

INFORMATION TECHNOLOGY

BCOM (computer Applications)

Semester – I, Paper-IC

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FOREWORD

Since its establishment in 1976, Acharya Nagarjuna University has been forging ahead in the path of progress and dynamism, offering a variety of courses and research contributions. I am extremely happy that by gaining a B++ (80-85) grade from the NAAC in the year 2003, the Acharya Nagarjuna University is offering educational opportunities at the UG, PG levels apart from research degrees to students from over 285 affiliated colleges spread over the three districts of Guntur, Krishna and Prakasam.

The University has also started the Centre for Distance Education with the aim to bring higher education within reach of all. The centre will be a great help to those who cannot join in colleges, those who cannot afford the exorbitant fees as regular students, and even housewives desirous of pursuing higher studies. With the goal of bringing education to the doorstep of all such people, Acharya Nagarjuna University has started offering B.A., and B.Com courses at the Degree level and M.A., M.Com., M.Sc., M.B.A., and L.L.M., courses at the PG level from the academic year 2003-2004 onwards.

To facilitate easier understanding by students studying through the distance mode, these self-instruction materials have been prepared by eminent and experienced teachers. The lessons have been drafted with great care and expertise in the stipulated time by these teachers. Constructive ideas and scholarly suggestions are welcome from students and teachers involved respectively. Such ideas will be incorporated for the greater efficacy of this distance mode of education. For clarification of doubts and feedback, weekly classes and contact classes will be arranged at the UG and PG levels respectively.

It is my aim that students getting higher education through the centre for Distance Education should improve their qualification, have better employment opportunities and in turn facilitate the country's progress. It is my fond desire that in the years to come, the Centre for Distance Education will go from strength to strength in the form of new courses and by catering to larger number of people. My congratulations to all the Directors, Academic Coordinators, Editors and Lesson-writers of the Centre who have helped in these endeavors.

Prof. P. Raja Sekhar
Vice-Chancellor
Acharya Nagarjuna University

INFORMATION TECHNOLOGY

I Year B Com (CA), Semester – I, Paper-I

Syllabus

Objectives:

1. To help students become literate in the fundamental understanding of information technology (IT)
2. Give students a basic understanding of basic concepts and terminology of information technology and be able to define them and have a basic understanding of personal computers and their operations
3. To provide hands-on use of Microsoft Office 2007 applications Word, Excel and PowerPoint.

Unit-I

Introduction computers: Computer Definition - Characteristics and Limitations of Computer, Generations of Computer, Classification of Computers, Applications of Computer, **Hardware** – Basic organization of Computer - Input and Output Devices

Unit- II (Understanding computer memory and software)

Memories: primary, secondary and cache memory, **Software:** types of software, system software, Application software, commercial software, open source software, domain software and free ware software, **Programming Languages:** Introduction to Programming Languages – Generations of Programming Languages

Unit- III Get in touch with Word Processing (MS word)

Features of MS Word - Parts of Word Window – Creating, Saving, Opening document, Printing, Formatting: Formatting of Text and Paragraph - Bullets and Numbering - Editing - Moving and Copying - Find and Replace Text – Tables: Creating tables, inserting and deleting rows and columns, Insertion of pictures – Insertion of clipart - Mail Merge

Unit-IV Working with MS Excel

Features of Excel, Parts of Excel window, Workbooks, Creating, Opening and Saving a Workbook, Worksheets, rows, columns, Inserting and Deleting rows and columns, cells, Entering labels, values, and formulas in worksheet, Formatting: Adjusting row height and column width - Formatting cell values, Formulas and Functions: operators used in formula, cell references in formula, Mathematical, Statistical, Logical and Text functions, Charts: Different types of charts, Creating a chart

Unit-V MS Power point

Features of PowerPoint, Parts of PowerPoint window, creating, saving and opening presentation, working with slides: Inserting, deleting, copying slides, editing text, formatting text, Formatting and Modifying Presentations: Applying transition and animation to the slides, inserting music or sound on a slide, viewing slide show

Books for study and reference:

1. P.Mohan computer fundamentals- HimalayaPublications.
2. R.K.Sharma and Shashi K Gupta, Computer Fundamentals - Kalyani Publications
3. Fundamentals of Computers ByBalagurusamy, Mcgraw Hill
4. Fundamentals of Computers Rajaraman V Adabala N
5. MS-Office S.S. Shrivastava
6. Microsoft Office 2007 Fundamentals, 1st Edition By Laura Story, Dawna Walls

Online Resources:

1. <https://support.office.com/en-us/office-training-center>
2. <https://www.skillshare.com/browse/microsoft-office>
3. https://www.tutorialspoint.com/computer_fundamentals/i
4. [ndex.htm https://www.javatpoint.com/computerfundamentalstutorial](https://www.javatpoint.com/computerfundamentalstutorial)
5. <https://edu.gcfglobal.org/en/subjects/office/>
6. <https://www.microsoft.com/en-us/learning/training.aspx>

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7. Working with MS-Excel	
8. MS Power Point	

LESSON- 1

INTRODUCTION TO COMPUTERS

AIMS AND OBJECTIVES

In this unit the student can recognize the importance of computer literacy, describe the categories of computers, and discuss various computer applications in society. After completing this chapter you will be able to explain why computer literacy is vital to success in today's world, define the term computer, and differentiate among types, sizes and functions of computers.

STRUCTURE

- 1.1 Introduction**
- 1.2 Computer Definition**
- 1.3 Characteristics of a Computers**
- 1.4 Limitation of a Computer**
- 1.5 Generations of a Computer**
 - 1.5.1 First generation
 - 1.5.2 Second Generation
 - 1.5.3 Third Generation
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- 1.6 Classification of Computers**
 - 1.6.1 Super Computer
 - 1.6.2 Mainframe Computer
 - 1.6.3 Mini Computer
 - 1.6.4 Micro Computer
- 1.7 Applications of Computers**
- 1.8 Summary**
- 1.9 Technical Terms**
- 1.10 Self-Assessment Questions**
- 1.11 Suggested Readings**

1.1 INTRODUCTION

Our lifestyle has undergone a sea change with the advancement of technology especially in the field of computer. Computers are an integral part of our lifestyle today and can be found in offices, homes, schools, colleges, hotels, shops, etc. This advancement of technology has made our lives easier and more comfortable. Computers can simplify tasks such as word processing, designing, website development, and database management.

Computer is an advanced electronic device that takes raw data as input from the user and processes it under the control of set of instructions (called program), gives the result (output), and saves it for the future use. A computer system is made up of both hardware and software. Software is another term for computer program. Software controls the computer and makes it do useful work. Without software a computer is useless. Hardware refers to the physical components that make up a computer system. These include the computer's processor, memory, monitor, keyboard, mouse, disk drive, and printer and so on.

1.2 COMPUTER - Definition

Computer is derived from the Latin keyword *computare* which means to calculate. In early days, the computer was originally developed to create a fast calculator. However, today, computer is used for purposes other than mathematical or calculation activities.

A computer is an electronic device that controls instructions stored in its own memory, which can accept data, process data according to specified instructions, generate output, and store the output for future reference.

Computers process data into information. Data is a collection of unprocessed items, which can include text, numbers, images, audio, and video. Information conveys meaning and is useful to people.

1.3 CHARACTERISTICS OF A COMPUTER

1.3.1 Speed

We know that Computers are work very fast. It takes only few seconds for calculations that we take hours to complete. we determine the speed of computer in terms of microsecond (10^{-6} part of a second) or nano-second (10^{-9} part of a second).

1.3.2 Accuracy

Suppose someone calculates faster but commits a lot of errors in computing. Such result is useless. The degree of accuracy of computer is very high and every calculation is performed with the same accuracy. The accuracy level is determined on the basis of design of computer. The errors in computer are due to human and inaccurate data.

1.3.3 Diligence

A computer is free from tiredness, lack of concentration, fatigue, etc. It can work for hours without creating any error. If millions of calculations are to be performed, a computer will perform every calculation with the same accuracy. Due to this capability it overpowers human being in routine type of work.

1.3.4 Versatility

It means the capacity to perform completely different type of work. We can use our computers for different tasks randomly with any complexity.

1.3.5 Power of Remembering

Computer has the power of storing any amount of information or data. Any information can be stored and recalled as long as you require it, for any numbers of years. It depends entirely upon you how much data you want to store in a computer and when to lose to retrieve these data.

1.3.6 Storage

The Computer has an in-built memory where it can store a large amount of data. You can also store data in secondary storage devices such as floppies, which can be kept outside your computer and can be carried to other computers.

1.4 LIMITATIONS OF A COMPUTER

Even though, a computer system performs various services to its users, it also suffers from the following limitations.

- The computer can only do things that are designed or programmed. If you ask a computer to get full payroll for a certain period of time, it will only give you total payroll and not the net salary or gross salary of each employee.
- It does not correct the input data. If you enter incorrectly at the rate of 50 per hour, the computer will not respond at the rate of 40 per hour.
- It does not think and derives meanings from objects. The computer does not understand your favorite topic or your current state of mind.
- It can only process jobs that are expressed in several steps leading to a precisely defined goal.
- It does not completely prevent faults due to power fluctuations, system malfunction and human disorders.

- Computers do not have the necessary skills. They must be pre-programmed so that decisions can be made.
- Computers are machines with a zero IQ. They cannot think for themselves and need to be directed to every step.
- Although we have succeeded in building memory for the computer, no computer is equal to the human heart and soul.

1.5 GENERATIONS OF A COMPUTER

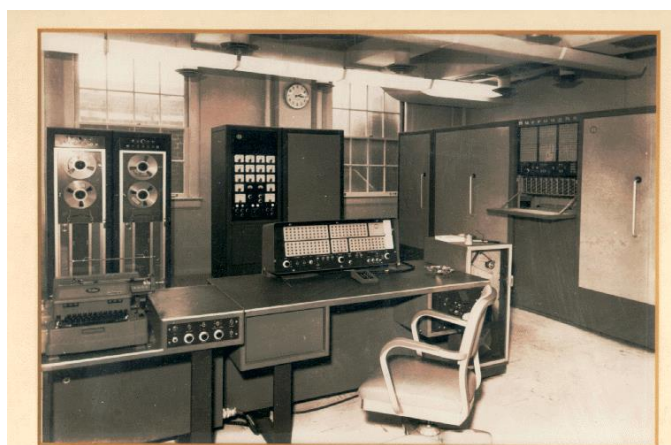
The term generation indicates the type of technology used in the computer construction. As new technology was emerging, it was being used in the making of computer. The new technology improved the speed, accuracy and storage capacity of the computers. Different technologies have been used for computers in different times.

Therefore, computers can be divided into five generations depending upon the technologies used. These are:

1. First Generation (1945 - 1956)
2. Second Generation (1956 - 1963)
3. Third Generation (1964 - 1971)
4. Fourth Generation (1971 - Present)
5. Fifth Generation (Present and beyond)

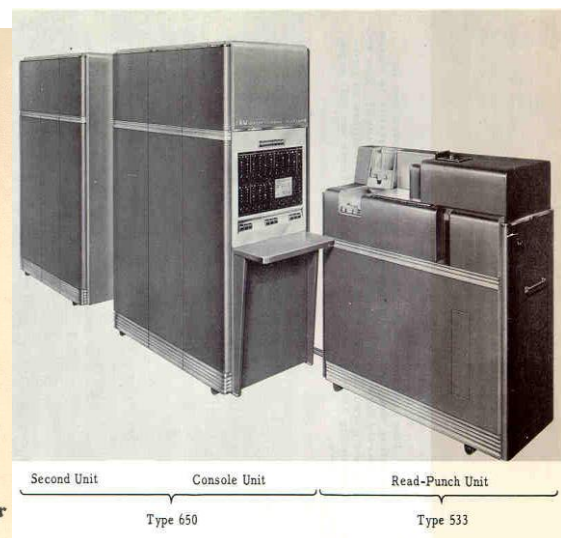
1.5.1 First Generation Computers (1945 – 1956)

The *vacuum tube* technology was used in first-generation computers. Mark-1m, ENIAC, EDSAC, EDVAC, UNIVAC-1 etc. machines belong to the first generation of computers. The machine language only was used in first-generation computers.



Computer-Science Center
University of Virginia

Burroughs 205 Computer
1960-1964



Second Unit

Console Unit

Read-Punch Unit

Type 650

Type 533

Advantages

The main advantages of first-generation computers were:

1. These computers were the fastest of their time.
2. They were programmed using machine language.
3. The electronic digital computers were introduced due to the vacuum tube technology.

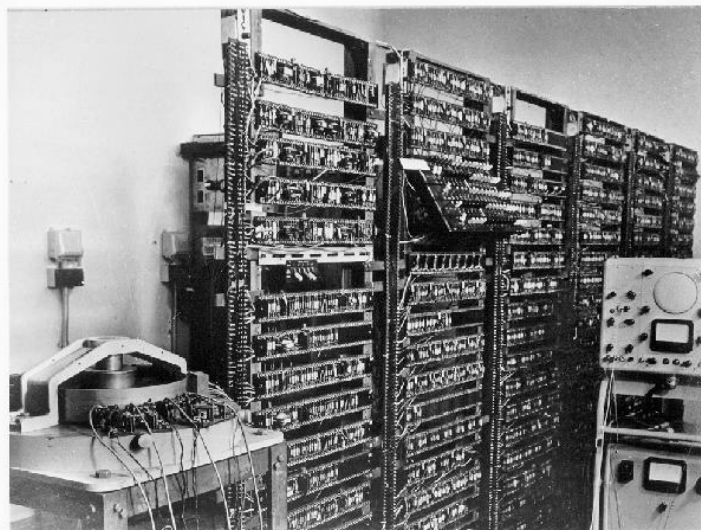
Disadvantages

The main disadvantages of first-generation computers were:

1. Very big in size
2. Not reliable
3. Consumed large amount of energy
4. Constant maintenance required
5. More heat generated and air-conditioning was required
6. More costly
7. Very slow in speed (data processing)
8. It was difficult to programmed, because they used only machine language
9. Non-portable
10. Limited commercial use

1.5.2 Second Generation Computers (1956 – 1963)

The *transistor* technology was used in second-generation computers. The electronic component transistor was invented in 1948 at Bell Laboratories. The transistor is smaller in size and more reliable than vacuum tube. Therefore, the transistor technology was used in computer in place of vacuum tube technology. The programming assembly language was also introduced in second-generation of computers.



Advantages

The main advantages of second-generation computers as compared to first-generation computers are:

1. Low in cost
2. Smaller in size
3. Fast in speed
4. Less heat generated More reliable and accurate in calculations
5. Consume low power etc.
6. Used for commercial purposes
7. Portable
8. Assembly language was introduced. This language is easy to write program than machine language

Disadvantages

The main disadvantages of this generation computers were:

1. Air-conditioning required
2. Commercial production was difficult and these were very costly
3. Constant (or frequent) maintenance required
4. Only used for special purposes

1.5.3 Third Generation Computers (1964 – 1971)

The *IC (Integrated Circuits)* technology was used in third-generation computers. In a small IC chip (5 mm square size) a circuit is designed having large number of electronic components like transistors, capacitors, diodes, resistors etc. Initially, an IC contained only about ten to twenty components. Thus the IC technology was named as Small Scale Integration (SSI). The third-generation was based on IC technology and the computers were designed using this technology.



Advantages

The main advantages of third-generation as compared to previous generations of computers were:

1. Smaller in size
2. Production cost was low
3. Very fast in computational power
4. More reliable
5. Low power consumption

6. Maintenance cost was low because failure rate of hardware was very low
7. Magnetic disk, used for external storage
8. More storage capacity
9. Easily portable
10. Easy to operate
11. Upgraded easily
12. Widely used for various commercial applications all over the world
13. Lower heat generated
14. High-level languages were commonly used
15. Many input/output devices were introduced such as mouse and keyboard etc.

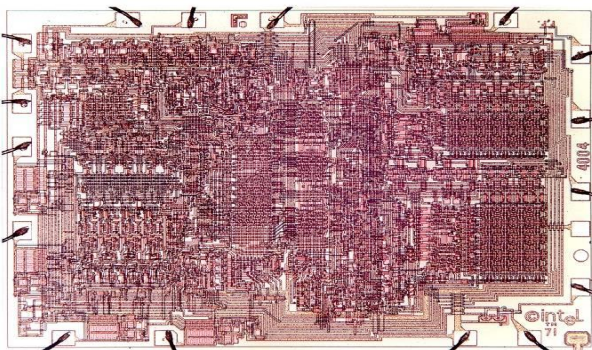
Disadvantages

The main disadvantages of third-generation computers were:

1. Air-conditioning required
2. Highly sophisticated technology required for the manufacturer chips

1.5.4 Fourth Generation Computers (1971 – Present)

The *microchip technology* was introduced in this generation of computers. With the advancement in IC technology, LSI (Large Scale Integration) chips were developed. It was possible to integrate over 30,000 or more components on to single LSI chip. After LSI, the VLSI (Very Large Scale Integration) was developed and the development of *microprocessor* possible. It is expected that more than one million components will be integrated on a single chip of VLSI. Using VLSI technology, the entire CPU is designed on a single silicon chip. The use of microprocessor as CPU introduced another class of computers called the microcomputers. Thus fourth-generation may be called Microcomputer generation. IBM introduced its personal computer for use in 1981.



Intel 4004 chip

Advantages

The advantages of fourth-generation as compared to previous generation computers are:

1. Smaller in size
2. Production cost is very low
3. Very reliable

4. Hardware failure is negligible
5. Easily portable because of their small size
6. Totally general purpose
7. Air conditioning is not compulsory
8. Very high processing speed
9. Very large internal and external storage capacity
10. Used advanced input & output devices such as optical readers, laser printers, CD-ROM/DVD-ROM drives etc.

Disadvantages

The main disadvantages of fourth-generation computers is:

1. Highly sophisticated technology required for the manufacturer of microprocessor chips

1.5.5 Fifth Generation Computers (In process)

The main drawback of first to fourth generation computers is that the computers have not their own thinking power. These are totally depending upon the instructions given by the users.

Fifth generation computers are supposed to be the ideal computers, but do not exist. The scientists are working to design such computers that will have the following features.

1. Having their own thinking power
2. Making decisions themselves
3. Having capabilities of learning
4. Having capabilities of reasoning
5. Having large capacity of internal storage
6. Having extra high processing speed
7. Having capabilities of parallel processing

In these computers following technologies will be used:

- ULSIC (Ultra Large Scale Integrated Circuits) technology
- Artificial Intelligence (AI) technology also called the knowledge Processor. The AI means automatic programs that let the machines to think and decide themselves. The programming languages LISP (List Processor) and PROLOG (Programming with Logic) are used for artificial intelligence. The scientists at ICOT in Japan use the PROLOG to develop the Artificial Intelligence software.

1.6 CLASSIFICATION OF COMPUTERS

Computers are classified according to their data processing speed, amount of data that they can hold and price. Generally, a computer with high processing speed and large internal storage is called a big computer. Due to rapidly improving technology, we are always confused among the categories of computers.

Depending upon their speed and memory size, computers are classified into following four main groups.

1. Supercomputer.
2. Mainframe computer.
3. Mini computer.
4. Microcomputer.

1.6.1 Supercomputer

Supercomputer is the most powerful and fastest, and also very expensive. It was developed in 1980s. It is used to process large amount of data and to solve the complicated scientific problems. It can perform more than one trillions calculations per second. It has large number of processors connected parallel. So parallel processing is done in this computer. In a single supercomputer thousands of users can be connected at the same time and the supercomputer handles the work of each user separately. Supercomputers are mainly used for:

- Weather forecasting.
- Nuclear energy research.
- Aircraft design.
- Automotive design.
- Online banking.
- To control industrial units.

The supercomputers are used in large organizations, research laboratories, aerospace centers, large industrial units etc. Nuclear scientists use supercomputers to create and analyze models of nuclear fission and fusions, predicting the actions and reactions of millions of atoms as they interact. The examples of supercomputers are CRAY-1, CRAY-2, Control Data CYBER 205 and ETA A-10 etc.

1.6.2 Mainframe Computers

Mainframe computers are also large-scale computers but supercomputers are larger than mainframe. These are also very expensive. The mainframe computer specially requires a very large clean room with air-conditioner. This makes it very expensive to buy and operate. It can support a large number of various equipment. It also has multiple processors. Large mainframe systems can handle the input and output requirements of several thousands of users. For example, IBM, S/390 mainframe can support 50,000 users simultaneously. The users often access then mainframe with terminals or personal computers. There are basically two types of terminals used with mainframe systems. These are:

i) **Dumb Terminal**

Dumb terminal does not have its own CPU and storage devices. This type of terminal uses the CPU and storage devices of mainframe system. Typically, a dumb terminal consists of monitor and a keyboard (or mouse).

ii) **Intelligent Terminal**

Intelligent terminal has its own processor and can perform some processing operations. Usually, this type of terminal does not have its own storage. Typically, personal computers are used as intelligent terminals. A personal computer as an intelligent terminal gives facility to access data and other services from mainframe system. It also enables to store and process data locally.

The mainframe computers are specially used as servers on the World Wide Web. The mainframe computers are used in large organizations such as Banks, Airlines and Universities etc. where many people (users) need frequent access to the same data, which is usually organized into one or more huge databases. IBM is the major manufacturer of mainframe computers. The examples of mainframes are IBM S/390, Control Data CYBER 176 and Amdahl 580 etc.

1.6.3 Minicomputers

These are smaller in size, have lower processing speed and also have lower cost than mainframe. These computers are known as minicomputers because of their small size as compared to other computers at that time. The capabilities of a minicomputer are between mainframe and personal computer. These computers are also known as midrange computers.

The minicomputers are used in business, education and many other government departments. Although some minicomputers are designed for a single user but most are designed to handle multiple terminals. Minicomputers are commonly used as servers in network environment and hundreds of personal computers can be connected to the network with a minicomputer acting as server like mainframes, minicomputers are used as web servers. Single user minicomputers are used for sophisticated design tasks.

The first minicomputer was introduced in the mid-1960s by Digital Equipment Corporation (DEC). After this IBM Corporation (AS/400 computers) Data General Corporation and Prime Computer also designed the mini computers.

1.6.4 Microcomputer

The microcomputers are also known as Personal Computers or simply PCs. Microprocessor is used in this type of computer. These are very small in size and cost. The IBM's first microcomputer was designed in 1981 and was named as IBM-PC. After this many computer hardware companies copied the design of IBM-PC. The term "PC-compatible" refers any personal computer based on the original IBM personal computer design.

The most popular types of personal computers are the PC and the Apple. PC and PC-compatible computers have processors with different architectures than processors in Apple computers. These two types of computers also use different operating systems. PC and PC-compatible computers use the Windows operating system while Apple computers use the Macintosh operating system (MacOS). The majority of microcomputers sold today are part of

IBM-compatible. However the Apple computer is neither an IBM nor a compatible. It is another family of computers made by Apple computer.

Personal computers are available in two models. These are:

1. Desktop PCs
2. Tower PCs

A desktop personal computer is most popular model of personal computer. The system unit of the desktop personal computer can lie flat on the desk or table. In desktop personal computer, the monitor is usually placed on the system unit.

Another model of the personal computer is known as tower personal computer. The system unit of the tower PC is vertically placed on the desk or table. Usually the system unit of the tower model is placed on the floor to make desk space free and user can place other devices such as printer, scanner etc. on the desktop. Today computer tables are available which are specially designed for this purpose. The tower models are mostly used at homes and offices.

Microcomputers are further divided into following categories.

1. Laptop computer
2. Workstation
3. Network computer
4. Handheld computer

Laptop computer

Laptop computer is also known as notebook computer. It is small size (8.5-by-11 inch notebook computer) and can fit inside a briefcase. The laptop computer is operated on a special battery and it does not have to be plugged in like desktop computer. The laptop computer is portable and fully functional microcomputer. It is mostly used during journey. It can be used on your lap in an airplane. It is because it is referred to as laptop computer.

The memory and storage capacity of laptop computer is almost equivalent to the PC or desktop computer. It also has the hard disk, floppy disk drive, Zip disk drive, CD-ROM drive, CD-writer etc. it has built-in keyboard and built-in trackball as pointing device. Laptop computer is also available with the same processing speed as the most powerful personal computer. It means that laptop computer has same features as personal computer. Laptop computers are more expensive than desktop computers. Normally these computers are frequently used in business travelers.

Workstations

Workstations are special single user computers having the same features as personal computer but have the processing speed equivalent to minicomputer or mainframe computer. A workstation computer can be fitted on a desktop. Scientists, engineers, architects and graphic designers mostly use these computers.

Workstation computers are expensive and powerful computers. These have advanced processors, more RAM and storage capacity than personal computers. These are usually used as single-user applications but these are used as servers on computer network and web servers as well.

Network computers

Network computers are also version of personal computers having less processing power, memory and storage. These are specially designed as terminals for network environment. Some types of network computers have no storage. The network computers are designed for network, Internet or Intranet for data entry or to access data on the network. The network computers depend upon the network's server for data storage and to use software. These computers also use the network's server to perform some processing tasks.

In the mid-1990s the concept of network computers became popular among some PC manufacturers. As a result several variations of the network computers quickly became available. In business, variations of the network computer are Windows terminals, NetPCs and diskless workstations. Some network computers are designed to access only the Internet or to an Intranet. These devices are sometimes called Internet PCs, Internet boxes etc. In home some network computers do not include monitor. These are connected to home television, which serves as the output devices. A popular example of a home-based network computer is Web TV, which enables the user to connect a television to the Internet. The Web TV has a special set-top box used to connect to the Internet and also provides a set of simple controls which enable the user to navigate the Internet, send and receive e-mails and to perform other tasks on the network while watching television.

Network computers are cheaper to purchase and to maintain than personal computers.

Handheld computer

In the mid 1990s, many new types of small personal computing devices have been introduced and these are referred to as handheld computers. These computers are also referred to as Palmtop Computers. The handheld computers sometimes called Mini-Notebook Computers. The type of computer is named as handheld computer because it can fit in one hand while you can operate it with the other hand. Because of its reduced size, the screen of handheld computer is quite small. Similarly it also has small keyboard. The handheld computers are preferred by business traveler. Some handheld computers have a specialized keyboard. These computers are used by mobile employees, such as meter readers and parcel delivery people, whose jobs require them to move from place to place.

The examples of handheld computers are:

1. Personal Digital Assistance
2. Cellular telephones
3. H/PC Pro devices

1. Personal Digital Assistance (PDAs)

The PDA is one of the more popular lightweight mobile devices in use today. A PDA provides special functions such as taking notes, organizing telephone numbers and addresses. Most PDAs also offer a variety of other application software such as word processing, spreadsheet and games etc. Some PDAs include electronic books that enable users to read a book on the PDA's screen.

Many PDAs are web-based and users can send/receive e-mails and access the Internet. Similarly, some PDAs also provide telephone capabilities.

The primary input device of a PDA is the stylus. A stylus is an electronic pen and looks like a small ballpoint pen. This input device is used to write notes and store in the PDA by touching the screen. Some PDAs also support voice input.

2. Cellular phones

A cellular phone is a web-based telephone having features of analog and digital devices. It is also referred to as Smart Phone. In addition to basic phone capabilities, a cellular phone also provides the functions to receive and send e-mails & faxes and to access the Internet.

3. H/PC Pro Devices

H/PC Pro dive is new development in handheld technology. These systems are larger than PDAs but they are not quite as large as typical notebook PCs. These devices have features between PDAs and notebook PCs. The H/PC Pro device includes a full-size keyboard but it does not include disk. These systems also have RAM with very low storage capacity and slow speed of processor.

1.7 APPLICATIONS OF COMPUTERS

- **Education**

Nowadays educators are using techniques such as videos, pdfs, images and other animation software, so that the student can easily comprehend more complex and complex subjects with minimal effort to try and explain complex subjects in a more animated manner.

- **Technology**

Computer technology has gone to a different level. Every section of the society uses this modern machine to increase the productivity and quality of the products. Using computer technology farmers can predict the atmosphere and weather to exactly decide what should be next move.

- **Business**

At present time we can manage our business almost from anywhere just using a computer, laptop or mobile phone with internet connection. According to a survey in 2030, almost 95% of the business will use computers to help them in growing business and helping the service sector for improving their services.

- **Medical Fields**

In this Computer era, medical industry regulates their administrative as well as extra and better functionality of hospitals through Computers, which plays a vital role in the healthcare.

- **Government offices**

Almost every government offices use computers to reduce human load. Computers are used in a government office to send and receive mails for faster communications and to track the record of communications. In government office mainly work are done on spreadsheets, documents and text which this machine works in great speed.

- **Defense and Environment**

Super computers are used to track incoming missiles target to destroy them. They are used in tanks, planes and ship to target forces also for analysis and research.

- **Sports**

The introduction of the computers in sports and games is very great as the performance and the output of the result has been incredibly great. The chances of making the inaccurate or wrong decision are decreasing day by day. The computer can store data and analyze the history of games and specific players

- **Banking**

Every bank is computerized nowadays. Passbooks are updated using printers that are connected to a personal computer in a network that is centralized. ATM is another form of computer where we can withdraw as well as deposit cash. Online transactions has made possible because of these highly powerful and secured machines.

1.8 SUMMARY

A computing device, also referred as computer, processes the input data as per given instructions to generate desired output. This chapter provides information regarding computers generations. The characteristics of computer systems can be defined as the silent features they possess from time to time and uses of computers in day to day life.

1.9 TECHNICAL TERMS

Computer, Computer Generations, Supercomputer, Mainframe computer, Minicomputer, Microcomputer, ENIAC, LSI, PDA

1.10 SELF ASSESSMENT QUESTIONS

Essay questions:

1. What is Computer? Discuss various applications of computers.
2. Explain the generation of computers in detail.
3. Explain classifications of computer.

Short Notes:

1. Computer Definition
2. Characteristics of computers
3. Limitations of computers

1.11 SUGGESTED READINGS

1. P.Mohan computer fundamentals- HimalayaPublications.
2. R.K.Sharma and Shashi K Gupta, Computer Fundamentals - Kalyani Publications
3. Fundamentals of Computers ByBalagurusamy, Mcgraw Hill
4. Fundamentals of Computers Rajaraman V Adabala N

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LESSON- 2

HARDWARE

AIMS AND OBJECTIVES

In this unit the student can have overview of the basic design of a computer. He will understand how different parts of a computer are organized and how various operations are performed between different parts to do a specific task. The student can also understand the difference between input devices and output devices and their functionalities.

STRUCTURE

- 2.1 Introduction**
- 2.2 Basic organization of Computer**
- 2.3. Input Devices**
- 2.4 Output Devices**
- 2.5 Summary**
- 2.6 Technical Terms**
- 2.7 Self-Assessment Questions**
- 2.8 Suggested Readings**

2.1 INTRODUCTION

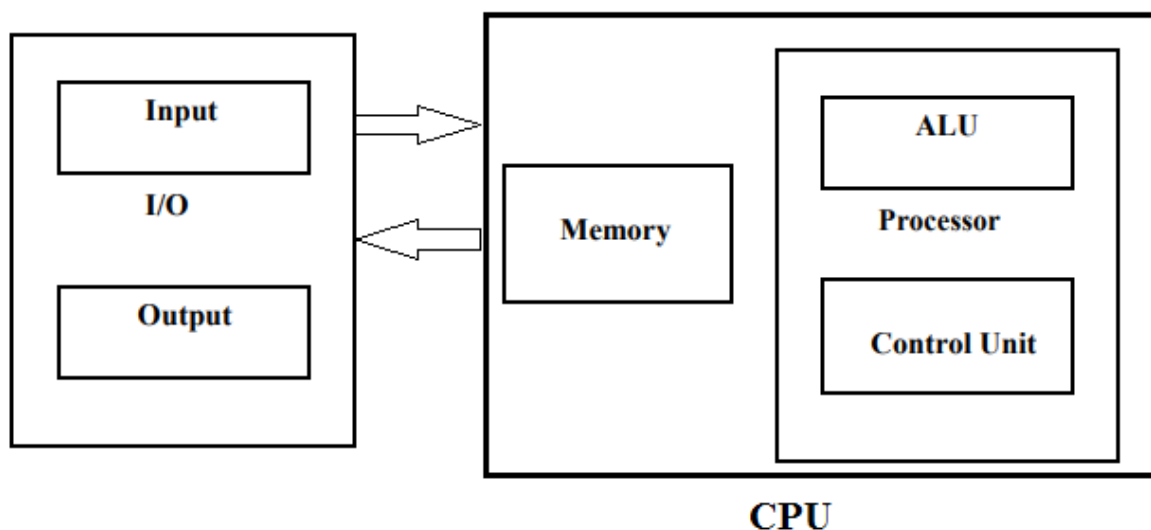
A computer can be defined as a fast electronic calculating machine that accepts the (data) digitized input information process it as per the list of internally stored instructions and produces the resulting information.

2.2 BASIC ORGANIZATION OF A COMPUTER

The main component of basic organization of a computer system is microprocessor (C.P.U), memory unit (MU), and input-output devices.

2.2.1 Functional Unit

In order to carry out the operations mentioned in the previous section the computer allocates the task between its various functional units. The computer system is divided into three separate units for its operation. They are arithmetic logical unit, control unit, and central processing unit.



2.2.2.1 Arithmetic Logic Unit (ALU)

Most of the computer operators are executed in ALU of the processor like addition, subtraction, division, multiplication, etc. the operands are brought into the ALU from memory and stored in high speed storage elements called register. Then according to the instructions the operation is performed in the required sequence.

The control and the ALU are many times faster than other devices connected to a computer system. This enables a single processor to control a number of external devices such as key boards, displays, magnetic and optical disks, sensors and other mechanical controllers.

2.2.2.2 Control Unit (CU)

The next component of computer is the Control Unit, which acts like the supervisor seeing that things are done in proper way. The control unit determines the sequence in which computer programs and instructions are executed. Things like processing of programs stored

in the main memory, interpretation of the instructions and issuing of signals for other units of the computer to execute them. It also acts as a switch board operator when several users access the computer simultaneously. Thereby it coordinates the activities of computer's peripheral equipment as they perform the input and output.

2.2.2.3 Central Processing Unit

The ALU and the CU of a computer system is together known as the Central Processing Unit. CPU is also called as the brain of a computer system. It is just like brain that takes all major decisions, makes all sorts of calculations and directs different parts of the computer functions by activating and controlling the operations.

The fundamental operation of most CPUs

The program is represented by a series of bits (instructions) that are kept in some kind of computer memory. There are four steps that nearly all CPUs use in their operation: fetch, decode and execute

- Fetch:
 - Retrieving an instruction from program memory.
 - The location in program memory is determined by a program counter (PC)
 - After an instruction is fetched, the PC is incremented by the length of the instruction word in terms of memory units.

- Decode :
 - The instruction is broken up into parts that have significance to other portions of the CPU.
 - The way in which the numerical instruction value is interpreted is defined by the CPU's instruction set architecture (ISA).
 - Opcode, indicates which operation to perform.
 - The remaining parts of the number usually provide information required for that instruction, such as operands for an addition operation.
 - Such operands may be given as a constant value or as a place to locate a value: a register or a memory address, as determined by some addressing mode.

- Execute :
 - During this step, various portions of the CPU are connected so they can perform the desired operation.
 - Suppose, if an addition operation was requested, an arithmetic logic unit (ALU) will be connected to a set of inputs and a set of outputs.
 - The inputs provide the numbers to be added, and the outputs will contain the final result.
 - If the addition operation produces a result too large for the CPU to handle, an arithmetic overflow flag in a flags register may also be set.

2.2.2.4 Memory

It is function into store programs and data. It is basically to two types

- Primary Memory: Is the one exclusively associated with the processor and operates at the electronics speeds programs must be stored in this memory while they are being executed. The memory contains a large number of semiconductors storage cells. Each cell is capable of storing one bit of information. These are processed in a group of fixed site called word. To provide easy access to a word in memory, a distinct address is associated with each word location. Addresses are numbers that identify memory location. Number of bits in each word is called word length of the computer. Programs must reside in the memory during execution. Instructions and data can be written into the memory or read out under the control of processor. Examples: RAM and ROM
- Secondary Memory: Is used where large amounts of data & programs have to be stored, particularly information that is accessed infrequently. Examples: - Magnetic disks & tapes, optical disks (ie CD-ROM's), floppies etc.,

2.2.2.5 Input Unit

The source program or data is fed to a computer through input devices. An input device sends information to a computer system for processing. An input device can send data to another device, but it cannot receive data from another device.

Examples: Keyboard, Mouse, Joystick, Digitizing Tablet, Touch Sensitive Screen, Light Pen, Space Mouse, Digital Stills Camera , Magnetic Ink Character (MICR) , Optical Mark Reader Recognition (OMR), Image Scanner, Bar Codes, Magnetic Reader , Smart Cards, Voice Data Entry, Sound Capture, Video Capture etc.,

2.2.2.6 Output Unit

An output device reproduces or displays the results of that processing. Output devices display information in a way that you can understand. An output device can receive data from another device and generate output with that data, but it cannot send data to another device. Some devices can accept input and display output, and they are referred to as I/O devices (input/output devices).

Examples:

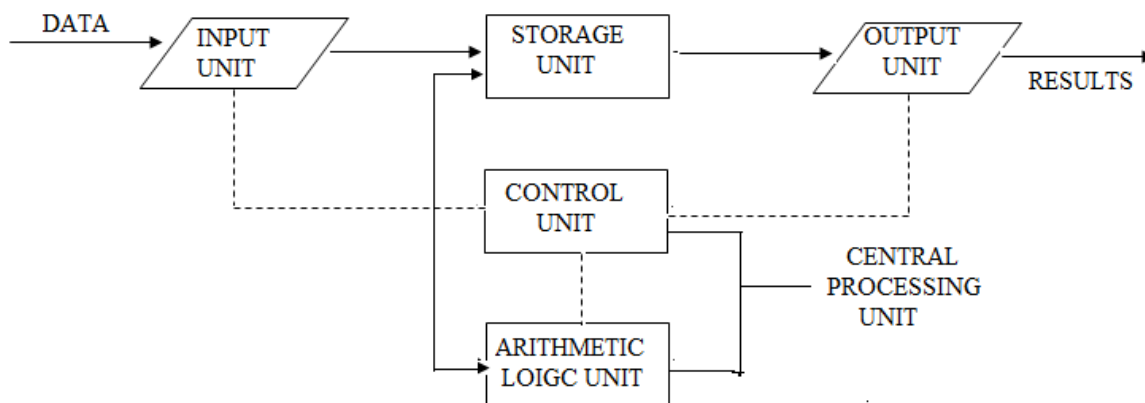
Printing : Plotter, Printer

Sound : Speakers

Visual : Monitor

2.2.2 Basic Computer Operations

A computer as shown in the below figure performs basically five major operations or functions irrespective of their size and make. These are 1) it accepts data or instructions by way of input, 2) it stores data, 3) it can process data as required by the user, 4) it gives results in the form of output, and 5) it controls all operations inside a computer. We discuss below each of these operations.



- **Input:** This is the process of entering data and programs in to the computer system. We should know that computer is an electronic machine like any other machine, which takes as inputs raw data and performs some processing giving out processed data. Therefore, the input unit takes data from us to the computer in an organized manner for processing.
- **Storage:** The process of saving data and instructions permanently is known as storage. Data has to be fed into the system before the actual processing starts. It is because the processing speed of Central Processing Unit (CPU) is so fast that the data has to be provided to CPU with the same speed. Therefore the data is first stored in the storage unit for faster access and processing. This storage unit or the primary storage of the computer system is designed to do the above functionality. It provides space for storing data and instructions.

The storage unit performs the following major functions:

- All data and instructions are stored here before and after processing
- Intermediate results of processing are also stored here.
- **Processing:** The task of performing operations like arithmetic and logical operations is called processing. The Central Processing Unit (CPU) takes data and instructions from the storage unit and makes all sorts of calculations based on the instructions given and the type of data provided. It is then sent back to the storage unit.

- **Output:** This is the process of producing results from the data for getting useful information. Similarly the output produced by the computer after processing must also be kept somewhere inside the computer before being given to you in human readable form. Again the output is also stored inside the computer for further processing.
- **Control:** The manner how instructions are executed and the above operations are performed. Controlling of all operations like input, processing and output are performed by control unit. It takes care of step-by-step processing of all operations inside the computer.

2.3 INPUT DEVICES

Keyboard:

The Keyboard is the standard data input and operator control device for a computer. It consists of the standard QWERTY layout with a numeric keypad and additional function keys for control purposes.

Mouse:

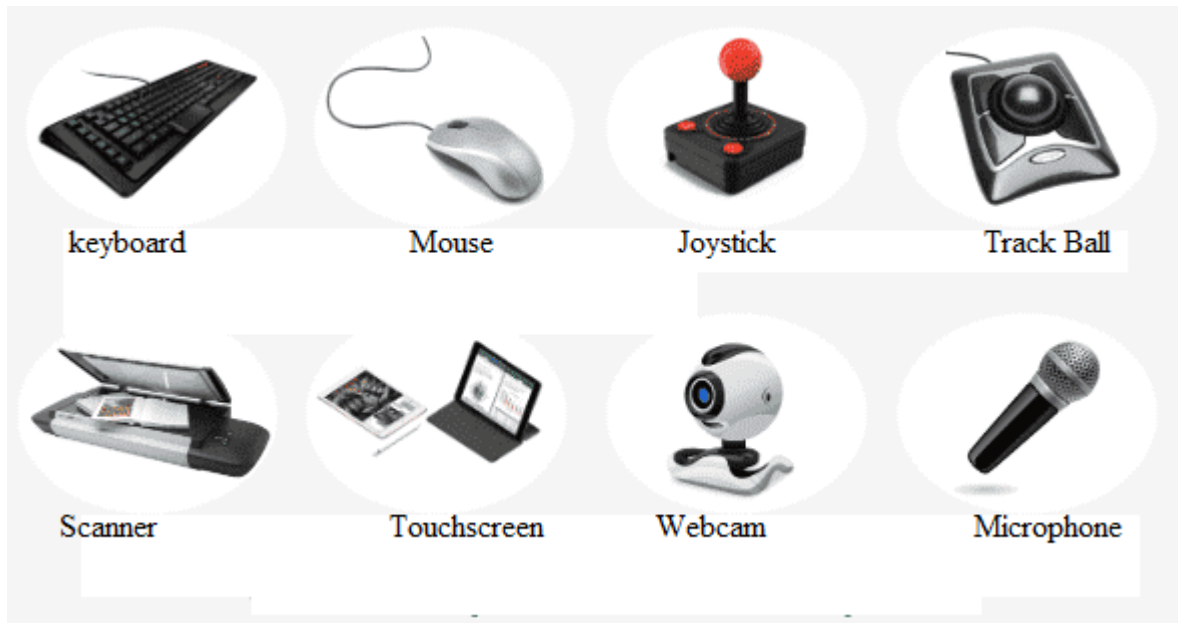
The Mouse is a popular input device. You move it across the desk and its movement is shown on the screen by a marker known as a 'cursor'. You will need to click the buttons at the top of the mouse to select an option.

Track Ball:

Track ball looks like a mouse, as the roller is on the top with selection buttons on the side. It is also a pointing device used to move the cursor and works like a mouse. For moving the cursor in a particular direction, the user spins the ball in that direction. It is sometimes considered better than a mouse, because it requires little arm movement and less desktop space. It is generally used with Portable computers.

MICR:

Magnetic Ink Character Recognition (MICR) is used to recognize the magnetically charged characters, mainly found on bank cheques. The magnetically charged characters are written by special ink called magnetic ink. MICR device reads the patterns of these characters and compares them with special patterns stored in memory. Using MICR device, a large volume of cheques can be processed in a day. MICR is widely used by the banking industry for the processing of cheques.

**JoyStick:**

The joystick is a rotary lever. Similar to an aircraft's control stick, it enables you to move within the screen's environment, and is widely used in the computer games industry.

Digitizing Tablet:

A Digitizing Tablet is a pointing device that facilitates the accurate input of drawings and designs. A drawing can be placed directly on the tablet, and the user traces outlines or inputs coordinate positions with a hand-held stylus.

Touch Screen:

A Touch Sensitive Screen is a pointing device that enables the user to interact with the computer by touching the screen. There are three types of Touch Screens: pressure-sensitive, capacitive surface and light beam.

Light Pen:

A Light Pen is a pointing device shaped like a pen and is connected to a VDU. The tip of the light pen contains a light-sensitive element which, when placed against the screen, detects the light from the screen enabling the computer to identify the location of the pen on the screen. Light pens have the advantage of 'drawing' directly onto the screen, but this can become uncomfortable, and they are not as accurate as digitising tablets.

OMR:

The Optical Mark Reader (OMR) can read information in the form of numbers or letters and put it into the computer. The marks have to be precisely located as in multiple choice test papers.

Scanners

Scanners allow information such as a photo or text to be input into a computer. Scanners are usually either A4 size (flatbed), or hand-held to scan a much smaller area. If text is to be scanned, you would use an Optical Character Recognition (OCR) program to recognise the printed text and then convert it to a digital text file that can be accessed using a computer.

Bar Code:

A Bar Code is a pattern printed in lines of differing thickness. The system gives fast and error-free entry of information into the computer. You might have seen bar codes on goods in supermarkets, in libraries and on magazines. Bar codes provide a quick method of recording the sale of items.

Card Reader:

This input device reads a magnetic strip on a card. Handy for security reasons, it provides quick identification of the card's owner. This method is used to run bank cash points or to provide quick identification of people entering buildings.

Smart Card:

Smart Card: This input device stores data in a microprocessor embedded in the card. This allows information, which can be updated, to be stored on the card. This method is used in store cards which accumulate points for the purchaser, and to store phone numbers for cellular phones.

2.4 OUTPUT DEVICES

Output devices are pieces of equipment that are used to get information or any other response out from computer. These devices display information that has been held or generated within a computer. Output devices display information in a way that you can understand. The most common output device is a monitor.

2.4.1 Printers:

Printer is an output device, which is used to print information on paper.

There are two types of printers –

- Impact Printers

Impact printers print the characters by striking them on the ribbon, which is then pressed on the paper. These printers are two types

Character printers

Character printers are the printers which print one character at a time. These are further divided into two types: Dot Matrix Printer (DMP), Daisy Wheel, and Dot Matrix Printer

Line Printers

Line printers are the printers which print one line at a time. These are of two types: Drum Printer, Chain Printer, and Drum Printer

- Non-impact Printers

Non-impact printers print the characters without using the ribbon. These printers print a complete page at a time, thus they are also called as Page Printers. These printers are of two types Laser Printers and Inkjet Printers

Characteristics of Non-impact Printers

- Faster than impact printers
- They are not noisy
- High quality
- Supports many fonts and different character size

2.4.2 Plotter

Plotter is a computer hardware device much like a printer that is used for printing vector graphics. Instead of toner, plotters use a pen, pencil, marker, or another writing tool to draw multiple, continuous lines onto paper rather than a series of dots like a traditional printer.

Plotters are specialized pieces of equipment designed to print out vector graphics in a variety of colors. Three types of plotters are most popular for their ability to allow you to create different designs.



Drum plotter: print graphics of any width and length adds great versatility in printing a wide variety of large documents. Some of the documents created include architectural drawings.

Flatbed plotter: useful for printing larger architectural or CAD drawings.

Inkjet plotters: Because of these affordable and versatile, they have many advantages in real time environment.

2.4.3 Speakers

Speakers are output devices that allow you to hear sound from your computer. Computer speakers are just like stereo speakers.

2.4.4 Projector

A projector is an output device that enables the user to project the output onto a large surface such as a big screen or wall. It can be connected to a computer and similar devices to project their output onto a screen. It uses light and lenses to produce magnified texts, images, and videos. So, it is an ideal output device to give presentations or to teach a large number of people.

Modern projects (digital projectors) come with multiple input sources such as HDMI ports for newer equipment and VGA ports that support older devices. Some projectors are designed to support Wi-Fi and Bluetooth as well. They can be fixed onto the ceiling, placed on a stand,

and more and are frequently used for classroom teaching, giving presentations, home cinemas, etc.

A digital projector can be of two types:

Liquid Crystal Display (LCD) digital projector

Digital Light Processing (DLP) digital projector

Monitors:

Monitors are also called as Visual Display Unit (VDU), are the main output device of a computer. It forms images from tiny dots, called pixels that are arranged in a rectangular form. The sharpness of the image depends upon the number of pixels.

There are two kinds of viewing screen used for monitors.

- Cathode-Ray Tube (CRT)

The CRT display is made up of small picture elements called pixels. The smaller the pixels, the better the image clarity or resolution. It takes more than one illuminated pixel to form a whole character

- Flat-Panel Display

The flat-panel display refers to a class of video devices that have reduced volume, weight and power requirement in comparison to the CRT. You can hang them on walls or wear them on your wrists. Current uses of flat-panel displays include calculators, video games, monitors, laptop computer, and graphics display.

2.5 SUMMARY

Computer hardware (usually simply called hardware when a computing context is concerned) is the collection of physical elements that constitutes a computer system. Computer hardware is the physical parts or components of a computer, such as the monitor, mouse, keyboard, computer data storage, hard disk drive (HDD), graphic cards, sound cards, memory, motherboard, and so on, all of which are physical objects that are tangible. In contrast, software is instructions that can be stored and run by hardware.

2.6 TECHNICAL TERMS

CPU, ALU, Memory, RAM, ROM, Instruction Cycle, Input Devices, Output Devices.

2.7 SELF ASSESSMENT QUESTIONS

Essay questions:

1. What are the five basic operations performed by the computer?
2. Explain various input devices
3. Explain various output devices.
4. Explain basic organization of a Computer.

Short Notes:

1. Define ALU, CU and CPU.
2. What are functional units of basic computer system?
3. Write short notes on any two input and output devices.

2.8 SUGGESTED READINGS

1. P.Mohan computer fundamentals- Himalaya Publications.
2. R.K.Sharma and Shashi K Gupta, Computer Fundamentals - Kalyani Publications
3. Fundamentals of Computers By Balagurusamy, Mcgraw Hill
4. Fundamentals of Computers Rajaraman V Adabala N

AUTHOR: Dr. G. NEELIMA

LESSON- 3

COMPUTER MEMORY

AIMS AND OBJECTIVES

In this unit the student will learn Characteristics required for a device to be used as a cell in a computer's memory. How memory cells are arranged to create different types of memories. How the main memory of the computer is maintained. He also learns about cache memory.

STRUCTURE

- 3.1 Introduction**
- 3.2 Basics of Computer Memory**
 - 3.2.1 Measurement of Memory
 - 3.2.2 Memory Hierarchy
- 3.3. Primary Memory**
- 3.4 Secondary Memory**
- 3.5 Cache Memory**
- 3.6 Summary**
- 3.7 Technical Terms**
- 3.8 Self-Assessment Questions**
- 3.9 Suggested Readings**

3.1 INTRODUCTION

Computer memory consists of number of storage locations, or cells, each of which has a unique numeric address. Addresses are usually written in hexadecimal. Each storage location can contain a fixed number of binary digits. The most common size is one byte. Most computers group bytes together into words.

Memory Unit is that component of a computer system, which is used to store the data, instructions and information before, during and after the processing by ALU. It is actually a work area (physically a collection of integrated circuits) within the computer, where the CPU stores the data and instructions. It is also known as a Main Memory or Primary Memory.

3.2 BASICS OF COMPUTER MEMORY

Both programs and data are stored in binary form in computer's memory. The binary system has only two digits, 0 and 1. These are called bits. A bit stands for binary digit, which stands for one binary piece of information.

Humans can understand the decimal system but the computer can understand only the binary system. The computer takes input in the form of 0 and 1 and gives output in the same form, i.e., 0 and 1 only. But we do not receive output in the form of 0's & 1's only. This is because every number stored in binary form can be converted to decimal system and vice versa.

For example, 1010 in binary is equivalent to 10 in decimal. Therefore, it is the computer that takes information or data in decimal form from user, converts it into binary form, processes it; produces output in binary form and finally again converts the output to decimal form.

3.2.1 Measurement of Memory

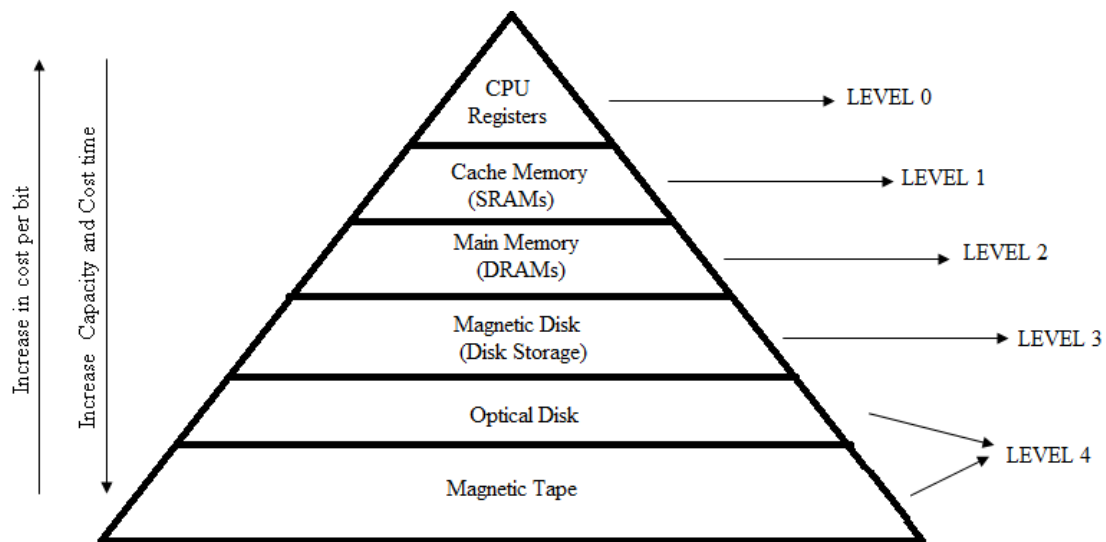
The primary or internal storage unit is made up of several small storage locations called cells. Each of these cells can store a fixed number of bits called word length. Each cell has a unique number assigned to it called the address of the cell and it is used to identify the cells. So we can say that memory is like a large cabinet that has as many drawers as there are addresses in memory. Each drawer has a word and the address is written on the outside of the drawer.

We know that data in computer is stored in the form of 0s and 1s. Each of these digits is known as a bit. A collection of 8 bits constitutes a byte. Each cell of memory contains one character or 1 byte of data. So the capacity is defined in terms of bytes or words. However higher units of memory are Kilobytes, Megabytes, Gigabytes etc.

Name	Equal To	Size(In Bytes)
Bit	1 Bit	1/8
Nibble	4 Bits	1/2 (rare)
Byte	8 Bits	1
Kilobyte	1024 Bytes	1024
Megabyte	1, 024 Kilobytes	1, 048, 576
Gigabyte	1, 024 Megabytes	1, 073, 741, 824
Terrabyte	1, 024 Gigabytes	1, 099, 511, 627, 776
Petabyte	1, 024 Terabytes	1, 125, 899, 906, 842, 624
Exabyte	1, 024 Petabytes	1, 152, 921, 504, 606, 846, 976
Zettabyte	1, 024 Exabytes	1, 180, 591, 620, 717, 411, 303, 424
Yottabyte	1, 024 Zettabytes	1, 208, 925, 819, 614, 629, 174, 706, 176

3.2.2 Memory Hierarchy

In the Computer System Design, Memory Hierarchy is an enhancement to organize the memory such that it can minimize the access time. The Memory Hierarchy was developed based on a program behavior known as locality of references.



This Memory Hierarchy Design is divided into 2 main types:

- External Memory or Secondary Memory –Comprising of Magnetic Disk, Optical Disk, Magnetic Tape i.e. peripheral storage devices which are accessible by the processor via I/O Module.
- Internal Memory or Primary Memory –Comprising of Main Memory, Cache Memory & CPU registers. This is directly accessible by the processor.

We can infer the following characteristics of Memory Hierarchy Design from above figure:

- Capacity:

It is the global volume of information the memory can store. As we move from top to bottom in the Hierarchy, the capacity increases.

- Access Time:

It is the time interval between the read/write request and the availability of the data. As we move from top to bottom in the Hierarchy, the access time increases.

- Performance:

Earlier when the computer system was designed without Memory Hierarchy design, the speed gap increases between the CPU registers and Main Memory due to large difference in access time. This results in lower performance of the system and thus, enhancement was required.

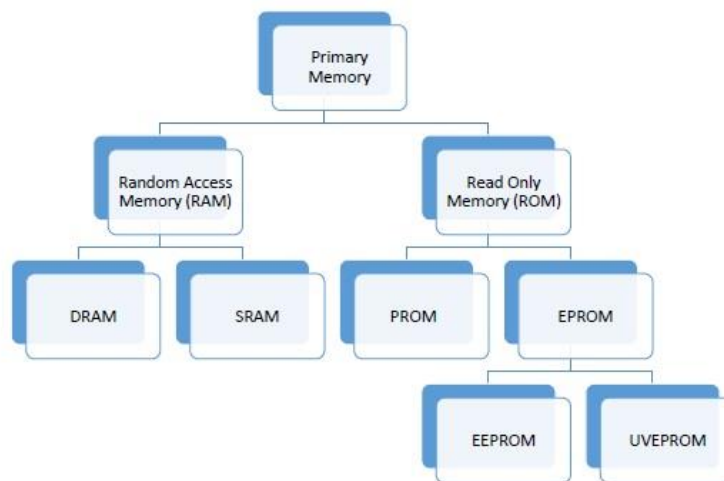
This enhancement was made in the form of Memory Hierarchy Design because of which the performance of the system increases. One of the most significant ways to increase system performance is minimizing how far down the memory hierarchy one has to go to manipulate data.

- Cost per bit

As we move from bottom to top in the Hierarchy, the cost per bit increases i.e. Internal Memory is costlier than External Memory.

3.3 PRIMARY MEMORY

Primary memory is the memory that is accessed by the processor directly. It is also known as main memory or internal memory. It helps in executing applications that are temporarily stored in a specific memory location. Primary memory is of two types – RAM and ROM.



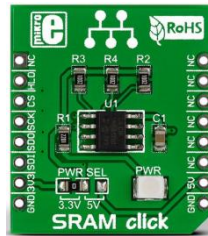
3.3.1 Random Access Memory (RAM)

Random Access Memory (RAM) is the type of memory in which it is possible to randomly select and use any location of the memory directly to store and retrieve data. It is also called as read/write memory. Since it is volatile, the data from RAM is lost as soon as the power to the computer is switched off.

Two main types of RAM are:

- *Static RAM*

Static RAM is the full form of SRAM. In this type of RAM, data is stored using the state of a six transistor memory cell. Static RAM is mostly used as a cache memory for the processor (CPU).



- *Dynamic RAM*

DRAM stands for Dynamic Random Access Memory. It is a type of RAM which allows you to store each bit of data in a separate capacitor within a specific integrated circuit. Dynamic RAM is a standard computer memory of the many modern desktop computers.

This type of RAM is a volatile memory that needs to be refreshed with voltage regularly. Else it loses the information stored on it.



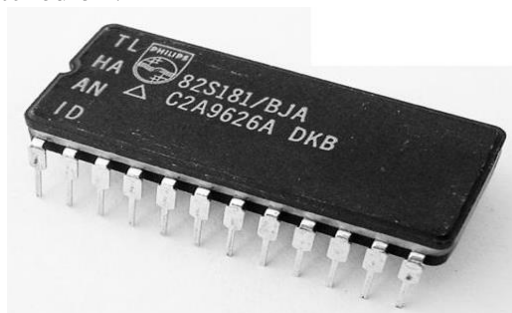
3.3.2 Read Only Memory (ROM)

This is another type of primary memory from which data can only be read. We cannot write or modify data once written on to the ROM. Also this type of primary memory is not volatile. The storage of program and data in the ROM is permanent.

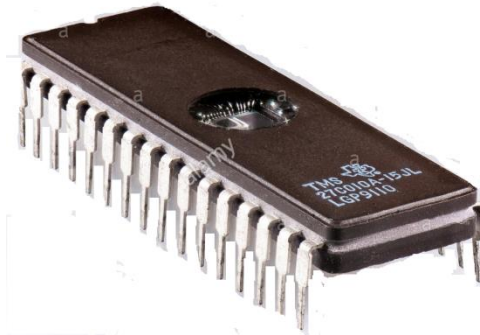
The ROM stores some standard processing programs supplied by the manufacturers to operate our computer. The Basic Input Output System (BIOS) is stored in the ROM. It examines and initializes the startup process of the computer and also checks various peripheral devices attached to the PC when the computer is turned ON.

The various types of ROMs are discussed below:

- *Programmable Read Only Memory (PROM):* You know that it is not possible to modify or erase programs stored in ROM, but it is possible for you to store your program in PROM chip. Once the programs are written it cannot be changed. Also the program is not lost even if power is switched off.



- *Erasable Programmable Read Only Memory (EPROM)*: This type of ROM overcomes the problem of PROM and ROM. EPROM chip can be programmed time and again by erasing the information stored earlier in it. Information stored in EPROM can be erased by exposing it to ultraviolet light. This memory can be reprogrammed using a special programming facility. When the EPROM is in use, information can only be read.



- *Electrically Erasable Programmable Read Only Memory (EEPROM)*: This type of ROM is somewhat similar to EPROM. The only difference is that unlike EPROM, electrical signals are used to erase the contents of EEPROM. Also, this type of ROM need not be completely erased. Partial modification of ROM is possible.



3.4 SECONDARY MEMORY

The need for secondary storage

Computers use main memory such as random access memory (RAM) and cache to hold data that is being processed. Secondary storage memory is volatile - it loses its contents when the computer is switched off. Secondary storage is non-volatile, long-term storage. Without secondary storage all programs and data would be lost the moment the computer is switched off.

There are three main types of secondary storage in a computer system:

- solid state storage devices
- optical storage devices
- magnetic storage devices

3.4.1 Solid state storage Devices:

Solid state storage is a special type of storage made from silicon microchips. It can be written to and overwritten like RAM. However, unlike RAM, it is non-volatile, which means that when the computer's power is switched off, solid state storage will retain its contents.

Solid state is also used as external secondary storage, for example on USB memory sticks and solid state drives. One of the main advantages of solid state storage is that there are no moving parts. For this reason, it is more portable and produces less heat compared to traditional magnetic storage devices. Less heat means the components last longer. And solid storage device is more portable and durable.

Solid state storage is also faster than traditional hard disk drives because the data is stored as electrically in silicon chips called cells. In cells, binary data is stored by capturing electrical current in a transistor with on / off mode. Unlike RAM, which uses a similar technology, it has solid state storage even when power is turned off using a technology called flash memory.

Solid state is a storage medium suitable for many modern devices such as tablets, smartphones and digital cameras.

Solid State Hard Disc



Memory Stick



Flash Memory



Micro Flash Memory



3.4.2 Magnetic devices

Magnetic devices, such as hard disk drives, use magnetic fields to magnetize small individual sections of a metal spinning disc. Each small section represents a bit. The magnetized section represents binary '1' and the demagnetized section represents binary '0'. These partitions are so small that disks can contain terabytes (TB) of data.

As the disk rotates, a read / write head moves across its surface. To write data, the head magnetizes or demagnetizes a section of disk that rotates beneath it. To read the data, the head makes a note of whether the section is magnetized or not.

Magnetic devices are very cheap in cost, high efficiency and durable. However, they are more likely to be damaged if dropped. They can also damage magnetic fields - erasing the data that a strong magnetic device holds.



hard disk



floppy disks



zip disks

3.4.3 Optical devices

Optical devices use a laser to scan the surface of a spinning disc made of metal and plastic. The disk surface is divided into tracks, each track having several flat areas and hollows. Flat areas are called lands and hollows are called as pits.

When the laser shines on the disc surface, lands reflect the light back, whereas pits scatter the laser beam. A sensor looks for the reflected light. Reflected light - land - represents a binary '1', and no reflection - pits - represents a binary '0'.

When the laser flashes on the disk surface, the surface of disk reflects the light back, while the pits scatter the laser beam. The sensor looks for reflected light. Reflected light surface denotes binary '1' and no reflection that is pits denote binary '0'.



3.5 CACHE MEMORY

A Cache (Pronounced as “cash”) is a small and very fast temporary storage memory. It is designed to speed up the transfer of data and instructions. It is located inside or close to the CPU chip. It is faster than RAM and the data/instructions that are most recently or most frequently used by CPU are stored in cache.

The data and instructions are retrieved from RAM when CPU uses them for the first time. A copy of that data or instructions is stored in cache. The next time the CPU needs that data or instructions, it first looks in cache. If the required data is found there, it is retrieved from cache memory instead of main memory. It speeds up the working of CPU.

Levels of Cache Memory:

A computer can have several different levels of cache memory. The level numbers refers to distance from CPU where Level 1 is the closest. All levels of cache memory are faster than RAM. The cache closest to CPU is always faster but generally costs more and stores less data than other level of cache.

The following are the deferent levels of Cache Memory.

Level 0 (L0) Cache

It has have been proposed in the past as an inexpensive way to improve performance and reduce energy consumption in resource-constrained embedded processors.

Level 1 (L1) Cache

It is also called primary or internal cache. It is built directly into the processor chip. It has small capacity from 8 Km to 128 Kb.

Level 2 (L2) Cache

It is slower than L1 cache. Its storage capacity is more, i-e. From 64 Kb to 16 MB. The current processors contain advanced transfer cache on processor chip that is a type of L2 cache. The common size of this cache is from 512 kb to 8 Mb.

Level 3 (L3) Cache

This cache is separate from processor chip on the motherboard. It exists on the computer that uses L2 advanced transfer cache. It is slower than L1 and L2 cache. The personal computer often has up to 8 MB of L3 cache

3.6 SUMMARY

Computer memory is the storage space in the computer, where data is to be processed and instructions required for processing are stored. The memory is divided into large number of small parts called cells. The chapter has introduced the concept of memory units and its categories as the main and the second memory and their characteristic features. It discusses the features of RAM, ROM, PROM, and EPROM and Cache Memory.

3.7 TECHNICAL TERMS

Memory, Memory Hierarchy, RAM, ROM, Cache Memory, Primary Memory, Secondary Memory.

3.8 SELF ASSESSMENT QUESTIONS

Essay questions:

1. Differentiate RAM and ROM
2. Describe how the data is read from a Hard Disk
3. Write any four examples of optical storage media..

Short Notes:

1. Explain what is meant by primary and secondary storage.
2. Memory Hierarchy
3. Cache Memory

3.9 SUGGESTED READINGS

1. P.Mohan computer fundamentals- HimalayaPublications.
2. R.K.Sharma and Shashi K Gupta, Computer Fundamentals - Kalyani Publications
3. Fundamentals of Computers ByBalagurusamy, Mcgraw Hill
4. Fundamentals of Computers Rajaraman V Adabala N

AUTHOR: Dr. G. NEELIMA

LESSON- 4

SOFTWARE

AIMS AND OBJECTIVES

Upon successful completion of this chapter, student will be able to:

- Define the term software;
- Describe the two primary categories of software;
- Understand how system software interacts with application software
- What are various types of software used in our daily life?

STRUCTURE

- 4.1 Introduction**
- 4.2 Types of Software**
- 4.3. System Software**
- 4.4 Application Software**
- 4.5 Commercial software**
- 4.6 Open Source Software**
- 4.7 Domain software**
- 4.8 Free ware software**
- 4.9 Summary**
- 4.10 Technical Terms**
- 4.11 Self-Assessment Questions**
- 4.12 Suggested Readings**

4.1 INTRODUCTION

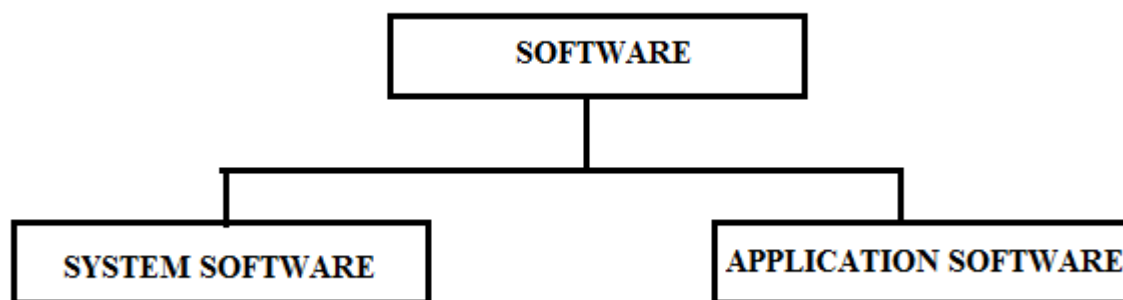
The organization of the computer is defined by its internal registers, the timing and control structure, and the set of instructions that it uses. Internal organization of a computer is defined by the sequence of micro-operations it performs on data stored in its registers. Computer can be instructed about the specific sequence of operations it must perform.

User controls this process by means of a Program. Program is a set of instructions that specify the operations, operands, and the sequence by which processing has to occur. Instruction is a binary code that specifies a sequence of micro-operations for the computer. The computer reads each instruction from memory and places it in a control register. The control then interprets the binary code of the instruction and proceeds to execute it by issuing a sequence of micro-operations is called Instruction Cycle

4.1.1 Software

Software is a collection of computer programs and related data that provides the instructions for telling a computer what to do and how to do it and also we can say that software is any set of instructions that guides the hardware and tells it how to accomplish each task.

Without software, there is no use of hardware. It cannot produce any output on its own. Software is a general term used to describe a collection of computer system programs, procedures and documentation that perform some task on a computer system. Usually written in high level programming languages software are easier and more efficient for users to use than machine language.



High level languages are compiled or defined into machine language object code. Software engineers develop and maintain software. With technological changes, software changes happen faster than hardware changes.

4.1.2 Characteristics of Good Software

- Provides the required functionality.
- It is usable even by the inexperienced users.
- Reliable and dependable.
- It functions efficiently.
- It has a life span at least measured in years.

- provides an appropriate user interface
- It is accompanied by complete documentation
- It can be maintained easily.

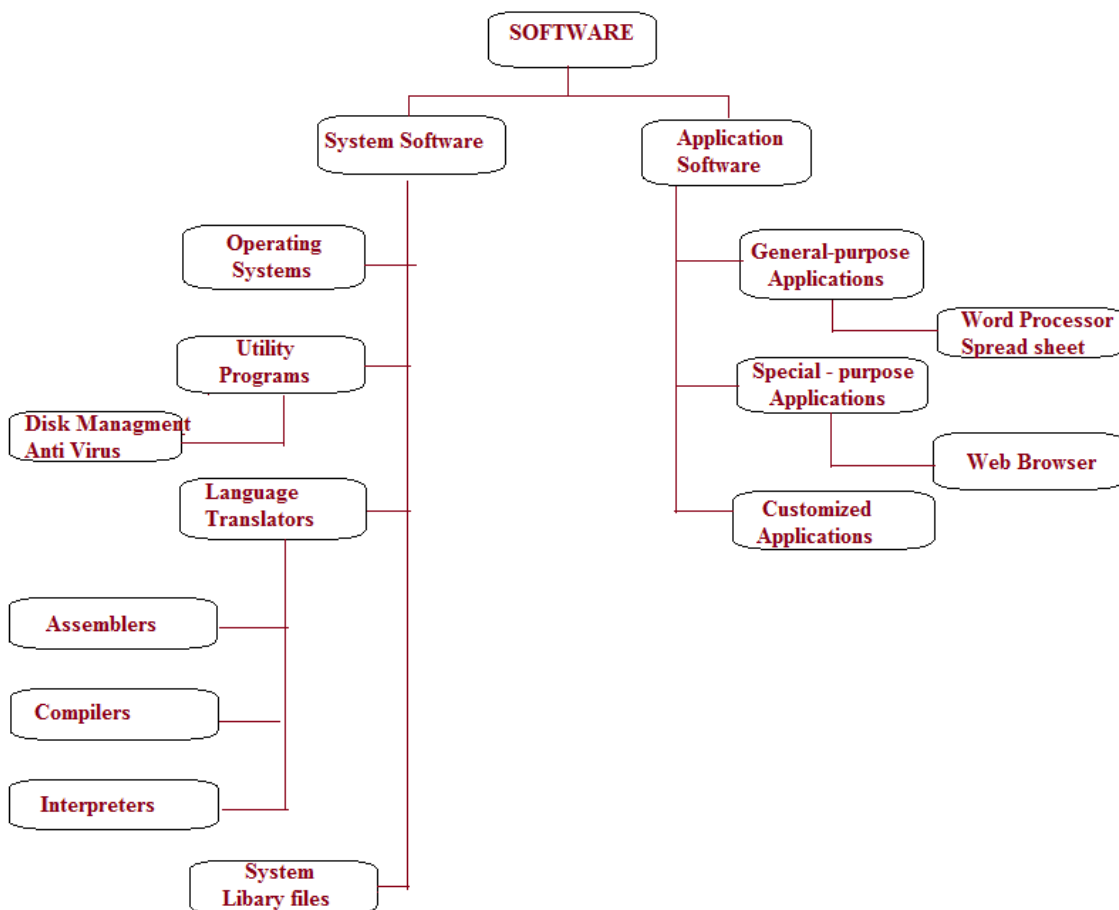
4.1.3 Functions of Software

- It manages the computer resources of organizations.
- It provides tools for people to make use of these resources.
- It acts as an intermediary between companies and stored data and information.

4.2 TYPES OF SOFTWARE

Computer software is mainly based on purpose the software serves.

This can be broadly classified into two categories i.e. Systems and Application software



4.3 SYSTEM SOFTWARE

System software is computer software designed to operate the computer hardware to provide basic functionality and to provide a platform for running application software. It also refers to the operating system and all utility programs that manage computer resources at a low level.

The BIOS (basic input/output system) gets the computer system started after you turn it on and manages the data flow between the operating system and attached devices such as the hard disk, video adapter, keyboard, mouse, and printer.

The boot program loads the operating system into the computer's main memory or random access memory (RAM).

There are various categories of systems software. Some of them are

- Operating system
- Utility programs
- Language Translators
- System library files.

4.3.1 Operating Systems

An operating system is act as an intermediary between the user of a computer and computer hardware. The purpose of an operating system is to provide an environment in which a user can execute programs in a convenient and efficient manner.

An operating system is software that manages the computer hardware. The hardware must provide appropriate mechanisms to ensure the correct operation of the computer system and to prevent user programs from interfering with the proper operation of the system.

The operating system so much relies on the device driver to communicate with each hardware device. A device driver is a small program that tells the OS how to communicate with the device.

4.3.2 Utility Programs

Utility programs are special programs are used to enhance performance of the computer system. They help to manage, maintain and control computer resources. These programs include: File viewers, File compression utility, backup utilities, antivirus, screen savers, etc

Various tasks of utility programs are scan and fix computer viruses, Help in file backup, Compress files of disks, Partition disks into individual logical drives., Perform tasks on files (move files, delete files, etc) and Diagnose computer problems.

Personal computers come loaded with utility programs designed to help resolve issues and maintain optimum performance. These utilities are easily accessed through Advanced Settings in our computer system.

4.3.3. Language Translators

A translator is a programming language processor that converts a computer program from one language to another. It takes a program written in source code and converts it into machine code. It discovers and identifies the error during translation.

It translates high-level language program into a machine language program that the central processing unit (CPU) can understand. It also detects errors in the program.

There are 3 different types of translators. They are compilers, interpreters and assemblers

Compilers convert high-level language code to machine (object) code at a time and then save the executable object code to memory. A compiler creates machine code that runs on a processor with a specific Instruction Set Architecture (ISA), which is processor-dependent.

Examples: Microsoft Visual Studio, GNU Compiler Collection (GCC), Common Business Oriented Language (COBOL)

Interpreter is a translator used to convert high-level programming language to low-level programming language. It converts the program one at a time and reports errors detected at once, while doing the conversion. With this, it is easier to detect errors than in a compiler. An interpreter is faster than a compiler as it immediately executes the code upon reading the code.

Examples: LISP, Python

An Assembler is a translator used to translate assembly language to machine language. Assembly language is difficult to understand as it is a low-level programming language. An assembler translates a low-level language, an assembly language to an even lower-level language, which is the machine code.

Examples: FORTRAN Assembly Program (FAP), Macro Assembly Program (MAP), Symbolic Optimal Assembly Program (SOAP).

4.3.4 System Library files

A library file is the actual executable code that does the work as specified in that header file. This is linked in by the linker to provide the actual functionality. Libraries are particularly useful for storing frequently used routines because we do not need to explicitly link them to every program that uses them. The linker automatically looks in libraries for routines that it does not find elsewhere. some library files extensions are .lib, .dll etc.,

4.4 APPLICATION SOFTWARE

Application software is a program that designed to meet user specific needs. The primary function of application software is to apply the computer to users solve problems and accomplish specific tasks. Application software, such as word processing, spreadsheets, e-mail, database, and Web browser, can help us perform tasks such as creating documents, analyzing finances, sending messages, organizing data, and viewing pages on the Internet respectively.

Application software can be classified into two types. They are Off- the shelf software and Customized or Bespoke software.

- **Off- the shelf software:** This is software designed and packaged for sale. A user will find it readily available in shops for sale. Off-the -shelf is further subdivided into two types. General purpose software and Special purpose software.
 - *General purpose application software* is a type of software that can be used for a variety of tasks. It is not limited to one particular function. For example a word processor could be classed as general purpose software as it would allow a user to write a novel, create a restaurant menu or even make a poster
 - *Special purpose application software* is a type of software created to execute one specific task. For example a camera application on your phone will only allow you to take and share pictures. Another example would be a chess game, it would only allow you to play chess, web browsers, calculators, media players, calendar programs etc.
- **Bespoke/Customized Application Software:** Bespoke application software is tailor made for a specific user and purpose. For example a factory may require software to run a robot to make cars, however, it is the only factory making that car in the world, so the software required would have to be specially build for the task. Other examples might include software for hospitals and medical equipment, software being written inside banks and other financial institutions.

Examples for application software are:

- MS Word, WordPad and Notepad
- Internet browsers like Firefox, Safari, and Chrome
- Microsoft Power Point, Keynotes
- Auto CAD
- MySQL, Oracle, MS Access
- Apple Numbers, Microsoft Excel
- Real Player, Media Player
- Dictionaries: Encarta, Britannica
- Mathematical: MATLAB
- Others: Google Earth, NASA World Wind
- OpenOffice, Microsoft Office

4.5 COMMERCIAL SOFTWARE

Refers to software that requires payment before it can be used. Commercial software programs typically come in a physical box, which is what you see displayed in retail stores, while others are available as downloads over the Internet.

Packaged software is an example of commercial software, which is copyrighted and designed to meet the needs of a wide variety of users. Software copyright is a law used by proprietary (commercial) software companies to prevent the unauthorized copying of their software. Microsoft products such as the Windows Operating System and MS Office are some of the most well-known examples of commercial software.

The benefits of commercial software include support guarantee, timely updates, and patches. While being free and customizable, open-source business software comes with hidden costs relating to maintenance, training staff, and security risks

Examples for Commercial Software are:

- A POS system (Point Of Sale)
- Inventory Systems
- Scheduling & Calendar Software
- Fleet Management Software
- Mapping or GIS Software
- Analytics software for specific industries
- A financial system used for accounting and finance
- A CRM System to manage customers
- An HR System used by Human Resources to Manage Personnel
- Charting or Visualization Software

4.6 OPEN SOURCE SOFTWARE

Open source software is Software provided for use, modification and redistribution. It is a software that any programmer can download from the Internet for free and modify with suggested improvements. The only qualification is that changes can't be copyrighted. It is so popular because any programmer can make improvements which can result in better quality software.

Examples:

- Firefox—a Web browser that competes with Internet Explorer
- OpenOffice—a competitor to Microsoft Office
- Gimp—a graphic tool with features found in Photoshop
- Marketcetera—an enterprise trading platform for hedge fund managers that competes with FlexTrade and Portware

- Zimbra—open source e-mail software that competes with Outlook server
- MySQL, Ingres, and EnterpriseDB—open source database software packages that each go head-to-head with commercial products from Oracle, Microsoft, Sybase, and IBM
- SugarCRM—customer relationship management software that competes with Salesforce.com and Siebel
- Free BSD and Sun's OpenSolaris—open source versions of the Unix operating system

Advantages:

- The source codes are available to users and they have the rights to modify them. This will allow improvements to the software without having to invest large sum of money in research and development.
- The modified and improved source codes can be freely redistributed.
- The open source software is created according to industry demands but allows for upgrades to take place freely when the need arises. Therefore, if bugs in the codes are found, they can be fixed by anyone interested and capable.
- The software can be used in any way and for any legal purposes. There is no restriction in a unilateral way on how the software could be used.

Disadvantages

- The codes are too complicated for beginner to understand.
- There is no particular official monitoring the works of a programmer improving the codes. This is because anyone is free to use, modify or even distribute the codes.
- Since nobody in particular is responsible for the codes, there is no exact knowledge and assurance on when the codes are going to be fixed if there a bugs in it. Thus, users will have to use the problematic software until someone rectifies the problem

4.7 DOMAIN SOFTWARE

One of the prerequisites for the development of a software system is that we have a definition and a clear understanding of the contents of the application domain concerned. This is the part of an organization for which we are to develop application software. This means that the application domain is our starting point and the context for our software development.

An application domain is the segment of reality for which a software system is developed. It is the background or starting point for the actual-state analysis and the creation of a domain model.

An application domain can be an organization, a department within an organization, or a single workplace.

Domain is a subject area in which our project belongs to. It may be banking, finance, sales, health, media, telecom, Insurance, Medical, Advertising, Travel, etc.

Different Domains in Software Development is -

- Web development
- Scientific development
- Business development
- Medical devices
- Industrial and process control
- Embedded systems
- Big Data
- Defense systems
- Systems software (Operating Systems & such)
- Tools (Assemblers, Compilers, Linkers, etc.)

4.8 FREEWARE SOFTWARE

Freeware is a combination of the words free and software, to mean “free software.” But it is not exactly the same as “free software.”

Freeware means there are no paid licenses required to use the application, no fees or donations necessary, no restrictions on how many times you can download or open the program, and no expiration date.

However, it can still be restrictive in some ways. Freeware is cost-free software. In other words, freeware is software under copyright but available at no cost; A freeware application may or may not have its source code freely available. The program itself does not cost and is completely usable without charge, but that doesn't mean that the program is editable and can be transformed to create something new, or inspected to learn more about the inner-workings.

Freeware might also be restrictive. For example, one program might be free only for private use and stop working if it's found to be used for commercial purposes, or maybe the software is restricted in functionality because there's a paid edition available that includes more advanced features.

Unlike the rights given to free software users, freeware users' freedoms are granted by the developer; some developers might give more or less access to the program than others. They also might restrict the program from being used in particular environments, lock down the source code, etc.

Examples:

- Adobe PDF
- yahoo messenger
- Google Talk
- MSN messenger

4.9 SUMMARY

Computer software provides instructions that tell the computer how to operate. Software is also called programs. These programs are usually created using other software called programming languages. System software directs all the activities and sets all the rules for how the hardware and software work together. MS DOS and Microsoft Windows are examples of system software or operating system software. Application software programs work with the operating system software to help us to use our computer to do specific types of work such as word processing to type a letter.

4.10 TECHNICAL TERMS

Software, System software, Application software, freeware, open source, domain.

4.11 SELF ASSESSMENT QUESTIONS

Essay questions:

1. Define Software. What are various categories of software
2. Explain the difference between System Software and Application Software.
3. Differentiate between Public domain software, freeware, commercial software

Short Notes:

1. Commercial software
2. Freeware software
3. Domain software

4.12 SUGGESTED READINGS

1. P.Mohan computer fundamentals- HimalayaPublications.
2. R.K.Sharma and Shashi K Gupta, Computer Fundamentals - Kalyani Publications
3. Fundamentals of Computers ByBalagurusamy, Mcgraw Hill
4. Fundamentals of Computers Rajaraman V Adabala N

AUTHOR: Prof. K. GANGADHARA RAO

LESSON- 5

PROGRAMMING LANGUAGES

AIMS AND OBJECTIVES

Upon successful completion of this chapter, student will be able to:

- Explain the need for programming languages
- Identify the different generations of programming languages
- Categorize programming languages
- What is Language Paradigm
- Provide examples of programming languages

STRUCTURE

- 5.1 Introduction**
 - 5.1.1 Computer Program**
 - 5.1.2 Programming Language**
 - 5.1.3 Types of Programming Languages**
 - 5.1.4 Computer Programmers**
 - 5.1.5 Language Paradigm**
- 5.2 Generations of Programming Languages**
- 5.3 Summary**
- 5.4 Technical Terms**
- 5.5 Self-Assessment Questions**
- 5.6 Suggested Readings**

5.1 INTRODUCTION

A programming language is a formal language comprising a set of strings that produce various kinds of machine code output. Programming languages are one kind of computer language, and are used in computer programming to implement algorithms such as C, C++, Java, and Python. While coding and programming seem to be synonymous at the front, they are altogether different from each other. While coding means writing codes from one language to another, programming means to program a machine with a given set of instructions to run.

The portion of the language that a computer can understand is called a “binary.” Translating programming language into binary is known as “compiling.” Each language, from C Language to Python, has its own distinct features, though many times there are commonalities between programming languages.

Programming languages follow grammar called syntax. There are certain basic program code elements which are common for all the programming languages

5.1.1 Computer Program

Computer Program is a step by step process of designing and developing various sets of computer programs to accomplish a specific computing outcome. The process comprises several tasks like analysis, coding, algorithm generation, checking accuracy and resource consumption of algorithms, etc. The purpose of computer programming is to find a sequence of instructions that solve a specific problem on a computer.

Computer programming is the process of writing, testing, debugging/troubleshooting, and maintaining the source code of computer programs. This source code is written in a programming language like C++, JAVA, and Perl etc.

5.1.2 Programming Languages

Programming language is a vocabulary and set of grammatical rules (syntax) for instructing a computer to perform specific tasks.

They can be used to create computer programs and design operating systems. The term programming language generally refers to high-level languages, such as BASIC, C, C++, COBOL, JAVA and Python etc.

The function of a programming language is write computer programs, which instruct a computer to perform some kind of computation, and/or organize the flow of control between external devices (such as a printer, a robot, or any peripheral). Programming languages may contain constructs for defining and manipulating data structures or for controlling the flow of execution.

5.1.2.1 Elements of a Programming Language

- Syntax

A programming language's surface form is known as its syntax. Most programming languages are purely textual; they use sequences of text including words, numbers, and punctuation, much like written natural languages. On the other hand, there are some programming languages which are more graphical in nature, using spatial relationships between symbols to specify a program. The syntax of a language describes the possible combinations of symbols that form a syntactically correct program.

- Type System

A type system defines how a programming language classifies values and expressions into types, how it can manipulate those types and how they interact. This generally includes a description of the data structures that can be constructed in the language.

A language is typed if operations defined for one data type cannot be performed on values of another data type. An untyped language, such as most assembly languages, allows any operation to be performed on any data type.

- Variables

Variables in programming tells how the data is represented which can be range from very simple value to complex one. The value they contain can be change depending on condition. As we know program consist of instructions that tell the computer to do things

and data the program use when it is running. Data is constant with the fixed values or variable. They can hold a very simplex value like an age of the person to something very complex like a student track record of his performance of whole year.

- Loops

We can define loop as a sequence of instructions that are repeated continuously till a certain condition is not satisfied. How a loop start understand this first a certain process is done, to get any data and changing it after that applied condition on the loop is checked whether counter reached to prescribed number or not. Basically a loop carry out execution of a group of instruction of commands a certain number of times. There is also a concept of infinite loop which is also termed as endless loop is a piece of code that lack from functional exit and goes to repeat indefinitely.

- Conditionals

Conditionals specify the execution of the statements depending on the whether condition is satisfied or not. Basically it refers to an action that only fulfil when the applied condition on instructions satisfied. They are one of the most important components of the programming language because they give freedom to program to act differently every time when it execute that depends on input to the instructions.

- Input/output

The element of computer programming allow interaction of the program with the external entities. Example of input/output element are printing something out to the terminal screen, capturing some text that user input on the keyboard and can be include reading and writing files. Let's take a language example to understand the concept of input and output. C++ use streams to perform input and output operation in sequential media in terms of screen, the keyboard or a file. We can define stream as an entity that can insert or extract characters and there is no need to know details about the media associated to the stream or any of its internal specification. We need to know about streams is that they are source or destination of characters and the characters are accepted sequentially.

Subroutines and functions: the element of the programming allow a programmer to use snippet of code into one location which can be used over and over again. The primary purpose of the functions is to take arguments in numbers of values and do some calculation on them after that return a single result. Functions are required where you need to do complicated calculations and the result of that may or may not be used subsequently used in an expression. If we talk about subroutines that return several results. Where calls to subroutines cannot be placed in an expression whether it is in the main program where subroutine is activated by using CALL statement which include the list of inputs and outputs that enclosed in the open and closed parenthesis and they are called the arguments of the subroutines.

5.1.3 Types of Programming Languages

5.1.3.1 Machine Level Language:

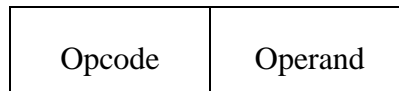
Machine languages are also known as machine code or object code, machine language is a set of binary digits or bits that a computer reads and interprets. The only language that a computer can understand is machine language. Therefore all references and data should be written using binary codes 1 and 0. Binary code is called machine code or machine Language. The exact machine language for a program is varies by an operating system.

Computer programs are written in one or more programming languages, such as C ++, Java, or Visual Basic. The computer does not directly understand the programming languages used to create computer programs, so the program code must be compiled. Once the code of the program has been compiled, the computer can understand it because the code of the program has been converted into machine language.

The compiler checks the entire user-written program (called the source program) and produces the complete program in machine language (called the object program). The source program is kept intact for possible changes and corrections, and the object program is loaded into the computer for execution.

For example, the machine language program instruction would be: 1011100101011010

Typical Machine language Instruction format



OPCODE (Operation code) tells the computer which operation to perform from the instruction set of the computer.

OPERAND (Address/Location) tells the address of the data on which the operation is to be performed.

- Advantage of Machine Language:

The only advantage is that program of machine language run very fast because no translation program is required for the CPU.

- Disadvantages of Machine language

- It is machine dependent i.e. it differs from computer to computer.
- It is difficult to program and write.
- It is prone to errors
- It is difficult to modify.

5.1.3.2 Assembly Level Language:

Assembly language, also known as symbolic language, is a low-level programming language that allows the user to write a program using alphanumeric mnemonic instructions. It requires a translator to translate the language into a machine language can be understood by computer. It is easier to remember and write than machine language.

Using alphanumeric mnemonic codes instead of numeric cods for the instruction in the instruction set e.g. using ADD instead of 1101 (binary) or 13 (decimal) for instruction to add. Allowing storage location to be represented in form of alphanumeric address instead of numeric address e.g. representing memory locations 1000, 1001 etc.

- *Assembler*: It is a computer program which converts or translate assembly language into machine language. It assembles the machine language program in the main memory of the computer and makes it ready for execution.

- *Assembly language program:* The main memory in a computer is called Random Access Memory. It is known as RAM. This is the part of the computer that stores operating system software, software application and other information for the CPU to have fast and direct access when needed to perform tasks.
- Advantages of Assembly language
 - The symbolic programming of Assembly Language is easier to understand and saves a lot of time and effort of the programmer.
 - It is easier to correct errors and modify program instructions.
 - Assembly Language has the same efficiency of execution as the machine level language. Because this is one-to-one translator between assembly language program and its corresponding machine language program.
- Disadvantages Assembly Language:
 - One of the major disadvantages is that assembly language is machine dependent. A program written for one computer might not run in other computers with different hardware configuration.
 - Long programs written in such languages cannot be executed on small sized computers.
 - It takes lot of time to code or write the program, as it is more complex in nature.

5.1.3.3 High Level Languages

High level languages are similar to the human language. Unlike low level languages, high level languages are programmers friendly, easy to code, debug and maintain.

High level language provides higher level of abstraction from machine language. They do not interact directly with the hardware. Rather, they focus more on the complex arithmetic operations, optimal program efficiency and easiness in coding.

Low level programming uses machine friendly language. Programmers writes code either in binary or assembly language. Writing programs in binary is complex and cumbersome process. Hence, to make programming more programmers friendly. Programs in high level language is written using English statements.

High level programs require compilers/interpreters to translate source code to machine language. We can compile the source code written in high level language to multiple machine languages. Thus, they are machine independent language.

Today almost all programs are developed using a high level programming language. We can develop a variety of applications using high level language. They are used to develop desktop applications, websites, system software's, utility software's and many more. High level languages are grouped in two categories based on execution model – compiled or interpreted languages.

The following figure depicts classification of high level language on the basis of execution model.



We can also classify high level language several other categories based on programming paradigm.

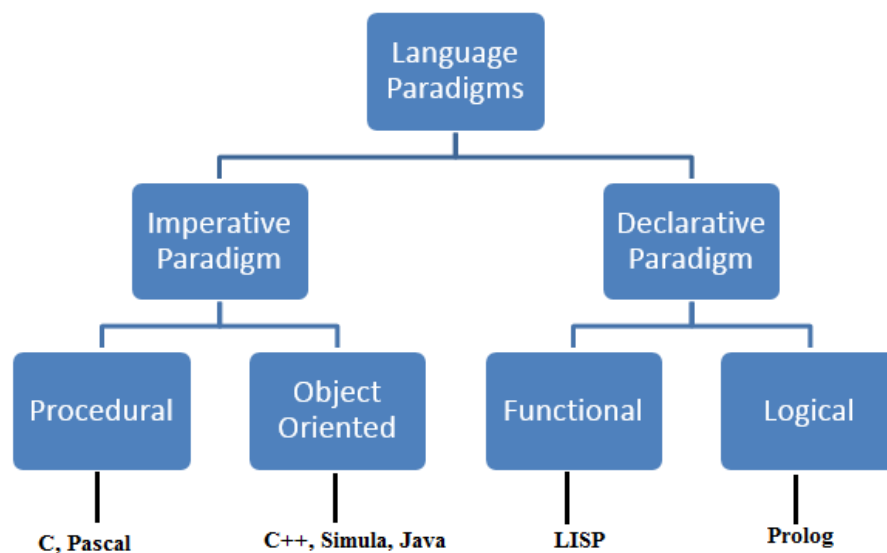


- Advantages of High level language
 - High level languages are programmer friendly. They are easy to write, debug and maintain.
 - It provide higher level of abstraction from machine languages.
 - It is machine independent language.
 - Easy to learn.
 - Less error prone, easy to find and debug errors.
 - High level programming results in better programming productivity.

- Disadvantages of High level language
 - It takes additional translation times to translate the source to machine code.
 - High level programs are comparatively slower than low level programs.
 - Compared to low level programs, they are generally less memory efficient.
 - Cannot communicate directly with the hardware.

5.1.4 Language Paradigm

Language paradigms were associated with classes of languages. First the paradigms are defined. Thereafter, programming languages according to the different paradigms are classified. The language paradigms are divided into two parts, imperative and declarative paradigms as shown in the Figure.



- **Imperative paradigm:** The meaning of imperative is “expressing a command or order”, so the programming languages in this category specify the step-by-step explanation of command.
 - Procedural paradigm: Procedural languages are statement oriented with the variables holding values. In this language the execution of a program is modeled as a series of states of variable locations.
 - Object oriented paradigm: The Object Oriented paradigm is centered on the concept of the object. Everything is focused on objects.

- **Declarative paradigm:** In this paradigm programs declare or specify what is to be computed without specifying how it is to be achieved. Declarative programming is also known as Value-oriented programming.
 - Functional paradigm: In this paradigm, a program consists of a collection of functions. A function just computes and returns a value.
 - Logic paradigm: In this paradigm programs only explain what is to be computed not how to compute it. Here program is represented by a set of relationships, between objects or property of objects known as predicate which are held to be true, and a set of logic/clauses (i.e. if A is true, then B is true). Basically logic paradigm integrates data and control structures.

5.2 GENERATIONS OF PROGRAMMING LANGUAGES

There are five generations of programming language.

5.2.1 First Generation Languages

Sometimes referred to as machine code or object code, machine language is a collection of binary digits or bits that the computer reads and interprets. Machine language is the only language a computer is capable of understanding.

First Generation languages are called as machine code or object code. Machine language is a set of binary digits or bits that a computer reads and describes. The only language that a computer can understand is machine language.

5.2.2 Second Generation Languages

Assembly language is a low-level programming language for a particular computer or other programmable device specific to a particular computer architecture, as opposed to most high-level programming languages, which are usually portable on multiple systems. The assembly language is converted into an executable machine code by a utility program that refers to assemblers such as NASM, MASM.

5.2.3 Third Generation Languages

High-level language is a programming language designed to simplify computer programming. This is "high-level" because it removes many steps from the actual code running on the computer processor. High-level source code contains easy-to-read syntax, which is then converted to low-level language, which is recognized and executed by a specific CPU.

Example: C, C++, Java, Visual Basic and JavaScript

5.2.4 Fourth Generation Languages

The fourth generation programming language (4GL) is any computer programming language that belongs to the class of languages which are considered to be advanced over the third generation programming languages (3GL). Each programming language generation aims to provide a higher level of capture of internal computer hardware details, making the language more programmer-friendly, powerful and versatile. Languages referred to as 4GL may support database management, report generation, mathematical optimization, GUI development, or web development. Sometimes 4GL is a subset of a domain-specific languages.

Example: Perl, Python, Ruby, SQL, MatLab

5.2.5 Fifth Generation Languages

Fifth generation programming language (5GL) is any programming language based on problem solving using programmed constraints, rather than using an algorithm written by the programmer. Fifth generation languages are most constraint-based and logic programming and declarative languages. Fifth generation languages are also designed to solve a given problem without a programmer. This way, the user only has to worry about what problems need to be solved and what situations need to be addressed, without having to worry about how to implement a routine or algorithm to solve them. Fifth generation languages are mainly used in artificial intelligence research.

Example: OPS5 and Mercury programming language.

5.9 SUMMARY

A programming language must be simple, easy to learn and use, have good readability and human recognizable. A programming language must be consistent in terms of syntax and semantics. Programming languages are broadly categorized into three types – Machine level language. Assembly level language. High-level language. Each phase of improved made in the development of the programming languages can be referred to as a generation. The programming language in terms of their performance reliability and robustness can be grouped into five different generations.

5.10 TECHNICAL TERMS

Program, 3GL, 4GL, 5GL, Language Paradigm, syntax, type system, imperative paradigm, Declarative Paradigm

5.11 SELF ASSESSMENT QUESTIONS

Essay questions:

1. Explain various type of programming languages
2. What is Generation? What are types of programming language Generations?

Short Notes:

1. Language Paradigm
2. Differentiate 4GL and 5GL
3. Elements of Programming Languages

5.12 SUGGESTED READINGS

1. P.Mohan computer fundamentals- HimalayaPublications.
2. R.K.Sharma and Shashi K Gupta, Computer Fundamentals - Kalyani Publications
3. Fundamentals of Computers ByBalagurusamy, Mcgraw Hill
4. Fundamentals of Computers Rajaraman V Adabala N

AUTHOR: Dr. G. NEELIMA

LESSON- 6

Microsoft Word

AIMS AND OBJECTIVES

After reading this chapter, the student will be able to do the following in MS Word:

- Understand the basic features of Microsoft Word.
- Create a new document, set basic document parameters, and save his work
- Edit an existing document with techniques such as moving text, using find and replace, modifying text, and using indentation and tabs and Mail Merge feature.

STRUCTURE

6.1 Introduction

6.2 Features of MS Word

6.3 Parts of Word Window

6.3.1 Creating a document

6.3.2 Saving a document

6.3.3 Opening a document

6.3.4 Printing a document

6.4 Formatting

6.4.1 Formatting of Text and Paragraph

6.4.2 Bullets and Numbering

6.4.3 Editing

6.4.4 Moving and Copying

6.4.5 Find and Replace Text

6.5 Tables

6.6 Insertion of Pictures

6.7 Mail Merge

6.8 Summary

6.9 Technical Terms

6.10 Self-Assessment Questions

6.11 Suggested Readings

6.1 INTRODUCTION

Microsoft Word is a word processing application that is part of the Microsoft Office suite. Microsoft Office Suite is a powerful set of applications designed to provide great tools for almost every potential business task from small to large organizations. So, the interface in all applications is consistent. Generally, it helps users move from application to application to manage their various business tasks

Microsoft Word is word processing application to create and edit letters, articles, newsletters, flyers, and any other text-based document.

6.2 FEATURES OF MS-WORD

The following are the main features of a Word Processor

- Using word you can create the document and edit them later, as and when required, by adding more text, modifying the existing text, deleting/moving some part of it.
- Changing the size of the margins can reformat complete document or part of text.
- Font size and type of fonts can also be changed. Page numbers and Header and Footer can be included.
- Paragraphs or text can be copied /moved throughout the document.
- Spelling can be checked and modified through the spell check facility.
- Multiple document/files can be merged.
- Tables can be made and included in the text.
- It also provides online help of any option.
- Word also has the facility of macros. Macros can be either attached to some function/special keys or to a tool bar or to a menu.
- Multiple copies of letters can be generated with different addresses through the mail-merge facility.

Microsoft Office 2007 is a departure from previous versions. With this product, Microsoft redesigned the user interface and changed the way users work with programs in the office. File, edit and view menus are gone; Menus, toolbars and workflows have been replaced with new features listed below.

6.2.1 The Ribbon

In Microsoft Word, Excel, PowerPoint, and Access, and in the mail composer/editor of Office Outlook, the menus (e.g., File, Edit, and View) and toolbars have been replaced by the Ribbon. This Ribbon groups commands previously found in menus or toolbars into collections based on activities.



6.2.2 The Microsoft Office Button

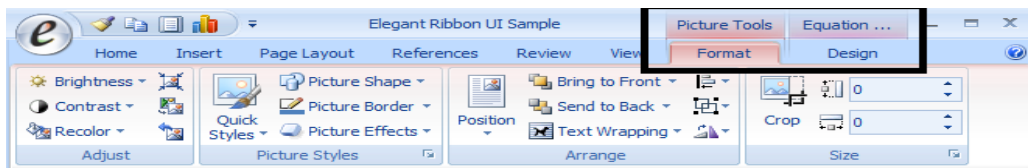
The Microsoft Office Button is a single place for the most commonly used commands in any office program, such as New, Open, and Save. The Home tab contains

application-specific authoring commands. The Office Button menu, however, contains file-level commands such as saving the file, naming it, or printing.



6.2.3 Contextual Tabs

Contextual tabs replace menus (e.g., File, Edit, View), and reside on the Ribbon. Contextual tabs are not fixed, but change based on the situation. Microsoft explains contextual tabs as follows: "Certain sets of commands are only relevant when objects of a particular type are being edited. For example, the commands for editing a chart are not relevant until a chart appears in a spreadsheet and the user is focusing on modifying it. In current versions of Microsoft Office applications, these commands can be difficult to find. Contextual tabs only appear when they are needed and make it much easier to find and use the commands needed for the operation at hand."



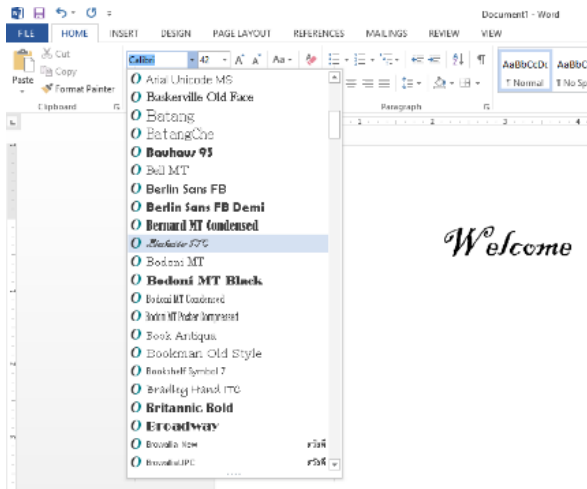
6.2.4 Galleries

Galleries are graphical representations of formatting options you can apply to given elements in an Office document. Galleries simplify the act of formatting a document's elements by placing them in one location. Some Galleries require no fewer clicks than in earlier Office versions, but others combine what would have been many individual settings and commands into a single click.



6.2.5 Live Preview

As we hover our pointer over a set of Gallery results, Live Preview displays the effect of an editing or formatting change. It provides an on-the-fly preview of the document in question (not in a preview window). For example, suppose we type a page of text and then go to the Page Layout Gallery. As you hover over the built-in themes, your document changes in response to each one.

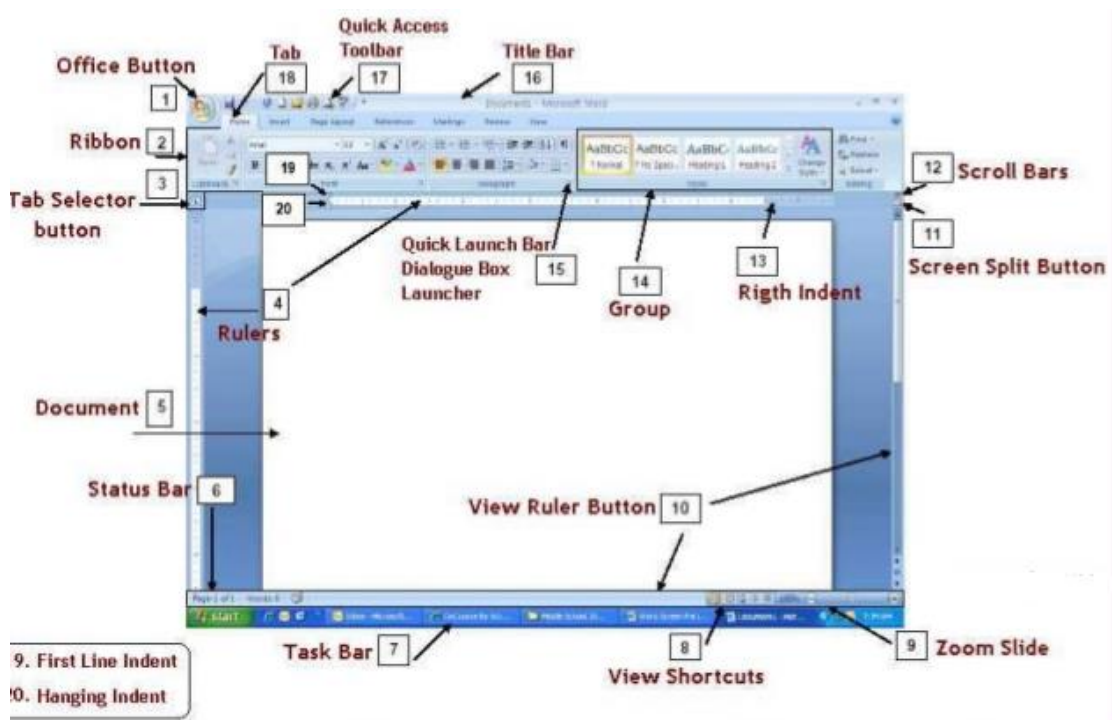


6.2.6 Mini Toolbar

The Mini toolbar, which appears near any selected text, provides access to frequently used formatting commands. If you move your cursor away from it, the toolbar becomes semi-transparent so that you can see whatever appears below it. When you move the mouse over it, the toolbar becomes opaque. It also appears above the contextual menu if you right-click selected text.



6.3 PARTS OF WORD WINDOW



1. Office Button

A button that provides access to menu commands in Word. The Microsoft Office Button replaces the File button in previous versions. Here is where you will find commonly known features such as New, Open, Save, Print and Recent Documents. This is also where you will find the Word Options commands that were previously located in the Tools menu in previous versions.

2. Ribbon

An area across the top of the screen that makes almost all the capabilities of Word available in a single area. The Ribbon replaces the menus and toolbars in previous versions. The Ribbon exposes most of the features that used to be hidden in File menus. The Ribbon makes it easier to see and find commands to format your document. The Ribbon can be reduced to a single line of tabs by pressing CTRL + F1.

3. Tab Selector button

It is also called the tab indicator, is a button to the left of the ruler that provides tab marker options. When aligning or positioning text, never do so using the spacebar as it can cause formatting problems.

4. Rulers

The Ruler is located below the Ribbon around the edge of the document. It is used to change the format of the document, i.e. it helps you align the text, tables, graphics and other elements of your document. It uses inches or centimeters as the measurements unit and gives you an idea about the size of the document.

5. Document

The document area is the blank section of a Word processor or other document program that allows the user to create content. Below is an example of a blank Microsoft Word document with the white page being the document area. When a document is opened, you can begin typing, and your text appears in the document

6. Status Bar

A horizontal bar at the bottom of an active window that gives details about the active document

7. Task Bar

The task bar, which appears at the bottom of your screen, enables you to quickly and easily access programs such as Microsoft Word.

8. View Toolbar

A toolbar that enables, adjusts, and displays different views of a document's content.

9. Zoom

A button that magnifies or reduces the contents in the document window.

10. View Ruler Button

We can view horizontal and vertical rulers when the document expanded than page view.

11. Screen split Button

Use this handy button to split your screen and save yourself scrolling up and down a Word document. You can split a document into two sections on one screen by applying horizontal sections.

12. Scroll Bars

A vertical bar on the right side of a window or a horizontal bar at the bottom of a window that is used to move the window contents up and down or left and right.

13. Right Indent

The Right indent controls the space between the paragraph and the right margin and has a marker of its own. It is indicated by a single triangle on the Ruler at the current right margin. Click and drag it to change the margin.

14. Group

A Group of buttons on a tab that are exposed and easily accessible. These buttons were formally embedded in menus on the Menu Bar

15. Dialogue Box launcher

A button that launches a dialog box containing options for refining a command.

16. Title Bar

A horizontal bar at the top of an active document. This bar displays the name of the document and application. At the right end of the Title Bar is the Minimize, Restore and Close buttons.

17. Quick Access Toolbar

A customizable toolbar at the top of an active document. By default the Quick Access Toolbar displays the Save, Undo, and Repeat buttons and is used for easy access to frequently used commands. To customize this toolbar click on the dropdown arrow and select the commands you want to add.

18. Tab

An area on the Ribbon that contains buttons that are organized in groups. The default tabs are Home, Insert, Page Layout, Reference, Mailings, Review and View.

19. First Line Indent

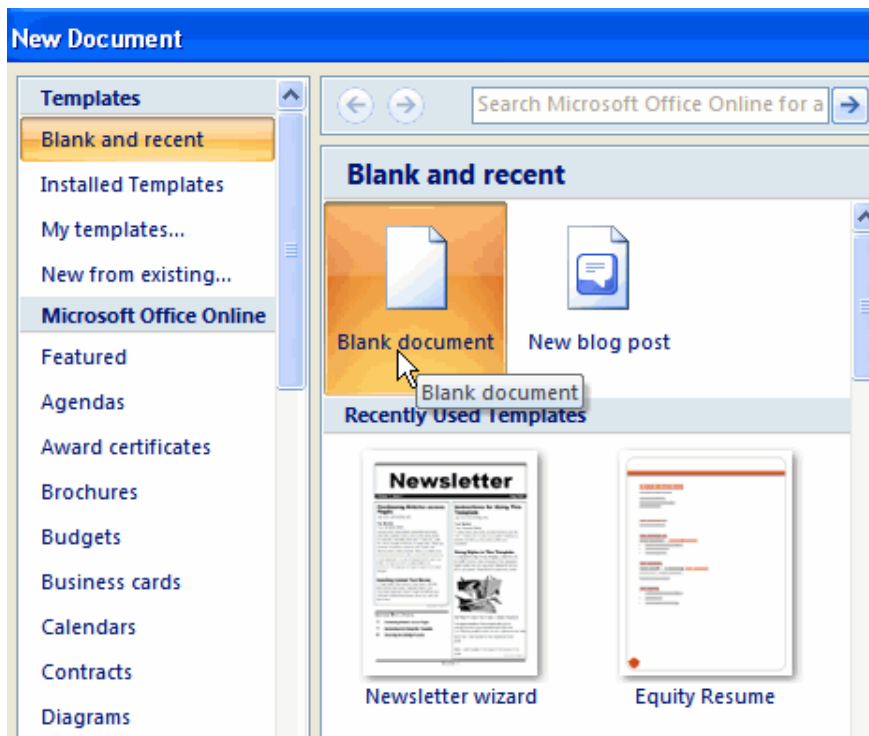
The First Line indent is used to indent the first line of a paragraph or of every paragraph.

20. Hanging Indent


A Hanging indent, also known as a second line indent, sets off the first line of a paragraph by positioning it at the margin, and then indenting each subsequent line of the paragraph.

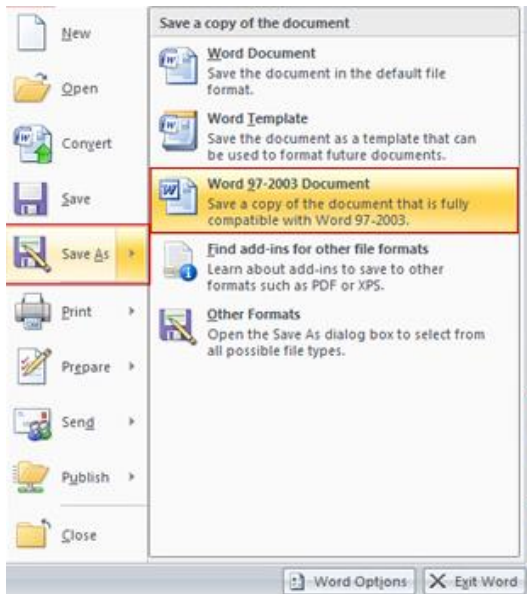
6.3.1 Creating a document

- Click the *Microsoft Office button*.
- Select *New*. The New Document dialog box appears.
- Select *Blank document* under the Blank and recent section. It will be highlighted by default.
- Click *Create*. A new blank document appears in the Word window

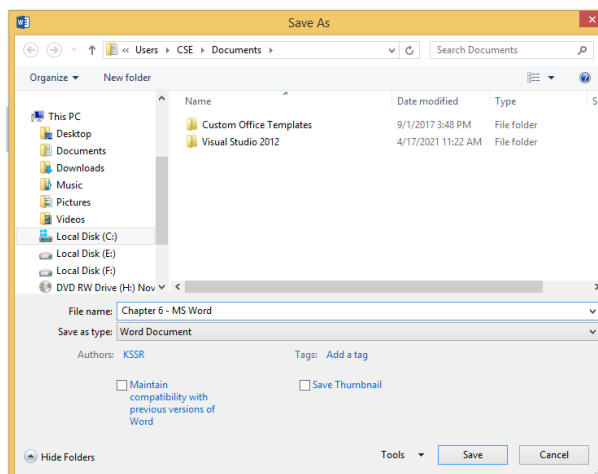


6.3.2 Saving a document

- Click the MS 2007 logo which is situated in the upper-left corner of your MS Word program. 
- Mouse-over *Save As* and then left-click on Word 97 – 2003 Document.



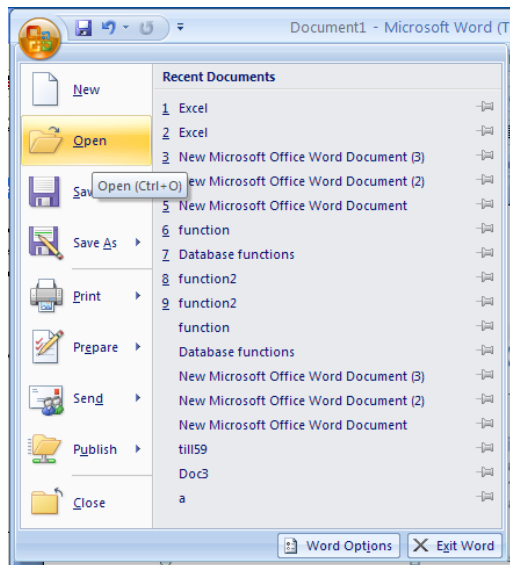
- In the *Save As* window, select a location on your local computer where you can later retrieve the file.



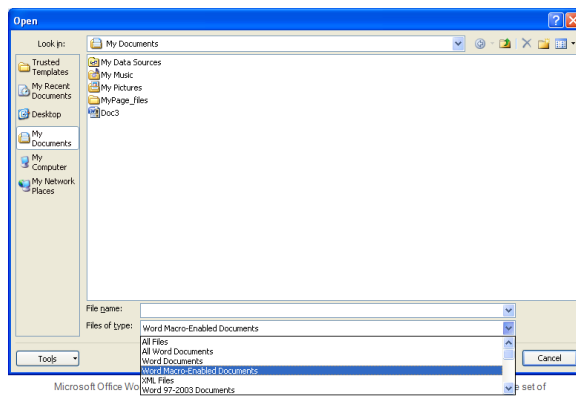
- In the *File name text box*, ensure that the name of the file is using your class' naming convention and that it ends with a .doc extension. The Save as type drop-down should have Word 97 – 2003 Document (*.doc) selected.
- Click the *Save* button. You can now close the Word document if you have finished your work. When you need to upload your file, retrieve it from the location on your computer selected in above step.

6.3.3 Opening a document

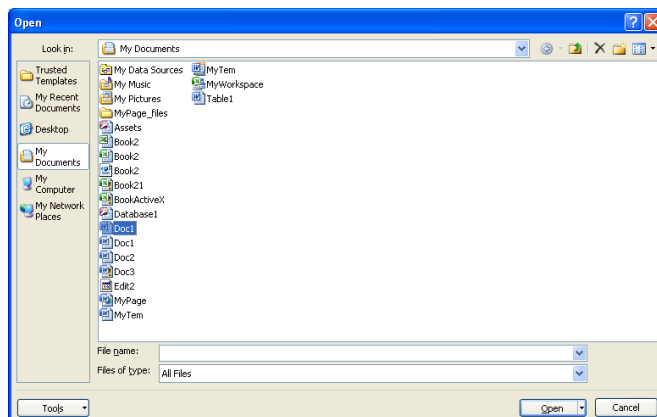
- Click the Microsoft Office button. Click *Open*.



- Click the *Files of type* drop-down list and select the file type to open

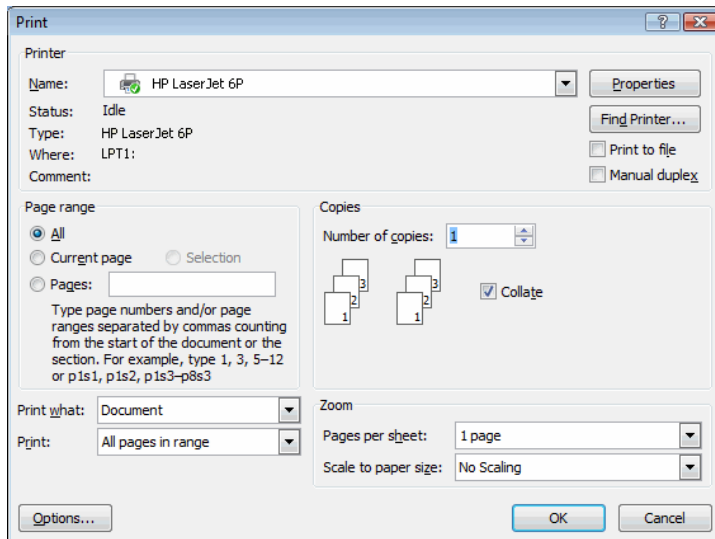


- Click the *file*. Click Open to open the file in Word.



6.3.4 Printing a document

- Click the Microsoft Office button Microsoft Office button.
- In the menu that opens, click *Print*.
- The Print dialog opens.
- Click *OK* to print the document.



6.4 FORMATTING

Formatting is the fine art of making your documents efficient and attractive. It enhances the presentation of the information. We can apply configuration to each element of your document from a single letter to whole paragraphs. Body text should be readable and light on the eyes. Captions should be large and bold and they should be consistent throughout your document. Important words should resonate with importance. Quotes and references should be set from other text.

Text formatting data may be qualitative (e.g., font family), or quantitative (e.g., font size, or color). It may also indicate a style of emphasis (e.g., boldface, or italics), or a style of notation (e.g., strikethrough, or superscript).

6.4.1 Formatting of Text and Paragraph

The first step in formatting any amount of text or an entire document is selecting the portion of text that needs formatting.

We can do boldface a section, add italics, underline, change the color, and change the font, highlight, cut, copy and paste.

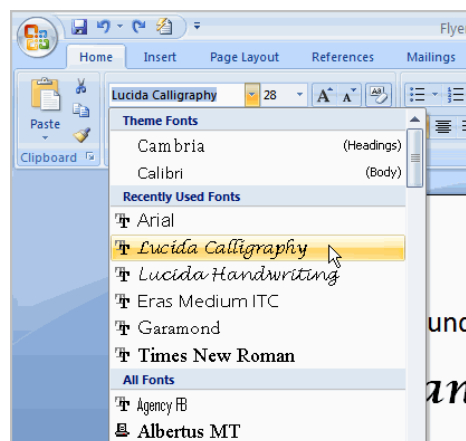
To do any formatting on text, we must first select the text that the formatting will be applied to within the document. Selecting text is easy and done in three easy steps.

1. Move the cursor to the beginning of the text that you want to select.
2. Click and hold in the left button on your mouse.
3. Drag it over the text you want to select. It will highlight the selected text in blue. Simply release the mouse button when you are finished selecting text.

If we want to select the entire document, simply click on the 'Home' tab and click 'Select' on the far right (located below 'find' and 'replace') as seen in the picture below. We will then select 'select all'. This will highlight all our text for formatting. Also note that we can select objects or text with similar formatting as our selected text when clicking on 'Select.'

6.4.1.1 Formatting Font Style

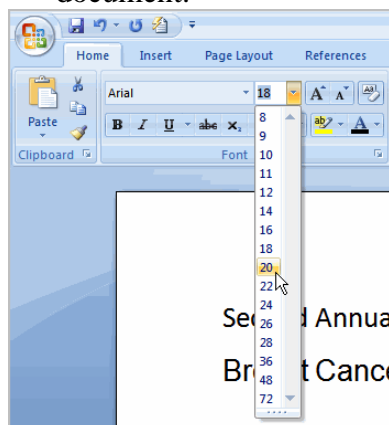
- We can apply a font to either an entire document or to certain portions of a document.
- To apply a font, click on the Home tab. We'll see the toolbars, or groups, as pictured below.



- The type of font we're currently using will appear. In the picture above, the current type of font is Calibri. We can click on the arrow in that window to display other types of font available to use.
- To change the type of font within a document or for the entire document, simply select the text to be formatted, and then we can select our new font.

6.4.1.2 Formatting Font Size

- First we have to select the text which we want to modify.
- Now Left-click the drop-down arrow next to the font size box on the Home tab.
- The font size drop-down menu appears. Move cursor over the various font sizes.
- A live preview of the font size will appear in the document.
- Left-click the font size what we want to use. The font size will change in the document.

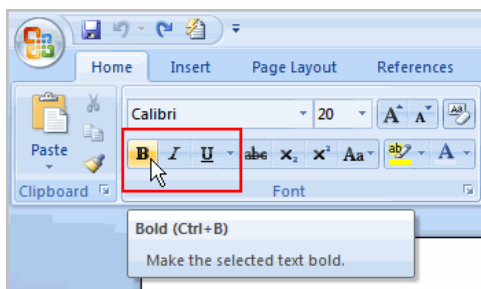


6.4.1.3 Formatting Font Color

- Select the text you want to modify.
- Left-click the drop-down arrow next to the font color box on the Home tab. The font color menu appears.
- Move your cursor over the various font colors. A live preview of the color will appear in the document.
- Left-click the font color you want to use. The font color will change in the document.
- Your color choices aren't limited to the drop-down menu that appears. Select More Colors at the bottom of the list to access the Colors dialog box. Choose the color you want, then click OK.

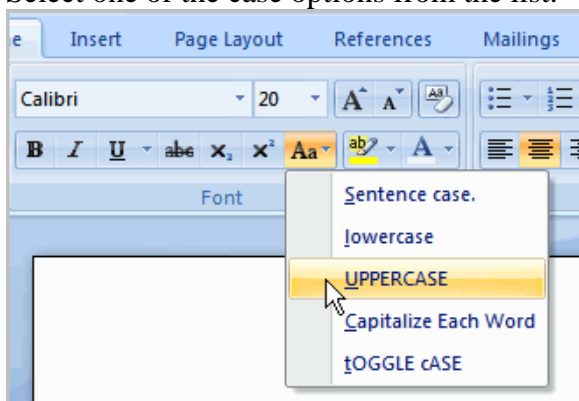
6.4.1.4 The Bold, Italic, and Underline commands:

- Select the text you want to modify.
- Click the Bold, Italic, or Underline command in the Font group on the Home tab.



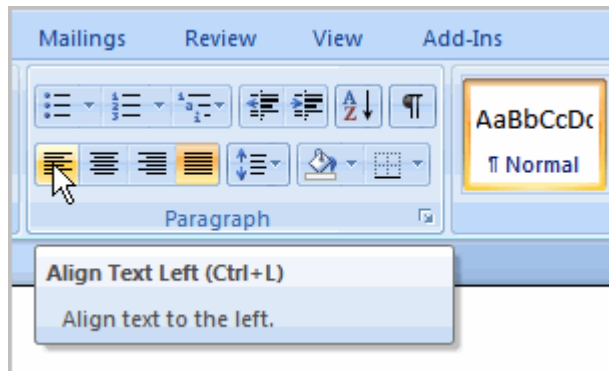
6.4.1.5 To change the text case:

- Select the text you want to modify.
- Click the Change Case command in the Font group on the Home tab.
- Select one of the case options from the list.



6.4.1.6 To change text alignment:

- Select the text you want to modify.
- Select one of the four alignment options from the Paragraph group on the Home tab.
- *Align Text Left*: Aligns all of the selected text to the left margin
- *Center*: Aligns text an equal distance from the left and right margins
- *Align Text Right*: Aligns all of the selected text to the right margin
- *Justify*: Aligns text equally to the right and left margins; used in many books, newsletters, and newspapers

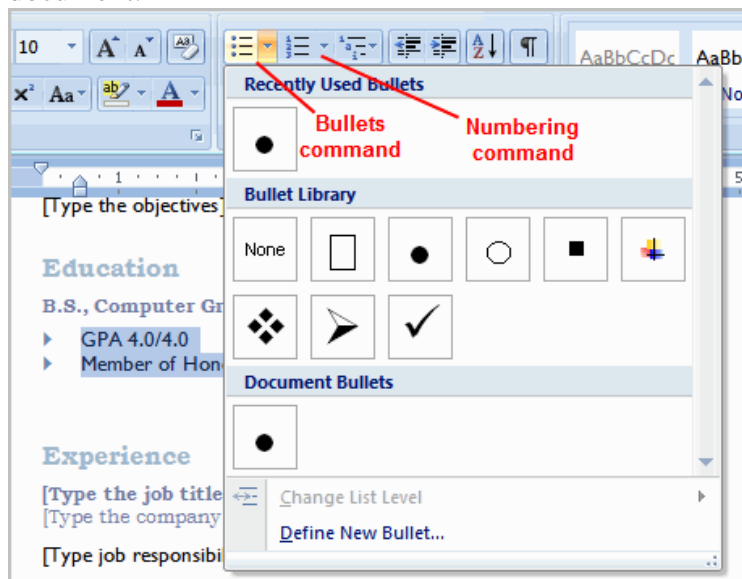


6.4.2 Bullets and Numbering

A bullet is a symbol placed before text, especially in a list, to emphasize it. Bullets or Numbering are used to sort a list of items, or to emphasize certain points or lists in a document. Adding bullets or numbers to a list makes it easier to read the list. We can create multilevel lists, in which an outline of a document is arranged in a hierarchical order on the list.

6.4.2.1 To insert a new list:

- Select the text you want to format as a list.
- Click the *Bullets or Numbering commands* on the Home tab.
- Bulleted or Numbered Lists
- Left-click the bullet or numbering style you want to use. It will appear in the document.



- Position your cursor at the end of a list item, and press the *Enter key* to add an item to the list.

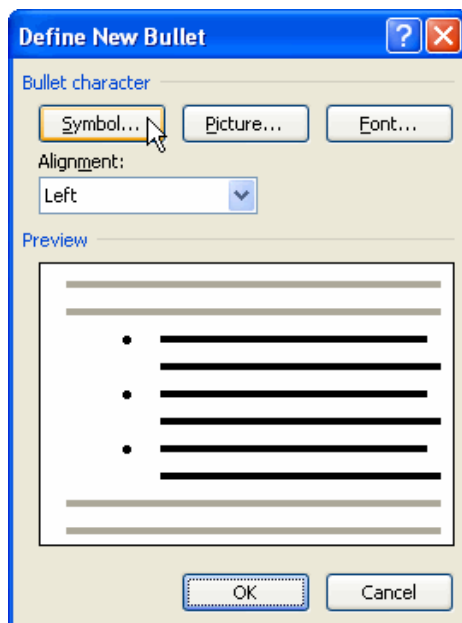
To remove numbers or bullets from a list, select the list and click the *Bullets or Numbering commands*.

6.4.2.2 To select an alternate bullet or numbering style:

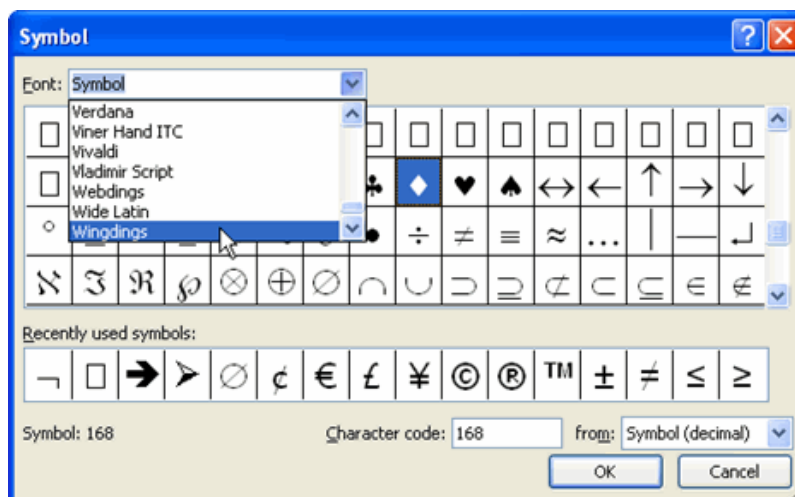
- Select all of the text in an existing list.
- Click the *Bullets or Numbering* commands on the Home tab.
- Left-click to select an alternate bullet or numbering style.

6.4.2.3 To use a symbol as a bullet:

- Select an existing list.
- Click the *Bullets* command.
- Select *Define New Bullet* from the list. The Define New Bullet dialog box appears.
- Click the *Symbol* button. The Symbol dialog box appears.



- Click *Symbol*
- Click the *Font*: drop-down box, and select a font category.



- Select *Font Drop-down*
- Left-click a symbol to select it.

- Click *OK*. The symbol will now appear in the Preview section of the Define New Bullet dialog box.
- Click *OK* to apply the symbol to the list in the document.

We can use a picture as a bullet. Click the *Picture* button in the Define New Bullet dialog box, and then locate the image file on your computer.

6.4.3 Editing

Ability to change text by adding, deleting and rearranging letters, words, sentences and paragraphs. The main operation performed by users on word processors is text editing.

6.4.3.1 To insert text:

Move your mouse to the location where you want text to appear in the document.

Left-click the mouse. The insertion point appears.

Type the text you want to appear.

6.4.3.2. To delete text:

Place your cursor next to the text you want to delete.

Press the *Backspace* key on your keyboard to delete text to the left of the cursor.

Press the *Delete* key on your keyboard to delete text to the right of the cursor.

6.4.4 Moving and Copying

We can move the selected text from its existing position to the new destination in the document. This feature of Microsoft word 2007 helps to reduce the time and efforts involved in re-typing the similar text. Using this we can copy the text from one location to another. Keeping the text at original place unchanged.

6.4.4.1 Moving Text

- Select the text to be moved.
- Click the *Cut* option from the Clipboard group under the Home tab.
- The selected text will disappear from the document.
- Bring the cursor to the new position where you want to shift the text.
- Click *Paste* option from the Clipboard group.
- The text will appear at the cursor position

6.4.4.2 Copying Text

- Select the text to be copied.
- Click Copy option in the clipboard group under the Home Tab.
- Bring the cursor to the new location where you want to copy the text.
- Click paste option in the clipboard group

6.4.5 Find and Replace Text

We can search any word or text in our document at different locations. We can also replace a particular word or text after finding it in our document with a new word or text

6.4.5.1 Finding Text

- Click Find option in the Editing group under Home Tab to open Find and Replace dialog box.
- In the Find what text box, type the word you want to search.
- Now click the Find Next button. The pointer will move to the first occurrence of that word.
- Use Find Next button to locate other occurrences of the same word in the document.

6.4.5.2 Replacing Text

- Click *Replace* option in the Editing group under the Home tab.
- *Find and Replace* dialog box will appear.
- Type the text or word that you want to change in the Find What box.
- Type the New word or text in the Replace with box.
- Click *Find Next* button to search the word and then click *Replace* button to change it with the new word.
- *Replace All* button will change the word at once for all the occurrences.

6.5 TABLES

MS Word tables are used to place information into rows and columns. We can also use tables as a way to position images that would otherwise be hard to place in the overall layout of a document. Word tables are the perfect easy way to display complex visual information in a page easily.

6.5.1 Insert or create a table

6.5.1.1 Use table templates

We can use table templates to insert a table that is based on a gallery of preformatted tables. Table templates contain sample data to help you visualize what the table will look like when we add our data.

- Click where we want to insert a table.
- On the *Insert* tab, in the *Tables* group, click *Table*, point to *Quick Tables*, and then click the template that you want.
- Replace the data in the template with the data that you want.

6.5.1.2 Use the Table menu

- Click where you want to insert a table.
- On the *Insert* tab, in the *Tables* group, click *Table*, and then, under *Insert Table*, drag to select the number of rows and columns that you want.

6.5.1.3 Use the Insert Table command

You can use the Insert Table command to choose the table dimensions and format before you insert the table into a document.

- Click where you want to insert a table.
- On the Insert tab, in the Tables group, click Table, and then click Insert Table.
- Under Table size, enter the number of columns and rows.
- Under AutoFit behavior, choose options to adjust the table size.

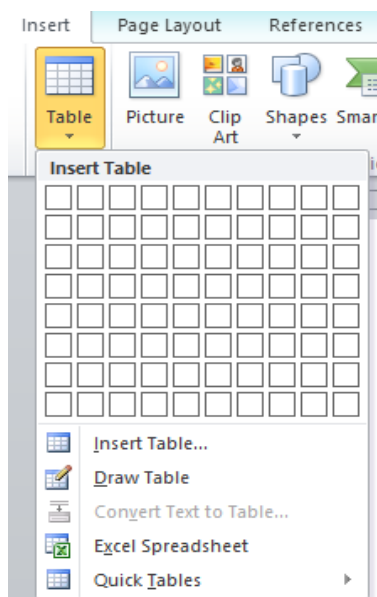
6.5.2 Create a table

We can create a table by drawing the rows and columns that you want or by converting text to a table.

6.5.2.1 Draw a table

We can draw a complex table — for example, one that contains cells of different heights or a varying number of columns per row.

- Click where you want to create the table.
- On the *Insert* tab, in the *Tables* group, click *Table*, and then click *Draw Table*.
- The pointer changes to a pencil.
- To define the outer table boundaries, draw a rectangle. Then draw the column lines and row lines inside the rectangle.
- To erase a line or block of lines, under Table Tools, on the Design tab, in the Draw Borders group, click Eraser.
- Click the line that you want to erase. To erase the entire table, see Delete a table or clear its contents.
- When you finish drawing the table, click in a cell and start typing or insert a graphic.



6.5.2.2 Convert text to a table

Insert separator characters — such as commas or tabs — to indicate where you want to divide the text into columns. Use paragraph marks to indicate where you want to begin a new row.

For example, in a list with two words on a line, insert a comma or a tab after the first word to create a two-column table.

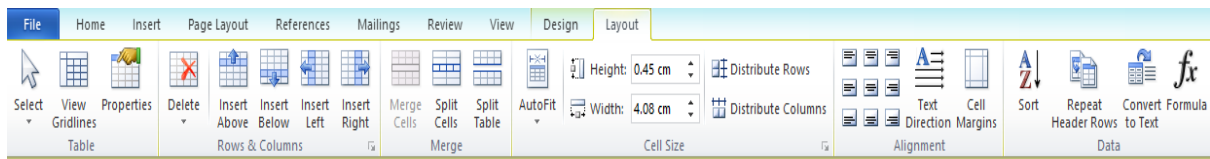
- Select the text that you want to convert.
- On the Insert tab, in the Tables group, click Table, and then click Convert Text to Table.
- In the Convert Text to Table dialog box, under Separate text at, click the option for the separator character that you used in the text.
- Select any other options that you want.

6.5.3 Add a cell

- Click in a cell that is to the right of or above where you want to insert a cell.
- Under Table Tools, on the Layout tab, click the Rows & Columns Dialog Box Launcher.

6.5.4 Add a row above or below

- Click in a cell above or below where you want to add a row.
- Under Table Tools, on the Layout tab, do one of the following:
- To add a row above the cell, click Insert Above in the Rows and Columns group.
- To add a row below the cell, click Insert Below in the Rows and Columns group.



6.5.5 Add a column to the left or right

- Click in a cell to the left or right of where you want to add a column.
- Under Table Tools, on the Layout tab, do one of the following:
- To add a column to the left of the cell, click Insert Left in the Rows and Columns group.
- To add a column to the right of the cell, click Insert Right in the Rows and Columns group.

6.5.6 Delete a cell

- Select the cell that you want to delete by clicking its left edge.
- Under Table Tools, click the Layout tab.
- In the Rows & Columns group, click Delete, and then click Delete Cells.

6.5.7 Delete a row

- Select the row that you want to delete by clicking its left edge.
- Under Table Tools, click the Layout tab.
- In the Rows & Columns group, click Delete, and then click Delete Rows.

6.5.8 Delete a column

- Select the column that you want to delete by clicking its top gridline or top border.
- Under Table Tools, click the Layout tab.
- In the Rows & Columns group, click Delete, and then click Delete Columns.

6.5.9 Merge cells

You can combine two or more table cells located in the same row or column into a single cell. For example, you can merge several cells horizontally to create a table heading that spans several columns.

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

6.5.10 Split cells

- Click in a cell, or select multiple cells that you want to split.
- Under Table Tools, on the Layout tab, in the Merge group, click Split Cells..

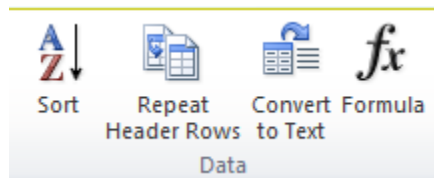
6.5.11 Apply Table Styles

Apply Table Styles Pre-built table styles can be applied to any table. The Table Styles are located on the Table Tools, Design tab, Table Styles Group



6.5.12 Repeat a Table Heading on Subsequent Pages

- You can have Headings repeat on subsequent pages for tables that span multiple pages.
- Select the row of text that you want to use as a table heading.
- NOTE: the selection must include the first row of the table.
- Next, choose Repeat Header Rows from the Data Group of the Table Tools, Layout tab.

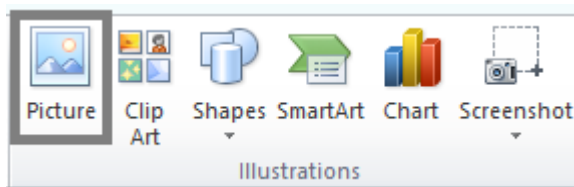


6.6 INSERTION OF PICTURES

Adding images from a variety of sources, including scanned images, images saved from the Internet, and clip art, is easy in Word 2007. The extensive Clip Art Gallery provides easy access to image.

6.6.1 Adding Images

- Click the location where we want the image to appear
- From the Insert command tab, in the Illustrations section, click Picture button. The Insert Picture dialog box appears.



- Using the Look in pull-down list, locate and select the desired image
- Click INSERT. The image appears in your document.

6.6.2 Positioning Images

Once we have inserted an image into our document, we can easily position or resize it as needed. In order to drag images freely in Word, the wrapping style of the image must not be In line with text.

- Click and hold the center of the image

- The cursor turns into a four-headed arrow when you are able to move the image.
- Drag the image to the desired location
- Release the mouse button

The image is now in the desired location.

6.6.3 Wrapping Text

Once we have inserted a picture into our document, we can control the way text will wrap around it. Word has two options for wrapping text around an image: the quick menu option and the command tab option.

Wrapping Text: Quick Menu Option

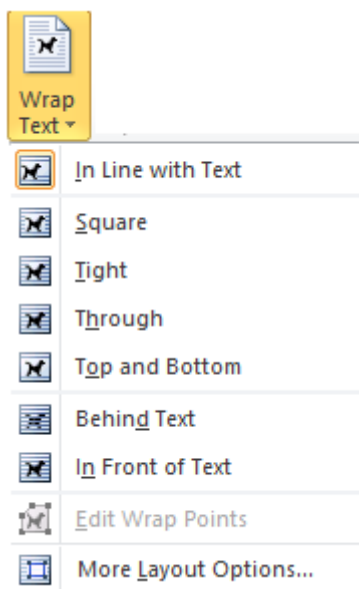
- Right click the image » select Text Wrapping » the desired wrapping option

Wrapping Text: Command Tab Option

Once you insert an image, the Picture Tools Format tab appears.

- On the Picture Tools Format tab, click TEXT WRAPPING text wrapping button» select the desired wrapping option

The In Line With Text option forces an image to align with the line of text in which it was inserted, making it impossible to move the image freely. To allow an image to be moved freely within your document, choose an option other than In Line With Text.



6.6.4 Picture Tools Command Tab Options

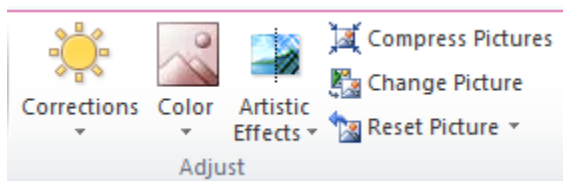
Once we have inserted a picture into our document, many options can enhance the look of your image. The Picture Tools command tab lets you change the appearance of our image by providing options such as line style, transparency, contrast, changing color, and cropping.

To access the Pictures Tools command tab

- Select an image
- Under the Picture Tools tab, the Format command tab appears.

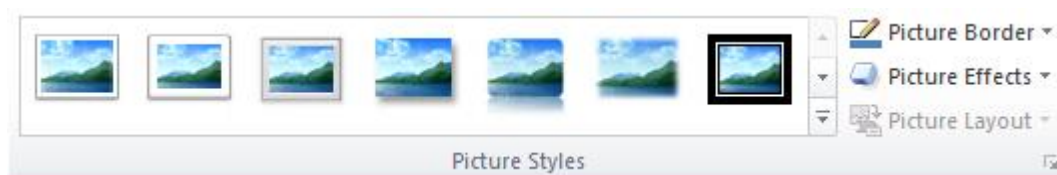
Adjust Group:

Allows you to edit the picture (e.g., adjust brightness, contrast, color), and also undo any changes you make.



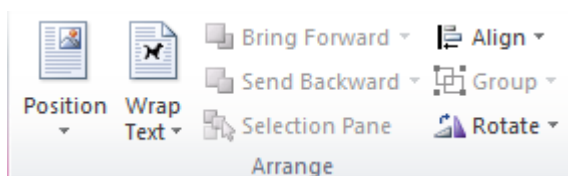
Picture Styles Group:

From here we can apply preset or custom picture styles (e.g., image shape, border, effects).



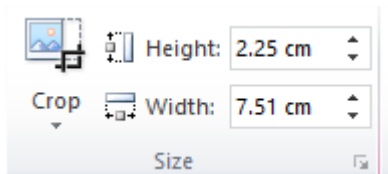
Arrange Group:

Let us to reposition, change text wrapping, arrange layers, and rotate objects.



Size Group:

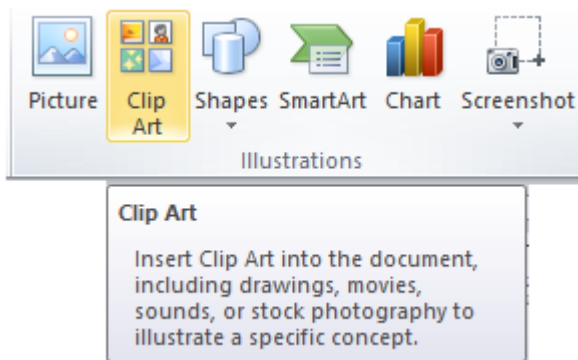
This is where we can change image size with the Crop tool or by specifying dimensions in the Height and Width text boxes. Changes made in the text boxes are proportional (i.e., if we change image height, its width changes proportionally).



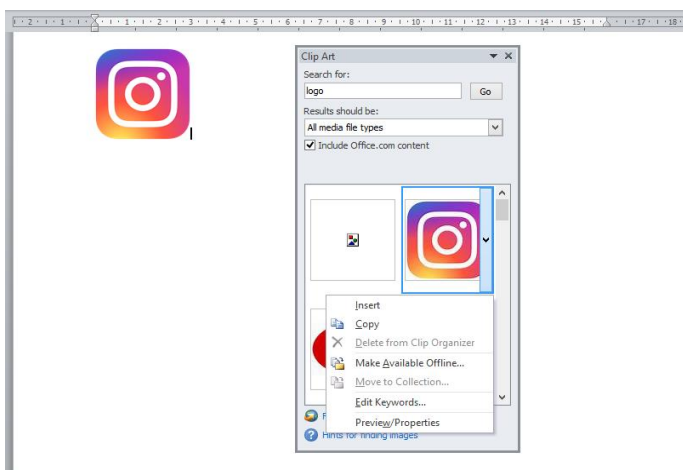
6.6.5 Insert a ClipArt

Clip art refers to a graphic or a picture that you can insert in your document. It comes in different formats and styles. It is used to enhance the appearance of a document.

- Place the cursor where you want to insert the clip art
- Select the *Insert* tab
- In *Illustrations* group click the *Clip Art* command.



- A task pane appears on the right side of document
- Enter the keyword in 'Search for' field and select the suitable option in 'Search in' and 'Results should be' fields
- Click Go, clip art menu will appear
- Select the desired clip art with a left click



6.7 MAIL MERGE

Mail Merge is a useful tool that will allow us to easily produce form letters, labels, envelopes, and more by using information stored in a list, database, or spreadsheet. It is the process of merging a list of data with a template.

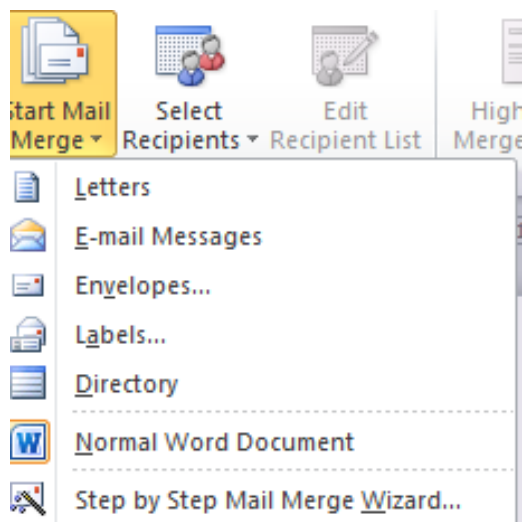
The mail merge process involves two files

The Main Document which contains the text and graphics that are the same for each version of the merged document.

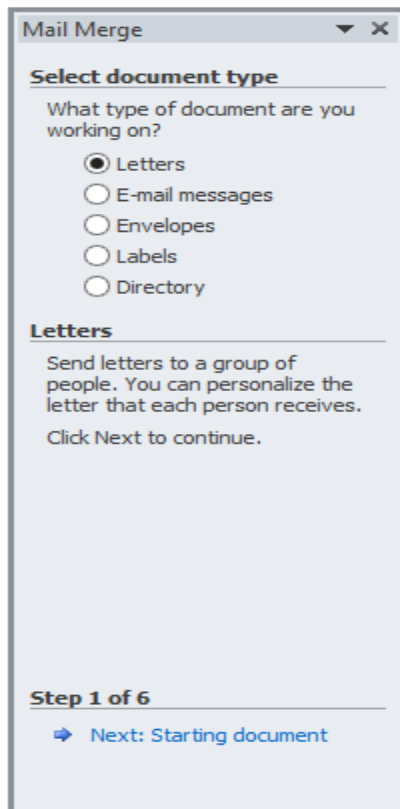
Data Source is a file that contains the information to be merged into a document. For example, the names and addresses of the recipients of a letter.

6.7.1 Form Letters

- Open Microsoft Word
- Type the letter with all needed text and formatting leaving areas for the data source data blank (name, address...)
- Click the Mailings tab
- Click Start Mail Merge
- Click Step by Step Mail Merge Wizard



The Mail Merge task pane appears on the right of your screen. Note there are 6 steps.



Step 1

- Click Letters for the document type
- Click Next: Starting document

Step 2

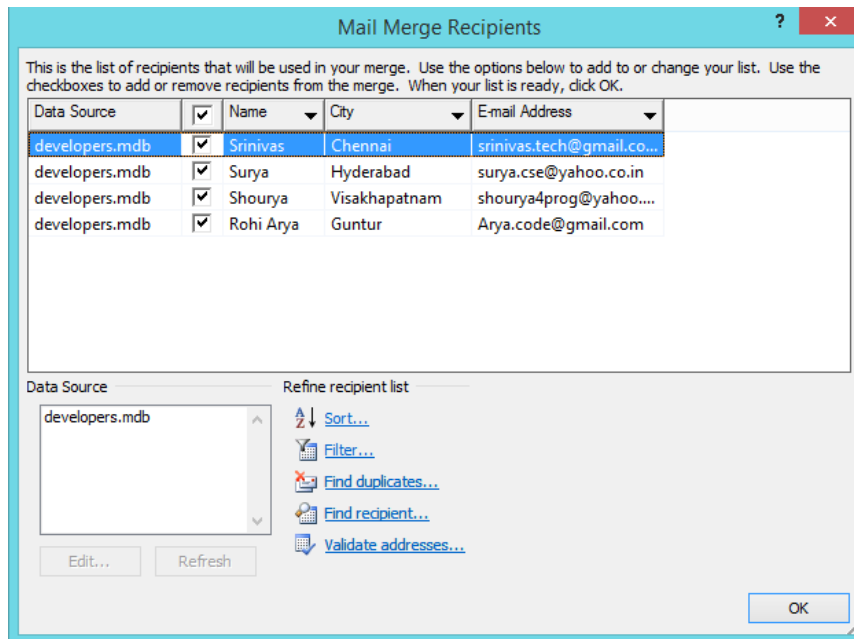
- Click Use the current document under Select starting document
- Click Next: Select recipients

Step 3

The recipients can come from either an existing Excel file, or Access table or you can create a new list.

- If Using an Existing List:
 - 1) Click Use an existing list under Select recipients
 - 2) Click Browse
 - 3) Select the file
 - 4) Click Open

Mail Merge Recipients opens showing the name, city and mails from your file



5) Click OK

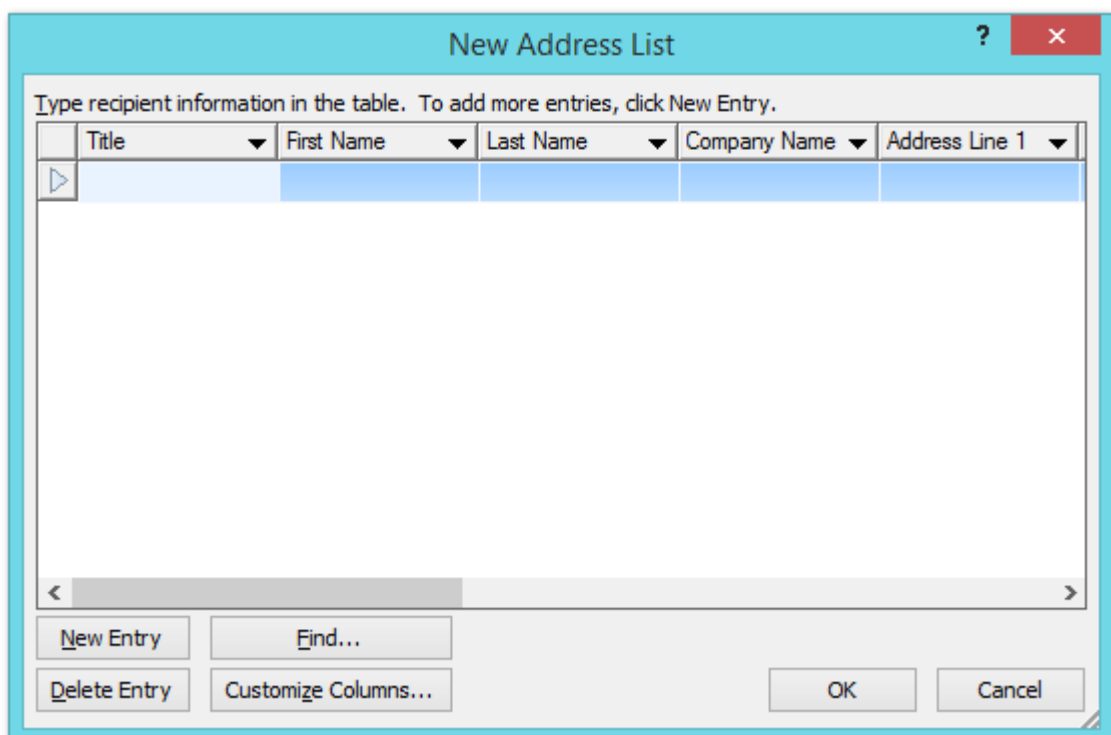
6) Click Next: Write your letter

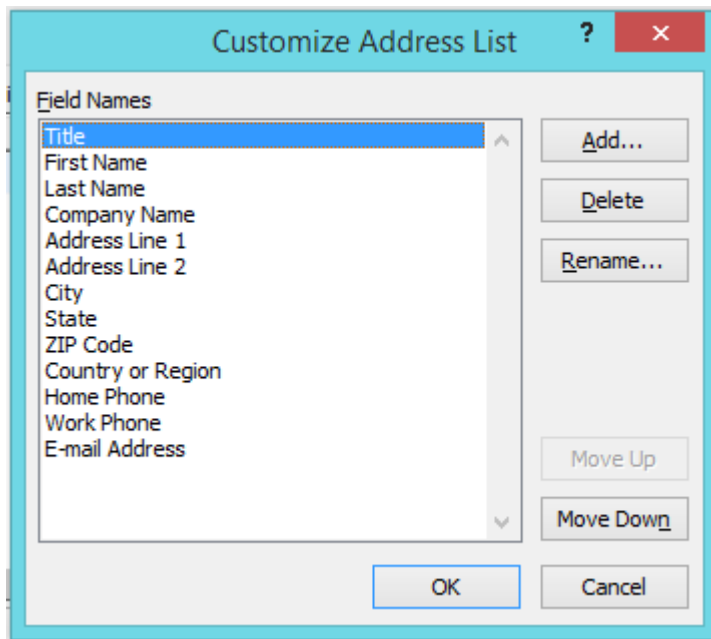
- To Type a New List:

1) Click Type a new list under Select recipients

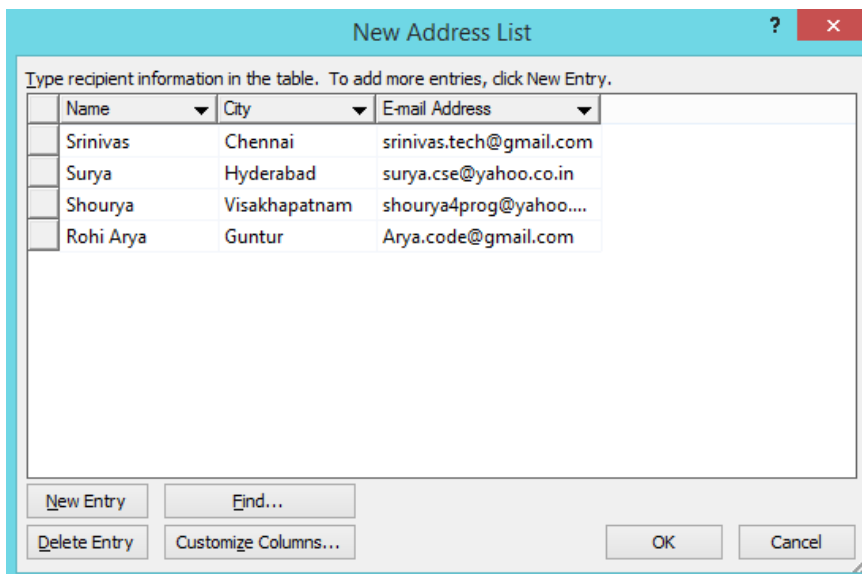
2) Click Create

3) Click Customize Columns to modify the list of fields





4) Delete any unnecessary field names and/or add new ones



5) Click OK

6) Type records here hitting TAB to advance to the next field and to continue adding new records

7) Click OK

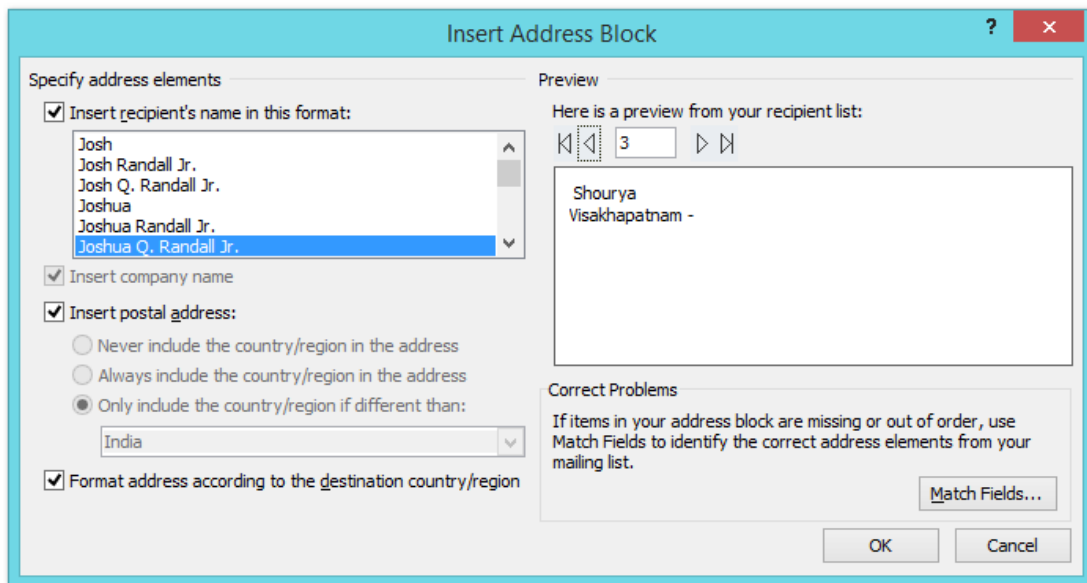
8) Click Save

The recipients list will be saved as a separate file as a Microsoft Access file type. It is saved in the My Data Sources folder. It is recommended to save the file in this folder.

9) Click Next: Write your letter

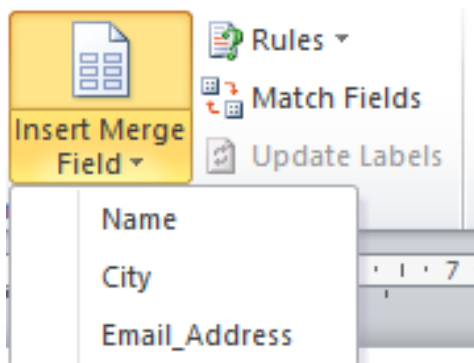
Step 4

- Click the location in your document where the data from the mail merge fields need to be inserted
- Click Address block...
- Select the address elements you want included
- Click OK



The field name will look like this: <<AddressBlock>>

The Address block will insert the following fields including any necessary punctuation: Name, city and email address.



If your fields do not match the ones listed above or you have additional fields, click More items...

- Click on the field from the list
- Click Insert
- Click Close

The field name will look like this - «Name». Repeat this step until all fields have been inserted. Remember to put spaces and punctuation where needed.

- Click Next: Preview your letters

Step 5

Here is where we can preview the first page with the fields filled in.

- Click Next: Complete the merge

Step 6

To Complete the Merge:

- Click Print to send directly to the printer
- Click Edit individual letters to create a new file

Remember to save your document as you go. The next time you open your document and click on Step by Step Mail Merge, the data file will be attached.

6.7.2 Creating Labels

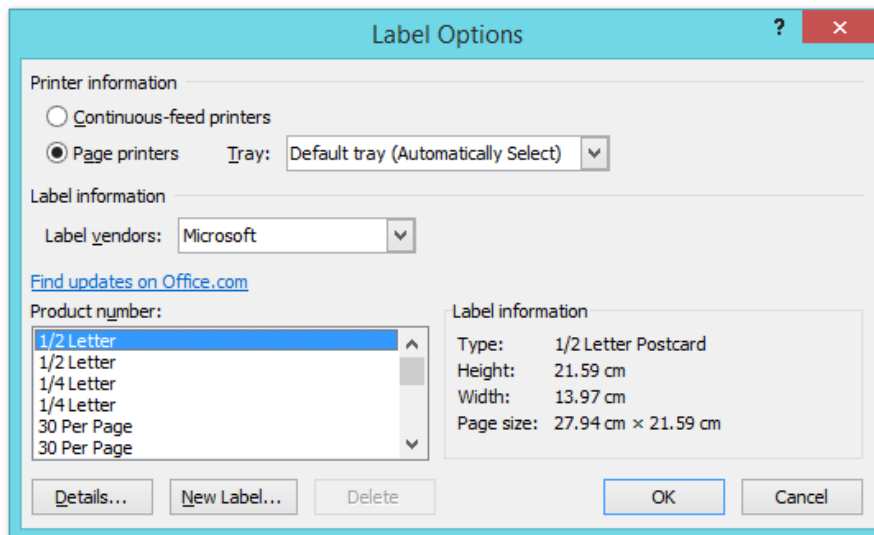
- Open a new blank document
- Click the Mailings tab
- Click Start Mail Merge
- Click Step by Step Mail Merge Wizard

Step 1

- Click Labels for the document type
- Click Next: Starting document

Step 2

- Click Label options under Change document layout
- Choose the label style you are using
- Click OK
- Click Next: Select recipients



Step 3

- Click Use an existing list under Select recipients
- Click Browse
- Select the file that contains the names and addresses
- Click OK
- Click Next: Arrange your labels

Step 4

- Click in the first label box and click on either Address block or More items to insert the data fields
- Click Update all labels to include the fields on all labels
- Click Next: Preview your labels

Step 5

Here is where you can preview the labels.

- Click Next: Complete the merge

Step 6

- Click Print to send directly to the printer or we can create a new file by click on the Edit individual labels.

6.8 SUMMARY

MS Word is a popular word-processing program used primarily for creating documents such as letters, brochures, quizzes and Posters. There are many simple but useful features available in Microsoft Word to perform the work easily.

6.9 TECHNICAL TERMS

Formatting, Window, Data Source, Mail Merge, Font Effects, Table Auto format, Template, Word Processing, Clip Art.

6.10 SELF ASSESSMENT QUESTIONS

Essay questions:

- 1) Explain the method for creating and editing word document with example.
- 2) Discuss Find and Replace in MS Word with example.
- 3) Explain the mail merge concept in MS Word

Short Notes:

1. Ways to create a table
2. Insert a ClipArt
3. Use of Mail Merge
4. Undo and Redo
5. Various Keyboard shortcuts in MS Word

6.11 SUGGESTED READINGS

1. MS-Office S.S. Srivastava
2. Microsoft Office 2007 Fundamentals, 1st Edition By Laura Story, Dawna Walls

AUTHOR: Dr. UDUGA SURYA KAMESWARI

LESSON- 7

Microsoft Excel

AIMS AND OBJECTIVES

After reading this chapter, the student will be able to do the following in MS Excel

- Indicate the names and functions of the Excel interface components.
- Enter and edit data.
- Format data and cells.
- Construct formulas, including the use of built-in functions, and relative and absolute references.
- Create and modify charts.
- Preview and print worksheets

STRUCTURE

7.1 Introduction

7.2 Features of Excel

7.3 Parts of Excel window

7.4 Workbooks

7.4.1 Creating, Opening and Saving a Workbook

7.5 Worksheets

7.5.1 Rows and columns

7.5.2 Inserting and Deleting rows and columns and cells

7.5.3 Entering labels and values

7.6 Formatting

7.6.1 Adjusting row height and column width

7.6.2 Formatting cell values

7.7 Formulas

7.7.1 Operators used in formula

7.7.2 Cell references in formula

7.8 Functions

7.8.1 Mathematical and Statistical

7.8.2 Logical

7.8.3 Text functions

7.9 Charts:

7.9.1 Different types of charts

7.9.2 Creating a chart

7.10 Summary

7.11 Technical Terms

7.12 Self-Assessment Questions

7.13 Suggested Readings

7.1 INTRODUCTION

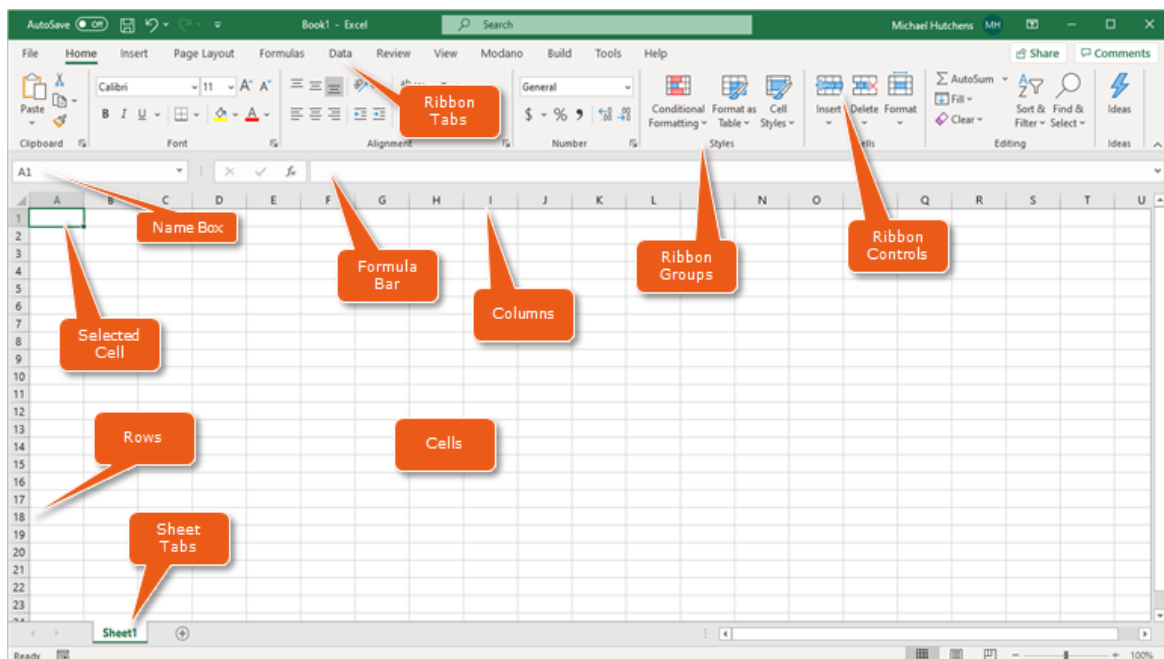
A sheet containing data in the form of rows and columns is called spreadsheet. Microsoft Excel or MS Excel, a part of Microsoft Office package, is an electronic spreadsheet program. It is used to organize data in an easy and concise manner. It is used by businessmen and individuals for storing data and its interpretation. This program helps in doing the tasks at the faster speed as all the calculations are performed using formulas and functions. It has many built-in features which can even help in performing complex calculations. Some other examples for spreadsheet software are Google Sheets, Lotus Symphony, OpenOffice Calc, LibreOffice Calc, Quattro Pro, etc.

7.2 FEATURES OF EXCEL

- **Autosum:** This feature helps you to add the data in a number of adjacent cells automatically
- **Autofill:** This feature allows you to quickly fill cells with repetitive or sequential data such as dates or serial numbers, and repeated text. Autofill can also be used to copy functions. You can also alter text and numbers with this feature.
- **Sort and Filter:** These features help you to organize data so that it is easier to analyse it. Sorting helps you to arrange the data in ascending or descending order. Filter command is used to display the specific value that meets the certain criteria.
- **Automatic Calculation:** This feature or predefined functions allow you to enter mathematical formulas ranging from simple arithmetic to complex statistics. There are many functions like SUM, AVERAGE, MAX, MIN, COUNT, CUBE, etc. to make calculations easily.
- **Data Analysis:** This feature helps you to analyze your data in different ways other than the simple grids and lines. A spreadsheet program can automatically create graphics and charts from your data to compare and analyze the information easily.

- **Automatic Report Generation and Distribution:** This feature eliminates the need for manually generating reports and reduces the possibility of errors. It also allows to share and distribute the generated reports.
- **Charts** can also be shown in a spreadsheet.
- **Reports** can be generated in the form of charts (of the data).

7.3 PARTS OF EXCEL WINDOW



- **Ribbon Controls**

It combines the original menu and toolbar(s) into one control, with various functions grouped into tabs and groups. The most important purpose was to make it easier for the user to discover all the functionality, instead of hiding it in long menus. The Ribbon also allows for prioritization of functionality, with the ability to use different sizes of buttons.

- **Ribbon Tabs /Toolbar**

There are a series of elements that are part of each menu bar. On the selection of any menu, a series of command options/icons will display on a ribbon. For example, if you press the “Home” tab, you will see cut, copy, paste, bold, italic, underline, and etc., commands. They are the top section of the Ribbon and contain groups of related commands. Home, Insert, Page Layout, Formula, Data, etc, are examples of ribbon tabs.

- **Ribbon Groups:**

They organize related commands; the name of each group appears below the Ribbon. For example, a group of commands related to fonts or group of commands related to alignment, etc.

- **Name box**

Show the location of the active cell, row or column. You can make more than one selection.

- **Formula bar**

It is a bar that allows you to observe, insert or edit the information/formula entered in the active cell.

- **Columns**

Columns are a series of boxes vertically organized in the entire sheet. It columns bar is located below the formula bar. The columns are listed with letters of the alphabet. Start with the letter A to Z, and then after Z, it will continue as AA, AB and so on. The maximum limit of columns is 16,384.

- **Rows**

It is that left part of the sheet where a sequence of numbers is expressed. Start with number one (1) and as we move the cursor down, more rows will be added. The maximum number of rows goes to 1,048,576.

- **Cells**

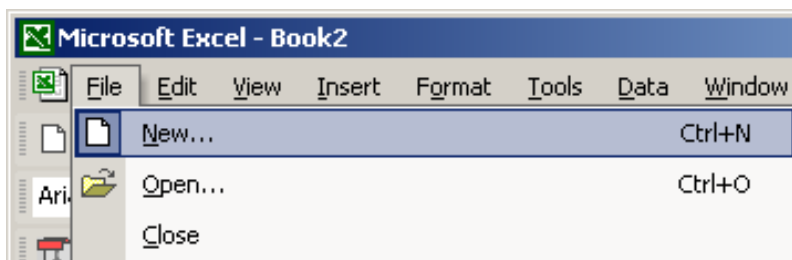
Cells are those parallelepipeds that divide the spreadsheet into several segments that allow rows to be separated from columns. The first cell of a spreadsheet is represented by the initial letter of the alphabet and the number one (A1).

7.4 WORKBOOKS

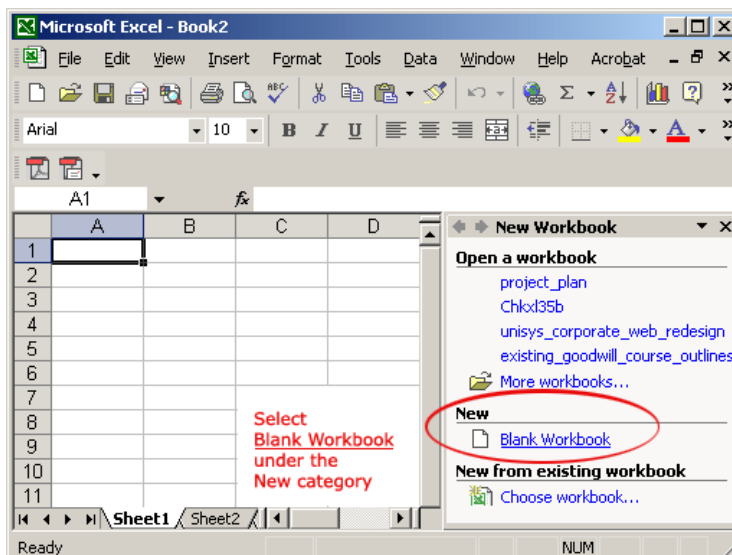
A workbook is a file that contains one or more worksheets to help you organize data. You can create a new workbook from a blank workbook or a template.

7.4.1 Create an Excel XP workbook:

- Choose *File* → *New* from the menu bar.



- The *New Workbook* task pane opens on the right side of the screen.



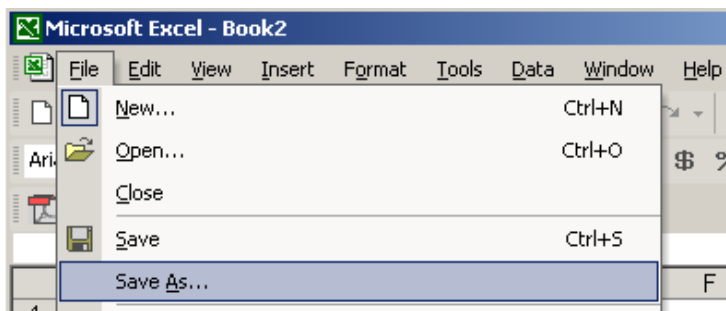
- Choose *Blank Workbook* under the *New* category heading.
- A blank workbook opens in the Excel window. The *New Workbook* task pane is closed.

7.4.2 Saving a workbook

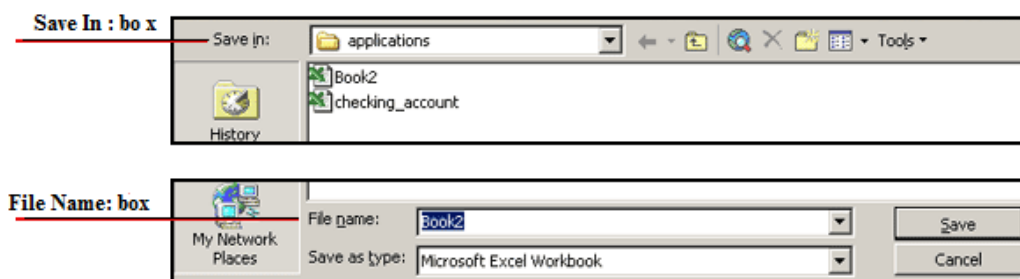
Every workbook created in Excel must be saved and assigned a name to distinguish it from other workbooks. The first time you save a workbook, Excel will prompt you to assign a name through the *Save As* operation. Once the file is assigned a name, any additional changes made to the text, numbers, or formulas must be saved using the *Save* operation.

To save a new workbook:


- Choose *File* → *Save As* from the menu bar.



- The *Save As dialog box* appears.
- Click the *Save In:* drop-down menu and locate where the file will be saved. Choose required directory and type a name for your file in the ***File Name:*** box.
- Click the *Save* button.



To save changes made to an existing workbook:

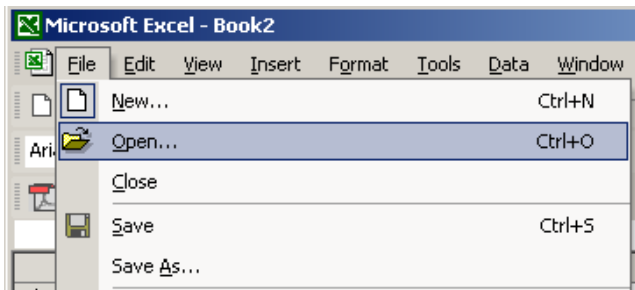
- Choose *File* → *Save* from the menu bar.
OR
- Click the  Save button on the Standard toolbar.

7.4.3 Opening a workbook

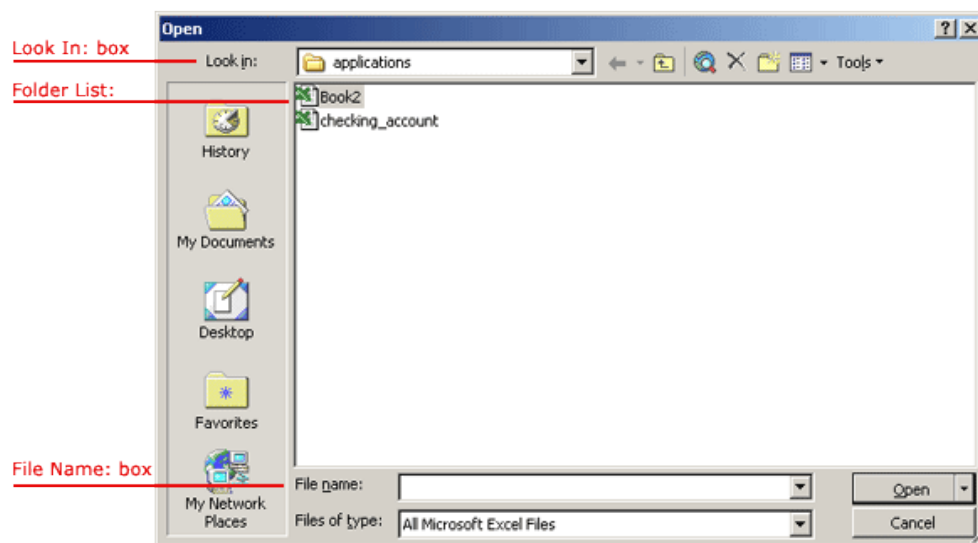
We can open any workbook that has previously been saved and given a name.

To open an existing Excel XP workbook:

- Choose *File* → *Open* from the menu bar.



- The *Open dialog box* opens.

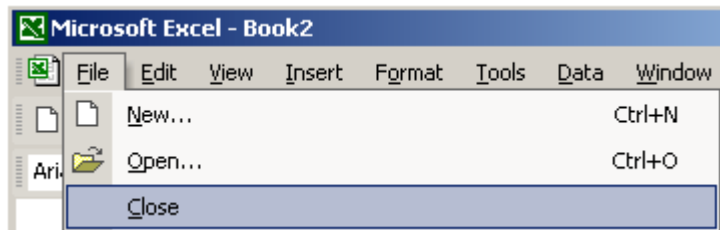


- In the *Look in* list, click the drive, folder, or Internet location that has the file you want to open.
- In the *folder list*, open the folder that contains the file. Once the file is displayed, click the file you want to open.
- Click the Open button.

7.4.4 Closing a workbook

To close an existing Excel XP workbook:

- Choose *File* → *Close* from the menu bar. The workbook in the Excel window is closed.



- Excel XP will prompt you to save information if anything has been typed between the last save and the time you close the file.

7.5 WORKSHEETS

7.5.1 Rows and columns

A worksheet in Excel is made up of Rows and Columns. Intersection of a Row and column in an Excel worksheet is a rectangle called as a Cell. Cells store a value, a formula, or text. An Excel worksheet contains very large number of cells. A cell is a smallest building block of an Excel worksheet.

- Rows in Excel worksheet

Similar to a Row in any table, a Row in Excel worksheet runs horizontally. Rows in Excel worksheet are identified by Row numbers. Row numbers in Excel 2010 starts from 1 and ends in 1048576.

- Columns in Excel worksheet

Similar to a Column in any table, a Column in Excel worksheet runs vertically. Columns in Excel worksheet are identified by Column letters. Column letters in Excel 2010 starts from "A" and ends in "XFD".

- Cells in Excel worksheet

Intersection of a Row and column in an Excel worksheet is a rectangle called as a Cell. A Cell can store one data at a time. The data can be text, number, formula, date etc.

A Cell in Excel worksheet is identified by a Cell Address consisting of Column letter and Row number. Below image shows a Cell in Excel worksheet.

The Cell shown below is the intersection of Column "C" and Row "5". Therefore the Cell address of cell shown below is "C5".

The thick border outline around the selected Cell in above image indicates that it is the Active cell in Excel Worksheet. The Active cell is where the focus is on and where the data will be entered when a key is typed on keyboard. Below image shows the Active Cell as C5, which is hi-lighted with a thick border. The Cell address of Active cell is displayed in Cell Name box in Excel formula bar.

7.5.2 Inserting and Deleting rows and columns and cells

• Insert and Delete Columns and Rows

You can insert and delete columns and rows. When you delete a column, you delete everything in the column from the top of the worksheet to the bottom of the worksheet. When you delete a row, you delete the entire row from left to right. Inserting a column or row inserts a completely new column or row.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	ID#	Balance	Qual_miles	cc1_miles	cc2_miles	cc3_miles	Bonus_miles	Bonus_trans	Flight_miles_1	Flight_trans	Days_since_enroll	Award?	
2	1	28143	0	1	1	1	174	1	0	0	7000	0	
3	2	19244	0	1	1	1	215	2	0	0	6968	0	
4	3	41354	0	1	1	1	4123	4	0	0	7034	0	
5	4	14776	0	1	1	1	500	1	0	0	6952	0	
6	5	97752	0	4	1	1	43300	26	2077	4	6935	1	
7	6	16420	0	1	1	1	0	0	0	0	6942	0	
8	7	84914	0	3	1	1	27482	25	0	0	6994	0	
9	8	20856	0	1	1	1	5250	4	250	1	6938	1	
10	9	443003	0	3	2	1	1753	43	3850	12	6948	1	
11	10	104860	0	3	1	1	28426	28	1150	3	6931	1	
12	11	40091	0	2	1	1	7278	10	0	0	6959	0	
13	12	96522	0	5	1	1	61105	19	0	0	6924	1	
14	13	43382	0	2	1	1	11150	20	0	0	6924	0	
15	14	43097	0	1	1	1	3258	6	0	0	6918	0	
16	15	17648	0	1	1	1	0	0	0	0	6912	0	
17	16	28495	0	4	1	1	49442	15	0	0	6912	1	
18	17	51890	0	4	1	1	48963	16	0	0	6910	1	
19	18	13958	0	1	1	1	4291	5	0	0	6905	1	
20	19	91473	0	3	1	1	27408	17	0	0	6903	1	
21	20	23354	0	3	1	1	10447	5	0	0	6896	1	
22	21	120576	0	5	1	1	58831	23	250	2	6896	1	
23	22	185681	2024	1	1	1	13300	16	1800	9	6896	1	
24	23	20584	0	1	1	1	3450	11	3450	11	6884	0	

• To delete columns F and G:

- Click the column F indicator and drag to column G.
- Click the down arrow next to Delete in the Cells group. A menu appears.
- Click Delete Sheet Columns. Excel deletes the columns you selected.
- Click anywhere on the worksheet to remove your selection.

• To delete rows 7 through 12:

- 1. Click the row 7 indicator and drag to row 12.
- Click the down arrow next to Delete in the Cells group. A menu appears.
- Click Delete Sheet Rows. Excel deletes the rows you selected.
- Click anywhere on the worksheet to remove your selection.

- **To insert a column:**
 - Click on A to select column A.
 - Click the down arrow next to Insert in the Cells group. A menu appears.
 - Click Insert Sheet Columns. Excel inserts a new column.
 - Click anywhere on the worksheet to remove your selection.

- **To insert rows:**
 - Click on 1 and then drag down to 2 to select rows 1 and 2.
 - Click the down arrow next to Insert in the Cells group. A menu appears.
 - Click Insert Sheet Rows. Excel inserts two new rows.
 - Click anywhere on the worksheet to remove your selection

- **Delete a Cell Entry**

To delete an entry in a cell or a group of cells, you place the cursor in the cell or Select the group of cells and press Delete.

 - Select cells A1 to A2.
 - Press the Delete key.

7.5.3 Entering labels and values

Entering data into a spreadsheet is just like typing in a word processing program, but you have to first click the cell in which you want the data to be placed before typing the data. All words describing the values (numbers) are called labels. The numbers, which can later be used in formulas, are called values.

First, place the cursor in the cell in which you want to start entering data. Type some data, and then press Enter. If you need to delete, press the Backspace key to delete one character at a time.

We can also edit the cell by using the Formula bar. You change "Surya" to "Sri" as shown below.

1. Move the cursor to cell A1.
2. Click in the formula or entries area of the Formula bar, and change Surya to Sri.
3. Press Enter.

7.6 FORMATTING

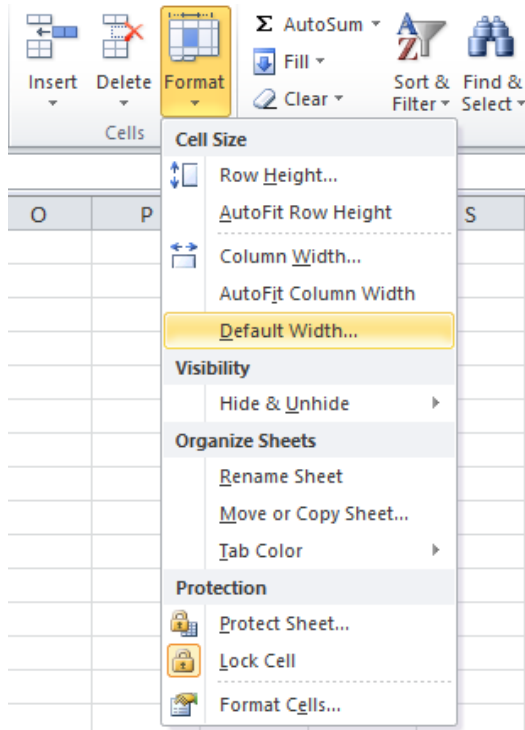
7.6.1 Adjusting row height and column width

The excel column's minimum size is 0, maximum size is 255 and default size is 8.43

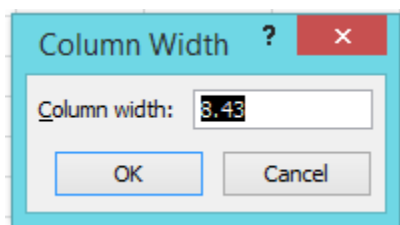
The excel row's minimum size is 0, maximum size is 409 and default size is 15.00

7.6.1.1 Set a column to a specific width

- Select the column or columns that you want to change.
- On the *Home* tab, in the *Cells* group, click *Format*.



- Under *Cell Size*, click *Column Width*.
- In the *Column width* box, type the value that you want.



- Click *OK*.

- **7.6.1.2 Set a row to a specific height**

Select the row or rows that you want to change.

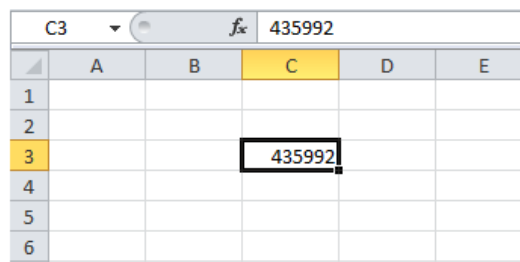
- On the *Home* tab, in the *Cells* group, click *Format*.
- Under *Cell Size*, click *Row Height*.
- In the *Row Height* box, type the value that you want.



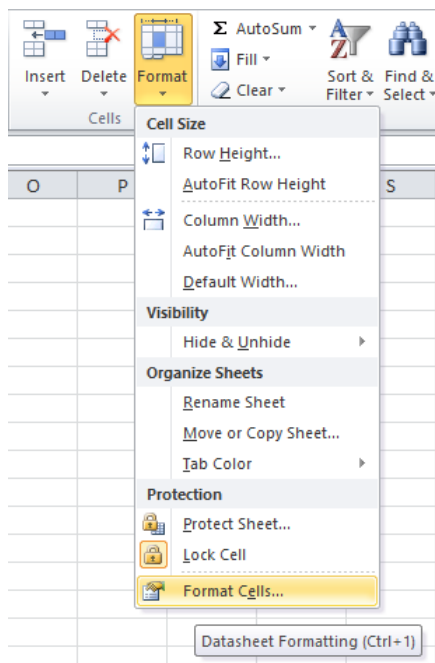
- Click *OK*

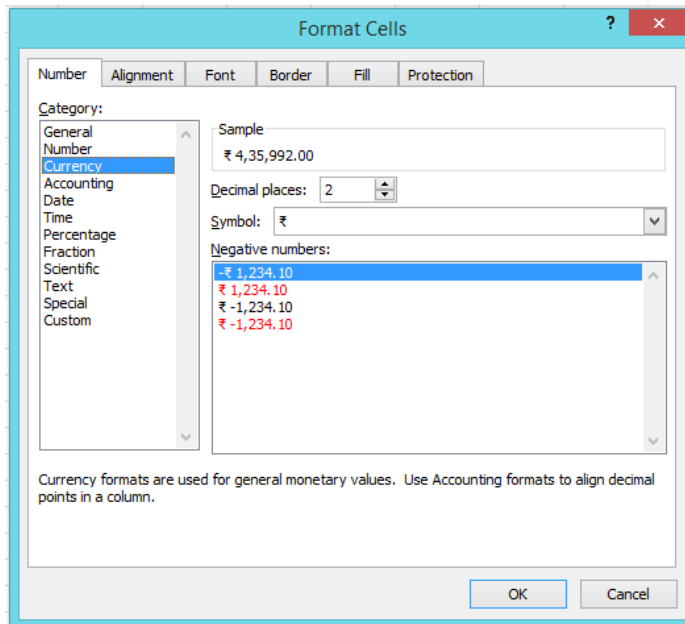
7.6.2 Formatting cell values

- Select the cells that you wish to format



- On the *Home* tab, in the *Cells* group, click *Format*.
- When the Format Cells window appears, select the *Number* tab. In the *Category* listbox, select your format. A sample of your text will appear on the right portion of the window based on the format that you've selected. Click the *OK* button when you are done.





- In this example, we have chosen to format the content of the cells as a currency number.

	A	B	C	D	E
1					
2					
3			₹ 4,35,992.00		
4					
5					
6					
7					

7.7 FORMULAS

Formulas are playing a vital role in Excel spreadsheet. A formula uses standard mathematical symbols to operate on cell addresses and/or numbers.

7.7.1 Operators used in formula

A formula can be a combination of values (numbers or cell references) and mathematical operators into an algebraic expression. Mathematical operators include the following symbols:

- | | | |
|---|---|----------------|
| + | - | Addition |
| - | - | Subtraction |
| * | - | Multiplication |

- / - Division
- % - Percentage
- ^ - Exponentiation (power)

We can also use parentheses and decimal points, whenever we required in formula.

For example to create a formula in cell D2 that adds a value entered in cell B2 by a value in cell C2, enter the following formula in cell D2: $= B2 + C2$

- To enter this formula in cell D2, follow these steps.
 - Select cell D2
 - Type the entire formula D2: $= B2 + C2$ in the cell.
 - Press Enter

Or do the following steps

- Select cell D2
- Type = (equal sign)
- Select cell A2 in the worksheet by using the mouse or keyboard. This action takes places the cell reference B2 in the formula in the cell.
- Type + and
- Select cell B2 in the worksheet by using the mouse or the keyboard. This action places the cell reference C2 in the formula.
- Click the Enter box to complete the formula entry, while at the timekeeping the cell cursor in cell D2.
- Excel displays the calculated answer in cell D2 and the formula D2: $= B2 + C2$ in the formula bar.

	A	B	C	D	E	F	G
1							
2		430	200	=B2+C2			
3							
4							
5							
6							

- **Repeat the calculation for every cell in a column**

To do this select the cell with the formula and when you move the pointer to the lower right hand corner of the cell, the cursor changes to a *bold plus (+) sign*. Click and hold down the

mouse while you drag to highlight cells down the column to the last row of data. Every highlighted cell now contains the formula. Note: Display of #NA indicates problem(s) with the formula or the result is larger than the width of cell.

7.7.2 Cell references in formula

Cell references are often used when creating Excel worksheets and writing formulas. A key element of a formula is the cell reference, and there are three types of cell references. Cell reference means the cell to which another cell refers. For instance, if in B2 you have =B3, cell B2 is referring to cell B3. The cell reference in this example is B3.

If we look at a formula such as = sum (B2:B10), the cell reference is B2:B10. The formula is telling Excel to sum or add all of the numbers starting in cell B2 through cell B10. Sometimes the cell reference may be referred to as the cell range because most references in a formula refer to multiple cells within a range.

- **Relative**

When you enter a cell reference or range into a formula, by default, the reference is relative. Relative cell references, when copied to another cell or across multiple cells, will change based on where you copy them.

We have a sample worksheet with income, expenses and profit numbers for five different stores. Column B is titled Income, column C is titled Expenses, and column D is titled Profit. The formula in D3 for Store 1 calculates the profit. The formula is = sum (B3 - C3). This is a very basic formula that takes the income and subtracts the expenses.

Imagine you want to copy the formula in D3, down the column for the other stores. When you copy the formula, the cell references will automatically change to reference the new row, row four, five, and six and so on. Instead of = sum (B3 - C3), you will get = sum (B4 - C4). Relative references are especially convenient whenever you need to repeat the same calculation across multiple rows or columns.

- **Absolute**

So, there may be times when we don't want the cell reference to change when copied to another cell or range of cells. This is where absolute cell references come to existence. To make absolute cell reference just add a dollar sign before the column letter and row number. For instance, =sum(\$B\$3 - \$C\$3). Unlike relative references, absolute references do not change when copied. You can use an absolute reference to keep a row or column constant.

o Mixed

Mixed references are tricky referencing. A dollar sign is used before the row or the column for mixed reference. Excel Mixed reference locks the column or the row behind which the dollar sign is applied. Mixed reference locks just one of the cells but not both.

In other words, part of the reference in mixed referencing is a relative & part is absolute. They can be used for copying the formula across rows of columns and rows, eliminating the manual need for editing.

The screenshot shows three examples of cell references in Excel:

- Relative Cell Reference:** A formula `=G2*H2` is shown in cell G2. A red callout box points to the formula with the text "Relative Cell Reference".
- Mixed Cell Reference:** A formula `=SUMIFS(C2:C17,A2:A17,$F2,$B$2:$B$17,G$1)` is shown in cell G2. A red callout box points to the formula with the text "Mixed Cell Reference".
- Absolute Cell Reference:** A formula `=A1` is shown in cell C1. A red callout box points to the formula with the text "Absolute Cell Reference".

The background shows a spreadsheet with columns for Product, Unit Price, Units Sold, Sales, Sales Manager, and months (Jan, Feb, Mar).

7.8 FUNCTIONS

A function is a special key word which can be entered into a cell in order to perform and process the data which is appended within brackets.

There is a function button on the formula toolbar f_x when we click with the mouse on it; a function offers assistance and useful prompts into a spreadsheet cell. Alternatively we can enter the function directly into the formula bar.

A function involves four main needs:

- Name of the function
- The purpose of the function
- The function needs what argument(s) in order to carry its assignment
- The result of the function.

A function is a built in set of formulas which starts with an = “equal to sign” such as = FunctionName (Data). The data (or argument in proper terminology) includes a range of cells.

By using functions, you can quickly and easily make many useful calculations, such as finding an average, the highest number, the lowest number, and a count of the number of items in a list. Microsoft Excel has many functions that you can use.

To use functions, you need to understand reference operators. Reference operators refer to a cell or a group of cells. There are two types of reference operators: range and union.

A range reference refers to all the cells between and including the reference. A range reference consists of two cell addresses separated by a colon. The reference A1:A3 includes cells A1, A2, and A3. The reference A1:C3 includes cells A1, A2, A3, B1, B2, B3, C1, C2, and C3.

A union reference includes two or more references. A union reference consists of two or more numbers, range references, or cell addresses separated by a comma. The reference A7,B8:B10,C9,10 refers to cells A7, B8 to B10, C9 and the number 10.

Functions are prewritten formulas. Functions differ from regular formulas in that you supply the value but not the operators, such as +, -, *, or /. For example, we can use the SUM function to add.

When using a function, remember the following:

- Use an equal sign to begin a formula.

- Specify the function name.
- Enclose arguments within parentheses. Arguments are values on which you want to perform the calculation. For example, arguments specify the numbers or cells you want to add.
- Use a comma to separate arguments.

Example:

=SUM(4,15,A1,D2:E8)

In this function, known as the SUM function:

- The equal sign begins the function.
- SUM is the name of the function.
- 4,15,A1 and D2:E8 are the arguments. Parentheses enclose the arguments.
- Commas separate the arguments.

After we type the first letter of a function name, the AutoComplete list appears. We can double-click on an item in the AutoComplete list to complete our entry quickly. Excel will complete the function name and enter the first parenthesis.

7.8.1 Mathematical and Statistical Functions

Function	Output
ABS	The absolute value of a number
AVERAGE	The average or arithmetic mean for a group of numbers
COUNT	The number of cell locations in a range that contain a numeric character
COUNTA	The number of cell locations in a range that contain a text or numeric character
MAX	The highest numeric value in a group of numbers
MEDIAN	The middle number in a group of numbers (half the numbers in the group are higher than the median and half the numbers in the group are lower than the median)
MIN	The lowest numeric value in a group of numbers
MODE	The number that appears most frequently in a group of numbers

PRODUCT	The result of multiplying all the values in a range of cell locations
SQRT	The positive square root of a number
STDEV.S	The standard deviation for a group of numbers based on a sample
SUM	The total of all numeric values in a group

Examples:**AVERAGE()**

The AVERAGE function is used to calculate the average of a series of numbers.

- Enter values 150, 85, and 65 in cells B1,B2 and B3 respectively.
- Move to cell A6.
- Type Average. Press the right arrow key to move to cell B6.
- Type =AVERAGE(B1:B3).
- Press Enter. The average of cells B1 to B3, which is 21, appears.

ABS()

ABS() function returns the absolute value of a number. The absolute value of a number is the number without its sign.

Syntax: *ABS(number)*

where Number is the real number of which you want the absolute value.

=ABS(2)	Absolute value of 2	2
=ABS(-2)	Absolute value of -2	2
=ABS(A2)	Absolute value of -4	4

SUM()

SUM() function returns the sum of values supplied. These values can be numbers, cell references, ranges, arrays, and constants, in any combination. SUM can handle up to 255 individual arguments.

=SUM (number1, [number2], [number3], ...)

where number1 - The first value to sum, number2 - [optional] The second value to sum and number3 - [optional] The third value to sum.

7.8.2 Logical Functions

Function	Description
AND function	Returns TRUE if all of its arguments are TRUE
FALSE function	Returns the logical value FALSE
IF function	Specifies a logical test to perform
IFERROR function	Returns a value you specify if a formula evaluates to an error; otherwise, returns the result of the formula
IFNA function	Returns the value you specify if the expression resolves to #N/A, otherwise returns the result of the expression
NOT function	Reverses the logic of its argument
OR function	Returns TRUE if any argument is TRUE
TRUE function	Returns the logical value TRUE
XOR function	Returns a logical exclusive OR of all arguments

IF Function

Returns one value if a condition you specify evaluates to TRUE and another value if it evaluates to FALSE.

Syntax: *IF(logical_test,value_if_true,value_if_false)*

Logical_test is any value or expression that can be evaluated to TRUE or FALSE. For example, A10=100 is a logical expression; if the value in cell A10 is equal to 100, the expression evaluates to TRUE. Otherwise, the expression evaluates to FALSE.

Value_if_true is the value that is returned if *logical_test* is TRUE.

Value_if_false is the value that is returned if *logical_test* is FALSE.

up to 64 IF functions can be nested as *value_if_true* and *value_if_false* arguments to construct more elaborate tests.

The IF function can be read as: “If *Logical_test* then *Value_if_true* otherwise *Value_if_false*”

Example

	A	B
1	Score	
2	45	
3	90	
4	78	
5		

Formula	Description (Result)
=IF(A2<50,"FAIL","PASS")	Assigns either a pass or fail remark to the first score (FAIL)
=IF(A2>89,"A",IF(A2>79,"B",IF(A2>69,"C",IF(A2>59,"D","F"))))	Assigns a letter grade to the first score (F)
=IF(A3>89,"A",IF(A3>79,"B",IF(A3>69,"C",IF(A3>59,"D","F"))))	Assigns a letter grade to the second score (A)
=IF(A4>89,"A",IF(A4>79,"B",IF(A4>69,"C",IF(A4>59,"D","F"))))	Assigns a letter grade to the third score (C)

AND Function: Returns TRUE if all its arguments are TRUE; returns FALSE if one or more argument is FALSE.

Syntax

AND(logical1,logical2, ...)

Logical1, logical2, ... are 1 to 255 conditions you want to test that can be either TRUE or FALSE.

7.8.3 Text functions

Function	Description
ASC function	Changes full-width (double-byte) English letters or katakana within a character string to half-width (single-byte) characters
CHAR function	Returns the character specified by the code number
CLEAN function	Removes all nonprintable characters from text
CODE function	Returns a numeric code for the first character in a text string
CONCAT function	Combines the text from multiple ranges and/or strings, but it doesn't provide the delimiter or Ignore Empty arguments.
CONCATENATE	Joins several text items into one text item

function	
DOLLAR function	Converts a number to text, using the \$ (dollar) currency format
EXACT function	Checks to see if two text values are identical
LEN, LENB functions	Returns the number of characters in a text string
LOWER function	Converts text to lowercase
PROPER function	Capitalizes the first letter in each word of a text value
REPLACE function	Replaces characters within text
SUBSTITUTE function	Substitutes new text for old text in a text string
TEXT function	Formats a number and converts it to text
TRIM function	Removes spaces from text
UPPER function	Converts text to uppercase
VALUE function	Converts a text argument to a number

ASC()

Syntax: ASC(text)

The ASC function syntax has the following arguments:

Text Required. The text or a reference to a cell that contains the text you want to change. If text does not contain any full-width letters, text is not changed.

Example

=ASC("Surya") equals "Surya"

CHAR()

Returns the character specified by a number. Use CHAR to translate code page numbers you might get from files on other types of computers into characters.

Syntax: CHAR(number)

Number Required. A number between 1 and 255 specifying which character you want. The character is from the character set used by your computer.

=CHAR(65) Displays the character represented by 65 in the computer's character set. A

=CHAR(33) Displays the character represented by 33 in the computer's character set. !

7.9 CHARTS

In Microsoft Excel, We can represent numbers in a chart. On the *Insert* tab, you can choose from a variety of chart types, including column, line, pie, bar, area, and scatter. The basic procedure for creating a chart is the same no matter what type of chart you choose. As you change your data, your chart will automatically update.

We can select a chart type by choosing an option from the Insert tab's Chart group. After you choose a chart type, such as column, line, or bar, you choose a chart subtype. For example, after you choose Column Chart, you can choose to have your chart represented as a two-dimensional chart, a three-dimensional chart, a cylinder chart, a cone chart, or a pyramid chart. There are further sub-types within each of these categories. As you roll your mouse pointer over each option, Excel supplies a brief description of each chart sub-type.

- **Create a Chart**

To create a chart first we have to create a worksheet with data .

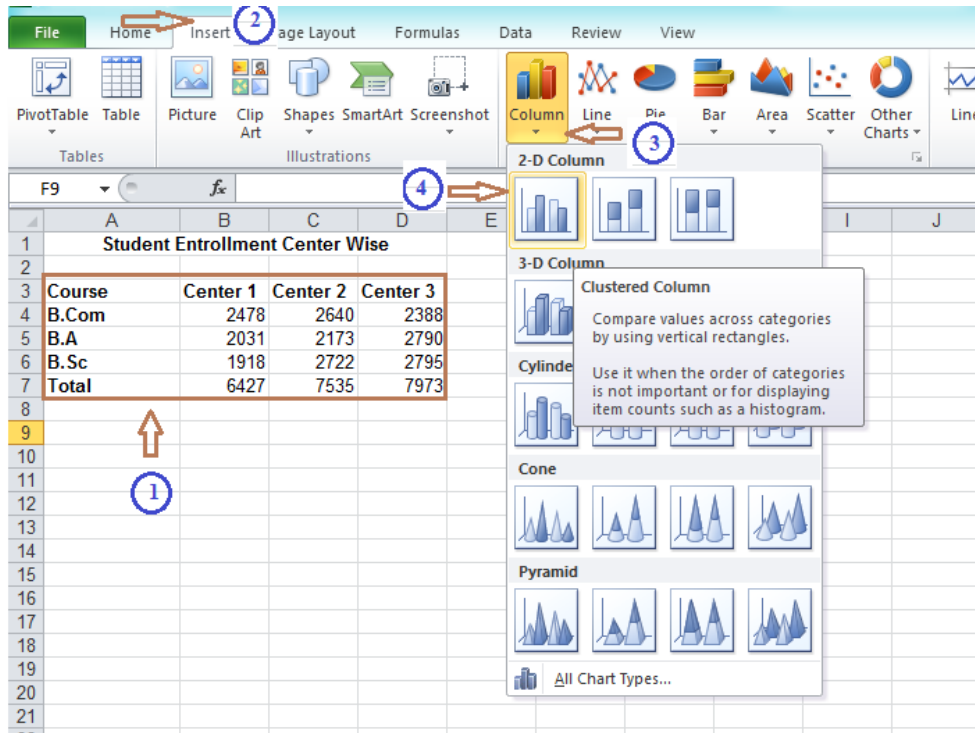
Example:

	A	B	C	D
1	Student Entrollment Center Wise			
2				
3	Course	Center 1	Center 2	Center 3
4	B.Com	2478	2640	2388
5	B.A	2031	2173	2790
6	B.Sc	1918	2722	2795
7	Total	6427	7535	7973
8				

After you have created the worksheet, you are ready to create your chart.

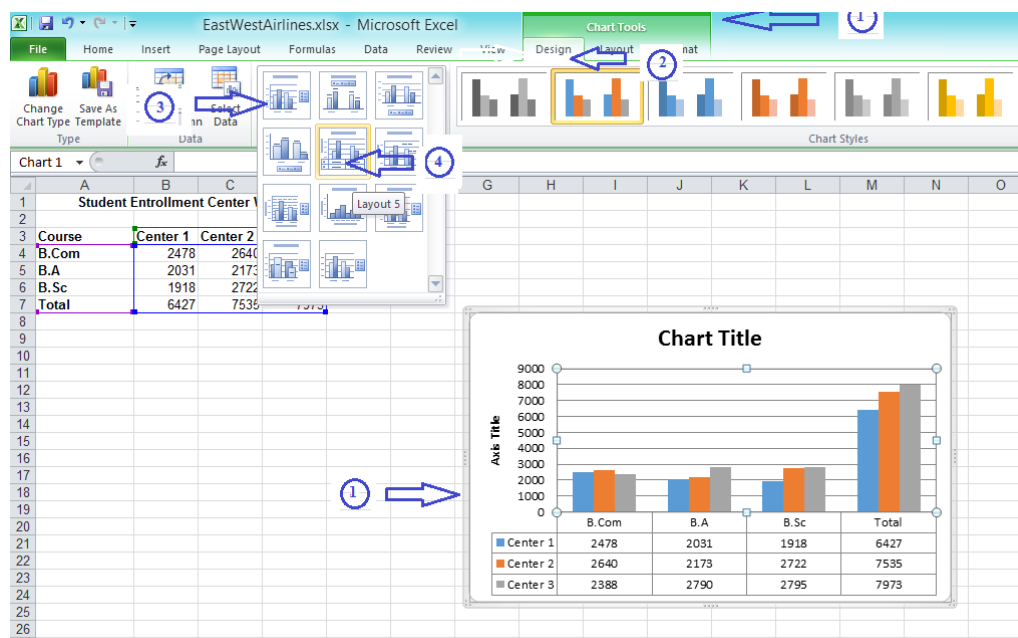
- **Create a Column Chart**

1. Select cells A3 to D6. You must select all the cells containing the data you want in your chart. You should also include the data labels.
2. Choose the Insert tab.
3. Click the Column button in the Charts group. A list of column chart sub-types types appears.
4. Click the Clustered Column chart sub-type. Excel creates a Clustered Column chart and the Chart Tools context tabs appear.



- **Apply a Chart Layout**

Context tabs are tabs that only appear when you need them. Called Chart Tools, there are three chart context tabs: Design, Layout, and Format. The tabs become available when you create a new chart or when you click on a chart. You can use these tabs to customize your chart.



1. Click your chart. The Chart Tools become available.
2. Choose the Design tab.
3. Click the Quick Layout button in the Chart Layout group. A list of chart layouts appears.
4. Click Layout
5. Excel applies the layout to your chart.

- **Change the Style of a Chart**

A style is a set of formatting options. You can use a style to change the color and format of your chart. Excel 2007 has several predefined styles that you can use. They are numbered from left to right, starting with 1, which is located in the upperleft corner.

1. Click your chart. The Chart Tools become available.
2. Choose the Design tab.
3. Click the More button in the Chart Styles group. The chart styles appear.
4. Click required Style then excel applies the style to your chart.

- **Change the Size and Position of a Chart**

When you click a chart, handles appear on the right and left sides, the top and bottom, and the corners of the chart. You can drag the handles on the top and bottom of the chart to increase or decrease the height of the chart. You can drag the handles on the left and right sides to increase or decrease the width of the chart. You can drag the handles on the corners to increase or decrease the size of the chart proportionally. You can change the position of a chart by clicking on an unused area of the chart and dragging.

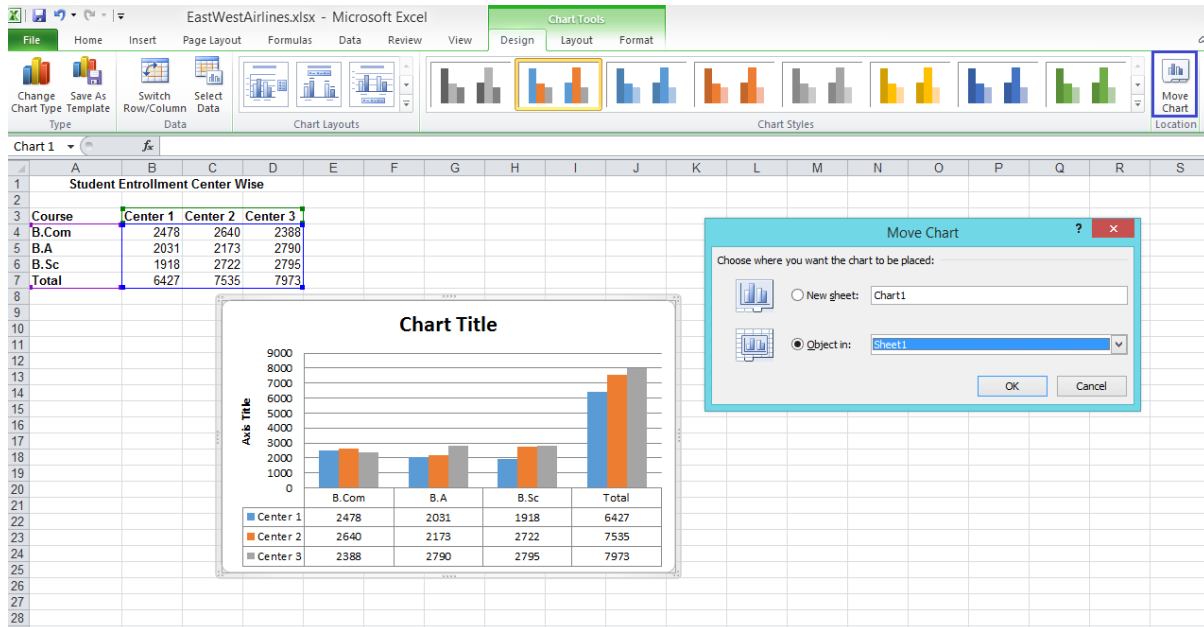
1. Use the handles to adjust the size of your chart.
2. Click an unused portion of the chart and drag to position the chart beside the data.

- **Move a Chart to a Chart Sheet**

By default, when you create a chart, Excel embeds the chart in the active worksheet. However, you can move a chart to another worksheet or to a chart sheet. A chart sheet is a sheet dedicated to a particular chart. By default Excel names each chart sheet sequentially, starting with Chart1. You can change the name.

1. Click your chart. The Chart Tools become available.
2. Choose the Design tab.x

3. Click the Move Chart button in the Location group. The Move Chart dialog box appears.
4. Click the New Sheet radio button.
5. Type Student Enrollment to name the chart sheet. Excel creates a chart sheet named Toy Sales and places your chart on it.



• Change the Chart Type

Any change you can make to a chart that is embedded in a worksheet, you can also make to a chart sheet. For example, you can change the chart type from a column chart to a bar chart.

1. Click your chart. The Chart Tools become available.
2. Choose the Design tab.
3. Click Change Chart Type in the Type group. The Chart Type dialog box appears.
4. Click Bar.
5. Click Clustered Horizontal Cylinder.
6. Click OK. Excel changes your chart type.

7.10 SUMMARY

Microsoft Excel is a software program included in the Microsoft Office suite. It is used to create spreadsheets, which are documents in which data is laid out in rows and columns. Spreadsheets present tables of values arranged in rows and columns that can be manipulated mathematically using both basic and complex arithmetic operations and functions. MS Excel is widely used for various purposes because the data is easy to save, and information can be added and removed without any discomfort and less hard work.

7.11 TECHNICAL TERMS

Workbook, Worksheet, Column, Cell, Row, Spreadsheet, Formula, Function.

7.12 SELF ASSESSMENT QUESTIONS

Essay questions:

- 1) What are the different Math, String functions that are available in Excel. Explain them with suitable syntax and example.
- 2) Describe the steps to align data in cells. Explain the use of chart wizard.
- 3) Explain the steps to create chart on a separate sheet and to print it. Explain the steps adjust and hide column.

Short Notes:

1. Write any five keyboard shortcut keys in MS-Excel
2. Write the features of spread sheet?
3. What are the various chart options available in MS-Excel
4. Write down the steps involved in copying data with drag and drop in excel worksheet

7.13 SUGGESTED READINGS

1. MS-Office S.S. Srivastava
2. Microsoft Office 2007 Fundamentals, 1st Edition By Laura Story, Dawna Walls

AUTHOR: Dr. UDUGA SURYA KAMESWARI

LESSON- 8

Microsoft PowerPoint

AIMS AND OBJECTIVES

After reading this chapter, the student will be able to do the following in MS Power Point:

- Understand the basic features of Microsoft Powerpoint
- Create, edit, save, and print presentations.
- Format presentations and add a graphic to a presentation.
- Create and manipulate simple slide shows with outlines and notes.
- Create slide presentations that include text, graphics, animation, and transitions.
- Use design layouts and templates for presentations.

STRUCTURE

8.1 Introduction

8.2 Features of Power Point

8.3 Parts of Power Point Window

8.3.1 Creating a presentation

8.3.2 Saving a presentation

8.3.3 Opening a presentation

8.4 Working with Slides

8.4.1 Inserting slides

8.4.2 Deleting slides

8.4.3 Copying slides

8.4.4 Editing Text

8.5 Formatting and Modifying Presentations

8.5.1 Slide Transition

8.5.2 Slide Animation

8.5.3 Inserting music or sound on a slide.

8.6 Viewing Slide Show

8.7 Summary

8.8 Technical Terms

8.9 Self-Assessment Questions

8.10 Suggested Readings

8.1 INTRODUCTION

MS PowerPoint is a program that is included in the Microsoft Office suite. The software allows users to create anything from basic slide shows to complex presentations.

PowerPoint is often used to create business presentations, but can also be used for educational or informal purposes. PPT is a powerful, easy-to-use presentation graphics software program that allows you to create professional-looking electronic slide shows.

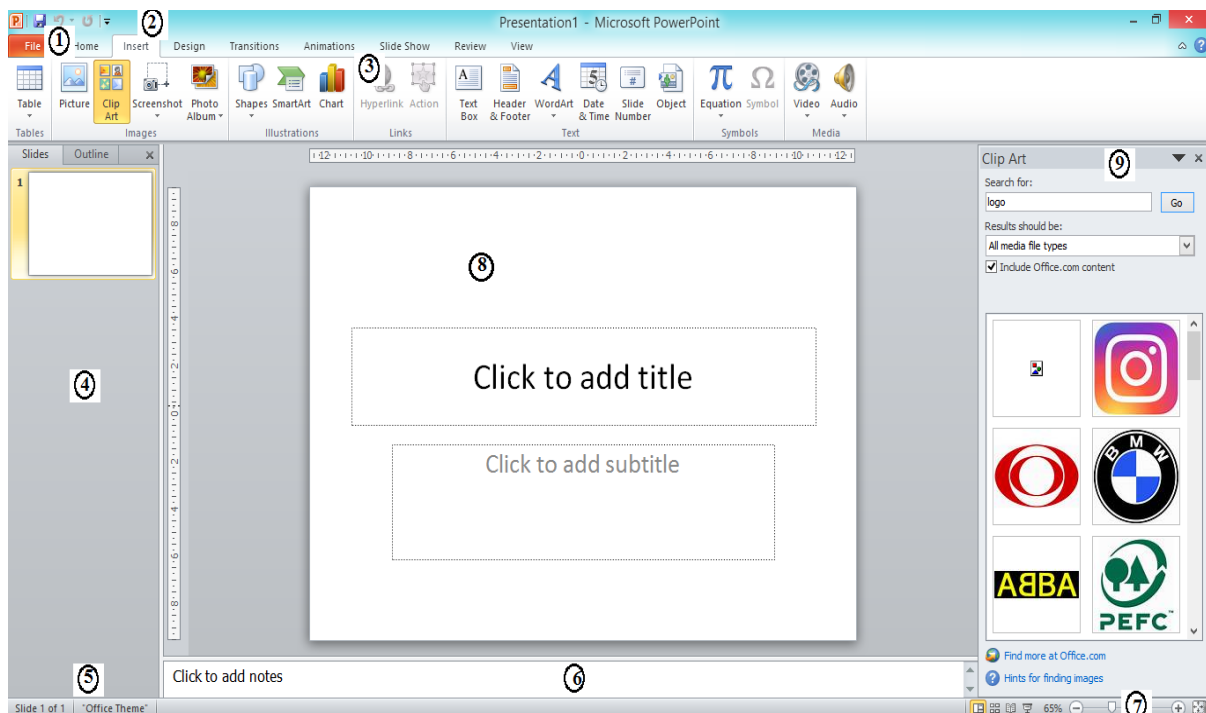
Presentation is a combination of various slides depicting a graphical and visual interpretation of data, to present information in a more creative and interactive manner.

The file extension of a saved Power Point presentation is “.pptx”.

8.2 FEATURES OF POWER POINT

- Easy to present and maintain eye contact with a large audience by simply advancing the slides with a keystroke, eliminating the need for handouts to follow the message.
- The creation of a presentation is now a more fluid process from beginning to end.
- Easy to modify compared to other visual aids, such as charts, and easy to drag and drop slides to re-order presentation.
- Simple bullet points: it can reduce complicated messages to simple bullet points. Bullet points are a good basis for a presentation and remind the speaker of main points and the organization of the message.
- Easy to create a colorful, attractive design: using the standard templates and themes, you can create something visually appealing, even if you do not have much knowledge of basic graphic design principles.
- The slide template design gallery is very graphical, and your presentation changes dynamically as you browse the gallery.
- SmartArt makes striking flowcharts, Venn diagrams and relationship models.
- Easy to modify: when compared to other visual aids such as charts, posters, or objects, it is easy to modify.
- Easily re-order presentation: with a simple drag and drop or using key strokes, you can move slides to re-order the presentation.

8.3 PARTS OF A POWERPOINT WINDOW



1. File menu and backstage view

When we click the File menu (the equivalent of the Office Button in PowerPoint 2007), we can see the new backstage view that contains all the creation, save, share, and print options for your presentations.

2. Quick Access Toolbar

Also known as the QAT, this is a customizable toolbar placed by default on the top of Ribbon, you can add icons for your often used commands to this toolbar. The QAT can also be placed below the Ribbon.

3. Ribbon

The Ribbon has tabs which in turn contain groups of buttons for various options, some groups also contain galleries

4. Slides/Outline Pane

Normally placed on the left side of the interface, this pane contains two tabs, the Slides tab and the Outline tab. The Slides tab shows thumbnails of all the slides in the open presentation. The Outline tab shows the same slides in outline view.

5. Status Bar

A horizontal strip that provides information about the opened presentation like slide number, applied Theme, etc. It also includes the view and zoom options.

6. Notes Pane

Directly below the active slide, this is where you input speaker notes for the current slide. None of this content is visible on the actual slide while presenting, although it is visible in both Notes Page view and Presenter view

7. View Buttons

Essentially there are three view buttons on the status bar displayed towards the left of the zoom-in and zoom-out options:

Normal View - Clicking this enables Normal view, Shift-clicking this gets you to Slide Master View.

Slide Sorter View - Clicking this displays zoomable thumbnails of every slide in the open presentation. Shift-clicking this button gets you to Handout Master view.

Slide Show from current slide - Show the presentation as a full screen slideshow from the current selected slide. Shift-clicking brings up the Set Up Show dialog box

8. Slide Area

Displays the active slide.

9. Task Pane

The Task Pane contains more options and appears when you choose an option in one of the Ribbon tabs, for example if you click the Clip Art button on the Insert tab of the Ribbon, the Clip Art task pane opens

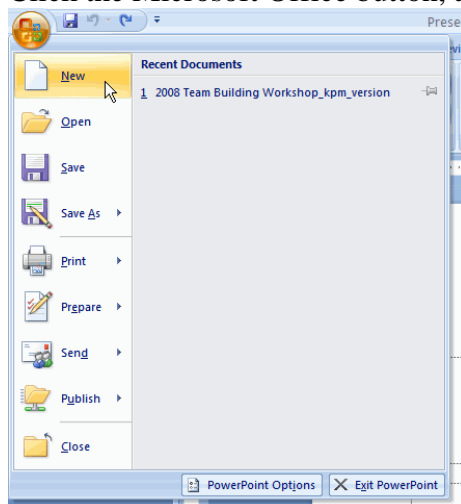
10. Mini Toolbar

This toolbar is not shown in the figure above, it's a semitransparent floating toolbar that spawns right next to the cursor, and it is also available instantly with a right-click

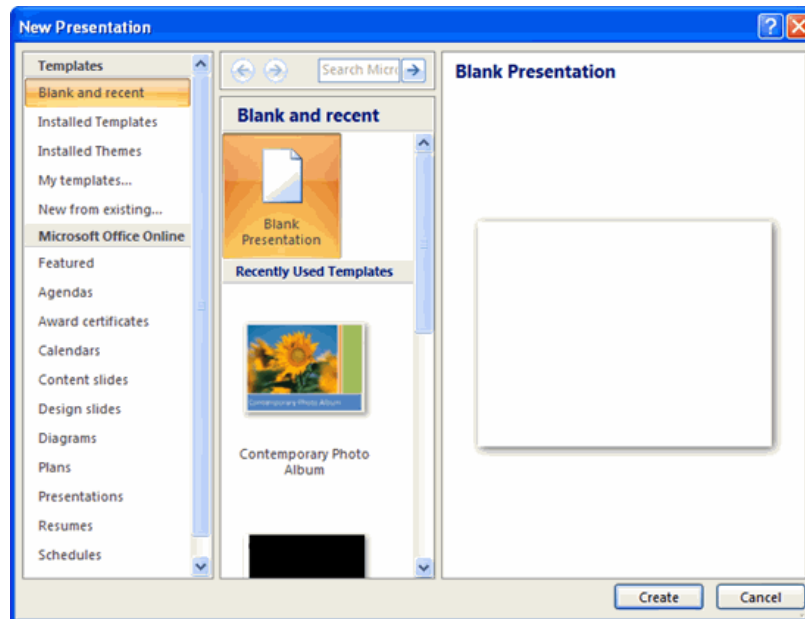
8.3.1 Creating a presentation

When we open PowerPoint from the Start menu, a new presentation with one slide appears by default. We can also create a new presentation while PowerPoint is already open.

- Click the Microsoft Office button, and choose New from the menu.



- The New Presentation dialog box will appear. Blank presentation is selected by default.



- Click Create, and a new presentation will open in the PowerPoint window.
- The default slide that appears when you create a new presentation is a Title Slide layout.

8.3.2 Saving a presentation

If you are saving a document for the first time, you will need to use the *Save As* command; however, if you have already saved a presentation, you can use the *Save* command.

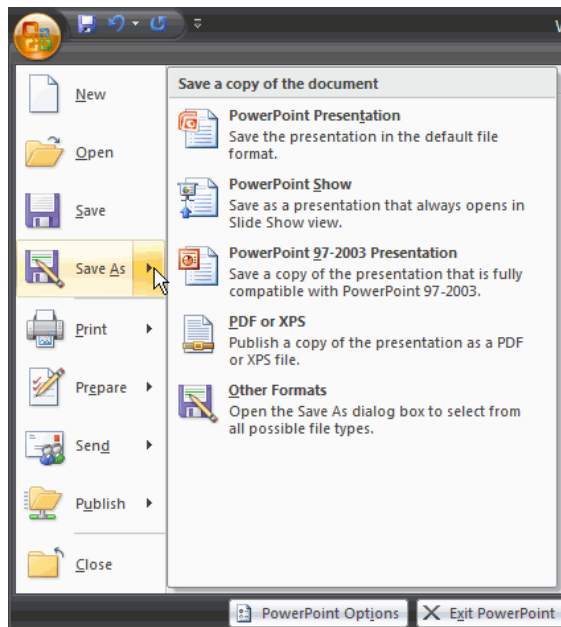
8.3.2.1 To use the Save As command:

- Click the Microsoft Office button.
- Select Save As. A menu will appear.
- Select the type of file you want to save the presentation as.

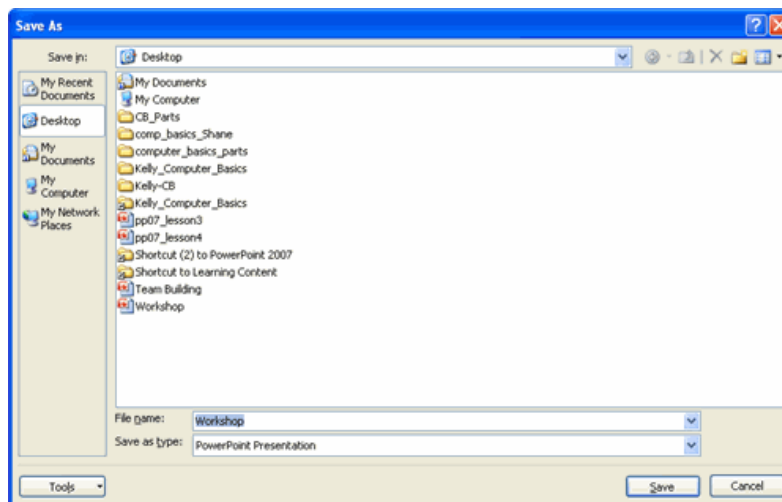
The two most commonly used file types are:

PowerPoint Presentation: This saves the presentation as a 2007 PowerPoint file. Only users with PowerPoint 2007 or the compatibility pack can view the file without possibly losing some of the formatting.

PowerPoint 97-2003 Presentation: This saves the presentation so it is compatible with some previous versions of PowerPoint. If you will be sending the presentation to someone who does not have Office 2007, you should use this file type.



- The Save As dialog box will appear. Select the location where you want to save the document using the drop-down menu.



- Enter a name for the document.
- Click the Save button.

8.3.2.2. To use the Save command:

- Click the Microsoft Office button.
- Select *Save* from the menu.
- Using the Save command saves the document in its current location using the same file name.

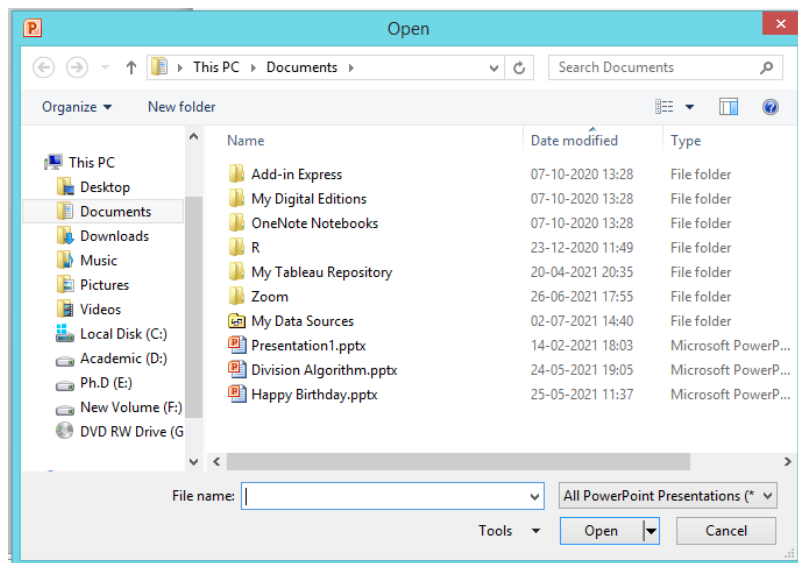
8.3.3 Opening a presentation

If you want to work once again in your previously saved presentation, you can open the same as follows:

- Select *Open* option from the Microsoft Office button menu.



- Open dialog box will display on the screen.
- Select your file from the list displayed in the open dialog box.
- Click *Open* button.

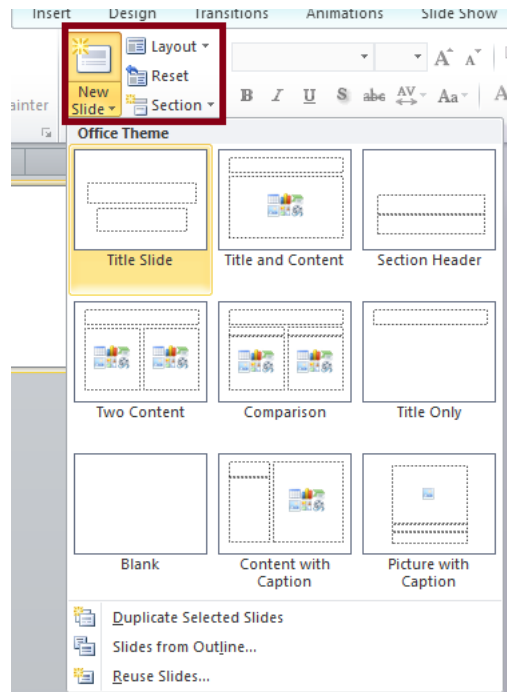


8.4 WORKING WITH SLIDES

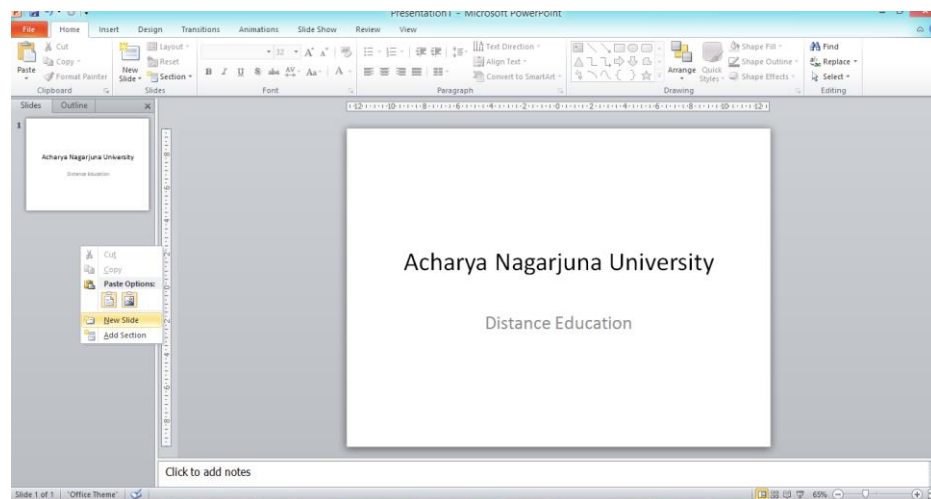
8.4.1 Inserting slides

There are three ways to add a slide in PowerPoint.

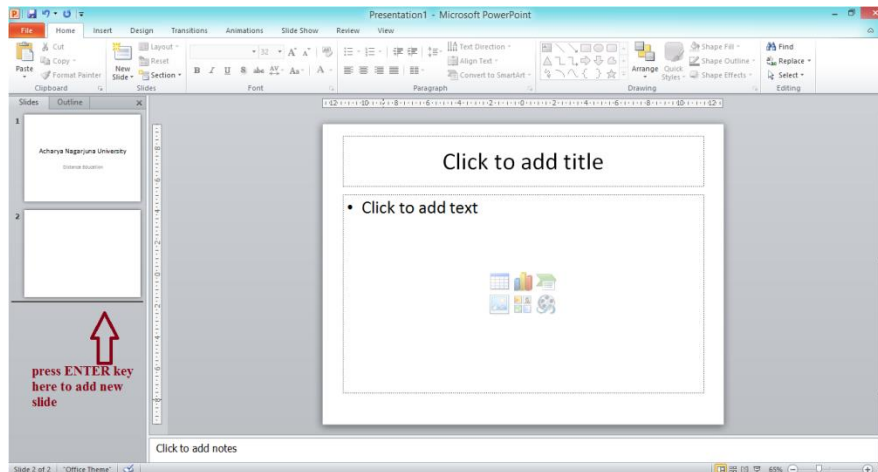
- On the *Home* tab, in the *Slides* group, click *New Slide*.



- *Right-click* on the slide from the slide tabs and selects *New Slide* on the pop-up menu.



- *Click on a slide* from the slides tab and hit the *enter* key.



8.4.2 Deleting slides

- Right-click the slide that you want to delete.
- Click *Delete Slide*.

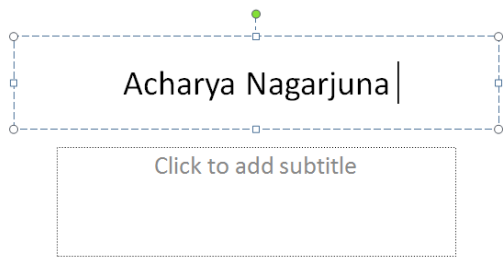
8.4.3 Copying slides

- In the pane that contains the Outline and Slides tabs, click the *Slides tab*.
- Select the slide that you want to copy by doing one of the following:
 - To select a single slide, click it.
 - To select multiple sequential slides, click the first slide, press SHIFT, and then click the last slide that you want to select. Feel free also to make use of the SHIFT + CURSOR down command which allows you to select the slides sequentially one by one until you get to the last preferred slide. You can press CURSOR UP while still holding onto the SHIFT button to go up and deselect the last slide.
 - To select multiple non-sequential slides, press CTRL, and then click each slide that you want to select.
- Right-click one of the selected slides, and then click *Copy*.
- In the destination presentation, on the *Slides tab*, right-click the slide that you want your copied slides to follow, and then click *Paste*. You can also use the paste shortcut CTRL + V to save time
- To retain the original design of the copied slides, click the *Paste Options* button Button image, which appears near the pasted slides on the *Outline or Slides tab* in Normal view, or in the *Slides* pane, and then click *Keep Source Formatting*.

8.4.4 Editing Text

Slide layouts contain placeholders. The dotted border represents placeholders; just click inside the border and you can add text or insert objects. The slide's layout will determine the position and size of placeholders.

- Click inside a text placeholder.
- Type or Paste the Text.



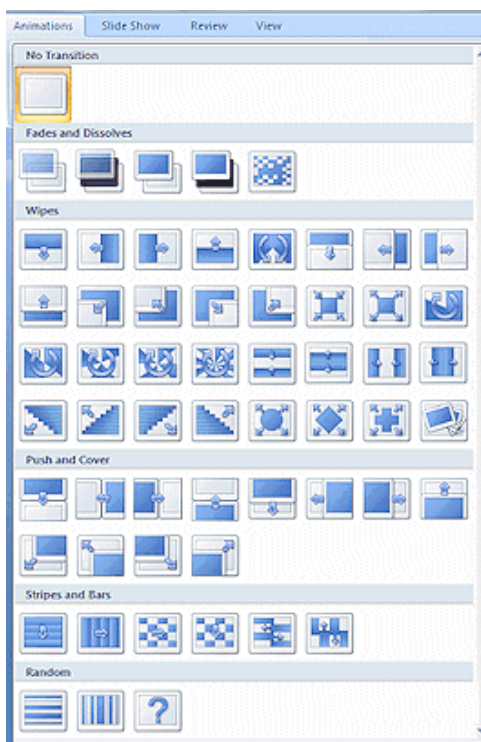
If your text exceeds the size of the placeholder, PowerPoint reduces the font size and line spacing incrementally as you type, to make the text fit.

8.5 FORMATTING AND MODIFYING PRESENTATIONS

8.5.1 Slide Transition

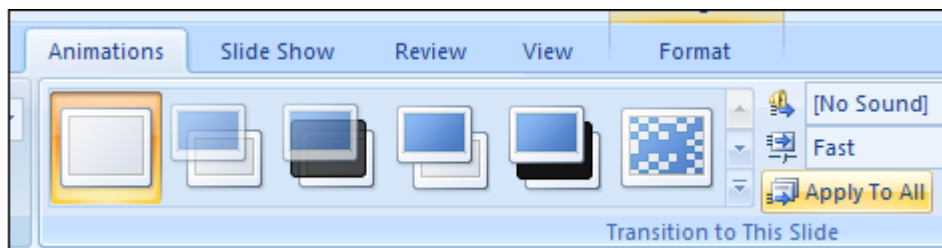
The term animation in PowerPoint refers to the movements of text and objects on the slide. A slide transition is how one slide is removed from the screen and the next slide is displayed during a presentation. PowerPoint offers many entertaining and different slide transition schemes.

- **To apply a transition to one slide:**
 - Select the slide you want to modify.
 - Select the *Animations* tab.
 - Locate the *Transition to This Slide* group. By default, *No Transaction* is applied to each slide.
 - Click the *More* drop-down arrow to display all available transition effects.



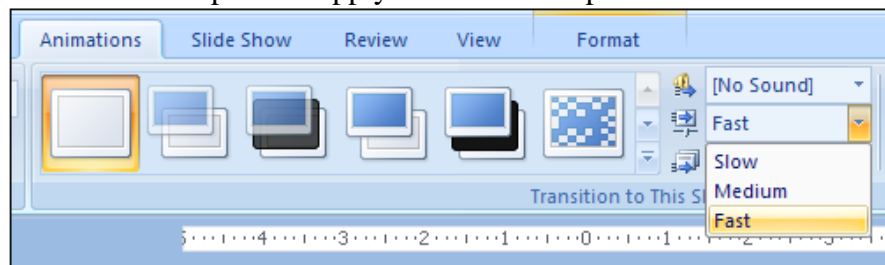
- Click a *slide transition effect* to apply it to the selected slide.

- Hover over a slide transition effect to see a live preview of the effect on the slide.
- **apply a slide transition to all slides:**
 - Select the slide you want to modify.
 - Select the *Animations* tab.
 - Locate the *Transition to This Slide* group. By default, No Transition is applied to each slide.
 - Click the *More* drop-down arrow to display all transition effects.
 - Click a *slide transition effect* to apply it to the selected slide.
 - Click *Apply To All* to apply the transition to all slides in the presentation.



A star Play Animations icon will appear beneath any slide that has a transition effect applied to it, as well as any slide that uses animation effects for text or objects. The icon is visible on the Slides tab in the task pane on the left and in Slide Sorter view. Click the star Play Animations icon to preview the animation or transition effect.

- **Modifying transitions**
- To set slide transition speed:
 - Apply a *slide transition effect* to a slide.
 - Click the *Transition Speed* drop-down menu in the *Transition to This Slide* group on the Animations tab.
 - Select a menu option to apply the transition speed to the selected slide.



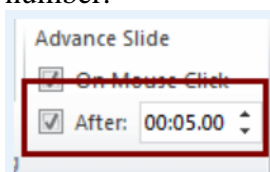
- You can set the transition speed when you apply the transition effect, or you can return to the Animations tab and apply it later. If you want to apply the transition effect and transition speed to all slides, Click *Apply to All*.
- To remove a slide transition effect:
 - Select the slide you want to modify.
 - Select the *Animations* tab.
 - Click *No Transition* in the *Transition to This Slide* group.



- Repeat this process for each slide you want to modify.
- OR
- Click *Apply To All* to remove the slide transition effect from each slide in the presentation.

- **To set timing for slides:**

- View the slides in *Slide Sorter view*.
- Select a slide.
- Select the *Animations* tab.
- Locate the *Advance Slide* section of the *Transition to This Slide* group.
- Enter the time in the *Automatically After* field. Use the arrows or type the number.



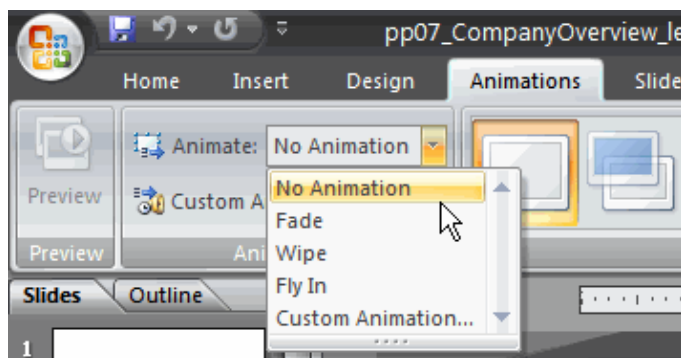
- Select another slide and repeat the process until all desired slides have the timing set.
- If you want to apply the same transition effect and timing for each slide, set the transition effect timing for one slide and click *Apply to All*.

8.5.2 Slide Animation

PowerPoint animation is a form of animation which uses Microsoft PowerPoint and similar programs to create a game or movie. The artwork is generally created using PowerPoint's AutoShape features, and then animated slide-by-slide or by using Custom Animation.

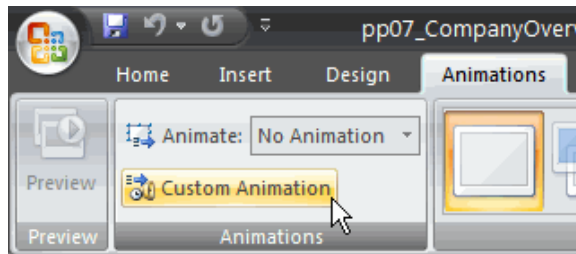
- **To apply a default animation effect:**

- Select the *text* or *object* on the slide you want to animate.
- Select the *Animations* tab.
- Click the *Animate* drop-down menu in the *Animations* group to see the *animation options* for the selection. The options change based on the selected item.

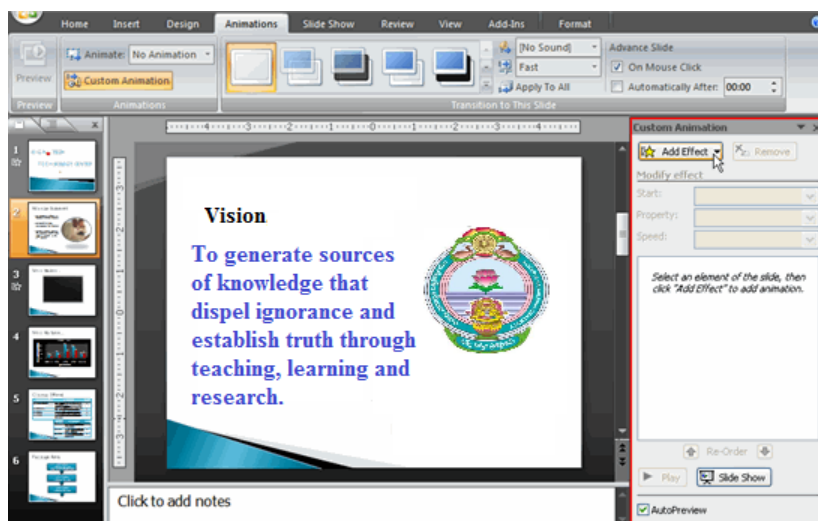


- Move your cursor over each option to see a live preview of the animation on the slide.
- Click an option to select it.

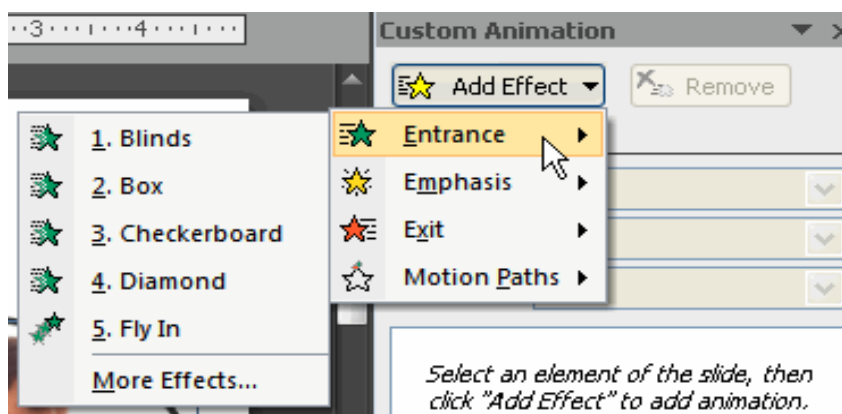
- **To apply a custom animation effect:**
 - Select the *text* or *object* on the slide you want to animate.
 - Select the *Animations* tab.
 - Click *Custom Animation* in the Animations group. The Custom Animation task pane will appear on the right.



- Click *Add Effect* in the task pane to add an animation effect to the selected text or object.



- Select *Entrance*, *Emphasis*, *Exit*, or *Motion Path* to display a submenu of animation effects for the category.



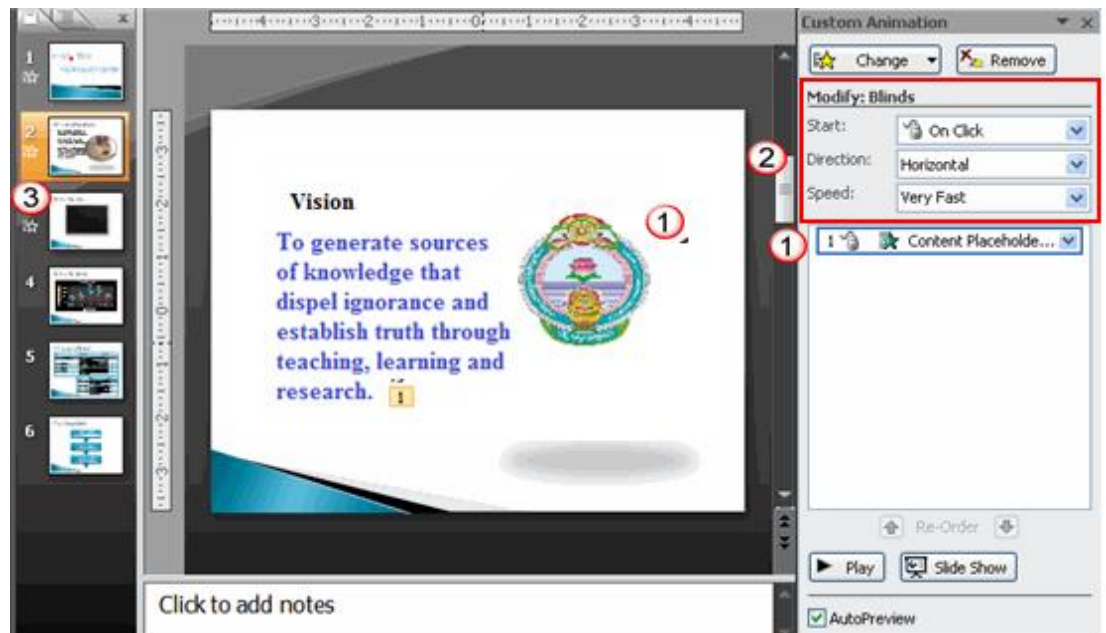
Entrance: Changes how the selected item appears on the page

Emphasis: Draws attention to the selected item while the slide is displayed

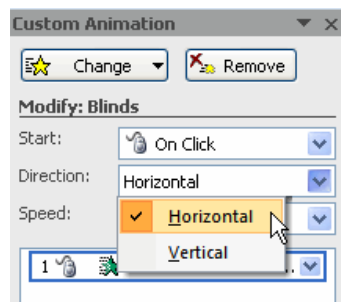
Exit: Changes the way the selected item disappears from the slide

Motion Path: Animates the selected item so it moves to a specific place on the screen

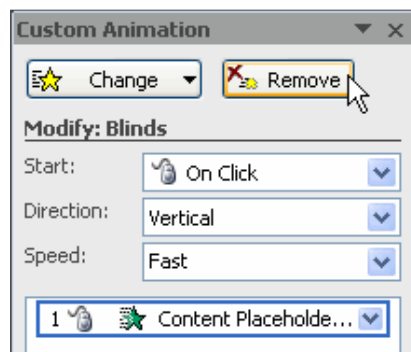
- Select an *animation effect* to apply it.
- The animation will display on the selected item on the slide and will appear listed in the Custom Animation task pane.



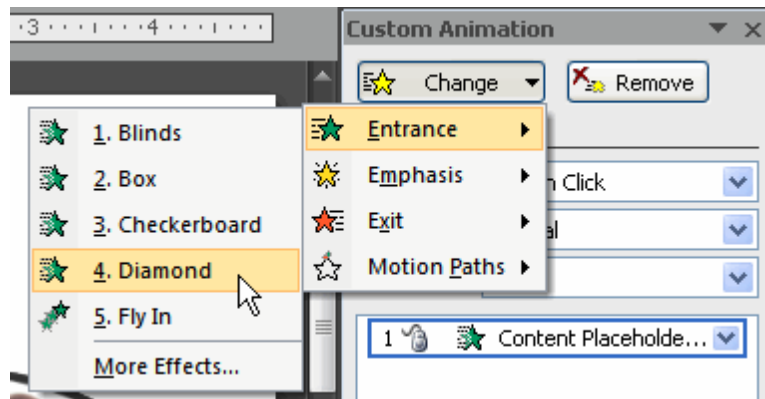
- A *number label* appears on the slide next to the animated object. A matching number label also appears next to the animation in the Custom Animation *task pane list*.
- *Drop-down menus* appear at the top of the Custom Animation task pane. You can define the animation effect in greater detail here.
- The star *Play Animations* icon appears beneath the slide on the Slides tab in the task pane on the left. It indicates that the slide has an animation effect.
- Select *More Effects* or *More Motions Paths* from the menu to see more animation effect options.
- **To modify a default or custom animation effect:**
 - After you apply an animation effect, *drop-down menus* will appear at the **top** of the Custom Animation task pane. The menus vary based on the animation effect.
 - Select an option from a drop-down menu to *change the default* setting.



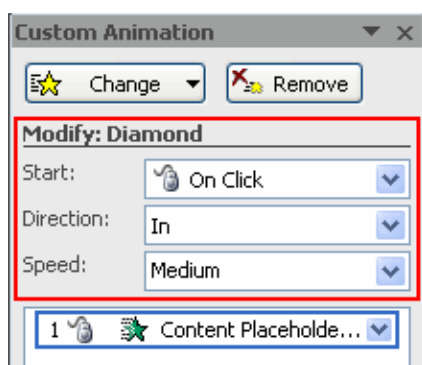
- Repeat until all menu options are at desired settings.
- **To remove an animation effect:**
 - Select the *text* or *object* on the slide you want to modify.
 - Select the *Animations* tab.
 - Click *Custom Animation* in the Animations group. The Custom Animation task pane will appear on the right.
 - Select the animation in the Custom Animation task pane list, if it is not already selected.
 - Click *Remove*. The animation label will disappear from the slide and from the Custom Animation task pane list.



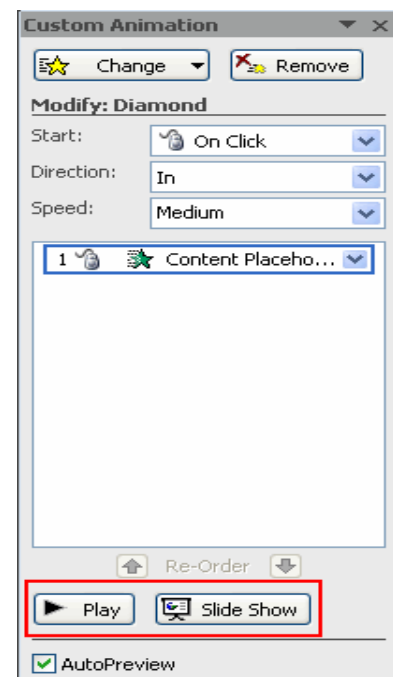
- **To apply a different animation effect:**
 - Select the *text* or *object* on the slide you want to modify.
 - Select the *Animations* tab.
 - Click *Custom Animation* in the Animations group. The Custom Animation task pane will appear on the right.
 - Select the animation in the Custom Animation task pane, if it is not already selected.
 - Click *Change*.
 - Select an *Entrance*, *Emphasis*, *Exit*, **or** *Motion Path* animation effect.



- New drop-down menus with default settings will appear at the top of the Custom Animation task pane.



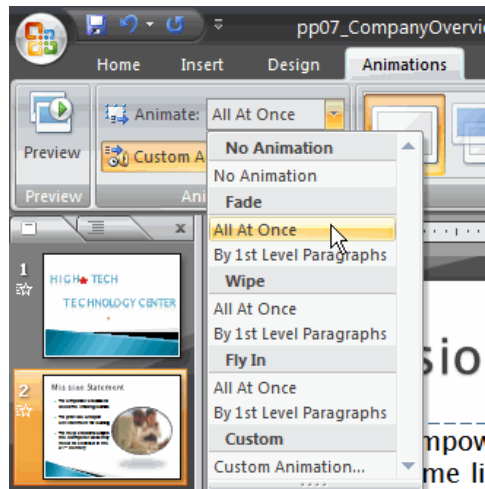
- **To preview an animation effect:**
 - Select the *text* or *object* you want to modify on the slide.
 - Select the *Animations* tab.
 - Click *Custom Animation* in the Animations group. The Custom Animation task pane will appear on the right.
 - Select the animation in the Custom Animation task pane list.
 - Click *Play* at the bottom of the task pane to see a **preview** of the animation **in Normal view**.
 - OR
 - Click *Slide Show* to see the animation **in Slide Show view**. Press the **Esc** key to return to Normal view.



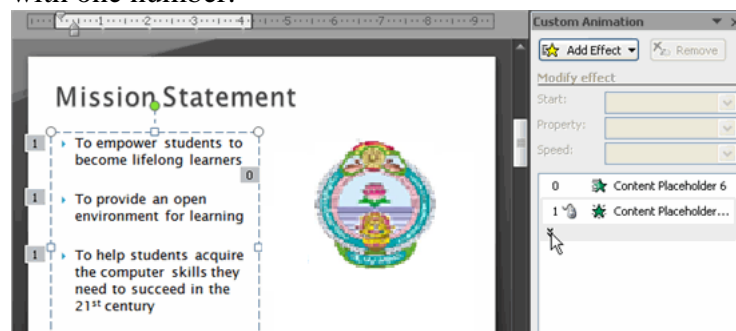
To animate text with a default animation:

- Select the text box or text you want to animate on the slide.
- Select the *Animations* tab.

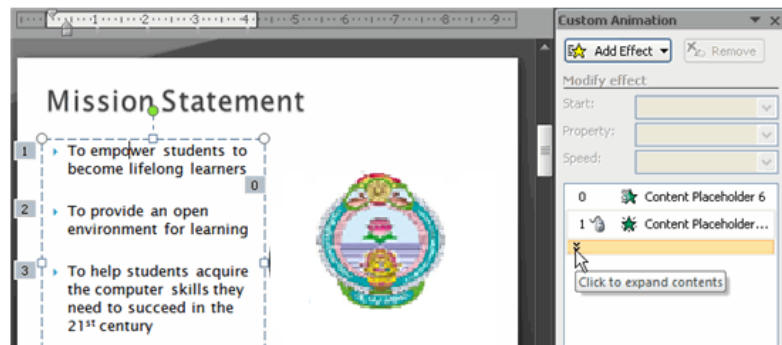
- Click the *Animate* drop-down menu in the Animations group to see the *animation effects* for the selected text. The effects vary based on the selected item.
- Select an animation effect.



- *All At Once*: The selected text appears all at once. The entire text is labeled with *one number* on the slide. Click the drop-down arrow in the task pane to expand the contents and see that the text is labeled with one number.



- *By 1st Level Paragraphs*: The text will appear bullet by bullet, or paragraph by paragraph. *Each level* of text is labeled with a *different number* on the slide. Click the drop-down arrow in the task pane to expand the contents and see that the text is labeled with multiple numbers.



- **To modify an animation effect in other ways:**

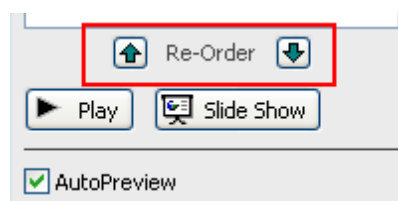
- Select an animation effect in the Custom Animation task pane list.
- Click the arrow to display a drop-down menu.
- Select *Effects Options* or *Timing*. A dialog box will appear.
- In the dialog box, add enhancements such as sounds, and define what happens after the animation effect is applied to the selected item.



- The dialog box name is based on the animation effect name. In the example above, the animation effect is *Fade*. The tabs and options on the tabs will vary based on the animation effect that is being modified.

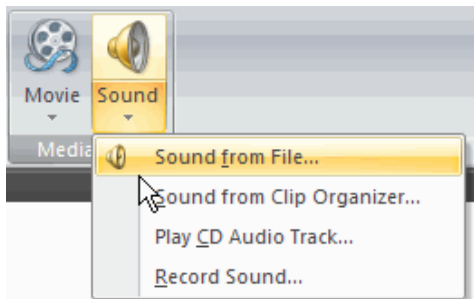
- **To reorder animation effects.**

- Select the *Animations* tab.
- Click *Custom Animation* in the Animations group.
- Select the animation effect you want to move in the Custom Animation task pane list.
- Click the *arrows* at the bottom of the task pane to reorder the selected animation effect.

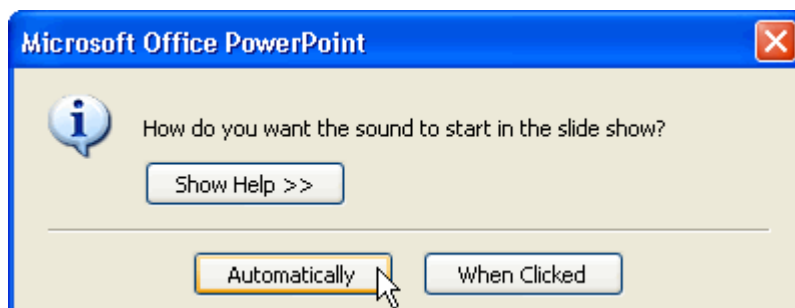


8.5.3 Inserting music or sound on a slide.

- Apply a *slide transition effect* to a slide.
- Click the *Transition Sound* drop-down menu in the *Transition to This Slide* group on the Transitions tab.



- Select a *sound* to apply it to the selected slide.
- Click *Apply To All* if you want to apply the transition effect and transition sound to all slides.



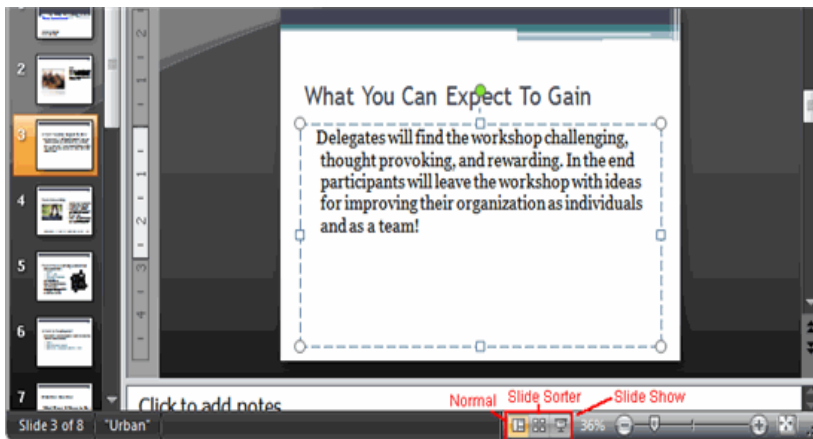
8.6 Viewing Slide Show

When you are done creating slides, you may want to look at your presentation to make sure that everything you see is visible. PowerPoint gives you the ability to view the display in four ways depending on what task you are completing. For example, if you use your slides to talk to an audience PowerPoint is often used — you may want to practice your presentation and view your slides in a slideshow view.

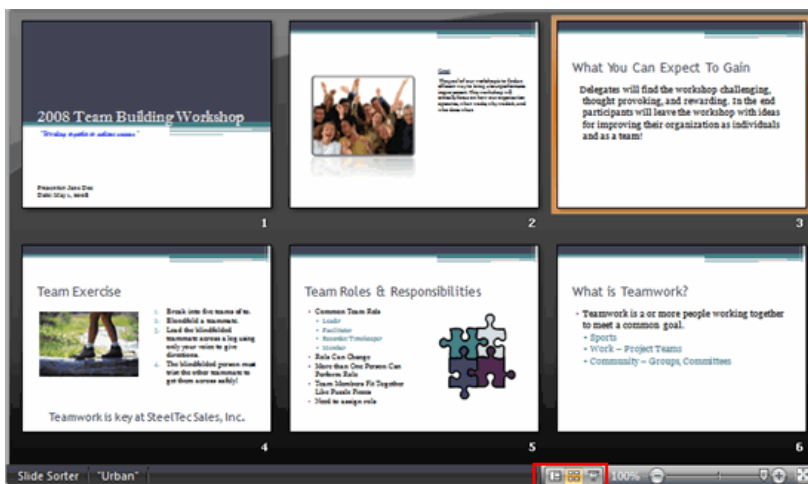
8.6.1 Slide views

It's important for you to be able to access the different PowerPoint slide views and use them for various tasks. Three of the four views are visible from the Normal default view. *The slide view commands* are located on the bottom-right side of the PowerPoint window in Normal view. Click a view command to switch to that view.

- **Normal view:** This view is where you create and edit your slides. You can also move slides in the Slides tab on the task pane on the left.



- **Slide Sorter view:** Miniature slides are arranged on the screen in this view. You can drag and drop slides easily to reorder them, and you can see more slides at one time. This is a good view to use to confirm that you have all the necessary slides and that none have been deleted.



- **Slide Show view:** This view fills the computer screen with a slide and is what the audience will see when they view the presentation. The Slide Show view has an additional menu that allows you to navigate the slides, as well as other features you can use during a presentation.

What You Can Expect To Gain

Delegates will find the workshop challenging, thought provoking, and rewarding. In the end participants will leave the workshop with ideas for improving their organization as individuals and as a team!



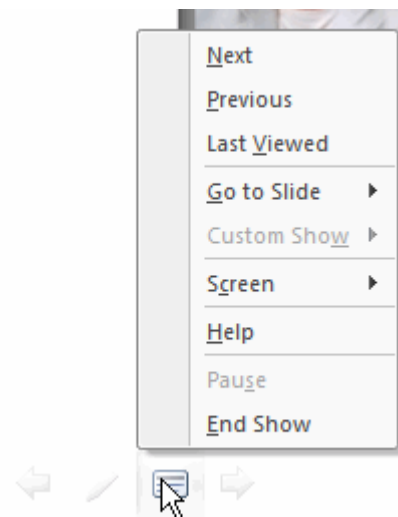
Use the arrow keys, Page Up and Page Down keys, spacebar, and Enter key to move through the slides in Slide Show view. Press the Esc key to end a slide show.

- **The slide show menu**

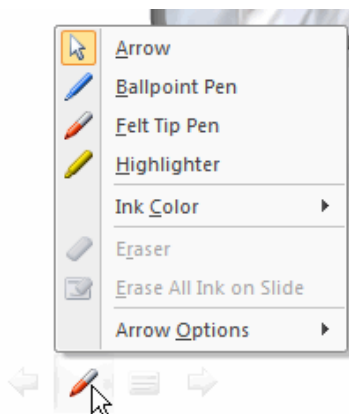
Arrows: The forward arrow displays the next slide, while the back arrow displays the previous slide.



Menu icon: Click the menu icon, and a menu appears that gives you the option to move to the next or previous slide, jump to a specific slide, change your screen options, or end the show.



Pen icon: Click the pen icon, and a menu appears that allows you to change your cursor to a ballpoint pen, felt-tip pen, or highlighter, as well as to choose the color of the pen. This allows you to annotate your slides and make notes while you present to an audience.



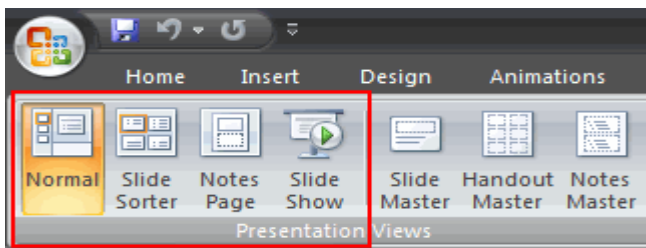
- **Notes Page view**

The fourth view is **Notes Page view**. It is not one of the view commands included at the bottom of Normal view; however, it can be accessed from the View tab. Notes Page view provides a space for presentation notes, which are often called speaker notes. The notes can be added to the presentation from this view. You can enter your speaker notes directly into the text placeholder in Notes Page view, or while in Normal view you can enter your notes in the area below the slide.

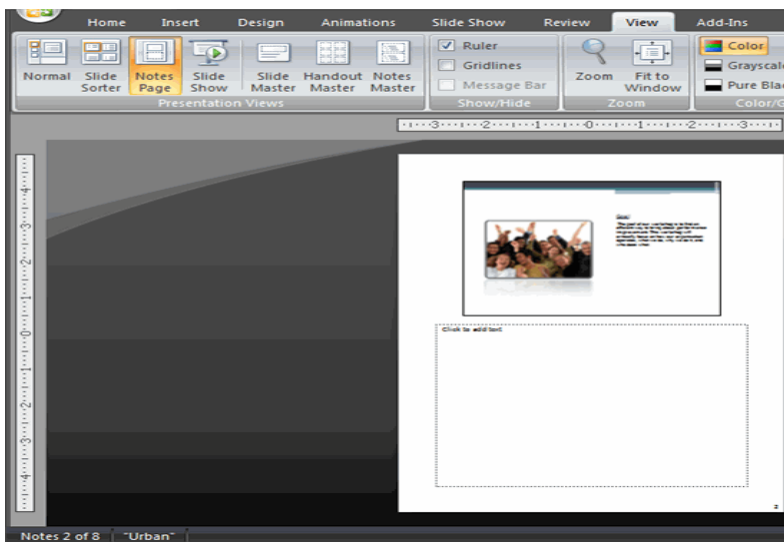
To change to Notes Page view:

Select the *View* tab.

Locate the *four view commands* on the left side of the Presentation Views group.



Click *Notes Page view*.



8.7 SUMMARY

Microsoft PowerPoint is a computer software package that displays information in the form of a slide show. PowerPoint presentations consist of a number of individual pages or “slides” with individual slides containing text, graphics, sound, video, or other objects that can be arranged by the presenter. A PowerPoint presentation can be automatically controlled by pre-programming transitions from one slide to another, or manually controlled by a user.

8.8 TECHNICAL TERMS

Power point slide, slide master, slide sorter, Graphics, Sound, Video, Custom Animations, Transition, slide show view.

8.9 SELF ASSESSMENT QUESTIONS

Essay questions:

- 1) What is a presentation? Explain steps to create a presentation in MS PowerPoint.
- 2) What are the various views in PowerPoint
- 3) Explain about slide transition
- 4) Explain various steps to apply animation effects to objects.

Short Notes:

1. What is side layout? List any two types of Side layouts
2. Write steps to apply motion effect to an object.
3. Differentiate slide design and auto content wizard.
4. Write any two applications of power point

8.10 SUGGESTED READINGS

1. MS-Office S.S. Shrivastava
2. Microsoft Office 2007 Fundamentals, 1st Edition By Laura Story, Dawna Walls

AUTHOR: Dr. UDUGA SURYA KAMESWARI