



GOVERNMENT OF TAMILNADU

# COMPUTER TECHNOLOGY

## HIGHER SECONDARY FIRST YEAR

**Untouchability is Inhuman and a Crime**

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Department of School Education

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## PREFACE

Human civilization achieved the highest peak with the development of computer known as "Computer era".

Literate are those who have the knowledge in using the computer whereas others are considered illiterate inspite of the other degrees obtained.

The growth of the nation at present lies in the hands of the youth, hence the content of this book is prepared in such a way so as to attain utmost knowledge considering the future needs of the youth.

## HOW TO USE THE BOOK

- This book does not require prior knowledge in computer Technology
- Each unit comprises of simple activities and demonstrations which can be done by the teacher and also students.
- Technical terminologies are listed in glossary for easy understanding
- The "Do you know?" boxes enrich the knowledge of reader with additional information
- Workshops are introduced to solve the exercises using software applications
- QR codes are used to link supporting additional materials in digital form

### How to get connected to QR Code?

- o Download the QR code scanner from the google play store/ apple app store into your smartphone
- o Open the QR code scanner application
- o Once the scanner button in the application is clicked, camera opens and then bring it closer to the QR code in the textbook.
- o Once the camera detects the QR code, a URL appears in the screen. Click the URL and go to the content page.



# CAREER GUIDANCE AFTER 12<sup>TH</sup>

COURSES	COLLEGES/ UNIVERSITIES	PROFESSION
B.E / B.Tech	All University and their affiliated Colleges and Self financing Colleges in India and Abroad.	Software Engineer, Hardware Engineer, Software Development, Healthcare Section, IT & ITEs
<b>Science and Humanities</b>		
B.Sc (Computer Science) BCA B.Sc ( Maths, Physics, Chemistry, Bio-Chemistry, Geography, journalism, Library Sciences, Political Science, Travel and Tourism)	All University and their affiliated Colleges and Self financing Colleges in India and Abroad.	Government Job and Private Company BPO, Geologist, Journalist
<b>LAW</b>		
LLB B.A+LLB B.Com BBM+LLB BBA+LLB	All University and their affiliated Colleges and Self financing Colleges in India and Abroad.	Lawyer, Legal Officer, Govt Job
CA	The Institute of Chartered Accountant of India (ICAI)	CA Private and Govt.
Diploma	Government Polytechnic and Self-financing colleges	Junior Engineer (Government and Private)
<b>Commerce Courses</b>		
B.com-Regular, B.com-Taxation & Tax Procedure, B.com-Travel &Tourism, B.com-Bank Management, B.com-Professional, BBA/BBM-Regular, BFM- Bachelors in Financial Markets, BMS-Bachelors in Management Studies, BAF- Bachelors in Accounting & Finance, Certified Stock Broker & Investment Analysis, Certified Financial Analyst, Certified Financial Planner, Certified Investment Banker	All University and their affiliated Colleges and Self financing Colleges in India and Abroad.	Private Organization , Government ,Banking sectors and prospects for self – employment.

COURSES	COLLEGES/ UNIVERSITIES	PROFESSION
<b>Management Courses</b>		
Business Management Bank Management Event Management Hospital Management Human Resource Management Logistics Management	All University and their affiliated Colleges and Self financing Colleges in India and Abroad.	Private Organization , Government ,Banking sectors and prospects for self – employment.
<b>LAW</b>		
LLB B.A+LLB B.Com BBM+LLB BBA+LLB	All University and their affiliated Colleges and Self financing Colleges in India and Abroad.	Lawyer, Legal Officer, Private Organization , Government, Banking sectors and prospects for self – employment
CA-Chartered Accountant CMA-Cost Management Accountant. CS-Company Secretary (Foundation)	The Institute of Chartered Accountant of India (ICAI)	CA, Private Organization, Government ,Banking sectors and prospects for self – employment.
<b>Science and Humanities</b>		
B.Sc.Botany B.Sc.Zoology B.Sc.Dietician & Nutritionist B.Sc.Home Science B.Sc.Food Technology B.Sc.Dairy Technology B.Sc. Hotel Management B.Sc. Fashion Design B.Sc. Mass Communication B.Sc. Multimedia B.Sc. -3D Animation	All University and their affiliated Colleges and Self financing Colleges in India and Abroad	Government Job and Private Company BPO, Geologist, Journalist
<b>LAW</b>		
LLB B.A+LLB B.Com BBM+LLB BBA+LLB	All University and their affiliated Colleges and Self financing Colleges in India and Abroad.	Lawyer, Legal Officer, Govt Job
CA	The Institute of Chartered Accountant of India (ICAI)	CA Private and Govt.
Diploma	Government Polytechnic and Self-financing colleges	Junior Engineer (Government and Private)

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E - book



Assessment



DIGI links



## Learning Objectives

After learning the concepts in this chapter, the students will be able

- To know about Computers
- To learn about various generations of computer
- To understand the basic operations of computers
- To know the components and their functions.
- To know about booting of a computer

### Father of Computer

**DO YOU KNOW?**

Charles Babbage is considered to be the father of computer, for his invention and the concept of Analytical Engine in 1837. The Analytical Engine contained an Arithmetic Logic Unit (ALU), basic flow control, and integrated memory; which led to the development of first general-purpose computer concept.




## Introduction to Computers

### 1.1 Introduction to Computers

Computers are seen everywhere around us, in all spheres of life, in the field of education, research, travel and tourism, weather forecasting, social networking, e-commerce etc. Computers have now become an indispensable part of our lives. Computers have revolutionised our lives with their accuracy and speed of performing a job, it is truly remarkable. Today, no organisation can function without a computer. In fact, various organisations have become paperless. Computers have evolved over the years from a simple calculating device to high speed portable computers.

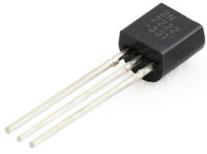
The growth of computer industry started with the need for performing fast calculations. The manual method of computing was slow and prone to errors. So, attempts were made to develop fast calculating devices, the journey started from the first known calculating device (Abacus) which has led us today to an extremely high speed calculating devices.

### 1.2 Generations of Computers

Growth in the computer industry is determined by the development in technology.

Based on various stages of development, computers can be categorised into different generations.

SN	Generation	Period	Main Component used	Merits/Demerits
1	<b>First Generation</b>	1940-1956	 Vacuum tubes	<ul style="list-style-type: none"> <li>• Big in size</li> <li>• Consumed more power</li> <li>• Malfunction due to overheat</li> <li>• Machine Language was used</li> </ul>

First Generation Computers - ENIAC , EDVAC , UNIVAC 1				
ENIAC weighed about 27 tons, size 8 feet × 100 feet × 3 feet and consumed around 150 watts of power				
2	Second Generation	1956-1964	 Transistors	<ul style="list-style-type: none"> <li>• Smaller compared to First Generation</li> <li>• Generated Less Heat</li> <li>• Consumed less power compared to first generation</li> <li>• Punched cards were used</li> <li>• First operating system was developed - Batch Processing and Multiprogramming Operating System</li> <li>• Machine language as well as Assembly language was used.</li> </ul>
Second Generation Computers IBM 1401, IBM 1620, UNIVAC 1108				
3	Third Generation	1964 -1971	 Integrated Circuits (IC)	<ul style="list-style-type: none"> <li>• Computers were smaller, faster and more reliable</li> <li>• Consumed less power</li> <li>• High Level Languages were used</li> </ul>
Third Generation Computers IBM 360 series, Honeywell 6000 series				
4	Fourth Generation	1971-1980	 Microprocessor Very Large Scale Integrated Circuits (VLSI)	<ul style="list-style-type: none"> <li>• Smaller and Faster</li> <li>• Microcomputer series such as IBM and APPLE were developed</li> <li>• Portable Computers were introduced.</li> </ul>
5	Fifth Generation	1980 - till date	 Ultra Large Scale Integration (ULSI)	<ul style="list-style-type: none"> <li>• Parallel Processing</li> <li>• Super conductors</li> <li>• Computers size was drastically reduced.</li> <li>• Can recognise Images and Graphics</li> <li>• Introduction of Artificial Intelligence and Expert Systems</li> <li>• Able to solve high complex problems including decision making and logical reasoning</li> </ul>

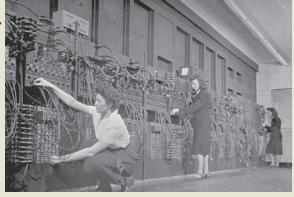
6	<b>Sixth Generation</b>	In future		<ul style="list-style-type: none"> <li>• Parallel and Distributed computing</li> <li>• Computers have become smarter, faster and smaller</li> <li>• Development of robotics</li> <li>• Natural Language Processing</li> <li>• Development of Voice Recognition Software</li> </ul>
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Table 1.1 Generations of computers

**The first digital computer**

**DO YOU KNOW?**

The ENIAC (Electronic Numerical Integrator And Calculator) was invented by J. Presper Eckert and John Mauchly at the University of Pennsylvania and began construction in 1943 and was not completed until 1946. It occupied about 1,800 square feet and used about 18,000 vacuum tubes, weighing almost 50 tons. ENIAC was the first digital computer because it was fully functional.



### 1.3 Sixth Generation Computing

In the Sixth Generation, computers could be defined as the era of intelligent computers, based on Artificial Neural Networks. One of the most dramatic changes in the sixth generation will be the explosive growth of Wide Area Networking. Natural Language Processing (NLP) is a component of Artificial Intelligence (AI). It provides the ability to develop the computer program to understand human language.

**DO YOU KNOW?**

Optical Character Recognition (Optical Grapheme Recognition) engine for the Indus Scripts has been developed using Deep Learning Neural Networks (a sub-field of Artificial Intelligence). Given photographs, scans, or any image feed of an Indus Valley Civilization artifact, the system will be able to recognise the inscriptions (the symbol/grapheme sequences) from the image. There are totally 417 Symbols/Graphemes/Characters in the Indus Scripts and just 3700+ text inscriptions of data for the machine to learn and attain expert-level status.





### 1.4. Data and Information

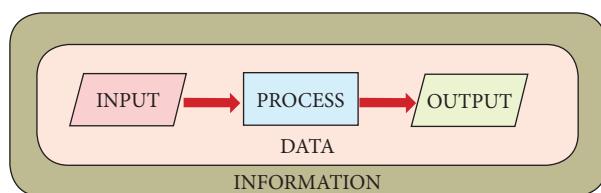
We all know what a computer is? It is an electronic device that processes the input according to the set of instructions provided to it and gives the desired output

at a very fast rate. Computers are very versatile as they do a lot of different tasks such as storing data, weather forecasting, booking airlines, railway or movie tickets and even playing games.

**Data:** Data is defined as an unprocessed collection of raw facts, suitable for communication, interpretation or processing.

For example, 134, 16 ‘Kavitha’, ‘C’ are data. This will not give any meaningful message.

**Information:** Information is a collection of facts from which conclusions may be drawn. In simple words we can say that data is the raw facts that is processed to give meaningful, ordered or structured information. For example Kavitha is 16 years old. This information is about Kavitha and conveys some meaning. This conversion of data into information is called data processing.



*Figure 1.1 Data and Information*

“A Computer is an electronic device that takes raw data (unprocessed) as an input from the user and processes it under the control of a set of instructions (called program), produces a result (output), and saves it for future use.”

## 1.5 Components of a Computer

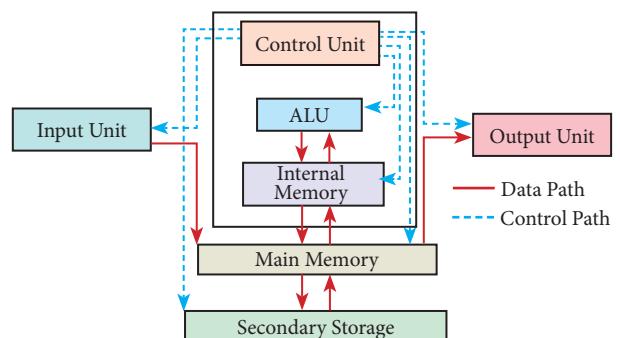
The computer is the combination of hardware and software. Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc., while software is the set of

programs or instructions. Both hardware and software together make the computer system to function.



*Figure 1.2: Computer*

Let us first have a look at the functional components of a computer. Every task given to a computer follows an Input- Process- Output Cycle (IPO cycle). It needs certain input, processes that input and produces the desired output. The input unit takes the input, the central processing unit does the processing of data and the output unit produces the output. The memory unit holds the data and instructions during the processing.



*Figure 1.3 components of a computer*

### 1.5.1 Input Unit

Input unit is used to feed any form of data to the computer, which can be stored in the memory unit for further processing. Example: Keyboard, mouse, etc.

### 1.5.2 Central Processing Unit

CPU is the major component which interprets and executes software instructions. It also controls the operation of all other components such as memory, input and output units. It accepts binary data as input, process the data according to the instructions and provide the result as output.

The CPU has three components which are Control unit, Arithmetic and logic unit (ALU) and Memory unit.

#### 1.5.2.1 Arithmetic and Logic Unit

The ALU is a part of the CPU where various computing functions are performed on data. The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations. The result of an operation is stored in internal memory of CPU. The logical operations of ALU promote the decision-making ability of a computer.

#### 1.5.2.2 Control Unit

The control unit controls the flow of data between the CPU, memory and I/O devices. It also controls the entire operation of a computer.

#### 1.5.3. Output Unit

An Output Unit is any hardware component that conveys information to users in an understandable form. Example: Monitor, Printer etc.

#### 1.5.4. Memory Unit

The Memory Unit is of two types which are primary memory and secondary memory. The primary memory is used

to temporarily store the programs and data when the instructions are ready to execute. The secondary memory is used to store the data permanently.

The Primary Memory is volatile, that is, the content is lost when the power supply is switched off. The Random Access Memory (RAM) is an example of a main memory. The Secondary memory is non volatile, that is, the content is available even after the power supply is switched off. Hard disk, CD-ROM and DVD ROM are examples of secondary memory.

### 1.5.5. Input and Output Devices

#### Input Devices:

**(1) Keyboard:** Keyboard (wired / wireless, virtual) is the most common input device used today. The individual keys for letters, numbers and special characters are collectively known as character keys. This keyboard layout is derived from the keyboard of original typewriter. The data and instructions are given as input to the computer by typing on the keyboard. Apart from alphabet and numeric keys, it also has Function keys for performing different functions. There are different set of keys available in the keyboard such as character keys, modifier keys, system and GUI keys, enter and editing keys, function keys, navigation keys, numeric keypad and lock keys.



Figure 1.4 Keyboard

**(2) Mouse:** Mouse (wired/wireless) is a pointing device used to control the

movement of the cursor on the display screen. It can be used to select icons, menus, command buttons or activate something on a computer. Some mouse actions are move, click, double click, right click, drag and drop.

Different types of mouse available are: Mechanical Mouse, Optical, Laser Mouse, Air Mouse, 3D Mouse, Tactile Mouse, Ergonomic Mouse and Gaming Mouse.

**Who invented Mouse?**

The computer mouse as we know it today was invented and developed by Douglas Engelbart, with the assistance of Bill English, during the 1960's and was patented on November 17, 1970.

CPDJL5

**(3) Scanner:** Scanners are used to enter the information directly into the computer's memory. This device works like a Xerox machine. The scanner converts any type of printed or written information including photographs into a digital format, which can be manipulated by the computer.



Figure 1.5 Scanner

**(4) Fingerprint Scanner:** Fingerprint Scanner is a fingerprint recognition device used for computer security, equipped with the fingerprint recognition feature that uses biometric technology.

Fingerprint Reader / Scanner is a very safe and convenient device for security instead of using passwords, which is vulnerable to fraud and is hard to remember.



Figure 1.6 Fingerprint Scanner

#### **(5) Track Ball:**

Track ball is similar to the upside-down design of the mouse. The user moves the ball directly, while the device itself remains stationary. The user spins the ball in various directions to navigate the screen movements.



Figure 1.7 Track Ball

**(6) Retinal Scanner:** This performs a retinal scan which is a biometric technique that uses unique patterns on a person's retinal blood vessels.



Figure 1.8 Retinal Scanner

**(7) Light Pen:** A light pen is a pointing device shaped like a pen and is connected to a monitor. The tip of the light pen contains a light-sensitive element which detects the light from the screen enabling the computer to identify the location of the pen on the screen. Light pens



Figure 1.9 Light Pen

have the advantage of ‘drawing’ directly onto the screen, but this becomes hard to use, and is also not accurate.

**(8) Optical Character Reader:** It is a device which detects characters printed or written on a paper with OCR, a user can scan a page from a book. The Computer will recognise the characters in the page as letters and punctuation marks and stores. The Scanned document can be edited using a wordprocessor.



Figure 1.10 Optical Character Reader

**(9) Bar Code / QR Code Reader:** A Bar code is a pattern printed in lines of different thickness. The Bar code reader scans the information on the bar codes transmits to the Computer for further processing. The system gives fast and error free entry of information into the computer.

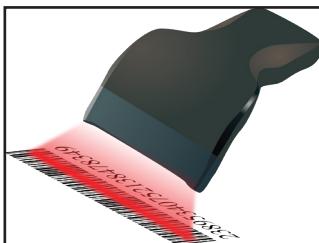


Figure 1.11 Bar code Reader

**QR (Quick response) Code:** The QR code is the two dimension bar code which can be read by a camera and processed to interpret the image.

#### (10) Voice Input Systems:

Microphone serves as a voice Input device. It captures the voice data and send it to the Computer. Using the microphone along with speech recognition software can offer a completely



Figure 1.12 Voice input System

new approach to input information into the Computer.

**(11) Digital Camera:** It captures images / videos directly in the digital form. It uses a CCD (Charge Coupled Device) electronic chip. When light falls on the chip through the lens, it converts light rays into digital format.



Figure 1.13  
Digital Camera

**(12) Touch Screen:** A touch screen is a display device that allows the user to interact with a computer by using the finger. It can be quite useful as an alternative to a mouse or keyboard for navigating a Graphical User Interface (GUI). Touch screens are used on a wide variety of devices such as computers, laptops, monitors, smart phones, tablets, cash registers and information kiosks. Some touch screens use a grid of infrared beams to sense the presence of a finger instead of utilizing touch-sensitive input.



Figure 1.14 Touch Screen

( 1 3 )  
**Keyer :** A Keyer is a device for signaling by hand, by way of pressing one or more switches. Modern keyers have a large number of switches but not as many as a full size keyboard.

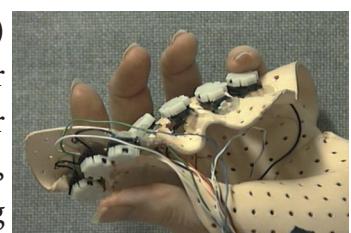


Figure 1.15 Keyer

Typically, this number is between 4 and 50. A keyer differs from a keyboard, which has "no board", but the keys are arranged in a cluster.

### Output Devices:

**(1) Monitor:** Monitor is the most commonly used output device to display the information. It looks like a TV. Pictures on a monitor are formed with picture elements called **PIXELS**. Monitors may either be **Monochrome** which display text *Figure 1.16 Monitor* or images in **Black and White** or can be **color**, which display results in multiple colors. There are many types of monitors available such as **CRT** (Cathode Ray Tube), **LCD** (Liquid Crystal Display) and **LED** (Light Emitting Diodes). The monitor works with the **VGA** (Video Graphics Array) card. The video graphics card helps the keyboard to communicate with the screen. It acts as an interface between the computer and display monitor. Usually the recent motherboards incorporate built-in video card.



*Figure 1.16 Monitor*

The first computer monitor was part of the Xerox Alto computer system, which was released on March 1, 1973.

**(2) Plotter:** Plotter is an output device that is used to produce graphical output on papers. It uses single color or multi color pens to draw pictures.



*Figure 1.17 Plotter*

**(3) Printers:** Printers are used to print the information on papers. Printers are divided into two main categories:

- Impact Printers
- Non Impact printers

### Impact Printers

These printers print with striking of hammers or pins on ribbon. These printers can print on multi-part (using carbon papers) by using mechanical pressure. For example, Dot Matrix printers and Line matrix printers are impact printers.



*Figure 1.18 Impact Printer*

A Dot matrix printer that prints using a fixed number of pins or wires. Each dot is produced by a tiny metal rod, also called a "wire" or "pin", which works by the power of a tiny electromagnet or solenoid, either directly or through a set of small levers. It generally prints one line of text at a time. The printing speed of these printers varies from 30 to 1550 CPS (Character Per Second).

Line matrix printers use a fixed print head for printing. Basically, it prints a page-wide line of dots. But it builds up a line of text by printing lines of dots. Line

printers are capable of printing much more than 1000 Lines Per Minute, resulting in thousands of pages per hour. These printers also uses mechanical pressure to print on multi-part (using carbon papers).

### Non-Impact Printers

These printers do not use striking mechanism for printing. They use electrostatic or laser technology. Quality and speed of these printers are better than Impact printers. For example, Laser printers and Inkjet printers are non-impact printers.

### Laser Printers

Laser printers mostly work with similar technology used by photocopiers. It makes a laser beam scan back and forth across a drum inside the printer, building up a pattern. It can produce very good quality of graphic images. One of the chief characteristics of laser printer is their resolution – how many Dots per inch(DPI). The available resolution range around 1200 dpi. Approximately it can print 100 pages per minute(PPM)



Figure 1.19 Laser Printer

### Inkjet Printers:

Inkjet Printers use colour cartridges which combined Magenta, Yellow and Cyan inks to create color tones. A black cartridge is also used for monochrome output. Inkjet printers work by spraying ionised ink at a sheet of paper. The speed of Inkjet printers generally range from 1-20 PPM (Page Per Minute).



Figure 1.20 Inkjet Printer

They use the technology of firing ink by heating it so that it explodes towards the paper in bubbles or by using piezoelectricity in which tiny electric currents controlled by electronic circuits are used inside the printer to spread ink in jet speed. An Inkjet printer can spread millions of dots of ink at the paper every single second.

### Speakers:

Speakers produce voice output (audio) . Using speaker along with speech synthesise software, the computer can provide voice output. This has become very common in places like airlines, schools, banks, railway stations, etc.



Figure 1.21 Speakers

### Multimedia Projectors:

Multimedia projectors are used to produce computer output on a big screen. These are used to display presentations in meeting halls or in classrooms.



Figure 1.22 Multimedia Projector

## 1.6 Booting of computer

An Operating system (OS) is a basic software that makes the computer to work. When a computer is switched on, there is no information in its RAM. At the same time, in ROM, the pre-written program called POST (Power on Self Test) will be executed first. This program checks if the devices like RAM, keyboard, etc., are connected properly and ready to operate. If these devices are ready, then the BIOS (Basic Input Output System) gets executed. This process is called Booting. Thereafter, a program called “Bootstrap Loader” transfers OS from hard disk into main memory. Now the OS gets loaded (Windows/Linux, etc.,) and will get executed. Booting process is of two types.

- 1) Cold Booting
- 2) Warm Booting

**Cold Booting:** When the system starts from initial state i.e. it is switched on, we call it cold booting or Hard Booting. When the user presses the Power button, the instructions are read from the ROM to initiate the booting process.

**Warm Booting:** When the system restarts or when Reset button is pressed, we call it Warm Booting or Soft Booting. The system does not start from initial state and so all diagnostic tests need not be carried out in this case. There are chances of data loss and system damage as the data might not have been stored properly.

### Points to Remember:

- Computers are seen everywhere around us, in all spheres of life.
- It is an electronic device that processes the input according to the set of instructions provided to it and gives the desired output at a very fast rate.
- Based on various stages of development, computers can be divided into six different generations.
- The computer is the combination of hardware and software.
- Hardware is the physical component of a computer.
- Input unit is used to feed any form of data to the computer.
- CPU interprets and executes software instructions.
- The ALU is a part of the CPU where various computing functions are performed on data.
- The control unit controls the flow of data between the CPU, memory and I/O devices.
- An Output Unit is any hardware component that conveys information to one or more people in user understandable form.
- The Memory Unit is of two kinds which are primary memory and secondary memory.

### Activity



### STUDENT ACTIVITY

1. Explain the classification of computers.
2. Give the details of motherboard names, RAM capacity used in the years 1993, 1995, 2005, 2008, 2016.
3. Mention two new input and output devices that are not given in this chapter.

## Evaluation



### SECTION - A

Choose the correct answer:

1. First generation computers used
  - (a) Vacuum tubes
  - (b) Transistors
  - (c) Integrated circuits
  - (d) Microprocessors
  
2. Name the volatile memory
  - (a) ROM                  (b) PROM
  - (c) RAM                  (d) EPROM
  
3. Identify the output device
  - (a) Keyboard              (b) Memory
  - (c) Monitor               (d) Mouse
  
4. Identify the input device
  - (a) Printer               (b) Mouse
  - (c) Plotter               (d) Projector
  
5. .... Output device is used for printing building plan.
  - (a) Thermal printer
  - (b) Plotter
  - (c) Dot matrix
  - (d) inkjet printer
  
6. Which one of the following is used to in ATM machines
  - (a) Touch Screen       (b) speaker
  - (c) Monitor              (d) Printer
  
7. When a system restarts which type of booting is used.
  - (a) Warm booting
  - (b) Cold booting
  - (c) Touch boot
  - (d) Real boot.



8. Expand POST
  - (a) Post on self Test
  - (b) Power on Software Test
  - (c) Power on Self Test
  - (d) Power on Self Text
  
9. Which one of the following is the main memory?
  - (a) ROM                  (b) RAM
  - (c) Flash drive           (d) Hard disk
  
10. Which generation of computer used IC's?
  - (a) First                  (b) Second
  - (c) Third                  (d) Fourth

### SECTION-B

#### Short Answers

1. What is a computer?
2. Distinguish between data and information.
3. What are the components of a CPU?
4. What is the function of an ALU?
5. Write the functions of control unit.
6. What is the function of memory?
7. Differentiate Input and output unit.
8. Distinguish Primary and Secondary memory.

### SECTION-C

#### Explain in Brief

1. What are the characteristics of a computer?
2. Write the applications of computer.
3. What is an input device? Give two examples.
4. Name any three output devices.
5. Differentiate optical and Laser mouse
6. Write shortnote on impact printer
7. Write the characteristics of sixth generation.
8. Write the significant features of monitor.



## SECTION - D

### Explain in detail

1. Explain the basic components of a computer with a neat diagram.
2. Discuss the various generations of computers.
3. Explain the following
  - a. Inkjet Printer
  - b. Multimedia projector
  - c. Bar code / QR code Reader



- (1) Fundamentals of Computers – V. Rajaraman – PHI Publications
- (2) Computer Science text book – NCERT, New Delhi



- (1) [www.wikipedia.org](http://www.wikipedia.org)
- (2) <https://www.computerhope.com/jargon/c/computer.htm>



Prepare a comparative study of various computers of past and present with respect to speed, memory, size, power consumption and other features

<b>Computer</b>	It is an electronic device that processes the input according to the set of instructions provided to it and gives the desired output at a very fast rate.
<b>Vacuum tube</b>	Vacuum tubes contain electrodes for controlling electron flow and were used in early computers as a switch or an amplifier.
<b>Transistors</b>	The transistor ("transfer resistance") is made up of semiconductors. It is a component used to control the amount of current or voltage used for amplification/modulation of an electronic signal.
<b>Punched cards</b>	Punch cards also known as Hollerith cards are paper cards containing several punched or perforated holes that were punched by hand or machine to represent data.
<b>Machine Language</b>	Machine language is a collection of binary digits or bits that the computer reads and interprets.
<b>Assembly language</b>	An assembly language is a low-level programming language.

<b>Integrated Circuits</b>	The IC is a package containing many circuits, pathways, transistors, and other electronic components all working together to perform a particular function or a series of functions.
<b>Microcomputer</b>	Micro computer is used to describe a standard personal computer.
<b>High-level languages</b>	A high-level language is a computer programming language that isn't limited by the computer, designed for a specific job, and is easier to understand.
<b>Natural Language Processing (NLP)</b>	Natural Language Processing is a method used in artificial intelligence to process and derive meaning from the human language.
<b>Robotics</b>	Robot is a term coined by Karel Capek in the 1921 to play RUR (Rossum's Universal Robots). It is used to describe a computerized machine designed to respond to input received manually or from its surroundings.
<b>Nanotechnology</b>	Nanotechnology is an engineering, science, and technology that develops machines or works with one atom or one molecule that is 100 nanometers or smaller.
<b>Bioengineering</b>	A discipline that applies engineering principles of design and analysis to biological systems and biomedical technologies

### Learning Objectives

- To know how the computer interprets and stores data in the memory.
- To learn various data representations and binary arithmetic.
- To learn conversion between various Number Systems.

#### 2.1 Introduction

The term data comes from the word **datum**, which means a raw fact. The data is a fact about people, places or some objects.

#### Example:

Let ‘Name’, ‘Age’, ‘Class’, ‘Marks’ and ‘Subject’ be some defined variables. Now, let us assign a value to each of these variables.

Name	=	Rajesh
Age	=	16
Class	=	XI
Mark	=	65
Subject	=	Computer Science

Figure 2.1 Example for Data

In the above example, the values assigned to the five different variables are called **data**. When the above data is processed, we get an information “Rajesh is 16 years old, studying in Class XI, has scored 65 marks in Computer Science subject”.

### Number Systems

#### 2.2 Data Representations

Computer handles data in the form of ‘0’(Zero) and ‘1’ (One). Any kind of data like number, alphabet, special character should be converted to ‘0’ or ‘1’ which can be understood by the Computer. ‘0’ and ‘1’ that the Computer can understand is called **Machine language**. ‘0’ or ‘1’ are called ‘Binary Digits’(BIT). Therefore, the study of data representation in the computer is important.

- A **bit** is the short form of **Binary digit** which can be ‘0’ or ‘1’. It is the basic unit of data in computers.
- A **nibble** is a collection of 4 bits (Binary digits).
- A collection of 8 bits is called **Byte**. A byte is considered as the basic unit of measuring the memory size in the computer.
- **Word length** refers to the number of bits processed by a Computer’s CPU. For example, a word length can have 8 bits, 16 bits, 32 bits and 64 bits (Present day Computers use 32 bits or 64 bits)

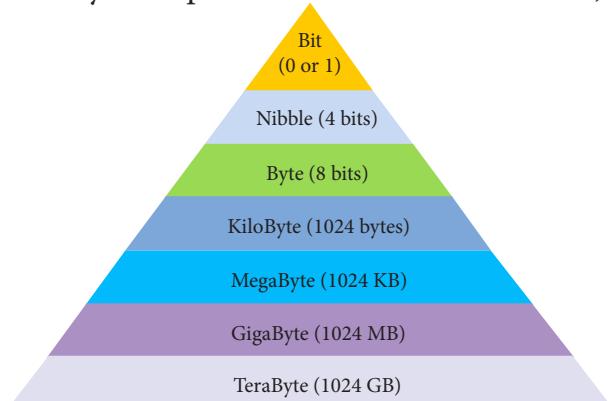


Figure 2.2 Data Representation

**Computer memory** (Main Memory and Secondary Storage) is normally represented in terms of KiloByte (KB) or MegaByte (MB). In decimal system, 1 Kilo

represents 1000, that is ,  $10^3$ . In binary system, 1 KiloByte represents 1024 bytes that is  $2^{10}$ . The following table represents the various memory sizes:

Table 2.1 Memory Size (Read  $2^{10}$  as 2 power 10)



Name	Abbr.	Size
Kilo	K	$2^{10} = 1,024$
Mega	M	$2^{20} = 1,048,576$
Giga	G	$2^{30} = 1,073,741,824$
Tera	T	$2^{40} = 1,099,511,627,776$
Peta	P	$2^{50} = 1,125,899,906,842,624$
Exa	E	$2^{60} = 1,152,921,504,606,846,976$
Zetta	Z	$2^{70} = 1,180,591,620,717,411,303,424$
Yotta	Y	$2^{80} = 1,208,925,819,614,629,174,706,173$

Bytes are used to represent characters in a text. Different types of coding schemes are used to represent the character set and numbers. The most commonly used coding scheme is the **American Standard Code for Information Interchange** (ASCII). Each binary value between 0 and 127 is used to represent a specific character. The ASCII value for (blank space) is 32 and the ASCII value of numeric 0 is 48. The range of ASCII values for lower case alphabets is from 97 to 122 and the range of ASCII values for the upper case alphabets is 65 to 90.



The speed of a computer depends on the number of bits it can process at once. For example, a 64-bit computer can process 64-bit numbers in one operation, while a 32-bit computer break 64-bit numbers down into smaller pieces, making it slower.

### 2.3 Different Types of Number Systems

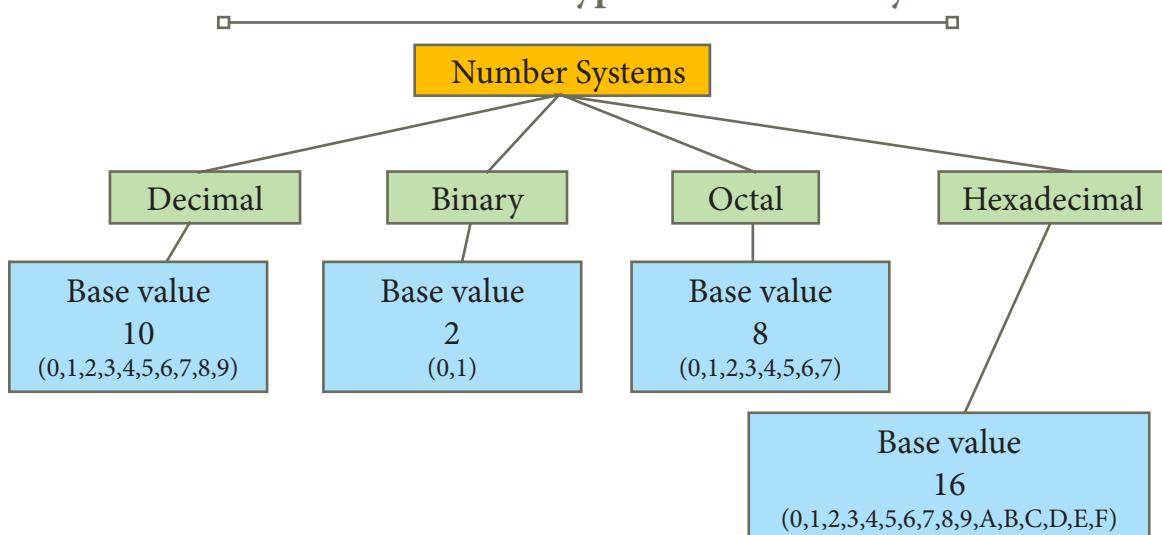


Figure 2.3. Number Systems

A numbering system is a way of representing numbers. The most commonly used numbering system in real life is Decimal number system. Other number systems are Binary, Octal, Hexadecimal number system. Each number system is uniquely identified by its **base value or radix**. Radix or base is the count of number of digits in each number system. Radix or base is the general idea behind positional numbering system.

### 2.3.1 Decimal Number System

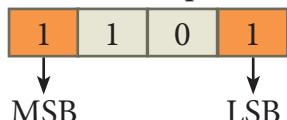
It consists of 0,1,2,3,4,5,6,7,8,9(10 digits). It is the oldest and most popular number system used in our day to day life. In the positional number system, each decimal digit is weighed relative to its position in the number. This means that each digit in the number is multiplied by 10 raised to a power corresponding to that digit's position.

#### Example

$$\begin{aligned}(123)_{10} &= 1 \times 10^2 + 2 \times 10^1 + 3 \times 10^0 \\ &= 100 + 20 + 3 \\ &= (123)_{10}\end{aligned}$$

### 2.3.2 Binary Number System

There are only two digits in the Binary system, namely, 0 and 1. The numbers in the binary system are represented to the base 2 and the positional multipliers are the powers of 2. The left most bit in the binary number is called as the **Most Significant Bit (MSB)** and it has the largest positional weight. The right most bit is the **Least Significant Bit (LSB)** and has the smallest positional weight.



#### Example

The binary sequence  $(1101)_2$  has the decimal equivalent:

$$\begin{aligned}(1101)_2 &= 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 \\ &= 8 + 4 + 0 + 1 \\ &= (13)_{10}\end{aligned}$$

### 2.3.3 Octal Number System

Octal number system uses digits 0,1,2,3,4,5,6 and 7 (8 digits). Each octal digit has its own positional value or weight as a power of 8.

#### Example

The Octal sequence  $(547)_8$  has the decimal equivalent:

$$\begin{aligned}(547)_8 &= 5 \times 8^2 + 4 \times 8^1 + 7 \times 8^0 \\ &= 5 \times 64 + 4 \times 8 + 7 \times 1 \\ &= 320 + 32 + 7 \\ &= (359)_{10}\end{aligned}$$

### 2.3.4 Hexadecimal Number System

A hexadecimal number is represented using base 16. Hexadecimal or Hex numbers are used as a shorthand form of binary sequence. This system is used to represent data in a more compact manner. Since 16 symbols are used, 0 to F, the notation is called hexadecimal. The first 10 symbols are the same as in the decimal system, 0 to 9 and the remaining 6 symbols are taken from the first 6 letters of the alphabet sequence, A to F, where A represents 10, B is 11, C is 12, D is 13, E is 14 and F is 15.

Table 2.2 Binary, Octal, Hexadecimal equivalent of Decimal Numbers

Decimal	Binary	Octal	Hexadecimal
0	0000	000	0000
1	0001	001	0001
2	0010	002	0002
3	0011	003	0003
4	0100	004	0004
5	0101	005	0005
6	0110	006	0006
7	0111	007	0007
8	1000	010	0008
9	1001	011	0009
10	1010	012	A
11	1011	013	B
12	1100	014	C
13	1101	015	D
14	1110	016	E
15	1111	017	F

### Example

The hexadecimal sequence  $(25)_{16}$  has the decimal equivalent:

$$\begin{aligned}(25)_{16} &= 2 \times 16^1 + 5 \times 16^0 \\ &= 32 + 5 \\ &= (37)_{10}\end{aligned}$$

### Workshop

1. Identify the number system for the following numbers

S. No.	Number	Number system
1	$(1010)_{10}$	Decimal Number system
2	$(1010)_2$	
3	$(989)_{16}$	
4	$(750)_8$	
5	$(926)_{10}$	

2. State whether the following numbers are valid or not. If invalid, give reason.

S.No.	Statement	Yes / No	Reason (If invalid)
1.	786 is an Octal number		
2.	101 is a Binary number		
3.	Radix of Octal number is 7		

## 2.4 Number System Conversions

### 2.4.1 Decimal to Binary Conversion

Generally two methods followed.

**Method 1:** To convert Decimal to Binary “Repeated Division by 2” method can be used. Any Decimal number divided by 2 will leave a remainder of 0 or 1. Repeated division by 2 will leave a sequence of 0s and 1s that become the binary equivalent of the decimal number. Suppose it is required to convert the decimal number N into binary form, dividing N by 2 in the

decimal system, we will obtain a quotient N1 and a remainder R1, where R1 can have a value of either 0 or 1. The process is repeated until the quotient becomes 0 or 1. When the quotient is ‘0’ or ‘1’, it is the final remainder value. Write the final answer starting from final remainder value obtained to the first remainder value obtained.

### Example

Convert  $(65)_{10}$  into its equivalent binary number

2	65		Remainder
2	32 - 1	LSB	
2	16 - 0		Note :
2	8 - 0		$65/2 = 32 + 1$
2	4 - 0		$32/2 = 16 + 0$
2	2 - 0		$16/2 = 8 + 0$
2	1 - 0	MSB	$8/2 = 4 + 0$
			$4/2 = 2 + 0$
			$2/2 = 1 + 0$

$$(65)_{10} = (1\ 0\ 0\ 0\ 0\ 0\ 1)_2$$

### Method 2 : Sum of Powers of 2.

A decimal number can be converted into a binary number by adding up the powers of 2 and then adding bits as needed to obtain the total value of the number.

- a) Find the largest power of 2 that is smaller than or equal to 65.

$$65_{10} > 64_{10}$$

- b) Set the 64's bit to 1 and subtract 64 from the original number

$$65 - 64 = 1$$

- c) 32 is greater than the remaining total.  
Therefore, set the 32's bit to 0.
- d) 16 is greater than the remaining total.  
Therefore, set the 16's bit to 0.
- e) 8 is greater than the remaining total.  
Therefore, set the 8's bit to 0.
- f) 4 is greater than the remaining total.  
Therefore, set the 4's bit to 0.
- g) 2 is greater than the remaining total.  
Therefore, set the 2's bit to 0.
- h) As the remaining value is equivalent to 1's bit, set it to 1.

$$1 - 1 = 0$$

Conversion is complete       $65_{10} = (1000001)_2$

### Example

The conversion steps can be given as follows:

Given Number : 65

Equivalent or value less than power of 2 is : 64

$$(1) \ 65 - 64 = 1$$

$$(2) \ 1 - 1 = 0$$

Power's of 2	64	32	16	8	4	2	1
Binary Number	1	0	0	0	0	0	1

$$65_{10} = (1000001)_2$$

### 2.4.2 Decimal to Octal Conversion

To convert Decimal to Octal, “**Repeated Division by 8**” method can be used. The method is the same we have learnt in 2.4.1, but in this method, we have to divide the given number by 8.

#### Example

Convert  $(65)_{10}$  into its equivalent Octal number

8	65		LSB
8	8 - 1		
	1 - 0	MSB	

$$(65)_{10} = (101)_8$$

### 2.4.3 Decimal to Hexadecimal Conversion

To convert Decimal to Hexadecimal, “**Repeated division by 16**” method can be used. The method is the same as we have learnt in 2.4.1, but in this method, we have to divide the given number by 16.

#### Example

Convert  $(31)_{10}$  into its equivalent hexadecimal number.

16	31		LSB
	1 - 15	MSB	

$$(16)_{10} = (1F)_{16} (\text{Refer Table 2.2 } F=15)$$

#### 2.4.4 Conversion of fractional Decimal to Binary

The method of **repeated multiplication by 2** has to be used to convert such kind of decimal fractions.

The steps involved in the method of **repeated multiplication by 2**:

- Step 1: Multiply the decimal fraction by 2 and note the integer part. The integer part is either 0 or 1.
- Step 2: Discard the integer part of the previous product. Multiply the fractional part of the previous product by 2. Repeat Step 1 until the same fraction repeats or terminates (0).
- Step 3: The resulting integer part forms a sequence of 0s and 1s that become the binary equivalent of decimal fraction.
- Step 4: The final answer is to be written from first integer part obtained till the last integer part obtained.

Integer part	
$0.2 \times 2 = 0.4$	0 (first integer part obtained)
$0.4 \times 2 = 0.8$	0
$0.8 \times 2 = 1.6$	1
$0.6 \times 2 = 1.2$	1
$0.2 \times 2 = 0.4$	0 (last integer part obtained)

**Note:** Fraction repeats, the product is the same as in the first step.

Write the integer parts from top to bottom to obtain the equivalent fractional binary number. Hence  $(0.2)_{10} = (0.00110011\dots)_2 = (0.00110011)_2$

#### Workshop

3. Convert the following Decimal numbers to its equivalent Binary, Octal, Hexadecimal.

- 1) 1920      2) 255      3) 126

#### 2.4.5 Binary to Decimal Conversion

To convert Binary to Decimal we can use positional notation method.

- Step 1: Write down the Binary digits and list the powers of 2 from right to left(Positional Notation)
- Step 2: For each positional notation written for the digit, now write the equivalent weight.
- Step 3: Multiply each digit with its corresponding weight
- Step 4: Add all the values.

Table 2.3 Positional Notation and Weight

Positional Notation	Weight	Positional Notation	Weight
$2^0$	1	$2^6$	64
$2^1$	2	$2^7$	128
$2^2$	4	$2^8$	256
$2^3$	8	$2^9$	512
$2^4$	16	$2^{10}$	1024
$2^5$	32		

#### Example

Convert  $(111011)_2$  into its equivalent decimal number.

Weight	32	16	8	4	2	1
Positional Notation	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
Given number	1	1	1	0	1	1

$$\begin{array}{rcl} 32+16+8+0+2+1 & = (59)_{10} \\ (111011)_2 & = (59)_{10} \end{array}$$

#### 2.4.6 Binary to Octal Conversion

- Step 1: Group the given binary number into 3 bits from right to left.
- Step 2: You can add preceding 0 to make a group of 3 bits if the left most group has less than 3 bits.
- Step 3: Convert equivalent octal value using "2's power positional weight method"

*Table 2.4 Octal numbers and their Binary equivalent*

Octal	Binary Equivalent
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

#### Example

Convert  $(11010110)_2$  into octal equivalent number

- Step 1: Group the given number into 3 bits from right to left.

$011\ 010\ 110$

Note: The left most groups have less than 3 bits, so 0 is added to its left to make a group of 3 bits.

- Step-2: Find Octal equivalent of each group

$$\begin{array}{rcl} 011 & 010 & 110 \\ \underbrace{\quad}_{3} & \underbrace{\quad}_{2} & \underbrace{\quad}_{6} \\ (11010110)_2 & = (326)_8 \end{array}$$

#### 2.4.7. Binary to Hexadecimal Conversion

Step 1: Group the given number into 4 bits from right to left.

Step 2: You can add preceding 0's to make a group of 4 bits if the left most group has less than 4 bits.

Step 3: Convert equivalent Hexadecimal value using "2's power positional weight method"

#### Example

Convert  $(1111010110)_2$  into Hexadecimal number

- Step 1: Group the given number into 4 bits from right to left.

$0011\ 1101\ 0110$

**Note:** 0's are added to the left most group to make it a group of 4 bits

$$\begin{array}{rcl} 0011 & 1101 & 0110 \\ \underbrace{\quad}_{3} & \underbrace{\quad}_{D} & \underbrace{\quad}_{6} \\ (1111010110)_2 & = (3D6)_{16} \end{array}$$

#### 2.4.8 Conversion of fractional Binary to Decimal equivalent

Follow the steps to convert fractional Binary number to its Decimal equivalent.

- Step 1: Convert integral part of Binary to Decimal equivalent using positional notation method (Procedure is same as discussed in 2.4.5)

- Step 2: To convert the fractional part of binary to its decimal equivalent.

Step 2.1: Write down the Binary digits in the fractional part

Step 2.2: For all the digits write powers of 2 from left to right starting from  $2^{-1}, 2^{-2}, 2^{-3}, \dots, 2^{-n}$ , now write the equivalent weight.

Step 2.3: Multiply each digit with its corresponding weight

Step 2.4: Add all the values which you obtained in Step 2.3

*Table 2.5 Positional notation and weight*

Positional notation	Weight
$2^{-1}$ (1/2)	0.5
$2^{-2}$ (1/4)	0.25
$2^{-3}$ (1/8)	0.125
$2^{-4}$ (1/16)	0.0625
$2^{-5}$ (1/32)	0.03125
$2^{-6}$ (1/64)	0.015625
$2^{-7}$ (1/128)	0.0078125

Step 3: To get final answer write the integral part (after conversion), followed by a decimal point(.) and the answer arrived at Step 2.4

#### Example

Convert the given Binary number  $(11.011)_2$  into its decimal equivalent  
Integer part  $(11)_2 = 3$  (Refer **table 2.2**)

$2^1$	$2^0$	$2^{-1}$	$2^{-2}$	$2^{-3}$
↑	↑	↑	↑	↑
1	1	.	0	1

$$3 + .(0 \times 0.5 + 1 \times 0.25 + 1 \times 0.125) = 3.375$$

$$(11.011)_2 = (3.375)_{10}$$

#### Workshop

4. Convert the given Binary number into its equivalent Decimal, Octal and Hexadecimal number.

- 1) 101110101 2) 1011010 3) 101011111

#### 2.4.9. Octal to Decimal Conversion

To convert Octal to Decimal, we can use positional notation method.

1. Write down the Octal digits and list the powers of 8 from right to left(Positional Notation)

2. For each positional notation of the digit write the equivalent weight.
3. Multiply each digit with its corresponding weight
4. Add all the values

#### Example

Convert  $(1265)_8$  to equivalent Decimal number

Weight	512	64	8	1
Positional Notation	$8^3$	$8^2$	$8^1$	$8^0$
Given number	1	2	6	5

$$(1265)_8 = 512 \times 1 + 64 \times 2 + 8 \times 6 + 1 \times 5 \\ = 512 + 128 + 48 + 5 \\ (1265)_8 = (693)_{10}$$

#### 2.4.10 Octal to Binary Conversion

For each Octal digit in the given number write its 3 digits binary equivalent using positional notation.

#### Example

Convert  $(6213)_8$  to equivalent Binary number

6	2	1	3
↓	↓	↓	↓
110	010	001	011

$$(6213)_8 = (110010001011)_2$$

#### Workshop

5. Convert the following Octal numbers into Binary numbers.

- (A) 472      (B) 145      (C) 347  
(D) 6247      (E) 645

## 2.4.11 Hexadecimal to Decimal Conversion

To convert Hexadecimal to Decimal we can use positional notation method.

1. Write down the Hexadecimal digits and list the powers of 16 from right to left(Positional Notation)
2. For each positional notation written for the digit, now write the equivalent weight.
3. Multiply each digit with its corresponding weight
4. Add all the values to get one final value.

### Example

Convert  $(25F)_{16}$  into its equivalent Decimal number.

Weight	256	16	1
Positional Notation	$16^2$	$16^1$	$16^0$
Given number	2	5	F(15)

$$\begin{aligned}(25F)_{16} &= 2 \times 256 + 5 \times 16 + 15 \times 1 \\ &= 512 + 80 + 15 \\ (25F)_{16} &= (607)_{10}\end{aligned}$$

## 2.4.12 Hexadecimal to Binary Conversion

Write 4 bits Binary equivalent for each Hexadecimal digit for the given number using positional notation method.

### Example

Convert  $(8BC)_{16}$  into equivalent Binary number

8	B	C
↓	↓	↓
1000	1011	1100

$$(8BC)_{16} = (100010111100)_2$$

## Workshop

6. Convert the following Hexadecimal numbers to Binary numbers  
 (A) A6      (B) BE  
 (C) 9BC8      (D) BC9

## 2.5 Binary Representation for Signed Numbers

Computers can handle both positive (unsigned) and negative (signed) numbers. The simplest method to represent negative binary numbers is called **Signed Magnitude**. In signed magnitude method, the left most bit is Most Significant Bit (MSB), is called **sign bit or parity bit**.

The numbers are represented in computers in different ways:

- Signed Magnitude representation
- 1's Complement
- 2's Complement

### 2.5.1 Signed Magnitude representation

The value of the whole numbers can be determined by the sign used before it. If the number has '+' sign or no sign it will be considered as positive. If the number has '-' sign it will be considered as negative.

### Example:

+43 or 43 is a positive number

-43 is a negative number

In signed binary representation, the left most bit is considered as sign bit. If this bit is 0, it is a positive number and if it 1, it is a negative number. Therefore a signed binary number has 8 bits, only 7 bits used for storing values (magnitude) and the 1 bit is used for sign.

+43 is represented in memory as follows:

Sign bit	Magnitude (Value)						
0							
Least Significant Bit (LSB)							

Most Significant Bit (MSB)  
(‘0’ represent that the number is positive)

-43 can be represented in memory as follows.

Sign bit	Magnitude (Value)						
1							
Least Significant Bit (LSB)							

Most Significant Bit (MSB)  
(‘1’ represent that the number is negative)

### 2.5.2 1's Complement representation

This is an easier approach to represent signed numbers. This is for negative numbers only i.e. the number whose MSB is 1.

The steps to be followed to find 1's complement of a number:

- Step 1: Convert given Decimal number into Binary
- Step 2: Check if the binary number contains 8 bits , if less add 0 at the left most bit, to make it as 8 bits.
- Step 3: Invert all bits (i.e. Change 1 as 0 and 0 as 1)

### Example

Find 1's complement for  $(-24)_{10}$

Given Number	Binary Number	1's Compliment
$(-24)_{10}$	00011000	11100111

### 2.5.3 2's Complement representation

The 2's-complement method for negative number is as follows:

- Invert all the bits in the binary sequence (i.e., change every 0 to 1 and every 1 to 0 ie.,1's complement)

- Add 1 to the result to the Least Significant Bit (LSB).

### Example

2's Complement represent of  $(-24)_{10}$

Binary equivalent of +24:	11000
8bit format:	00011000
1's complement:	11100111
Add 1 to LSB:	+1
<b>2's complement of -24:</b>	<b>11101000</b>



7. Write the 1's complement number and 2's complement number for the following decimal numbers:

- (A) 22 (B) -13 (C) -65 (D) -46

## 2.6 Binary Arithmetic

As decimal numbers, the binary numbers also permit computations like addition, subtraction, multiplication and division. The following session deals only with binary addition and subtraction.

### 2.6.1 Binary Addition

The following table is useful when adding two binary numbers.

A	B	SUM (A + B)	Carry
0	0	0	-
0	1	1	-
1	0	1	-
1	1	0	1

In  $1 + 1 = 10$ , is considered as sum 0 and the 1 as carry bit. This carry bit is added with the previous position of the bit pattern.

**Example** Add:  $1011_2 + 1001_2$

(Carry Bit)→

$$\begin{array}{r}
 & 1 & 1 \\
 1 & 0 & 1 & 1 \\
 + & 1 & 0 & 0 & 1 \\
 \hline
 1 & 0 & 1 & 0 & 0
 \end{array}$$

$1011_2 + 1001_2 = 10100_2$

**Example** Perform Binary addition for the following:  $23_{10} + 12_{10}$

Step 1: Convert 23 and 12 into binary form

$23_{10}$					
2's power	16	8	4	2	1
Binary Number	1	0	1	1	1
$23_{10} = 00010111_2$					

$12_{10}$					
2's power	8	4	2	1	
Binary Number	1	1	0	0	
$12_{10} = 00001100_2$					

Step 2: Binary addition of 23 and 12:

Carry Bit →	1	1	1			
$23_{10} = 0$	0	0	1	0	1	1
$12_{10} = 0$	0	0	0	1	1	0
$35_{10} = 0$	0	1	0	0	0	1

## 2.6.2 Binary Subtraction

The table for Binary Subtraction is as follows:

A	B	Difference (A-B)	Borrow
0	0	0	0
1	0	1	0
1	1	0	0
0	1	1	1

When subtracting 1 from 0, borrow 1 from the next Most Significant Bit, when borrowing from the next Most Significant Bit, if it is 1, replace it with 0. If the next Most

Significant Bit is 0, you must borrow from a more significant bit that contains 1 and replace it with 0 and 0s upto that point become 1s.

**Example** Subtract  $1001010_2 - 10100_2$

$$\begin{array}{r}
 & 1 & 0 & 1 & 0 & 1 & 0 \\
 1 & 0 & 0 & 1 & 0 & 1 & 0 \\
 (-) & 1 & 0 & 1 & 0 & 0 & 0 \\
 \hline
 1 & 1 & 0 & 1 & 1 & 0 & 0
 \end{array}$$

**Example** Perform binary addition for the following:  $(-21)_{10} + (5)_{10}$

Step 1: Change -21 and 5 into binary form

$21_{10}$					
2's power	16	8	4	2	1
Binary Number	1	0	1	0	1
$21_{10} = 00010101_2$					

$5_{10}$					
2's power	4	2	1		
Binary Number	1	0	1		
$5_{10} = 00000101_2$					

Step 2:

$21_{10}$	0	0	0	1	0	1	0	1
1's Compliment	1	1	1	0	1	0	1	0
2's Compliment	1	1	1	0	1	0	1	1

Step 3:

Binary Addition of -21 and 5 :

Carry bit				1	1	1	1	
$-21_{10}$	1	1	1	0	1	0	1	1
$5_{10}$	0	0	0	0	0	1	0	1
$-16_{10}$ (Result)	1	1	1	1	0	0	0	0



8. Perform the following binary computations:

- (A)  $10_{10} + 15_{10}$       (B)  $-12_{10} + 5_{10}$   
 (C)  $14_{10} - 12_{10}$       (D)  $(-2_{10}) - (-6_{10})$

## 2.7 Representing Characters in Memory

As represented in introduction, all the input data given to the computer should be in understandable format. In general, 26 uppercase letters, 26 lowercase letters, 0 to 9 digits and special characters are used in a computer, which is called character set. All these character set are denoted through numbers only. All Characters in the character set needs a common encoding system. There are several encoding systems used for computer. They are

- BCD – Binary Coded Decimal
- EBCDIC – Extended Binary Coded Decimal Interchange Code
- ASCII – American Standard Code for Information Interchange
- Unicode
- ISCII - Indian Standard Code for Information Interchange

### 2.7.1 Binary Coded Decimal (BCD)

This encoding system is not in the practice right now. This is  $2^6$  bit encoding system. This can handle  $2^6 = 64$  characters only.

### 2.7.2 American Standard Code for Information Interchange (ASCII)

This is the most popular encoding system recognized by United States. Most of the computers use this system. Remember this encoding system can handle English characters only. This can handle  $2^7$  bit which means 128 characters.

In this system, each character has individual number (Refer Appendix).

The new edition (version) ASCII -8, has  $2^8$  bits and can handle 256 characters are represented from 0 to 255 unique numbers.

The ASCII code equivalent to the uppercase letter 'A' is 65. The binary representation of ASCII (7 bit) value is 1000001. Also 01000001 in ASCII-8 bit.

### 2.7.3 Extended Binary Coded Decimal Interchange Code (EBCDIC)

This is similar to ASCII Code with 8 bit representation. This coding system is formulated by International Business Machine(IBM). The coding system can handle 256 characters. The input code in ASCII can be converted to EBCDIC system and vice - versa.

### 2.7.4 Indian Standard Code for Information Interchange (ISCII)

ISCII is the system of handling the character of Indian local languages. This as a 8-bit coding system. Therefore it can handle 256 ( $2^8$ ) characters. This system is formulated by the department of Electronics in India in the year 1986-88 and recognized by Bureau of Indian Standards (BIS). Now this coding system is integrated with Unicode.

### 2.7.5 Unicode

This coding system is used in most of the modern computers. The popular coding scheme after ASCII is Unicode. ASCII can represent only 256 characters. Therefore English and European Languages alone can be handled by ASCII. Particularly there was a situation, when the languages like Tamil, Malayalam, Kannada and Telugu could not be represented by ASCII. Hence, the Unicode was generated to handle all the coding system of Universal languages. This is 16 bit code and can handle 65536 characters.

Unicode scheme is denoted by hexadecimal numbers. The Unicode table of Tamil, Malayalam, Telugu and Kannada is shown in Table 2.6

Table 2.6

Unicode Table of Tamil									Unicode Table of Malayalam								
	0B8	0B9	0BA	0BB	0BC	0BD	0BE	0BF		0D0	0D1	0D2	0D3	0D4	0D5	0D6	0D7
0		ஃ 0B90		ஃ 0BB0	ஃ 0BC0	ஃ 0BD0	ஃ 0BE0	ஃ 0BF0	0	ଓ 0D00	ୟ 0D10	ଓ 0D20	ଓ 0D30	ଓ 0D40	ଓ 0D60	ଓ 0D70	ଓ 0D70
1				ஃ 0BB1	ஃ 0BC1				1	ଓ 0D01		ଓ 0D21	ଓ 0D31	ଓ 0D41		ଓ 0D61	ଓ 0D71
2	ଓ 0B82	ଓ 0B92		ஃ 0BB2	ஃ 0BC2				2	ଓ 0D02	ଓ 0D12	ଓ 0D22	ଓ 0D32	ଓ 0D42		ଓ 0D62	ଓ 0D72
3	ଓ 0B83	ଓ 0B93	ଣ 0BA3	ଣ 0BB3					3	ଓ 0D03	ଓ 0D13	ଓ 0D23	ଓ 0D33	ଓ 0D43		ଓ 0D63	ଓ 0D73
4		ଓ 0B94	ଓ 0BA4	ଓ 0BB4					4		ଓ 0D14	ଓ 0D24	ଓ 0D34	ଓ 0D44	ଓ 0D54		ଓ 0D74
5	ଓ 0B85	ଓ 0B95		ଓ 0BB5					5	ଓ 0D05	ଓ 0D15	ଓ 0D25	ଓ 0D35		ଓ 0D55		ଓ 0D75
6	ଓ 0B86			ଓ 0BB6	ଓ 0BC6		ଓ 0BE6	ଓ 0BF6	6	ଓ 0D06	ଓ 0D16	ଓ 0D26	ଓ 0D36	ଓ 0D46	ଓ 0D56	ଓ 0D66	ଓ 0D76
7	ଓ 0B87			ଓ 0BB7	ଓ 0BC7	ଓ 0BD7	ଓ 0BE7	ଓ 0BF7	7	ଓ 0D07	ଓ 0D17	ଓ 0D27	ଓ 0D37	ଓ 0D47	ଓ 0D57	ଓ 0D67	ଓ 0D77
8	ଓ 0B88		ଓ 0BA8	ଓ 0BB8	ଓ 0BC8		ଓ 0BE8	ଓ 0BF8	8	ଓ 0D08	ଓ 0D18	ଓ 0D28	ଓ 0D38	ଓ 0D48	ଓ 0D58	ଓ 0D68	ଓ 0D78
9	ଓ 0B89	ଓ 0B99	ନ 0BA9	ନ 0BB9			ଓ 0BE9	ଓ 0BF9	9	ଓ 0D09	ଓ 0D19	ଓ 0D29	ଓ 0D39		ଓ 0D59	ଓ 0D69	ଓ 0D79
A	ଓ 0B8A	ଓ 0B9A	ଓ 0BAA		ଓ 0BCA		ଓ 0BEA	ଓ 0BFA	A	ଓ 0D0A	ଓ 0D1A	ଓ 0D2A	ଓ 0D3A	ଓ 0D4A	ଓ 0D5A	ଓ 0D6A	ଓ 0D7A
B					ଓ 0BCB		ଓ 0BE8		B	ଓ 0D0B	ଓ 0D1B	ଓ 0D2B	ଓ 0D3B	ଓ 0D4B	ଓ 0D5B	ଓ 0D6B	ଓ 0D7B
C		ଓ 0B9C			ଓ 0BCC		ଓ 0BEC		C	ଓ 0D0C	ଓ 0D1C	ଓ 0D2C	ଓ 0D3C	ଓ 0D4C	ଓ 0D5C	ଓ 0D6C	ଓ 0D7C
D					ଓ 0BCD		ଓ 0BED		D		ଓ 0D1D	ଓ 0D2D	ଓ 0D3D	ଓ 0D4D	ଓ 0D5D	ଓ 0D6D	ଓ 0D7D
E	ଓ 0B8E	ଓ 0B9E	ଓ 0BAE	ଓ 0BBE			ଓ 0BEE		E	ଓ 0D0E	ଓ 0D1E	ଓ 0D2E	ଓ 0D3E	ଓ 0D4E	ଓ 0D5E	ଓ 0D6E	ଓ 0D7E
F	ଓ 0B8F	ଓ 0B9F	ଓ 0BAF	ଓ 0BBF			ଓ 0BEF		F	ଓ 0D0F	ଓ 0D1F	ଓ 0D2F	ଓ 0D3F	ଓ 0D4F	ଓ 0D5F	ଓ 0D6F	ଓ 0D7F

Table 2.6

Unicode Table of Telugu									Unicode Table of Kannada								
	0C0	0C1	0C2	0C3	0C4	0C5	0C6	0C7		0C8	0C9	0CA	0CB	0CC	0CD	0CE	0CF
0	ఁ	ః	ర	ర	ి		మూ		0	ಂ	ಃ	ರ	ರ	ಿಂ		ಮೂ	
1	ఁఁ		డ	ಅ	ಂ		ಂ		1	ಂ		ಡ	ಅ	ಂ	ಂ	ಂ	ಂ
2	ఁఁ	ః	ఁ	ల	ఁ		ఁ		2	ಂ	ಃ	ಡ	ಲ	ಂ	ಂ	ಂ	ಂ
3	ఁఁ	ఁ	ఁ	ఁ	ఁ		ఁ		3	ಂ	ಁ	ಁ	ಁ	ಂ	ಂ	ಂ	ಂ
4		ಂ	ತ	ಅ	ಂ				4	ಂ	ತ			ಂ			
5	ಅ	ರ	ఁ	వ		ಂ			5	ಅ	ರ	ಁ	ವ		ಂ		
6	ಅ	ಖ	ದ	ಷ	ಂ	ಂ	ಂ		6	ಅ	ಖ	ದ	ಷ	ಂ	ಂ	ಂ	
7	ಂ	ಗ	ಁ	ಷ	ಂ	ಂ	ಂ		7	ಂ	ಗ	ಁ	ಷ	ಂ	ಂ	ಂ	
8	ಂ	ಫ	ನ	ನ	ಂ	ಂ	ಂ		8	ಂ	ಫ	ನ	ನ	ಂ	ಂ	ಂ	
9	ಂ	ಜ		ಂ					9	ಂ	ಜ		ಂ		ಂ		
A	ಂ	ಚ	ಪ		ಂ	ಂ	ಂ		A	ಂ	ಚ	ಪ		ಂ		ಂ	
B	ಂ	ಫ	ಷ		ಂ	ಂ	ಂ		B	ಂ	ಫ	ಷ		ಂ		ಂ	
C	ಂ	ಜ	ಬ		ಂ	ಂ	ಂ		C	ಂ	ಜ	ಬ		ಂ		ಂ	
D		ರು	ಭ	ಸ	ಂ		ಸ	ಸ	D	ರು	ಭ	ಸ	ಸ	ಂ	ಸ	ಸ	
E	ಎ	ಇ	ಮ	ಂ	ಂ		ಂ	ಂ	E	ಎ	ಇ	ಮ	ಂ	ಂ	ಂ	ಂ	
F	ಎ	ಉ	ಯ	ಂ			ಂ	ಂ	F	ಎ	ಉ	ಯ	ಂ		ಂ	ಂ	

**Appendix**  
 American Standard Code for Information Interchange (ASCII)  
 (Few specific characters only)

### Alphabets

Alphabets	Decimal number	Binary number (8 bit)	Octal number	Hexadecimal number
A	65	01000001	101	41
B	66	01000010	102	42
C	67	01000011	103	43
D	68	01000100	104	44
E	69	01000101	105	45
F	70	01000110	106	46
G	71	01000111	107	47
H	72	01001000	110	48
I	73	01001001	111	49
J	74	01001010	112	4A
K	75	01001011	113	4B
L	76	01001100	114	4C
M	77	01001101	115	4D
N	78	01001110	116	4E
O	79	01001111	117	4F
P	80	01010000	120	50
Q	81	01010001	121	51
R	82	01010010	122	52
S	83	01010011	123	53
T	84	01010100	124	54
U	85	01010101	125	55
V	86	01010110	126	56
W	87	01010111	127	57
X	88	01011000	130	58
Y	89	01011001	131	59
Z	90	01011010	132	5A
a	97	01100001	141	61
b	98	01100010	142	62
c	99	01100011	143	63
d	100	01100100	144	64
e	101	01100101	145	65

f	102	01100110	146	66
g	103	01100111	147	67
h	104	01101000	150	68
i	105	01101001	151	69
j	106	01101010	152	6A
k	107	01101011	153	6B
l	108	01101100	154	6C
m	109	01101101	155	6D
n	110	01101110	156	6E
o	111	01101111	157	6F
p	112	01110000	160	70
q	113	01110001	161	71
r	114	01110010	162	72
s	115	01110011	163	73
t	116	01110100	164	74
u	117	01110101	165	75
v	118	01110110	166	76
w	119	01110111	167	77
x	120	01111000	170	78
y	121	01111001	171	79
z	122	01111010	172	7A

## Numerals

Alphabets	Decimal number	Binary number (8 bit)	Octal number	Hexadecimal number
0	48	00110000	60	30
1	49	00110001	61	31
2	50	00110010	62	32
3	51	00110011	63	33
4	52	00110100	64	34
5	53	00110101	65	35
6	54	00110110	66	36
7	55	00110111	67	37
8	56	00111000	70	38
9	57	00111001	71	39

## Special Characters

Special symbols	Decimal number	Binary number (8 bit)	Octal number	Hexadecimal number
Blank	32	00100000	40	20
!	33	00100001	41	21
"	34	00100010	42	22
#	35	00100011	43	23
\$	36	00100100	44	24
%	37	00100101	45	25
&	38	00100110	46	26
'	39	00100111	47	27
(	40	00101000	50	28
)	41	00101001	51	29
*	42	00101010	52	2A
+	43	00101011	53	2B
,	44	00101100	54	2C
-	45	00101101	55	2D
.	46	00101110	56	2E
/	47	00101111	57	2F
:	58	00111010	72	3A
;	59	00111011	73	3B
<	60	00111100	74	3C
=	61	00111101	75	3D
>	62	00111110	76	3E
?	63	00111111	77	3F
@	64	01000000	100	40
[	91	01011011	133	5B
\	92	01011100	134	5C
]	93	01011101	135	5D
^	94	01011110	136	5E
_	95	01011111	137	5F
`	96	01100000	140	60
{	123	01111011	173	7B
	124	01111100	174	7C
}	125	01111101	175	7D
~	126	01111110	176	7E

## Evaluation



### Part I

#### I Choose the best answer

1. Which refers to the number of bits processed by a computer's CPU?  
A) Byte              B) Nibble              C) Word length      D) Bit
2. How many bytes does 1 KiloByte contain?  
A) 1000              B) 8              C) 4              D) 1024
3. Expansion for ASCII  
A) American School Code for Information Interchange  
B) American Standard Code for Information Interchange  
C) All Standard Code for Information Interchange  
D) American Society Code for Information Interchange
4.  $2^{50}$  is referred as  
A) Kilo              B) Tera              C) Peta              D) Zetta
5. How many characters can be handled in Binary Coded Decimal System?  
A) 64              B) 255              C) 256              D) 128
6. For  $1101_2$ , the equivalent Hexadecimal equivalent is?  
A) F              B) E              C) D              D) B
7. What is the 1's complement of 00100110?  
A) 00100110      B) 11011001      C) 11010001      D) 00101001
8. Which amongst this is not an Octal number?  
A) 645              B) 234              C) 876              D) 123

#### II Very Short Answers

1. What is data?
2. Write the 1's complement procedure.
3. Convert  $(46)_{10}$  into Binary number
4. We cannot find 1's complement for  $(28)_{10}$ . State reason.
5. List the encoding systems that represents characters in memory.

#### III Short Answers

1. What is radix of a number system? Give example
2. Write note on binary number system.
3. Convert  $(150)_{10}$  into Binary, then convert that Binary number to Octal
4. Write short note on ISCII
5. Add    a)  $-22_{10} + 15_{10}$               b)  $20_{10} + 25_{10}$

#### IV Detail Answers

1. a) Write the procedure to convert fractional Decimal to Binary  
b) Convert  $(98.46)_{10}$  to Binary
2. Find 1's Complement and 2's Complement for the following Decimal number  
a) -98      b) -135
3. a) Add  $1101010_2 + 101101_2$   
b) Subtract  $1101011_2 - 111010_2$

## Computer Organisation

### Learning Objectives

- To know the organisation of the computer components and their interconnections.
- To know the processors and their characteristics.
- To know the importance of memory devices and their roles in a computer.
- To explore RAM, ROM and differentiate each of them.
- To know about cache memory and how it improves the performance of a computer
- To know the secondary devices and their usage
- To know about the ports and interfaces so that external devices can be connected



#### 3.1 Introduction

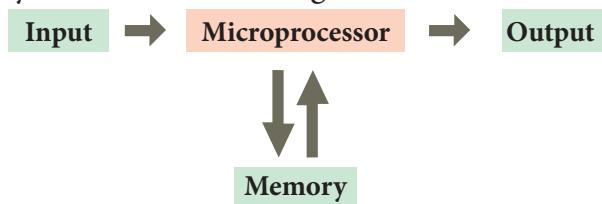
Computer organisation deals with the hardware components of a computer system. It includes Input / Output devices, the Central Processing Unit, storage devices and primary memory. It is concerned with how the various components of computer hardware operate. It also deals with how they are interconnected to implement an architectural specification. The term computer organisation looks similar to the term computer architecture. But, computer architecture deals with the

engineering considerations involved in designing a computer. On the other hand, Computer Organisation deals with the hardware components that are transparent to the programmer.

#### 3.2. Basics of Microprocessors

The CPU is the major component of a computer, which performs all tasks. This is realized by the microprocessor which is an Integrated Circuit. Microprocessors were first introduced in early 1970s. The first general purpose microprocessor, 4004 was developed by Intel Inc.

The microprocessor is a programmable multipurpose silicon chip. It is driven by clock pulses. It accepts input as a binary data and after processing, it provides the output data as per the instructions stored in the memory. A block diagram of a microprocessor based system is shown in Figure 3.1.



*Figure 3.1 A Microprocessor - Based System*

The microprocessor is made up of 3 main units. They are:

- **Arithmetic and Logic unit (ALU):** To perform arithmetic and logical instructions based on computer instructions.

- **Control unit:** To control the overall operations of the computer through signals.
- **Registers (Internal Memory):** They are used to hold the instruction and data for the execution of the processor.

## Characteristics of Microprocessors

A Microprocessor's performance depends on the following characteristics:

- Clock speed
- Instruction set
- Word size
- Clock Speed**



**Hertz** – abbreviated as Hz is the standard unit of measurement used for measuring frequency. Since frequency is measured in cycles per second, one hertz equals one cycle per second.

Hertz is commonly used to measure wave frequencies, such as sound waves, light waves, and radio waves. For example, the average human ear can detect sound waves between 20 and 20,000 Hz. Sound waves close to 20 Hz have a low pitch and are called "bass" frequencies. Sound waves above 5,000 Hz have a high pitch and are called "treble" frequencies.

While hertz can be used to measure wave frequencies, it is also used to measure the speed of computer processors. For example, each CPU is rated at a specific clock speed. This number indicates how many instruction cycles the processor can perform in every second. Since modern processors can perform millions or even billions of instructions per second, clock speeds are typically measured in megahertz or gigahertz.

instruction set carries out the following types of operations:

- Data transfer
- Arithmetic operations
- Logical operations
- Control flow
- Input/output

### c) Word Size

- The number of bits that can be processed by a processor in a single instruction

Every microprocessor has an **internal clock** that regulates the speed at which it executes instructions. The speed at which the microprocessor executes instructions is called the **clock speed**. Clock speed is measured in MHz (Mega Hertz) or in GHz (Giga Hertz).

### b) Instruction Set

A command which is given to a computer to perform an operation on data is called an **instruction**. Basic set of machine level instructions that a microprocessor is designed to execute is called as an **instruction set**. This

## Speed Measurement

is called its **word size**. **Word size** determines the amount of RAM that can be accessed by a microprocessor.

### 3.3 Data communication between CPU and memory

The Central Processing Unit(CPU) has a Memory Data Register (MDR) and a Memory Address Register (MAR). The Memory Data Register (MDR) keeps the data which is transferred between the Memory and the CPU. The Program Counter (PC) is a special register in the CPU which always keeps the address of the next instruction to be

executed. The Arithmetic and Logic unit of CPU places the address of the memory to be fetched, into the Memory Address Register.

A bus is a collection of wires used for communication between the internal components of a computer.

The word in the RAM has the same size (no. of bits) as the Memory Data Register (MDR). If the processor is an 8-bit processor like Intel 8085, its MDR and the word in the RAM both have 8 bits.

The read operation transfers the data(bits) from word to Memory Data Register. The write operation transfers the data(bits) from Memory Data Register to word.



If 5V is applied at one end of a wire, the other end also can receive 5V. In the same way, the buses are wires, and the binary data are voltages (5V as 1 and 0V as 0), and these buses can simply pass the data as voltages from one end to other.

### 3.4 Types of Microprocessors

Microprocessors can be classified based on the following criteria:

- The width of data that can be processed
- The instruction set

#### 3.4.1 Classification of Microprocessors based on the Data Width

Depending on the data width, microprocessors can process instructions. The microprocessors can be classified as

follows:

- 8-bit microprocessor
- 16-bit microprocessor
- 32-bit microprocessor
- 64-bit microprocessor

#### 3.4.2 Classification of Microprocessors based on Instruction Set

The size of the instruction set is important consideration while categorizing microprocessors. There are two types of microprocessors based on their instruction sets.

- Reduced Instruction Set Computers (RISC)
- Complex Instruction Set Computers (CISC)

Examples of RISC processors are Pentium IV, Intel P6, AMD K6 and K7.

Examples of CISC processors are Intel 386 & 486, Pentium, Pentium II and III, and Motorola 68000.

### 3.5 Memory Devices

A memory is just like a human brain. It is used to store data and instructions. Computer memory is the storage space in the computer, where data and instructions are stored. There are two types of accessing methods to access (read or write) the memory. They are sequential access and random access. In sequential access, the memory is accessed in an

orderly manner from starting to end. But, in random access, any byte of memory can be accessed directly without navigating through previous bytes. Different memory devices are arranged according to the capacity, speed and cost as shown in Figure 3.6.

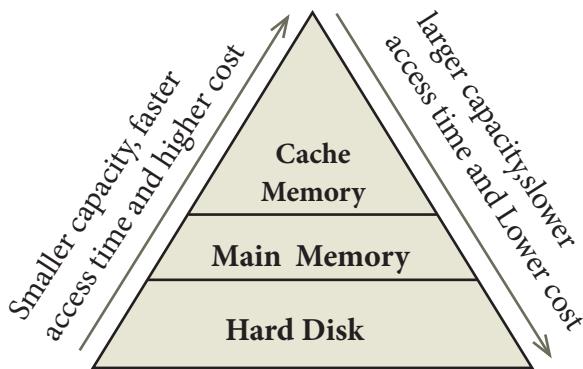


Figure 3.6 Memory Hierarchy

### 3.5.1 Random-Access Memory (RAM)

The main memory is otherwise called as **Random Access Memory**. This is available in computers in the form of Integrated Circuits (ICs). It is the place in a computer where the Operating System, Application Programs and the data in current use are kept temporarily so that they can be accessed by the computer's processor. The smallest unit of information that can be stored in the memory is called as a bit. The memory can be accessed by a collection of 8 bits which is called as a byte.

RAM is a volatile memory, which means that the information stored in it is not permanent. As soon as the power is turned off, whatever data that resides in RAM is lost. It allows both read and write operations.

### 3.5.2 Types of RAM

There are two basic types of RAM

- Dynamic RAM (DRAM)
- Static RAM (SRAM)

These two types differ in the

technology they use to hold data. Dynamic RAM being a common type needs to be refreshed frequently. Static RAM needs to be refreshed less often, which makes it faster. Hence, Static RAM is more expensive than Dynamic RAM.

### 3.5.3 Read Only Memory (ROM)

Read Only Memory refers to special memory in a computer with pre-recorded data at manufacturing time which cannot be modified. The stored programs that start the computer and perform diagnostics are available in ROMs. ROM stores critical programs such as the program that boots the computer. Once the data has been written onto a ROM chip, it cannot be modified or removed and can only be read. ROM retains its contents even when the computer is turned off. So, ROM is called as a non-volatile memory.

#### 3.5.3.1 Programmable Read Only Memory (PROM)

Programmable read only memory is also a non-volatile memory on which data can be written only once. Once a program has been written onto a PROM, it remains there forever. Unlike the main memory, PROMs retain their contents even when the computer is turned off.

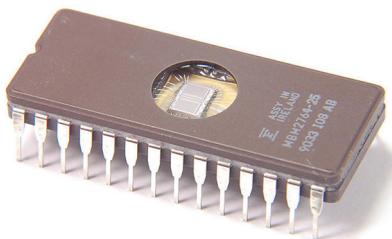
The PROM differs from ROM. PROM is manufactured as a blank memory, whereas a ROM is programmed during the manufacturing process itself. PROM programmer or a PROM burner is used to write data to a PROM chip. The process of programming a PROM is called burning the PROM.

#### 3.5.3.2 Erasable Programmable Read Only Memory (EPROM)

Erasable Programmable Read Only Memory is a special type of memory which

serves as a PROM, but the content can be erased using ultraviolet rays. EPROM retains its contents until it is exposed to ultraviolet light. The ultraviolet light clears its contents, making it possible to reprogram the memory.

An EPROM differs from a PROM, PROM can be written only once and cannot be erased. EPROMs are used widely in personal computers because they enable the manufacturer to change the contents of the PROM to replace with updated versions or erase the contents before the computer is delivered.



*Figure 3.7 Erasable Programmable Read Only Memory*



Most of the EPROM chips have a transparent area at the top surface which is covered by stickers. If it gets removed, the ultraviolet light in the sunlight may erase the contents.

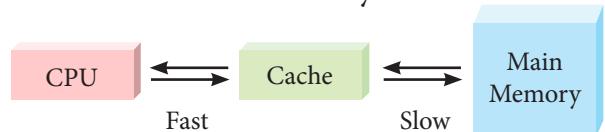
### 3.5.3.3 Electrically Erasable Programmable Read Only Memory (EEPROM)

Electrically Erasable Programmable Read Only Memory is a special type of PROM that can be erased by exposing it to an electrical charge. Like other types of PROM, EEPROM retains its contents even when the power is turned off. Comparing with all other types of ROM, EEPROM is slower in performance.

### 3.5.4 Cache Memory

The cache memory is a very high speed and expensive memory, which is used to speed

up the memory retrieval process. Due to its higher cost, the CPU comes with a smaller size of cache memory compared with the size of the main memory. Without cache memory, every time the CPU requests the data, it has to be fetched from the main memory which will consume more time. The idea of introducing a cache is that, this extremely fast memory would store data that is frequently accessed and if possible, the data that is closer to it. This helps to achieve the fast response time, Where response Time, (Access Time) refers to how quickly the memory can respond to a read / write request. Figure 3.8 shows the arrangement of cache memory between the CPU and the main memory.



*Figure 3.8 Cache Memory Arrangement*

## 3.6 Secondary Storage Devices

A computer generally has limited amount of main memory which is expensive and volatile. To store data and programs permanently, secondary storage devices are used. Secondary storage devices serve as a supportive storage to main memory and they are non-volatile in nature, secondary storage is also called as Backup storage

### 3.6.1 Hard Disks

Hard disk is a magnetic disk on which you can store data. The hard disk has the stacked arrangement of disks accessed by a pair of heads for each of the disks. The hard disks come with a single or double sided disk.

### 3.6.2 Compact Disc (CD)

A CD or CD-ROM is made from 1.2 millimeters thick, polycarbonate plastic material. A thin layer of aluminium or gold is applied to the surface. CD data is represented as tiny indentations known as

"pits", encoded in a spiral track moulded into the top of the polycarbonate layer. The areas between pits are known as "lands". A motor within the CD player rotates the disk. The capacity of an ordinary CD-ROM is 700MB.



*Fig 3.9 Compact Disc*

### 3.6.3 Digital Versatile Disc (DVD)

A **DVD (Digital Versatile Disc or Digital Video Disc)** is an optical disc capable of storing up to 4.7 GB of data, more than six times what a CD can hold. DVDs are often used to store movies at a better quality. Like CDs, DVDs are read with a laser.

The disc can have one or two sides, and one or two layers of data per side; the number of sides and layers determines how much it can hold. Double-layered sides are usually gold-coloured, while single-layered sides are usually silver-coloured, like a CD.



*Fig 3.10 Digital Versatile Disc*

### 3.6.4 Flash Memory Devices

Flash memory is an electronic (solid-state) non-volatile computer storage medium that can be electrically erased and reprogrammed. They are either EEPROM or EPROM. Examples for Flash memories are pendrives, memory cards etc. Flash memories can be used in personal computers, Personal Digital Assistants (PDA), digital audio

players, digital cameras and mobile phones. Flash memory offers fast access times. The time taken to read or write a character in memory is called access time. The capacity of the flash memories vary from 1 Gigabytes (GB) to 2 Terabytes (TB). A sample of flash memory is shown in Figure 3.11.



*Figure 3.11 Flash Memory*

### 3.6.5 Blu-Ray Disc

Blu-Ray Disc is a high-density optical disc similar to DVD. Blu-ray is the type of disc used for PlayStation games and for playing High-Definition (HD) movies. A double-layer Blu-Ray disc can store up to 50GB (gigabytes) of data. DVD uses a red laser to read and write data. But, Blu-ray uses a blue-violet laser to write. Hence, it is called as Blu-Ray.



*Fig 3.12 Blu- Ray Disc*

## 3.7 Ports and Interfaces

The Motherboard of a computer has many I/O sockets that are connected to the ports and interfaces found on the rear side of a computer (Figure 3.13). The external devices can be connected to the ports and interfaces. The various types of ports are given below:

**Serial Port:** To connect the external devices, found in old computers.

**Parallel Port:** To connect the printers, found in old computers.

**USB Ports:** To connect external devices like cameras, scanners, mobile phones, external hard disks and printers to the computer.

**USB 3.0** is the third major version of the Universal Serial Bus (USB) standard to connect computers with other electronic gadgets as shown in Figure 3.13. USB 3.0 can transfer data up to 5 Giga byte/second. USB3.1 and USB 3.2 are also released.



Figure 3.13 USB 3.0 Ports

**VGA Connector:** To connect a monitor or any display device like LCD projector.

**Audio Plugs:** To connect sound speakers, microphone and headphones.

**PS/2 Port:** To connect mouse and keyboard to PC.

**SCSI Port:** To connect the hard disk drives and network connectors.

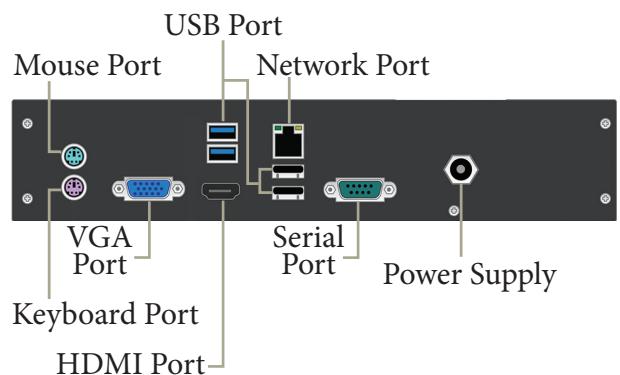


Fig 3.14 Ports and Interfaces

#### High Definition Multimedia Interface (HDMI)

High-Definition Multimedia Interface is an audio/video interface which transfers the uncompressed video and audio data from a video controller, to a compatible computer monitor, LCD projector, digital television etc.

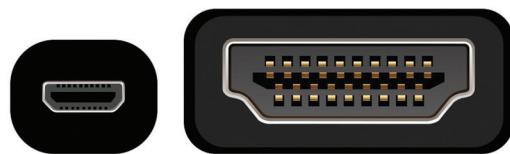


Figure 3.15 HDMI Ports



#### Student Activity

- Identify the components of a computer
- Connecting external devices like printer/LCD projector.

#### Teacher Activity

- Show the components of a computer
- Display different ROM ICs
- Display the flash memory
- Demonstrate various ports and their usage

## Evaluation



### Part - I

#### Choose the correct answer

1. Which of the following is said to be the brain of a computer?
  - (a) Input devices
  - (b) Output devices
  - (c) Memory device
  - (d) Microprocessor
2. Which of the following is not the part of a microprocessor unit?
  - (a) ALU      (b) Control unit
  - (c) Cache memory (d) register
3. How many bits constitute a word?
  - (a) 8
  - (b) 16
  - (c) 32
  - (d) determined by the processor used.
4. Which of the following device identifies the location when address is placed in the memory address register?
  - (a) Locator      (b) encoder
  - (c) decoder      (d) multiplexer
5. Which of the following is a CISC processor?
  - (a) Intel P6      (b) AMD K6
  - (c) Pentium III      (d) Pentium IV
6. Which is the fastest memory?
  - (a) Hard disk
  - (b) Main memory
  - (c) Cache memory
  - (d) Blue-Ray disc
7. How many memory locations are identified by a processor with 8 bits address bus at a time?
  - (a) 28                (b) 1024
  - (c) 256               (d) 8000
8. What is the capacity of 12cm diameter DVD with single sided and single layer?
  - (a) 4.7 GB            (b) 5.5 GB
  - (c) 7.8GB            (d) 2.2 GB
9. What is the smallest size of data represented in a CD?
  - (a) blocks            (b) sectors
  - (c) pits               (d) tracks
10. Display devices are connected to the computer through.
  - (a) USB port
  - (b) Ps/2 port
  - (c) SCSI port
  - (d) VGA connector

### Part - II

- (1) What are the parameters which influence the characteristics of a microprocessor?
- (2) What is an instruction?
- (3) What is a program counter?
- (4) What is HDMI?
- (5) Which source is used to erase the content of a EPROM?

### Part - III

- (1) Differentiate Computer Organisation from Computer Architecture.

- (2) Classify the microprocessor based on the size of the data.
- (3) Write down the classifications of microprocessors based on the instruction set.
- (4) Differentiate PROM and EPROM.
- (5) Write down the interfaces and ports available in a computer.
- (6) Differentiate CD and DVD
- (7) How will you differentiate a flash memory and an EEPROM?

#### Part - IV

- (1) Explain the characteristics of a microprocessor.
- (2) How the read and write operations are performed by a processor? Explain.
- (3) Arrange the memory devices in ascending order based on the access time.
- (4) Explain the types of ROM.



<b>Computer hardware</b>	The physical parts or components of a computer, such as the CPU, mother board, monitor, keyboard, etc.
<b>Intel</b>	Intel Corporation is an American multinational corporation and technology company involving in hardware manufacturing, especially mother board and processors
<b>Silicon chip</b>	Silicon chip is an integrated , set of electronic circuits on one small flat piece of semiconductor material, silicon.
<b>Multipurpose</b>	Multipurpose is several purpose
<b>Address bus</b>	Address bus is a collection of wires that carry the address as bits
<b>Data bus</b>	Data bus is a collection of wires to carry data in bits
<b>Control bus</b>	Control bus is a control line/collection of wires to control the operations/functions
<b>Arithmetic operations</b>	Arithmetic operations are the mathematical operations on data like add, subtract etc
<b>Data Transfer</b>	Data Transfer means moving data from one component to another
<b>Logical operations</b>	Logical operations are the operations on binary/Boolean data like AND, OR , NOT
<b>Bidirectional</b>	Bidirectional means both the directions/ways
<b>Unidirectional</b>	Unidirectional means only one direction
<b>Access time</b>	Access time is the time delay or latency between a request to an electronic system, and the access being completed or the requested data returned

## Theoretical concepts of Operating System



### Learning objectives

- ✓ To know the concept of Operating Systems and their types.
- ✓ To acquire the basic Knowledge of Operating Systems and its functions.

#### 4.1 Introduction to Software

A software is set of instructions that perform specific task. It interacts basically with the hardware to generate the desired output.

##### 4.1.1 Types of Software

Software is classified into two types:

- 1) Application Software
- 2) System Software



##### Application Software:

Application software is a set of programs to perform specific task.

For example MS-word is an application software to create text document and VLC player is familiar application software to play audio, video files and many more.

##### System Software:

System software is a type of computer program that is designed to run the computer's hardware and application programs. Example Operating System and Language Processor

#### 4.2 Introduction to Operating System (OS):

An Operating System (OS) is a system software which serves as an interface between a user and a computer.

This controls input, output and other peripheral devices such as disk drives, printers and electronic gadgets. The functions of an Operating System include file management, memory management, process management and device management and many more.

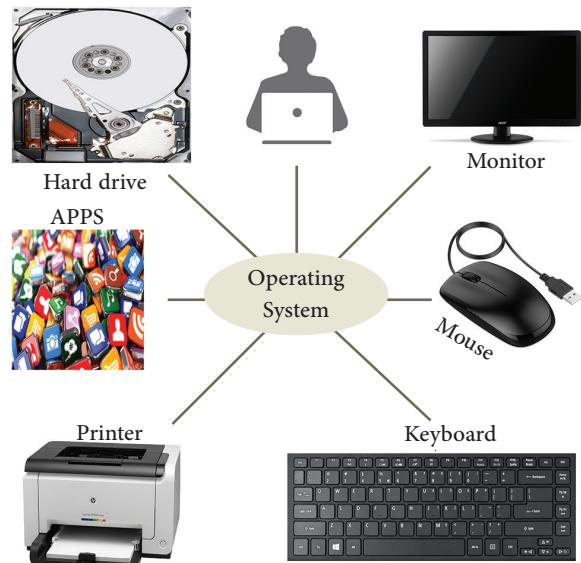
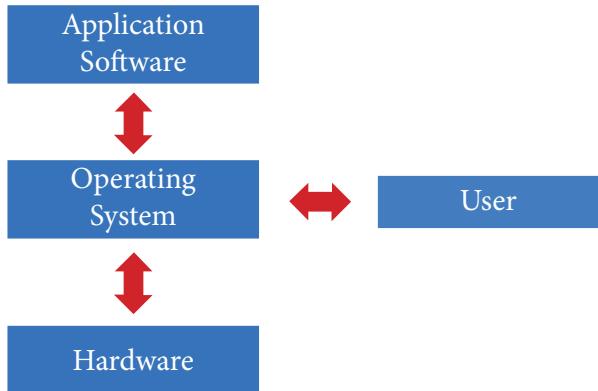


Figure: 4.1 Operating System

Without an Operating System, a computer cannot effectively manage all the resources. When a computer is switched on, the operating system is loaded in to the memory automatically.

Some of the popular Operating Systems used in personal computers and laptops are **Windows**, **UNIX** and **Linux**. The mobile devices mostly use **Android** and **iOS** as mobile OS.



*Figure: 4.2 Interaction of Operating system and user*

### Uses of Operating Systems

#### The following are few uses of Operating System

The main use of Operating System is

- to ensure that a computer can be used to extract what the user wants it do.
- Easy interaction between the users and computers.
- Starting computer operation automatically when power is turned on (Booting).
- Controlling Input and Output Devices
- Manage the utilisation of main memory.
- Providing security to user programs.

### 4.3 Types of Operating System

Operating System are classified into the following types depending on their processing capabilities.

#### 4.3.1 Single User Operating Systems

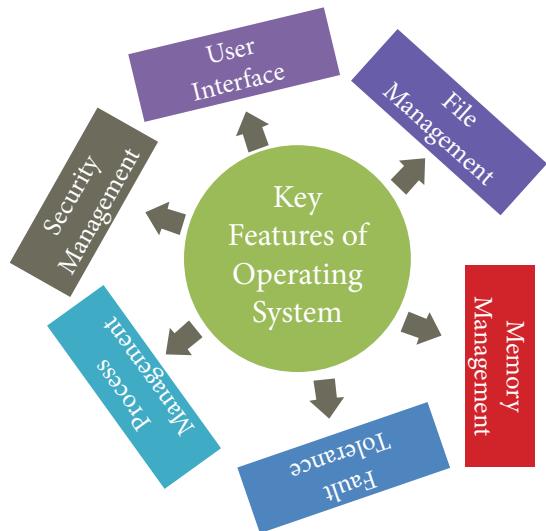
An operating system allows only a single user to perform a task at a time. It is called as a Single user and single Task operating system. MS-DOS is an example for a single user and single task Operating System.

#### 4.3.2 Multi-user Operating Systems

It is used in computers and laptops that allow same data and applications to be accessed by multiple users at the same time. The users can also communicate with each other. Windows, Linux and UNIX are examples for multi-user Operating System.

### 4.4 Key features of the Operating System

The various key features are given below



*Figure: 4.3 Key Features of the Operating System*

#### 4.4.1 User Interface (UI)

User interface is one of the significant feature in Operating System. The only way that user can make interaction with a computer. This is a main reason for key success of GUI (Graphical User Interface) based Operating System. The GUI is a window based system with a pointing device to direct I/O, choose from menus, make selections and a keyboard to enter text. Its vibrant colours attract the user very easily.

Now Linux distribution is also available as GUI based Operating System. The following points are considered when User Interface is designed for an application.

1. The user interface should enable the user to retain this expertise for a longer time.
2. The user interface should also satisfy the customer based on their needs.
3. The user interface should save user's precious time.
4. The ultimate aim of any product is to satisfy the customer. The User Interface is also to satisfy the customer.
5. The user interface should reduce number of errors committed by the user

#### 4.4.2 Memory Management

Memory Management is the process of controlling and coordinating computer's main memory and assigning memory block (space) to various running programs to optimize overall computer performance. The Memory management involves the allocation of specific memory blocks to individual programs based on user demands.

The objective of Memory Management process is to improve both the utilization of the CPU and the speed of the computer's response to its users via main memory. For these reasons the computers must keep several programs in main memory that associates with many different Memory Management schemes.

The Operating System is responsible for the following activities in connection with memory management:

- Keeping track of which portion of memory are currently being used and who is using them.
- Determining which processes (or parts of processes) and data to move in and out of memory.
- Allocation and de-allocation of memory blocks as needed by the program in main memory. (Garbage Collection)

#### 4.4.3 Process management

Process management is function that includes creating and deleting processes(program) and providing mechanisms for processes to communicate and synchronize with each other.

A system task, such as sending output to a printer or screen, can also be called as a Process.

A computer consists of a collection of processes, they are classified as two categories:

- Operating System processes which is executed by system code
- User Processes which is execute by user code

All these processes can potentially execute concurrently on a single CPU.

The following algorithms are mainly used to allocate the job (process) to the processor.

1. FIFO
2. SJF
3. Round Robin
4. Based on Priority

#### FIFO (First In First Out)Scheduling:

This algorithm is based on queuing technique. Assume that a student is

standing in a queue (Row) to get grade sheet from his/her teacher. The other student who stands first in the queue gets his/her grade sheet first and leaves from the queue (Row). Followed by the next student in the queue gets it corrected and so on. This is the basic logic of the FIFO algorithm.

Technically, the process that enters the queue first is executed first by the CPU, followed by the next and so on. The processes are executed in the order of the queue (row).

#### SJF (Shortest Job First)Scheduling:

This algorithm works based on the size of the job being executed by the CPU.

Consider two jobs A and B.

- 1) A = 6 kilo bytes
- 2) B = 9 kilo bytes

First the job “A” will be assigned and then job “B” gets its turn.

#### Round RobinScheduling

The Round Robin (RR) scheduling algorithm is designed especially for time sharing systems. Jobs (processes) are assigned and processor time in a circular method. For example take three jobs A, B, C. First the job A is assigned to CPU then job B and job C and then again A, B and C and so on.

#### Based On Priority

The given job (process) is assigned based on a Priority. The job which has higher priority is more important than other jobs. Take two jobs A and B. Let the priority of A be 5 and priority B be 7.

Job B is assigned to the processor before job A.

#### 4.4.4 Security Management

The major challenge in computer and software industry is to protect user's legitimate data from hackers. The Operating System provides three levels of securities to the user end. They are

- (1) File access level
- (2) System level
- (3) Network level

In order to access the files created by other people, you should have the access permission. Permissions can either be granted by the creator of the file or by the administrator of the system.

System level security is offered by the password in a multi-user environment.

Both windows and Linux offer the password facility.

Network security is an indefinable one. So people from all over the world try to provide such a security.

All the above levels of security features are provided only by the Operating System.

#### 4.4.5 Fault Tolerance

The Operating Systems should be robust. When there is a fault, the Operating System should not crash, instead the Operating System have fault tolerance capabilities and retain the existing state of system.

#### 4.4.6 File Management

File management is an important function of OS which handles the data storage techniques. The operating System manages the files, folders and directory systems on a computer. The FAT(File Allocation Table) stores general information about files like filename, type (text or binary), size, starting address and access mode. The file manager of the operating system helps to create, edit, copy, allocate memory to the files and also updates the FAT. There are few other file management techniques available like Next Generation File System (NTFS) and ext2(Linux).

#### 4.4.7 Multi-Processing

This is a one of the features of Operating System. It has two or more processors for a single running process (job). Processing takes place in parallel is known as parallel processing. Since the execution takes place in parallel, this feature is used for high speed execution which increases the power of computing.

#### 4.4.8 Time-sharing

This is a one of the features of Operating Systems. It allows execution of multiple tasks or processes concurrently. For each task a fixed time is allocated. This division of time is called Time- sharing. The processor switches rapidly between various processes after a time is elapsed or the process is completed.

For example assume that there are three processes called P1, P2, P3 and time allocated for each process 30, 40, 50 minutes

respectively. If the process P1 completes within 20 minutes then processor takes the next process P2 for the execution. If the process P2 could not complete within 40 minutes, then the current process P2 will be paused and switch over to the next process P3.

#### 4.4.9 Distributed Operating Systems

The Distributed Operating System is used to access shared data and files that reside in any machine around the world using internet/intranet. The users can access as if it is available on their own computer.

The advantages of distributed Operating System are as follows:

- A user at one location can make use of all the resources available at another location over the network.
- Many computer resources can be added easily in the network
- Improves the interaction with the customers and clients.
- Reduces the load on the host computer.



Figure: 4.4 Distributed Operating Systems

## 4.5 Prominent Operating Systems

Prominent OS are as follows:

- UNIX
- Microsoft Windows
- Linux
- iOS
- Android

Modern operating systems use a Graphical User Interface(GUI). A GUI lets you use your mouse to click icons, buttons, menus and everything, is clearly displayed on the screen using a combination of graphics and text elements.

### Student Activity

Activity 1: Draw a line between the operating system logo and the correct description.

A command-line operating system is an example of Open Source software development and Free Operating System	
A popular Operating System for mobile phone technology which is not linked with Apple products.	
Used with Apple computers and works well with cloud computing.	
Designed to be used for the Apple iPhone	
Is an Operating System that is very popular in universities, companies, big enterprises etc	
The most popular GUI Operating System for personal computers.	

## Evaluation



### Part I

- 1) Operating system is a
  - A) Application Software
  - B) Hardware
  - C) System Software
  - D) Component  
CZGDTG
- 2) Identify the usage of Operating Systems
  - A) Easy interaction between the human and computer
  - B) Controlling input & output Devices
  - C) Managing use of main memory
  - D) All the above
- 3) Which of the following is not a function of an Operating System?
  - A) Process Management
  - B) Memory Management
  - C) Security management
  - D) Compiler Environment
- 4) Which of the following OS is a Commercially licensed Operating system?
  - A) Windows
  - B) UBUNTU
  - C) FEDORA
  - D) REDHAT
- 5) Which of the following Operating systems support Mobile Devices?
  - A) Windows 7
  - B) Linux
  - C) BOSS
  - D) iOS
- 6) File Management manages
  - A) Files
  - B) Folders
  - C) Directory systems
  - D) All the Above

- 7) Interactive Operating System provides
- A) Graphics User Interface (GUI)
  - B) Data Distribution
  - C) Security Management
  - D) Real Time Processing
- 8) An example for single task operating system is
- A) Linux
  - B) Windows
  - C) MS-DOS
  - D) Unix
- 9) The File management system used by Linux is
- A) ext2
  - B) NTFS
  - C) FAT
  - D) NFTS

## Part II

- 1) List out any two uses of Operating System?
- 2) What is multi-user Operating system?
- 3) What is a GUI?
- 4) What are the security management features available in Operating System ?
- 5) What is multi-processing?
- 6) What are the different Operating Systems used in computer?

## Part III

- 8) What are the advantages and disadvantages of Time-sharing features?
- 9) List out the key features of Operating system
- 10) Write a note on Multiprocessing

## Part IV

- 11) Explain the concept of a Distributed Operating System along with its advantages.
- 12) List out the points to be noted while creating a user interface for an Operating system.
- 13) Explain the process manangement algorithms in Operating System.

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## Working with Windows Operating System



### Learning Objectives

After learning the concepts in this chapter, the students will be able

- To know the concepts of Operating System.
- To know the versions of the windows operating system.
- To know the concepts like desktop and the elements of window.
- To explore the document window.
- To compare the different types of icons.
- To explore the windows directory structure.
- To practice creating files and folders in specific drives.
- To manage the files and folders.
- To know the procedure to start and shutdown the computer.

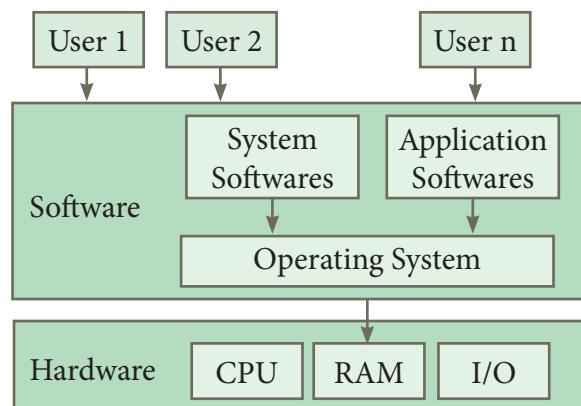


#### 5.1. Introduction to Operating System

An Operating System (OS) is a system software (Figure 5.1) that enables the hardware to communicate and operate with other software. It also acts as an interface between the user and the hardware and controls the overall execution of the computer.

Following are some of the important functions of an Operating System as discussed in the previous chapter:

- Memory Management
- Process Management
- Device Management
- File Management
- Security Management
- Control overall system performance



*Figure 5.1. Overview of an Operating System*

#### 5.2. Introduction to Windows Operating System

Every computer needs an Operating System to function. Microsoft Windows is one of the most popular Graphical User Interface (GUI). Multiple applications can execute simultaneously in Windows, and this is known as “**Multitasking**”.

Windows Operating System uses both Keyboard and mouse as input devices. Mouse is used to interact with Windows by clicking its icons. Keyboard is used to enter alphabets, numerals and special characters.

## Some of the functions of Windows Operating System are:

- Access applications (programs) on the computer (word processing, games, spread sheets, calculators and so on).
- Load any new program on the computer.
- Manage hardware such as printers, scanners, mouse, digital cameras etc.,
- File management activities (For example creating, modifying, saving, deleting files and folders).

- Change computer settings such as colour scheme, screen savers of your monitor, etc.

With reference to the Table 5.1, let us see the versions of Windows Operating System.

### 5.4. Handling the mouse

Before learning Window Operating System, you should know more about mouse and its actions.

### 5.3. Various versions of Windows

Versions	Logo	Year	Specific features
Windows 1.x	 MICROSOFT WINDOWS	1985	<ul style="list-style-type: none"> <li>• Introduction of GUI in 16 - bit processor</li> <li>• Mouse was introduced as an input device.</li> </ul>
Windows 2.x	 MICROSOFT WINDOWS	1987	<ul style="list-style-type: none"> <li>• Supports to minimize or maximize windows.</li> <li>• Control panel feature was introduced with various system settings and customising options.</li> </ul>
Windows 3.x	 MICROSOFT WINDOWS	1992	<ul style="list-style-type: none"> <li>• Introduced the concept of multitasking.</li> <li>• Supported 256 colours which brought a more modern, colourful look to the interface.</li> </ul>
Windows 95	 MICROSOFT WINDOWS	1995	<ul style="list-style-type: none"> <li>• Introduced Start button, the taskbar, Windows Explorer and Start menu.</li> <li>• Introduced 32 - bit processor and focused more on multitasking.</li> </ul>
Windows 98	 MICROSOFT WINDOWS	1998	<ul style="list-style-type: none"> <li>• Integration of the Web browser (Internet Explorer) with the Operating System.</li> <li>• DOS gaming began to disappear as Windows based games improved.</li> <li>• Plug and play feature was introduced.</li> </ul>
Windows NT	 MICROSOFT WINDOWS		<ul style="list-style-type: none"> <li>• Designed to act as servers in network.</li> </ul>
Windows Me	 Microsoft Windows Me Millennium Edition	2000	<ul style="list-style-type: none"> <li>• It introduced automated system diagnostics and recovery tools.</li> </ul>

Windows 2000		2000	<ul style="list-style-type: none"> <li>Served as an Operating System for business desktop and laptop systems.</li> <li>Four versions of Windows 2000 were released: Professional (for business desktop and laptop systems), Server (both a Web server and an office server), Advanced Server (for line-of-business applications) and Data Centre Server (for high-traffic computer networks).</li> </ul>
Windows XP		2001	<ul style="list-style-type: none"> <li>Introduced 64-bit Processor.</li> <li>Improved Windows appearance with themes and offered a stable version.</li> </ul>
Windows Vista		2006	<ul style="list-style-type: none"> <li>Updated the look and feel of Windows.</li> </ul>
Windows 7		2009	<ul style="list-style-type: none"> <li>Booting time was improved, introduced new user interfaces like Aero Peek, pinning programs to taskbar, handwriting recognition etc. and Internet Explorer 8.</li> </ul>
Windows 8		2012	<ul style="list-style-type: none"> <li>Windows 8 is faster than previous versions of Windows.</li> <li>Start button was removed.</li> <li>Windows 8 takes better advantage of multi-core processing, solid state drives (SSD), touch screens and other alternate input methods.</li> <li>Served as common platform for mobile and computer.</li> </ul>
Windows 10		2015	<ul style="list-style-type: none"> <li>Start Button was added again.</li> <li>Multiple desktop.</li> <li>Central Notification Center for App notification and quick actions.</li> <li>Cortana voice activated personal assistant.</li> </ul>

Table 5.1 Versions of Windows Operating System.

Right Click

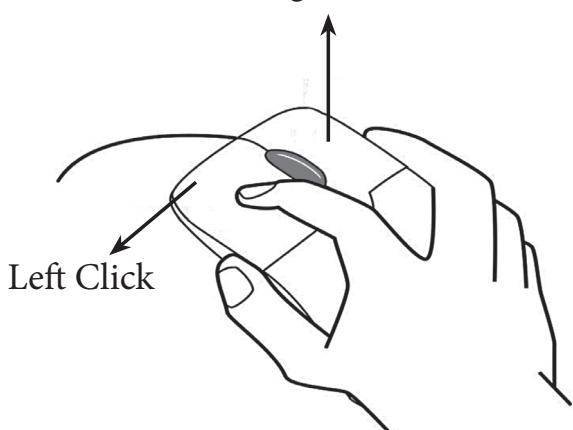


Figure 5.2.Mouse actions

The following are the mouse actions:

Action	Reaction
Point to an item	Move the mouse pointer over the item.
Click	Point to the item on the screen, press and release the left mouse button.
Right click	Point to the item on the screen, press and release the right mouse button. Clicking the right mouse button displays a pop up menu with various options.
Double-click	Point to the item on the screen, quickly press twice the left mouse button.

## Drag and drop

Point to an item then hold the left mouse button as you move the pointer press and you have reached the desired position, release the mouse button.

## 5.5. Windows Desktop

The opening screen of Windows is called “Desktop”.

The desktop of your computer may look different from what is seen in Figure 5.3.

This is because Windows allows you to change the appearance of the desktop.

In Figure 5.3, the desktop shows the Start button, Taskbar, Notification Area and date and time.



Figure 5.3. Microsoft Windows 7 Desktop

### 5.5.1. The Icons

Icon is a graphic symbol representing the window elements like

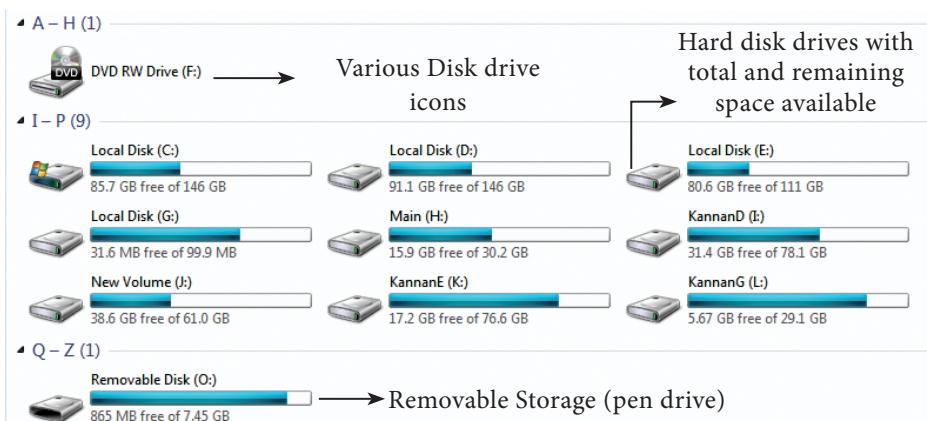


Figure 5.6.Disk drive Icons

files, folders, shortcuts etc., Icons play a vital role in GUI based applications.

#### 5.5.1.1.Standard Icons

The icons which are available on desktop by default while installing Windows OS are called standard icons. The standard icons available in all Windows OS are My Computer, Documents and Recycle Bin.



Figure 5.4. Aero peek button

#### 5.5.1.2. Shortcut Icons:

Shortcut icons can be created for any application or file or folder. By double clicking the icon, the related application or file or folder will open.

(Figure 5.5)



Figure 5.5.The types of Icons

### 5.5.1.3. Disk drive icons:

The disk drive icons graphically represent five disk drive options. (i) Hard disk (ii) CD-ROM/DVD Drive (iii) Pen drive (iv) Other removable storage such as mobile, smart phone, tablet etc., (v) Network drives if your system is connected with other system. (Figure 5.6)

**DO YOU KNOW?** You can move to the Desktop any time by pressing the Winkey + D or using Aero Peek while working in any application.

You can see Figure 5.4 to know where Aero peek lies in the Taskbar.

## 5.6. The Window

Window is a typical rectangular area in an application or a document. It is an area on the screen that displays information for a specific program.

### 5.7. Application Window

It is an area on a computer screen with defined boundaries, and within which information is displayed. Such windows can be resized, maximised, minimised, placed side by side, overlap, and so on.

An Application Window contains an open application i.e. current application such as Word or Paint. When two or more windows are opened, only one of them is active and the rest are inactive. Figures 5.7 and 5.8 display the Application Window of OpenOffice Writer and the appearance of the Multiple Windows opened (overlapped) in the Desktop.

### 5.8. Document Window

A document window is a section of the screen used to display the contents of a document. Figure 5.9 is an example of a document window.

### Note

When you open any application, such as OpenOffice Writer, OpenOffice Impress or OpenOffice Calc etc., you will find two Windows on the screen. The larger Window is called the Application Window. This Window helps the user to communicate with the Application program. The smaller window, which is inside the Application Window, is called the Document window. This Window is used for typing, editing, drawing, and formatting the text and graphics.

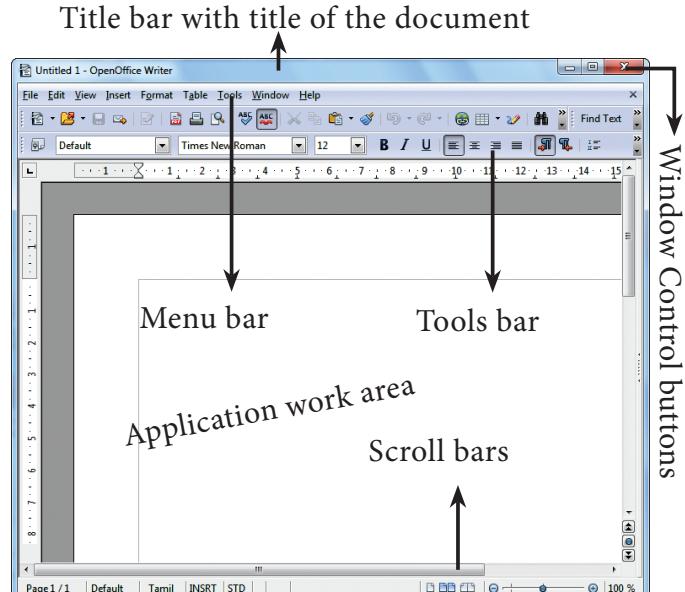


Figure 5.7. Application Window

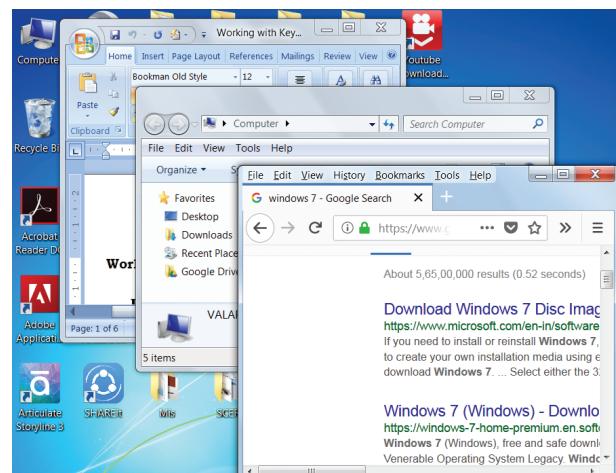


Figure 5.8. Multiple Windows opened in Desktop

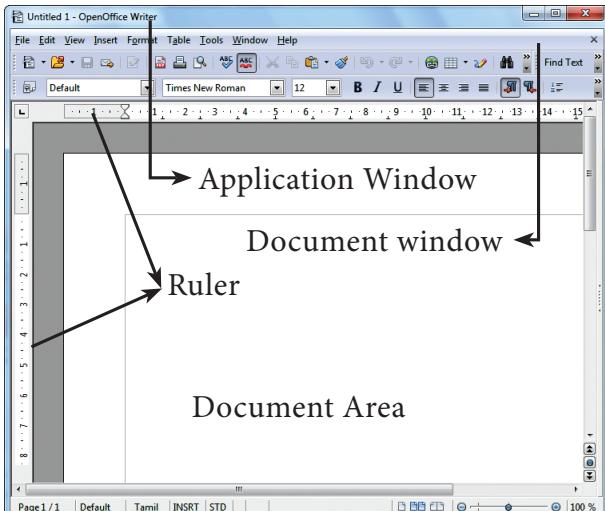


Figure 5.9. Document Window

## 5.9. Elements of a window

Figure 5.10 helps to understand the elements of a window.

**5.9.1. Title Bar** – The title bar will display the name of the application and the name of the document opened. It will also contain minimize, maximize and close button.

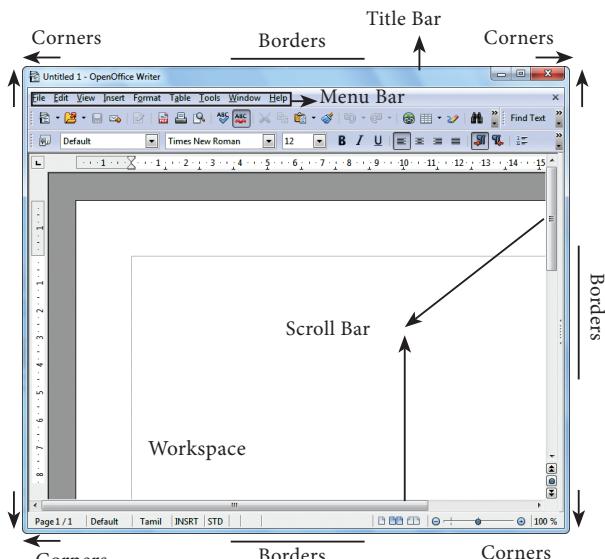


Figure 5.10 The elements of a window.

### 5.9.2 Menu Bar

The menu bar is seen under the title bar. Menus in the menu bar can be accessed by pressing Alt key and the letter that appears underlined in the menu title. Additionally, pressing Alt or F10 brings the focus on the first menu of the menu bar.

In Windows 7, in the absence of the menu bar, click **Organise** and from the drop down menu, click the **Layout** option and select the desired item from that list.

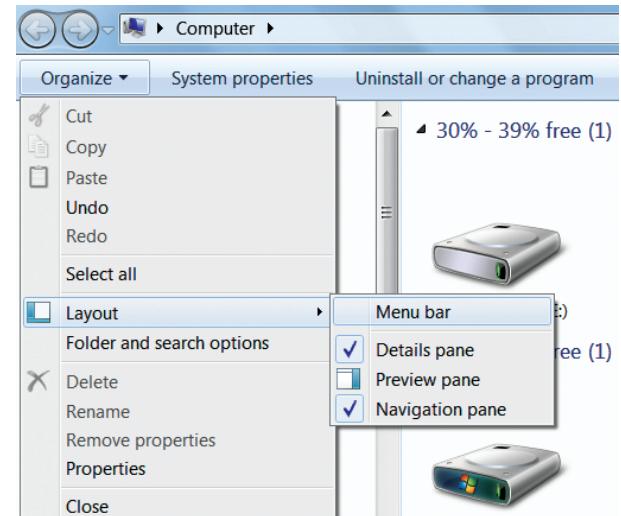


Figure 5.11. To display Menu Bar

Figure 5.11 helps to understand how to make menu bar visible in its absence.

### 5.9.3. The Workspace

The workspace is the area in the document window to enter or type the text of your document. Figure 5.10 Shows the workspace area in the document window.

**5.9.4. Scroll bars** - The scroll bars are used to scroll the workspace horizontally or vertically. Figure 5.10 shows the Scroll bars.

### 5.9.5. Corners and borders

The corners and borders of the window helps to drag and resize the windows. The mouse pointer changes to a double headed arrow when positioned over a border or a corner. Drag the border or corner in the direction indicated by the double headed arrow to the desired size as shown in Figure 5.10. The window canbe resized by dragging the corners diagonally across the screen.

### 5.10.1. Start Menu

In the lower left-hand corner of the windows screen is the Start button. When you click on the button, the Start menu will appear. Using the start menu, you can start any application.

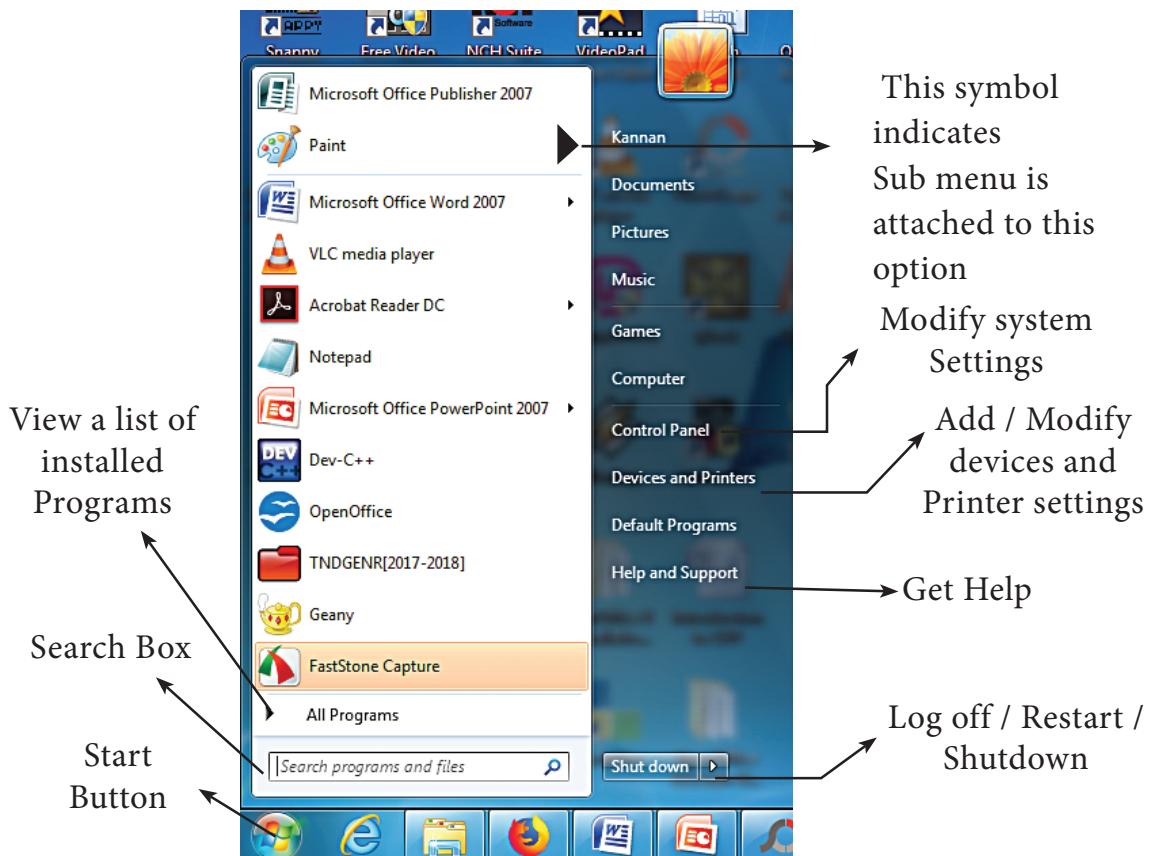


Figure 5.12 - Start Menu

### Taskbar

At the bottom of the screen is a horizontal bar called the taskbar. This bar contains (from left to right) the Start button, shortcuts to various programs, minimised programs and in the extreme right corner you can see the system tray which consist of volume control, network, date and time etc. Next to the Start button is the quick Launch Toolbar which contains task for frequently used applications.

### 5.10.2. Computer Icon

By clicking this icon, the user can see the disk drivers mounted in the system. In windows XP, Vista, this icon is called "My computer" in Windows 8 and 10, it is called "This PC". The functionality of computer icon remains the same in all versions of windows as shown in Figure 5.14.

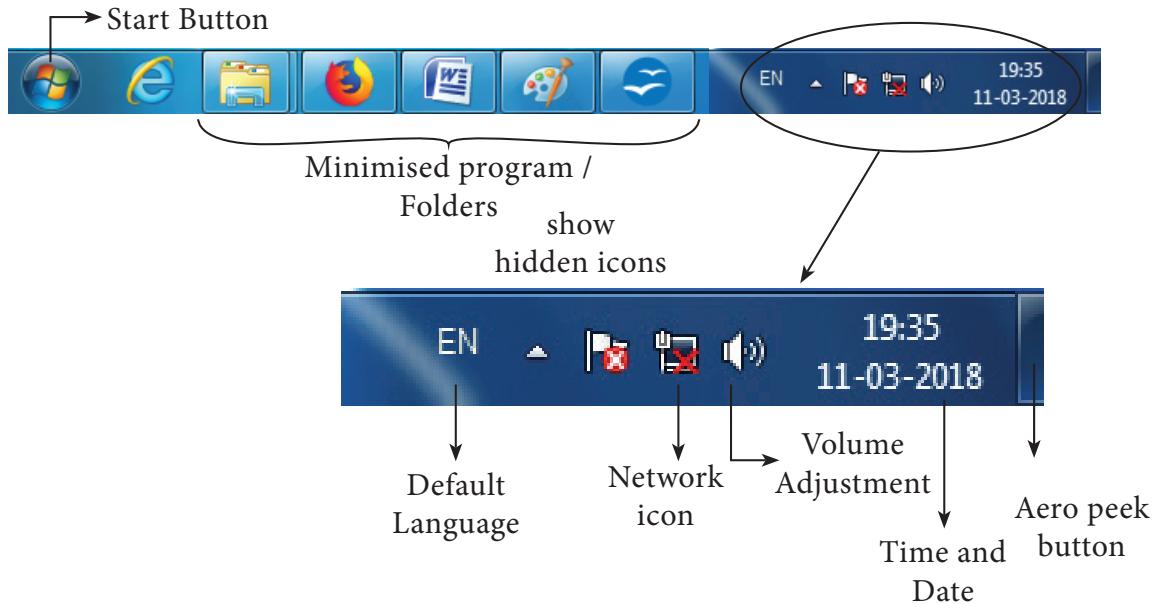


Figure 5.13. Taskbar



Figure 5.14. Computer icon in versions of Windows OS

### 5.10.3. Starting and Closing Applications

Most of the applications installed on your computer are available through the start menu. Depending on the system setup, the applications in the Start menu varies. To start an application:

1. Click the Start button and then point to All Programs. The Program menu appears.(Figure 5.15)
2. Point to the group that contains the application you want to start, and then click the application name.

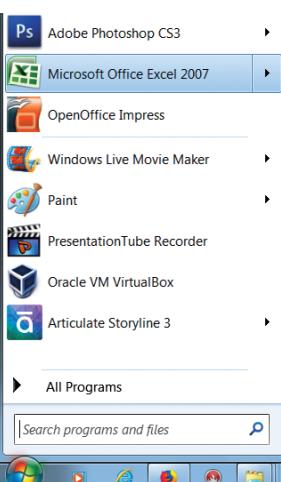


Figure 5.15. Starting a application using Start menu

3. You can also open an application by clicking Run on the Start menu, and the name of the application. (Figure 5.16)

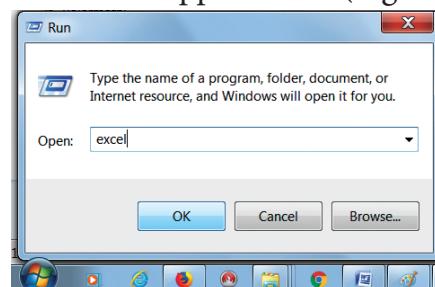
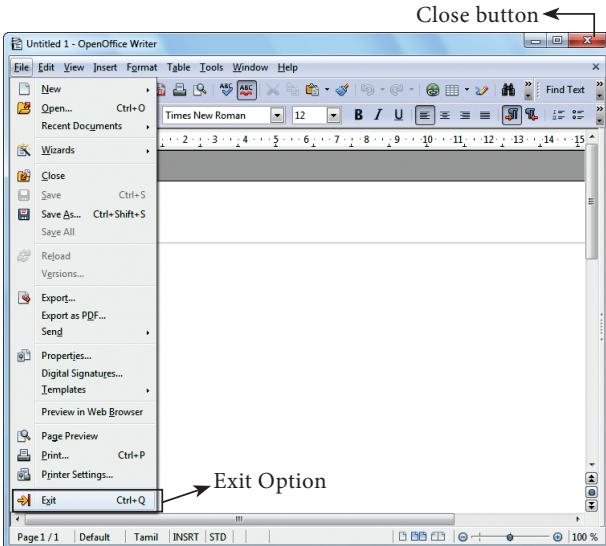


Figure 5.16. Starting a program using Run option

4. To quit an application, click the Close button in the upper right corner of the application window. (Figure 5.17)

### Workshop

- ◆ Start the application Wordpad using Start menu and Run option.  
◆ Close the Wordpad application using File menu.



*Figure 5.17.Closing the application using Close button and Exit option*

5. You can also quit an application by clicking on File → Exit and File → Close option in Windows 7. (Figure 5.17)

## 5.11. Managing Files and Folders

In Windows 7, you can Organise your documents and programs in the form of files and folders. You can move, copy, rename, delete and search the files and folders.

### 5.11.1. Creating files and Folders

You can store your files in many locations – on the hard disk or in other devices. To better organise your files, you can store them in folders.

**There are two ways in which you can create a new folder:**

#### Method I:

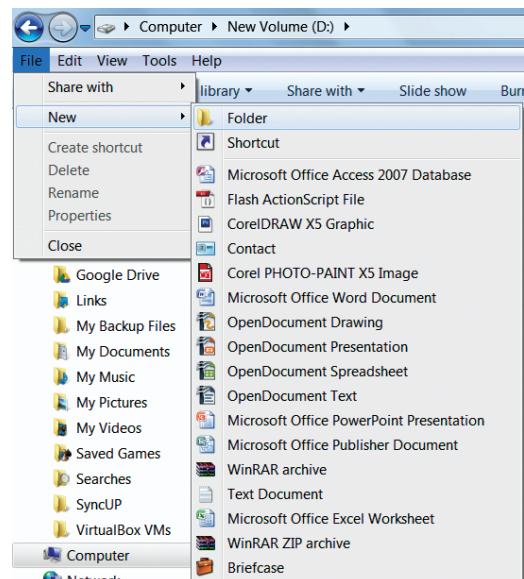
Step 1: Open Computer Icon.

Step 2: Open any drive where you want to create a new folder. (For example select D:)

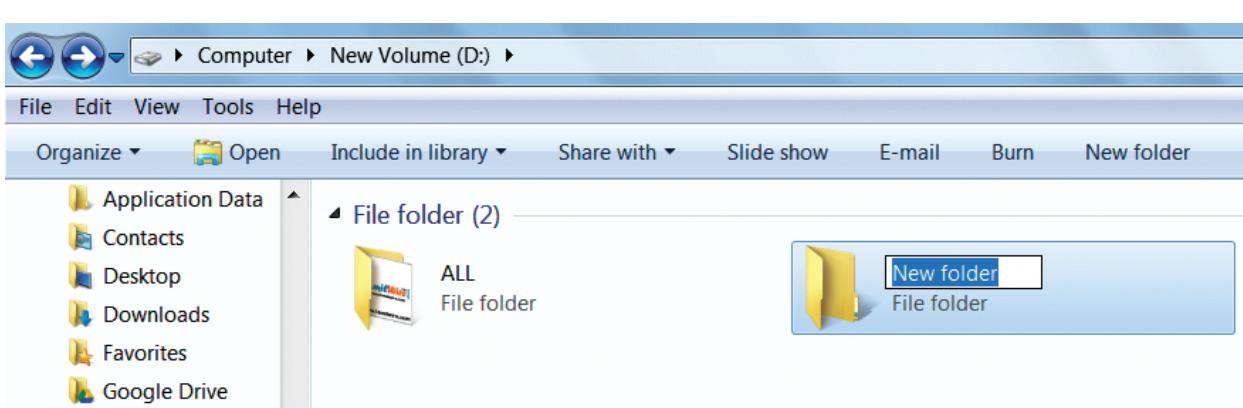
Step 3: Click on File → New → Folder.

Step 4: A new folder is created with the default name “New folder”. (Figure 5.19)

Step 5: Type in the folder name and press Enter key. (Figure 5.20 shows the newly created Folder named “Test Folder ”).



*Figure 5.18. Creating a Folder using File menu*



*Figure 5.19. New Folder created with the default name*

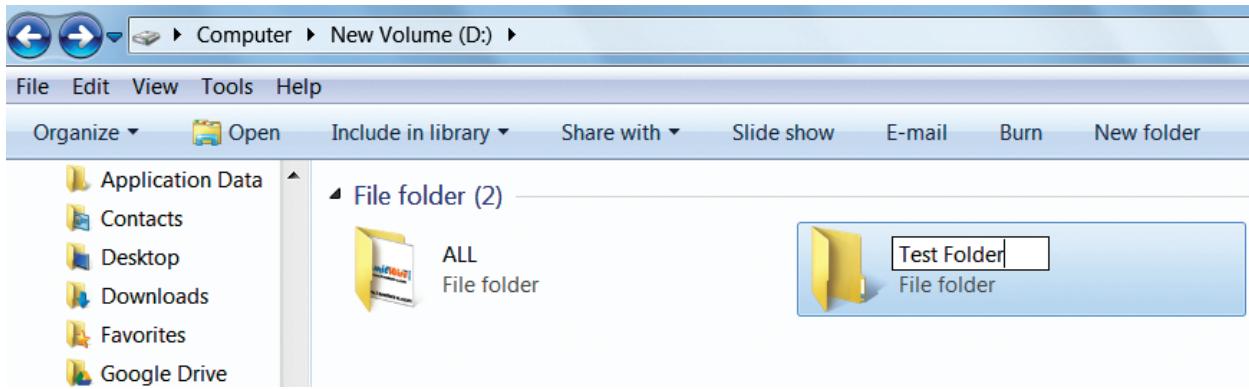


Figure 5.20. Renaming the new Folder

### Method II:

In order to create a folder in the desktop:

Step 1: In the Desktop, right click → New → Folder. (Figure 5.21 Shown the procedure)

Step 2: A Folder appears with the default name “New folder” and it will be highlighted as shown in the Figure 5.22.

Step 3: Type the name you want and press Enter Key.

Step 4: The name of the folder will change.

2. Type the contents in the workspace and save the file using File → Save or Ctrl + S.
3. Save As dialog box will be opened.
4. In the dialog box, select the location where you want to save the file by using look in drop down list box.
5. Type the name of the file in the **file name** text box.
6. Click save button.

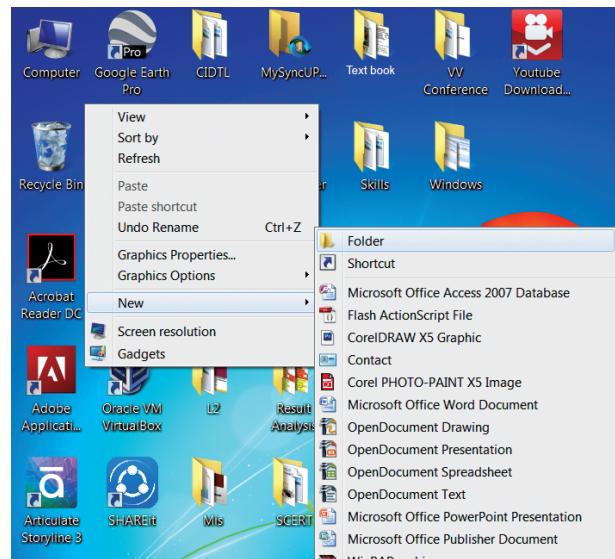


Figure 5.21. Creating a folder in the desktop

#### 5.11.1.2 Creating Files (Wordpad)

Wordpad is an in-built word processor application in Windows OS to create and manipulate text documents.

In order to create files in wordpad you need to follow the steps given below.

1. Click Start → All Programs → Accessories → Wordpad or Run → type Wordpad, click OK. Wordpad window will be opened as shown in Figure 5.23.

3. Open the Wordpad application and save it under a folder created with your name in My Documents.

### Workshop



Figure 5.22 New folder icon on the desktop

### 5.11.2. Finding Files and Folders

You can use the **search** box on the **Start** menu to quickly search a particular folder or file in the computer or in a specific drive.

#### To find a file or folder:

1. Click the **Start** button, the **search** box appears at the bottom of the start menu.
2. Type the name of the file or the folder you want to search. Even if you give the part of the file or folder name, it will display the list of files or folders starting with the specified name. (Figure 5.24)
3. The files or the folders with the specified names will appear, if you

click that file, it will directly open that file or the folder.

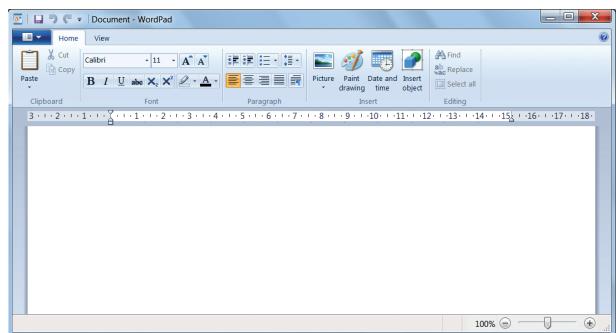


Figure 5.23. Wordpad - Word Processor application

4. There is another option called “**See more results**” which appears above the **search** box.
5. If you click it, it will lead you to a **Search Results** dialog box where you can click and open that file or the folder.

#### Searching Files or folders using Computer icon

1. Click **Computer Icon** from desktop or from **Start menu**.
2. The Computer disk drive screen will appear and at the top right corner of that screen, there is a **search** box option. (Figure 5.25)
3. Type the name of the file or the folder you want to search. Even if you give the part of the file or folder name, it will display the list of files or folders starting with the specified name. (Figure 5.24)

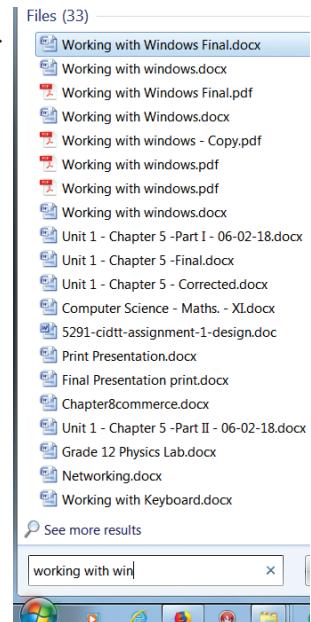


Figure 5.24. Finding a File/Folder using Start button

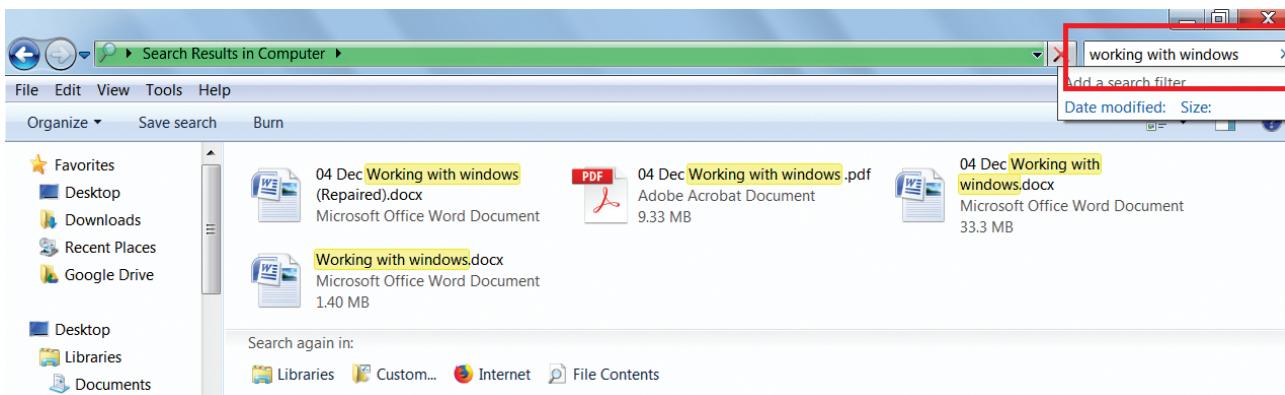


Figure 5.25. Finding a File/Folder in the Computer icon screen

4. Just click and open that file or the folder.

### Workshop

4. Find the file created in Workshop-3 using the above procedure

#### 5.11.3. Opening existing Files or Folders

The most common way of opening a file or a Folder is to double click on it.

#### 5.11.4. Renaming Files or Folders

There are number of ways to rename files

or folders. You can rename using the File menu, left mouse button or right mouse button.

#### Method 1

Using the FILE Menu

1. Select the File or Folder you wish to Rename.
2. Click File → Rename.
3. Type in the new name.
4. To finalise the renaming operation, press Enter as in Figure 5.26.

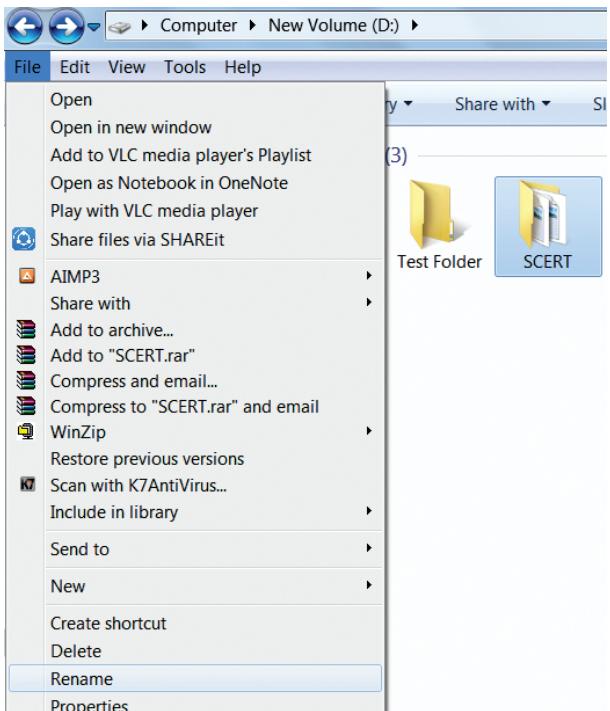


Figure 5.26. Renaming File/Folders using the File menu

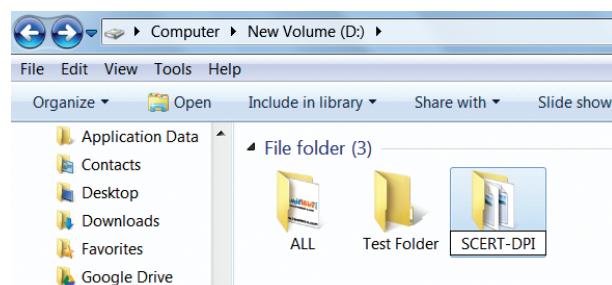


Figure 5.27. Folder renamed

Figure 5.27, you can see that the folder is renamed as SCERT-DPI from SCERT.

#### Method 2

**Using the Right Mouse Button**

1. Select the file or folder you wish to rename.
2. Click the right mouse button over the file or folder. (Figure 5.28)
3. Select Rename from the pop-up menu.

4. Type in the new name.
5. To finalise the renaming operation, press Enter.
6. Figure 5.29. Shows that the folder "New Folder" is renamed as C++.

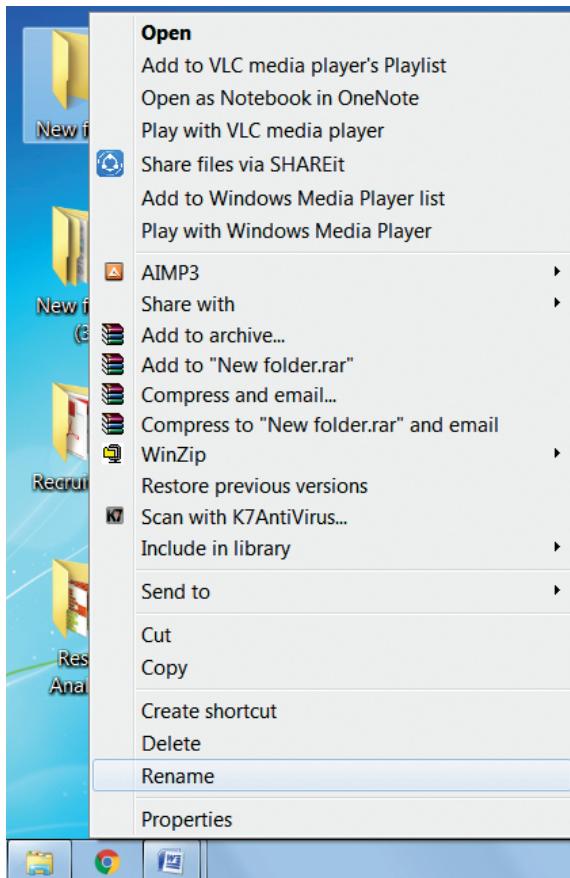


Figure 5.28. Renaming File/Folders using the Right Mouse Button



Figure 5.29. New Folder is renamed as C++

### Method 3

Using the Left Mouse Button

1. Select the file or folder you wish to rename.

2. Press F2 or click over the file or folder. A surrounding rectangle will appear around the name.
3. Type in the new name.
4. To finalise the renaming operation, press Enter.

## Workshop

5. Rename the file created by you using the File menu, left mouse button or right mouse button.

### 5.11.5. Moving/Copying Files and Folders

You can move your files or folders to other areas using variety of methods.

#### Moving Files and Folders

##### Method I-CUT and PASTE

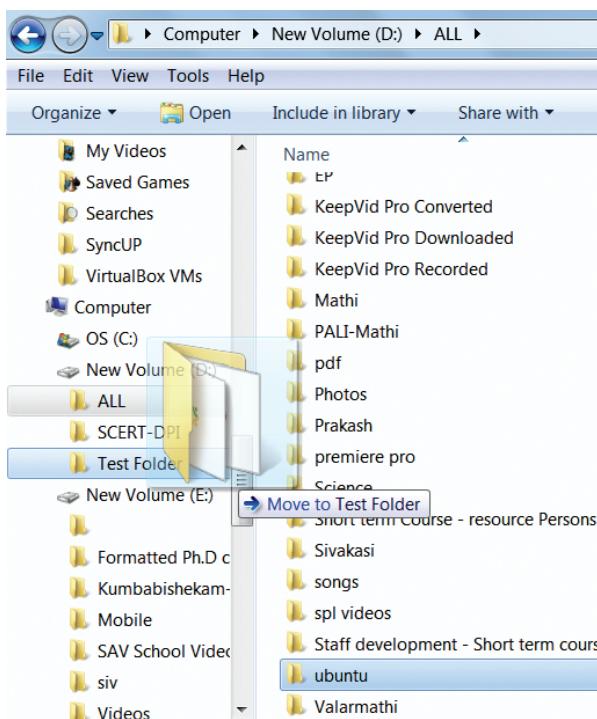
To move a file or folder, first select the file or folder and then choose one of the following:

- Click on the **Edit → Cut** or **Ctrl + X** Or right **click → cut** from the pop-up menu.
- To move the file(s) or folder(s) in the new location, navigate to the new location and paste it using **Click Edit → Paste** from edit menu or **Ctrl + V** using keyboard.
- Or Right **click → Paste** from the pop-up menu. The file will be pasted in the new location.

##### Method II – Drag and Drop

In the disk drive window, we have two panes called left and right panes. In the left pane, the files or folders are displayed like a tree structure. In the right pane, the files inside the specific folders in the left pane are displayed with various options.

- In the right pane of the Disk drive window, select the file or folder you want to move.
- Click and drag the selected file or folder from the right pane, to the folder list on the left pane.
- Release the mouse button when the target folder is highlighted (active).
- Your file or folder will now appear in the new area. Figure 5.30 shows how to move files or folders using drag and drop method.



*Figure 5.30.Moving the File/  
Folder using drag and drop*

## Copying Files and Folders

There are variety of ways to copy files and folders:

### Method I - COPY and PASTE

To copy a file or folder, first select the file or folder and then choose one of the following:

- Click **Edit → Copy** or **Ctrl + C** or **right click → Copy** from the pop-up menu.

- To paste the file(s) or folder(s) in the new location, navigate to the target location then do one of the following:
- Click **Edit → Paste** or **Ctrl + V**.
- Or **Right click → Paste** from the pop-up menu.

### Method II – Drag and Drop

- In the RIGHT pane, select the file or folder you want to copy.
- Click and drag the selected file and/or folder to the folder list on the left, and drop it where you want to copy the file and/or folder.
- Your file(s) and folder(s) will now appear in the new area.

**Note** If you want to select multiple files or folders, use **Ctrl + Click**.

### 5.11.6. Copying Files and Folders to removable disk

There are several methods of transferring files to or from a removable disk.

- Copy and Paste
- Send To

### METHOD I - Copy and Paste

- Plug the USB flash drive directly into an available USB port.
- If the USB flash drive or external drive folder does NOT open automatically, follow these steps:
- Click Start→Computer. (Figure 5.31)

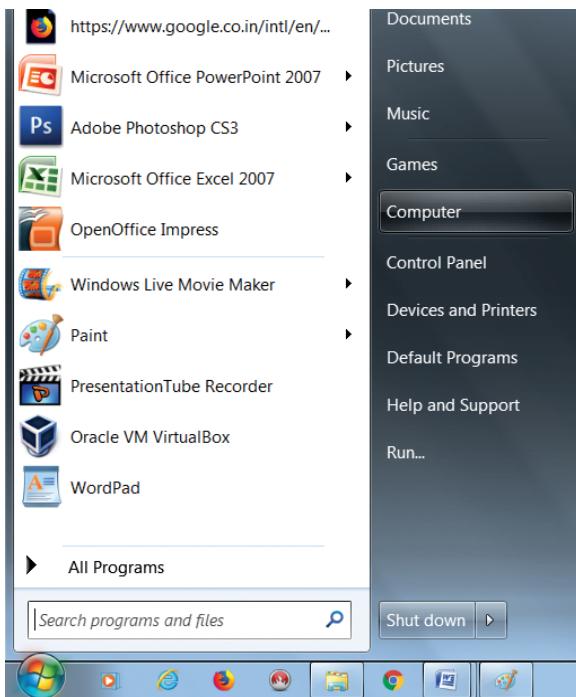


Figure 5.31. Selecting Computer option from Start menu

- Double-click on the Removable Disk associated with the USB flash drive. (Figure 5.32)

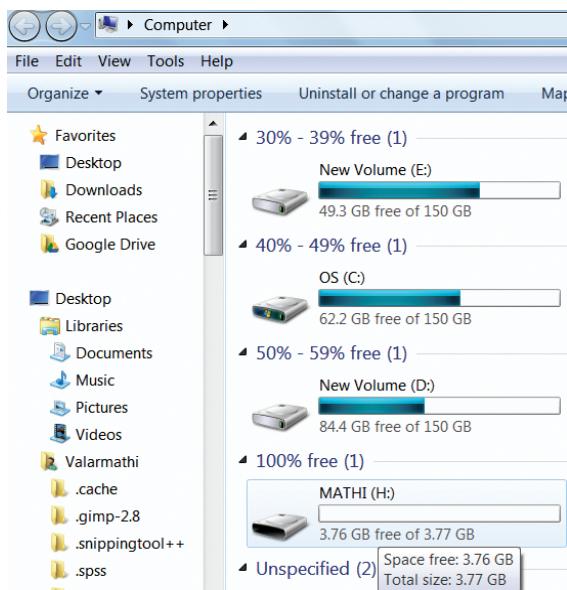


Figure 5.32. Double Clicking Removable Disk

- Navigate to the folders in your computer containing files you want to transfer.

Right-click on the file you want to copy, then select **Copy**. (Figure 5.33)

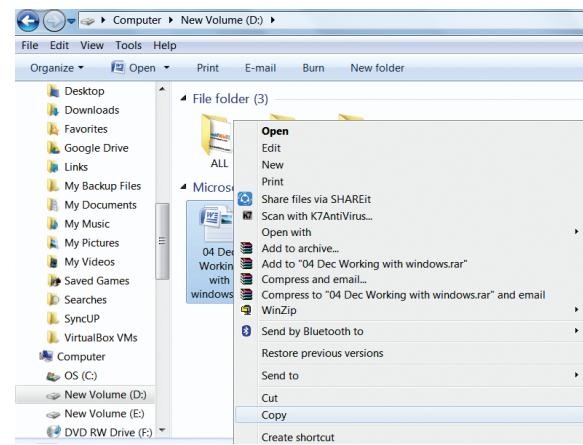


Figure 5.33. Copying File using right click

- Return to the Removable Disk window, right-click within the window, then select **Paste**. (Figure 5.34)

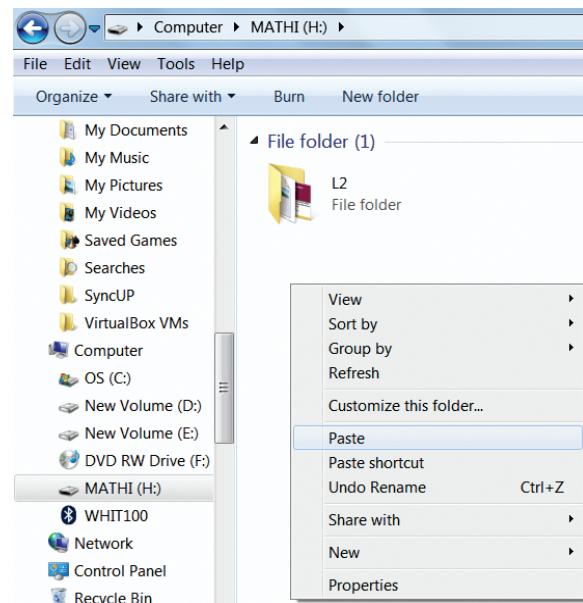


Figure 5.34. Pasting File using right click

## METHOD II - Send To

- Plug the USB flash drive directly into an available USB port.
- Navigate to the folders in your computer containing files you want to transfer.
- Right-click on the file you want to transfer to your removable disk.
- Click **Send To** and select the Removable Disk associated with the USB flash drive. (Figure 5.35)

## Workshop

6. • Move the file created by you in My Documents to Drive D:.
  - Copy the file created by you from drive D: to a removable disk.

### 5.11.7. Deleting Files and Folders

- When you delete a file or folder, it will move into the Recycle Bin.

#### To delete a file or folder:

Select the file or folder you wish to delete.

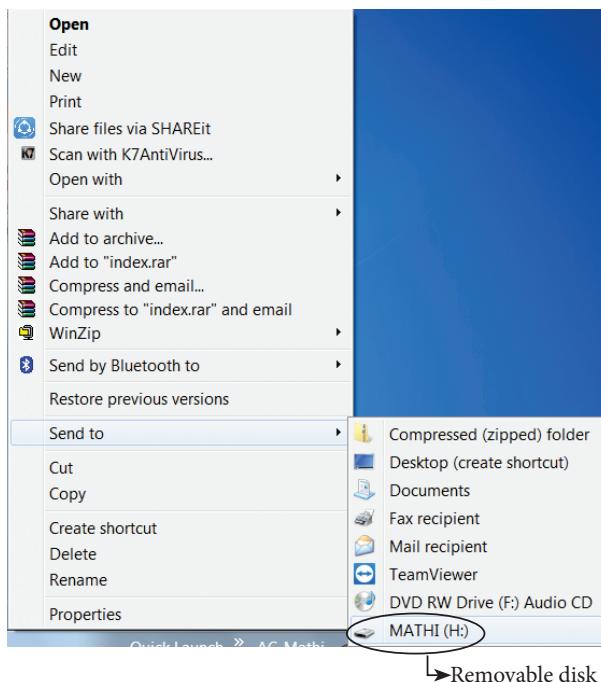


Figure 5.35. Copying File using Send to option

1. Right-click the file or folder, select **Delete** option from the pop-up menu or Click **File → Delete** or press **Delete** key from the keyboard.
2. The file will be deleted and moved to the Recycle bin.

## Workshop

7. Delete the file created by you after duplicating the same under My Documents.

#### Note

To permanently delete a file or folder (i.e. to avoid sending a file or folder to the Recycle Bin), hold down the SHIFT key, and press **delete** on the keyboard.



#### Recycle Bin

Recycle bin is a special folder to keep the files or folders deleted by the user, which means you still have an opportunity to recover them. The user cannot access the files or folders available in the Recycle bin without restoring it. To restore file or folder from the Recycle Bin

- *Open Recycle bin.*
- Right click on a file or folder to be restored and select **Restore** option from the pop-up menu.
- To restore multiple files or folders, select **Restore all items**.
- To delete all files in the Recycle bin, select **Empty the Recycle Bin**.

### 5.12. Creating Shortcuts on the Desktop

Shortcuts to your most often used folders and files may be created and placed on the Desktop to help automate your work.

- Select the file or folder that you wish to have as a shortcut on the Desktop.
- Right click on the file or folder.
- Select **Send to** from the shortcut menu, then select **Desktop (create shortcut)** from the sub-menu.
- A shortcut for the file or folder will now appear on your desktop and you can open it from the desktop in the same way as any other icon. Figure 5.36.

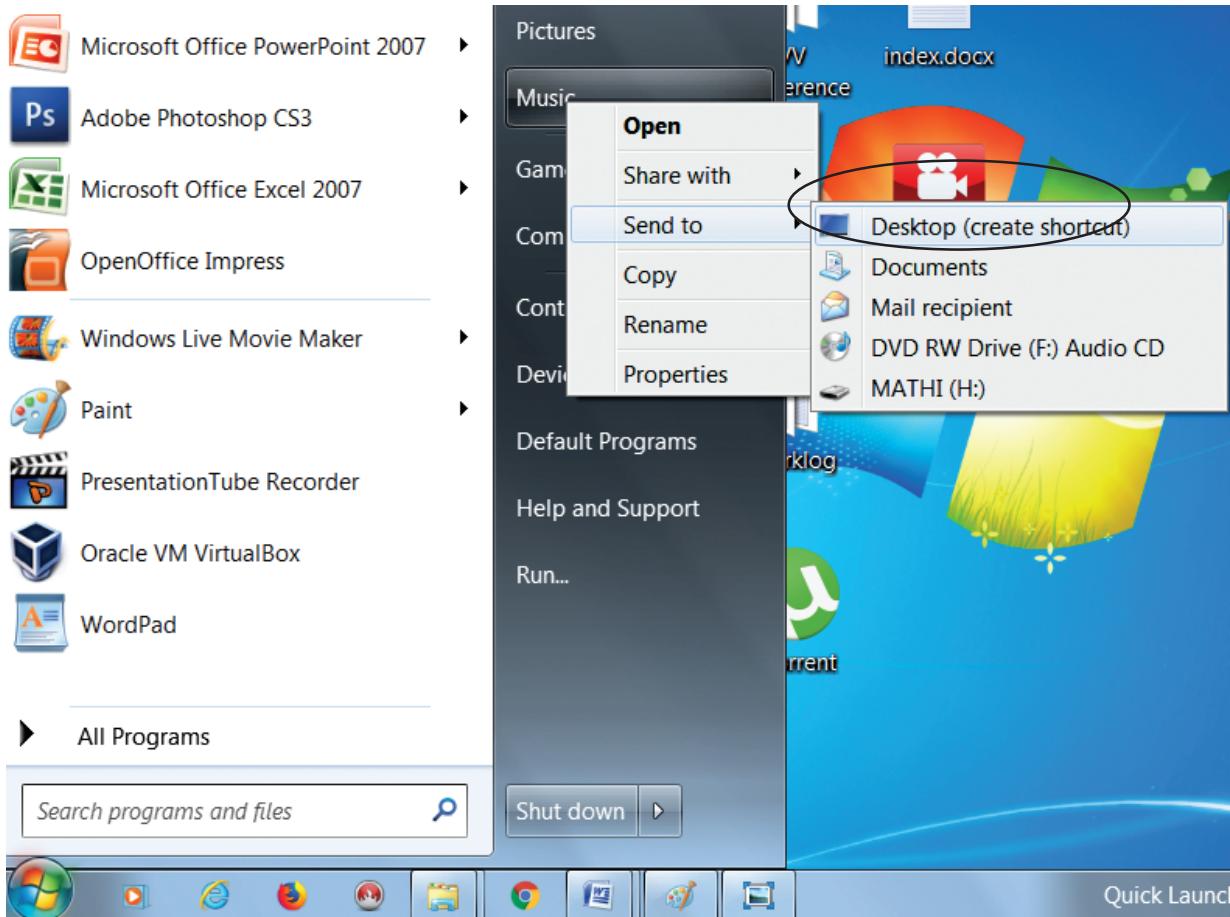


Figure 5.36 Creating Shortcut

### 5.13. Shutting down or Logging off a Computer

Once you have closed all open applications, you can either log off your computer or shut down the computer.

#### Log Off

To Log off/Shut down the computer:

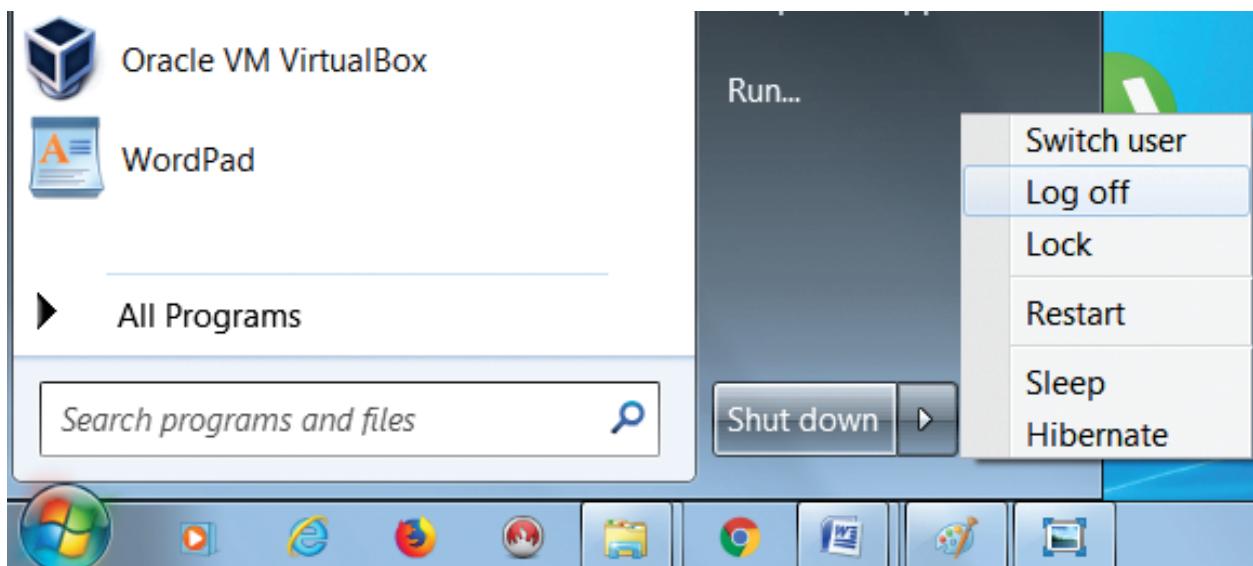


Figure 5.37. Log off option

- Click **start** → **log off** (click the arrow next to Shut down) or **Start** → **Shutdown**. (Figure 5.37.)
- If you have any open programs, then you will be asked to close them or windows will Force shut down, you will lose any un-saved information if you do this.
- **Switch User:** Switch to another user account on the computer without closing your open programs and Windows processes.
- **Log Off:** Switch to another user account on the computer after closing all your open programs and Windows processes.
- **Lock:** Lock the computer while you're away from it.
- **Restart:** Reboot the computer. (This option is often required as part of installing new software or Windows update.)
- **Sleep:** Puts the computer into a low-power mode that retains all running programs and open Windows in computer memory for a super-quick restart.
- **Hibernate** (found only on laptop computers): Puts the computer into a low-power mode after saving all running programs and open Windows on the machine's hard drive for a quick restart.



### Student Activity

1. Create files and folders using Windows and Ubuntu and compare them.
2. Create a File/Folder in Windows 7, Windows 8 and Windows 10. Prepare a report on the differences you face while creating the same.
5. The shortcut key used to rename a file in windows
  - F2
  - F4
  - F5
  - F6

### Evaluation



#### PART I

##### Choose the Best Answer



1. From the options given below, choose the operations managed by the operating system.
  - Memory
  - Processes
  - Disks and I/O devices
  - all of the above
2. Which is the default folder for many Windows Applications to save your file?
  - My Document
  - My Pictures
  - Documents and Settings
  - My Computer
3. Under which of the following OS, the option Shift + Delete – permanently deletes a file or folder?
  - Windows 7
  - MS-DOS
  - Linux
  - Android OS
4. What is the meaning of "Hibernate" in Windows XP/Windows 7?
  - Restart the Computer in safe mode
  - Restart the Computer in hibernate mode
  - Shutdown the Computer terminating all the running applications
  - Shutdown the Computer without closing the running applications
5. The shortcut key used to rename a file in windows
  - F2
  - F4
  - F5
  - F6

## PART II

1. Differentiate cut and copy options.
2. What is the use of a file extension?
3. Differentiate Files and Folders.
4. Differentiate Save and save As option.
5. How will you Rename a File?

## PART III

1. Analyse: Why the drives are segregated?
2. If you are working on multiple files at a time, sometimes the system may hang. What is the reason behind it.

3. How can you reduce it?
4. Are drives such as hard drive and floppy drives represented with drive letters? If so why, if not why?
5. Write the two ways to create a new folder.
6. Differentiate copy and move

## PART IV

1. Explain the versions of Windows Operating System.
2. Explain the different ways of finding a file or Folder
3. Write the procedure to create shortcut in Windows OS.



<b>Operating System (OS)</b>	System software that enables the hardware to communicate and operate with other software.
<b>Mouse</b>	Handheld hardware input device that controls a cursor in a GUI and can move and select text, icons, files, and folders.
<b>Windows</b>	Familiar operating system developed by Microsoft corporation.
<b>Desktop</b>	Opening screen of windows operating system.
<b>Icon</b>	Tiny image representing a command.
<b>Folder</b>	Container of files
<b>Linux</b>	An operating system.

## Part - I Introduction to Word Processor

### 6.1 An introduction to Word Processor

Word processor is a computer software to create, edit, manipulate, transmit, store and retrieve a text document. The above said activities are called as “Word Processing”. In other words, Word processing is an activity carried out by a computer with suitable software to create, edit, manipulate, transmit, store and retrieve text documents.

There are many word processing software available as proprietary source as well as open source. The familiar word processing packages are given in the following Table 6.1 given below.

Table 6.1 – Word Processing softwares

Proprietary source Word processing software		Open Source Word processing software	
Package	Developer	Package	Developer
Microsoft Word	Microsoft Corporation	OpenOffice Writer	Apache
WPS Word	Kingsoft	Libre Office Writer	The document foundation
WordPro	Lotus Corporation	Abiword	Abisource

### Tamil Word Processors

Tamil OpenOffice writer, Tamil LibreOffice Writer, Kamban 3.0, Mentamizh2017 – these are familiar word

processors exclusively for Tamil Language. Microsoft also provides full Tamil interface for all office suite.



In this chapter, you are going to learn about a word processor (OpenOffice Writer).

### 6.2 An Introduction to OpenOffice Writer

OpenOffice is the leading open-source office software suite for word processing, spreadsheets, presentations, graphics, databases and much more. It is available in many languages and works on all computers. It stores all your data in an International open standard format and can also read and write files from other office software packages. OpenOffice is easy to learn.

OpenOffice is a productive office suite with a collection of different software packages such as

- OpenOffice Writer - Word Processor to create text documents
- OpenOfficeCalc - Spreadsheet to create worksheets
- OpenOffice Base - Database
- OpenOffice Impress - Presentation software

- OpenOffice Draw-Drawing Software
- OpenOfficeFormula -Create formula and equations

OpenOffice Writer is the word processor component of OpenOffice. In addition to the usual features of a word processor (spelling check, thesaurus, hyphenation, autocorrect, find and replace, automatic generation of tables of contents and indexes, mail merge and others), Writer provides these important features:

- Templates and styles.
- Page layout methods, including frames, columns, and tables.
- Embedding or linking of graphics, spreadsheets, and other objects.
- Built-in drawing tools.
- Master documents—to group a collection of documents into a single document.
- Database integration, including a bibliography database.

- Database integration.
- Track changes to document.
- Export to PDF easily.

### 6.2.1 Download and Install OpenOffice

Download and Install the latest version of OpenOffice suite from <http://www.openoffice.org/download> at free of cost.

### 6.2.2 Creating a new document in OpenOffice Writer

A new OpenOffice Writer document can be created by various methods. From Windows, select

**Start → All Programs → OpenOffice → OpenOfficeWriter**

(or)

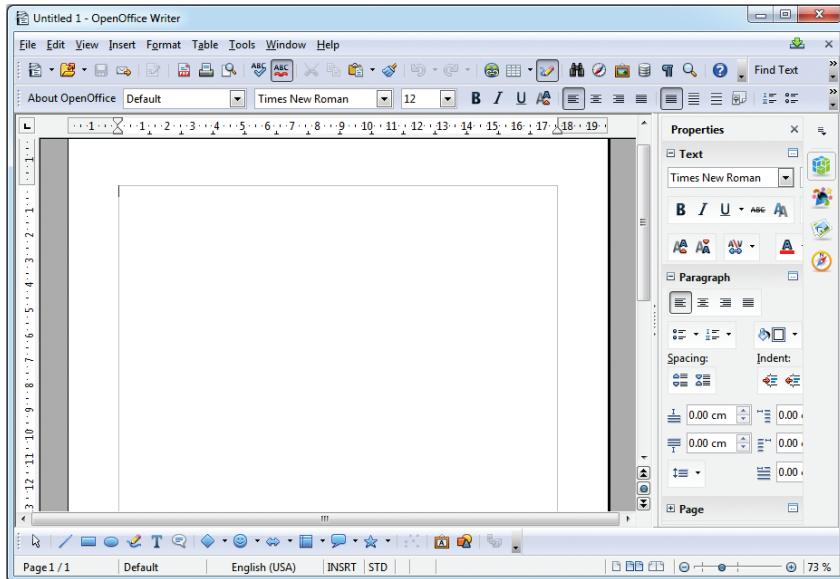
**From Star Center (Welcome Screen):**

- Double-click on “OpenOffice” icon on the desktop
- Now, a welcome screen appears as shown in Figure 6.1



Figure 6.1 Opening Screen (Star Center) of OpenOffice

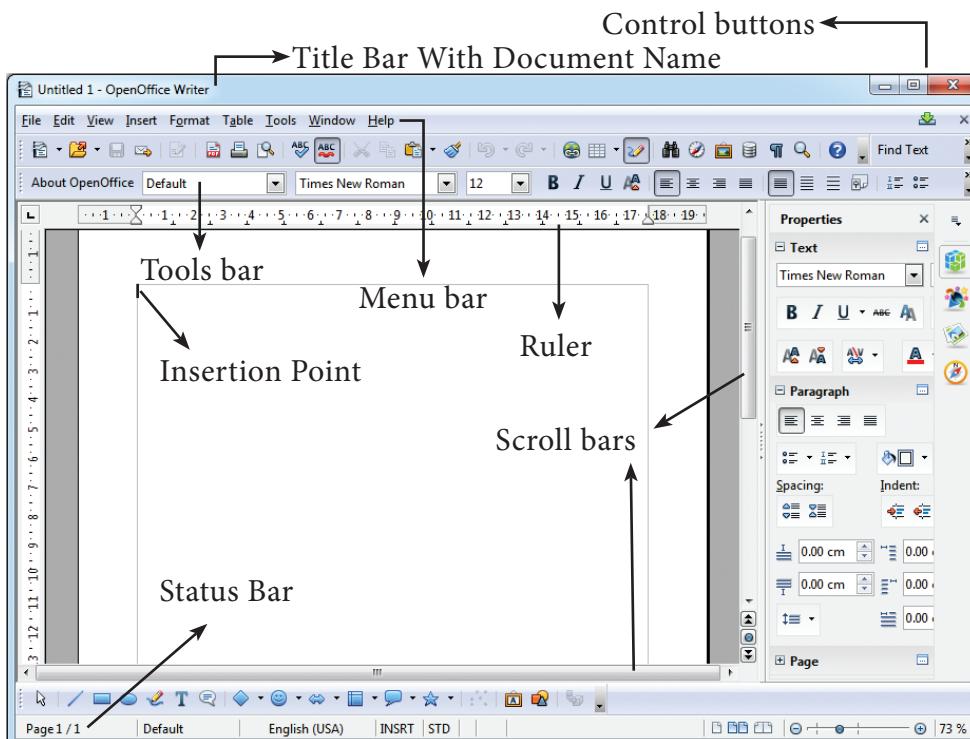
This opening screen is called as “Star Center”. Writer is one of the components of OpenOffice. So, it may be invoked from the “Star Center” by simply clicking on the “Text Document” icon. (or) A new text document can also be created by selecting File → New →Text Document (or)Ctrl + N keyboard short cut can also be used to open a new text document as shown in the Figure 6.2



*Figure 6.2 OpenOffice Writer Window*

### 6.2.3 Parts of Writer Window:

The Figure 6.3 displays the contents of OpenOffice Writer window such as Title bar, Menu bar, Standard Toolbar, Formatting Tool bar, Ruler, Work space and Status bar. The components of a OpenOffice Writer window in Figure 6.3 are explained below :



*Figure 6.3 Components of Writer Window*

## Title Bar

The title bar is displayed at the top of the window, which displays the name of the document and its application. By default, the initial document is given the name as Untitled1.

### Control Buttons:

At the right corner of title bar the controls buttons available are (1) minimize, (2) maximize/restore and (3) close.

#### (1) Minimize button:

When you click minimize button, it shrinks your document window smaller in size and shows it as a button on the taskbar(Refer figure 6.5). To restore it in its original size, place your mouse pointer on the OpenOffice button which is available in the taskbar, you can view your document as miniature and when you click on the button, your document is restored to its original size.

#### (2) Maximize button :

When you click maximize button, your document window is displayed in full screen. When it is in full screen, the maximize button is changed to “Restore”. When you click restore button, the document window regains to its original size.



Figure 6.4 – Sizing buttons



Figure 6.5 Miniature button of OpenOffice document

#### (3) Close button :

When you click close button, the current application is closed and OpenOffice returns back to the desktop. The red colored close button as shown in Figure 6.6 may also be called as “Exit” or “Quit”. There is another X mark on the right most corner of the menu bar. This is actually used to close your document. When you click this X mark, your document will be closed, OpenOffice will continue to be open condition.

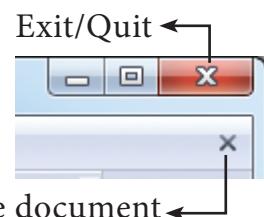


Figure 6.6 Close and close document button

## Menu Bar

The menu bar is below the title bar which comprises of various menus and each menu consists of various options(Refer figure 6.7):

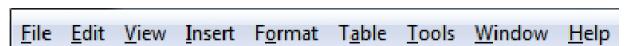


Figure 6.7- Menu bar

**File** –The File menu contains various options for file management tasks such as New, Open, Close, Save, Save As, Print, Export etc.

**Edit** – The Edit menu contains cut, copy, paste, Undo, Redo etc.

**View** – The View menu contains the options that is used to modify the environment of Writer such as display of toolbars, web layout, print layout, navigator etc.

**Insert** – The Insert menu contains options for inserting various elements such as pictures, tables, charts, comments, headers, footers, special characters etc.

**Format** – The Format menu contains options of various text and page formatting features like page size, layout, font characteristics, bullets and numbering etc.

**Tables** – The Tables menu contains various tools to manage and manipulate tables such to create a table, insert rows, insert columns, split cells, merge cells etc.

**Tools** – The Tools menu contains various tools and functions such as spell check,

macros, mail merge, end notes/footnotes etc.

**Window** – The window menu shows display options such as New Window, Close Windows, Split and Freeze.

**Help** – The Help menu displays the inbuilt help features available in OpenOffice.

### **Toolbar:**

Under the menu bar, there are two toolbars available by default. They are:

**(1) Standard Toolbar**

**(2) Formatting Toolbar**

**Standard Toolbar** – This tool bar is just below the menu bar which consists of shortcut icons for frequently performed tasks. There are many shortcut icons like cut, copy, paste, undo etc... (Refer figure 6.8)



Figure 6.8 –Standard Tool bar

**Formatting Toolbar** – The formatting toolbar is below the standard toolbar which consists of icons used for formatting the text like bold, underline, italics, font type, font color etc. (Refer figure 6.9)



Figure 6.9- Formatting toolbar

## Ruler

The ruler is a scale below the formatting tool bar which shows the margins. There are two set of rulers (1) Horizontal ruler and (2) Vertical ruler. Horizontal ruler is used to set left and right margins of a page and vertical ruler for top and bottom setting.



Figure 6.10 - Ruler

## Work Space

The work space is the blank area which is used to type the content of the file. A flashing vertical bar that appears at the beginning of the screen which is called as “Insertion pointer”.

## Status Bar

The status bar is at the bottom of the window which shows the current status of the document such as number of pages, current page number, default language etc.

### 6.2.4 Entering the Text

Once a new document is opened, the text can be typed in the blank area of the screen. As the text is typed they appear on the screen and the flashing vertical bar called the insertion pointer moves to the right. When the text reaches the end of the line, the word is automatically wrapped to the next line. This feature in any word processor is known as “Word Wrap”.

The **Enter** key must not be pressed at the end of the each line. The Enter key should be pressed only at the end of a paragraph or when a blank line is to be inserted. When a page is filled up, OpenOffice Writer automatically creates a new page.

### 6.2.5 Moving within the document

There are different ways of moving around a document. The shortcut keys given in Table 6.2 are used to move easily within a document.

Table 6.2 – Short cut keys

KEY	ACTION
→	To move a character right
←	To move a character left
↑	To move one line up
↓	To move one line down
Ctrl + →	One word right
Ctrl + ←	One word left
Ctrl + ↑	One paragraph up
Ctrl + ↓	One paragraph down
Home	To the beginning of line
End	To the end of line
Ctrl + Home	To the beginning of document
Ctrl + End	To the end of document
Tab	To move one cell to right
Shift + Tab	To move one cell to left
Pg up (Page Up)	To scroll one screen up
Pg Down (Page Down)	To scroll one screen down

### 6.2.6 Saving the Document

The first time the document is saved, OpenOffice Writer prompts for a name. Naming the file enables the user to find and open that file again. One can select the drive and folder where the file will be stored. To save a document for a first time, the following steps are used:

- Click File → Save (or) File → Save As (or) Ctrl + S
- “Save As” dialog box appears as on Figure 6.11.

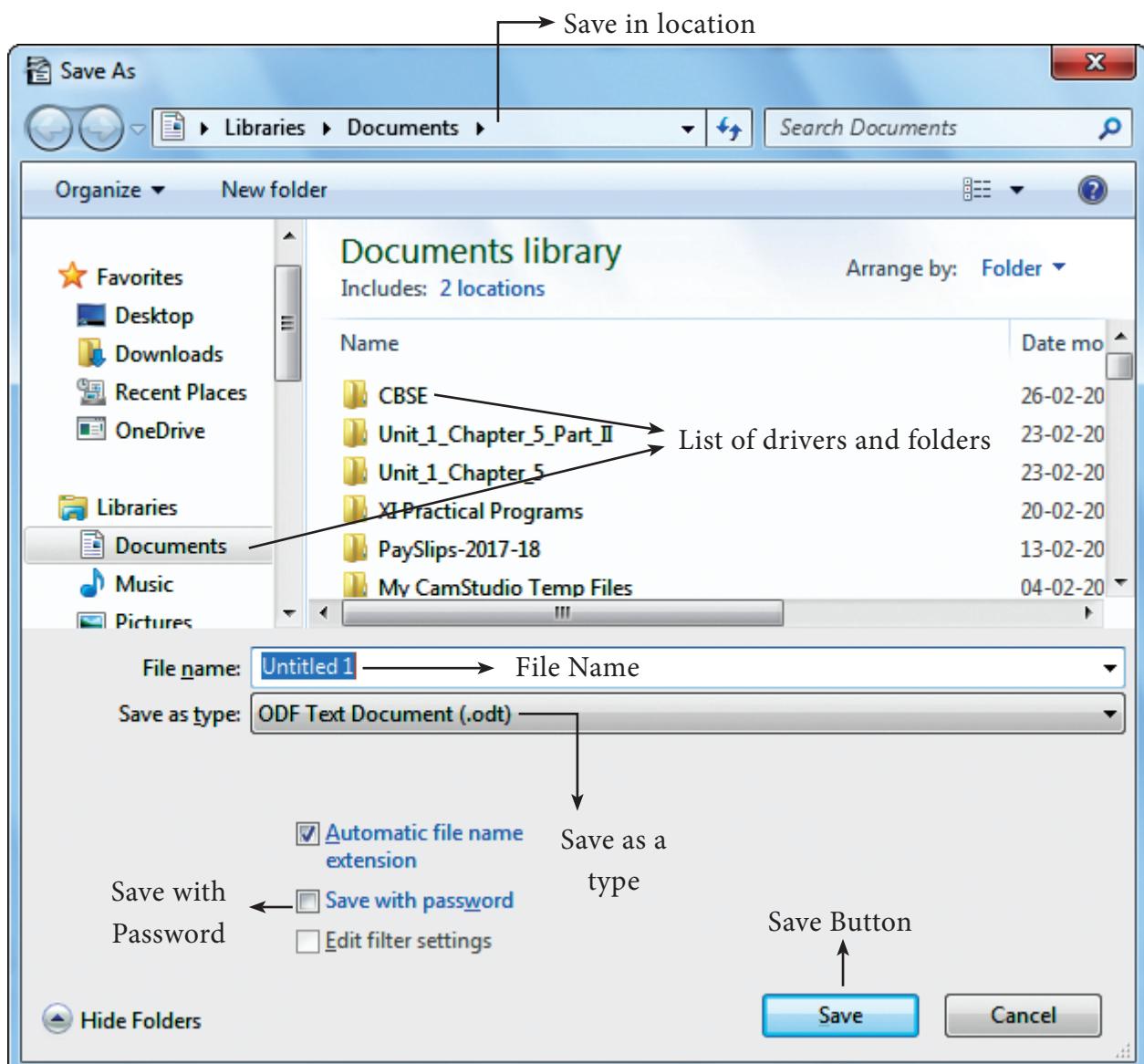


Figure 6.11-Save As dialog box

- Select location to store your document. The default location to store all documents is “Documents” folder in Windows.

- Type your document name in the File Name text box.
- All documents in OpenOffice Writer will be stored with **.odt** extension. You can store your OpenOffice document as Microsoft Word document or **.pdf**. To do so, select file type from **Save as list box** and select the required file type.
- Finally, Click “**Save**” button.
- Once the file is saved, your document name will be displayed on the title bar.

### Saving with password

In OpenOffice Writer, a document can be protected with a password. You can set a password to protect your document while saving a file. To save a file with password, click on “**Save with Password**” check box in Figure 6.11 and then click “Save” button. Immediately it shows “Set Password” dialog box as shown in Figure 6.12.



Figure 6.12 – Password dialog box

In this dialog box, Enter a password in “Enter Password to open” text box and retype the same password in “Confirm Password” box for confirmation. Finally click “**OK**” button.

### 6.2.7 Closing a Document

After your document is saved, it is still open. So, you can continue typing your document. When the work is finished, you should save the document and close the document using **File → Close** command (or) Press **Ctrl + W**.

#### Closing Unsaved Document:

When you close an unsaved file using the close control button, Writer shows a warning message (Refer Figure 6.13).

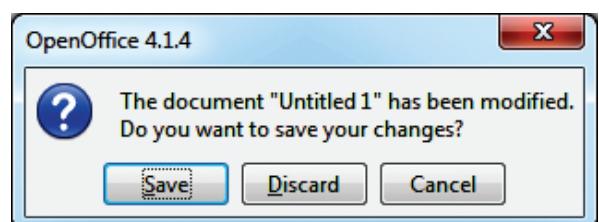


Figure 6.13 Alert Message box

If you accept the warning message, click the “**Save**” button. When you click the “**Save**” button, it proceeds to save the file. If you are not willing to save the file, then click “**Discard**”, or if you want to cancel this warning and continue working in the same document, click “**Cancel**”.

### 6.2.8 Opening an existing document

Once a document is saved, it can be opened at any time. To open an existing document, Click on the **File → Open** or

**Ctrl + O**, the Open dialog box appears, enter the name of the file in the File name text box and click the OPEN button as in Figure 6.14.

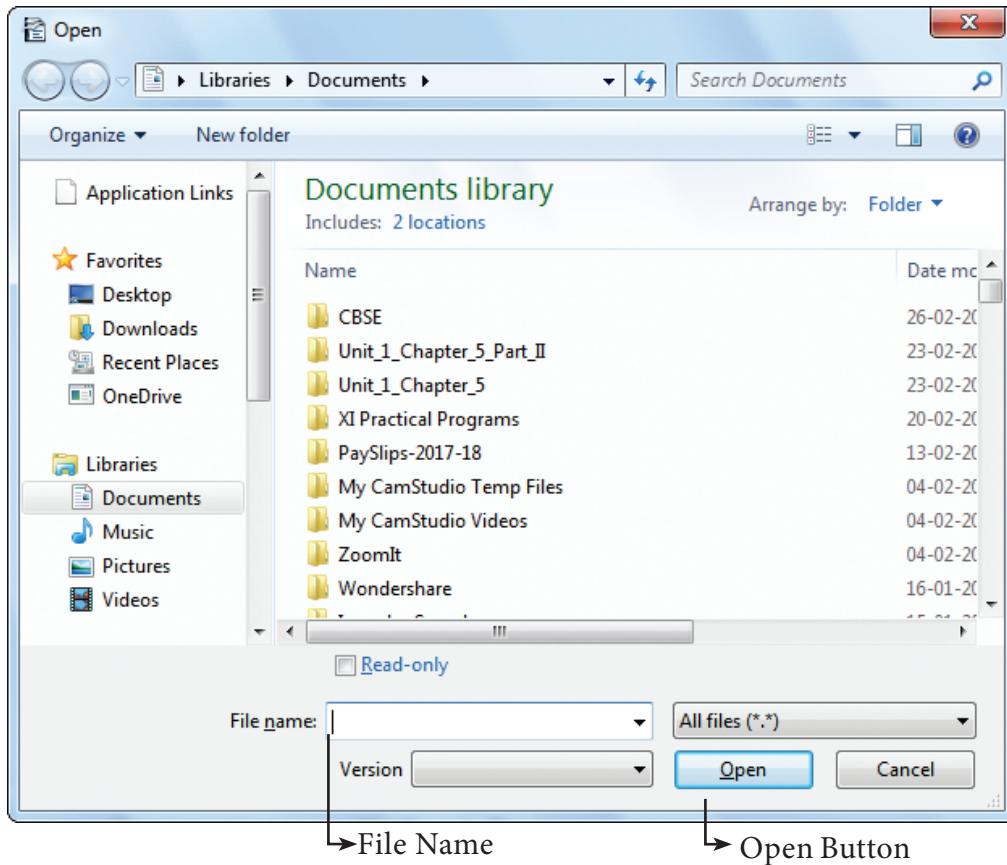


Figure 6.14 – Open dialog box

### 6.3 Tamil Typing Interface

Typing in Tamil has different methods.

- Using Tamil Font
- Using Tamil Interface.

In the first method specific Tamil fonts are available which has to be downloaded and installed and should be included in the font folder of the control panel. But this method has some drawbacks:

- The user must be aware of Tamil typing.
- The particular font must be available in the system.
- It does not support other languages including English.

- The computer accepts characters as symbols not as language.
- It is not portable, i.e. if the document is sent to another computer, if the same font is not available, it is recognized as symbols not as original characters.

To overcome the drawbacks in the first method, the interface method provides the following advantages:

- It follows Unicode technique. Hence knowledge of Tamil typing is not necessary.
- It is easy to type documents in Tamil in any word processor.
- Some of the Unicode fonts like “Arial Unicode” supports all Indian languages including Tamil and English using respective language interface.

### 6.3.1 Download and Install Tamil Typing Interface

Many Tamil Typing Interfaces are available as open source such as “Murasu”(it is exclusively for Tamil), “NHM Writer”(It is universal to all Indian languages) etc.

To download and install:

- “Murasu” use the link : <http://anjal.net/download>
- “NHM writer” use the link : <http://software.nhm.in>

### 6.3.2 Connecting with Writer

Once the Tamil Interface is downloaded and installed in your

computer, each time you start, the interface automatically gets activated and this is indicated by a unique symbol in the notification area. By default the shortcut keys are set as Alt+1 for English and Alt+2 for Tamil and it can be changed. For different languages shortcut keys can be assigned.

### 6.3.3 Entering Text in Tamil

**Step 1 :** Open a new document in Writer.

**Step 2 :** Press Alt+2 to type in Tamil, Alt + 1 to type in English.

The keyboard structure for Tamil interface is given in Annexure-2:

Different styles of Unicode Tamil fonts can be downloaded from this link:<http://www.tamilvu.org/tkbd/indexen.html>

## 6.4. Editing a document

Once a document is typed, it can be edited in many ways. If there is some insertions or deletions, it can be done while typing or after typing also. Corrections can be made in two different ways :

**Backspace Key:** Deletes the character to the left of the insertion pointer

**Delete Key :** Deletes the character to the right of the insertion pointer

To insert new text in between, if something is left out, insertion can be made by taking the insertion pointer to the current location and Press the Insert Key, the newly typed text is inserted, and the existing text moves to the right. This is **Insert mode**. Press the **Insert Key** again,

the text is over written on the existing text. This is known as **Type over mode**. You can toggle between the insert mode and type over mode by pressing the **Insert Key**.

## 6.5 Select, Move and Copy text

### 6.5.1 Selecting Text

In any word processor, the text has to be selected for performing any operation like copying, moving, formatting etc. The text selection can be done in two methods:

- i) Selecting the Continuous text.
- ii) Selecting the Non-continuous text.

**Selecting the Continuous text** – To select the text continuously move the insertion pointer to the begining of the text,

- Hold the **SHIFT** key and drag the mouse across until the required text is selected and then release the **SHIFT** key.
- The selected text can be used for any operation.

#### Selecting the Non-continuous text-

To select the text not continuous, move the insertion pointer to the begining of the text,

- Hold the **CTRL** key and drag across the required text is to be selected and release the **CTRL** key.
- The selected text can be used for any operation.

### Selection by Different methods:

#### Selection using Mouse :

To select the text using mouse:

- (i) Move the insertion pointer to the begining of the text
- (ii) Hold down the **Left mouse** button and drag it across the text
- (iii) Release the mouse button when the required portion of text is selected
- (iv) The selected text will be highlighted.

#### Selection using Keyboard :

To select the text using keyboard :

- (i) Move the insertion pointer to the begining of the text
- (ii) **Hold** the **SHIFT** key and use the movement keys to drag across the required portion.
- (iii) When the required portion is selected release the **SHIFT** key
- (iv) The selected text will be highlighted.

#### Selection using Short Cut Keys:

Short cut keys help to select the text quickly and easily

- To select a word - Double click on the word
- To select the entire document – Press **Ctrl + A**

## 6.5.2 Moving and Coping text

### Moving text

To move a text from one location to another

- select the text to be moved
- Click **Ctrl + X** or Cut Icon  or **Edit → Cut**
- The text is removed from the source location and placed in the clipboard
- Take the insertion pointer to the new location to be moved and
- Click **Ctrl + V** or Paste Icon  or **Edit → Paste**

The required text is moved to the new location.

### Copying text

To copy a text from one location to another

- select the text to be copied
- Click **Ctrl + C** or Copy Icon  or **Edit → Copy**
- A duplicate copy of the text is made and sent to the clipboard
- Take the insertion pointer to the new location to be copied and
- Click **Ctrl + V** or Paste Icon  or **Edit → Paste**

The required text is copied to the new location.

The Editing shortcut keys are as given in Table 6.3.

Table 6.3 Cut, Copy , Paste Icons and shortcut keys

OPERATION	ACTION	ICONS	SHORTCUT KEY
CUT	Cuts the selected text		Ctrl +X
COPY	To make a duplication of the text.		Ctrl +C
PASTE	To paste the text to a new location after cut or copy process.		Ctrl +V
UNDO	Cancels the previous operation that was performed		Ctrl +Z

## 6.6 Help System in Writer

OpenOffice Writer provides several forms of help. By pressing F1 or select Help from the menu bar the help window appears as shown in Figure 6.15:

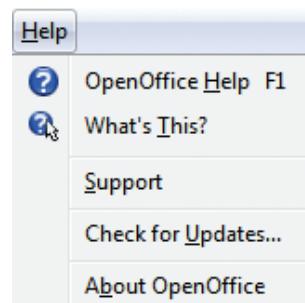


Figure 6.15 Help window

- To activate tooltips, extended tips, and the help Agent, click Tools → Options → OpenOffice

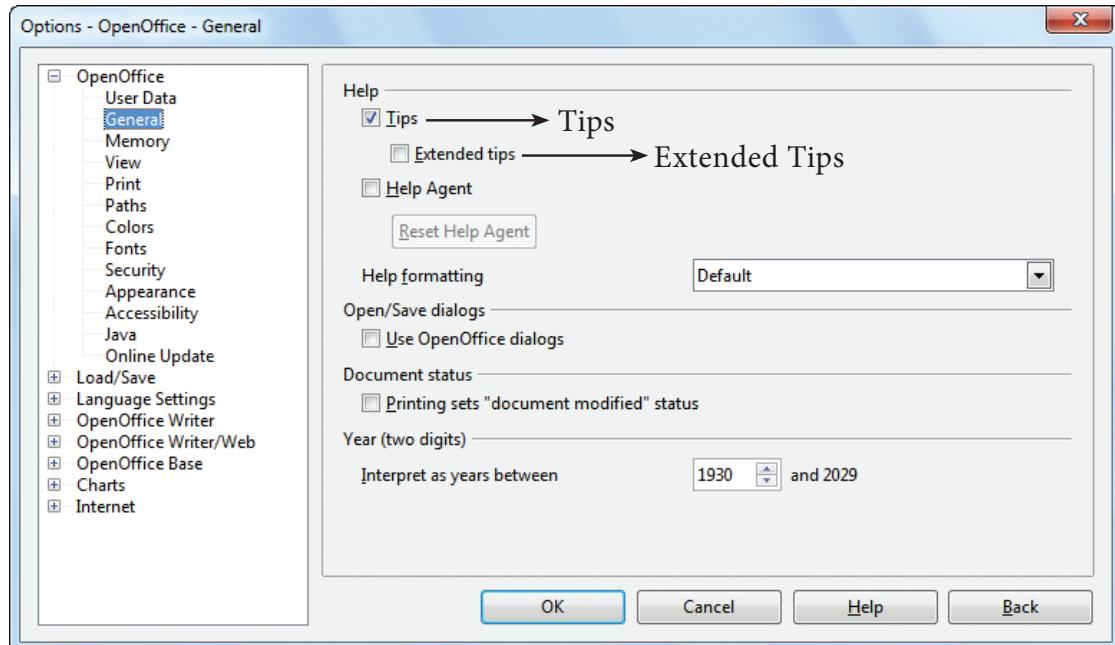


Figure 6.16 – General settings window

- For a more detailed explanation, select Help → What's This? and hold the mouse pointer over the icon where you want more help Figure 6.16 shows the general setting window.

## Workshop

6 -1 Open a new document in Open office writer.

- Type the following paragraph.
- “The ignited minds of the youth is the most powerful resource on the earth. The power of the youth, if properly directed, will bring about transformed humanity by meeting its challenges and bring peace and prosperity.”
- Save and close the document.
- Exit from Open Office Writer.

6.2 Open the document created in Workshop 6.1.

- Append the following paragraph.

- “We are as young as our faith and as old as our doubts. We are also as young as our self-confidence and as old as our fears. We are as young as our hopes and as old as our despairs.”
- Save the document
- Using Delete or Backspace key remove the last line of the first paragraph.
- Type the following lines after the second paragraph and create it as a new paragraph.
- “It doesn’t matter who you are, if you have a and determination to achieve that vision, you will certainly do so.”
- In the third paragraph insert the word “vision” between “a” and “and ”.

- |                                                                                                                                                                                                                                                                |                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>6.3 Open the document created in workshop-6.1.</p> <p>2. Copy and paste the following words into a new document either using keyboard or mouse shortcuts.<br/>         Ignited (ii) powerful (iii) humanity<br/>         (iv) challenges (v) prosperity</p> | <p>3. Save the new document</p> <p>4. In the first document, move the following words either using keyboard mouse shortcuts.</p> <p>(i) Ignited (ii) Challenges<br/>         (iii) Prosperity</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Part - II Formatting text and Paragraph

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### 6.7 Text formatting

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A text without any special formatting gives a monotonous appearance. OpenOffice Writer offers a number of choices for formatting such as bold or italics, defining the font, type, and font size. Bold, italic underlined are the most common types of text formatting. Almost all the formatting options are available under the **Format menu**.

#### 6.7.1 Changing font style, size and colour

A font is a set of characters in a particular style. Changing the default appearance of the text like changing the font type , size, color, style etc., are called as **Text formatting**. To make the text attractive and more appealing, various formatting like bold, italic and underline can be done by using the following commands given in Table 6.4.

**Table 6.4 Text formatting shortcuts**

OPERATION	ACTION	ICON	SHORTCUT KEY
BOLD	Makes the text bold		Ctrl+B
ITALICS	Italicizes the text		Ctrl +I
UNDERLINE	Underlines the text		Ctrl +U

The default font type is Times New Roman and the type of font can be changed by clicking on the Font Type icon. 

The default size of font is 12 points which can be changed by clicking on the Font Size icon . 

The default font color is black and the font color can be changed by clicking on the **Font color** icon  which shows the color palette from which the required color can be selected.

Besides the regular formatting like Bold, Italics and underline, other formatting options can be done by using **Format → Character**. The Character dialog box is displayed as shown in the Figure 6.17 appears, using which all the formatting can be done easily.

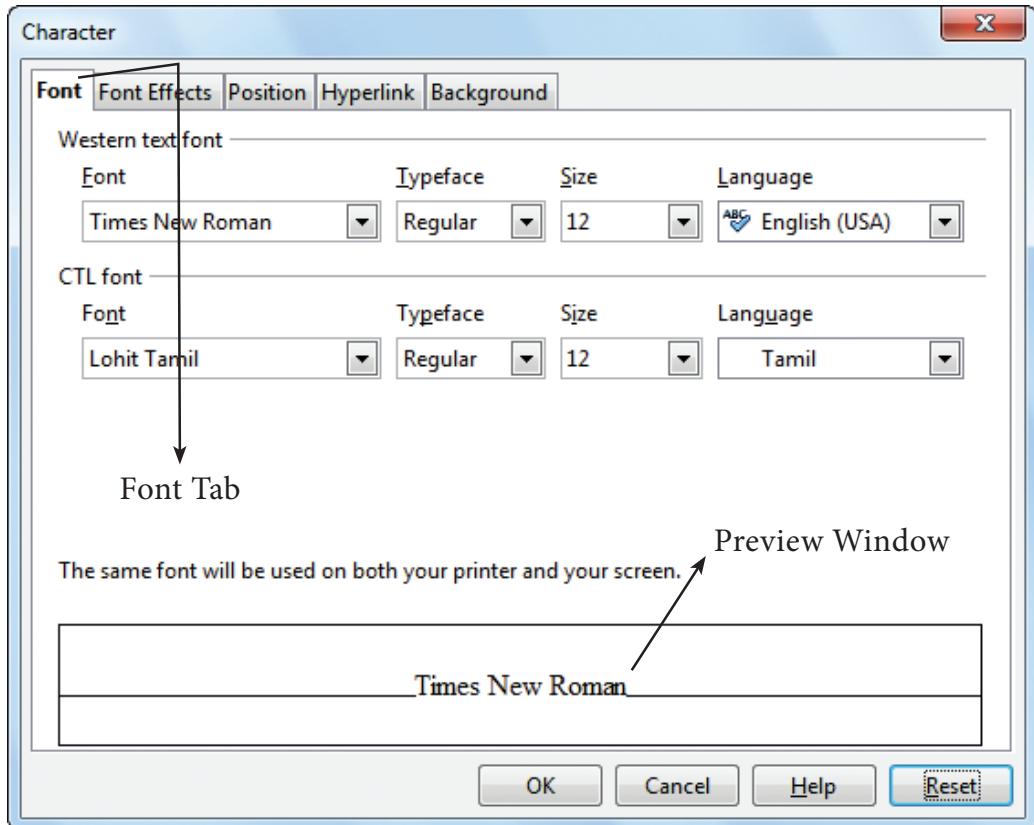


Figure 6.17 – Character dialog box

### 6.7.2 Changing Case

Normally any text can be typed in upper or lower case. The text can be changed to different cases like

- Uppercase(Capital letters),
- toggle case(reverse case),
- sentence case(first letter of each sentence capital),
- Capitalize every word(first letter of each word capital),
- lower case (small letters).

**This can be done by :**

- Select the text to change case
- Select **Format → Change case**.

### 6.7.3 Highlighting text

Highlighting is used to draw attention to important information in a text. Highlighting is beneficial because it first asks the reader to pick out the important parts, and then gives an effective way to review that information later.

Highlighting can be applied by selecting the text and click **Highlighting** icon , the color palette is displayed, select the required color, and the text is highlighted. Highlighting can be removed by selecting the text and click **No Fill** from the color palette.

Note 

Highlighting is to draw attention to important or key points in a document for easy reference by marking it with a different color.

### 6.7.4 Clearing the formatting

To clear the formatting applied to the text.

- Select the entire document by Ctrl + A or Edit →Select All,
- clear the formatting by Ctrl + M.

## 6.8 Paragraph formatting

A paragraph is any text that ends with a hard return. A hard return is accomplished any time you press the Enter key. Paragraph Alignment or justification refers to the way in which the lines of a paragraph are aligned. Paragraph alignment lets you to control the appearance of individual paragraphs. There are four types of alignment available in OpenOffice

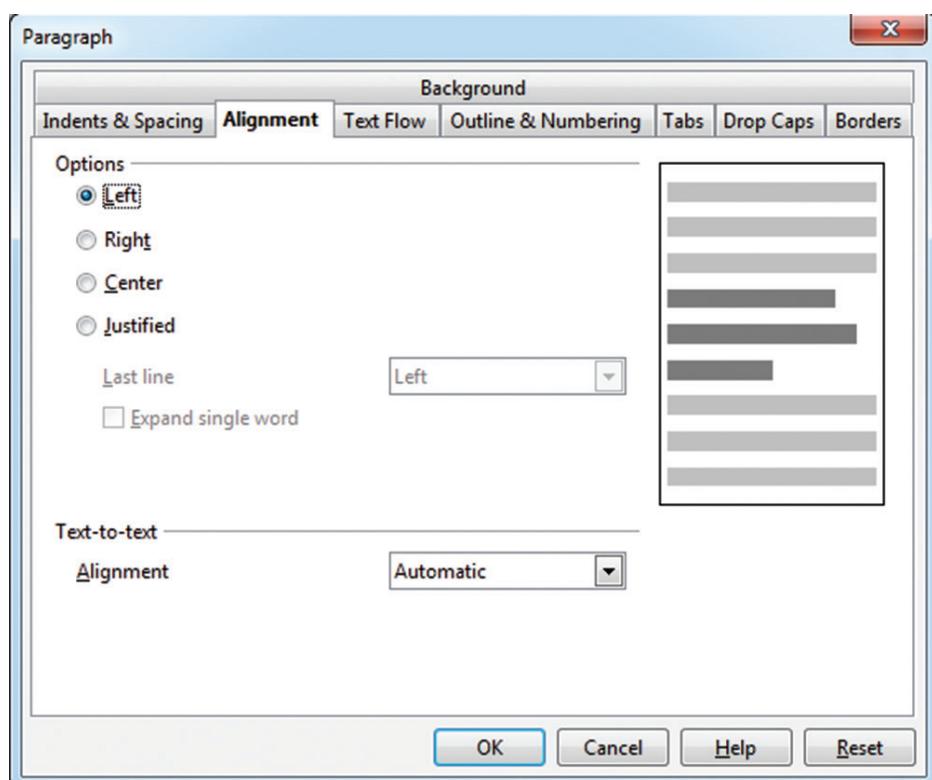


Figure 6.18 – Paragraph dialog box

Writer-Left-alignment, Right-alignment, Center-alignment, and Justified-alignment.

**Left-alignment** - A paragraph's text is LEFT aligned when it is aligned evenly along the left margin and uneven along the right margin. This is the default alignment when a paragraph is typed.

**Right-alignment** - A paragraph's text is RIGHT aligned when it is aligned evenly along the right margin and uneven along the left margin.

**Center-alignment** - All the lines in the paragraph are aligned to the center of the page size.

**Justified-alignment** - All the lines in the paragraph, are arranged evenly both on the left and right margins. This is achieved in writer by automatically inserting additional space between the words.

Paragraph formatting can be applied by **Format→Paragraph**, the paragraph dialog box appears as displayed in Figure 6.18.

The paragraph formatting can also be done by icons using the formatting tool bar as shown in Figure 6.19 and shortcut keys as shown in Table 6.5.

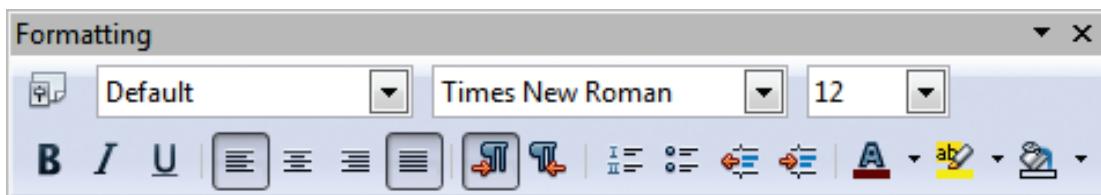


Figure 6.19 – Formatting toolbar

Table 6.5 Paragraph Alignment Icons and Shortcut keys

ALIGNMENT	ACTION	ICON	SHORT CUT KEY
LEFT	Aligns the paragraph with respect to the left margin		Ctrl + L
RIGHT	Aligns the paragraph with respect to the right margin		Ctrl + R
CENTER	Aligns the paragraph with respect to the center of the page		Ctrl + E
JUSTIFIED	Aligns the paragraph with respect to both the left and right margin		Ctrl + J

## An example showing all the four paragraph alignment :

### Left Alignment

All power is with in you take up one idea, make that one idea your life. Think of it dream of it, live on that idea let the brain, muscles, nerves, every part of your body be full of that idea, and just leave every other idea alone. This is the way to success.

### Right Alignment

All power is with in you take up one idea, make that one idea your life. Think of it dream of it, live on that idea let the brain, muscles, nerves, every part of your body be full of that idea, and just leave every other idea alone. This is the way to success.

### Center Alignment

All power is with in you take up one idea, make that one idea your life. Think of it dream of it, live on that idea let the brain, muscles, nerves, every part of your body be full of that idea, and just leave every other idea alone. This is the way to success.

### Justified Alignment

All power is with in you take up one idea, make that one idea your life. Think of it dream of it, live on that idea let the brain, muscles, nerves, every part of your body be full of that idea, and just leave every other idea alone. This is the way to success.

### *Example 6.1 Paragraph Alignment*

#### 6.8.1 Line Spacing

Line spacing determines the amount of vertical space between lines of text in a paragraph. By default, the lines are single line spaced. The easiest method to change the line spacing is to right-click on the line and select line spacing from the pop up menu, the pop up menu provides three options single, 1.5 lines or double from which the user can select the desired type (Refer figure 6.20).

To Change the line spacing using paragraph dialog box.

- Select the required text
- Select **Format → paragraph**
- The paragraph dialog box appears, click on Indents & Spacing tab
- In the line spacing drop down, select the required line spacing (there are seven different types of line spacing) and
- click OK button.

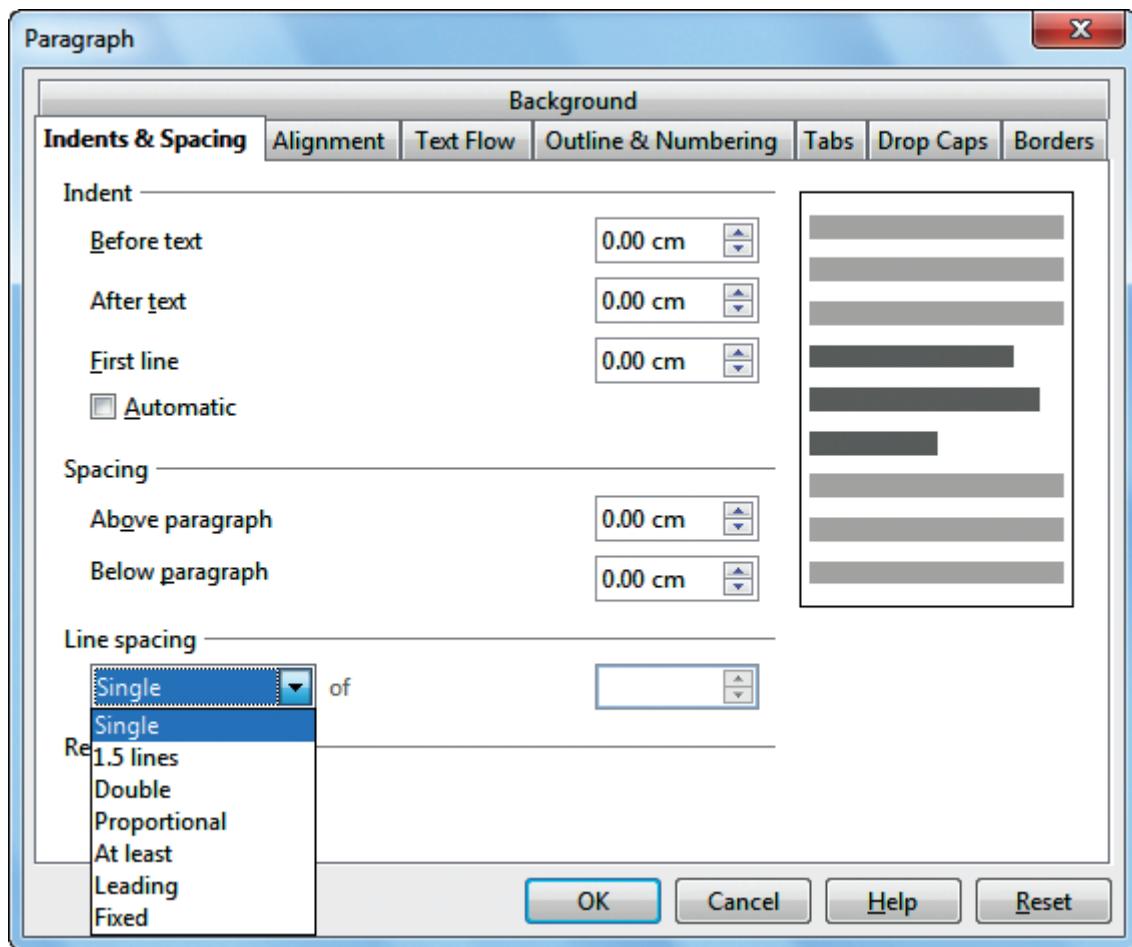


Figure 6.20 Paragraph dialog box

### 6.8.2 Indenting text

Indent is the distance from the left and right margin of a paragraph. It is used to improve the efficiency and readability of the paragraph and makes the paragraph look more attractive. In paragraphs, an easy way to apply indent for the first line of text can be created by moving the insertion pointer to the beginning of the line and pressing the tab key on the keyboard.

There are two ways to apply indents:

- Using Icons
- Using Dialog Box

**Using Icons :**

**Increase Indent Icon ** : The increase indent icon controls the space between the paragraph and the left margin. Each click on the Increase indent icon moves the paragraph  $\frac{1}{2}$  inch away from the left margin.

**Decrease Indent Icon ** : This is reverse of increase indent. It undoes the indent applied by increase indent. Each click on the Decrease indent icon moves the paragraph  $\frac{1}{2}$  inch away from the right margin.

## Using Dialog Box:

Format → Paragraph displays the paragraph dialog box as shown in Figure 6.20, select the Indent & Spacing tab which has the indent group which has three options.

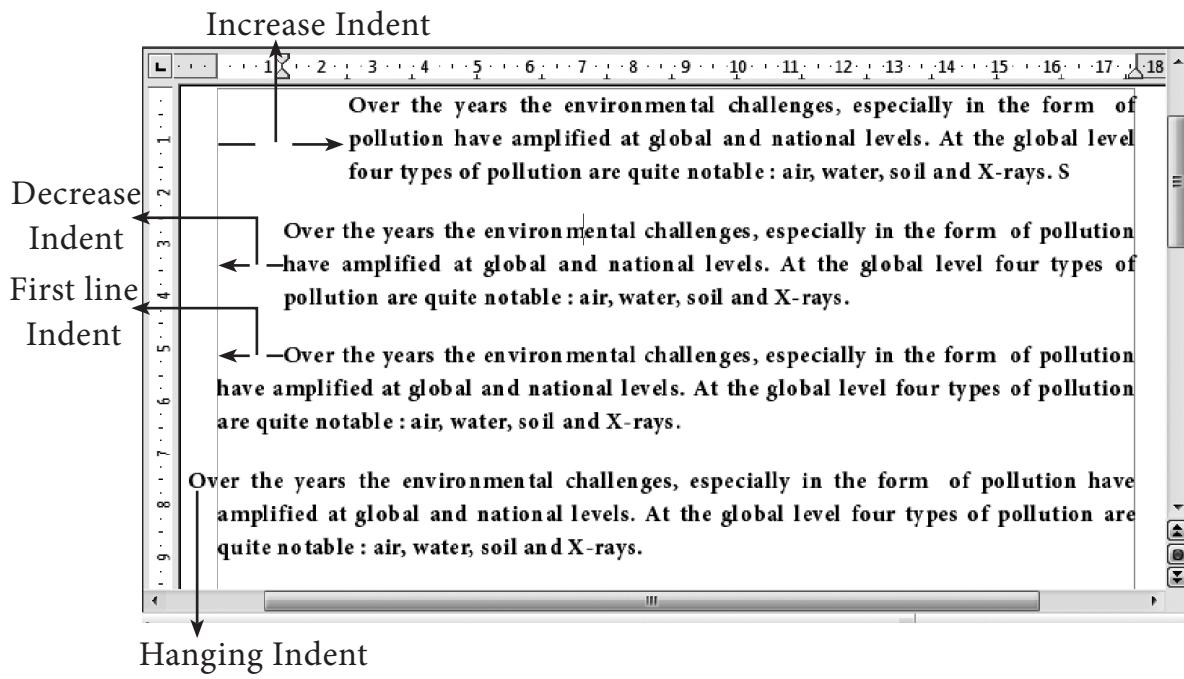
**Left Indent** : This is the default indent where a paragraph is moved away from the left margin. In the paragraph dialog box, in the “**Before Text**” spin box as shown in Figure 6.20, enter a value which moves the paragraph away from the left margin.

**Right Indent** : This is another type of indent which moves the paragraph away from the right margin. Enter a value in the “**After text**” spin box of the paragraph dialog box, which results in right indent.

**First Line Indent** - A first-line indentation indents the first line of the paragraph. It is the most common way to start a new paragraph. This indent can be applied by Format → Paragraph → Indents & Paragraph tab, select first line option in the indent group, enter a positive value which results in first line indent.

**Hanging indent** – This is a special kind of indent where the first line of the paragraph alone hangs outside leaving the rest of the text. To apply Hanging indent, a negative value is given in the “**first line**” option of the paragraph dialog box.

Example 6.2 shows different kinds of indents.



Example 6.2 - Different kinds of Indents

### 6.8.3 Bullets and Numbering

Bullets and numbering are used to emphasize list of things and make list easy to read and follow. It provides an excellent way to control the appearance in the form of bulleted or numbered list.

**Bullets** – This icon is used to add a bullet character to the start of each paragraph. This is suitable when the text has to be presented as a list of items preceded by a bullet symbol and no sequence has to be followed. Bullets are quickly created by clicking on the **Bullet** icon .

**Numbering** – This icon is used to add a numeral to the start of each paragraph. Numbering is more suitable when the text has to be presented as a sequence. In numbered list, each paragraph begins with an expression that includes a number or letter and a separator such as a period or parenthesis.

The numbers in a numbered list are updated automatically when you add or

remove paragraphs in the list. Numbering is quickly created by clicking on the **Numbering** icon .

#### 6.8.4 Style of Bullets and Numbering -

The default type of bullet is ( . ) and the default type of numbering is (1, 2, 3 .....). The style of bullets and numbering can be changed by applying the following steps:

- Select the text to be bulleted
- **Format → Bullets and Numbering**
- Select **Bullets Tab**
- The Bullets and Numbering dialog box appears with different styles of bullets are displayed

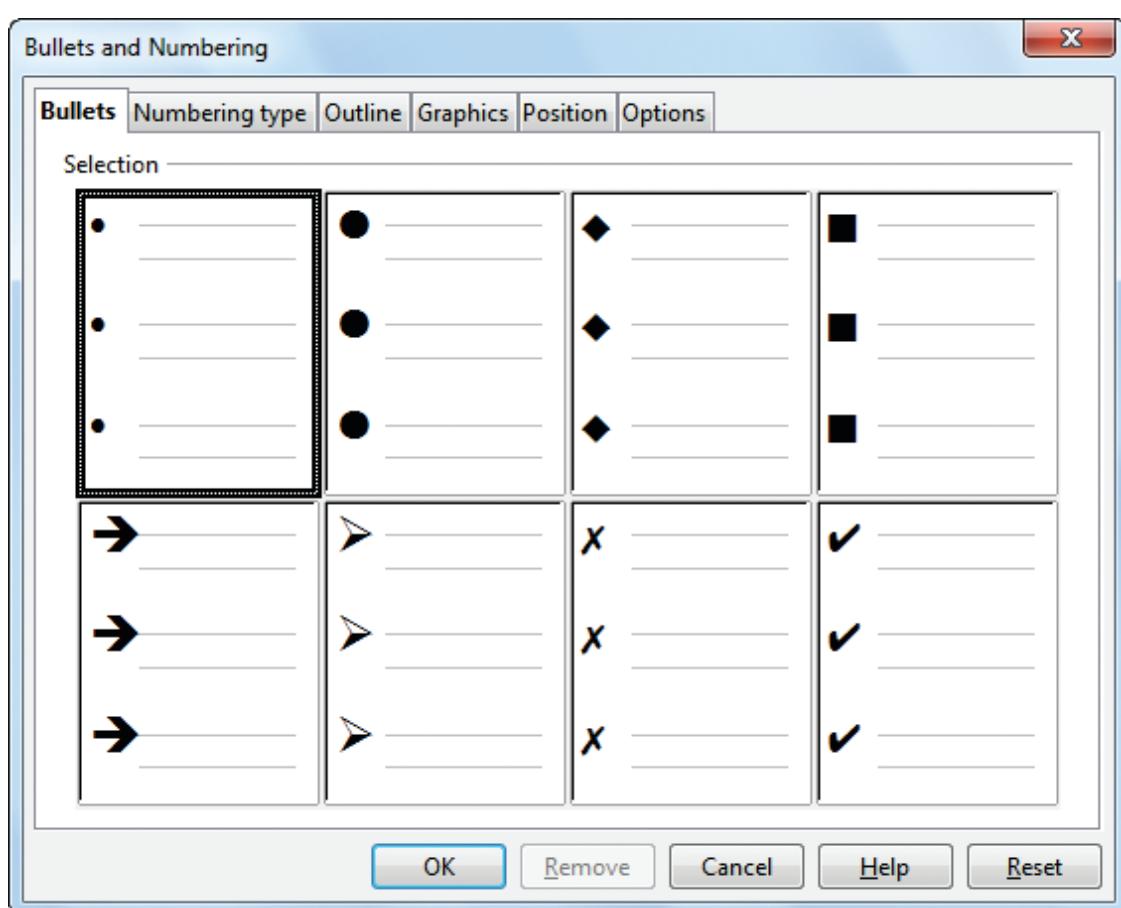
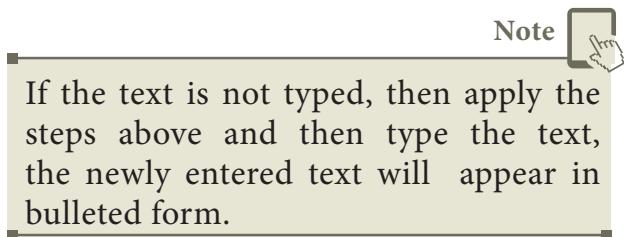


Figure 6.21 Bullets and Numbering dialog box

- Click on the required style
- Click **Ok** button

The selected text is bulleted.

The Bullets and Numbering dialog box with the bullets tab is displayed in Figure 6.21.

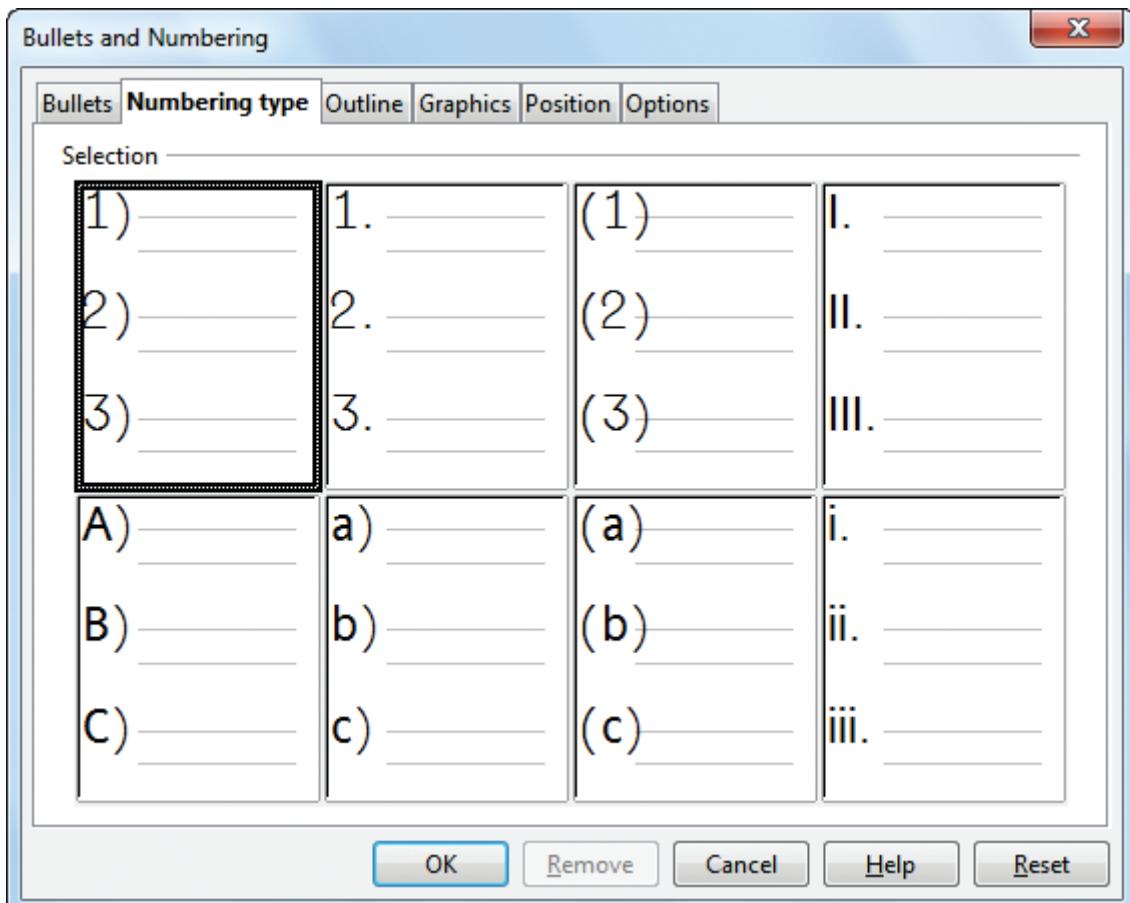
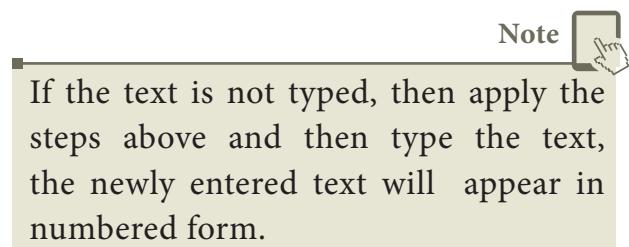


To apply Numbering

1. Select the text to be numbered
2. **Format → Bullets and Numbering**

3. Select **Numbering type** Tab
4. The Bullets and Numbering dialog box appears with different styles of numbering are displayed
5. Click on the required style
6. Click **Ok** button
7. The selected text is numbered.

The Bullets and Numbering dialog box with the numbering tab is displayed in Figure 6.22.



*Figure 6.22 Bullets and Numbering dialog box*

## Turning off Bullets and Numbering –

As you can quickly add bullets or numbers to existing text by clicking on the icons, the bullets and numbers can be removed easily.

- Select the text where the bullets and numbers are to be removed.
- Click on the bullets icon  again to remove bullets.
- Click on the numbering icon  again to remove numbering.

## 6.9 Page formatting

The most important thing in a word processor is how to format the page by changing margins, numbering, page layout, headers and footers. Formatting your page makes it look more attractive and make it easier to read.

### 6.9.1 Setting the page size and margins Changing page size

The default page size in Writer is **8.5 x 11"**, the same as that of a standard A4 printing paper. However, for different types of documents, you may need to change the page size. To change the page size:

- Select the page to be resized
- Select **Format → Page**, the page style dialog box appears as shown in Figure 6.23.
- Select Page Tab
- In the **paper format group**, select the format like A4, legal .... etc
- Or the **width** and **height** option can be used to set the page size.

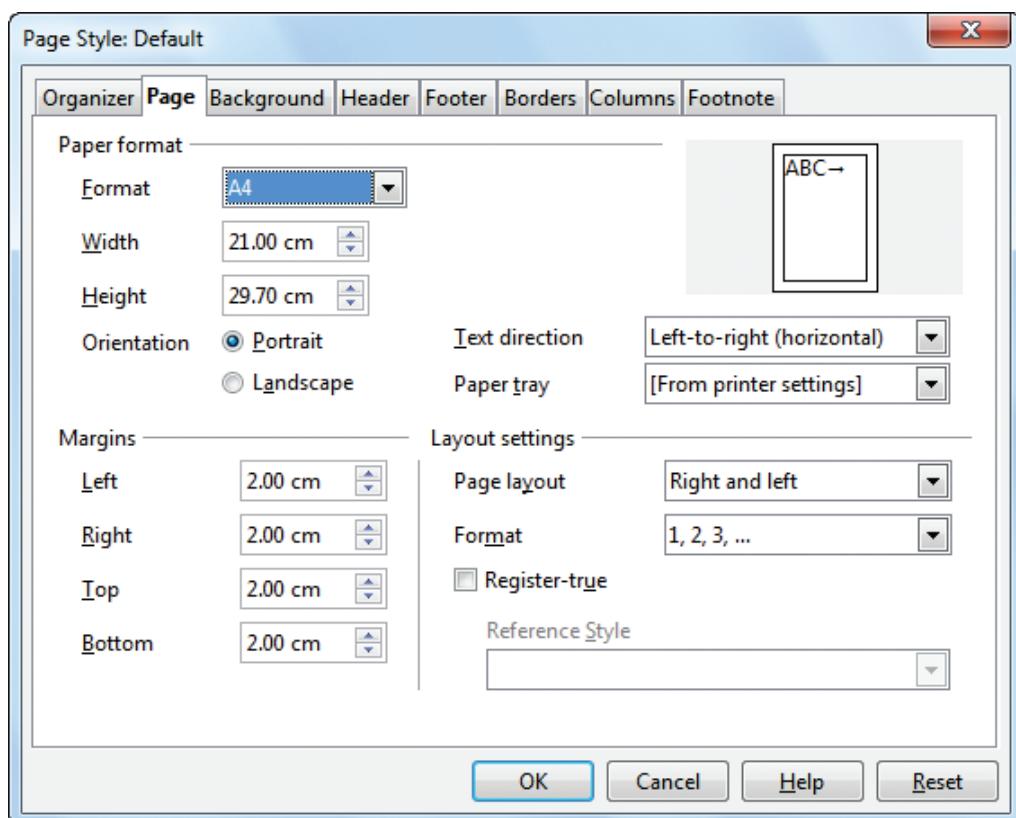


Figure 6.23 Page style dialog box

## Changing page margins

Page margins are the white space around the top, bottom, left, and right of your document. Margins let Writer know where to start placing the text at the top of a document, when to move on to the next page at the bottom, where to start typing text on the left side, and where to stop and move to the next line on the right.

Changing or setting page margins in OpenOffice writer can be done in two ways:

1. Using the **Rulers**—quick and easy, but does not have precise values.
2. Using the **Page Style** dialog box—can specify precise values for the margins.

### Changing page margins - using Ruler

1. The shaded sections of the rulers are the margins.
2. Hold the mouse pointer over the line between the gray and white sections.
3. The mouse pointer turns into a double-headed arrow.
4. Hold down the left mouse button and drag the mouse to move the margin and release it at the required point.
5. The new margin is set.

### Using Page Style dialog box

#### To change margins using the Page Style dialog box

1. Right-click anywhere on the page and select Page from the popup menu or select page tab of Page Style dialog box as shown in Figure 6.23.
2. In the **Margins** group, specify the values for left , right , top and bottom margins.
3. Click on ok button.

## 6.9.2 Orientation

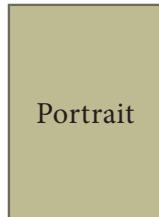
Page orientation refers to how the document will be displayed on screen and printed. There are two different orientations:

**Landscape** - The width of the document is more than the height. This is best suited for displaying table, professional photos, invitations, album etc.



Landscape

**Portrait** – This is the most common and default orientation. Here, the height of the document is more than the width. Normally books, newspapers will be displayed in this format.



Portrait

#### To change the orientation:

- Select the page whose orientation is to be changed
- In the **Page style** dialog box, under the **Orientation** group,
- Select **Portrait** or **Landscape** button.

### 6.9.3 Page colour and borders

Changing the page color is not quite common. To do so, in the **Page style** dialog box , in the **Background** option, click on **color** and select the “color” from the color palette or select “graphic” to apply an image as a page background, it, as shown in Figure 6.24.

Borders can be applied to an entire document, an entire page, paragraph, or just to certain sections of the document. From the Page Style dialog box , select the Border tab, the **user defined area** helps to define the area of borders, the line style of borders, color of borders Figure 6.25 shows the borders setting in the Page Style dialog box.

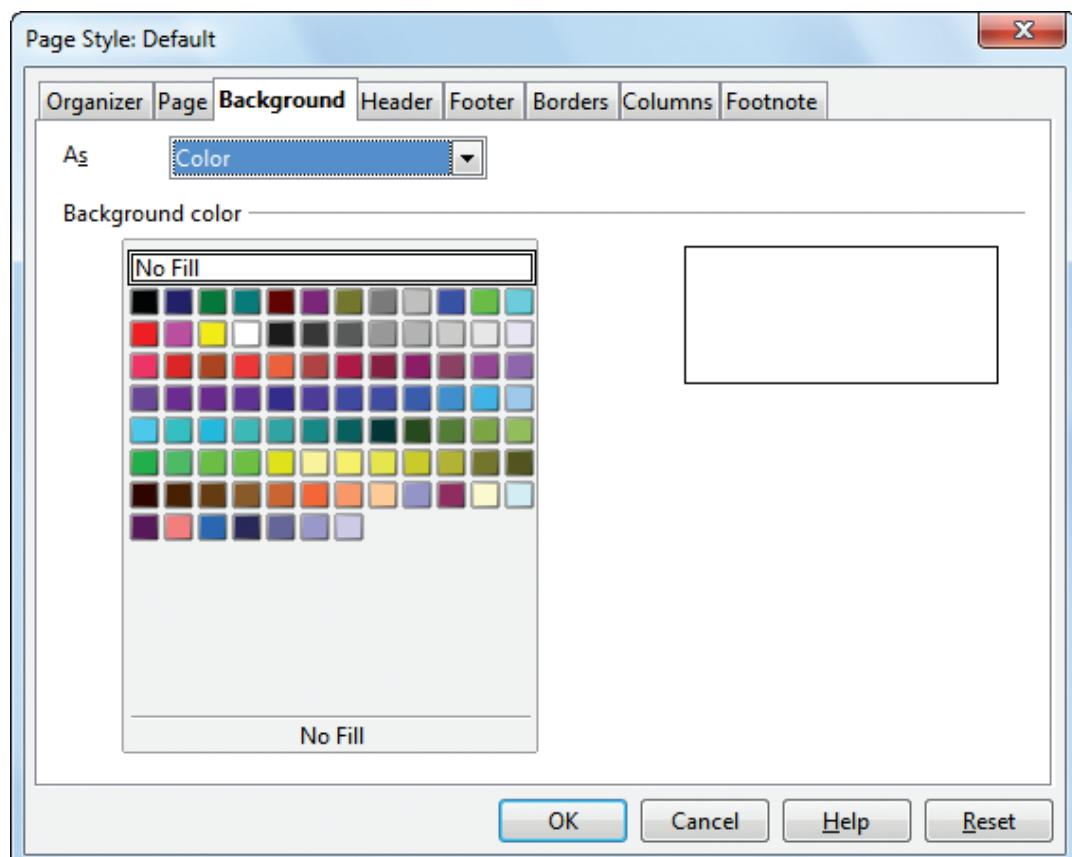


Figure 6.24 Background color

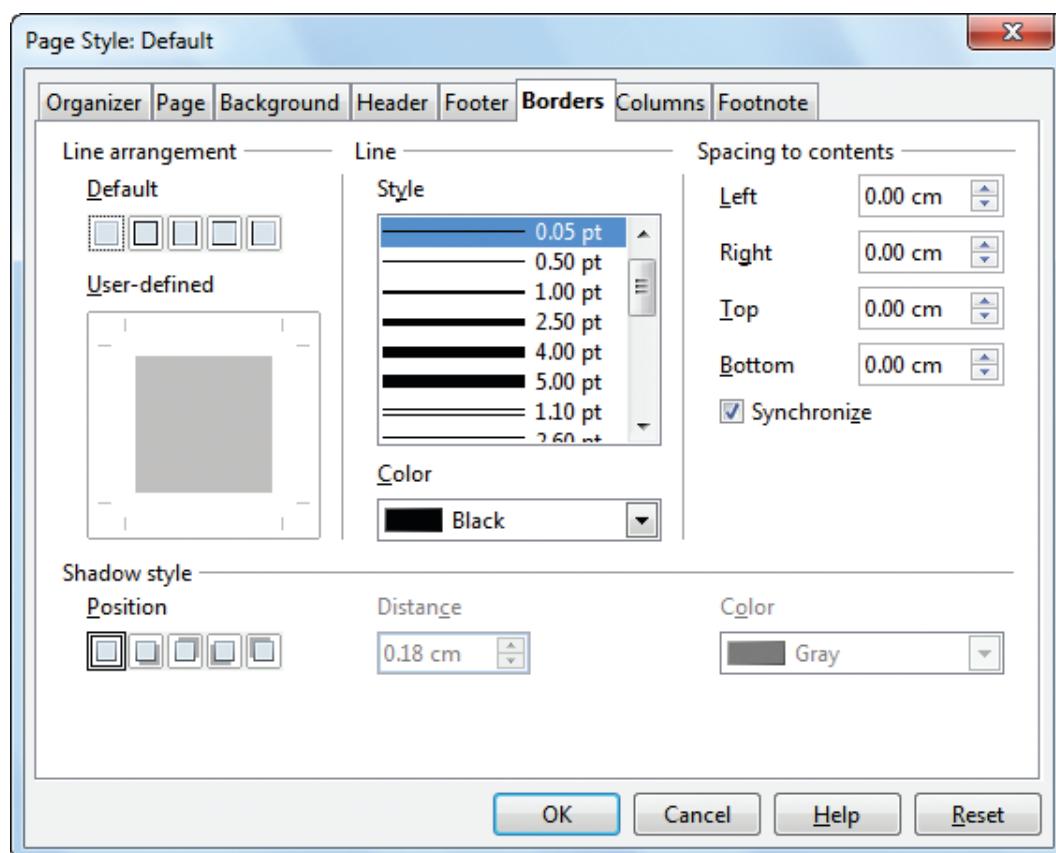


Figure 6.25 Page style dialog box - Borders

## 6.10 Working with Headers and Footers

The **Header** is a section of the document that appears in the **top margin**, which displays the title or chapter name, author name of a document.

The **Footer** is a section of the document that appears in the **bottom margin** of the page which displays the page number, date, time etc. which gets displayed on all the pages automatically.

### 6.10.1 Inserting Header and Footer

- Select from the main menu **Insert → Header → Default**
- The header text area is separated from the normal text area.
- Enter the text that is to be repeated in all pages or Select **Insert → Fields → Title**.

Similarly to insert a Footer, the steps are as given below:

- Select from the main menu **Insert → Footer → Default**
- Place the insertion pointer in the Footer area of the page.
- Select **Insert → Fields → Date** to insert date in all the pages.

Once the Headers and Footers are given in the first page, the same text will appear in all the pages.

### 6.10.2 Inserting and Formatting page numbers

Once the Header / Footer area are created, the page numbers can be inserted by performing the following steps:

- Place the insertion pointer where you want to insert the number.

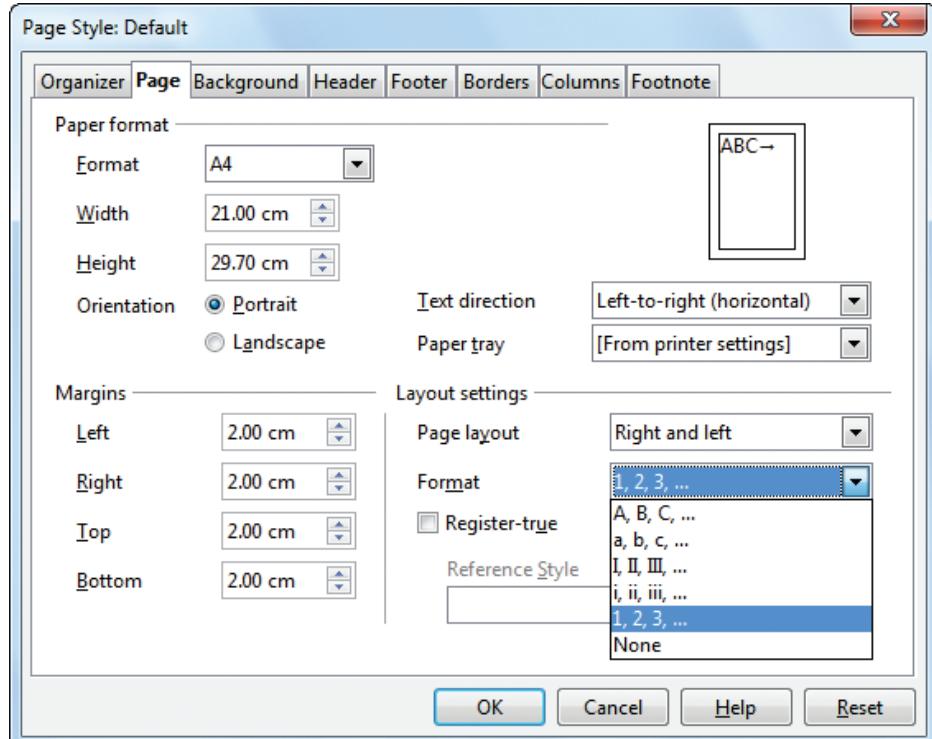


Figure 6.26 Page style dialog box

- choose **Insert** → **Fields** → **Page Number**
- The page number appears with a gray background

Normally, the page numbers appear as 1,2,3....., To change the numbering style, the following sequence of steps can be performed:

- Position the insertion pointer where the page number has to appear
- Select **Format** → **page**, which will display the Page Style dialog box as on Figure 6.26.
- Select Page Tab
- In the Layout settings, select the format drop down combo box
- Select the desired style and click **OK** button.

## Workshop

### 6.4 Open a new document in OpenOffice writer.

- Type the following paragraph

“Learning gives creativity, creativity leads to thinking, thinking provides knowledge, and knowledge makes you great”

- Save the document
- Perform text formatting features like Bold, Italics, Underline, Change font, change Size, Color and change case (Upper case to lower case, lower to upper) for the words. (in the paragraph and make the paragraph more appealing to read.

- Highlight the text “Knowledge makes you great”
- Undo all formatting options using keyboard shortcut.

### 6.5 Open the document created in the workshop 6.4

- Type the following lines below the first paragraph

“ When one door closes, another opens, but we often look so long and so regretfully upon the closed door that we do not see the one that has opened for us – Alexander Grahambell ”

- Using any one of the paragraph alignment icons or keyboard shortcuts (left, right, center, or justified) align the first paragraph.
- Change the line spacing of second paragraph to any one of the type.
- Create bullets for the first paragraph and numbering for the second paragraph using icon or menu choice.
- Save and close this documents.

### 6.6 Open the document created in workshop-6.5

- Change page size, margin and orientation, change border and background color.
- Apply suitable header and footer for the table.

## Part - III Find and Replace

### 6.11 Find and Replace

OpenOffice Writer has a Find and Replace feature that helps to locate for a text inside a document and replace it with another word. In addition to finding and replacing words and phrases, you can also use wildcards and regular expressions to perform advanced search. To search a word

- Click **Edit → Find & Replace** (or) **Ctrl + F**
- The Find & Replace dialog box appears as shown in Figure 6.27.

#### Steps to find and replace a text

1. Type the text you want to find in the **Search for** box

**For Example:** To search for a word “Bombay” in a document and replace with “Mumbai”, enter the word “Bombay” in the Search for box

2. To replace the word with different text, type the new text in the **Replace with** box

Enter the word “Mumbai” in the Replace with box and

Click **Find** button , to start the search , the found word is highlighted

The first occurrence of “Bombay” is highlighted

3. To replace text, click **Replace** button.

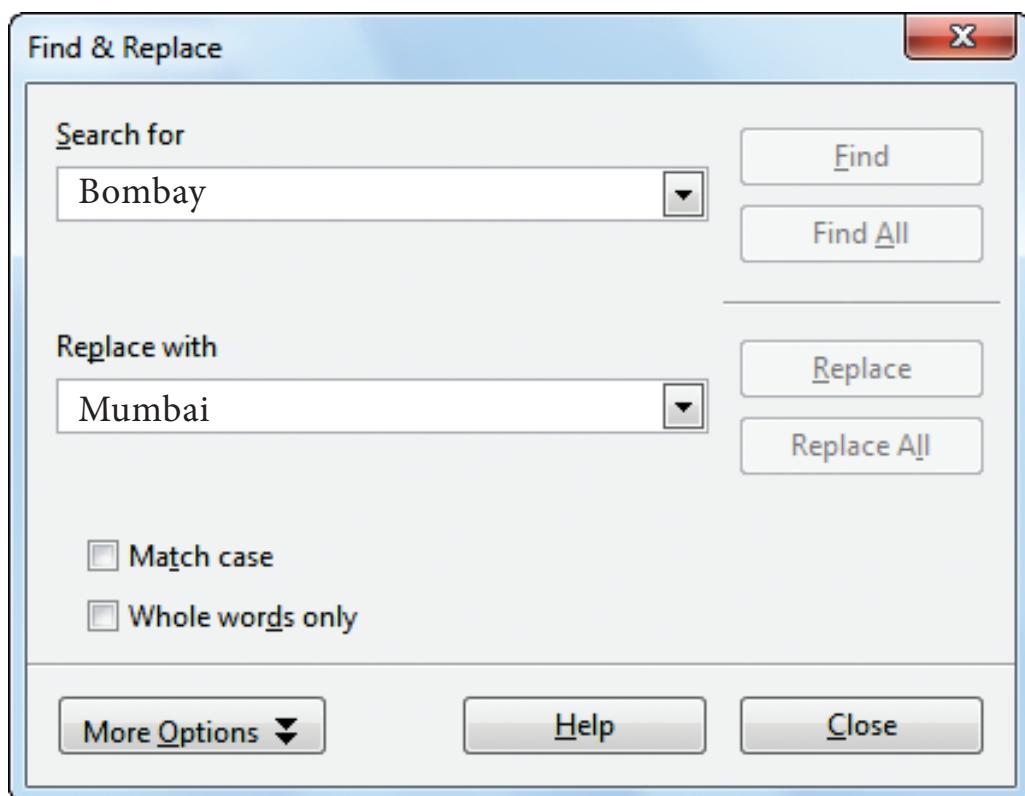


Figure 6.27 Find and Replace dialog box

The highlighted word is replaced with the word given in the **Replace with box**.

- Click **Find All**, Writer selects all instances of the search text in the document

All occurrences of “Bombay” are highlighted.

- Click **Replace All** button, Writer replaces all matches.

This will replace all occurrences of “Bombay” with “Mumbai”

- Enable **Match case** to perform the search case sensitively so that uppercase and lower cases are distinguished separately.

- Enable **Whole Words only** to make the search more specific. For e.g. if you search for the word “image” the command will only find “image” not “imaging”, “images” etc.

## Workshop

### 6.7 Open a new document.

- Type the following paragraph
- “All birds find shelter during a rain. But Egles avoid rain by flying above the clouds. Problems are common, but attitude make the difference.”
- Apply Find & Replace.
- Find the word “Egles” and replace it with “Eagles”.
- Save the document with password.

## Annexure

### List of Keyboard Shortcuts

Shortcut Key	Function
Ctrl+A	Select the whole document.
Ctrl+B	Makes text bold.
Ctrl+C	Copy the text.
Ctrl+D	Double Underline text.
Ctrl+E	Text is center aligned.
Ctrl+F	Find and Replace.
Ctrl+I	Makes text Italics.
Ctrl+J	Text is Justified.
Ctrl+L	Text is left aligned.
Ctrl+R	Text is right aligned.
Ctrl+U	Underlines text.
Ctrl+V	Paste the text.
Ctrl+X	Move the text.
Ctrl+Y	Redo last action.
Ctrl+Z	Undo last action.
Left Arrow	Move cursor one character left.

Right Arrow	Move cursor one character right.
UpArrow	Move cursor one line up.
DownArrow	Move cursor one line down.
Shift+ LeftArrow	Move cursor with selection to the left.
Shift+ RightArrow	Move cursor with selection to the right.
Ctrl+ LeftArrow	Go to beginning of word.
Ctrl+ RightArrow	Go to end of word.
Home	Go to beginning of line.
End	Go to end of line.
Ctrl+Home	Go to start of document.
Ctrl+End	Go to end of document.
Shift+Home	Go and select from the beginning of line.
Shift+End	Go and select till end of line.
Insert	Insert mode on/off.
Page Up	Move one screen up.
Page Down	Move one screen down.
Ctrl+Shift+B	Subscript.
Ctrl+Shift+P	Superscript.

### Unicode Tamil Keyboard Typing Chart

a	அ	k	க்	ka	க	ke	கே
aa	ஆ	ng	ங்	nga	ஙு	kee	கே
i	இ	s	ச்	sa	ச	ko	கொ
ii	ஈ	nj	ஞ்	nja	ஞு	koo	கோ
u	உ	d / t	ட்	da / ta	ட	kau	கௌ
uu	ஊ	N	ண்	Na	ண		
e	எ	w	ஃ	wa	ஃ	we	ஃ
ee	ஏ	th	த்	tha	த	wee	ஃ
ai	ஐ	p	ப்	pa	ப	wo	ஃ
o	ஓ	m	ம்	ma	ம	woo	ஃ
oo	ஓ	y	ய்	ya	ய	wau	ஃ
au	ான	r	ர்	ra	ர		
q	ஃ	l	ல்	la	ல		
		v	வ்	va	வ		
		z	ழ்	za	ழ		
		L	ள்	La	ள		
		R	ற்	Ra	ற		
		n	ன்	na	ன		

j	ja	jaa	je	jee	jo	joo	ji	jii	ju	juu
ஜ	ஜ	ஜா	ஜெ	ஜீ	ஜோ	ஜோ	ஜி	ஜீ	ஜு	ஜூ
sh	sha	shaa	she	shee	sho	shoo	shi	shii	shu	shuu
ஷ்	ஷ	ஷா	ஷெ	ஷே	ஷோ	ஷோ	ஷி	ஷீ	ஷு	ஷூ

Type the following content in Tamil using any interface (Murasu / NHM / Azhagi).

kaNNan - கண்ணன்	joothpur - ஜூத்பூர்
sennai – சென்னை	juulai – ஜூலை
thamizwaadu – தமிழ்நாடு	shiiradi – வீரடி
thaajmahaal – தாஜ் மஹால்	hamadu – ஹமது
shaajakaan – ஷாஜ் கான்	vaashington - வாஷிங்டன்

சென்னையில் உள்ள மாநகராட்சிப் பள்ளிகள் சென்னைப்பள்ளிகள் (Chennai Schools) என்று அழைக்கப்படுகிறது. இந்த பள்ளிகளை நிர்வகிக்க சென்னை மாநகராட்சயில் கல்வித்துறை (Education Department) இயங்கி வருகின்றது. ஒரு இந்திய ஆட்சிப்பணி (IAS) அதிகாரி, ஒரு கல்வி அலுவலர் (Educational Officer) மற்றும் 10 துணைக் கல்வி அலுவலர்களுடன் (Assistant Educational Officers - AEO) இத்துறை செயல்படுகிறது.



### Student Activity

1. To make the students prepare a invitation for school annual day.
2. To make the students create greeting card in landscape format with a picture and a birthday message and distribute to students on their birthday.

### Teacher Activity

1. To show a demo to the students how to type a question paper by using indents and bullets and auto numbering, changing the margins.

## Evaluation



### Part I Choose The Best Answer

1. Which is the command to be selected to open the Table Format dialog box.
  - a. File ->Table properties
  - b. Format->Table properties
  - c. Table->Table properties
  - d. Edit->Table properties
2. The bottom of the window which shows the status of the document is:
  - a. Task bar
  - b. Title bar
  - c. Status bar
  - d. Tool bar
3. Which is the section of document that appears in the top margin.
  - a. Head area
  - b. Foot area
  - c. Header
  - d. Footer
4. The top most part of the window which displays the name of the application
  - a. Menu bar
  - b. tool bar
  - c. title bar
  - d. format bar
5. Changing the default appearance of the text is called
  - a. Text formatting
  - b. Page formatting
  - c. special formatting
  - d. paragraph formatting
6. The Find and Replace option is available in which menu?
  - a. File
  - b. Edit
  - c. Format
  - d. Tools
7. Which button selects all instances of the search text in the document?
  - a. Find
  - b. Find All
  - c. Replace
  - d. replace All
8. Which is the short cut key to go to start of document?
  - a. Ctrl+Home
  - b. Ctrl+ End
  - c. Home
  - d. End
9. What is the shortcut key for finding and replacing text in a document?
  - a. Ctrl + F1
  - b. Ctrl + F4
  - c. Ctrl + F5
  - d. Ctrl +F7
10. Shortcut key for Undo is
  - a. Ctrl + E
  - b. Ctrl + U
  - c. Ctrl + Z
  - d. Ctrl + n

## **Part II**

1. What is Text formatting?
2. What are the different packages in OpenOffice writer?
3. State the difference between Proprietary software and open source software.
4. How do you make corrections to your document?
5. Name some features of OpenOffice writer.

## **Part III**

1. What is the difference between moving and copying text?
2. What are the different types of orientation?
3. How do you turn off bullets and numbering?
4. What are the different ways to save a document?
5. Write the steps to change the line spacing of text.

## **Part IV**

1. What are the different methods to change margin in writer?
2. What are Header and Footer? How do you insert page numbers?
3. What are the different types of paragraph alignment?
4. Write the steps to find and replace a word with another in OpenOffice writer.
5. What are indents ? How do you apply it in a document?

## INSERTING TABLES, OBJECTS AND PRINTING DOCUMENT

### 7.1 Working With Tables

A table is a grid with a specified number of rows and columns. A well-designed table can help readers to understand better what you are trying to convey.

#### 7.1.1. Different Techniques To Insert Table

There are two methods to create a table :

- Using table Icon
- Using Insert Table dialog box

#### Using Table Icon

To insert a table quickly from the standard tool bar:

1. Place the insertion pointer where you want the table to appear.

2. Click the down arrow on the right side of the Table icon  on the standard toolbar.
3. In the drop down grid, move the mouse to select the number of rows and columns for the table.
4. The table will appear at the location of the insertion pointer.

#### Using The Insert Table Dialog Box

To insert a table with more control over the settings and properties, use the Insert Table dialog box. To open the dialog box, click **Table → Insert → Table** or **Ctrl + F12**. The Insert table dialog box appears as shown in Figure 7.1:

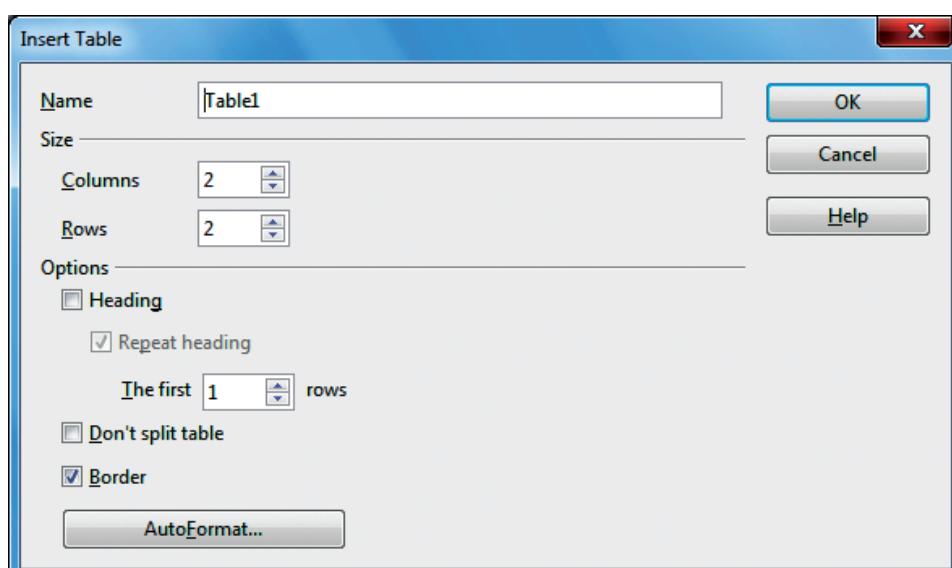


Figure 7.1 Insert Table Dialog Box

- In the **Name** text box give a suitable name to the table.
- Specify the number of columns and rows either using spin arrows or enter the value directly.
- Click the **Heading** check box to make the first row of the table as heading. The **Repeat heading** check box can be enabled to repeat the heading row when the table spans more than one page.
- Select the **Border** check box to display table with grid.
- Click **OK** button to create a table.

#### Entering data into theTable :

Once the table is created with the specified number of rows and columns, you are ready to enter data.

The table is normally created with uniform row height and column width in the entire area. The insertion pointer is placed in the first cell(intersection of row and column) and you can start typing the text into the cell. You can easily move from one cell to the next cell towards right by pressing the **Tab** key and press

**Shift + Tab** to move towards left. Once the table is created the Table formatting toolbar appears on the formatting toolbar as shown in Figure 7. 2. This toolbar can also be opened by **View → Toolbars → Table**.

#### 7.1.2 Inserting And Deleting Rows And Columns

##### Inserting Rows

To insert rows in a table there are different ways :

1. The easiest way to add a row is to press **Tab** from the last cell.
2. To insert a single row anywhere, place the insertion pointer in that particular cell and click the **Insert row** icon  from the Table Formatting toolbar.
3. To insert more than one row, click **Table → Insert → Rows**, the Insert Rows dialog box appears as shown in Figure 7.3, enter the value using spin arrows or type the number directly. In the position option, select Before or After radio button to specify the position of the row.
4. Click **OK** button.



Figure 7.2 Table Formatting toolbar

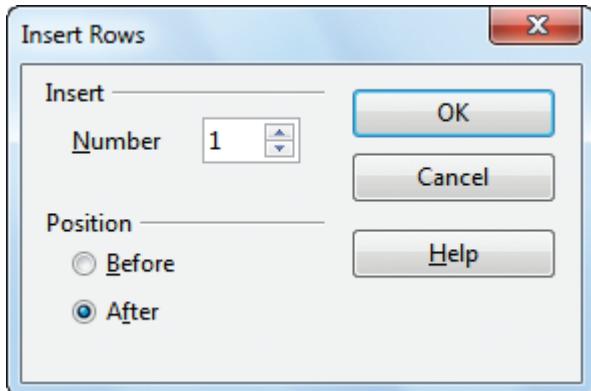


Figure 7.3 – Insert Rows dialog box

### Inserting Columns

To insert columns there are different ways

1. Place the insertion pointer in the particular column and click the **Insert column** icon to insert a blank column right of the insertion point.
2. To insert more than one column, place the insertion point in the particular column and click **Table → Insert → Column**, the insert column dialog box appears as shown in Figure 7.4, enter the value using spin arrows or type the number directly.
3. In the position option, select Before or After radio button to specify the position of the column.
4. Click OK button.

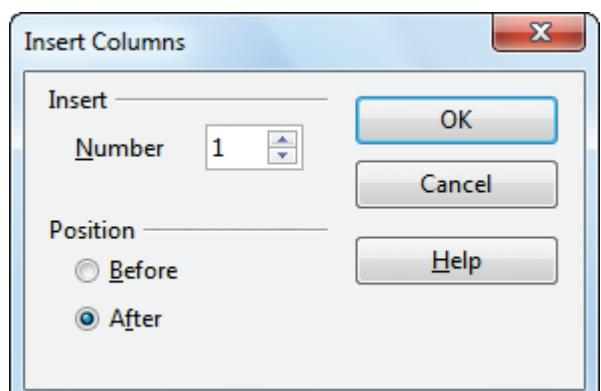


Figure 7.4 – Insert Columns dialog box

### Deleting Rows And Columns

#### To delete rows and columns:

1. To delete a single row, place the insertion pointer in the row or to delete more than one row, select the rows to be deleted and click delete row icon from the Table Formatting tool bar (or) select **Table → Delete → Rows**, the selected row/ rows will be deleted.
2. To delete a single column, place the insertion pointer in the column or to delete more than one column, select the columns to be deleted and click delete column icon from the Table Formatting tool bar (or) select **Table → Delete → Columns**, the selected column/ columns will be deleted.

#### Deleting Contents of A Table

1. To delete the contents of a table :

- Select the contents of the table to be deleted and click **Delete** key, The contents will be deleted, the table will remain as it is.

#### Deleting An Entire Table

1. To delete the entire table :

- Select the entire table by **Edit → SelectAll** or **Ctrl + A**
- Click **Table → Delete → Table**
- The entire table is deleted.

### 7.1.3 Merging and Splitting Cells

To merge a group of cells:

1. Select the cells to merge.
2. Click **Table → Merge Cells** or click **merge cells icon** or **Right Click → Cell → Merge**,
3. The selected cells will be merged into a single cell.

To split a single cell:

1. Place the insertion pointer inside the cell.
2. Click **Table → Split Cells** or click **Split cells icon** or **Right click → Cell → Split**, the split cells dialog box appears as shown in Figure 7.5.

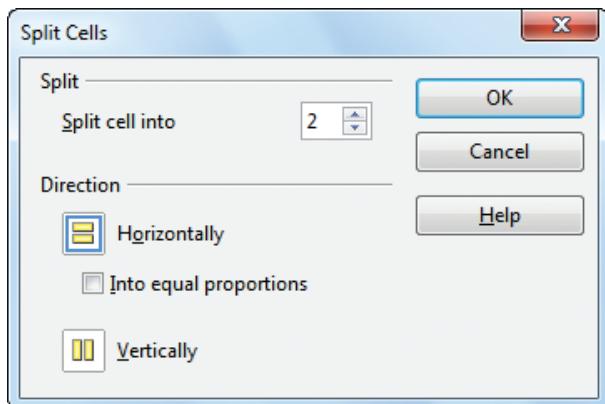


Figure 7.5 Split cells Dialog Box

3. Select the number of cells to split using spin arrows or enter the value directly.
4. Select the direction of the split, horizontally (for rows), or vertically (for columns).

5. A single cell is split into the desired number of rows and columns.

### 7.1.4 Resize the position of Table

A newly created table will occupy the entire width of the page area by default. The table can be resized as per our requirement:

- To resize a table quickly, move the mouse over the table edge until the cursor becomes a double headed arrow, and drag the border to its new desired position.

**To resize a row height / column width using Mouse :**

**To resize row height**

- Move the insertion pointer over the horizontal border for the row height now the insertion point will change into double headed arrow , click and drag to resize the row height.

**To resize column width**

- Move the insertion pointer over the vertical border for the column width now the insertion pointer will change into double headed arrow , click and drag to resize the row height.

**To resize column width using dialog box**

- To give precise measurement for column width, Click **Table → Table Properties**, the Table Format dialog box as shown in Figure 7.6

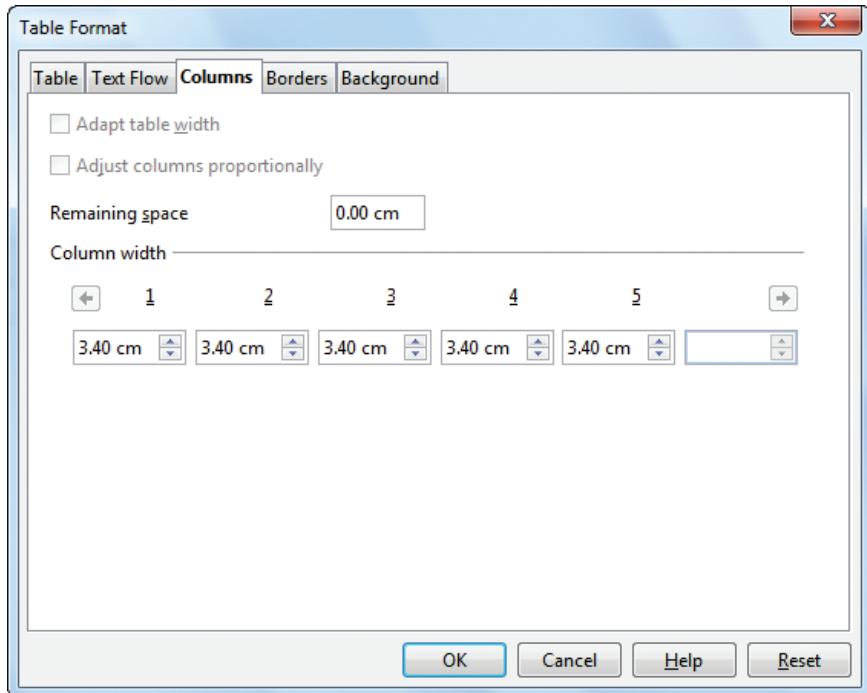


Figure 7.6 Table Format Dialog Box

- Click the Columns tab. In the column width spin box enter the new column width or use spin arrow for the columns.
- Click OK button.
- The width of columns are resized as per the new values.

## 7.2 Formatting The Table

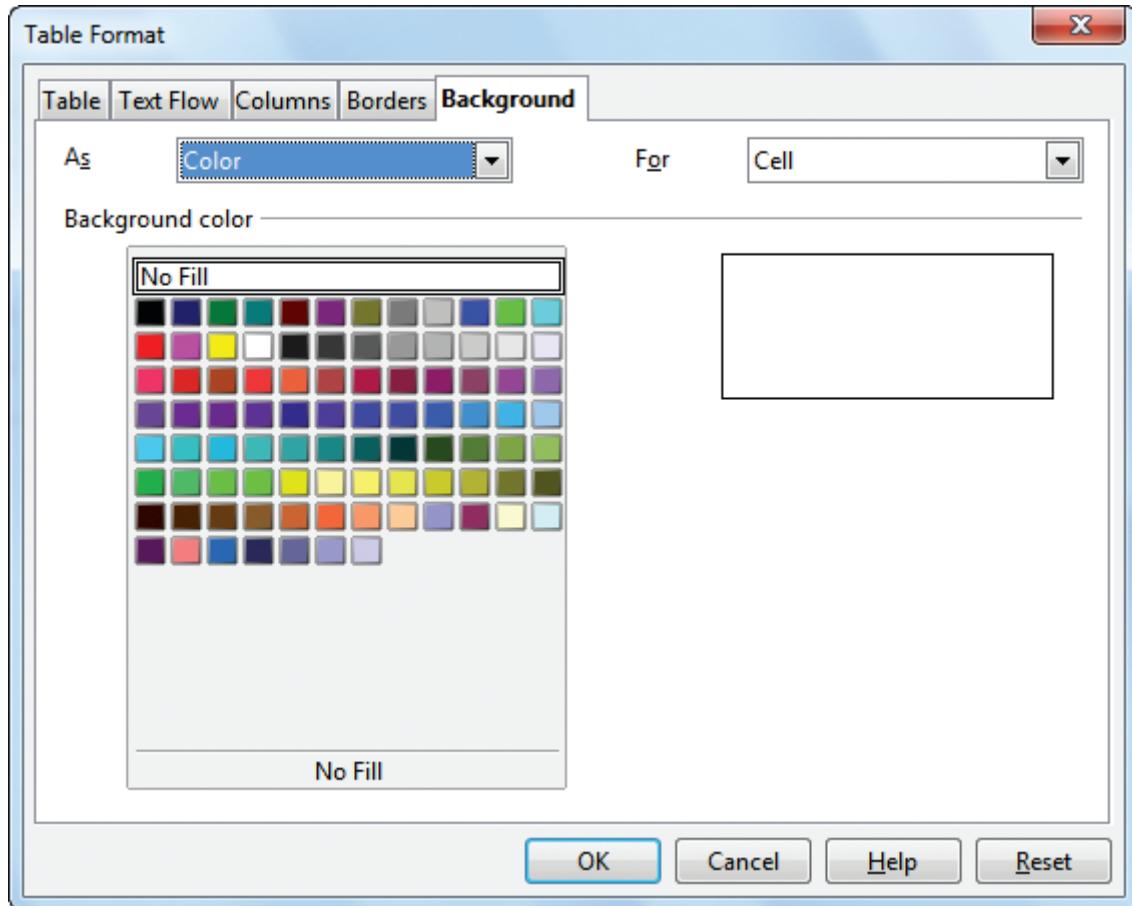
Formatting a table involves formatting of the table layout, formatting of the table text, changing borders, background and autoformatting.

### 7.2.1 Changing Background

To change the background of a table in a document:

Place the insertion pointer inside the table.

- Select **Table → Table Properties**.
- Select the **Background** tab inside the Table Format dialog box as shown in Figure 7.7.
- In the **For** section, choose to apply the background to the cell, row or table.
  - Cell:** To apply background to a cell or a group of selected cells.
  - Row:** The background will be applied to the entire row or group of selected rows.
  - Table:** The background will be applied to the entire table.
- In the **As** section, choose to apply a color or graphic:
  - To apply **color**, select the color from the color palette and click **OK** button.



*Figure 7.7 Table format dialog box - Background*

- To apply graphic, select **Graphic**, click on the browse button to select the required image file and click **OK** button. The image appears in the selected cell as background.

### 7.2.2 Changing Text Direction In Table

To change the text direction

- Select the text to change the direction in the cell.
- Select **Format → Character**, the character dialog box appears.
- Click Position tab, in the Rotation / scaling option,
- Select the required rotation angle(0, 90, 270, Fit to Line) and click OK.

### 7.2.3 Changing Table Border

To change the table border, select **Table → Table Properties**, the Table Format dialog box appears, select Borders Tab , you can set the borders for a table or a group of cells.

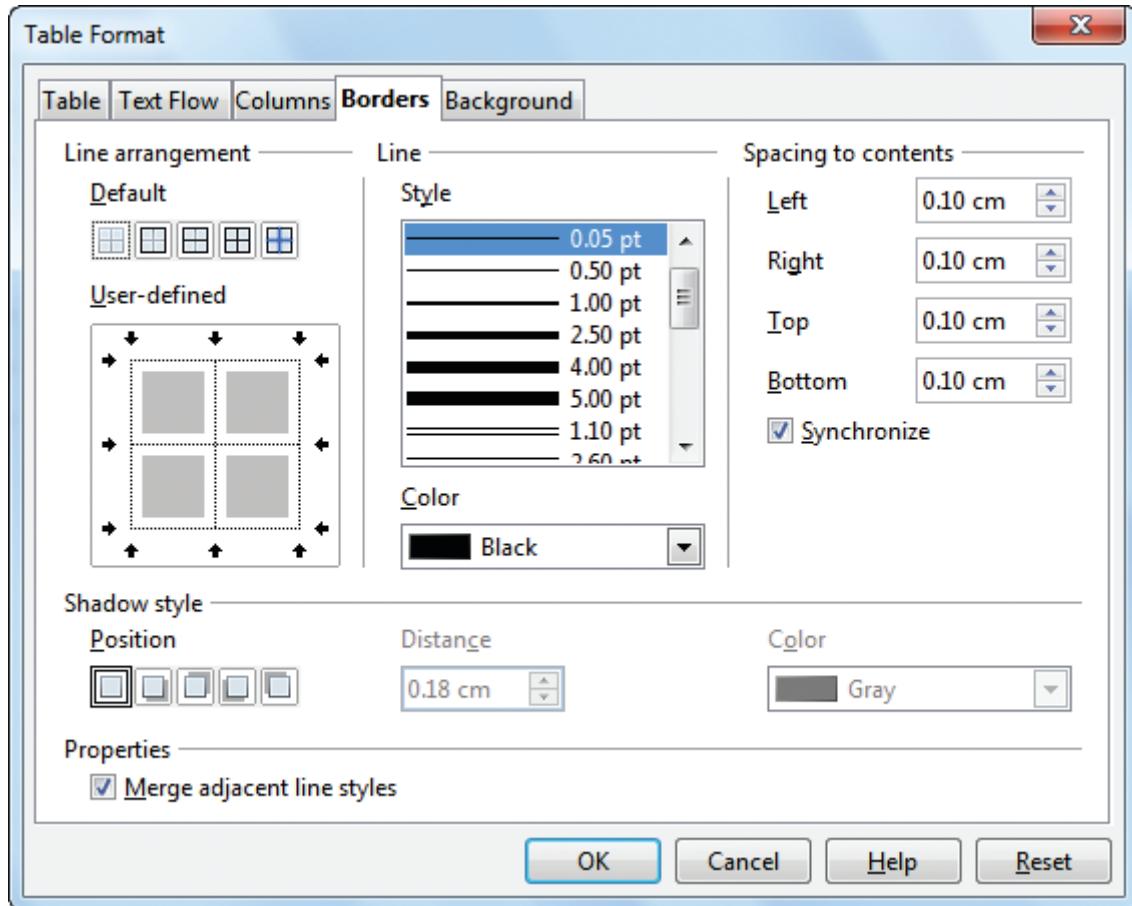


Figure 7.8 Table format dialog box to apply borders

## Properties of Border

- **Line arrangement** specifies how the borders apply. Writer provides five arrangements as shown in Figure 7.9, you can modify the arrangement by clicking on the line arrangement you want to customize.

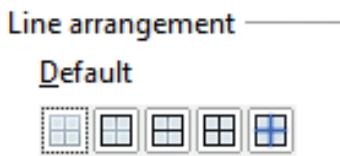


Figure 7.9 Line Arrangement

- **Line** option specifies the border style.
- **Color** option helps to select the color of border line.
- **Spacing to contents** option specifies how much space to leave between the border and cell contents.

#### 7.2.4 Autoformatting Table

The AutoFormat option helps to format the table with predefined styles. This is a simple and easy way to format tables. AutoFormatting can be applied by :

- Create a Table with the desired number of rows and columns.
- Click **Table → AutoFormat**
- A set of already designed styles with predefined names are available in the Auto Format dialog box as shown in Figure 7.10.
- Select the desired style and click OK button.
- The selected style is applied into your table.

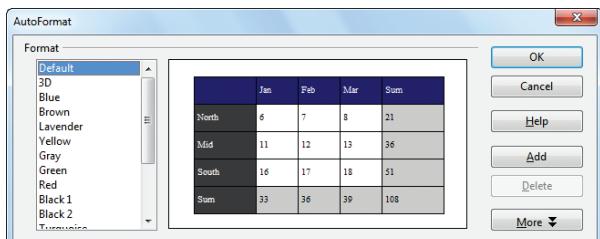


Figure 7.10 Auto format Dialog Box

#### 7.3 Inserting Formulae in Tables

We can use formulae in Writer to perform spreadsheet like calculations easily.

To perform calculations on the data in the table

- Create a Table with the following data:

Item sold	Jan	Feb	Total
Books	15	70	
Pens	30	50	
Ruler	25	25	
Total Goods			

Click in the empty cell where you want a calculation.

- Choose Table → Formula or press F2 and you will get the spreadsheet-like toolbar with the formula entry field.



Figure 7.11 Formula Tool bar

- If you want to add a range of cells then in the current cell type = <B2:B4> and press Enter key. The total will appear as given in the example below.

#### NOTE

This method is applicable only to find summation of the selected range. The cell address must be in capital letters.

Item sold	Jan	Feb	Total
Books	15	70	
Pens	30	50	
Ruler	25	25	
Total Goods	=<B2:B4>		

- The formula Toolbar as shown in Figure 7.11 can be used when the user wants to perform other arithmetic calculations.

Item sold	Jan	Feb	Total
Books	15	70	=<B2>+<C2>
Pens	30	50	
Ruler	25	25	
Total Goods	70		

- If you want to perform calculations using individual cells, individual cell reference should be placed within <> .

Note : In the table structure the columns are labelled as A, B, C.....and the rows are numbered as 1,2,3,..... etc. For Ex. The first cell is referred as A1, B1 etc.

- In the above example, to find the sum, of the books purchased in January and February, the total is calculated using the formula =<B2>+<C2>.
- A subtraction formula for instance is given as =<B2>-<C2>.
- If you want something more complicated than addition, subtraction, multiplication, and division, click on the formula dropdown list as shown in Figure 7.12.

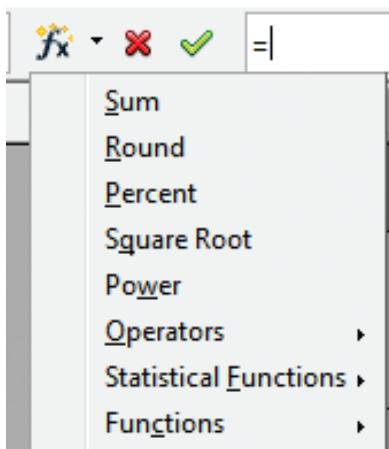


Figure 7. 12 Formula dropdown list

## Workshop



7-1 Open a new document.

- Using icon or table menu create the given table with 5 rows and 6 columns with the labels S.No., Name, Maths, Phy, Che and Total
- Calculate the Total of three subject using SUM functions.
- After the sixth row add a new row and type suitable data for the new row.
- Delete the second row using icon or command.
- Using icon or command after the second column add a new column and type suitable data for the new column.
- Delete any one column using icon or command.
- Save and close the document.

7-2 Open the document created in workshop-7.1.

- Do the following options
- Change the border style and border line width for one table.
- Change height and width for the row and column respectively.
- Save and close the document.

### 7-3 Create a new document.

- Create a 4 x 4 table using icons in toolbar or using commands.
- Split any one row/ column in one given table into more than one cell using icon or command.
- Merge any two or more row / column in the given table using icon or command.

### 7-4 Open the document created in workshop-7.1.

- Delete the table content.
- Perform all table formatting options for this table.
- Add two more rows and columns and also delete the rows and columns.
- Save and close the document.

## 7.4 Inserting Objects

### 7.4.1 Inserting And Formatting Pictures

Open Office Writer has the ability to insert and edit images in a simple way. The picture gallery of the Writer consists of a collection of images from which the desired image can be selected and inserted into the document. To insert an image from a file, the steps are as follows:

- Place the insertion pointer where you want the image to appear
- Select **Insert → Picture → From file**
- The **insert picture dialog box** appears where the picture gallery opens from which the desired picture can be selected.
- If the picture is not in the gallery, then browse the picture from the folder, choose the desired picture.
- Click on the **Open** button.

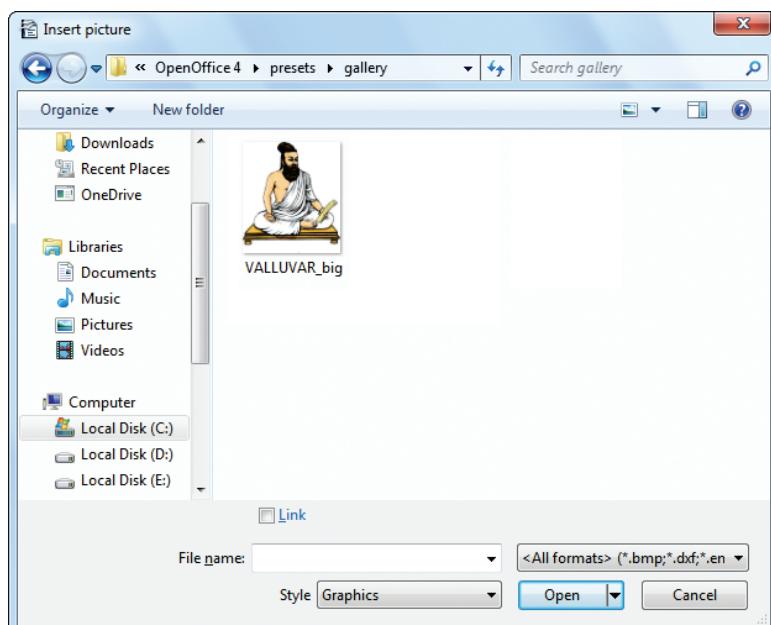


Figure 7.13 Picture Toolbar

- The selected picture is inserted into the document. Figure 7.13 shows the Insert Picture dialog box.

## Formatting Pictures

Using Picture toolbar of Writer one can modify the format of the inserted picture.

A click inside the picture displays the picture toolbar as shown in Figure 7.14 which helps to format the picture by cropping the picture, adding borders, setting the height and width, changing the background color and performing various other formatting.



Figure 7.14 Picture Toolbar

- To increase and decrease the size of the picture, click and drag at the four corners.
- Clicking on **Crop tool** displays the cropping handles. Click and drag a handle to crop an image. Click the Crop command to deselect the crop tool.

- Clicking on Default drop down arrow displays options like Black and white, Grey scale or Water mark (background) while default option displays the picture as original.
- Clicking on **Flip horizontally icon** flips the picture horizontally.
- Clicking on **Flip vertically icon** flips the picture vertically.
- Clicking on **Transparency icon** helps to adjust the clarity of the picture in %.

### 7.4.2 Inserting Special Character And Equations

Many symbols which are used in a mathematical equation like alpha ( $\infty$ ), beta ( $\beta$ ), pi ( $\pi$ ) etc., are not available on the standard keyboard. However, representing these characters are very much essential in mathematical equations. To insert such characters, the procedure given below is followed:

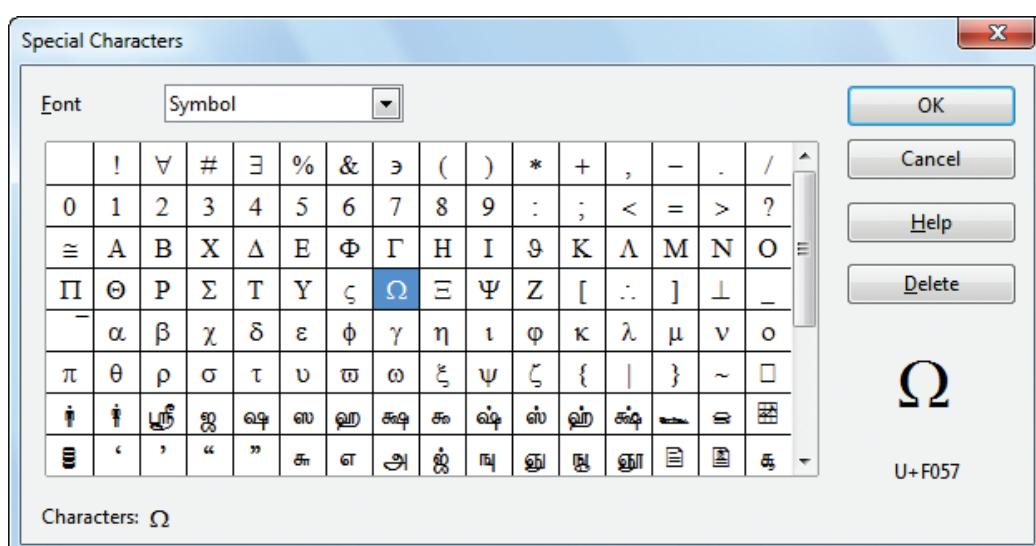


Figure 7.15 Insert Symbol Dialog box

- Place the insertion pointer in your document where you want the character to appear
- Click on the **Insert → Special Character**
- The **Special Character dialog box** appears as shown in Figure 7.15 from which the desired symbol can be selected by clicking on the character.
- Click the OK button to insert the special character.

Open Office Writer helps to insert mathematical equations using the various symbols. These equations can be inserted by following the steps below:

- Click on the **Insert → Object → Formula**
- The equation editor opens at the bottom of the screen.
- Click in the equation editor and type the equation.
- To include symbols in the equation Right-click in the equation editor and select the symbol from the pop-up menu.
- Click inside the document to include the equation in the document and this

will automatically exit the control from equation editor.

- Double-click on a formula to edit the equation.

#### 7.4.3 Inserting And Editing Shapes

OpenOffice Writer uses the drawing tools, to create various shapes by using the Drawing toolbar. Select **View → Toolbars → Drawing** to display Drawing toolbar as on Figure 7.16 which contains various drawing tools.

##### To use a drawing tool:

- Click in the document where you want the drawing.
- Select the **tool** from the **Drawing toolbar**. The mouse pointer changes to a **cross-hair pointer**.
- Move the **cross-hair pointer** to the place in the document where you want the drawing to appear and then click-and-drag to create the drawing object. Release the mouse button. The selected drawing function remains active, so you can draw another object of the same type.
- To cancel the selected drawing function, press the **Esc** key or click on the **Select icon** on the **Drawing toolbar**.



Figure 7.16 Drawing toolbar

- You can now change the properties (fill color, line type, width, etc.) of the drawing object using the **Drawing Object Properties toolbar**.
- Click on **T** Icon to create a text box and type any amount of text which can be moved anywhere into the document.

#### 7.4.4 Inserting Page Break

OpenOffice Writer inserts a page break automatically when the content exceeds a page, this is known as soft page break. Sometimes the user need to insert a page break manually, it is called as hard page break.

1. Place the insertion pointer in the document where the page break is to be inserted.
2. Select **Insert → Manual Break**, the Insert break dialog box appears as shown below in Figure 7.17.

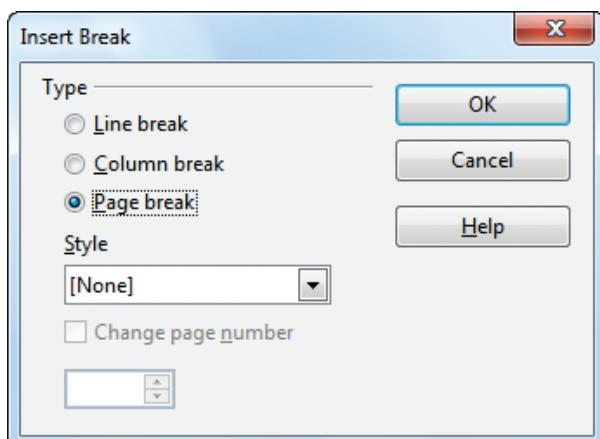


Figure 7.17 Insert Break dialog box

3. Under the type option choose Page break and click **OK** button .
4. A page break is inserted at the current location.

#### 7.4.5 Inserting Word Art

WordArt is a feature in OpenOffice Writer which includes effects such as shadows, outlines, colors, gradients, and 3D effects that can be added to a word or phrase to make it more presentable and attractive.

To insert WordArt , the steps to be followed are :

- Click the **Fontwork icon** on the Drawing toolbar.
- Fontwork gallery window with various font work is displayed as in Figure 7.18.
- Double-click on the required Font work style, and type the required word or phrase and click OK button.

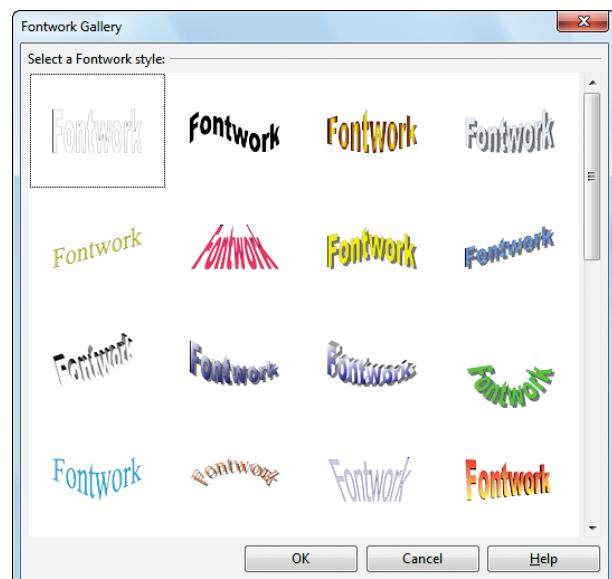


Figure 7.18 WordArt Dialog Box

#### 7.4.6 Inserting Auto Text

AutoText allows the user to assign text, tables, graphics and other items to a key or key combination. For example, rather than typing "TamilNadu" every

time you use that phrase, you might just type "tn" and press F3. You can also save a formatted Tip as AutoText and then insert a copy by typing "tip" and pressing F3.

**To assign AutoText shortcut to some text, the steps are as follows:**

1. Select the text for which shortcut is to be created. So that it is highlighted.
2. Select **Edit → AutoText** (or press **Ctrl+F3**).
3. In the Name textbox, type the shortcut. Writer will automatically show one letter shortcut in the Shortcut textbox.

4. Click the ▾ of the AutoText button on the right and select New (text only) from the menu.
5. Click Close to return to your document.
6. Once the entry is created, to insert the auto text into the document, place the insertion point where the text is to be inserted and click **Ctrl+F3**.
7. Select the name from the list of entries and click Insert button or type the shortcut and press F3.
8. The auto text is inserted into your text.

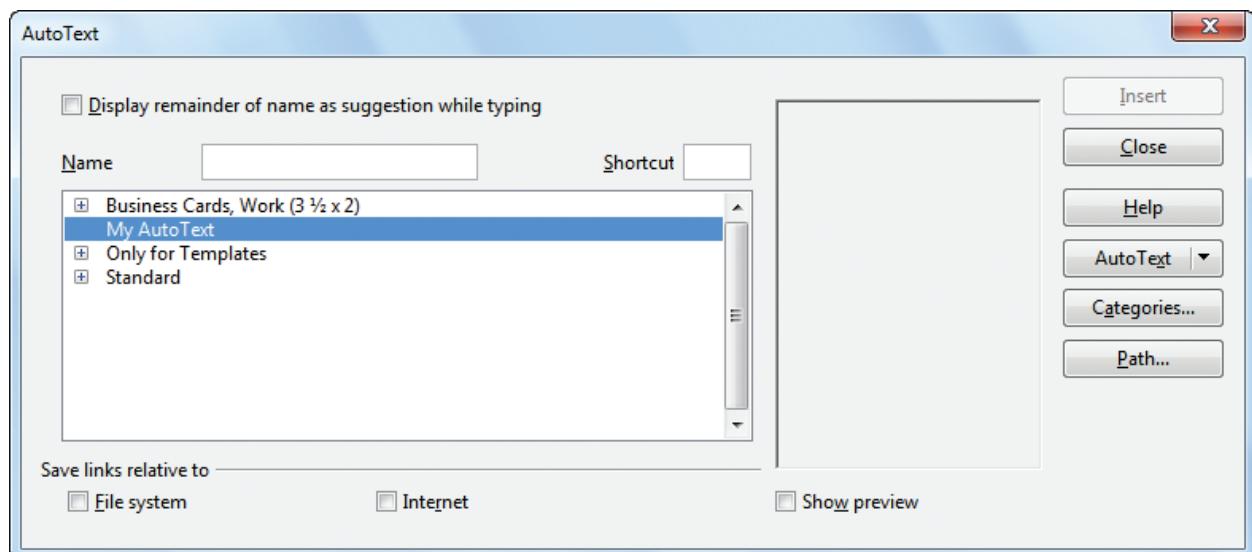


Figure 7.19 Auto text Dialog Box

If the only option under the AutoText button is Import, either you have not entered a name for your AutoText or there is no text selected in the document.

Note



## 7.5 Page Preview, Setting the printer and Printing a Document

### 7.5.1 Preview the document to be printed

It is a good practice to preview the document before taking the print out. The steps to be followed to preview the document :

1. Click **File** → **Page Preview**, or click the **Page Preview** button . The Writer displays the Page Preview toolbar displayed on Figure 7.20.



Figure 7.20 Page Preview Toolbar

2. In the page preview toolbar click **Multiple pages** icon to display multiple pages.
3. To close the preview click on **Close Preview** button.

### 7.5.2 Setting the Printer and Printing

The following are some steps to change the printer setting :

1. Click **File** → **Print** or **Ctrl+P** or Print File icon which opens the Print dialog box that appears as shown in Figure 7.21.

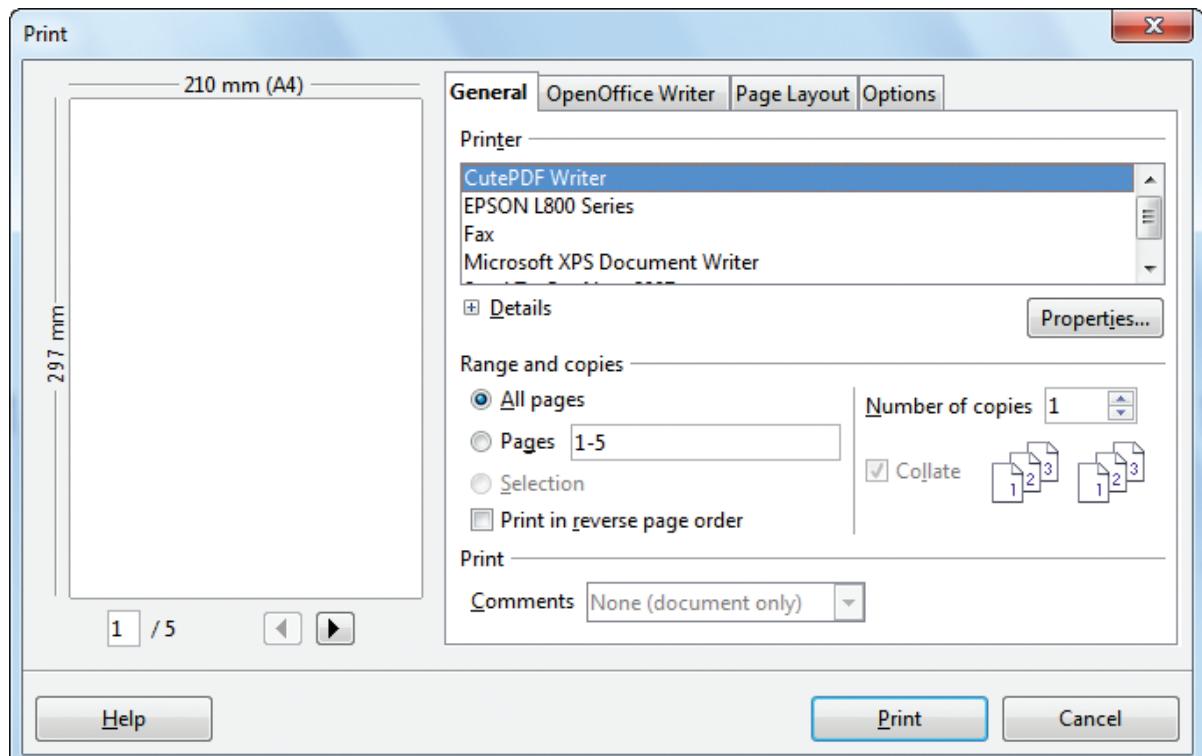


Figure 7.21 Print Dialog box

2. Click **General** tab.
3. Select the required printer from the list of printers
2. Under Range and copies section : select **All pages** option to print all pages, select **Pages** option to specify the particular page or page range.
3. Specify **Number of copies** using spin arrows.
4. Click **Print** button.

7-5 Open the document created in Part-1 workshop-1.

- Download images related to Dr. A.P.J ABDUL KALAM from internet and insert the images in the document at required place using command or icon.
- Open the document in Part-III – workshop-1 , download images related to the content from internet and insert the images at required place.
- Save the document and close.

7-6 Open a new document.

- Using the commands to insert special characters, special symbols
- Type the following equations (i)  $A\alpha + B\beta + C\gamma$  (ii)  $\pi r^2 h$ .
- Using drawing toolbar insert various drawings/ shapes in your document
- Save and close the document.

7-7 Open the document created in workshop-2

- Using Autotext command or keyboard shortcut create shortcut for “Vital Information Under Seize” as “VIRUS” and make it appear in one document.
- Using Print icon change printing attributes, preview and print the document.

7-8 Open the document created in workshop-4 of part I of ch-6

- Insert suitable picture of a circle.
- Type the formula for the circumference of a circle using insert special character option.
- Using drawing tools draw the following in the document.
- Print the document using print command.



## Activity

### Student Activity

1. Based on the concept of calculation using formulae, make the students type the Mark sheet in a table and calculate their total and average in writer.
2. Make the students prepare a invitation for school annual day with school name as Watermark.
3. Let the students prepare their class timetable in table format and format it in an attractive manner.

### Teacher Activity

1. To show a demo to the students how to type a question paper by using formulas and special characters, changing the margins and printing in the practical session.
2. To show the students a demo of inserting a picture and applying crop , color changes, background and others features to modify it and make more attractive.

## Evaluation



### Part I Choose the Best Answer

1. To give precise measurement for column width, which command gets the Table Format dialog box?
  - a. File→Table properties
  - b.Format→Table properties
  - c. Table→Table properties
  - d. Table →Table format.
2. Which option helps to assign text, tables, graphics and other items to a key or key combination?
  - a. Autoformat
  - b. Automatic
  - c. Auto text
  - d. Autographics
3. Which command on the insert menu is used to insert a page break in the document?
  - a.ManualBreak
  - b. Hard page break
  - c. Section break
  - d. Page Break

4. What is the short cut key to open the insert table dialog box?
  - a. Ctrl + F5
  - b. Ctrl + F8
  - c. Ctrl + F10
  - d. Ctrl + F12
5. Which icon on the drawing toolbar gets you a text box?
  - a. Text icon
  - b Text box icon
  - c. Draw icon
  - d. Draw box icon

## **Part II Very Short Answers**

1. How do you insert pictures in to your document?
2. Write the steps to insert special characters in a document?
3. How do you split and merge cells in a table?
4. What is the use of WordArt in writer?

## **Part III Short Answers**

1. Write about the drawing toolbar
2. How do you insert rows and columns?
3. How do you change the clarity of the picture in background?

## **Part IV Explain**

1. Write the steps to create autotext for a word.
2. How do you resize the position of a table?
3. How do you format pictures?
4. Write the steps to preview before printing and steps in printing a document.
5. Write the steps to compute the sum for a set of data in a table by using formulae.

## Mail Merge & Additional Tools

### 8.1 Mail Merge

A word processing task is to create a document with different mailing addresses for sending to different people. The mailing feature in Word processor helps the user to organize the address data and merge it into a document and prints it out in the desired format.

The main feature of Word processor is **Mail Merging**. Merging a list of names and addresses to a single document that can be sent to different people in their names and addresses.

Multiple copies of a document can be sent to a list of different recipients (form

letters) through the following facilities.

- Mailing
- labels
- Envelopes

All these facilities, are related to a registered “data source”. The Variables refer different field of **data source**.

#### Creating data source for mail merge:

A data source is a database containing the name and address or records of other information from which a mailing list may be derived. Printing the mailing labels and envelopes does not require data source facilities.

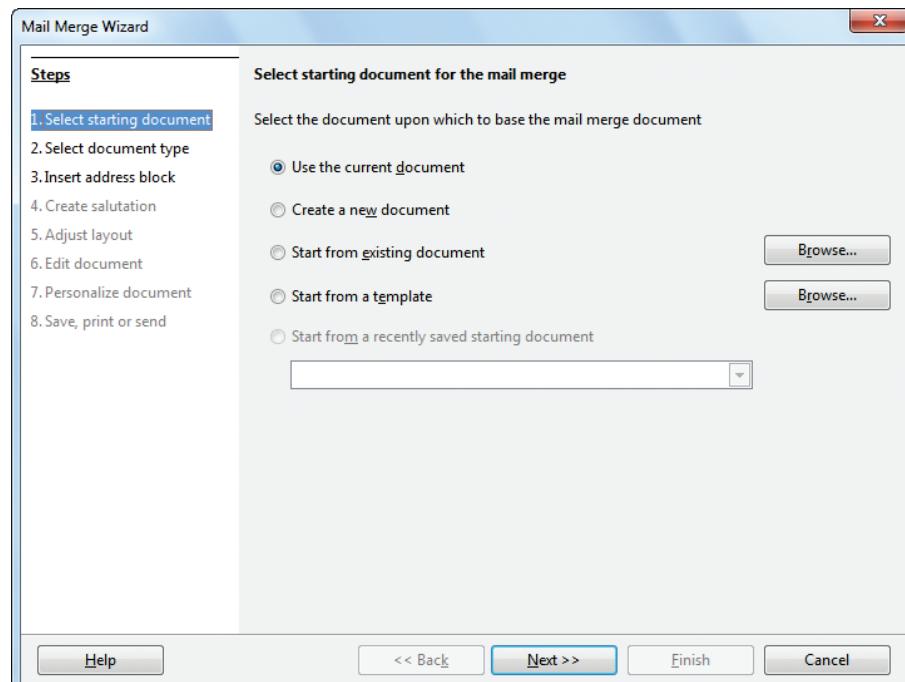


Figure 8.1: Mail Merge Wizard – Select Starting document



Open Office Mail merge can access a wide variety of data sources, including spreadsheets, text files and databases such as MySQL, Adabas, and ODBC

The following example uses a spreadsheet with the following column (field) headers: Title, First name, Last name, Address, State/Country, Country, Post Code, Gender, and Points. The mail merge wizard is shown in Figure 8.1. The following steps perform mail merge operation.

### Tools -> Mail Merge Wizard

#### Step 1: Select starting document

This step has five options:

- Use the current document.

- Create a new document.
- Start from an existing document.
- Start from a template.
- Start from a recently saved document.

Choose “Create a new document” option and click **Next Button**

#### Step 2: Select document type

This step has two options:

- Letter
- E-mail message

Choose “Letter” as option - to send letters to a group of recipients as shown in Figure 8.2.

Click **Next button**

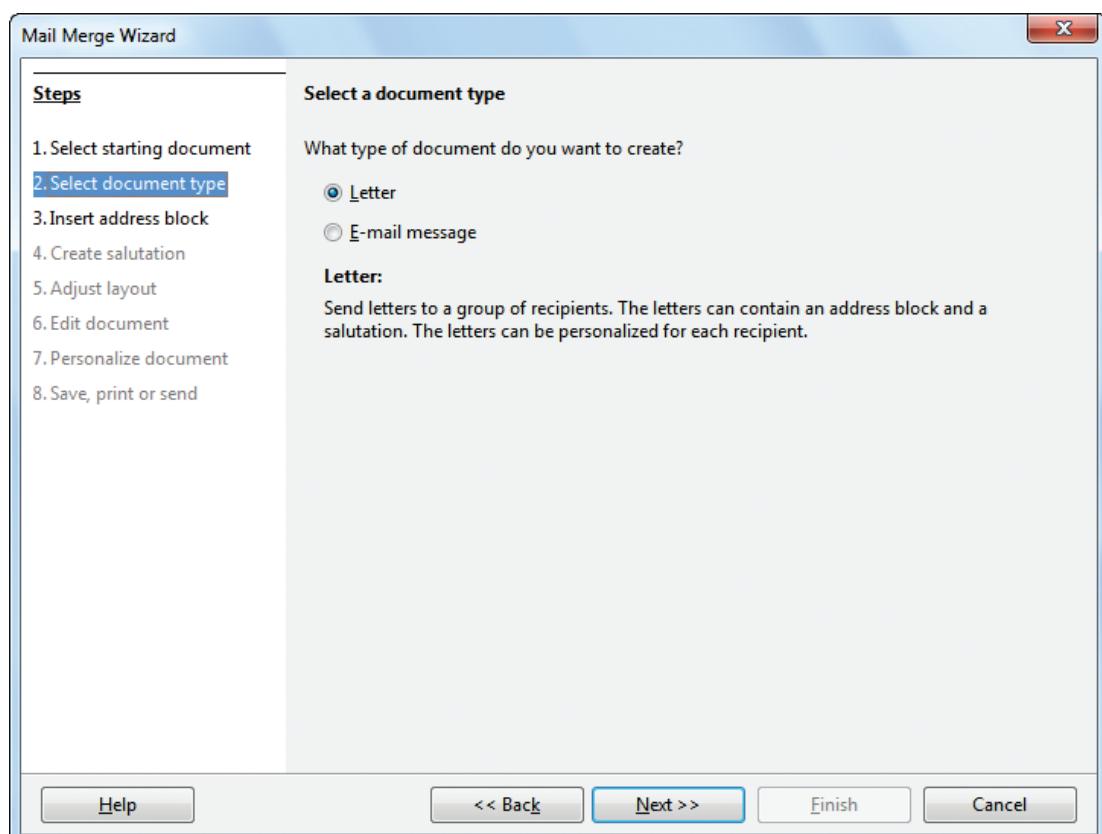


Figure 8.2 Choose document type

### Step 3: Insert Address block

This step helps to select the address list to be merged with the document as shown in Figure 8.3.

#### This step has four sections

Click “Select Address list” button to choose the address list from an existing file or create a new address file.

Click “Add” button to include the existing data source as shown in Figure 8.4.

(or) Click “Create” to create a new data source.

This window shows default fields for the address as shown in Figure 8.5.

Click “Customize” to add or delete or rename fields

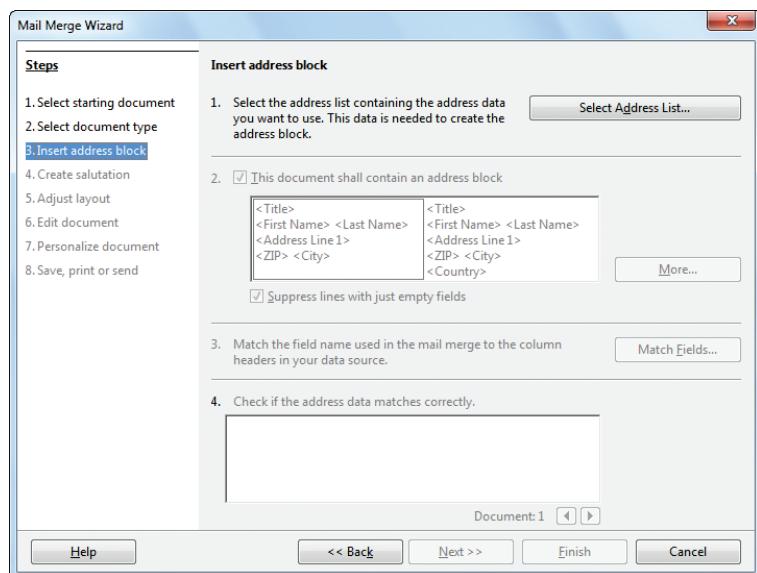
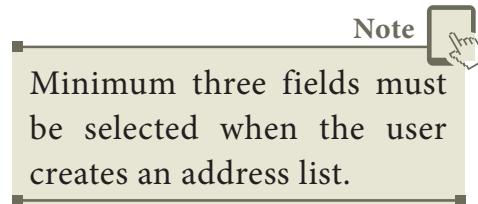


Figure 8.3. Insert Address block

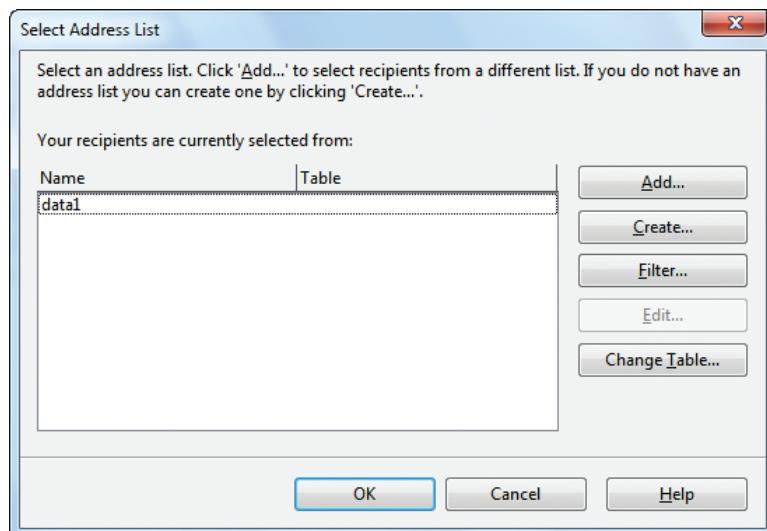


Figure 8.4. Select Add

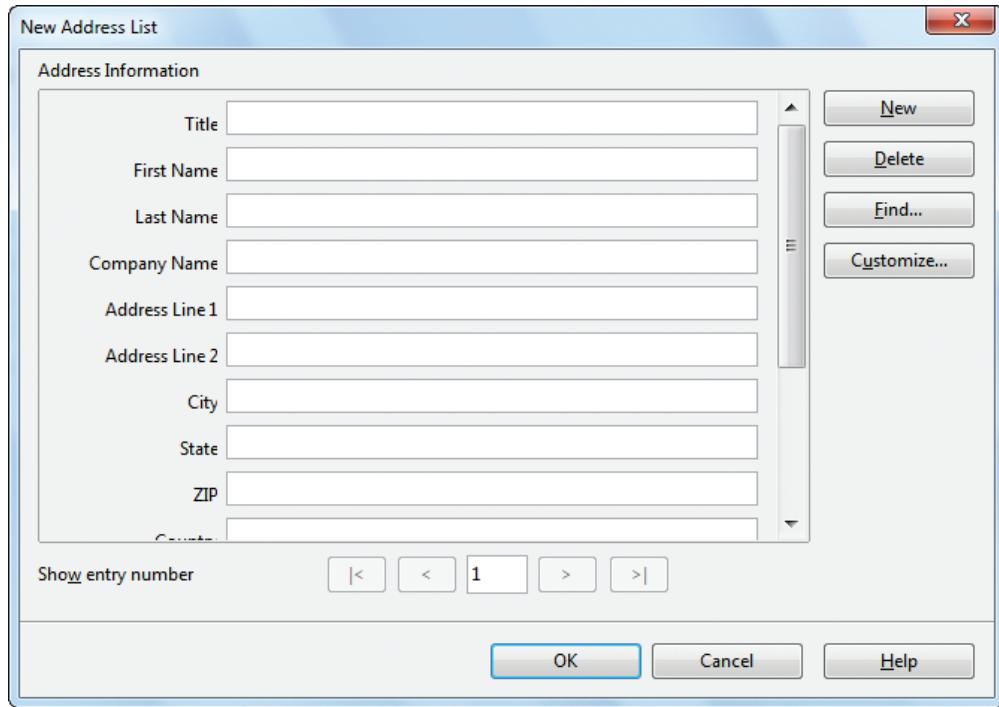


Figure 8.5 New Address List

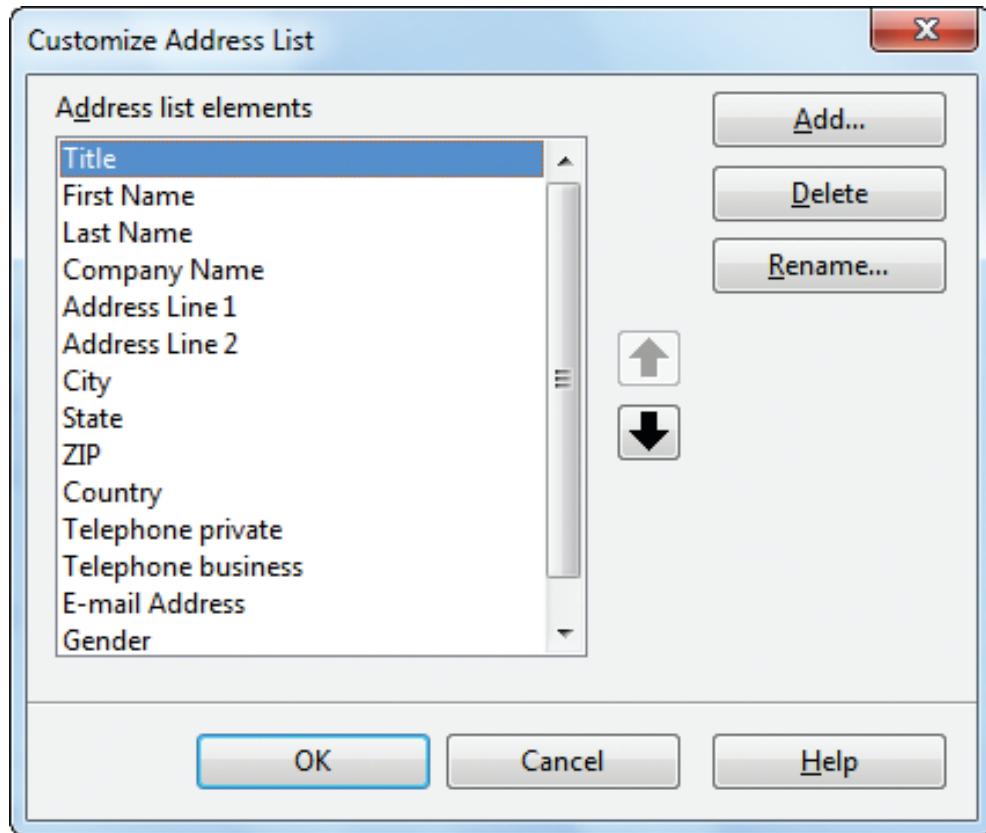


Figure 8.6 Customize Address List

In Figure 8.6, after selecting the required fields for the address list Click **OK** button.

This will get back to the previous window, where the user can add records.

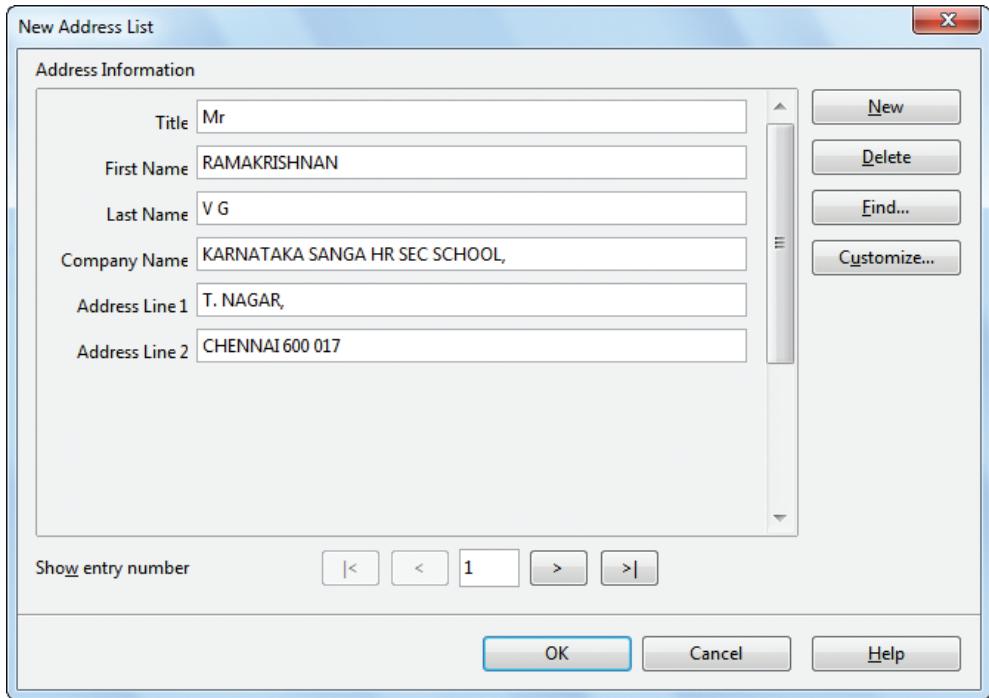


Figure 8.7 Filled New Address List

Click **New** to add more records

If the user wants to delete any particular record, select the record using navigation buttons and then Click **Delete**. Click **OK** The “Save As” dialog box appears to save the records.

This returns back to “Select Address List” dialog box. Click Ok

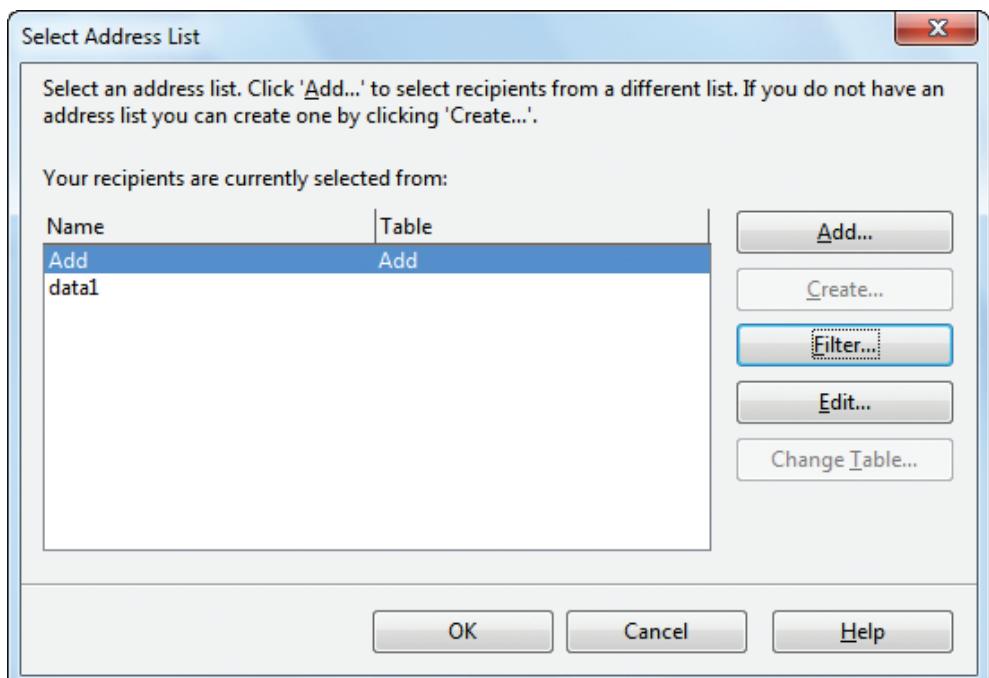


Figure 8.8 New Address List

Mail merge wizard main window appears, Click Next

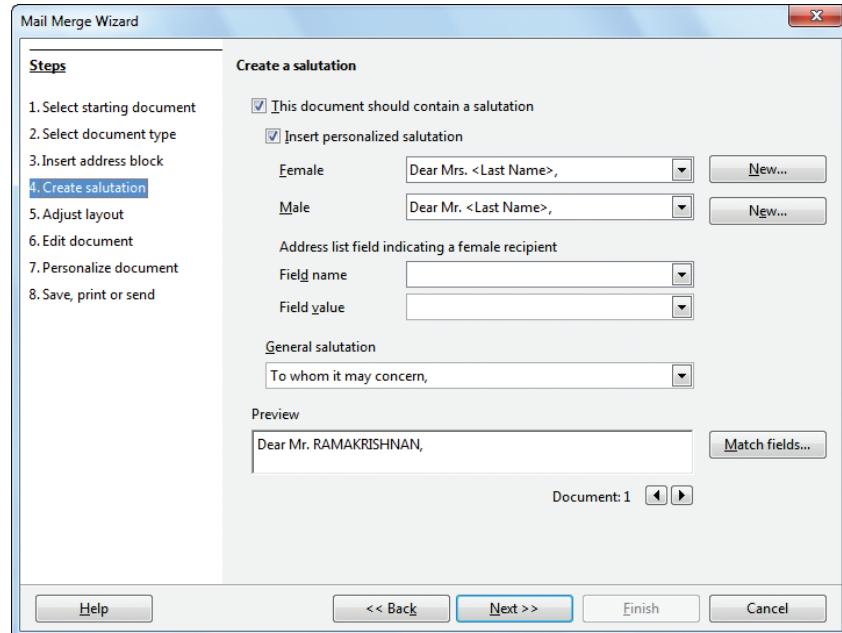


Figure 8.9 Create a Salutation in Mail Merge Wizard

**Step 4:** Create Salutation dialog box appears as shown in Figure 8.9.

This is an optional window to add general salutations to the letter.

Click Next

**Step 5:** The Adjust Layout window appears as shown in Figure 8.10.

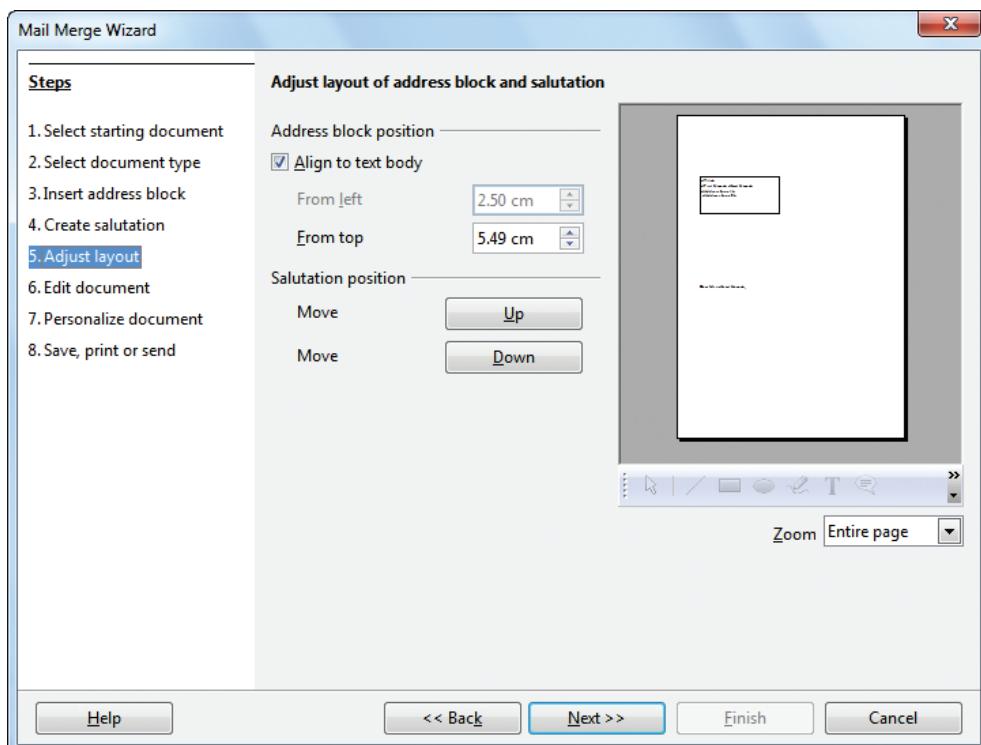


Figure 8.10 Adjust layout of address block and salutation

This helps us to modify the position of the address label and general salutation.

Click Next

**Step 6: Edit document** helps us to add or modify the content of the letter.

When the user click “**Edit document**” mail merge wizard window shrinks and the control is transferred to the document enabling the user to modify the content.

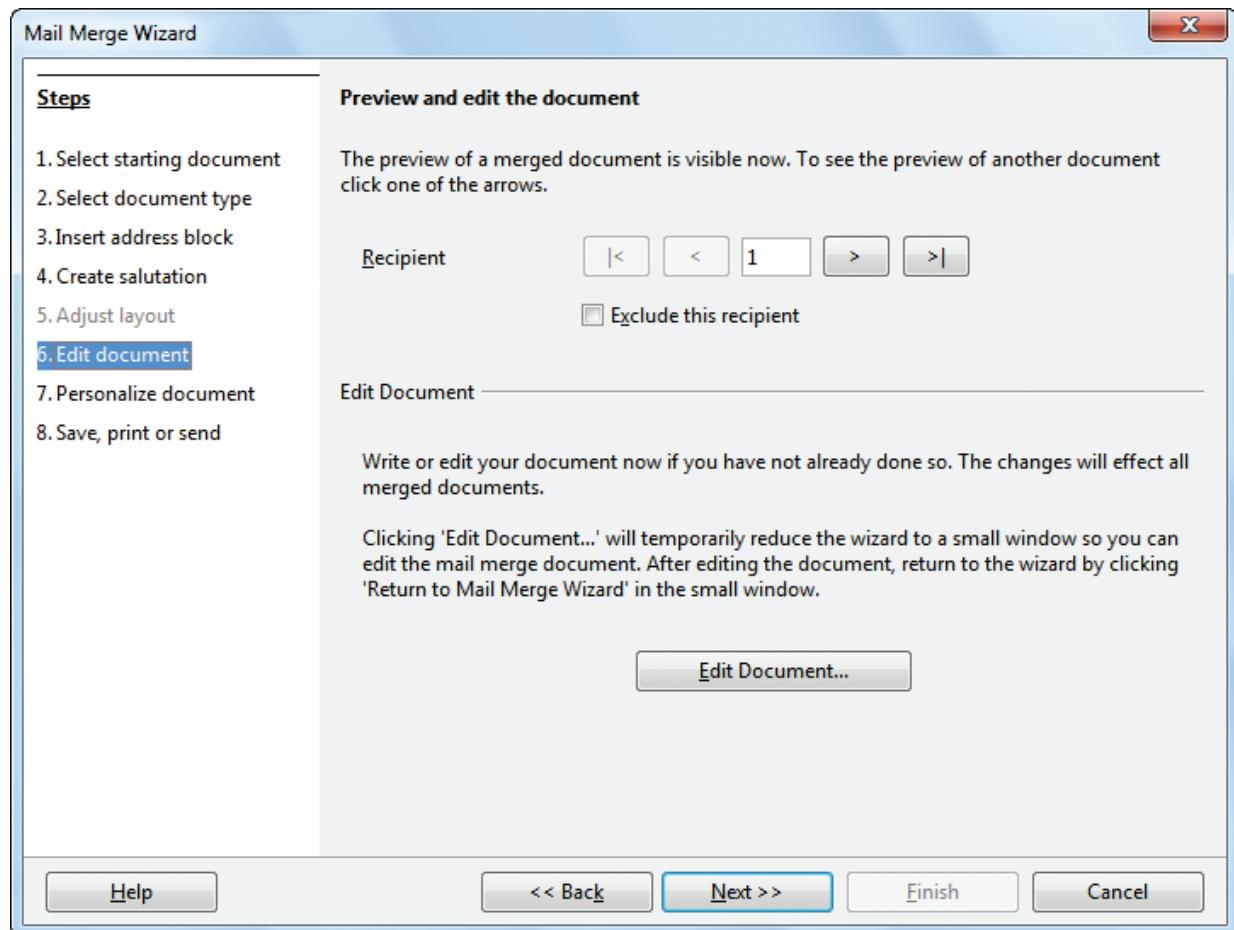


Figure 8.11 Preview and Edit document

After editing the document. Click on “**Return to Mail Merge Wizard**” from the pop-up that appears on the top left corner of the document to return back to mail merge wizard window.

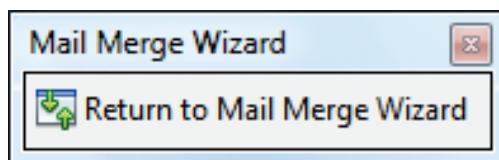


Figure 8.12 Minimized mail merge wizard

Click Next

**Step 7: Personalize Document** window appears, this window helps to add specific comments to selected records, Click Next

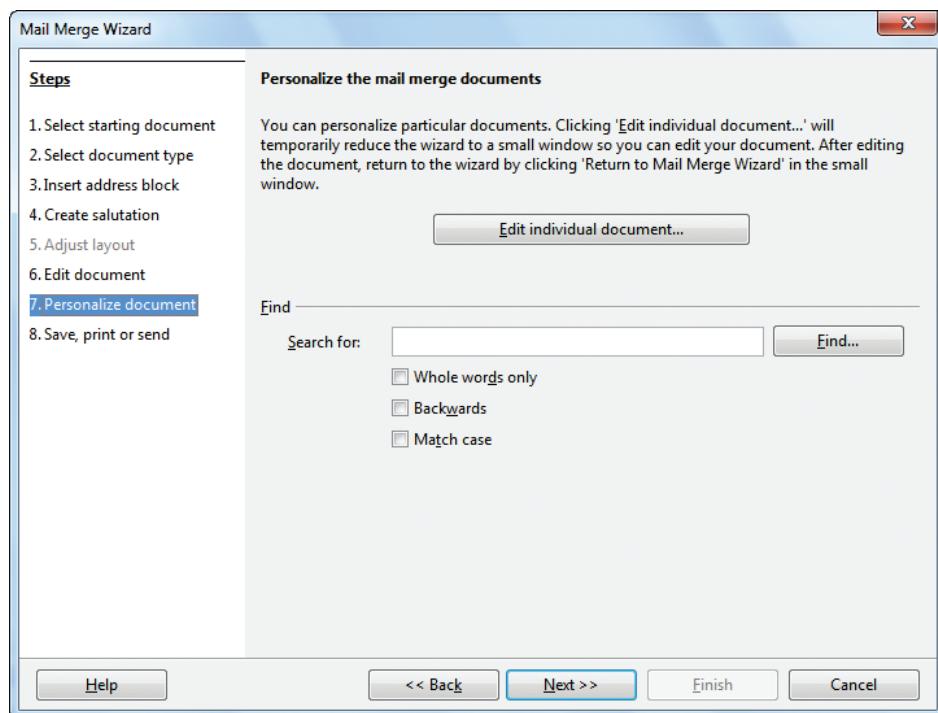


Figure 8.13 personalize the mail merge documents

**Step 8: Save, Print or Send** the save as dialog box is used to save the created document by giving a suitable name.

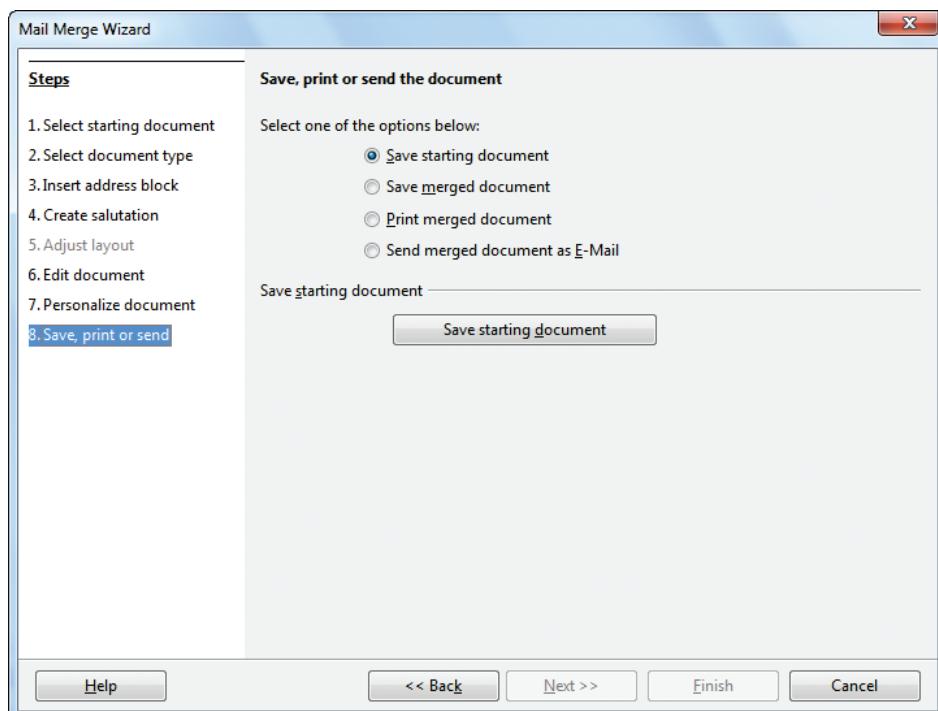


Figure 8.14 Save print or send the document

One can also save, merge, print and send merged document as E-mail using this step.

Click **finish** to view the mail merge on the screen.

## 8.2 Additional Tools

### 8.2.1 Spell Check

The documents prepared using word processing software should be without any spelling mistake. For this purpose OpenOffice Writer includes a dictionary and spell check program. OpenOffice Writer can identify the spelling mistakes as the document is typed or after the entire document is typed.

### 8.2.2 AutoSpellCheck

AutoSpellCheck option checks each word as it is typed and displays a wavy red line under any misspelled word. Once the word is corrected, the red wavy line disappears. This can be done by clicking the AutoSpellCheck icon. 

Right-click on a word with a wavy underline, to open a powerful context menu. Correct words can be selected from the suggested words on the menu. The selection will replace the misspelled word with correct word.

To perform a separate spelling check on the document (or a text selection) click the Spelling and Grammar icon . This checks the document or selection and opens the Spelling dialog box (Figure 8.15) if any misspelled words are found. This can also be achieved by pressing F7 key.

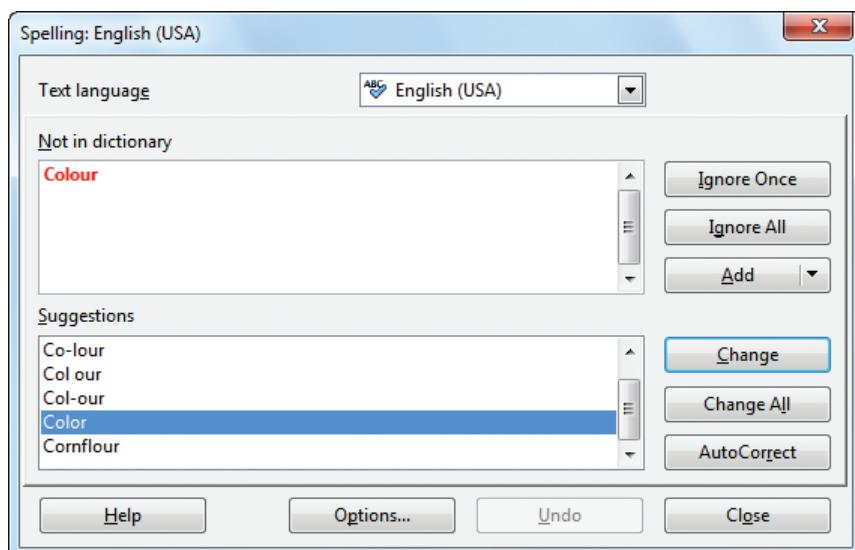


Fig: 8.15 The Spelling dialog box

Here are some more features of the spelling command:

- The **Not in dictionary** text area displays the misspelt word.
- The **Suggestions** box displays the alternate spelling.
- The **Ignore Once** button skips the word once.
- The **Ignore All** button skips all occurrences of the word.
- The **Change** button will change only that particular occurrence.
- The **Change All** button will change all the occurrences of the word.
- The Text language can be changed (for example, Spanish, French, or German) from the Spelling dialog box.
- The new words can be added to a dictionary. Click **Add** in the Spelling dialog box and pick the dictionary to add to it.

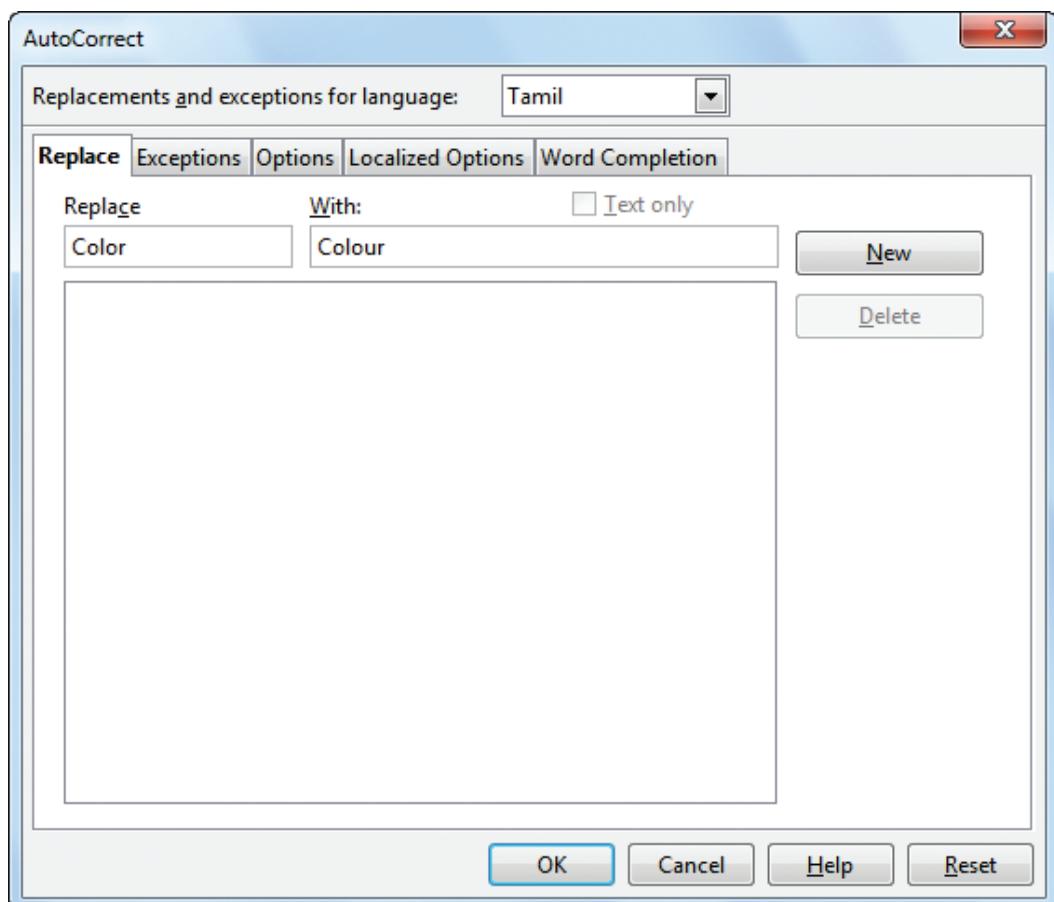


Figure 8.16 AutoCorrect wizard

### 8.2.3 Automatic correction

AutoCorrect feature has the facility to correct the common misspellings and typing errors, automatically. For example, “hte” will be changed to “the” which can be done through, menu option **Tools** → **AutoCorrect** to open the AutoCorrect dialog box as shown in Figure 8.10 which provides the chance to change the misspelled word with the correct word. To make an auto correct entry

1. Select **Tools** → **AutoCorrect**
2. AutoCorrect dialog box appears
3. Click Replace Tab
4. In replace box, type the misspelt word
5. In with box , type the correct word
6. Click New.



AutoCorrect is automatically turned on. To turn it off, uncheck **Format** → **Autocorrect** → **While Typing**. AutoCorrect can be used as a quick way to insert special characters. For example, (c) will be autocorrected to ©. You can add your own special characters.

#### Activity 1:

Do the necessary steps to correct the word “comupter” into “computer” automatically.

1. Goto **Tools** → **AutoCorrect Option**

AutoCorrect dialog box appears as shown in Figure 8.17

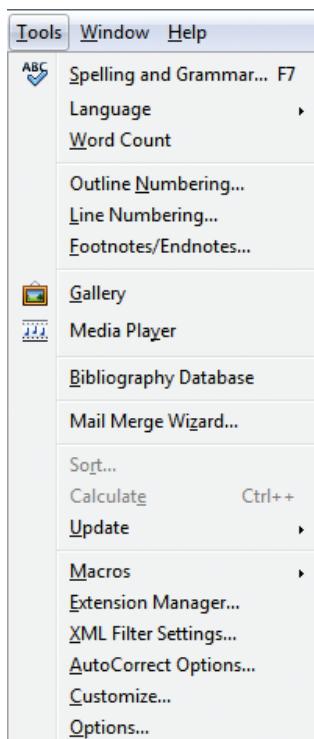


Figure 8.17 Auto correct menu

2. Click the Replace tab and type “comupter” in Replace text box and “computer” in with textbox.
- Then Click New and then OK.

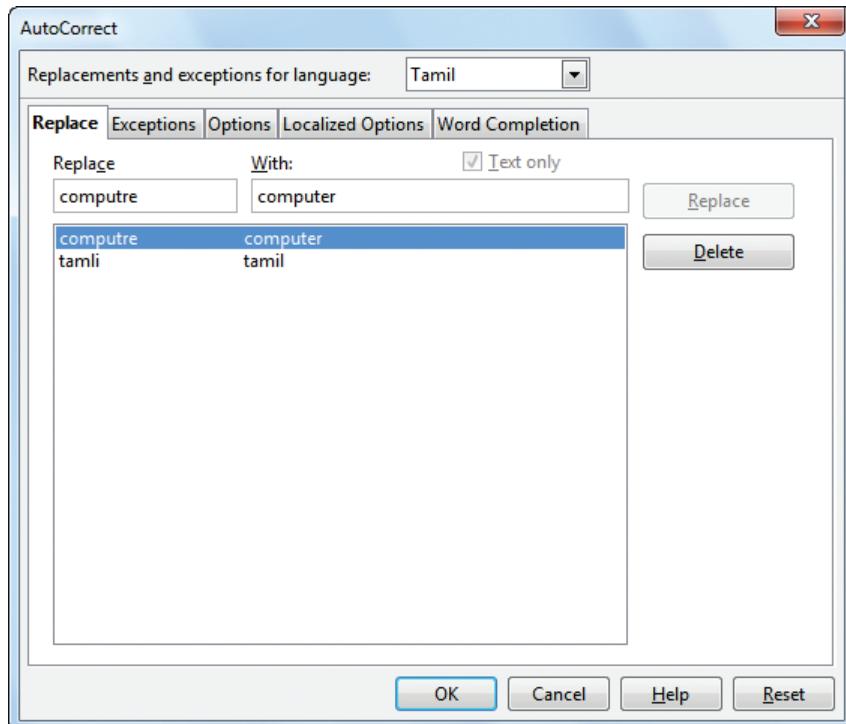


Figure 8.18 Autocorrect dialog box

3. The word “comupter” is replaced with “computer” and displayed in the list.

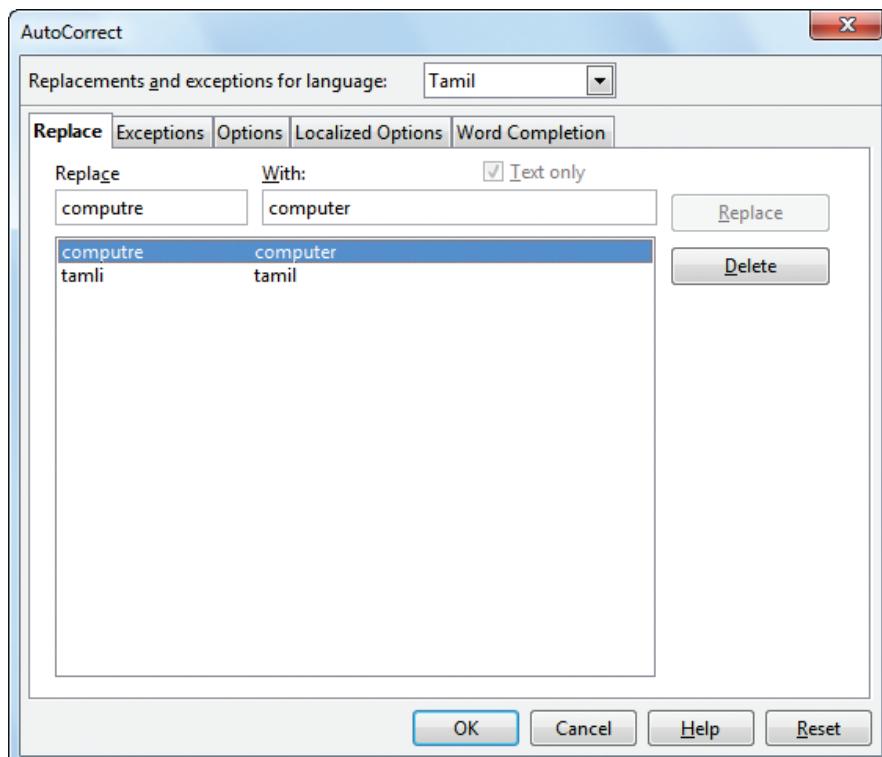


Figure 8.19 Auto correct list

After entering this, when you type “comupter” in the document, it will be automatically changed to the correct spelling “computer”.

### Counting the words in a selection:

Select the required text and choose **Tools → Word Count**.

This displays the number of words and characters in the selected text. Word count dialog box appear as shown in Figure 8.20

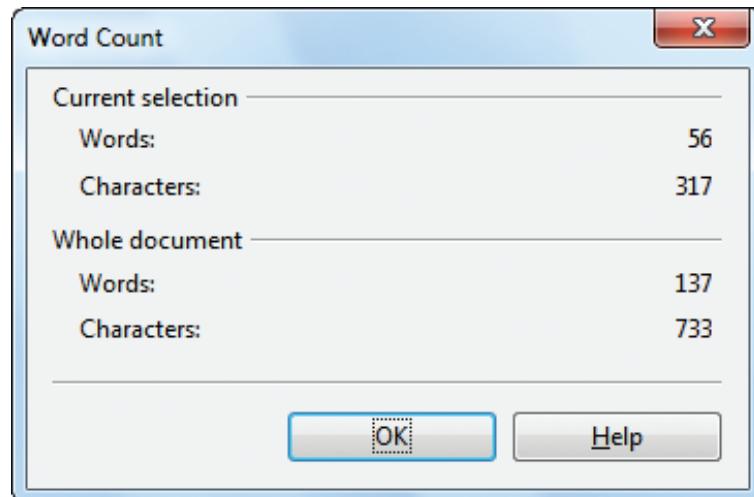


Figure 8.20 Word Count Dialog Box

The number of words and characters in the entire document can also be found from **File→Properties → Statistics Tab**. (Figure 8.21)

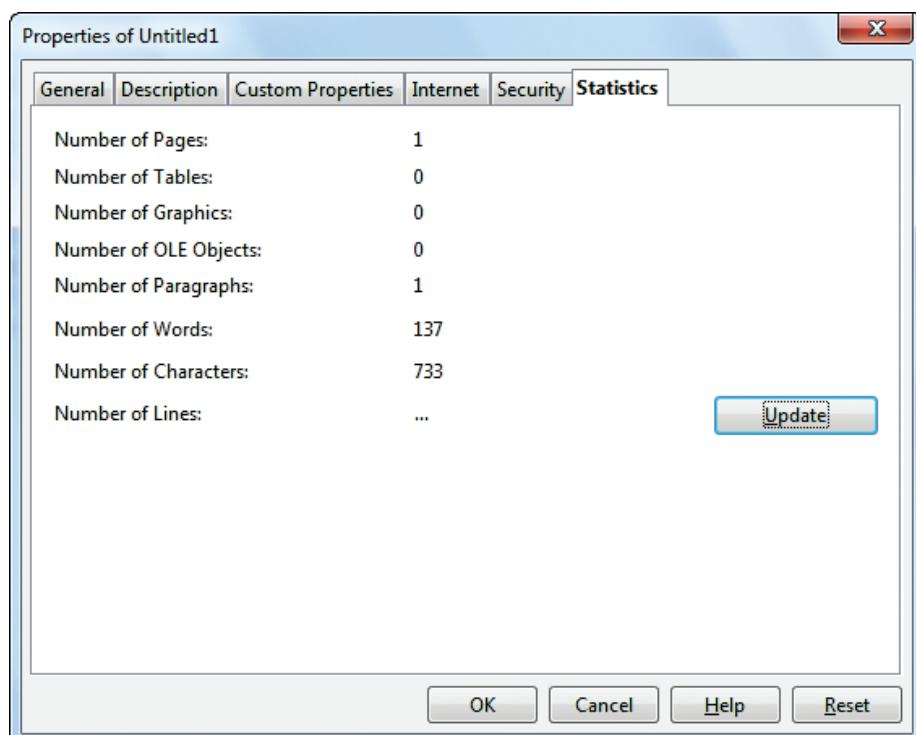


Figure 8.21 Word count in a document



## Student Activity1

Use mail merge feature to create an invitation to invite parents to visit science exhibition at your school.

## Student Activity 2

Create Birthday Invitation and use Mail merge to send it your friends

## Staff Activity 3

Use mail merge feature to create an invitation to invite parents to attend parents meeting at school.

## Evaluation



### Part I Choose The Best Answer

1. To send a document to a number of people whose details are stored in the table. Which feature would you use to send the document to all the people?
  - a. Turn on the Online Collaboration feature
  - b. Turn on the Track Changes feature
  - c. Use the Mail Merge feature
  - d. Enabling Hyperlink
2. A -----is a database containing the name and address or records of other information from which a mailing list may be desired
  - a. data source
  - b. Word Processor
  - c. Text File
  - d. Page Layout
3. A ----- is a computer application that is used to create, edit, and organize a document.
  - a. Word processor
  - b. Spreadsttheet
  - c. Presentation
  - d. Database
4. Which one is not a Mail Merge feature?
  - a. Send Mail content to many recipients
  - b. Creating and storing data
  - c. Labels
  - d. Calculator
5. Which of the following option is not responsible for external address book creation wizard?
  - a. Mozilla/Netscape
  - b. LDAP Address Data
  - c. Outlook address book
  - d. windows system address book

6. Which menu option of the menu bar is used to Mail Merge a document?  
a. View                    b. Format                    c. Table                    d. Tools
7. Which among the following list of files cannot be used as an Address List in Mail Merge?  
a. OpenOffice Calc                    b. Microsoft Excel  
c. OpenOffice Base                    d. OpenOffice Impress
8. Spelling errors can be viewed in a document through \_\_\_\_\_.  
a) Green wavy line                    b) Blue wavy line  
c) Black strike                        d) Red wavy line
9. The alternate words in Open Office Writer are called \_\_\_\_\_.  
a) Antonyms                        b) Thesaurus                    c) Comments                    d) Meanings

## Part II Very Short Answers

- 1) What is Mail Merge?
- 2) What is Address book?
- 3) What is Data source?
- 4) How will you add your name to the dictionary?
- 5) How will you replace a misspelled word with a correct word?

## Part III Short Answers

- 1) List the advantages of the Mail Merge feature
- 2) List out the data sources in Mail Merge
- 3) Open a document and find the number of words available in the document
- 4) Write down the steps to find the number of words in a paragraph

## Part IV Explain

- 1) Explain Mail Merge feature
- 2) Explain Address book feature
- 3) How to create and storing data in mail merge

**A-Z  
GLOSSARY**



Active file	-	நடப்புக் கோப்பு
Algorithm	-	நெறிமுறை
Alignment	-	இசைவு
Anti-virus	-	நச்சுநிரற்கொல்லி/நச்சுநிரல் எதிர்ப்பான்
Application software	-	பயன்பாட்டு மென்பொருள்
Artificial intelligence	-	செயற்கை நுண்ணறிவு
Binary number	-	இரும் எண்
Bit	-	நுண்மி
Browser	-	உலாவி
Browsing	-	உலாவுதல்
Buffering	-	இடையைப்படுத்துதல்
Central Processing Unit (CPU)	-	மையச் செயலகம்
Chat	-	உரையாடல்
Checkbox	-	தேர்வுப்பெட்டி
Communication	-	தொடர்பு
Compact disc (CD)	-	குறுவட்டு/இறுவட்டு
Computer network	-	கணினி வகையைமைப்பு
Condition	-	நிபந்தனை
Control key	-	கட்டுப்பாட்டு விசை
Control structure	-	கட்டுப்பாட்டு அமைவு
Control unit	-	கட்டுப்பாட்டு பிரிவு
Copy	-	நகல்
Data	-	தரவு
Decimal number	-	பதின்ம் எண்
Desktop	-	முகப்புத் திறை
Devices	-	சாதனங்கள்
Disk drive	-	வட்டு இயக்கி
Distributed Computing	-	பரவலாக்கப்பட்ட கணிப்பொறி திறன்
Document	-	ஆவணம்
Download	-	பதிவிறக்கம்
E-mail	-	மின்னஞ்சல்
Error	-	பிழை
Field	-	புலம்
File	-	கோப்பு
File management	-	கோப்பு மேலாண்மை
Flow chart	-	நெறிமுறை விளக்கப்படம்
Folder	-	கோப்புறை
Font	-	எழுத்துரு
Function	-	செயற்கூறு
GUI	-	வரைகலை பயனர் இடைமுகம்
Hard disc	-	வண்வட்டு
Hardware	-	வண்பொருள்
Icon	-	பணிக்குறி
Information	-	தகவல்
Insertion point	-	செருகும் புள்ளி
Internet	-	இணையம்
Internet protocol address	-	இணைய நெறிமுறை முகவரி
Internet service provider (ISP)	-	இணையச் சேவை வழங்குனர்

Interpreter	-	வரிமொழிமாற்றி/இடைமாற்று
Intranet	-	உள்வலை
iOS(I phone OS)	-	ஆப்பிள் ஐ-போன் இயக்க அமைப்பு
Keyboard	-	விசைப்பலகை/தட்டச்சப்பலகை
Keyword	-	சிறப்புச் சொல்
Laptop computer	-	மடிக்கணினி
Log in	-	புகுபதி/உற்புகு
Log out	-	விருபதி/வெளியேறு
Machine language	-	இயந்திர மொழி
Memory	-	நினைவுகம்
Menu	-	பட்டியல்
Micro processor	-	நூண் செயலி
Multimedia	-	பல்வூடகம்
Multitasking	-	பல்பணி
Navigation	-	வழிசெலுத்தல்
Network	-	பிணையம்/வலையமைப்பு
Notation	-	குறிமானம்
Object	-	பொருள்
Operating system	-	இயக்க அமைப்பு
Page layout	-	பக்க வடிவமைப்பு
Password	-	கடவுச்சொல்
Peripherals	-	உபகரணங்கள்
Print	-	அச்சிடு
Printer	-	அச்சப்பொறி
Program	-	நிரல்
Protocols	-	நெறிமுறைகள்
Reset	-	மீட்டமை
Robotics	-	எந்திரணியல்
Scheduling	-	திட்டமிடுதல்
Security	-	பாதுகாப்பு
Sessions	-	அமர்வுகள்
Shortcut	-	குறுவழி/குறுக்குவழி
Shutdown	-	அணை/மூடு
Software	-	மென்பொருள்
Spooling	-	சுருளாக்கம்
String literals	-	சர மதிப்புருக்கள்
Structured programming	-	கட்டுரு நிரலாக்கம்
Syntax error	-	தொடரமைப்புத் தவறு
Tab	-	தத்தல்
Toolbar	-	கருவிப்பட்டை
Trash	-	மறுசூழ்நிலைப் பெட்டி
URL	-	(இணைய) முகவரி
Version	-	பதிப்பு
Virus	-	நச்சநிரல்
Website	-	இணையத்தளம்
Wizard	-	வழிகாட்டி
Word processor	-	சொற் செயலி
Workstation	-	பணிநிலையம்
World Wide Web (WWW)	-	தைய விரிவு வலை

## Introduction to Spreadsheet

### Learning Objectives

Students will be able

- To know the features of OpenOffice Calc.
- Use of different operators.
- Generation of Series.
- Edit Formula in Worksheet.
- Manipulation of Rows/Columns in Worksheet.
- Understand various text format in options.
- Use of Number format in Worksheet.



### 9.1 Introduction to spreadsheet

Spreadsheet is a very useful office automation tool to organise, analyse and store data in a tabular form. Spreadsheet was developed as computerized equivalent to paper-based accounting worksheets.

Spreadsheet users can adjust any of the stored values and can observe the effects on the calculated values. This is called "**What if**" analysis. Modern spreadsheet can have multiple interacting sheets and can display data either as text or numerals or in a graphical form.

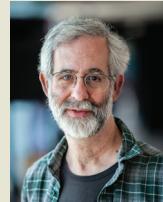
#### 9.1.1 Evolution of Spreadsheet

**Daniel Bricklin** and **Bob Frankston** developed the first spreadsheet called "VisiCalc" in 1979 for Apple II. In 1982, Lotus Corporation introduced "Lotus 1-2-3"; Lotus 1-2-3 was the first to introduce cell names and macros. In 1987, Microsoft Corporation introduced Excel. Excel implemented a Graphical User Interface (GUI) and the ability

to point and click using a mouse. There are lots of other spreadsheet applications; Microsoft Excel continues to be the most popular spreadsheet software.



#### Daniel Singer "Dan" Bricklin The Father of Spreadsheet

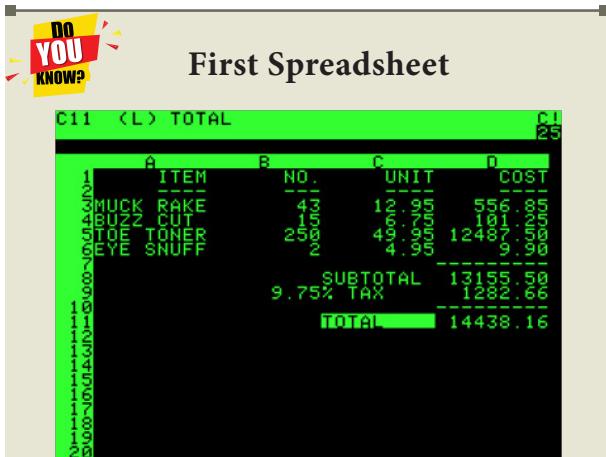


Daniel Singer "Dan" Bricklin (born 16 July 1951), often referred to as "The Father of the Spreadsheet", is the American Co-Creator, with Bob Frankston, of VisiCalc spreadsheet. He also founded Software Garden, Inc., in which he is currently the President of Trellix Corporation, which is currently owned by Web.com. He currently also serves as the Chief Technology Officer of Alpha Software.

OpenOffice Calc is a popular open source spreadsheet application maintained by Apache Foundation. Star Office calc is the parent application of OpenOffice Calc which was developed by a German Company namely, Star Division in 1985.

### 9.2 Working with OpenOffice Calc

Calc is the spreadsheet component of OpenOffice. You can enter any kind of data in a spreadsheet and then manipulate this data to produce certain results. Alternatively, you can enter data and then use Calc in a 'What If...' manner by changing some of the data and observing the results without having to retype the entire spreadsheet.



VisiCalc ("Visible Calculator") was the first spreadsheet for personal computers, originally released for the Apple II by VisiCorp. It is considered that VisiCalc turned the microcomputer from a hobby for computer enthusiasts into a serious business tool, prompting IBM to introduce the IBM PC, two years later. It was sold over 700,000 copies in six years, and as many as 1 million copies over its history.

### 9.2.1 Features of OpenOffice Calc:

- **Connecting with Excel** - Ability to open, edit, and save Microsoft Excel spreadsheets.
- **AutoSum** - helps you to add the contents of a cluster of adjacent cells.
- **List AutoFill** - automatically extends cell formatting when a new item is added to the end of a list.
- **AutoFill** - allows you to quickly fill cells with repetitive or sequential data such as chronological dates or numbers, and repeated text. AutoFill can also be used to copy functions. You can also alter text and numbers with this feature.
- **Charts** - helps you in presenting a graphical representation of your data in the form of Pie, Bar, Line charts and more.

- **Functions** - which can be used to create formula to perform complex calculations on data
- **Database functions** - to arrange, store, and filter data

### 9.3 Creating a new worksheet

A new worksheet can be created through various methods. From Windows, select

**Start → All Programs → OpenOffice → OpenOffice Calc (or)**

From Star Center (Welcome Screen):

Double-click on “**OpenOffice**” icon the desktop

Now, a welcome screen appears as shown in Figure 9.1.

This open screen is called as “**Star Center**”. Calc is one of the component of OpenOffice. So, it may be invoked from the “**Star Center**” by simply clicking on the “**Spreadsheet**” icon.

(or)

A new spreadsheet can also be created by selecting **File → New → Spreadsheet** from any OpenOffice Application. After using any one of the above said methods, OpenOffice Calc window appears as shown in Figure 9.2. The outline of the window is very similar to other application windows of OpenOffice. The main area of the Calc window is called as “**Work area**” or “**Worksheet**”.

A worksheet is a grid of cells with a programmable calculator attached to each cell. When you open a new spreadsheet, there are three worksheets available by default(Sheet1, Sheet2, Sheet3). You can include more sheets and organize them.

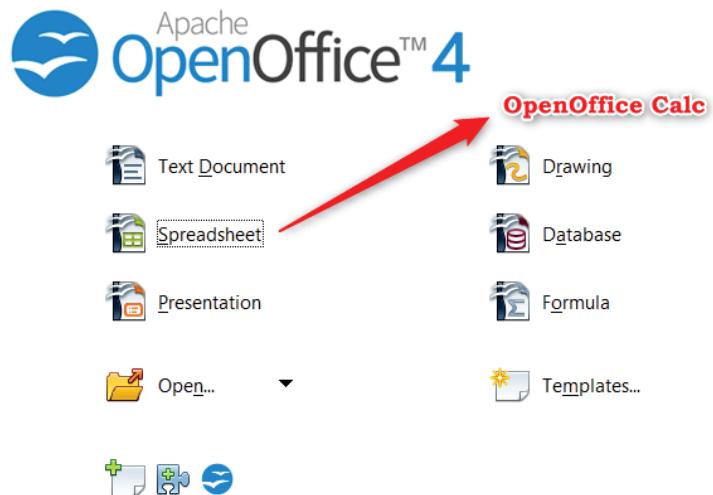
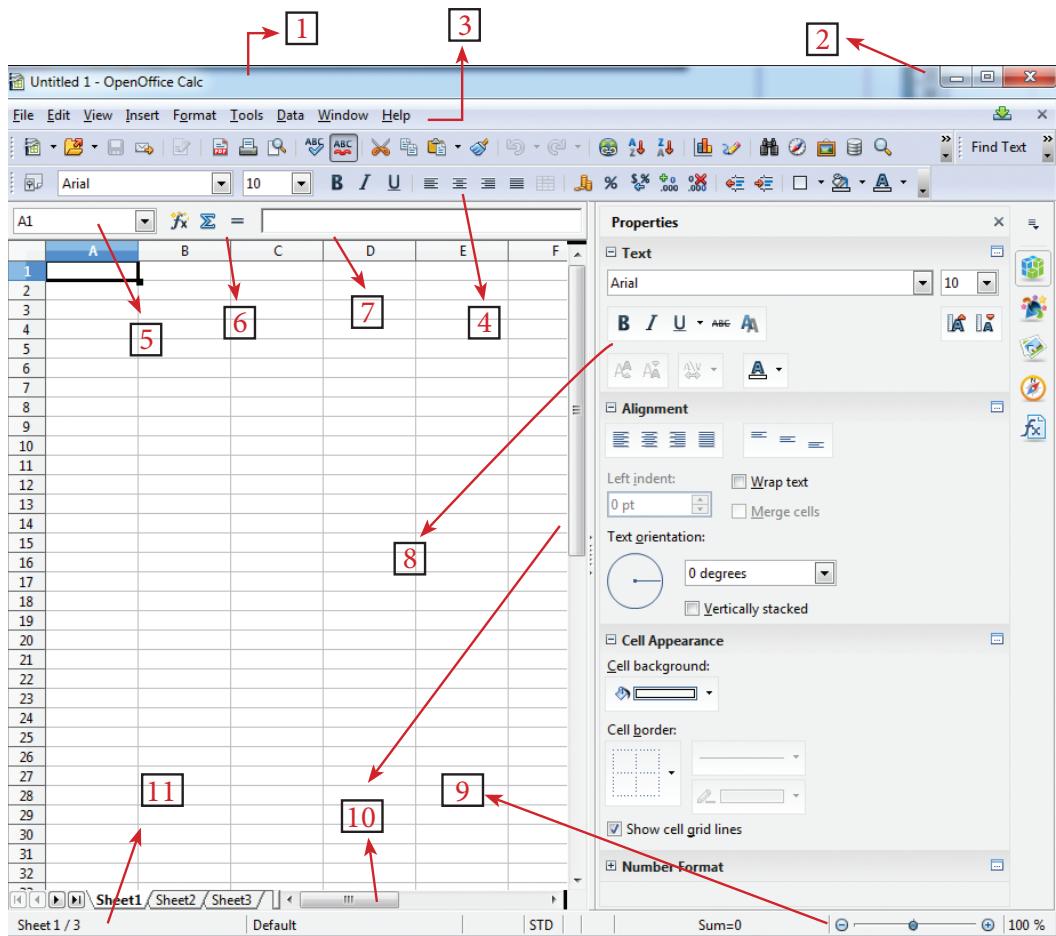


Figure 9.1 Opening Screen (Star Center) of OpenOffice



1. Title Bar	2. Control Buttons	3. Menu Bar	4. Tools Bar
5. Name Box / Address Box	6. Quick Function Wizard	7. Formula Bar / Input Line	8. Formatting Properties
9. Zoom	10. Scroll bars	11. Status Bar	

Figure 9.2 OpenOffice Calc Window

### 9.3.1 Parts of the OpenOffice Calc Window

Appearance of the Calc window is very similar to that of the Writer window. The workspace of Writer is a big blank area. But, in Calc, the grid of cells is the workspace.

#### 9.3.1.1 Title Bar

At the top of the window is the “Title Bar”. It is used to show the name of the file and its application. In OpenOffice Calc, the default name for the first unsaved worksheet is “Untitled1”.

#### 9.3.1.2 Control Buttons:

In the right corner of title bar, (1) minimize, (2) maximize / restore and (3) close control buttons are available.

#### 9.3.1.3 Menu Bar

Below the title bar is the menu bar. Most of the menus are very similar to what you have learnt in OpenOffice Writer.

**File** - menu contains the commands of all file management tasks like, Create a new file, Open an existing file, Close the current file, Save a file, Save a file in another name, print file, Export file etc.

**Edit** - menu contains the editing commands like, cut, copy, paste, Undo, Redo, Fill etc., Most of the menu items are similar to Writer Edit menu. But, for Calc, some special editing options are available

under this menu.

**View** - menu contains the commands which are used to modify the environment of Calc.

**Insert** – menu contains commands for inserting various Calc elements such as cells, columns, rows, functions, charts etc.,

**Format** – menu contains the commands of various text and cell formatting features.

**Tools** – menu contains various tools and functions such as spell check, protect document, insert pictures, macros, etc.,

**Data** – menu contains the commands to manipulate data in a worksheet such as sort, filter, subtotal, validity etc.,

**Window** – menu shows display options such as New Window, Close Window, Split and Freeze.

**Help** – menu lists in-built help features available with OpenOffice.

#### 9.3.1.4 Tools Bar

Under the menu bar, there are three toolbars available by default. They are:

- (1) Standard Toolbar
- (2) Formatting Toolbar
- (3) Formula bar

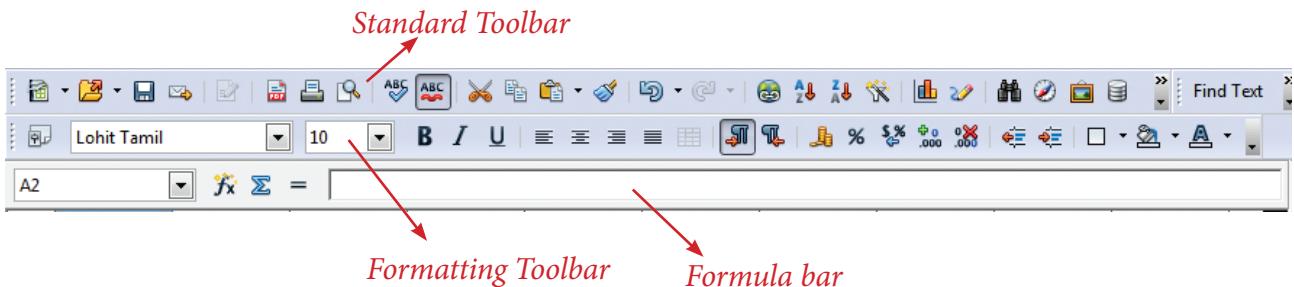


Figure 9.3 OpenOffice Calc Tool bar

**Standard Toolbar** – contains frequently used menu such as File, Edit, Data etc., commands as icons such as New Open Save, Send, Print, Print Preview, Cut, Copy, Paste, Sorting, Inserting chart etc.,

**Formatting Toolbar** – contains frequently used text and cell formatting commands as such as changing font style, font size, font colour, alignments, cell formatting etc.,

**Formula bar** – This is a very important element in a spreadsheet. It contains Name box, Function Wizard, Sum button, Function button and Input line (Refer Figure 9.4).

**Name box :** It displays the current cell address

**Function Wizard :** It is used to insert function

**Sum button :** It is used to quickly insert sum function.

**Input Line :** This is used to show the contents of the current cell. It always

shows actually what is typed in a cell. It can also be used to edit the contents.

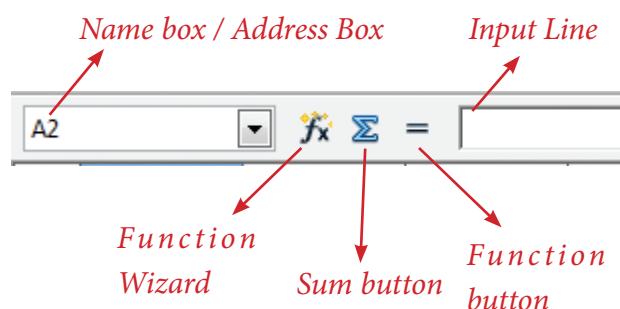


Figure 9.4 Calc Formula bar

#### 9.3.1.5 Scroll bar

Spreadsheet window also has two sets of scroll bars (1) Vertical Scrollbar and (2) Horizontal Scrollbar (Refer Figure 9.5)

**Vertical Scroll bar :** It is used to move the screen up and down.

**Horizontal Scroll bar :** It is used to move the screen left and right.

**Scroll buttons :** used to move the screen to the relative distance.

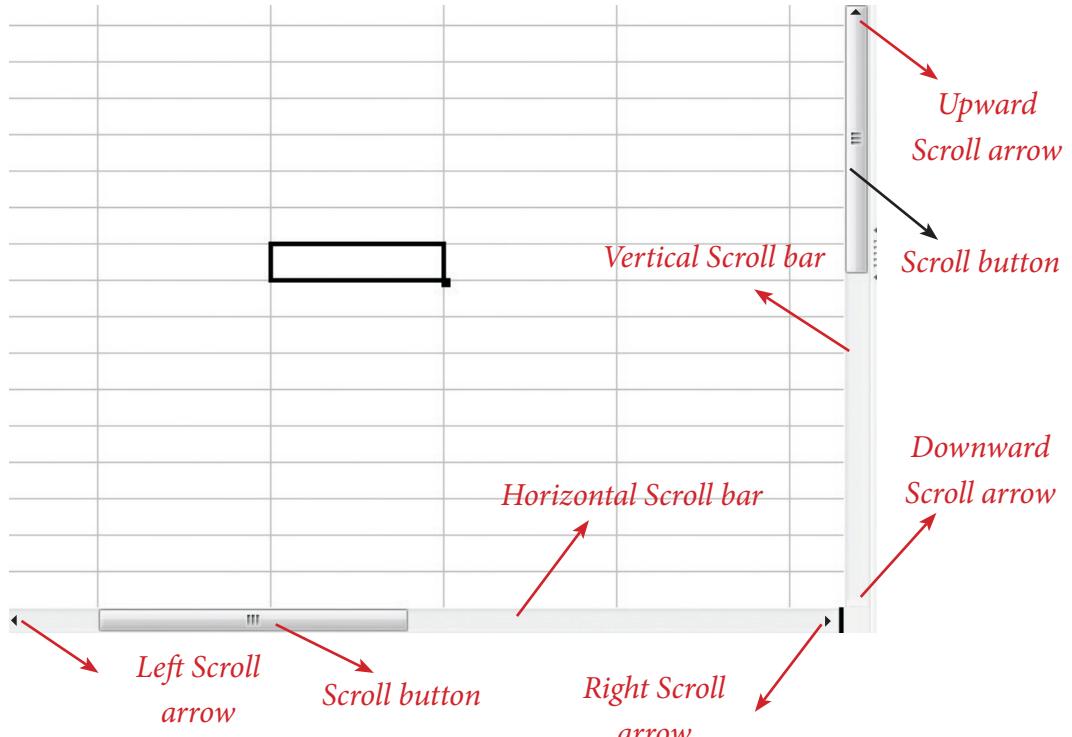


Figure 9.5 Calc Scrolling bar

#### 9.3.1.6 Row, Column, Cell and Cell Pointer

Below the **formula bar** contains the worksheet of work area which consist of grid cells. The worksheet has number of rows and columns, where each column is labelled as A, B, C, D ..... AA, AB, AC ..... and the rows are numbered from 1, 2, 3 .... (Figure 9.6).

OpenOffice Calc version 4.1.5 contains **1024** columns and **10,48,576** rows. Column heading starts from A and end with **AMJ**. In the case of Microsoft Excel 2016, there are **16,384** columns (A to XFD) and **10,48,576** rows. (OpenOffice Calc Version 4.1.5).

#### Cell

Intersection of each row and column is a box which is called as a “Cell”. Each cell has a unique address.

Cell address is the combination of column heading and row number. For example, the intersection of column B and row 4 makes a cell B4. (Figure 9.7). Every cell is thus identified by its unique cell address.

Cell pointer is a rectangular box which can be moved around the worksheet. The cell in which the cell pointer is currently located is known as “**Active cell**”. When you type any content, it will appear in the active cell. The address of the active cell is displayed in the Name box / Address box. Active cell’s column name and row number will be highlighted. Using this visual clue, one can easily identify an active cell. Moreover, the contents of an active cell will be displayed in the formula bar.

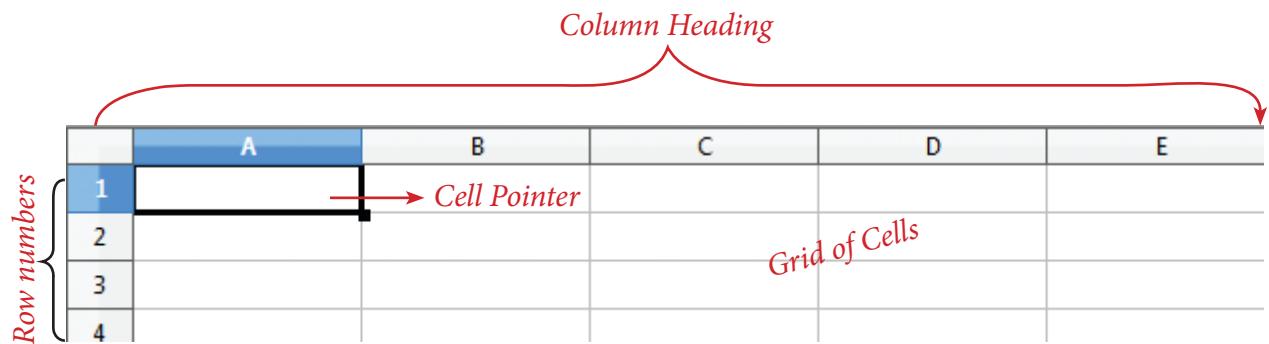


Figure 9.6 Calc Rows, Columns, Cells

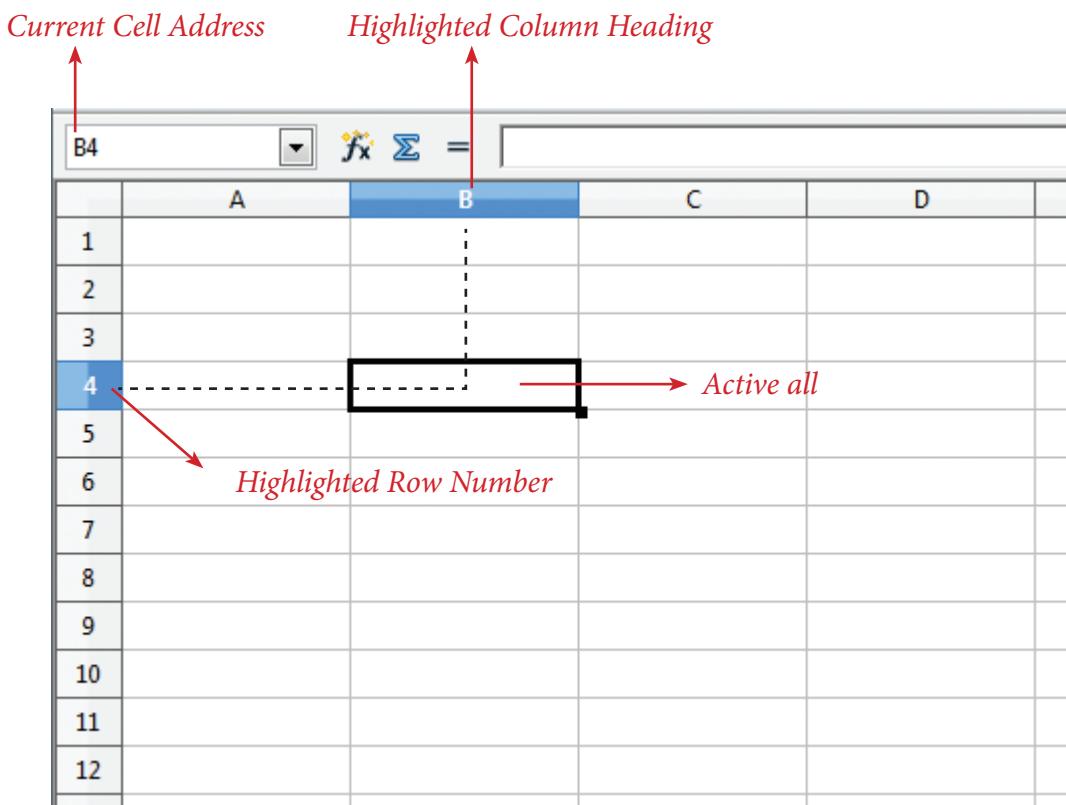


Figure 9.7 Cells, Rows and Columns

### 9.3.1.7 Worksheet tabs

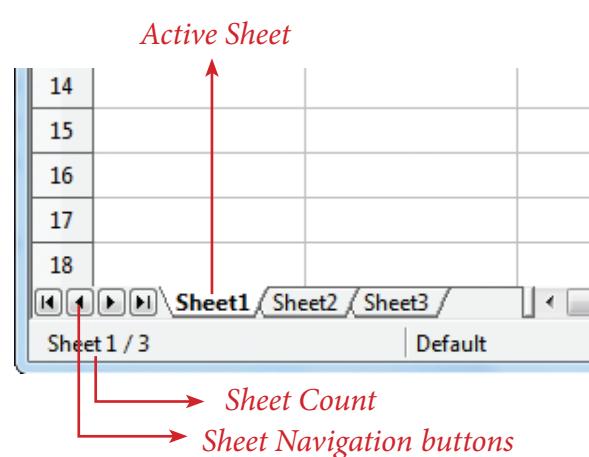


Figure 9.8 Calc Sheet Tab

At the bottom of the grid of cells are the sheet tabs. By default there are 3 sheets “Sheet1”, “Sheet2” and “Sheet3”, (Figure 9.8). When you open a new worksheet, sheet1 is the default active sheet. Active sheet tab will appear in white colour. If you click on another sheet, it will become active and its colour will turn white. Multiple sheets can also be selected by clicking the sheet and press the **Ctrl** button (**Ctrl + Click**). Selected sheets will turn to white colour.

On the left of the sheet tab, four navigation buttons are used to move between worksheets (Figure 9.9).

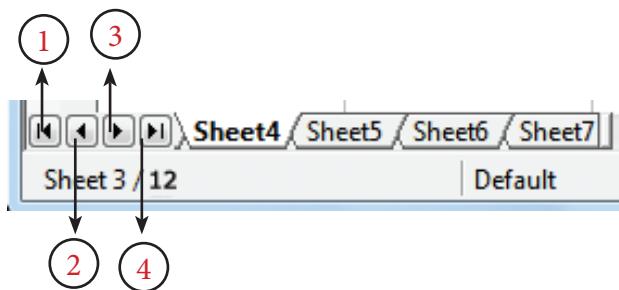


Figure 9.9 Calc Sheet tab and Navigation buttons

- (1) Move to the First sheet
- (2) Move to the previous sheet
- (3) Move to Next sheet
- (4) Move to the Last sheet

Left corner of status bar shows the total count of sheets and the present active sheet number. For example, if the status bar shows sheet 3/12; 3 refers to the serial number of the current sheet and 12 refers to the total number of sheets available.

Each sheet name can be renamed. To rename a sheet, just double-click on the sheet, which will show a small box as shown in Figure 9.10.

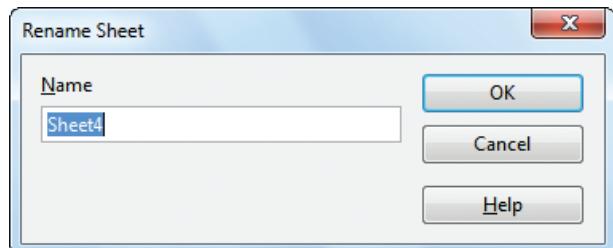


Figure. 9.10 Rename Sheet dialog box

It shows the current name; delete or overwrite the existing name and type a new name; click OK button. New name will be displayed on the sheet.

#### 9.3.1.8 Status bar

Below the sheet tabs and horizontal scrolling bar is the “Status Bar”. It shows the current status of the worksheet (Refer Figure 9.11).

**Sheets count:** Displays current serial number of the sheet / total number of sheets available.

**Page Style:** Displays the page style of the current sheet. To make changes, just double-click on “Default” and it will show you the “Page Style” dialog box, which is used to change the margin, orientation, paper size, inserting header, footer, border style etc.,

**Selection Mode:** Displays the selection mode of the current sheet. There are three modes available to select the cells of a worksheet. They are, Standard (STD), Extend (EXT) and Add (ADD).

**Unsaved Changes:** An asterisk (\*) symbol indicates that the changes are made in the worksheet but not yet saved. If you have saved your changes, it will disappear.

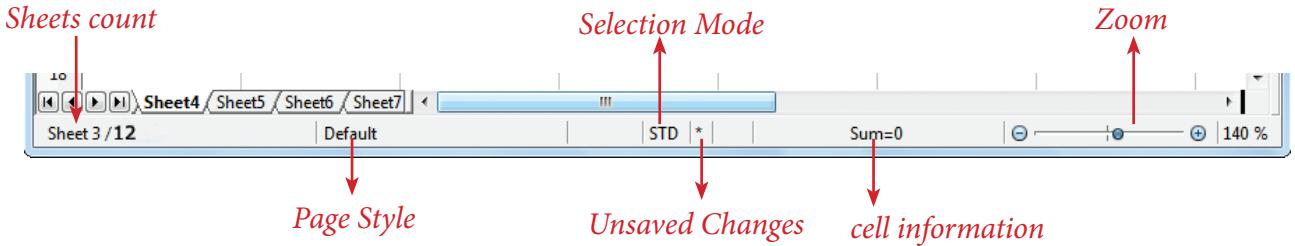


Figure 9.11 Calc Status bar

## 9.4 Working with Data

When you open a new worksheet, the cell pointer is located in cell A1. So, the cell A1 is known as “**Home Cell**”. Cell pointer can be moved anywhere in the worksheet using the direction keys.

“**Tab key**” is used to move the cell pointer towards the right side or in the forward direction. “**Shift+Tab**” is used to move backward i.e. from right to left in a row. “**Enter**” key is also used to move the cell pointer. Enter moves the cell pointer to a cell below the current cell i.e. downwards. Four “**direction keys**” are used to move the cell pointer anywhere in the worksheet.

### 9.4.1 Entering Data:

Any data can be typed directly in any cell of the worksheet. But, the cell in which you type data should be an active cell. So, move the cell pointer to a particular cell to make it active cell; or click any cell to make it active cell. Then, start typing any data. When you type data, spreadsheet recognises the type of data entered in cells.

#### Data types:

Data are of different types. Data are made up of **alphabets**, **numbers**, **Date** and **time** is also another data type even though it has numbers and symbols. In

general, data types are classified as:

**Alphabetic data type** – consists of alphabets only, **Numeric data type** – consists only of numbers (whole number or fractional numbers), **Alphanumeric data types** – consists of a combination of alphabets and numerals, **Date data type** – consists only of date, **Time data type** – consists only time.

#### 9.4.1.1 Entering Numbers:

Any numeric data can be entered in a worksheet. Entered numbers are aligned to the right side within the cell by default. Negative numbers may be entered with a minus sign or within brackets (Refer Figure 9.12). If you enter any number within the bracket, it will be changed as negative number i.e., number prefixed with minus. If any number starts with 0 (zero), Calc will drop the leading zero.

	B	C	D	E
		5478		
		-142		

Figure 9.12 Entering data

#### 9.4.1.2 Entering Text:

Unlike numbers, any character can be entered as data in Calc. Entered text will be

aligned to the left side within the cell by default. When you enter any numeric value, if it is aligned left, it is understood that the entered content is not a number. If there is any number that starts with a single quote, Calc converts that number to text (Refer Figure 9.13).

B	C	D
	Chennai	
	458	

Figure 9.13 Entering Text

#### 9.4.1.3 Entering Date and Time:

Before entering date, ensure the format of your system date. Calc accepts date as per the system date format. If your system has American date format i.e. month-date-year; you should enter dates in Calc spreadsheet as mm/dd/yy. If your system follows the Indian date format, date should be entered as dd/mm/yy form in Calc.

For example: if your system has American Date format, 18th December 2017 should be entered as 12/18/17. As soon as the date is typed in the correct form, the entered date will be aligned on the right side within the cell, and if you place the cell pointer in that cell, the formula bar shows your date as “12/18/2017” (Figure 9.14). This is a visual clue to know whether the date is accepted or not.

A Date format can be changed to any other valid form using “Cell Formatting” dialog box and it will be discussed later.

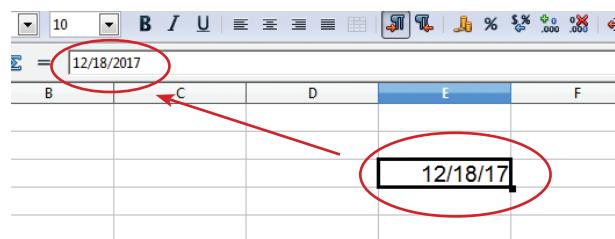


Figure 9.14 Entering Date

Like dates, for entering time, Calc follows the general format HH:MM:SS, where HH, MM and SS represent hours, minutes and seconds respectively.

#### Different Date Formats

Order styles	Countries
DD/MM/YYYY	Asia (Central, SE, West), Australia, New Zealand, parts of Europe, Latin America, North Africa, India, Indonesia, Bangladesh and Russia
YYYY/MM/DD	Bhutan, Canada, China, Koreas, Taiwan, Hungary, Iran, Japan, Lithuania, Mongolia.
MM/DD/YYYY	United States, Federated States of Micronesia, Marshall Islands
DD/MM/YYYY and MM/DD/YYYY	Malaysia, Nigeria, Philippines, Saudi Arabia, Somalia
DD/MM/YYYY and YYYY/MM/DD	Afghanistan, Albania, Austria, Czech Republic, Germany, Kenya, Macau, Maldives, Montenegro, Namibia, Nepal, Singapore, South Africa, Sri Lanka, Sweden.

## 9.5 Creating Formulae

After entering the data in worksheet, you can perform calculations on the data in the worksheet. In order to create formulae, you first need to know

the syntax that describes the format for specifying a formula.

In Calc, you can enter formulas in two methods, either directly into the cell or at the input line. Formula in Calc may start with equal (=) or plus(+) or minus(–) sign followed by a combination of values, operators and cell references. But, as a general practice, all formulas should start with an equal sign. If any formula starts with a + or –, the values will be considered as positive or negative respectively.

### 9.5.1 Operators

Operators are symbols for doing some mathematical, statistical and logical calculations. Combination of values, operators and cell references is called as “**Expression**”. Calc supports a variety of operators which are categorized as:

- (1) Arithmetic Operators
- (2) Relational Operators
- (3) Reference Operators
- (4) Text Operator

#### 9.5.1.1 Arithmetic Operators

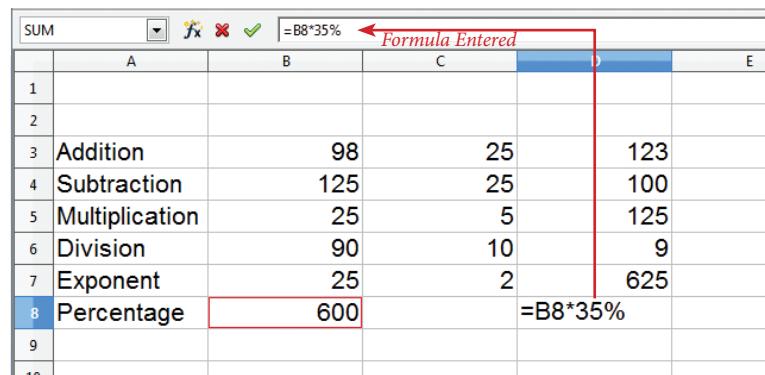
Arithmetic operators are symbols for performing simple arithmetic operations such as

addition, subtraction, multiplication, division etc., These operators return a numerical result.

	A	B	C	D	E	F
1	Operator	Name	Value in Column C	Value in Column D	Formula in Column E	Result in Column F Operator
2	+	Addition	98	25	= B2 + C2	123
3	-	Subtraction	125	25	= B3 - C3	100
4	*	Multiplication	25	5	= B4 * C4	125
5	/	Division	90	10	= B5 / C5	9
6	^	Exponent	25	2	= B6 ^ C6	625
7	%	Percent	600		= B7 * 35%	210
8		Percentage (%) operator shows percentage of the content.				

Table 9.1 List of Arithmetic Operators

Formula bar shows the formula what the user has entered. But, the cell shows the resultant value (Figure 9.15).



SUM	A	B	C	D	E
	1				
	2				
	3	Addition	98	25	123
	4	Subtraction	125	25	100
	5	Multiplication	25	5	125
	6	Division	90	10	9
	7	Exponent	25	2	625
	8	Percentage	600		=B8*35%
	9				
	10				

Figure 9.15 Percentage Operator

#### 9.5.1.2 Relational Operators

Relational operators are symbols used for comparing two values such as greater than, less than, equal to etc. The relational operators are also called as “**Comparative operators**”. These operators return either a True or a False.

	A	B	C	D	E	F
1	Operator	Name	Value in Column C	Value in Column D	Formula in Column E	Result in Column F
2	>	Greater than	98	100	=B2>C2	FALSE
3	>=	Greater than or equal to	85	72	=B3>=C3	TRUE
4	<	Less than	54	24	=B4<C4	FALSE
5	<=	Less than or equal to	55	55	=B5<=C5	TRUE
6	=	Equal to	12	12	=B6=C6	TRUE
7	<>	Not equal to	54	45	=B7<>C7	TRUE

Table 9.2 List of Relational Operators of cells.

### 9.5.1.3 Reference Operator

Reference operators are used to refer cell ranges. A **continuous group of cells is called as “Range”**. There are three types of reference operators that are used to refer cells in Calc: they are (1) Range Reference Operator, (2) Range Concatenation (3) Intersection Operator.

#### Range Reference Operator

Colon (:) is the range reference operator. It is used to group a range of cells. An expression using a range operator has the following syntax:

**reference left : reference right**

where reference left is the starting cell address of a linear group of cells or upper left corner address of a rectangular group

Reference right is the last cell address of a linear group or lower right corner address of a rectangular group of cell.

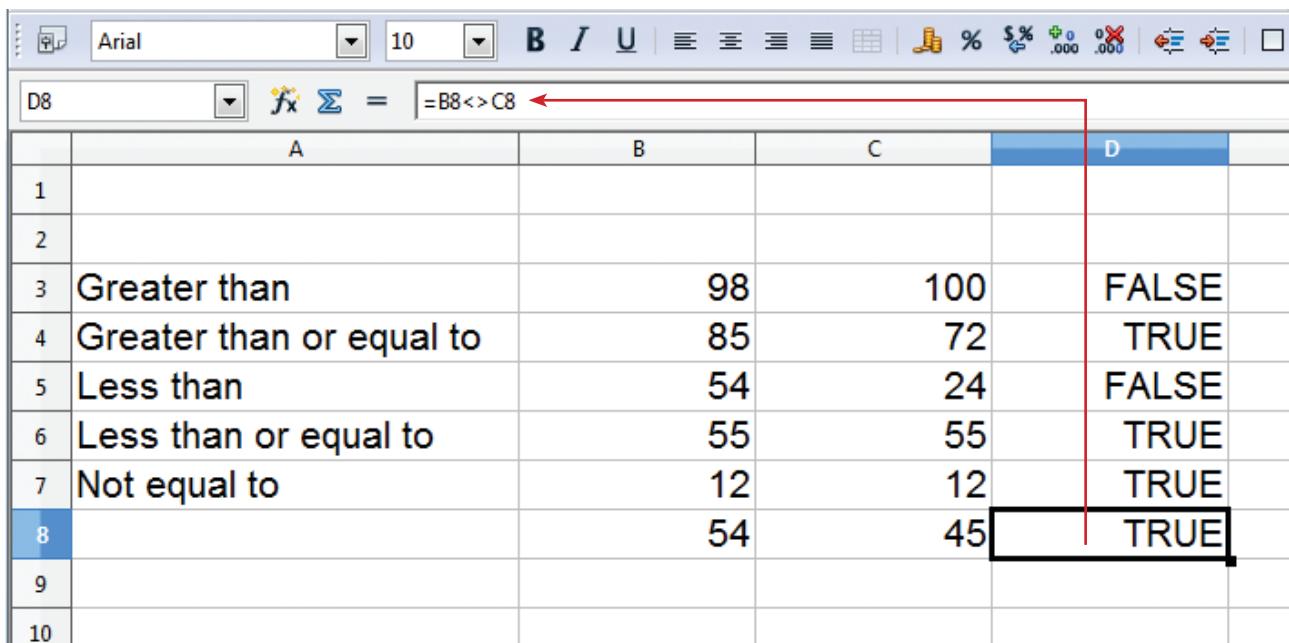


Figure 9.16 Entering Relational Operator

### Example:

- (i) Linear group of cells A1, A2,A3,A4,A5 is referred as A1:A5
- (ii) Rectangular group of cells A2, A3, A4, .... B2, B3, B4,...D5, D6 is referred as A2:D6 (Refer Figure 7.17)

	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Figure 9.17 Range of selected cells

Name box shows the reference A2:D6 corresponding to the cells included in the drag operation with the mouse to highlight the range.

### Reference concatenation operator:

Concatenation means joining together. Tilde (~) symbol is used as a concatenation operator in calc. An expression using a concatenation operator has the following syntax:

**reference left ~ reference right**

### Example:

If you want to find the sum of the values from A1 to A6 and C3 to F3. The formula is =SUM(A1:A6 ~ C3:F3)

Note

SUM is a function to find the sum of a group of values. (Refer Figure 9.18)



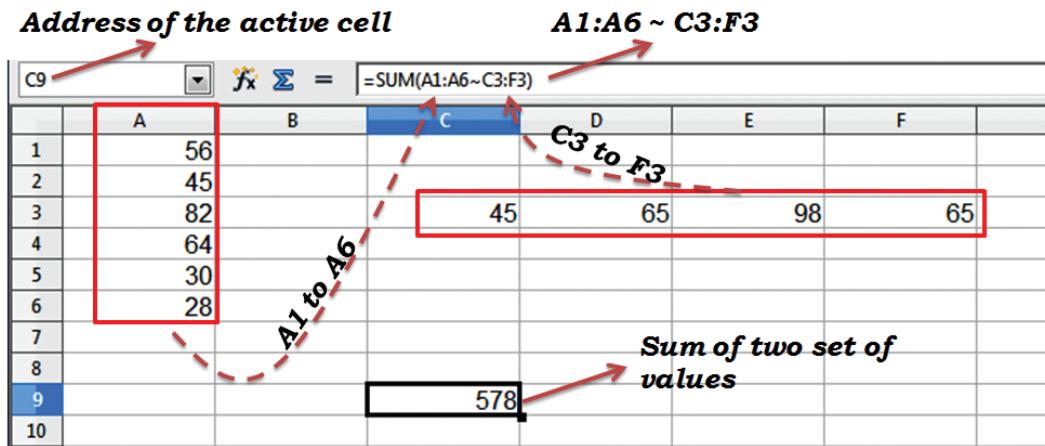


Figure 9.18 Reference concatenation operator

### Intersection Operator:

Intersection operator is used to join two set of groups. It is very similar to Range concatenation operator. The intersection operator is represented by an exclamation

*reference left ! reference right*

**Example:** (A2:D3 ! B2:E4)

						Range - 1 [A2 : D3]	Range 2 [B2:E4]
						A    B    C    D    E    F	
1	A1	B1	C1	D1	E1	F1	
2	A2	B2	C2	D2	E2	F2	
3	A3	B3	C3	D3	E3	F3	
4	A4	B4	C4	D4	E4	F4	

Intersection of  
Range 1 and Range 2      [B2:D3]

Figure 9.19 Intersection operator

The result of (A2:D3 ! B2:E4) is referred by the range B2:D3, because these cells are both inside A2:D3 and B2:E4 (Refer Figure 9.19 and 9.20).

E8		=SUM(A2:D3!B2:E4)	
	A	B	C
1			
2	28	78	45
3	47	65	68
4	65	92	24
5			
6	Sum of A2 to D3		374
7	Sum of B2 to E4		681
8	Sum of Intersection of (A2:D3) and (B2:E4) ie, (B2:D3)		299
9			

Figure 9.20 Worksheet with Intersection operator

#### 9.5.1.4 Text Operator:

In Calc, “&” is a text operator which is used to combine two or more text. Joining two different texts is also known as “Text Concatenation” (Refer Figure 9.21). An expression using the text operator has the following syntax:

*text reference1 & text reference2*

D3		=B3&C3	
	A	B	C
1			
2			
3		Tamil	Nadu
4			
5			

Figure 9.21 Text operator

When arithmetic operators are used in a formula, Calc displays the results using the rule of precedence followed in Mathematics. The order is:

- |                                           |                                       |
|-------------------------------------------|---------------------------------------|
| I. Exponentiation ( ^ )                   | II. Negation ( - )                    |
| III. Multiplication and Division ( *, / ) | IV. Addition and Subtraction ( +, - ) |

Here is an example to illustrate how to create a formula:

### Illustration 1:

Create a Marks worksheet with the following data:

Reg. No	Name	Tam	Eng	CS	Com	Acc
12001	Jayashree J	147	136	105	163	162
12002	Kowsalya T	156	148	149	147	179
12003	Muskan S	149	165	123	168	179
12004	Ashia Steph R	168	144	146	192	167
12005	Vennila T P	199	198	150	200	200
12006	Deepika M	187	141	98	130	178
12007	Tharani J	165	102	100	192	192
12008	Thulasi A	143	169	88	176	173
12009	Ayisha B	120	138	109	182	167
12010	Jenifer A	145	135	95	180	185

After completing the data entry, your worksheet will look as shown in Figure 9.22.

Small red triangle indicates the column width is not sufficient to display the entire text

A	B	C	D	E	F	G	H
1	Reg. No	Name	Tam	Eng	CS	Com	Acc
2	12001	Jayashree	147	136	105	163	162
3	12002	Kowsalya ▾	156	148	149	147	179
4	12003	Muskan S	149	165	123	168	179
5	12004	Ashia Step ▾	168	144	146	192	167
6	12005	Vennila T ▾	199	198	150	200	200
7	12006	Deepika M	187	141	98	130	178
8	12007	Tharani J	165	102	100	192	192
9	12008	Thulasi A	143	169	88	176	173
10	12009	Ayisha B	120	138	109	182	167
11	12010	Jenifer A	145	135	95	180	185
12							

Figure 9.22 Worksheet Illustration

#### 9.5.2 Construction of formula

To construct a formula, follow the steps below:

- Cell pointer should be in the cell in which you want to display the result.
- Formula should begin with an = sign.
- While constructing a formula, **BODMAS rule** should be kept in mind.
- General Syntax of constructing a formula is: = **cell reference1 <operator> cell reference2 <operator> .....**

- Cell references are of two types (i) Relative cell reference (ii) Absolute Cell reference.
- In Calc, while constructing formulae, cell addresses are "Relative cell reference" by default.
- Examples of Relative Cell addressing:

Adding values of A1, B1, C1, D1	=A1+B1+C1+D1
Subtract E4 from H3	= H3 – E4
Multiply A5 and B5	= A5 * B5
Average of G1, G2, G3, G4	=(G1+G2+G3+G4)/4

- In the above table, all cell references are “Relative cell addressing”.
- While using a formula, if you use the \$ symbol in front of a column name and row number, it will become an “**Absolute Cell addressing**”.
- Examples of Absolute cell addressing:

Adding values of A1, B1, C1, D1	=\$A\$1+\$B\$1+\$C\$1+\$D\$1
Subtract E4 from H3	= \$H\$3 – \$E\$4
Multiply A5 and B5	= \$A\$5 * B5
Average of G1, G2, G3, G4	=(\$G\$1+G2+\$G\$3+G4)/4

- In an expression, all cells need not necessarily be relative or absolute. You can mix both type of references.
- The following section explains the use of relative cell addressing. About “Absolute cell addressing”, you will be learn later in this chapter.

#### Finding Total to the above Illustration:

- Move the cell pointer to H2 (Total column)
- Type the following formula; after entering the formula, press “Enter” key  
= C2+D2+E2+F2+G2 (Refer Figure 9.25)
- Now, you will get the sum of all the values of C2, D2, E2, F2 and G2
- The above-mentioned formula clearly states that, how worksheets are working with cells.
- While referring to the cell addresses in a formula, the worksheet reads the value inside the cell that you refer. This is a good practice of constructing a formula. Because, if you change any value, the worksheet recalculates it with a new value.

After entering a formula the result is displayed as in **Figure 9.23**

The screenshot shows a spreadsheet application window. The formula bar at the top contains the formula `=C2+D2+E2+F2+G2`. A red arrow points from the formula bar to the cell reference `C2` in the formula. The main table has columns labeled `Reg. No`, `Name`, `Tam`, `Eng`, `CS`, `Com`, `Acc`, and `Tot`. The last column, `Tot`, contains the sum of the previous seven columns for each row. The value `713` is highlighted in a black box in the `Tot` column of the second row.

	A	B	C	D	E	F	G	H
1	Reg. No	Name	Tam	Eng	CS	Com	Acc	Tot
2	12001	Jayashree J	147	136	105	163	162	713
3	12002	Kowsalya T	156	148	149	147	179	
4	12003	Muskan S	149	165	123	168	179	
5	12004	Ashia Stephy R	168	144	146	192	167	
6	12005	Vennila T P	199	198	150	200	200	
7	12006	Deepika M	187	141	98	130	178	
8	12007	Tharani J	165	102	100	192	192	
9	12008	Thulasi A	143	169	88	176	173	
10	12009	Ayisha B	120	138	109	182	167	
11	12010	Jenifer A	145	135	95	180	185	
12								

Figure 9.23 Constructing formula in Worksheet

## 9.6 Save, Close and Open the Worksheet:

### 9.6.1 Saving Worksheet

The process of saving a worksheet is very similar to saving a document. Steps to save a worksheet are as follows:

**Step 1: File Save** (or) **Ctrl + S** (or) Click “Save” icon on the standard tool bar.

**Step 2:** If the worksheet has not been saved previously, the **Save As** dialog box will appear.

**Step 3:** Type the name in “File Name” list box. OpenOffice Calc Spreadsheets are stored with extension **.ods** by default.

**Step 4:** Click “Save” button.

After clicking the save button, the given file name is displayed in the title bar as shown in **Figure 9.24**.



## File Extension:

A file extension or file name extension helps to identify the type of file. Following table gives the file extension of commonly used files.

Familiar File Type	Extension
Text Files	.txt
Microsoft Word Documents	.doc / .docx
OpenOffice Documents	.odt
Microsoft Excel	.xls / .xlsx
OpenOffice Calc	.ods
Microsoft PowerPoint	.ppt / .pptx
OpenOffice Impress	.odp
Executable Files / Applications	.exe
Web Pages	.htm / .html
Portable Document Format	.pdf
Photos	.jpg / .jpeg (Joint Photographic Experts Group)
Animated Images	.gif (Graphic Interchange Format)
Audio	.mp3
Audio / Video	.mp4

A	B	C	D
1	<b>Reg. No</b>	<b>Name</b>	<b>Tam</b>
2	12001	Jayashree J	147
3	12002	Kowsalya T	156
4	12003	Muskan S	149
5	12004	Ashia Stephy R	168
6	12005	Vennila T P	199
			198

Figure 9.24 Saved Spreadsheet

Note: The saved file is stored in the "**Documents**" folder by default.

**DO YOU KNOW?**

**What is save?**

Technically saving is a process of transferring or shifting contents from primary memory (RAM) to Secondary storage medium such as Hard disk, Pen drive, memory chip etc.

### 9.6.2 Auto Save:

OpenOffice saves a file at regular intervals. This is called as "**Auto Save**" feature. The default time interval is 15 minutes. It can be reduced even to one minute. If any unexpected shutdown occurs, this feature will recover your file.

### 9.6.3 Closing a Worksheet

After saving the worksheet; it remains open. So, you can continue to working with it. When the work is finished, you should save using **File → Save** (or) Click "Save" icon (or) **Ctrl + S** and then to close the worksheet using **File → Close** command (or) Press **Ctrl + W**.

### 9.6.4 Opening an existing worksheet

#### 9.6.4.1 Using Open dialog box

To reopen an existing worksheet, the **File → Open** command (or) "Open" icon (or) **Ctrl + O** can be used. An Open dialog box appears as shown in **Figure 9.25** that is similar to "Save As" dialog box.

The name of the file to be opened can be chosen from the list or folder in which worksheet has been saved.

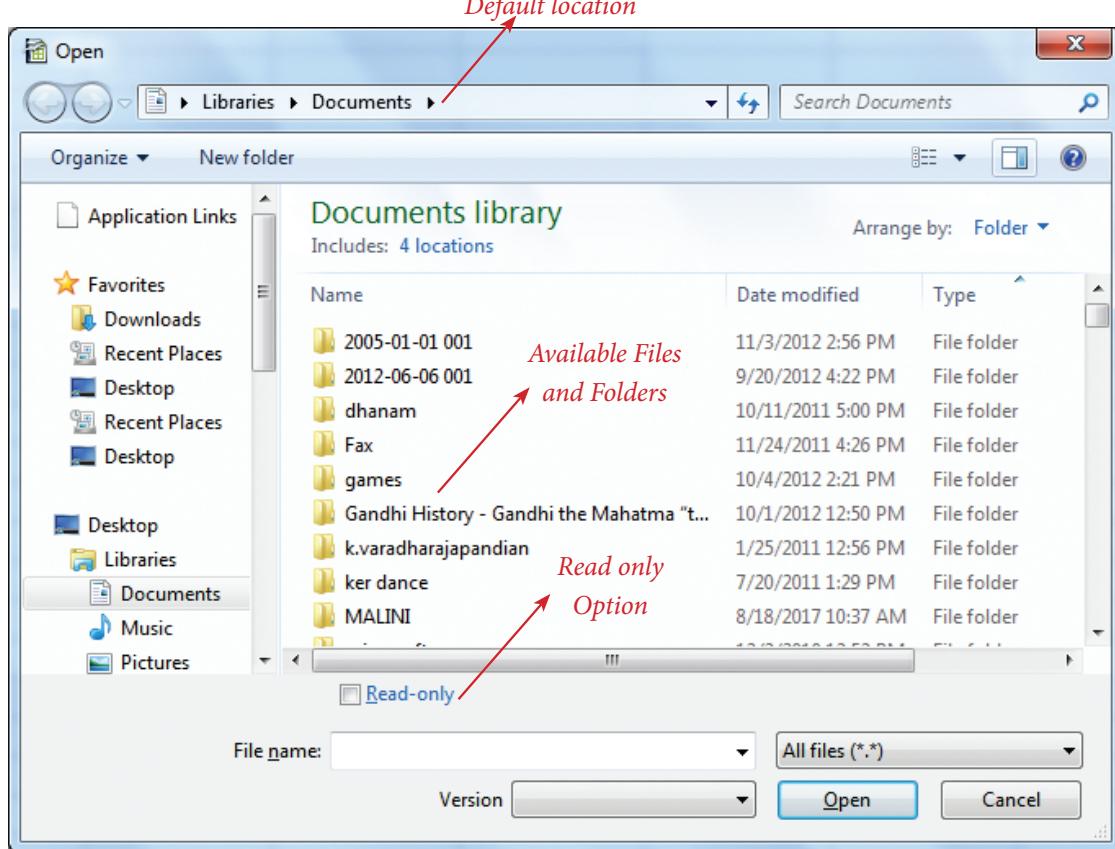


Figure 9.25 Open Dialog box

#### 9.6.4.2 Using Recent documents

OpenOffice keeps a list of recently opened files. **File → Recent Documents** option can be used to open an existing worksheet from the list as shown in **Figure 9.26**.

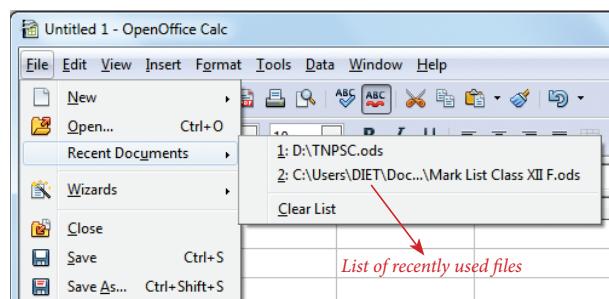


Figure 9.26 List of Recent Documents

## 9.7 Copy, Cut and Paste

### 9.7.1 Copy and Paste Data (Copying Data)

- Select the cell or cells you want to copy

- Select **Edit → Copy** or Click “Copy” icon from the standard toolbar or Press **Ctrl + C**.
- Move the cell pointer to the cell in which you want to paste.
- Select **Edit → Paste** or Click “Paste” icon or Press **Ctrl + V**

### 9.7.2 Cut and Paste Data (Moving Data)

- Select the cell or cells you want to cut
- Select **Edit → Cut** or Click “Cut” icon from the standard toolbar or Press **Ctrl + X**
- Move the cell pointer to the cell in which you want to paste.
- Select **Edit → Paste** or Click “Paste” icon or Press **Ctrl + V**.

### 9.7.3 Copy and Paste Formula

- The process of Copy and Paste data is used for copying formula.
- When you copy a formula from one cell to another cell, the address of the pasted formula will change according to its row. This is called “**Relative Cell Reference**” (Refer Figure 9.27).

Example:

*While pasted it becomes = B3 \* C3*

*Originally typed formula = B2 \* C2*

Figure 9.27 Copy and Paste formula to multiple cells

### 9.7.4 Copy a formula from one cell and paste it in multiple cells:

(For illustration 1 - Refer Figure 9.23)

**Step 1:** Copy the formula from H2 using **Ctrl + C** or **Edit → Copy** (or) click “**Copy**” icon.

Figure 9.28 Copy and Paste formula to Multiple cells

**Step 2:** Select all cells (i.e. H3 to H11) in which you want to paste the addition formula.

**Step 3:** Paste the copied formula using **Ctrl + V** or **Edit → Paste** (or) Click “**Paste**” icon.

## WorkShop Practice:



1. Open the worksheet which was created in Illustration 1.
2. Add one more column heading “Average” in I1
3. Create a formula to find the average of all marks in I2.
4. Apply the formula to the remaining cells.
5. Save the changes and close the file

## 9.8 Auto Fill Feature:

You have learnt how to copy and paste a formula from one cell to other cells in the previous section. The process of Copy and Paste can be replaced by a click and drag and it is called as “**Auto Fill**”. This is an alternate way to copy and paste.

Auto Fill feature fills the contents from one cell to all the dragged cells. The content may be a data or formula. If you fill a relative formula, all the addresses of filled formulae will be changed.



Figure 9.29 Drag fill handle

Cell pointer’s “**Drag fill handle**” is used to auto fill. Just click and drag this handle to fill the contents. It can be dragged towards right or down. Same can be achieved by **Edit → Fill → Down** (or) **Edit → Fill → Right**.

### 9.8.1 Auto Fill Series:

Auto Fill is also used to generate a series of values. For example, if you want to generate 1,2,3..... up to some value; it can be done by a simple clicking and drag process.

Generating whole number series: (Refer **Figure 9.30**).

**Step 1:** In cell A1, type as 1 (one) and press enter

**Step 2:** Click A1 to place the cell pointer

**Step 3:** Click “Drag Fill Handle” of cell pointer; now the mouse pointer becomes a small + sign

**Step 4:** Drag over the cells; while dragging, the generated values will be displayed.

**Step 5:** Release the mouse pointer. Selected cells will be filled with series of values.

A1	B	C
1	1	
2		
3		
4		
5		
6	6	
7		
8		
9		
10		
11		

Figure 9.30 AutoFill series

### 9.8.2 Generating series using command

**Edit → Fill → Series** Command is used to generate different set of series. Before using this feature, a set of cells should be selected. Using Fill Series feature, you can fill series of values at any direction. (Remember that, auto fill only fills either right or down). Refer **Figure 9.31**.

**Direction :** Down / Right / Up / Left (Selected cell direction will be default)

**Series type :**

**Linear :** To generate a sequence of series (Example 2,4,6,8,10.....)

**Growth :** To generate multiplication series (Example 2,4,8,16,32,64.....)

**Date :** To generate date series (when you select date as series type; time unit section gets enabled)

**AutoFill :** To generate a continuous series of values (1,2,3,.....). When you select “AutoFill”, Time unit section, End value and Increment text boxes become disabled.

**Time Unit:** (Enabled only when you select the series type as “Date”)

Day : To generate date series day-wise

Weekday : To generate date series weekday-wise

Month : To generate date series month-wise

Year : To generate date series year-wise

### **Start Value:**

- Initial value of the series should be typed

### **End Value:**

- End value of the series should be typed
- If you fail to specify the end value, series will be generated upto the selected cells.

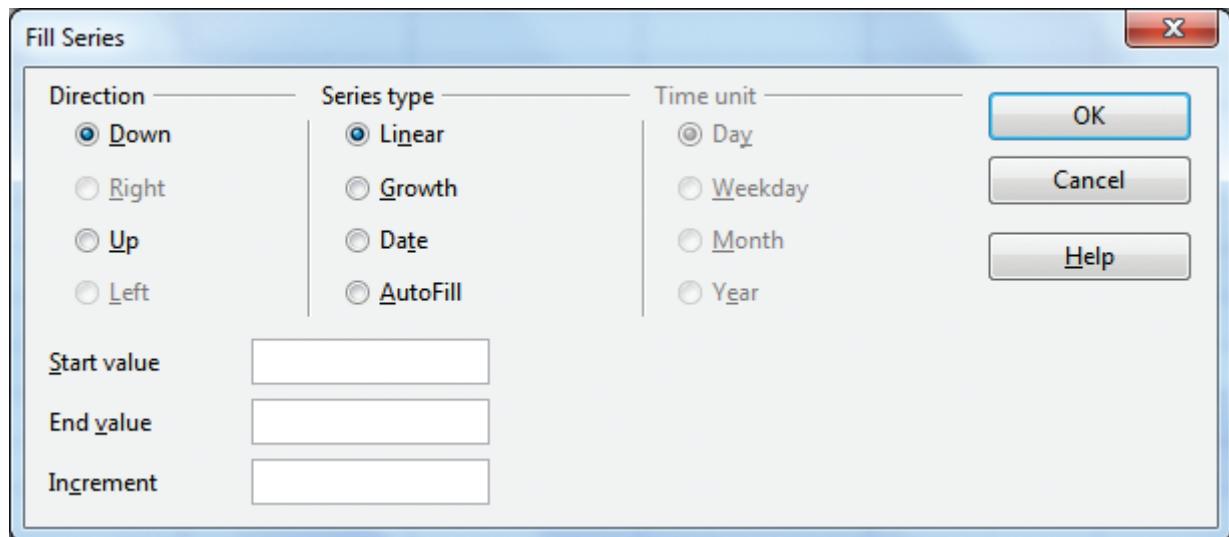


Figure 9.31 Fill series dialog box

- If your selection is less than the specified end value, series will be generated only upto the selected cells.

### **Increment:**

- It is a difference value between the first and second value of your series. So, the next value (Third value) of the series will be generated based on this value.
- If you want to generate a decreasing order series, negative value should be specified as an increment value.

### **Self Practice:**



- (i) Generate Even number series from 2 to 20
- (ii) Generate a series of 5, 10, 15, 20 ..... upto selected cells.
- (iii) Generate a series of 2,4,8,16,..... 2048
- (iv) Generate a series of 33, 30, 27 ..... upto 3
- (v) Assume, today is Friday and generate next 25 Fridays (Date series).

### 9.8.3 Date Arithmetic:

Manual date calculations can be tricky because you have to keep track of the number of days in a month. In spreadsheets, date calculations become very simple. Here you can add a number to a date and arrive at a new date, find the difference between two dates and use a wide variety of function and formats to get what you want.

For example, enter a date 02/26/2018 in a cell, say A2. Suppose you want to calculate the date 80 days after this date. To do so, enter the formula, = A2 + 80, in another cell, say A4.

The date 05/17/18 appears in the cell.



#### To Find out how many days you were born? your birth?

- Type today's date in first cell.
- Type your birth date in second cell.
- Type the following formula in third cell = first\_cell\_reference – second\_cell\_reference

A screenshot of a Microsoft Excel spreadsheet. The formula bar shows the formula =C2-C3. The spreadsheet has three columns labeled B, C, and D. Column B contains the text "Today", "My Birth Date", and "No. of days". Column C contains the dates 01/15/18, 09/30/03, and 5221. The cell containing 5221 is highlighted with a black border.

	B	C	D
	Today	01/15/18	
	My Birth Date	09/30/03	
	No. of days	5221	

## Editing and Formatting Worksheet

### 9.9 Inserting Columns, Rows and Cells

In Calc, columns, rows and cells can be inserted individually or in groups.

#### 9.9.1 Inserting a Column:

When you insert a new column, it is inserted to the left of the current column. The location of the cell pointer present, is the Current column. In Calc, you can insert a new column anywhere in the worksheet.

**Step 1:** Select the column where a new column to be inserted.

**Step 2:** Right-click on the selected column name. A pop-up menu appears.

**Step 3:** click the “Insert Columns” option from the menu.

Now, a new column will be inserted to the left of the current column.

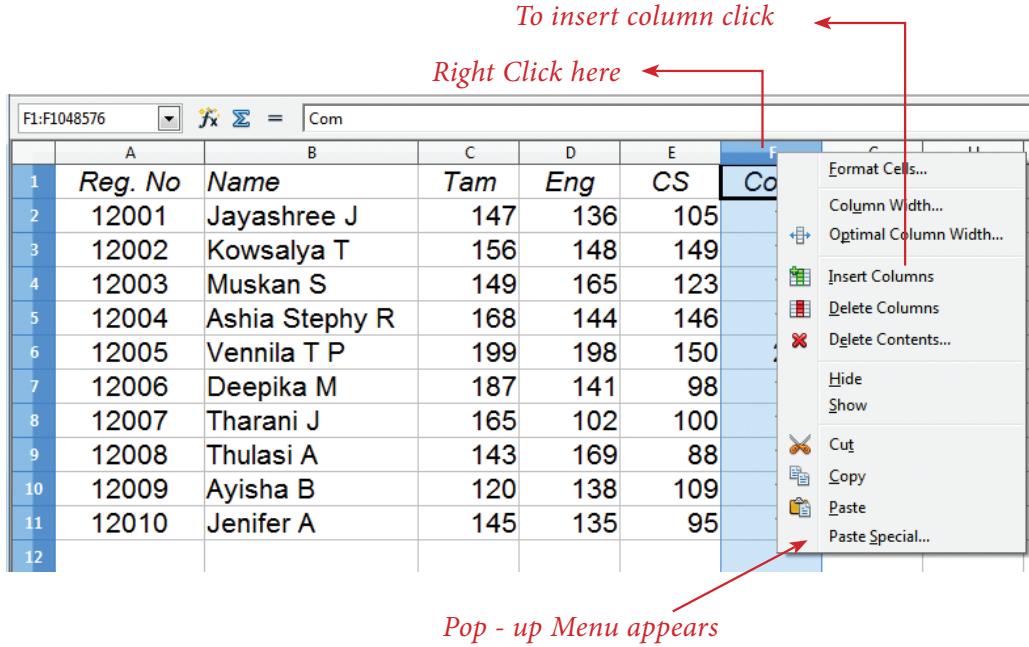


Figure 9.32 Insert Column pop-up menu

A new column can also be inserted using **Insert → Columns** command. (Refer Figure 9.32).

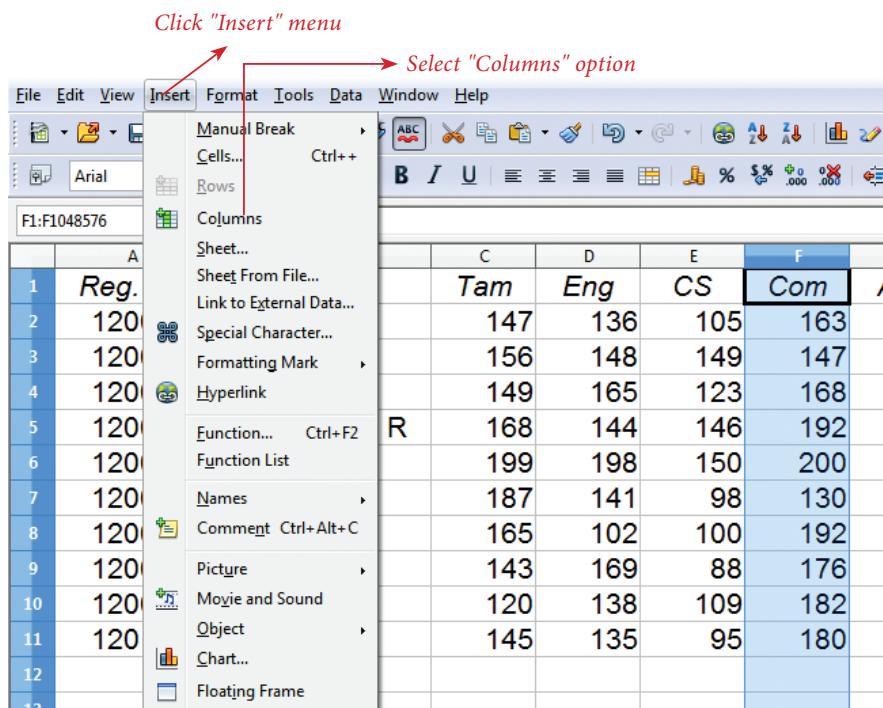


Figure 9.33 Insert Column menu bar

## Workshop



1. Open the worksheet which was created in Illustration 1.
2. Insert a new column between column E and F
3. Give the heading as “Eco” and Enter the Economics marks for all the students
4. Insert one more column between the columns, Name and Tamil marks.
5. Give the heading as “Date of Birth” and Enter the date of birth for all the students.
6. Save the changes and close the file.

### 9.9.2 Inserting Rows

When you insert a new row, it is inserted above the current row. The location of the cell pointer present is the current row. In Calc, you can insert a new row anywhere in the worksheet.

**Step 1:** Select the row where a new row to be inserted.

**Step 2:** Right-click on the row number, a pop-up menu appears

**Step 3:** click “**Insert Rows**” option from the menu.

Now, a new row will be inserted to above the current row.

A screenshot of a LibreOffice Calc spreadsheet window. The spreadsheet has four columns labeled A, B, C, and D. Row 4 is selected, highlighted with a blue background. A context menu is open over the selected row, listing options such as 'Format Cells...', 'Row Height...', 'Optimal Row Height...', 'Insert Rows' (which is highlighted with a red arrow), 'Delete Rows', 'Delete Contents...', 'Hide', 'Show', 'Cut', 'Copy', 'Paste', and 'Paste Special...'. The menu is titled 'Right Click here to select the row as well as get popup menu'. The status bar at the bottom shows 'Sheet2 / Sheet1' and 'Default | STD | \* |'.

	A	B	C	D
1	<b>Reg. No</b>	<b>Name</b>	<b>Tam</b>	<b>Eng</b>
2	12001	Jayashree J	147	136
3	12002	Kowsalya T	156	148
4	12003	Muskan S	149	165
5		Sa Stephy R	168	144
6		Nila T P	199	198
7		Pika M	187	141
8		Ani J	165	102
9		Asi A	143	169
10		Rha B	120	138
11		Ter A	145	135

Figure 9.34 Insert Rows popup menu

**Insert → Rows** command is used to insert a new row. Refer **Figure 9.35**.

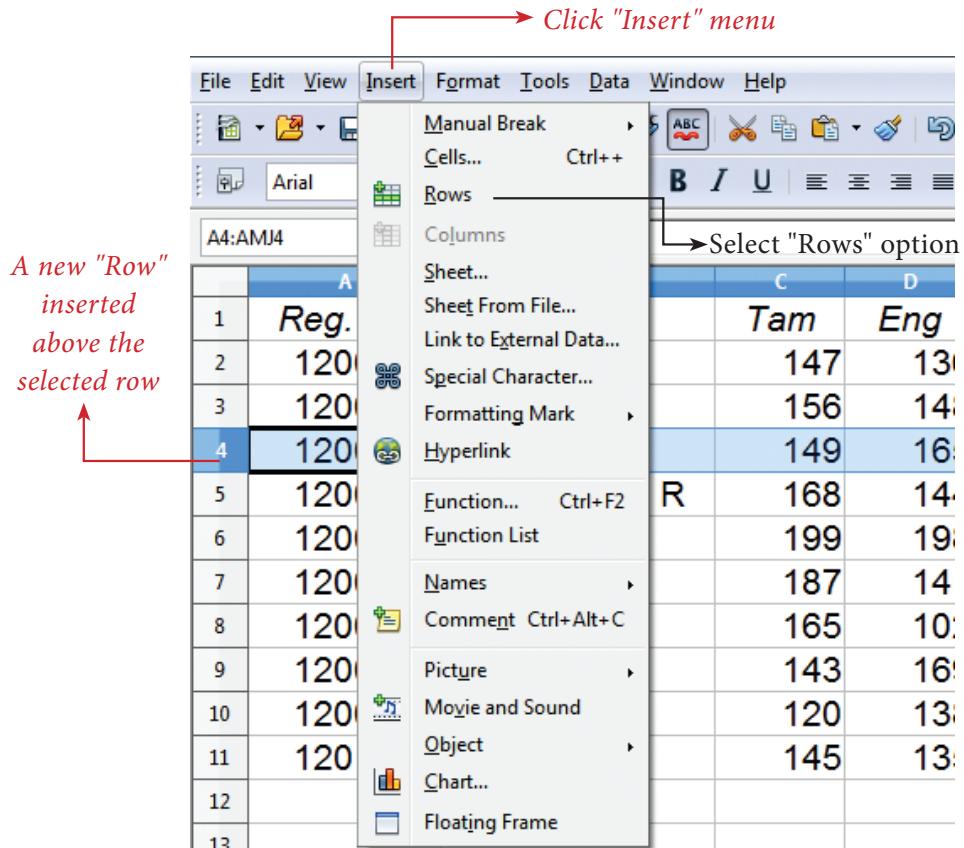


Figure 9.35 Insert Rows menu bar

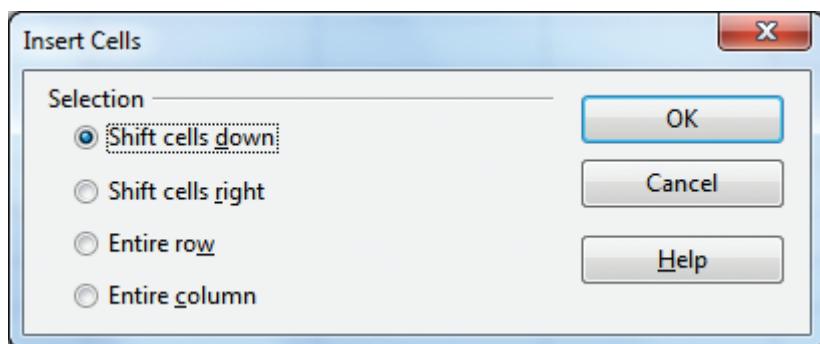
## Workshop

1. Open the worksheet which was created in Illustration 1.
2. Insert 8 rows one by one, then insert the following student details
3. Save the changes and close the file.

Reg. No	Name	Date of Birth	Tam	Eng	CS	Eco	Com	Acc
12101	Sarika S	26/05/2001	145	135	145	125	180	196
12102	Jewees Celcyia J	11/04/2001	102	165	134	95	180	134
12103	Yuvarani T	27/06/1999	172	130	107	155	162	130
12104	Meharunisha I	30/05/2001	132	146	112	185	192	176
12105	Priya W	07/03/2000	130	172	100	92	162	155
12106	Vijaya Vasavi K	03/06/2001	198	175	149	148	158	135
12107	Deepika B	14/03/2001	120	182	103	144	107	186
12108	Viji V	19/04/2001	137	173	128	148	125	177

### 9.9.3 Inserting Cells

- To insert a new cell between two existing cells, just right-click on any existing cell
- From the pop-up menu, select “**Insert**” option *Figure 7.36 Insert cells*
- The “**Insert Cells**” dialog box appear with four options
  - i) **Shift cells down**
  - ii) **Shift cells right**
  - iii) **Entire row**
  - iv) **Entire Column**
- Any one of the **four** options can be selected.
- Selecting “**Shift cells down**”, inserts a new cell in the present location and the existing cells are shifted downwards.
- Selecting “**Shift cells right**”, inserts a new cell in the present location and the existing cells are shifted towards right.
- Selecting the “**Entire Row**” or “**Entire Column**” option, inserts a new row or a new column respectively.



*Figure 9.36 Insert cells*

### 9.9.4 Inserting multiple columns or rows

Multiple columns or rows can be inserted at once rather than inserting one at a time.

- Select multiple rows or columns for insertion.
- Follow steps as in 9.9.1 and 9.9.2

### 9.9.5 Inserting Columns, Rows and Cells using “Insert Cells” Toolbar

- **Insert Cells** floating toolbar is also used to insert cells, rows and columns
- Click **View → Toolbars → Insert Cell**
- A floating toolbar appears on the screen with four icons. Using these icons, you can insert cells, rows and columns. Refer **Figure 9.37**.

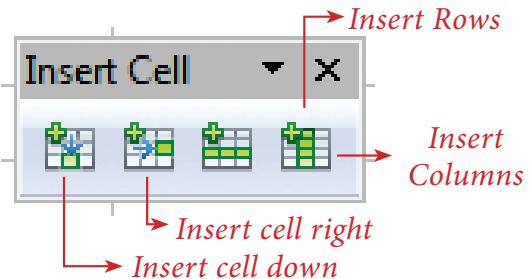


Figure 9.37 Insert cell tool bar

## 9.10 Deleting columns and rows

A single or multiple columns or rows can be deleted.

**DO YOU KNOW?** Inserting a new Column or row is really possible in a Spreadsheet?

All spreadsheets have some specific number of rows and columns, then is it possible to insert an additional row or column?

**Technically this is NOT POSSIBLE.**

Additional column, row or even cell cannot be inserted in any spreadsheet. When you insert a column or row, the contents within the column or row will be shifted to the next column or row. But visually it is felt that a new column or row has been inserted.

### 9.10.1 Delete single column or row

A single column or row can be deleted by using the mouse:

- Select the column or row to be deleted.
- Choose **Edit →Delete Cells** from the menu bar.

(or)

- **Right-click** on the column or row header.
- Choose **Delete Columns** or **Delete Rows** from the pop-up menu.

### 9.10.2 Delete multiple columns or rows

Multiple columns or rows can be deleted at a time. Refer **Figure 9.38**.

- Select the required columns or rows to be deleted.
- **Right-click** on the selected columns or row.
- Choose **Delete Columns** or **Delete Rows** from the pop-up menu or **Edit → Delete Cells**.

### Workshop:



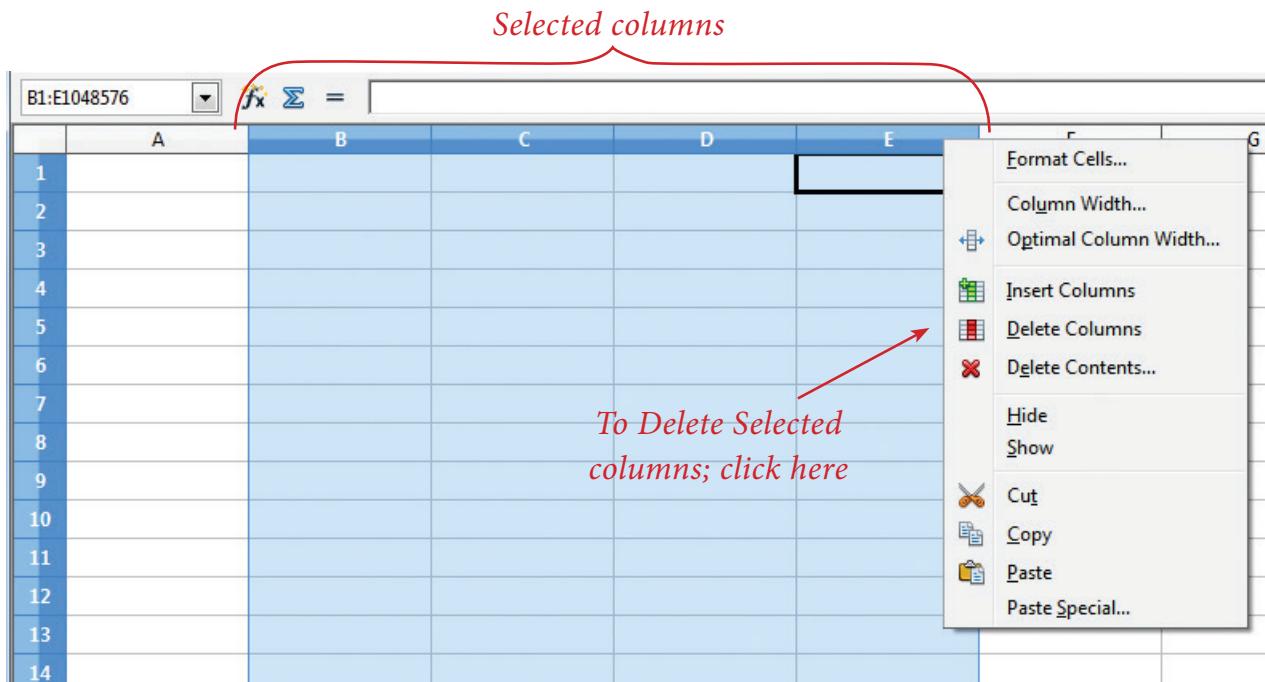
1. Open the spreadsheet which was created in Illustration 1.
2. Delete the details of any 3 students. Save the changes and close the file.

**DO YOU KNOW?** Deleting Column or Row is not Possible

Same as inserting column or row, Deleting a column or row is also not possible. No one can delete any column or row in a spreadsheet. When you delete a column or row, all the contents will be removed from the column or row. Actually, this is also another kind of deleting contents from a column or row.

## 9.11 Formatting Worksheet

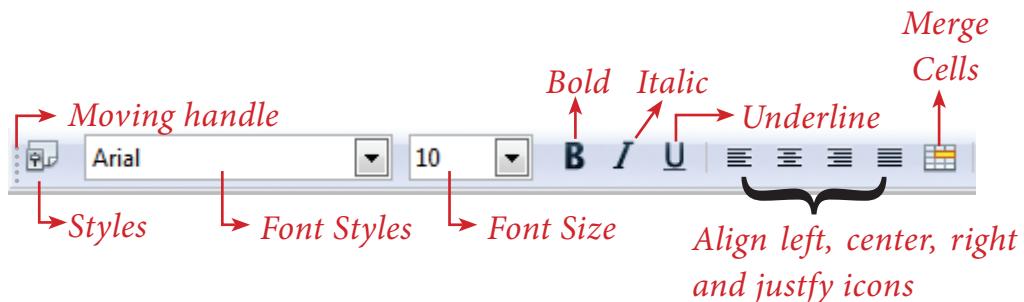
Formatting Data in a cell gives additional effect to the text. Additional effect includes changing the font style, font size, automatic wrapping, bold, underline, italic etc. The data in Calc can be formatted in several ways, using formatting icons.



*Figure 9.38 Delete multiple columns*

### 9.11.1 Text Formatting

Making the cell contents as bold, italics, underline, changing font style, size, colour etc., comes under text formatting. All text formatting options are available as icons in **Formatting toolbar** learnt in OpenOffice Writer.



*Figure 9.39 (a) Text Formatting Toolbar*

Formatting Option	Keyboard Shortcut	Description
Font style		Used to change Font style
Font size		Used to change Font size
Bold	Ctrl + B	Used to make the data as Bold
Italic	Ctrl + I	Used to italicize data
Underline	Ctrl + U	Used to underline the data
Left Align	Ctrl + L	Left Align data within a cell
Right Align	Ctrl + R	Right Align data within a cell
Center Align	Ctrl + E	Center Align data within a cell
Justify	Ctrl + J	Align the data evenly both on left and right side of a cell
Merge cell		Makes selected cells as a single cell

### 9.11.2 Number formatting

Number formatting options are used to visually change the format of a numeric content. These formatting changes appear for visual as, it does not change the original value. For example, to display a number in currency form use Number format: Currency.

Number format: Currency will be used as shown **Figure 9.39(b)**.

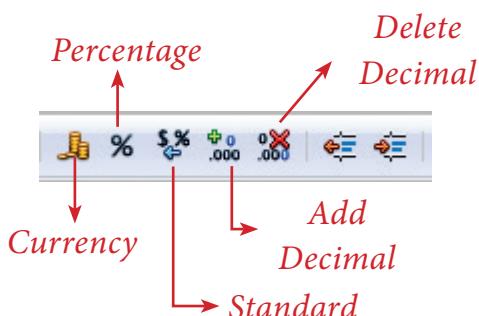


Figure 9.39 (b) Formatting toolbar

Number Format	Keyboard Shortcuts
Currency Symbol	Ctrl+Shift+4
Percent	Ctrl+Shift+5
Standard	Ctrl+Shift+6
Add Decimal Place	
Delete Decimal Place	

## Workshop

1. Open the worksheet which was created in Illustration 1.
2. Align all headings as center and make them bold.
3. Align all Register numbers and marks in center
4. Apply different font styles to the entire worksheet.
5. Save the changes and close the file

### Workshop 1

1. Create a worksheet with following data

Emp. No	Name of Emp.	Basic	DA	HRA	CCA	MA	GPF	IT	HF
1001	Manivannan M	25500	25 % of Basic and DA  %15 of Basic and DA		600	300	12 % of Basic  %10 of Gross		250
1002	Kannan K	20200			600	300			250
1003	Gowrishankar N V	24300			600	300			250
1004	Lenin K	23400			600	300			250
1005	Suryanarayanan T	24100			600	300			250
1006	Ramesh K	18500			600	300			250
1007	Govindasami A	13200			600	300			250
1008	Kannan S	20250			600	300			250
1009	Penchil Rao K	28300			600	300			250
1010	Logeswaran M	30200			600	300			250
1011	Arumugam E	12000			600	300			250
1012	Vasu G N	25000			600	300			250

Based on the above data,

- (1) Calculate the Gross Salary, Total Deductions and Net Salary
- (2) Insert “IT Cess” column and calculate 3% of cess to all employees

(3) Delete the records of “Govindasami” and “Arumugam”.

(4) Insert four new rows and enter the following employee details.

(5) Calculate the Total amount of GPF, IT and Cess

Emp. No	Name of Emp.	Basic	DA	HRA	CCA	MA	GPF	IT	HF
2001	Murali G	24750							
2002	Munirathnam A	23550							
2003	Ramakrishnan V G	25500							
2004	Srinivasan R	27500							

### Workshop: 2

1. Create a new worksheet in OpenOffice Calc.

2. Enter the following stock and sales details of “Chennai whole sale Marketing Pvt. Ltd.” during the month of Jan-2018.

Code	Product Name	Weight (gm)	Opening stock	Cost price	Sales in units	Rate of Discount	Amount of Discount	Selling price	Amount of Sale	Closing Stock
100	Marie Gold	120	345	15	147	5%				
101	Milk Bikis	85	106	10	63	5%				
102	Dark Fantasy	75	147	25	43	3%				
103	Nutri Choice	250	98	50	12	10%				
104	Lays potato chips	52	172	15	152	4%				
105	Oreo	120	112	25	85	6%				

3. Calculate the following using formula

- Amount of Discount, Selling price and Amount of sales for each product
- Total amount of discount and Sales of the month
- Closing stock of each product

## Workshop: 3

1. Create a worksheet in OpenOffice Calc.
2. Enter the following details of loan sanctioned during the month of January 2018 of “Tamil Finance Corporation”.

AC No Emp. No	Name	Amount of Loan	Loan Sanction date	Duration of Loan	Rate of Interest	Interest (Rs)	Total Amount	Due date
2001	Senthil	250000	02/01/2018	120 days	9.5%			
2002	Kumar	175000	15/01/2018	150 days	9.5%			
2003	Ibrahim	550000	16/01/2018	140 days	10.5%			
2004	Valli	375000	21/01/2018	210 days	10%			
2005	Charles	450000	28/01/2018	130 days	10.5%			

3. Create the formula to calculate
  - (i) Interest, Total amount and due date.
  - (ii) Gross total of loan amount, interest and total amount.
4. Insert 5 new rows between Kumar and Ibrahim and include the following details

AC No	Name	Amount of Loan	Loan Sanction date	Duration of Loan	Rate of Interest	Interest (Rs)	Total Amount	Due date
3001	Pari	250000	03/02/2018	125 days	9.5%	5%		
3002	Arul	375000	07/02/2018	155 days	9.5%	5%		
3003	Raman	350000	10/02/2018	130 days	10.5%	3%		
3004	Givind	450000	10/02/2018	100 days	10%	10%		
3005	Zeenath	800000	26/02/2018	90 days	10%	4%		

### **Points to Remember:**

- Spreadsheet is a very useful office automation tool for organization, analysis and storage of data in a tabular form.
- Daniel Bricklin and Bob Frankston developed the first spreadsheet software called “VisiCalc” in 1979 for Apple II.
- OpenOffice Calc is a popular open source spreadsheet application software presently maintained by Apache Foundation.
- A worksheet is a grid of cells with a programmable calculator attached to each cell.
- OpenOffice Calc version 4.1.5 contains a total of 1024 columns and 10,48,576 rows.
- Intersection of each row and column forms a rectangular box which is called as “Cell”.
- Cell pointer is a rectangle element which can be moved around the worksheet.
- The cell in which the cell pointer is currently located is known as “Active cell”.
- All formula should start with an equal sign.
- There are four types of operators supported by Calc.



### **Student Activity**

1. Based on the concept of calculation using formula, make the students to create various worksheet data.

### **Teacher Activity**

1. To show the demo of working with spread sheets using simple example in class room.

## Evaluation



### Part - I



Choose the correct answer

1. Which is the first electronic spreadsheet?  
(A)Excel                   (B) Lotus 1-2-3           (C) Visicalc           (D) OpenOffice Calc
2. Which of the following applications is the parent to OpenOffice Calc?  
(A)Visicalc               (B) LibreCalc              (C) Lotus 123           (D) StarOffice Calc
3. Grid of cells with a programmable calculator:  
(A)Spreadsheet                                                  (B) Database  
(C) Word processor                                              (D) Linux
4. A column heading in Calc is a  
(A)Number                   (B) Symbol                   (C) Date                   (D) Alphabet
5. Which key is used to move the cell pointer in the forward direction within the worksheet?  
(A)Enter                   (B) Tab                       (C) Shift + Tab           (D) Delete
6. A formula in calc may begin with  
(A) =                       (B) +                       (C) -                       (D) All the above
7. What will be the result of the following formula (Assume A1=5, B2=2)? + A1^B2  
(A) 7                       (B) 25                       (C) 10                       (D) 52
8. What will be the result of the following expression (Assume H1=12, H2=12)? = H1<>H2  
(A) True                   (B) False                   (C) 24                       (D) 1212
9. Which of the following symbol is used to make a cell address as absolute reference?  
(A) +                       (B) %                       (C) &                       (D) \$
10. Which of the following key combination is used to increase the width of the current column?  
(A)Alt + Right arrow                                           (B) Ctrl + Right arrow  
(B)Alt + Left arrow                                           (D) Ctrl + Left arrow

### Part – II

**Answer to the following questions (2 Marks)**

11. What are the types of toolbars available in OpenOffice calc?
12. What is a cell pointer?
13. Write about the text operator in OpenOffice Calc.
14. Write the general syntax of constructing a formula in Calc.
15. What are the keyboard shortcuts to cut, copy and paste?
16. Can you edit the contents of a cell? If yes, explain any one of the method of editing the cell content.
17. What are the options available in “Insert Cells” dialog box?
18. Match the following

A	B
(a) Cut, Copy and Paste	(1) Absolute Cell
(b) Cell pointer	(2) Status bar
(c) Selection Mode	(3) Standard Toolbar
(d) \$A\$5	(4) Active cell

19. Define the following (i) Text Operator (ii) Rows and Columns of spreadsheet
20. Differentiate between Copy -Paste and Cut-Paste

**Part – III**

**Answer to the following questions (3 Marks)**

21. Write a short note on OpenOffice Calc.
22. Write about inserting columns and rows in Calc.
23. Differentiate Deleting data using Backspace and Delete Keys
24. Write any three formatting options.
25. In cell A1=34 A2=65 A3=89 write the formula to find the average.

**Part – IV**

### **Answer to the following questions (5 Marks)**

1. Explain about changing the column width in Calc.
2. Write the steps to generate the following series. 5, 10, 20 .... 2560
3. Read the following table

	A	B	C	D	E
1	Year	Chennai	Madurai	Tiruchi	Coimbatore
2	2012	1500	1250	1000	500
3	2013	1600	1000	950	350
4	2014	1900	1320	750	300
5	2015	1850	1415	820	200
6	2016	1950	1240	920	250

Above table shows the sales figures for “Air Cooler” sold in four major cities of Tamilnadu from the year 2012 to 2016. Based on this data, write the formula to calculate the following.

- (1) Total sales in the year 2015.
- (2) Total sales in Coimbatore from 2012 to 2016.
- (3) Total sales in Madurai and Tiruchi during 2015 and 2016.
- (4) Average sales in Chennai from 2012 to 2016
- (5) In 2016, how many “Air Coolers” are sold in Chennai compared to Coimbatore?

**A-Z**  
**GLOSSARY**

Spreadsheet	Sheet of paper that shows accounting or other data in rows and columns
What-if analysis	It is a process of changing the values in a cell to see how these changes will affect output.
VisiCalc	The first electronic spreadsheet application
GUI	Graphical User Interface
Excel	Familiar spreadsheet application developed by Microsoft Corporation.
Cell	Intersection of rows and columns.
Cell Pointer	A rectangular box, highlighting the cell in a spreadsheet.
Active cell	A cell in which the cell pointer is presently located.
Formula	A formula is an expression that tells the computer what mathematical operation to perform on a specific value.
Operator	A symbol that usually represents an action or process
Range	Group / Collection of cells
BODMAS Rule	Order of mathematical calculation: Brackets - Orders (powers or square roots) - Division – Multiplication – Addition - Subtraction.
Drag fill handle	A small black box at the bottom right corner of the cell pointer.
Function	Predefined formula / a group of instructions to return a single result or a set of results.
Chart	Graphical representation of data.
Database	A large quantity of indexed digital information.
Flat file database	Single table, non relative database

**Learning Objectives**

Students will be able

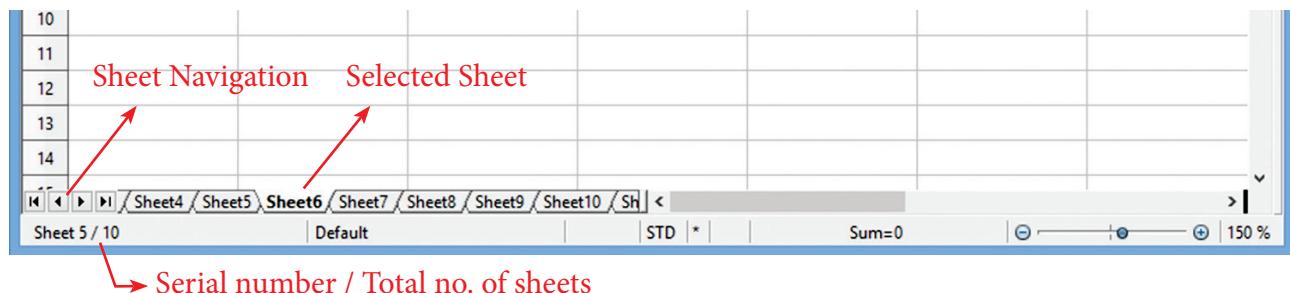
- To know how to work with multiple sheets.
- To learn to rename, delete worksheet.
- To know to copy, move and change the order the sheets.
- To understand how to select cells, columns and rows.
- To learn how to format tool bar.
- To understand the types of cell referencing
- To know how to use functions in Open Office calc.
- To learn to create charts in Open Office Calc.

**10.1 – Managing Worksheets****10.1.1 – Selecting Worksheets**

One or multiple sheets can be selected using a mouse. This feature is useful when same changes are to be made at the time in multiple sheets.

**10.1.2 Selecting single sheet**

Click on the sheet tab for the sheet you want to select. The active sheet becomes white and any action that you perform will now affect the selected cells in the sheet.



*Figure 10.1 Selecting Single Sheet*

If you want unselect the selection, click on any unselected sheet.

### 10.1.3. Selecting multiple continuous sheets

The following steps should be followed to select multiple continuous sheets.

- Click on the sheet **tab** for the first desired sheet.
- Hold down the **Shift** key and click on the last sheet **tab**.

All the tabs between these two sheets will be selected and will turn white. Any actions that you perform will now affect all highlighted sheets. For example, if you want to select from **sheet1** to **sheet5**. Do the following,

Step 1: Click on **Sheet1** to select first sheet

Step 2: Press and hold down “**Shift**” key and Click on the **Sheet 5** i.e., last sheet

All the sheets between Sheet1 and Sheet5 will be selected and their sheet colour turns to white as given in the Figure 10.2 and any actions that you perform will now affect all highlighted sheets.

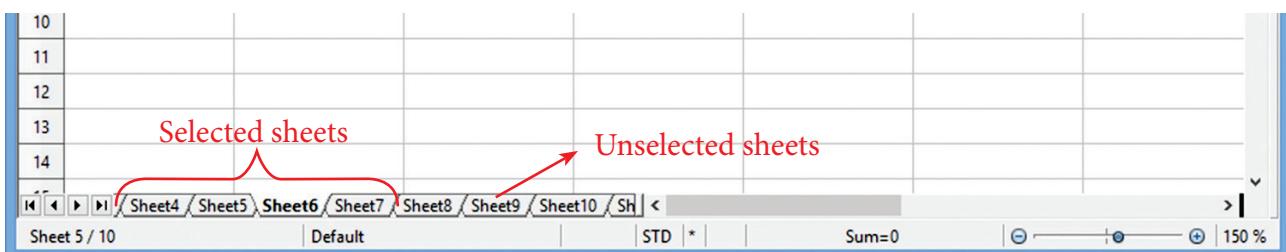


Figure 10.2 Multiple continuous sheets

If you want to unselect the selection, click on any unselected sheet.

### 10.1.4 Selecting multiple non-continuous sheets.

If you want to select multiple non-continuous sheets the following steps will be followed.

- Click on any sheet,
- Hold down the **Ctrl** key,
- Click another sheet.

**Ctrl + Click on any sheet** is used to select multiple sheets. Selected sheets tab colour turns into “White”.

For example, if you want to select Sheet1, Sheet3 and Sheet 7;

Step 1: Click on **Sheet1** and then

Step 2: Hold down the **Ctrl** key

Step 3: Click on **Sheet4, Sheet6 and Sheet8.**

Selected Sheets colour becomes “**White**” and any actions that you perform will now affect all Selected sheets.

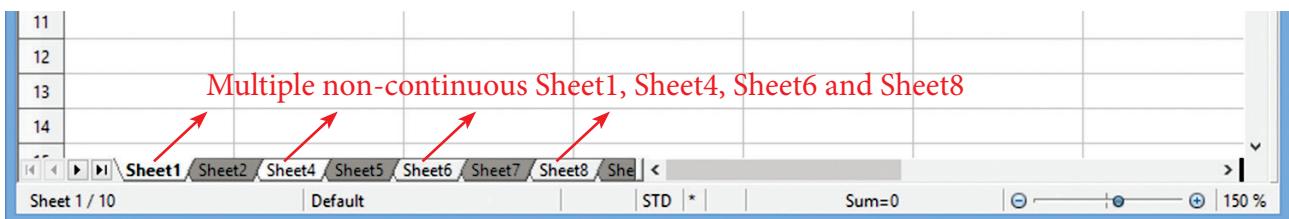


Figure 10.3 Selecting Multiple non-continuous sheets

## 10.2 Selecting all sheets

To select all sheets, **Right-click** any one of the sheet tabs and choose **Select All Sheets** option from the pop-up menu.

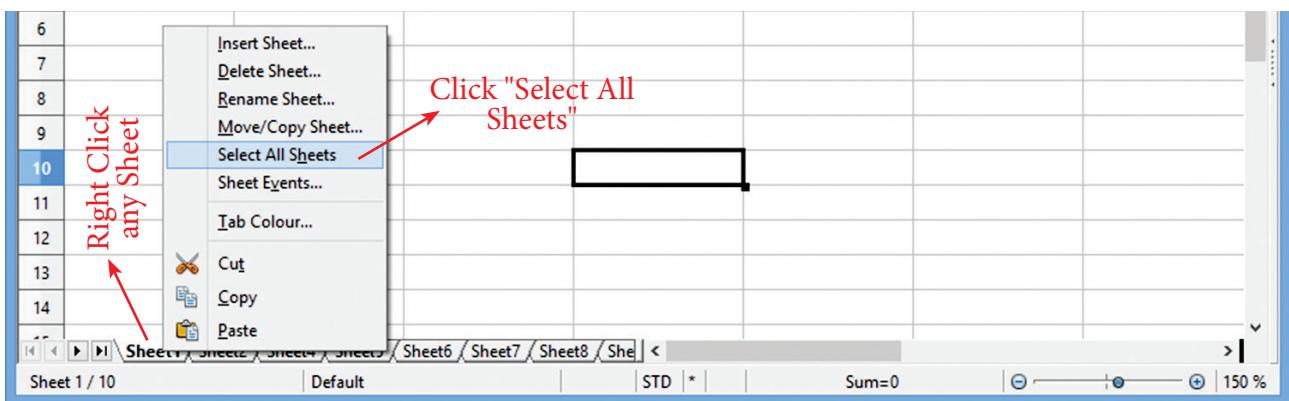


Figure 10.4 (a) - Selecting all sheets

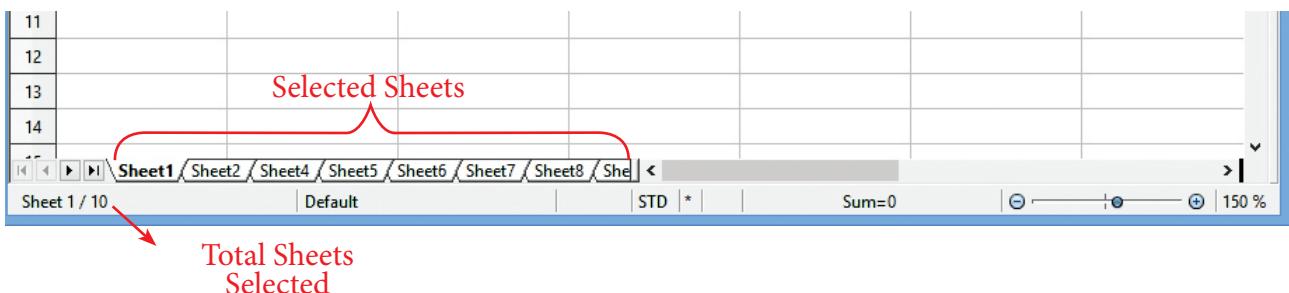


Figure 10.4(b) - Selecting all sheets

## Deselect sheets

Deselecting a selected sheet is a very simple process. The following table shows you the deselect methods for various selections.

SN	Selection Type	Deselect process
1	Single Sheet	Click on any unselected sheet
2	Multiple continuous sheets	Click on any unselected sheet
3	Multiple non-continuous sheets	Click on any unselected sheet
4	All sheets	Click on any sheet

To deselect the already selected sheets, **Right-click → Deselect All Sheets** option from the pop-up menu is selected.

### 10.3 – Renaming Worksheets

The default name of a new sheet is Sheet-n, where n is a number. There are two methods to give a more meaningful name to a sheet.

#### Method 1:

- Double-click** on a Sheet in which you want rename
- A small “Rename Sheet” box is appears as shown in Figure 10.5

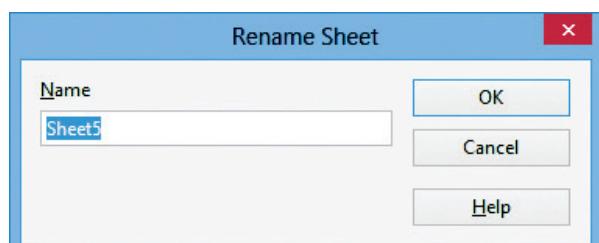


Figure. 10.5 Rename Sheet dialog box

- Type a new name and click “OK” button.

#### Method 2:

- Right-click** on a sheet tab and choose **Rename Sheet** option from the pop-up menu now.
- Now **Rename Sheet** dialog box appears and type a new name and then click on **ok** button.

 Sheet names must start with either a letter or a number or some special characters like &!,@ etc. Attempting to rename a sheet with an invalid name will produce an error message.

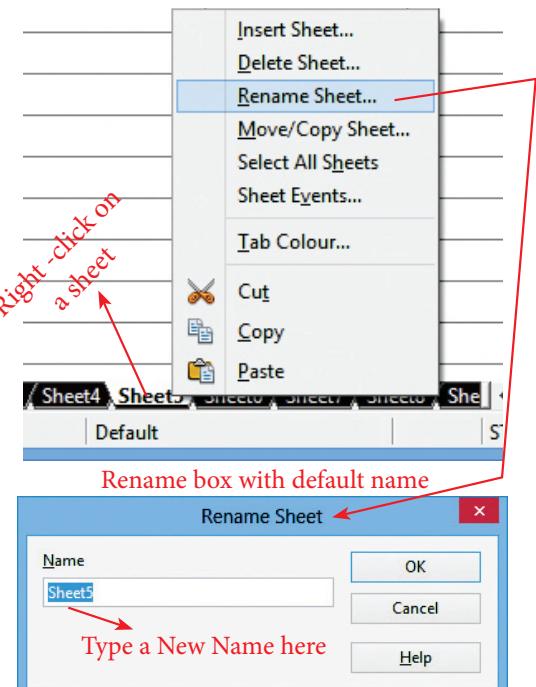


Figure 10.6 Renaming a sheet

#### 10.3.1 – Inserting and Deleting Worksheets

When you create a new worksheet, three sheets are there by default. If needed, one or more new worksheets can be added or deleted.

### 10.3.1 – Inserting Worksheets

There are different ways to insert a new sheet.

#### Step 1:

- Right-click on a sheet tab and choose **Insert Sheet option** from the pop-up menu now.  
(or)
- Choose **Insert → Sheet** option from the menu bar.  
(or)
- Click the **Enter Key** between last sheet and horizontal scroll bar.

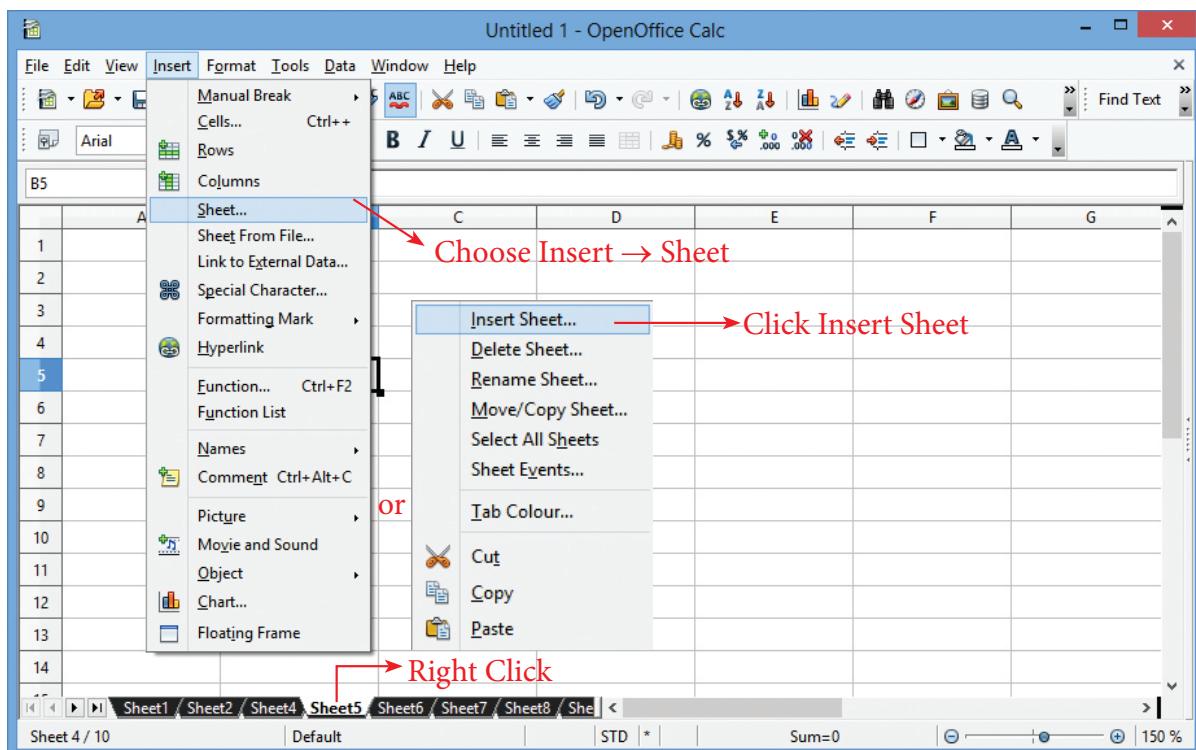


Figure 10.7 Inserting more sheets

#### Step 2:

- “**Insert Sheet**” dialog box appears (Refer Figure 10.8).

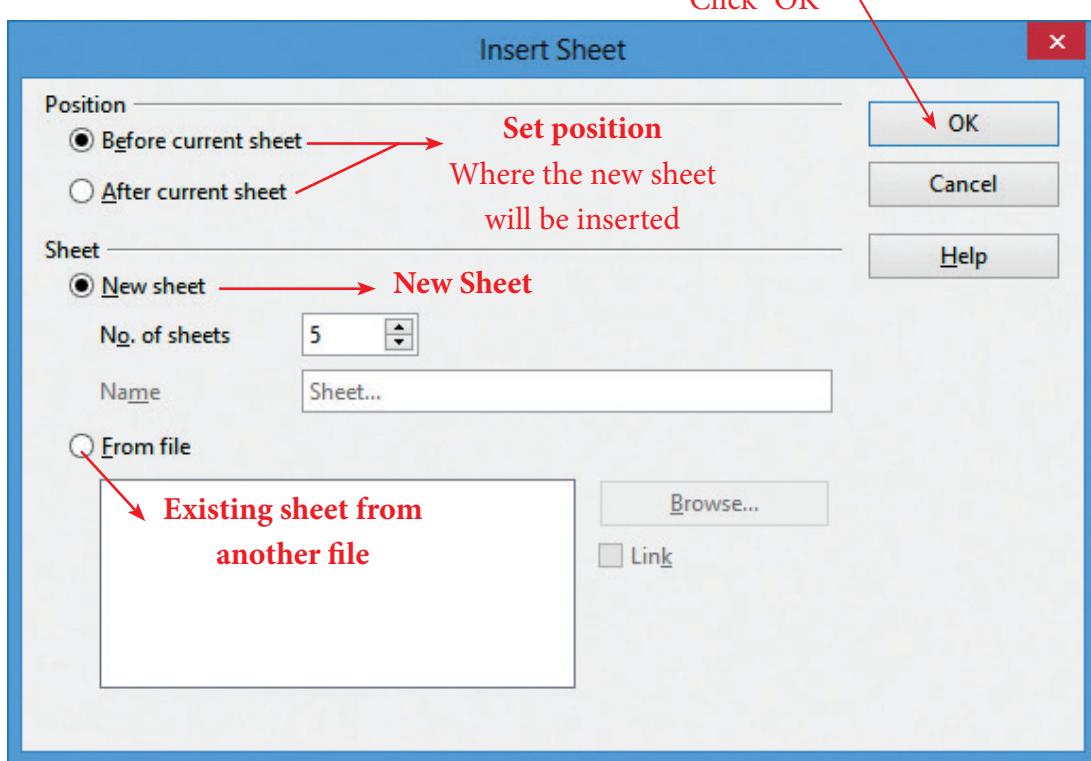


Figure 10.8 Insert Sheet dialog box

In this dialog box,

- Set position by clicking “Before current sheet” or “After current sheet”. If you select “Before” the new sheet(s) will be inserted left side of the active sheet ie., selected sheet. If you select “After”, the new sheet(s) will be inserted right side of the active sheet.
- Type or spin the number of sheets you need to insert. If you type or spin one sheet, Name box will be activated, and you can enter new name of the sheet to be inserted. If you set more sheets, Name box will be disabled.
- The **minimum** number of sheet must be **one** and **maximum** will be **253 (OpenOffice Calc 4.1.5)**.
- Finally, click **OK** button.

### 10.3.2 – Deleting Worksheets

In a worksheet sheets can be deleted individually or in groups.

**To delete single sheet:**

1. Right-click on the tab of the sheet which is to be deleted and choose. **Delete Sheet** from the pop-up menu, or

2. Choose **Edit → Sheet → Delete** from the Menu bar (Refer Figure 10.9).

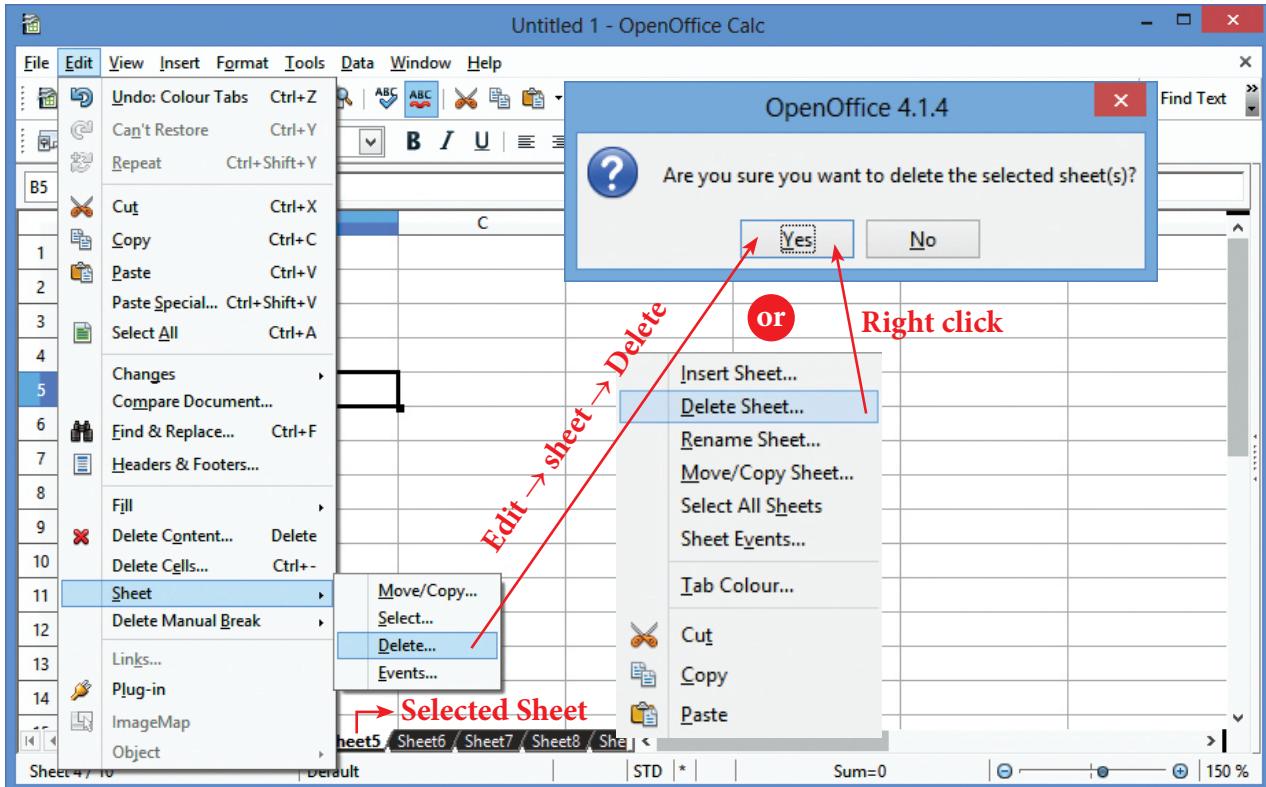


Figure 10.9 Delete Sheet

3. Either way, an alert will ask if you want to delete the sheet permanently. Click Yes.

#### To delete multiple sheets:

To delete multiple sheets, select them as mentioned earlier and either **right-click** over one of the tabs and choose **Delete Sheet** from the **pop-up** menu, or choose **Edit → Sheet → Delete** from the menu bar. Rest of the procedure are similar to deleting a single sheet what you learnt earlier.

#### 10.4 – Copy, Move and change the order of sheets

**Click and drag** the sheet tab is the simple way to move the sheets.

Menu also can be used to move sheets.

1. **Right-click** the sheet you want to move and select **Move/Copy Sheet** from the **pop-up** menu, or select **Edit → Sheet → Move/Copy** from the main menu (Refer Figure 10.10).

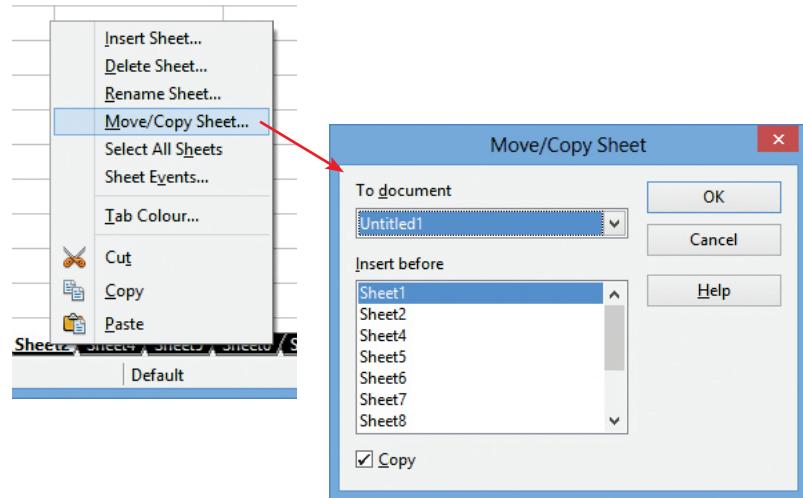


Figure 10.10 Move / Copy Sheets

2. Specify the new position of the sheet in the **Move/Copy Sheet** dialog box. You can even move the sheet to a different document that is opened in Calc.
3. **Copy** Checkbox to be selected to copy sheet.
4. Click **OK**.

## 10.5 – Selecting Cells, Columns and Rows

### 10.5.1 Selecting a single cell:

- Move the mouse pointer to a cell and click to select a cell (or)
- Specify required cell address in the address bar to select a cell.

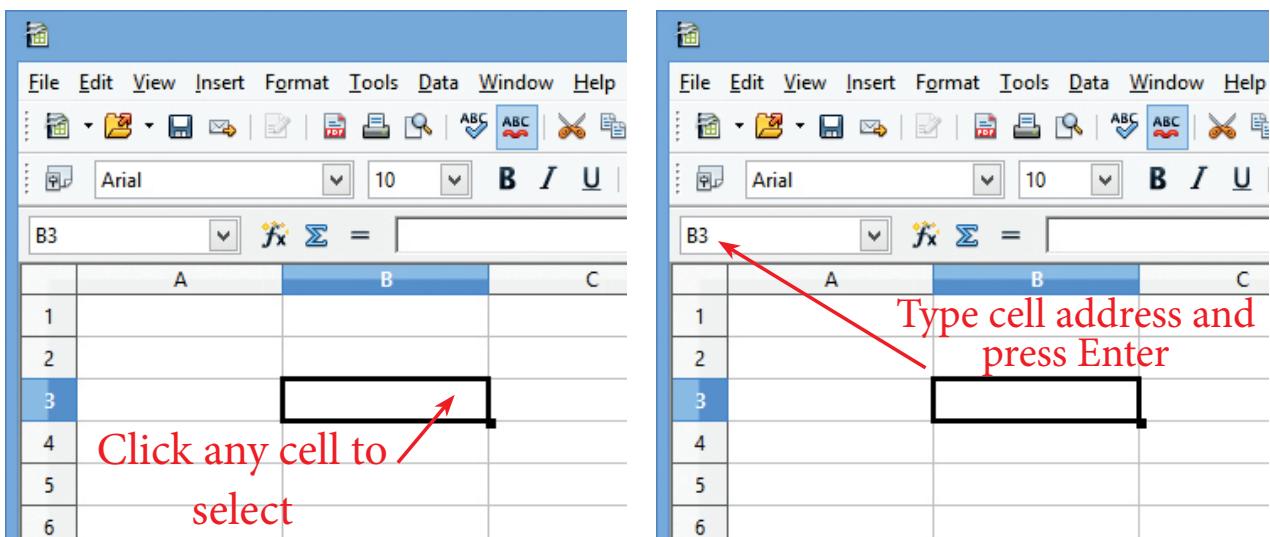


Figure 10.11 Selecting a Cell

### 10.5.2 Selecting Multiple Cells:

Continuous cells can be selected using the keyboard or the mouse.

#### 10.5.2.1 Selecting Multiple cells using mouse:

- Click in a cell.
- Press and hold down the left mouse button.
- Move the mouse till the desired location is selected.
- Once the desired block of cells is selected, release the left mouse button.

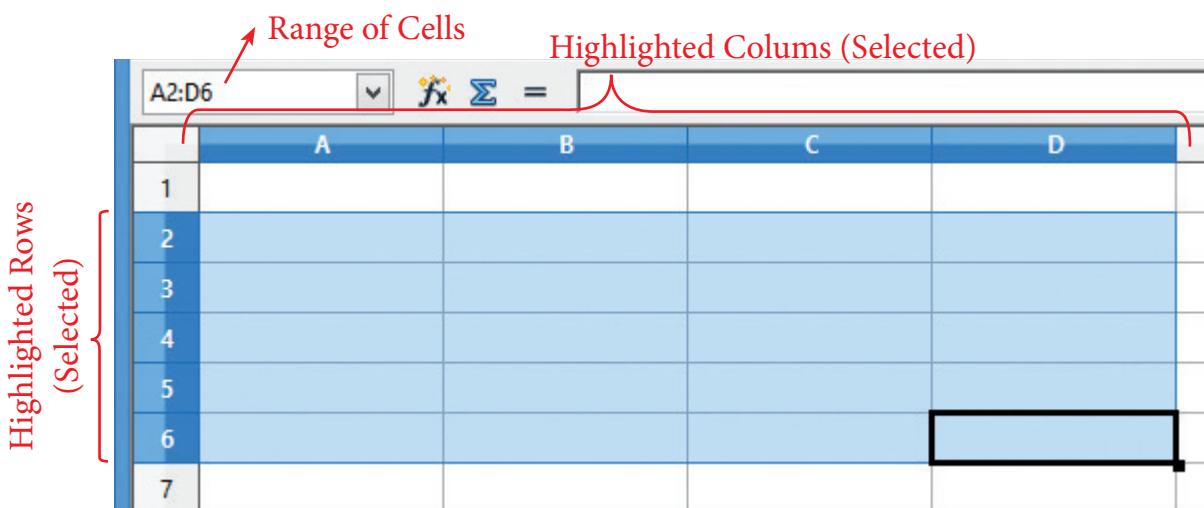


Figure 10.12 Selecting Multiple Sheets

#### 10.5.2.2 Selecting multiple cells using keyboard:

- Move to the starting cell.
- Holding down the Shift key, use the cursor movement arrow keys to select the rest of the range.

#### 10.5.3 Selecting single column or single row:

- To select a single column, click on the column identifier letter
- To select a single row, click on the row identifier number.

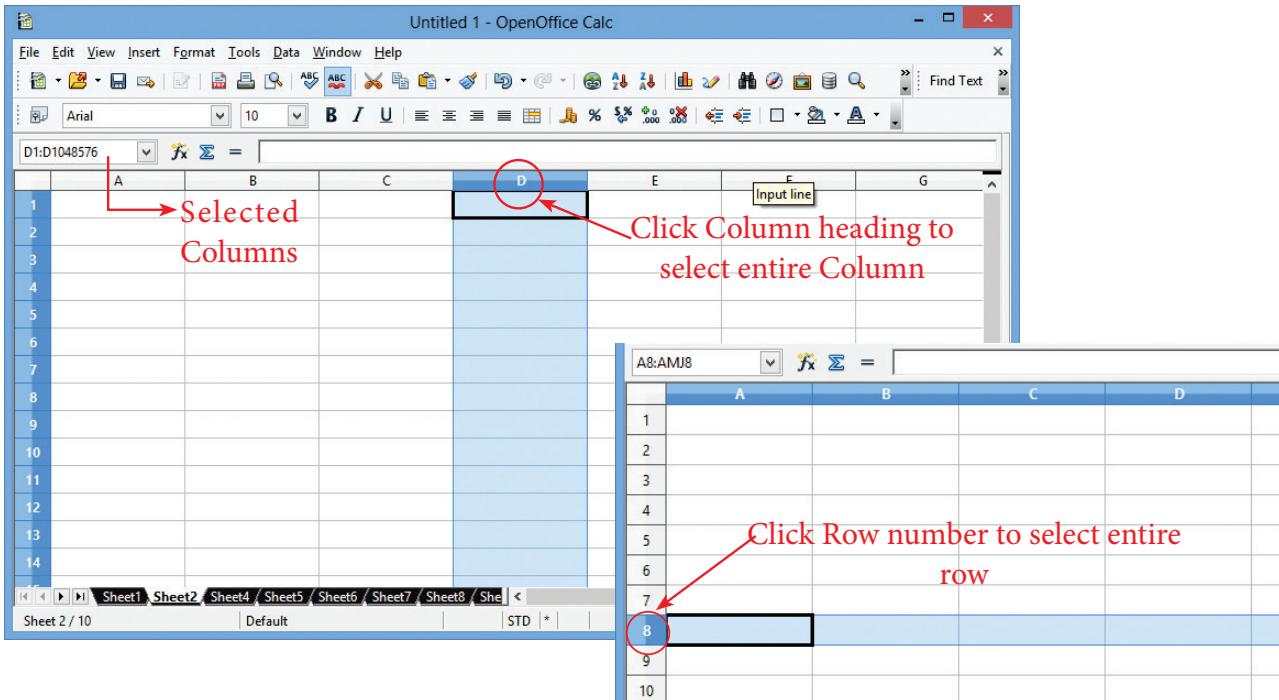


Figure 10.13 Selecting Single column or single row

#### 10.5.4 Selecting Continuous multiple columns or rows

- Click on the first column or row in the group.
- Hold down the Shift key.

Click the last column or row in the group.

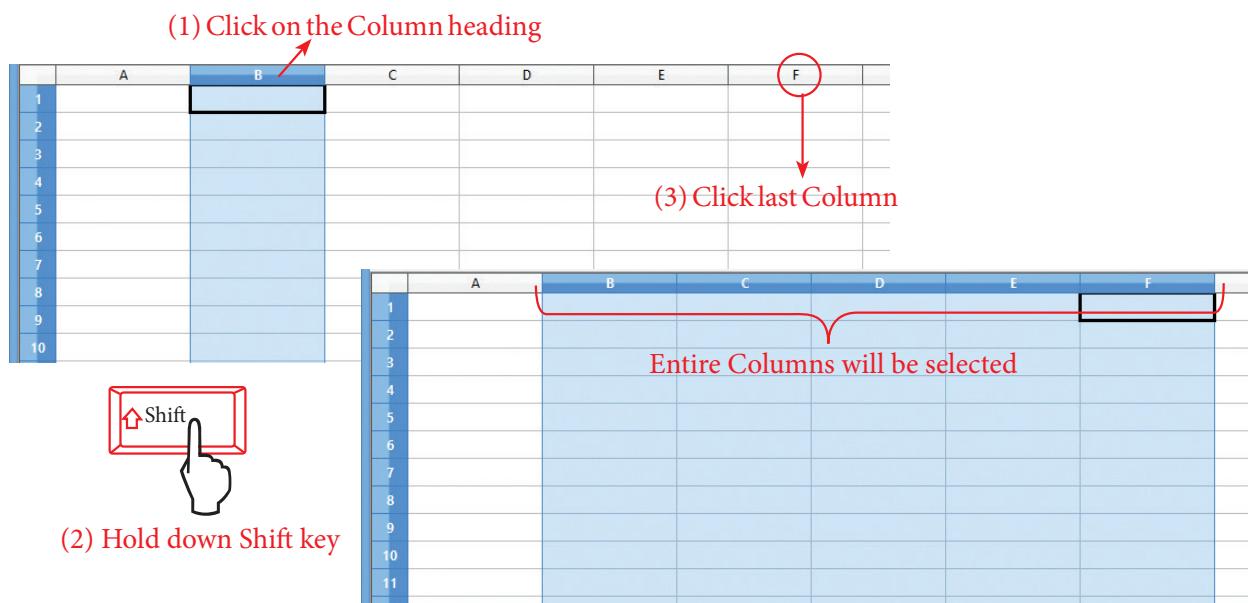


Figure 10.14 Selecting Continuous multiple columns or rows

#### 10.5.5 Selecting multiple columns or rows that are not continuous:

- Click on the first column or row in the group.

- Hold down the **Ctrl** key.
- Click on all of the subsequent columns or rows while holding down the **Ctrl** key.

### To select range of non-continuous cells

- Select the cell or range of cells using one of the methods above.
- Move the mouse pointer to the start of the next range or single cell.
- Hold down the **Ctrl** key and **Click** or **Click-and-drag** to select another range of cells with already selected range.
- Repeat if necessary.

## 10.6 – Hide/Show Rows and Columns

When elements are hidden, they are neither visible nor printed, but can still be selected for copying if you select the elements around them. For example, if column B is hidden, it is copied when you select columns A and C. When you need a hidden element again, you can reverse the process, and show the element.

- To hide or show rows and columns, use the option in the **Format** menu or the **right-click** and choose from pop-up menu.
- To hide a row/column, first select the row/column, and then use menu options,
- **Format → Row → Hide** or **Format → Column → Hide** to hide row and column respectively.

- The same can be achieved by choosing “**Hide**” option from the pop-up menu when you **right-click** the selected **row/column**.
- To show the hidden row / column, choose **Format→ Row → Show** or **Format→Column → Show** (or)
- **Right-click** and choose **Show** from pop-up menu.

### 10.7 - Freezing and Unfreezing rows and columns

Freezing locks number of rows at the top of a spreadsheet or number of columns on the left of a spreadsheet or both. Frozen columns and rows remain in view during scrolling, whereas other rows and columns gets scrolled.

	A	B	C	D	E	F	G
1	Reg No	Student Name	Maths Marks	Chemistry Marks	Physics Marks	Comp. Sci Marks	Total Marks
2	1001	Suresh	163	180	125	123	591
3	1002	Raman	160	158	154	145	617
4	1003	Venkatesh	165	178	145	185	673
5	1004	Arun	164	175	186	189	714
6	1005	Velu	178	168	198	189	733
7							
8							
9							
10							

Figure 10.15 Freezing and Unfreezing rows and columns

#### Freezing single rows or columns:

1. Click on the **Header** for the row below where to the freeze or for the column to the right of where to freeze.
2. Choose the **Window -> Freeze**. A dark line appears, indicating where the freeze is done.

#### Freezing a row and a column:

1. Click the **Cell** that is immediately below the row to be frozen and immediately to the right of the column to be frozen.

2. Choose **Window -> Freeze**.
3. Two lines appear on the screen, a horizontal line above this cell and a vertical line to the left of this cell. Now as you scroll around the screen, everything above and to the left of these lines will remain in view.

#### Unfreeze:

To unfreeze rows or columns, choose **Window -> Freeze**. The check mark in Freeze will vanish.

### 10.8 - Merge Cells

To merge a group of cells into one cell:

Select the cells to merge.

1. Click on **Merge Cell**  icon or select **Format -> Merge Cells** option from menu bar.

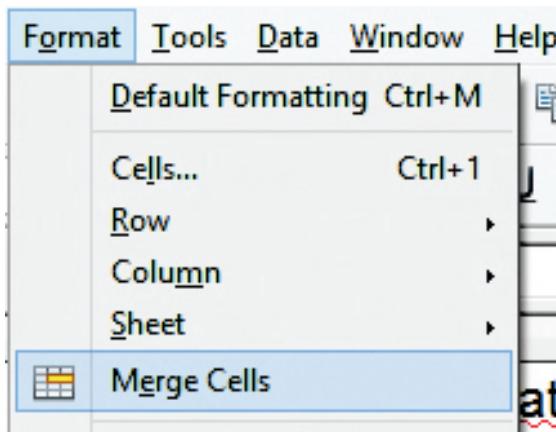


Figure 10.16 Merge cells

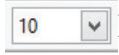
### 10.9 – Formatting Cells and Protecting Worksheets, locking and hiding cells

Formatting Data in a cell gives additional effect to the text. Additional effect includes changing the Font type, Style, Font size, automatic wrapping, bold, underline, italic etc. The data in Calc can be formatted in several ways using the icons of the Formatting Tool bar (Refer Figure 10.17)



Figure 10.17 Formatting Tool bar

#### 10.9.1 - Icons available in the Formatting Tool Bar:

1.  **Font Name list box:** Various fonts are available in the list from which the required font can be selected.
2.  **Font Size list box:** Font size can be selected from this list box.

3. **B Bold Icon:** This icon is used to apply bold for selected cell. Key board shortcut **Ctrl + B** can also be used.
4. **I Italic Icon:** Italic icon is used to apply italic style to selected cell. **Ctrl + I** can also be used to apply italic.
5. **U Under line Icon:** To apply underline for selected cell this icon can be used. **Ctrl + U** can also be used for this.
6. **Four alignment Icons:** Using this icon content of a cell can be aligned Left, Center, Right and Justify. The key board short cuts are **Ctrl + L**, **Ctrl + E**, **Ctrl + R** and **Ctrl + J** can also be used respectively to align cell content.
7. **Number Format Icon:** Currency symbol (**Ctrl + Shift + 4**), Percent (**Ctrl + Shift + 5**), Standard (**Ctrl + Shift + 6**), Add Decimal Place,

Delete Decimal Place can be applied using this icons.

8. **Increase Indent and Decrease Indent Icons** can be used to indent the cell content.
9. **Borders Icon, Background Colour Icon and Font Colour Icons** can be used to apply border, to change cell background colour and to change font colour.

#### 10.9.2 - Formatting using Format Cells Dialog Box:

The above formatting options can be applied individually one by one. The Format Cells dialog box is used to apply formatting and see the preview. Select a cell and **Right-click** and select Format cells or click **Format → Cells** or press **Ctrl+1**, now **Format Cells** dialog box appears with seven tabs as follows.

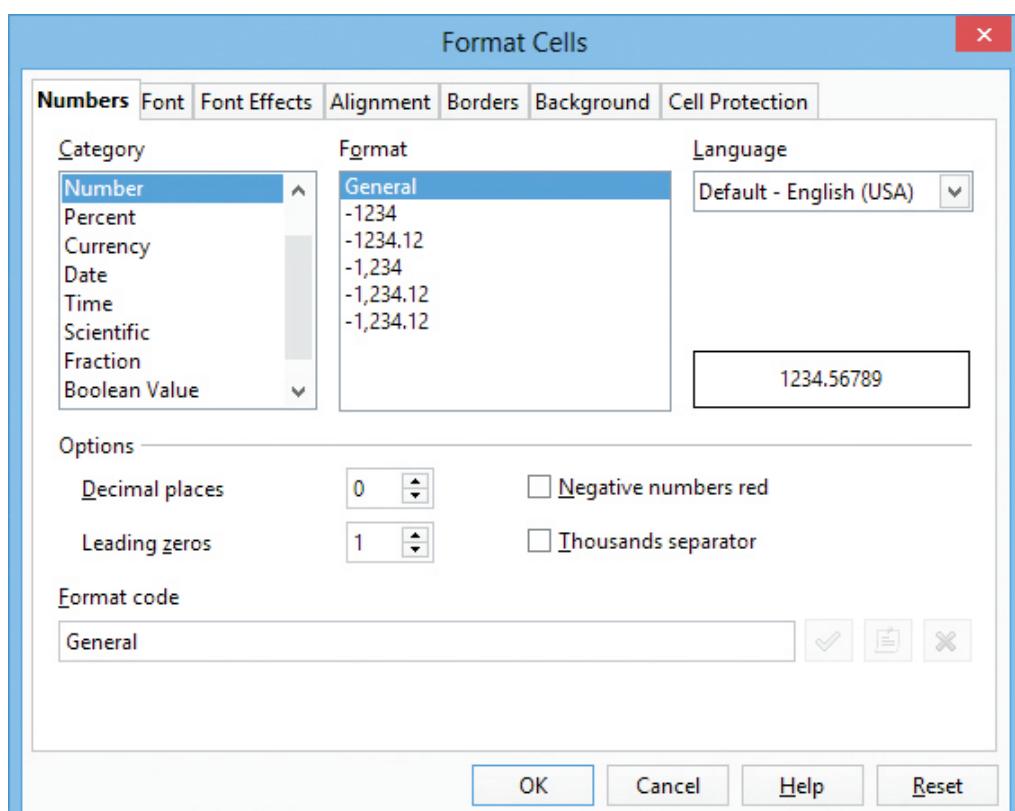


Figure 10.18 Format Cells

## Numbers Tab :

Several number formats like Category, Format, Language, Decimal places, leading zeros and Thousands separator. User-defined Format code is also applied. The main advantage here is that preview is available.

## Cell Protection Tab :

In Open Office Calc, cells are protected against any accidental changes. Protection can be provided by means of a password. Authorization is given by entering the correct password. It is clear that the Cell Protection with a **Protected** attribute is only effective when the whole sheet is in protected mode.

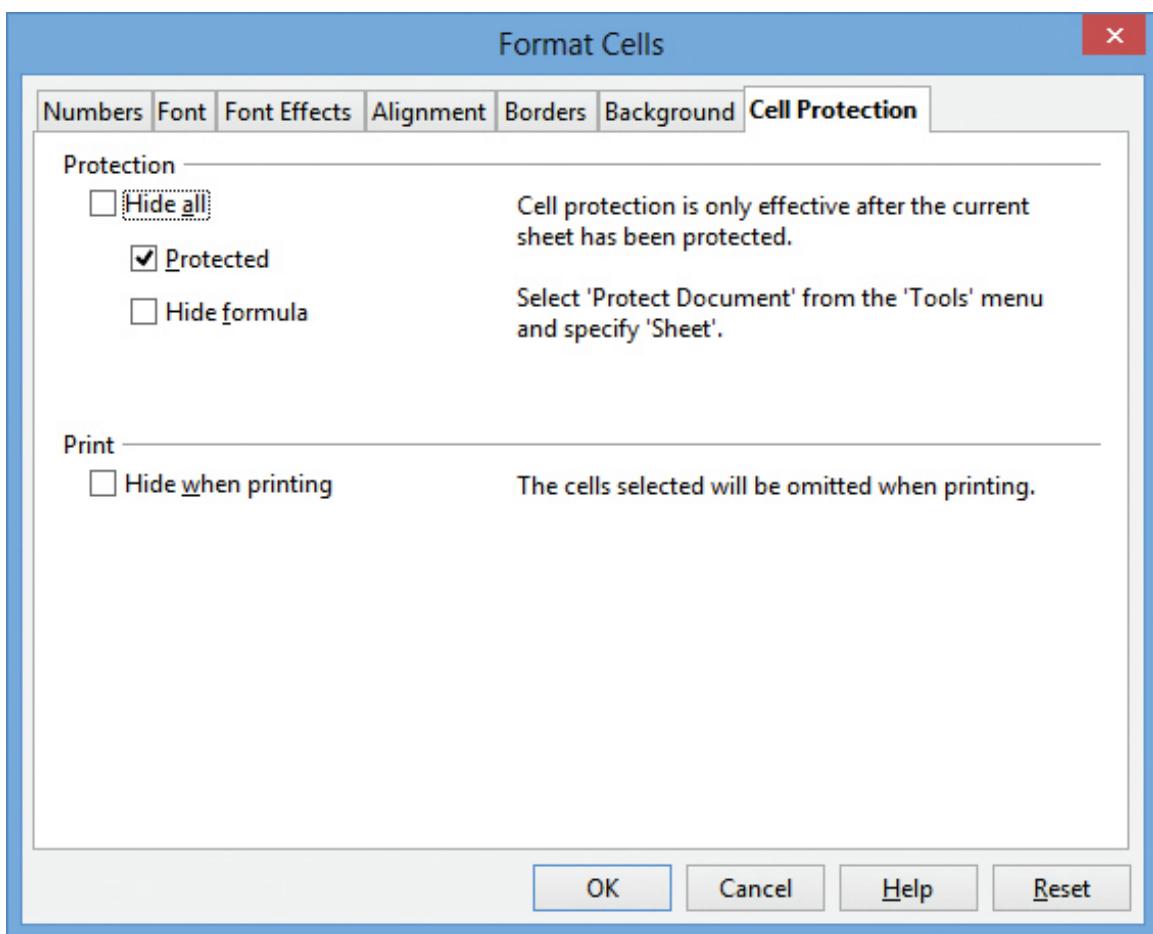
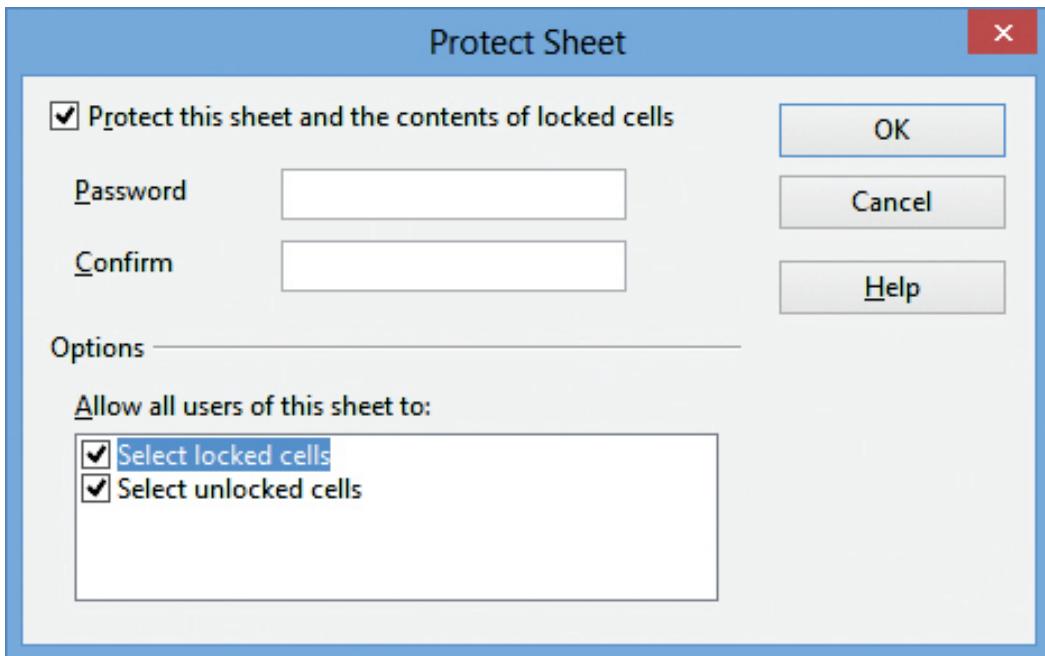


Figure 10.19 Format Cell - Cell Protection

1. Select the cells that you want to apply the cell protection feature..
2. Choose **Format → Cells** and click the **Cell Protection** tab.
3. In the **Protection** group, the **Protected** check box is enabled, click Ok button. This becomes effective only when password and confirm are entered through **Tools → Protectd Document → Sheet**(Refer Figure 10.20).



*Figure 10.20 Protecting the Sheet*

In the Format Cells dialog box - for cell protection under the Protection group::

4. Enable **Protected** to prevent changes to the contents and the format of a cell.
5. Enable **Hide formula** to hide and to protect formulae from changes.
6. Enable **Hide when printing** to hide protected cells in the printed document. (The cells are not hidden on screen).
7. Click **OK**.
8. Apply the protection options.
  - 8.1 To protect the cells from being changed / viewed / printed according to your settings in the **Format→ Cells Dialog box**, choose **Tools → Protect Document → Sheet**.
  - 8.2 Enter a password with atleast 5 or more characters.

### 10.10 –Cell Referencing

#### 10.10.1 Relative Addressing

The cell from **A1** to **A3** is addressed as **A1:A3**. Assume **A4** has the formula =**SUM(A1:A3)**. When the same formulae is copied to column **B4** Relative Addressing automatically changes the formulae in **B4** as =**SUM(B1:B3)**. Relative here means that the reference to this area will be changed automatically when you copy the formulae.

### 10.10.2 Absolute Addressing

Absolute Addressing is opposite to Relative Addressing. A dollar sign is placed before each column name and row number in an Absolute Addressing, for example, assume A5 has the formula =SUM(\$A\$1:\$A\$3), when it is copied to B5 the reference will not automatically change and formulae in B5=SUM(\$A\$1:\$A\$3) that is same as A5.

	A	B
1	20	45
2	30	545
3	50	45
4	100	635
5		

Figure: 10.21 Relative Cells Addressing

	A	B	C
1	20	45	
2	30	545	
3	50	45	
4	100	100	
5			

Figure: 10.22 Absolute Cell Addressing

### 10.11 – Functions in OpenOffice Calc

#### 10.11.1 – Introduction

A function is a predefined calculation entered in a cell to help to analyze or manipulate data in a spreadsheet. These functions simplify help to create the formulas needed to get the expected results. Formulae are equations using numbers and variables to get a result. In a spreadsheet, the variables are cell locations that hold the data needed for the equation to be completed. Open Office Calc includes over 350 functions to analyze and reference data. Many of these functions are used for working on numbers, dates, times, and text.

## 10.11.2 – Familiarization with the categories of functions

The most commonly used functions are the built-in functions, which is available in the Function Wizard. To open the Function Wizard choose **Insert→ Function** or press the shortcut key **Ctrl+F2**.

1. Once the Function Wizard is open, Select a **Category** from the Category dropdown box and select the function from the Function list box.
2. When you select a function its description appears on the right-hand side of the dialog box. Double-click on the required function.
3. The Wizard now displays a textbox where you can enter data manually in the text box and the result will be displayed in the Result text box

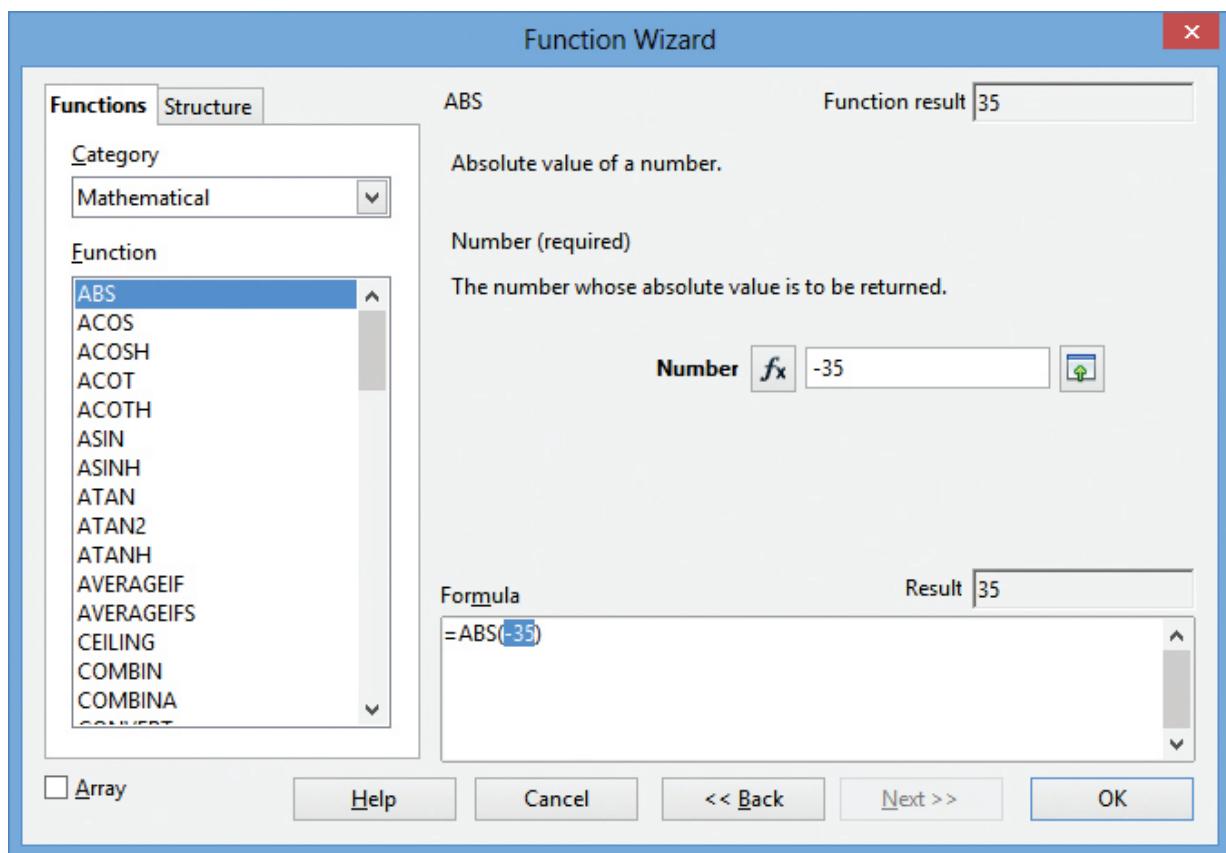


Figure: 10.23 Function Wizard Dialoge Box

## 10.11.3 – Working with the functions in Mathematical and Statistical Category

### 10.11.3.1 - Mathematical functions under Mathematical Category:

Various Mathematical functions are readily available under Mathematical category for mathematical calculations.

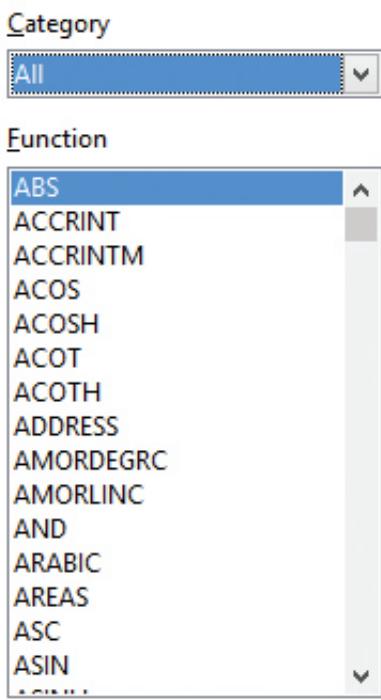


Figure: 10.24 Mathematical functions

Few mathematical functions are listed below.

#### ABS (Number/Cell Address)

**Number/ Cell Address** is the value whose absolute value is to be calculated. The absolute value of a number is its value without +/- sign.

#### Example

=ABS (-76) returns 76, =ABS (74) returns 74, =ABS (0) returns 0.

#### ACOS (Number/Cell Address)

This function returns the inverse trigonometric cosine of **Number** which is in radians. The angle returned is in the range 0.0 to +PI. To return the angle in degrees, use the **DEGREES** function.

#### Example

=ACOS (-1) returns 3.14159265358979 (PI radians)

=DEGREES (ACOS(0.5)) returns 60. The cosine of 60 degrees is 0.5.

#### ACOSH (Number/Cell Address)

This function returns the inverse hyperbolic cosine of a Number. The Number must be greater than or equal to +1.0.

#### Example

=ACOSH(1) returns 0, =ACOSH(COSH(4)) returns 4.

#### ACOT(Number/Cell Address)

This function returns the inverse trigonometric cotangent of a Number. Where the angle is in radians is Number. The angle returned is in the range 0.0 to +PI. To return the angle in degrees, use the **DEGREES** function.

#### Example

=ACOT(1) returns 0.785398163397448 (PI/4 radians).

=DEGREES(ACOT(1)) returns 45. The tangent of 45 degrees is 1.

#### ASIN (Number/Cell Address)

This function returns the inverse trigonometric sine of Number where the angle is in radians. The angle returned is in the range -PI/2 to +PI/2. To return the angle in degrees, use the **DEGREES** function.

## Example

=ASIN (0) returns 0. =ASIN (1) returns 1.5707963267949 (PI/2 radians).

=DEGREES (ASIN (0.5)) returns 30. The sine of 30 degrees is 0.5.

## ATAN (Number/Cell Address)

This function returns the inverse trigonometric tangent of Number where the angle is in radians. The angle returned is in the range -PI/2 to +PI/2. To return the angle in degrees, use the **DEGREES** function.

## Example

=ATAN (1) returns 0.785398163397448 (PI/4 radians).

=DEGREES (ATAN (1)) returns 45. The tangent of 45 degrees is 1.

## CEILING (Number; Significance; Mode)

This function rounds a number up to the nearest multiple of Significance. **Number** is the number that is to be rounded up. **Significance** is the value that the number is to be rounded up to a multiple of. **Mode** is an optional value. If the Mode parameter is supplied and is not equal to zero and if Number and Significance are negative, rounding up is carried out based on the absolute value of Number. This parameter is omitted when exporting to Microsoft Excel since Excel does not support a third parameter for this function

## Example:

=CEILING (15.5;2;2) returns 16,  
=CEILING(-11;-2) returns -10

=CEILING (-11;-2;0) returns -10,  
=CEILING(-11;-2;1) returns -12

## COMBIN (Count1; Count2)

Returns the number of combinations for a given number of objects (without repetition). Count1 is the number of items in the set. Count2 is the number of items to choose from the set. **COMBIN** returns the number of ordered ways to choose these items. For example if there are 3 items A, B and C in a set, you can choose 2 items in 3 different ways, namely AB, AC and BC. **COMBIN** implements the formula:  $\text{Count1!}/(\text{Count2!}^*(\text{Count1}-\text{Count2})!)$

## Example:

=COMBIN (3;2) returns 3, =COMBIN(5;3) returns 10.

## COMBINA (Count1; Count2)

Returns the number of combinations of a subset of items including repetitions. **Count1** is the number of items in the set. **Count2** is the number of items to choose from the set. **COMBINA** returns the number of unique ways to choose these items, where the order of choosing is irrelevant, and repetition of items is allowed. For example if there are 3 items A, B and C in a set, you can choose 2 items in 6 different ways, namely AB, BA, AC, CA, BC and CB. **COMBINA** implements the formula:  $(\text{Count1}+\text{Count2}-1)! / (\text{Count2}!(\text{Count1}-1)!)$

## Example

=COMBINA(3;2) returns 6,  
=COMBINA(4;3) returns 20

## COS (Number)

Returns the (trigonometric) cosine of Number, whose angle is in radians. To return the cosine of an angle in degrees, use the **RADIANS** function.

### Examples:

=COS(PI()/2) returns 0, the cosine of PI/2 in radians.  
=COS(RADIANS(60)) returns 0.5, the cosine of 60 degrees.

## COUNTBLANK (Range)

Returns the number of empty cells in the cell range.

### Example:

=COUNTBLANK (A1:B2) returns 4 if cells A1, A2, B1 and B2 are all empty.

## COUNTIF (Range; Criteria)

**Range** is the range where the criteria is to be applied.

### Example:

The Criteria determines which cells are counted and is in the form of a number, an expression or a text string. The search text may also be given in the form of a regular expression. The command "b.\*" is given for all words that begin with b. If search is for literal text, enclose the text in double quotes.

A1:A10 is a cell range containing the numbers 2000 to 2009. Cell B1 contains the number 2006. In cell B2, you enter a formula:

=COUNTIF (A1:A10;2006) - this returns 1

=COUNTIF (A1:A10;B1) - this returns 1

=COUNTIF (A1:A10;">=2006") - this returns 4

=COUNTIF (A1:A10;"<"&B1) - when B1 contains 2006, this returns 6

=COUNTIF (A1:A10;C2) where cell C2 contains the text >2006 counts the number of cells in the range A1:A10 which are > 2006.

To count only negative numbers:

=COUNTIF (A1:A10;"<0")

### 10.11.3.2 - Statistical functions

#### Category



#### Function

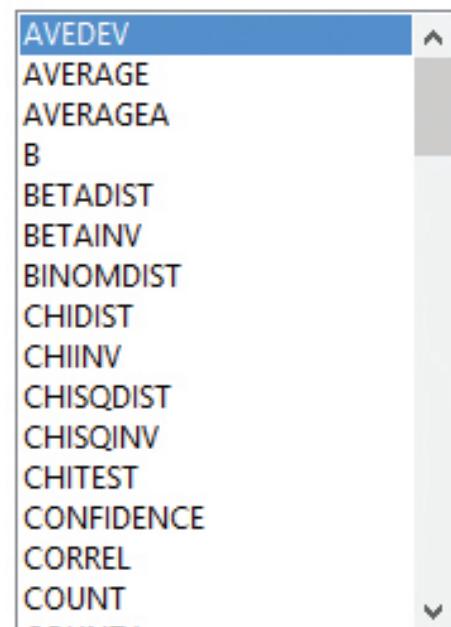


Figure: 10.25 Statistical functions

### COUNT(Value1; Value2; ... Value30)

Counts how many numbers are in the list of arguments. Text entries are normally ignored. Value1; Value2; ... Value30 are 1 to

30 values or ranges representing the values to be counted.

### Example

The entries 2, 4, 6 and eight in the Value 1 ... 4 fields are to be counted.

=COUNT (2;4;6;"eight") = 3. The count of numbers is therefore 3. Text is ignored.

### COUNTA(Value1; Value2; ... Value30)

Counts how many values are in the list. Text entries are also counted, even when they contain an empty string of length 0. Value1; Value2; ... Value30 are 1 to 30 arguments representing the values to be counted.

### Example

The entries 2, 4, 6 and eight in the Value 1 ... 4 fields are to be counted.

=COUNTA(2;4;6;"eight") = 4. The count of values is therefore 4.

### CORREL(Data1; Data2)

Returns the correlation coefficient between two data sets. Data1 is the first data set. Data2 is the second data set.

### Example

=CORREL(A1:A20;B1:B20)  
calculates the correlation coefficient as a measure of the linear correlation of the two data sets.

### LARGE(Data; Rank\_C)

Returns the Rank\_c-th largest value in a data set. Data is the cell range of data. Rank\_C is the ranking of the value.

### Example

=LARGE(A1:C50;2) gives the second largest value in the range A1:C50.

### SMALL(Data; Rank\_C)

Returns the Rank\_c-th smallest value in a data set. Data is the cell range of data. Rank\_C is the rank of the value.

### Example

=SMALL(A1:C50;3) gives the third smallest value in the range A1:C50.

### AVERAGE(Number1; Number2; ... Number20)

Returns the average of the arguments. Number1; Number2; ... Number20.

### Example

=AVERAGE(A1:A20) returns the average of set of values in the cell range A1:A20

### 10.11.4 – Working with the functions in Logical Category.

### IF (Test; TrueValue; FalseValue)

Specifies a logical test to be performed. Test is any value or expression that can be TRUE or FALSE. TrueValue (optional) is the value that is returned if the logical test is TRUE. FalseValue (optional) is the value that is returned if the logical test is FALSE.

## Example

=IF(A1>5;"True";"too small") If the value in A1 is higher than 5 then the text "True" is returned in the current cell otherwise the text "too small" (without quotes) will be returned.

### 10.11.5 – Working with the functions in Date and Time Category

OpenOffice Calc internally handles a date/time value as a numeric value. To change the number format to date or time, Select the cell containing the date or time, Click **Format→Cell**, select **Numbers** tab of the **Format Cells Dialog Box**, select the desired format.

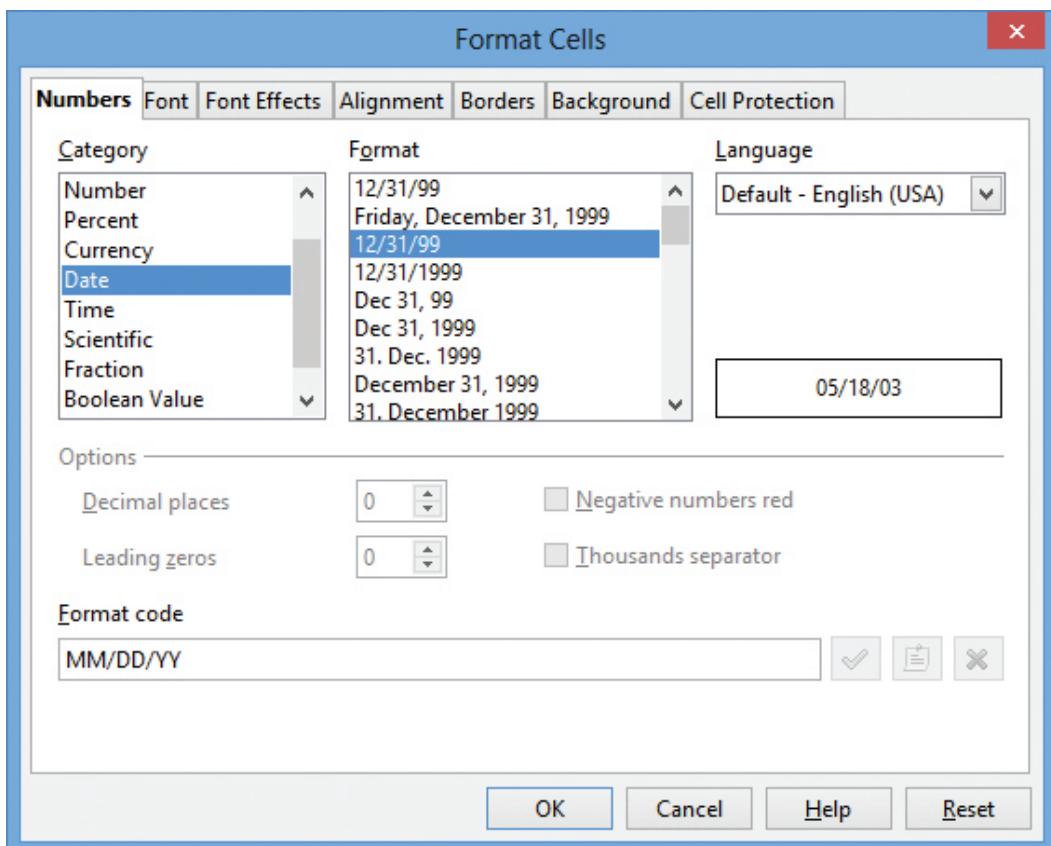


Figure: 10.26 Number format

### 10.11.6 – Working with the functions in Text Category

CONCATENATE("Text1"; "Text2";"Text3"; ...)

Combines several text strings into one string. **Text1**; **Text2**; **Text3**; ... are 1 to 30 text passages which are to be concatenated together into one string.

## Example

=CONCATENATE("Good ";"Morning ";"Mr. ";"Ramki") returns **Good Morning Mr. Ramki**

## **DECIMAL("Text"; Radix)**

Converts a text string with characters from a number system to a positive integer in the base radix given. Text is the text string to be converted. To differentiate between a hexadecimal number, such as A1 and a cell address A1, you must place the text in quotation marks, for example, "A1" or "FACE". Radix indicates the base of the number system. It may be any positive integer in the range 2 to 36.

### **Example**

=DECIMAL("17";10)      returns      17.  
=DECIMAL("FACE";16)    returns    64206.

=DECIMAL("0101";2) returns 5.

## **10.12 – Charts in OpenOffice Calc**

### **10.12.1 – Introduction**

Charts and graphs are powerful ways to convey information to the reader through a pictorial representation. OpenOffice Calc offers a variety of different charts and graph formats for data representation. Calc helps to customize charts and graphs to enhance the Presentation in a best manner.

### **10.12.2 – Familiarization with the types of charts**

There are various types of charts and graphs for representing data through relevant pictorial representation. The creation and presentation of charts are discussed in the following sections.

The following are the types of charts that Calc provides.

1. Column chart
2. Bar chart
3. Pie chart
4. Area chart
5. Line chart
6. Scatter or XY chart
7. Bubble chart
8. Net chart
9. Stock chart
10. Column and line chart

### **Column Chart**

This is a bar chart or bar graph with vertical bars. The height of each bar is proportional to its value. The x-axis shows categories. The y-axis shows the value for each category.

**Normal** type is a sub-type which shows all data values belonging to a category next to each other. Main focus is on the individual absolute values, compared to every other value.

**Stacked** type is a sub-type which shows the data values of each category on top of each other. Main focus is the overall category value and the individual contribution of each value within its category.

**Percent** is a sub-type which shows the relative percentage of each data value with regard to the total of its category. The main focus is the relative contribution of each value to its total category.

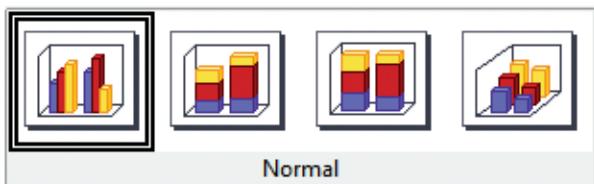


Figure: 10.27 Percentage

## Bar Chart

This type shows a bar chart or bar graph with horizontal bars. The length of each bar is proportional to its value. The y-axis shows categories. The x-axis shows the value for each category.

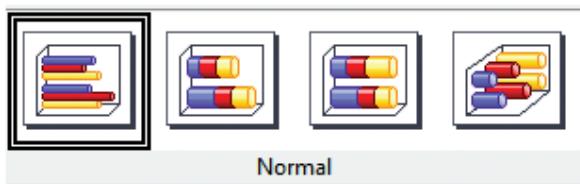


Figure: 10.28 Horizontal Bar

## Pie Chart

A pie chart shows values as circular sectors of the total circle. The length of the arc, or the area of each sector, is proportional to its value.

**Normal Pie** is a sub-type which shows sectors as colored areas of the total pie, for one data column only. In the created chart, you can click and drag any sector to separate that sector from the remaining pie or to join it back.

**Exploded pie** is a sub-type which shows the sectors already separated from each other. In the created chart, you can click and drag any sector to move it along a radial from the pie's center.

**Doughnut** is a sub-type that shows multiple data columns. Each data column is shown as one doughnut shape with a hole inside, where the next data column can be shown. In the chart created, you can click and drag an outer sector to move it along a

radial from the doughnut's center.

Exploded doughnut is a sub-type that shows the outer sectors already separated from the remaining doughnut. In the created chart, you can click and drag an outer sector to move it along a radial from the doughnut's center.

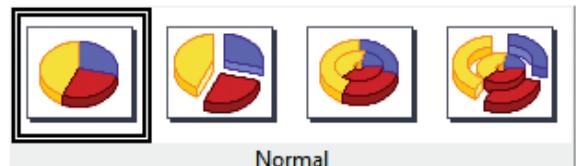


Figure: 10.29 Pie Chart

## Area chart

An area chart shows values as points on the y-axis. The x-axis shows categories. The y-values of each data series are connected by a line. The area between each two lines is filled with a colour. The area chart's focus is to emphasise the changes from one category to the next.

**Normal** - this sub-type plots all values as absolute y-values. It first plots the area of the last column in the data range, then the next to last, and so on, and finally the first column of data is drawn. Thus, if the values in the first column are higher than the other values, the last drawn area will hide the other areas.

**Stacked** - this sub-type plots values cumulatively stacked on each other. It ensures that all values are visible, and no data set is hidden by others. However, the y-values no longer represent absolute values, except for the last column which is drawn at the bottom of the stacked areas.

**Percent** - this sub-type plots values cumulatively stacked on each other and scaled as percentage of the category total.

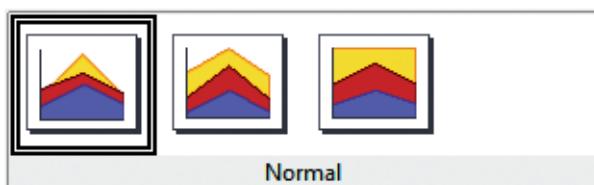


Figure: 10.30 Area Chart Percentage

## Line chart

A line chart shows values as points on the y-axis. The x-axis shows categories. The y-values of each data series can be connected by a line.

**Points only** - this sub-type plots only points.

**Points and lines** - this sub-type plots points and connects points of the same data series by a line.

**Lines only** - this sub-type plots only lines.

**3-D lines** - this sub-type connects points of the same data series by a 3-D line.

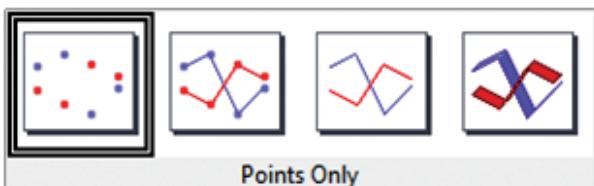


Figure: 10.31 Line Chart - Points Only

## Scatter or XY chart

An X-Y chart in its basic form is based on one data series consisting of a name, a list of x values, and a list of y values. Each value pair ( $x|y$ ) is shown as a point in a coordinate system. The name of the data series is associated with the y values and shown in the legend.

All the charts are created with default settings. After the chart is finished, you can edit its properties to change the appearance. Line styles and icons can be changed on the

**Line** tab page of the data series properties dialogue box.

Double-click on any data point to open the **Data Series** dialogue box. In this dialogue box, you can change many properties of the data series.

For 2-D charts, you can choose **Insert - y-Error Bars** to enable the display of error bars.

You can enable the display of mean value lines and trend lines using commands on the **Insert** menu.

### Points only

Each data point is shown by an icon. OpenOffice uses default icons with different forms and colours for each data series. The default colours are set using **Tools → Options → Charts → Default Colours**.

### Lines Only

This variant draws straight lines from one data point to the next. The data points are not shown by icons.

The drawing order is the same as the order in the data series. Mark **Sort by x-values** to draw the lines in the order of the x-values. This sorting applies only to the chart, not to the data in the table.

### Points and Lines

This variant shows points and lines at the same time.

### 3-D Lines

The lines are shown like tapes. The data points are not shown by icons. In the finished chart choose **3-D View** to set properties like illumination and angle of view.



*Figure: 10.32 3D Points Only*

### Bubble chart

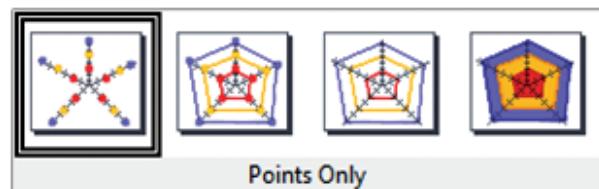
A bubble chart shows the relation of three variables. Two variables are used for the position on the x-axis and y-axis, while the third variable is shown as the relative size of each bubble.

The **Data Series dialog box** for a bubble chart has an entry to define the data range for the Bubble Size.

### Net chart

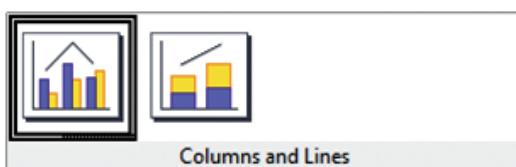
A Net chart displays data values as points connected by some lines, in a grid net that resembles a spider net or a radar tube display.

For each row of chart data, a radial is shown on which the data is plotted. All data values are shown with the same scale, so all data values should have the same magnitude.



*Figure: 10.33 Bubble Chart Points Only*

### Column and line chart



*Figure: 10.34 Column and Line Charts*

A Column and Line chart is a combination of a Column chart with a Line chart.

Select one of the variants

- Columns and Lines. The rectangles of the column data series are drawn side by side so that you can easily compare their values.
- Stacked Columns and Lines. The rectangles of the column data series are drawn stacked above each other, so that the height of a column visualises the sum of the data values.
- You can insert a second y-axis with Insert - Axis after you finish the wizard.

### 10.12.3 – Creating and formatting charts

1. Select the cells that contain the data that you want to present in your chart.
2. Click the Insert->Chart option or click **Insert Chart** icon  on the Standard toolbar.

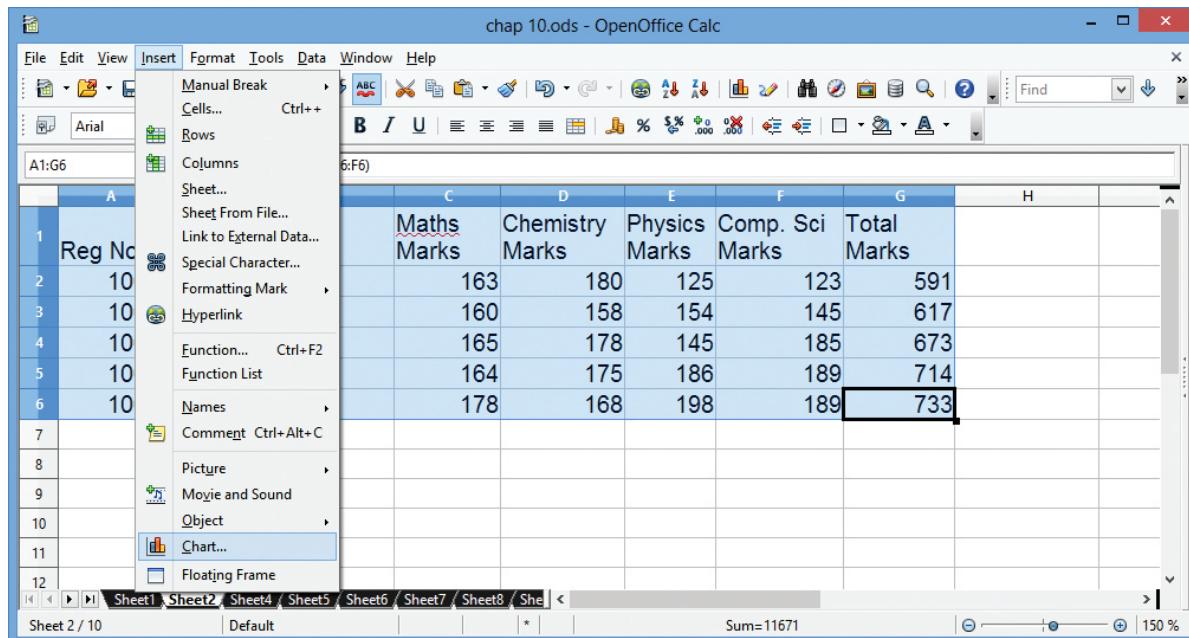


Figure: 10.35a Insert Chart

3. The Chart Wizard has three main parts:

- List of steps involved in setting up the chart,
- List of chart types, and
- The options for each chart type.

At any time you can go back to a previous step and change selections.

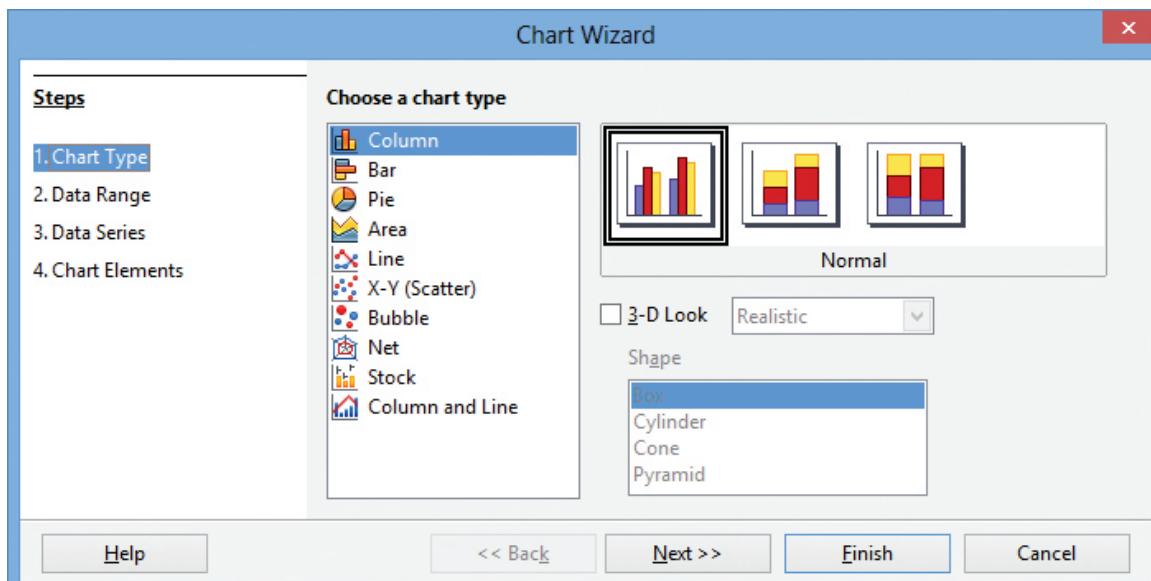


Figure: 10.35b Chart Type

4. Choose a **Chart type** and its option type. Then click **Next >** button.

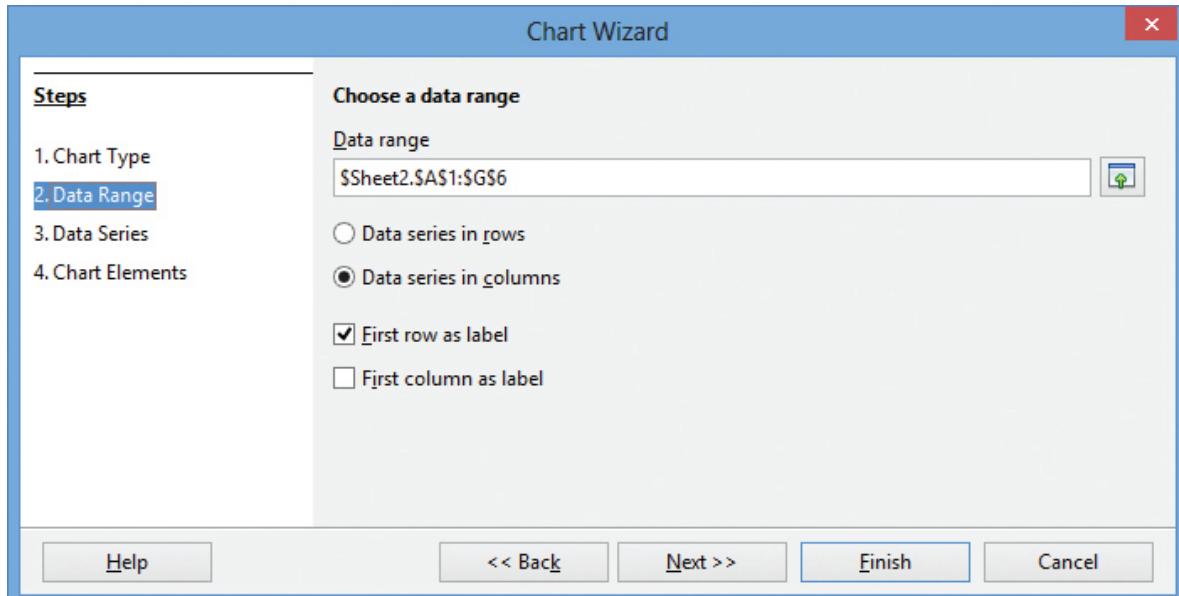


Figure: 10.35c Data Range

5. In Step 2, **Data Range**, helps to manually correct any mistakes made in selecting the data. Click one of the options for **Data series in rows** or in **columns**. Check whether the data range has labels in the first row or in the first column or both. Then click the **Finish** button, or click **Next** to change some more details of the chart.

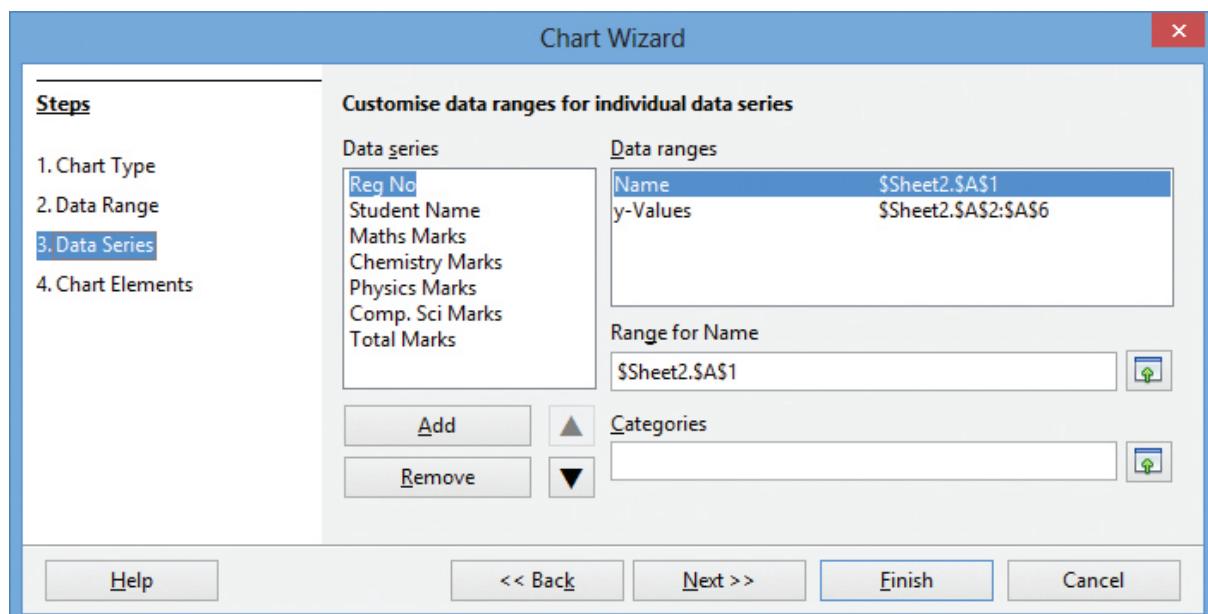


Figure: 10.35d Data Series

6. The **Data Series** list box contains a list of all data series in the current chart.

- To organize the data series, select an entry in the list.
- Click **Add** to add another data series below the selected entry. The new data series has the same type as the selected entry.

- Click **Remove** to remove the selected entry from the Data Series list.
- Use the Up and Down arrow buttons to move the selected entry in the list up or down. This does not change the order in the data source table, but changes only the arrangement in the chart.
- Then click **Next** button

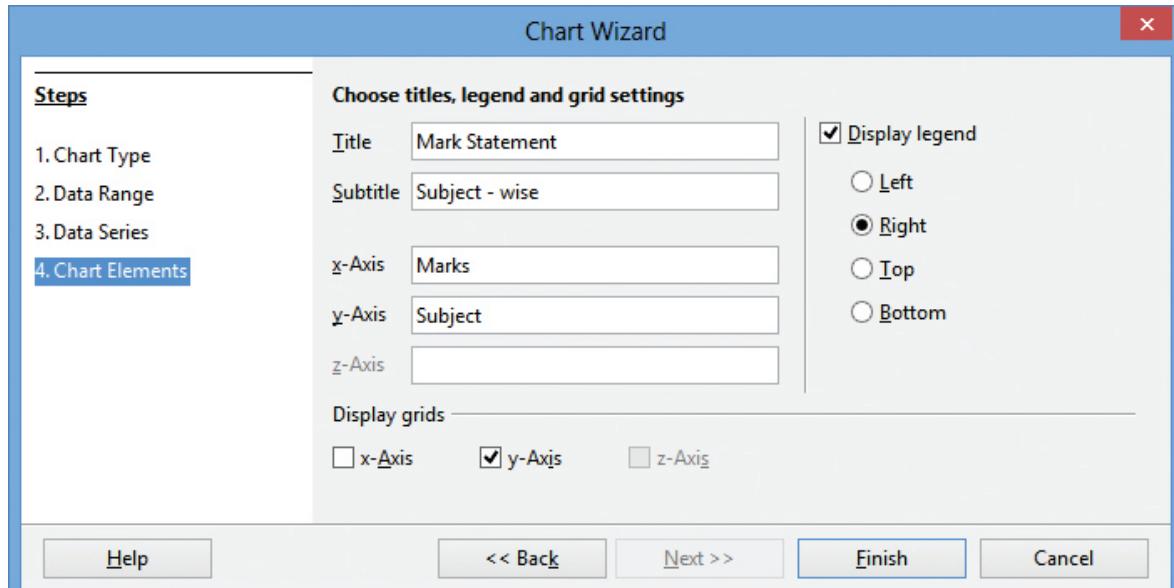


Figure: 10.35e Chart Elements

- In the **Chart Elements** page, chart a title and, if desired, a subtitle. Give a suitable title that draws the viewers' attention to the chart: For example: Figure 10.35f has the chart Title as **Mark Statement**. Then click **Finish** to create chart..

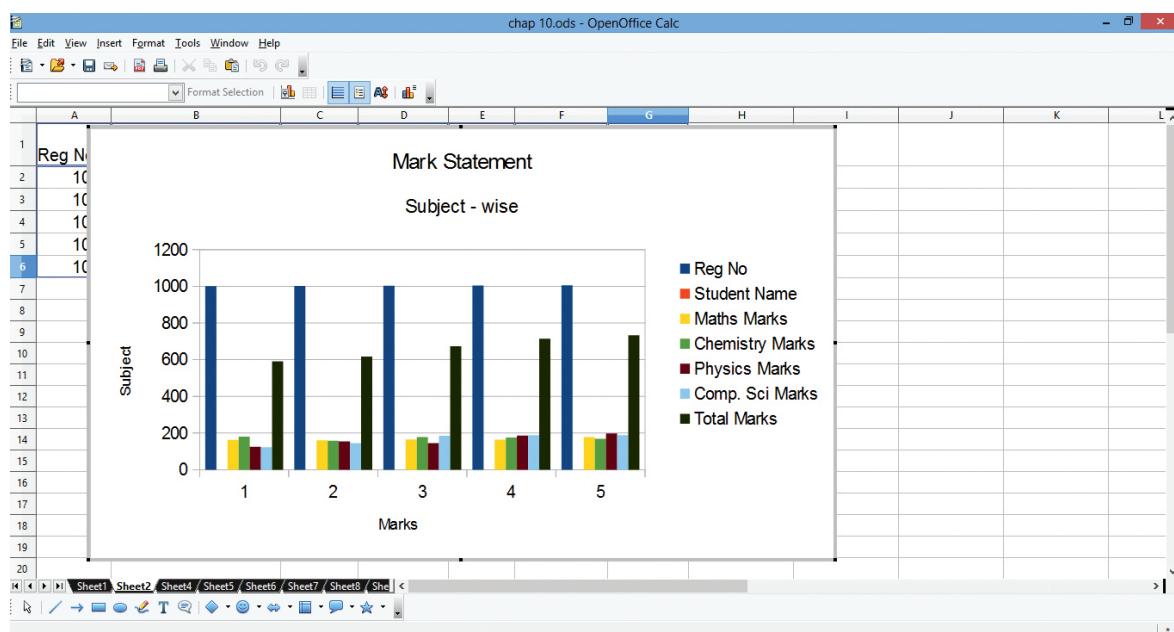


Figure: 10.35f Final Chart

**Case Study:** Create a spreadsheet file to store sales data of a particular product and present it in the form of Chart.

## Evaluation



### Part - A

Choose the best answer:

1. The active sheet colour will be of which colour?  
A) Grey      B) Green      C) White      D) Yellow
  
2. To select multiple continuous sheet which key is used?  
A) Ctrl      B) Shift      C) Alt      D) tab
  
3. To delete a single sheet which command is to be selected?  
A) File → Sheet → Delete  
B) Delete → Sheet → Delete  
C) Sheet → Delete  
D) Edit → Sheet → Delete
  
4. Which command is used to show the hidden row in OpenOffice Calc?  
A) Format → Row → Show  
B) Format → Show → Row  
C) Format → Display → Row  
D) Format → Row → Display
  
5. To protect cell in Open Office Calc Format → Cells and click which tab?  
A) Protect Cell  
B) Protection Cell  
C) Cell Protection  
D) Cell Protect
  
6. To make which cell address absolute we use sign?  
A) Absolute      B) Relative      C) Comparative      D) Reference
  
7. Which function rounds a number upto the nearest multiple of significance?  
A) COMBINA      B) CEILING      C) Floor      D) ABS

8. If cell A5 contains value 18, then if(A5>26; "true", "False") will return  
A)True                    B)False                    C)Blasse                    D) Error
9. Which can be a powerful way to convey information to the reader through a pictorial representation?  
A) Charts and images                    B) graphs and images  
C) Charts and graphs                    D) Images and Pictures
10. What will be value returned by = decimal ("16";1101)  
A) 12                    b) 13                    c) d                    d) e

### Part-II

#### Answer the following questions (2 Marks)

1. How to select continuous and non-continuous sheets in OpenOffice Calc?
2. Write the method to rename sheet.
3. What is the use of freezing a sheet?
4. What are the types of Cell addressing?
5. What is a Chart?

### Part-III

#### Answer the following questions (3 Marks)

1. Differentiate Relative cell addressing from Absolute cell addressing
2. What are functions in OpenOffice Calc?
3. How to hide/show rows and columns in sheet?
4. Write briefly about ASIN function in Open Office Calc.
5. What is a range? Give example.

### Part-IV

#### Answer the following questions (5 Marks)

1. Create a Worksheet which consist of student database with the following fields. Rollno., Name, English, Tamil, Maths, Science, Social, Total, average.
2. Explain how to format a worksheet
3. Discuss in detail the steps to create chart in OpenOffice calc.
4. How to use function in Open Office Calc? Explain with suitable example.

## Data Tools and Printing

### Learning Objective

- To Learn various data processing tools in spreadsheet.
- To Learn about page formatting and printing in the spreadsheet.



#### 11.1 Data tools

Data Tools are used to manipulate the information in spreadsheet. The data tools in spreadsheet are used for automated manipulation. For the new users, these tools may be like advanced options. But, a user who is experienced in these tools can do complex manipulation in a simple way.

#### 11.2 Applying conditional format

An important aspect of the data tools lies in the visualization of those data for easy understanding of the user. Conditional formatting gives different font size, font colour and background colour for different data, based on the user requirement.

Cell formats help to change the font size, font colour, background colour depending on conditions that we specify. For example, in a table of numbers, all the values above average can be displayed in green and below average in red by specifying condition.

For example, if the marks of the students are entered in the spreadsheet. The marks should be shown in different colours for different mark ranges.

**Illustration 11.1:** Apply the conditional formatting for **Table 11.1** as for the condition given below.

1. Mark less than or equal to 50 in Lightgreen
2. Mark greater than 50 in blue

**Table 11.1 Data with conditional Formatting**

Name	Marks
Kumar	32
Arun	67
Gayathri	50
Chandru	98

### Procedure to apply conditional formatting:

1. Select the cells which contain marks
2. Choose **Format → Conditional Formatting** from the menu bar

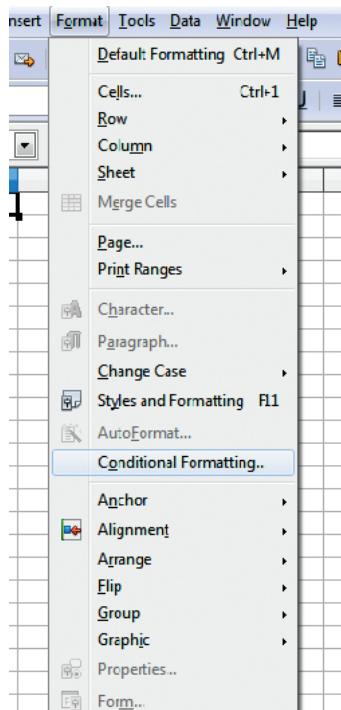


Figure 11.1 Format → Conditional Formatting

3. Conditional formatting dialog box appears as shown in **Figure 11.2**

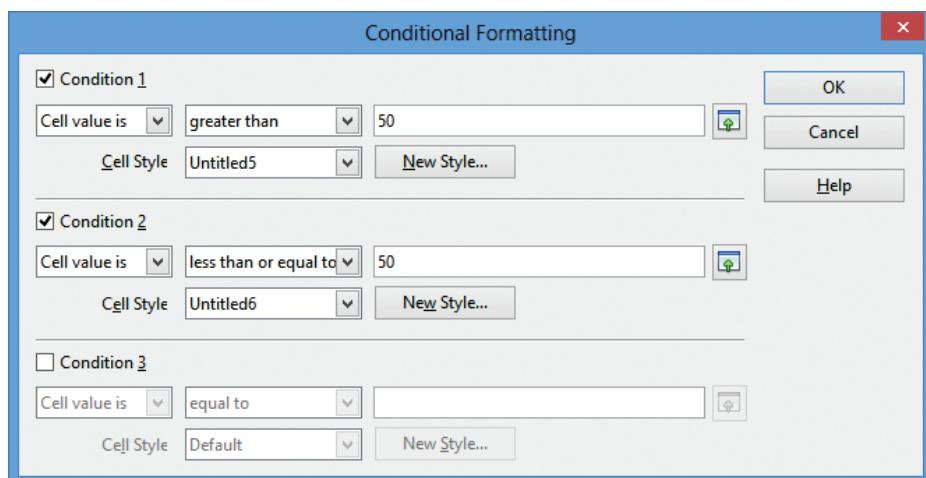


Figure 11.2 Conditional Formatting Dialog Box

4. Select Condition 1, choose **cell value** is “greater than” and type **50** in the value box.
5. Then click **New Style** button. The New Style button has various options such as Font Style, Font Size, Font colour, Font alignment, Border Colour, and Background colour.

Now, the cell style dialog box appears as shown in Figure 11.3a will appear. Click Background Tab and choose light green and click **Ok** button.

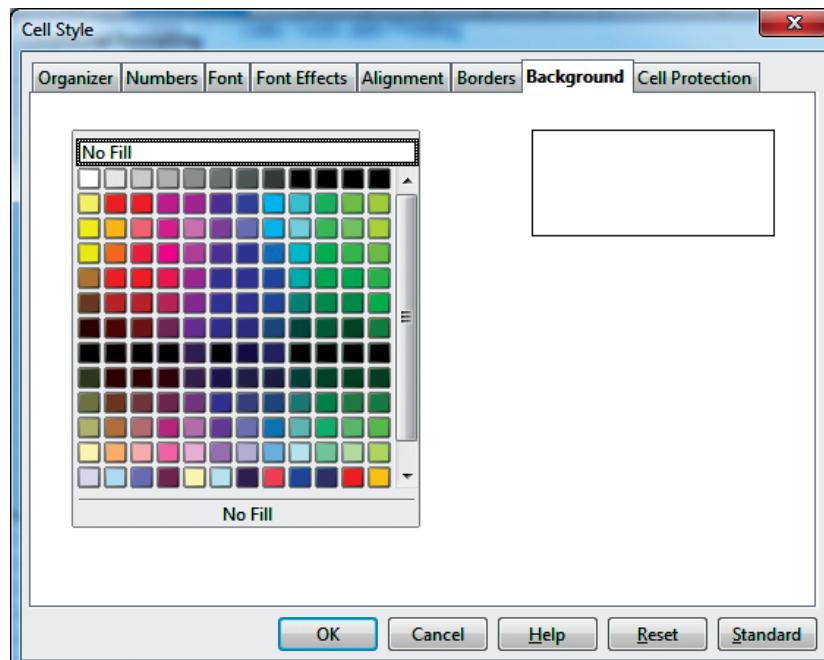


Figure 11.3a Conditional Formatting → New Style → Background

- Similarly, Select Condition 2, choose cell value is “less than” and type 50 in the value box. In the background tab, choose blue colour and click **Ok** button.

Finally OpenOffice calc shows the result as given below:

	A	B	C	D
1	Name	Marks		
2	Kumar	32		
3	Arun	67		
4	Gayathri	50		
5	Chandru	98		
6				

Figure 11.3b Background Colour

### 11.3 Sorting

Sorting is the process of re-arranging data in ascending or descending order. There are three types of sorting in OpenOffice Calc. They are,

- (1) Simple Sorting
- (2) Multi Sorting
- (3) Sort by selection

### 11.3.1 Simple Sorting

Arranging data using a single column is known as simple sorting. To sort the data, calc provides two icons on the standard tool bar viz. (1) Sort Ascending (2) Sort Descending.

- Sort Ascending – Arranging data in alphabetical order (A to Z / Small to Large)
- Sort Descending – Arranging data in reverse order (Z to A / Large to Small)

1	SL No	B Class	C Group Code	D Student Name	E Gender	F Comm	G Date of Birth	H Religion
2	1	XII - F1	302	GANDHIMATHI N	F	SC	02/10/2000	H
3	2	XII - H2	402	SANDHIYA D	F	SC	19/08/2000	H
4	3	XII - H2	402	SUMATHI P	F	BC	06/09/1999	H
5	4	XII - F1	302	JAYASREE J	F	BC	09/06/2001	H
6	5	XII - H1	402	JOTHIKA A	F	SC	07/04/2001	H
7	6	XII - H2	402	RAMYA T	F	MBC	23/11/2000	H
8	7	XII - F1	302	KOWSALYA T	F	SC	14/12/2000	H
9	8	XII - F1	302	ASHA A P	F	SCA	14/09/2000	H
10	9	XII - A	102	VENNILA T P	F	BC	14/02/2000	H
11	10	XII - F2	302	SANGEETHA G	F	MBC	14/01/2000	H
12	11	XII - H1	402	BHAVANI K	F	OC	25/11/2000	H
13	12	XII - F1	302	GAJA LAKSHMI S	F	MBC	18/02/2000	H
14	13	XII - H2	402	SAKTHIPRIYA E	F	SC	03/01/2000	H
15	14	XII - H2	402	SANDHIYA SRI M	F	SC	08/04/2001	H
16	15	XII - F1	302	ALFIYA BEE R	F	BCM	29/07/2000	M
17	16	XII - F2	302	VIGNESHWARI P	F	SC	20/07/2000	H
18	17	XII - F2	302	PRIYA W	F	SC	07/03/2000	H
19	18	XII - F1	302	ANJALI S	F	BC	21/02/2000	H
20	19	XII - H2	402	PAVITHRA S	F	SC	28/12/2000	H
21	20	XII - F1	302	KAMALESHWARI V	F	BC	16/02/2000	H
..								

Figure 11.4 Spreadsheet Data Table

### Sorting data

**Step 1:** Place the cell pointer in the field (column) to be sorted

**Step 2:** Click Sort Ascending or Sort Descending icon

OpenOffice Calc, sorts the data based on selected column and its corresponding values present in other columns are also arranged simultaneously. Refer **Figure 11.6**.

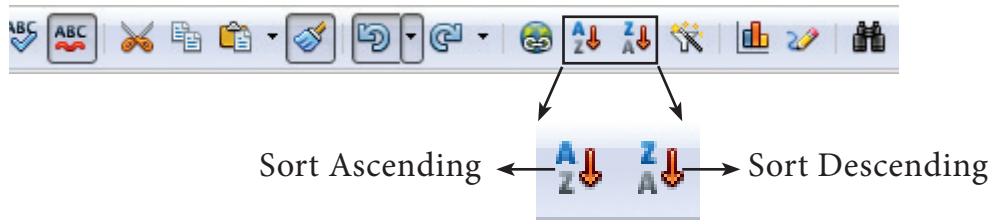


Figure 11.5 Standard Tool Bar with Sort Ascending / Descending

*Click "Sort Ascending" icon to arrange ascending order ↪*

D2 Lohit Tamil 12 B I U = GANDHIMATHI N

	A	B	C	D	E	F	G	H
1	SL No	Class	Group Code	Student Name	Gender	Comm	Date of Birth	Religion
2	1	XII - F1	302	GANDHIMATHI N	F	SC	02/10/2000	H
3	2	XII - H2	402	SANDHIYA D	F	SC	19/08/2000	H
4	3	XII - H2	402	SUMATHI P	F	BC	06/09/1999	H
5	4	XII - F1	302	JAYASREE J	F	BC	09/06/2001	H
6	5	XII - H1	402	JOTHIKA A	F	SC	07/04/2001	H
7	6	XII - H2	402	RAMYA T	F	MBC	23/11/2000	H
8	7	XII - F1	302	KOWSALYA T	F	SC	14/12/2000	H
9	8	XII - F1	302	ASHA A P	F	SCA	14/09/2000	H
10	9	XII - A	102	VENNILA T P	F	BC	14/02/2000	H
11	10	XII - F2	302	SANGEETHA G	F	MBC	14/01/2000	H
12	11	XII - H1	402	BHAVANI K	F	OC	25/11/2000	H
13	12	XII - F1	302	GAJA LAKSHMI S	F	MBC	18/02/2000	H
14	13	XII - H2	402	SAKTHIPRIYA E	F	SC	03/01/2000	H
15	14	XII - H2	402	SANDHIYA SRI M	F	SC	08/04/2001	H
16	15	XII - F1	302	ALFIYA BEE R	F	BCM	29/07/2000	M
17	16	XII - F2	302	VIGNESHWARI P	F	SC	20/07/2000	H
18	17	XII - F2	302	PRIYA W	F	SC	07/03/2000	H
19	18	XII - F1	302	ANJALI S	F	BC	21/02/2000	H

*Place the Cell pointer anywhere in name column*

Figure 11.6 Sort Ascending

### 11.3.2 Multi Sorting

Sorting data based on more than one field (column) is known as **multi sorting**. For example, consider a worksheet containing data of 20 students belonging to different groups and classes. To rearrange this data alphabetically by name and group code, multi sorting is used. Refer **Figure 11.6**.

## Multi-sorting data

Step 1: Select Data → Sort

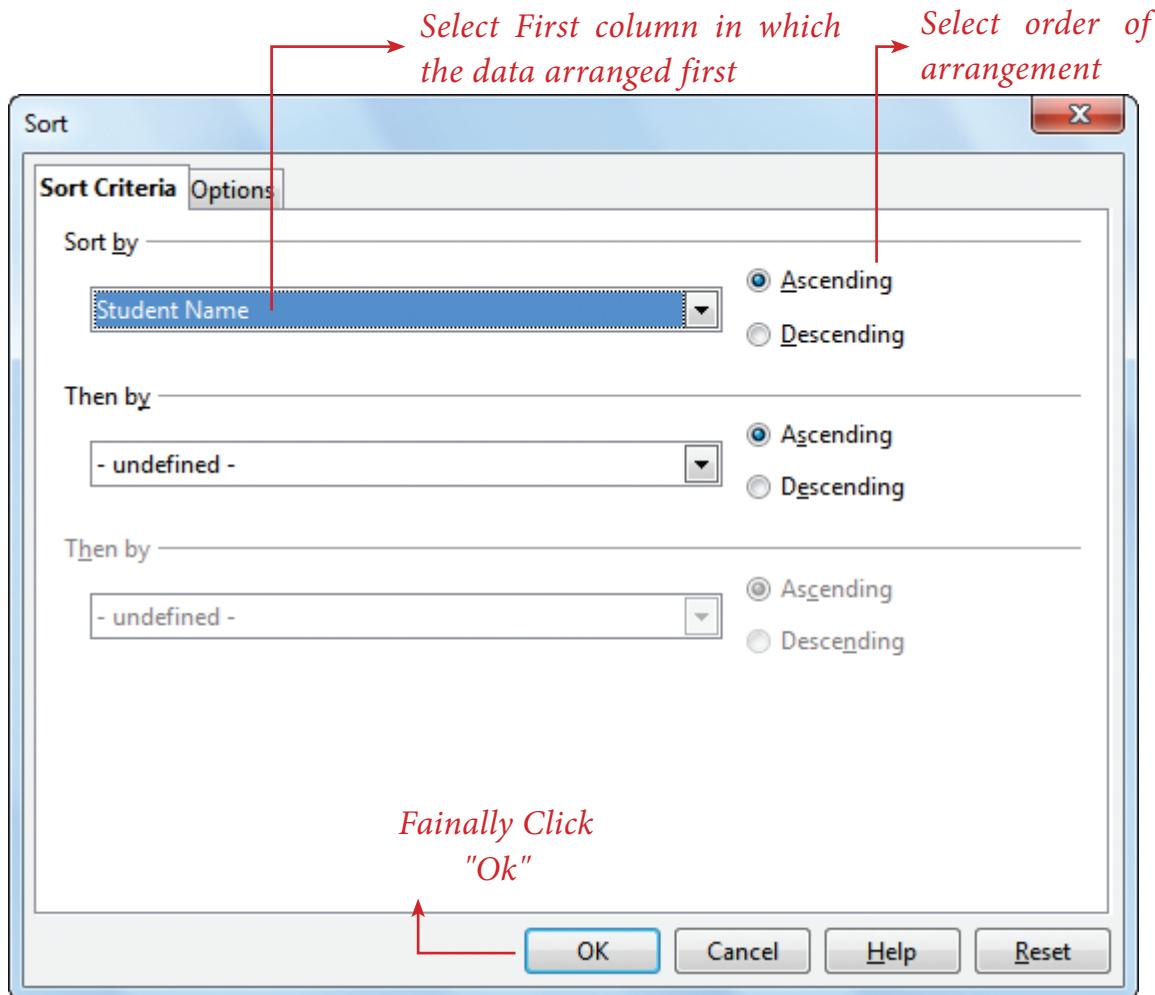


Figure 11.7 Multi-sorting dialog box

Step 2: Sort dialog box appears. (Refer Figure 11.7).

Step 3: Select the field name (Student name) in which you want to sort from the “sort by” dropdown list box and then choose order of sorting i.e. **Ascending** or **Descending**. Ascending is the default selection.

Step 4: Select another field name (Group Code) from the “Then by” dropdown list box and choose the order of sorting to this column.

Step 5: Click “OK” button.

In OpenOffice Calc, multi sort can be done only for three fields.

	A	B	C	D	E	F	G	H
1	Sl. No	Class	Group Code	Student Name	Gender	Comm	Date of Birth	Religion
2	15	XII - F1	302	ALFIYA BEE R	F	BCM	29/07/2000	M
3	18	XII - F1	302	ANJALI S	F	BC	21/02/2000	H
4	8	XII - F1	302	ASHA A P	F	SCA	14/09/2000	H
5	11	XII - H1	402	BHAVANI K	F	OC	25/11/2000	H
6	12	XII - F1	302	GAJA LAKSHMI S	F	MBC	18/02/2000	H
7	1	XII - F1	302	GANDHIMATHI N	F	SC	02/10/2000	H
8	4	XII - F1	302	JAYASREE J	F	BC	09/06/2001	H
9	5	XII - H1	402	JOTHIKA A	F	SC	07/04/2001	H
10	20	XII - F1	302	KAMALESHWARI V	F	BC	16/02/2000	H
11	7	XII - F1	302	KOWSALYA T	F	SC	14/12/2000	H
12	19	XII - H2	402	PAVITHRA S	F	SC	28/12/2000	H
13	17	XII - F2	302	PRIYA W	F	SC	07/03/2000	H
14	6	XII - H2	402	RAMYA T	F	MBC	23/11/2000	H
15	13	XII - H2	402	SAKTHIPRIYA E	F	SC	03/01/2000	H
16	2	XII - H2	402	SANDHIYA D	F	SC	19/08/2000	H
17	14	XII - H2	402	SANDHIYA SRI M	F	SC	08/04/2001	H
18	10	XII - F2	302	SANGEETHA G	F	MBC	14/01/2000	H
19	3	XII - H2	402	SUMATHI P	F	BC	06/09/1999	H
20	9	XII - A	102	VENNILA T P	F	BC	14/02/2000	H
21	16	XII - F2	302	VIGNESHWARI P	F	SC	20/07/2000	H
22								

Figure 11.8 Sorted Table

Note: Names are arranged in Ascending order according to names, while the other data are also rearranged simultaneously.

### 11.3.3 Sort by selection

In Calc sorting can be done on selected range. But this kind of sorting is generally not recommended, because the other relevant data are also not sorted. Therefore, OpenOffice Calc displays a warning message for this type of sorting. Refer **Figure 11.9**.

#### Sorting data by selection:

**Step 1:** Select any particular field in which you want sort.

**Step 2:** Click required Sort icon from standard tool bar or **Data → Sort** command. Calc displays a “Sort Range” warning message as shown in the **Figure 11.9** “Sort Range” message box has two options, viz. (1) Extend selection (2) Current selection.

**Step 3:** “Extend Selection” – Sorts the data beyond on the selection. “Current Selection” – Sort only the selected range of data, remaining data are not sorted.

The screenshot shows a spreadsheet application window with a toolbar at the top. The active cell is D2, containing the text "GANDHIMATHIN". The table has columns labeled SL No, Class, Group Code, Student Name, Gender, Comm, Date of Birth, and Religion. A context menu is open over the cell D2, showing options like Sort, Filter, and Insert. A "Sort Range" dialog box is displayed, asking if the user wants to extend the sort range to A1:H21 or sort the currently selected range, F1:F21. It also includes a tip: "Tip: The sort range can be detected automatically. Place the cell cursor inside a list and execute sort. The whole range of neighboring non-empty cells will then be sorted." The dialog has buttons for Extend selection, Current selection, and Cancel.

	A	B	C	D	E	F	G	H
1	SL No	Class	Group Code	Student Name	Gender	Comm	Date of Birth	Religion
2	1	VII - E1	302	GANDHIMATHIN	E	SC	02/10/2000	H
3	2						19/08/2000	H
4	3						06/09/1999	H
5	4						09/06/2001	H
6	5						07/04/2001	H
7	6						23/11/2000	H
8	7						14/12/2000	H
9	8						14/09/2000	H
10	9						14/02/2000	H
11	10						14/01/2000	H
12	11						25/11/2000	H
13	12						18/02/2000	H
14	13						03/01/2000	H
15	14	XII - H2	402	SANDHIYA SRI M	F	SC	08/04/2001	H
16	15	XII - F1	302	ALFIYA BEE R	F	BCM	29/07/2000	M
17	16	XII - F2	302	VIGNESHWARI P	F	SC	20/07/2000	H
18	17	XII - F2	302	PRIYA W	F	SC	07/03/2000	H
19	18	XII - F1	302	ANJALI S	F	BC	21/02/2000	H

Figure 11.9 Sort by selection

## 11.4 Filtering

Filter is a way of limiting the information that appears on screen. Filters are a feature for displaying and browsing a selected list or subset of data from a worksheet. The visible records satisfy the condition set by the user. Those that do not satisfy the condition are only hidden, but not removed.

OpenOffice Calc allows three types of filters. They are **AutoFilter**, **Standard Filter** and **Advanced Filter**.

### 11.4.1 Auto Filter:

Auto Filter applies a drop-down list box to each field (columns) filled with similar data available in that field. Using the list box item, you can filter the data that matches the criteria of the data concerned.

#### Using Auto Filter:

- Click Auto Filter icon available on the “Standard tool bar” (or) Click Data → Filter → Auto Filter

- The list box contains similar data in the fields. Refer Figure 11.10 and 11.11
- Each list box item will be considered as filter criteria.

Drop down list box

	A	B	C	D	E	F	G	H
1	SL No	Class	Group Code	Student Name	Gender	Comm	Date of Birth	Religion
2	1	XII - F1	302	GANDHIMATHI N	F	SC	02/10/2000	H
3	2	XII - H2	402	SANDHIYA D	F	SC	19/08/2000	H
4	3	XII - H2	402	SUMATHI P	F	BC	06/09/1999	H
5	4	XII - F1	302	JAYASREE J	F	BC	09/06/2001	H
6	5	XII - H1	402	JOTHIKA A	F	SC	07/04/2001	H
7	6	XII - H2	402	RAMYA T	F	MBC	23/11/2000	H
8	7	XII - F1	302	KOWSALYA T	F	SC	14/12/2000	H
9	8	XII - F1	302	ASHA A P	F	SCA	14/09/2000	H
10	9	XII - A	102	VENNILA T P	F	BC	14/02/2000	H

Figure 11.10 Spreadsheet table with Auto Filter

	A	B	C	D	E	F	G	H
1	SL No	Class	Group Code	Student Name	Gender	Comm	Date of Birth	Religion
2	1	XII - F1	All	ANDHIMATHI N	F	SC	02/10/2000	H
3	2	XII - H2	Top 10	ANDHIYA D	F	SC	19/08/2000	H
4	3	XII - H2	Standard Filter...	SUMATHI P	F	BC	06/09/1999	H
5	4	XII - F1	102	JAYASREE J	F	BC	09/06/2001	H
6	5	XII - H1	302	JOTHIKA A	F	SC	07/04/2001	H
7	6	XII - H2	402	RAMYA T	F	MBC	23/11/2000	H
8	7	XII - F1		KOWSALYA T	F	SC	14/12/2000	H
9	8	XII - F1		ASHA A P	F	SCA	14/09/2000	H

Figure 11.11 Auto Filter dropdown list box

- Select the data item from the list box. Now, Calc shows only the records which are satisfy the selected criteria.

#### Example:

If you want to apply an auto filter to the contents of the **Figure 11.4**, follow the following two steps

Step 1: Place cell pointer anywhere in the table

Step 2: Click Auto Filter icon available on the “Standard tool bar” (or) Click **Data → Filter → Auto Filter**

In the above table, if you want to view only the students belonging to the **Group Code 402**

- Click the dropdown list box’s drop arrow (a tiny triangle) to get the filter criteria. (Refer **Figure 11.11**)

- Select group code 402 from the list
- The worksheet displays only the student's details who are studying in group code 402 (Refer **Figure 11.12**) and the remaining records are hidden.

A	B	C	D	E	F	G	H
SL No	Class	Group Code	Student Name	Gender	Comm	Date of Birth	Religion
3	2	XII - H2	402	SANDHIYA D	F	SC	19/08/2000
4	3	XII - H2	402	SUMATHI P	F	BC	06/09/1999
6	5	XII - H1	402	JOTHIKA A	F	SC	07/04/2001
7	6	XII - H2	402	RAMYA T	F	MBC	23/11/2000
12	11	XII - H1	402	BHAVANI K	F	OC	25/11/2000
14	13	XII - H2	402	SAKTHIPRIYA E	F	SC	03/01/2000
15	14	XII - H2	402	SANDHIYA SRI M	F	SC	08/04/2001
20	19	XII - H2	402	PAVITHRA S	F	SC	28/12/2000

Figure 11.12 Filtered details

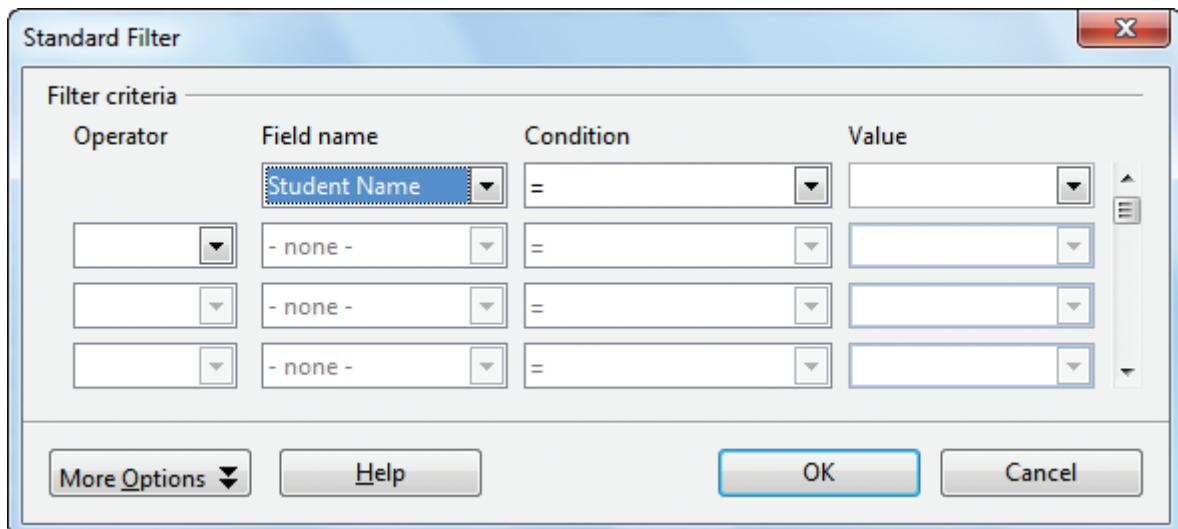


Figure 11.13 Standard Filter dialog box

#### Removing Auto Filter:

- To remove auto filter, click “Auto filter” icon once again .
- The original table is displayed without filter.

#### 11.4.2 Standard Filter:

Auto filter is used only for a single criteria on data, whereas Standard filter is used for multiple critieria.

### **Step 1:**

- Select **Data → Filter → Standard Filter.**
- Now, the entire data is selected and "Standard Filter" dialog box displays as shown in **Figure 11.14.**

### **Step 2:**

- Select the column heading from the "**Field name**" list box for the first criteria.
- Select conditional operator such as  $>$ ,  $<$ ,  $=$  etc., from "**Condition**" list box.
- Type or select the value of criteria in the "**Value**" box.

### **Step 3:**

- Select the one of the logical operator (AND / OR) from "**Operator**" list box to fix second criteria.
- Follow the step 2, for the next criteria.

### **Step 4:**

- Click "**Ok**" to finish.

### **Example for Standard filter:**

If you want to filter the records of "XII-H2" students of group code 402 from the **Figure 11.4.**

#### **Step 1: Select Data → Filter → Standard Filter**

- Now, "Standard Filter" dialog box appears as in **Figure 11.14.**

#### **Step 2: In "Standard Filter" dialog box, select the first criteria:**

- Select Field name as "Group code".
- Select Condition as " $=$ ".
- Type or select Value as "402".

#### **Step 3: To select the second criteria:**

- Select Operator as "AND".
- Select Field name as "Class".
- Select Condition as " $=$ ".
- Type or select Value as "XII- H2".

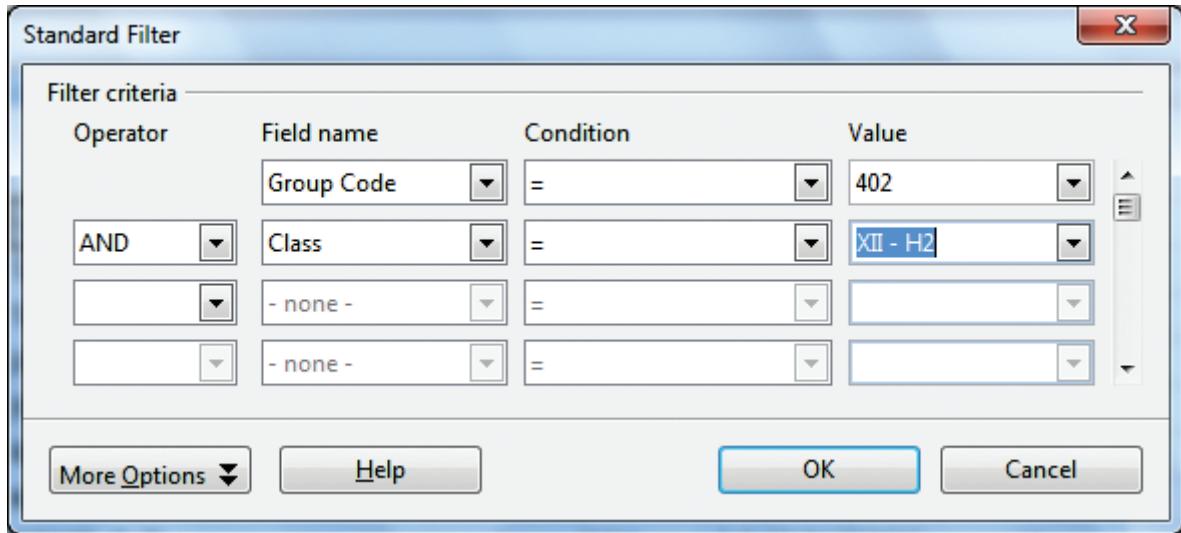


Figure 11.14 Standard Filter

**Step 4:** Click “OK”

- Now, the table displays only the records which match the given two criteria. Refer **Figure 11.15**.

**To Remove Standard Filter:**

- Select Data → Filter → Remove Filter

A1:H21											=	GANDHIMATHIN
	A	B	C	D	E	F	G	H				
1	SL No	Class	Group Code	Student Name	Gender	Comm	Date of Birth	Religion				
3	2	XII - H2	402	SANDHIYA D	F	SC	19/08/2000	H				
4	3	XII - H2	402	SUMATHI P	F	BC	06/09/1999	H				
7	6	XII - H2	402	RAMYA T	F	MBC	23/11/2000	H				
14	13	XII - H2	402	SAKTHIPRIYA E	F	SC	03/01/2000	H				
15	14	XII - H2	402	SANDHIYA SRI M	F	SC	08/04/2001	H				
20	19	XII - H2	402	PAVITHRA S	F	SC	28/12/2000	H				
22												

Figure 11.15 XII-H2 students of Group 402

## 11.5 Applying Validation

Validation will limit the data to be entered in the selected row/column/cell. For example, in the student database, the maximum roll no is 50. Hence, if the user enters a roll no above 50, it should give an error message.

**Step 1:** Enter Roll No in a cell A1 and select the entire column (column A)

**Step 2:** select Data → Validity, the validity dialogue box appears. Select Criteria tab, Select whole numbers in the Allow field. It means only integer values are allowed. Fractional values are not allowed. In the Data field, select less than and in the Maximum field type 50. Refer **Figure 11.16**.

Roll No	Name
1	P.Vishwanathan
2	V.Gowriyammal
6	V.Perumal
3	P.Ganam
4	P.Punitha
5	P.Kumutha
6	P.Komathi
7	P.Sumathi
9	A.Arthi
10	A.Sangeetha
11	K.Aravinth
12	K.P.Arumugam
13	S.Kumar
14	K.Kumaravel

**Validity**

**Criteria** **Input Help** **Error Alert**

**Allow:** Whole Numbers

Allow empty cells

**Data:** less than

**Maximum:** 50

**OK** **Cancel** **Help** **Reset**

Figure 11.16 Screen shot of validity dialogue box (Criteria Tab)

Then select **Error Alert** Tab, select "Show error message when invalid values are entered" check box. Then select **Warning** in the Action dropdown list box, Enter title of the error message (such as invalid) in the Title text box. Then type the error message in the Error message multi line text box. Refer **Figure 11.17**.

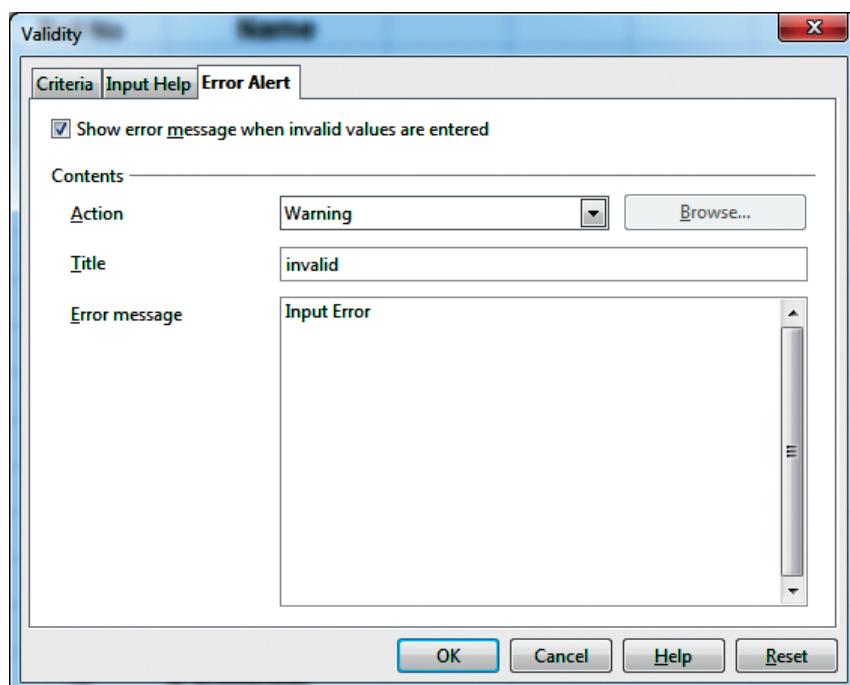


Figure 11.17 Screen shot of validity dialogue box (Error Alert Tab)

Now, in the Roll No column, if the user types values above 50, the error message will appear as shown in **Figure 11.18**.

Roll No	Name
1	P.Vishwanathan
2	V.Gowriyammal
6	V.Perumal
3	P.Ganam
4	P.Punitha
55	P.Kumutha
6	P.Komathi
7	P.Sumathi
9	A.Arthi
10	A.Sangeetha
11	K.Aravinth
12	K.P.Arumugam
13	S.Kumar
14	K.Kumaravel

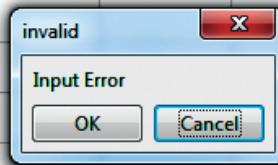


Figure 11.18 Screen shot of validity error

## 11.6 Creating and using Input Help List

Input Help is used to provide various options such as choosing the gender of a person (Male or Female), Month (Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec).

The following steps will guide to generate the List for Gender.

**Step 1:** In any one cell (ex: A1) type Gender

**Step 2:** Select the next cell (may be in A2 or B1)

**Step 3:** Go to Data → Validity then the dialogue box will appear (refer **Figure 11.19**)

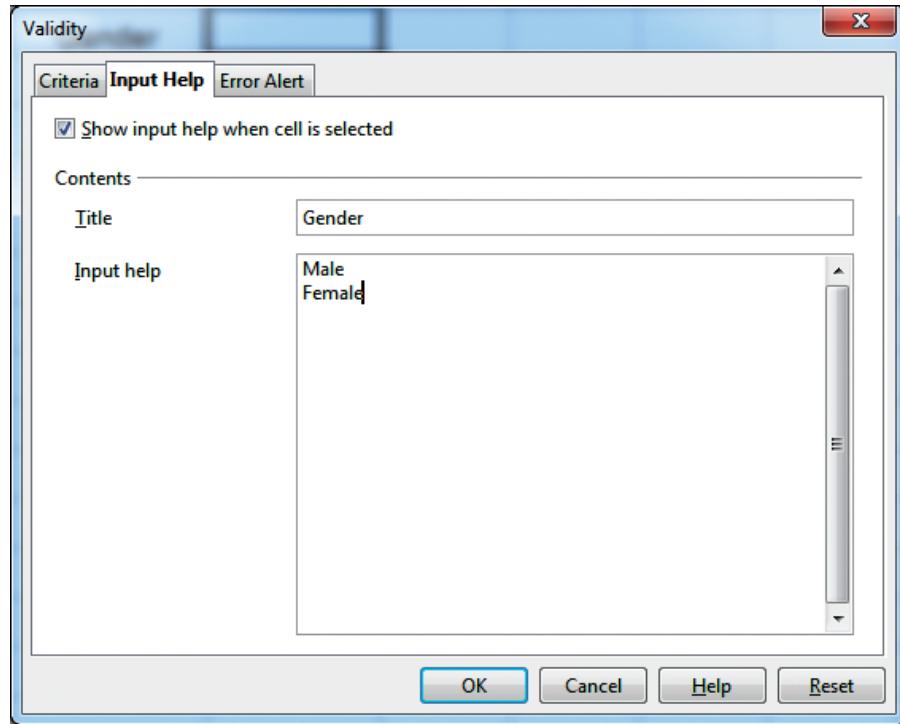


Figure 11.19 Screen shot of Input Help list

**Step 4:** Select **Input Help** Tab, type **Title** as Gender. then type, Male and Female in the **Input Help** Field. Then press “Ok”.

**Step 5:** Goto the selected cell no, the input help message will appear (refer **Figure 11.20**).

Gender	

Figure 11.20 Screen shot of spread-sheet after applying Input Help list

## 11.8 Printing Spreadsheet

### 11.8.1 Setting the page size, Orientation and Margins

**Step 1:** To format the page size, go to **Format → Page** in the menu bar. The dialogue box will appear as shown in **Figure 11.21**.

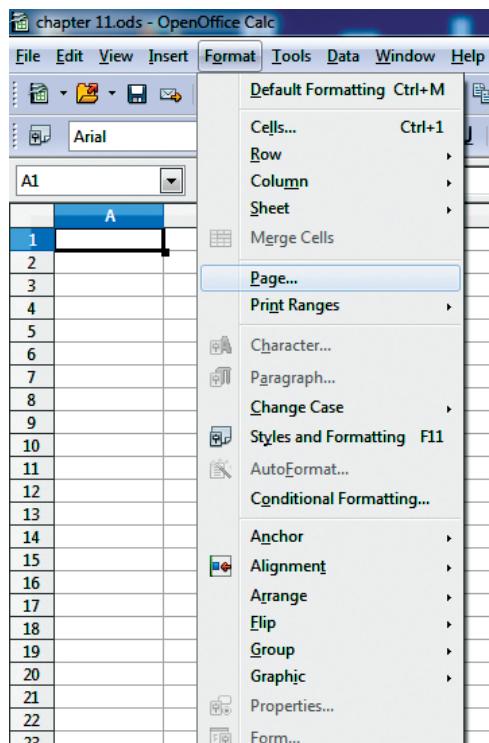


Figure 11.21 Page Style dialoge box

**Step 2:** Choose Page Tab (refer Figure 11.22)

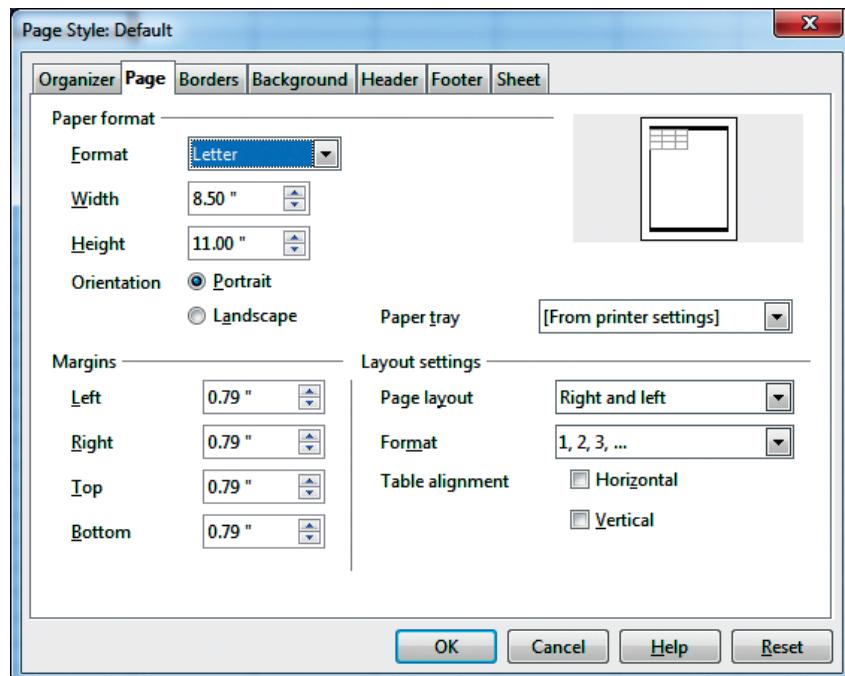


Figure 11.22 Screen shot of page formatting

**Step 3:** Choose the Page size, Orientation and Page Margin

Before printing the worksheet, it is necessary to verify the **Print Preview**, in order to check the required format.

For print preview, go to **File -> Page Preview**

If the worksheet appears in the required format, press close preview, otherwise choose **Format** → **Page** Tab in the top of the screen.

### 11.8.2 Inserting Header and Footer

Header and Footer are some titles (such as Document Title, Author Name) or references (such as page no, number of pages, date) or remarks to be printed in the top (called as Header) and bottom of the page (called as Footer). The header and footer dialogue boxes are shown in **Figure 11.23** and **11.24**.

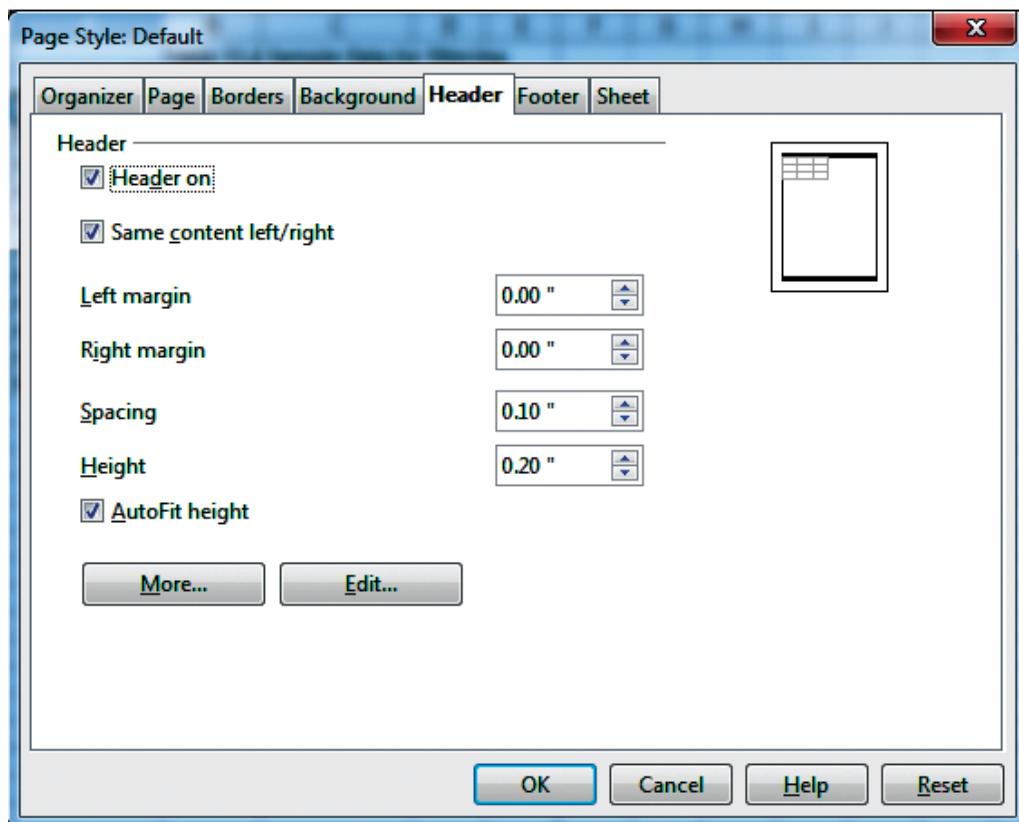


Figure 11.23 Header Dialogue Box

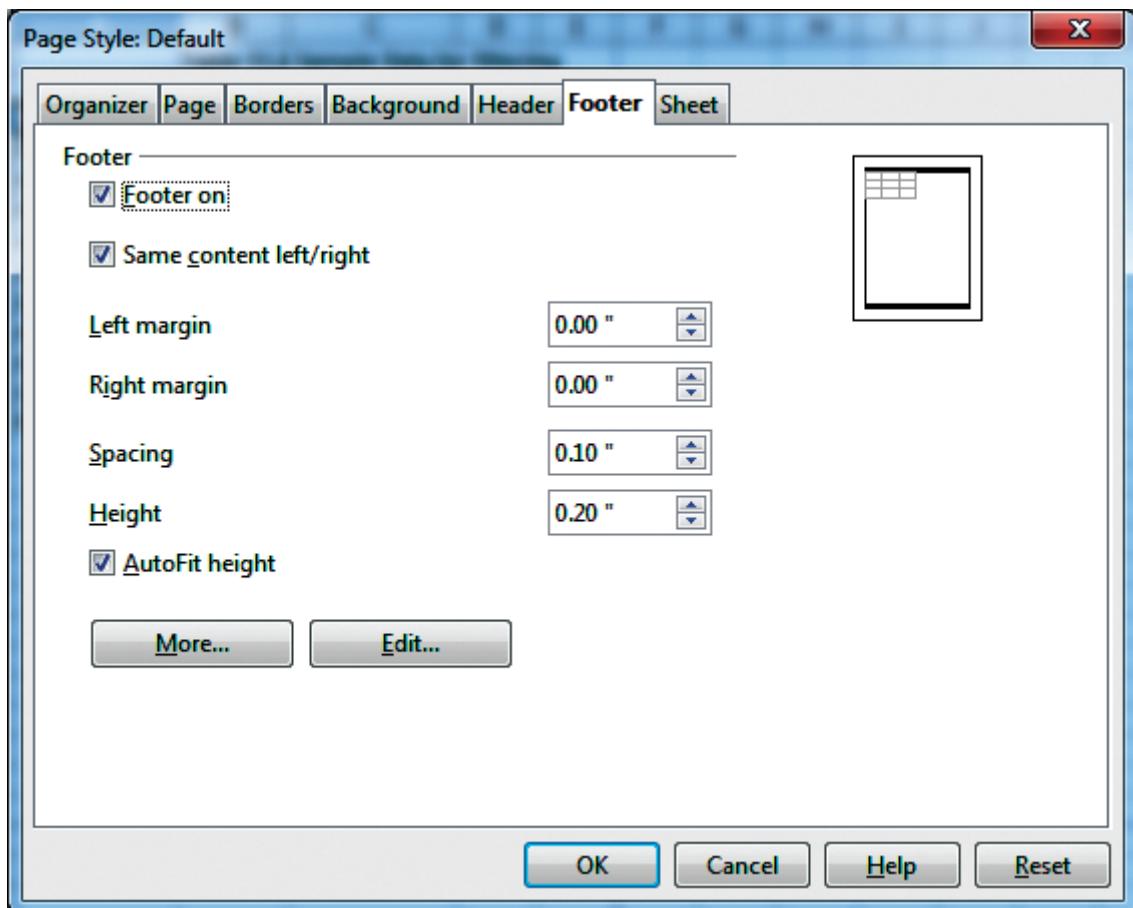


Figure 11.24 Footer Dialogue Box

### 11.8.3 Repeating Rows / Columns in all pages

If a sheet is printed on multiple pages, you can set up certain rows or columns to repeat on each printed page.

For example, if the top two rows of the sheet as well as column A need to be printed on all pages, do the following steps:

**Step 1:** Choose Format → Print Ranges → Edit.

1	Table 11.4 Sample Data for filtering		
2	Name	Marks	Result
5	K.P.Arumugam	60	Pass
6	P.Ganam	60	Pass
7	P.Kumutha	65	Pass
8	P.Komathi	70	Pass
9	A.Sandhya	90	Pass
10	S.Ruba	95	Pass
11	S.Aathauv Krishna	98	Pass
12	A.Sangeetha	99	Pass
13	A.Arthi	100	Pass
14	K.Aravindh	100	Pass
15	R.Sethuraman	100	Pass
16			
17			
18			
19			
20			

**Edit Print Ranges** dialog box open over the table:

- Print range:** Set to '- entire sheet -'.
- Rows to repeat:** Set to '- user defined -' with value '\$1\$15'.
- Columns to repeat:** Set to '- none -'.

Figure 11.25 Printing Repeatative Rows/Columns

**Step 2:** On the Edit Print Ranges dialog box, type the rows in the text entry box under Rows to repeat. For example, to repeat rows 1 and 2, type \$1:\$2. This automatically changes Rows to repeat from “- none -“ to “- user defined -“.

### Points to Remember:

- Data Tools are used to manipulate the information in the spread-sheet
- Conditional format gives different font size, font colour and background colour for different data based on the user requirements.
- Sorting is used to re-arrange the items in ascending or descending order based on alphabets or based on values.
- Filters are used to show only the selected portion of data from a large size database
- Input Help is used to provide various options like week, month etc
- Header and Footer are some titles (such as Document Title, Author Name) or references (such as page no, number of pages, date) or remarks to be printed in the top (called as Header) and bottom of the page (called as Footer).
- If a sheet is printed on multiple pages, we can set up certain rows or columns to repeat on each printed page.

### Evaluation



#### Part I

##### Choose the correct answer

1. There are 10000 rows in a worksheet. The user needs to view only particular rows of the database. Which of the following tool is used?  
A. Sorting      B. Merging      C. Filtering      D. Formatting
2. The customer is required to design the item number between 101 to 200. If the user types above 200 or below 100, the system should give an error message. Which of the following tool is used?  
A. Listing      B. Filtering      C. Formatting      D. Validating
3. In a form, the teacher needs “True or False” as a drop down menu. Which of the following tool is used?  
A. Form      B. Data      C. List      D. Format
4. The size of an A4 paper is 21 cm x 29 cm. If the user chooses Landscape orientation, then the size of the paper is.....?  
A. 21 x 29      B. 29 x 21      C. None of the above      D. All of the above

## Part II

### Answer the following questions (2 Marks)

5. What is sorting?
6. What are the type of the filters?
7. What is header and footer?
8. Write the steps to format the margin of the paper as 1" in all sides.

## Part III

### Answer the following questions (3 Marks)

9. The user needs page number at the bottom of all pages. Which tool is used? Write the steps to design the needs.
10. Write the steps for sorting the database based on the customer name in ascending order
11. Write the steps to print the title row on every page of the spread-sheet

## Part IV

### Answer the following questions (5 Marks)

12. Create a student database with register number, student name, Mark1, Mark2, and Mark3. Calculate the total and average of the students. Show the marks which are below 50 in red colour and marks above 50 in green colour.
13. Explain the applications of Header and Footer with example

### Practicals

Type the registration number and name of the student, mark 1 if the student is present and mark 0 if the student is absent on the date. Apply conditional formatting such as if the student is present that should represent in green colour and the absentees should represent in red colour. Then calculate number of present days, number of absent days and attendance percentage of the student. Also calculate number of student present per day and number of student absent per day.

Register No	Name	29-Nov	08-Dec	13-Dec	20-Dec
160172	SHIVA. M	0	0	0	0
170001	MONICA. A	1	1	1	1
170002	SUGANYA. D	1	1	1	1
170004	POOJA. P	1	1	0	1
170005	MANJU. M	1	1	1	1
170006	MOTHILAL. T	1	1	1	1
170007	DIYA N	1	1	1	0
170008	PRAJAKTA S	1	1	1	1
170009	SIRISHA S	1	1	1	1
170010	SUSMITA S	1	1	1	1
170011	DIVYA K	1	1	1	1
170012	THOMAS S	1	1	1	1
170013	SUPRAJA A	1	1	1	1
170014	RAVIRAJ R	1	1	1	1



### Learning Objectives

After learning this chapter, the students will be able to

- Know the OpenSource presentation software
- Explore opening a new presentation using Impress
- Create a new presentation using various ways using Impress
- Know parts of the main Impress Window
- Differentiate five sections of Task pane
- Explain Window elements of Impress
- Differentiate various views in Workspace
- Explore drawing Objects and inserting OLE
- Draw freeform shapes
- Rotate Objects
- Create animation in slides/objects

## Presentation Basics

### 12.1 Presentation Software - Meaning

- A presentation software is a computer software package used to show information, in the form of a slide show.

It includes three major functions:

- an editor that allows the text to be inserted and formatted,
  - a method for inserting and manipulating graphic images.
  - a slide-show system to display the content.
- Presentation software is used to create presentations, quizzes, e-learning packages and multimedia products.
- Most presentation software packages will create your multimedia product using a series of slides.
- Text, images, video, animation effects, links and sound can be combined on each slide to create a final product.

The most commonly known presentation programs are OpenOffice Impress, Microsoft PowerPoint and Apple's Keynote. In this chapter, we are going to explore on OpenOffice presentation Software Impress.

## 12.2. Impress

Impress is the OpenOffice presentations (slide show) module. You can create slides using Impress. It contains different elements like text, bullets and numbered lists, tables, charts, clipart and a range of graphic objects. Impress has access to the spelling checker and thesaurus. Also, it comes with pre-packaged text styles, background styles with online help.

### 12.3. Opening a new presentation

You can start Impress in several ways:

- In order to open Impress using **Start button**, click Start button and select **All Programs** → **OpenOffice 4.1.4** → **OpenOffice Impress**. (**Figure 12.1**)
- If it is already pinned in the Start menu, just click and open it. (**Figure 12.2**)

### 12.4. Creating a new presentation

You can create a presentation by any one of the following methods.

1. By selecting an Empty presentation
2. By selecting From Template

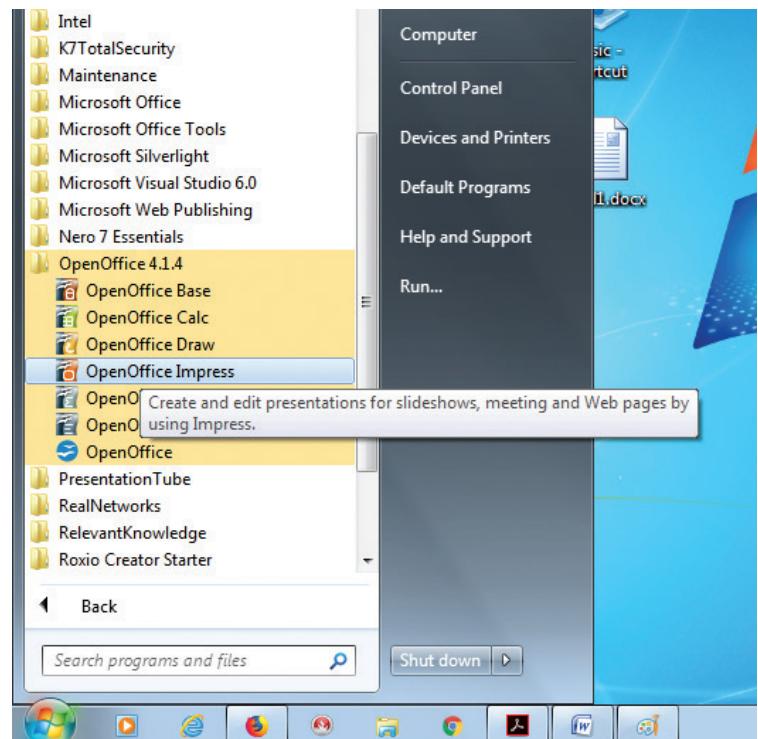


Figure 12.1 – Opening Impress using Start → All Programs

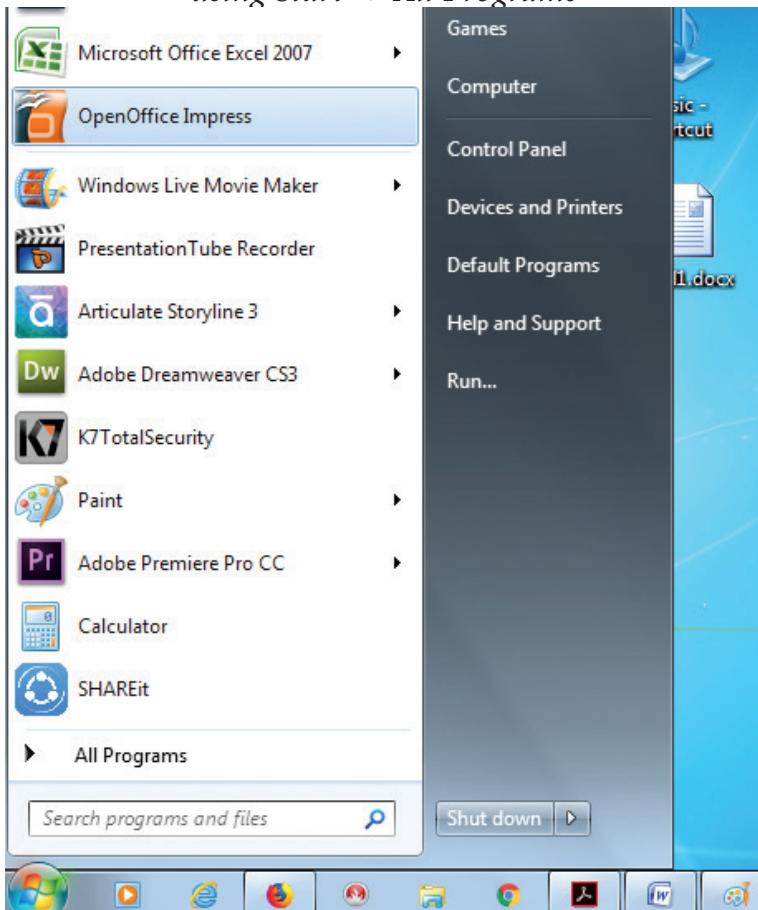


Figure 12.2 – Opening Impress using Start button

3. By selecting from Open existing presentation

#### 12.4.1. Using Empty presentation

1. Select **Empty presentation** under Type. It creates a presentation from scratch.
2. Click **Next**. The Presentation Wizard Step 2 appears. **Figure 12.4** shows the Wizard.
3. Choose a design under **Select a slide**

**design.** The slide design section gives you two main choices: **Presentation Backgrounds** and **Presentations**.

4. Select the output medium from the list of choices for slide design. Choose anyone from the list. The preview of the same will be shown in the preview pane.

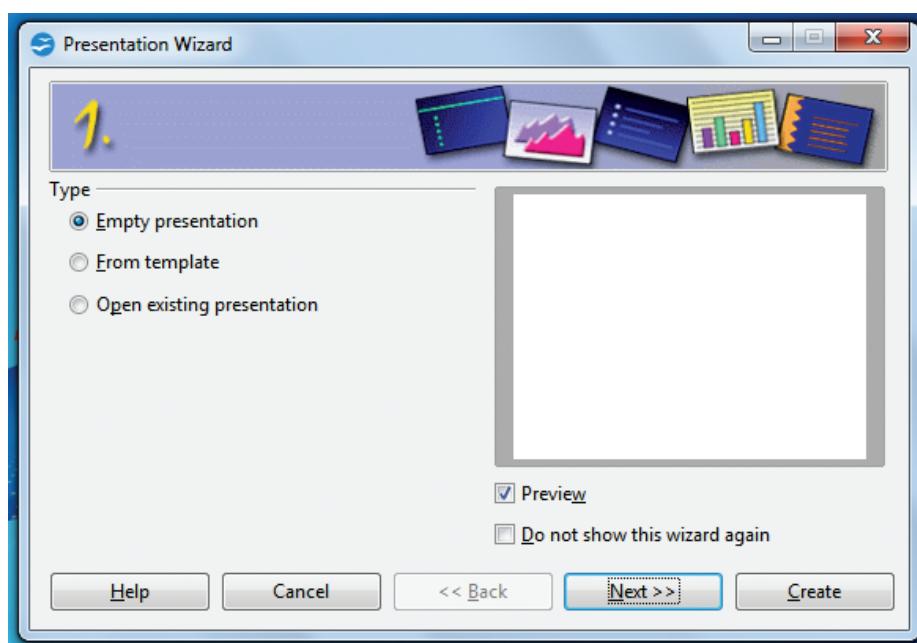


Figure 12.3 – Using the Presentation Wizard to choose the type of presentation

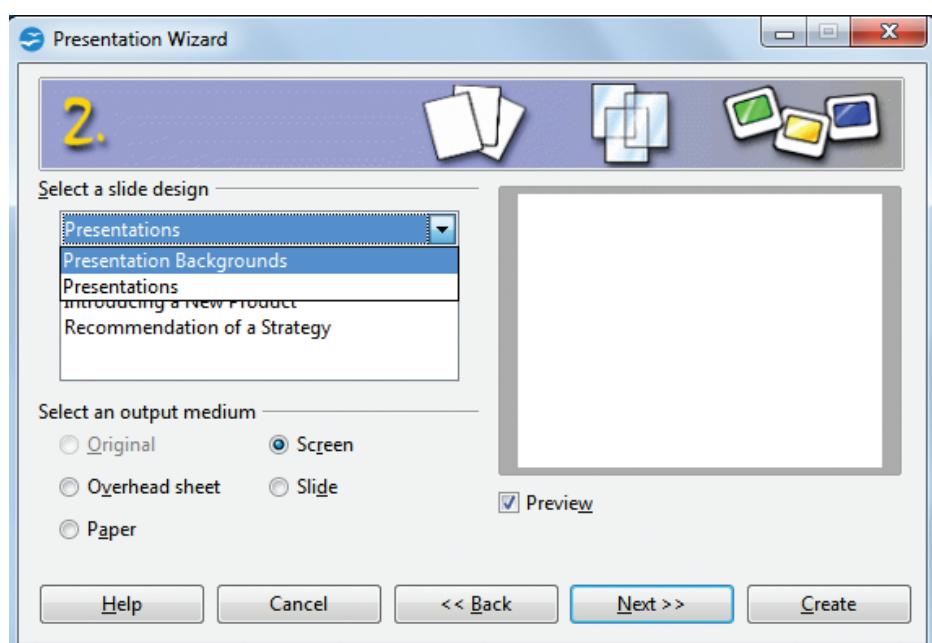


Figure 12.4 Wizard showing the main choices

5. <Original> is an empty background. You can also select among three predefined Presentations:<Original>, **Introducing a New Product**, and **Recommendation of a Strategy**. (Figure 12.6).
6. Click an item to see a preview of the slide design in the Preview window.
7. Select how the presentation will be used under **Select an output medium**. Generally, presentations are created for computer screen display, so select **Screen option**. (Figure 12.6).
8. Click **Next**. The Presentation Wizard Step 3 appears (Figure 12.7). In this step, you can choose the desired slide transition from the **Effect** drop-down menu. Select the desired **speed** for the transition between the different slides in the presentation from the **Speed** drop-down menu. **Medium** is a good choice. Click **Create**. A new presentation is created. (Figure 12.8)

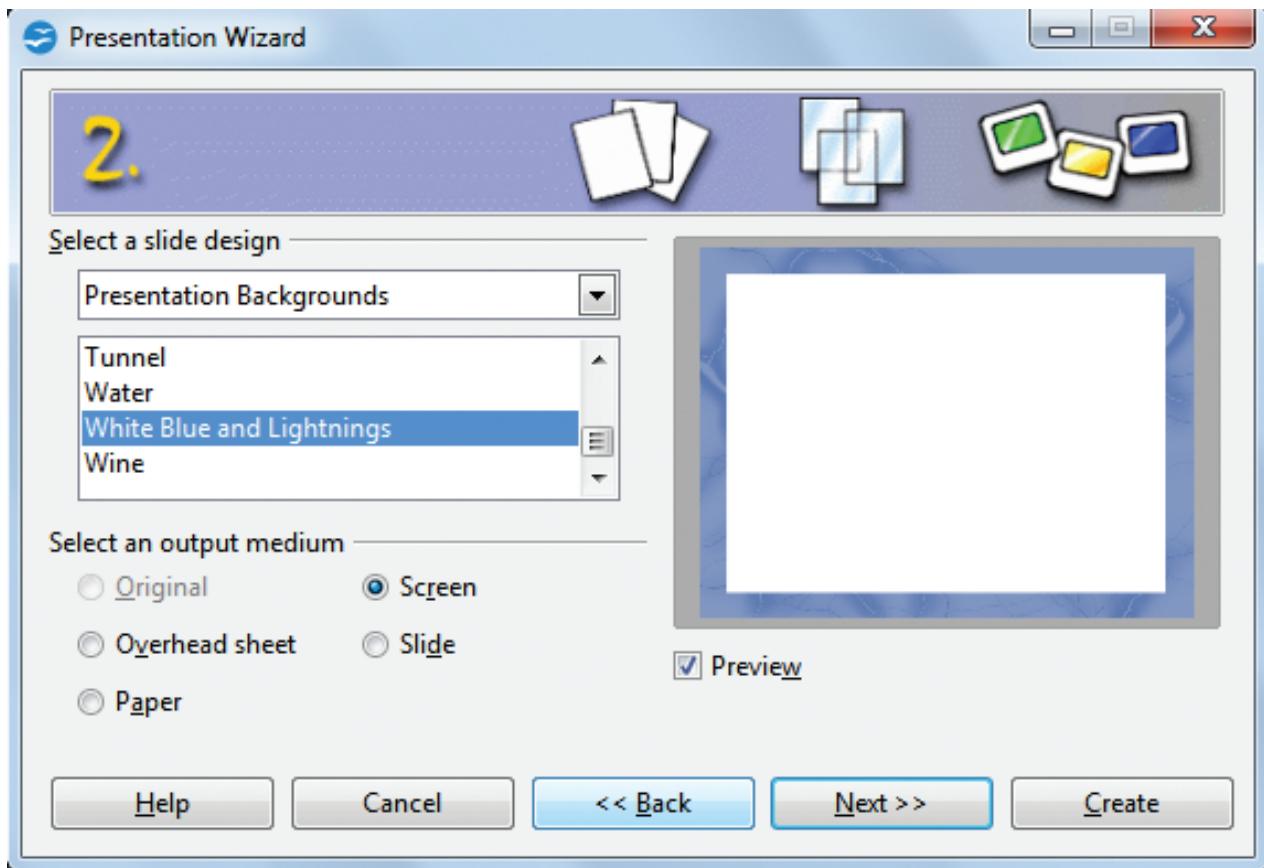


Figure 12.5 Selecting a slide design using Presentation Backgrounds

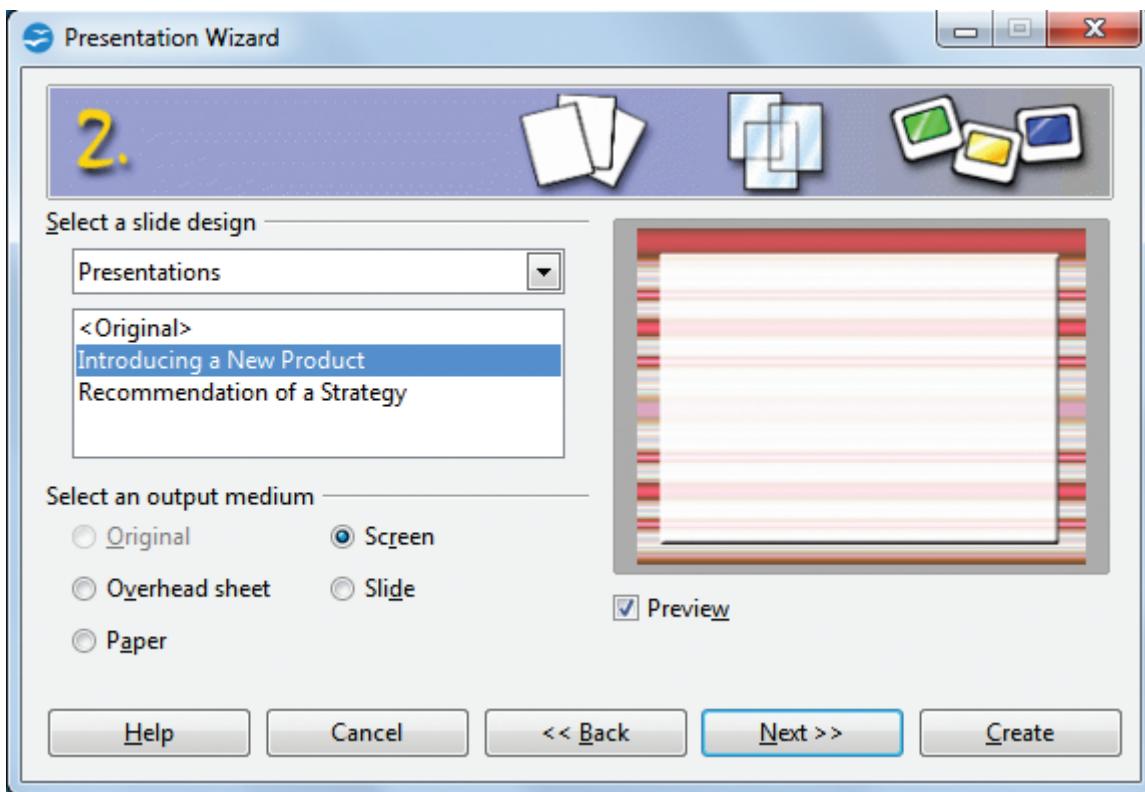


Figure 12.6 Selecting a slide design using Presentations

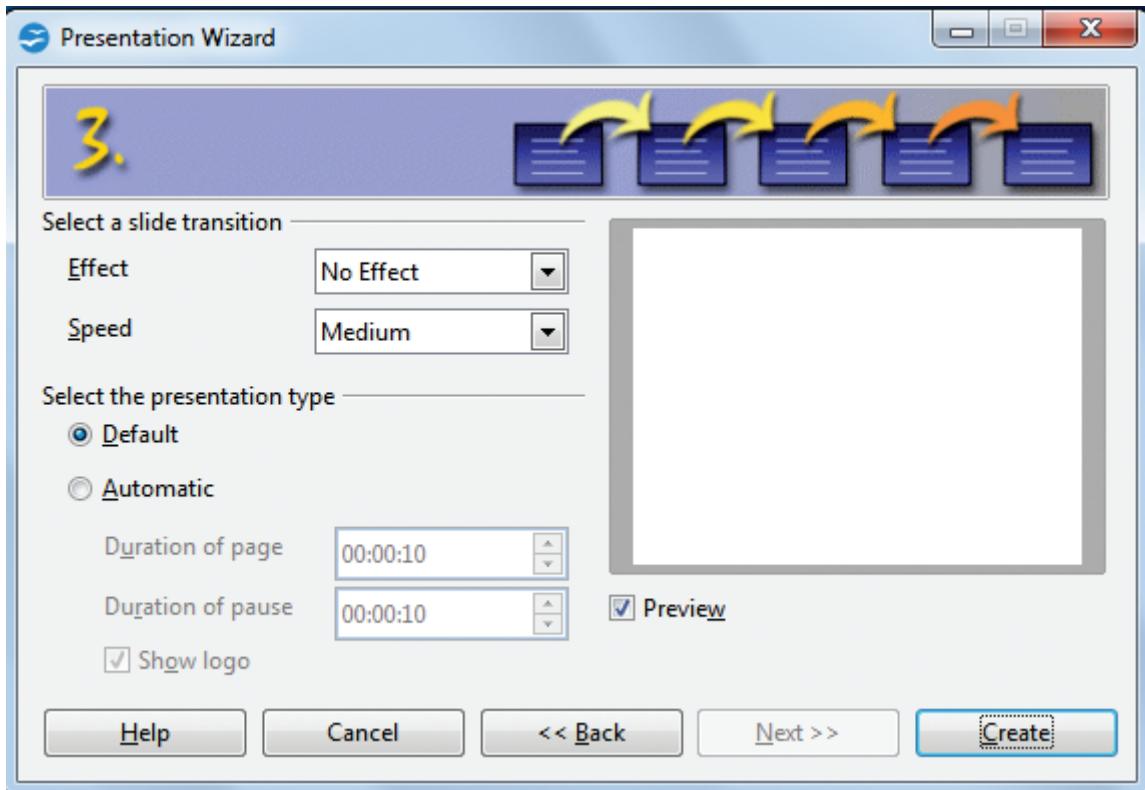


Figure 12.7 Selecting a slide transition effect

#### 12.4.2. Using Template

- If you choose the option **From template**, it uses a template design already created as the basis for a new presentation. The wizard changes to show a list of available templates.

Choose the template that you want. (**Figure 12.9**).

- "Introducing a New Product" and "Recommendation of a Strategy" are pre-packaged presentation templates.

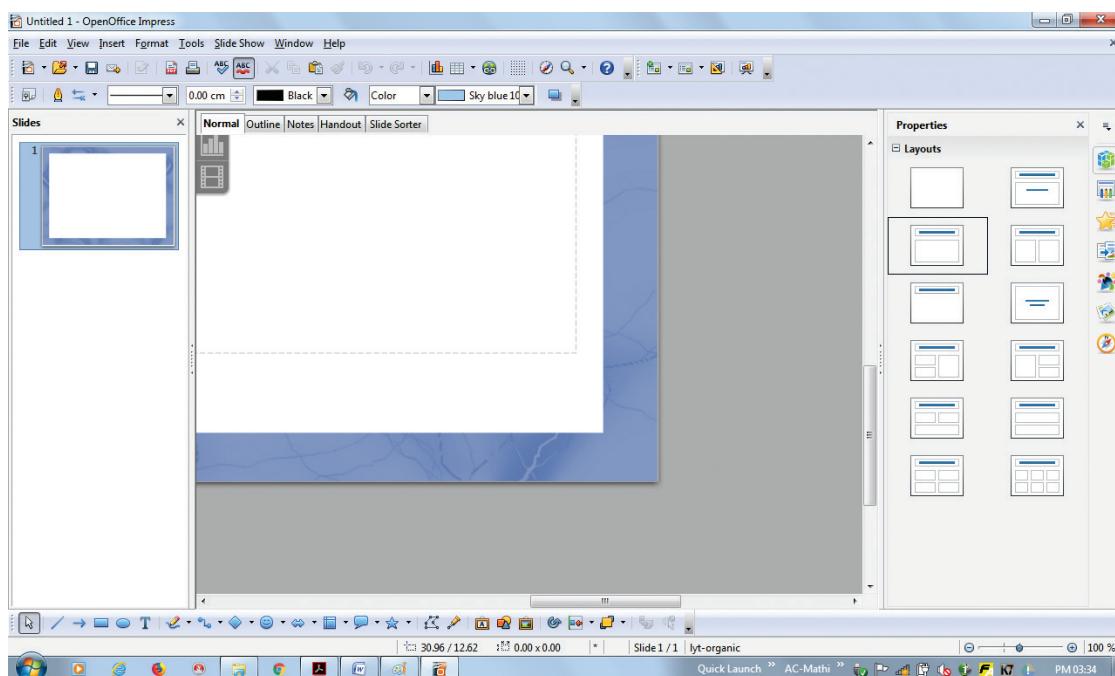


Figure 12.8 New presentation

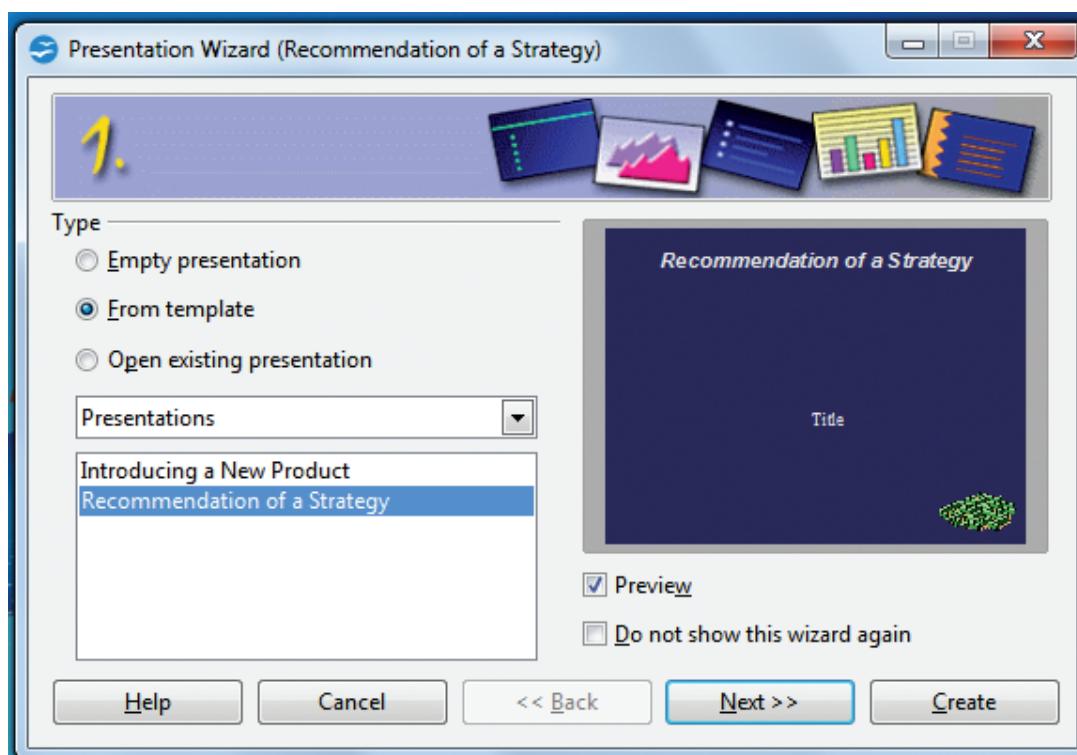


Figure 12.9 Opening a new presentation using From template option

#### 12.4.3. Using Open existing presentation

- If you choose the option **Open existing presentation**, it helps in continuing the work on a previously created presentation.

- You have to open a presentation already prepared by clicking **Open** button. The wizard changes to show a list of existing presentations, from which you can choose the one that you want. (**Figure 12.10**).

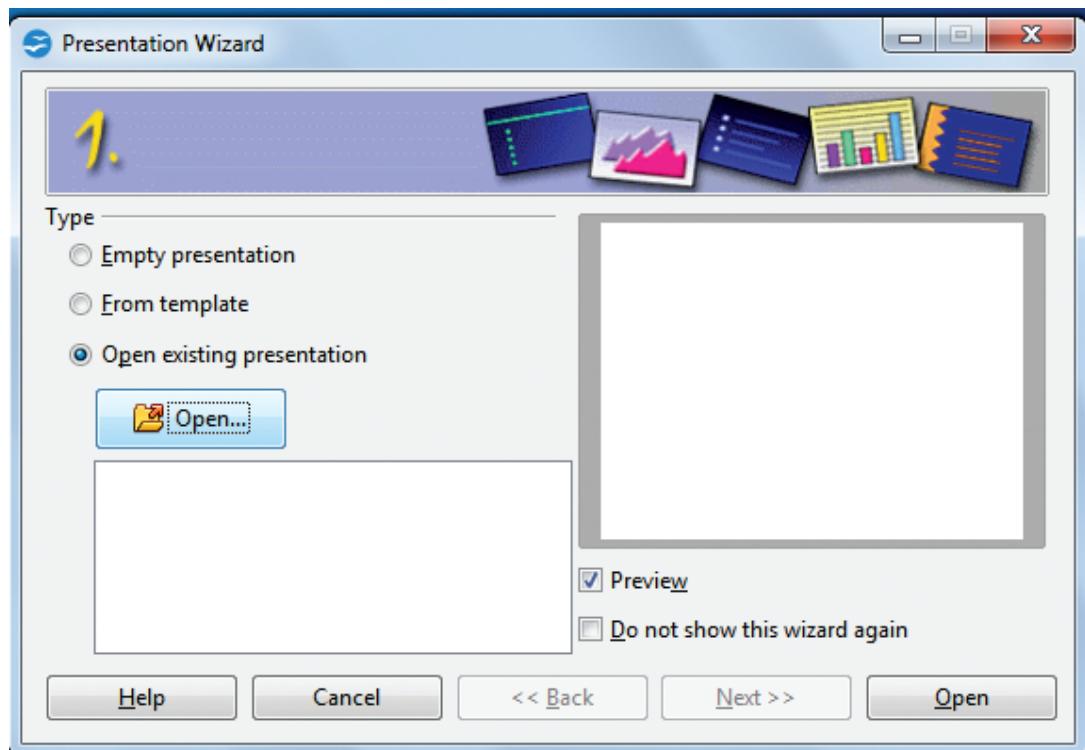


Figure 12.10 Opening a new presentation using Open existing presentation option

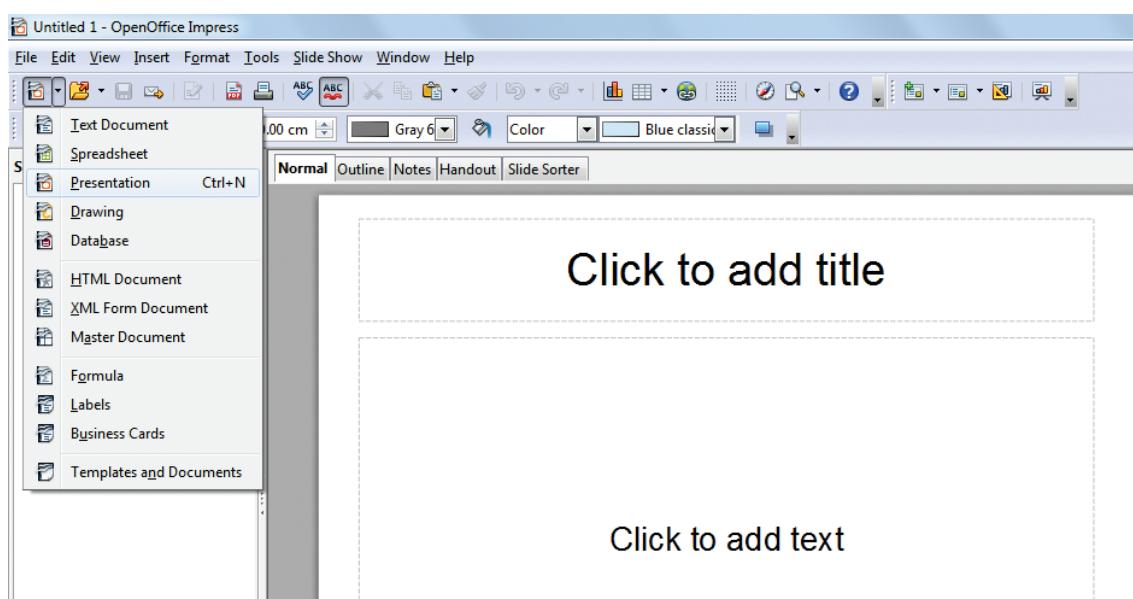
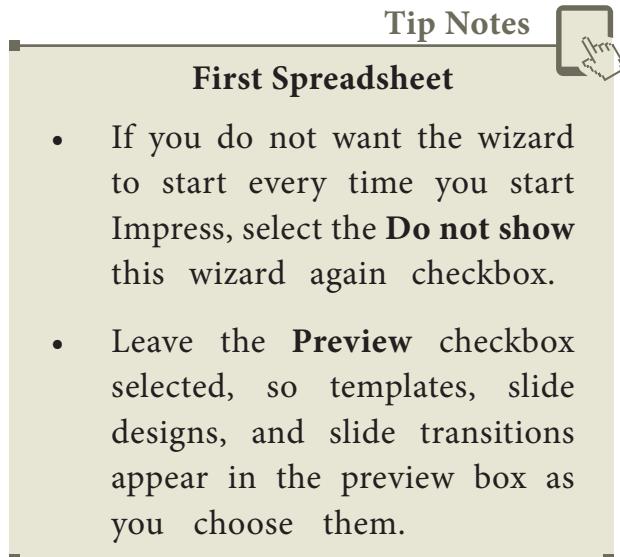


Figure 12.11 Opening a new presentation using New icon



### Various ways of Starting Impress:

You can start Impress in various methods.

- You can select the presentation from the **system menu** or the **OpenOffice Quickstarter**.
- Or you can click the **New** icon and select **Presentation** from the drop-down menu (**Figure 12.11**).

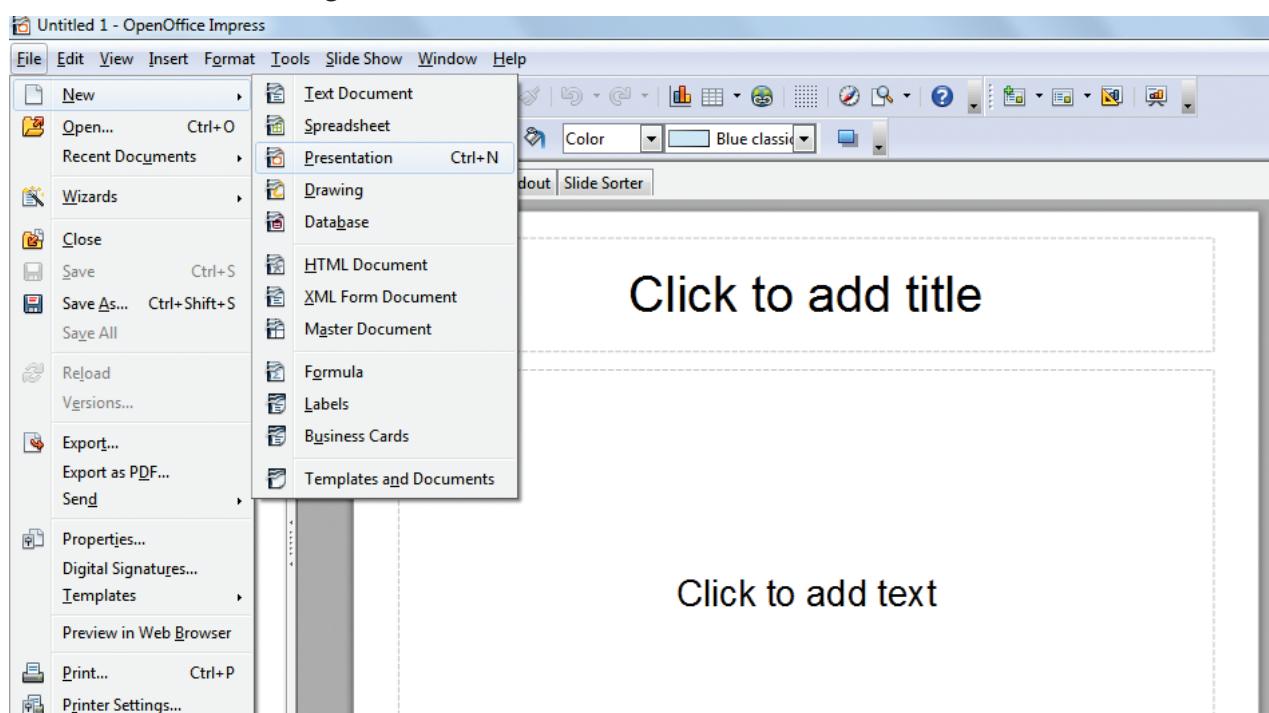
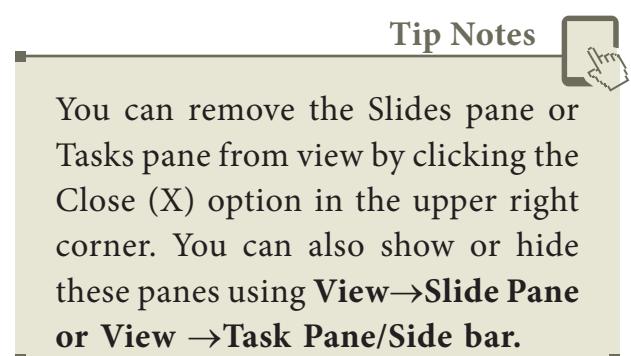


Figure 12.12 Opening a new presentation using File menu

- Or else, choose **File → New → Presentation**. (**Figure 12.12**).

### 12.5. Parts of the Main Impress window

The main Impress window (**Figure 12.13**) has three parts: the Slides pane, the Workspace and the Task pane. Additionally, several toolbars can be displayed or hidden during the creation of a presentation.



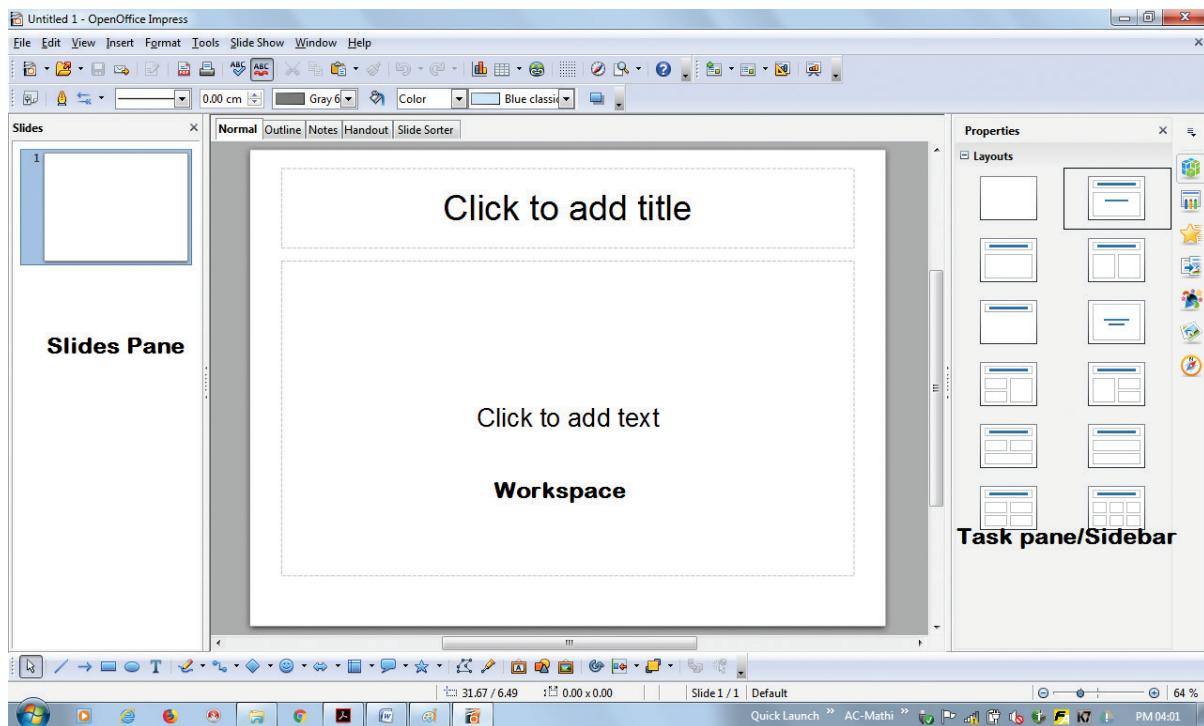


Figure 12.13 Main window of Impress

#### 12.5.1. Slides pane

- The Slides pane contains thumbnail pictures of the slides in your presentation, in the order of our insertion of slides.
- Clicking a slide in this pane selects it and places it in the Workspace. While it is there, you can apply any changes that are desired to that particular slide.

Several additional operations can be performed on one or more slides in the Slides pane:

- **Add new slides** at any place within the presentation after the first slide.
- **Mark a slide as hidden** so that it will not be shown as part of the slide show.
- **Delete a slide** from the presentation if it is no longer needed.

- **Rename a slide** helps to change the name of a slide. The default names are slide1, slide2,....
- **Copy or move the contents** of one slide to another (copy and paste, or cut and paste, respectively).

It is also possible to perform the following operations, other than using the Slides pane.

- **Change the slide transition** following the selected slide or after each slide in a group of slides.
- **Change the sequence of slides** in the presentation.
- **Change the slide design.** (A window opens allowing you to load your own design.)
- **Change slide layout** for a group of slides simultaneously. (This requires using the Layouts section of the Tasks pane.)

### 12.5.2. Tasks pane

The Tasks pane has five sections:

#### 1. Master Pages

You can define the page style for your presentation using **Master Pages**. Impress contains pre-packaged Master Pages (slide masters). One of them by default is **blank**, and the rest have a specific background. (Figure 12.14)



Figure 12.14 Master Pages

#### 2. Layout

Pre-packaged layouts are shown. You can choose the one that you want,

use it as it is or modify it to suit your own requirements. At present, it is not possible to create custom layouts. (Figure 12.15)

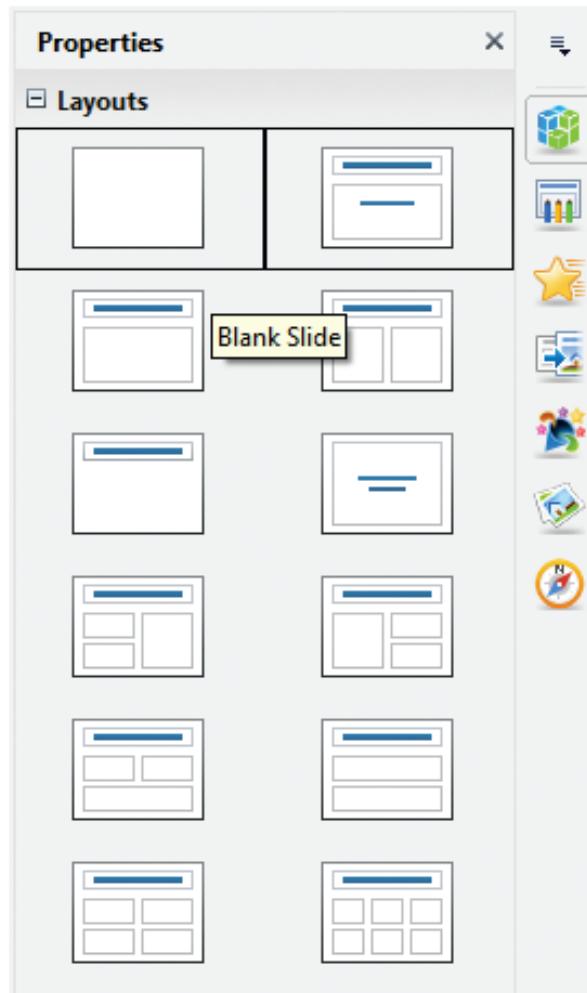


Figure 12.15 Layout

#### 3. Table Design

Standard table styles are provided in this pane. You can further modify the appearance of a table with the selections to show or hide specific rows and columns, or to apply a banded appearance to the rows and columns. (Figure 12.16)

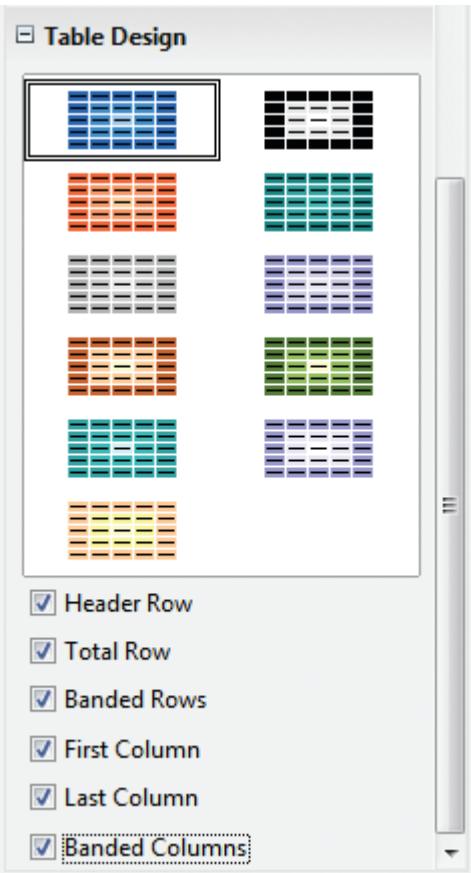


Figure 12.16 Table Design

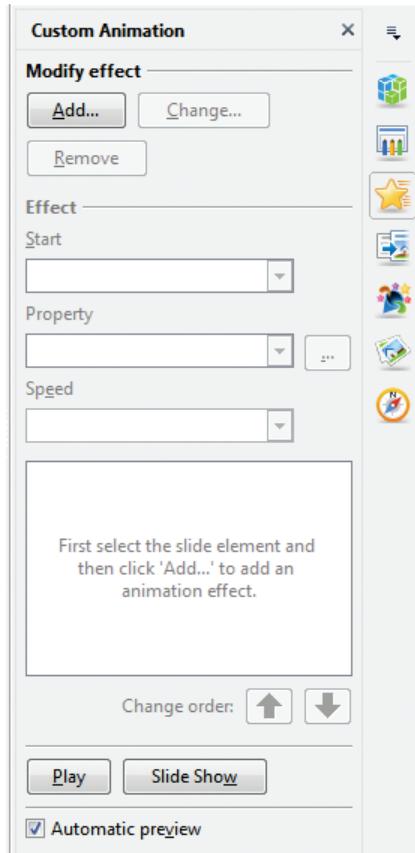


Figure 12.17 Custom Animation

#### 4. Custom Animation

A variety of animations for selected elements of a slide are listed here. Animation can be added to selected elements of a slide and it can also be changed or removed later. (Figure 12.17)

#### 5. Slide Transition

Transitions are available, including **No Transition**. You can select the transition speed (**slow**, **medium**, **fast**). You can also choose between an **automatic** or **manual** transition, and how long you want the selected slide to be shown (automatic transition only). (Figure 12.18)

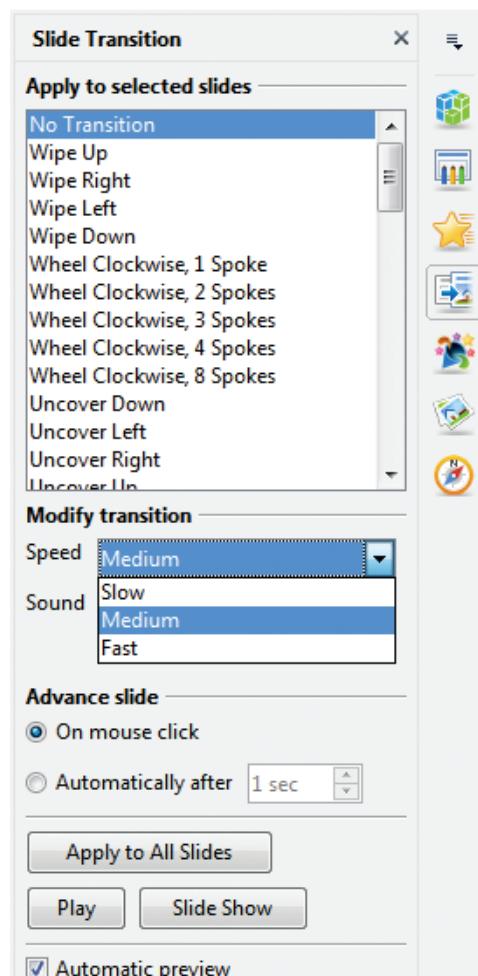


Figure 12.18 Slide Transition

## 12.6. Window elements of Impress

**Figure 12.19** shows the elements of the Impress Window Open source application.

The window elements of Impress include Title Bar, Menu Bar, Tool Bar, Ruler Bar and the Scroll Bar which are similar to the elements in Open Office writer.

### 12.6.1. View Buttons:

The Workspace has five tabs: **Normal, Outline, Notes, Handout, and Slide Sorter**, as seen in **Figure 12.19**. These five tabs are called **View Buttons**.

### 12.6.2. Status Bar:

Status Bar is present at the bottom of your window, which gives you some statistics about the file that you are

viewing. It is a good practice to check the information shown there. In case you do not need the information in the Status Bar, you can hide it by selecting **View → Status Bar** from the main menu.

### 12.6.3. Navigator

The Navigator (**Figure 12.20**) displays all objects contained in a document. It provides another convenient way to move around a document and find items in it. The Navigator button is located on the Standard toolbar. You can also display the Navigator by choosing **Edit → Navigator** on the menu bar or pressing **Ctrl+Shift+F5**.

The Navigator is more useful if you give your objects (pictures, spreadsheets, and so on) meaningful names, instead of names as “Object 1” and “Picture 1” as shown in **Figure 12.20**.

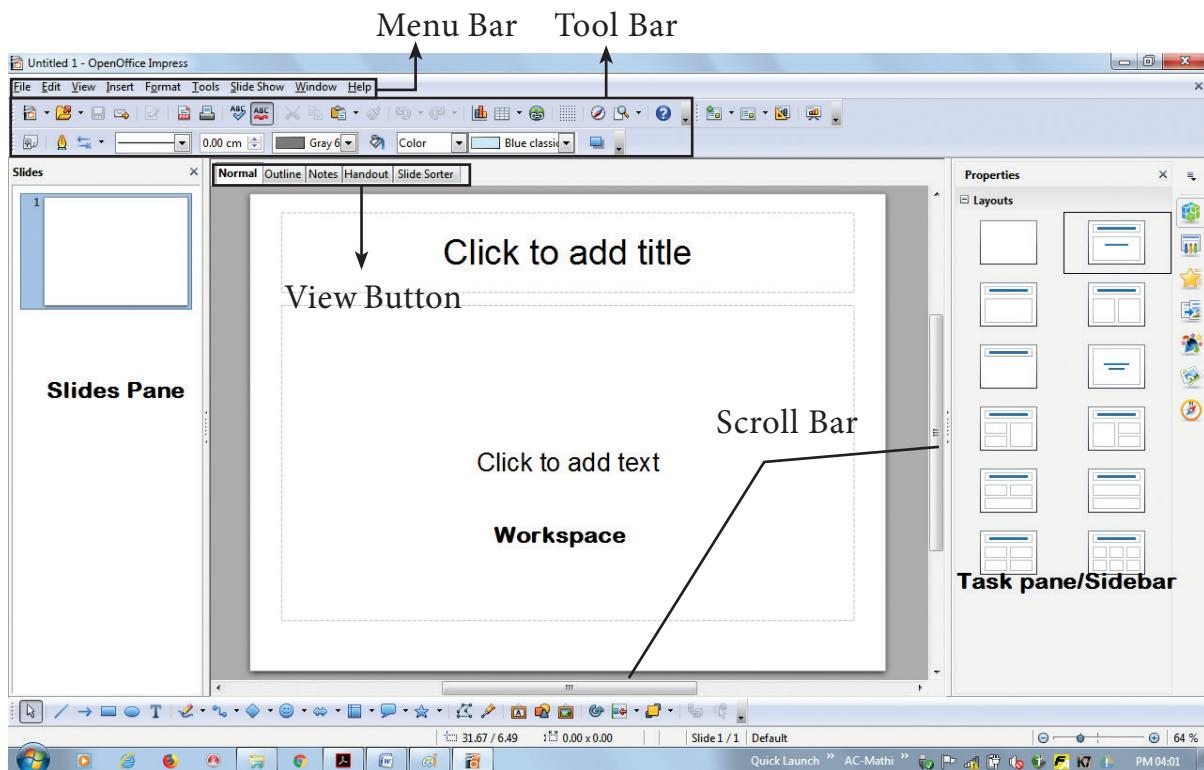


Figure 12.19 Window elements of Impress

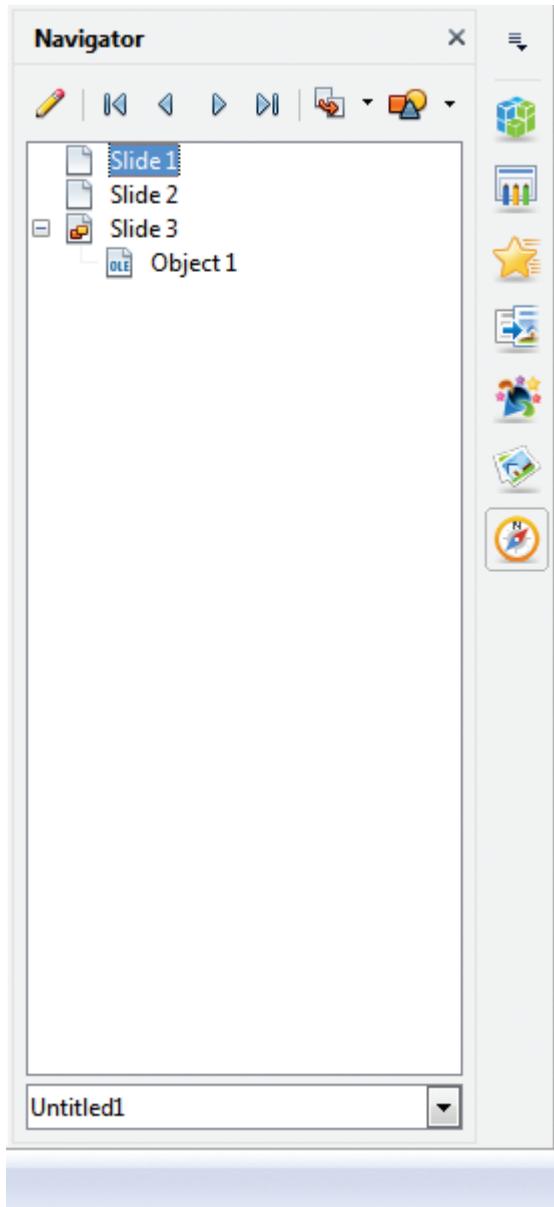


Figure 12.20 Navigator

## 12.7. Workspace

The Workspace has five tabs: **Normal**, **Outline**, **Notes**, **Handout** and **Slide Sorter**, as seen in **Figure 12.19**. These five tabs are called **View Buttons**. There are many toolbars that can be used during the slide creation; they are revealed by selecting them with **View → Toolbars**.

The actual Workspace section is below the View Buttons. This is where

you assemble the various parts of your selected slide. Each view is designed to ease the completion of certain tasks.

**Normal view** is the main view for creating individual slides. Use this view to format and design slides and to add text, graphics and animation effects.

**Outline view** shows topic titles, bulleted lists and numbered lists for each slide in outline format. Use this view to rearrange the order of slides, edit titles and headings, rearrange the order of items in a list and add new slides.

**Notes view** lets you add notes to each slide that are not seen when the presentation is shown.

**Slide Sorter view** shows a thumbnail of each slide in order. Use this view to rearrange the order of slides, produce a timed slide show, or add transitions between selected slides.

**Handout view** lets you print your slides for a handout. You can choose one, two, three, four, or six slides per page from **Tasks pane → Layouts**. Thumbnails can be re-arranged in this view by dragging and dropping them.

### 12.7.1. Normal view

There are two ways to place a slide in the Slide Design area of the Normal view: clicking the slide thumbnail in the Slides pane or using the Navigator.

To open the **Navigator**, click the Navigator button in the **Standard Toolbar** or press **Ctrl+Shift+F5** and select a slide

by scrolling down the Navigator list until you find the one that you want and then double-click it. (Figure 12.21).

### 12.7.2. Outline view

Outline view contains all the slides of the presentation in their numbered sequence. Only the text in each slide is shown. Slide names are not included.

Outline view serves for two purposes.

#### 1) Making changes in the text of a slide:

- Add or delete text in a slide just as in the Normal view.
- Move the paragraphs of text in the selected slide up or down by using the up and down arrow buttons (Move Up

or Move Down) on the Text Formatting toolbar.

Change the outline level for any of the paragraphs in a slide using the left and right arrow buttons (**Promote** or **Demote**).

Both move a paragraph and change its outline level using a combination of four arrow buttons.

2) Comparing the slides with your outline (if you have prepared one in advance). If you notice from your outline that another slide is needed, you can create it directly in the Outline view or you can return to the Normal view to create it, then return to review all the slides against your outline in the Outline view.

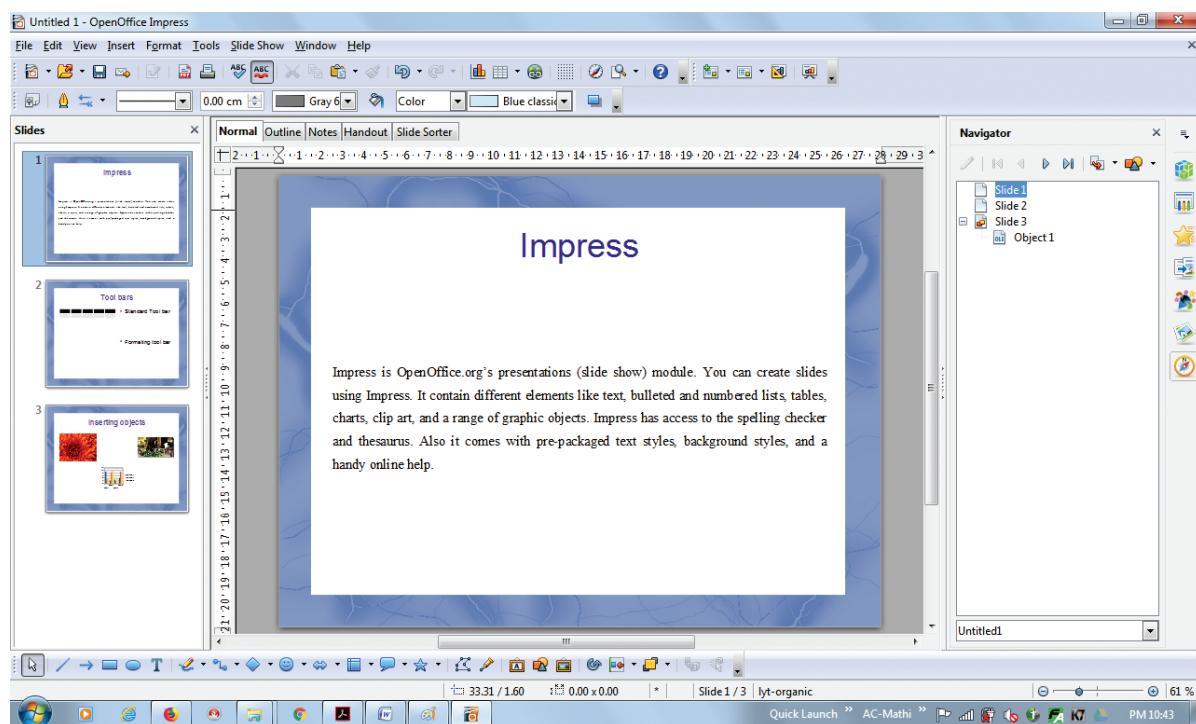


Figure 12.21 Presentation in Normal view

If a slide is not in the correct sequence, you can move it to its proper place:

- Click the **slide icon** of the slide that you wish to move, as indicated in **Figure 12.22**.
- Drag and drop it where you want.

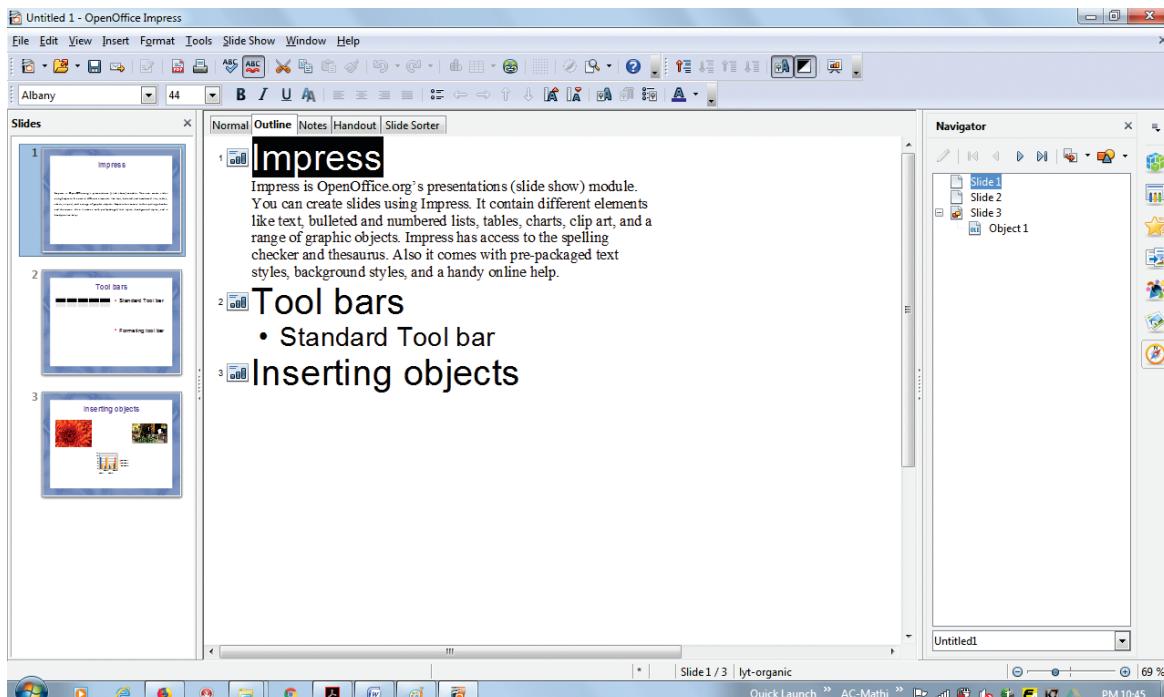


Figure 12.22 Presentation in Outline view

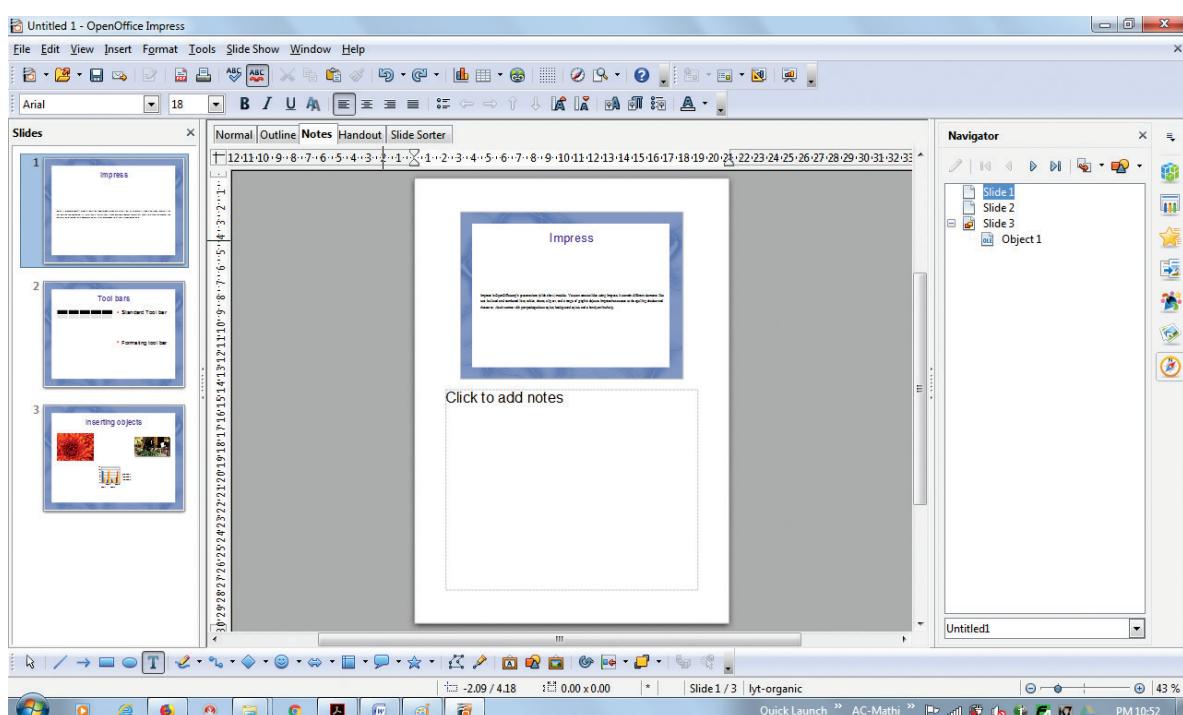


Figure 12.23 Presentation in Notes view

### 12.7.3. Notes view

Use the Notes view to add notes to a slide:

- Click the Notes tab in the **Workspace** (**Figure 12.23**).
- Select the slide to which you will add notes.

- Double-click the slide in the **Slide pane**, or
  - Double-click the slide's name in the **Navigator**.
- 3) In the text box below the slide, click on the words **Click to add notes** and begin typing.

You can resize the notes text box using the **green resizing handles** and move it by placing the pointer on the border, then click and drag. To make changes in the text style, press the **F11** key to open the **Styles and Formatting window**.

#### 12.7.4. Slide Sorter view

The Slide Sorter view contains all of the slide thumbnails (**Figure 12.24**).

Use this view to work with a group of slides or with only one slide.

Change the number of slides per row, if desired:

- 1) Check **View → Toolbars → Slide View** to show the Slide view toolbar (**Figure 12.24**).

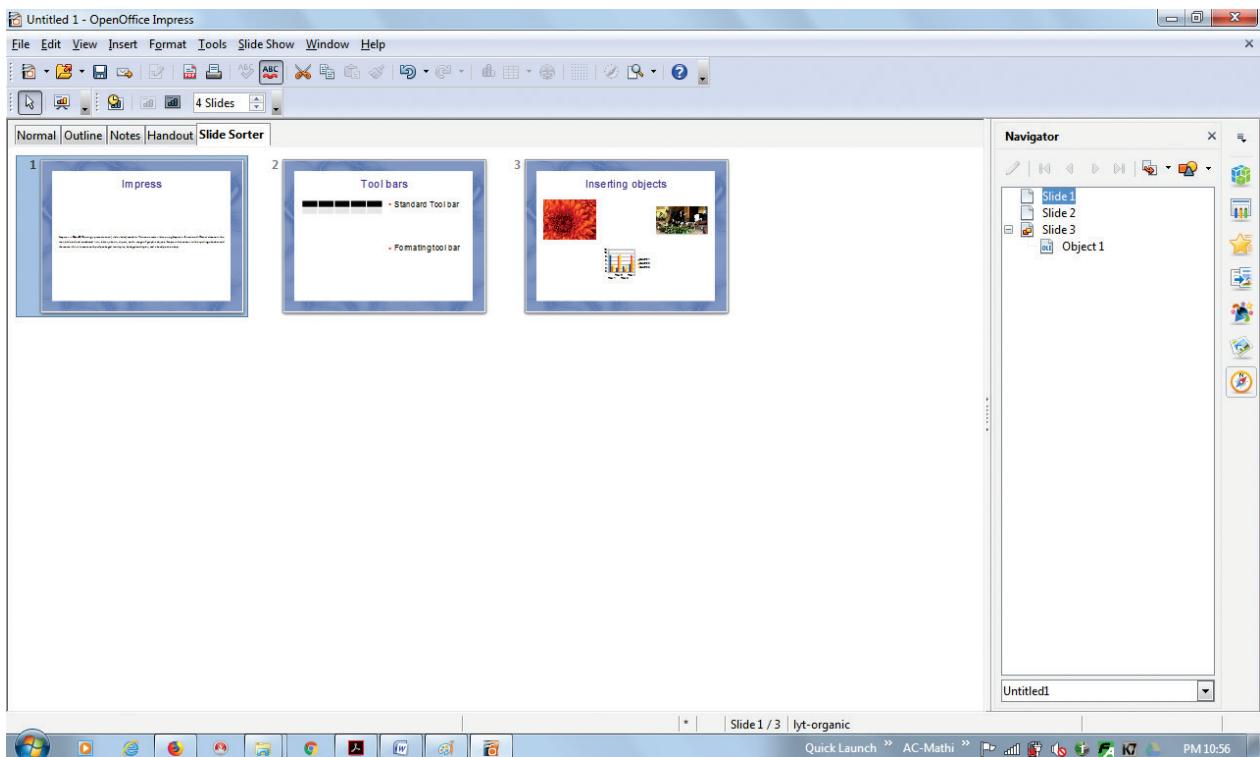
- 2) Adjust the number of slides (up to a maximum of 15).
- 3) After you have adjusted the number of slides per row, **View → Toolbars → Slide**. **View** will remove this toolbar from view.

#### To move a slide in a presentation using the Slide Sorter:

- 1) Click the **slide**. A thick black border is drawn around it.
- 2) **Drag and drop** it to the location you want.
  - As you move the slide, a black vertical line appears to one side of the slide.
  - **Drag the slide** until this black vertical line is located where you want the slide to be moved

#### To select a group of slides, use one of these methods:

- Use the **Control (Ctrl)** key: Click on the first slide and, while pressing Control, select the other desired slides.



*Figure 12.24 Presentation in Slide Sorter view*

- **Use the Shift key:** Click on the first slide, and while pressing the Shift key, select the final slide in the group. This selects all of the other slides in between the first and the last.
- **Use the cursor:** Click on the first slide to be selected. Hold down the left mouse button.
- Drag the cursor to the last slide thumbnail.

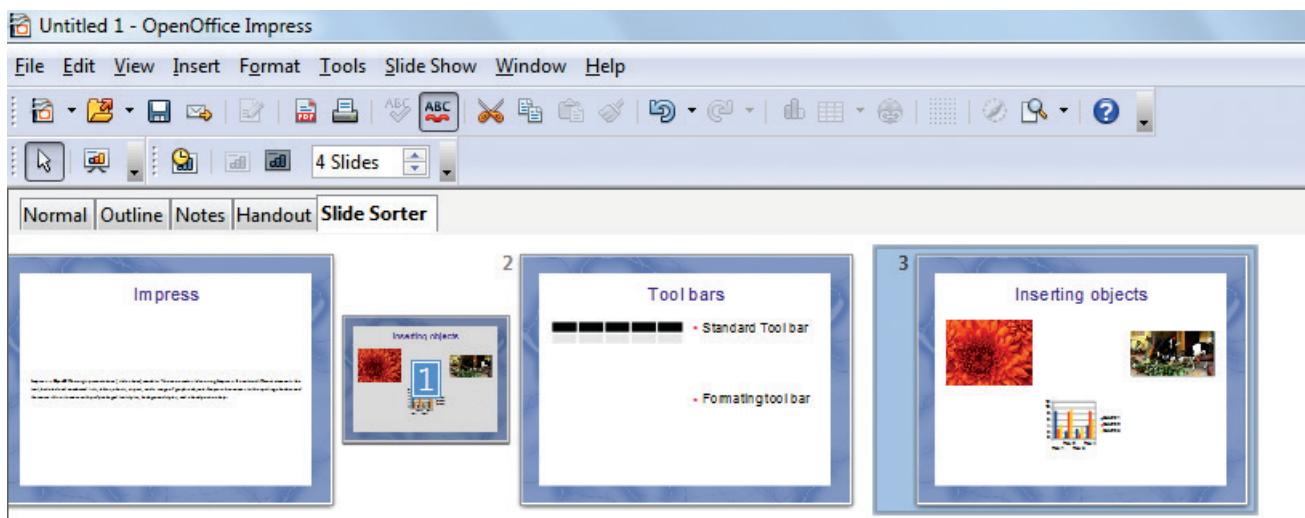
A dashed outline of a rectangle forms as you drag the cursor through the slide thumbnails and a thick black border is drawn around the selected slides. Make sure that this rectangle includes all the slides you want to select. (**Figure 12.25**)

#### To move a group of slides:

- 1) Select the group of slides.
- 2) **Drag and drop** the group to their new location. The same vertical black line appears to show you where the group of slides will go. You can work with slides in the Slide Sorter view as in the Slide pane.

To make changes, **right-click** a slide and do the following, using the pop-up menu:

- **Add a new slide** after the selected slide.
- **Delete or rename** the selected slide.
- **Change the Slide Layout.**
- **Change the Slide Transition.**
  - For one slide, click the slide to select it. Then add the desired transition.
  - For more than one slide, select the group of slides and add the desired transition.
- Mark a slide as hidden. Hidden slides will not be shown in the slide show.
- Copy or cut and paste a slide.



*Figure 12.25 To move a slide in a presentation using the Slide Sorter*

#### 12.7.5. Handout view

Handout view is for setting up the layout of your slides for a printed handout. Click the Handout tab in the workspace, then choose **Layout** in the tasks pane (**Figure 12.26**). You can then choose to print one, two, three, four, or six slides per page.

**To print a handout:**

- 1) Select the slides using the Slide Sorter. (Use the steps listed in selecting a group of slides.)
- 2) Select **File → Print** or press **Ctrl+P** to open the Print dialog box.
- 3) Select **Options** in the bottom left corner of the Print dialog box.

- 4) Check **Handouts** in the Contents section, and then click OK.
- 5) Click **OK** to close the Print dialog box.

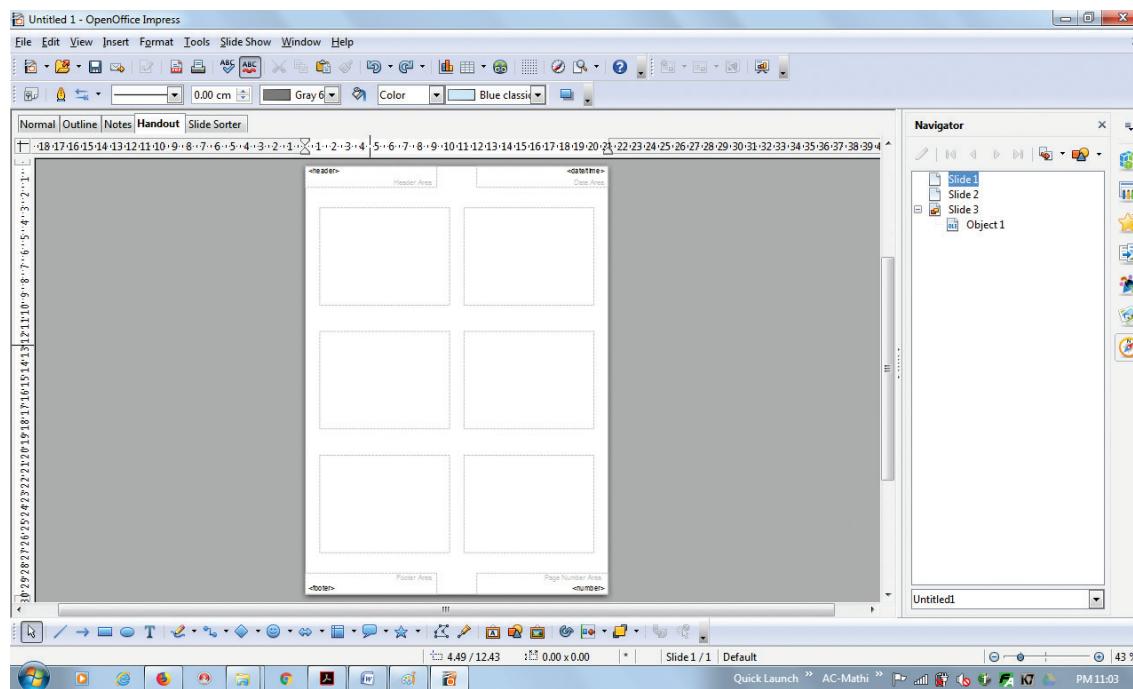


Figure 12.26 Presentation in Handout view

#### Tip Notes



If you do not know the names for the pre-packaged layouts, you can use the tooltip feature. Position the cursor on an icon in the Layout section (or on any toolbar icon) and its name will be displayed in a small rectangle. If the tooltips are not enabled, you can enable them. From the main menu, select **Tools→Options → OpenOffice.org → General→ Help** and mark the Tips checkbox. If the Extended tips checkbox is also marked, you will get more detailed tooltip information, but the tooltip names themselves will not be provided.



## Student Activity

1. Open a presentation using
  - Empty presentation
  - From Template
  - Open Existing Presentation
2. Compare the difference on opening the presentation using the above three methods.
3. Open impress using different ways.

## Teacher Activity

This entire chapter can be taught with the help of the following methodology.

1. Laboratory Activity – the teacher can make the entire class to go to the lab and can explain the concept using a projector in the lab.
2. Or else, the teacher can demonstrate the concept using a PC and a projector inside the classroom.
3. The teacher apart from this Open source software, can compare the elements of the windows and creating presentations in MS PowerPoint also.

## Evaluation



### Part I



## Choose the correct Answer

1. A convenient way to move around a document.  
A) Compass    B) Navigator    C) Fill color    D) Page border
2. Which is the shortcut key to view the slideshow?  
A) F6    B) F9    C) F5    D) F10

3. In Impress, which views shows thumbnail versions of all your slides arranged in horizontal rows.  
A) Notes      B) Outline      C) Handout      D) Slide Sorter
4. Identify the default view in Impress.  
A) Normal      B) Slide Sorter      C) Handout      D) Notes
5. Which menu contains the Slide Transition option?  
A) Slide Show    B) View      C) Tools      D )Format
6. Identify the extension of the Impress presentation.  
A) .odp      B) .ppt      C) .odb      D) .ood
7. In presentation tools, the entry effect as one slide replaces another slide in a slide show. Identify the option that suits after reading the statement.  
A) Animation      B) Slide Transition  
C) Custom animation      D) Rehearse Timing
8. Vanya has made a presentation on “Global Warming”. She wants to progress her slide show automatically while speaks on the topic in the class. Which features of Impress would she use?  
A) Custom Animation      B) Rehearse Timing  
C) Slide Transition      D) Either (a) or (b).

## Part II

### Answer to all the questions (2 Marks)

1. What is the difference between a slide and a slide show?
2. How many in-built slide layouts does impress consist of?
3. What do you understand by a presentation?
4. Define a template in Impress.
5. What do you understand by the slide layout?

### **Part III**

#### **Answer to all the questions (3 Marks)**

1. How many types of views are provided by Impress to its users?
2. Who uses the presentation software and why?
3. Define the Slide Sorter view and its significance.
4. What is a Normal view? Explain.
5. How are transition effects helpful in creating an effective presentation in Impress?

### **Part IV**

#### **Answer to all the questions (5 Marks)**

1. Valarmathi's teacher asks her to create a presentation in OpenOffice Impress. As Valarmathi has never worked in Impress before, help her to perform the following tasks:
  - a. She wants that except for the first slide, all the slides should have the same design. For this, what does she need to do?
  - b. To easily communicate with her audience, she wants to provide them with a hard copy of the slides of the presentation. What should she create for it?
  - c. She wants to insert some pictures and movie files in some slides. How can she do that?
  - d. Suggest her the view that would be the most suitable for showing the presentation to the audience.
  - e. To make her presentation more attractive, she wants to add some effects in it. How can she do it? Suggest.
2. Explain how a presentation can help a sales person to promote his/her products.
3. Sivabalan created a presentation to be shown at his school's Annual Function. Just 5 minutes before the presentation, he noticed that he has misspelt the name of the school, which is appearing in all the 30 slides of the presentation. How can he rectify this mistake in all the slides in one-shot?
4. List some advantages of using templates.

## Learning Objectives

After learning this chapter, the students will be able to

- Know inserting and formatting text
- Know inserting and formatting shapes and pictures
- Insert tables and charts in a presentation
- Insert and edit organization charts
- Demonstrate inserting hyperlinks
- Explain inserting music and video
- Give various animation effects to the inserted objects
- Modify the slide transition
- Setup and control the slide show



### 13.1 Inserting text features

#### 13.1.1. Inserting and formatting text

##### Pasting text

Text may be inserted into the text box by copying it from another document and pasting it into Impress. There are several ways to ensure consistency. These methods are explained below.

##### Pasting unformatted text

It is normally good practice to paste text without formatting and apply the formatting later. To paste without formatting, press **Ctrl+Shift+V** or select **Unformatted text** from the dialogbox that appears (**Figure 13.1**), or click on the small black triangle next to the paste symbol in the standard toolbar (**Figure 13.2**)and select Unformatted text.

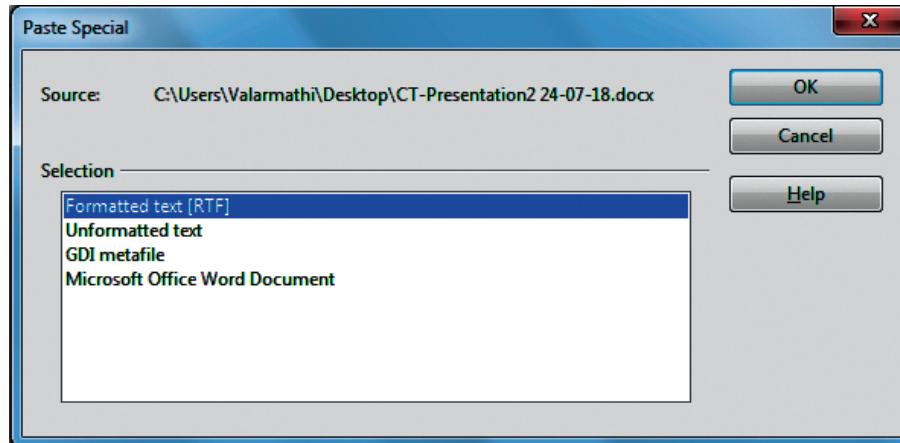


Figure 13.1 dialog box to paste text

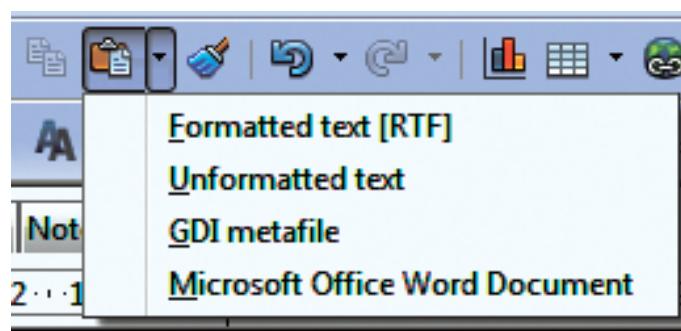


Figure 13.2 paste symbol in the standard toolbar to paste text

### Formatting pasted text

If pasting the text into an AutoLayout area, then to give the pasted text the same look and feel of the rest of the presentation apply the appropriate out line style to the text. To do so:

1. Paste the text in the desired position.
2. Select the text you have just pasted .
3. Select **Format → Default formatting** from the menu bar.(Figure 13.3)
4. Use the four arrow buttons in the Text Formatting toolbar to move the text to the appropriate position.

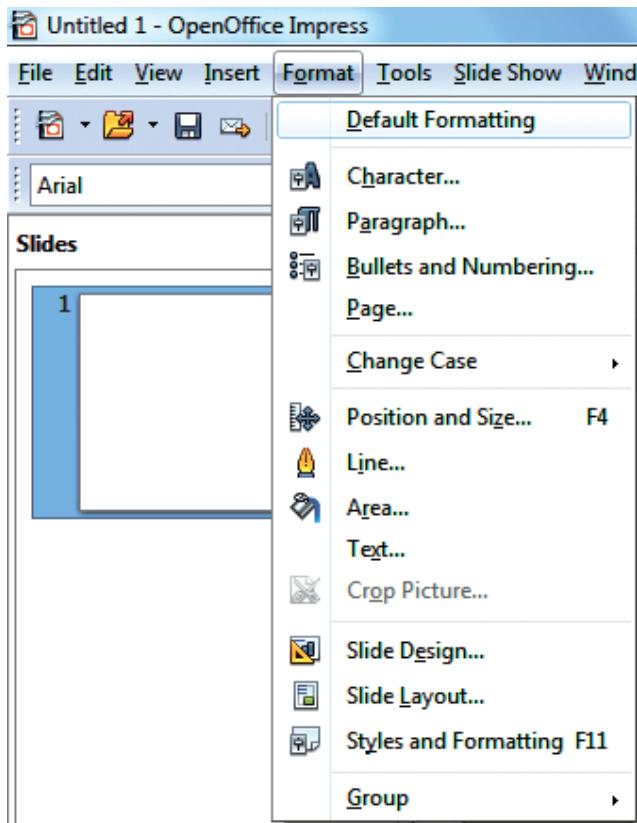


Figure 13.3 Selecting Default formatting from the menu bar

### Inserting special characters

To insert special characters, such as copyright, math, geometric or monetary symbols, or characters from another language:

1. Click in the place in the text where you want to insert the character.
2. Choose **Insert** → **Special Character**. The Special Characters dialog box appears. (**Figure 13.4**).
3. Choose the font and character subset from the Font and Subset drop-down menus.
4. Click the character you want to insert. You may have to scroll to find the one you want.
5. Click OK.

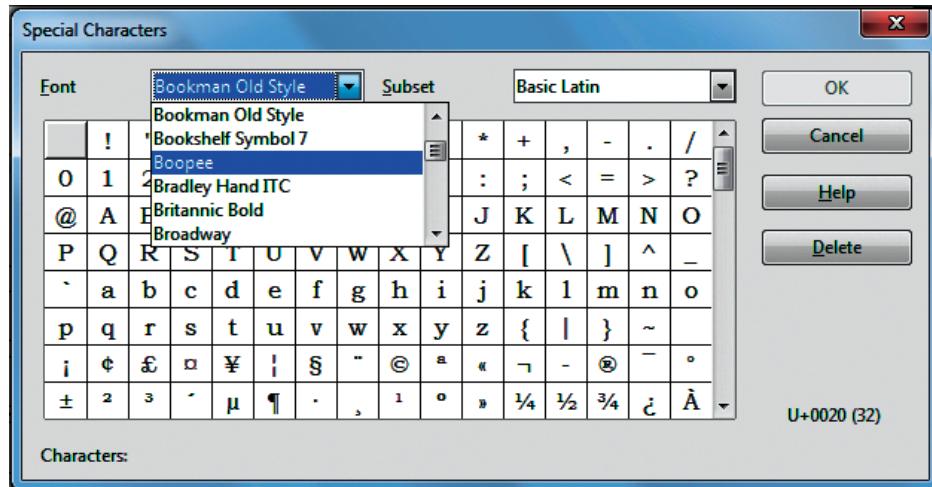


Figure 13.4 Inserting special characters

To show toolbar buttons that are not visible, click on the small down-arrow on the right end of the tool bar, move the cursor over Visible Buttons and then click on the icon you wish to make visible (**Figure 13.5**).

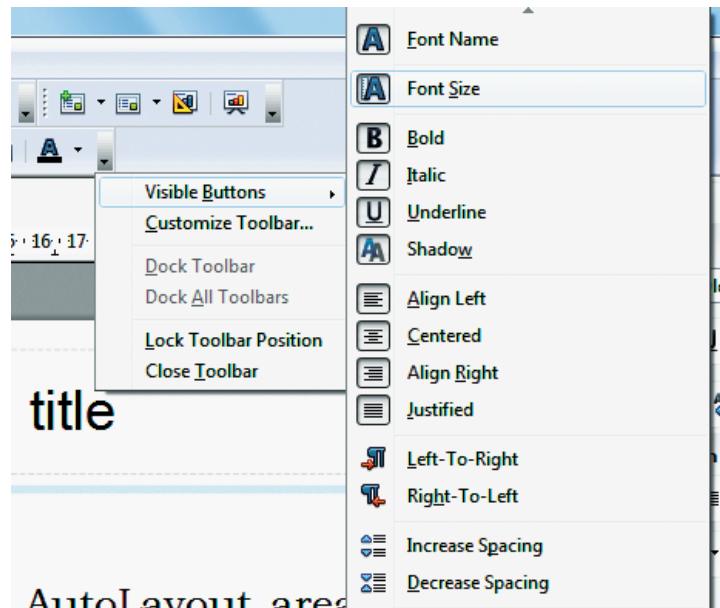


Figure 13.5 Making tool bar buttons visible

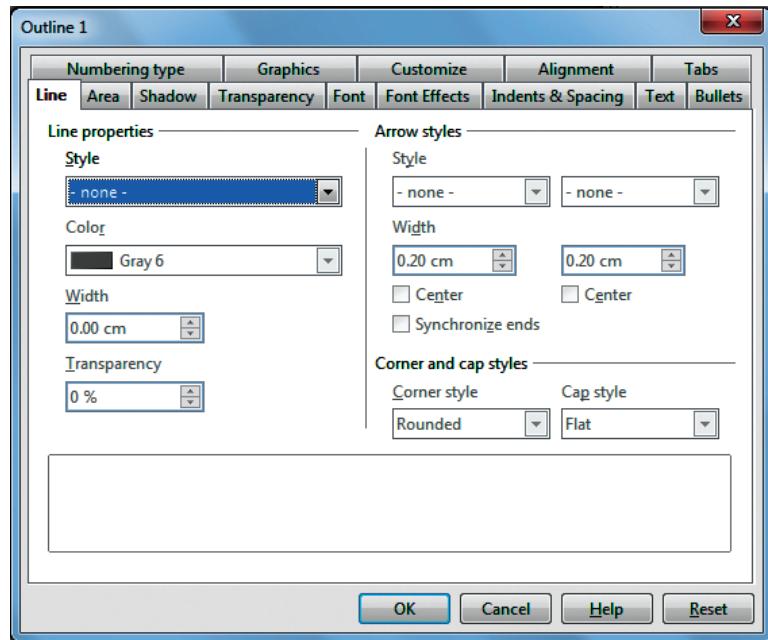
## Formatting text

Formatting text can give a presentation a consistent look and a dynamic feel.

### Modifying a style

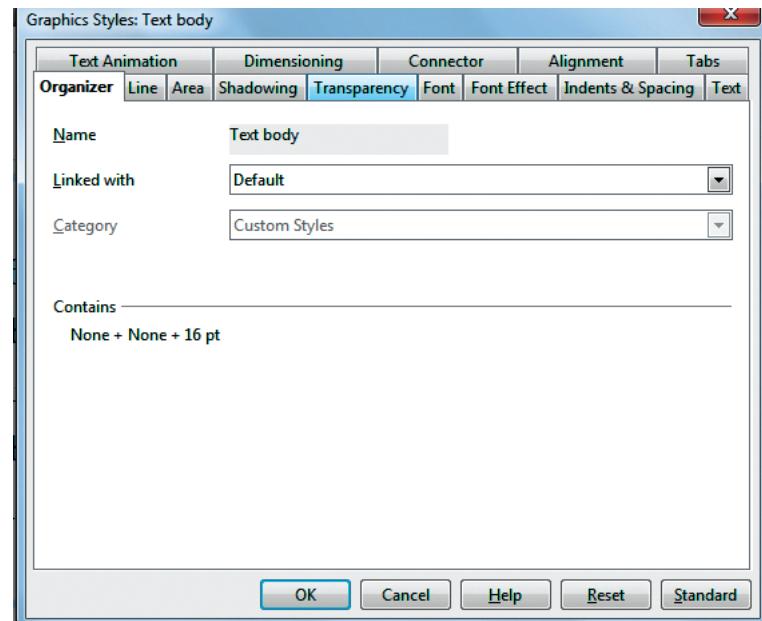
In Impress there are two categories of styles: presentation styles and graphics styles. When inserting text in an **Auto Layout** area, the presentation styles become available. When inserting text in a text box or a graphic object it is possible to apply the graphic styles.

If you have selected a presentation style, the dialog box in **Figure 13.6** will appear. The Presentation Style dialog box determines the formatting of the text.



*Figure 13.6 The Presentation Style dialog box*

The dialog box for making modifications to a graphics style is shown in **Figure 13.7**. Text must be selected before it can be formatted manually.



*Figure 13.7 The Graphics Style modification dialog box*

### Formatting characters

To view the character formatting options, select **Format → Character** or click the Character button on the Text Formatting toolbar. (If a toolbar with the text icon is not visible, choose **View→ Toolbars → Text Formatting**.) The Character dialog box appears.

## Font page

Use the Font page, shown in **Figure 13.8**, to select the desired font type, its base attributes (Italic, Bold, etc.) as well as the size. A sample of the font is displayed in the lower part of the dialog box. You can also specify the language of this style. This page is available when creating or modifying a presentation style or a graphics style.

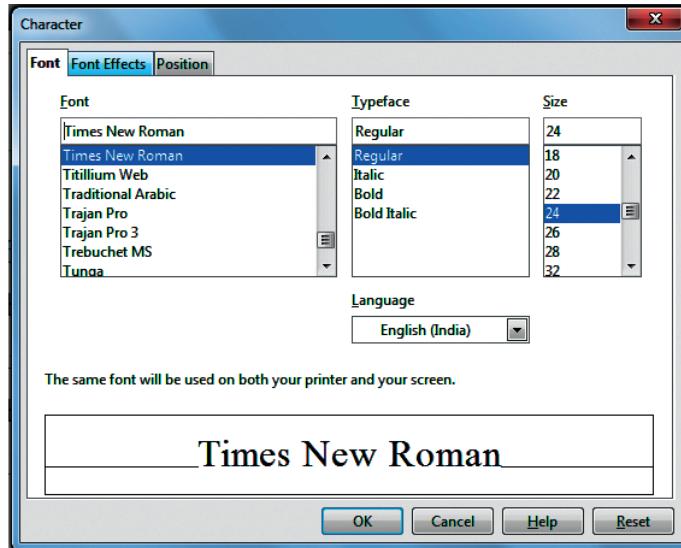


Figure 13.8 The dialog box to set the basic font attributes

When writing a presentation in multiple languages, you can make the best of the language setting by creating two styles that only differ in the language but are otherwise the same. This allows you to check the spelling of all of the contents without affecting the appearance.

## Font Effects page

Use the Font Effects page, shown in **Figure 13.9**, to apply special effects to the text, such as underlining, color, shadow and so on. A sample of the text is displayed in the lower part of the dialog box allowing a quick visual check of the effects applied. This page is available when creating or modifying a presentation style or a graphics style.

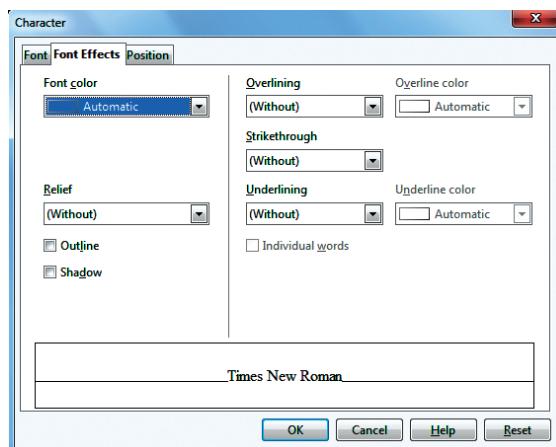


Figure 13.9 Applying special effects to the text

## Position page

The Position page, shown in **Figure 13.10**, has advanced options to customize text. This page is not available when creating or modifying a presentation style or a graphics style. Use this page to set the text position relative to the baseline when you need to insert subscripts or superscripts.

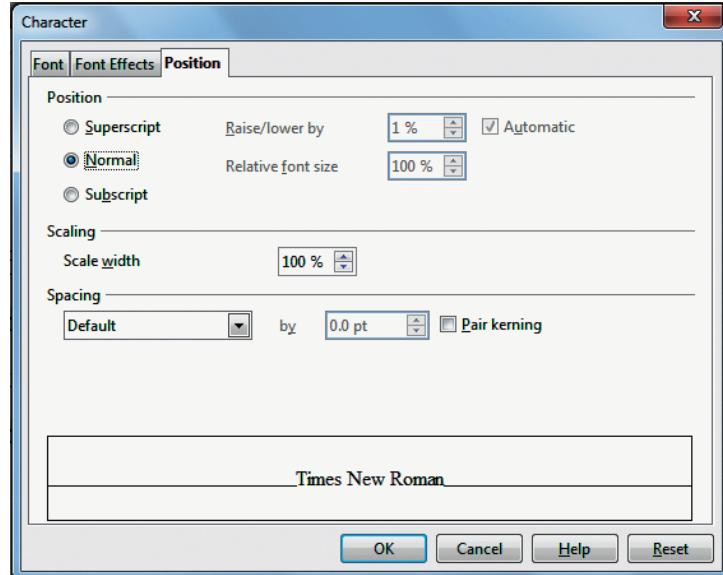


Figure 13.10 Setting the character position attributes

## Formatting paragraphs

To view the paragraph formatting options, select **Format → Paragraph** or click the Paragraph button on the Text Formatting toolbar. If a toolbar with the text icon is not visible, choose **View → Toolbars → Text Formatting**. The Paragraph dialog box (**Figure 13.11**) is shown.

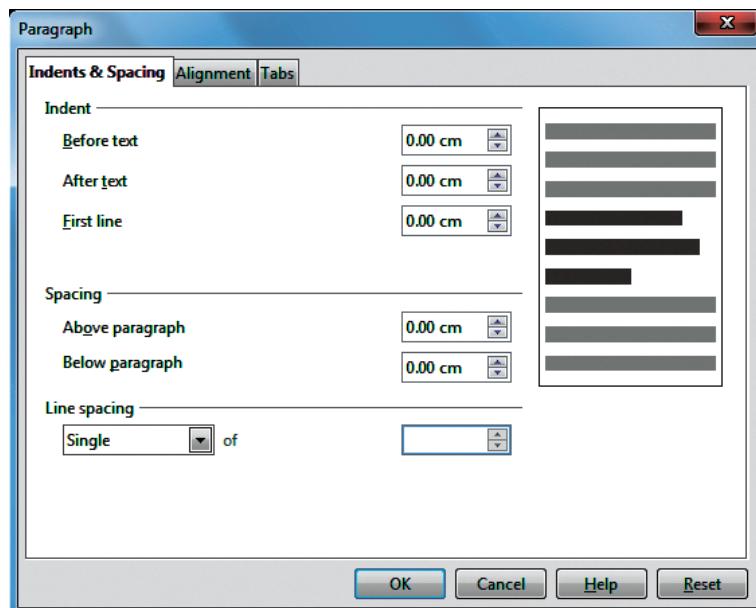


Figure 13.11 The paragraph formatting dialog box

## Indents and Spacing page

The Indents and Spacing page, shown in Figure 13.12, has four sections:

- **Indent:** modifies the indentation of the text (before and after) as well as the indentation of the first line.
- **Spacing:** defines the space before and after each paragraph formatted with the style.
- **Line spacing:** determines the spacing between two lines

## Alignment page

Use the Alignment page to determine the text alignment: **Left**, **Right**, **Center**, or **Justified**. A preview shows the effects of the changes. (Figure 13.12)

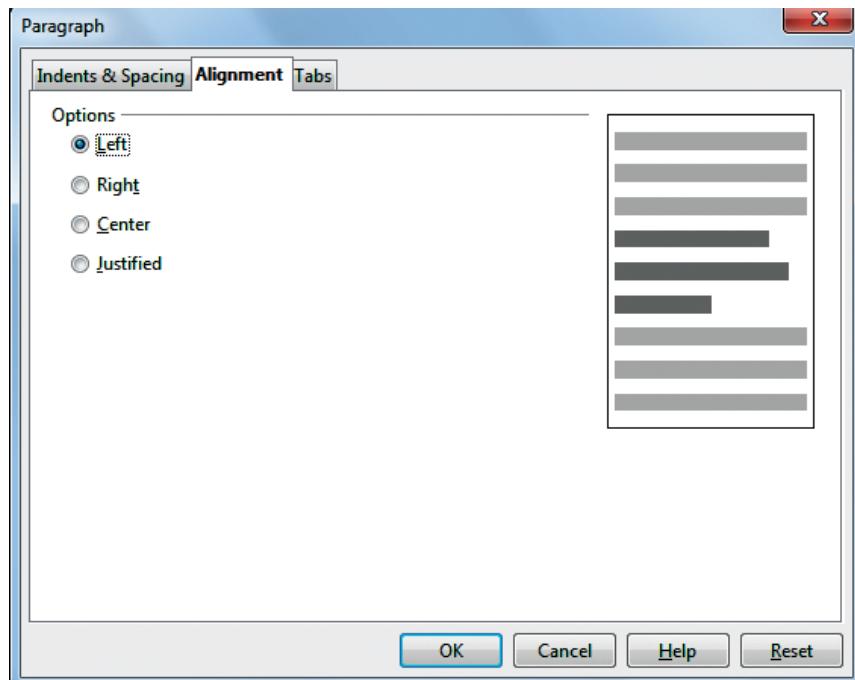


Figure 13.12 The Alignment option in paragraph formatting dialog box

## Tabs page

Use the Tabs page, shown in Figure 13.13, to set tab stops. To delete one existing tab stop, select it in the list and click the Delete button. To delete all the tab stops, click the Delete All button.

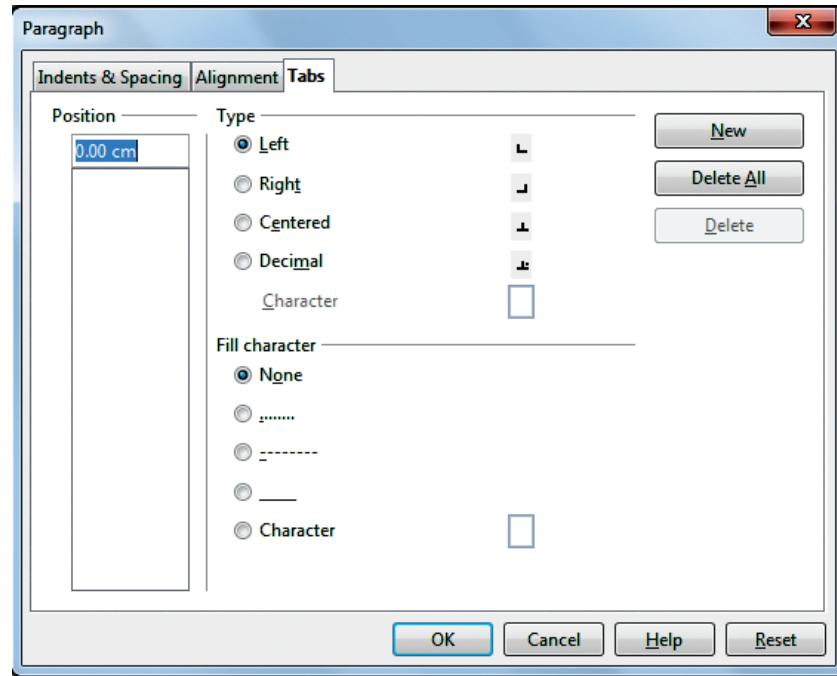


Figure 13.13 The tabs option in paragraph formatting dialog box

### Creating bulleted and numbered lists

You can customize the appearance of a list, changing the bullet type or numbering for the entire list or for single entry. All the changes can be made using the Bullets and Numbering dialog box. It is accessed by selecting **Format → Bullets and Numbering** or by clicking on the Bullets and Numbering icon on the text formatting toolbar. (Figure 13.14)

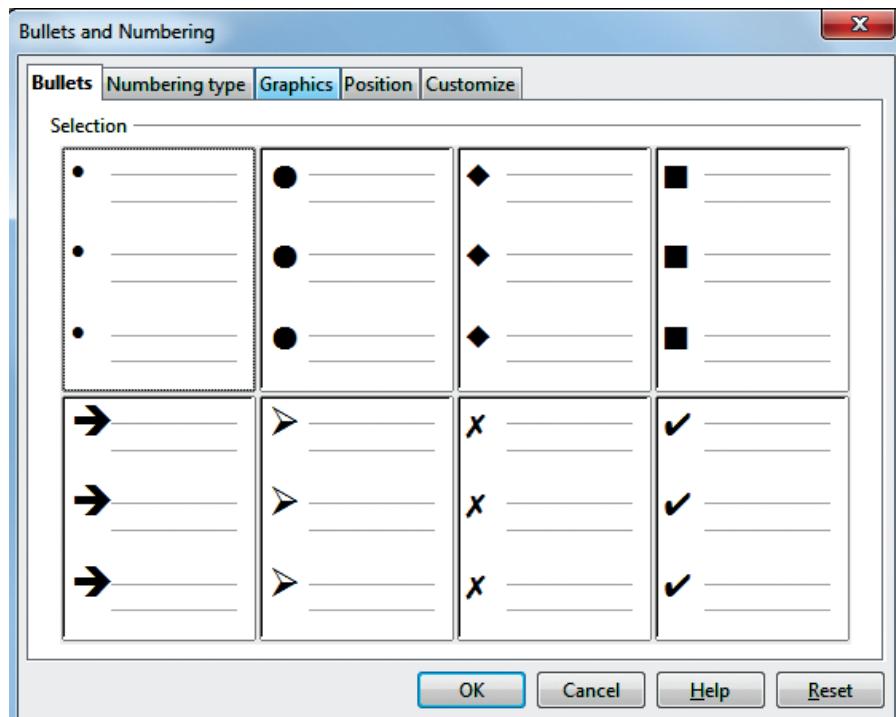


Figure 13.14 The Bullets and Numbering dialog box

## Workshop -1

1. Create a presentation using 8 slides and insert the following features in each slide.

- Pasting using unformatted text
- Formatting the text pasted
- Inserting special characters
- Formatting text (Changing font attributes)
- Formatting characters
- Formatting paragraphs
- Creating bulleted and numbered lists

### 13.1.2 Inserting and formatting shapes and pictures

In order to insert an image in OpenOffice Impress, place the cursor in the place where you want the image to be inserted. Then, Click **Insert** → **Picture** → **From File** option from the menu. **Refer Figure 13.15.**

OpenOffice Impress will display the dialog box, where you can select the image from the specific location and select open. The image will be inserted in the specified location. **Refer Figure 13.16.**

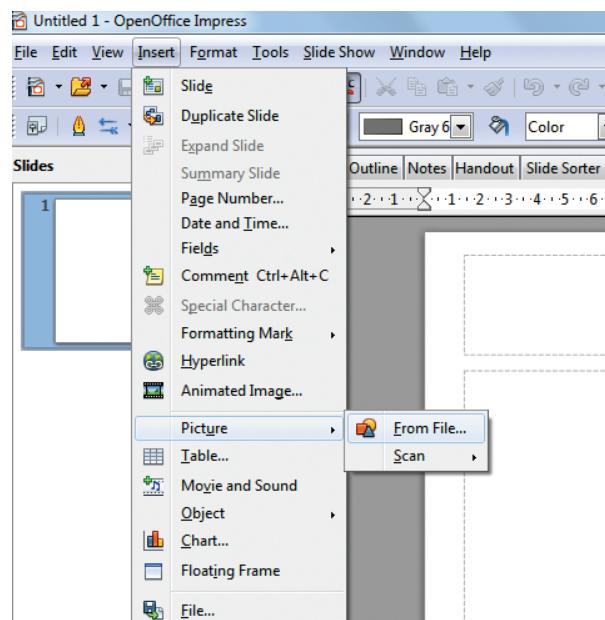


Figure 13.15 Inserting picture from Insert menu

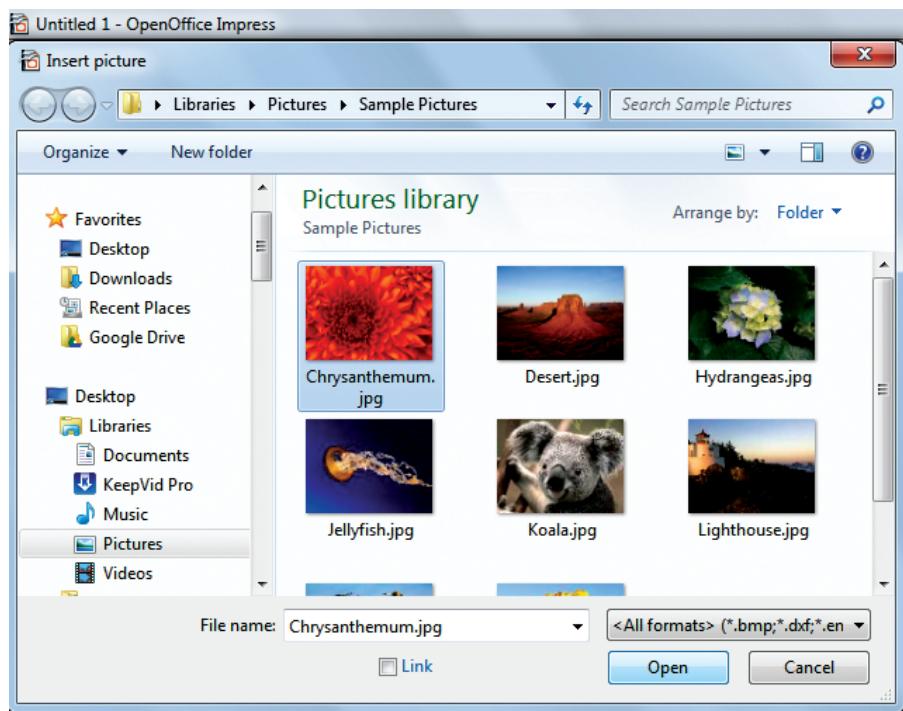


Figure 13.16 Inserting picture from the specific folder

In order to format pictures, right click on the picture and select the option you want to do to that picture. Through the options, you can crop, resize, align, arrange, flip and so on.

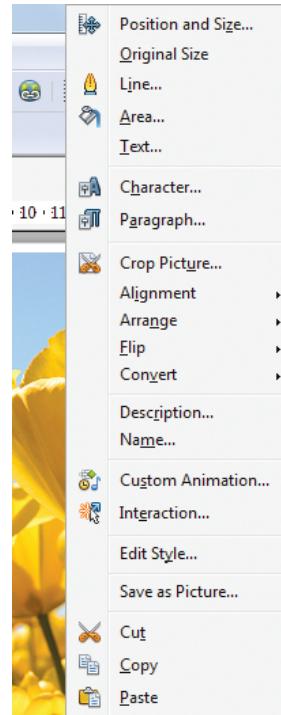


Figure 13.17 Formatting pictures using right click

## Inserting and formatting shapes

In order to insert shapes, make the Drawing tools visible by choosing **View → Toolbars → Drawing** option as shown in **Figure 13.18**. If it is already available, it will be in the bottom of the screen as in **Figure 13.19**. You can insert 2D as well 3D shapes. You can customise as per your need.

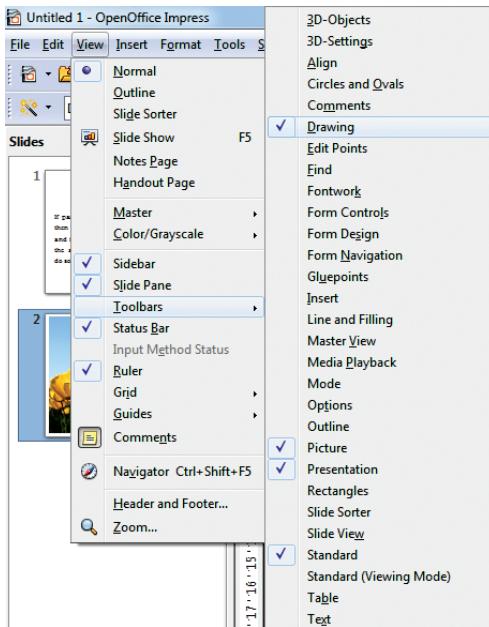


Figure 13.18 Making the Drawing tool visible



Figure 13.19 Drawing toolbar

### 13.1.3 Inserting tables and charts

To create a table proceed as follows:

1. Position the slide which will contain the table in the workarea. If necessary modify the slide layout in order to reserve the place for the table.
2. If the task pane is already open select Table Design. If the task pane is not visible, select **View → Task pane**, then select the **Table Design** task.
3. You can create a table directly by selecting **Insert → Table** from the main menu, the default style and settings are applied to the newly created table. (**Figure 13.20**)
4. Select one of the predefined styles. You will be able to change the color scheme.
5. Selecting a style opens the dialog box of **Figure 13.21**, where you can specify the number of rows and columns.

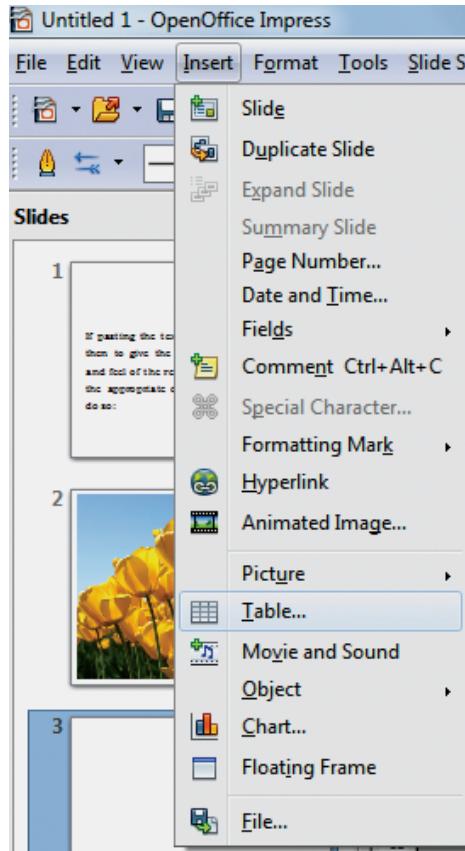


Figure 13.20 Inserting a table using main menu

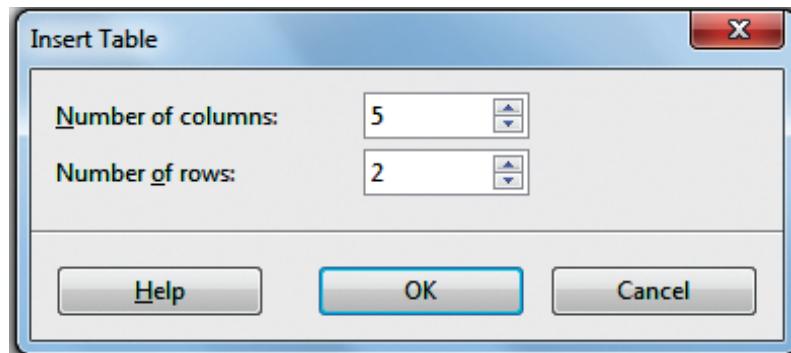


Figure 13.21 Specifying the number of rows and columns

The table is placed at the center of the slide, but you can move it wherever it is more convenient by selecting it then dragging it in the new position.

### Table toolbar

When a table is selected, the Table toolbar (Figure 13.22) will be displayed. If necessary, you can open the toolbar using **View → Toolbars → Table**. By default the toolbar will float, but you can fix it to the side or top of the work area wherever you want.

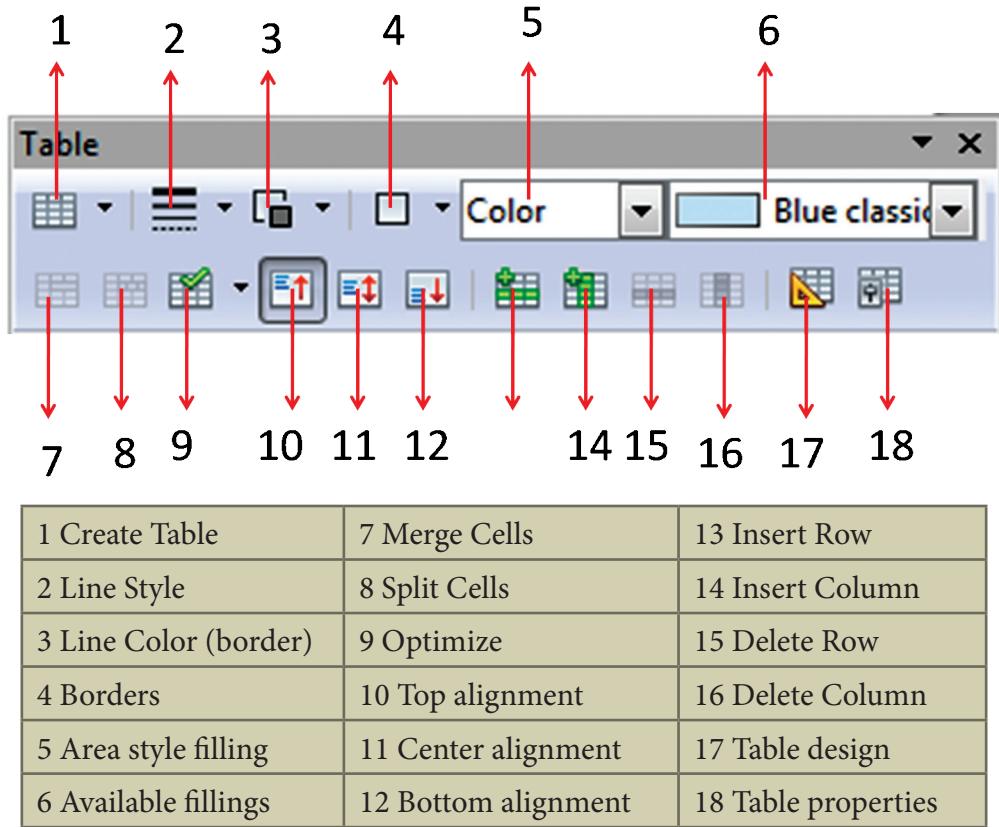


Figure 13.22 The Table Toolbar

The Table toolbar contains the tools you need to manipulate a table.

### Deleting a table

To delete a table, select it and then press the Delete key on the keyboard.

### Inserting a chart

To create a chart using the Insert Chart feature do the following:

1. Select **Insert → Chart**, or click the Insert Chart icon on the Standard toolbar. A chart appears that has been created using sample data. See **Figure 13.23**.

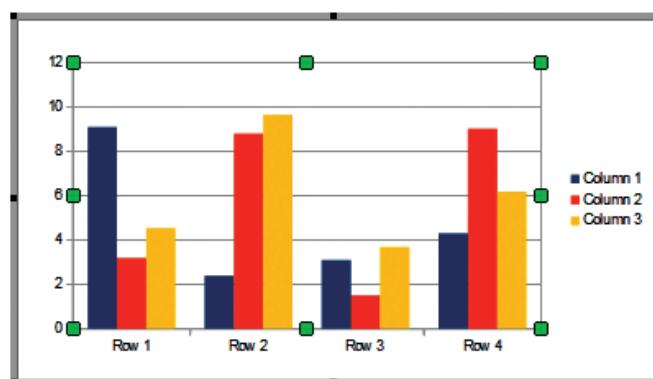


Figure 13.23 Chart made with sample data

2. To enter your own data in the chart, select **Chart Data Table** by right clicking the chart made with sample data. (Figure 13.24)

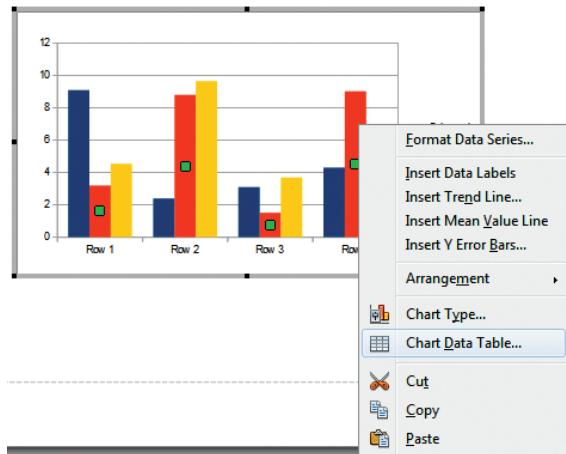


Figure 13.24 Selecting Chart Data Table by right clicking

3. A table with predefined data's will be seen. You can change the data as per your need. (Figure 13.25)

	Categories	Y-Values	Y-Values	Y-Values	
1	Row 1	9.1	3.2	4.54	
2	Row 2	2.4	8.8	9.65	
3	Row 3	3.1	1.5	3.7	
4	Row 4	4.3	9.02	6.2	

Figure 13.25 Changing the Chart Data Table

4. A wide range of chart types and variations are available. You can choose any chart. (Figure 13.26)

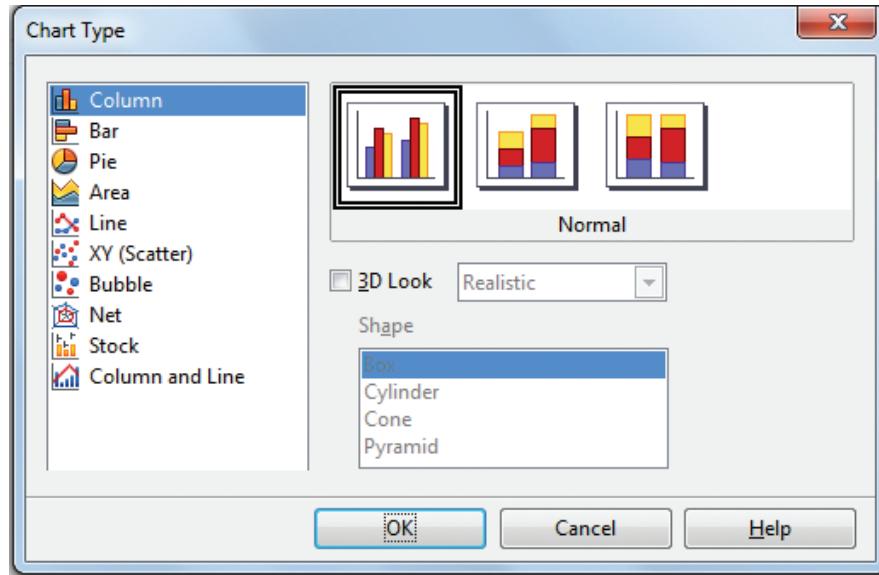


Figure 13.26 Chart Type dialog box showing two-dimensional charts

#### 13.1.4 Inserting Hyperlinks

To insert a hyperlink, or to customize the appearance of a hyperlink, select **Insert → Hyperlinks** from the menu bar. The dialog box shown in **Figure 13.27** will appear

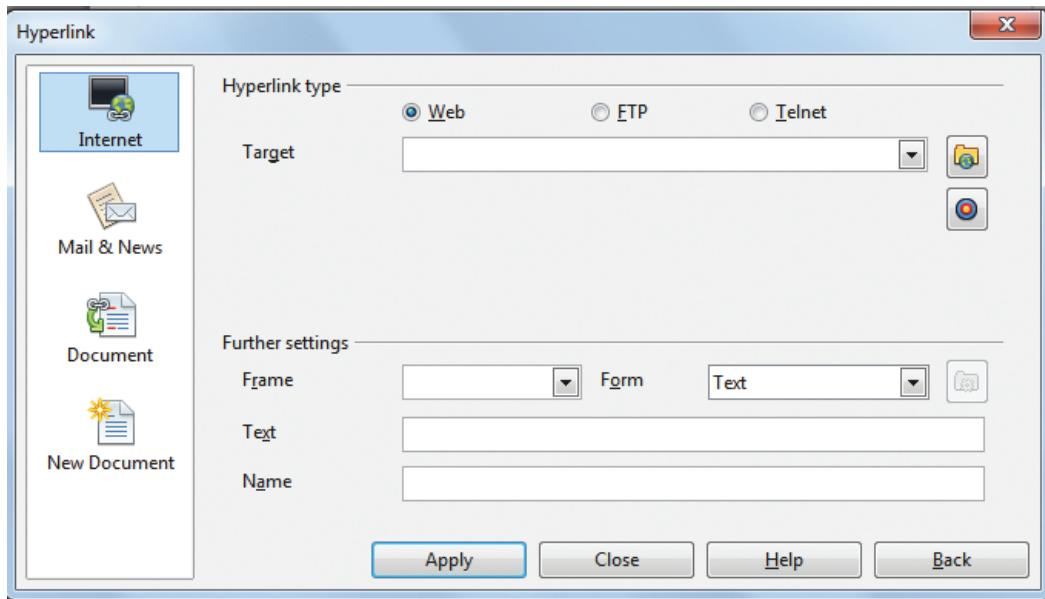


Figure 13.27 Dialog box to edit hyperlinks

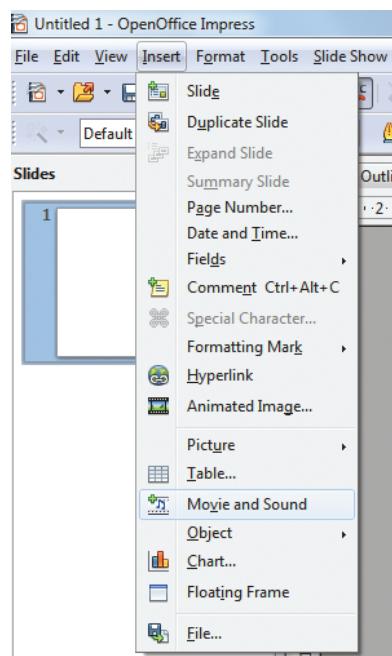
On the left hand side, select one of the four types of hyperlinks:

- **Internet:** a web address, normally starting with http://
- **Mail & News:** for example an email address.

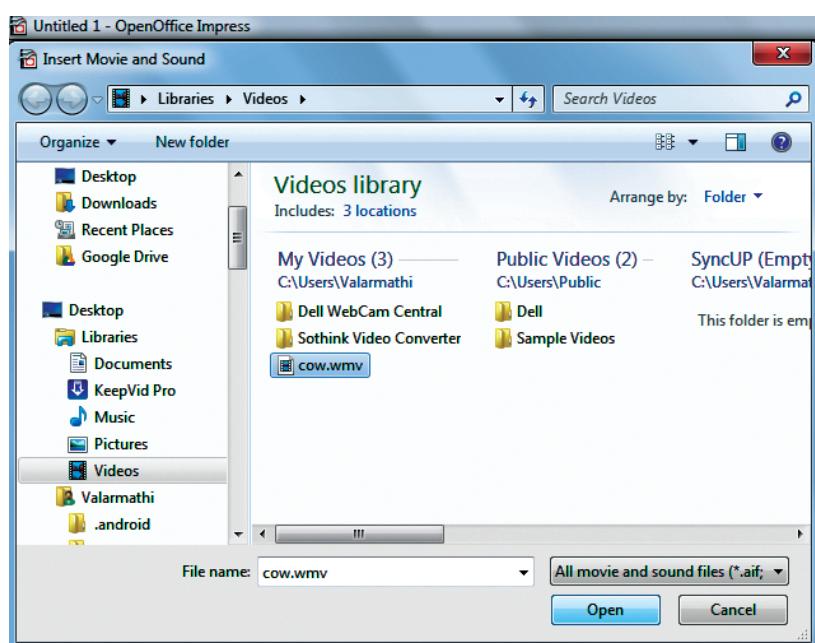
- **Document:** the hyperlink points to another document or to another place in the presentation.
- **New document:** the hyperlink creates a new document.

### 13.1.5 Inserting music and video

Open Office Impress will let you insert audio files or movie files. The audio and movie files can be inserted by clicking **Insert → Movie and Sound** option from the menu. Refer **Figure 13.28**.



*Figure 13.28 Selecting Movie and Sound from Insert menu*



*Figure 13.29 Selecting Movie and Sound file from a folder*

Same as inserting images, a dialog box will be opened. Select the audio or movie file from the specified location and click Open button. It will be opened in the slide as follows. **Refer Figure 13.29.** The movie or audio file inserted will be played during the slide show by clicking the mouse over it.

### 13.1.6. Inserting various animation effects to the inserted objects

#### Applying an animation effect

- In Normal View, open the desired slide.
- Select the text or object you want to animate.
- In the Tasks pane, choose Custom Animation (**Figure 13.30**). Click **Add**. The Custom Animation dialog box appears.
- Choose an effect from one of the pages of this dialog box and choose the speed or duration of that effect.
- To choose the animation to be applied when the object is placed on the screen, use an effect, for example **Fly In** or **Dissolve In**.
- Use the **Emphasis** page to apply an effect that changes the font color or applies special effects to the text such as blinking text.
- To choose the effect to be applied when the object is leaving the page, use the **Exit** page.

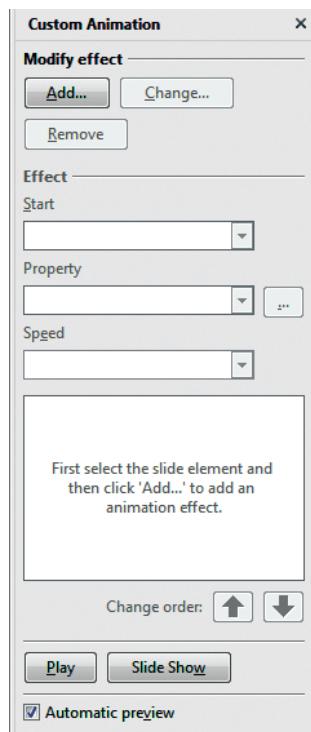


Figure 13.30 Task pane, showing Custom Animation page

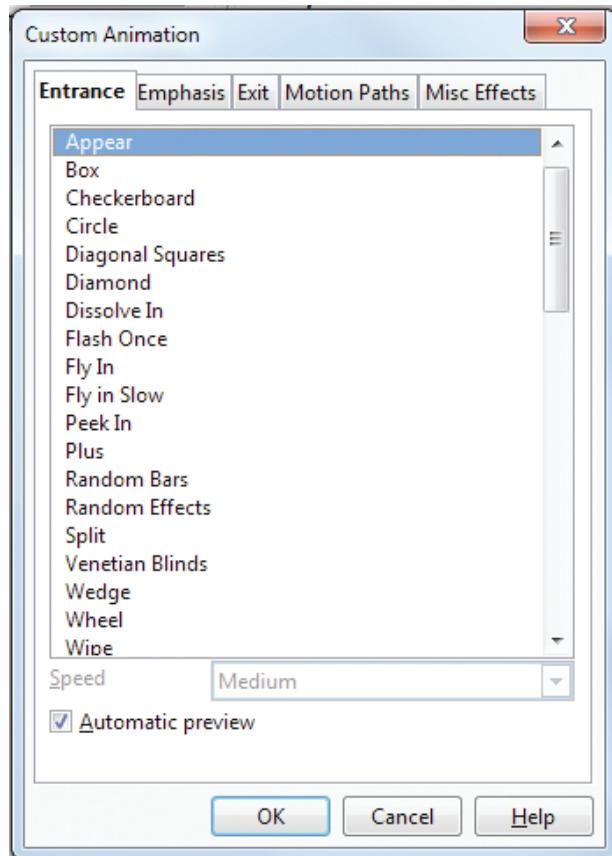


Figure 13.31 Custom Animation dialog box.

- If you want the object to move along a line or curve, select an animation from the **Motion Paths** page.
- Click OK to save the effect and return to the Custom Animation page on the Task pane. Here you can choose how to start the animation, change the speed, and apply some additional properties of the selected effect.
- Choices may vary depending on the selected object. For example, pictures and text have different Emphasis choices.

### Starting an animation effect

You have **three choices** for starting an animation effect:

**On click**—the animation stops at this effect until the next mouse click.

**With previous**—the animation runs at the same time as the previous animation.

**After previous**—the animation runs as soon as the previous animation ends.

## 13.2. Modifying the slide transition

Slide transitions are the effects that take place when one slide gives way to the next one in the presentation, like Roll down from top or Fly in from left. They add dynamic style to a slideshow, smoothing the transition between slides.

You can add transitions while in Slide Sorter view or in Normal view. To see the effect of a selection, you need to be in Normal view and select the Automatic preview checkbox in the Slide Transition page of the Tasks pane.

You can apply a single type of transition to all slides in the presentation or apply a different transition to any single slide, even having a different transition for every slide in the show.

### Applying a slide transition effect

- In the Tasks pane, choose **Slide Transition** (**Figure 13.32**).
- In the Slides pane or **Slide Sorter view**, select the slides to which you want to apply the transition.
- If you want to apply the transition to select slides, he transition to apply to all slides.
- In the **Apply to selected slides** list, select a transition.
- Modify the selected transition by changing the speed or adding a sound, in the Modify transition area.
- If you choose to play a sound, select it in the **Sound list**. The **Loop until** next sound checkbox now becomes active. Select this checkbox to play the sound repeatedly until another sound starts.
- Choose how to advance to the next slide: manually (on mouse click) or automatically. If you choose automatically, you can specify how long the slide remains visible before it automatically advances to the next slide.
- If you want the effect you just defined to apply to all slides in the show, click the **Apply to All Slides** button.
- To preview the transition effect, click the **Play button**.
- To start the slide show from the current slide (so you can see all the transitions), click the **Slide Show** button.

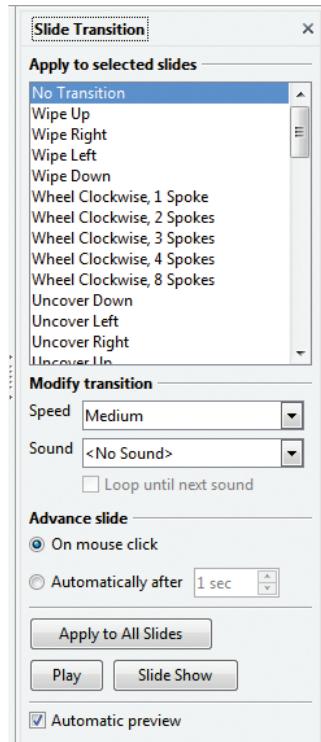


Figure 13.32 Slide Transition

### Removing a transition effect

1. Select the desired slides.
2. Choose **No Transition** in the list on the **Slide Transition** page of the Tasks pane.

If you want most of the slides to have the same transition, but a few to be different, you may find it easiest to apply one transition to all slides and then change only the ones you want to be different.

### 13.3 Setting and Controlling the slide show - timer or mouse controlled

#### Running the slide show

To run the slide show, do one of the following:

- Click **Slide Show > Slide Show** on the main menu bar. (**Refer Figure 13.33**).
- Click the **Slide Show** button on the Presentation toolbar or the Slide Sorter toolbar (**Refer Figure 13.34**).
- Press **F5**.

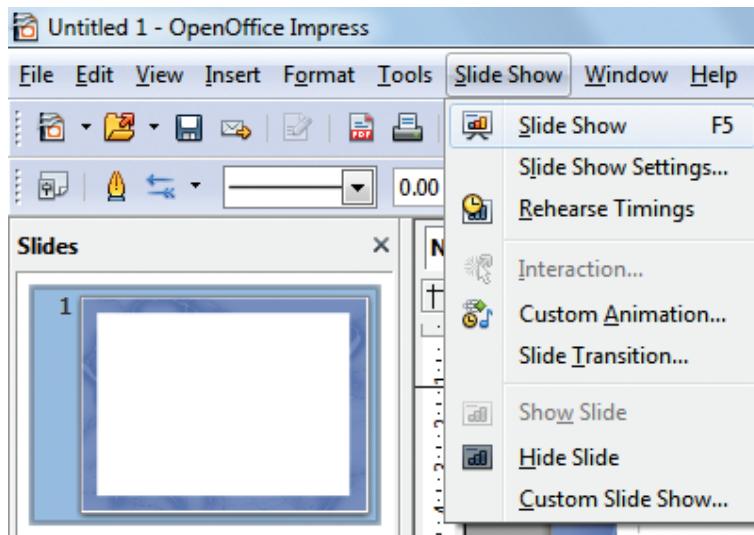


Figure 13.33 Running Slideshow using Slideshow menu

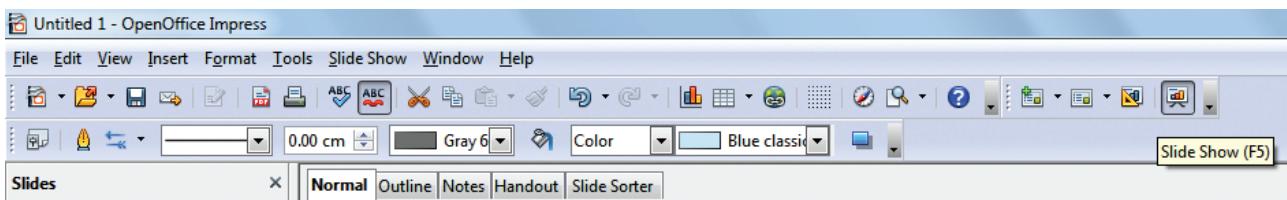


Figure 13.34 Running Slideshow using Slideshow button from the Toolbar

- If the slide transition is set **Automatically**, after x seconds the slide show will run by itself.
- If the slide transition is **On mouse click**, do one of the following to move from one slide to the next.
- Use the **arrow keys** on the keyboard **to go to the next slide or to go back to the previous one.**
- Click the mouse button to advance to the next slide.
- Press the **Spacebar** on the keyboard to advance to the next slide.
- When you advance past the last slide, the message “**Click to exit presentation...**” appears. Click the mouse or press any key to exit the presentation.
- To exit the slide show at any time, including at the end, press the **Esc** key.

## Points to Remember:

- Inserting slide – Insert → Slide
- Deleting Slide – Edit → Delete slide
- Running slide show – Slide Show → slide show
- Save presentation - File → Save
- To view slide master – Click View → master → Slide Master
- To insert Graphic object - View → Toolbars → Drawings
- To insert picture – Insert → Picture → From File
- To insert Audio & Video – Insert → Movie and Sound

## Evaluation



### Part I

#### Choose the correct answer

- 1) Which of the following is the default pre-packaged layout in a new presentation?  
A) Blank Slide layout                              B) Title Slide layout  
C) Title Only layout                              D) Title and content Layout
- 2) Which is not pre-packaged layout in presentation?  
A) Main Content layout                              B) Title, 6 Content layout  
C) Blank Slide layout                              D) Title, 2 content over content
- 3) What is the usage of Extended Tips option in Help Menu?  
A) Detailed Tool Tip Information                      B) Helps to resize the Tips window  
C) To enable frequently ask question                    D) To create Footer content
- 4) Which is the shortcut key for adjustment to formatting text  
A) F10                                      B) F7                                      C) F11                                      D) F5
- 5) ..... is the default pre-packaged layout for inserting additional slides  
A) Blank Slide layout                              B) Title Slide layout  
C) Title, 6 Content layout                            D) Centered Text Layout
- 6) Name of the button in the picture  
A) Create New Presentation                            B) Create New layout  
C) Create New Layout                                    D) Create New additional Slides
- 7) Which element is not available in additional slides?  
A) Insert Chart                                      B) Inset Movie  
C) Insert Picture                                      D) Insert Grid
- 8) You can use the running slideshow option by clicking slide show button on the .....  
A) Tool bar    B) Menu Bar                            C) Navigation Bar    D) Sliding Tool Bar

## Part II

**Answer to the following questions (2 Marks)**

- 1) What do you understand by Save Auto Recovery Information?
- 2) Define Extended Tips option?
- 3) List out pre-packaged layouts
- 4) Define slide master
- 5) List out the presentation supported file types.

## Part III

**Answer to the following questions (3 Marks)**

- 1) How to create first slide in presentation?
- 2) How to Delete a Slide in presentation?
- 3) How to perform Saving a Presentation file?
- 4) How do you insert Pictures into a slide?
- 5) What are the multimedia options available in Drawing toolbar?

## Part IV

**Answer the following questions (5 Marks)**

- 1) Discuss in detail about Graphic Objects feature in Presentation
- 2) Explain methods to handle Multimedia files in presentation slides
- 3) List out and explain the advantages of Master slides in presentation.
- 4) Create and perform the following presentation activity about school annual achievement
  - 1) Inserting the first slide using Title Slide layout
  - 2) Create additional slides and insert images and videos about school annual achievement
  - 3) Perform delete and rearrange operations in the existing presentation file
  - 4) Finally Running the slide show and start your presentation



1.	<i>Auto recovery</i>	:	<i>Recovering a damaged file automatically</i>
2.	<i>Layout</i>	:	<i>Predefined design</i>
3.	<i>Right Click</i>	:	<i>Pressing right mouse button</i>
4.	<i>Rearrange</i>	:	<i>Changing original order of arrangement</i>
5.	<i>Master slide</i>	:	<i>Primary slide contains predefined background design</i>
6.	<i>Slide Masters</i>	:	<i>Contains 28 prepackaged master pages</i>

## Computer Network

### Learning Objectives

By the end of this chapter, the students will be able

- To explain the evolution of Networking
- Types of Network Topologies
- To explain the types of Network
- To compare the types of Networks
- To identify the types of network in the lab
- To identify computers and users over a network
- To explain wireless mobile communication
- To explain internet applications
- To know Network security concepts
- To use a DNS server to connect it to a network resource/server



### 14.1. Evolution of Networking

Computers exchange data in automatic mode, is, essentially, the basic mechanism of any computer network. Developers of the first networks implemented services for file exchange, database synchronization, e-mail and other network services.

#### 14.1.1. ARPANET

ARPANET was established by the Advanced Research Projects Agency (ARPA) in 1969 for two main reasons:

- To allow the transfer of data between various research institutes.
- To answer the call of the U.S. Department of Defence for a technology to provide messaging capabilities to the government in the event of nuclear war.

#### 14.1.2 World Wide Web(WWW)

The World-Wide Web is a collection of documents and services. It is distributed across the Internet and linked together by hypertext links. The web is therefore a subset of the Internet.

**World Wide Web** was created by **Timothy Berners Lee** in 1989 at CERN in Geneva.

**Web page** is a document available on World Wide Web. A web page can contain

information including text, graphics, audio, video and hyper links. These hyper links are the link to other web pages.

**Web Browser** is an application software that allows us to view and explore information on the web.

Following are the most common web browser available today:

Table 14.1

Browser	Vendor
Internet Explorer	Microsoft
Google Chrome	Google
Mozilla Firefox	Mozilla
Netscape Navigator	Netscape Communications Corp.
Opera	Opera Software
Safari	Apple
Sea Monkey	Mozilla Foundation
K-meleon	K-meleon

## WWW Operation

WWW works on client- server approach. Following steps explain how the web works:

1. The User enters the URL (say <http://www.tngovernmentjobs.in/>) of the web page in the address bar of web browser.
2. The browser then requests the Domain Name Server for the IP address corresponding to [www.tngovernmentjobs.in](http://www.tngovernmentjobs.in).
3. After receiving the IP address, the browser sends a request to the web page and web server using HTTP protocol.
4. The web server receives request using HTTP protocol and checks for the requested web page. If found returns back to the web browser and closes the HTTP connection.
5. Now the web browser receives the web page, it interprets and displays the contents of web page in web browser's window.

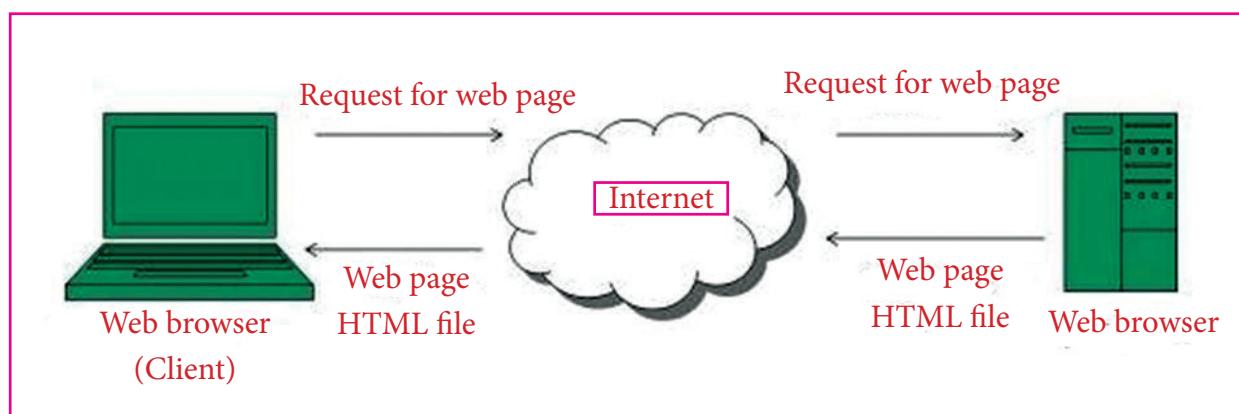


Figure 14.1 WWW Operation

Web server is a computer where the web content is stored. Basically web server is used to host the web sites.

## Internet

- Internet is a world-wide global system of interconnected computer networks.
- Internet uses the standard Internet Protocol (TCP/IP).
- Every computer in internet is identified by a unique IP address.
- IP Address is a unique set of numbers (such as 110.22.33.114) which identifies a computer location.
- A special computer DNS (Domain Name Server) is used to give name to the IP Address so that the user can locate a computer by a name.
- Internet is accessible to every user all over the world.

## Evolution

- The origin of Internet is devised from the concept of **Advanced Research Project Agency Network (ARPANET)**.

## Advantages

- Internet allows us to communicate with the people sitting at remote locations. There are various apps available on the web that uses Internet as a medium for communication. One can find various social networking sites such as:

- Facebook
- Twitter
- Yahoo

- Google+
- Flickr
- Orkut
- One can surf for any kind of information over the internet with the help of a search engine.
- Apart from communication and source of information, internet also serves as a medium for entertainment. Following are the various modes for entertainment over internet.
  - Online Television
  - Online Games
  - Songs
  - Videos
  - Social Networking Apps
- Internet allows us to use many services like:
  - Internet Banking
  - Online Educational Services
  - Online Shopping
  - Online Ticket Booking
  - Online Bill Payment
  - Data Sharing
  - E-mail
- Internet provides concept of electronic commerce, that allows the business deals to be conducted on electronic systems

## **Topology:**

Topology describes the physical cabling layout and the logical way of moving data between components.

### **14.2. Network Topologies**

Network Topology is the schematic description of a network arrangement, connecting various nodes (sender and receiver) through lines of connection.

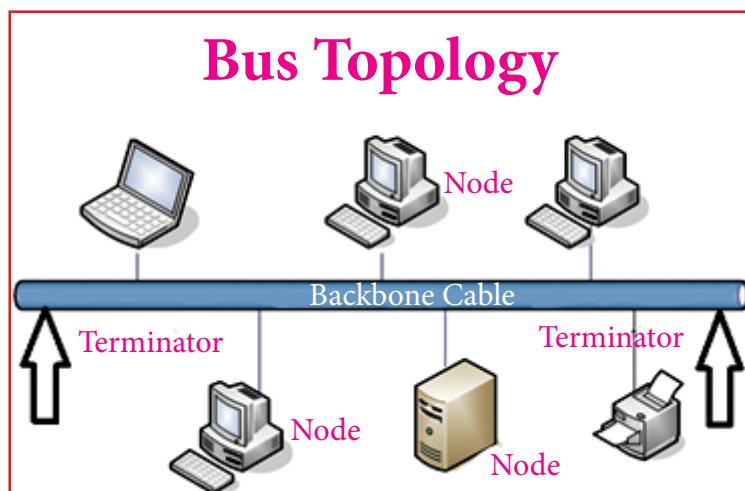
#### **14.2.1. BUS Topology**

Bus topology is a network type in which every computer and network device

is connected to a single cable. All devices are connected to a common backbone. Maximum nodes that can be attached are 30.

#### **Features of Bus Topology**

1. It transmits data only in one direction.
2. Every device is connected to a single cable.

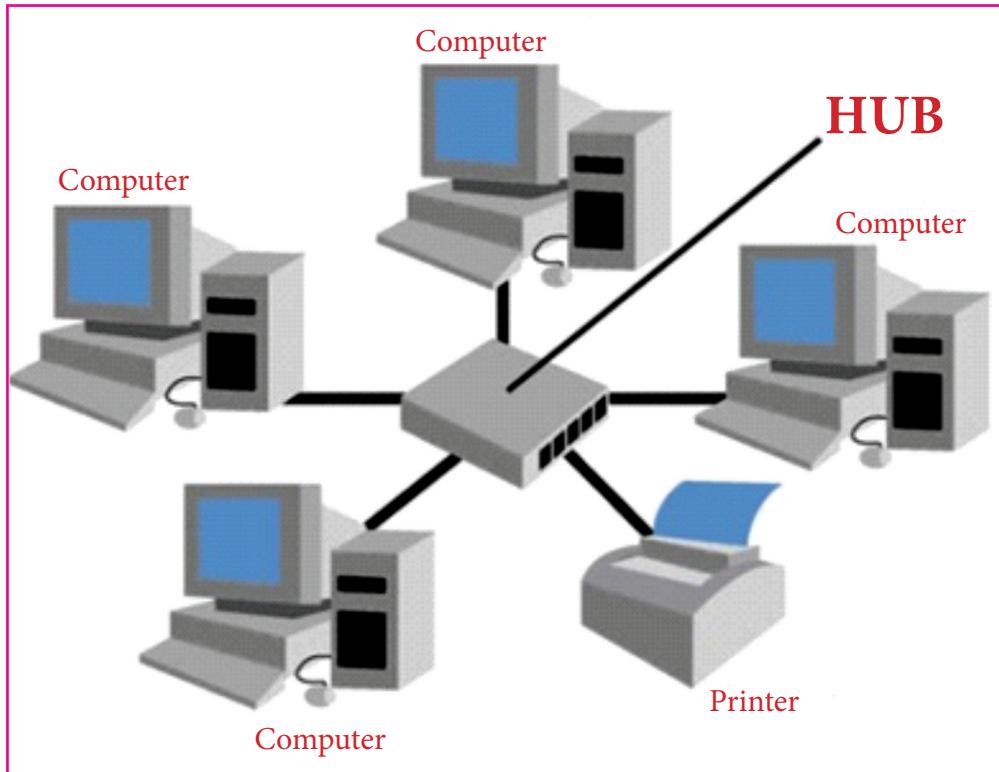


*Figure 14.2 Bus Topology*

#### **Advantages of Bus Topology**

1. It is cost effective.
2. Installation of device is easy.
3. Cable required is less compared to other network topology.
4. Used in small networks.

## STAR Topology



*Figure 14.3 STAR Topology*

In this type of topology all the computers are connected to a single hub/switch through cables. This hub is the central node and all others nodes are connected to the central node.

### Features of Star Topology

1. In this type, every node has its own dedicated connection to the hub.
2. The hub acts as a repeater for data flow.

### Advantages of Star Topology

1. The performance is fast with few nodes and low network traffic.
2. The hub can be upgraded easily.
3. It is easy to troubleshoot, to setup and modify.
4. Only the failed node will get affected, and the rest will work smoothly.

## TREE Topology

This type of topology is arranged in the form of a tree like structure in which top level contains **parent node** (root node), which is connected with the child nodes in

the second level of hierarchy. The second level nodes are connected to the third level nodes, which in turn are connected to the fourth level nodes and so on. Except the top-level nodes, each level node has a parent node. It is also called **hierarchical topology**.

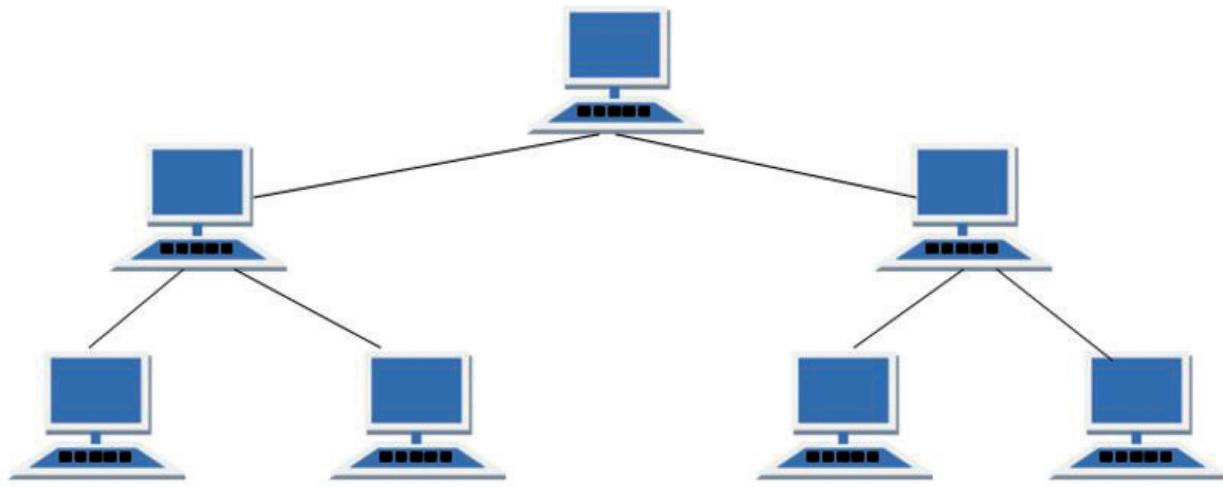


Figure 14.4 Tree Topology

### Features of Tree Topology

1. It is ideal if workstations or nodes are located in groups.
2. It can be used in Wide Area Network.

### Advantages of Tree Topology

1. The expansion of nodes is possible in this type.
2. It can be easily managed and maintained.
3. The error detection can be done easily.

### Workshop-1

Go to your Computer laboratory and identify the type of topology followed there. Seek help from your teacher.

### 14.3. Types of Network

**14.3.1. Computer Networks** are classified into four types based on the size, distance and the structure namely: **LAN** (Local Area Network), **MAN** (Metropolitan Area Network), **WAN** (Wide Area Network) and **PAN** (Personal Area Network).

#### Personal area network

- A personal area network, or PAN, is a computer network that enables communication between computer devices.
- PANs can be wired, such as USB or FireWire, or they can be wireless, such as infrared, ZigBee, Bluetooth and ultra wide band (UWB).
- The range of a PAN typically is a few meters. Examples of wireless PAN (WPAN) are devices include cell phone

,headsets, wireless keyboards, wireless mice, printers, bar code scanners and game consoles.

### LAN (Local Area Network)

- A **Local Area Network** is a privately owned computer **network** covering a **small Network geographical area**, like a home, office, or groups of buildings e.g. a school Network.
- We can use different types of topologies through LAN.

- LAN networks are also widely used to share resources like printers, shared hard-drive etc.
- The size of LAN is usually small. The various devices in LAN are connected to central devices called **Hub** or **Switch** using a cable.
- Now-a-days LANs are being installed using wireless technologies.
- LAN offers high speed communication of data rates between 4 to 16 megabits per second (Mbps).

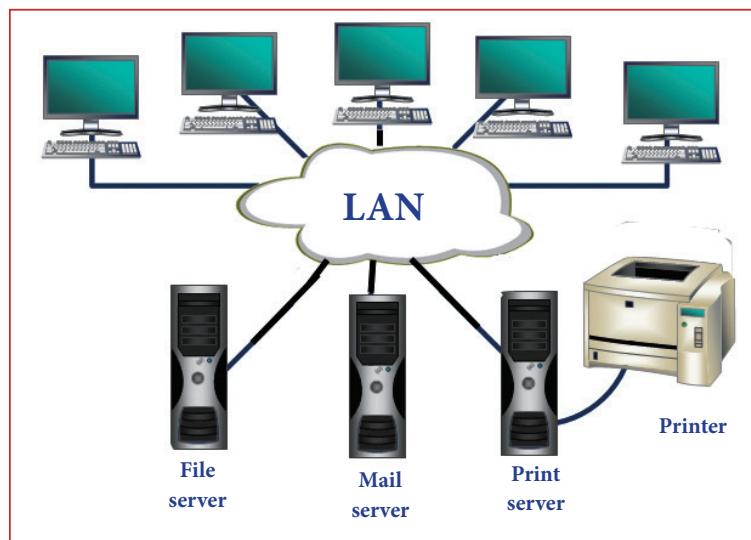


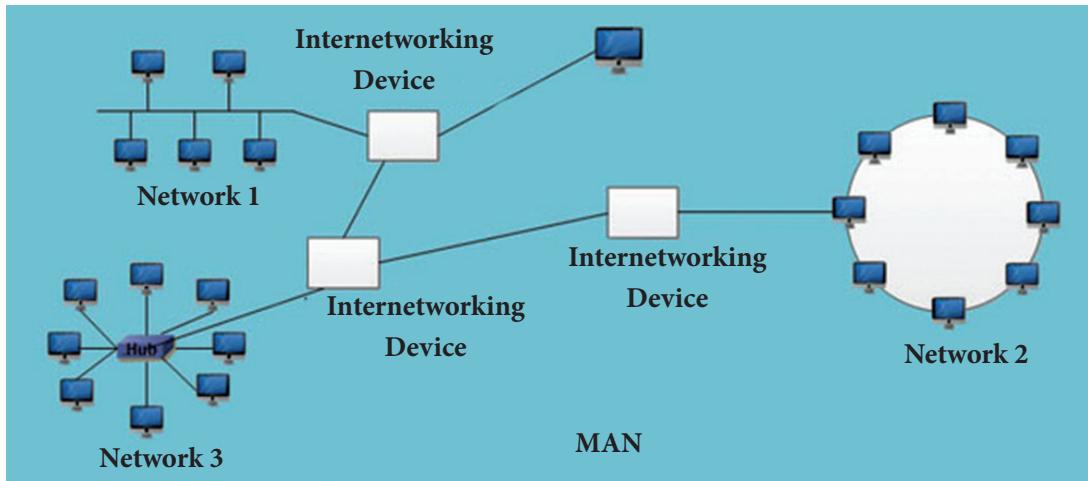
Figure 14.5 Local Area Network

### Advantages of LAN

- In this network one can become a server serving all the remaining computers called **clients**. A Software can be stored on the server and it can be used by the remaining clients.
- Without internet access, it is possible to connect all the workstations in a building with each other locally.
- It is easy to share common resources like printers with LAN.

### Metropolitan Area Network (MAN)

It is basically a bigger version of LAN. It is designed to extend over the entire city. MANs extend beyond 100 KM. MANs are usually owned by large organizations to interconnect its various branches across a city. MAN comprises combination of different hardware and transmission media. It can be single network such as a cable TV network, or it is a means of connecting a number of LANs into a larger network so that resources can be shared through LAN to LAN as well as device to device.



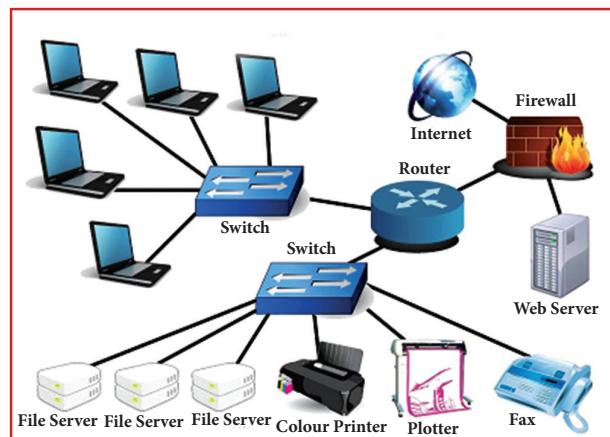
*Figure 14.6 Metropolitan Area Network (MAN)*

### Advantages of MAN

- It is extremely efficient and provides fast communication via high-speed carriers, such as fibre optic cables.
- It provides a good back bone for large network and provides greater access to WANs.
- The dual bus used in MAN helps the transmission of data in both directions simultaneously.
- A MAN usually encompasses several blocks of a city or an entire city.

### Wide area network (WAN)

A wide area network (WAN) is a telecommunication network. WANs connect LANs that may be on opposite sides of a building, across the country or around the world. Computers connected to a Wide Area Network are often connected through public networks, such as the telephone system. They can also be connected through leased lines or satellites. The largest WAN in existence is the Internet.



*Figure 14.7 Wide area network*

### Advantages of WAN

- It covers a large geographical area.
- It shares software and resources with connecting workstations.
- Messages can be sent very quickly to anyone else on the network. These messages can have picture, sounds or data included with them (called attachments).
- Everyone on the network can use the same data. This avoids problems where some users may have older information than others.

## Workshop-2

Go to your Computer laboratory and try to identify the type of computer network followed there. Seek help from your teacher.

## 14.4. Wired Technologies

The means through which data is transferred from one place to another is called transmission or communication media. There are two categories of transmission media used in computer communications.

- Wired/Bounded/Guided media
- Wireless/Unbounded/Unguided media

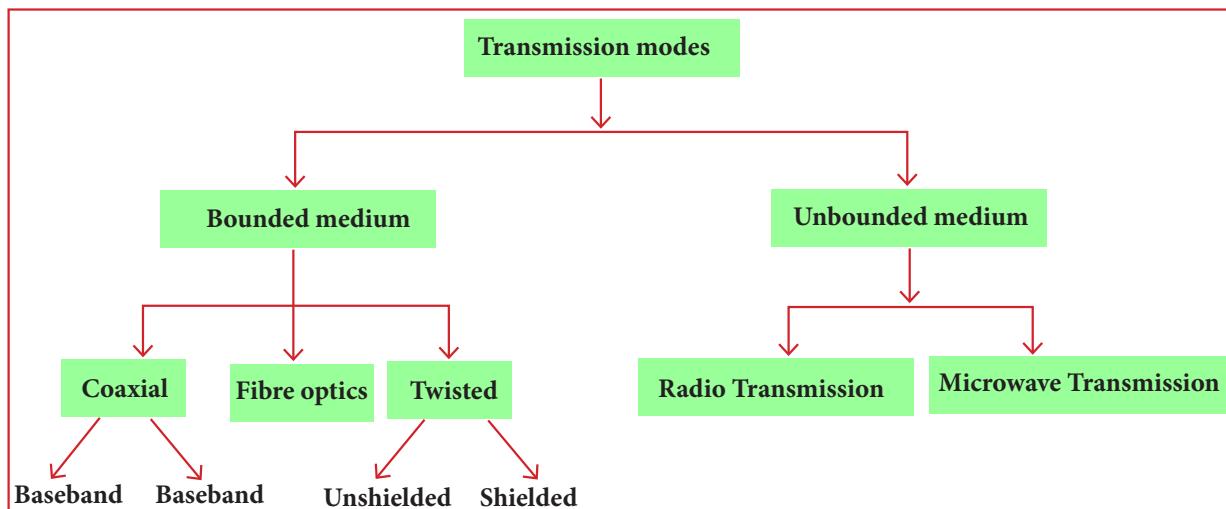


Figure 14.8 Wired Technologies

### Bounded/Guided Media

There are three common types of bounded media in the data transmission. They are

- Twisted-Pair Cable,
- Coaxial Cable, and
- Fibre-Optic Cable.

Twisted-pair and coaxial cable use metallic (copper) conductors that accept and transport signals in the form of electric current. Optical fibre is a cable that accepts and transports signals in the form of light.

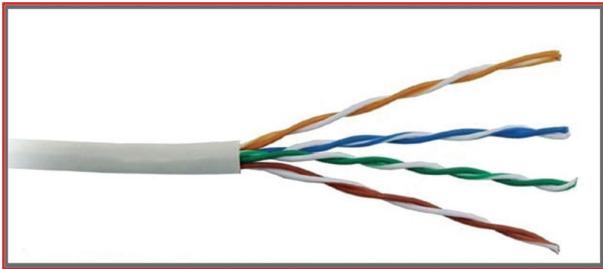
#### 14.4.1. Twisted Pair Cable

A twisted pair consists of two conductors (normally copper), each with its own plastic insulation, twisted together. One of these wires is used to carry signals to the receiver, and the other is used only as ground reference. In addition to the signal sent by the sender on one of the wires, interference (noise) and crosstalk may affect both wires and create unwanted signals.

#### Twisted Pair is of two types:

- Unshielded Twisted Pair (UTP)
- Shielded Twisted Pair (STP)

#### Unshielded Twisted Pair Cable



*Figure 14.9 Unshielded Twisted Pair Cable*

It consists of two insulating copper wires (1mm thick). The wires are twisted together in a helical form to reduce electrical interference from similar pair.

### Advantages

- It has high speed capacity.
- Higher grades of UTP are used in LAN technologies like Ethernet.

### Shielded Twisted Pair Cable

This cable has a metal foil or braided-mesh. Electromagnetic noise penetration is prevented by metal casing. Shielding also eliminates crosstalk. It is faster than unshielded and coaxial cable.



*Figure 14.10 Shielded Twisted Pair*

### Advantages

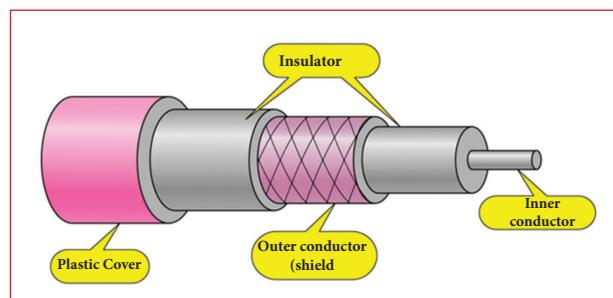
- It can be used for Analog or Digital transmission
- It increases the signalling rate.
- It eliminates crosstalk.

### Coaxial Cable

- Coaxial is called by this name because it

contains two conductors that are parallel to each other.

- Copper is used in this as a central conductor. It is surrounded by PVC installation.
- Outer metallic wrapping is used as a shield against noise and as a second conductor which completes the circuit.
- The outer conductor is also encased in an insulating sheath. The outermost part is the plastic cover which protects the whole cable.
- The most common coaxial standards are:
  - 50-Ohm RG-7 or RG-11 : used with thick Ethernet.
  - 50-Ohm RG-58 : used with thin Ethernet
  - 75-Ohm RG-59 : used with cable television
  - 93-Ohm RG-62 : used with A R C N E T .



*Figure 14.11 Coaxial Cable*

### Advantages

- It is used in long distance telephone lines.
- It transmits digital signals at a very high rate of 10Mbps.
- It has higher noise immunity.
- It transmits data without distortion.

- This can span longer distance at higher speeds as they have better shielding when compared to twisted pair cable.

## Fiber Optical Cable

A fibre-optical cable is made of glass or plastic and transmits signals in the form of light. In fibre optical cable, light moves only in one direction. For two way communication to take place a second

communication must be made between the two devices. Optical fibres use reflection to guide light through a channel. A glass or plastic core is surrounded by a cladding of less dense glass or plastic. The difference in density of the two materials must be such that a beam of light moving through the core is reflected off the cladding instead of being refracted into it.

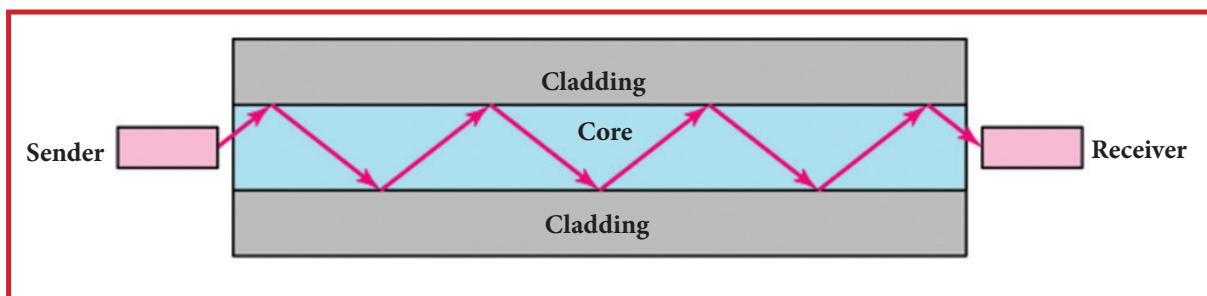


Figure 14.12 Fibre-Optical Cable

## Fibre-Optic Cable Connectors

There are three types of connectors for fibre-optic cables, as shown in the figure below.

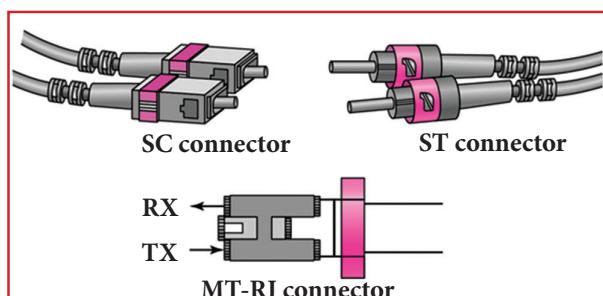


Figure 14.13 Fibre-Optical Cable Connectors

The Subscriber Channel (SC) connector is used for cable TV. It uses push/pull locking system. The Straight-Tip (ST) connector is used for connecting cable to the networking devices. The MT-RJ connector utilizes two fibres and integrates them into a single design that looks similar to an RJ45 modular connector.

## Advantages

Fibre optic has several advantages over metallic cable:

- It is resistant to corrosion.
- It shows greater immunity to tapping.

## Workshop-3

Go to your Computer laboratory. Identify the type of wired technology applicable there. Write a report on using the same.

## 14.5. Wireless Technologies

Wireless communication plays a significant role in day to day life. The term wireless refers to the communication or transmission of information over a distance without requiring wires, cables or any other electrical conductors.

The Communication is set and the information is transmitted through

electromagnetic waves like radio frequencies, infrared, satellite, etc., in a wireless communication technology network.

## Types of Wireless Communication Technologies

The devices used for wireless communication are cordless telephones, mobiles, GPS units, wireless computer parts, and satellite television.

### 14.5.1. Bluetooth

It is named after a Danish king named Harald Bluetooth. Bluetooth is used to connect different electronic devices wirelessly to a system for transferring and sharing data. Cell phones are connected to hands-free earpieces, wireless keyboard, mouse and mike to laptops with the help of Bluetooth as it transmits information from one device to other device.



Figure 14.14 Bluetooth Technology

### Infrared

Infrared technology is a type of wireless communication technology to transfer data between two infrared enabled

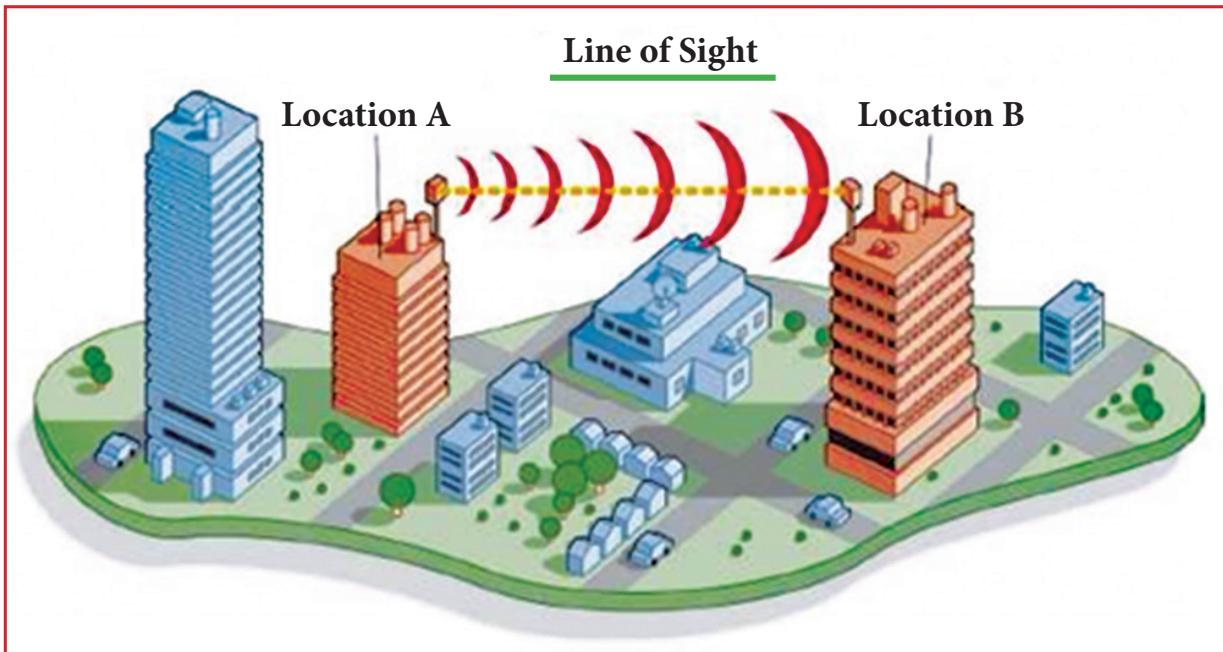
devices through infrared radiation. This technology plays a very important role in wireless data communication. Infrared is used in devices such as the mouse, wireless keyboard and printers.

Unlike Wi-Fi and Bluetooth technologies, infrared network signals cannot penetrate walls or other obstructions and work only with a direct line of sight.

Due to its short-range communication system, the use of an infrared communication system in one room will not be affected by the use of another system in the next room. This is why using an infrared TV remote control in our home will not interfere with the use of our neighbour's infrared TV remote control.

**DO YOU KNOW?** They also operate in diffuse mode, also called scatter mode. This means that the source and destination are not directly visible to each other. An example is a television remote-control box. The box does not have to be pointed directly at the set, although the box must be in the same room as the set, or just outside the room with the door open.

**DO YOU KNOW?** Line-of-sight transmission is a characteristic of electromagnetic radiation which means waves will travel in a direct path from the source to the receiver.



*Figure 14.15 Line of Sight*

## Wi-Fi

Wi-Fi is a low-cost wireless communication technology. A WiFi setup consists of a wireless router which serves a communication hub, linking portable device with an internet connection. This network facilitates connection of many devices depending on the router configuration. These networks are limited in range due to the low power transmission, allowing the user to connect only in the close proximity.



*Figure 14.16 wifi*

**DO YOU KNOW?** Bluetooth is designed to connect two devices directly together by pairing them so they can communicate, usually for the purposes of relaying information (like sound or instructions) from one device to the other. The distance to which they will be able to connect is only short, usually several feet, while the range of Wi-Fi is greater.

Wi-Fi is generally used to connect many devices to one central device, typically a Wi-Fi enabled router, most often for the purposes of accessing the Internet. Wi-Fi is considered more stable and performs better when connecting for longer periods of time and transferring larger amounts of data.

## Radio link

- A radio link is a wireless connection (also called wireless Point-to-Point connection) between two nodes, or

- radio units, in a data network.
- Each radio unit consists of a transceiver (a device that can both send and receive communication) and a highly directive antenna. The antenna only emits or receives power in the direction it is pointing.
  - The two radio units are mounted and are directed towards each other with no obstacles, such as buildings, in between them that can hinder or disturb the transmission.
  - As the connection is very directive it enables very high signal to noise ratio and thereby high data rates.
  - The primary downside is that radio links require direct so called line-of-sight for optimum performance. Compared to fibre the connection is less stable as bad weather can interrupt the connection, in particular at higher frequencies.

### Microwave Link

- Microwave is a line-of-sight wireless communication technology that uses high frequency beams of radio waves to provide high speed wireless connections that can send and receive voice, video and data information.
- One of the reasons microwave links are so adaptable is that they are broadband.
- They require no equipment or facilities between the two terminal points, so installing a microwave link is often faster and less costly than a cable connection.

- Microwaves are also able to penetrate rain, fog and snow, which means bad weather doesn't disrupt transmission.

### Satellite link

- Satellite communication is one of the wireless technologies, used to transfer the signals from the transmitter to a receiver with the help of satellites.
- It is widely spread all over the world allowing users to stay connected virtually anywhere on the Earth.
- The Satellites used in this mode of communication, communicate directly with the orbiting satellites via radio signals.
- The process of satellite communication begins at an earth station. Here an installation is designed to transmit and receive signals from a satellite in orbit around the earth.
- The transmission system from the earth station to the satellite through a channel is called the **uplink**. The system from the satellite to the earth station through the channel is called the **downlink**.

#### Workshop-4

Identify the ways of pairing a mobile phone with other one using Bluetooth technology.

### 14.6. Network devices

Network devices are components used to connect computers or other electronic devices together so that they can share files or resources.

#### 14.6.1. Hub

It is a common connection point for devices in a network. It joins together the workstations, printers, and servers on a network to communicate with each other. Each hub has a number of ports that connect it to the other devices via a network cable. A hub connects all the devices on its ports together. When data arrives at one port, it is sent to the other ports so that all the devices can see all the information, commonly called **packets**.

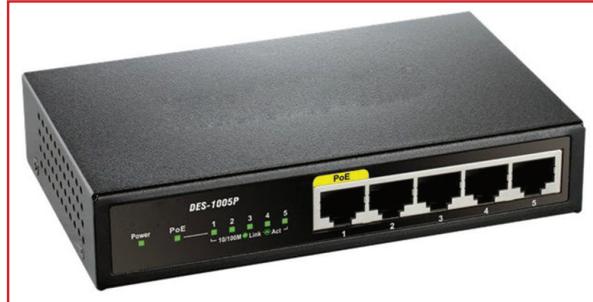


Figure 14.17 Hub

#### Switch

A **switch** is a hardware device that filters and forwards network packets. A network switch also connects computers to each other, like a hub. When a switch receives a packet of data, it determines what computer or device the packet is intended for and sends it to that computer only. It does not broadcast the packet to all computers as a hub. For this reason alone, switches are usually preferred over a hub.



Figure 14.18 Switch

#### Repeater

Repeaters remove the unwanted noise in an incoming signal. It increases a signal's strength, so it can be transmitted and received over a greater distance without loss in quality. Network repeaters receive and retransmit incoming electrical, wireless or optical signals.

Whenever a repeater receives a signal through one of its ports, it repeats or sends the incoming signal onto the other port. Its main use is to amplify and regenerate signals.



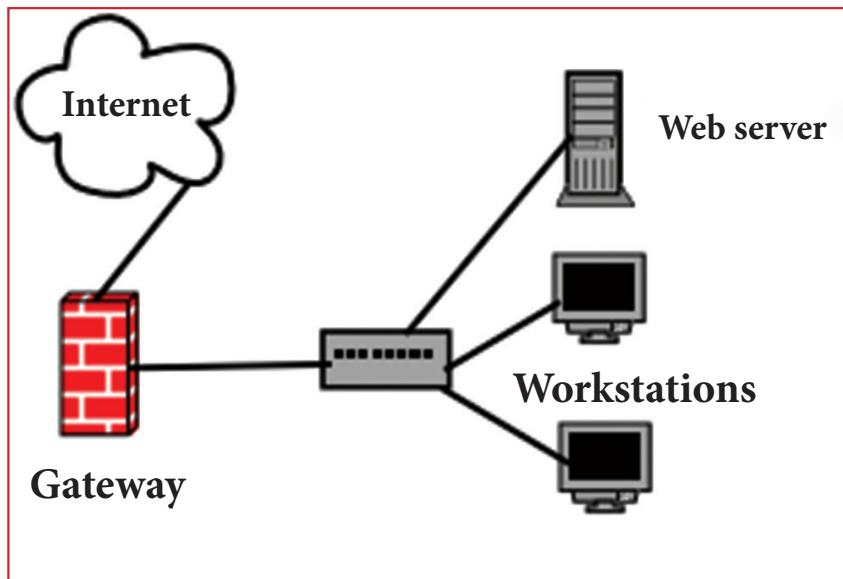
*Figure 14.19 Repeater*

## Gateway

A network gateway joins two networks so the devices on one network can communicate with the devices on another network. Gateways serve as the entry and exit point of a network. For basic Internet connections at home, the gateway is the Internet Service Provider that gives you access to the entire Internet.

A gateway is often associated with a router. Routers can be gateways because a router can control the path through which information is sent in and out.

The default gateway is the machine IP number that you need to access to get to the rest of the network or the Internet.



*Figure 14.20 Gateway*

## 14.7. Identifying computers and users over a network

### 14.7.1. Basic concept of domain name

- A domain name is a unique name that identifies a website. Each website has a domain name that serves as an address, which is used to access the website. For example, "google.com" is a domain name.

- Whenever you visit a website, the domain name appears in the address bar of the web browser. Some domain names are preceded by "www" (which is not part of the domain name), while others omit the "www" prefix.
- All domain names have a domain suffix, such as .com, .net, or .org. The domain suffix helps identify the type of website the domain name represents. There are only a limited number of such domains. For example:

- gov - Government agencies
- edu - Educational institutions
- org - Organizations (nonprofit)
- mil - Military
- com - commercial business
- net - Network organizations
- ca - Canada
- th - Thailand

Domain names are relatively cheap to register, though they must be renewed every year or every few years. Anyone can register a domain name, so you can purchase a unique domain name for your blog or website.



When you access a website, the domain name is actually translated to an IP address, which defines the server where the website is located. This translation is performed dynamically by a service called DNS.

## MAC Address

- MAC stands for "Media Access Control".
- A MAC address is a hardware identification number that uniquely identifies each device on a network.

## IP address

- IP stands for "Internet Protocol." An IP address, is a unique address that identifies a device on the Internet or a local network.



A valid IP address must be in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255. IPv6 is the sixth revision to the Internet Protocol and the successor to IPv4. It functions similarly to IPv4 in that it provides the unique, numerical IP addresses necessary for Internet-enabled devices to communicate. It utilizes 128-bit addresses. IPv4 uses 32 bits for its Internet addresses.

## Workshop-5

Write down the IP address of the PCs used in your computer laboratory.

## 14.8. Wireless/Mobile Communication

Wireless communications is a type of data communication that is performed and delivered wirelessly. This is a broad term that incorporates all procedures and forms of connecting and communicating between two or more devices using a wireless signal through wireless communication technologies and devices.

### 14.8.1. GSM (Global System for Mobile Communication)

The Global System for Mobile Communications (GSM) is a second generation (2G) standard for mobile networks.

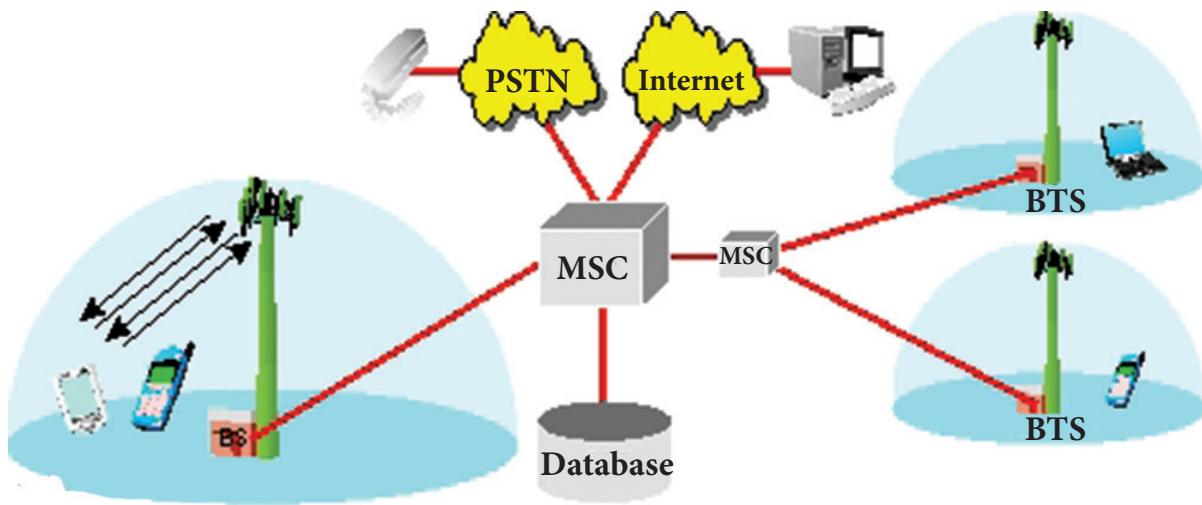


Figure 14.21 GSM Block Diagram

In the early 1980s, a group was formed by the European Telecommunications Standards Institute (ETSI) to develop a digital mobile communication system. Aptly named Groupe Speciale Mobile (GSM), its main task was to develop a single, consistent network for all of Europe and come up with a better and more efficient technical solution for wireless communication.



The GSM standard operates on three different carrier frequencies: the 900 MHz band, which was used by the original GSM system; the 1800 MHz band, which was added to support the swelling number of subscribers and the 1900 MHz frequency, which is used mainly in the U.S.

### CDMA (Code Division Multiple Access)

CDMA (Code-Division Multiple Access) refers to a protocol used in second-generation (2G) and third-generation (3G) wireless communications. Code Division Multiple Access (CDMA) is a sort of multiplexing that facilitates various signals to occupy a single transmission channel. It optimizes the use of available bandwidth. This technology is commonly used in ultra-high-frequency (UHF) cellular telephone systems, bands ranging between the 800-MHz and 1.9-GHz.

### GPRS (General Packet Radio Service)

General Packet Radio Service (GPRS) is a packet-switching communications protocol for cellular networks. Mobile phones that have the GPRS technology can be used to receive data and information, such as web pages and email. GPRS is an "always on" technology which means that the mobile phone is always ready to receive data.

## Other features supported by GPRS include:

- Short Message Service (SMS) – It is a special-purpose communication protocol designed for text messaging
- Multimedia Messaging Service (MMS)
  - It is an extension to SMS to enable transmission of videos in addition to text
- Wireless Application Protocol (WAP)
  - It is a specialized communication protocol for mobile browsers.

## WLL (Wireless Local Loop)

WLL is a system that connects subscribers to the local telephone station wirelessly. Wireless local loop is used for wireless communication links which deliver plain old telephone services or broadband services to customers. This is an ideal application which provides telephone services remotely and is mostly used in developing countries where cable infrastructure is either expensive or speed is not fast. This wireless link can be a part of the connection between the subscribers and switch.

This system is based on radio networks which provide services like telephone in remote areas. Different types of wireless local loop include Broadband Wireless Access, Radio in the Loop, Fixed Radio Access and Fixed Wireless Access.



All 4G service is called 4G or 4G LTE(Long Term Evolution), the underlying technology is not the same with every carrier. Some use WiMax technology for their 4G network, while Verizon Wireless uses a technology called Long Term Evolution, or LTE(Long Term Evolution).

## 14.9. Internet Applications

### 14.9.1. SMS

SMS stands for Short Message Service. It is commonly referred to as "text messaging". It is a service for sending short messages of up to 160 characters (224 characters if using a 5-bit mode) to mobile devices, including cellular phones, smartphones and PDAs.

### Voice Mail System (VMS) and answering Machine

Voice mail system can be thought as a message box for phone user to store voice messages and retrieve it through telephone. User can divert all his calls to his voice mail system when he wishes so.



Figure 14.22 Voice Mail System

Main difference between answer machine and voice mail system is that voice

mail system is a centralized system where voice mail boxes are managed for many users, while answering machine is an independent individual system connected to a telephone line. Many telephone instrument comes with built-in answering machine.

Messages stored in answering machine is played back on the answering machine equipment, cannot be accessed remotely. But voice mail messages can be accessed, listened and managed from anywhere in the world through telephone line.

Answering machine is usually suitable for home use for single line, while voice mail system is more suitable for office use where there are multiple telephone connections as well as extensions through EPABX.



### EPABX Machine

A typical voice mail system operation:

1. A dials B.
- 2 B is unable to attend the call. So call from A gets diverted to voice mail box of B.
3. Caller A hears a greetings from B welcoming him to mailbox of B and asks A to leave/record his voice message after a beep.
4. Once caller A speaks to record his voice message for B, he gets option to hear what he has recorded or hang up.
- 5 Next time whenever B lifts his phone, he gets to hear a message that he has an unheard voice message that can be heard by pressing some key.
6. If B is out of town, B can dial his voice mail box number ( a predefined number connected to voice mail system) to check if new voice mail has arrived. Then he can browse through his voice mails, listens them, delete them.

## E-Mail

E-mail (electronic mail) is the exchange of computer-stored messages by telecommunication. E-mail messages are usually encoded in ASCII text. However, you can also send non-text files, such as graphic images and sound files, as attachments sent in binary streams. E-mail is one of the first uses of the Internet and is still the most popular one. A large percentage of the total traffic over the Internet is e-mail. E-mail can also be exchanged between online service provider users and in networks other than the Internet, both public and private.

## Chat

Chat is a text-based communication that is live or in real-time. For example, when talking to someone in chat any typed text is received by other participants immediately.

## Video Conferencing

A video conference is a live, visual connection between two or more people residing in separate locations for the purpose of communication. At its simplest, video conferencing provides transmission of static images and text between two locations. It provides transmission of full-motion video images and high-quality audio between multiple locations.

For example, a point-to-point (two-person) video conferencing system works much like a video telephone. Each participant has a video camera, microphone and speakers mounted on his or her computer. As the two participants speak to one another, their voices are carried over the network and delivered to the other's speakers and whatever images appear in front of the video camera appear in a window on the other participant's monitor.

Multipoint videoconferencing allows three or more participants to sit in a virtual conference room and communicate as if they were sitting right next to each other.

## 14.10. Network Security Concepts

### 14.10.1. Cyber Law

Cyber law is the part of the overall legal system that deals with the Internet, cyberspace, and their respective legal issues. Cyber law covers a fairly broad area including freedom of expression, access to and usage of the Internet and online privacy. Cyber law has been referred to as the Law of the Internet.



Figure 14.23 Cisco Hardware Firewall

A firewall is a network security system, either hardware- or software-based, that uses rules to control incoming and outgoing network traffic. A firewall acts as a barrier between a trusted network and an untrusted network.

#### Cookies

Cookies are small files which are stored on a user's computer. They are designed to hold a modest amount of data specific to a particular client and website, and can be accessed either by the web server or the client computer.

#### Hacking

Computer hacking refers to the practice of modifying or altering computer software and hardware to accomplish a goal that is considered to be outside of the creator's original objective. Those individuals who engage in computer hacking activities are typically referred to as "hackers."

#### Crackers

A cracker is someone who breaks into someone else's computer system, often on a network; bypasses passwords or licenses in computer programs; or in other ways intentionally breaches computer security.

#### Points to Remember:

- A computer network is an interconnection of various computers
- ARPANET was established by the Advanced Research Projects Agency (ARPA) in 1969
- World Wide Web was created by Timothy Berners Lee in 1989 at CERN in Geneva.
- Web page is a document available on World Wide Web
- Web Browser is an application software that allows us to view and explore information on the web
- Web server is a computer where the web content is stored. Basically web server is used to host the web sites
- Internet is a world-wide global system of interconnected computer networks.

- Network Topology is the schematic description of a network arrangement, connecting various nodes (sender and receiver) through lines of connection.
- A personal area network, or PAN, is a computer network that enables communication between computer devices
- A Local Area Network is a privately owned computer network covering a small Networks geographical area, like a home, office, or groups of buildings e.g. a school Network
- MANs are usually owned by large organizations to interconnect its various branches across a city.
- Computers connected to a Wide Area Networks are often connected through public networks
- A fibre-optic cable is made of glass or plastic and transmits signals in the form of light.
- The term wireless refers to the communication or transmission of information over a distance without requiring wires, cables or any other electrical conductors.
- Bluetooth is used to connect different electronic devices wirelessly to a system for transferring and sharing data.
- Infrared technology is a type of wireless communication technology to transfer data between two infrared enabled devices through infrared radiation.
- A WiFi setup consists of a wireless router which serves a communication hub, linking portable device with an internet connection.
- Hub is a common connection point for devices in a network.
- A switch is a hardware device that filters and forwards network packets.
- Repeaters remove the unwanted noise in an incoming signal.
- Gateways serve as the entry and exit point of a network.
- A domain name is a unique name that identifies a website.
- MAC stands for "Media Access Control" Address.
- IP stands for "Internet Protocol." An IP address, is a unique address that identifies a device on the Internet or a local network.
- Wireless communications is a type of data communication that is performed and delivered wirelessly.
- The Global System for Mobile Communications (GSM) is a second generation (2G) standard for mobile networks.
- CDMA (Code-Division Multiple Access) refers to a protocol used in second-generation (2G) and third-generation (3G) wireless communications.
- General Packet Radio Service (GPRS) is a packet-switching communications protocol for cellular networks.
- WLL is a system that connects subscribers to the local telephone station wirelessly.
- Voice mail system can be thought as a message box for phone user to store voice

messages and retrieve it through telephone.

- A video conference is a live, visual connection between two or more people residing in separate locations for the purpose of communication.
- Cyber law is the part of the overall legal system that deals with the Internet, cyberspace, and their respective legal issues.
- A firewall is a network security system, either hardware- or software-based, that uses rules to control incoming and outgoing network traffic.
- Cookies are small files which are stored on a user's computer.
- A cracker is someone who breaks into someone else's computer system



### Student Activity

1. Identify the type of network in your computer lab.
2. Analyse the type of wired technologies in the computer lab.
3. Prepare a report on the types of cables used in your school. (Include the image of the cables in the report)
4. How will you change your computer's IPv4 address? Write the steps.
5. Identify 10 domain names of famous educational websites.



### Teacher Activity

1. The teacher should make the students to go to the lab for explaining the following concepts:
  - a. Network Topologies
  - b. Types of Networks
  - c. Wired Technologies
  - d. Wireless Technologies
  - e. Network devices
2. The teacher can prepare a PPT for the same and explain the concepts.
3. The teacher can make use of real objects like types of cables, network devices to explain those concepts.
4. The teacher should demonstrate how to set/change the IPv4 address.

## Evaluation



### Part I

Answer the correct answer

1. Which one of the following is not used in media access control?  
A) ethernet                      B) digital subscriber line  
C) fiber distributed data interface D) none of the mentioned
2. Which is the first network used to exchange information?  
A) CNNET                      B) NSFNET                      C) ASAPNET                      D) ARPANET
3. Which of the following type of network contains Bluetooth as its example?  
A) personal area network              B) local area network  
C) virtual private network              D) none of the mentioned
4. Identify the device that forwards packets between networks by processing the routing information included in the packet.  
A) bridge                      B) firewall                      C) router                      D) all of the mentioned
5. Your company has a LAN in its downtown office and has now set up a LAN in the manufacturing plant in the suburbs. To enable everyone to share data and resources between the two LANs, what type of device(s) are needed to connect them? Choose the most correct answer.  
A) Modem                      B) Cable                      C) Hub                      D) Router
6. Identify the data communication system within a building or campus.  
A) LAN                      B) WAN                      C) MAN                      D) None of the mentioned
7. Identify the twisted pair cable in which metal casing improves penetration of noise or crosstalk.  
A) insulated twisted pair cable              B) Shielded twisted pair cable  
C) Unshielded twisted pair cable              D) Both A & B
8. ASCII stands for -----  
A) American Standard Code for Information Interchange  
B) American Scientific Code for International Interchange  
C) American Standard Code for Intelligence Interchange  
D) American Scientific Code for Information Interchange
9. Read the statements and identify the correct option.  
Statement A: Voice mail system is a centralized system where voice mail boxes are managed for many users.  
Statement B: voice mail messages can be accessed, listened and managed from anywhere in the world through telephone line.  
A) Statement A is correct                      B) Statement B is correct  
C) Both the statements are correct              D) None of them

10. Identify the network security system that uses rules to control incoming and outgoing network traffic.
- A) Firewall      B) Cookies      C) Hacking      D) Crackers

## Part II

### Answer to all the questions (2 Marks)

1. Define Computer network.
2. What is electronic commerce?
3. What is spamming?
4. What do you understand by the term node in computer networks?
5. Differentiate 3G and 4G communication.

## Part III

### Answer to all the questions (3 Marks)

1. Differentiate Web page, Web browser and a Web Server.
2. Switches are usually preferred over a hub. Why?
3. Write short notes on the following: a) Hub b) Switch c) Gateway
4. Draw an outline for the following: a) Coaxial Cable      b) Fiber Optic Cable
5. Write the specific functions of a) Subscriber Channel (SC)      b) Straight-Tip (ST) c) MT-RJ connector

## Part IV

### Answer to all the questions (5 Marks)

1. Define Topology. Explain different topologies using schematic diagram.
2. Explain the types of computer networks based on its size, distance and the structure.
3. Define wired technology. Explain the common types of bounded media in the data transmission.
4. Mention the types of wireless technologies we are using. Write in brief on each of them.
5. Explain the applications of internet.

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## GLOSSARY

<b>Routers</b>	<i>Routers are small electronic devices that join multiple computer networks together via wired or wireless connections.</i>
<b>World Wide Web (www)</b>	<i>The World Wide Web is an information space where documents and other web resources are identified by Uniform Resource Locators (URLs).</i>
<b>MILNET</b>	<i>Military network was the name given to a network that split off from ARPANET in 1983 to create an internetwork designated for use by the U.S. Department of Defense. MILNET later became part of the DoD Defense Network (DDN).</i>
<b>NSFNET</b>	<i>The National Science Foundation Network (NSFNET) was a program of coordinated, evolving projects sponsored by the National Science Foundation (NSF).</i>
<b>HTTP</b>	<i>HTTP (Hypertext Transfer Protocol) is the set of rules for transferring files (text, graphic images, sound, video, and other multimedia files) on the World Wide Web.</i>
<b>MTRJ Connector</b>	<i>MT-RJ stands for Mechanical Transfer Registered Jack. MT-RJ is a fiber-optic Cable Connector that is very popular for small form factor devices due to its small size.</i>
<b>RJ 45 Connector</b>	<i>A registered jack (RJ) is a standardized physical network interface for connecting telecommunications or data equipment. RJ 45 is an 8-pin/8-position plug or jack and is commonly used to connect computers onto Ethernet-based local area networks (LAN).</i>
<b>GSM (Global System for Mobile Communication)</b>	<i>GSM (Global System for Mobile Communications) is a standard developed by the European Telecommunications Standards Institute (ETSI)</i>
<b>wireless communication.</b>	<i>Wireless communication, is the transfer of information or power between two or more points that are not connected by an electrical conductor. The most common wireless technologies use radio waves.</i>
<b>CDMA (Code Division Multiple Access)</b>	<i>Code-division multiple access (CDMA) is a channel access method used by various radio communication technologies.</i>
<b>GPRS (General Packet Radio Service)</b>	<i>General Packet Radio Service (GPRS) is a packet oriented mobile data service on the 2G and 3G cellular communication system's global system for mobile communications(GSM).</i>

## Introduction to Internet and Email

### Learning Objectives

To know the

- Necessity of Internet in Commerce
- Types of Network available
- Services available in Internet
- Applications of Internet
- Difference between Internet, Intranet and extranet
- Difference between Webpage and Website
- Difference between Static and Dynamic Webpage
- Difference between Browser and Search engine
- Do's and don't of safe Surfing on Internet

#### 15.1 Necessity of Internet

It is important to understand what a network is and the importance of network. Simply put, a network is a collection of interconnected devices (such as computers, printers, etc.). To understand the importance of networks, let us look at how things worked before networks were created. For this, consider a large multinational company that sells food products in a time when networks did not exist.



Let us call this company Sri Mother International Ltd. Imagine the amount of information such as sales, inventory, etc. required by the management of the company to make everyday decisions. To get this information they will need to call their local offices. Their local offices will need to mail or fax printed reports or even send media (floppies!) through the postal service. By the time the mail is received, the data is already days old. Even if reports are faxed, it will be a cumbersome task to consolidate all reports. This task also increases chance of human error since large numbers of reports are manually collated. This is just one part of the equation. You also need to consider the information required by the local offices. They also need various data from the head office and other offices around the world.

Now consider the same company, but in the present time with all their offices interconnected. They would use a single application around the world that takes advantage of their global network. The data from all offices would be instantly stored at the central location and with a single click, the management team can see data from around the world in any format they like. This data would also be real-time. This means that they see it, as its happening. Since the data is centralized, any office location can see data pertaining to any location.

As you can see, the cost, time and effort involved in transferring data was

much higher without networks. So networks decrease cost, time, and effort and thereby increase productivity. They also help in resource optimization by helping to share resources. A simple example of resource sharing is a printer, shared between many different computers in a typical office.

## 15.2 INTERNET And WWW

Several networks, small and big all over the world, are connected together to form a Global network called the internet. The internet uses TCP/IP(Transmission Control Protocol/ Internet Protocol ) to transmit data via various types of media. .The internet protocol (IP) addressing system is used to keep track of the millions of users. Each computer on net is called as **host**. The internet is the most cost-effective method of communications in the world. Examples of few services available are:

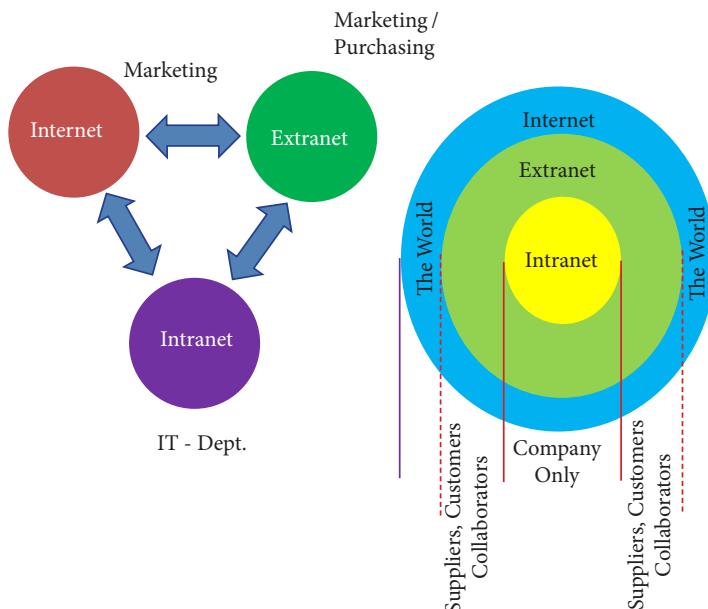


Figure 15.1

The **Internet** works by using a protocol called TCP/IP. TCP/IP allows one computer to talk to another computer via the Internet through compiling packets of data and sending them to right location.

An extranet is a private network that uses Internet technology and the public telecommunication system to securely share part of a business's information or operations with suppliers, vendors, partners, customers, or other businesses.

An Intranet is a website used by organizations to provide a place where employees can access company information (eg policies, procedures, staff, directory, department info), tools (quick links to common apps, forms etc.) and (collaborate (to social sharing tools similar facebook)).

- Email
- Web-enabled audio/video conferencing services
- Online movies and gaming
- Data transfer/file-sharing, often through File Transfer Protocol (FTP)
- Instant messaging
- Internet forums
- Social networking
- Online shopping
- Financial services

#### 15.2.1 Domain Name

It is a name or an identity which become a online identity and can be access by the web browser when connected to internet.

Table: 15.1

Generic Domain Name	Description
.com	Commercial Organisation
.gov	Government institution
,org	Non-profit Organisation
.net	Network Support Group
.edu	Educational Institution



The heart of intranets and the internet is called as the **Domain Name System(DNS)**, the way computers can contact each other and do things such as exchange electronic mail or display Web pages. The Internet Protocol (IP) uses this Internet address information and the DNS to deliver mail and other information from computer to computer

Table: 15.2

Country Level Domain Name	Description
.in	India
.au	Australia
.us	United States of America
.jp	Japan
.ru	Russia
.sg	Singapore

### 15.2.2 What is URL?

Every server on the internet has an IP number, a unique number consisting of four parts separated by dots. The IP number is the server's address

165.113.245.2

128.143.22.55



Figure 15.2

At times the number keeps changing hence it is harder for people to remember number than to remember word combinations. So, addresses are given "word-based" addresses called URL. The URL and the IP number are one and the same.



A URL is an address that shows where a particular page can be found on the World Wide Web. URL is an abbreviation for '**Uniform Resource Locator (URL)**'.

### 15.2.3 Who Governs the Internet?

One of the most frequently asked questions about the internet is, "Who runs it?" The truth is that no centralized management of the internet exists.



ICANN was created on September 18, 1998, and incorporated on September 30, 1998, in the US State of California. It is headquartered in the Playa Vista neighborhood of Los Angeles.

The internet as a whole does not have a single controller. But the internet society, which is a voluntary membership organization, takes the responsibility to promote global information exchange through the internet technology. Internet Corporation for Assigned Names and Numbers( ICANN) administers the domain name registration. It helps to avoid a name which is already registered.

### 15.3.4 What is W3C?

W3C stands for "World Wide Web Consortium." The W3C is an international community that includes a full-time staff, industry experts, and several member organizations. These groups work together to develop standards for the World Wide Web.

The World Wide Web Consortium (W3C) is an international organization committed to improving the web. It is made up of several hundred member organizations from a variety of related IT industries. W3C sets standards for the World Wide Web (WWW) to facilitate better communication ability and cooperation among all web stakeholders. It was established in 1994 by the **creator of the WWW**, Tim Berners-Lee.

## 15.3 Types of Internet Service

Here are some common types of Internet service.

### **Wireless**

Radio frequency bands are used in place of telephone or cable networks. One of the greatest advantages of wireless Internet connections is the "always-on" connection that can be accessed from any location that falls within network coverage. Wireless connections are made possible through the use of a modem, which picks up Internet signals and sends them to other devices.

### **Mobile**

Many cell phone and smartphone providers offer voice plans with Internet access. Mobile Internet connections provide good speeds and allow you to access the Internet.

### **Hotspots**

Hotspots are sites that offer Internet access over a wireless local area network (WLAN) by way of a router that then connects to an Internet service provider. Hotspots utilize Wi-Fi technology, which allows electronic devices to connect to the Internet or exchange data wirelessly through radio waves. Hotspots can be phone-based or free-standing, commercial or free to the public.

### **Broadband**

This high-speed Internet connection is provided through either cable or telephone companies. One of the fastest options available, broadband Internet uses multiple data channels to send large quantities of information. The term broadband is shorthand for broad bandwidth. Broadband Internet connections such as DSL and cable are considered high-bandwidth connections. Although many DSL connections can be considered broadband, not all broadband connections are DSL.

### **DSL**

DSL, which stands for Digital Subscriber Line, uses existing 2-wire copper telephone line connected to one's home so service is delivered at the same time as landline telephone service. Customers can still place calls while surfing the Internet.

### **Cable**

Cable Internet connection is a form of broadband access. Through use of a cable modem, users can access the Internet over cable TV lines. Cable modems can provide extremely fast access to the Internet.

### **Satellite**

In certain areas where broadband connection is not yet offered, a satellite Internet option may be available. Similar to wireless access, satellite connection utilizes a modem.

### **ISDN**

ISDN (Integrated Services Digital Network) allows users to send data, voice and video content over digital telephone lines or standard telephone wires. The installation of an ISDN adapter is required at both ends of the transmission—on the part of the user as well as the Internet access provider.

## Dongles / Data Card

Today, many dongles provide wireless capabilities. For example, USB Wi-Fi adapters are often called dongles. Since most computers now have built-in Wi-Fi chips, mobile data adapters, such as 3G and 4G dongles, are more prevalent. These types of dongles allow to connect to the Internet even when Wi-Fi is not available.

### Comparison between Data Card and Dongle

Dongle	Data Card
Refers to any removable component used for enabling extra security. USB Dongles can be divided into <ul style="list-style-type: none"><li>• WiFi Dongles</li><li>• BlueTooth Dongle</li><li>• Memory Dongle</li></ul>	It is a removable electronic card which is used for storing data. Types of datacard are <ul style="list-style-type: none"><li>• Expansion Card</li><li>• Memory Card or Flash Card</li><li>• Identification Card</li></ul>

### 15.3.1 Internet Connection and Access Methods

There are several ways or methods of connecting to the Internet.

There are two access methods direct and Indirect and these can be either fixed or mobile.

#### 15.3.1.1 Indirect Access

This is most common method used in home and office networks.

The device e.g. computer connects to a network using Ethernet or WiFi and the network connects to the Internet using Asymmetric digital subscriber line (ADSL) or fibre.

#### 15.3.1.2 Direct Access

This is most common method used when travelling.

The device e.g. smart phone connects directly to the Internet using 3G/4G mobile networks or public Wi-Fi.

There are two ways to look for the information on the web.

1. If the URL of the website is known, enter it on the address bar.
2. If the URL is not known, then “Search Engines” will help us to get the information.

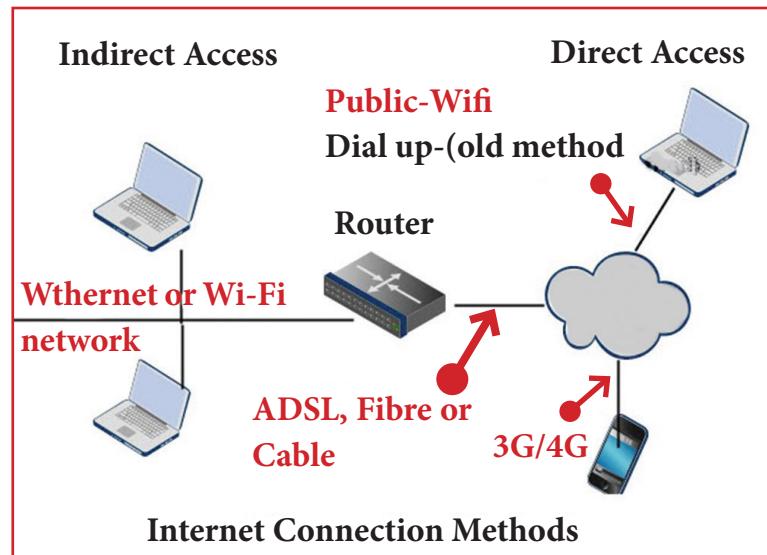


Figure 15.3

A search engine is a software system that is designed to search for information on the World Wide Web.

Examples of popular search engines are Yahoo, Lycos, Altavista, Hotbot, Google and Askjeeves.

1. A browser is used to access websites and web pages whereas a search engine is used to search for particular information.
2. Internet Explorer, Chrome, Firefox, Safari, and are the most popular web browsers while Google and Yahoo are the most popular search engines.
3. A browser is used to access the Internet whereas in order to open a search engine you need a browser.

The list of content returned via a search engine to a user is known as a search engine results page (SERP).

#### 15.4 Internet Applications

##### **1. Internet telephony using VoIP (Voice-over-Internet Protocol) Example Skype**

- |                                |                                                                                                                                                                                                                     |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2. Job search</b>           | :Nowadays, many people search for their jobs online using naukri.com,monster.com, recruitmentindia.com etc as it is quicker .                                                                                       |
| <b>3. Online Shopping</b>      | :The internet has also facilitated the introduction of a new market concept consisting of virtual shops. For example amazon.com                                                                                     |
| <b>4. Stock market updates</b> | :- Selling or buying shares sitting on computer through internet. Several websites like ndtvprofit.com, moneypore.com, provide information regarding investment                                                     |
| <b>5. Travel</b>               | :- One can use internet to gather information about various tourist place .it can be used for booking Holiday tours. Some of the web sites providing this service are goibibo.com, makemytrip.com, olacabs.com.     |
| <b>6. Research</b>             | :-Research papers are present online which helps in the researcher doing a literature review                                                                                                                        |
| <b>7. Video conferencing</b>   | :- It enables direct face-to-face communication across networks via web cameras, microphones, and other communication tools.                                                                                        |
| <b>8. e-commerce</b>           | :- e-commerce (electronic commerce or EC) is the buying and selling of goods and services, or the transmitting of funds or data, Largest e-commerce companies in India are Flipkart, Snapdeal, Amazon India, Paytm. |
| <b>9. Online payments</b>      | :- The rising boom of online payments in India has given way to many new entrants in the industry such as Paytm etc who are majorly wallet driven payment companies.                                                |

- 10. Social Networking** :- Social networking is the use of internet-based social media programs to make connections with friends, family etc. Examples of social networking includes Facebook
- 11. Voicemail** :- Voicemail is a system of sending messages over the phone.
- 12. Chatting** :- On the Internet, chatting is talking to other people who are using the Internet at the same time you are.
- 13. e-banking** :- e-banking (Online banking) , also known as internet banking, it is an electronic payment system that enables customers of a bank or other financial institution to conduct a range of financial transactions through the financial institution's website. The online banking system will typically connect to or be part of the core banking system operated by a bank and is in contrast to branch banking which was the traditional way customers accessed banking services.
- 14. e-learning** :- e-Learning are courses that are specifically delivered via the internet to somewhere other than the classroom where the professor is teaching. It is not a course delivered via a DVD or CD-ROM, video tape or over a television channel

e-learning is utilizing electronic technologies to access educational curriculum outside of a traditional classroom. It is a program delivered completely online. E-learning is interactive in that you can also communicate with teachers, professors or other students in a class. There is always a teacher/ professor interacting/ communicating, grading participation, giving assignments and conducting tests.

**15. E-governance** :- Electronic governance or e-governance is the application of information and communication technology (ICT) for delivering government services.

#### **Benefits of E-governance**

- Reduced corruption
- High transparency
- Increased convenience
- Reduction in overall cost.
- Expanded reach of government

#### 15.5 Email

Electronic mail or email is information stored on a computer that is exchanged between two users over telecommunications. Email is a message that may contain text, files, images or any other attachments sent through a network to a specified individual or group of individuals



The **first mail** was sent by **Ray Tomlinson** in 1971 as a test e-mail message containing the text like “QWERTYUIOP”

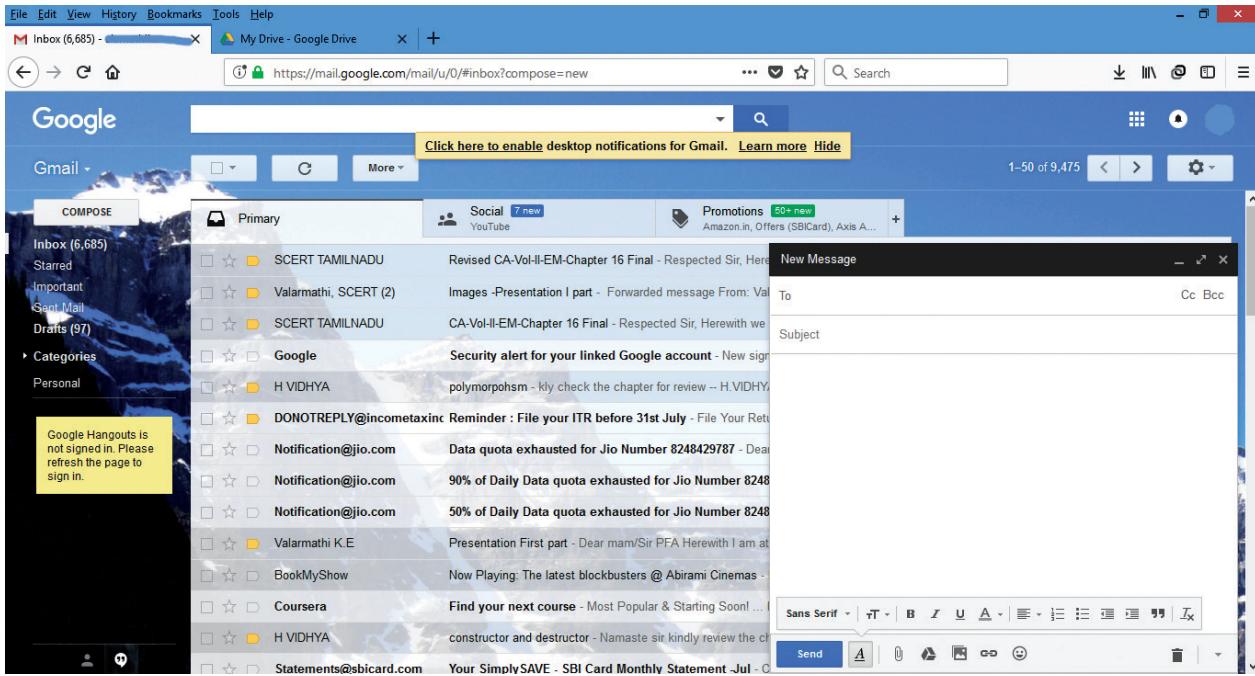


Figure 15.4

### 15.5.1 Structure of email

Click the **Compose** button and then writing an e-mail contents

**When sending an e-mail message, several fields are required to be filled:**

- The **To** field is where you type the e-mail address of the person who is the recipient of your message.
- The **From** field should contain your e-mail address.
- If you are replying to a message, the To and From fields are automatically filled out; if it's a new message, you'll need to enter them manually.
- The **Subject** should consist of a few words describing the e-mail's contents. The Subject lets the recipient see what the e-mail is about, without opening and reading the full e-mail. This field is optional.
- The **CC (Carbon Copy)** field allows you to specify recipients who are not direct addressees (listed in the "To" field). This field is optional.
- The **BCC (Blind Carbon Copy)** field is similar to CC, except the recipients are secret. Each BCC recipient will receive the e-mail, but will not see who else received a copy. The addressees (anyone listed in the "To" field) remain visible to all recipients. This field is optional.
- Finally, the **Message Body** is the location you type your main message. It often contains your signature at the bottom; similar to a hand-written letter.

### 15.5.2 Advantages of email

Some of the main advantages of email are listed below.

- **Free delivery** - Sending an e-mail is virtually free, outside the cost of Internet service. There is no need to buy a postage stamp to send a letter.
- **Global delivery** - E-mail can be sent to nearly anywhere around the world, to any country.
- **Instant delivery** - An e-mail can be instantly sent and received by the recipient over the Internet.
- **File attachment** - An e-mail can include one or more file attachments, allowing a person to send documents, pictures, or other files with an e-mail.
- **Long-term storage** - E-mails are stored electronically, which allows for storage and archival over long periods of time.
- **Environmentally friendly** - Sending an e-mail does not require paper ( Paperless ), cardboard, or packing tape, conserving paper resources.

### 15.5.3 What is sent in an email

In addition to text messages being sent over e-mail, it is also possible to attach a file or other data in an e-mail. For example, an attachment could be a picture, PDF, word processor document,, or any file stored on the computer.

## 15.6 Internet Threat

It's a dangerous world out there in the World Wide Web. Just as your mother may have told you to never talk to strangers, the same advice holds true for the virtual world. You may know to be wary of giving strangers your business bank account details. But can you be sure the website you're logging into is that of your bank and not a forgery created by a cybercriminal? Cybercriminals use many different methods to lure you into parting with your confidential personal or business information. Hence you ought to be aware of the issues and be extra vigilant when online and offline..

**Computer virus:** A computer virus is a small piece of software that can spread from one infected computer to another. The virus could corrupt, steal, or delete data on your computer—

**Malware:** Malware is short for “malicious software.” Malware is used to mean a “variety of forms of hostile, intrusive, or annoying software or program code.” Malware could be computer viruses, worms, Trojan horses, dishonest spyware, and malicious rootkits—all of which are defined below.

**Trojan horse:** Users can infect their computers with Trojan horse software simply by downloading an application they thought was legitimate but was in fact malicious.

**Malicious spyware:** Malicious spyware is used to describe the Trojan application that was created by cybercriminals to spy on their victims.

**Computer worm:** A computer worm is a software program that can copy itself from one computer to another, without human interaction.

**Botnet:** A botnet is a group of computers connected to the Internet that have been compromised by a hacker using a computer virus or Trojan horse. An individual computer in the group is known as a “zombie” computer.

**Spam:** Spam in the security context is primarily used to describe email spam. Unwanted

messages in your email inbox. Spam, or electronic junk mail, is a nuisance as it can clutter your mailbox as well as potentially take up space on your mail server.

**Phishing:** Phishing scams are fraudulent attempts by cybercriminals to obtain private information. Phishing scams often appear in the guise of email messages designed to appear as though they are from legitimate sources. For example, the message would try to lure you into giving your personal information by pretending that your bank or email service provider is updating its website and that you must click on the link in the email to verify your account information and password details.

**Rootkit:** A rootkit is a collection of tools that are used to obtain administrator-level access to a computer or a network of computers. A rootkit could be installed on your computer by a cybercriminal exploiting a vulnerability or security hole in a legitimate application on your PC and may contain spyware that monitors and records keystrokes.

## 15.7. Browsers

Looking for information on the internet is called **surfing or browsing**. To browse the internet, a software called the **web browser or browser** is used.

E-commerce, social media, and many other things we take for granted today would be impossible without internet browsers. Web browsers translates HTML documents of the website and allows to view it on the screen.

### 15.8.1 Familiar Internet Browser

1. **Google Chrome** is a freeware familiar web browser **developed by Google Inc.** It is best for its speed, simplicity, security, privacy and customization features. Google Chrome supports on Android 4.0 or higher, iOS 6.0 or higher, Mac OSX 10.6 or higher and Windows (XP sp2 or higher) and Linux system.
2. **Mozilla Firefox** is a free and open source web browser **developed by Mozilla Foundationand Mozilla Corporation.** FireFox is **default browser in Ubuntu** . It supports Windows, Mac OS X, Linux and Android system.
3. **Internet Explorer** commonly known as Microsoft Internet Explorer or Windows Internet Explorer is the first or default browser for a Windows PC. It is **developed by Microsoft.**
4. **Safari** is a web browser **developed by Apple Inc.** and comes with OS X and iOS. Some version of safari browser also supports in Windows Operating System. **Exclusively used in Apple Mac system.**

## 15.8 Web Page Vs Web Site

### Websites

A website is a collection of webpages. For example if there is a company that owns sricompany.com then this website will have several Webpages like Home, About Us, Contact Us, Testimonials, Products, Services, FAQ's, and others. The first page of the website is called a Home Page. All of these pages together make up a Website.

## Web Pages

A webpage is a page of a Website. A web page can be accessed by a URL in a browser and that page can be copied and or send to a friend for review whereas websites are collections of multiple pages that must be navigated to view other content.

A webpage is a page of a Website. Every page has a unique address called the Uniform Resource Locator (URL). The URL locates the pages on the internet.

### Difference between Webpage and Website

Webpage	Website
Consists of a single document displayed by a browser	A collection of multiple documents displayable by a browser
Shares a unique domain name	Has its own unique domain name
Makes up a website	Contains one or more webpages

### 15.9 Static and Dynamic Web Pages

Web pages are classified as Static and Dynamic Webpages

Web pages are called Static websites as they remain the same whenever it is visited. Examples of static Websites are website owned by Small business organizations, School websites etc.

Websites that display marks of Public Examinations and Entrance Exams changes when different register numbers are given. Such websites are called as Dynamic Websites. Eg., Websites of Government and Entrance Exams.

### Comparison of Static and Dynamic Web Pages

Static Web Page	Dynamic Web Page
The content and layout of a web page is fixed	The content and layout may change during run time
Static Web pages never use databases	Databases is used to generate dynamic content through queries
Static web pages directly run on the browser and do not require any server side application program	Dynamic web pages runs on the server side application programs and displays the results
Static Web pages are easy to develop	Dynamic web page development requires programming skills

### 15.10 Safe Surfing on Internet

As a great reminder that Internet security is something that needs constant vigilance. It's also a great reminder that a lot of things can happen on the Internet if you don't properly take precautions against them. With that in mind, be sure to have a safe and happy Safer Internet Day.

## **SAFER INTERNET DAY**

Safer Internet Day (SID) 2018 is celebrated around the world in February of every year with a theme of "Create, connect and share respect: A better internet starts with you".

### **Following is the do's and don't of safe Surfing on Internet**

1. Don't give out your personal information – Don't put personal details such as your home address, telephone numbers or parent's work address online as cybercriminals can use this information to create a fake profile with your details
2. What goes online, stays online – Use privacy settings to make sure only your friends and family can see photos you post. Avoid posting holiday plans as criminals have been known to track your movements
3. Check your security and privacy settings – Make sure your social network privacy settings are secured so only your friends can see your personal information and use your privacy settings to restrict who can see your posts, videos and photos
4. Password safety – Sharing your password with your parents is a sensible idea, but avoid sharing your password with your friends, even if they promise they won't tell anyone! Also, when setting your password, make sure it isn't something people may guess such as your pet's name. Use a mixture of letters, numbers and upper and lower case characters
5. Always protect your mobile device – Make sure your mobile phone is pin-protected so all your personal information stored on it is safe. Download a security app which allows you to remotely wipe any personal data, should your mobile be lost or stolen
6. Don't talk to strangers online or offline – Don't meet up with strangers and let your parents know if a stranger has tried to get in contact with you online.
7. Listen to the adults who know – Adults will always be worried about you. Help set their mind at rest and avoid chatting online with strangers.
8. Be wary of unsecured or unknown websites – When shopping online, use reputable and known retailers.
9. Be careful what links you click on – Avoid clicking links in an email, Instant Message or on your social network unless you are sure the message is from someone you know.

Now that we have come to the end of this chapter, the next chapter introduces you to create a web page using html tags.

### **Points to Remember:**

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- The different type of network are LAN, MAN, WAN, PAN, CAN and WLAN
- Two things required for TCP/IP needed are
  - a) Message to transmit
  - b) Means to reliably transmit the message
- Each computer on net is called as host
- Internet Corporation for Assigned Names and Numbers ( ICANN) administers the domain registration to avoid name already registered.
- W3C stands for world wide web consortium.
- Hotspots are sites that offer internet access over wireless local network.
- Video conferencing enables direct face-to-face communication across networks via web cameras, microphones, and other communication tools.
- E-commerce (electronic commerce or EC) is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, primarily the Internet.
- Social networking is the use of internet-based social media programs to make connections with friends, family, classmates, customers and clients.
- Voicemail is a system of sending messages over the phone.
- Email is short for 'electronic mail' similar to a letter, it is sent via the internet to a recipient
- An internet browser, also known as a web browser, is a software program that you can use to access the internet and view web pages on your computer.
- A website is a collection of webpages.
- Dongle refers to removable component used for enabling software protection. E.g. USB, WiFi
- A webpage is a page of a Website.
- E-commerce is the activity of buying or selling of products on online services or over the Internet.
- Electronic governance or e-governance is the application of information and communication technology (ICT) for delivering government services.

## Evaluation



### PART - I

**Choose the correct answer:**

1. What is the expansion of WLAN?  
a) Wireless Local Area Network  
c) Wireless Local Area Netware  
b) Wired local Area Network  
d) Wireless Area Netbande
  
2. Range of Campus Network is  
a) 10 KM                  b) 5 KM  
c) 25 KM                  d) 20 KM
  
3. Each computer on net is called  
a) host                  b) server  
c) workstation            d) node
  
4. The internet is governed by  
a) ICANM                b) ICANN  
c) ICMA                  d) ICNNA
  
5. Expansion of W3C  
a) World Wide Web Consortium  
c) World Web Wide Consortium  
b) Wide World Web Consortium  
d) World Wide Web Consortium
  
6. W3C was established in 1994 by  
a) Tim Berners-Lee  
c) Kim Berners  
b) Tim Burnard Lee  
d) Kim Bernard Lee
  
7. Hotspot uses which type of network services?  
a) LAN                  b) PAN                  c) WLAN                  d) CAN
  
8. USB WiFi adapters are often called as  
a) Data Card            b) Pen Drive            c) Dongles                d) Memory Card
  
9. Looking for information on the internet is called  
a) Surfing              b) Searching            c) Finding                d) glancing
  
10. Safari web browser was developed by  
a) Google                b) Apple                c) Microsoft             d) Linux Corpn.
  
11. How many types of websites are available?  
a) 3                    b) 2                    c) 4                    d) 6

## PART -II

### Answer to the following questions (2 Marks):

1. Name the two important protocols for internet?
2. What is a network?
3. What is the role of ICANN ?
4. What is a search engine?
5. What is a browser?
6. What are the components of url addressing ?
7. What is a website?
8. What is CC and BCC in an email?
9. What is a Static web Page?
10. What is a Dynamic web page?
11. What are the benefits of e-governance?
12. What is Phishing ?

## PART-III

### Answer to the following questions (3 Marks):

1. What is TCP/IP ?



#### Student Activity

Explain the different types of network.

Mention a few internet services you know.

Mention a few Internet Applications other than that is given in the textbook

List some browsers not given in the text book

#### Teacher Activity

Students is taught to develop Static and Dynamic Websites as workshop.



Acronym	Description
VSNL	Videsh Sanchar Nigam Ltd
TCP	Transmission Control Protocol
IP	Internet Protocol
Host	A host is a computer connected to a computer network

<i>ICANN</i>	<i>Internet Corporation for Assigned Names and Numbers</i>
<i>W3C</i>	<i>World Wide Web Consortium</i>
<i>WWW</i>	<i>World Wide Web</i>
<i>Tim Berners-Lee</i>	<i>Creator of WWW</i>
<i>DSL</i>	<i>Digital Subscriber Line</i>
<i>ISDN</i>	<i>Integrated Services Digital Network</i>
<i>URL</i>	<i>Uniform Resource Locator</i>
<i>Dongle</i>	<i>A small device able to be connected to and used with a computer, allowing access to wireless broadband or use of protected software.</i>
<i>ADSL</i>	<i>Asymmetric Digital Subscriber Line</i>
<i>Browser</i>	<i>A browser is software that is used to access the internet Eg. Chrome, FireFox</i>
<i>Search Engine</i>	<i>A search engine is a web-based tool that enables users to locate information on WWW. Eg. Google</i>
<i>SERP.</i>	<i>The list of content returned via a search engine to a user is known as a search engine results page.</i>
<i>Phishing</i>	<i>Phishing scams are fraudulent attempts by cybercriminals to obtain private information</i>
<i>WebSite</i>	<i>Collection of Webpages</i>
<i>WebPage</i>	<i>It is page of Website.</i>
<i>EDI</i>	<i>Electronic Data Interchange</i>
<i>Voice mail</i>	<i>System of sending messages over the phone.</i>
<i>e-commerce</i>	<i>Electronic Commerce, Buying and selling goods and services over an electronic network.</i>
<i>e-governance</i>	<i>Electronic governance. Application of information and communication technology for delivering government services.</i>
<i>Internet</i>	<i>Several networks, small and big all over the world, are connected together to form a Global network called the internet.</i>
<i>Intranet</i>	<i>It is a website used by organizations to provide a place where employees can access company related information.</i>
<i>Extranet</i>	<i>It is a private network using internet technology to share part of business information with suppliers partners and customers.</i>

#### References:

1. Mastering HTML, CSS & JavaScript Web Publishing – Laura Lemay, Rafe Colburn, Jennifer Kyrnin – BPB Publications.

## Tamil Computing



### 16.1 Introduction

“ பிறநாட்டு நல்லறிஞர் சாத்திரங்கள்  
 தமிழ்மொழியிற் பெயர்த்தல் வேண்டும்;  
 இறவாத புகழுடைய புதுநால்கள்  
 தமிழ்மொழியில் இயற்றல் வேண்டும்;  
 மறைவாக நமக்குள்ளே பழங்கதைகள்  
 சொல்வதிலோர் மகிமை இல்லை;  
 திறமான புலமையெனில் வெளிநாட்டோர்;  
 அதை வணக்கஞ் செய்தல் வேண்டும்.”

- மகாகவி பாரதி

Human civilization developed with the innovation of computer in the twentieth century. Computer development began as a early calculating tool and has now become a essential ingredient for gigantic growth for the existence of human life without computers.

It is true that any language will be outdated when it does not have the ability to adapt itself to the changing technologies. Tamil is the living language for thousands of years. Development of modern technologies, does not affect the growth of classical Tamil as it is ready to adopt the growing technological changes. **Tamil is not just a language, it is our identity, our life and our sense.**

“எங்கள் வாழ்வும், எங்கள் வளமும் மங்காத தமிழென்று சங்கே முழங்கு” – புரட்சி கவி.

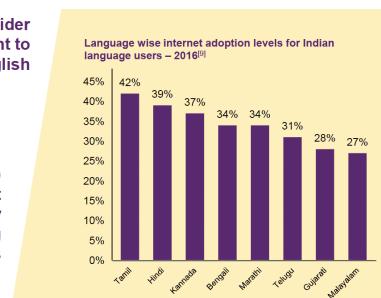
### 16.2 Tamil in Internet

We know that the internet today plays a vital role in every man's life. Internet is the best information technological device, through which we get know only infotmation.

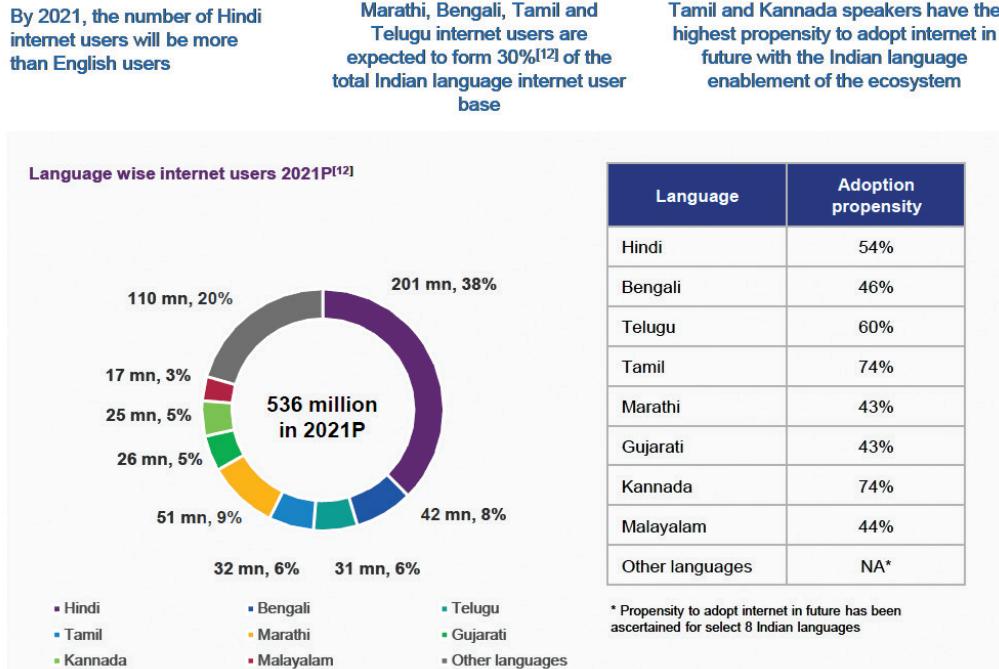
In 2017 a study conducted by KPMG a Singapore based organization along with google, reported that, Tamil topped the list, among the most widely used languages in India, where 42% are using the Internet in Tamil

**68%<sup>[9]</sup> Internet users consider local language digital content to be more reliable than English**

Currently, Tamil (42%) has the highest internet adoption levels followed by Hindi and Kannada among the Indian language users



As per study, by 2021, 74% of people in India will access internet using Tamil and it will be in the top usage of Internet in India.



These statistical data will be useful to improve internet services in Tamil.

### 16.3 Search Engines in Tamil

The “Search Engines” are used to search any information from the cyber space. Although there are many search engines, but only a few of them are frequently in use. In the top ten search engines, Google, Bing and Yahoo take first three places respectively. Google and Bing provide searching facilities in Tamil, which means you can search everything through Tamil. A Google search engine gives you an inbuilt Tamil virtual keyboard.

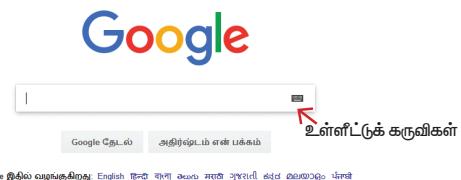


Figure 16.1(a) Google Search Engine (India)

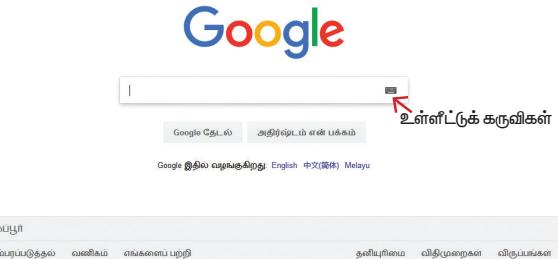


Figure 16.1(b) Google Search Engine (Singapore)

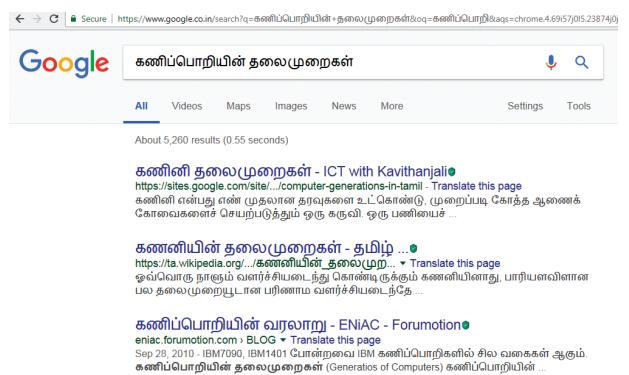
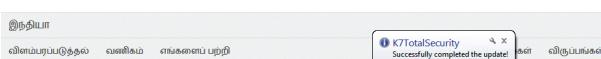


Figure 16.2 Searching in Tamil



## 16.4 e – Governance:

Getting Government services through internet is known as e-Governance. Govt. of Tamilnadu has been giving its services through Internet. One can communicate with Govt. of Tamilnadu from any corner of the state. One can get important announcements, government orders, and government welfare schemes from the web portal of Govt. of Tamilnadu.



Figure 16.3 Official Website of Govt. of Tamilnadu

E-Governance through Tamil	Web Address
Official Website of Govt. of Tamilnadu	<a href="http://www.tn.gov.in/ta">http://www.tn.gov.in/ta</a>
Department of Agricultural Engineering	<a href="http://www.aed.tn.gov.in/">http://www.aed.tn.gov.in/</a>
Department of Environment	<a href="http://www.environment.tn.nic.in/">http://www.environment.tn.nic.in/</a>
Directorate of Govt. Examinations	<a href="http://www.dge.tn.nic.in/">http://www.dge.tn.nic.in/</a>
Tamilnadu Health Department	<a href="http://www.tnhealth.org/">http://www.tnhealth.org/</a>
Tamilnadu Micro, Small and Medium Enterprises Department	<a href="http://www.msmeonline.tn.gov.in/">http://www.msmeonline.tn.gov.in/</a>
Rural Development and Panchayat Raj Department	<a href="http://www.tnrd.gov.in/">http://www.tnrd.gov.in/</a>
Backward, Most Backward and Minorities Welfare Department	<a href="http://www.bcmbcmw.tn.gov.in/">http://www.bcmbcmw.tn.gov.in/</a>
Tamilnadu Forest Department	<a href="https://www.forests.tn.gov.in/">https://www.forests.tn.gov.in/</a>
Hindu Religious and Charitable Endowments Department.	<a href="http://www.tnhrce.org/">http://www.tnhrce.org/</a>
Tamil Nadu Public Service Commission (TNPSC)	<a href="http://www.tnpsc.gov.in/tamilversion/index.html">http://www.tnpsc.gov.in/tamilversion/index.html</a>
Official Website of Govt. of Srilanka	<a href="https://www.gov.lk/index.php">https://www.gov.lk/index.php</a>

Outside India, Government of Srilanka provides all their services through the official website in Tamil.

services provide thousands of Tamil Books as ebooks mostly at free of cost. It is the most useful service to Tamil people who live far away from their home land.

## 16.5 e-Library

E-Libraries are portal or website of collection of e-books. Tamil e-Library

Tamil e-Library	Website address
Tamilnadu School Education and Teacher Education Training Textbooks and Resource Books	<a href="http://www.textbooksonline.tn.nic.in/">http://www.textbooksonline.tn.nic.in/</a>
Tamil Virtual Academy	<a href="http://www.tamilvu.org/library/libindex.htm">http://www.tamilvu.org/library/libindex.htm</a>
Connemara Public Library	<a href="http://connemarapubliclibrarychennai.com/Veettukku_oru_noolagam/index.html">http://connemarapubliclibrarychennai.com/Veettukku_oru_noolagam/index.html</a>
Tamil Digital Library	<a href="http://tamildigitallibrary.in/">http://tamildigitallibrary.in/</a>
Chennai Library	<a href="http://www.chennailibrary.com/">http://www.chennailibrary.com/</a>
Thamizhagam	<a href="http://www.thamizhagam.net/parithi/parithi.html">http://www.thamizhagam.net/parithi/parithi.html</a>
Project Madurai	<a href="http://www.projectmadurai.org/pmworks.html">http://www.projectmadurai.org/pmworks.html</a>
Old Books and Manuscripts	<a href="http://www.tamilheritage.org/old/text/ebook/ebook.html">http://www.tamilheritage.org/old/text/ebook/ebook.html</a>
Noolaham	<a href="http://www.noolaham.org/wiki/index.php/">http://www.noolaham.org/wiki/index.php/</a>
Anna Centenary Libraray	<a href="http://www.annacentenarylibrary.org/">http://www.annacentenarylibrary.org/</a>



## 16.6 Tamil Typing and Interface software

Tamil is mostly used to type documents in word processors and search information on the internet. Typing Tamil using Tamil interface software is a familiar one among the different methods of typing. This is the simplest method of typing Tamil in both Computer and Smart phones.

### 16.6.1 Familiar Tamil Keyboard Interface:

- NHM Writer, E-Kalappai and Lippikar – are familiar Tamil keyboard interfaces software that is used for Tamil typing which works on Tamil Unicode, using phonetics.
- Sellinam and Ponmadal – are familiar Tamil keyboard layouts that works on Android operating system in Smart phone using phonetics.

Figure 16.4 eKalappai Opening screen

## 16.7 Tamil Office Automation Applications

Famous Office automation software like Microsoft Office, Open Office etc., provides complete Tamil interface facility. These softwares are downloadable and installed in your computer. After installation, your office automation software environment will completely change to Tamil. Menu bars, names of icons, dialog boxes will be shown in Tamil. Moreover, you can save files with Tamil names and create folders with Tamil names.

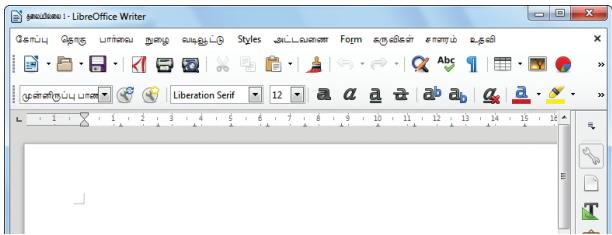


Figure 16.5 Libra Office Writer Environments in Tamil

Apart from that Tamil Libra Office, Tamil Open Office, Azhagi Unicode Editor, Ponmozhi, Menthamiz, Kamban, Vani are office automation software working exclusively for Tamil. You can use these applications to work completely in Tamil.

### 16.8 Tamil Translation Applications

Thamizpori (தமிழ்பெற்றி) is a Tamil translation application having more than 30000 Tamil words equivalent to English words. Using this application, we can translate small english sentences into Tamil. Google also gives an online translation facility.

### 16.9 Tamil Programming Language

Programming languages to develop software in computers and smart phones are available only in English. Based on Python programming language, the first Tamil programming language “Ezhil” (எழில்) is designed.

### 16.10 Tamil Information Interchange Coding Systems

#### TSCII (Tamil Script Code for Information Interchange)

Computers handle data and information as binary system. Computers use ASCII encoding system to handle data and information. The ASCII encoding system is applicable only for handling English language. Therefore, TSCII (Tamil Script Code for Information Interchange) is the first coding system to handle our

Tamil language. This encoding scheme was registered in IANA (Internet Assigned Numbers Authority) a unit of ICANN.

#### ISCII (Indian Script Code for Information Interchange)

This is one of the encoding schemes specially designed for Indian languages including Tamil. It was unified with Unicode.

#### Unicode:

Unicode is an encoding system, designed to handle various world languages, including Tamil. Its first version 1.0.0 was introduced in October 1991. Unicode is the best suitable to handle Tamil.

### 16.11 Tamil Operating System

An operating system is needed to access electronic systems such as computer and smart phone. Microsoft Windows is very popular operating system for personal computers.

Windows Tamil Environment interface should be downloaded and installed from the internet. It displays all window elements such as Taskbar, desktop elements, names of icons, commands in Tamil.

### .12 Organisation and projects to develop Tamil

#### Tamil Virtual Academy:

With the objectives of spreading Tamil to the entire world through internet, Tamil Virtual University was established on 17th February 2001 by the Govt. of Tamilnadu. Now, this organisation functions with the name of “Tamil Virtual Academy”. It offers different courses in Tamil language, Culture, heritage etc., from kindergarten to under graduation level.

Website: <http://www.tamilvu.org/index.php>

## Tamil Language Council, Singapore

With the objectives of promoting the awareness and greater use of Tamil among the Singaporeans, in 2001 the council of Tamil



Language was formed by the ministry of Information Communications and Arts, Govt. of Singapore. The council is called as “வளர்தமிழ் இயக்கம்”.

Website: <http://tamil.org.sg/ta>

### Madurai Project

Project Madurai is an open and voluntary initiative to collect and publish free electronic editions of ancient tamil literary classics. This means either typing-in or scanning old books and archiving the text is one of the most readily accessible formats for use on all popular computer platforms.

Since its launch in 1998, Project Madurai etexts released are in Tamil script

form as per TSCII encoding. Since 2004 we have started releasing etexts in Tamil unicode as well.

Web Site: <http://www.projectmadurai.org/>  
**Tamil Wikipedia:**

Wikipedia is a open source encyclopedia. Any person can write an article about any subject. There are more than 1 lakh articles in Tamil Wikipedia.

**Web Site: <https://ta.wikipedia.org/>**

In order to make Tamil as a living language, it is the duty of every Tamilian to involve Tamil in development of technology. Those who forgotten their values, the will be considered as “Nomads”. If we learn about how many great technologies we have to add Tamil as a symbol of our race. It is our duty to combine our world's first language and language for more than five thousand years with growing technology.

### Points to Remember:

- Tamil topped the list of the most widely used regional languages in India by the end of 2016, among 42% are using the Internet.
- Google and Bing provide searching facilities in Tamil.
- Getting Government services through internet is known as e-Governance.
- Tamil e-Library services provide thousands of Tamil Books as ebooks mostly at free of cost.
- Thamizpori (தமிழ்பொறி) is a Tamil translation application having more than 30000 Tamil words equivalent to English words.
- The first Tamil programming language is “Ezhil” (எழில்)
- Unicode is an encoding system, designed to handle various world languages, including Tamil.
- Among the various encoding scheme, Unicode is the suitable to handle Tamil.
- Windows Tamil Environment interface should be downloading and install from internet.

### Evaluation



### Answer to the following questions

1. List of the search engines supporting Tamil.
2. What are the keyboard layouts used in Android?
3. Write a short note about Tamil Programming Language.
4. What is TSCII?
5. Write a short note on Tamil Virtual Academy.

\*\*\*\*

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