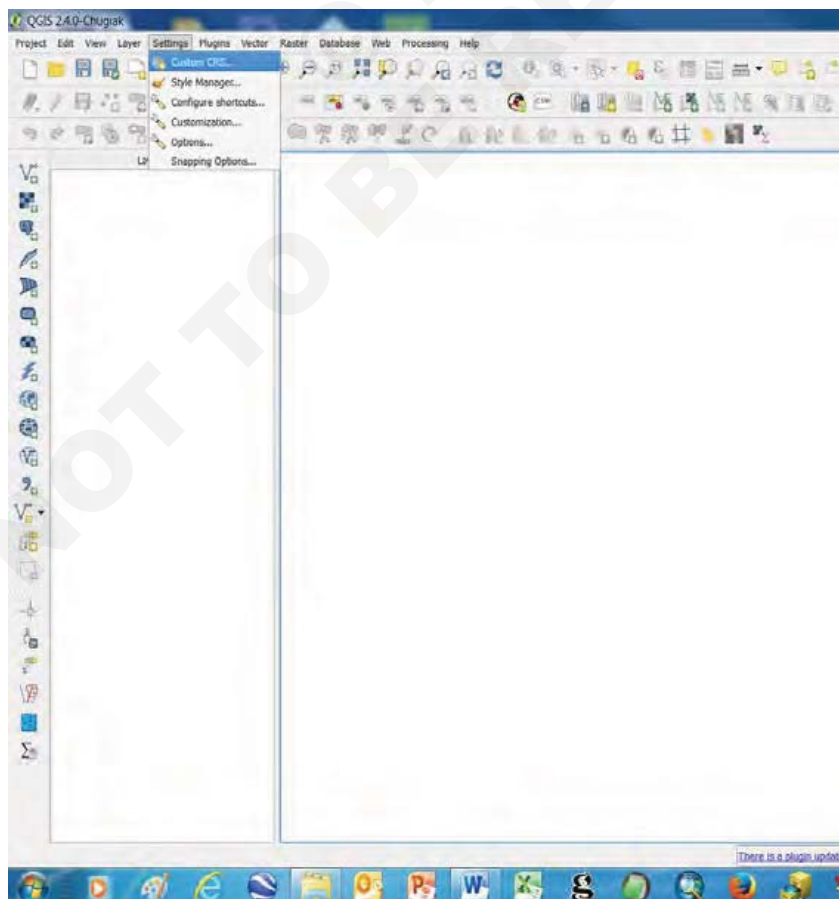
4 In Name Section, type "EPSG_3106_BTM_D_GULSAN_NEW"

5 Copy the following text and paste it in the Parameters section.

Fig 1

```
+proj=tmerc +lat_0=0 +lon_0=90 +k=0.9996 +x_0=500000  
+y_0=0 +a=6377276.345 +b=6356075.41314024
```

Fig2



6 Then Click OK

7 A new CRS named EPSG_3106_BTMD_GULSAN_NEW will be created in QGIS. We will use this CRS for all projection transformation in this exercise.

Vector Data CRS

Checking the Coordinate Reference System

In this exercise, we will learn how to check the coordinate system of vector data in QGIS. This is important to assure you are working with the right systems, and to determine why some layers may not render as expected.


- 1 If you have not done so already, launch QGIS Desktop 2.4.0 from your desktop
- 2 Click  and load the BD_UPZ_GCS.shp file
- 3 To find the coordinate reference system (CRS) layer, first right click on the layer name in the layer section, then click Properties. Next, click on the Metadata tab. The CRS is displayed under the Layer Spatial Reference System header under Properties. The example below shows that the layer projection is Geographic coordinate system and the datum is WGS84.

Fig 3

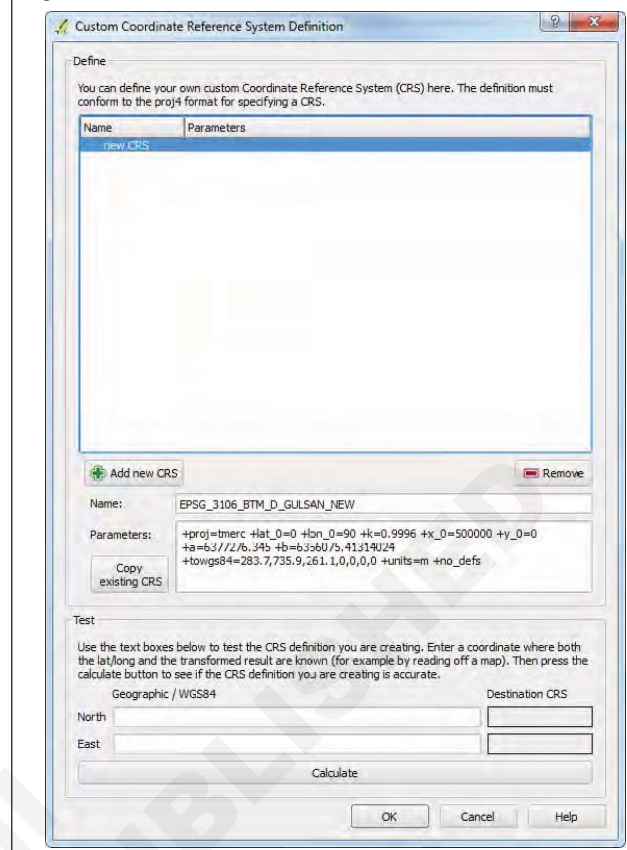
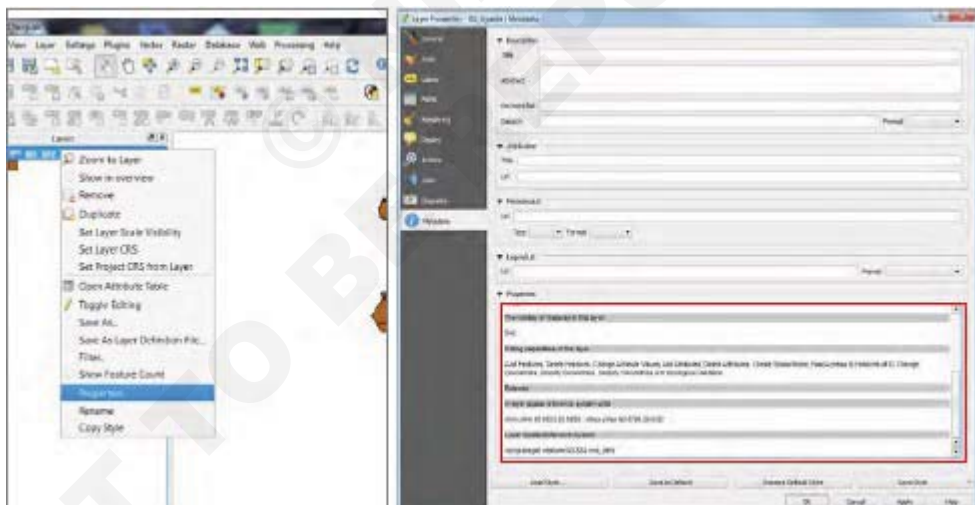



Fig 4



Projection of a Vector Data

We have already shown the BD_UPZ_GCS vector layer in a Geographic Coordinate Systems with a datum WGS84 (EPSG:4326). In the following exercise, you will next learn how to convert GCS to BTM using a custom CRS that we created before. This process is important to correct for incorrect projections, and to align layers you are working with in an analysis.

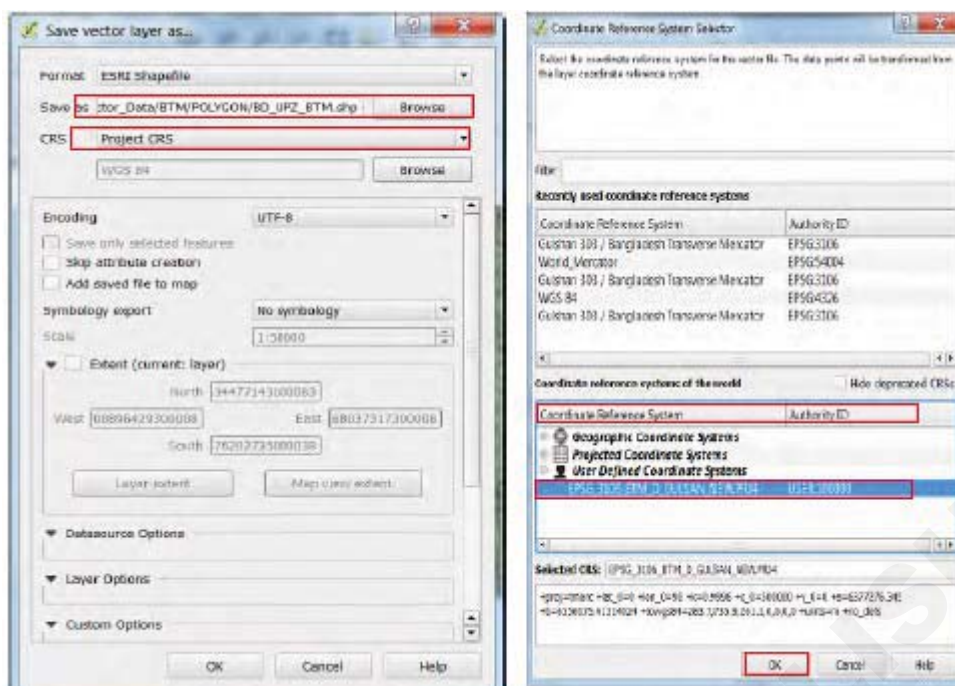
- 1 Click  and select BD_UPZ_GCS.shp file. After clicking Open, the map should appear on the QGIS canvas (if not already completed in the step above).
- 2 Right click on the BD_UPZ_GCS.shp in the layers menu, then click Save as
- 3 Use the Save as Browse'option to choose (MODULE_04\Data) for the new layer to be saved and give the layer name as BD_UPZ_BT.shp, and hit return.
- 4 In the CRS section, select Project CRS and then Click Browse
- 5 Scroll down in the Coordinate reference system of world section of the Coordinate Reference System Selector window, and select EPSG_3106_BTMD_GULSAN_NEW from User

defined Coordinate Systems (this may take time for you to find, but be patient).

6 Next, click OK.

7 Then Click OK again.

Fig 5



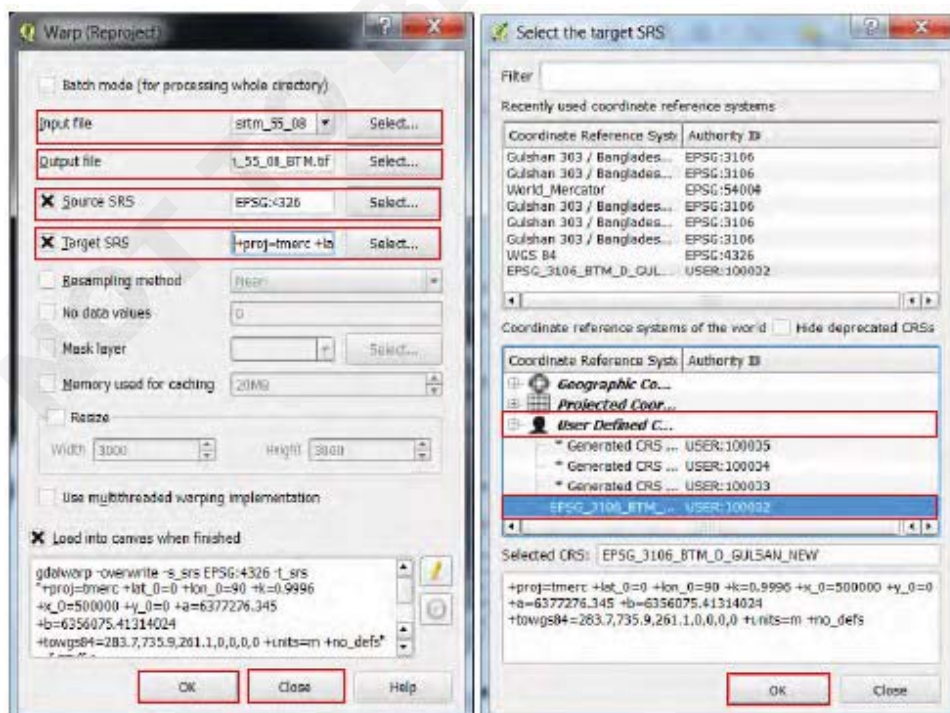
Raster Data CRS

In this exercise, which focuses on raster data as defined in Module 3, we will use Landsat 5 TM scenes downloaded from the <http://glovis.usgs.gov/> website. These data have been projected in Universal Transverse Mercator (UTM) Zone 46 with the WGS84 datum (EPSG:32646). We can re-project a single file or multiple files with batch projection mode from geographic coordinate system to our custom CRS (EPSG_3106_BTMD_GULSAN_NEW).

Checking the Coordinate Reference System

- 1 Click the Add raster layer button and select the file srtm_55_08.tif from ALL_SHEETS_DEM_GCS sub-directory of Chapar_03/Data folder.
- 2 After clicking Open, the map should appear on the QGIS canvas. If you encountered an error, make sure you are opening the file under the raster prompt.

Fig 6



- 3 Check the MetaData tab in the Properties window for this raster to determine what the Spatial Reference System (SRS) is. The SRS is displayed under the Layer Spatial Reference System header under Properties. The projection of this raster is Geographic coordinate system and the datum is WGS84.

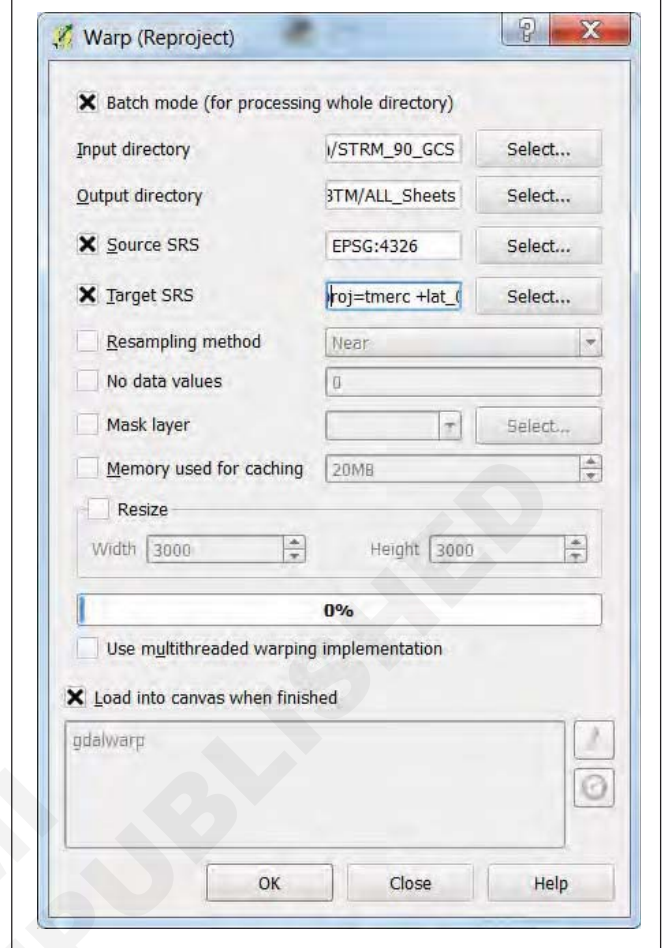
Projection of a Single Raster

- 1 On your top-bar menu, click Raster->Projection->Warp(Reproject)
- 2 Define Output file as strm_55_08_BTM and file type GeoTIFF and save it in MODULE_04/Data/
- 3 EPSG:32646 will be popping up as Source SRS
- 4 Check Target SRS and Select EPSG_3106_BTM_D_GULSAN_NEW as Target SRS and click OK
- 5 Click OK again and then, Close

Batch Projection of Multiple Rasters:

- 1 Launch QGIS Desktop 2.4 from your desktop
- 2 Click Raster->Projection->Warp (Reproject)
- 3 Check Batch mode (for processing whole directory)
- 4 Select ALL_SHEETS_DEM_GCS as an Input directory.
- 5 Select ALL_SHEETS_DEM_BTM as a Output directory
- 6 Select EPSG:4326 as Source SRS and EPSG_3106_BTM_D_GULSAN_NEW as a Target SRS
- 7 Click OK.

Fig 7



Attribute Data Generation


Objective: At the end of this exercise you shall be able to

- **generating attribute data using GIS.**

PROCEDURE

Adding attribute data

Adding fields

- 1 Right - click the table or layer in the table of contents and choose open attribute table
- 2 Click the table options button  in the table window. You can make calculations without being in an editing session; however, in that case, there is no way to undo the results.
- 3 Click add field.
- 4 Type the name of the field.
- 5 Click the type arrow and click the field type.
- 6 Set any other field properties as necessary.
- 7 Click OK

Calculating area, length, and other geometric properties



- 1 Start an edit session. You can make calculations without being in an editing; however, in that case, there is no way to undo the results.
- 2 Right -click the layer and click open attribute table. You can only perform geometric calculations on attribute tables.
- 3 Right -click the field heading for which you want to make a calculation and click calculate geometry. Optionally, you can press CTRL+SHIFT+G to open the calculate geometry dialog box.
- 4 Click the geometric property (area, perimeter, length etc) you want to calculate. Different properties are available depending on the type of layer you are using.
- 5 Click to use either the coordinate system of the data source or the coordinate system of the data frame.
- 6 Click the units of the output calculations.

- 7 Optionally, if you have selected records in the table, choose whether to apply the calculations to all records or just the selected ones.

- 8 Click OK.

Querying on attribute data

Selecting records in a table by attributes

- 1 Click to open layer attribute data, click on Table options  in the table you want to query and click select by attributes .
- 2 Click the method arrow and click the selection procedure you want to use.
- 3 Double -click the field from which you want to select.
- 4 Click the logical operator you want to use.
- 5 Click the get unique values button, then scroll to and double-click the value you want from the unique values first. Optionally, you can type a value directly into the text box.
- 6 Click verify to verify your selection.
- 7 Click apply to update the selection.
- 8 Click close.

Note : Write a query in the query builder.

Example :

- 1 "height">= 550
- 2 "water body"='Osman sagar'

Result

- 1 New attribute data field is added to the shapefile layer and calculated its geometry
- 2 Selected records in a table by using querying on attribute data.

Introduction to Spatial Data Base Creation

Objective: At the end of this exercise you shall be able to

- view the spatial database created.
- create three types of themes in the GIS environment

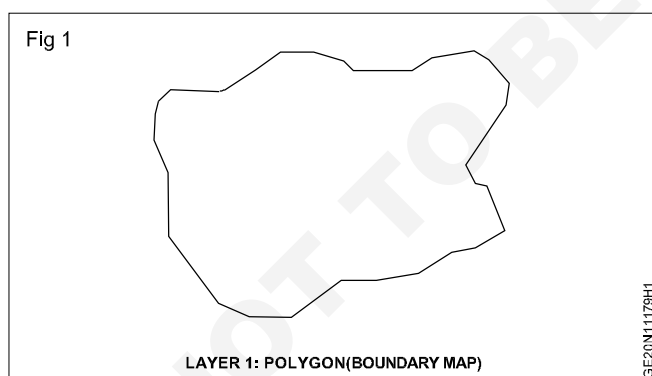
Requirements

Tools/Equipments/Instruments

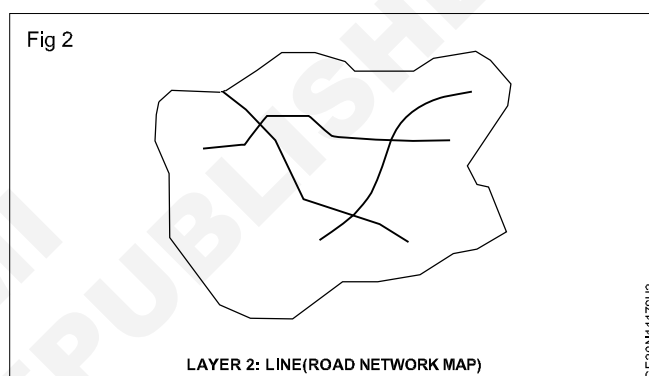
- Scanned image of topo-graphic sheet of an area;
- PC with a GIS software installed

PROCEDURE

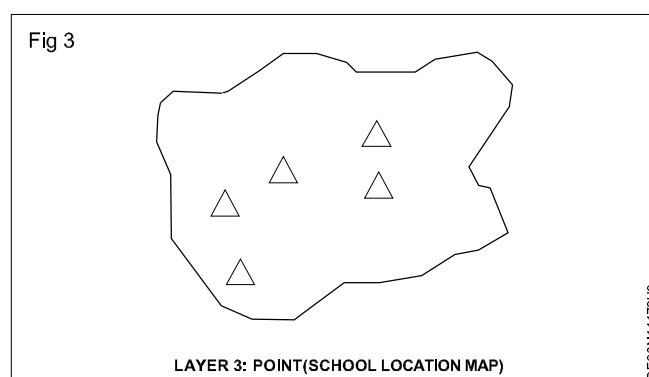
- Take a scanned image! topo-sheet of an area;
- Run the GIS software installed on your PC;
- Open/ add the raster image (scanned image/ topo-sheet) of the study area;
- Create layer 1 by selecting polygon as an option;
 - i) Start tracing the boundary of the area viewing the background toposheet image which is polygon.
 - ii) Create a polygon representing the boundary of the area taken up for the exercise,
 - iii) Open the attribute table of the area and put the one or two non- spatial information available about the area.
 - iv) Name the layer/ theme as Boundary Map.



- Add or Create layer 2 by selecting line as <U1 option; and
 - i) Draw the 3-4 major roads of the area (with the help of background topo-sheet image).
 - ii) Open the attribute table and put the names of the roads shown in the layer.
 - iii) Name the layer/ theme as Road Network Map.



- Add or Create layer 3 by selecting point as an option.
 - i) Put 3-4 locations like schools etc. of the areawith the help of background topo-sheet image or through your understanding.
 - ii) Open the attribute table and put the names of the schools shown in the layer.
 - iii) Name the layer/ theme as School Location Map.



Observations

Three types of themes namely boundary map, road network map and school location map of the area under consideration have been prepared. These layers (thematic maps) can be opened and displayed one by one and different spatial features viz. area under consideration, different roads and location of different schools viewed along with related non-spatial information.

Results

Following three types of themes created for the area under consideration. The created themes were displayed and viewed in the GIS environment.

- boundary map;
- road network map; and
- school location map.

The basics of spatial database handling by the GIS software/environment were comprehended.

— — — — —

© NIMI
NOT TO BE REPUBLISHED

Creation of Non Spatial Data Sets into DBF Format

Objective: At the end of this exercise you shall be able to
• **create tables.**

Requirements

Tools/Equipments/Instruments

- Computer, Internet Connection
- GIS Software

PROCEDURE

MS Access files are read through the Microsoft Jet Engine.

There are a few limitations on using MS Access files.

Select queries created in MS Access must be saved as a table.

Other types of databases and remote tables can also be accessed through an OLE DB provider and ODBC.

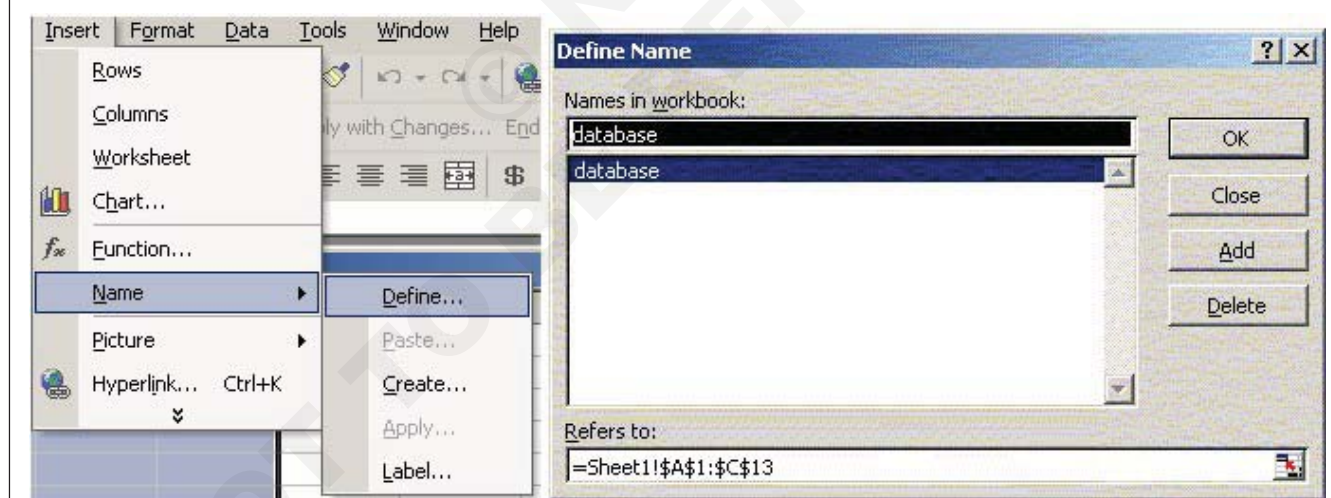
I often use Excel to edit ArcView attribute or dbf files, even those associated with shape files since the table editor in ArcView is not very friendly.

This is especially true if you want to convert field type (character to number), or add and edit fields/records. If you want to use Excel for editing the Dbase (dbf) files make sure you have defined the database range in the worksheet before saving.

The database region is defined using the Insert>Name>Define menu. The cells should be appropriately formatted in excel as well – avoid using 'General' formatting.

Quote comma (csv) and Tab separated files can be used.

Fig 1



ArcGIS will attempt to read the format of the text files and generate a schema.ini file. The first line in these files must contain the names of the fields.

The type of the field, unless all values are in quotes, is determined by the content of the field. This can sometimes cause problems when you want a character string field that contains only numbers.

If you cannot join two tables based on a field that appears to contain the same information in two tables check the type (character/numeric) of each field. Character fields are left justified, numeric fields are right justified.

When bringing data from SAS the simplest method would be to save the file in DBF format using PROC EXPORT or PROC DBF, or as comma separated files using the _lotus macro.

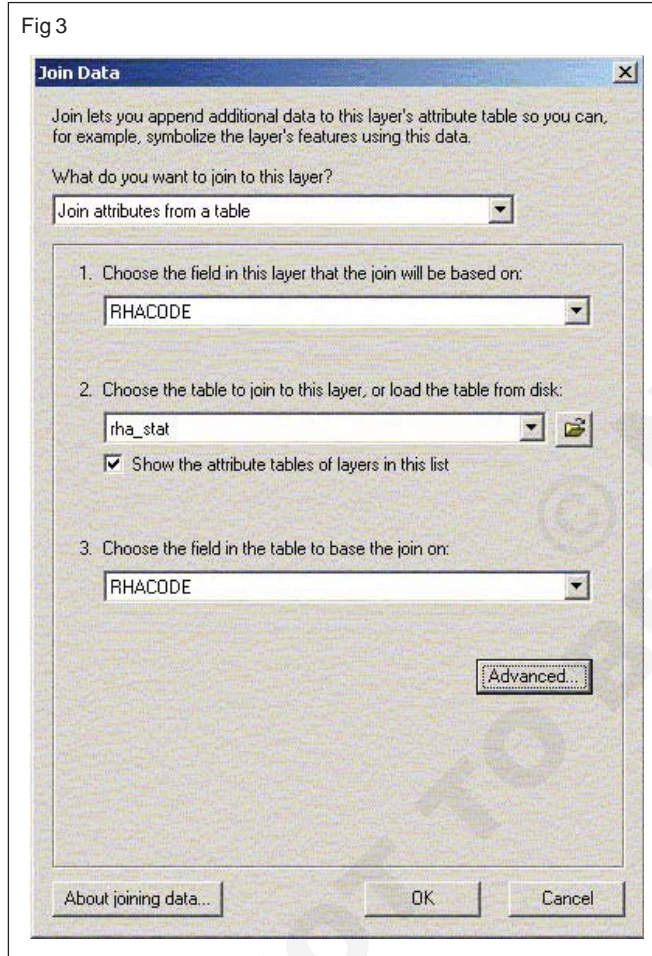
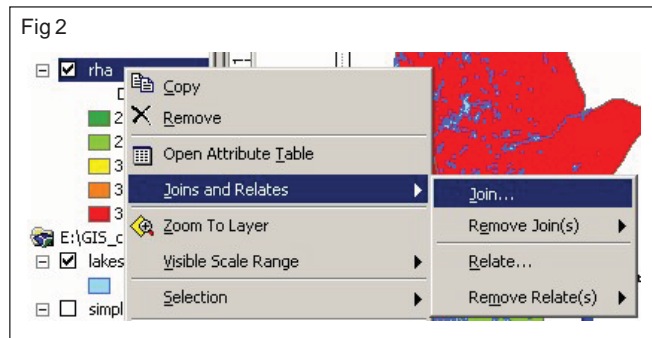
Most programmers at MCHP are familiar with the _lotus macro for saving comma or tab delimited files.

The advantage to using the _lotus macro is titles and program information can be added. Extra titles and/or comments would have to be removed since ArcGIS would not understand what to do with those records.

You can merge your tables using the join feature of ArcMap.

The name of the common field does not need to be the same but the content must be the same.

Typically you will want to add imported tables to a layer attribute table. Once tables have been joined the new fields will be available for mapping.



Spatial joins can be used to add RHA information to other themes.

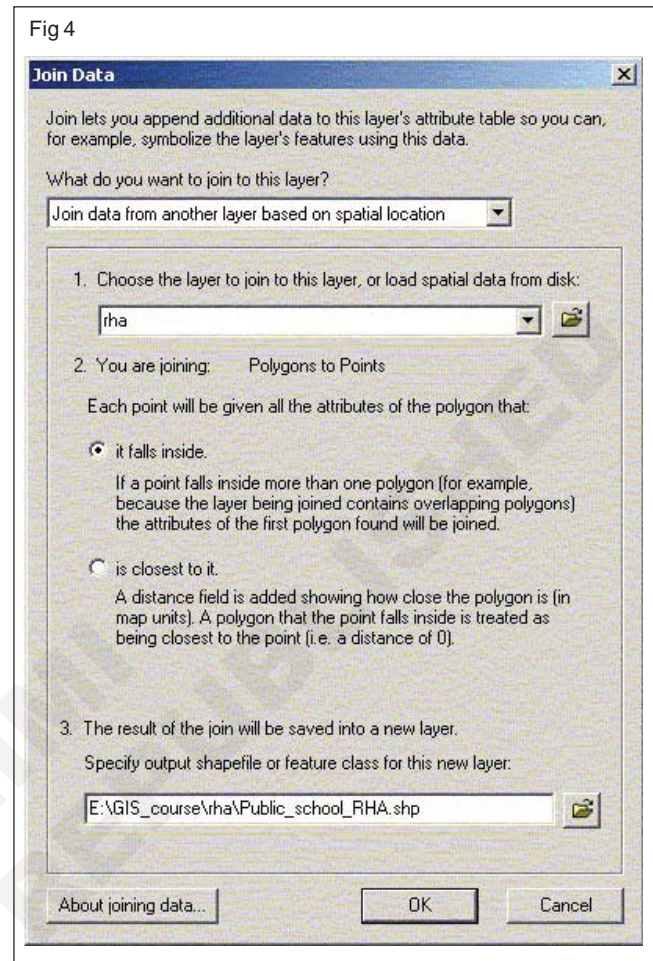
In fact, almost any two attributes tables can be joined with a spatial join.

The exception is joining a point or line theme into a polygon theme.

The spatial join can be used to measure distance between points – if you join two attribute tables of points or lines, the spatial join table will give you a column with the distance in map units to the closest point from the original table.

If the underlying table contains a join you will need to remove it if you want to join the table to another.

The underlying table in any given join cannot already be joined to anything. You can remove all or specific joins to a table by selecting remove from the join menu.



There is a relate option within ArcMap for relating two tables.

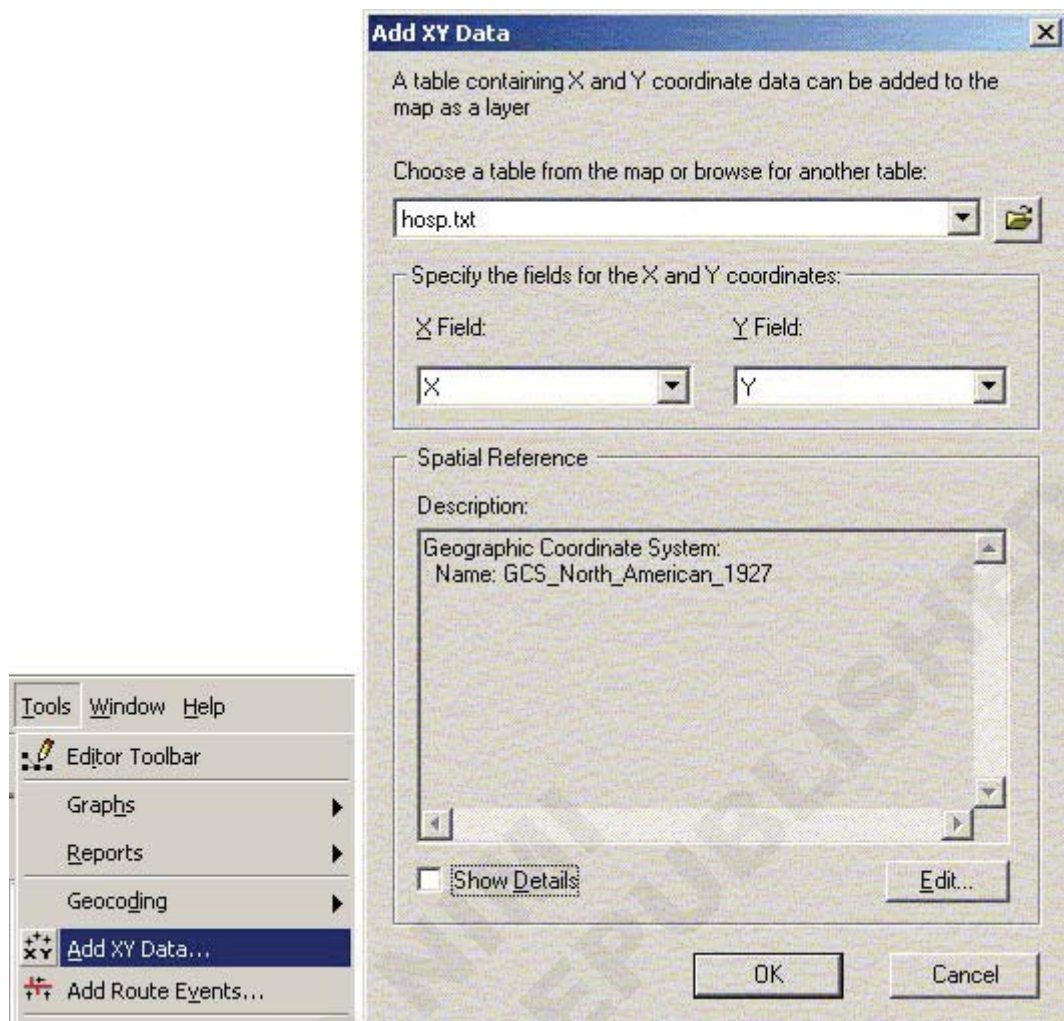
Unlike joining tables, relating tables simply defines a relationship between two tables. The fields of the source table are not appended into the fields of the destination table.

After a relate is created, selecting a record in the destination table will automatically select the record(s) in the related or source table. Relates allow a one-to-many relationship to be established between two tables.

If you want to generate a theme from a table without X and Y coordinates, you can join it to a table with coordinates such as a postal code table.

When you join a larger table to a smaller table only those records from the active table are retained.

Fig5



Over View of Projection Support

Objective: At the end of this exercise you shall be able to

- find the importance of projection support.

Requirements

Tools/Equipments/Instruments

- Computer with Internet Connection
- GIS Software, Power source

PROCEDURE

Projections

Open the RHA map file that was saved before the last activity.

Projections are used to fix this problem. Most of the data at MCHP is stored in decimal degrees and needs to be projected.

The conversion has been made already and the underlying data is saved in projected units (e.g. meters). Generally decimal degrees provide a wider range of options but there are problems when trying to measure some scales, distances, bearings, or areas, trying to change projections, sharing your data with other people or software applications.

Most simple mapping applications such as EpiMap do not have the ability to re-project data and will only display geographic files as they are provided.

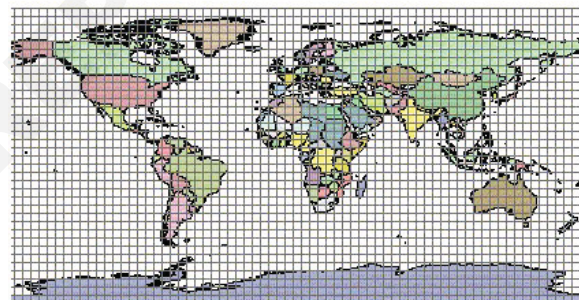
The usual projection used for Manitoba is UTM Zone 14 (NAD 83 or 27), although there are others.

Manitoba does cross three zones (14, 15, 16) so the east, and especially the north east of the province will have more distortion.

Fig 1

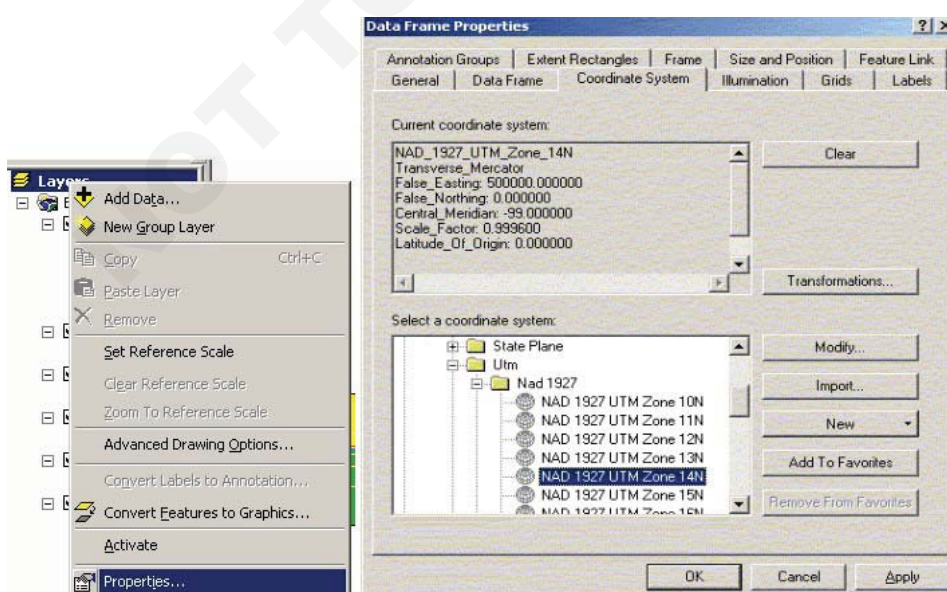


Earth as a Sphere



Cylindrical Projection or Plate Carree

Fig 2



Zone 14 gives a reasonable approximation across most of the province and is suitable for our needs.

If you plan on doing large distance/bearing calculations in the east/north east of the province you may want to consider another projection.

Make sure you know the datum that was used to create the data.

This is a question to ask if someone is providing any map data. ArcGIS can use data projected in multiple formats, ArcGIS will allow you to use different projections at the same time and as long as they are based on the same datum they should line up correctly.

Fig 3

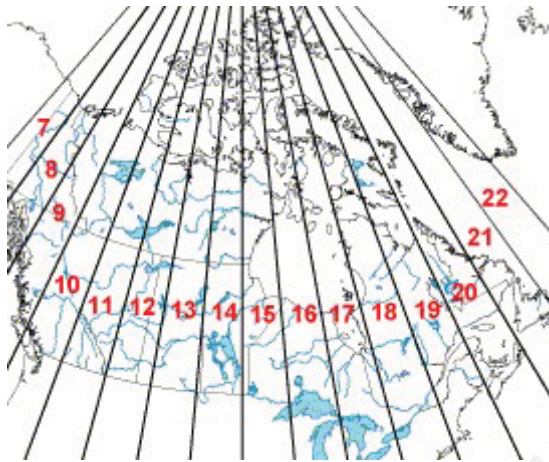
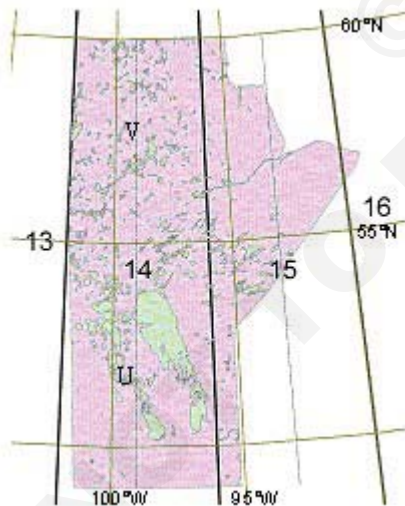


Fig 4



After you have projected your map, remember to change the map units to meters under the general tab (this should be set since meters is the unit for UTM's) and the Distance measure to kilometres or what ever measurement you prefer for distances.

The issue of projections and projected data usually arises when you get data and you don't know the units or projection that it was saved in.

Convert one of the projected themes in the current project to a new shape file.

Only the selected features in the theme will be saved into the new shape file. Note that ArcGIS will ask if you want to save in original format (decimal degrees) or projected units.

Typically you will want to save in decimal degrees.

There are times when you want to calculate distance or areas in a specific way, or export the geographic file to another application (e.g. MS Map or EpiMap) in these cases you will need to save the shape file in projected units.

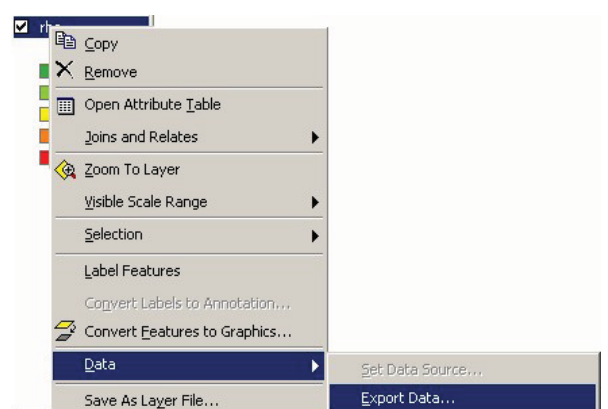
When adding imported data to your view, you may run into a problem in which not all parts of your map line up.

This could be because some of your data is already projected, while some of it is still in decimal degrees or the two data sources were generated using different datums.

While ArcGIS will allow you to combine in one data view multiple projections, sometimes the projection is not known and there will be problems.

If you know the projection information it can be added through the use of ArcToolbox.

Fig 5



The screenshot shows the ArcMap application window titled "Initial Example.mxd - ArcMap - ArcView". The interface includes a menu bar (File, Edit, View, Insert, Selection, Tools, Window, Help), a toolbar with various GIS tools, and a status bar at the bottom. The main map area displays a map of Minnesota with a legend on the left. The legend lists several layers: "E:\GIS_course\rha" (with sub-layers "public", "major_roads", and "rha"), "D_PMR" (with a color-coded legend for values 2.90584 to 6.1), "E:\GIS_course" (with sub-layers "lakes and water" and "simple_lakes_and"), and "simple_lakes_and". The "rha" layer is checked. The map shows a large red area in the north, a blue area in the center, and a green area in the south. A scale bar at the top indicates a distance of 1:5,816,917. A north arrow is located in the top right corner. The status bar at the bottom shows the coordinates "-3.81 17.07 Centimet".

Practice of Reprojection of Data

Objective: At the end of this exercise you shall be able to

- change the projection of any data to another defined projection.

Requirements

Tools/Equipments/Instruments

- Computer with Internet Connection
- GIS Software, Power source

PROCEDURE

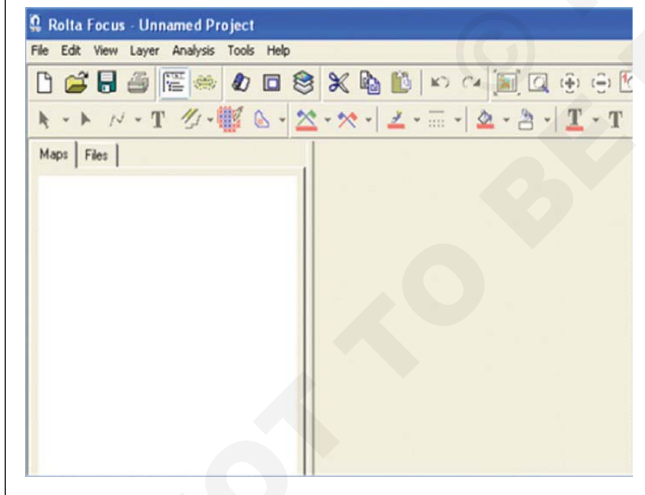
Start > Programs list select Rolta Geomatica > Rolta Geomatica. Rolta Geomatica Toolbar will be open. Click on first tool "Focus" of toolbar to open or Focus can be invoked from Windows menu, select:

Start > Programs >> Rolta Geomatica > Rolta Focus.

Fig 1



Fig 2



Go to File menu and add to select the file which need to be reprojected. For example 45D14.tif

Click Open.

File will be displayed in Map Window as shown below.

In Rolta Focus window, from Tools option select Reprojection tool.

Tools > Reprojection

Click browse to give the Destination (output) file.

Window also gives information of existing Projection system of the input file.

Fig 3

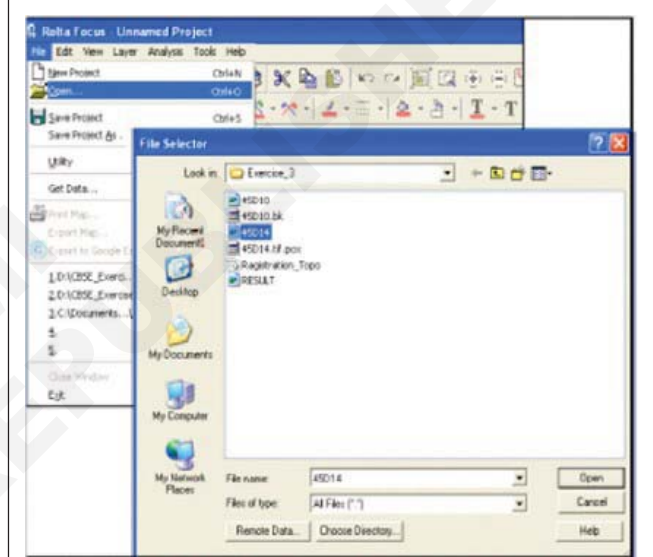
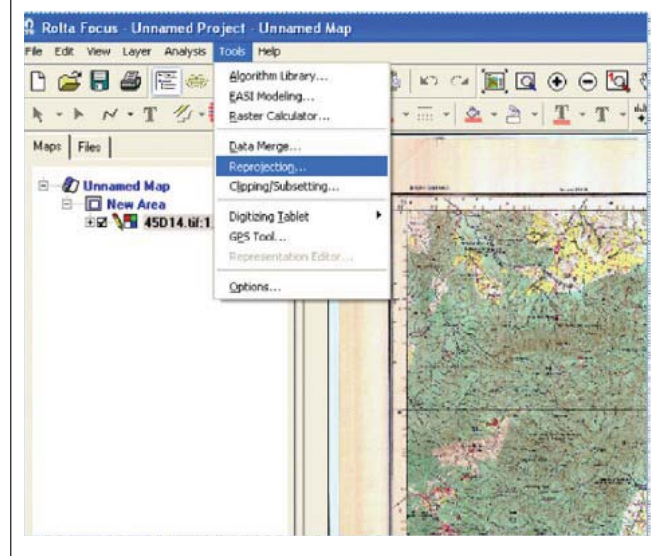
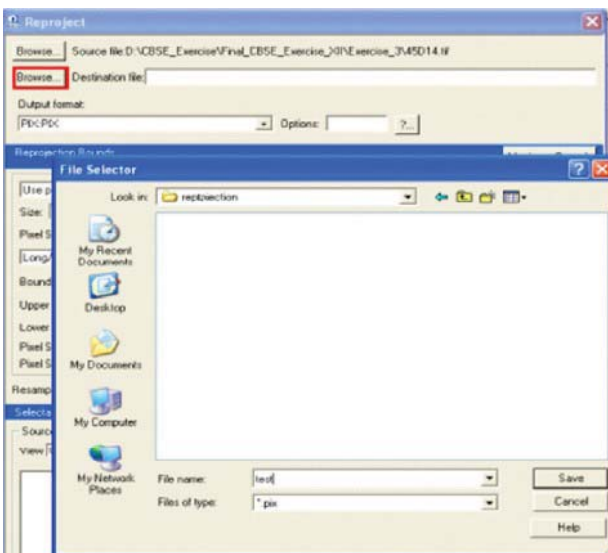


Fig 4



Drop down the menu next to Earth Model & Select UTM in place of Long/Lat & accept. For datum choose WGS84. Following parameters need to be entered.

Fig 5



- UTM as a Projection
- WGS 84 as an Earth Model and accept it.
- Zone 43 as a UTM Zone and accept it.
- Row T as a UTM Rows and accept it.

After selecting all the parameters, click on Accept button which shows all the layers at the bottom of same window to select & add to Destination layer.

Click on the Button reproject.

On clicking reproject process progress monitor will show the process.

Using this function we can re-project georeferenced Raster as well as Vector data to other projection system.

Fig 6

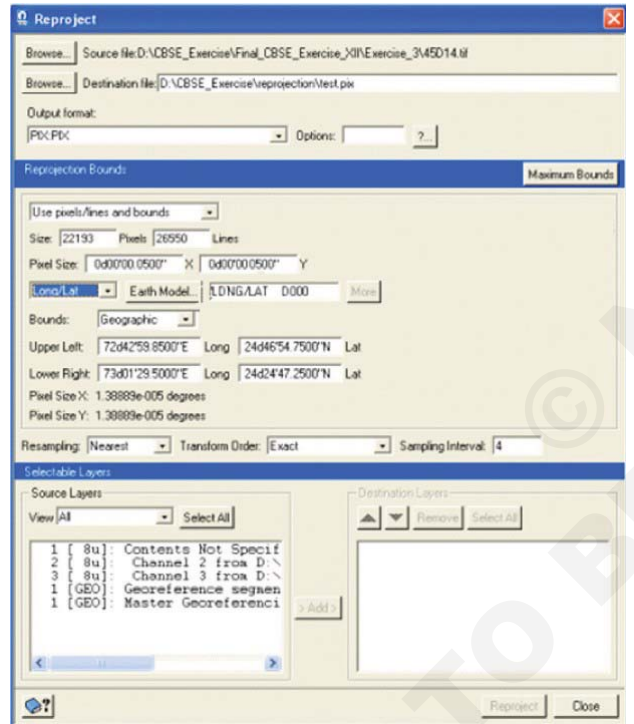


Fig 7

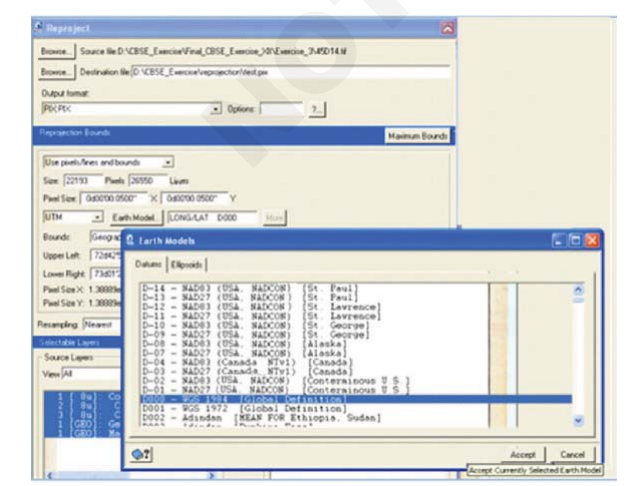
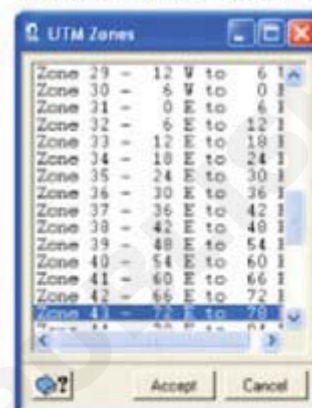


Fig 8

Zone 43 as a UTM Zone



Row T as a UTM Rows

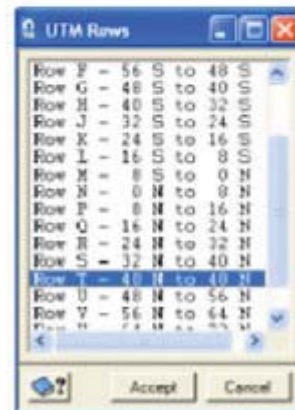


Fig 9

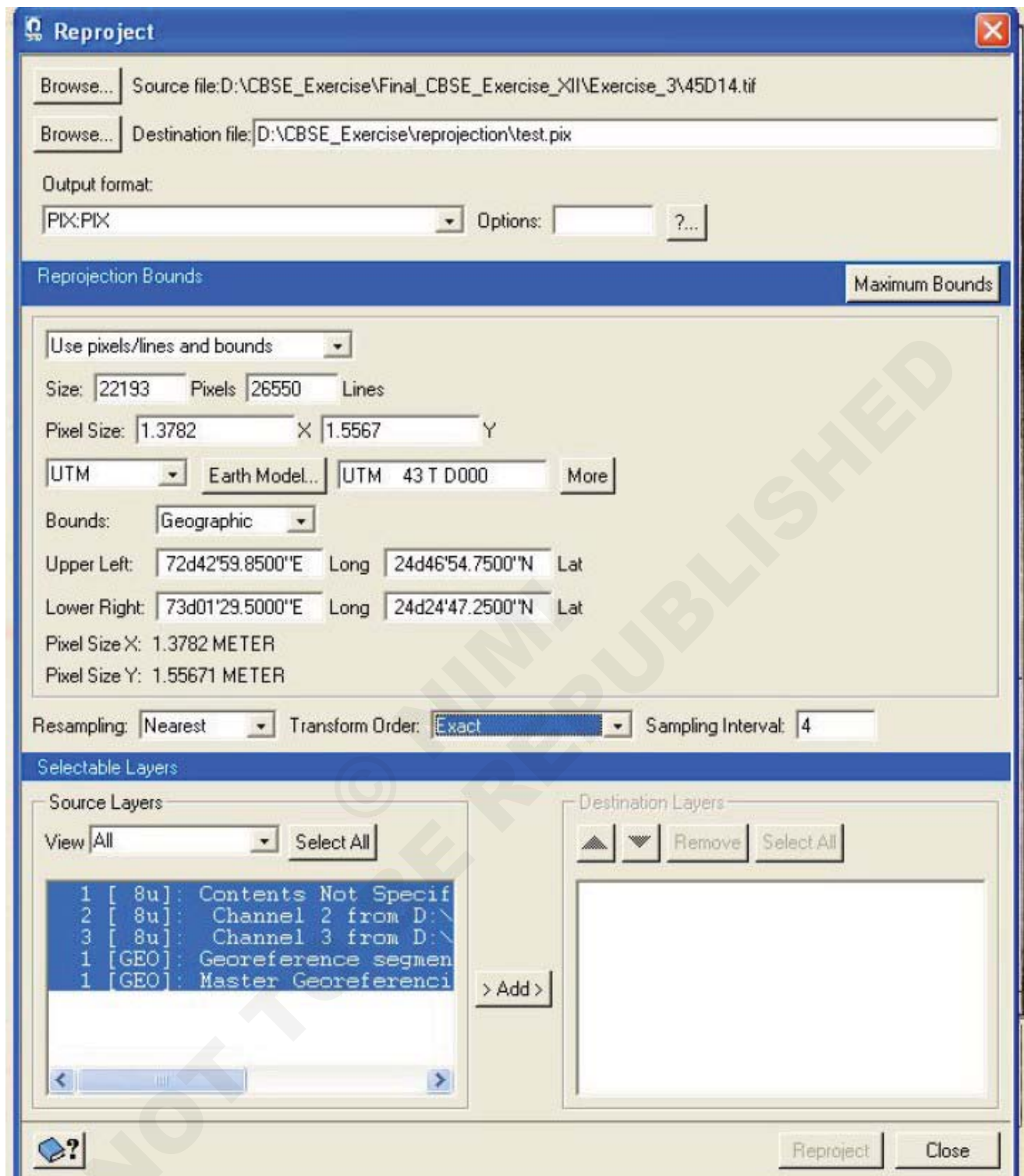


Fig 10

Reproject

Browse... Source file: D:\CBSE_Exercise\Final_CBSE_Exercise_XII\Exercise_3\45D14.tif

Browse... Destination file: D:\CBSE_Exercise\reprojection\test.pix

Output format: PIX:PIX Options: ?...

Reprojection Bounds Maximum Bounds

Use pixels/lines and bounds

Size: 22193 Pixels 26550 Lines

Pixel Size: 1.3782 X 1.5567 Y

UTM Earth Model... UTM 43 T D000 More

Bounds: Geographic

Upper Left: 72d42'59.8500"E Long 24d46'54.7500"N Lat

Lower Right: 73d01'29.5000"E Long 24d24'47.2500"N Lat

Pixel Size X: 1.3782 METER

Pixel Size Y: 1.55671 METER

Resampling: Nearest Transform Order: Exact Sampling Interval: 4

Selectable Layers

Source Layers View All Select All

1 [8u]: Contents Not Specif
2 [8u]: Channel 2 from D:\
3 [8u]: Channel 3 from D:\
1 [GEO]: Georeference segmen
1 [GEO]: Master Georeferenci

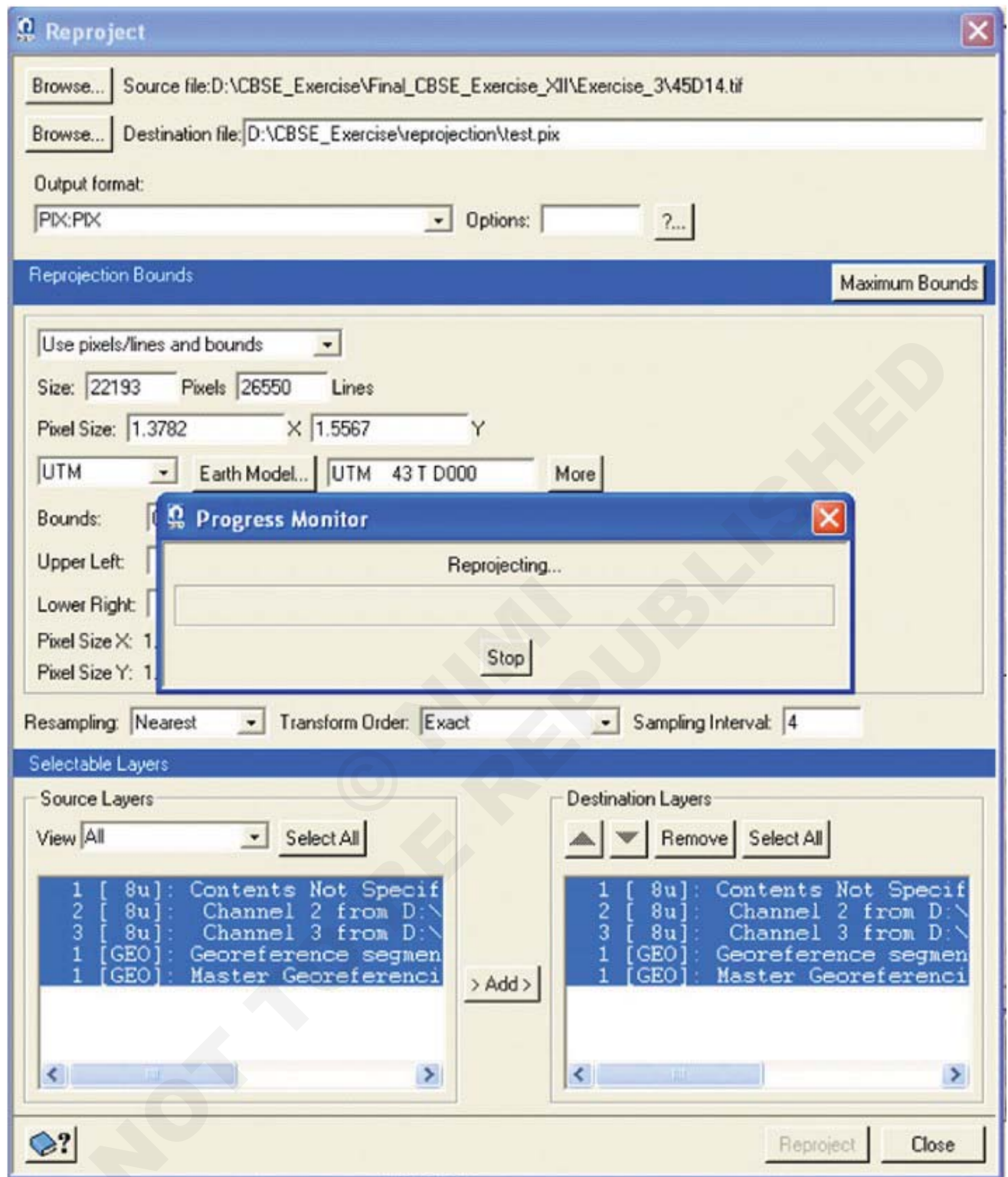
> Add >

Destination Layers

1 [8u]: Contents Not Specif
2 [8u]: Channel 2 from D:\
3 [8u]: Channel 3 from D:\
1 [GEO]: Georeference segmen
1 [GEO]: Master Georeferenci

Reproject Close

Fig 11



Practice of Default Datum Transformation

Objective: At the end of this exercise you shall be able to
• **practice of default datum transformation using GIS.**

Requirements	
Tools/Equipments/Instruments	
• Computer with Internet Connection	• GIS Software

PROCEDURE

A geographic datum transformation is calculation used to convert between two geographic coordinate systems to ensure that data is properly aligned.

Geographic coordinate systems describe how locations on the earth are placed on a hypothetical reference spheroid.

They use angular units, such as degrees, to assign locations to coordinates on a reference spheroid.

The transformation is a calculation to convert the geographic coordinate system of the layers to match the geographic coordinate system of the map as the map draws so that everything is aligned.

The data is not changed by a transformation. This real-time translation is sometimes referred to as projecting on the fly.

In Arc GIS Pro, the best transformation for your map is suggested based on the data and the extent, but you can specify a different one.

Projected coordinate systems always include an underlying geographic coordinate system. A projection transforms the angular coordinates (such as latitude and longitude) from the reference spheroid to distance units (such as meters) on a flat surface.

Transformations relate to the underlying geographic coordinate systems only.

A transformation is applied only when the geographic coordinate systems are not identified.

Explore Supported Data Formats

Objective: At the end of this exercise you shall be able to

- exploration of data formats using GIS.

Requirements

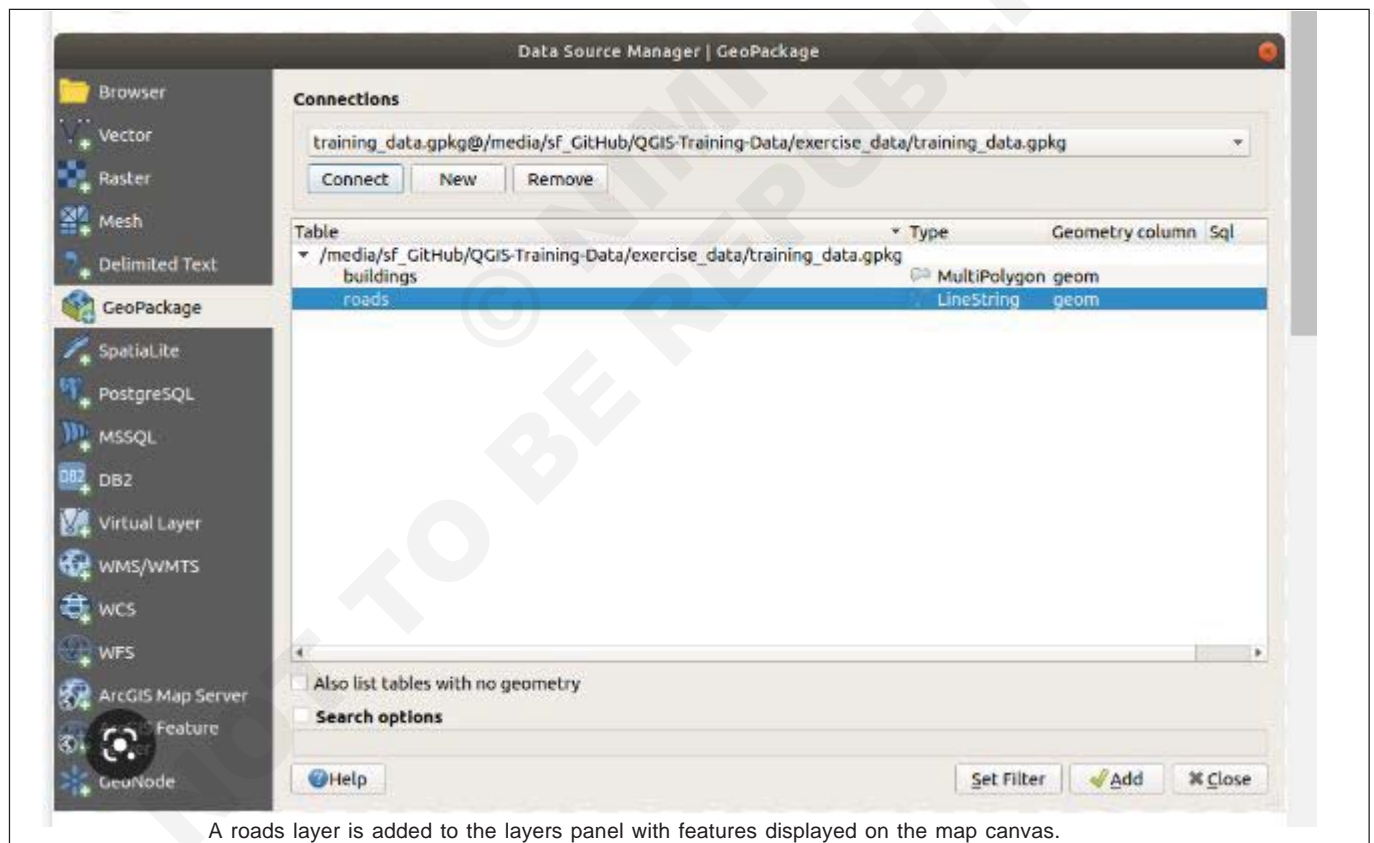
Tools/Equipments/Instruments

- Computer with Internet Connection
- GIS Software

PROCEDURE

In order to load a layer from a Geopackage, you will first need to create the connection to it.

- 1 Click on the ** open data source manager button.
- 2 On the left, click on the ** Geopackage tab.
- 3 Click on, the “New” button and browse to the training_data.gpkg file in the exercise_data folder created for this exercise.
- 4 Select the file and press open. The file path is now added to the geopackage connections list, and appears in the drop- down menu.



- 3 Click on close.

Explore the Vector Properties Dialog

Objective: At the end of this exercise you shall be able to

- state important techniques for vector data geoprocessing and analysis tools in QGIS.

Requirements

Tools/Equipments/Instruments

- Computer with Internet Connection
- GIS Software

PROCEDURE

Convex Hull

A convex hull takes the outer border nodes from a vector shape (which you will recall may consist of points, lines or polygons) and uses them to develop a polygon of the minimum sized area that surrounds all features in the dataset, but that also avoids any concave angles. Below, we will use SRDI soil sampling point (GOLPALGANJ_SOIL_DATA_BTM) data from Gopalganj district to create a convex hull using geoprocessing tools.


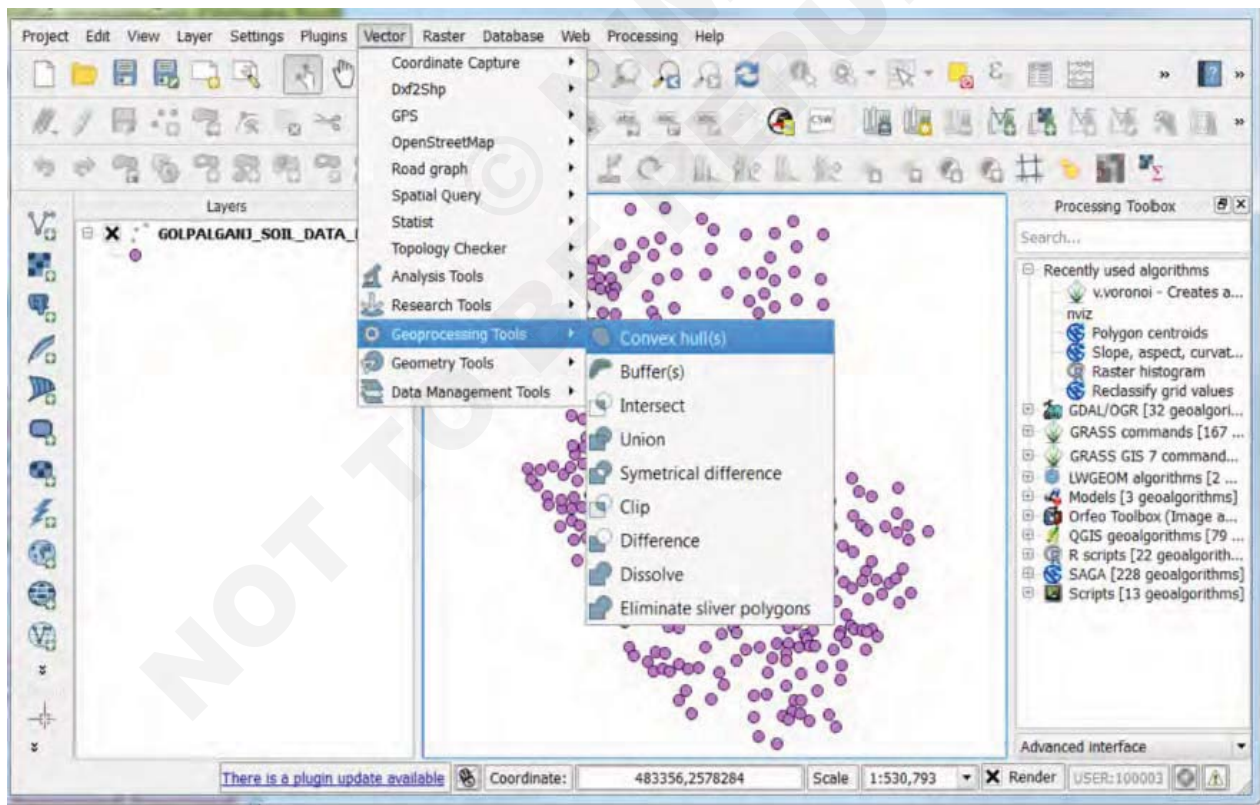
- Click Add Vector Layer,  Icon
- Select File from Source Type, and then select Encoding UTF-8 from the popup menu
- Then click browse and select GOLPALGANJ_SOIL_DATA_BTM.shp file (~MODULE_07\Data)

Fig 1



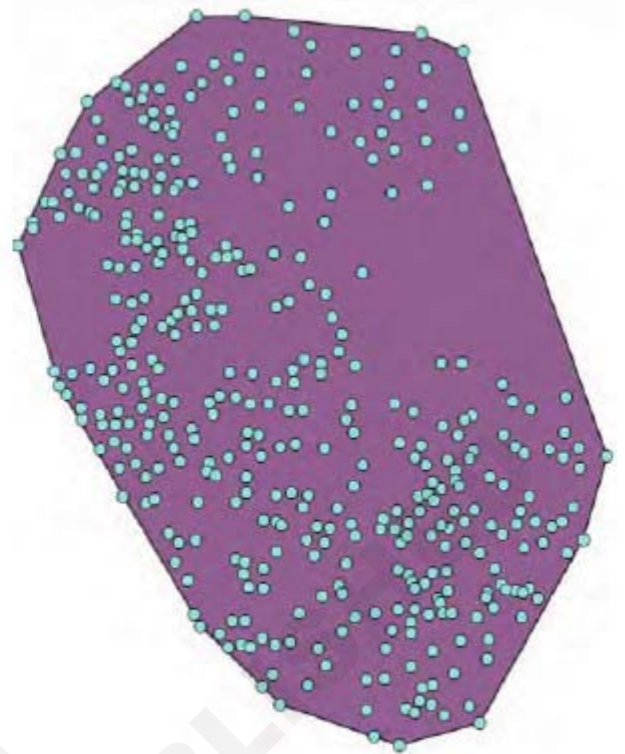
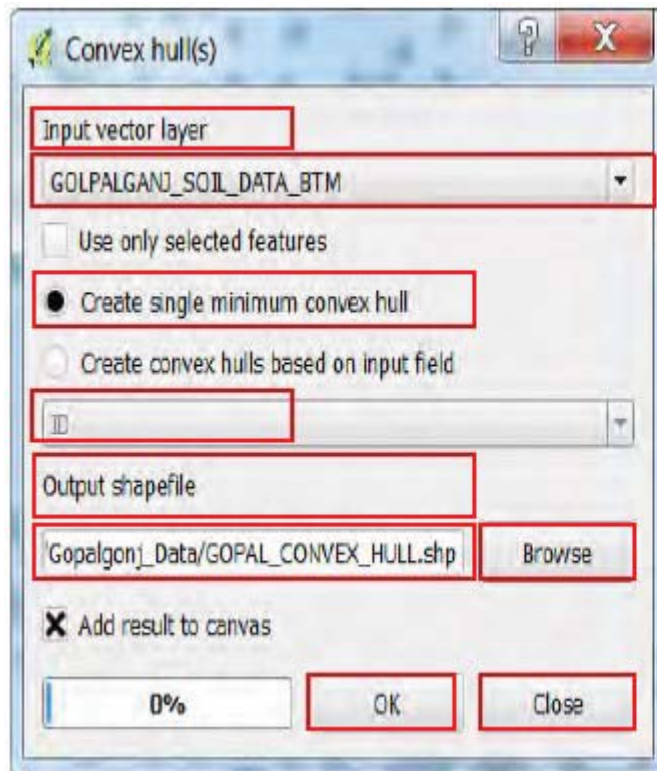
- Then click Open
- Click Vector -> Geoprocessing Tools -> Convex hull (s)

Clipping

Clipping creates a new shape that is based on the area of the input layer, but that is overlapped by a clipping layer.

This is similar to the process of intersecting layers, but differs because the attributes of the chosen layer are copied only to the new shape. Below, we will use Gopalganj district boundary to clip road network polylines, inundation class land type polygons, and BGS groundwater arsenic point data.

Fig 2



Polyline

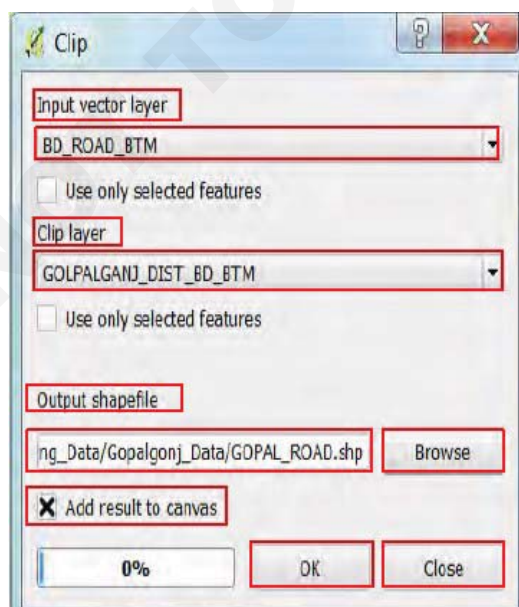
- 1 First, load GOPALGANJ_DIST_BD_BTM.shp and BD_ROAD_BTM.shp (~MODULE_07\Data) files in QGIS canvas.
- 2 Click Vector -> Geoprocessing Tools -> CLIP
- 3 Select BD_ROAD_BTM as an Input vector layer and GOPALGANJ_DIST_BD_BTM as a Clip layer
- 4 Check Add result to canvas
- 5 Browse to the directory (~MODULE_07\Data) and then save as GOPAL_ROAD.shp

- 6 Click OK and Close.

Point layer

- 1 Load GOPALGANJ_DIST_BD_BTM.shp and BGS_groundwater_BTM.shp (~MODULE_07\Data) files in QGIS canvas.
- 2 Click Vector -> Geoprocessing Tools -> CLIP
- 3 Select BGS_groundwater_BTM as a Input vector layer and GOPALGANJ_DIST_BD_BTM as a Clip layer
- 4 Check Add result to canvas

Fig 3



5 Browse to the directory (~MODULE_07\Data) and save as GOPAL_BGS.shp

6 Click OK and Close.

Polygons

1 Load GOPALGANJ_DIST_BD_BT.M.shp and

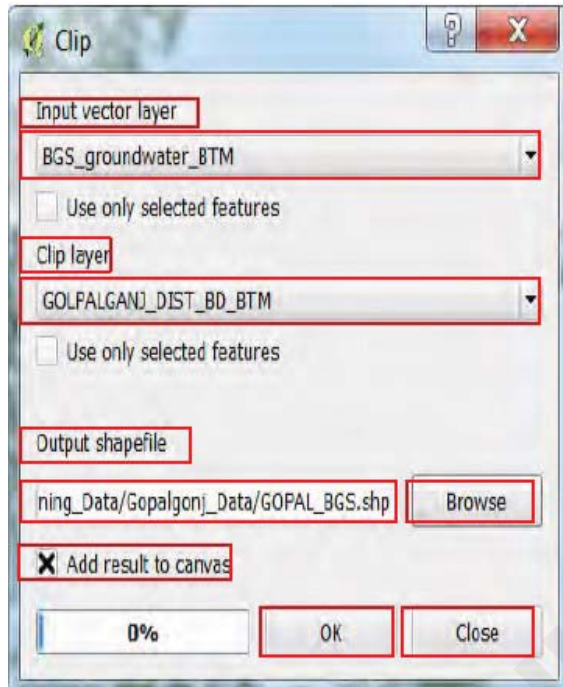
BD_Lantype_BT.M.shp (~MODULE_07\Data) files in QGIS canvas.

2 Click Vector -> Geoprocessing Tools -> CLIP

3 Select BD_Landtpe_BT.M as a Input vector layer and GOPALGANJ_DIST_BD_BT.M as a Clip layer

4 Check Add result to canvas

Fig 4



5 Browse to the directory (~MODULE_07\Data) and save as GOPAL_LandType.shp

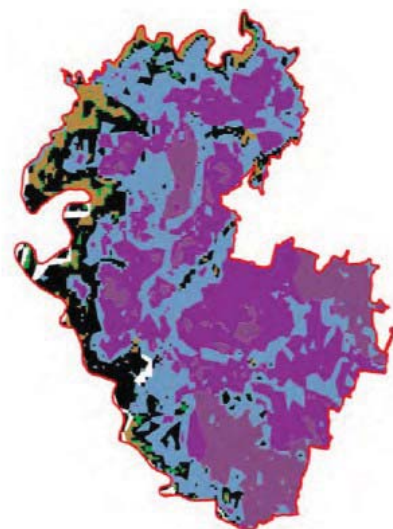
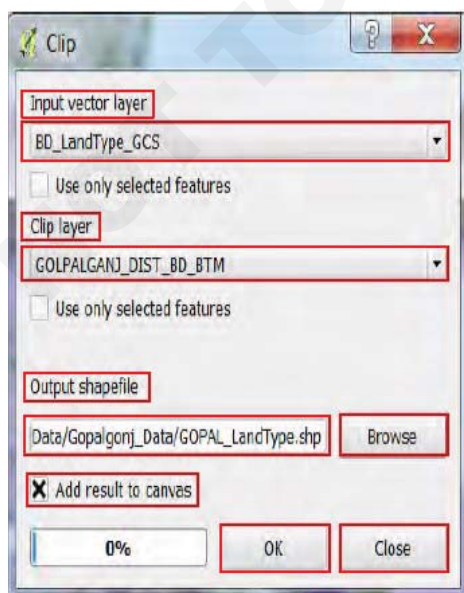
6 Click OK (it will take several minutes to process all data and complete this work) and then, click Close.

Buffer

Buffering creates an envelope of space around selected features in source layer or file. For this reason, buffers are

sometimes referred to as a zone of a specified distance around a polygon, line, or point features. Buffering is often used for proximity analysis. In this section, we will create 400 m buffer zones around the road network and BGS sampling points of Gopalganj district. Such a buffer could be used later on to examine the extent of farmland or

Fig 5



sampling points within the buffer, etc. This activity thus has many uses for spatial quantification and data analysis.

Buffering of Polylines

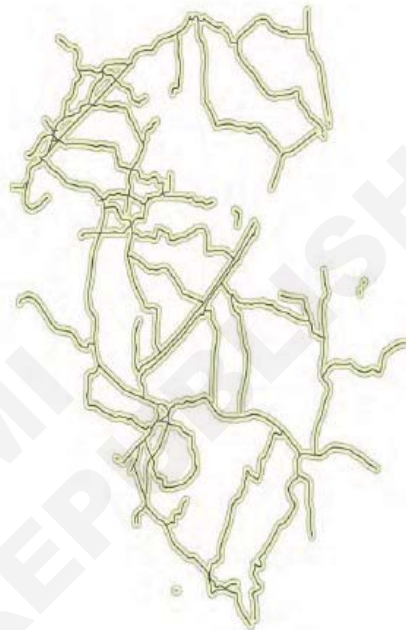
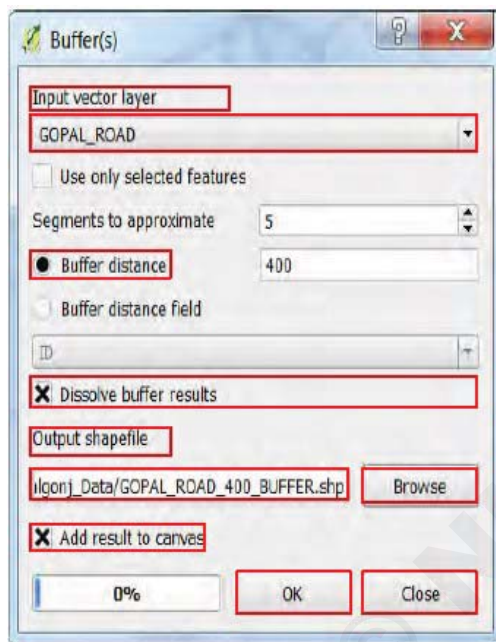
- 1 Load GOPAL_ROAD.shp file (~MODULE_07\Data) in QGIS canvas.
- 2 Click Vector -> Geoprocessing Tools -> Buffer (S)
- 3 Select GOPAL_ROAD as a Input vector layer
- 4 400 m as Buffer distance

- 5 Check Dissolve buffer results and Add result to canvas
- 6 Browse to the directory (~MODULE_07\Data) and save as GOPAL_ROAD_400_BUFFER.shp

Buffering of Point layers

- 1 Load GOPAL_ROAD.shp file (~MODULE_01\Data) in QGIS canvas.
- 2 Click Vector -> Geoprocessing Tools -> Buffer (S)
- 3 Select GOPAL_BGS as a Input vector layer
- 4 400 m as Buffer distance

Fig 6



- 5 Check Dissolve buffer results and Add result to canvas
- 6 Browse to the directory (~MODULE_07\Data) and save as GOPAL_BGS_400_BUFFER.shp

Dissolve

Dissolve separates overlapping areas in the same layer. Here, we will use a district shape file to create a country boundary shape file after dissolving boundary all districts.

- 1 Load BD_DIST_BT.M.shp file (MODULE_07\Data) in QGIS canvas.
- 2 Click Vector -> Geoprocessing Tools -> Dissolve
- 3 Select BD_DIST_BT.M as a Input vector layer
- 4 Select Dissolve all in Dissolve field
- 5 Check Add result to canvas
- 6 Browse to the directory (~MODULE_07\Data\) and then save as BD_BOUNDARY_BT.M.shp
- 7 Click OK and Close.

Merge shapefiles

Here, you will learn how to merge multiple shape files to

create a single shapefile. We will use layers from seven divisions of Bangladesh to create the single layer file.

- 1 Click Vector -> Data Management Tools -> Merge shapefiles to one
- 2 Select Polygon as Shapefile type
- 3 Browse and select Input directory folder ~MODULE_07\Data\BD_DIVISION
- 4 Browse to the directory folder (~MODULE_07\Data) and save as BD_DIV_GCS.shp.
- 5 Click Add result to canvass, then OK and then, close. Note that you may need to accept each layer by clicking OK again if additional windows appear.

Using Query Builder to Select Areas

In this section, we will create a shape of the hilly districts using Query Builder. This is a useful process that can be later employed to sort spatial data according to queries that you can build (e.g., to show areas larger or smaller than a specified number or by capturing specified data).

- 1 Load BD_DIST_BT.M.shp file (~MODULE_07\Data) in QGIS canvas.

Fig 7

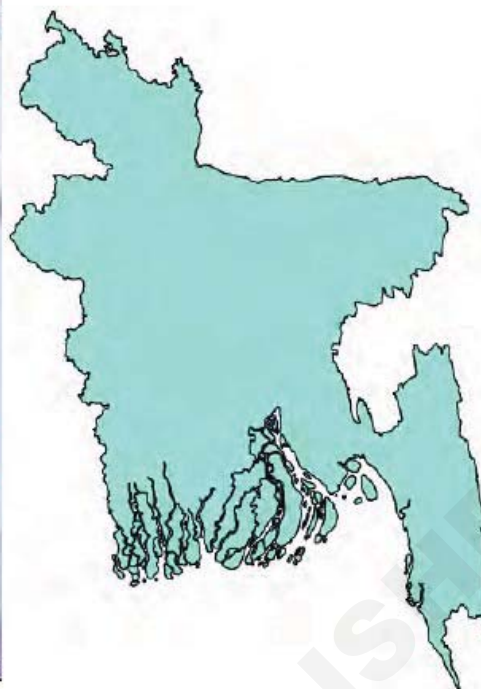
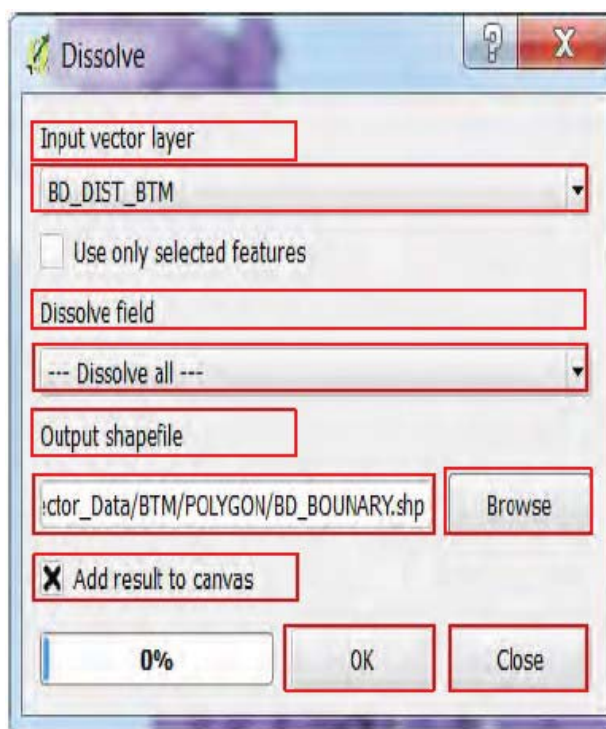
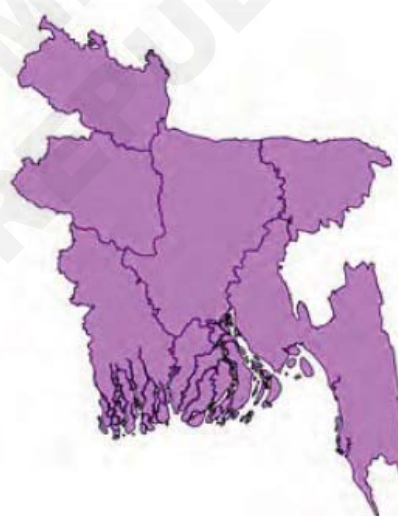
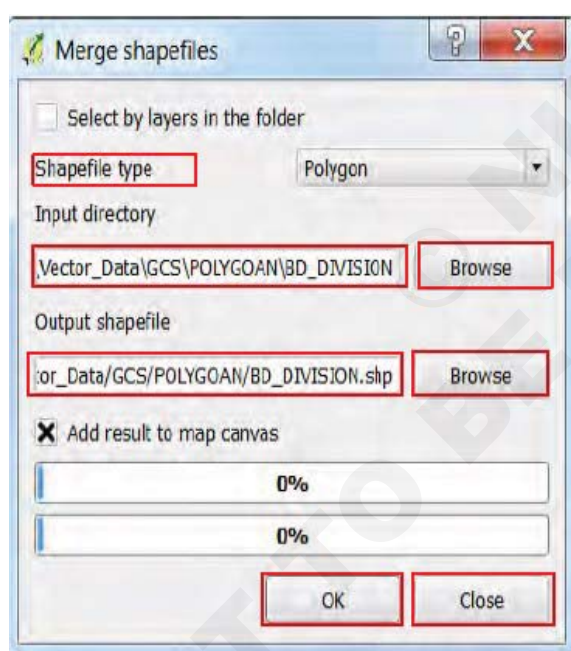


Fig 8



- 2 Right click on BD_DIST_BTМ and select Filter
- 3 In the Fields form, select DIST_NAME and double click on it, and it should appear in the Expression form.
- 4 Click All in Values form and all district names should appear in the values form.
- 5 Then, click once on the operator button "=", and double click on 'Bandarban' and then click "OR".
- 6 Double click DIST_NAME and click "=", click 'Cox's Bazar'.

- 7 Repeat steps 4-5 for Chittagong, Khagrachhari, and Rangamatidistricts. The final expression should look as follows:

"DIST_NAME" = 'Bandarban' OR "DIST_NAME" = 'Cox's Bazar' or "DIST_NAME" = 'Chittagong' OR "DIST_NAME" = 'Khagrachhari' OR "DIST_NAME" = 'Rangamati'

- 8 Click TEST which will validate the expression. If correct, your result of the test will indicate that the where clause returned five rows of data.

9 Then, click OK

10 Save selected districts as BD_HILLY_AREA.shpin
~MODULE_07\Data\

Polygon Editing

1 Load BD_HILLY_AREA_BT.M.shp file
(~MODULE_07\Data) in QGIS canvas.

2 Click View -> Toolbars and Check Advanced Digitizing

3 Then, click Layer -> Toggle Editing

4 Click Delete Part tools

5 With this tool we can delete all islands in the
HILLY_HILLY_AREA layer file.

6 After deleting, click Layer -> Toggle Editing and save
your work.

Fig 9

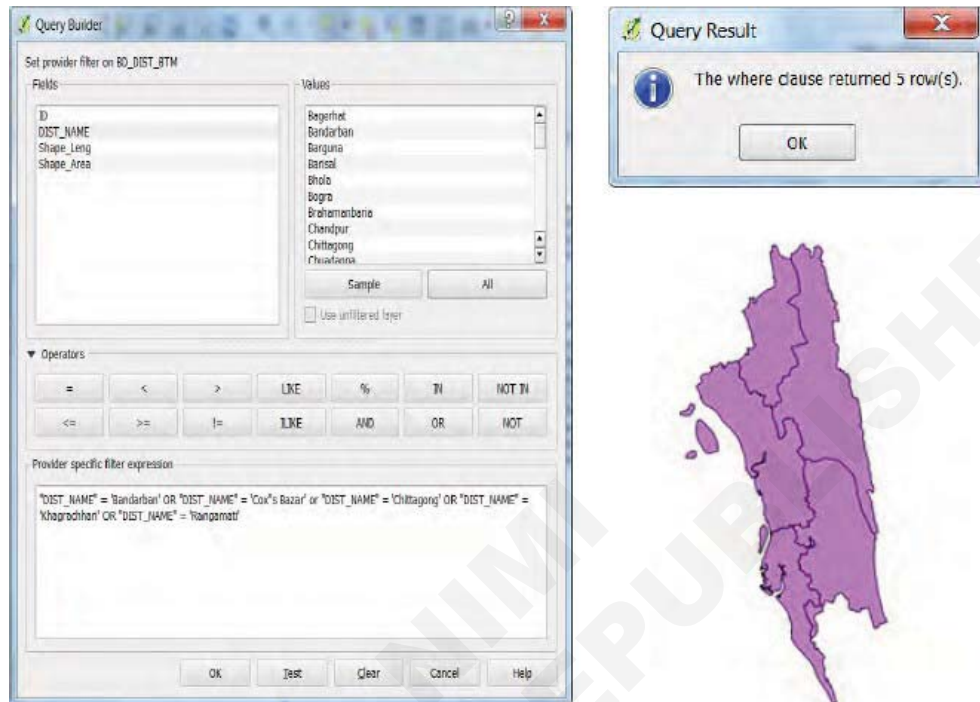
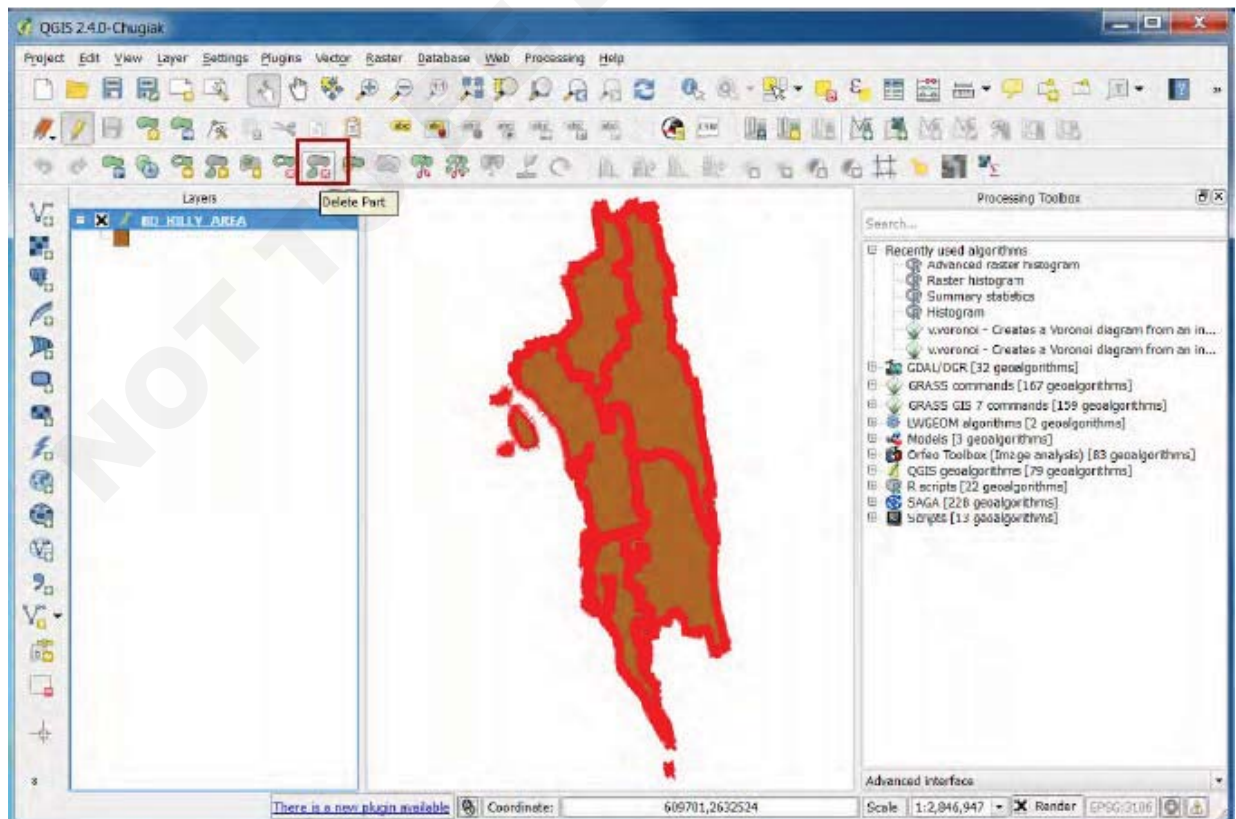


Fig 10



Explore Editing of Shape Files

Objective: At the end of this exercise you shall be able to

- **digitize (vectorization) a map/toposheet using ArcGIS.**

Requirements
Tools/Equipments/Instruments <ul style="list-style-type: none">• Arc GIS Software• Georeferenced• Projected Survey of India Topo Sheet

PROCEDURE

Shapefile

A shapefile is an Esri vector data storage format for storing the location, shape, and attributes of geographic features. It is stored as a set of related files and contains one feature class. Shapefiles often contain large features with a lot of associated data and historically have been used in GIS desktop applications such as ArcMap.

Creating a new shapefile

- 1 Open ArcCatalog
- 2 Navigate to project folder
- 3 From the menu, click File>New>Shapefile
- 4 Give shapefile a name and select geometry (point, line or polygon), based on what type of features are trying to draw.
- 5 Use the Edit button to select the projected coordinate system WGS_1984_UTM_Zone_44N.
- 6 Click on ok to create shapefile.
- 7 Use the same projection for all map layers in a project in order to preserve accuracy.

Editing Shapefile

- 1 Add shapefile to ArcMap project
- 2 Open the Attribute Table of shapefile
- 3 Using the Attribute Table Options button, use the Add

Field button to add fields you want to keep track of.

- 4 Optional: Set the symbology of your fields now. This will save time later when creating features.

Digitization

- 1 Open the snapping toolbar Via Customize Toolbars>snapping
- 2 Make sure snapping is turned on and that all types are active.
- 3 Editor -> start editing. Select which layer to edit (your new shapefile point, line or polygon). Select the task to perform (Create New Feature).
- 4 Select the editing pencil tool and click on, along, or around the features in a georeferenced and projected map you want to digitize or vectorize. You can zoom and pan to make this easier.
- 5 When finished drawing, right click and select Finish Sketch.
- 6 To edit the attribute table for the feature you just created click the Attributes icon on the Editor Toolbar.
- 7 All the editable fields for the feature you just created will appear. This way you can label your features as you create them.
- 8 When you're done creating features click on the Editor button on the Editor toolbar and select Save Edits, and then Stop Editing.

Explore Query Builder Field Calculator

Objective: At the end of this exercise you shall be able to

- find and high light the building of specific properties based on its attribute data.

Requirements

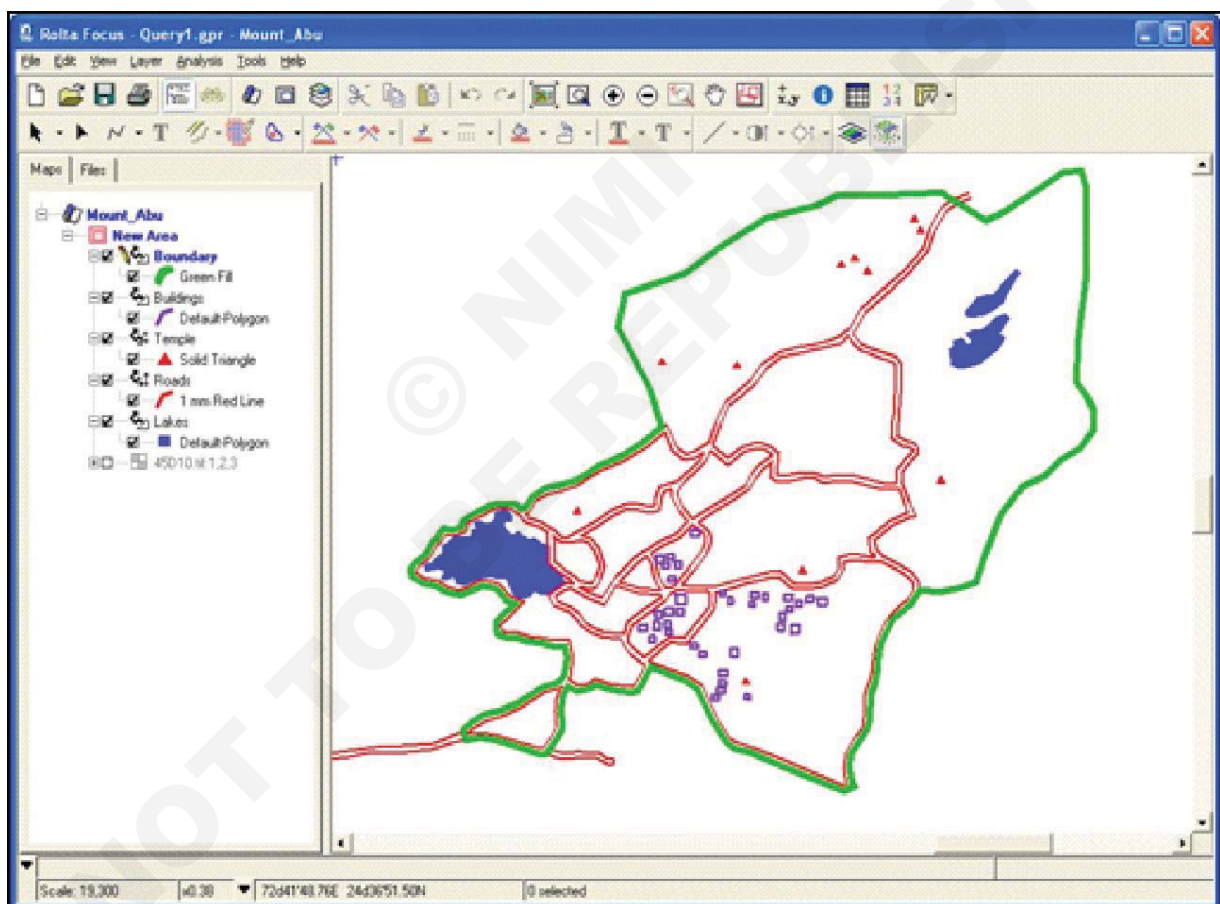
Tools/Equipments/Instruments

- Computer with Internet Connection
- GIS Software

PROCEDURE

- 1 Open a new unnamed project. Add all the vector layers into it and save it.
- 2 Open the attribute of the vector layer by right clicking on the layer.

Fig 1



- 3 Attribute Manager Dialogue box will open.
 - 4 Here we have buildings name with Type A, B, C, D etc.
 - 5 If you want to see all the buildings with Type A, then highlight any one of them from the map.
 - 6 Go to Spatial Query window & select query by example.
 - 7 Query by example dialogue box will open; Select Name in Attributes box and Attribute Value as per requirement (For Example A to display all the Buildings Naming with A Attributes).
 - 8 Then click on Add & Apply & OK.
 - 9 Now all the building with type A gets highlighted.
- Spatial query tool can be select from the tool bar as shown above:

Fig2

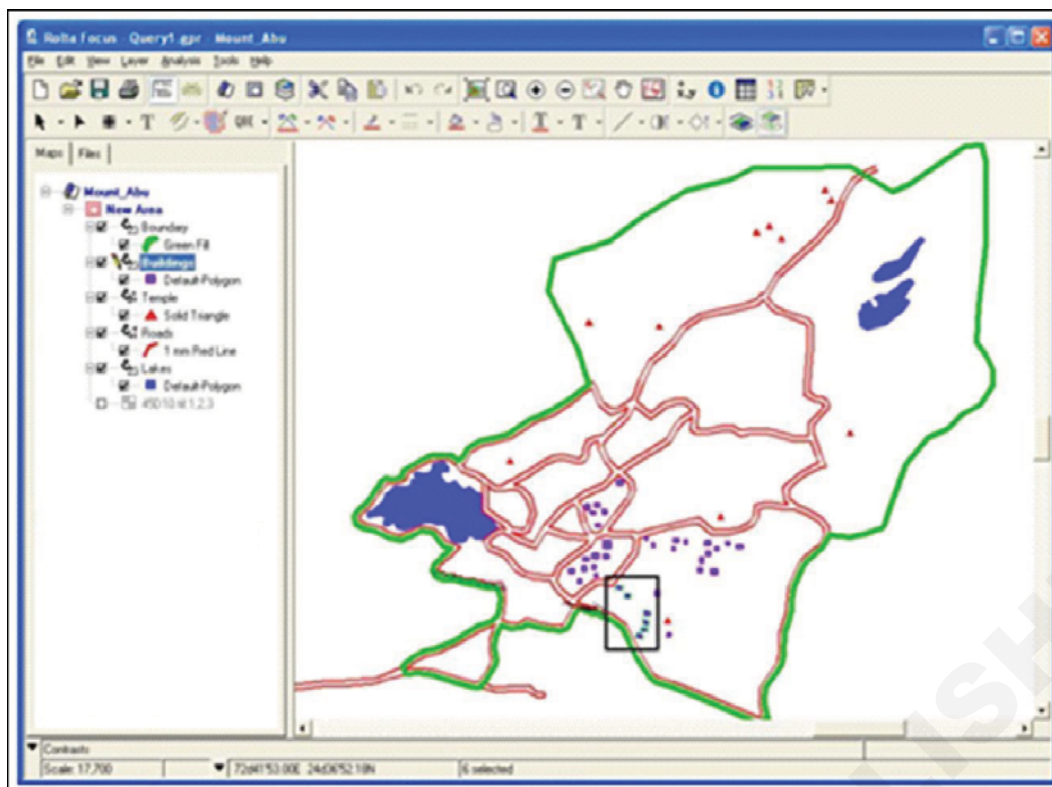
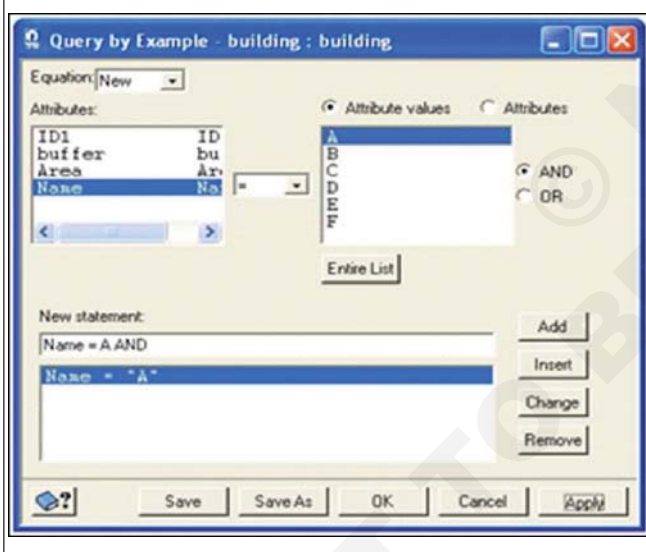


Fig3



Let's find Temple with the name "Dilwara Jain Temple"

- 1 Right click on Temple layer.
- 2 Open the attribute of the vector layer by right clicking on the layer.

- 3 Attribute Manager Dialogue box will open.
- 4 Suppose if we want to see the Temple with the name "Dilwara Jain temple", go to Spatial Query window & select query by example.
- 5 Query by example dialogue box will open; Select Name in Attributes box and Attribute Value as per requirement.
- 6 Set attribute as name, select Dilwara Jain temple in Entry List.
- 7 Then click on Add & Apply & OK
- 8 Now Dilwara Jain Temple will get highlighted.

Similarly, if we want to find out the lake area equal to 2642.42, we can build query based on area from Mount Abu map. Select Water Body to build the query as below:

- Select area as attribute and attribute value from entry list, add it in new statement, click on apply & OK.
- As result we can see the lake equal to 26462.042.

Result:

Fig4

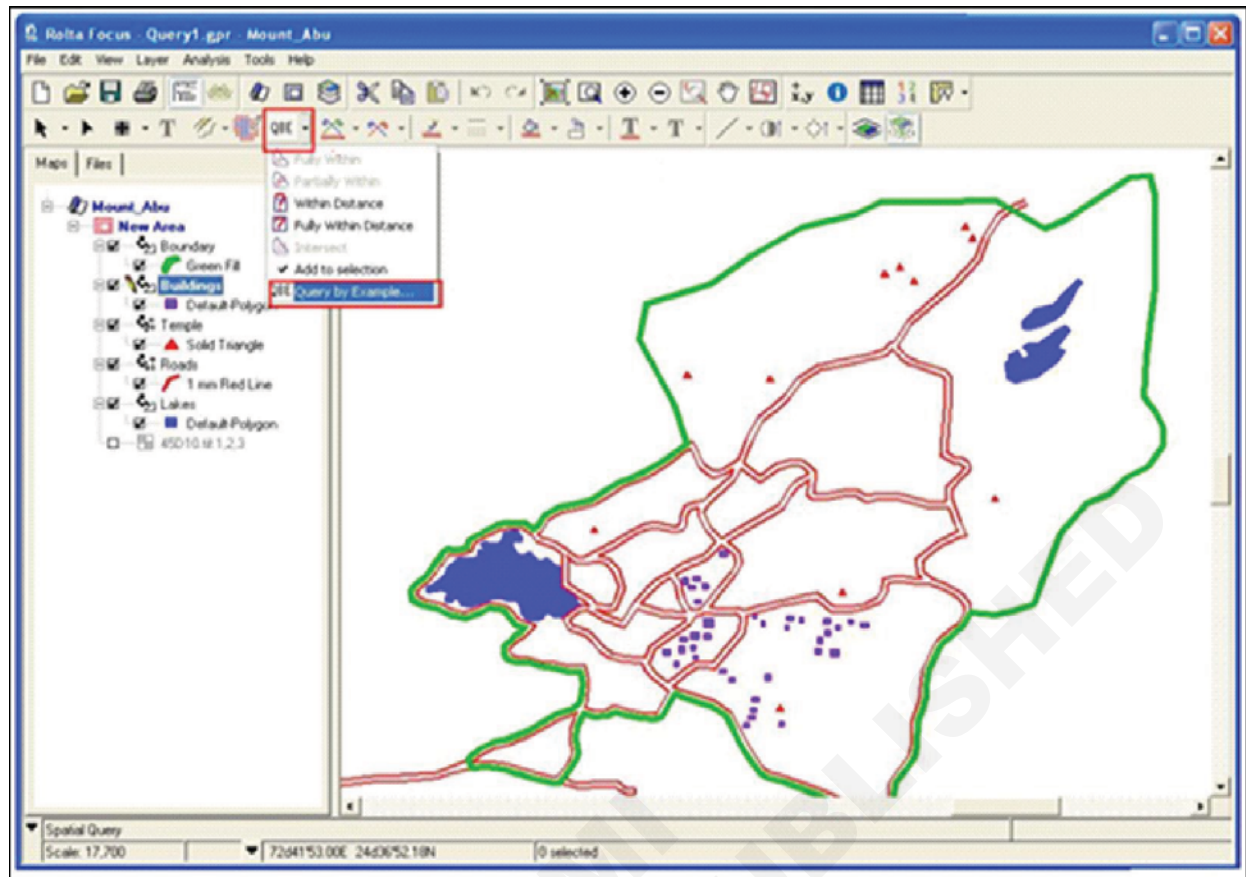


Fig5

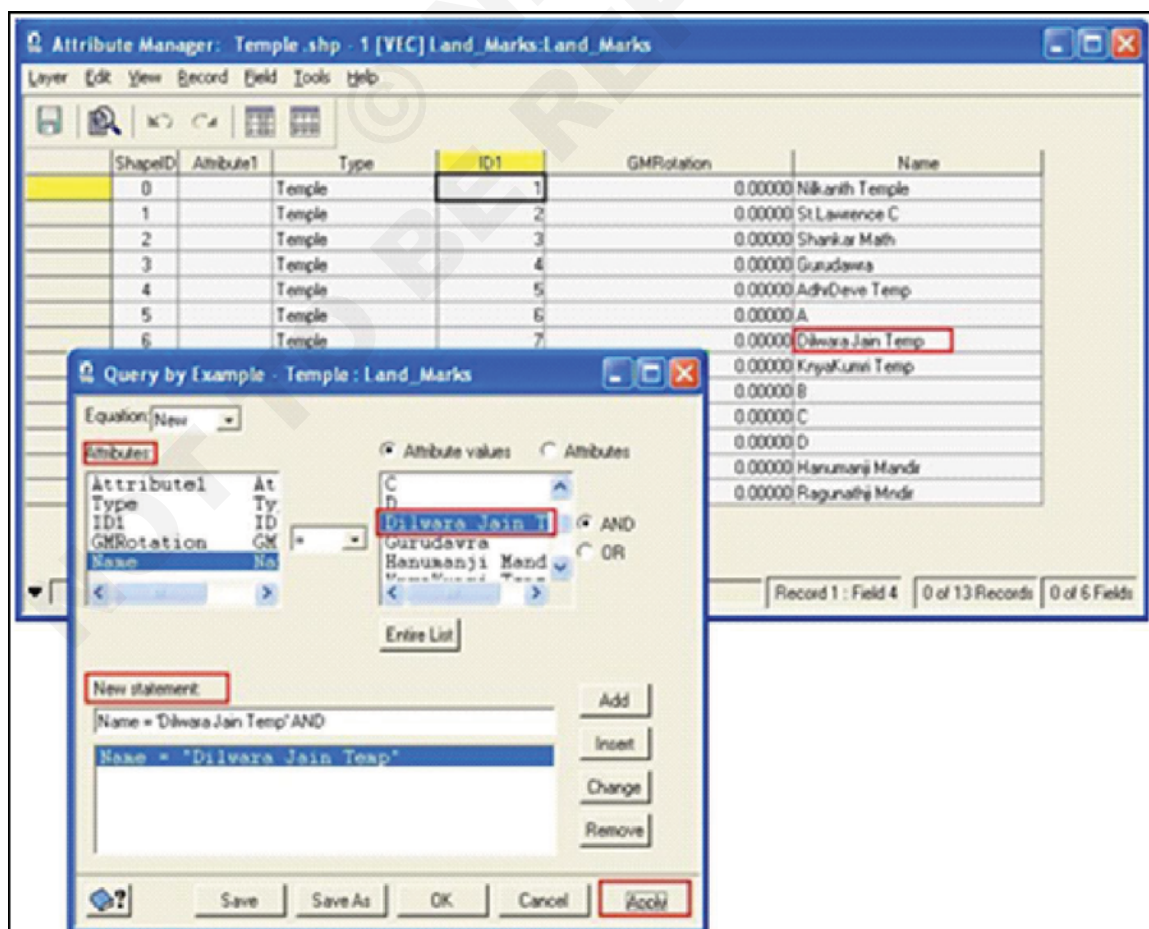


Fig6

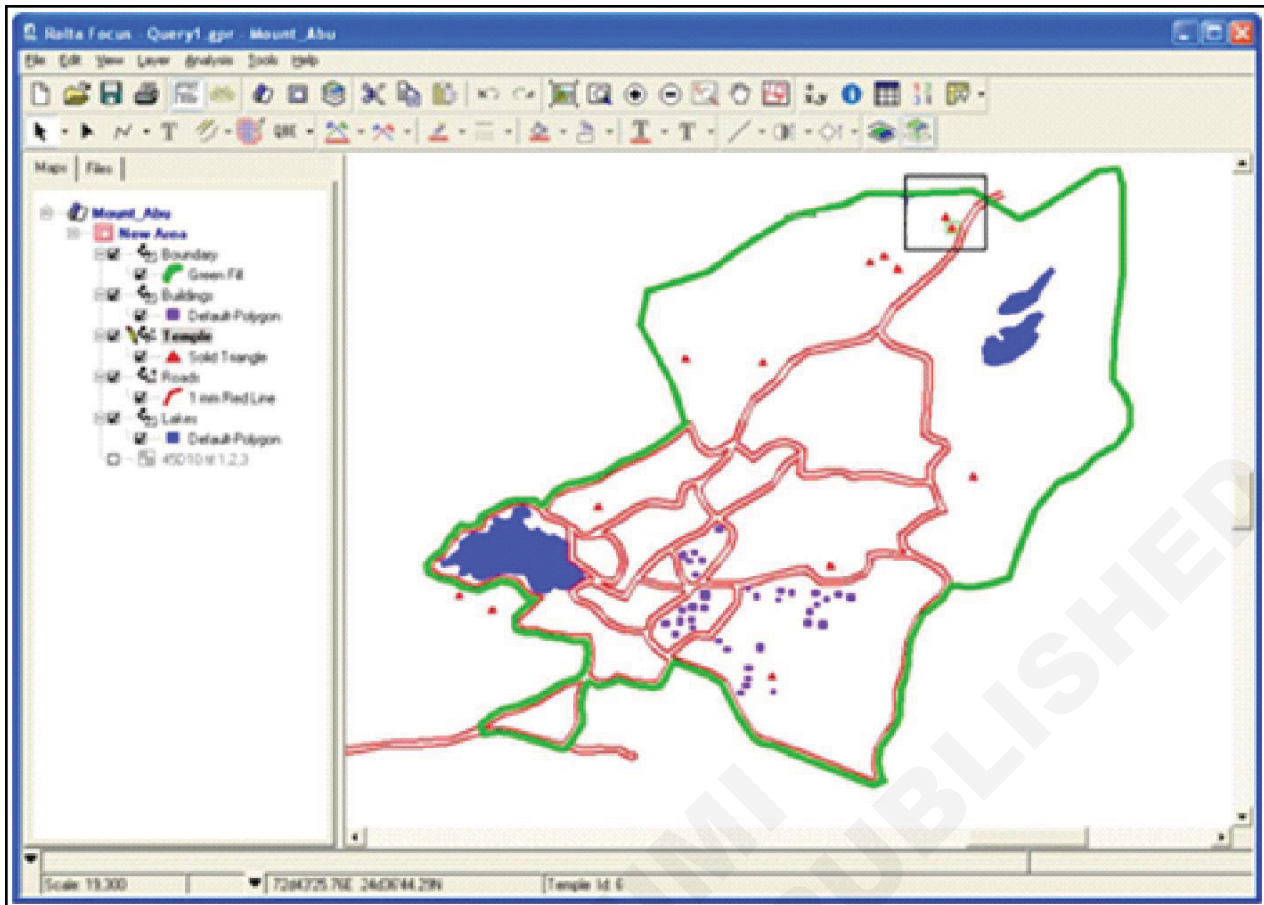


Fig 7

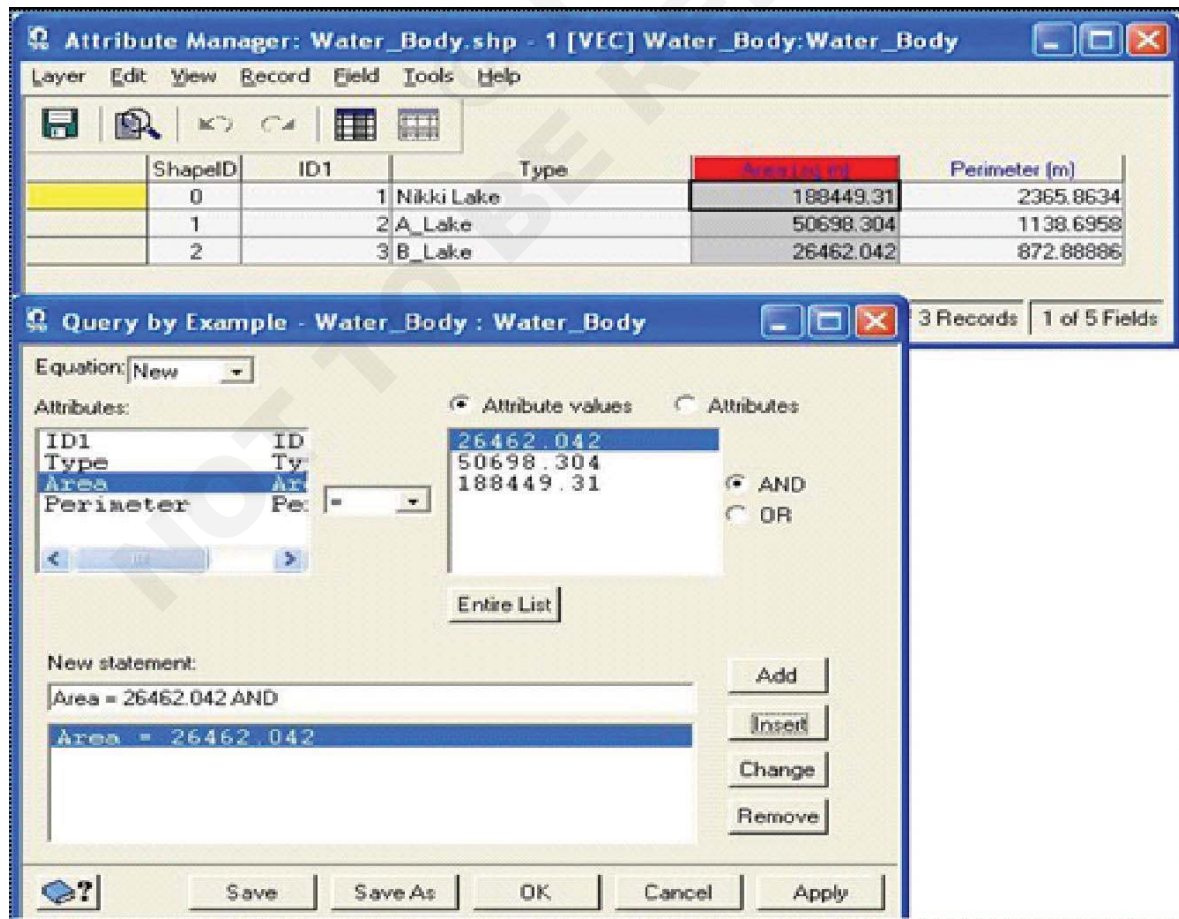
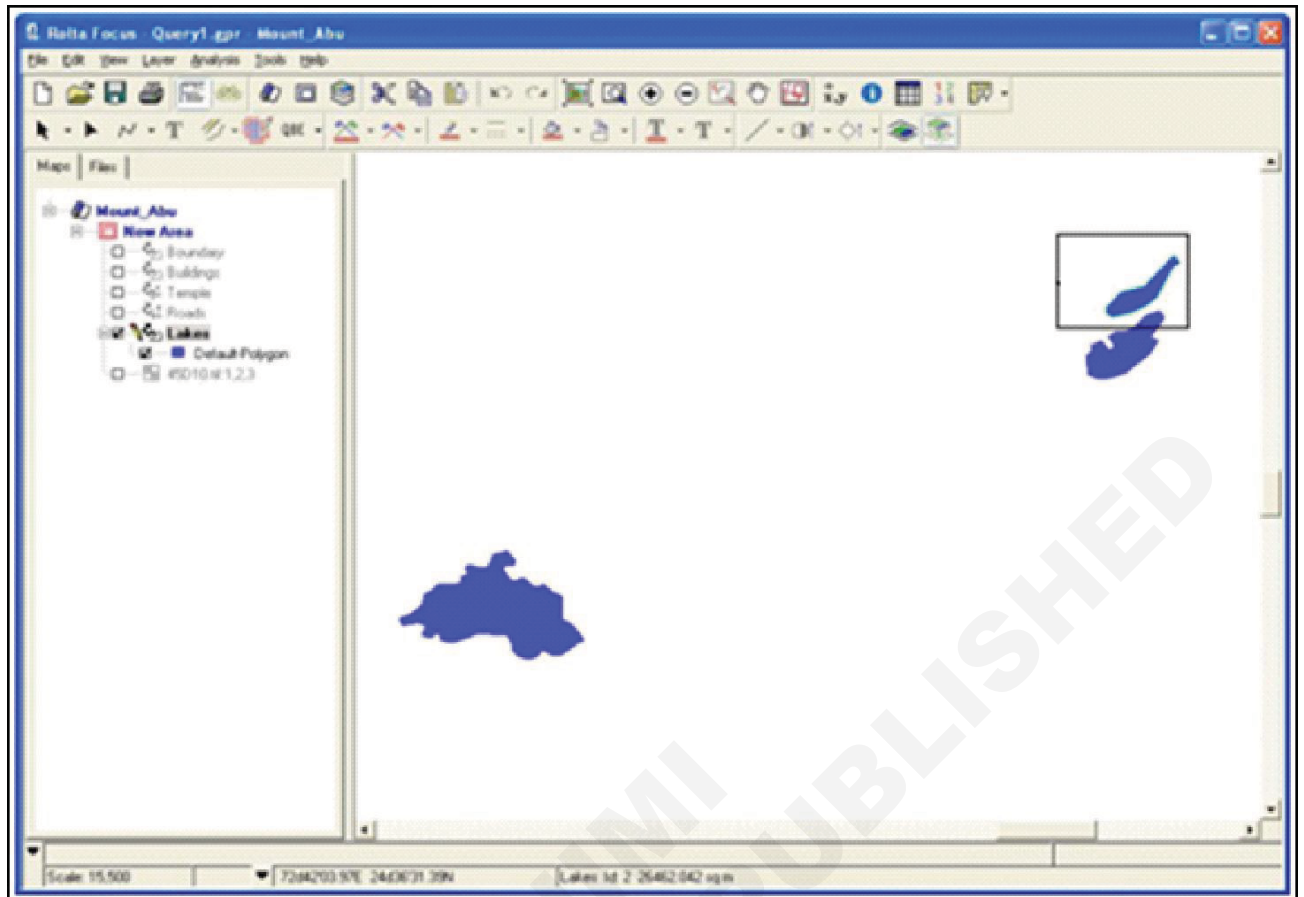


Fig 8



Practice of Various Quires in Query Builder

Objective: At the end of this exercise you shall be able to

- practice of various quires using GIS software.

Requirements

Tools/Equipments/Instruments

- Computer with Internet Connection
- GIS Software

PROCEDURE



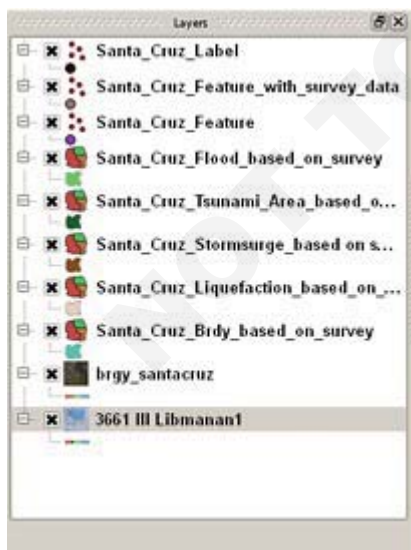
- 1 Open Quantum GIS.
- 2 Use these icons to add vector  or raster  data.
- 3 Now right click inside the “table of contents” then click “Add group”. Drag all the features you want to group (i.e. layer based on survey or layer based on NSO boundary).
- 4 To change the color and style of the feature/s, right click each layer then choose “Properties”.

Fig 1



Fig 2



In a new dialogue box, click “Symbology” tab then choose “Legend type” from drop down menu then select the

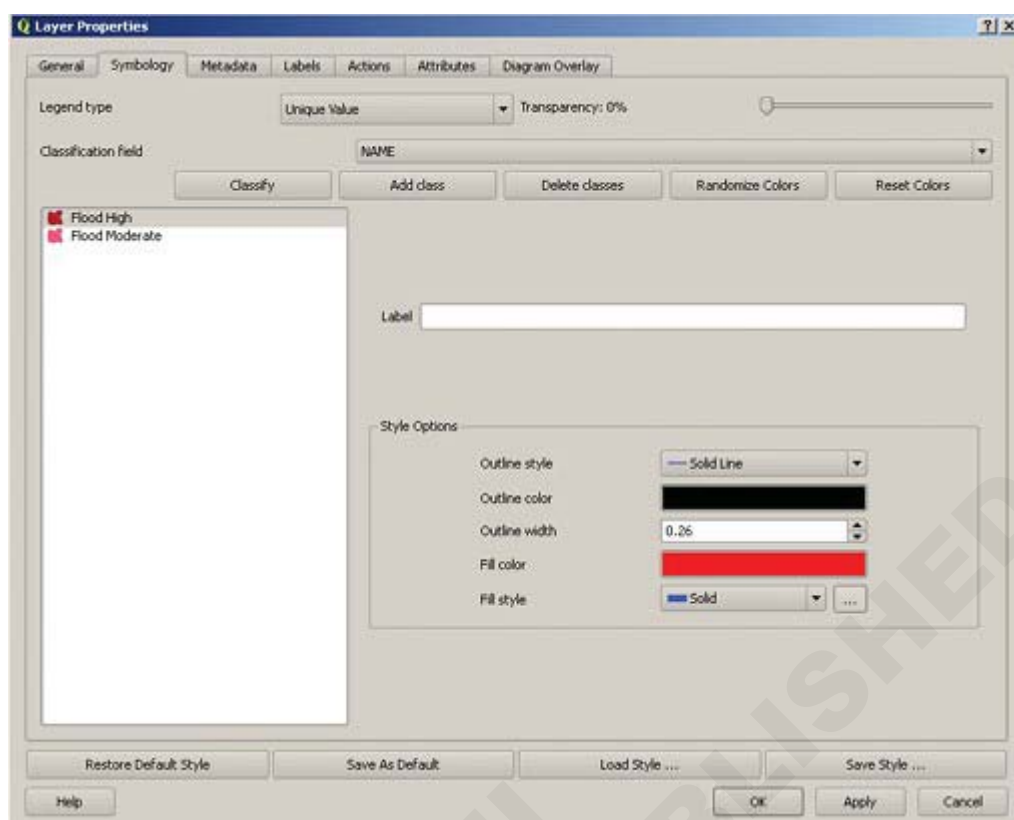
Fig 3



“Classification field” you want to use from drop down menu and then click “Classify” button. Click each layer to activate the color option from “Style Options” portion. You can also set the layer transparency to overview the satellite/NAMRIA as base map by sliding the “Transparency” slide bar. Click “OK” when you finish.

- High Susceptibility = Color RED
 - Moderate Susceptibility = Color PINK
 - Low Susceptibility = Color YELLOW
- 6 By simple investigation process in the map you can immediately see the houses that are considered at risk.
 - 7 ave the project.

Fig 4



Explore Raster Properties Dialog

Objective: At the end of this exercise you shall be able to

- explore the properties of raster.

Requirements

Tools/Equipments/Instruments

- Computer with Internet Connection
- GIS Software

PROCEDURE

- 1 Mergers (mosaic) of multiple sheets to create a continuous raster

- 2 Clipping the Merged-DEM with the Bangladesh country boundary

- 3 Re-projection of the Clipped-DEM to a custom CRS.

The data for this exercise are located in: ~\MODULE_08\Data\ directory:

- 1 Four DEM raster in ALL_SHEETS_DEM_GCS sub-directory of MODULE_03/Data
- 2 Country boundary of Bangladesh

Merge

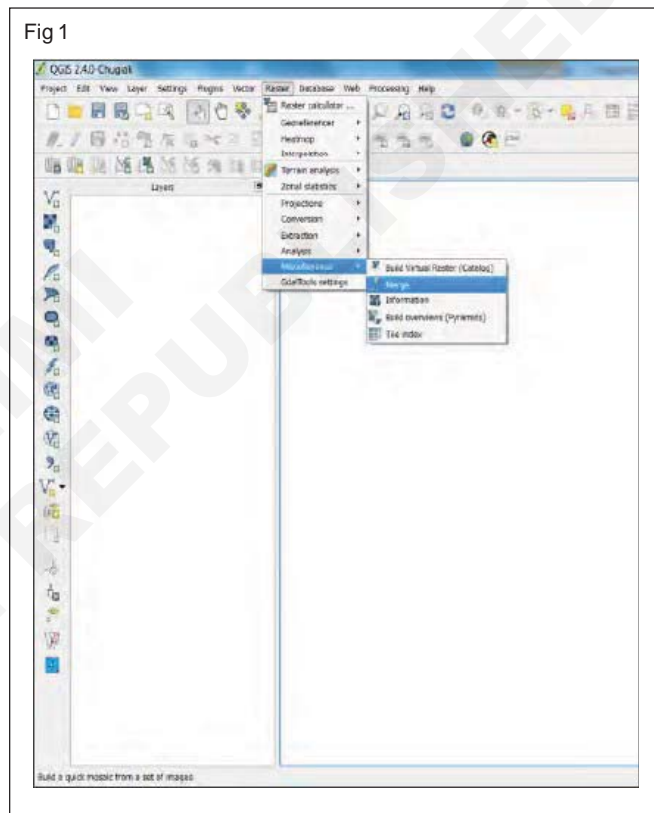
In this exercise, we will choose the directory (ALL_Sheets_DEM_GCS) from MODULE_03/Data folder to merge all sheets in this directory to create a seamless raster using the built-in batch processing capability in QGIS.

- 1 Click on the menu item Raster -> Miscellaneous-> Merge
- 2 Check Choose input directory instead of file
- 3 Select the ALL_Sheets_DEM_GCS folder as an Input directory from ~\MODULE_03/Data
- 4 Select DEM_MERGE_GCS.tif as an Output file
- 5 Check Load into canvas when finished
- 6 Click OK and then, Close

Clip

- 1 Open DEM_MERGE_GCS.TIF raster and BD_BOUNDARY_GCS.shp on the QGIS canvas. This step overlays vector data on raster data.
- 2 Click on the menu item Raster -> Extraction-> Clipper
- 3 Select DEM_MERGE_GCS as an Input file (raster) and BD_DEM_GCS as an Output file in .tif format

Fig 1



- 4 Next, change No data value to -9999 (The aspect value -9999 is generally used as the 'nodata' value to indicate use of an undefined aspect in areas lacking variation in topography, with slope=0. This will be clarified in Module 9)

- 5 Select Mask layer as Clipping mode and Select BD_BOUNDARY_GCS as a Mask layer

- 6 Click OK and then Close

Re-projection

The digital elevation model, or DEM, obtained in the last step is not yet suitable as an input for digital terrain modeling (e.g. Slope, Aspect, Curvature, etc. are incorrect). This is because while its elevation values are in meters, cell size of the rasters is not expressed in meters (this is because that layer uses a CRS with geographic

coordinates). Because of these issues, a re-projection is needed. To reproject a raster layer, the Warp (reproject) algorithm can be used again. We reproject into a CRS with meters as units, so we can then correctly all spatial analysis function.


- 1 Click the Add raster layer button  and select the file BD_DEM_GCS.tif
- 2 Click Raster->Projection->Warp(Reproject)
- 3 Define Output file as BD_DEM_BTМ and file type GeoTIFF
- 4 EPSG:4326 will be popping up as Source SRS
- 5 Check Target SRS and Select EPSG_3106_BTМ_D_GULSAN_NEW as Target SRS and click OK
- 6 No data value as -9999, and Load into canvas when finished
- 7 Click OK again and then, Close. Note that processing may take some time.

Fig 2

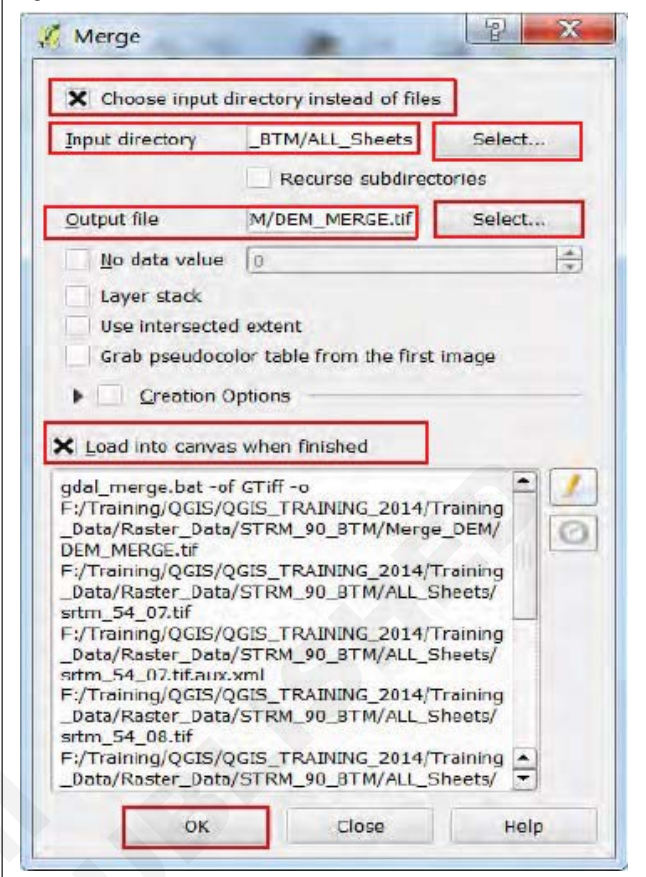


Fig 3

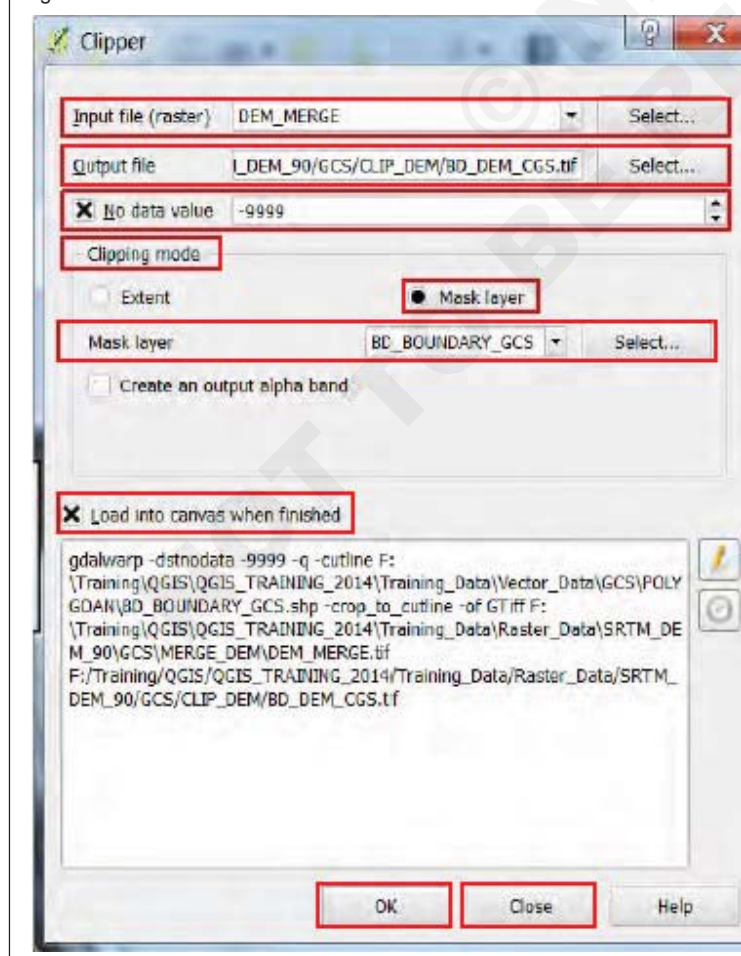
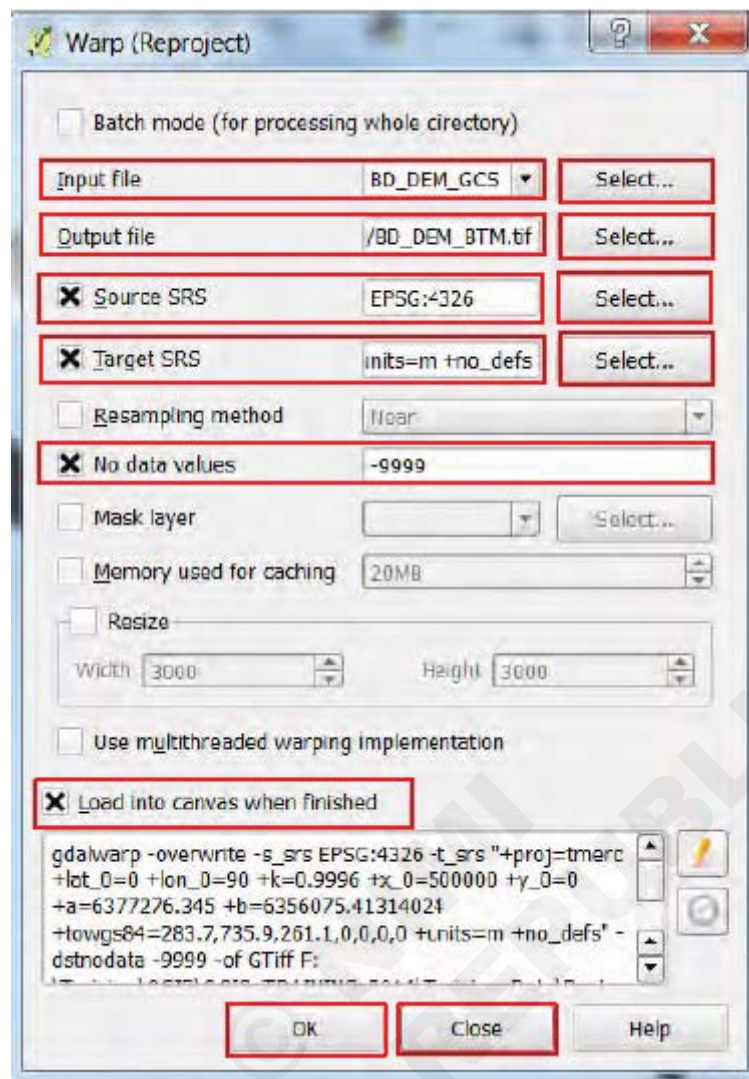


Fig 4



Practice Use of Raster Calculator Raster

Objective: At the end of this exercise you shall be able to

- to create a raster of a constant value within the extent and cell size of the analysis window.

Requirements

Tools/Equipments/Instruments

- Computer with Internet Connection
- GIS Software

Description

The basic GIS function includes querying, Integrating and manipulating spatial data. The core functionality of GIS is that is combines computer mapping function that handles and displays the spatial data, with DBMS function to handle attribute data.

PROCEDURE

- The “create constant raster tool” assigns the specified value to every cell in the output raster.
- The constant value must be a numeric value scientific notation is acceptable (for example, $3.048e - 4$ for 0.003048)
- Select constant value - The constant value with which to populate all the cells in the output raster.
- Select data type .

- Select cell size - The cell size for the output raster dataset - Analyais cell size.
- Extent - The extent for the output raster dataset- The extent is a python class.
- The output raster for which each cell will have the specified constant value.

Result

The raster analysis was performed for given data with python program.

- Click point. Shp and Click toggle editing. Give unique point number for each point.
- Similary repeat point number 6 for line. Ship and polygon.shp.
- Save the output as a layout format (with Legends, scale, north arrow, etc)

Familiarization with RS Software ILWIS Installation

Objective: At the end of this exercise you shall be able to


- install RS software.

Requirements

Tools/Equipments/Instruments

- Computer & Internet Connection
- ILWIS Software

PROCEDURE

- 1 First, create a folder named ILWIS in your computer
- 2 Copy the downloaded file to the folder just created
- 3 Extract the file using either the winzip utility or the compressed folder utility
- 4 The extracted folder which you can rename would have another folder named 'I1wis38' (it will have all the rewired files and be about 79 MB in size)
- 5 Look for the  icon within the folder
- 6 Double-click the icon to install the software and follow the instructions and
- 7 You can directly use the software from the folder or for easy use you can place a shortcut to the application on the desktop.

Key Features of ILWIS GUI



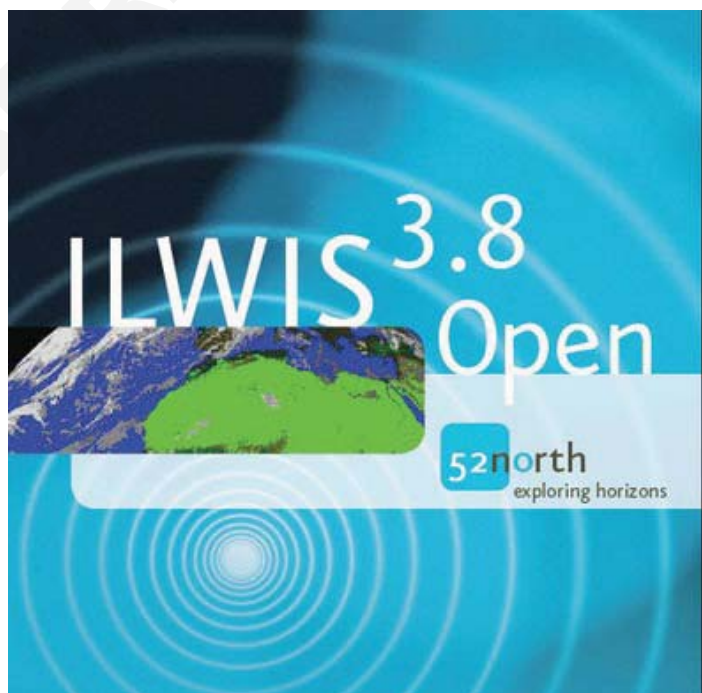
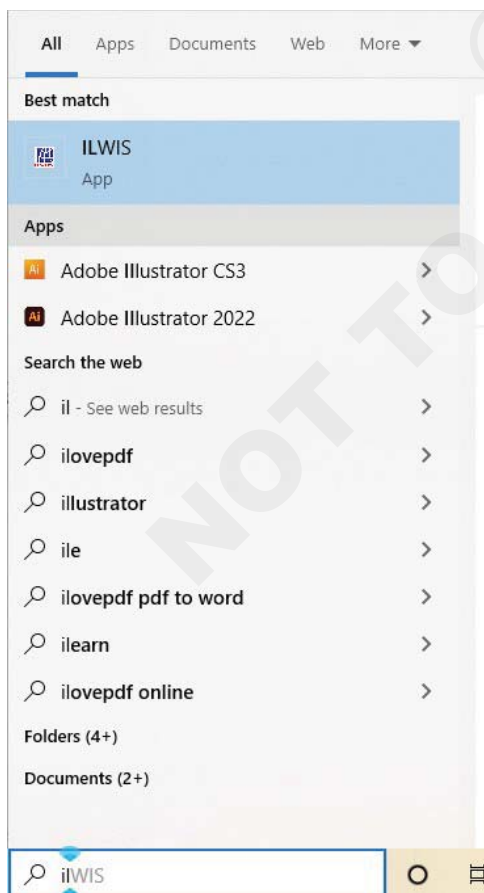
The software can be launched /started by double clicking the  icon from the windows start menu as indicated in the Fig 1a or by double clicking the  icon from the desktop shortcut. The main. window which opens up after the opening screen (Fig 1b) would look similar to what is shown in Fig 2.

Fig 1a & b



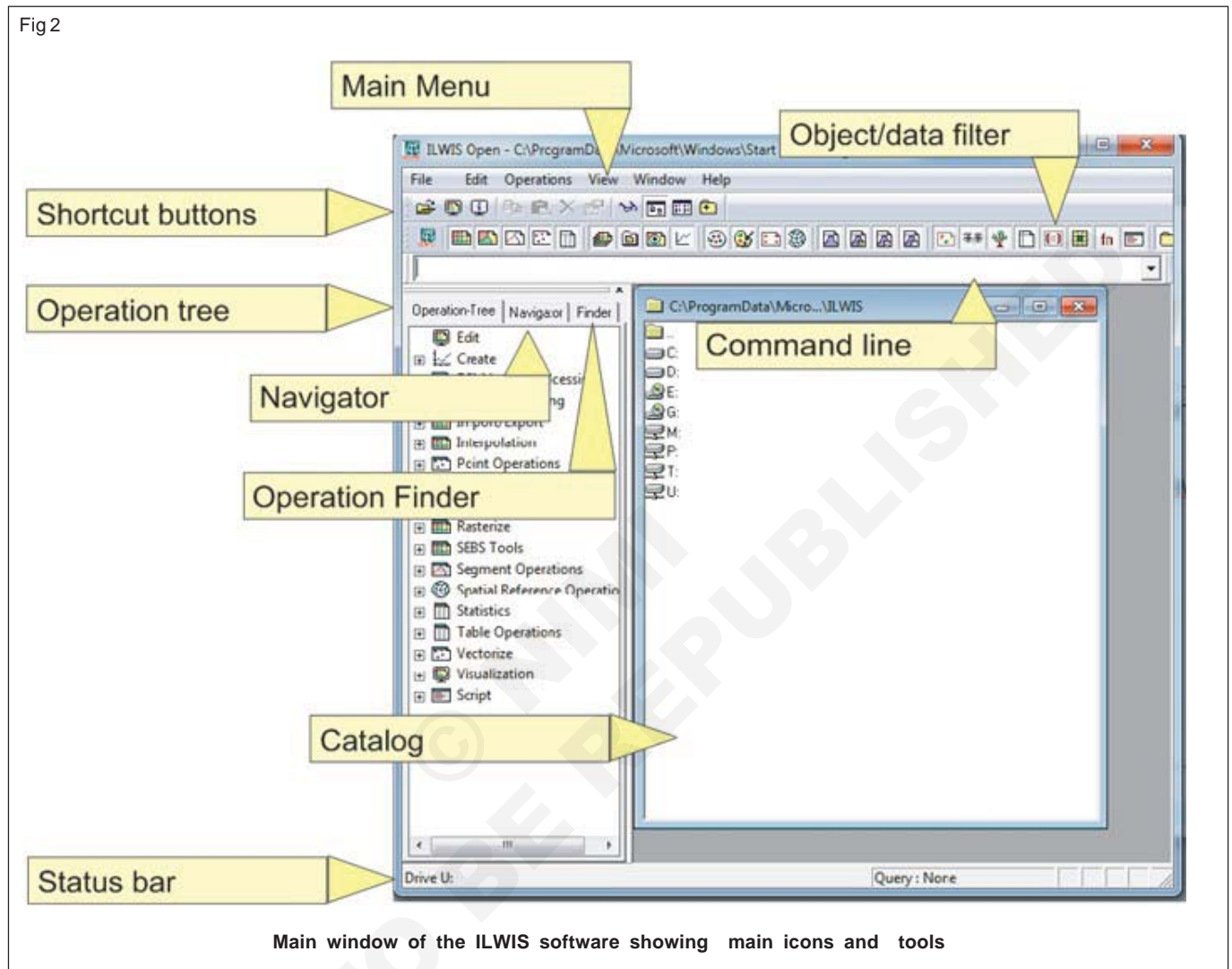
(a) Launching of ILWIS software from start menu, and
(b) opening screen the ILWIS software version 3.3.1 (Source : www.ilwis.org)

By default the main window consists of the following as illustrated in Fig 2.

- 1 Title bar
- 2 Menu bar

- 3 Standard toolbar
- 4 Object selection bar
- 5 Command line
- 6 Status bar
- 7 Navigator/Operation pane.

Fig 2

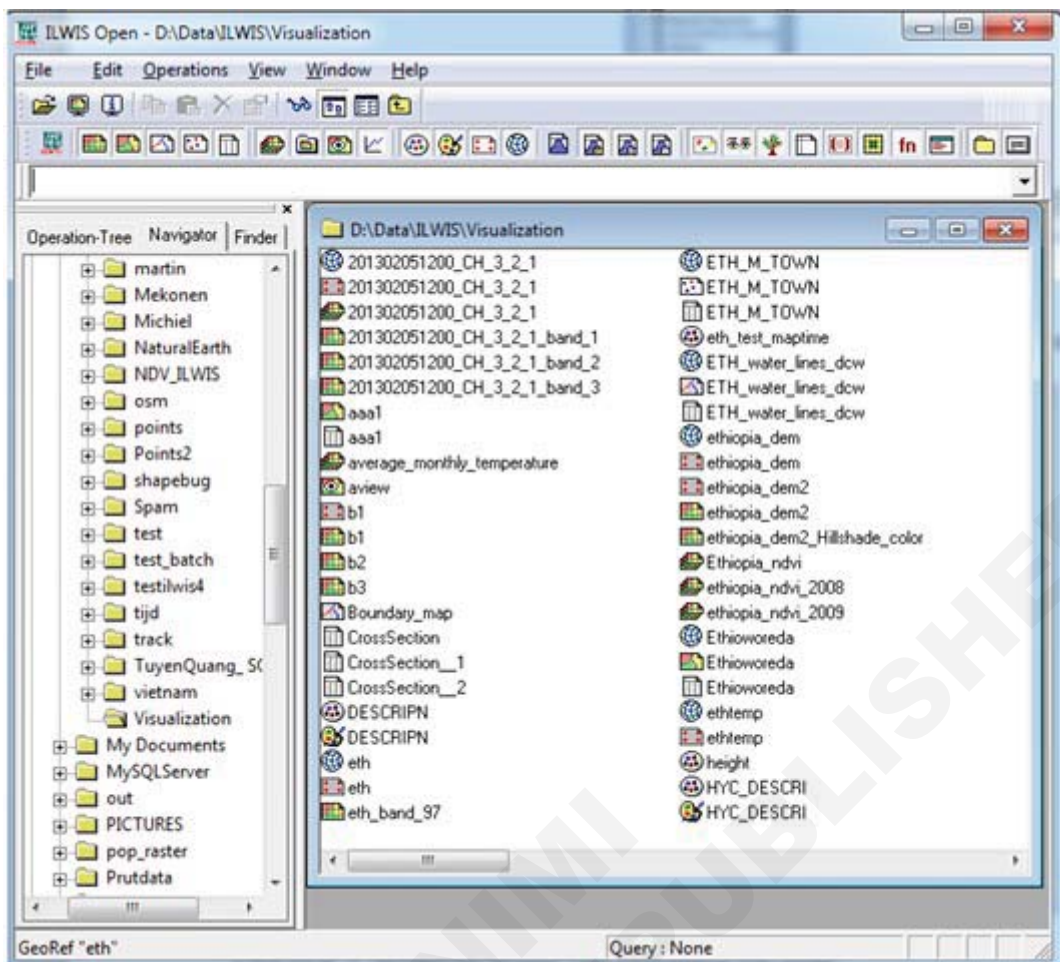


We will now discuss main features of ILWIS GUI (Graphics User Interface).

- **Title bar:** It shows the name of the currently active Catalogue. You can move a window to another position by dragging its Title bar.
- **Menu bar:** It allows the opening of files, starting different operations as well as links to the help and
- **Standard toolbar:** It provides shortcuts to the commonly used menu commands. It also helps to customise the catalogue as well as getting information about specific files. When you point your mouse on top of a button a ToolTip appears with the name of the button/menu command that it performs.
- **Object selection bar:** It allows you to specify the objects that you want to see in the current catalogue. Only the objects which are pressed down will be seen in the catalogue.

- **Command line:** It is not so important for the beginners but it is useful to perform operations by typing a formula and expression. You can use Arrow Up and Arrow Down keys of your keyboard to retrieve previously used expressions and commands.
- **Status bar:** When the mouse pointer is positioned on an operation, the Status bar, which is located at the bottom of the main window, shows a short description of that operation.
- **Operations/Navigation pane:** The Operation-Tree (Fig 3a) provides shortcuts to all the applications that the software provide & It is a grouping of similar applications in a drop down menu format. The Navigator (Fig 3b) allows you to move to different directories and sub directories within the computer. Finder (Fig 3c) is the alphabetical arrangement of all the applications. You can find any application by typing key words in the box provided.

Fig 3




The three different views of the navigation/operation pane of ILWIS;
(a) Operation-Tree, (b) Navigator and (c) Finder

Catalogue: The catalogue window indicates the current directory in which the operations will be carried out. In a part of the main window, maps, tables and other ILWIS objects in the working directory are displayed with its own type of icon. The catalogue can be customised by clicking the Customise Catalog button in the standard toolbar of the main window to view only specified files. It is possible to open more than one catalogues. When more than one catalogues are opened, result of the operation that are being carried out will be stored in the catalogue which is active. It has links to subfolders.

You can get help for the ILWIS software by opening the Help menu and selecting appropriate item from the list. It allows to obtain help information from any point within the program.

Download all the relevant user guides and sample datasets from the following webpage prior to carrying out the next exercise: <http://52north.org/Community/avis/ilwis-userguide/>.

To close the ILWIS software go to file menu and select exit. You can also close the window by clicking  icon at the top right corner of the ILWIS window.

Introduction to Opening and Saving and Reopening Projects in ILWIS

Objective: At the end of this exercise you shall be able to

- open file and saving the projects.

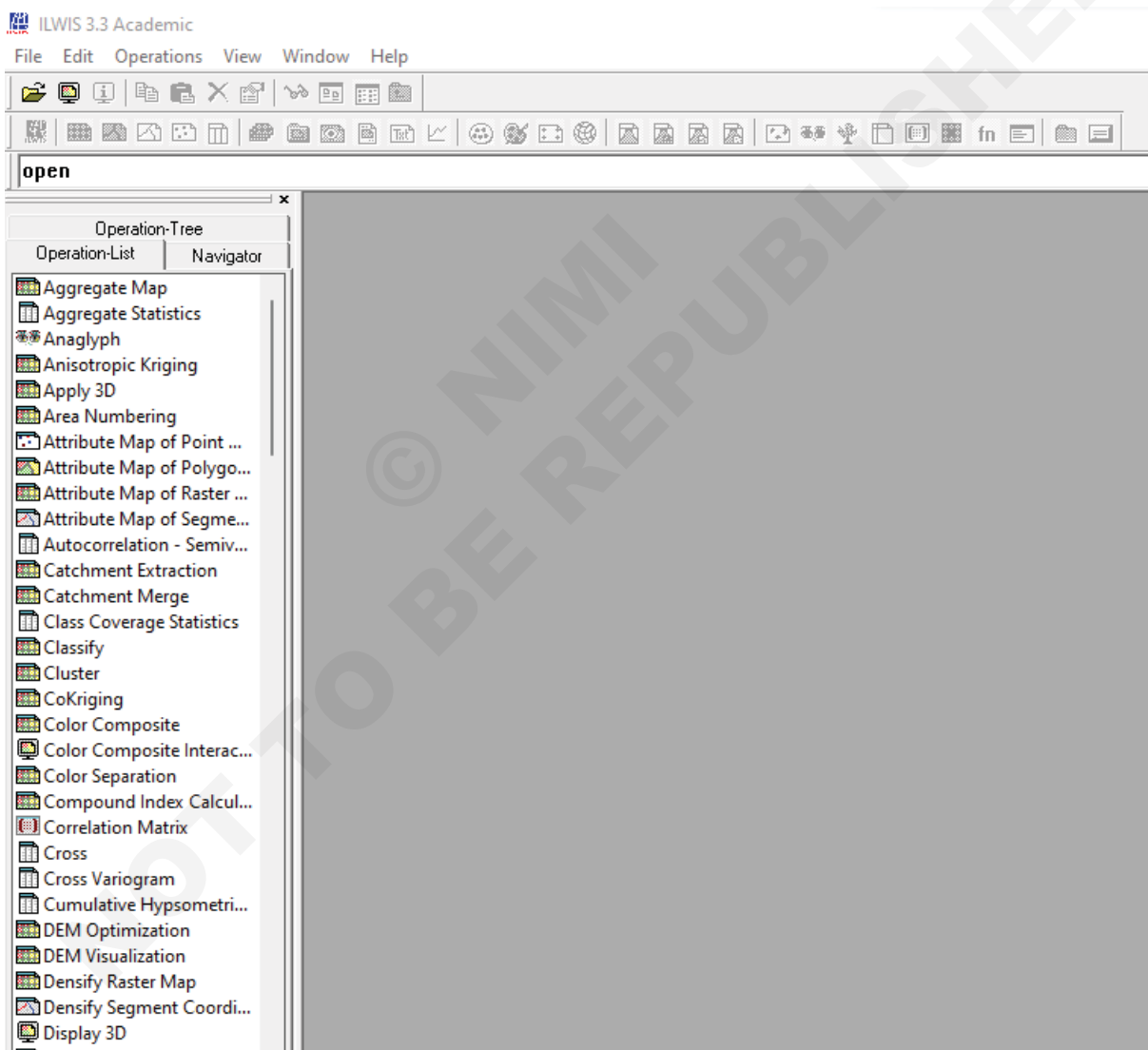
Requirements

Tools/Equipments/Instruments

- Computer & Internet Connection
- RS Software

PROCEDURE

Fig 1



Introduction

ILWIS for Windows is a Windows-based, integrated GIS and Remote Sensing application consisting of:

- Display of raster and multiple vector maps in map windows
- Display of tables in table windows
- Interactive retrieval of attribute information

- Image processing facilities
- Manipulation of maps in a Map Calculator
- Manipulation of tables in a Table Calculator
- GIS analysis tools
- Script language to perform 'batch' jobs

ILWIS functionality for vectors includes: digitizing with mouse and/or digitizer, interpolation from isolines or points, calculation of segment or point density, pattern analysis.

ILWIS functionality for raster includes: distance calculation, creation of a Digital Elevation Model (DEM), calculation of slope/aspect, deriving attribute maps, classifying maps, manipulating maps with iff-statements, with Boolean logic, crossing maps, etc.

For satellite imagery: creation of histograms, color composites, sampling and classification, filtering, multi-band statistics.

When you are new to Windows

When you are new to Windows you might have to learn some basic Windows terminology and techniques

The following Windows terms and techniques should be familiar to you:

Minimize, maximize, moving windows, sizing windows, title bar, menu bar, using scroll bars, using menus. You can read more about this in the following topics:

Windows features : introduction

(minimize, maximize, move, etc.)

Windows features : parts of a window

(terms like title bar, menu bar, scroll bars, etc.)

Windows features : using a menu

(terms related to menus and commands)

Windows features : Control-menu

(commands of the Control-menu)

Windows features : using a dialog box

(list boxes, check boxes, option buttons, etc.)

When the ILWIS icon is double-clicked on the desktop, the ILWIS logo appears, followed by the ILWIS Main window.

Main window

Click a map or menu command. This is the command line, on which you can type for example MapCalc statements. Toolbar which allows you to quickly display maps or tables use the navigator: the list boxes to the right of the toolbar.

The central right part of the Main window is the Catalog. It displays the ILWIS objects in the current directory.

Select a map, table, or any other object and show/open it in a new window.

This dialog box appears:

- when you choose Open from the File menu in the Main window,
- when you choose Visualization, Show Map from the Operations menu in the Main window,
- when you expand the Visualization item in the Operation-tree, and double-click the Show item,
- when you double-click the Show item in the Operation-list,
- when you click the Show Map button in the toolbar of the Main window.

Dialog box options

Select an object: Select an object which you want to open in a new window.

Select object type: Select the type of object you want to open: a map, a table, a map list, a map view, a domain, a representation, a georeference, a coordinate system, a histogram, etc.

Directories: If necessary, change the current directory.

Drives: If necessary, change the current drive.

A map is displayed in a new map window. A Display Options dialog box appears to set display options for the map. To display multiple maps in one map window, use the Add Layer command on the Layers menu of a map window.

A table, histogram, two-dimensional table, or an annotation text object will be displayed in a table window.

For other objects: either a specific editor is opened, or a dialog box appears.

When the selected object is not open yet, it is opened in a new window.

When the selected object is already open, the object is restored and its window becomes the active window.

Observing Title Bar, Manu Bar, Standard Tool Bar, Object

Objective: At the end of this exercise you shall be able to

- **handling of software by knowing title bar, menu bar, standard tool bar.**

Requirements	
Tools/Equipments/Instruments	
<ul style="list-style-type: none"> • Computer & Internet Connection 	<ul style="list-style-type: none"> • RS Software

PROCEDURE

The map windows, table windows etc., in which ILWIS displays data, have some common Windows features:

Moving a window

A window can be moved over your desktop by dragging the title bar of a window to a new position: position the mouse pointer on the title bar, press the left mouse button and hold it down, and move the mouse pointer to a new position, then release the left mouse button.

Changing the size and shape of a window

A window can be sized by dragging its borders. Select the window you want to resize, point to a border or a corner of a window, the cursor changes into a two-headed arrow, drag (press the left mouse button and hold it down) the border or corner until the window has the size you want, then release the mouse button.

Maximize

A window can be enlarged to the full size of your screen:

- by clicking the maximize button (the delta-up button at the upper-right corner of a window), or
- by clicking the Control-menu box in the upper-left corner of a window to open the Control menu, select the Maximize command, or
- by double-clicking the title bar of a window.

To restore a window, double-click the title bar again. When two or more windows are open and you maximize one of them, all the others are covered up by the maximized one.

Minimize

To reduce a window to an icon:

- click the minimize button (the delta-down button at the upper-right corner of a window), or

- click the Control-menu box in the upper-left corner of the window to open the Control menu, select the Minimize command.

After a window is reduced to an icon, you can select and move the icon in the same way you select and move a window.

Restoring an icon: (after minimize)

An icon can be restored to a window by double-clicking it. You can also click the minimized icon and select Restore from the Control menu.

Using scroll bars

The best ways to use the scroll bars in ILWIS are:

- Click above or below the scroll box on the vertical scroll bar: the contents of the window will scroll vertically.
- Click to the left or right of the scroll box on the horizontal scroll bar: the contents of the window will scroll horizontally.
- Drag the scroll box in a scroll bar to the position you want. The section of the map/table that moves into view depends on where you position the scroll box. For example, if you position the scroll box half way down the vertical scroll bar, the contents halfway the map/table appear.

Closing a window

A window can be closed:

- from the File menu, choose Exit,
- by double-clicking the Control-menu box,
- from the Control menu, choose Close, or
- by pressing Alt+F4 on the keyboard.

Menu commands

File	Edit	Columns	Records	View
Create	Copy	Column	Goto Record	Record View
Print	Paste	Management	Goto First Record	Additional Info
	Delete	Add Column	Goto Previous	Confusion Matrix
	Edit	Goto Column	Record	
Properties		Sort	Goto Next Record	
	Select All	Update All Columns	Goto Last Recordt	Command Line
Exit				Statistics pane
	Add Record	Statistics		Toolbar
		Join		Status Bar
		Aggregation		
		Cumulative		
		Least Squares		
		Semi-variogram		
		Column Slicing		

ILWIS objects

Object collections

- can be created to organize your data as 'projects'
- are the result of Import via GeoGateway;
- are the result of importing ASTER (1A/1B) images through ILWIS Map Import.

A database collection is a special form of an object collection. While an object collection may contain all kinds of ILWIS objects (maps, tables, layouts, etc.), a database collection may only contain tables. The tables of a database collection are in Use As mode u.

A database collection is the result of:

- accessing an external database.

Names of object collections

In ILWIS 3, object names comply with Windows long file names. Also Universal Naming Convention (UNC) paths are supported. For more information, see How to use long object names.

To create an object collection

Open the File menu in the Main window and select the Create Object Collection command, or double-click the New Object Collection item in the Operation-list. In the appearing Create Object Collection dialog box, you can enter a name and description for the object collection. The object collection will be directly opened.

Identify Various Tool Bar Selection Tool Bar, Command Line Catalog, Status Bar, Navigator Pane

Objective: At the end of this exercise you shall be able to

- identifying and utilizing of tool bar selection tool bar, status bar etc.

Requirements

Tools/Equipments/Instruments

- Computer & Internet Connection
- RS Software

PROCEDURE

Toolbar

The following actions can be performed:

Entire Map: Displays the entire map in the map window.

Redraw: Redraws the contents of the map window.

Measure Distance

Allows you to measure the distance and the angle between two points in the map window.

The mouse pointer will change into a pair of compasses, then:

- draw a line between two points of interest.

Pan: Allows you to roam through the map window when zoomed in.

The mouse pointer will change into a hand, then:

- click somewhere in the map window, and drag this part of the map window to another position.

Zoom In

Allows you to zoom in on a selected spot or area in the map window.

The mouse pointer will change into a magnifying-glass with a large plus inside, then:

- click in the map window to zoom in on that position with a factor 2, or
- drag the mouse pointer in the map window from one corner of interest to another (any zoom in factor).

Zoom Out: Allows you to zoom out from a map window.

The mouse pointer will change to a 'magnifying'-glass with a large minus inside, then:

- click in the map window to zoom out with a factor 2, or
- drag a rectangle with the mouse pointer in the map window; the smaller the rectangle, the more you will zoom out.

Normal: Switch off Measure Distance, Pan, Zoom In, or Zoom Out and return to normal pointing mode. The mouse pointer will change back into a normal pointer. You can also press the Esc key or the Ctrl+N keys on the keyboard to return to Normal mode.

Add Layer

Add another data layer or an annotation text layer to the map window. The Add Layer dialog box will appear.

Remove Layer: Remove a selected layer from the map window. First select the layer to be removed in the Layer Management pane of the map window.

Save View : Save the contents of this map window as a map view. When this is the first time you save the map window as a map view, the Save View As dialog box will appear. (Fig 1)

Fig 1



Status bar

The status bar:

- gives a brief explanation on highlighted menu commands,
- gives a brief explanation on the functionality of buttons in the toolbar,
- displays the X and Y coordinate information depending on the position of the mouse pointer in the map window,
- displays Row and Column numbers when a raster map is displayed, and
- displays geographic coordinates when the coordinate system used by a point, segment or polygon map, or by a georeference of a raster map, has projection information.

Selection tool bar

File	Edit	Operations	View	Window
Create	Copy	Visualization	Tools	New Catalog
Open	Copy Object To	Raster Operations	List	Refresh
Open As Table	Paste	Image Processing	Details	Arrange Catalogs
Open Pixel Information	Delete	Statistics	Customize Catalog ...	Close All Catalogs
Create Pyramid Layers	Select All	Interpolation	Show	Data Windows
Preferences	Edit Object	Vector Operations	Sort By	Catalog 1
Setup Digitizer	Properties	Rasterize	Catalog Queries	Catalog 2
Map Reference		Vectorize	Standard Toolbar	Object Collection "OBC"
Import		Table Operations	Object Selection Toolbar	Map List "SPOT99"
Export		DEM Hydro-Processing	Operation-List/Navigator	Etc.
Exit		Script	Command Line	
			Status Bar	

Catalog - Details View

To see only object names and icons in a Catalog, use List View.

Furthermore, you can

- specify the object types you want to see,

Available columns in Details View

Name	lists object's icon and the object's name.
D	lists whether the object is Dependent (D) or not (blank).
C	lists whether a dependent object is Calculated (C) or not (N); blank for non-dependent objects.
U	lists whether a dependent object is Up-to-Date (U) or not (N); blank for non-dependent objects.
R	lists whether the object is Read-only (R) or not (blank).
Modified	lists the date and time the object was modified last.
Domain	lists the name of the domain that is used by the object; blank if object does not use a domain.
Domain type	lists the type of domain used by the object.
CoordSystem	lists the name of the coordinate system that is used by the object; blank if object does not use a coordinate system.
Csy type	lists the type of coordinate system that is used by the object; blank if object does not use a coordinate system.

Available columns in Details View

Georef	lists the name of the georeference that is used by the object; blank if object does not use a georeference.
Georef type	lists the type of georeference that is used by the object; blank if object does not use a georeference.
Size	lists the 'Contents Size' of the object, e.g. nr of lines and cols for raster maps, nr of polygons for polygon maps, nr of records and columns in a table, nr of items in a class or ID domain, etc.
Attribute	lists the name of the attribute table that is linked to a map or to a domain; blank if object does not have an attribute table.
Description	lists the Description of an object; when during an operation no description is filled out for the dependent output object, the dependent output object will use its definition or expression as description; blank if a non-dependent object has no description.
Expression	lists for a dependent object the expression or definition by which the object was created; blank for non-dependent objects.
Type	Lists the type of the object.

Navigator

The Navigator is located on the third tab in the Operations/ Navigator pane, by default along the left hand side of the Main window.

The Navigator

- provides a tree structure for all drives and directories,

- has a history of recently visited drives and directories.

When you click a directory in the Navigator, the contents of the currently active Catalog will be replaced with the contents of the selected drive or directory.

When you click a directory in the Navigator with the right mouse button, and choose New Catalog from the context-sensitive menu, the contents of the selected directory will be shown in a new Catalog.

Use of Operation Tree, Operation List, Navigator, Output, View Data

Objective: At the end of this exercise you shall be able to

- use of operation tree, operation list etc.

Requirements	
Tools/Equipments/Instruments	
<ul style="list-style-type: none"> • Computer & Internet Connection 	<ul style="list-style-type: none"> • RS Software

PROCEDURE

The Operation-tree and the Operation-list are very sensitive to clicking, double-clicking and drag and drop actions. The Operation-tree and Operation-list are mostly used to start operations bypassing the Operations menu, or to create, show or edit objects. Using the Operation-tree and Operation-list capabilities is far more efficient than using menus.

- move the mouse pointer over an operation, the status bar gives a brief description of that operation, or
- click with the right mouse button on an operation, and select Help from the context-sensitive menu.

To start an operation

- double-click the desired operation in the Operation-tree or Operation-list, or

- click with the right mouse button on an operation, and select Run from the context-sensitive menu.

To start an operation with a certain input map or table:

- drag a map or table from the Catalog to an operation in the Operation-tree or the Operation-list.

To extend the Operation-tree, the Operation-list and the Operations menu

ILWIS scripts and external applications can be added to the Operation-tree, the Operation-list and the Operations menu by setting one or more Script or Tools folders/directories in the Preferences.

Explore Data and Compose Maps, Create, Edit Manage and Export Data

Objective: At the end of this exercise you shall be able to
• exploring composing, exporting, creating datas.

Requirements	
Tools/Equipments/Instruments	
• Computer & Internet Connection	• RS Software

PROCEDURE

Data objects are:

Raster maps	(containing pixels)
Polygon maps	(containing closed area features)
Segment maps	(containing line features)
Point maps	(containing point features)
Tables	(containing columns)
Columns	(not listed in Catalog)

In ILWIS 3, object names comply with Windows long file names.

- In object names, any character may be used except \ / : * ? < > | "
- The maximum length of an object name is 255 characters including the full path.

On the command line and in scripts however, object names must be enclosed by single quotes e.g. 'My Map'.mpr when the object name:

- starts with a digit from 0 to 9,
- starts with or contains one or more spaces, or
- starts with or contains any of the following special characters ` ~ ! @ # \$ ^ & () - + = [] { } ; ' , .
- when you choose Create Domain from the File menu in the Main window,
- when you double-click the New Domain item in the Operation-list,
- when you clicked the little create button next to a domain drop-down list box in a dialog box.

Dialog box options

Name: Type a new name for the domain.

Domain type: Select the domain type:

Class: Create a class domain when the elements in your map are classes which occur in several places in your map

(e.g. soil units: clay, sandy loam). Subsequently, the domain Class/ID editor is opened where you can add all classes of this domain.

Group : Only select 'Group' if you want to create a domain Group with which you can permanently slice or classify the values in an image or in a value map. The domain Group editor is opened where you can add the upper boundary values of groups, group names, etc. See also tip 5 below.

Identifier: Create an ID domain when the elements in your map are uniquely identified (e.g. cadastral plots: 1024, 1025).

Nr. of items: Type a value for the number of items that should be automatically added to this ID domain.

- When you accept the default number of items 0, the domain Class/ID editor is opened; you have to add IDs yourself.
- When you type a value, the specified number of IDs are automatically added to the domain as numbers starting from 1. All IDs will be preceded by the prefix which you have to specify in the Prefix box.

The maximum number of items that can be shown in the domain Class/ID editor is 100 million.

Prefix: Type a (short) text that will be used as the prefix for all numbered IDs which will be automatically added to this domain. The IDs in this domain may appear for instance as My Prefix 1, My Prefix 2, etc. The default prefix is nr. In a prefix, it is allowed to use spaces and characters as @, #, etc., the colon character : however may not be used in a prefix.

Bool: Create a Bool domain when the elements in your map may only use 2 possible codes (e.g. "Suitable" and "Not Suitable") or may be undefined. Subsequently, the Edit Bool domain dialog box will be opened.

Value: Create a value domain when the elements in your map represent measurable values (e.g. height, concentration).

Min Max: Type values for the minimum and maximum value of this domain. This is also called the value range.

Precision: Type a value for the precision of this domain. By specifying a precision of 0.01, all values will use 2 decimals; by specifying a precision of 25, all values will increase or decrease in steps of 25, etc.

The combination of specified values for minimum, maximum and precision implies the store type of raster maps that use this domain.

Description: Type a description for the domain. The description is visible on the status bar of the Main window when moving the mouse pointer over the domain in the Catalog.

Edit

A representation defines the manner in which the classes of a map with a class domain, a group domain or a picture domain, or the values of a map with a value domain or the image domain should be represented on the screen and on a printer. When a map is shown by an attribute column, the domain of the attribute column determines the (default) representation. A representation is a service object of a domain.

Representations can be edited:

- by opening a representation class in the Representation Class editor, or by opening a representation value or gradual in the Representation Value/Gradual editor,
- interactively in a map window when the map window displays a map with a class domain,
- by opening a representation class as a table (advanced).

Mind

- System representations such as the representations gradual Pseudo or Gray are read-only and cannot be edited.
- Some special display possibilities exist for point maps and point attributes that use a Value domain or an ID domain.
- Maps that use a Bool, Bit, ID or the Color domain do not have a representation.

To open a representation editor from the Main window

- in the Catalog, double-click a representation,
- in the Catalog, click a representation with the right mouse button, and choose Open from the context-sensitive menu,
- in the Catalog, select a representation, then open the Edit menu in the Main window and choose the Edit Object command,
- in the Operation-tree or the Operation-list, double-click the Edit item and select any representation,
- drag any representation from the Catalog to the Edit item in the Operation-tree or the Operation-list.

To open a representation editor from a map window

- in the Layer Management pane of a map window, double-click the word "Legend",
- choose the Representation command from the Edit menu of a map window.

To open a representation editor from the domain Class/ID editor

- click the Representation button in the toolbar, or
- choose the Open Representation command from the File menu.

Export raster maps in the ILWIS raster format to a number of other formats.

Arc/Info ASCII: Exports to Arc/Info non-compressed ASCII format (extension .ASC).

Erdas GIS: Exports to Erdas .GIS format.

The Erdas-LAN and Erdas-GIS formats can only handle North-oriented maps.

The output consists of a .GIS file which contains the raster map, and, in case you exported a raster map with a class domain, a .TRL file which contains class and representation information.

Erdas LAN: Exports a series of images in an ILWIS map list or a single raster map to the Erdas .LAN format.

The Erdas-LAN and Erdas-GIS formats can only handle North-oriented maps.

The output file contains a header (according to the Erdas .LAN format) with a description of the data that follows in the same file. In case you exported raster map with a class domain, also a trailer file (extension .TRL) will be written.

IDA image IMG: Exports to IDA (Image Display and Analysis) image format (extension .IMG). IDA claims compatibility with the Terramar Micro-Image System. Image type and projection are set to 0, resp. generic and none.

Idrisi IMG/DOC: Exports to Idrisi format (extensions .DOC, .IMG, and optionally .PAL)

The ILWIS raster map can have a class domain, an ID domain (only less than 32767 items allowed in Idrisi), the Image domain or a value domain. Furthermore, the ILWIS raster map must be north-oriented.

In case you export an ILWIS map with a class domain or a picture domain, also a file with color information (.PAL) is created. In Idrisi, this file must be translated into the internal Idrisi format with the palette workshop: read in as .PAL, and Save As .SMP.

ILWIS 1.4: Exports to ILWIS 1.4 format (extensions .MPD, .MPI, and optionally .INF and .COL). Mind: ILWIS 1.4 map names may not be longer than 8 characters.

ILWIS ASCII: Exports to ILWIS ASCII format (extension .ASC).

TIFF (GeoTiff): Exports to Tagged Interchange File format (extension .TIF).

Any ILWIS raster map can be exported to TIFF format

Windows Bitmap BMP: Exports to Microsoft Windows bitmap format (extension .BMP). Any ILWIS raster map

(domain Bit, Bool, Class, ID, Picture, Image, Value, Color) can be exported to a Windows bitmap. The procedure is similar to TIFF

© NIMI
NOT TO BE REPUBLISHED

Analyzing Data Digitizing, Map Composer, Symbology User Interface, Map Legent, Map View

Objective: At the end of this exercise you shall be able to

- setting a digitizer, map composer etc.

Requirements	
Tools/Equipments/Instruments	
<ul style="list-style-type: none"> • Computer & Internet Connection 	<ul style="list-style-type: none"> • RS Software

PROCEDURE

Setting up a digitizer

- 1 First, connect all cables of the digitizer to the proper components.
- 2 Then,
 - either download and install the WinTab driver, or
 - configure the digitizer tablet yourself.
- 3 Connect the digitizer to a serial port on your computer and note the port number.
- 4 Start ILWIS:
 - In the Main window, open the File menu, and choose Setup Digitizer. The Setup Digitizer wizard is started.
 - First, the Setup Digitizer - Select Port page appears on which you can choose to use the WinTab driver, or the serial port to which your digitizer is connected.
 - When you installed the WinTab driver, click the Finish button: the Setup Digitizer wizard will be closed and your digitizer will be ready for use.

The Setup Digitizer command on the File menu of the Main window will now be preceded by a check mark .

- When you did not install the WinTab driver, click the Next button: three more pages of the Setup Digitizer wizard need to be filled out.
- The Setup Digitizer - Port Settings page appears which lists the communication settings of the selected port (baud rate, data bits, parity, stop bits).

If necessary, change these port settings so that the port settings are exactly the same as used during the configuration of the digitizer tablet. Then, click the Next button.

- The Set Up Digitizer - Automatic Detection page appears.

If so, follow the instructions on this page for automatic setup and press digitizer cursor buttons 0, 1, 2, 3.

If not, check the setup of the digitizer tablet itself, go back to the Digitizer Set Up - Select Port page and make the settings equal to the digitizer settings until you have communication.

- When Automatic Setup has succeeded, the Set Up Digitizer - Size, Resolution and Final Check page appears.

Map Reference

To establish a relation between digitizer coordinates and map coordinates, you have to do a Map Reference.

- 1 Fix an analog map onto your digitizer. Write down the map coordinates that you want to use as reference or control points (usually the four corners of the map).
- 2 From the Main window in ILWIS, open the File menu, and choose Map Reference.
- 3 First, the Map Reference - Coordinate System dialog box appears.

Select a coordinate system or create one using the little create button , and choose for metric coordinates or geographic coordinates.

- 4 Then, the Map Reference - Digitizer Control Points dialog box appears.

Do the following

- Click a reference point in the map with the digitizer cursor;
- In the left-hand part of the dialog box, the digitizer 'coordinates' as received from the digitizer appear;
- In the right-hand part of the dialog box, type the corresponding map coordinates for this point as read from the paper map in step 1;

(map coordinates should fall inside the selected coordinate system of step 3),

- Continue with the other reference or control points;
- Check the feedback values for diff X and diff Y; for a good map reference, these figures should be in the range of $-0.3 \leq \text{diff X} \leq 0.3$.

Also check the feedback values for Sigma and Scale (of the map).

- click the OK button when finished.

The Map Reference command on the File menu of the Main window will now be preceded by a check mark .

Start digitizing a new map

- 1 On the File menu in the Main window, check whether the Setup Digitizer and the Map Reference commands are both preceded by a check mark .
- 2 Create a new point or segment map by choosing for instance the Create command from the File menu (see also How to create a map).

In the Create Point Map or the Create Segment Map dialog box:

- Select the coordinate system you wish to use; this is normally the coordinate system which was selected or created during Map Reference.
 - Decide on the domain of the map, i.e. the set of class names, IDs or values that you want to assign to your points or segments. You can also edit or create a representation for a domain of type Class or Value.
- 3 When you click OK in the Create Point Map or the Create Segment Map dialog box, the point editor or the segment editor will be started.
 - Choose Digitizer, Active from the File menu of the point editor or from the File menu of the segment editor.

The Digitizer, Active command on the File menu of the editor will then be preceded by a check mark .

You can now start digitizing your map

- 1 On the File menu in the Main window, check whether the Setup Digitizer and the Map Reference commands are both preceded by a check mark .
- 2 If your map is still at the same position on your digitizer tablet, you can directly continue digitizing. If you fix a map onto the digitizer now, first do Map Reference again.
- 3 To open the appropriate map editor.
 - in the Catalog, click with the right mouse button on the point, seg se Edit from the context-sensitive menu, or
 - open the map in a map window, open the Edit menu, and choose the Edit Layer command.

The point editor, the segment editor or the polygon editor will be opened.

- 4 In the point editor, the segment editor or the polygon editor:

- make sure that the Digitizer, Active command on the File menu of the point editor, on the File menu of the segment editor, or on the File menu of the polygon editor is preceded by a check mark .

1 Tokenizer

- breaks the expression into tokens such as special characters (e.g. brackets, commas, +, *, /, <, >, =), composed tokens (e.g. <=, lt, >=, gt), strings, and values,
- feeds the result to the parser.

2 Parser

- performs a simple syntax check on the tokens, for instance a check on the correct number of brackets,
- translates the tokens into map names, tables names, column names, constants, operators (+, *), functions, variables, brackets, etc.
- feeds the result to code generator.

3 Code generator

- performs an indepth syntax check, for instance a check on the number and type of parameters for all functions and operators used,
- determines the output domain, value range and georeference,
- creates an instruction stack.

4 Calculator

- for each line of the maps carries out all instructions on the stack.

For efficiency reasons, the process is done line by line. This has the same result as when the instructions were carried out pixel by pixel.

Names of map views

In ILWIS 3, object names comply with Windows long file names. Also Universal Naming Convention (UNC) paths are supported.

To create a map view

Display the required data layers, annotation text layers, grid lines, and/or graticule(s) in a map window. Then, from the File menu in the map window, select the Save View or the Save View As command. You can also click the Save button in the toolbar of the map window. When a map window has not been saved before, the Save View As dialog box will appear.

To display a map view

The easiest way to display a map view is to double-click it in a Catalog. All layers stored by the map view will be directly displayed in a map window.

To edit a map view

Open a map view, and add or remove layers or edit display options of layers. Then, save the map window again as a map view either using the Save View or Save View As commands or by clicking the Save button.

For more information, see also How to use layers in a map window or Map window : Layer Management.

Map views can also be edited and saved from within the layout editor. For more information, see Layout editor : functionality.

Operations on map views

On a map view, no operations can be performed. When a map view is displayed, you can copy the map view as a picture to clipboard and paste it into another Windows application. When one or more map views are inserted in a layout, you can add annotation such as a legend, print the layout and export the layout as a bitmap.

— — — — —

© NIMI
NOT TO BE REPUBLISHED

Explore Measuring, Identify Features Annotation Tools

Objective: At the end of this exercise you shall be able to

- measuring distance between two places.

Requirements	
Tools/Equipments/Instruments	
<ul style="list-style-type: none"> • Computer & Internet Connection 	<ul style="list-style-type: none"> • RS Software

PROCEDURE

Measure distance

To start the Measure Distance function:

- Choose Measure Distance from the Options menu in a map window, or
- click the Measure Distance button in the toolbar of the map window.

When the mouse pointer appears as a pair of compasses:

- 1 locate the mouse pointer at the start position from which you wish to measure;
- 2 press and hold down the left mouse button;
- 3 move the mouse pointer to the end position; while moving the mouse pointer, the distance is continuously displayed;
- 4 then, release the left mouse button.

Results in the Measure Distance message box

From: Shows the XY-coordinate or the LatLon-coordinate of the start position.

To: Shows the XY-coordinate or the LatLon-coordinate of the end position.

Distance on map: Shortest distance in meters between start position and end position, calculated in a plane (Euclidean distance).

Azimuth on map: Angle between the line from start position to end position and the XY North of the map (in degrees, clockwise). Tip: You can show the XY-North of a map by adding grid lines to the map window.

- For North oriented maps, e.g. raster maps with a georef corners, and by default for all vector maps:

Start	End	Azimuth
South	North	0
North	South	180
West	East	90
East	West	270

- For satellite images with a georeftiepoints, etc.: the map North can be located anywhere.

Ellipsoidal Distance: Shortest distance in meters (or kilometers) between start position and end position, calculated over the ellipsoid.

- In case the distance is larger than 800 km, the distance will be calculated over the sphere, using the current equatorial radius.
- Also, when system coordinate system LatLon is used, which has no ellipsoid, the distance will be calculated over the sphere (spherical distance).

Ellipsoidal Azimuth: Angle between the line from start position to end position and the geographic North of the map (in degrees, clockwise). Tip: You can show the geographic North of a map by adding a graticule to the map window.

Scale Factor: Indicator of scale distortion, calculated as Distance on map / Ellipsoidal Distance.

For example, when the Scale Factor is 1.001500, it means that the measured Distance on map should be divided by 1.001500 to obtain the true distance (Ellipsoidal Distance).

The Scale Factor depends on the position in the map and on the parameters of the map's projection.

- As the Scale Factor is calculated over the total measured distance, the Scale Factor figure should be regarded as an average.
- The Scale Factor is therefore most reliable when measuring very short distances (in theory, an infinitely small distance should be measured).
- In literature, Tissot indicatrices are used to graphically represent scale factors in different directions and at different positions in a projected map.
- For maps with a conformal projection, the Scale Factor is independent of the direction of measurement.
- For other types of projections, the Scale Factor is generally not the same when measuring for instance in North-South direction or in East-West direction, etc.

Meridian Convergence: The difference between the geographic North and the XY-North of the map, calculated as Ellipsoidal Azimuth - Azimuth on map (degrees).

- The Meridian Convergence is positive when the XY-North points more to the East than the geographic North.
- The Meridian Convergence is calculated for the starting position.

— — — — —

© NIMI
NOT TO BE REPUBLISHED

Identify User Interface with DIP Software (ILWIS)

Objective: At the end of this exercise you shall be able to

- identify user interface with DIP software.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connections cables
- RS Software, Internet connection

PROCEDURE

Graphical user interface (Fig 1 & 2)

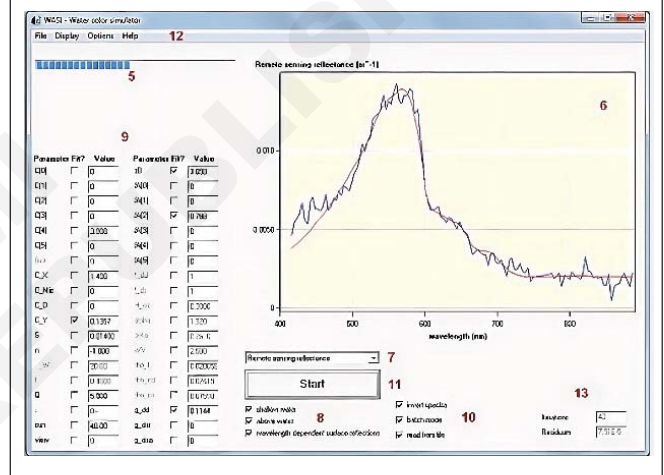
Fig 1



Image preview of 2D module, panel B : Main window of WASI.

- 1 File name of image
- 2 Processed pixels
- 3 Original image

Fig 2



- 4 Marked pixels
- 5 Progress bar
- 6 Spectrum of actually processed pixel (blue : measurement, red : fit curve)
- 7 Spectrum type
- 8 Model options
- 9 Parameter list
- 10 Operation mode
- 11 Start button
- 12 Menu bar
- 13 Fit quality measure

Familiarization with Loading of Digital Data into DIP Software

Objective: At the end of this exercise you shall be able to

- explore the vector properties dialog.

Requirements

Tools/Equipments/Instruments

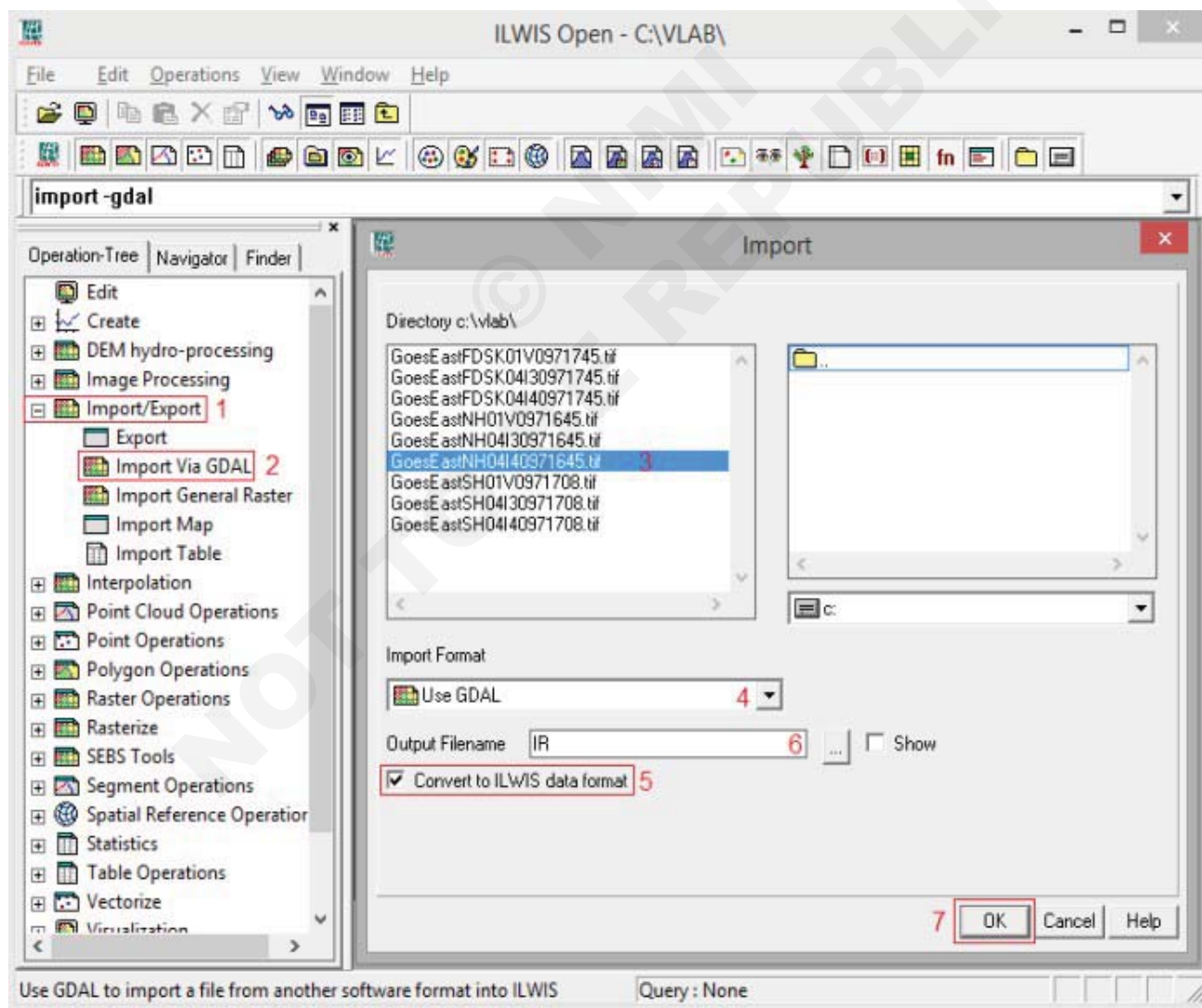
- PC with Windows OS
- Inter connections cables
- RS Software, Internet connection

Job Sequence

In the main window, after browsing to your work folder in the Operation - Tree select "Import/Export" -> "Import via

GDAL". The "Import" window will be opened. (Fig 1)

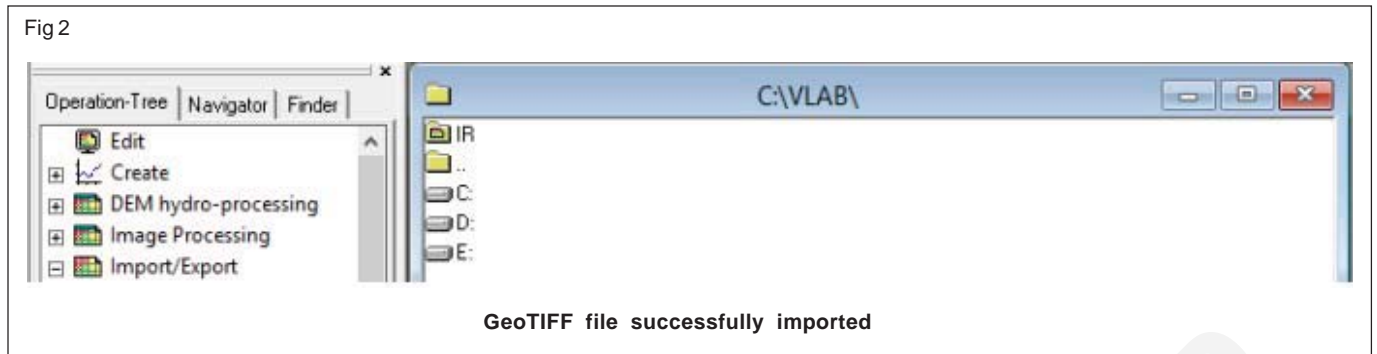
Fig 1



GeoTIFF importing sequence

In the "Import" window, in the item list, click once on "GoesEstNH04140971645.tif", type a name for the resulting file (in the example image below, simply "IR"), click in the option "Convert to ILWIS data format", and click "OK".

The imported GeoTIFF will be shown in the work folder. (Fig2)



Exploring How to Convert Digital Data into Image Processing Software Format

Objective: At the end of this exercise you shall be able to

- practice on how to convert digital data into image processing software.

Requirements

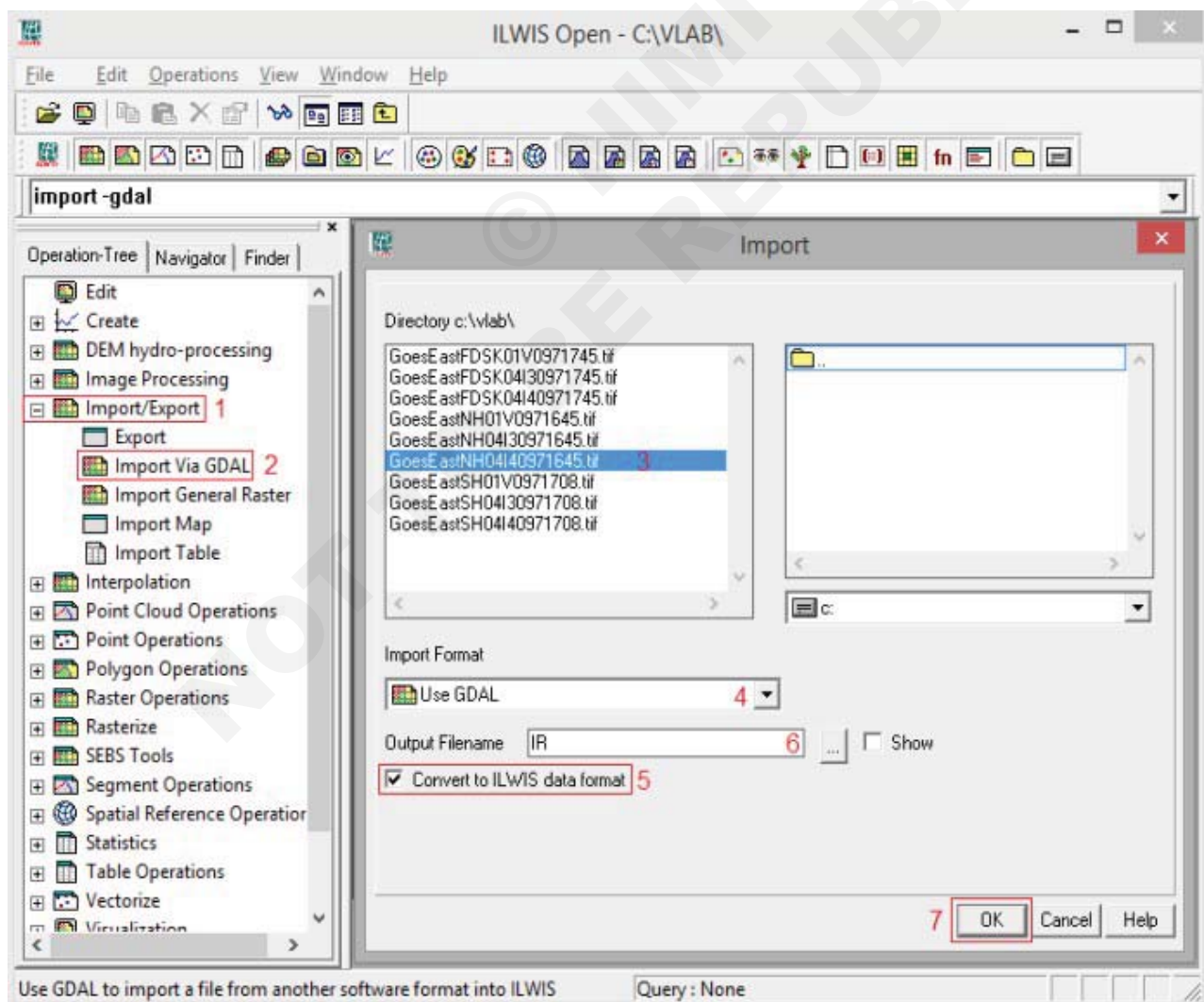
Tools/Equipments/Instruments

- PC with Windows OS
- Inter connections cables
- RS Software, Internet connection

PROCEDURE

- 1 Import the map (Tif format or JPG format)
- 2 Choose the import format to TIF
- 3 Choose the map and
- 4 Give a name of the output file (Fig 1)

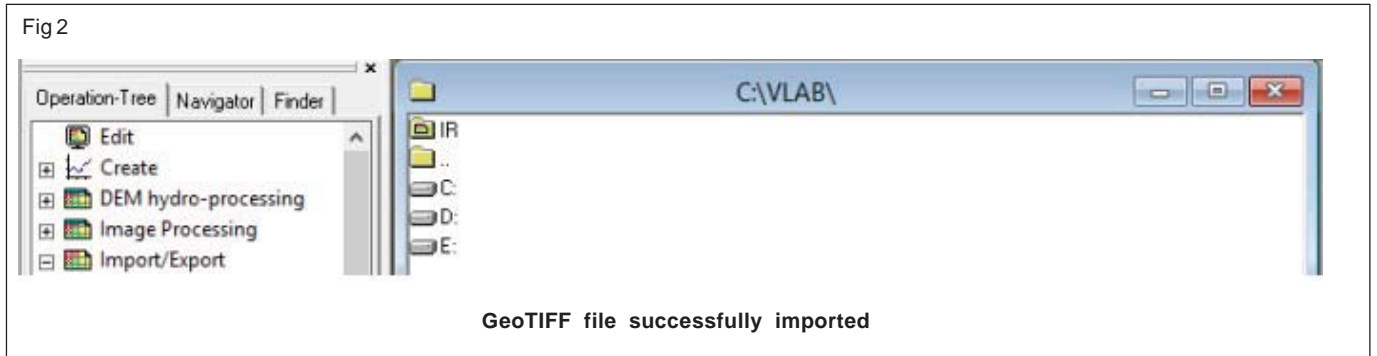
Fig 1



GeoTIFF importing sequence

Visualize the Map (Fig 2)

Fig 2



Practice on How to Apply Projection and Datum for Newly Loaded Data

Objective: At the end of this exercise you shall be able to

- practice on how to apply projection and datum for newly loaded data.

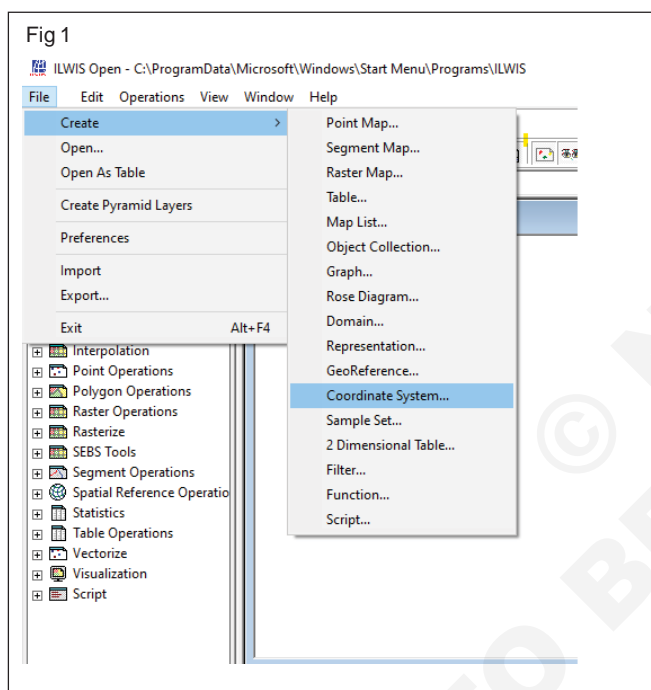
Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connections cables
- RS Software, Internet connection

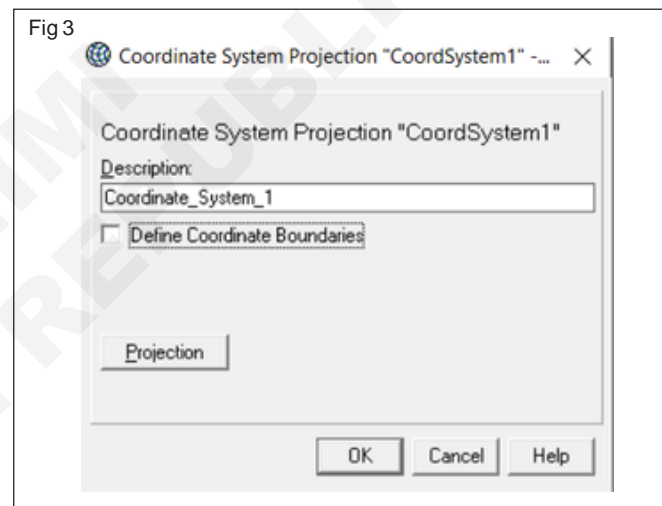
PROCEDURE

Go to file select the Create --> Coordinate System (Fig 1)



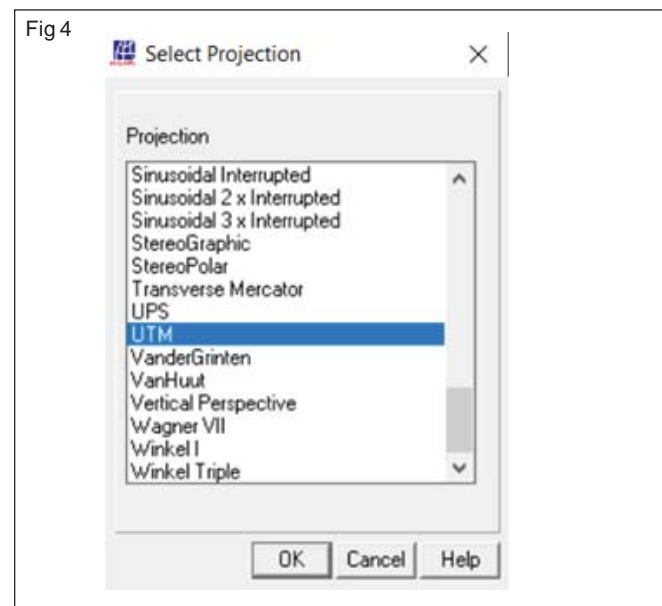
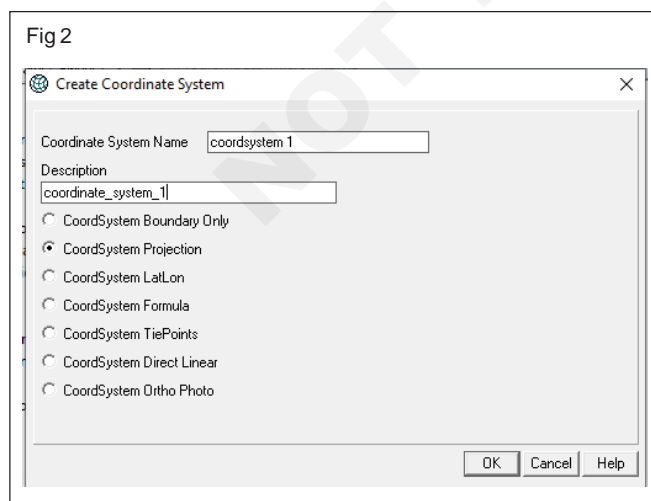
Input a name for the new coordinate system, and select Coord System Projection. Press OK.

The Coordinate System Projection window will open. Click Projection. (Fig 3)



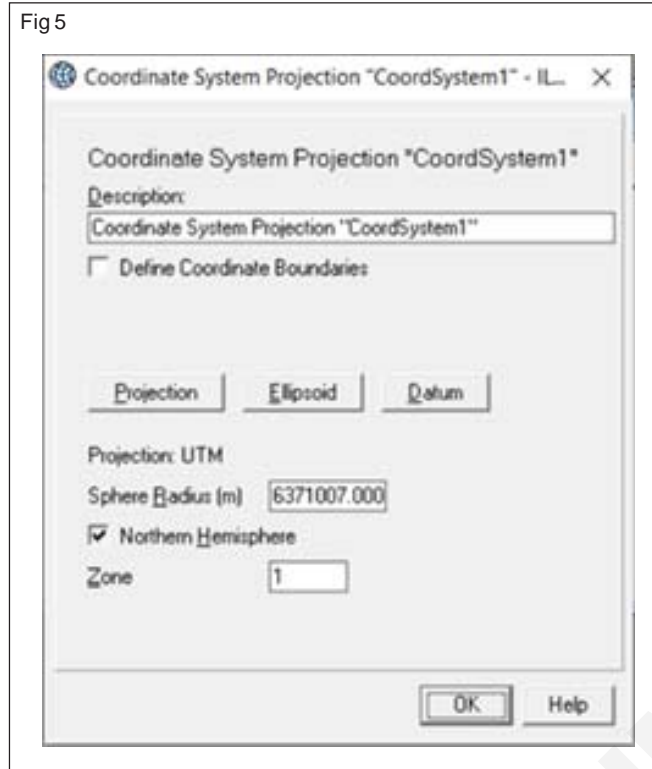
- The Select Projection window will open. (Fig 4)

The Create Coordinate System window will open. (Fig 2)



Double-click the projection list. In this case the Universal Transverse Mercator (UTM) projection was selected.

- The Coordinate System Projection window will open again, this time with more options. (Fig 5)



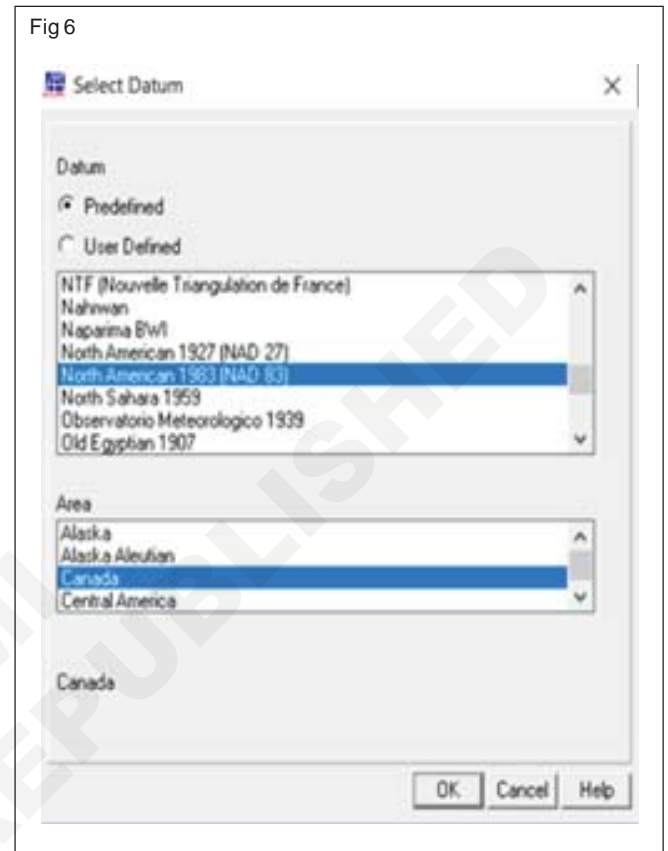
Click Datum.

- The Select Datum window will open.

Choose the geodetic datum coordinate system from the list, and the Area for the datum if available. In this case, North American 1983 (NAD 83) and the Canada was selected as the area.

- Again, the Coordinate System Projection window will open, this time with more changes. (Fig 6)

Check the Northern Hemisphere option (if applicable), and enter UTM zone that your area of interest is located in. In this case, Okanagan Lake is located in UTM zone 44. Click OK. Now the new coordinate system has been created, and appears in your working folder.



Practice on Changing Projection and Datum for Newly Loaded Data

Objective: At the end of this exercise you shall be able to

- practice on changing projection and datum for newly loaded data.

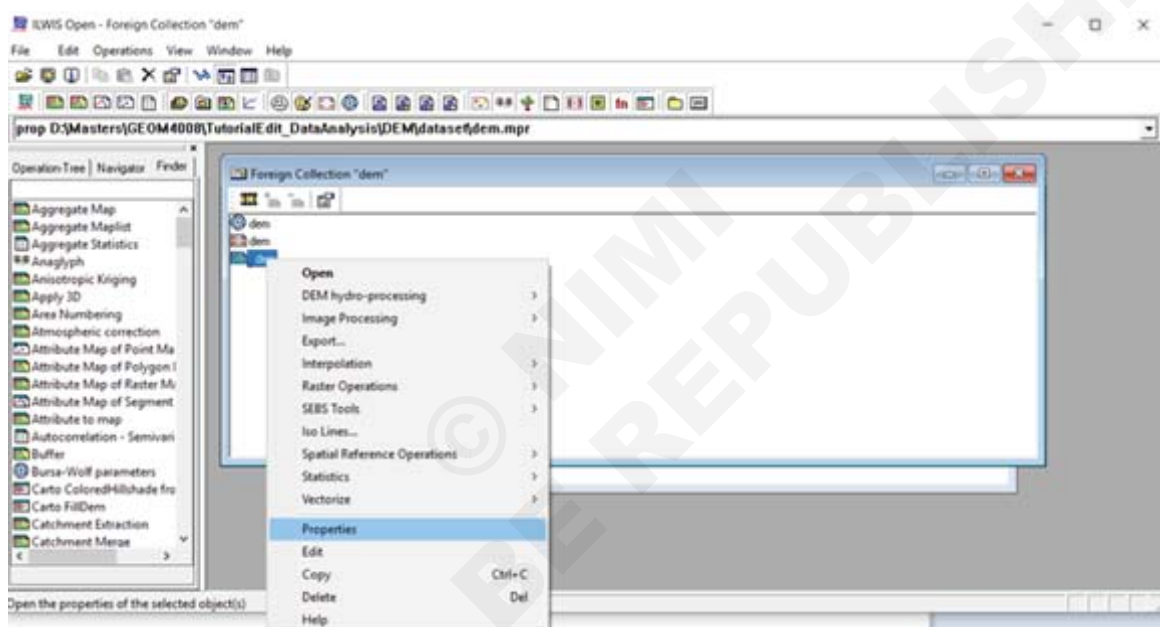
Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connections cables
- RS Software, Internet connection

PROCEDURE

Fig 1



- Again, the Properties of Raster Map window will open.
- Create Georeference window will open.
- Click down-arrow for the Coordinate System menu. (Fig 1)
- Select new coordinate system from this list.
- Press OK in the Create Georeference window.
- Then, Press OK in the Properties of Raster Map window.
- Now the raster map has been projected into the new coordinate system. (Fig 2, 3)

Fig 2

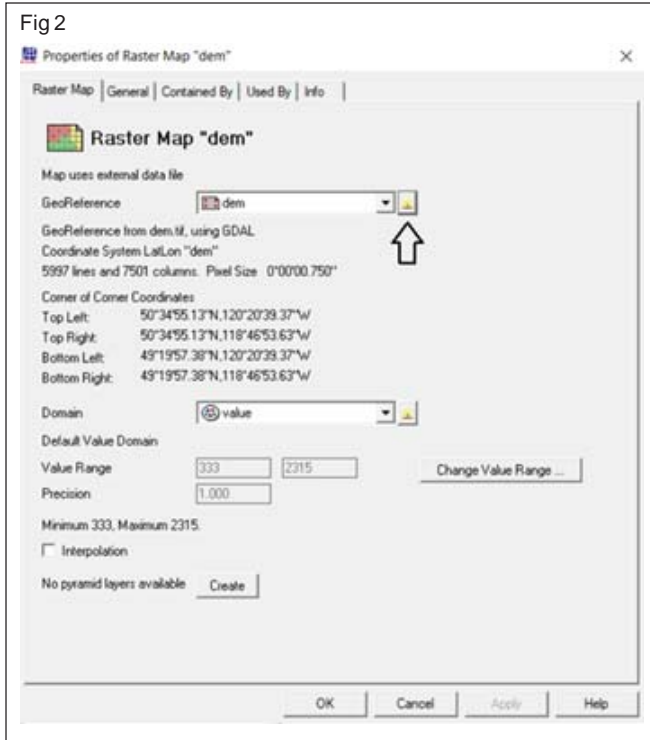
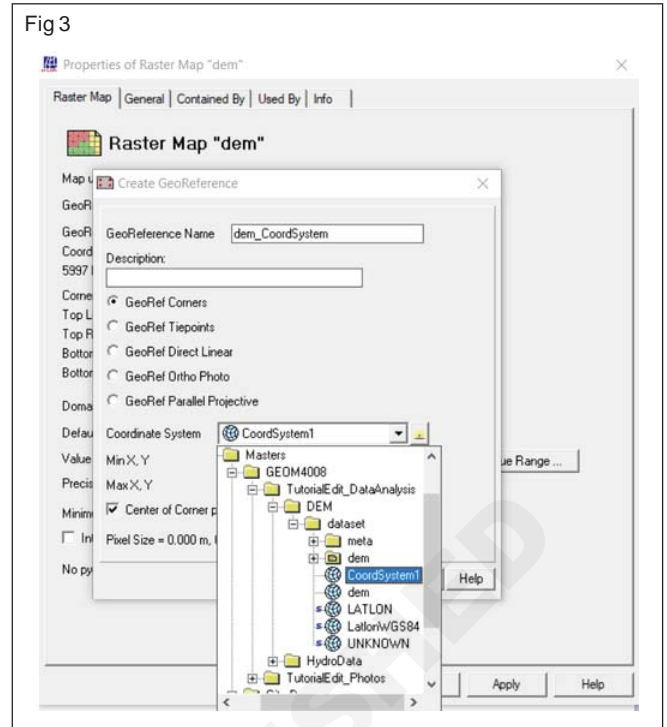


Fig 3



Identify Different Type of Data Products Available

Objective: At the end of this exercise you shall be able to

- identify different types of data products available.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connections cables
- Images data, Internet connection

PROCEDURE

Landsat 4 (Fig 1 , 2)

Fig 1

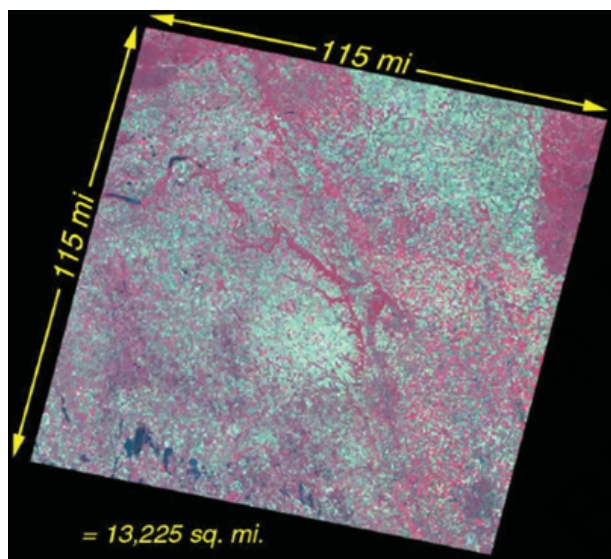
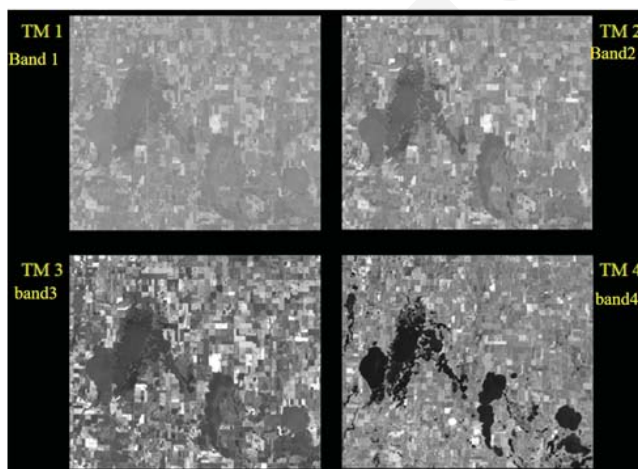


Fig 2



True Colour

False Colour

Near Infrared or NIR

Short Wavelength Infrared or SWIR

LandSat 7

ETM+ Pan (15 X 15 m)

ETM+ 4 (30 X 30m)

Band 2, 3, 4 (Fig 3 to 5)

Fig 3



Fig 4



Fig 5



Fig 6



Band 2, 4, 7

LISS-III

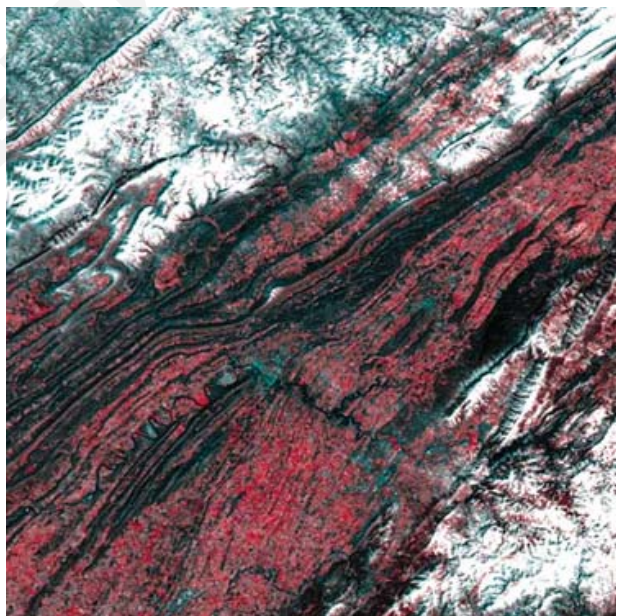
LISS-IV

LISS-III PAN (Fig 6)

Fig 7



Fig 8



Identify Images From Different Satellites and Sensors Used

Objective: At the end of this exercise you shall be able to

- explore the vector properties dialog.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connections cables
- Sensors, Internet connection

PROCEDURE

Resourcesat-1 (also known as IRS-P6) has two sensors

LISS-3 sensor and

AWiFS sensor

Resourcesat-2 has three sensors

LISS-3 sensor,

AWiFS sensor and

LISS-4 sensor

CartoSat-1 / IRS-P5 has two sensors/ cameras

Two panchromatic cameras of PAN

PAN-Fi (Panchromatic Forward-pointing Camera) featuring a fixed forward tilt of 26°.

PAN-A (Panchromatic Aft-pointing Camera), it is fixed at an aft tilt of -5°.

CartoSat-2 (Table 1)

Table - 1

Parameter, Mission	TES	CartoSat-2, -2A, -2B	CartoSat-2C, -2D, -2E		CartoSat-3, -3A, -3B		
Sensor Name	PAN	PAN	PAN	MX	PAN	MX	HySI
Spectral range (μm)	0.5-0.85	0.5-0.85	0.45-0.90	0.45-0.86	0.45-0.90	0.45-0.86	0.4-2.5
Channels (bands)	1	1	1	4	1	4	>200
Resolution (m)	1	0.8	0.65	2	0.25	1	12
Swath width (km)	16	10	10	10	16	16	5
Data quantization (bit)	7	10	11	11	11	11	11

Identify Features of Digital Images in Hard Copy

Objective: At the end of this exercise you shall be able to

- identify features of digital images in hard copy.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connections cables
- Digital images data, Internet connection

PROCEDURE

For identify features in image we need visual Image Interpretation techniques.

They are-

Tone, texture, shape, size, pattern, shadow, and Association.

Tone (Fig 1)

Tone refers to consistent gray levels that an area in the image has. Or refers to the relative brightness or colour of the objects in the image.

Fig 1



See in the image A area and B area have two different Tone variations.

Texture (Fig 2)

It refers to smoothness or roughness of an area can often be a valuable clue in image interpretation. Textures are very fine patterns that provide clues to the type of feature being observed.

See in the image A area and B area have two different Texture variations.

Shape (Fig 3)

Shape refers to the general form, structure, or outline of individual objects. Shape can be a very distinctive clue for interpretation.

Fig 2

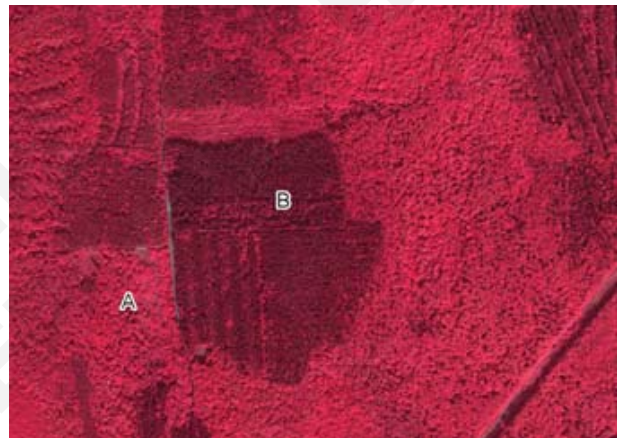
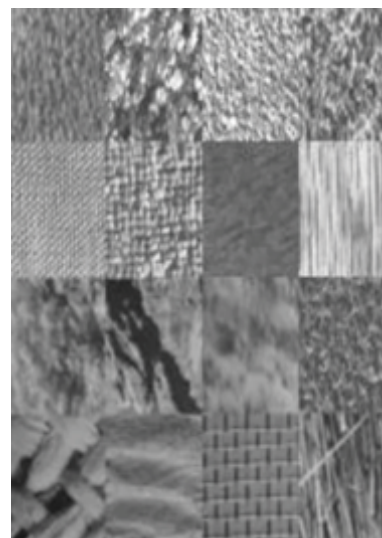


Fig 3



Size (Fig 4)

Some objects are easily categorized and recognized by their size. For instance, most homes are smaller than barns or industrial buildings.

Fig 4



See in the image, in circle or yellow colour we can see houses and in rectangle or black colour industrial buildings.

Pattern

Pattern refers to the spatial arrangement of visibly discernible objects.

Shadow

Shadow is also helpful in interpretation as it may provide an idea of the profile and relative height of a target or targets which may make identification easier.

Association

Association takes into account the relationship between other recognizable objects or features in proximity to the target of interest.

The building in this image is a school. The associated objects, such as several athletic fields, are indicators of this interpretation.

Identify the Natural Color Composite Satellite Image

Objective: At the end of this exercise you shall be able to

- identify the natural colour composite satellite image.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connections cables
- Satellite image data, Internet connection

PROCEDURE

A natural color composite image displays a combination of visible red, green and blue bands with the corresponding red, green and blue channels.

The natural color composite corresponds to how we usually see the world; vegetation appears green, water from blue to black, and bare earth and impervious surfaces light gray and brown. (Fig 1, 2)

Fig 1

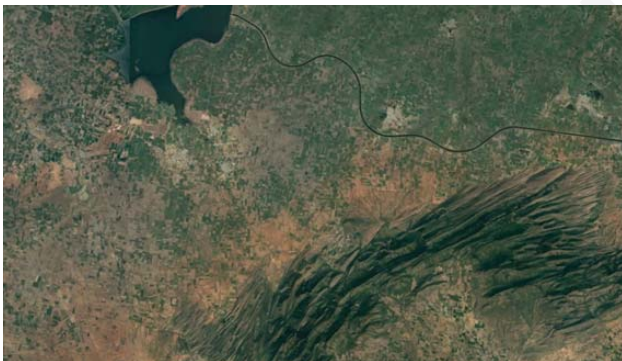


Fig 2



Identify the False Color Composite Satellite Image

Objective: At the end of this exercise you shall be able to

- practice on how to find the false colour composite satellite image.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connections cables
- Satellite image data, Internet connection

PROCEDURE

A false color image is used to reveal or enhance features otherwise invisible or poorly visible to a human eye.

False color imagery can be produced using different color combinations (schemes).

The choice of a color scheme depends on the type of objects that need to be emphasized in the image.

SWIR-2, SWIR-1, Red False Color Scheme

This false color combination enhances a variety of objects in the image assigning them each a specific color.

Water bodies are blue or black which makes coastlines appear more distinct.

Snow and ice are more easily discernible as their dark blue color stands out.

Urbanized areas can appear white, gray, or purple, providing contrast with the dark green vegetation.

In other words, every characteristic feature of the Earth's surface has its unique color or shade of a color.

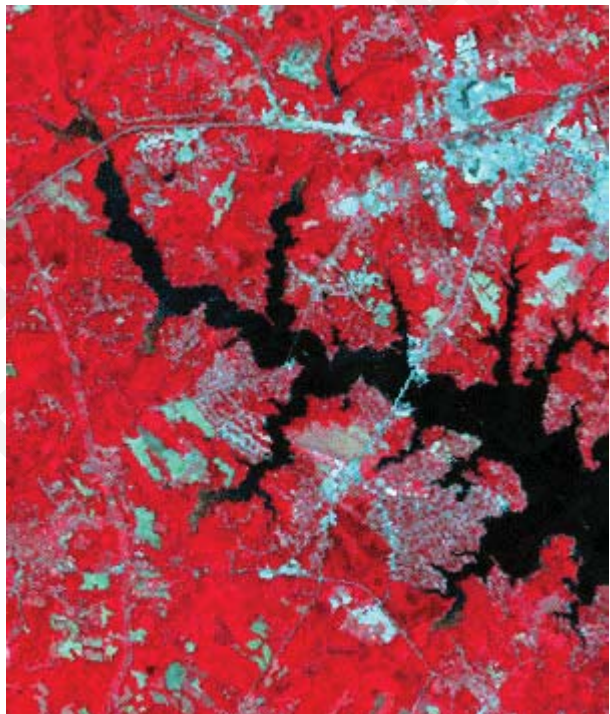
A false color composite produced using the **SWIR-2, SWIR-1, Red scheme** is also often used to detect and analyze aerosols

NIR, Red, Green false color scheme

Each color (band) combination can be tailored to enhance some specific object or feature type.

For instance, a false color image made out of the NIR (near-infrared), Red, and Green bands, will give all the vegetation a distinct red color, allowing it to be more easily distinguished from its surroundings by the human eye.

Fig 1



NIR, Red, Green scheme helps to distinguish clear water (cyan) in a false color image.

SWIR, NIR, Red false color scheme

Combining short-wave infrared (**SWIR**), near-infrared (**NIR**), and **Red** bands highlights the presence of vegetation, clear-cut areas and bare soils, active fires, and smoke; in a false color image. (Fig 1)

Practice of How to Import Data in Image Processing Software

Objective: At the end of this exercise you shall be able to

- practice how to import data in image processing software.

Requirements

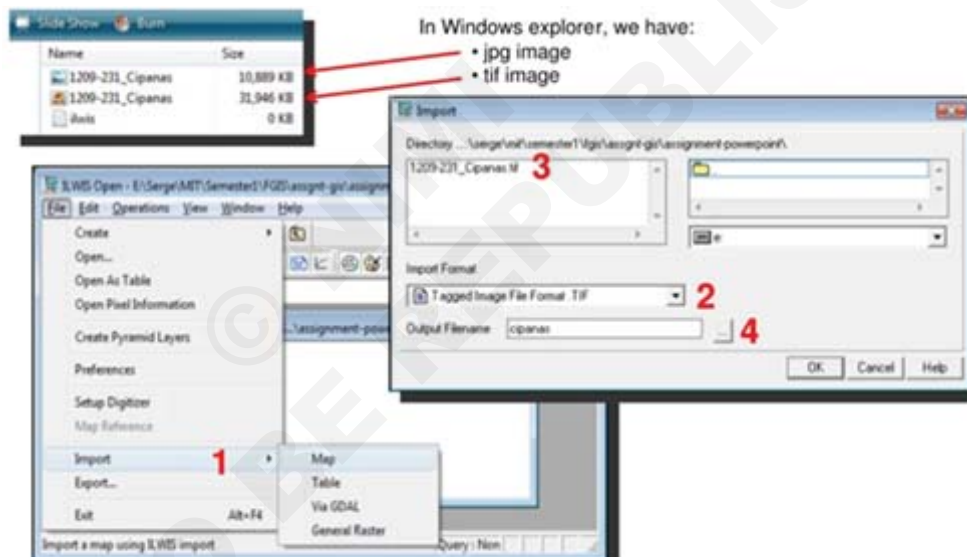
Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

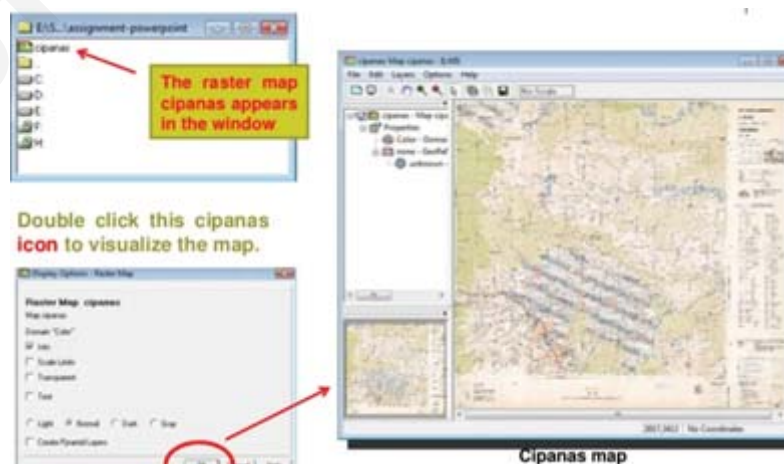
- 1 Import the map (Tif format or JPG format)
- 2 Choose the import format to TIF
- 3 Choose the map
- 4 Give a name of the output file. (Fig 1)

Fig 1



Visualize the Map (Fig 2)

Fig 2



Practice of Image Georeferencing, Registration /Rectification

Objective: At the end of this exercise you shall be able to

- practice image geo-referencing, registration and rectification.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

Georeferencing (Fig 1)

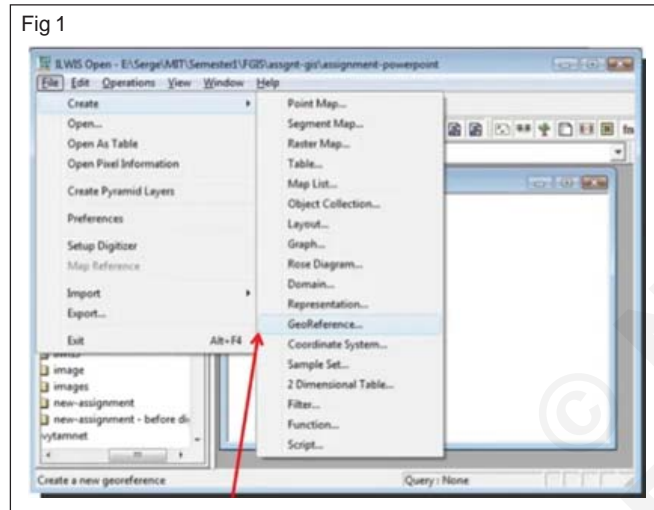


Fig 2

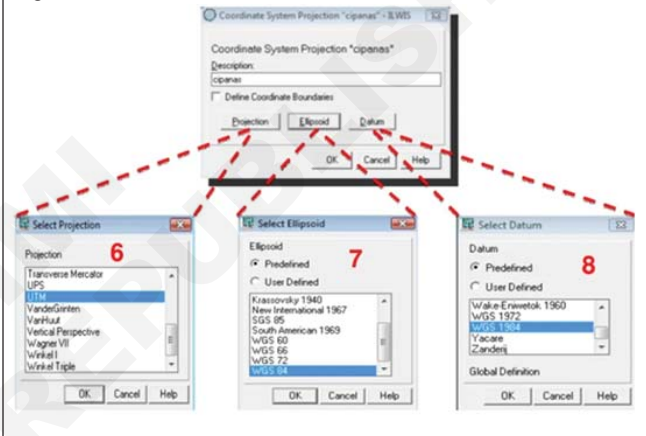
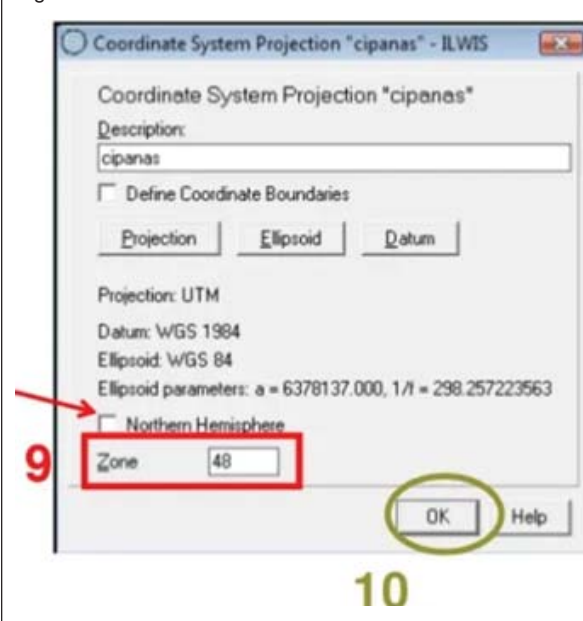


Fig 3



We create a new georeference for Map

We will create a new georeference and a new coordinate system for map.

- 1 Give the georeference name
- 2 Give a description
- 3 Choose GeoRef tie-points
- 4 Create coordinate system
- 5 Click ok

Coordinate system (Fig 2)

- 6 Projection select UTM
- 7 Ellipsoid select WGS 84
- 8 Datum select WGS 1984
- 9 Input Zone 44 (select the check box Northern Hemisphere) (Fig 3)
- 10 Click ok

Select the raster data as background map.

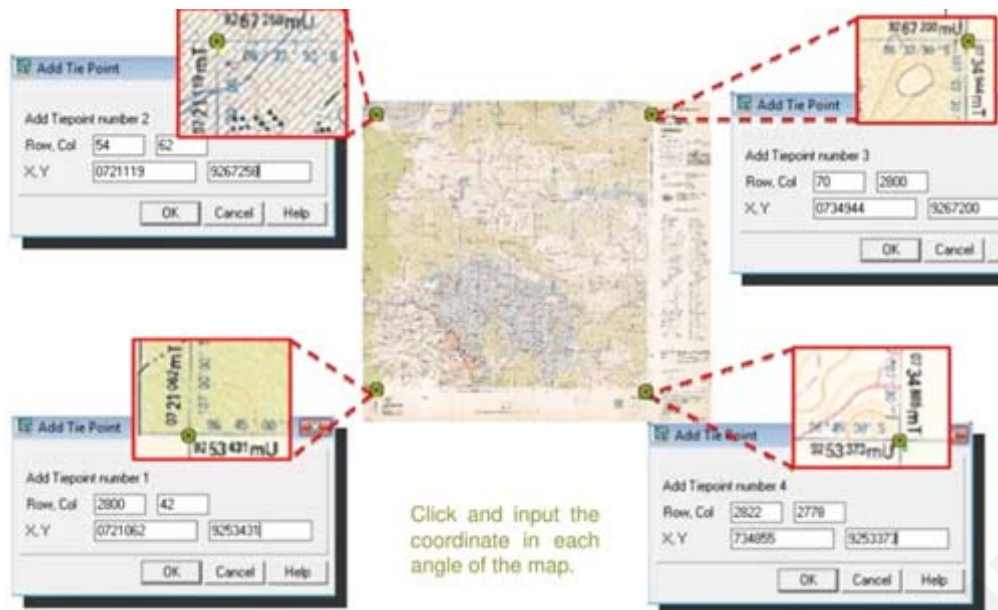
Then click ok

Georeference: Editor (Fig 4)

After clicking ok button, we start to create the Georeference.

Click and input the coordinate in each angle of the map.

Fig 4



Practice of Mosaic Creation, Sub Setting, Visualization of Single Band Images

Objective: At the end of this exercise you shall be able to

- practice mosaic creation, sub-setting, visualization of single band image.

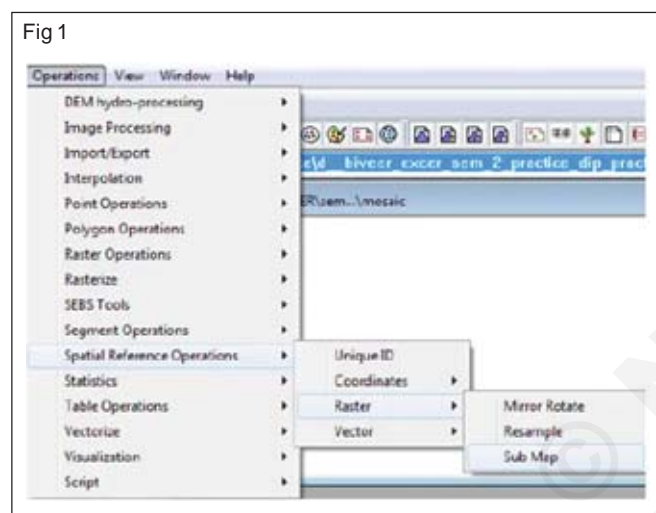
Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Internet connection
- Inter connecting cables
- Image Processing data

PROCEDURE

Mosaic creation or Mosaicking (Fig 1)



- The Glue raster maps operation glues or merges two or more georeferenced input raster maps into one output raster map.
- The output map then comprises the total area of all input maps.
- The domains of the input maps are merged when needed.

Main menu Bar



Operations



Raster Operations



Glue Maps

Give input maps and output file name

Glue Raster Maps DBX open

Select the Radio button for number of input maps

Browse for the input maps

Then give the name of output map (EX: mosaic_sub.mpr)

Click on show

Sub Setting

Main menu Bar



Operations



Spatial Reference Operations



Raster



Sub Map

Sub Map of Raster Map DBX open

Select the radio button of coordinates

Type the two coordinates of diagonal of rectangle

Type the output file name

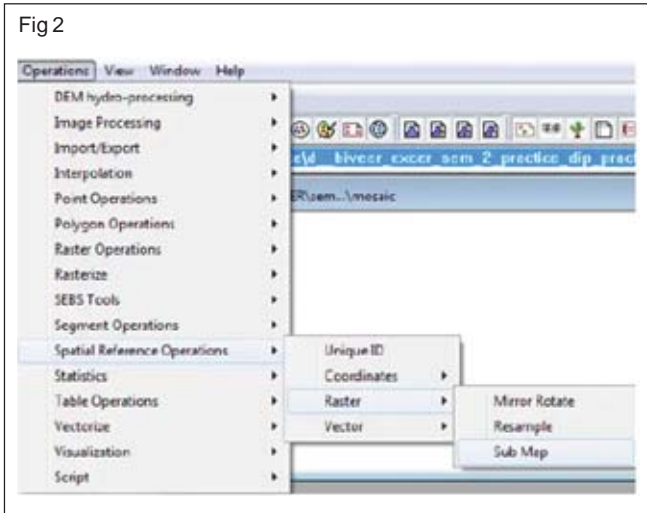
On the "sub map of raster map" window (Fig 2)

- 1 Select corners
- 2 Copy the coordinate values in a note pad
- 3 Type the output raster map name
- 4 Type the Description
- 5 Click on show

Visualization of single band images (Fig 3 to 5)

LISS-4 (Linear Imaging Self-Scanning Sensor-4)

Fig 2

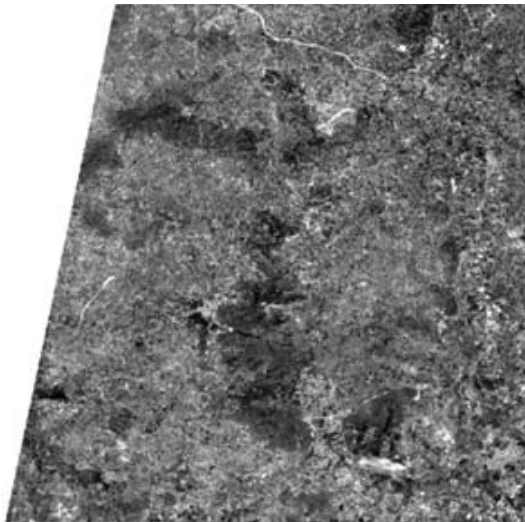


The LISS-4 multispectral high-resolution camera is the prime instrument of this sensor complement. with a spatial resolution of 5.8 m and a swath of 70 km.

B4: 0.77-0.86 (NIR)

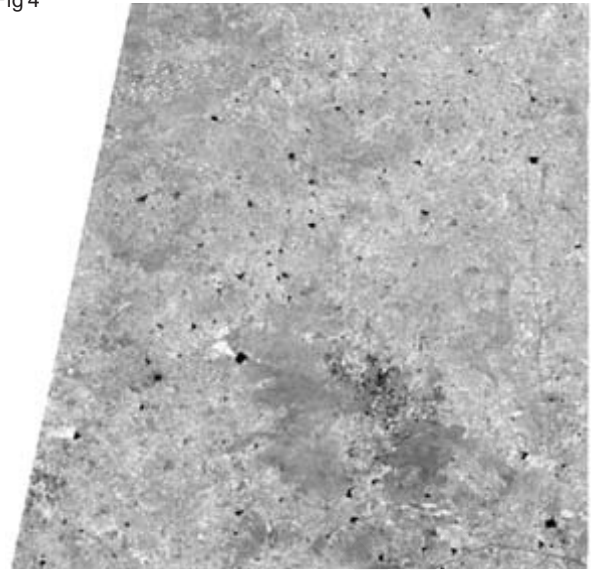
B2: 0.52-0.59, (green)

Fig 3



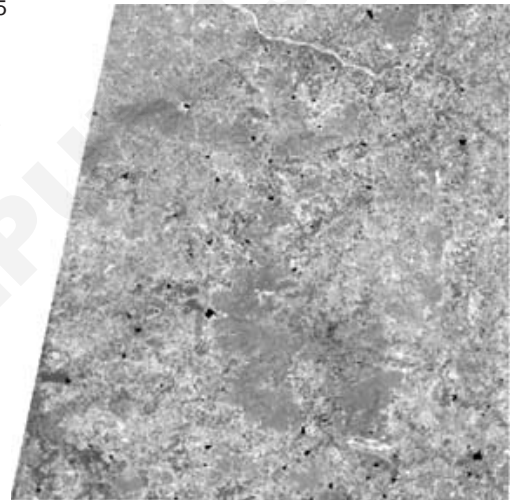
B3: 0.62-0.68, (red)

Fig 4



B3-default band for mono

Fig 5



Practice of Displaying of Individual Pixel Values

Objective: At the end of this exercise you shall be able to

- practice the displaying of individual pixel values.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

Fig 1

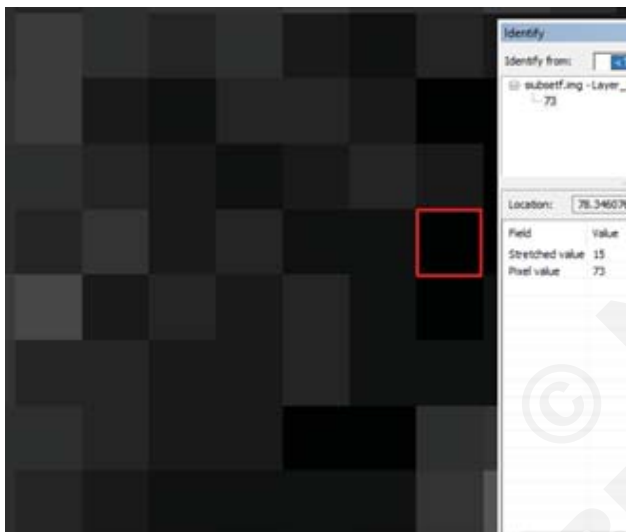


Fig 2

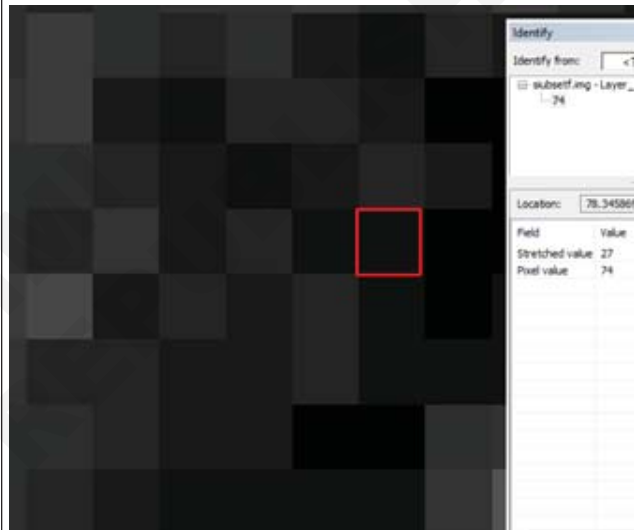
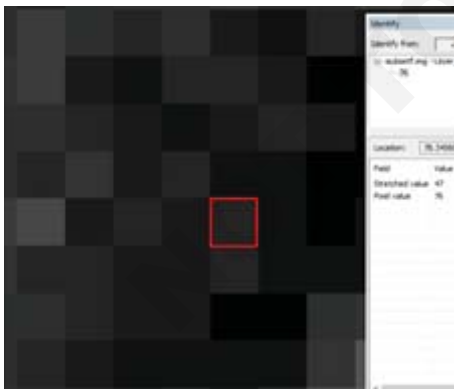


Fig 3



Displaying Pixel Values of More than One Band

Objective: At the end of this exercise you shall be able to

- practice the displaying of pixel values of more than one band.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

Operations> Image Processing> Color Composite
(Fig 1 to 3)

Fig 1

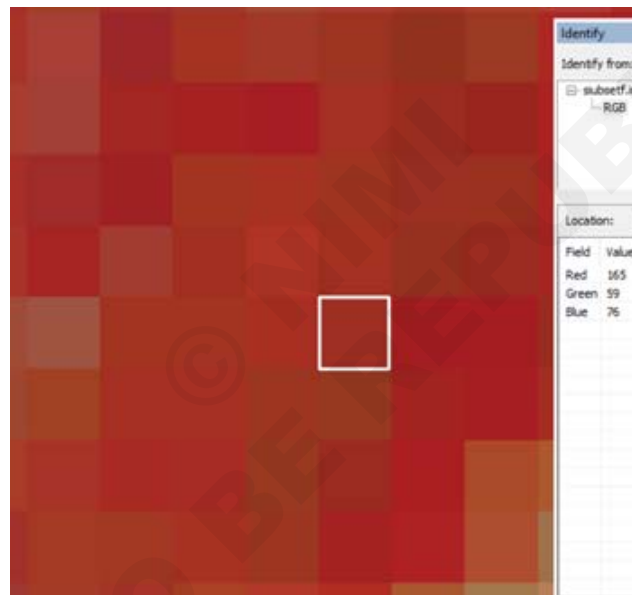


Fig2

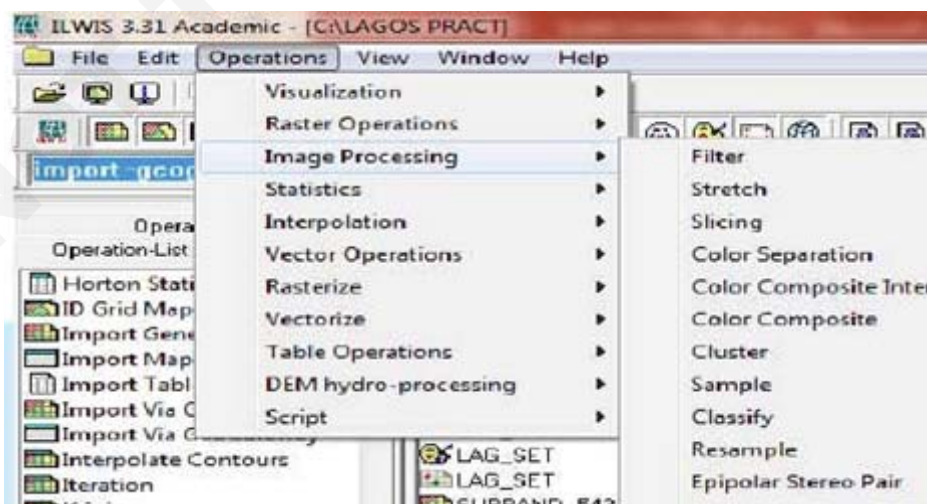
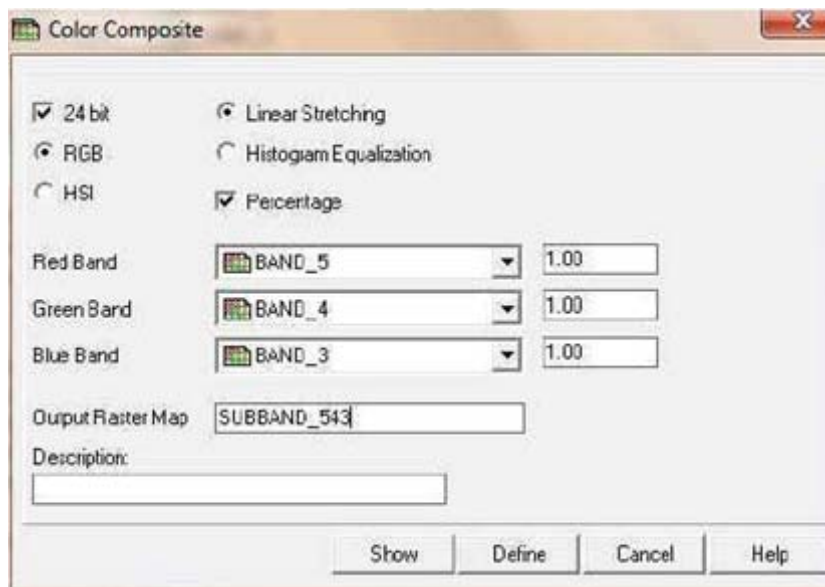


Fig 3



Displaying Color Composites

Objective: At the end of this exercise you shall be able to

- practice the displaying of colour composites.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

Fig 1

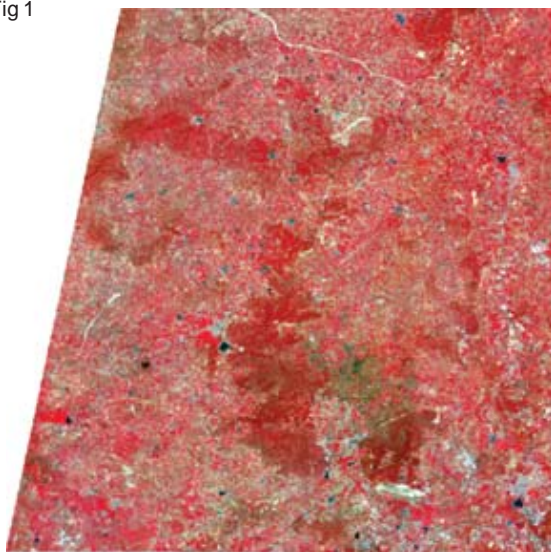


Fig 2

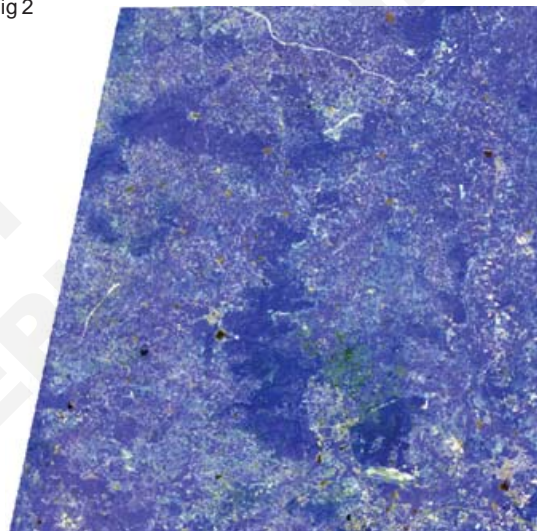
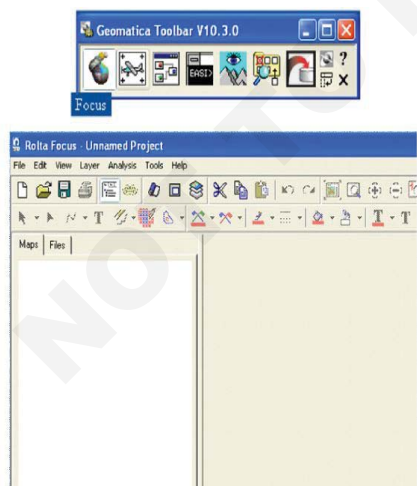


Fig 3



Introduction to Supervised Classification and Unsupervised Classification

Objective: At the end of this exercise you shall be able to

- understand and perform the classification for satellite imagery
- to perform unsupervised classification
- to perform supervised classification.

Requirements

Tools/Equipments/Inst ruments

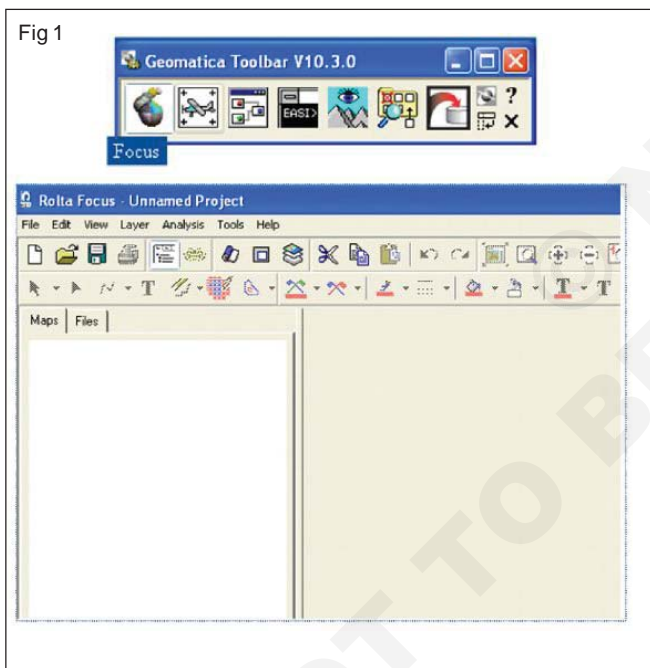
- Images - Mount_Abu_Reg.tif - registered
- Rolta Geomatica prime software

PROCEDURE

Unsupervised Classification

- From the Start > Programs list select Rolta Geomatica > Rolta Geomatica. Rolta Geomatica
- Toolbar & Rolta Focus will be open. (Fig 1)

Fig 1

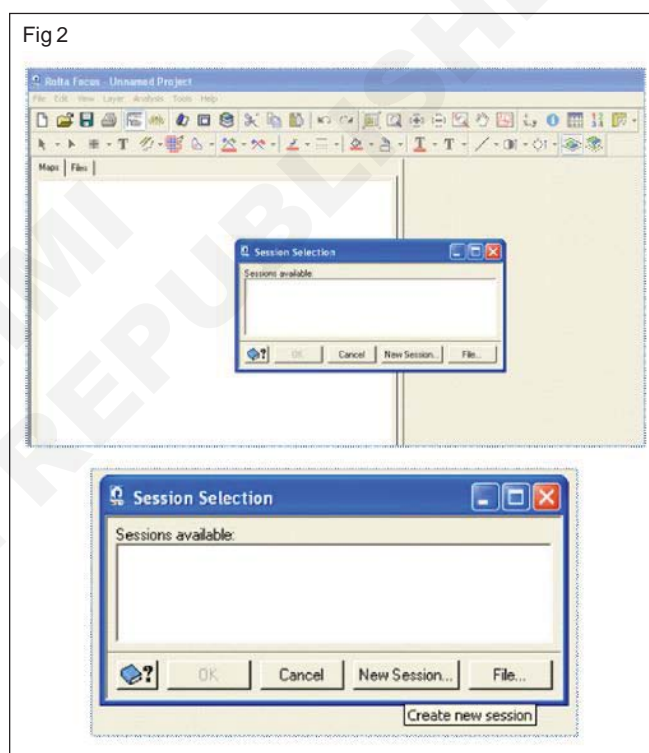


- Go to Analysis > Image Classification > Unsupervised Classification.
- Open Mount_Abu_Reg.tif Raster file in to PIX format. (Fig2)
- After file will open, it displays Session Selection window where we can create a new session (Fig 3)

On choosing New Session, the new Session Configuration window will open. Here we need to configure the parameters

- In the Description box, type Unsupervised Session.
- Don't change the Red, Green, and blue color values.

Fig 2



- Using Add layer button add 3 more layers (Max. Limit of adding layers is 30).
- In the Input Channels column, select channels 1 to 6.
- In the Output Channel column, select channel 7. This channel will store Output classification results.
- Click OK. (Fig 3 & 4)

New layers will be created. Click OK to close the window.

Now Unsupervised Classification window appears where we can set the parameter like Number of

Output Classes, Iteration value etc. Click Ok to run the process.(Fig5)

Progress bar will show the progress of classification. (Fig 6)

Fig 3

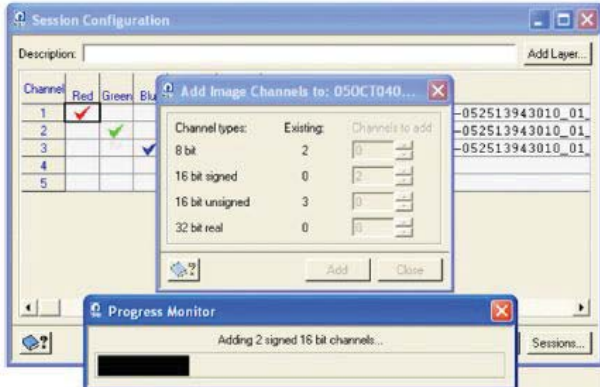
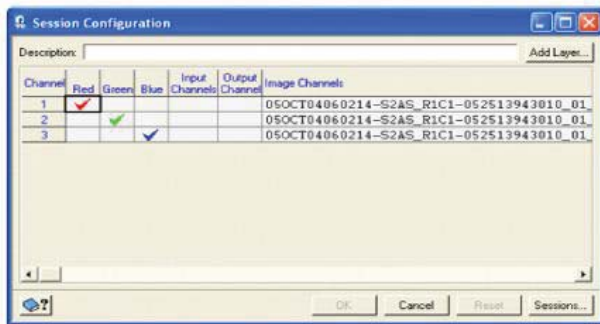


Fig 4

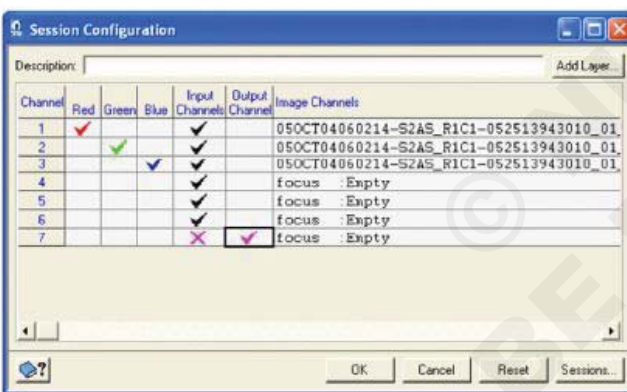
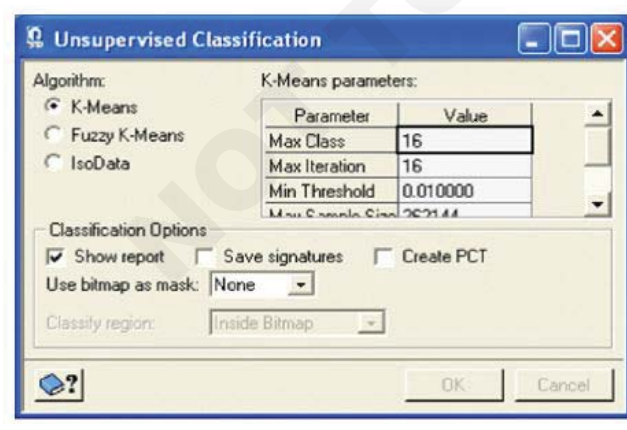


Fig 5



On completion of process, the Progress Monitor will close. Classification Report will open and the classified image displays in the Focus view area. (Fig 7)

Fig 6

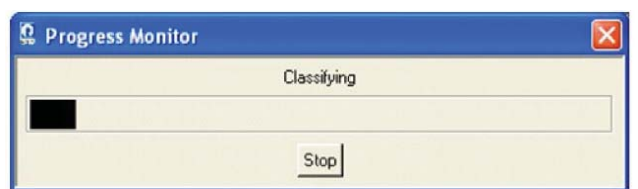


Fig 7

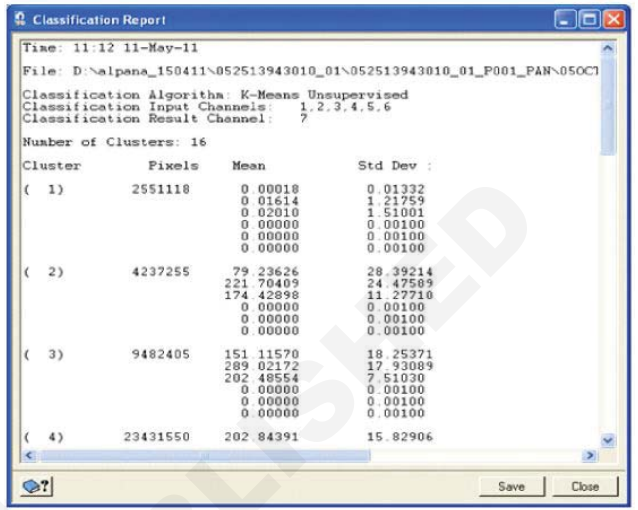
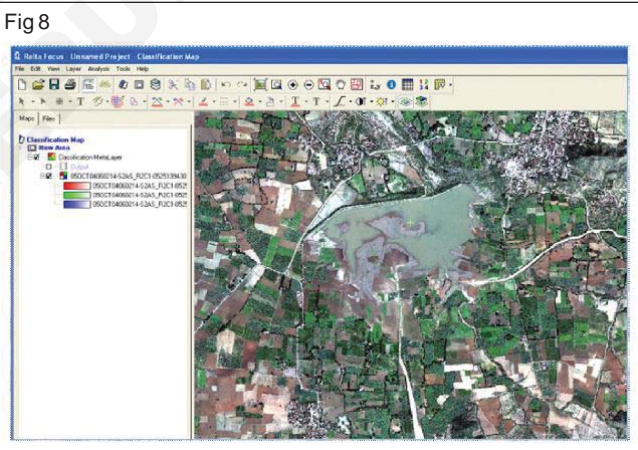
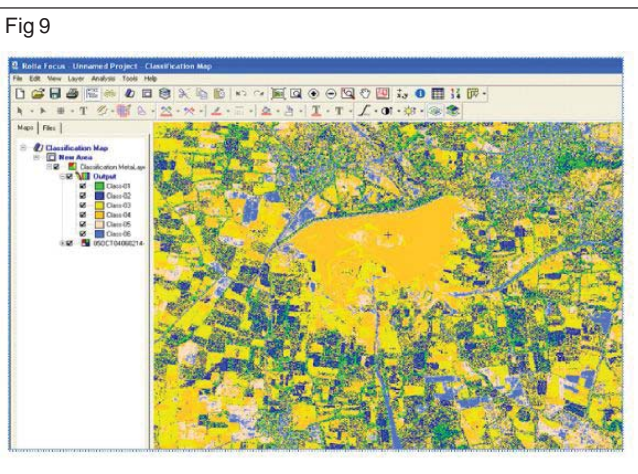


Image Before Classification (Fig 8)

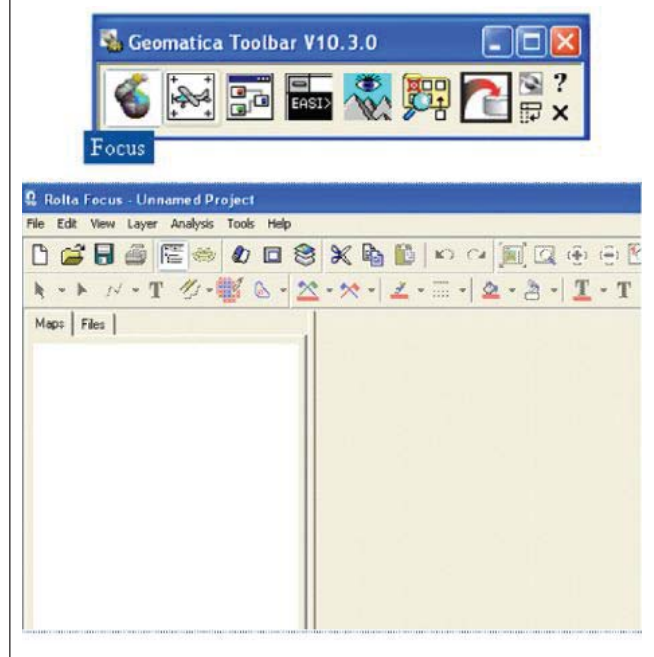


Output of Classified Image (Fig 9)



Supervised Classification (Fig 10)

Fig 10



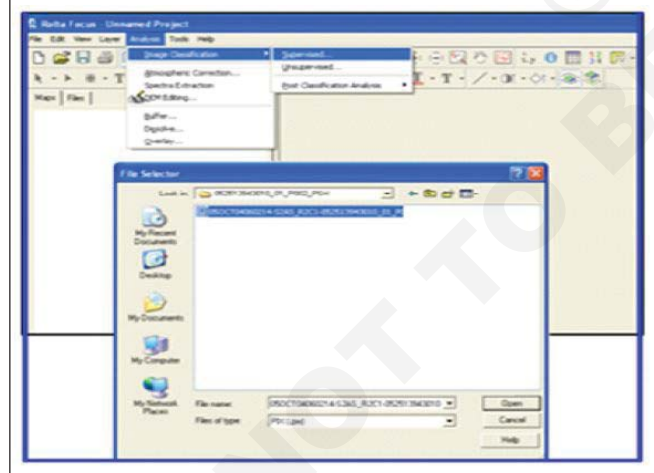
From the Start > Programs list select Rolta Geomatica > Rolta Geomatica. Rolta Geomatica

Toolbar & Rolta Focus will be open.

Go to Analysis > Image Classification > Supervised classification

Open Mount_Abu_Reg.tif Raster file in to PIX format. (Fig 11)

Fig 11



After file will open, it displays Session Selection window where we can create a new session. Click on new session, and create new session. (Fig 12 to 14)

On choosing New Session, the new Session Configuration window will open.

In the Description box, type Supervised Classification.

- Beside the Description box, click Add Layer.
- The Add Image Channels window opens.

Fig 12

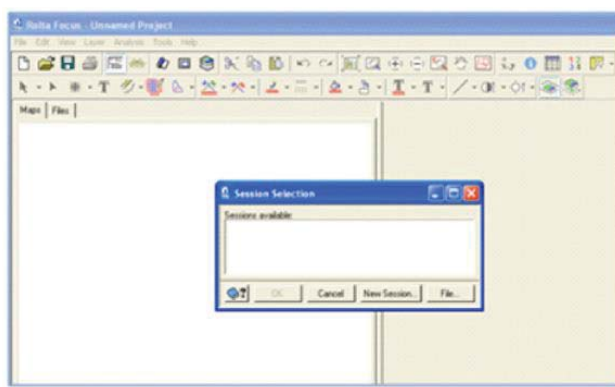
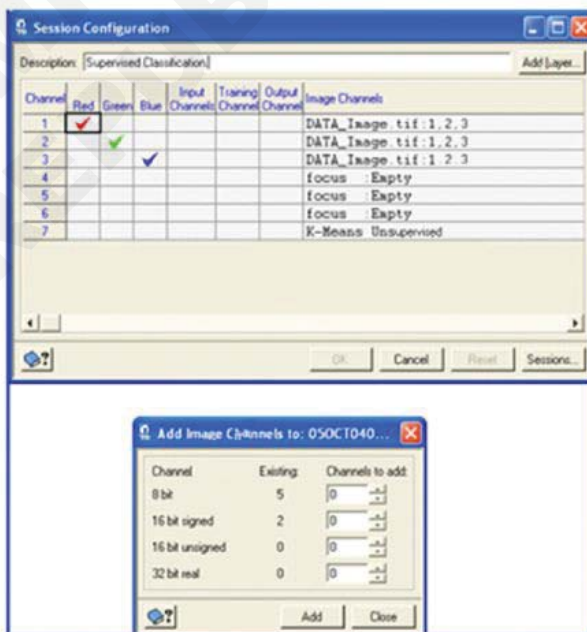
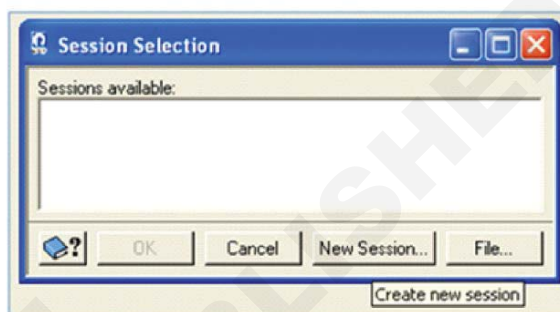


Fig 13 & 14



- Add two 8-bit channels (First channel will contain training sites; the second will contain the supervised classification result)
- Click Add. The channels will be added to the .pix file. (Fig 15)
- Select channel 1 to 4 as Input channels, 5th as Training channel and Channel 7th will be for Output. After configuring click OK. (Fig 16)

The Session Configuration window will close and the training site editor window will be open to classify the new required classes as well as their colors. (Fig 17)

Fig 15

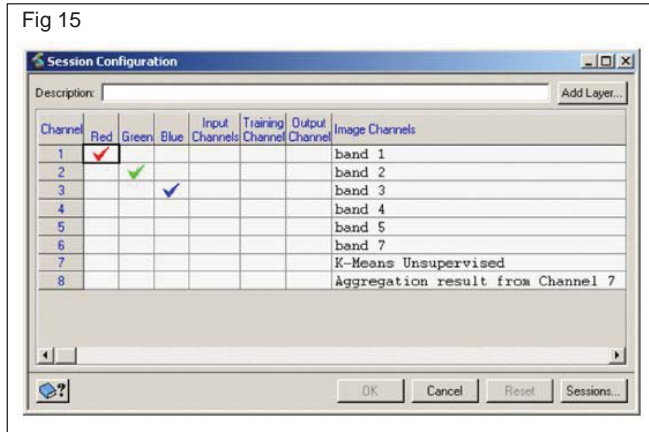
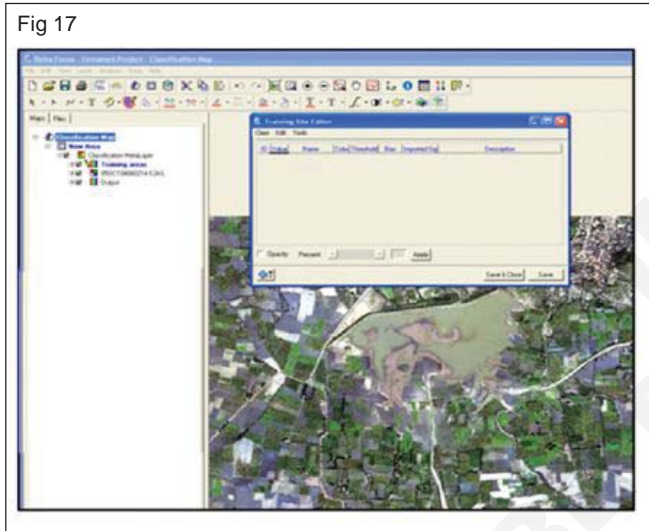


Fig 16



Fig 17



Now mark some training sites of given classes by using the trace polygon as given below (Fig 18)

Click on class option of Training Site Editor window to add new class and assign desired color and name. (Fig 19)

After editing, save all the Classes and close Training Site Editor

Right click on Map Window legend entry & select Run Classification. Supervised Classification window will open, set the parameters as desired and click Ok. (Fig 20)

Progress bar will come to show progress of process and generates the Classification report. On completion of process a Classified Raster data will be open in Focus window.

Save the file by selecting desired output format and name. (Fig 21)

On completion of process, the Progress Monitor will close. Classification Report will open and the classified image displays in the Focus view area. (Fig 22)

Fig 18

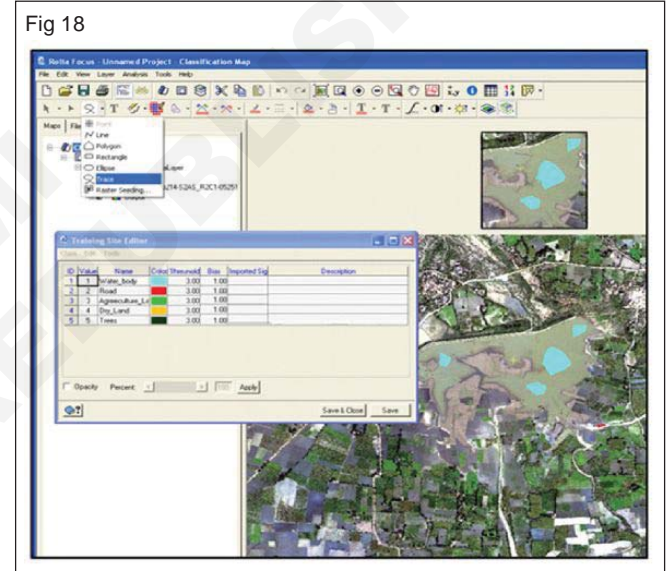


Fig 19

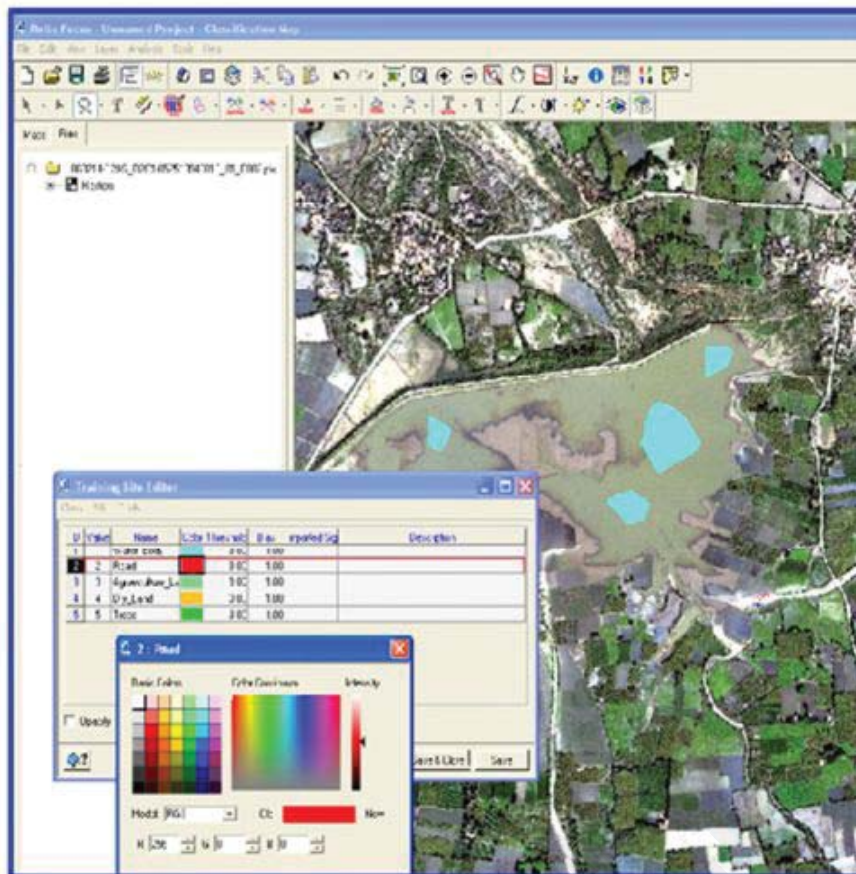


Fig 20

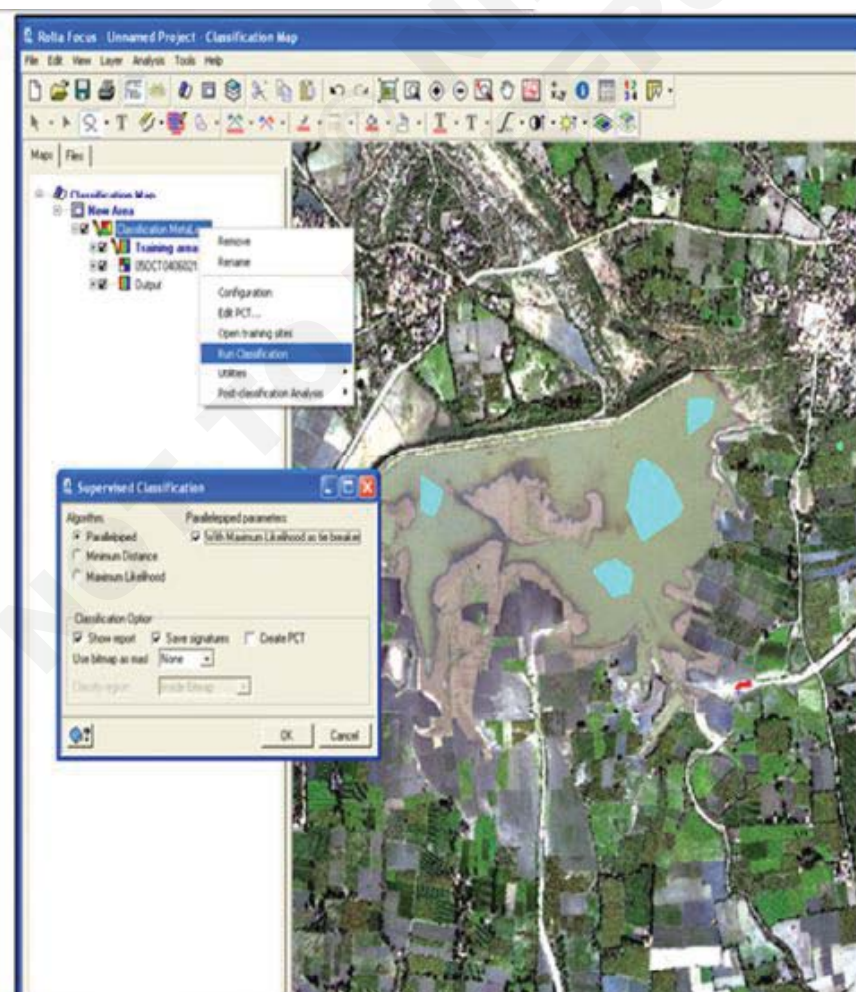


Fig 21

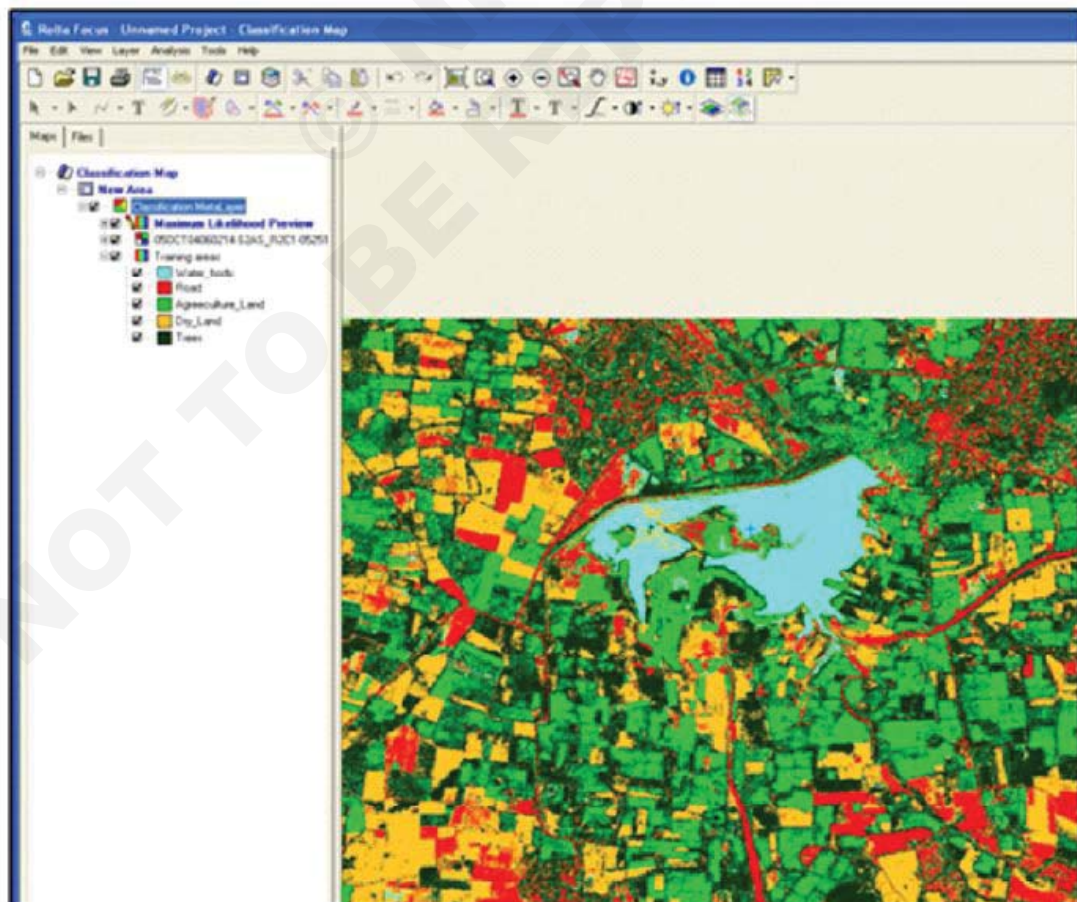
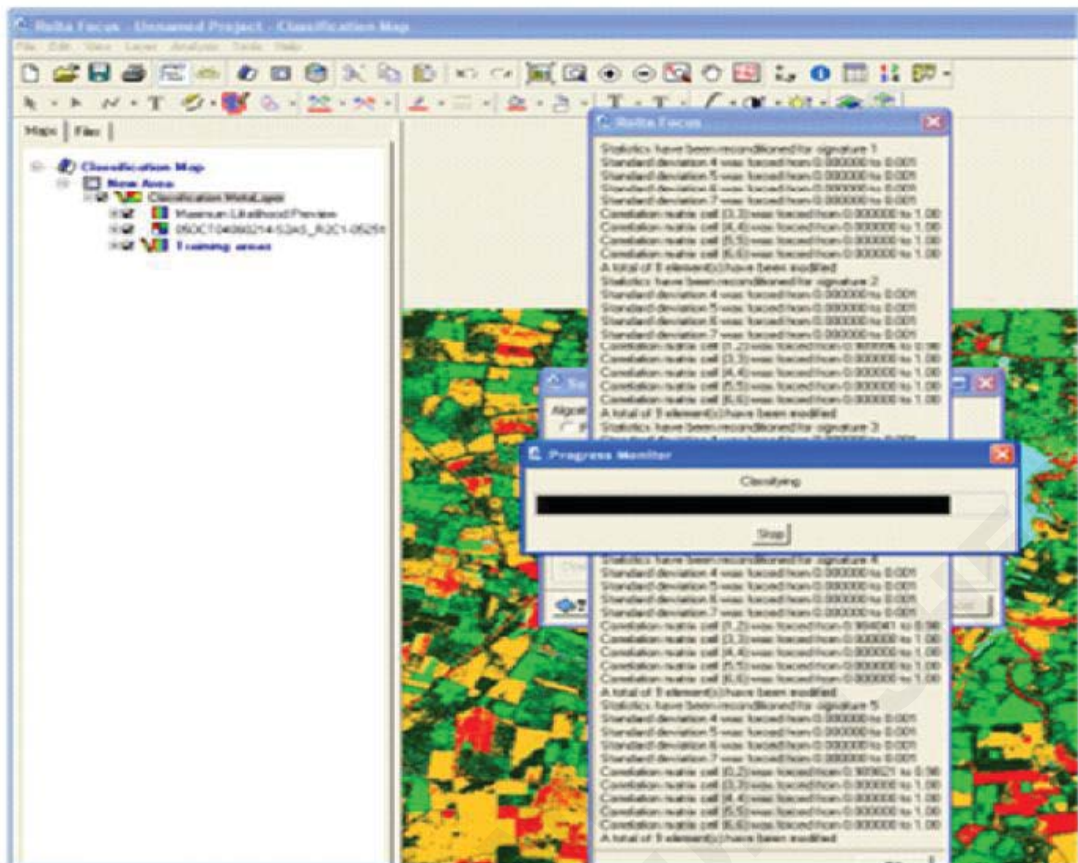
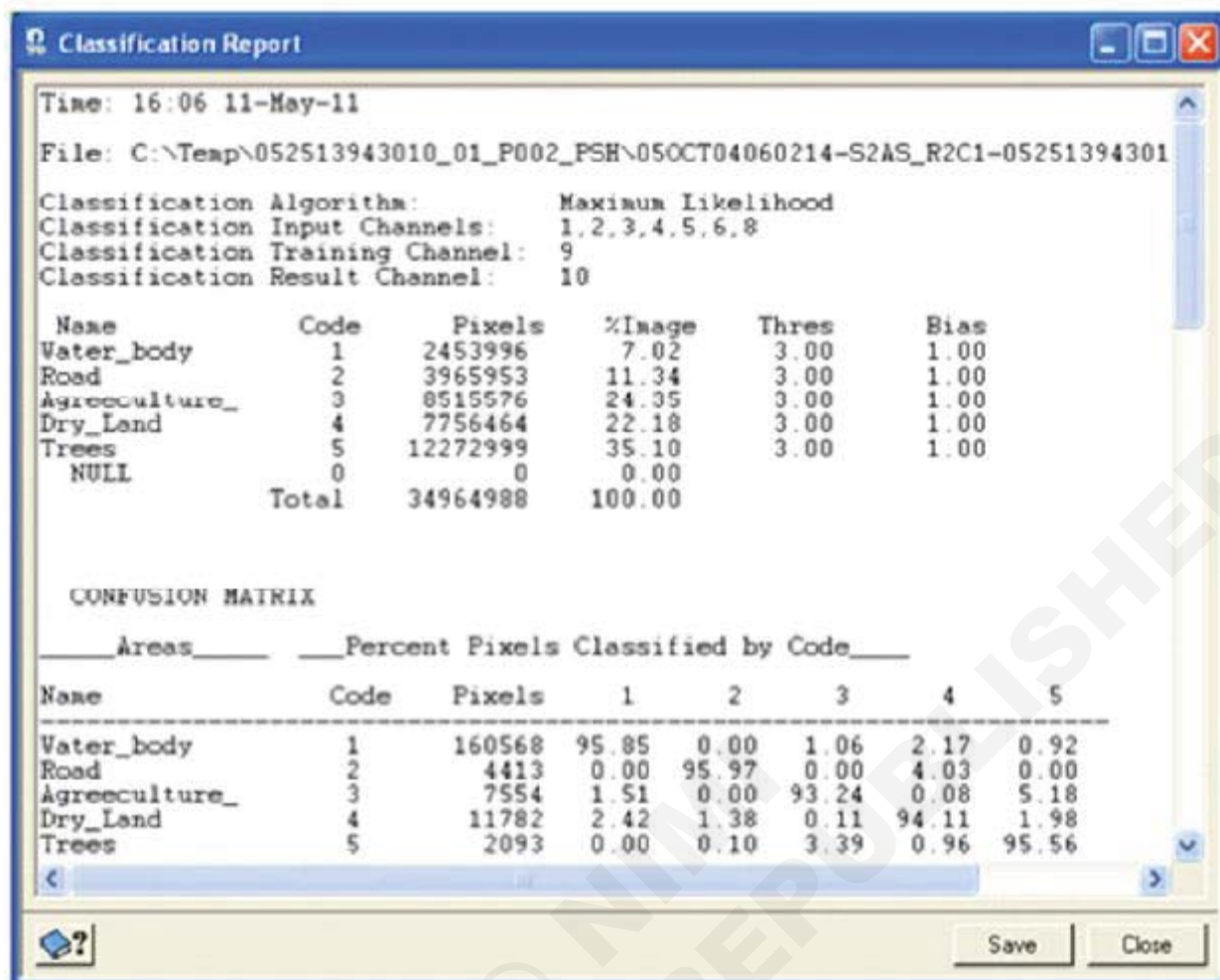


Fig 22



Practicing Unsupervised Classification - Defining Classes, Recording, Accuracy Assessment, Area Calculation

Objective: At the end of this exercise you shall be able to

- practicing unsupervised classification defining classes, recording, accuracy assessment, area calculation.

Requirements

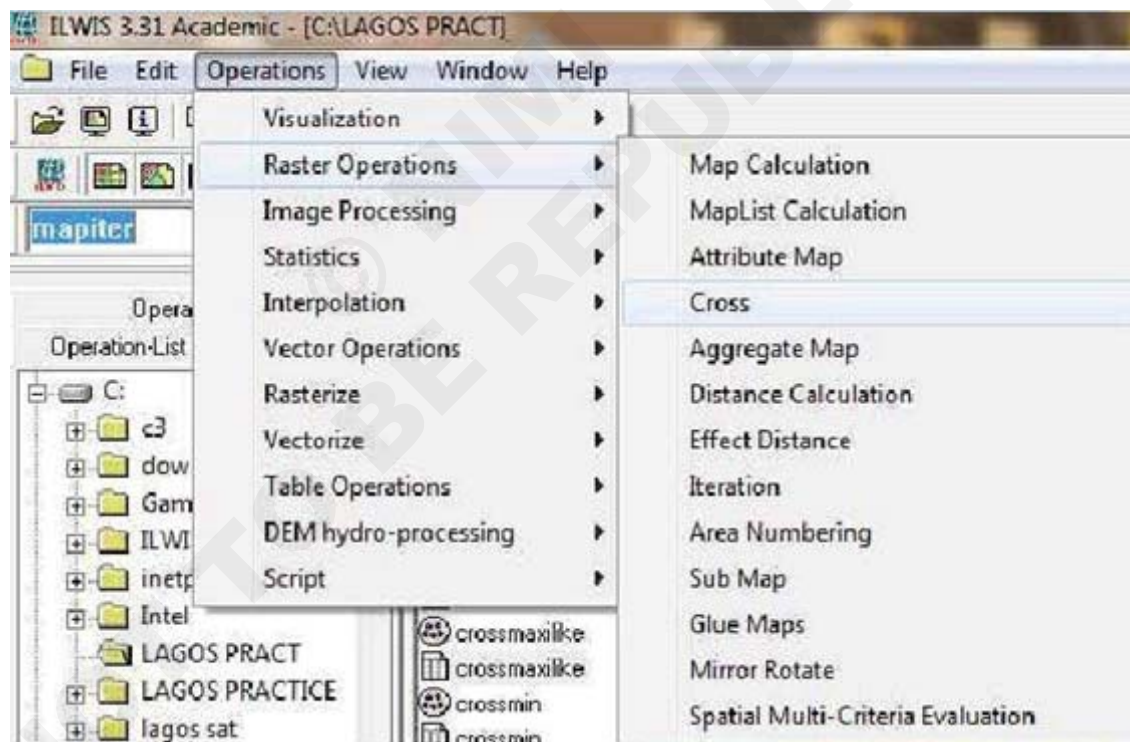
Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

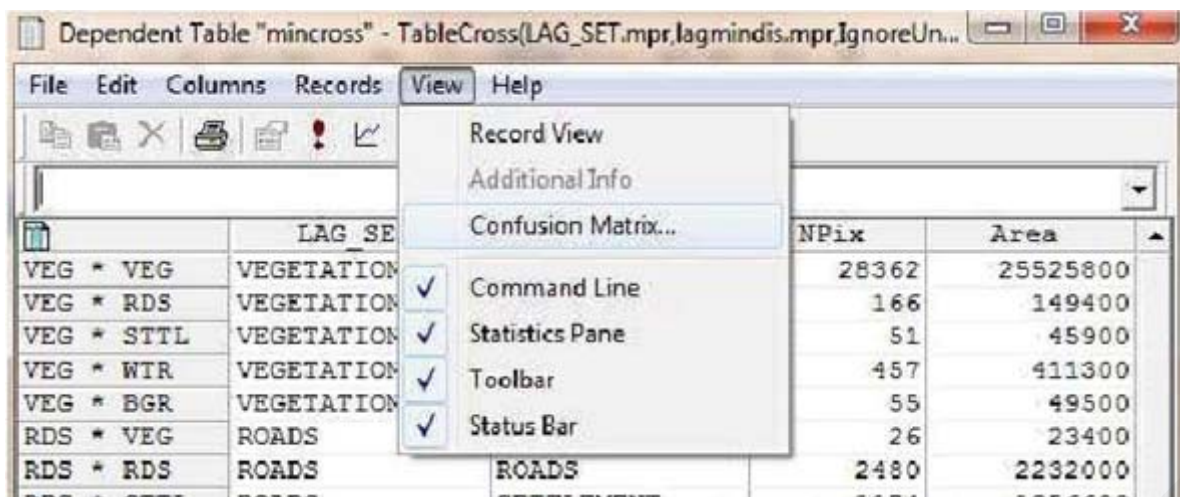
- 1 Go to Operations-> Click on raster operations-> Click on Cross. (Fig 1)
- 2 In the next dialogue box select the sample set used for the classification in the 1st map box (in this case it is the Lag_Set).

Fig 1



- 3 In the 2nd box select the next set of data which can either be Box classifier, Minimum distance, Minimum Mahalanobis distance, or Maximum likelihood. (Fig 2)
 - 4 Input the output table name.
 - 5 Click on Show
 - 6 After clicking on Show, a dependency table is displayed.
 - 7 Click on View and Select Confusion Matrix
- Clicking on the Ok button will show the Matrix confusion indicating the Average accuracy, Average reliability and Overall accuracy

Fig 2



Understand the Difference of Supervised and Unsupervised Classification

Objective: At the end of this exercise you shall be able to

- understanding the difference of supervised and unsupervised classification.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

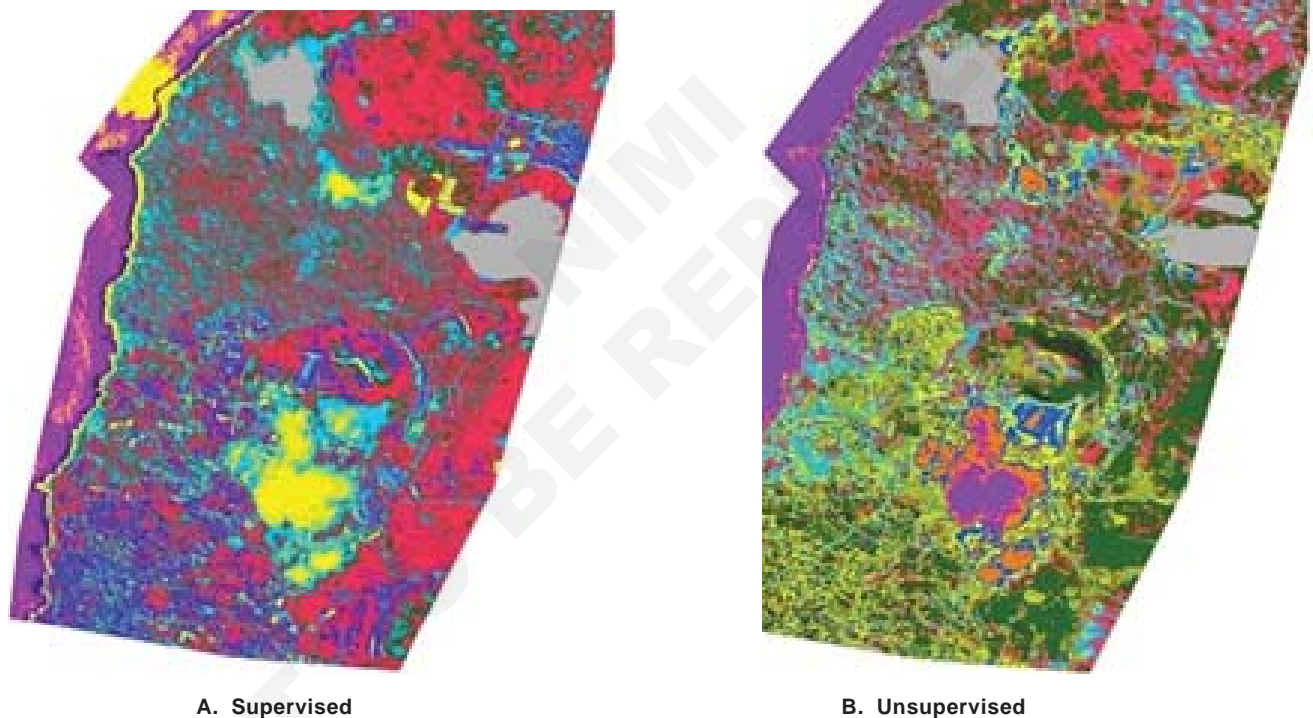
PROCEDURE

Supervised vs. unsupervised learning. (Fig 1)

Choosing the right approach for your situation depends on

how your data scientists assess the structure and volume of data, as well as the use case.

Fig 1



To make your decision, be sure to do the following:

- **Evaluate your input data:** Is it labeled or unlabeled data?

- **Define your goals:** Do you have a recurring, well-defined problem to solve?
- **Review your options for algorithms:** Are there algorithms with the same dimensionality you need.

Preparation of Land Use Map from Satellite Imagery

Objectives: At the end of this exercise you shall be able to

- to display the satellite imagery and toposheet of same area
- to identify the features such as roads, railway line, shadows, buildings, water body, river, forest area, open space, play grounds, airports etc., from toposheet as well as satellite image.

Requirements

Tools/Equipments/Instruments

- We have provided sample toposheets and images but depending on the availability, it is suggested to use regional Indian satellite images to toposheets. For comparison and better understanding, satellite images with different resolution & toposheet of same area with different scale can be used.
- Rolta geomatica software

PROCEDURE

- 1 Open rolta geomatica software
- 2 Add satellite image to display window
- 3 Identify the image features.
- 4 Add toposheet to display window
- 5 Identify the features in toposheet
- 6 Compare the features from both the data sets and discuss. (Fig 1 & Fig 2)

Result

Table 1

Name of the satellite image	
Identify resolution of image	
Identify same objects in image	
As well as in toposheet	

Solution : 1

IKONOS data set

Fig 1



Solution : 2

Landsat data set

Fig 2



Identification of Composer Items, Manage Items

Objective: At the end of this exercise you shall be able to

- identify the composer items and manage items. software.

Requirements

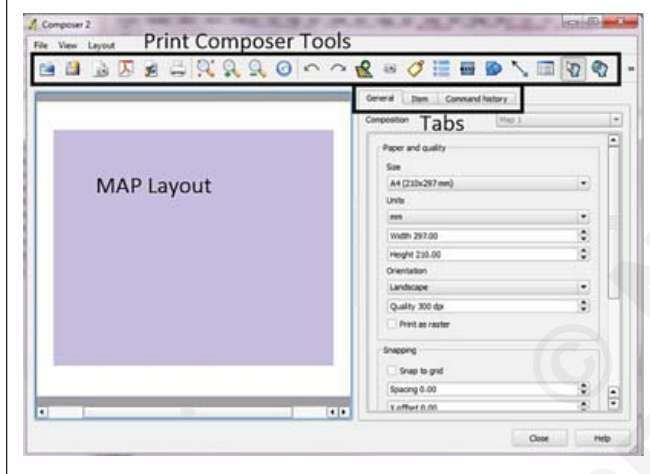
Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

Go to the menu FILE | NEW PRINT COMPOSER (Fig 1)

Fig 1

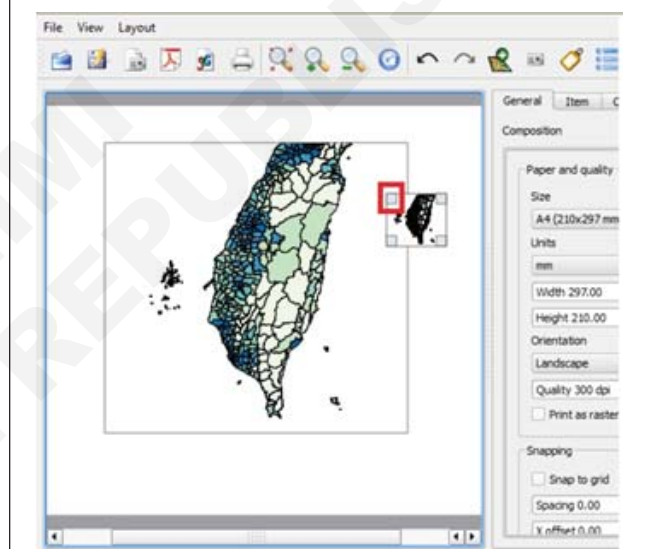


A wide window will appear, with a blank Map Layout on the left, tools along the top, and three tabs on the right: General Settings, Item Settings, Command History

- 1 Click on the green Add New Map button, then drag a box onto the Map Layout area and let go
- 2 The current Map View of the Taiwan Layer will appear in the Map Layout
- 3 Notice that any object added to the Map Layout will be the ACTIVE object when its four corners have small gray squares
- 4 Click DELETE to remove the second map object we added. Notice that the first map object is no longer ACTIVE. Click on the MOVE | SELECT tool (which looks like a hand with an arrow), then click on the map object to make it active again
- 5 Now you should be able to add or remove objects easily from the Map Layout
- 1 Let's start again with the Taiwan map view added to our layout. Click on the MOVE ITEM CONTENT tool (a hand over a globe) and drag the Taiwan map object.

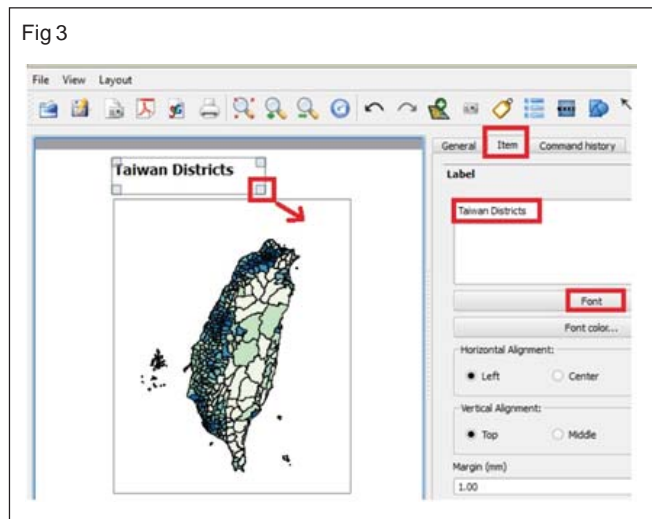
You will see that the object remains fixed but the map moves around inside of the object frame. (Fig 2)

Fig 2



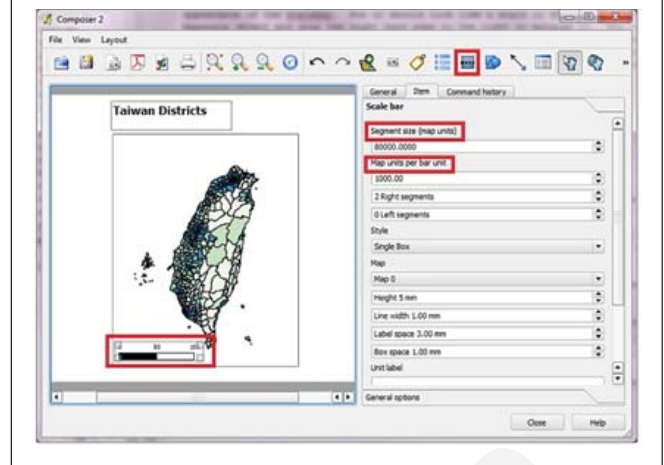
- 2 Click on the MOVE | SELECT tool again and drag the map object. This time you will see that the whole object frame moves on the Map Layout palette, while the content inside the frame remains the same.
- 3 Now you should be able to move objects or their contents on the Map Layout
- 1 Position the Taiwan map object roughly in the center of the Map Layout and leave room at the top for a title
- 2 Click on the LABEL tool and towards the top left of the Map Layout. You will see a very tiny Label object appear with the default text: Quantum GIS
- 3 Click on the ITEM tab to the right, you will see the controls related to the ACTIVE OBJECT, which in this case is the Label Object
- 4 Update the text with "Taiwan Districts"
- 5 Reset the Font to size 24 Bold, close the font controls

- Click on the MOVE | SELECT tool and drag the lower right corner of the Label Object until the full text is visible. You can also reposition the entire object. (Fig3)



- Now click on the SCALEBAR tool (which looks like a railroad on a blue square) and then click on the Map Layout to the lower left of the Taiwan map object.
- You will see a tiny scalebar object appear
- Recall that in our CRS setting (EPSG:2333) the map units = meters
- Click on the ITEM tab and look at the "Segment size (map units)" which should be a figure in meters

Fig 4



- Now change the "Map units per bar unit" to 1000 (in other words, set the bar units to kilometers instead of meters!)
- Changing the Map Units per bar unit should have changed the appearance of the scalebar. Now it should look like a scale in KM. Type in the units in the UNIT LABEL form (in this case KM). Click on the Mapscale object and drag the right hand edge to the right to enlarge it. Now try typing in a different number in the "Segment size" form (for example, change the value from 40,000 to 80,000). You will see how the scalebar has adjusted itself. You may use the SELECT | MOVE tool (when the hand looks closed) to move the object around to a better position. (Fig 4)

Familiarization with Revert and Restore Tools, Atlas 'Generation

Objective: At the end of this exercise you shall be able to

- familiar with revert and restore tools, atlass generation.

Requirements

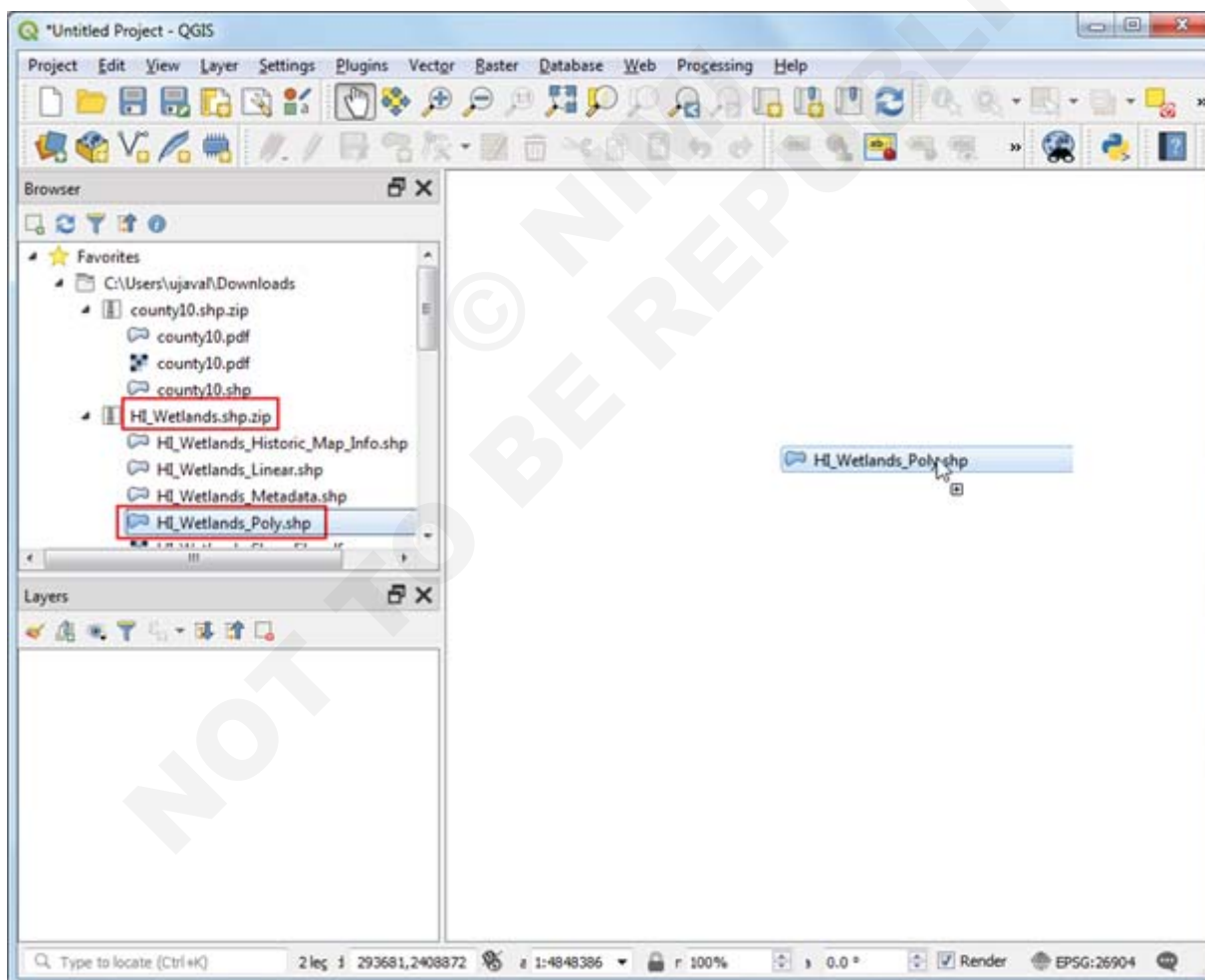
Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

- 1 Locate the HI_Wetlands.shp.zip file in the QGIS Browser and expand it. Select the HI_Wetlands_Poly.shp file and drag it to the canvas. (Fig 1)
- 2 Since we want to make separate wetlands map for each county in the state, we will need the county boundaries layer.

Fig 1

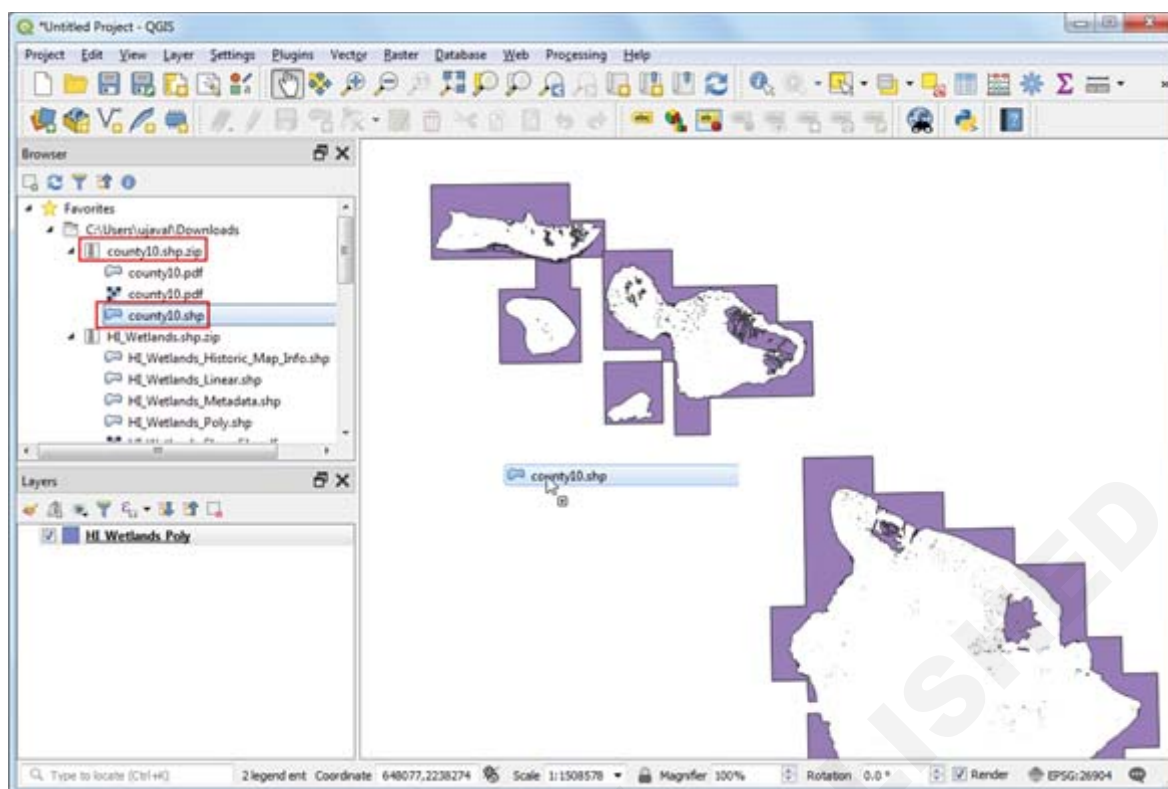


Browse to the county10.shp.zip file and expand it.
Select the county10.shp file and drag it to the canvas.
(Fig 2)

- 3 Turn off the visibility of the HI_Wetlands_Poly layer temporarily.

You will see the polygons from the county10 layer clearly now.

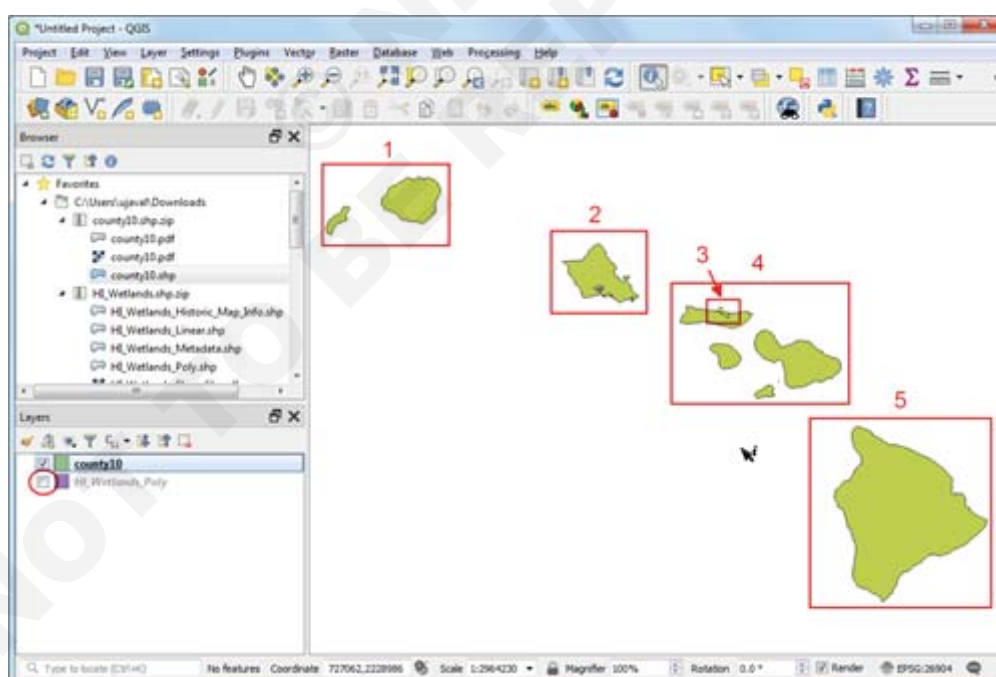
Fig 2



There are 5 features contained in this layer, with each feature having 1 or more polygons associated with it. (Fig 3)

4 Turn on the visibility of the HI_Wetlands_Poly layer. Go to Project. New Print Layout. (Fig 4 & 5)

Fig 3



- 5 Leave the print layout title empty and click OK.
- 6 In the Print Layout window, go to Layout ? Add Map.
- 7 Drag a rectangle while holding the left mouse button where you would like to insert the map.
- 8 In QGIS3, the Atlas tab is not visible by default. Select View ? Panels ? Atlas.

- 9 Switch to the Atlas tab. Check the Generate an atlas box.
- 10 Select the county10 as the Coverage layer. This will indicate that we want to create 1 map each for every polygon feature in the county10 layer. You can also check the Hidden coverage layer so that the features themselves will not appear on the map.

Fig 4

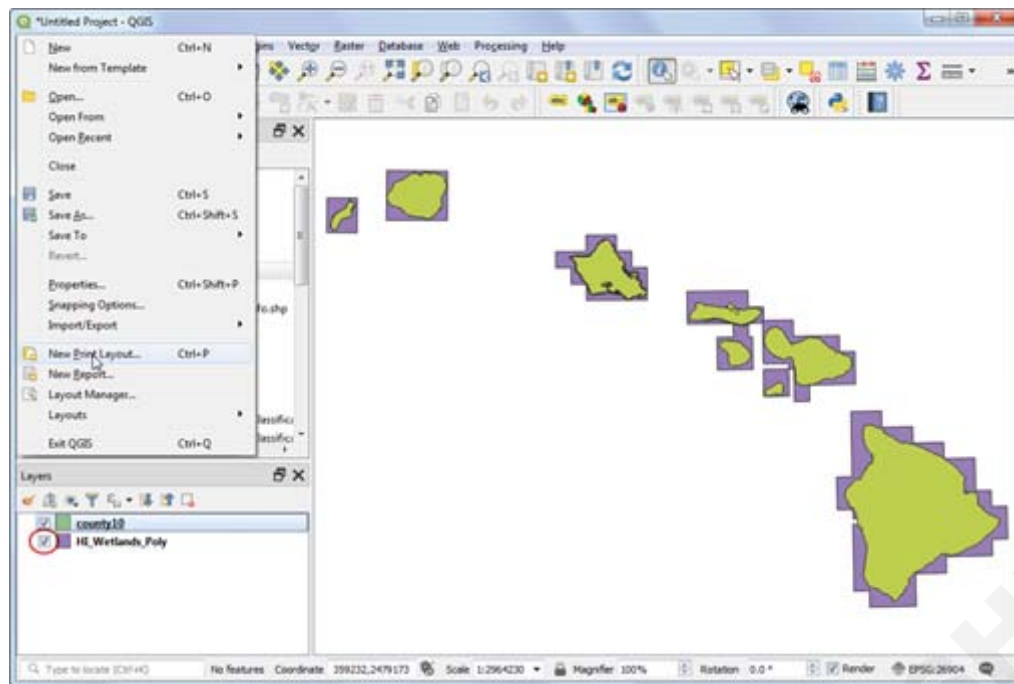
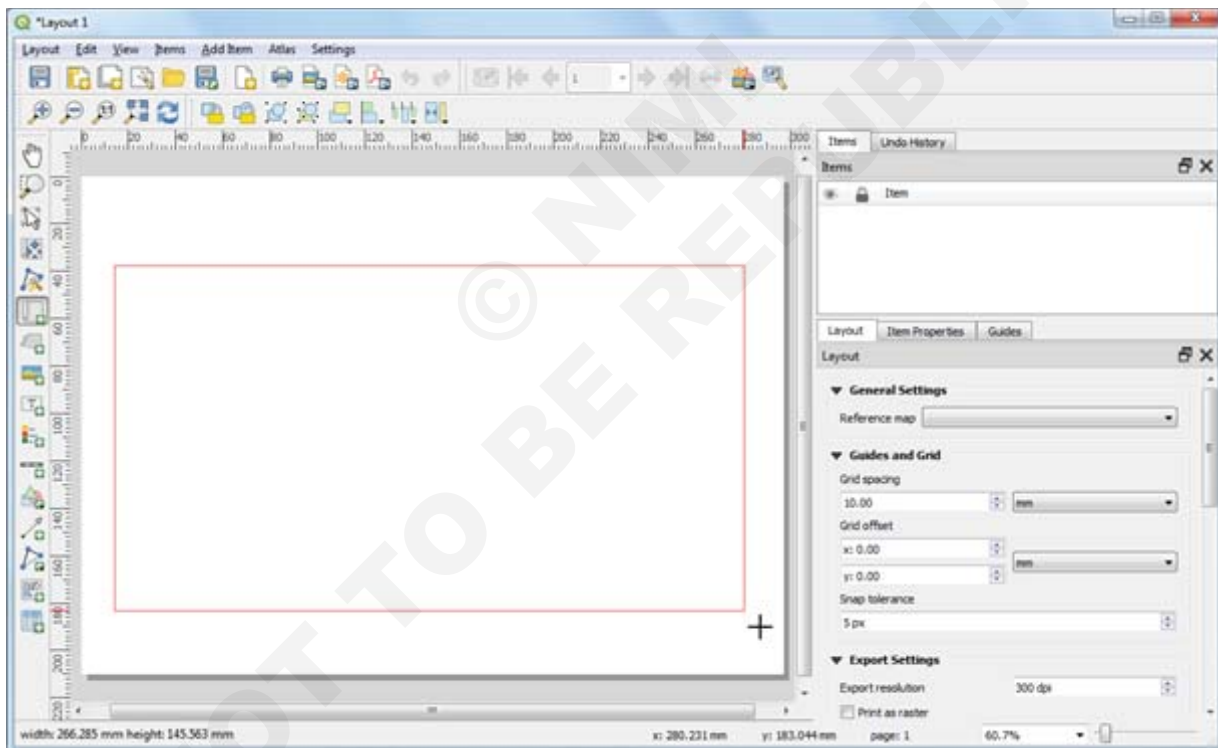


Fig 5



11 Switch to the Item Properties tab. Scroll down and check the Controlled by atlas box. This will indicate the layout that the content of the map displayed in this item will be determined by the Atlas tool.

12 Now that you have configuring the Atlas settings, go to Atlas? Preview Atlas.

13 You will see the map refresh and show how individual map will look like. You can preview how the map will look for each of the county polygons. Go to Atlas ? Next Feature. Atlas will render the map to the extent of the next feature in the coverage layer.

Generation of Output Map, Inserting Let Long

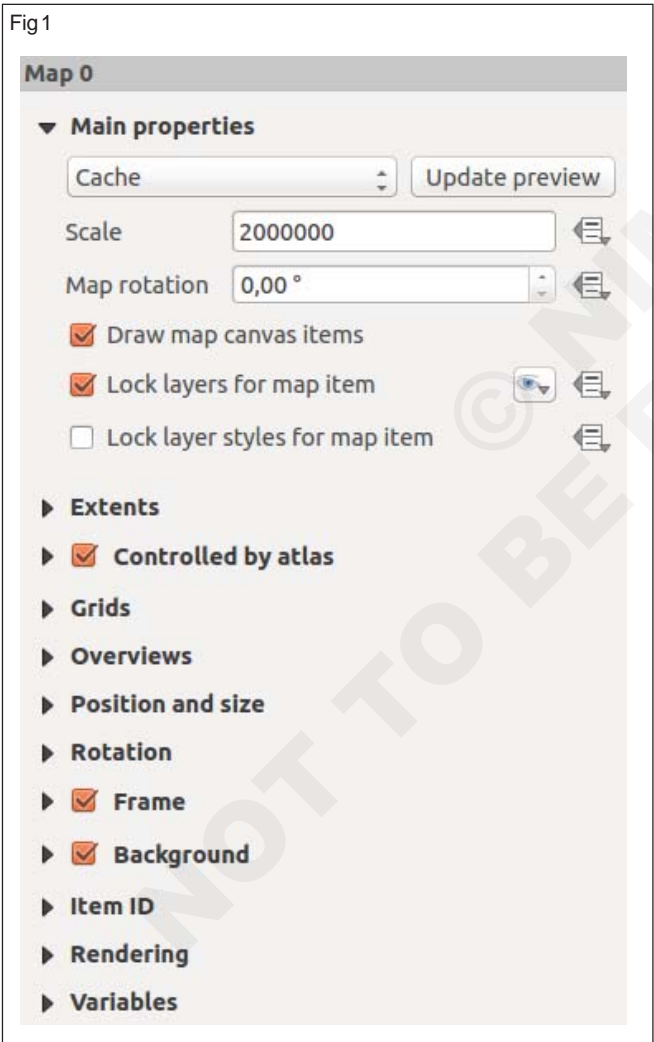
Objective: At the end of this exercise you shall be able to

- practice on generation of output map and inserting let long.

Requirements
Tools/Equipments/Instruments <ul style="list-style-type: none">• PC with Windows OS• Inter connecting cables• Internet connection

PROCEDURE

Grids (Fig 1)



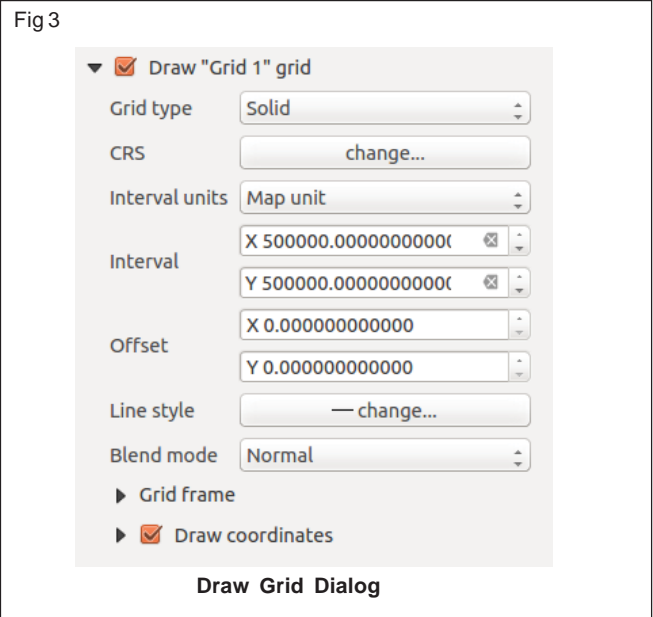
The Grids dialog of the map Item Properties tab provides the possibility to add several grids to a map item.

- With the plus and minus button you can add or remove a selected grid.
- With the up and down button you can move a grid in the list and set the drawing priority.


When you double click on the added grid you can give it another name. (Fig 2)

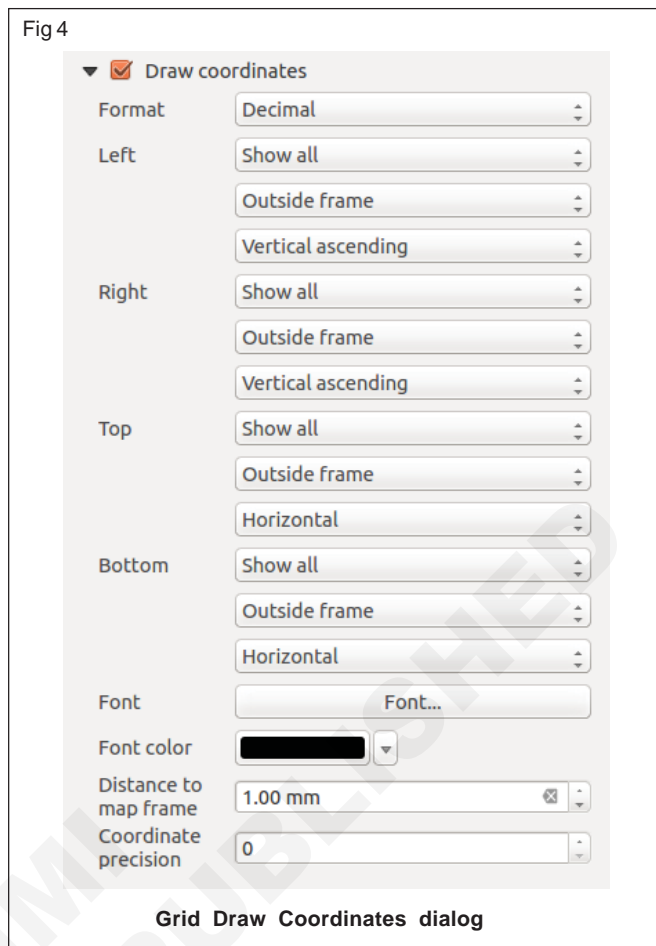


After you have added a grid, you can activate the checkbox **Draw grid** to overlay a grid onto the map element. Expand this option to provide a lot of configuration options. (Fig 3)



As grid type, you can specify to use a 'Solid', 'Cross', 'Markers' or 'Frame and annotations only'.

- There are different options to style the frame that holds the map.
- With 'Latitude/Y only' and 'Longitude/X only' setting in the divisions section you have the possibility to prevent a mix of latitude/y and longitude/x coordinates showing on a side when working with rotated maps or reprojected grids.
- Advanced rendering mode is also available for grids.
- The  **Draw coordinates** checkbox allows you to add coordinates to the map frame. You can choose the annotation numeric format, the options range from decimal to degrees, minute and seconds, with or without suffix, aligned or not and a custom format using the expression dialog. (Fig 4)



Map Composition, Map Projection, Map Generalization and Symbolization

Objective: At the end of this exercise you shall be able to

- generate map composition using map projection, map generation and symbolization.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

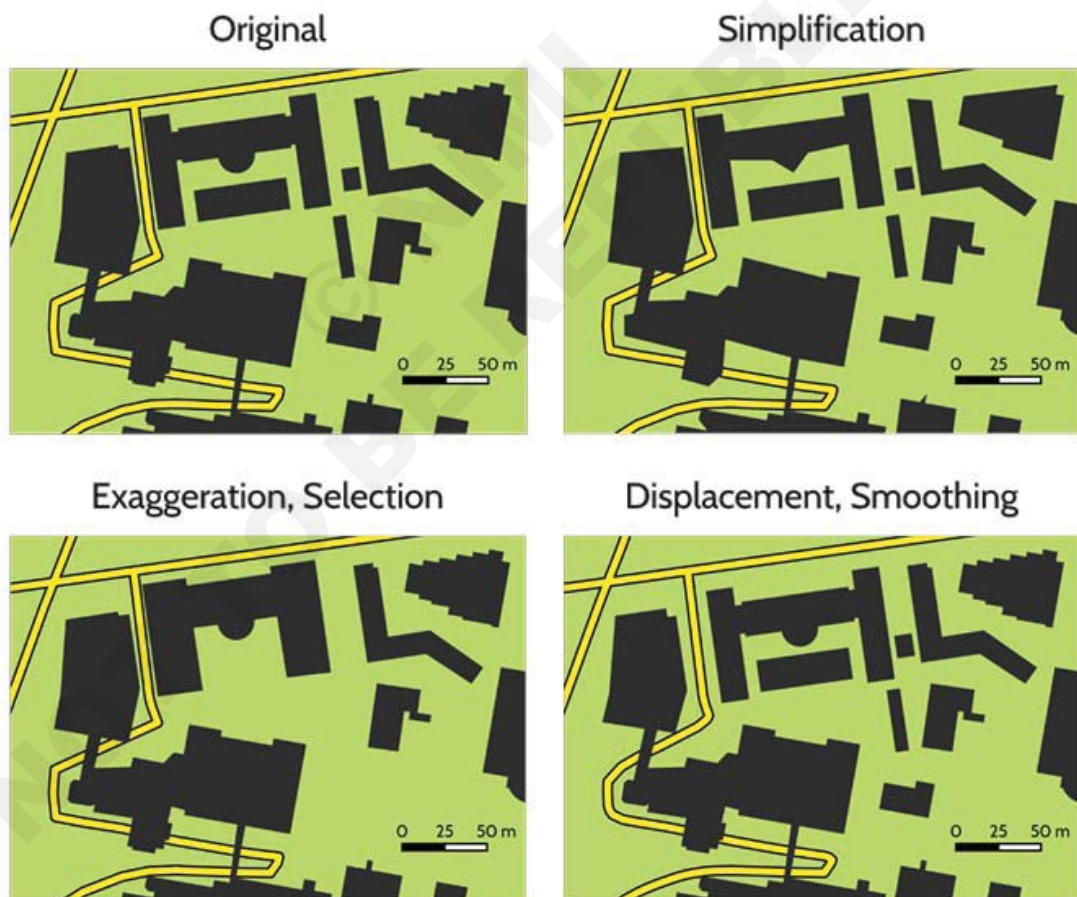
Map generalization (Fig 1)

Map generalization is the name of the process that simplifies the representation of geographical data to produce a map at a certain scale with a defined.

The best example for the map generalization is dot map.

Dot maps are used to visualize distributions and densities of a big number of discrete distributed single objects.

Fig 1



Symbolization (Fig 2 & 3)

Once you join tabular data to shapefiles in QGIS or have a shapefile with numeric or categorical data.

- 1 Double-click or right-click the shapefile/layer you want to symbolize and select Properties.
- 2 Click on the Style tab.

- 3 Choose between Categorical or Graduated (numerical) symbology depending on the type of data you have.

Categorical Data (Fig 4)

If you have data that is broken into categories (i.e. male or female, hair color, political party, etc.) you will choose the Categorized option.

Fig 2

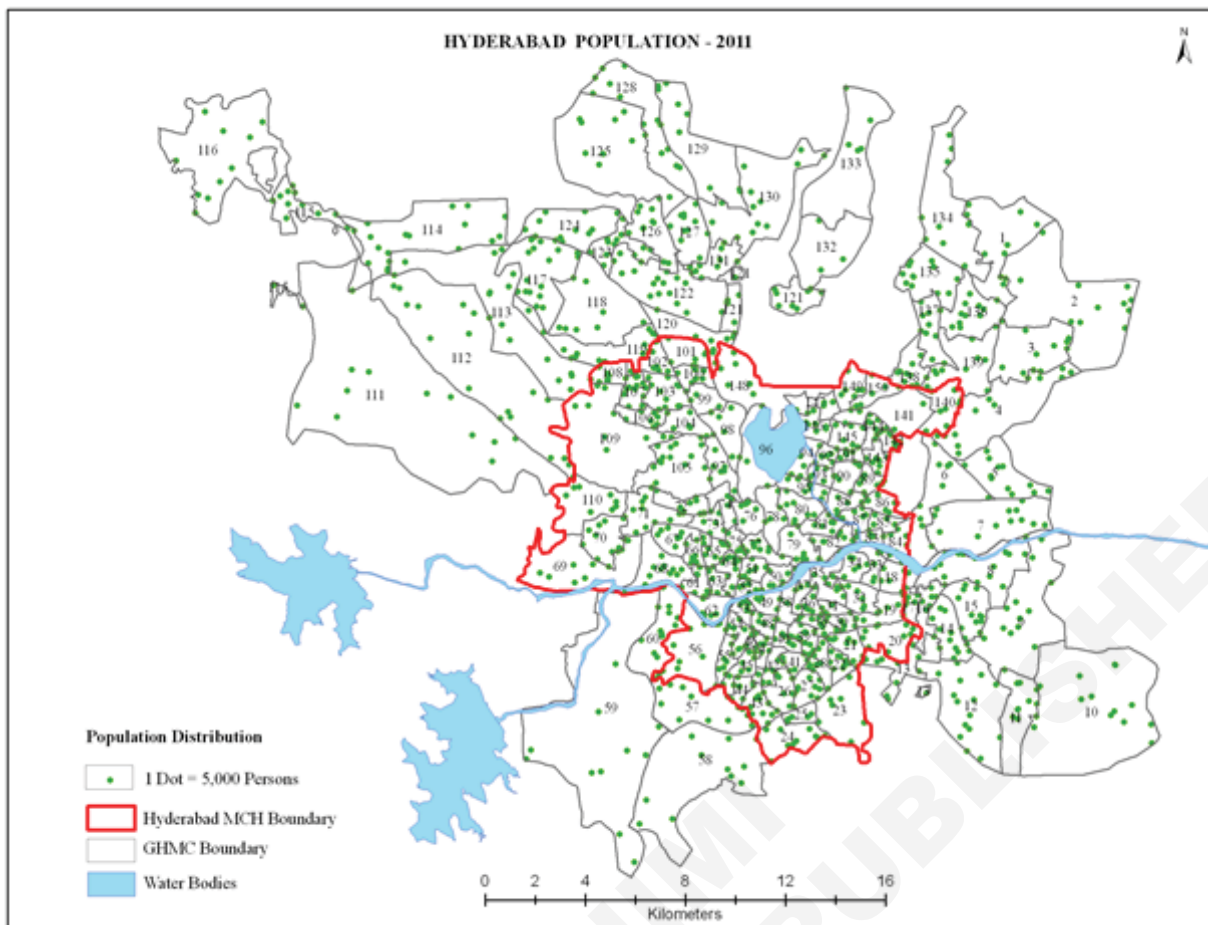
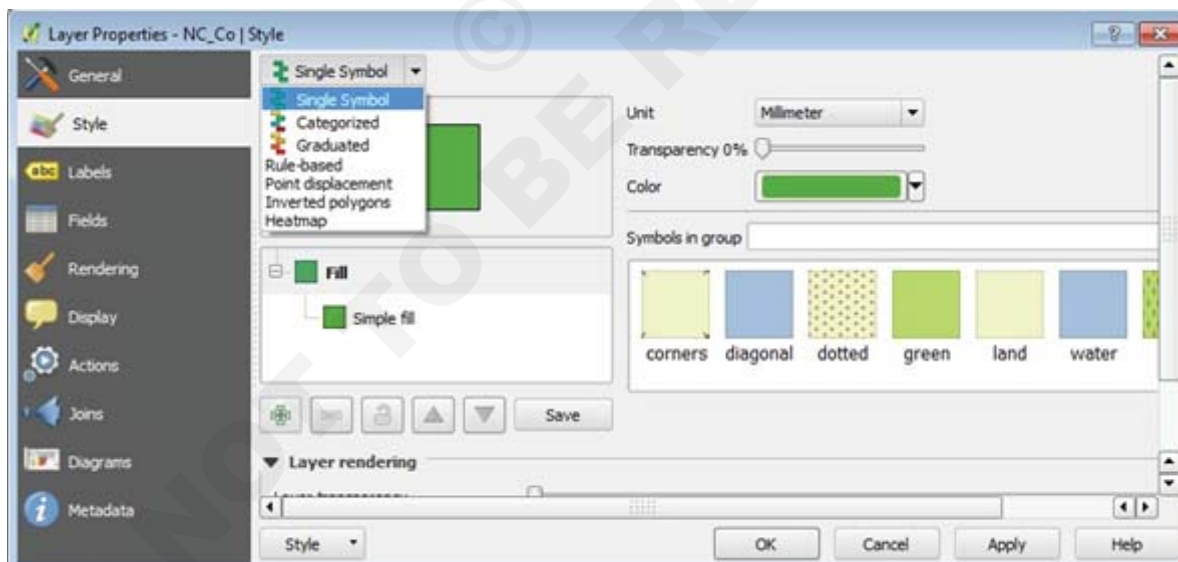


Fig 3



- 1 Next to the column option, use the drop-down arrow and select Categorized. Find the field with categorized data (in this case, election data) and select it.
- 2 Click Classify and the different categories will populate the Value field.
- 3 Click OK.

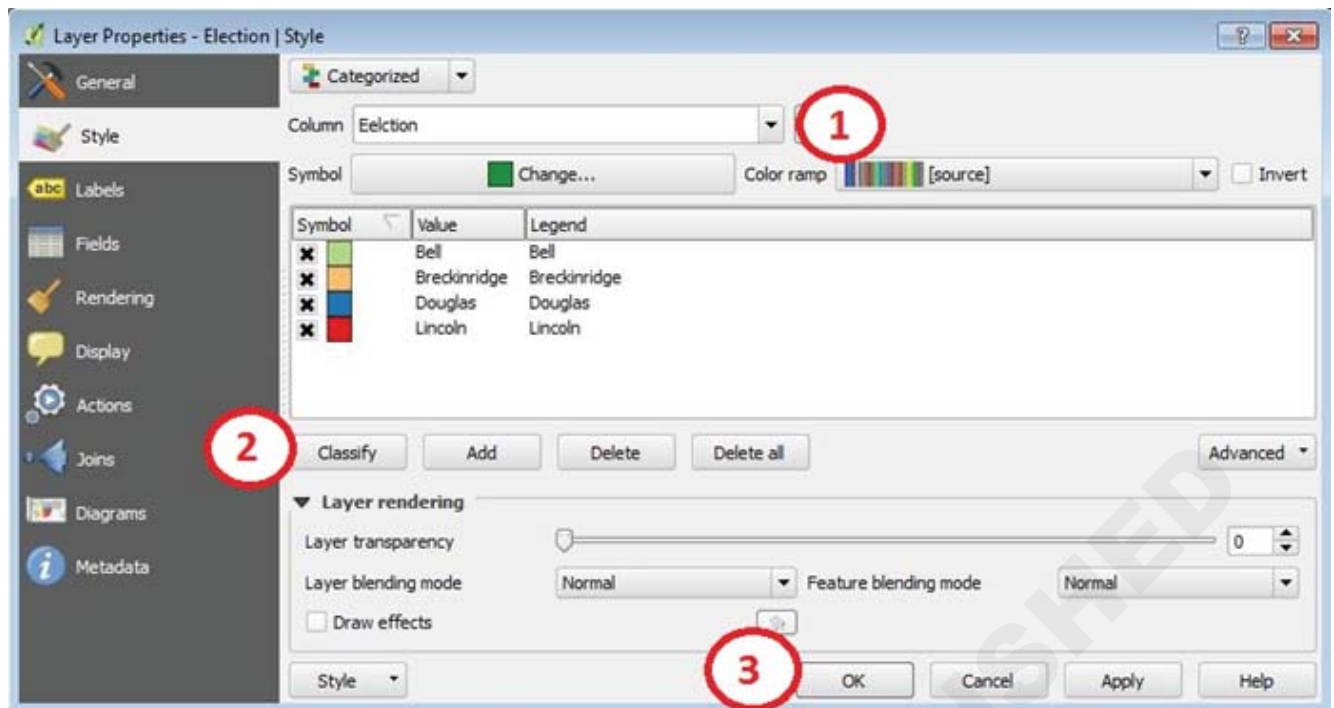
The result will look like this:

Numerical Data (Fig 5)

If you have numeric data you want to symbolize (i.e. total population) choose "Graduated" symbology.

- 1 Next to the Column option, use the drop-down arrow to select Graduated, and select a field with numerical data.
- 2 Choose a classification mode, define the number of classes, and click on Classify.

Fig 4



3 You can change the color scheme by clicking on the drop-down arrow next to the Color ramp.

4. Click OK.

The result will look like this:

Fig 5



Understanding Different Features of Topo Sheets, Numbering System of Topo Sheets

Objective: At the end of this exercise you shall be able to

- understand the different features of topo sheets, numbering system of topo sheets.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

Numbering system of topo sheets

The topographical maps in India are prepared in two series, i.e. India and Adjacent Countries Series and The International Map Series of the World.

India and Adjacent Countries Series: Topographical maps under India and Adjacent Countries Series were prepared by the Survey of India.

The topographical maps of India are prepared on 1 : 10,00,000, 1 : 250,000, 1 : 50,000 and 1: 25,000 scale providing a latitudinal and longitudinal coverage of $4^{\circ} \times 4^{\circ}$, $1^{\circ} \times 1^{\circ}$, $30' \times 30'$, $15' \times 15'$ respectively. The numbering system of each one of these topographical maps is shown in Fig 1.

Table - 1

Number of map	Name 41	Number of Divisions	Scale in Degrees	Scale in Centimeters
53	Million Sheet	136	$4^{\circ} \times 4^{\circ}$	1 CM=10 KM
53 C	Degree	16 (A to P)	$1^{\circ} \times 1^{\circ}$	1 CM=2.5 KM
53 C/ 8	Half Degree	16 (1 to 16)	$30' \times 30'$	1 CM=1.25 KM
53 C/8/NE	Quarter Degree	4 (NE, SE, NW and SW)	$15' \times 15'$	1 CM=.5 KM

Features of topo sheets (Fig 1, 2, 3)

Brown colour lines are contours

Black colour lines are streams

Red colour areas are settlements (buildings)

Linear red features are road networks

The blue colour features are water bodies

The green area features are forest areas and The yellow colour area features are cultivated areas

The white colour area features are scrublands or stony areas

Black colour with small dots linear features are railway lines

The white colour area with black dots features are dry water body

The green colour symbol features are trees

The triangle symbol with blue colour features are Tube wells

The black lines with black dot features are power lines

Global positioning System

Fig 1

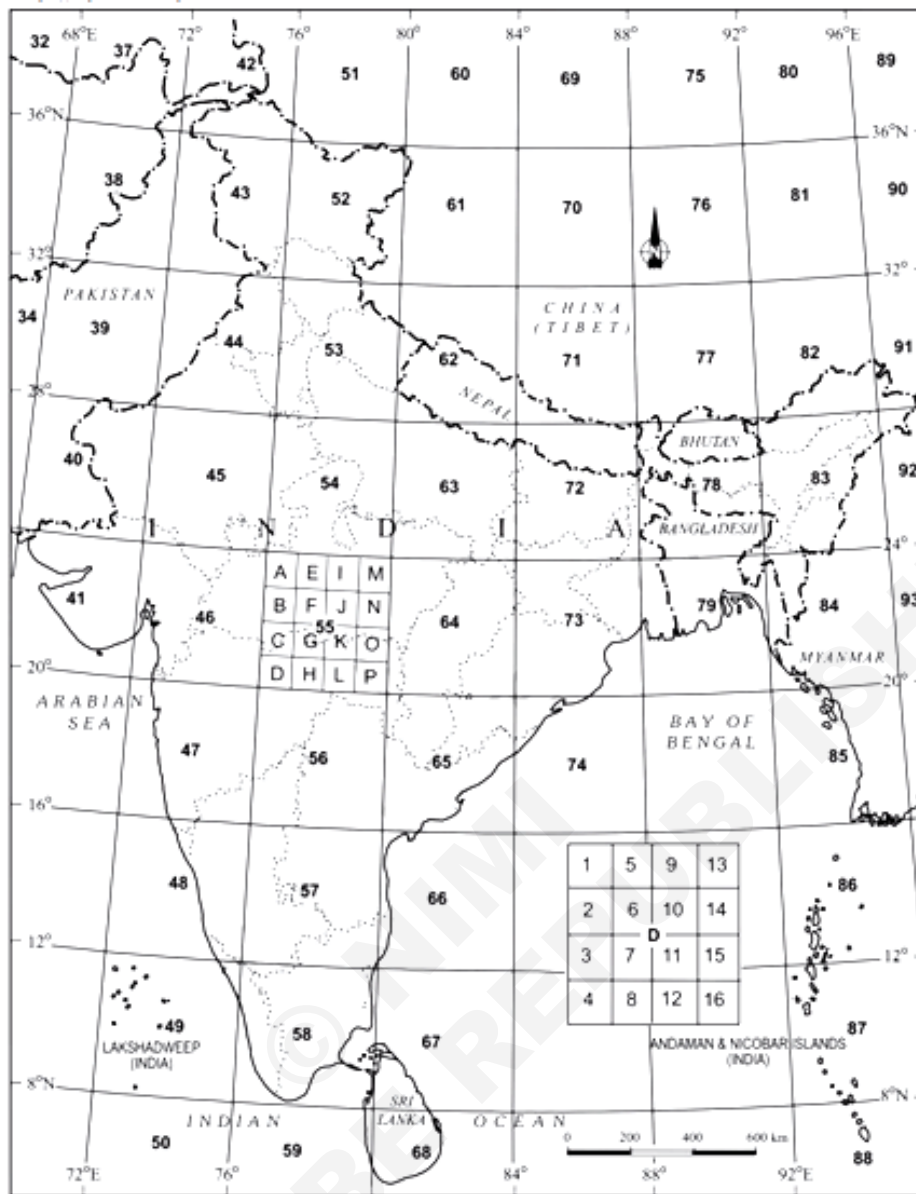


Fig2

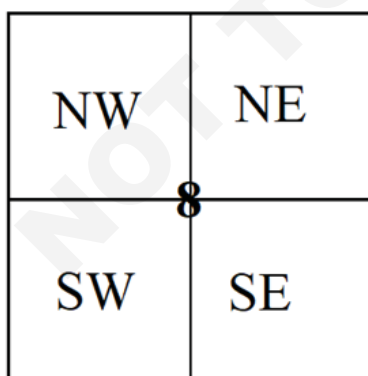
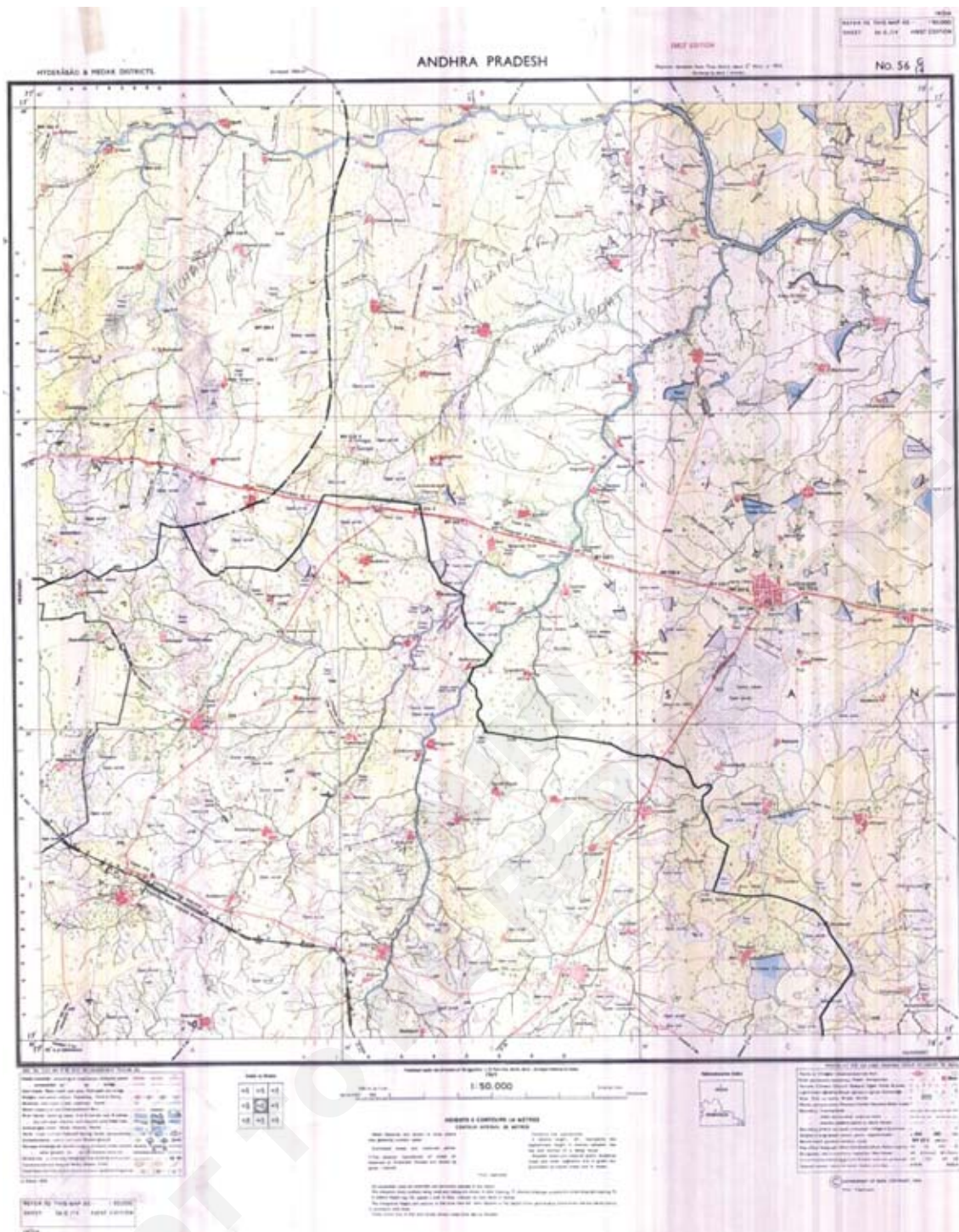


Fig3



Toposheet

Identification of Different Types of GPS

Objective: At the end of this exercise you shall be able to

- identify different types of GPS.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- GPS software, Internet connection

PROCEDURE

Types of GPS

- The global positioning system has a widely varied application. It has also undergone several modifications giving rise to the different types of GPS. While they all work using the same fundamental principle, each class specializes in meeting specific demands. The type of GPS systems include:

1 A-GPS

- Assisted GPS (A -GPS) is a type of GPS that allows receivers to get information from local network sources, which helps in the location of satellites.
- Assisted GPS is usually used in areas where satellite signals cannot easily reach, probably due to trees or tall buildings. However, there must be cellular networks for A- GPS to work
- Assisted GPS became necessary when GPS was introduced for commercial use.
- A-GPS is extensively used in smartphones where it makes the phone's location information accessible by emergency call dispatch.

2 S- GPS

- Simultaneous GPS (S- GPS) is a modification of GPS that allows both voice data and GPS signaling to be transmitted from a phone simultaneously.
- Both data types are sent simultaneously rather than alternating the SPS signal and the reception for the telephone call, and there is better sensitivity.
- This is particularly useful in emergencies to allow

service providers such as ambulances, fire stations, etc., to locate the source of a call even as the call is ongoing.

3 D-GPS

- Differential GPS (D-GPS) is a correction technique used to increase the accuracy of location data obtained from a traditional GPS receiver.
- D-GPS is an enhancement to GPS, providing a better sense of the actual location of an object or person.

4 Non - differential GPS

- Non - differential GPS, as opposed to differential GPS, uses direct satellite signals to deduce positioning.
- It is less accurate than D-GPS, but has a significantly more comprehensive range of use.

5 Mapping and non -mapping GPS

- Mapping GPS is a type of GPS unit that comes with in -built maps.
- It is also possible to download maps to add to the mapping GPS.
- This is the type of GPS unit often found in mobile devices and other handheld devices.
- Non -mapping GPS is a type of GPS unit that comes without maps.
- It shows you your location and the direction to get to another point without seeing roads or landmarks.
- It uses breadcrumb-like trails to mark your progress and direction.

Garmin ETrex 10

Fig 1



TRIMBLE Juno 3D

Fig 3



The Garmin GPS 72H

Fig 4



Gps garmin 62s

Fig 2



Identification of Various Buttons of GPS

Objective: At the end of this exercise you shall be able to

- identify various buttons in GPS.

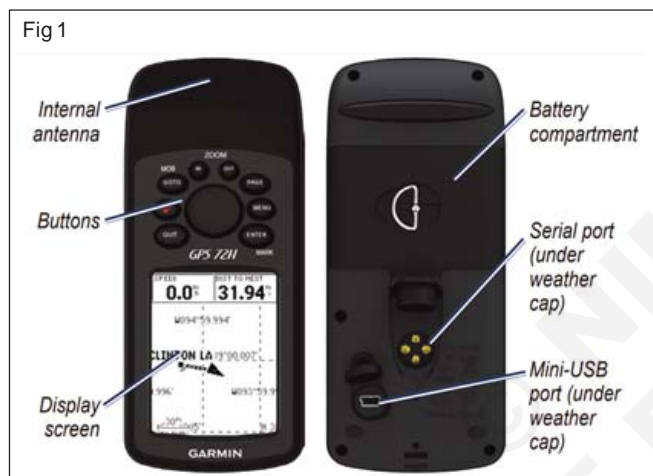
Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- GPS software, Internet connection

PROCEDURE

The Garmin GPS 72H (Fig 1)



Buttons (Fig 2)

QUIT-press to return to the previous page and cycle through the main pages in reverse order.

Power-press and hold to turn the device on or off. Press and release to adjust the backlight.

GO TO/MOB-press to begin or stop navigation to a waypoint. Press and hold (man overboard function) to store current location and begin navigation to that point.

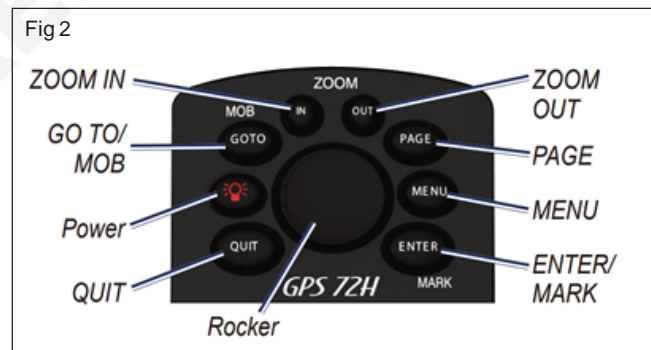
ZOOM IN-press to zoom the map in.

ZOOM OUT-press to zoom the map out.

PAGE-press to cycle through the main pages.

MENU-press and release to view the Menu for the current page. Press twice to view the Main Menu. ENTER/MARK-press to select a menu item, data field, or option. Press and hold to save your current location.

Rocker-rock up, down, right, and left to move through page items.



Demonstration on Operating GPS

Objective: At the end of this exercise you shall be able to

- demonstrate on operating GPS.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- GPS software, Internet connection

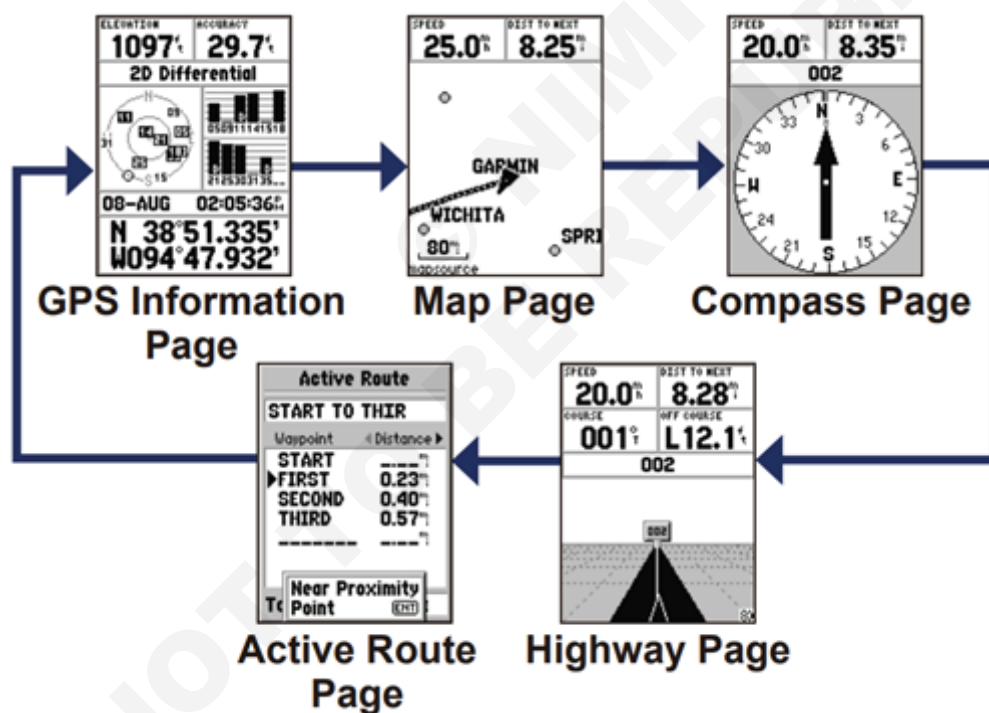
PROCEDURE

The Main Pages (Fig 1)

All of the information needed to operate your device is found on the five main pages: the GPS Information page, the Map page, the Compass page, the Highway page, and the Active route page.

- Press the PAGE button to navigate through the main pages.
- Press MENU to access the menu for these pages.
- Use the rocker and the ENTER button to select the option you want to change.

Fig 1



- Press MENU twice to access the Main Menu.

Map Page (Fig 2)

Your position on the map is represented by (position icon). As you travel, the pointer leaves a track log (trail). Waypoint names and symbols are also shown on the map.

To view the map with north up:

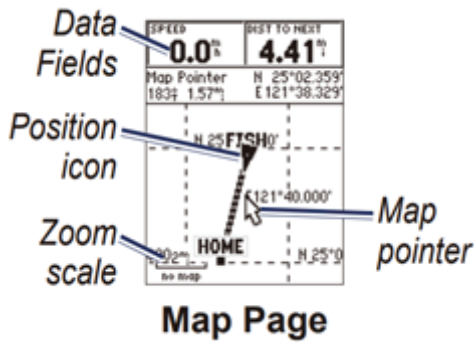
- 1 From the Map page, press MENU.
- 2 Select Setup Map > General > Orientation > North Up.

Compass Page (Fig 3)

The Compass page guides you to your destination with a graphic compass display and a bearing pointer or a course pointer.

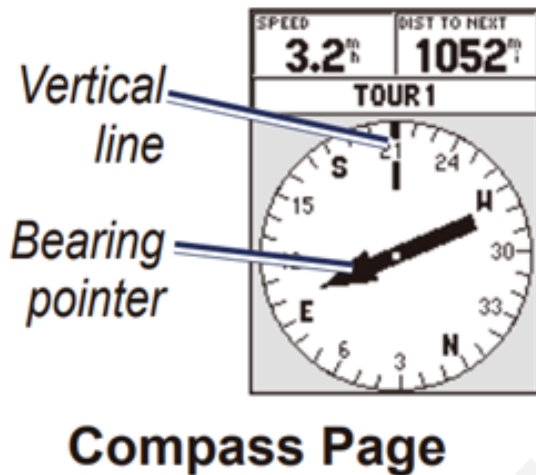
The rotating compass ring indicates the direction you are heading. The bearing pointer or course pointer indicates the direction to your destination, relative to your current heading direction.

Fig 2



Map Page

Fig 3



Compass Page

Highway Page (Fig 4)

Fig 4



Highway Page

The Highway page is for navigating when a straight line course can be followed. To navigate using the Highway page, just follow the road.

To access the highway page options, which the highway page displayed press the MENU key. To select an option from the Menu, highlight the desired selection then press ENTER. (Fig 5)

Active Route Page

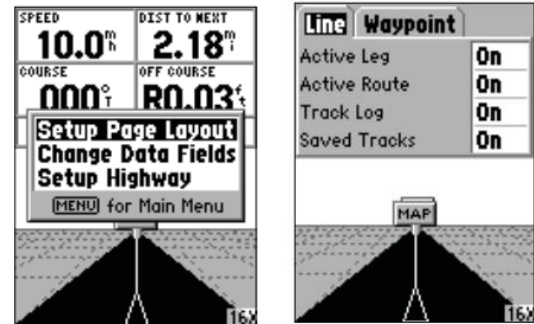
If you are navigating a route, the Active Route page displays the route information.

Active Route Page options

Use Map—switches to Map page.

Fig 5

Highway Page



Highway Page Options

Setup Highway Page

Add Waypoint—allows you to add an existing waypoint to the active route.

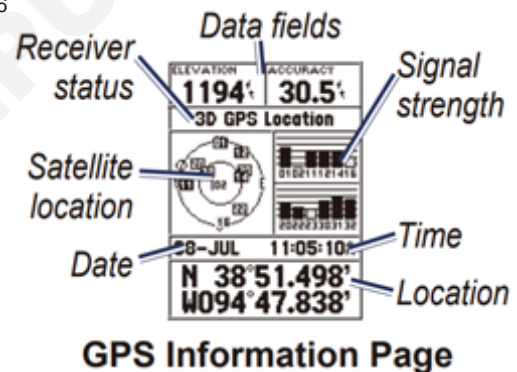
Remove Waypoint—allows you to remove a waypoint from the active route.

Reverse Route—reverses the active route, placing the last waypoint at the top of the list.

Plan Route—enter Speed, Fuel Flow, Depart Time, and Depart Date for future planned routes. **Stop Navigation**—stops navigation of active route.

GPS Information Page (Fig 6)

Fig 6



GPS Information Page

The GPS Information page displays your speed, elevation, the estimated accuracy, receiver status, satellite locations, satellite signal strength, the date, the time and the current location of the GPS receiver.

The Main Menu

The Main Menu contains settings and features not found on the main pages and submenus. The Main Menu is accessible from any page by pressing MENU twice.

Marking Your Current Location (Fig 7)

You must have a valid position fix to mark your current location.

To mark your current location

- 1 Press and hold MARK until the Mark Waypoint page appears.
- 2 A default three-digit name and symbol are assigned to the new waypoint.

Fig 7

Waypoint symbol

Waypoint name

Mark Waypoint Page

- To accept the waypoint default information, select OK.
- To change the waypoint information, select the appropriate field. After making changes, select OK.

Editing Waypoints

- 1 Press MENU twice > select Points > Waypoints.
- 2 Select the waypoint you want to edit.
- 3 Use the rocker and the ENTER button to make changes.
- 4 Select OK.

Recording your Tracks

The track log starts recording as soon as the device gets a location fix.

To save the entire track log:

- 1 Press MENU twice > select Tracks.
- 2 Select Save > Entire Log.

To save a portion of the track log:

- 1 Press MENU twice > select Tracks.
- 2 Select Save.
- 3 Select the portion of the track log to save from the list
- 4 Select OK.

To view a track on the map:

- 1 Press MENU twice > select Tracks.
- 2 Select a track to view.
- 3 Select Map.

Creating and Navigating Routes

A route is a sequence of waypoints that lead you to your destination. A route must have at least two waypoints.

- 1 Press MENU twice > select Routes > New.
- 2 Press MENU to add a waypoint using the Map page or from existing waypoints.
- 3 Select OK to add it to the route.
- 4 Repeat steps 2 through 4 to add additional waypoints to the route.
- 5 Press MENU > select Start Navigation.

Navigating a Route

- 1 Press MENU twice > select Routes.
- 2 Select a saved route > Navigate.

Note: To stop navigating, press MENU > select Stop Navigation.

Selection of Datum Units and Scale

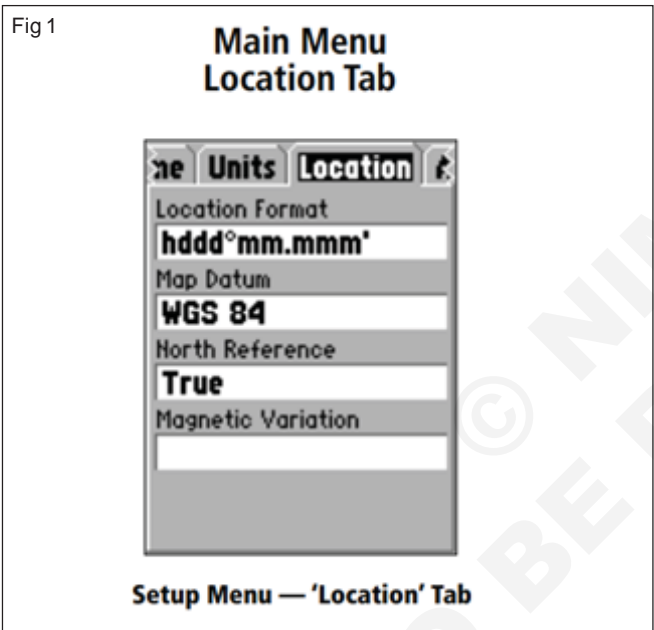
Objective: At the end of this exercise you shall be able to

- practice on how to select datum units and scale.

Requirements
Tools/Equipments/Instruments <ul style="list-style-type: none">• PC with Windows OS• Inter connecting cables• GPS software, Internet connection

PROCEDURE

To change the Datum, Units (Fig 1)



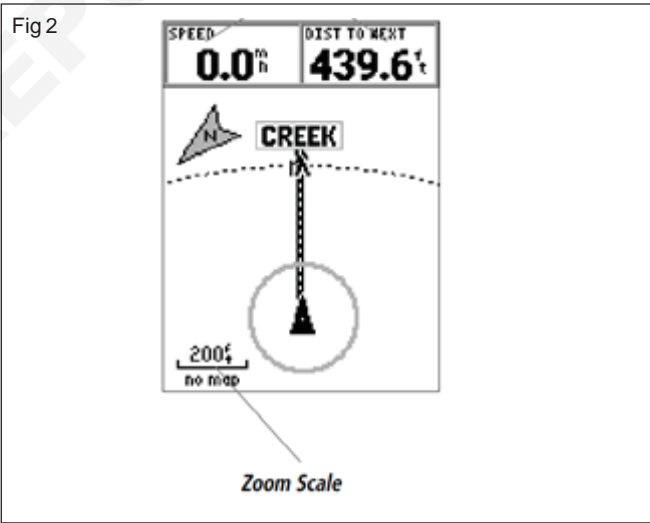
In main menu go to Units and Location tab and select whatever you want

Changing the zoom scale (Fig 2)

You can change the zoom scale on the map page allowing you to view a smaller area in greater detail or a larger area with less detail. The current zoom scale setting is displayed in the lower left corner of the map page.

To change the zoom scale

- 1 Press the IN key to decrease the zoom scale.
- 2 Press the OUT key to increase the zoom scale.



Practice on GPS Measurement

Objective: At the end of this exercise you shall be able to

- practice on GPS measurement.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- GPS software, Internet connection

PROCEDURE

- **Measure Distance (Fig 1)**– this option will allow you to measure the distance between two points.
- As you move the map pointer, the distance, bearing and location of the pointer are displayed at the top of the map.
- To measure the distance between to map points, press enter to set a reference, and then move the map pointer to the other location.
- The bearing and distance are displayed below the data fields.

Fig 1



Collection of GCPs

Objective: At the end of this exercise you shall be able to

- familiar with collect GCPs.

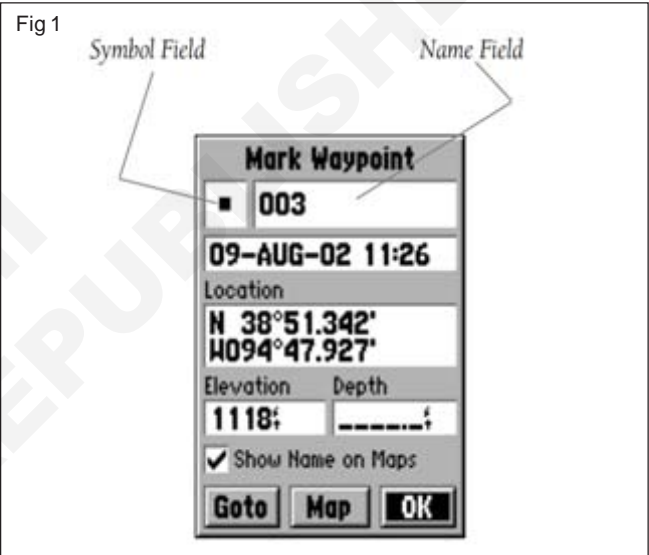
Requirements
<div>Tools/Equipments/Instruments</div> <ul style="list-style-type: none">• PC with Windows OS• Inter connecting cables• GPS software, Internet connection

PROCEDURE

Creating waypoints (Fig 1)

There are three methods for creating waypoints (or GCPs)

- **Creating a waypoint using the ENTER/MARK key-** when at a location that you want to save, press and hold ENTER/MARK until the mark waypoint page is displayed.
- At this point you can edit the waypoint name, symbol, elevation and depth.
- To save the waypoint to memory, highlight the OK button and press ENTER.
- Creating a waypoint on the map page- using the ROCKER, move the map pointer to the location on the map page and press ENTER/MARK.
- If the map pointer is not on a map feature, the new waypoint page will be displayed.
- At this point you can edit the waypoint name, symbol, elevation and depth.
- To save the waypoint to memory, highlight the OK button and press enter.
- **Creating a waypoint manually using existing coordinates-** press and hold ENTER/MARK until the mark waypoint page is displayed.



- The unit will capture its current location. Highlight the location field and press ENTER.
- Using the ROCKER, enter the new location. Press ENTER to accept the change.
- At this point you can edit the waypoint name, symbol, elevation and depth.
- To save the waypoint to memory, highlight the OK button and press ENTER.

Introduction to Mobile Mapping

Objective: At the end of this exercise you shall be able to

- introduce mobile mapping.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- GPS software, Internet connection

PROCEDURE

Mobile mapping

Routes

To display the routes page, highlight routes on the main menu then press ENTER.

Routes page options

With the routes page displayed, press MENU to view the available options.

Start/stop navigation- will start navigation of a highlighted route. Will stop navigation of an active route.

Copy route- will make a copy of a highlighted route.

Delete route- will remove the highlighted route.

Delete all routes- will remove all routes from the routes page.

Creating a new route (Fig 1 , 2)

Fig 1



To begin creating a new route, highlight the new button on the routes page then press ENTER.

A blank route page will be displayed.

To display the create route options, press MENU.

Fig 2



Inserting a waypoint on the Map Page

When you are creation a route, you should place the points in the route in the order that you wish to navigate them. (Fig 3, 4, 5)

Fig 3



Track Information Page

Fig 4

Main Menu Tracks

Tracks

Track Log 19% Full

Save Clear

Saved Tracks: 8 Unused

04-SEP-02
17-SEP-02

Main Menu — Tracks Page

Tracks

The tracks page displays the amount of track memory used, will allow you to save or clear the current track log, and displays a list of any saved tracks.

Save- when you select save you can choose how far back in the log you wish to save.

Fig 4

Tracks

Track Log 19% Full

Save Clear

Delete Saved Track
Delete All Saved
Setup Track Log

(MENU) for Main Menu

Tracks Page Options

Select the appropriate choice, press ENTER to save the selection.

Clear- the clear button will allow you to clear the track log.

If the map page is becoming cluttered from all of your tracks, clearing the track log will clean up the map.

Familiarization to various data collecting apps freely available on internet

Objective: At the end of this exercise you shall be able to

- familiar with various data collecting apps freely available on internet.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- GPS software, Internet connection

PROCEDURE

SW MAPS App (Fig 1)

Fig 1

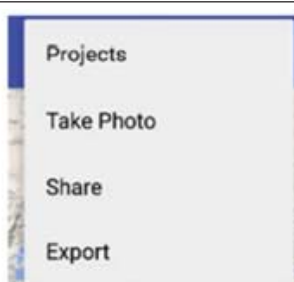


SW Maps is a GPS and GIS app for collecting, presenting and sharing geographic information, for phones and tablets.

SW Maps is currently available for devices running Android 4.0.3 and above. Google Play Services is required and will be updated if necessary.

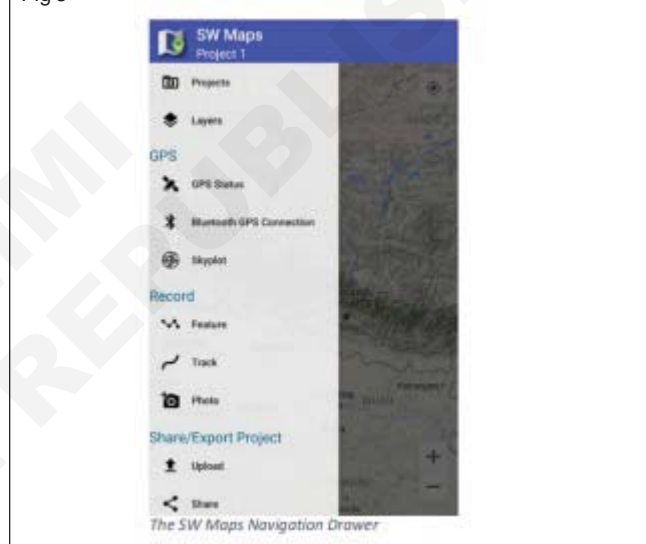
Pressing the menu button will reveal more common actions. (Fig 2)

Fig 2



The Navigation Drawer (Fig 3)

Fig 3



Swiping the app screen from left to right will open the Navigation Drawer, which can be used to access all the features of SW Maps. The navigation drawer contains a scrollable list of actions.

The navigation drawer has the following options

1 Project

Opens the Projects sidebar for creating, opening or deleting projects.

2 Layers

Opens the Layers sidebar for adding, editing and deleting layers.

a GPS Status

Opens a sidebar showing GPS status.

b Bluetooth GPS Connection

Press this button to connect to Bluetooth GPS receivers.

c Skyplot

Shows the GPS satellite skyplot.

3 Record

a Feature

Opens the Record Feature sidebar for recording features.

b Track

Opens the Record Track sidebar for recording tracks.

c Photo

Loads the camera application for quickly taking a photo.

4 Share/Export Project

a. Upload

Upload the project to an FTP server. More information on Section 11.3

b Share

Share project as kml or shapefiles. More information on Section 11.1

c Export

Export project as kml or shapefiles.

5 Templates

a Share Project Template

Share the project as a template.

b Export Project Template

Export the project as a template.

6 Other

a Compass

Opens a compass to show the current bearing.

b Preferences

Opens the app preferences.



c About










Button Symbols Used in SW Maps (Table 1)

SW Maps uses different button icons to symbolize the actions performed by the button.

Commonly used icons, along with their description, are shown below.

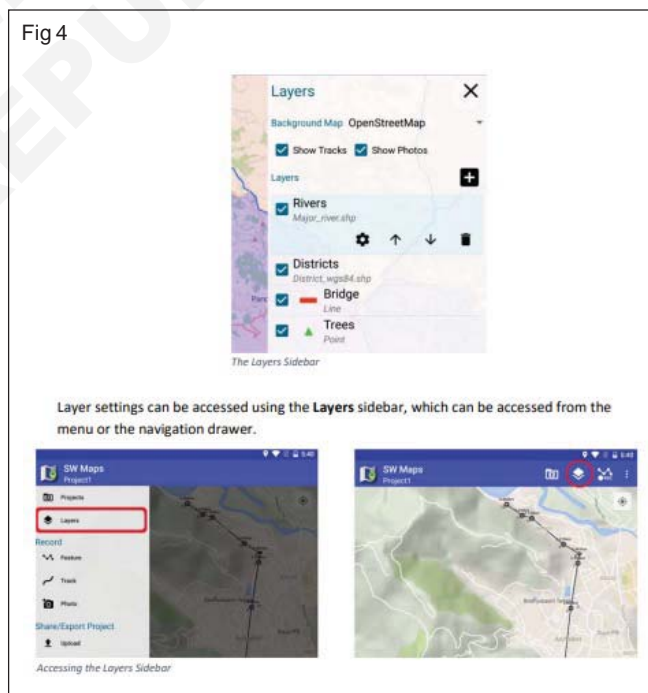
Table - 1

Symbol	Description
	This icon is used by buttons that are used to add them, such as layer and projects.
	This icon used for button delete items such as layers, attribute definitions, features, tracks and photos.

Symbol	Description
	This icon is used for button which change some settings or shows additional options.
	This icon is used for buttons which allow editing value.
	This icon is used in the close button of sidebars.
	This icon is used in the Record point button when recording features.
	The icon used in buttons which share items.
	The icon used in buttons which exports items.
	The icon is used in refresh buttonns
	This is used in buttons next to textboxes that save or update a value.
	This icon is used in save buttonngs.

Feature Layers (Fig 4)

Fig 4



To change the appearance of a feature layer, press the button showing its current symbol on the Layers sidebar. A dialog will be shown which allows you to change colors, point symbols and line width.

Transferring of GPS Data in to GIS Software

Objective: At the end of this exercise you shall be able to

- perform data transfer from GPS to GIS software.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- GPS software, Internet connection

PROCEDURE

For data transfer we need USB data cable and map source software for Garmin GPS 72

To connect your GPS unit to your computer

Your GPS unit came with a USB data cable, connect your GPS to an available USB data port.

To verify proper connection to the computer:

In map source software, click Utilities> Get Unit ID

To receive data from a GPS unit

Click Receive from device , or click Transfer> Receive from device.

The name of your GPS unit should appear automatically in the device menu.

The receive data file is in txt file. That text file we have to open in QGIS software.

Introduction to Various Components of DGPS

Objective: At the end of this exercise you shall be able to

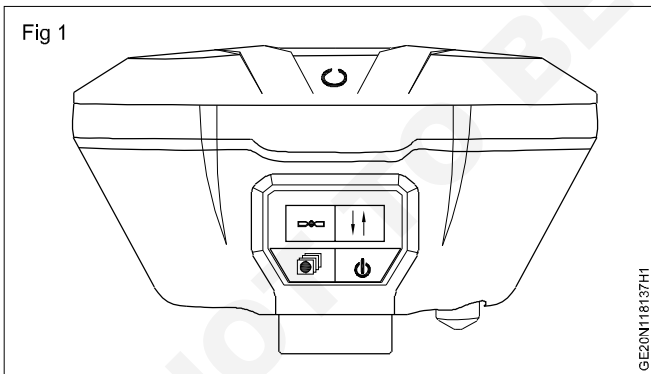
- introduce various components of DGPS.

Requirements		
Tools/Equipments/Instruments		
<ul style="list-style-type: none">• PC with Windows OS• Inter connecting cables• DGPS software, Internet connection	<ul style="list-style-type: none">• DGPS components	- Receiver, Lower housing, tripod etc.,

PROCEDURE

- Master Base Station or receiver and rover
- Master receiver is kept at known point
- Antenna with pre-amplifier
- Sensor to sense the data
- Memory and display panel
- Keyboard
- Precision oscillator (clock)-quartz
- Power supply- battery
- Computer with supporting software for data download and processing

Receiver



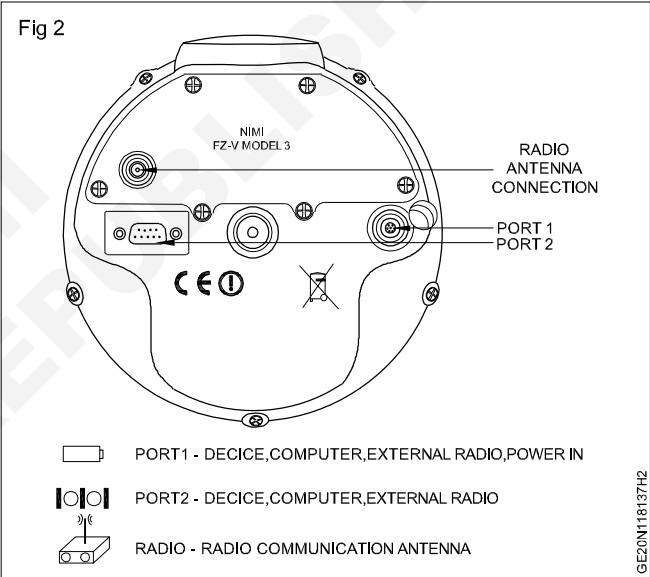
The image shows the receiver front panel. (Fig 1)

The front panel on the Trimble R6 GPS receiver is identical with R & G NSS.

The power button controls the receiver's power on or off functions.

The indicator LEDs show the status of power, satellite tracking, and radio reception

The Power button controls the receiver's power on or off functions.



Lower housing (Fig 1)

The lower housing of the Trimble R8 GNSS receiver. The lower housing contains the two serial ports, one TNC radio antenna or GSM antenna connector

External UHF or GSM antenna

TNC connection for an external antenna to enhance the UHF or GSM.

The UHF antenna is approximately 16.5 cm (6.5 inches) long, and round.

The GSM antenna is approximately 16.5 cm (6.5 inches), and flatter than the UHF antenna.

Make sure that you use the correct antenna or the signal will be degrade. (Fig 3)

DGPS tripod (Fig 3)

Tribrach (Fig 4)

Fig 3

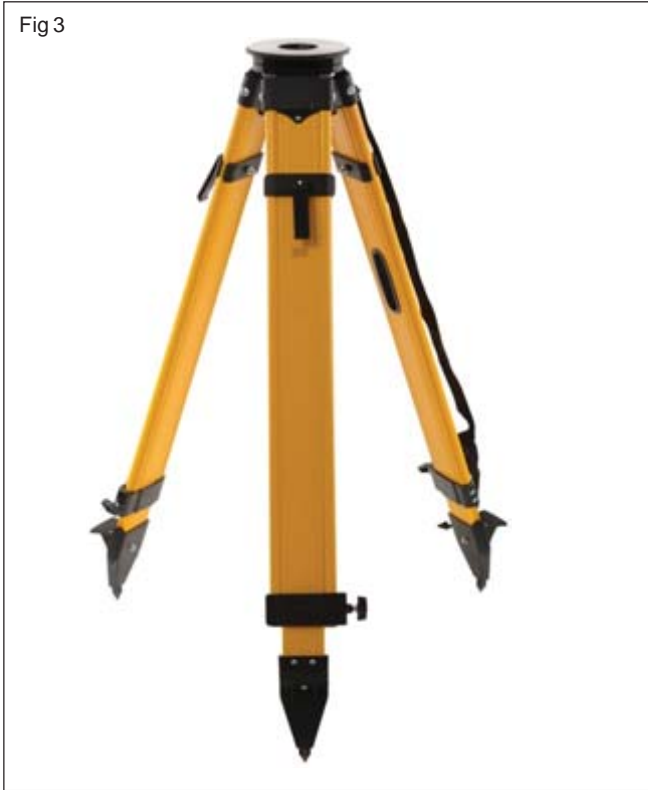
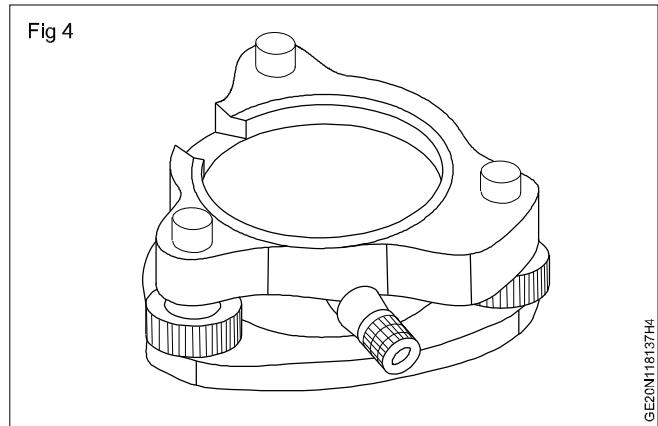
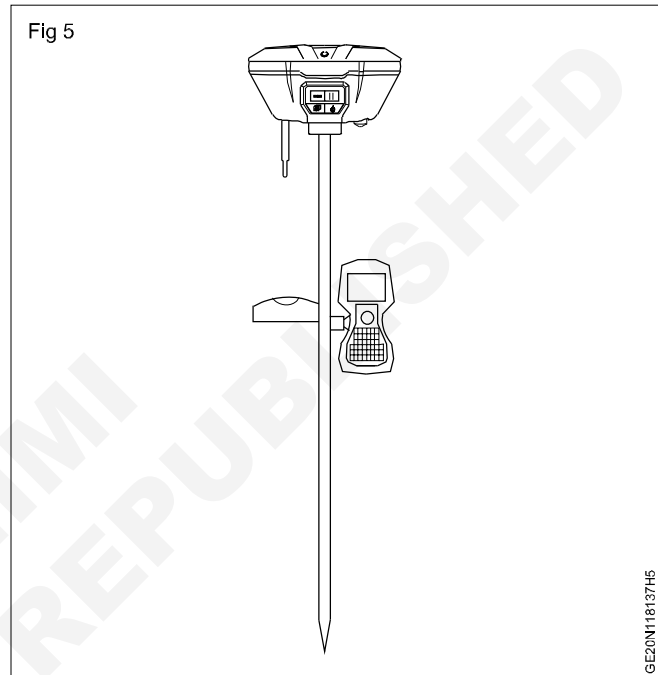


Fig 4



GE20N118137H4

Fig 5



GE20N118137H5

Receiver on a range pole (Fig 5)

To mount the receiver on a range pole:

- 1 Thread the receiver onto the range pole.
- 2 Attach the controller bracket to the pole.
- 3 Insert the controller into the controller bracket.

Familiarization to Operating Base and Rover

Objective: At the end of this exercise you shall be able to

- familiarize to operate base and rover.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Receiver, panel control setup, radio setup etc.,

PROCEDURE

Base station

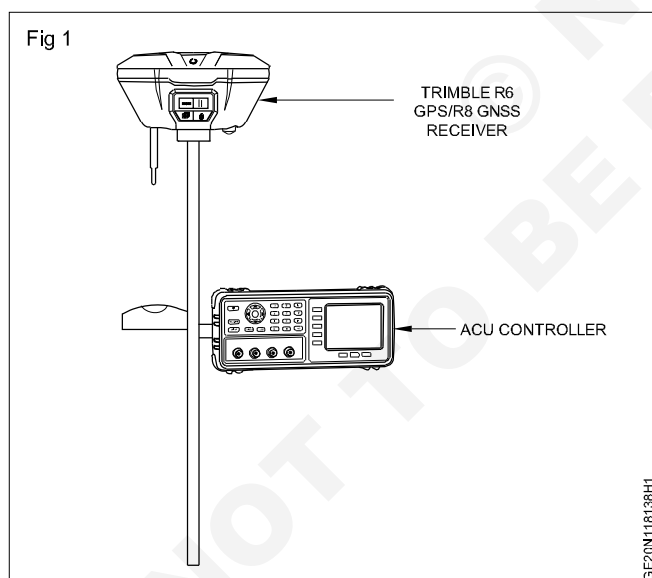
A base station is required to achieve 1' accuracy, without a base station accuracy is within 30'.

Base station sends correction signal to GPS rovers

A rover is a survey tool used to receive signals from satellites and a base station to calculate grade.

Rovers are typically mounted on poles, vehicles, or other similar types of raised locations.

Pole-mounted setup (Fig 1)



The pole-mounted setup for the receiver. To mount the receiver on a range pole:

- 1 Thread the unit onto the range pole.
- 2 Attach the controller bracket to the pole.
- 3 Insert the controller into the bracket

Radios

Radios are the most common data link for Real-Time Kinematic (RTK) surveying.

The receiver is available with an optional internal radio in the 450 MHz UHF band, or with an internal GSM module.

The receiver supports the following Trimble base radios with the internal 450 MHz radio:

- TRIMMARK™ 3
- TRIMMARK IIe
- TRIMTALK™ 450S
- Receiver internal 450 transmitter
- HPB450 radio-modem.

Internal GSM setup

You can configure the receiver optional internal GSM Module using the Trimble Survey Controller™ software.

Internal radio setup

To configure the receiver optional internal radio, use one of the following:

- The GPS Configurator software
- The WinFlash utility
- The Trimble Survey Controller software

Cellular modems and external radios

To connect an external cellular modem to the receiver, you need the following:

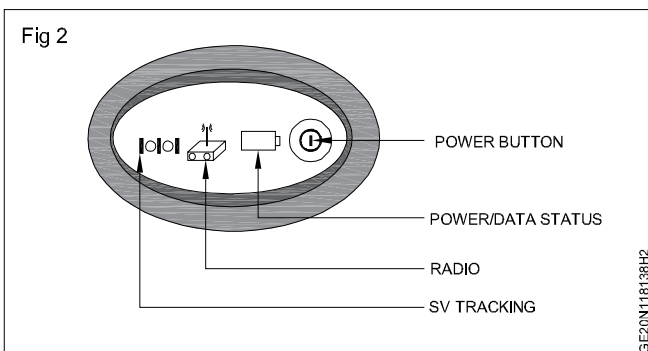
- A Trimble R6 GPS/R8 GNSS receivers.
- A cellular modem, or a cellphone that can transmit and receive data.
- Serial (cellphone to DB9) cable (supplied with the cellular modem or phone).
- Port 2 of the receiver supports full RS-232 protocol, and should function properly with most cellular phone cables.

To connect an external radio modem to a receiver, you need the following:

- A Trimble R6 GPS/R8 GNSS receiver.

- An external radio capable of receiving and decoding Trimble data packets.
- Serial cable for either Port 1 or Port 2 of the receiver, as supplied by the radio manufacturer.
- Radio mount for the range pole.

Front panel controls (Fig 2)



The receiver front panel controls for the power on/off functions, or receiver reset. The LEDs provide power, radio, data logging, and SV tracking status information.

Logging internally

The receiver logs GPS data internally on 11 MB of internal memory. You can then use the Trimble Data Transfer utility to transfer logged data files to the office computer.

Logging to a Trimble controller

When the receiver is connected to a Trimble controller, you can log GPS data from the receiver to the controller, or to a PC card inserted in the controller.

Setting up Base and Rover RTK

Objective: At the end of this exercise you shall be able to

- practice on setup base and rover RTX.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- GPS software, Internet connection


PROCEDURE

Installing the GPS Configurator software

A copy of GPS Configurator software is included on the receiver CD.

- 1 Insert the CD into the CD drive on your computer.
- 2 From the main menu, select Install individual software packages.
- 3 Select Install GPS Configurator X.XX.
- 4 Follow the onscreen instructions.

Configuring the receiver using GPS Configurator software

- 1 Connect Port 1 or 2 on the receiver to a serial (COM) port on the computer and apply power.
- 2 To start GPS Configurator, click  and then select Programs / Trimble / GPS Configurator / GPS Configurator.
- 3 In the Device Type dialog, select Trimble R8/R6. The software automatically establishes a connection with the receiver.
- 4 Make appropriate selections for your required receiver settings. For more information, refer to the GPS Configurator Help.
- 5 Click Apply.

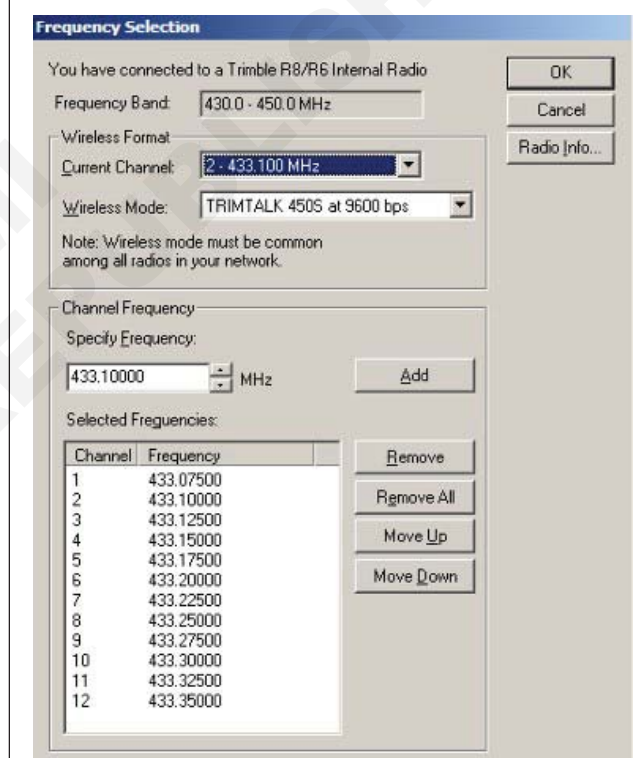
The settings in GPS Configurator software are applied to the receiver.

- 1 Start the WinFlash utility. The Device Configuration screen appears.
- 2 From the Device type list, select Trimble R8/R6.
- 3 From the PC serial port field, select the serial (COM) port on the computer that the receiver is connected to.
- 4 Click Next.

The Operation Selection screen appears. (Fig 1)

- 5 Select Configure Radio and then click Next.

Fig 1



- 6 In the Wireless Format group, select the appropriate channel and wireless mode. The Wireless Mode must be the same for all radios in your network.

- 7 In the Specify Frequency field, enter the frequency you require.

- 8 Click Add.

The new frequency appears in the Selected Frequencies list

- 9 When you have configured all the frequencies you require, click OK.

The WinFlash utility updates the receiver radio frequencies and then restarts the receiver

Options and Menu Settings

Objective: At the end of this exercise you shall be able to

- explore options and menu settings.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- GPS software, Internet connection

PROCEDURE

In the Trimble Access home screen, select the Settings button to open the Access settings module. (Fig 1)

Fig 1



In the Access settings module, select the Survey Styles button. (Fig 2)

Fig 2



In the Survey Styles screen, select one of your RTK survey styles that you use in the field with your Trimble rover. (Fig 3)

To connect to the internal receiver radio, pick the Connect soft key at the bottom of the screen.

You should see this message that the controller is connecting to the radio. (Fig 4)

Fig 3

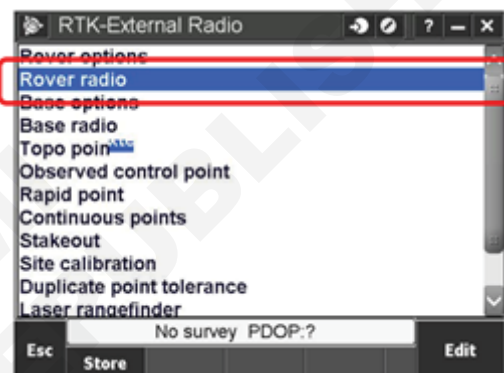
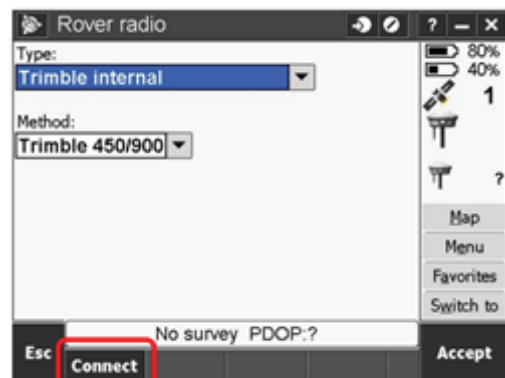


Fig 4



The Base Radio Mode must match your transmitting base radio. Select it from the drop-down menu and pick the Accept button. (Fig 5)

Configuration Settings

In the Trimble Access home screen, select the Settings button to open the Access settings module. (Fig 6)

In the Access settings module, select the Survey Styles button. (Fig 7)

Fig 5

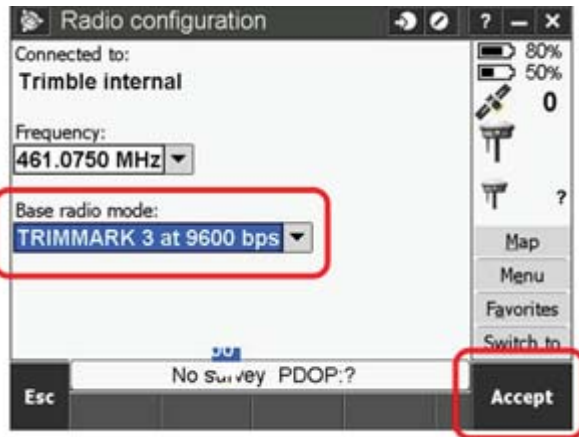


Fig 7



Fig 6



Calculating Position

Objective: At the end of this exercise you shall be able to

- calculate positions.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Click on General Survey (Fig 1)

Fig 1



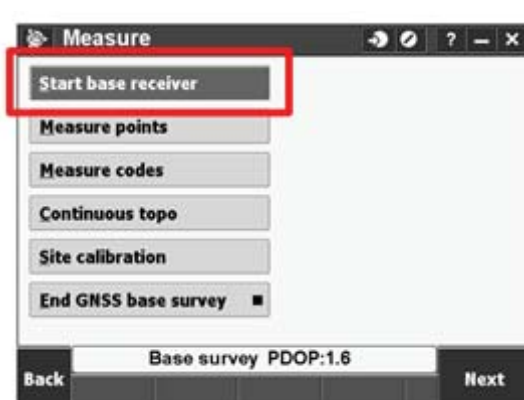
Select RTK Survey Style (Fig 3)

Fig 3



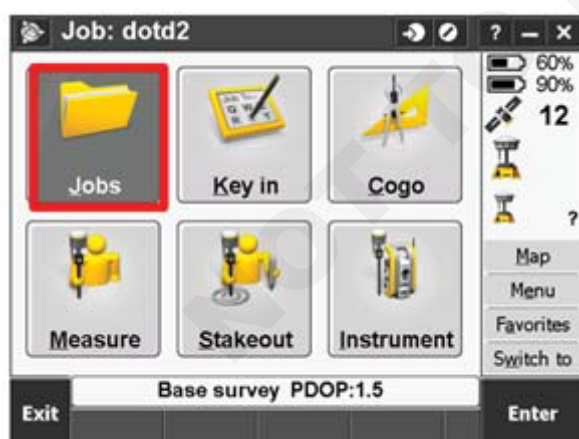
Start your Base (Fig 4)

Fig 4



Start a new job or existing one (Fig 2)

Fig 2



Select a point to start from (Fig 5)

Fig 5

Start base

Point name: ?

Code: ?

Observation class: Autonomous

Antenna height (Uncorrected): ?

Measured to: Bottom of antenna mount

Station index: 16

Transmit Delay: 0 ms

Base survey PDOP:1.6

Enter Antenna height (Fig 7)

Fig 7

Start base

Point name: BM

Code: ?

Observation class: Autonomous

Antenna height (Uncorrected): 2m

Measured to: Bottom of antenna mount

Station index: 16

Transmit Delay: 0 ms

Base survey PDOP:1.5

Select a point from a List or Key In (Fig 6)

Fig 6

Start base

Point name: ?

Code: ?

Observation class: Autonomous

Antenna height (Uncorrected): ?

Measured to: Bottom of antenna mount

Station index: 16

Transmit Delay: 0 ms

Base survey PDOP:1.6

Select Measured to and hit Start to start your Base (Fig 8)

Fig 8

Start base

Point name: BM

Code: ?

Observation class: Autonomous

Antenna height (Uncorrected): 6.562sft

Measured to: Bottom of antenna mount

Station index: 16

Transmit Delay: 0 ms

Base survey PDOP:3.1

Start

Measuring Distance

Objective: At the end of this exercise you shall be able to

- measuring distance.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Go to Measure (Fig 1)

Fig 1



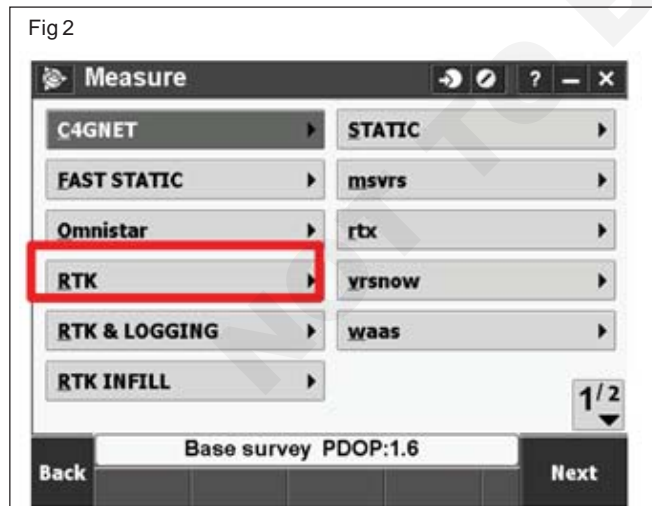
Select Measure points (Fig 3)

Fig 3



Select your Survey Style RTK (Fig 2)

Fig 2

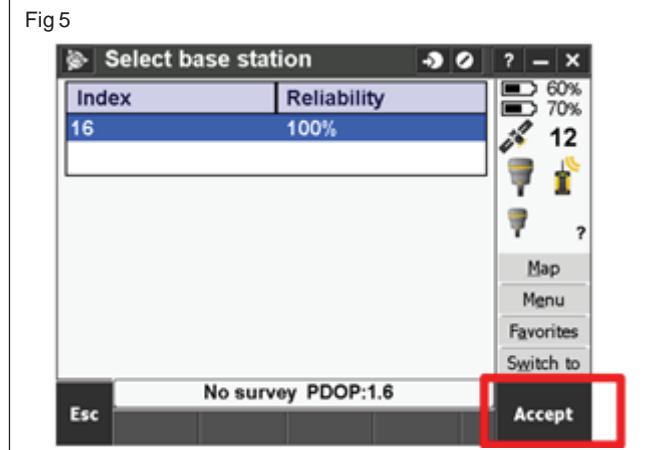


Connecting to Rover (Fig 4)

Fig 4



Select Accept (Fig 5)



You will start receiving corrections from the base and start Initializing (Fig 6)

You Can start Measurement now (Fig 7)

Fig 6

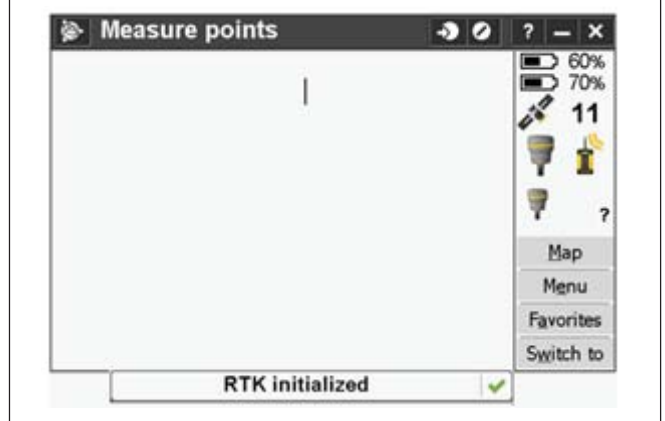
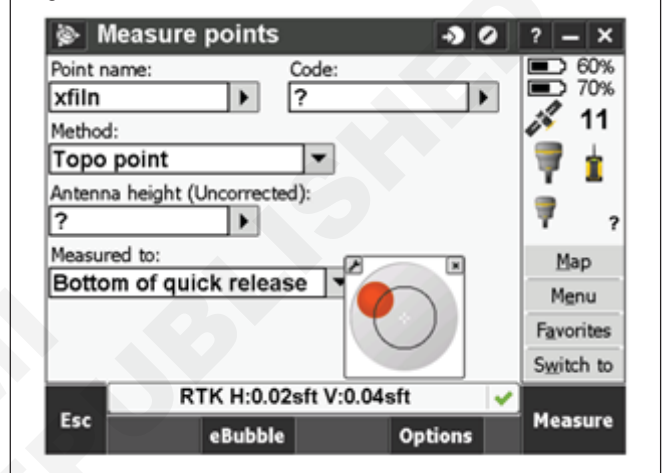


Fig 7



Triangulation (Geodetic)

Objective: At the end of this exercise you shall be able to

- explore triangulation.

Requirements

Tools/Equipments/Instruments

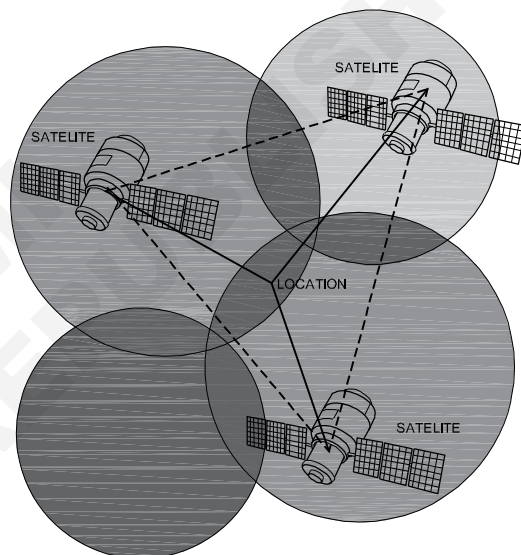
- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Triangulation

- A global positioning system (GPS) device uses data from satellites to locate a specific point on the earth in a process triangulation.
- To trilaterate, a GPS receiver measures the distances to satellites using radio signals.
- Trilateration is similar to triangulation, which measures angles, depicted in this figure.

Fig 1



GE20N118143H1

Data Downloading and Processing in Software

Objective: At the end of this exercise you shall be able to

- practice on data download & process software.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

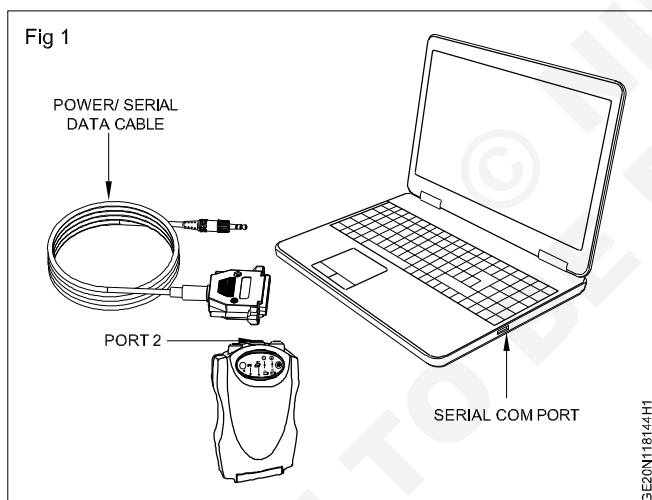
PROCEDURE

Connecting to the computer

The Trimble R7 GPS receiver has three serial (COM) ports and one USB port to connect to the office computer.

A USB connection is up to ten times faster than normal serial communications.

Use the standard power/serial data cable to connect the receiver to the computer. (Fig 1)



Use the USB cable to connect the receiver to the computer, as shown Fig 2.

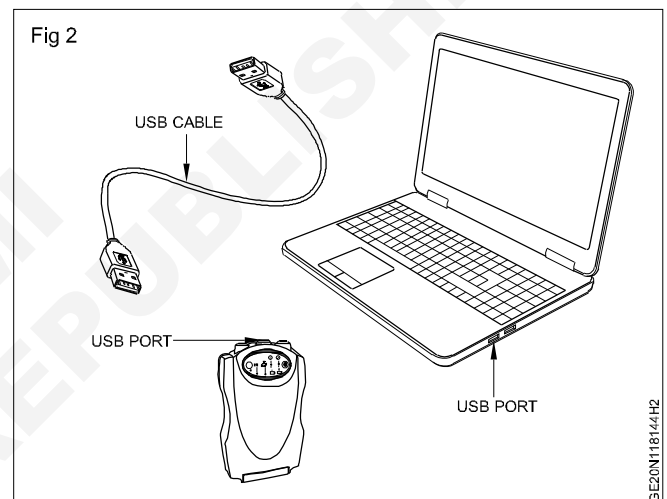
Transferring data

Transfer the data files to the computer using the Trimble Data Transfer utility.

Transferring files directly from a CompactFlash card

- Connect the receiver to the office computer and use the Data Transfer utility to transfer files.
- Remove the CompactFlash card from the receiver and connect it directly to your office computer, where it functions like a normal disk drive. Use Windows Explorer to transfer files.

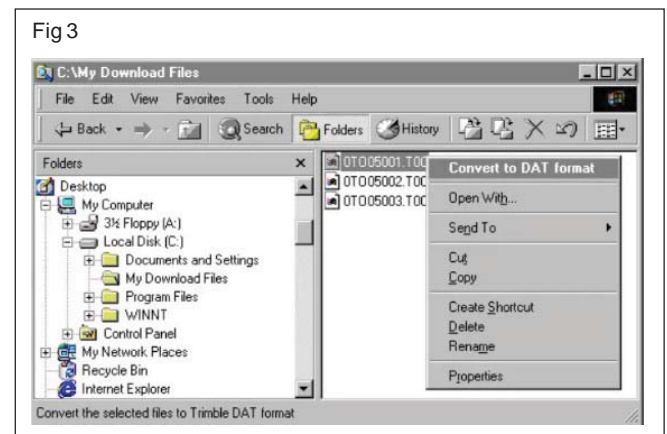
Fig 2



To convert a .T01 file on your office computer into the DAT format:

- 1 On your office computer, open Windows Explorer and navigate to the location of the .T01 file.
- 2 Right-click the file, and select Convert to DAT format from the shortcut menu: (Fig 3)

Fig 3



Sequence to Post-Process GPS Data

- 1 Run GrafNav program on PC. Requires software protection dongle.

- 2 Select "Convert raw GPS to GPB4 " (for base station data)
- 3 Find folder for base files and select "add all".
- 4 Select "global options" and uncheck "make all epochs kinematic". Select convert.
- 5 Select "Convert raw GPS to GPB" (figure 4) (for rover data).
- 6 Find folder for rover files and select "add all".
- 7 Select "global options" and check "make all epochs kinematic". Select convert.
- 8 Select "file, new project". Provide new configuration file name.
- 9 Select "file, add master GPB file" (converted base station data). Open base file in base directory. Add base antenna height, if missing.
- 10 Select "file, add remote GPB file" (converted rover data). Open a rover file in rover directory. 11. Select "Process, Process Differential". Under process tab,

"auto" should be checked and under general tab, data interval is 0.1 (s).

- 11 Click "process" button.

Sequence to Export GPS Time Tags to File

- 1 Perform differential post-processing according to previous section.
- 2 Select Output menu, Export Wizard.
- 3 Pick an output file name and the SIRE GPS data profile.
- 4 Accept the defaults and hit next. When asked for local time parameters, enter 4 if daylight saving time or 5 if eastern standard time. Hit finish to process. (Fig 4)

Example of the GrafNav data conversion utility. (Fig 5)

Example of the GrafNav differential data-processing utility. (Fig 6)

Fig 4

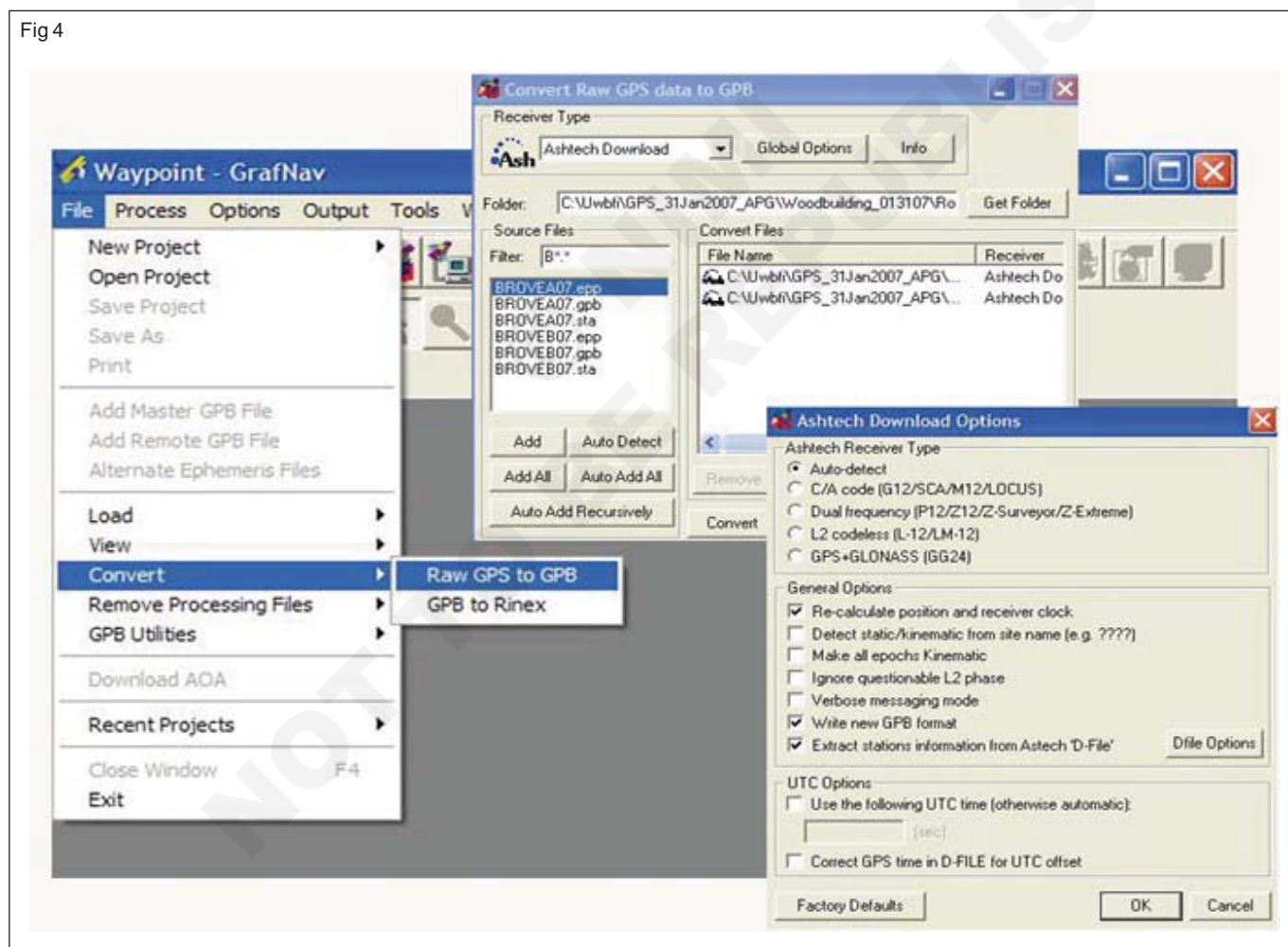


Fig 5

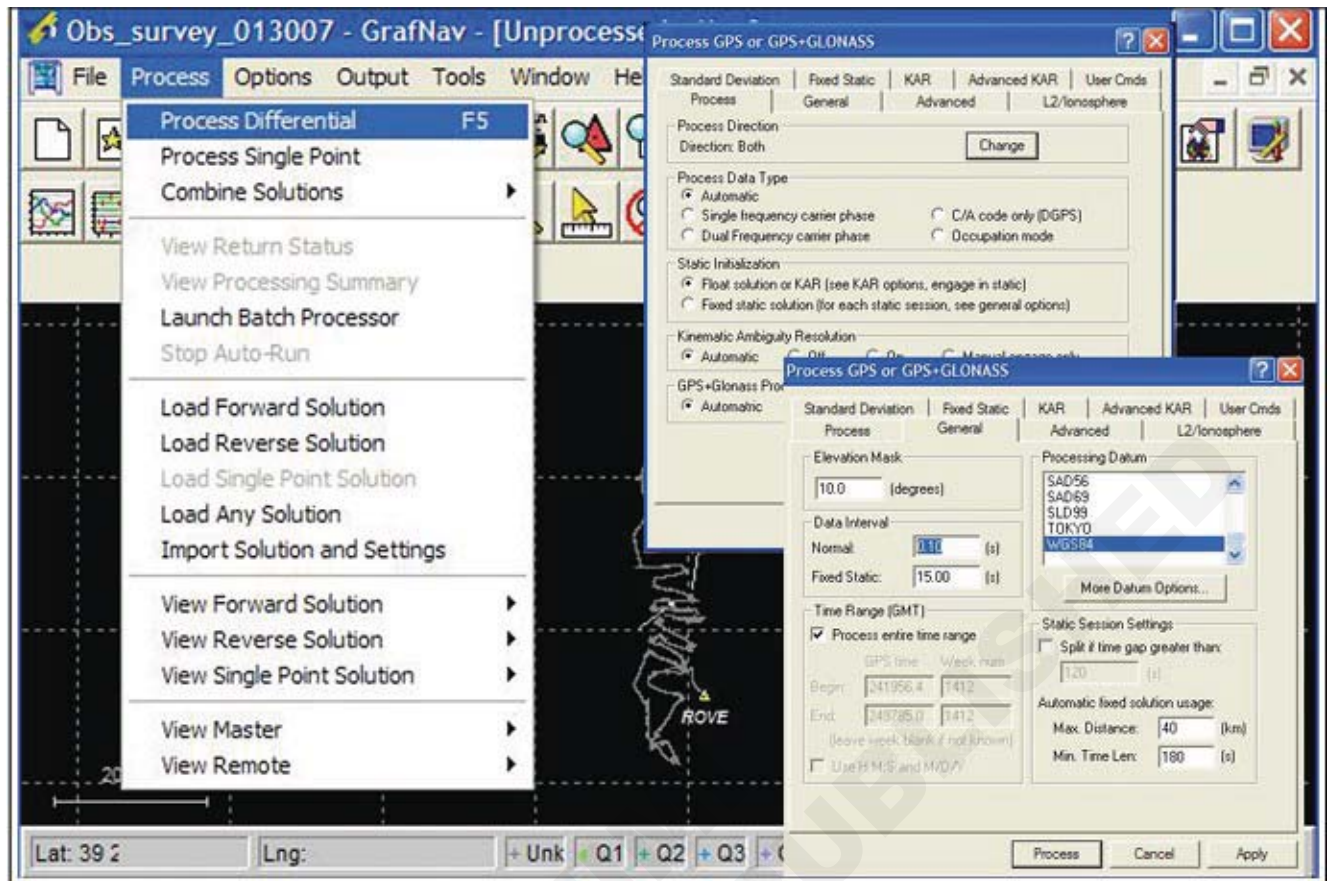
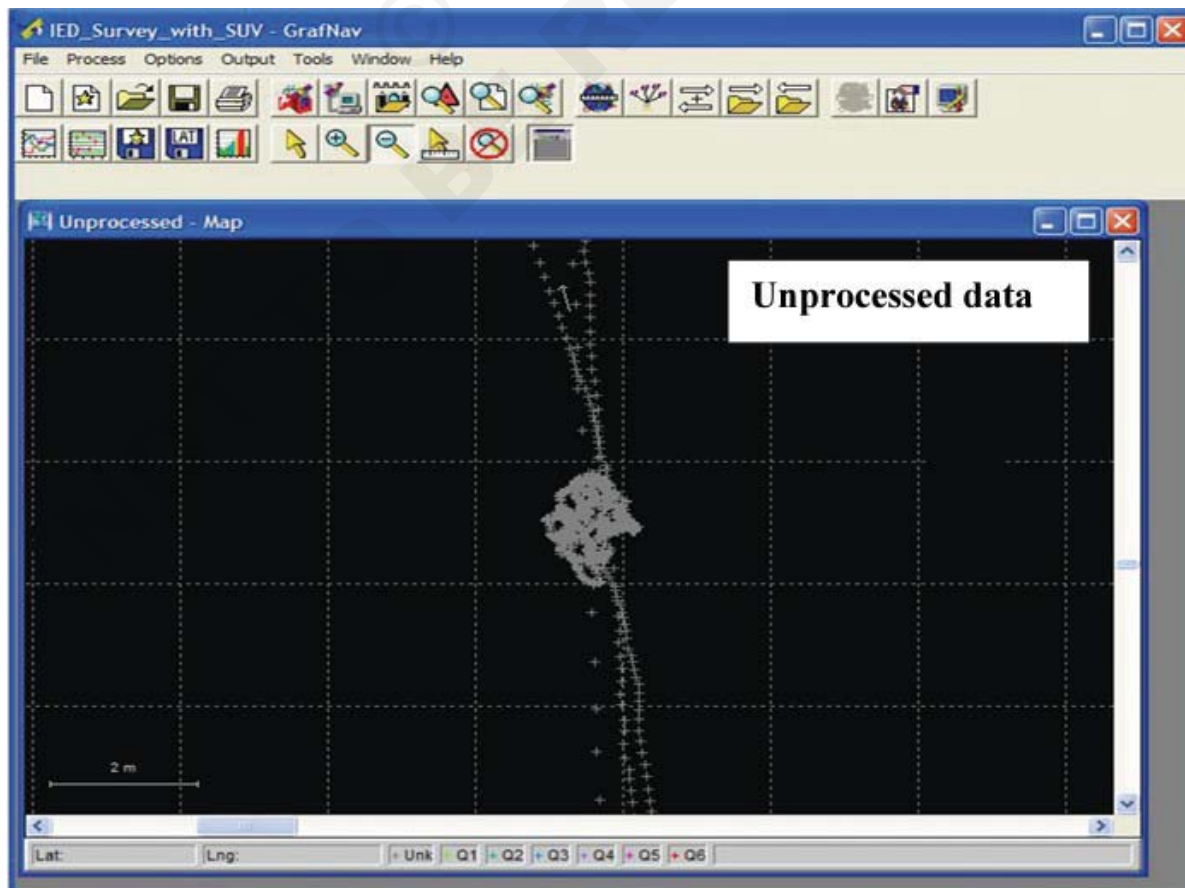


Fig 6



Creation of Shape Files in QGIS

Objective: At the end of this exercise you shall be able to

- create shape files in QGIS.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Select Layer > New > New Shapefile Layer to create the new empty layer for your vector feature.

You will then be prompted to confirm:

- The **Type of feature** you are tracing - point, line or polygon
- The **Name of the Attribute** you are tracing
- The **Type** of the Attribute - eg. Text, Whole Number
- The **Width** of the field for the Attribute. Select Add to Attribute list
- The **Shapefile Name** to save the layer as (Fig 1)

The shapefile will be added to the Table of Contents panel on the left hand side. RIGHT click on the layer to bring up a menu of options connected to it. (Fig 2)

Fig 1

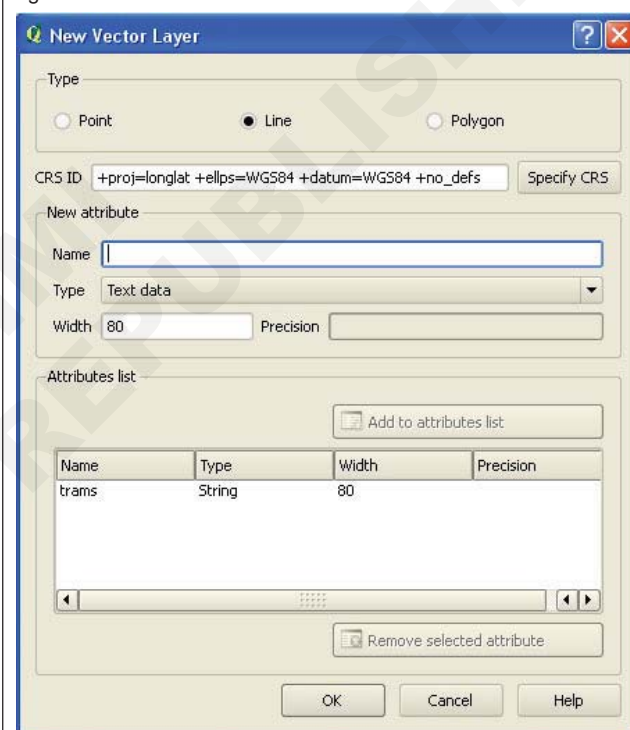
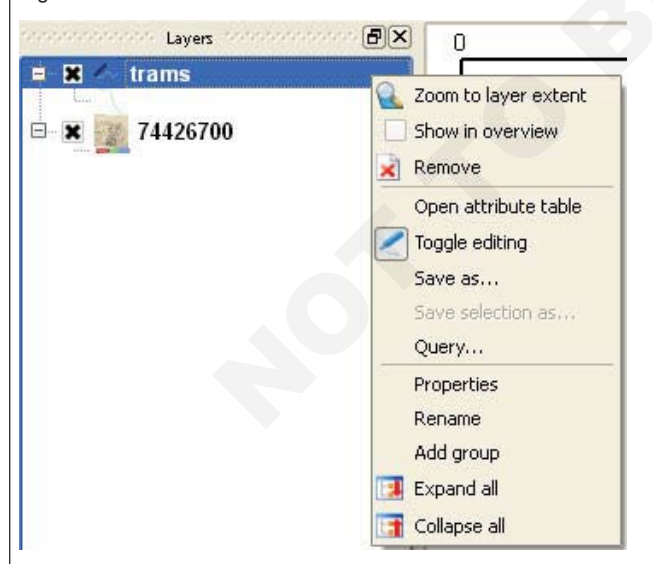


Fig 2



Importing Data to Post Gres

Objective: At the end of this exercise you shall be able to

- import data to post gres.

Requirements

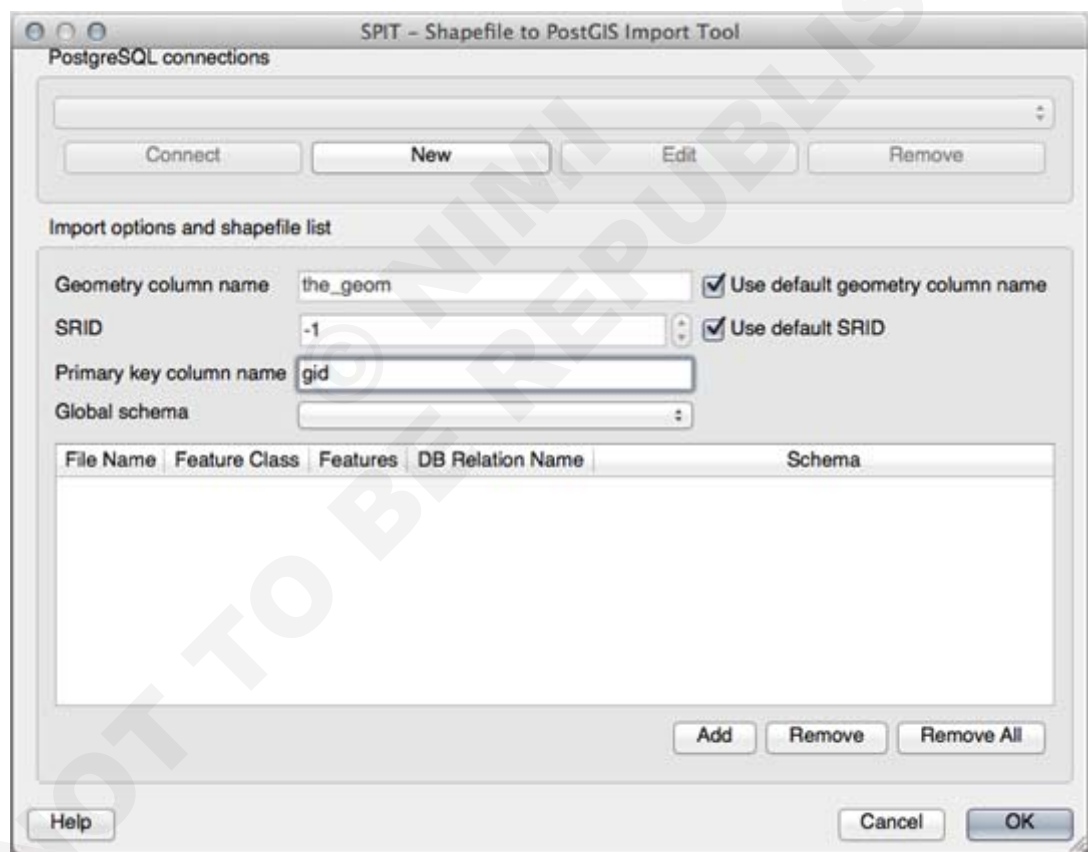
Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Clicking on it or selecting **Database -> Spit -> Import Shapefiles to PostgreSQL** from the menu. (Fig 1)

Fig 1



Connecting Post Gres to Geo Server

Objective: At the end of this exercise you shall be able to

- connect post gre to geo server.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

The first step is to create a **data store** for the PostGIS database “nyc”. The data store tells GeoServer how to connect to the database.

- 1 In a web browser navigate to <http://localhost:8080/geoserver>.
- 2 Navigate to Data→Stores.

New Data Source

Choose the type of data source you wish to configure.

Vector Data Sources

- **Directory of spatial files** - Takes a directory of spatial data files and exposes it as a data store
- **PostGIS NG** - PostGIS database
- **PostGIS NG (JNDI)** - PostGIS database (JNDI)
- **Properties** - Allow access to Java Property files containing feature information
- **Shapefile** - ESRI(tm) Shapefiles (*.shp)
- **Web Feature Server** - The WFSDataStore represents a connection to a Web Feature Server.

1 Adding a New Data Source

- 2 Create a new data store by clicking the PostGIS NG link.
- 3 Enter the Basic Store Info. Keep the default Workspace, and enter the Data Source Name as nyc_buildings or your data and a brief Description. (Fig 1)

Fig 1

Basic Store Info

Workspace
cite

Data Source Name
nyc_buildings

Description
Building of NYC

☒ Enabled

- 1 Basic Store Info
- 2 Specify the PostGIS database Connection Parameters (Table-1)

Table -1

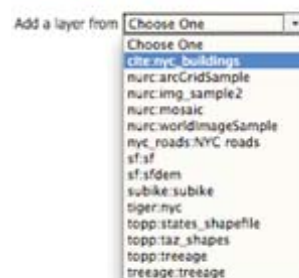
dbtype	postgisng
host	localhost
post	5432
database	nyc
schema	public
user	postgres
passwd	enter postgres password
validate connections	enable with check box

Create a Layer

- 1 Navigate to Data→Layers.
- 2 Click Add a new resource.
- 3 From the New Layer chooser drop-down menu, select cite:nyc_buidings.

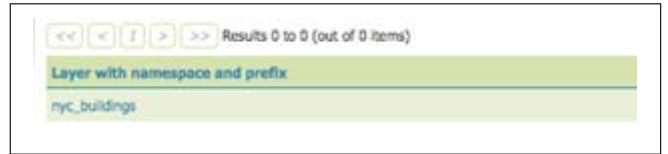
Fig 2

New Layer chooser



New Layer drop down selection

- 4 On the resulting layer row, select the layer name nyc_buildings. (Fig 2)



© NIMI
NOT TO BE REPUBLISHED

Publishing File on Geo Server

Objective: At the end of this exercise you shall be able to

- publish file on Geo server.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Preview the Layer

1 Navigate to the Layer Preview screen and find the cite:nyc_buildings layer. (Fig 1)

Layer Preview

2 Click on the OpenLayers link in the Common Formats column.

Fig 1

Layers

Add Layer...
Add Layer Group...
Add Style Group...

Drawing order	Type	Layer	Default Style	Style	Remove
1	Layer	sf:sfдем	<input checked="" type="checkbox"/>	дем	
2	Layer	sf:streams	<input checked="" type="checkbox"/>	simple_streams	

3 Success An OpenLayers map loads in a new page and displays the layer data with the default polygon style. (Fig 2)

Fig 2

Creating Map Services, Feature Services Coverage Services

Objective: At the end of this exercise you shall be able to

- create map server, feature service and coverage services.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Web Map Service (WMS)

- 1 The first thing you will do is create a workspace and a store. A workspace is a place where you can organize datasets for a project. A store is an actual folder or database. A workspace can contain multiple stores.
- 2 In the left-hand menu, click **Workspaces**. You'll see some sample workspaces.
- 3 Click **Add New Workspace**.
- 4 In the Name field, type **geog585**.
- 5 In the **Namespace URI** field type `http://localhost:8080/geoserver/geog585` (link is external) and then click **Save**. (Fig 1)

Fig 1

GeoServer

About & Status

- Server Status
- GeoServer Logs
- Contact Information
- About GeoServer

Data

- Layer Preview
- Workspaces
- Stores
- Layers
- Layer Groups
- Styles

Services

- WMTS
- WCS
- WFS
- WMSC

New Workspace

Configure a new workspace

Basic Info **Security**

Name
geog585

Namespace URI
http://localhost:8080/geoserver/geog585

The namespace uri associated with this workspace

☐ Default Workspace

☐ Isolated Workspace

Save **Cancel**

Google earth: Introduction, Digitization-Point, Line, Poly, Converting KML to Shape File and Vice Versa, Calculating Distance.

Objective: At the end of this exercise you shall be able to

- create google earth: introduction, digitization- point, line, poly, converting kml to shape file and vice versa, calculating.

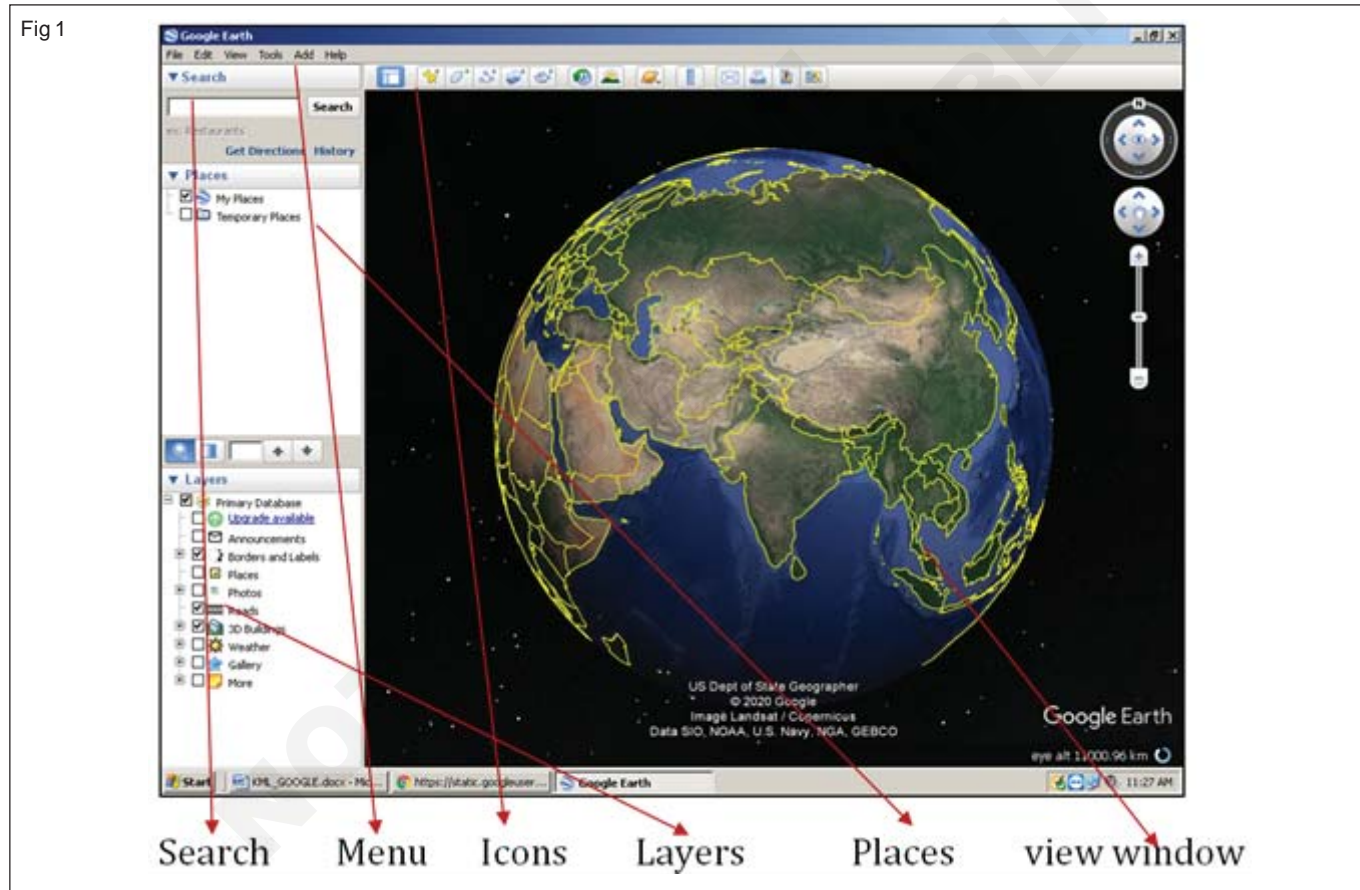
Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Google earth (Fig 1)



Google Earth file format:

KML: Keyhole Markup Language

KMZ: Keyhole Markup language Zipped...Less space/ Grouped Kml

Mouse Pointer Location information display at taskbar like Latitude, Longitude, Height, ... Etc

From google Earth pro we can open and save existing Files.

Like shape, txt.....etc. Click save as and store as kml file.

Google Earth Importing Formats:

Go through Search Box for your place to display at view.

Give Name or Latitude and Longitude at search window to navigate.

Ex: KBR Park or 17.42005 78.42305 (Fig 2)

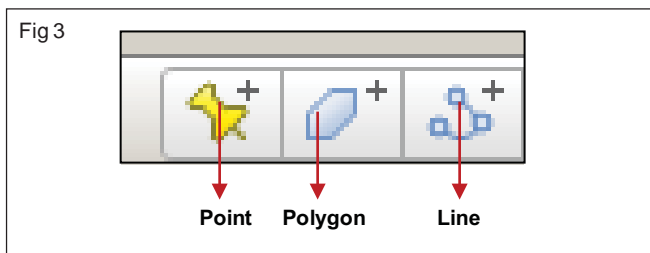


Three Features are useful for our works.

Point ...Add Place Mark....SMC works, Inventory Plots, Fire Points..etc

Line.... Add Path...CPT, Fire Lines, roads,...etc

Polygon....add Polygon... Plantations, Encroachment, ANR area, Boundaries..Etc (Fig 3)



Calculating distance and area of Polygon and line

Creating or Editing Lines or Polygons:

We can create lines or polygons on screen, It gives directly.

Select add path to draw lines.

Select Add Polygon to draw Polygon.

Take Icon and draw required shape using mouse and save.

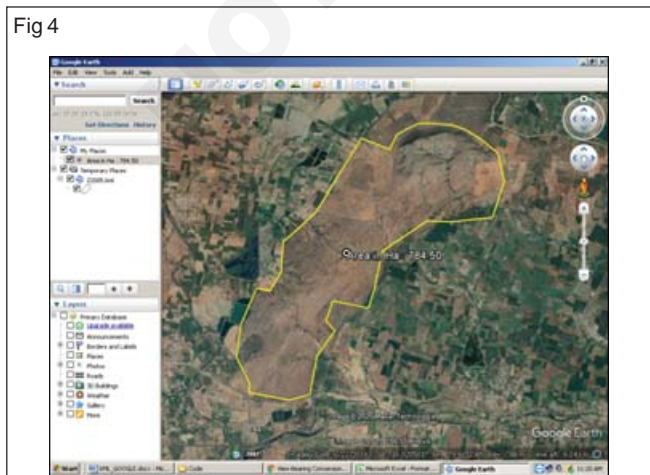
To get Polygon for surveyed Points Join all Points Manually.

Select file and go to properties to see Length, Perimeter, Area..Etc.

Convert KML to Shapefile in QGIS

Select Layer in the menu bar and press **Add Vector Layer** or select the shortcut icon.

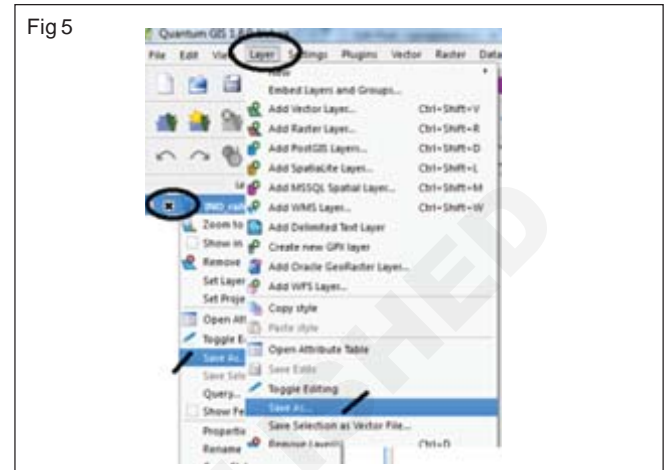
Select the **coordinate reference** type system if coordinate reference window pop ups and **press ok**. (Fig4)



- 3 In the **Layer file** appearing in the **left upper side**, right click on it, and select **save as**:
- 4 In the **Save vector layer as** window, Select the format from the drop down box as **ESRI Shapefile(OGR)** and browse the folder in which you want to save the shapefile. Name it and Press **OK**.

Convert Shapefile to kml in QGIS

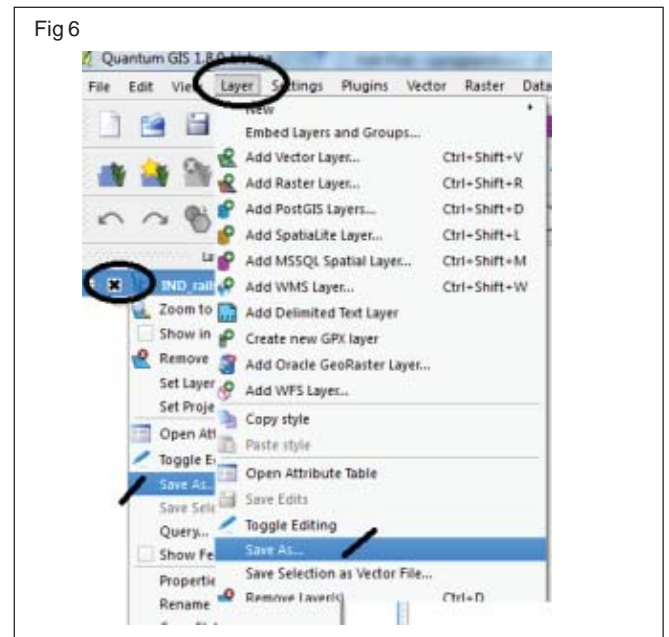
- 1 Open up the installed QGIS. (Fig 5)



- 2 In the menu bar, select **Layer** and press **Add Vector Layer**. Now select the source type in the pop up window opened as **File** and browse the source Shapefile(Note:Your shapefile .shp, .dbf and .shx file should be in same folder). Press open.

- 3 Right click on the name of **Shapefile layer** Appearing in the Left upper side and select **save as**:

You can select layer from the menu, and click on **save as**. (Image below provide demonstrate both the options with the indicator displayed) (Fig 6)



- 4 In the **Save vector layer as** window, Select the format from the drop down box as **Keyhole Markup Language (KML)** and browse the folder in which you want to save the KML file . Name it and Press **OK**.

Downloading Images from Google Earth and Mosaicing them

Objective: At the end of this exercise you shall be able to

- practice on download image from google earth and mosaicing them.

Requirements

Tools/Equipments/Instruments

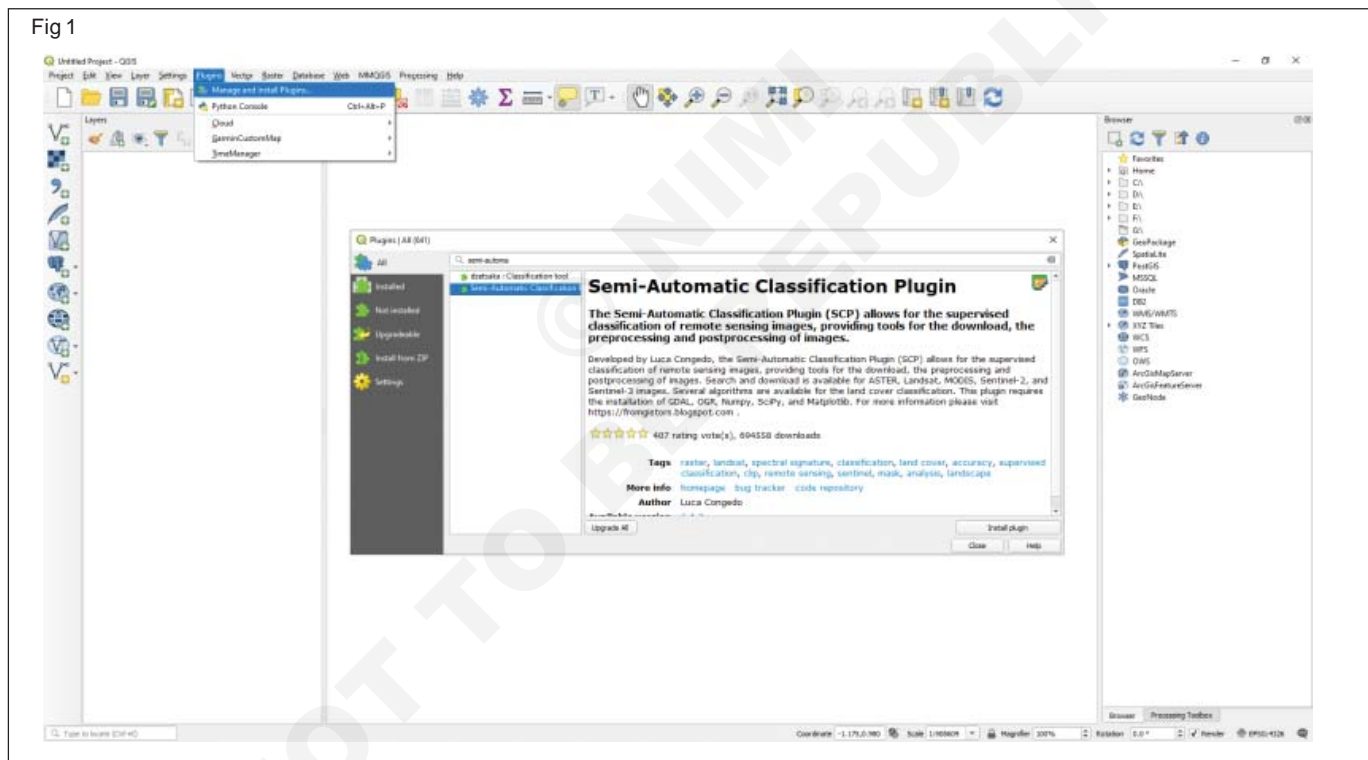
- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Downloading and Preprocessing Satellite Imagery using QGIS and Semi-Automatic Classification Plugin

QGIS and the Semi-Automatic Classification Plugin (SCP).

This is an easy exercise everyone can practice. The Semi-Automatic Classification Plugin (SCP) provide tools for the download, the preprocessing and the postprocessing of remote sensing images. (Fig 1)



The Main Interface Window is composed of several tabs. We will go and click on Download Products.

Next, go to the Login data sub-tab.

Here you will need to fill in the login information .

You can add the OpenStreetMap in the map using the OpenStreetMap button in the Semi-Automatic Classification Plugin window.

After the Basemap is added, in the Search sub-tab, go to the **Set Area in the map** button (red cross on a orange background) and select an area of interest in the map.

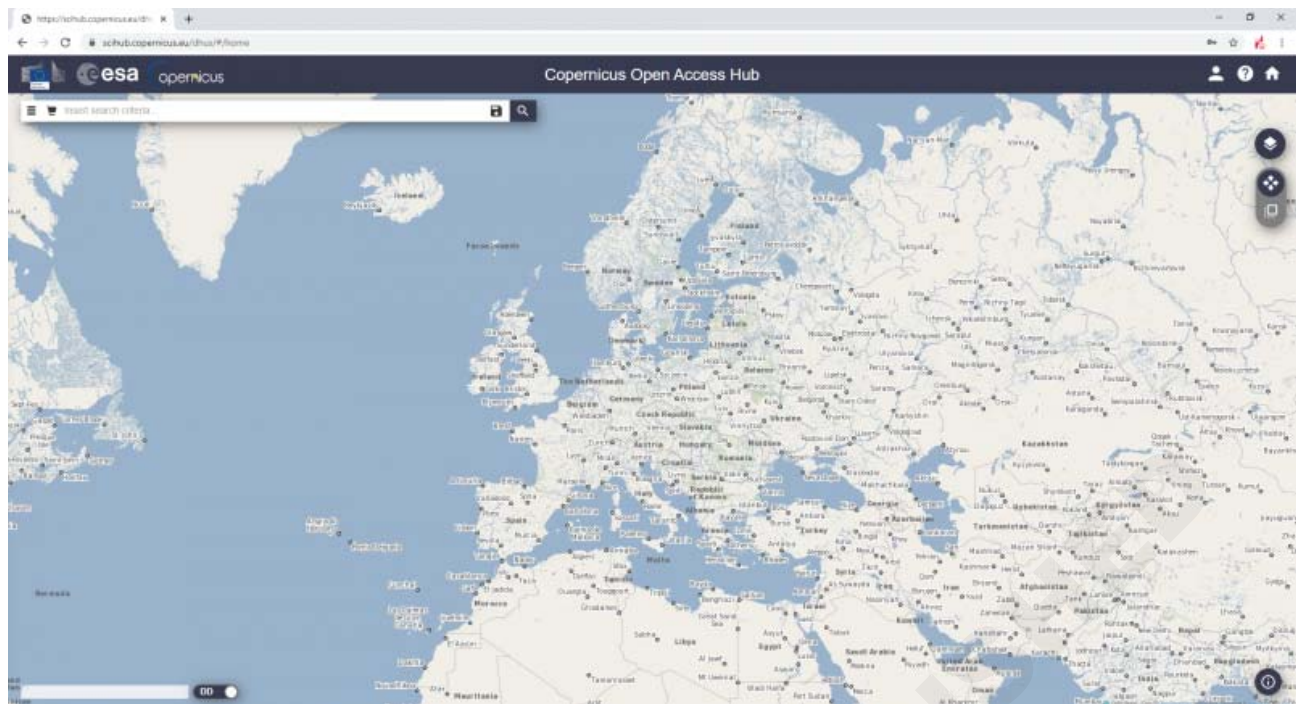
Use the left click and then the right click to draw a rectangle. (Fig 2)

In the Product List, all the available images, form the period of time selected will appear. Next, we will select the image which suits us and Click on Run. But before that, make sure you check the

- Preprocess images (checking this box will end up in converting the data to surface reflectance).
- Load bands in QGIS

Now, you can click on Run. Select a folder to download the image and click Select Folder.

Fig 2



The download will start. If your download will not start keep trying until it starts. (Fig 3)

Go to Raster > Miscellaneous > Build Virtual Raster.... (Fig 4)

Fig 3

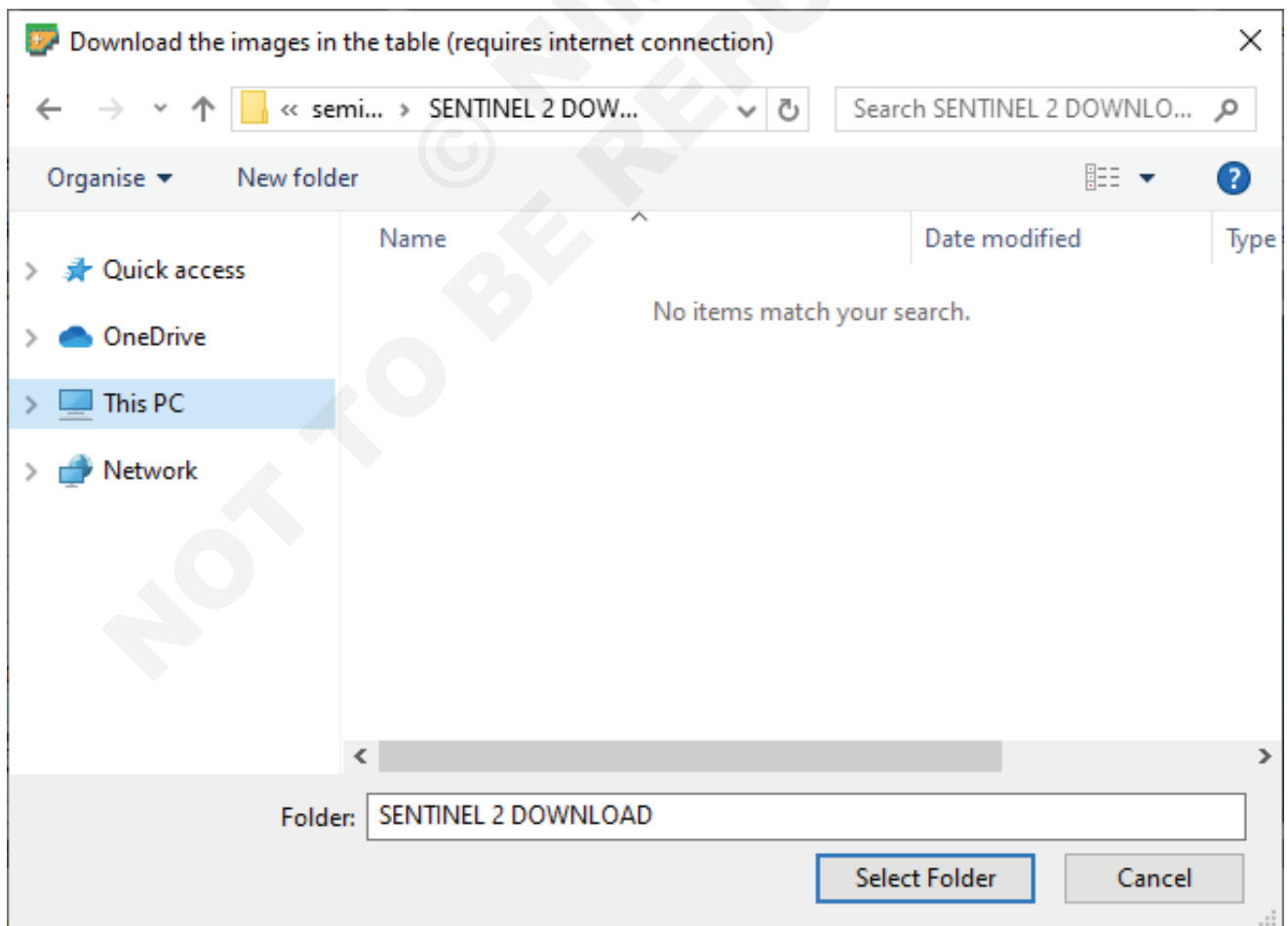
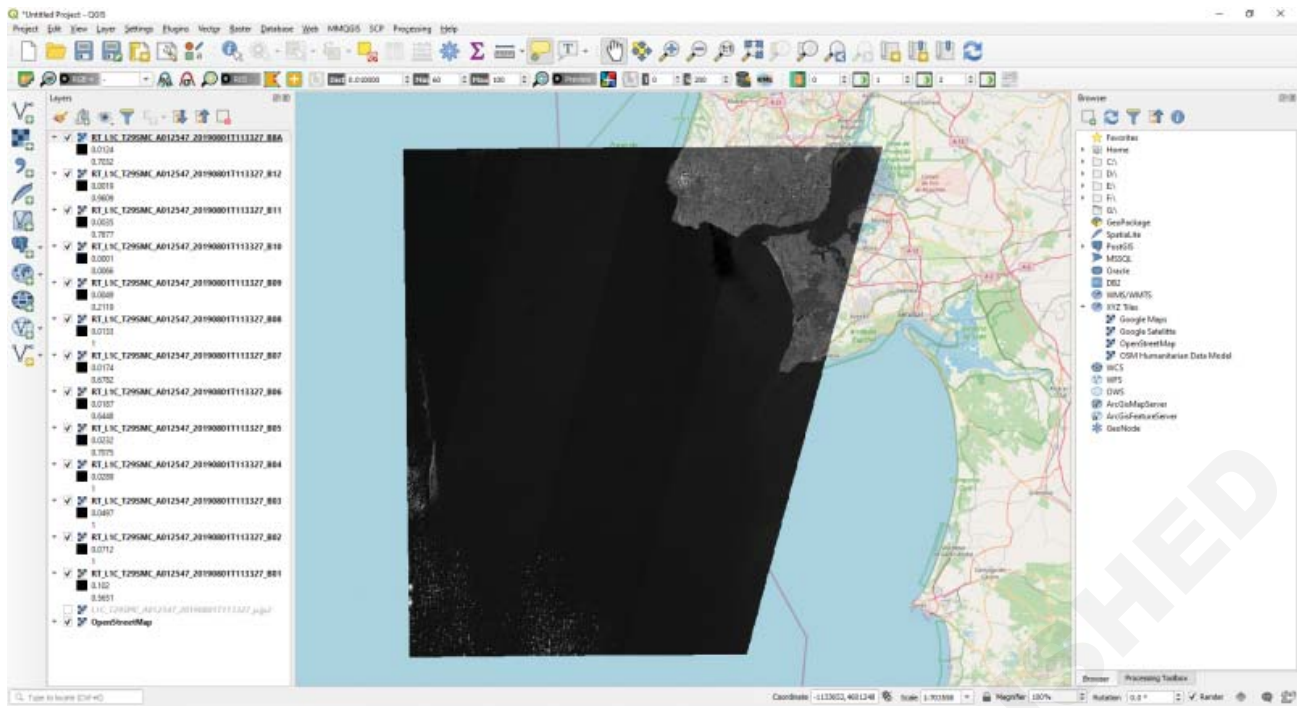


Fig 4

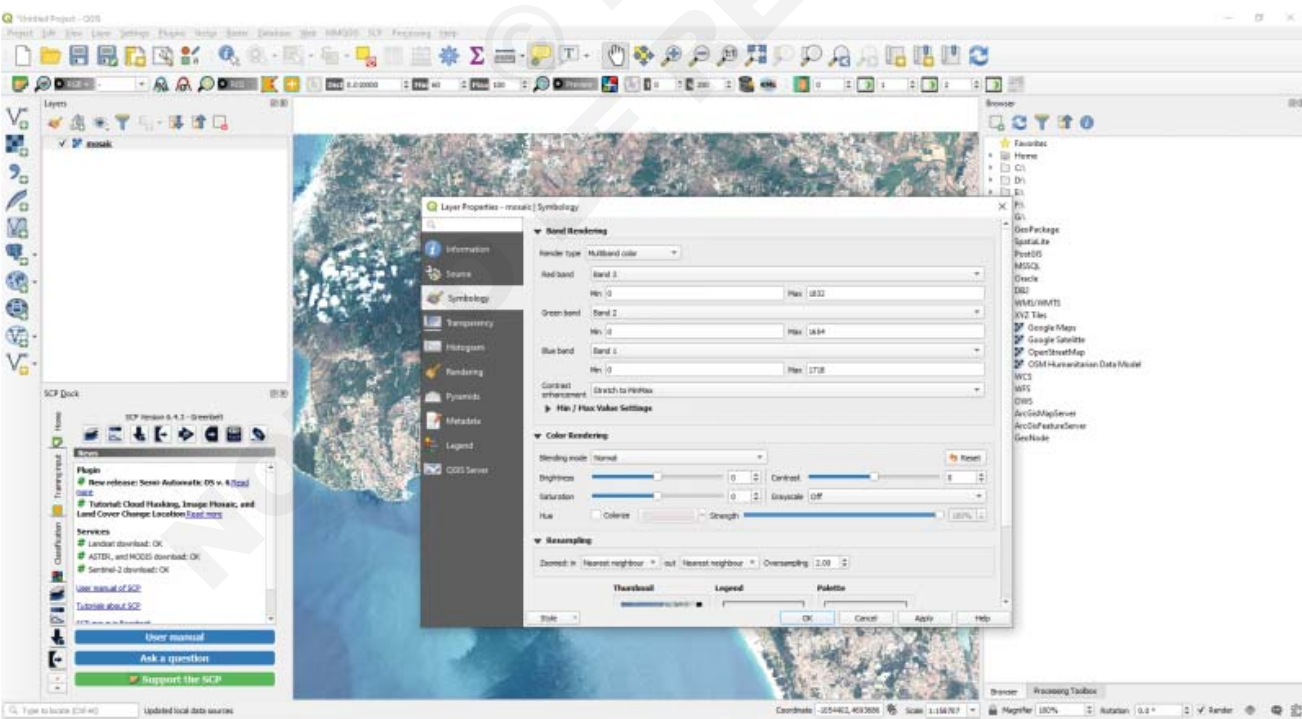


Select a new name and location for your new mosaic. Click Run. (Fig 5)

Open a new QGIS project and add the newly created raster. Symbolize it as: Render type – **Multiband color**

(RGB – red – green – blue) – (Red Band – Band 3; Green Band – Band 2; Blue Band – Band 1). This is also called Natural Colour Composite.

Fig 5



Demonstration and Use of Bhuvan Portal

Objective: At the end of this exercise you shall be able to

- demonstrate the use of bhuvan portal.

Requirements

Tools/Equipments/Instruments

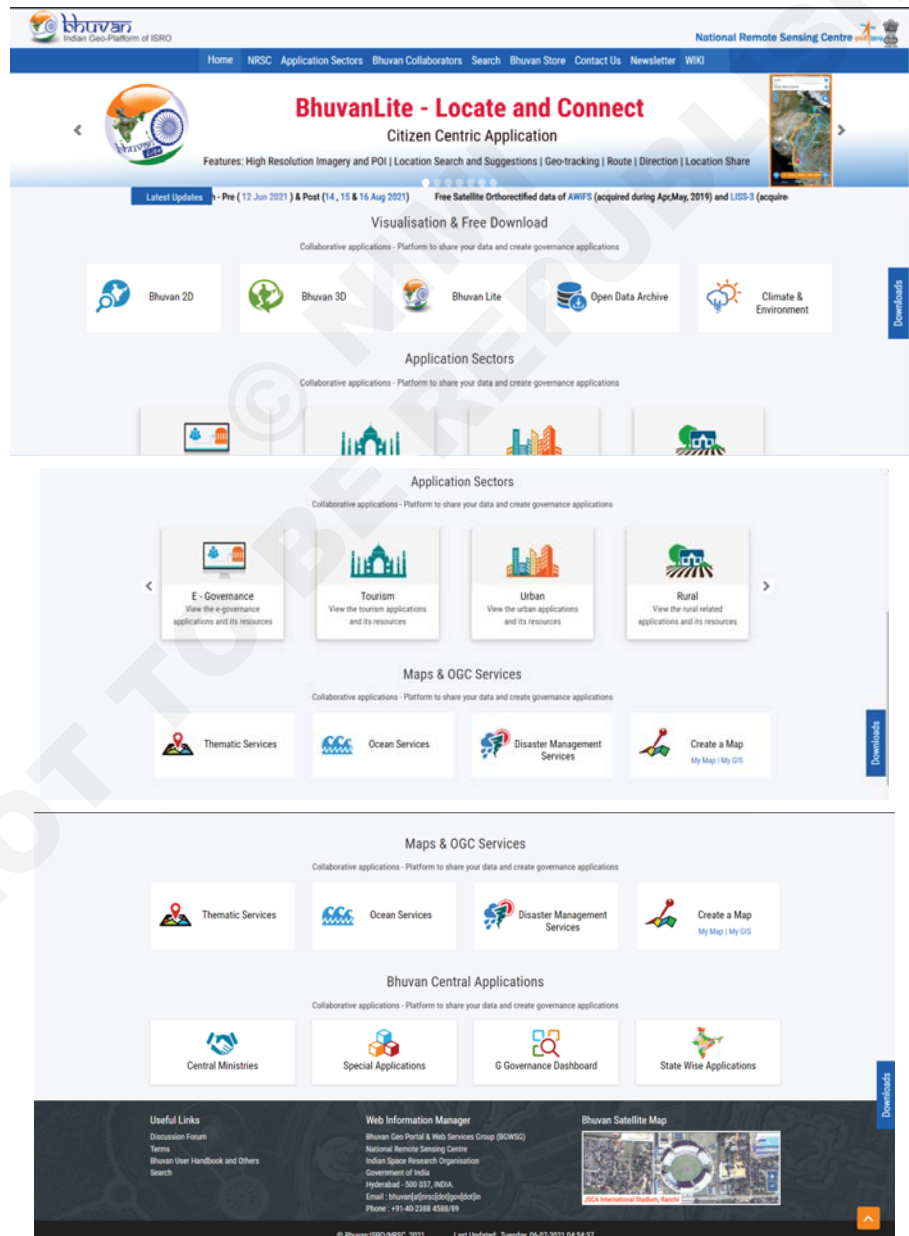
- PC with Windows OS
- Inter connecting cables
- DGPS software, Internet connection

PROCEDURE

Bhuvan Portal (Fig 1)

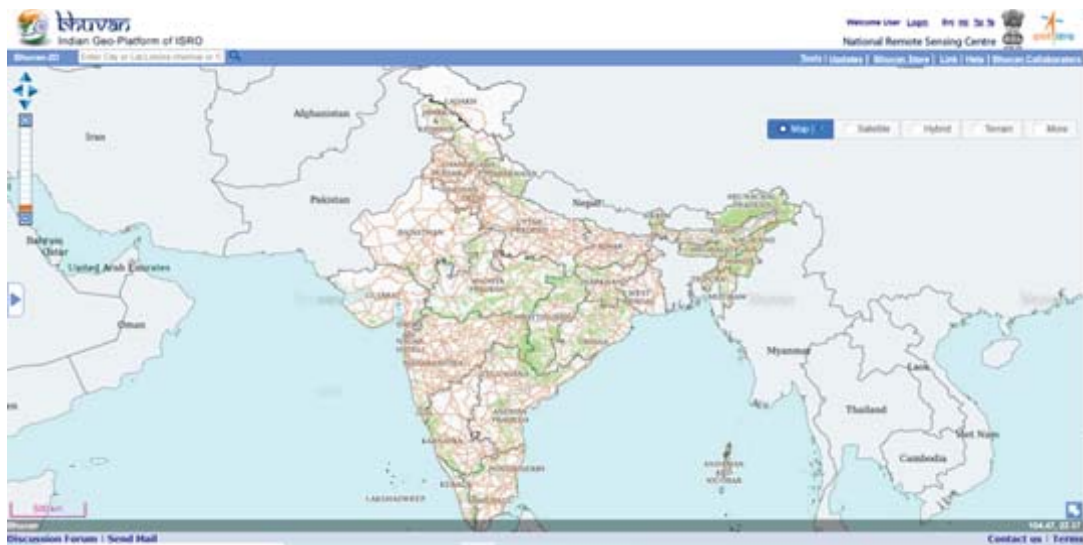
2D view of BHUVAN

Fig 1



Map view of BHUVAN (Fig 2)

Fig 2



Satellite view of BHUVAN (Fig 3)

Fig 3

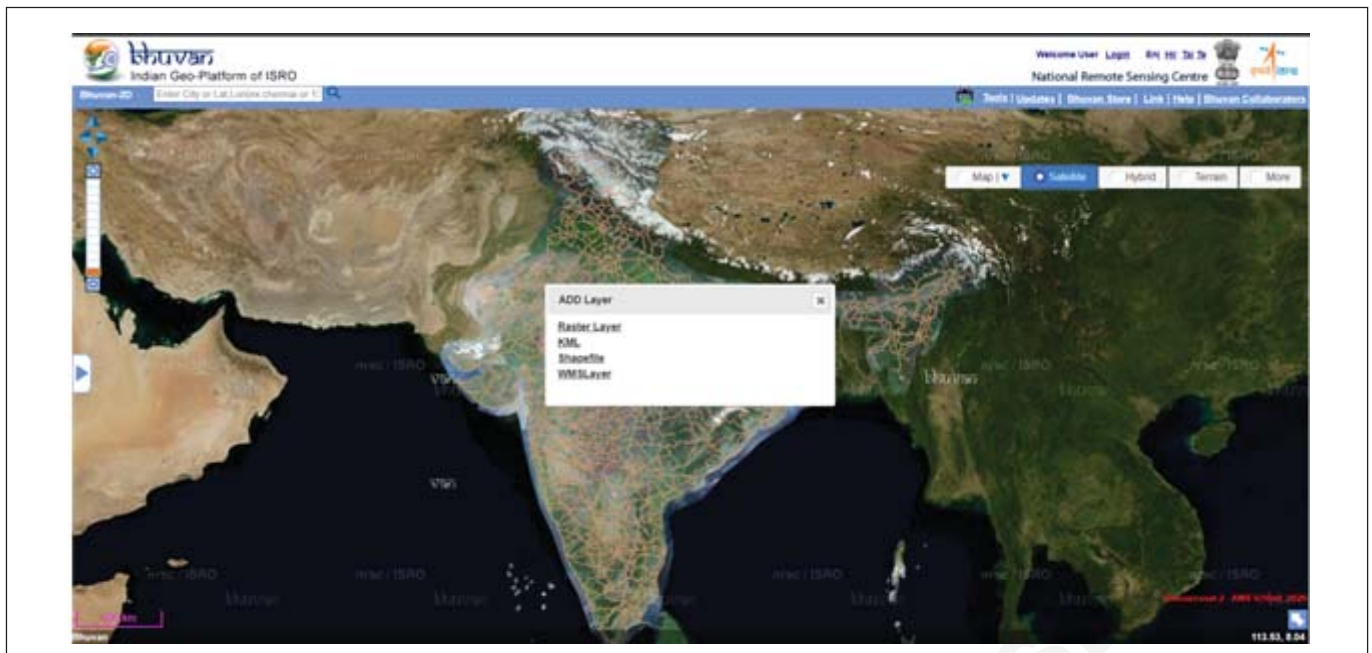


Tools in BHUVAN (Fig 4)

Fig 4



You can add your shapefile KML, WMSlayer and raster data in Bhuvan. (Fig 5)



And select the upload (Fig 6)



Downloading Satellite Data from Bhuvan

Objective: At the end of this exercise you shall be able to

- download satellite data from bhuvan.

Requirements

Tools/Equipments/Instruments

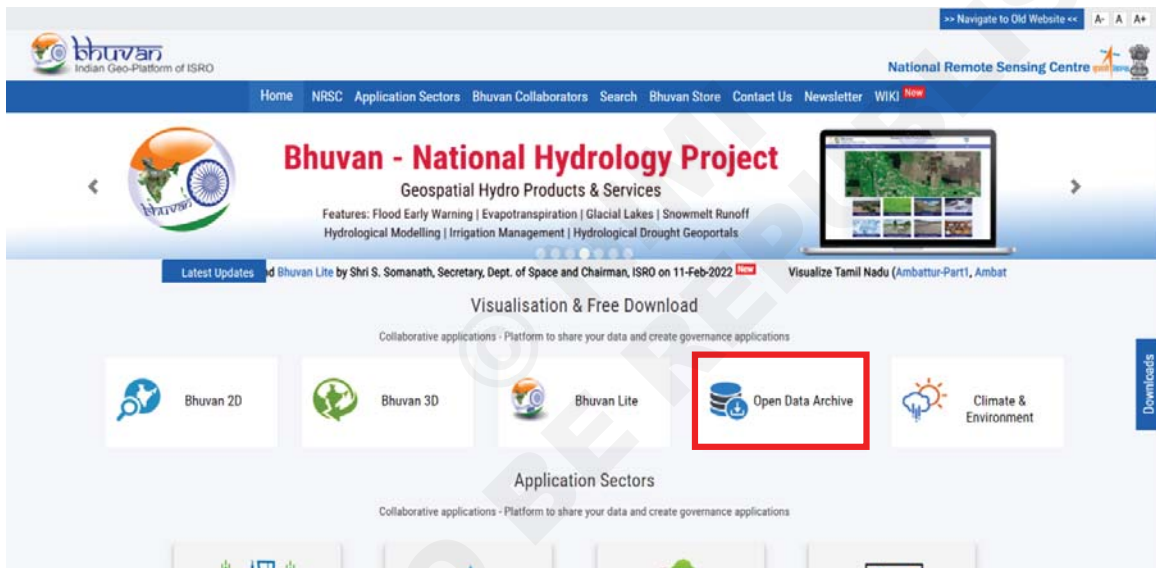
- PC with Windows OS
- Inter connecting cables
- Satellite Data, Internet connection

PROCEDURE

Downloading satellite data in BHUVAN (Fig 1)

For Downloading satellite data in BHUVAN select the **Open Data Archive**

Fig 1



Select Login

Give your username and password

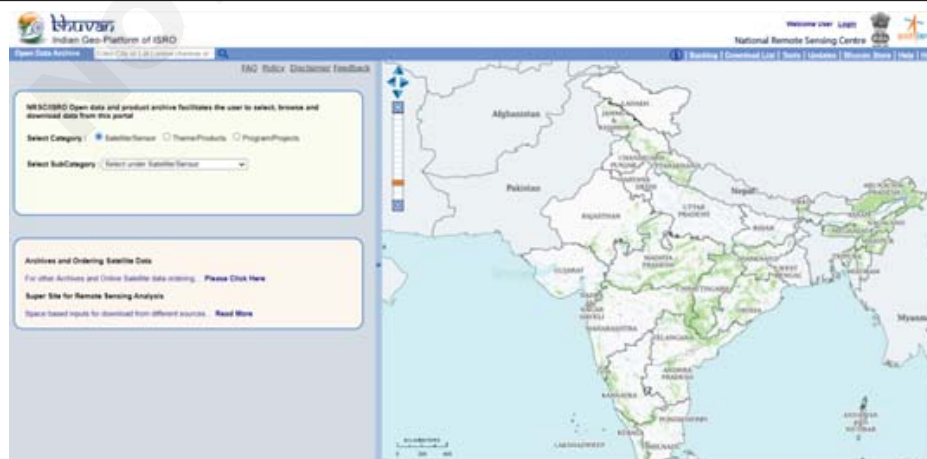
Select the category of satellite/sensor

Select the subcategory of LISS-III

And give lat and long or toposheet number

And download it. (Fig 2)

Fig 2



Use of Bhuvan Portal (ISRO) for Activity Planning at Panchayat Level

Objective: At the end of this exercise you shall be able to

- use bhuvan portal (ISRO) for activity planning at panchayat level.

Requirements

Tools/Equipments/Instruments

- PC with Windows OS
- Inter connecting cables
- Internet connection

PROCEDURE

BHUVAN PANCHAYAT PORTAL HOME PAGE you can see with this link. (<http://bhuvan-panchayat.nrsc.gov.in/>) (Fig 1, 2)

Fig 1

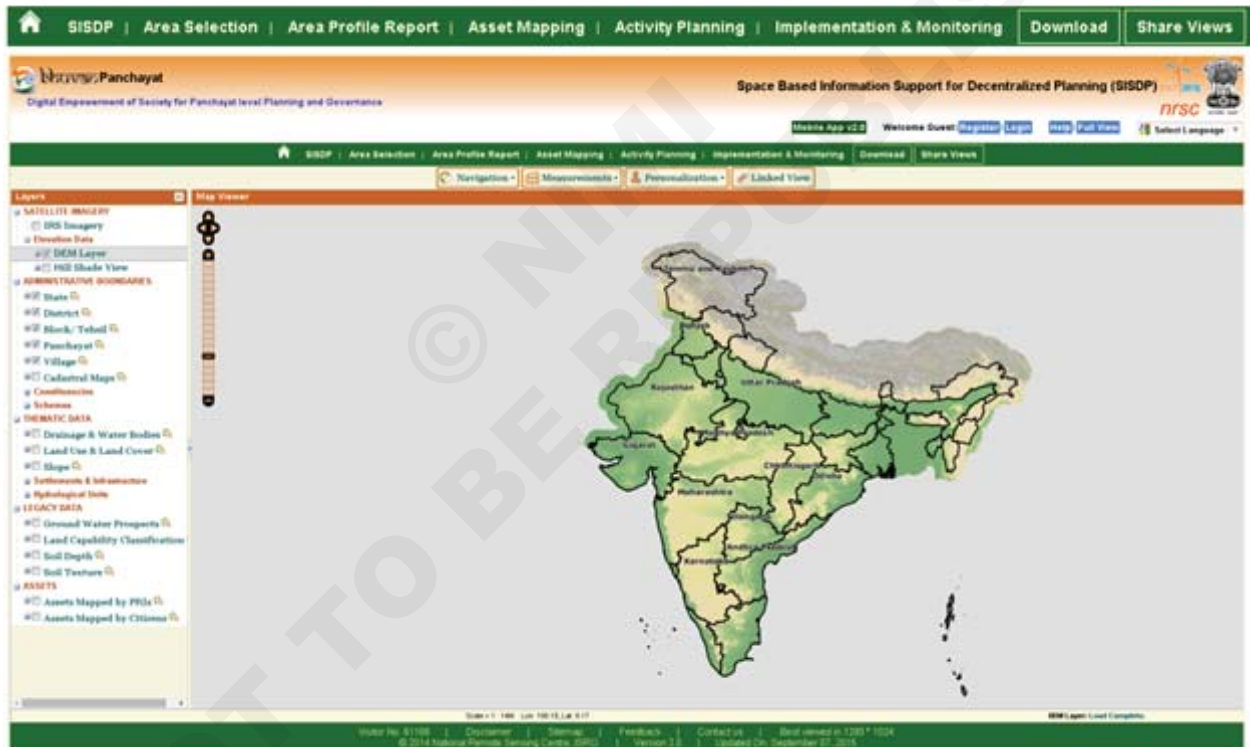
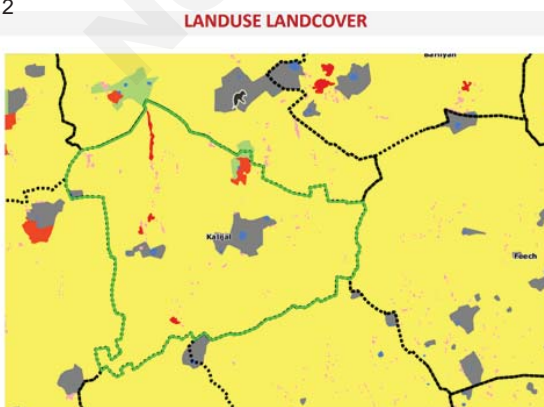


Fig 2



Area Selection (Fig 3)

The portal uses high-resolution data from recent earth observation satellites and offers detailed information to panchayats about their key assets. For the first time, the thematic maps of 1:10,000 scale have been generated based on high-resolution data given by Indian Space Research Organisation's (ISRO) new earth observation satellites. It is jointly implemented by the Ministry of Panchayati Raj and Department of Space, ISRO.

Fig 3

SISDP | Area Selection | Area Profile Report | Asset Mapping | Activity Planning | Implementation & Monitoring | Download | Share Views

Administrative Unit	Hydrological Unit	Constituency	Search
Select area of interest based on:	Select area of interest based on:	Select area of interest based on:	General search based on name.
<ul style="list-style-type: none"> State District Block Panchayat Village 	<ul style="list-style-type: none"> Basin Sub-Basin Watershed 	<ul style="list-style-type: none"> Parliamentary Constituency Assembly Constituency 	

Below the selection panels are three satellite maps showing different geographical areas. At the bottom, there are three 'Area Selection' pop-up windows with dropdown menus for State, District, Block, and Village, and buttons for 'Go' and 'Reset'.

AREA PROFILE REPORT (Fig 4)

Fig 4



Classification of Assets - Table - 1

Table - 1

S. No.	Major Category	Sub-Class	Asset Group	Assets(No.)
1	Civic amenities/ Infrastructure Assets (226 Assets)	Education Facilities	Schools	7
			Colleges/ Universities	10
			Training Institutions/Centres	6
			Public Libraries	1
			Other Educational Assets	1

S. No.	Major Category	Sub-Class	Asset Group	Assets (No.)
	Civic amenities/ Infrastructure Assets (226 Assets)	Medical and Health Facilities	Aanganwadis	1
			Women and Child Health Centres	1
			Health Centres / Hospitals	7
			Other Medical Facilities	16
		Veterinary and Fisheries Facilities	Veterinary Dispensaries / Hospitals	1
			Other Veterinary Facilities	1
		Transport and Connectivity	Road Types and Structures	12
			Road Transport Facilities	9
			Railway Types and Structures	9
			Railway Transport Facilities	6
			Air Transport Facilities	4
			Water Transport Facilities	7
		Power and Energy	Electricity and Usage	1
			Electric Assets	5
			Power Generation Plants	9
		Postal and Telecom	Postal Facilities	4
			Telecom Facilities	7
