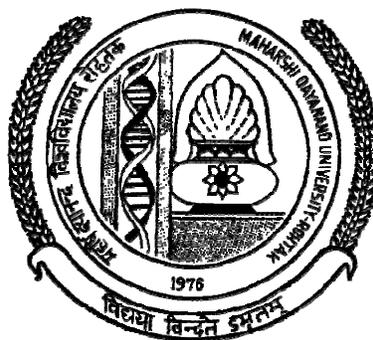


Bachelor of Commerce (DDE)

Semester – II

Paper Code – BM2006-II

BASICS OF COMPUTER - II



DIRECTORATE OF DISTANCE EDUCATION

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

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Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Types of software; Application and system software, multi programme, operating-system and its functions, Time sharing, multiprocessing.

Unit-II

Computer Applications: Computer application in Education, Commerce & Marketing and Management.

Unit-III

Introduction to windows: Types of windows, Windows as an operating system, Windows explorer, using clipboard, using paint brush, control panel installing a printer.

Unit-IV

Ms-Excel: Worksheet overview: Rows, Columns, Cell, Menus Creating worksheet, opening and saving worksheets, Formatting printing. Establishing Worksheet Links, Tables Creating and printing graphs. Macros, using V built-in functions.

Suggested Readings:

1. Introduction of Information System ALEXISLEON
2. Introduction to essential tools. Sushila Madan.

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CHAPTER - 1

SOFTWARE AND OPERATING SYSTEM CONCEPTS

OBJECTIVES OF THIS LESSON

This lesson is aimed to make you understand the basic concepts of software and operating systems. Readers will be able to understand the following:

- Software and its different types such as programming software, system software, application software and other software types
- Application software and its various types such as general-purpose application packages, application-specific packages and customised application packages
- Operating system and its characteristics, desirable features of operating system
- Classification of operating systems and their families
- Functions of operating system, main functions, basic roles of operating system, OS as an extended machine and as a Resource Manager

STRUCTURE OF THIS LESSON

- 1.1 Introduction
 - 1.2 Software Types
 - 1.2.1 Programming Software
 - 1.2.2 System Software
 - 1.2.3 Application Software
 - 1.2.4 Other Software Types
 - 1.3 Application Software
 - 1.3.1 General-purpose Application Packages
 - 1.3.2 Application-specific Packages
 - 1.3.3 Customised Application Packages
 - 1.4 Operating System
 - 1.4.1 Control Programs
 - 1.4.2 Processing Programs
 - 1.5 Characteristics of Operating System
 - 1.6 Desirable Features of Operating System
 - 1.7 Booting (or Bootstrapping)
 - 1.8 Family of Operating Systems
 - 1.9 Functions of Operating System
 - 1.9.1 Main Functions
 - 1.9.2 Basic Roles of Operating System
 - 1.9.3 OS as an Extended Machine
 - 1.9.4 OS a Resource Manager
 - 1.10 Classification of Operating Systems
- Summary of the Lesson
Self Assessment Questions and Exercises

1.1 INTRODUCTION

The hardware alone can't perform any particular calculation, computation or manipulation without being instructed exactly what to do, when to do and how to do it. These instructions are very important and are called software.

The software acts as an interface between the user and the computer or a software can be defined as a complete set of instructions written by the programmer which enables the computer to obtain the solution to a problem.

Software may be viewed as a general term that is used to describe any single program or a group of programs.

In its most general form, software is a term used in contrast to hardware to refer to all programs which can be used on a particular computer system i.e. the term software is used to describe program sets needed to operate an information processing system.

1.2 SOFTWARE TYPES

Software is the means by which computer systems speak with computer users. Software forms the heart of computer systems.



Figure 1.1

Software, by definition, is the collection of computer programs, procedures and documentation that performs different tasks on a computer system. The term 'software' was first used by John Tukey in 1958. Briefly, computer software is the language in which a computer speaks. There are different types of computer software.

1.2.1 Programming Software

This is one of the most commonly known and popularly used forms of computer software. These software come in forms of tools that assist a programmer in writing computer programs. Computer programs are sets of logical instructions that make a computer system perform certain tasks. The tools that help the programmers in instructing a computer system include text editors, compilers and interpreters.

1.2.2 System Software

It helps in running the computer hardware and the computer system. System software is a collection of system programs; device drivers, servers, windowing systems and utilities. System software helps an application programmer in abstracting away from hardware, memory and other internal complexities of a computer.

1.2.3 Application Software

It enables the end users to accomplish certain specific tasks. Business software, databases and educational software are some forms of application software. Different word processors, which are dedicated for specialized tasks to be performed by the user, are other examples of application software.

1.2.4 Other Software Types

Apart from these three basic types of software, there are some other well-known forms of computer software like inventory management software, ERP, utility software, accounting software and others.

1.3 APPLICATION SOFTWARE

An application package or application program is the software that has been written to process or perform specific job. The term application indicates that the software is applied to the job at hand. application packages are available for all types of tasks. These programs are called Application Packages because they accomplish the processing required for a particular application. They may be for business applications, engineering designs, home applications, teaching aids etc.

An end-user wishing to use an application package has to define his own requirements by means of parameters, which are employed by the programs in the system to produce the specific results required. These are usually written in high-level languages. Of course, the application packages run under the control of the operating system.

Application software is developed to aid in any task that benefits from computation. It is a broad category, and encompasses software of many kinds, including the internet browser being used to display this page. This category includes:

- Business software
- Computer-aided design
- Databases
- Decision making software
- Educational software
- Image editing
- Industrial automation
- Mathematical software
- Medical software
- Molecular modelling software
- Quantum chemistry and solid state physics software
- Simulation software
- Spreadsheets
- Telecommunications (i.e., the Internet and everything that flows on it)
- Video editing software
- Video games
- Word processing
and so on.

Remarks

Application packages can be classified as:

- *General-purpose Application Packages*
- *Application-specific Packages*
- *Customised Application Packages*

1.3.1 General-purpose Application Packages

It is that class of application packages that perform quite commonly used day-to-day tasks and also increase the productivity very significantly and that's why these are also known as productivity packages.

Some important examples of this category include:

- *Word processing packages for processing and manipulating text*
- *Spreadsheet packages for calculating finances and data analysis*
- *CAD for designing or drafting*
- *Database packages for management of files, database, storage and retrieval of information*
- *Engineering design packages*
- *Communication packages*
- *Integrated packages, etc.*

Some integrated packages have been developed which combine the functions of word processing, spreadsheets, graphics, database management and communication into a single software. MS-Office, Framework and Symphony are good examples of Integrated Packages.

1.3.2 Application-specific Packages

It is the type of application packages specifically meant for accomplishing a uncommon application.

Few important examples include :

- * **General Application Packages**
 - * *Payroll*
 - * *Personnel Management*
 - * *Attendance Management*
 - and so on.*
- * **Business Application Packages**
 - * *Inventory Control*
 - * *Finance and Accounting*
 - * *Marketing Analysis*
 - * *MRP (Material Requirements Planning)*
 - * *Human-resource Management*
 - and so on*
- * **Scientific Application Packages**
 - * *Computer-Aided Designing and Drafting (CADD)*
 - * *SPSS (Statistical Package For Social Sciences)*
 - * *Computer-Aided Manufacturing (CAM)*
 - * *Statistical Analysis Software (SAS)*
 - and so on.*
- * **Miscellaneous Application Packages**
 - * *Computer-Based Learning (CBL)*
 - * *MIDI (Musical Instrument Digital Interface) Package*
 - * *Computer-Based Training (CBT)*
 - and so on*

1.3.3 Customised Application Packages

It is a kind of application packages developed by the professional programmers. It has become the trend of the present day Software Industry to develop such kind of packages. Natural Language Processing (NLP) is getting world-wide attention because these are non-procedural and are more closer to human conversation. This is trend has been geared up probably due to the development of the non-procedural 4GLs (4th Generation Languages). This trend will continue to grow as the development in multimedia, graphics, artificial intelligence, networking solutions enhance.

Remarks

1.4 OPERATING SYSTEM

“Operating System (OS) is a collection of software written to provide the fundamental instructions that a computer needs to manage resources, such as memory, the file system, and processes”.

In other words, OS is a master program that controls a computer's basic functions and allows other programs to access the computer's resources such as disk drive, printer, keyboard, and screen.

There are several definitions of operating system. Few of these are:

“Operating system is a set of system programs which controls all the computer's resources and provides the base upon which application programs can be written”.

OR

“An operating system may be viewed as an organised collection of software extensions of hardware, consisting of control routines for operating a computer and for providing an environment for execution of programs”.

OR

“An operating system is a set of procedures (manual and/or automatic) that enables people or group of people to share a computer installation efficiently”.

OR

“An operating system is a program that act as an intermediary between a user of a computer and the computer hardware. The primary goals of an operating system are:

- *To make the computer system convenient to use and*
- *To use the computer hardware in an efficient manner”*

OR

“An operating system is an integrated collection of subsystems and further each subsystem consists of programs that perform specific duties. Just as the processor is the nucleus of the computer system, the operating system is the nucleus of all types software activities”.

Examples of operating systems: *Linux, MS Windows 95, MS Windows NT, Windows XP, UNIX, DOS and OS/2.*

Remarks

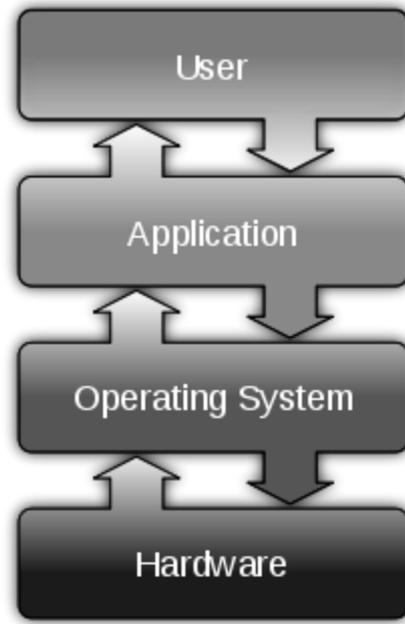


Fig. 1.2: Layers of Computer System

It co-ordinates all the hardware and software components of a computer

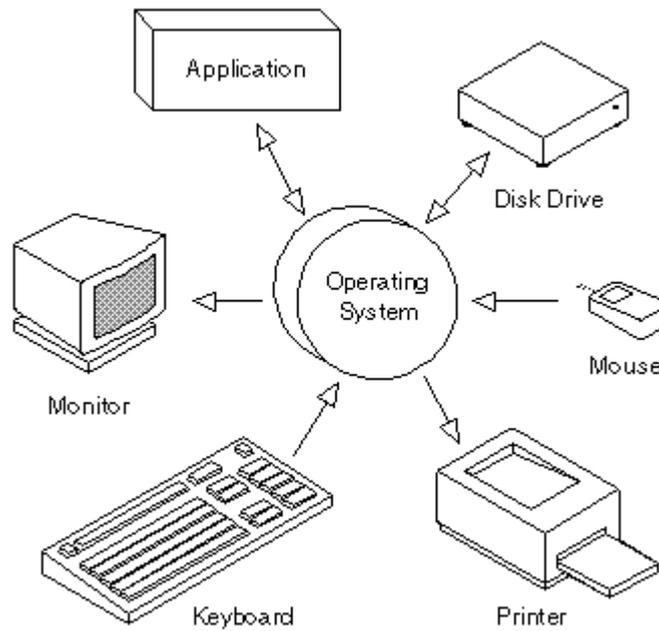


Fig. 1.3: OS as Co-ordinator

The following two types of programs make up the operating system:

- i) Control programs and
- ii) Processing programs

1.4.1 Control Programs

These programs oversee system operations and performs tasks such as input/output, scheduling, handling interrupts, and communication with computer operator or programmer. The control programs consist of the following :

- a) Supervisor Programs
- b) Job Control Programs
- c) Input/Output Management Program

1.4.2 Processing Programs

These are executed under the supervision of control programs and are used by the programmer to simplify program operation for the computer system. They include language translator programs, link editors, library programs and a set of utility programs. These programs collectively automate the management of all the computing resources available in a computer system including CPU, all peripherals, and software. This integrated collection of programs provides more efficient computer operation. Improved operating convenience is another benefit of an operating system.

Typically, operating systems (OSs) are used in microcomputer systems. They require mass storage media such as magnetic tape or floppy disk. most microcomputers systems use operating systems only with floppy disk mass storage. For this reason, these operating systems are referred to as disk operating systems (DOS). The most commonly used operating systems on personal computers are MS-DOS and PC-DOS.

1.5 CHARACTERISTICS OF OPERATING SYSTEM

- *Sharing*
- *Concurrency*
- *Long-term Storage*
- *Non-determinacy*

1.6 DESIRABLE FEATURES OF OPERATING SYSTEM

- *Efficiency*
- *Reliability*
- *Small-Size*
- *Maintainability*

Thus the operating system is responsible for directing a given computer into a batch mono-programming system, a multi-programmed system, a time-sharing system or a real-time system. Many operating systems can handle both batch and real-time applications simultaneously.

1.7 BOOTING (OR BOOTSTRAPPING)

The process of loading the operating system into memory is known as booting. When a computer is turned on the operating system must be brought into the memory of computer from the hard-disk storage. The process is normally started by a small program called bootstrap loader. This program resides in a ROM as a firmware. A computer is designed to fetch its very first instruction from the ROM when power is turned on. The first instruction is bootstrap loader. It is very simple program sufficient only to direct the CPU to look for specific file on the disk memory, and executes the instructions stored in the file. The file contains machine codes to direct the CPU to continue loading the rest of the operating system into the memory. When the operating system is fully loaded into the memory, the computer is ready to accept user's commands.

1.8 FAMILY OF OPERATING SYSTEMS

The family of operating systems have evolved over the years:

- a) Windows family of OS:

Remarks

Remarks

Windows 1.0
Windows 2.0
Windows 3.0 (the first version to make substantial commercial impact)
Windows 3.1x
Windows 95 (aka Windows 4.0)
Windows 98 (aka Windows 4.1)
Windows Me (aka Windows 4.2)
OS/2 (developed jointly with IBM)

Windows NT

Windows 2000 (aka Windows NT 5.0)
Windows XP (aka Windows NT 5.1)
Windows Server 2003 (aka Windows NT 5.2)
Windows Vista (to be released August 2006)
Windows Longhorn Server (to be released shortly after Windows Vista)
Microsoft Codename Blackcomb (to follow Vista)

b) Apple/Macintosh

Apple DOS
ProDOS
GS/OS
Lisa OS
A/UX
Mac OS
System 6
System 7 (code-named "Big Bang")
Mac OS 8
Mac OS 9
Mac OS X
Mac OS X v10.0 (aka Mac OS X 10.0 "Cheetah")
Mac OS X v10.1 (aka Mac OS X 10.1 "Puma")
Mac OS X v10.2 (aka Mac OS X 10.2 "Jaguar")
Mac OS X v10.3 (aka Mac OS X 10.3 "Panther")
Mac OS X v10.4 (aka Mac OS X 10.4 "Tiger")
Mac OS X v10.5 (aka Mac OS X 10.5 "Leopard")
Mac OS X Server
Darwin

c) Unix

d) Linux

e) Solaris.

1.9 FUNCTIONS OF OPERATING SYSTEM

The main functions of OS are:

1. It manages the hardware and software resources of the system. In a desktop computer, these resources include such things as the processor, memory, disk, etc.
2. It provides a stable, consistent way for applications to deal with the hardware without having to know all the details of the hardware.

1.9.1 Main Functions

OS acts as an interface between hardware and users. It controls overall operations of computers. It is mainly used for job management, data management, virtual memory management, input/output management, process management, security etc.

Remarks

- a) *Job Management:* OS manages the job waiting to be processed. It recognizes the jobs, identifies their priorities, allocates the memory for the job, schedules and finally runs each job at the appropriate moment.
- b) *Data Management:* Data management keeps track of the data on disk, tape and optical storage devices. The operating system's file system knows where that data are physically stored.
- c) *Virtual Storage Management:* OS is used for virtual memory management. OS makes possible to increase the capacity of main memory with out actually increasing its size.
- d) *Input/output Management:* OS manages the input and output operation of computer. This applies to the flow of data among the different devices of computer and application programs.
- e) *Process Management:* The main activities of process management are job queuing, job scheduling, keeping track of the status of each process etc.
- f) *Protection and Security:* OS job is to secure data inside the memory of computer. Operating systems provide password protection to keep unauthorized users out of the system.
- g) *User Interface:* OS acts as an interface between a user of a computer and the computer hardware.

1.9.2 Basic Roles of Operating System

- a) Easy interaction between human and computer.
- b) Starting computer operation automatically.
- c) Loading and scheduling users' programs/processes.
- d) Controlling I/O devices
- e) Managing various types of memories such as primary, secondary, cache etc.
- f) Providing security to users' jobs and files.
- g) Accounting hardware resources and handling network communication.
- h) Allowing users to share data and software among themselves.
- i) Preventing the system from unauthorized user, programs etc.

1.9.3 OS as an Extended Machine

The OS effectively isolates the hardware from the user. The user communicates only with the OS and it links the various languages and the systems and applications programs available. The OS fields all requests for services and totally eliminates the need for the user to deal with the hardware or related problems. Thus the operating system allows the user to concentrate on his application and prevents him for having to spend a lot of time determining how things are to be specifically accomplished by the hardware.

In this view, the function of an operating system is to prevent the user with the equivalent of an Extended Machine or Virtual Machine that is easier to program than the underlying hardware.

1.9.4 OS a Resource Manager

An operating system's major function is to manage the resources of the computer system. It allocates the resources on the basis of the user need and system capability. The four major functions of an operating system are:

- i) *File and Software Management*
- ii) *Input/Output and Peripheral Management*

Remarks

- iii) *Memory Management*
- iv) *Processor (or CPU) Management*

As a Resource Manager, the operating system must perform the following functions for each resource viz. processor, memory, I/O, files :

- a) *Keep track of status of each resource*
- b) *Decide which job should get the resource and for how much time, according to some policy*
- c) *Allocate the resource to the job decided*
- d) *After the resource is used by the job for the allocated time, make the resource free*

1.10 CLASSIFICATION OF OPERATING SYSTEMS

Within the broad family of operating systems, these may be categorized based on the types of computers they control and the sort of applications they support. These may be classified in the following categories:

- *Single-user, Single-task Operating System*
- *Single-user, Multi-task Operating System*
- *Multi-user (or time-sharing) Operating System*
- *Multi-access Operating System*
- *Multi-processing Operating System*
- *Multi-tasking and Multi-threading Operating System*
- *Real-time Operating System*
- *Distributed Operating System*
- *Embedded Operating System*

Single-user, single task Operating System

As the name implies, this operating system is designed to manage the computer so that one user can effectively do one thing at a time. The Palm OS for Palm handheld computers is a good example of a modern single-user, single-task operating system. Other examples of such operating systems include MS-DOS, PC-DOS, etc.

Single-user, multi tasking Operating System

This operating system allows a computer to perform more than one task at a time. Microsoft's Windows and Apple's Mac OS (Leopard) platforms are both examples of operating systems that will let a single user have several programs in operation at the same time.

Multi-user (or time-sharing) Operating System

A multi-user operating system allows many different users to take advantage of the computer's resources simultaneously. UNIX, VMS and mainframe operating systems, such as *MVS*, are examples of multi-user operating systems.

These operating systems allow two or more users to run their respective programs at the same time by making all these programs resident in the memory of computer. Such operating systems are normally made to work on minicomputers and mainframe computers.

Examples : VMS (on DEC Mainframes), UNIX, XENIX, MVS, etc.

Multi-access Operating System

In a multi-access operating system, a user may submit a job by typing on a terminal and may use the terminal to monitor and control the job as it runs. These operating systems allow simultaneous access of a single application onto a computer system through two or more terminals.

The operating system shares the computing resources among the different jobs so that it appears to each user that he has entire machine to himself.

An example is provided by some dedicated transaction-processing systems, such as Airline Ticket Reservation Systems, that supports hundreds of active terminals under control of a single program.

Multiprocessing Operating System

It is that class of operating systems that have the ability to support more than one process at the same time i.e. allowing more than one programs to run concurrently on the multiple CPUs in a single computer system. These operating systems differ from the time-sharing (or multi-user) operating systems in the manner that these refer to utilisation of multiple CPUs.

In such operating system, the resources are allocated comfortably to the competing processes in a reasonable manner which results in a high throughput.

Examples : OS/2 for high-end PCs, UNIX, MVS, etc.

Multitasking and Multithreading Operating System

These operating systems have the capability to execute more than one task concurrently on a computer system having a single CPU. In these operating systems, CPU switches from one task to another so quickly that it gives the illusion to the user of executing all the programs (or tasks) at the same time.

Multithreading permits different portions of a single program to run concurrently and this it is having the ability of an operating system to execute different parts of a program (called threads) simultaneously. It requires the programmer to design the program so carefully that all the threads can run at the same time without interfering with each other.

Examples : Windows 95/98, Windows NT, OS/2, etc.

Real-time Operating Systems (RTOS)

Real-time operating systems are used to control machinery, scientific instruments and industrial systems.

These operating systems have the following peculiar characteristics:

- *Fast response time*
- *Feedback mechanism*
- *Reliability*

A primary objective of real-time operating systems is to provide quick response-times, and thus meet the scheduling deadlines. In the design of these operating systems, user-convenience and resource utilisation are of secondary concern.

These operating systems must be designed in such a manner that response-time to the external-stimulus is very immediate as the same are designed for the purpose of controlling and monitoring of external activities with timing constraints.

Remarks

Remarks

Such applications include :

- *Industrial Control*
 - *Telephone Switching Equipments*
 - *Flight-Control*
 - *Real-time Simulators*
 - *Few Military Applications*
- etc.

Examples:

Some examples of real time operating systems are:

- BLMX (Board-Level Multitasking eXecutive)
 - BSO/RTOS (Boston Systems Office/ Real-time Operating System)
 - CCP (Communication Control Program) Operating System for IBM System/3
 - iRMX (Intel's 8086 family Real-time Multitasking Executive) Operating System
 - DMERT (Duplex Multiple Environment Real-time) Operating System
- etc.

Distributed Operating Systems

A distributed operating system governs the operation of a distributed computer system and provides a virtual machine abstraction to its users. The key objective of a distributed operating system is transparency. Ideally, component and resource distribution should be hidden from users and application programs unless they explicitly demand otherwise.

The added services necessary for pooling of shared system resources include :

- *Global naming*
- *Distributed file system, and*
- *Facilities for distribution of computations, such as inter-node process communication and remote procedure calls.*

Embedded Operating System

Embedded operating systems are mainly executed on computers that control devices. These devices are mobile phones, TV sets etc. These systems consist of circuits and 32-bit microprocessors that control the functioning of various operations.

Apart from the above main criterion for classification of operating systems, there will be other criterion as well, like basing on whether it is open code or not and whether it is available for free and similar.

Fig. 1.4 shows widely used operating systems in the market.

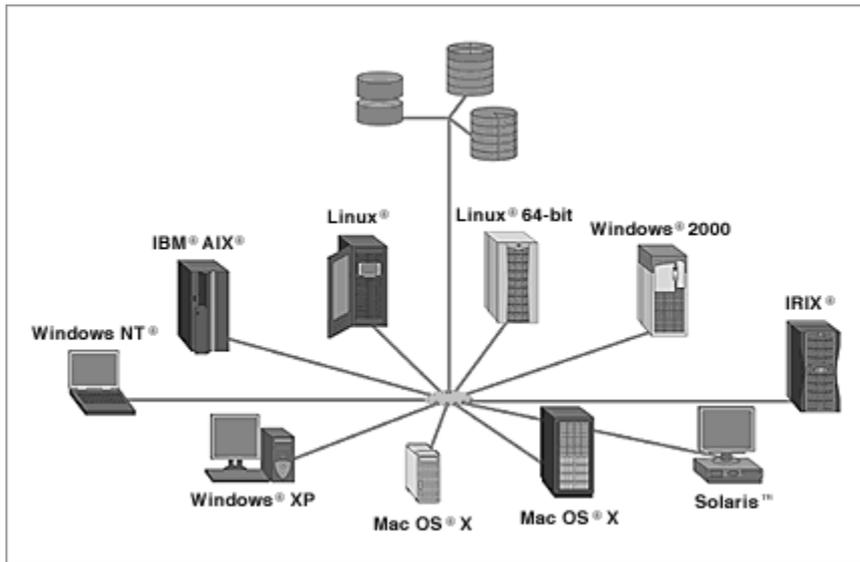


Fig. 1.4: Widely used OS

Remarks

SUMMARY OF THE LESSON

You learnt the following in this lesson:

- The software acts as an interface between the user and the computer or a software can be defined as a complete set of instructions written by the programmer which enables the computer to obtain the solution to a problem.
- There are different types of computer software such as Programming Software, System Software and Application Software
- An application package or application program is the software that has been written to process or perform specific job.
- Operating System (OS) is a collection of software written to provide the fundamental instructions that a computer needs to manage resources, such as memory, the file system, and processes.
- The control programs consist of Supervisor Programs, Job Control Programs and Input/Output Management Program
- Windows Explorer displays the hierarchical structure of files, folders, and drives on your computer. It also shows any network drives that have been mapped to drive letters on your computer.
- Both in Windows 7 and Windows 8, the *Print Management* console is part of *Administrative Tools*.
- The Control Panel is a part of the Microsoft Windows graphical user interface which allows users to view and manipulate basic system **settings** and controls via applets, such as adding hardware, adding and removing software, controlling user accounts, and changing accessibility options.

SELF ASSESSMENT QUESTIONS AND EXERCISES

1. Differentiate between application and system software.
2. What is meant by GUI ? What are the important features of GUI ? Explain.
3. What are various components of GUI ? Explain.
4. What is a computer software ?
5. What is an operating system ?
6. Discuss the important functions of an operating system.
7. What is a bootstrap program ?
8. What is a File Manager ? Outline its responsibilities.
9. Is word-processing package a system software ? Justify your answer.
10. Discuss the features of an integrated package.
11. What are advantages of Windows environment ?
12. Enumerate functions of a monitor program.
13. Chart the family of operating system.
14. What are main features of Windows operating system?

Remarks

CHAPTER - 2

Remarks

COMPUTER APPLICATIONS

OBJECTIVES OF THIS LESSON

This lesson is aimed to make you understand the use of computers in different walks of life. Though there are several computer applications but readers will be able to understand the use of computers in certain areas as under:

- Computer applications in education and uses of computers in education
- How computers may assist teachers and also explains computer-based teaching and learning
- Computer applications in commerce and marketing, concept of **marketing**, business processes, e-commerce
- CAD (computer aided design), CAM (computer aided manufacturing) and Simulations
- Computer applications in management, functions of management and use of IT in management

STRUCTURE OF THIS LESSON

- 2.1 Introduction
- 2.2 Computer Applications in Education
 - 2.2.1 Uses of Computers in Education
 - 2.2.2 Assistance to Teachers
 - 2.2.3 Computer-Based Teaching and Learning
- 2.3 Computer Applications in Commerce and Marketing
 - 2.3.1 Marketing
 - 2.3.2 Business Processes
 - 2.3.3 E-Commerce
 - 2.3.4 Industry
 - 2.3.5 Robots
 - 2.3.6 CAD (Computer Aided Design)
 - 2.3.7 CAM (Computer Aided Manufacturing)
 - 2.3.8 Simulations
- 2.4 Computer Applications in Management
 - 2.4.1 Functions of Management
 - 2.4.2 Use of IT in Management

Summary of the Lesson

Self Assessment Questions and Exercises

2.1 INTRODUCTION

Computers have become an essential part of modern human life. Owing to the widespread use of computers in every sphere, Life in today's world would be unimaginable without computers. Computers have made human lives better and happier. There are endless uses of computer in different fields of work.

Remarks

Computers are used in so many fields in our daily life. From Engineers to Doctors, Students, Teachers, and Government Organization they all use computers to perform specific tasks, for entertainment or just to finish office work. Computers have made our life easier. With greater precision and accuracy and less time taking computers can do a lot in short time while that task can take a lot of time while doing manually. Computers have taken industries and businesses to a whole new level. They are used at Home for work and entertainment purposes, at Office, in hospitals, in government organizations.

2.2 COMPUTER APPLICATIONS IN EDUCATION

The science and technology has been changing our life ever since its inception. Especially the greatest invention of human mind that most of the times defeat the human mind itself, i.e. the computer has brought out enormous changes to our society. Its contribution towards education sector has been truly marvellous.

Computers have taken the education systems in the entire world to a different level altogether. It is now used in education sector in various ways and has changed the way it earlier looked to a great degree.

2.2.1 Uses of Computers in Education

Following are few significant uses of computers in education:

1. Effective Classroom Teaching and Learning

The traditional classes have become modern and high-tech with the advent of computers. Students now see multimedia presentations, clips, images, etc. with the help of computers. This gives them a better experience of education as compared to the monotonous blackboard teaching. This way, the power of students to remember or recollect the taught concepts increases as the classroom learning becomes interesting.

2. Online and Distance Learning

Computers not only strengthen the traditional education system but also provide a new mode of pursuing educational courses and degrees. This mode is called as **online distance learning** mode of education. Through this mode a student can pursue a course, degree or training sitting at home with the help of a computer and internet connection. The curriculum of these online courses is similar to the traditional mode of pursuing the same. Online education system offers several benefits to the students which they can't avail in traditional education system. This is the reason why millions of people are attracted to online education as of today and this count will only increase day by day.

3. Improved Research Work

Computers help students of schools, colleges and universities in their research work. Gone are the days when students would go to libraries, and other Knowledge processing units to complete their research work. With the help of computers in network society students now pursue their research work with ease and get ample amount of information for the same with easy clicks.

4. New Areas of Education

Computers not only are useful in education sector but are also the reason for some fields of education. There are several educational courses that exist because of the computers. Some of these courses are IT training, web designing, hardware and networking, etc. Students pursuing these courses have bright future ahead as the computers have actually become the need of today.

Remarks

5. Scaling Up Education

Education today is no more confined to the walls of a classroom. It has rather gone global. Students, with the help of computers, interact with students from all over the world. They discuss and deliberate on various topics of common interests, brainstorm with international students and seek advice of international teachers and researchers. Indeed computers have armed the education field with some great features.

2.2.2 Assistance to Teachers

Computers are helping the teachers in the following areas:

- a. **Classification of pupils:** Computers help in classification of children according to their abilities and evaluating their performance.
- b. **Preparing time-table:** Computers help in preparing time-table, schedules, etc.
- c. **Maintenance of progress cards:** Computers maintain progress cards and preserve them efficiently and confidentially.
- d. **Tutorial and dialogue:** Computer can play effectively the role of the tutor. It helps the teacher in engaging students in tutorial work. There is tutorial interaction and dialogue.
- e. **Education to physically challenged:** Computers can be used in providing education to physically challenged people by several means.
- f. **Repetition:** A lesson if not understood once can be repeated number of times and thoroughly understood by even an average student. Computer can work according to the tune of the student.
- g. **Guidance:** Computer helps the teacher in providing information/data for guidance and reference.
- h. **Immediate feedback:** Computers helps the teacher in providing immediate feedback to students for better interaction and motivation.
- i. **Problem-solving and creativity:** Computers can be used to develop problem-solving ability and creativity among the students.
- j. **Laboratory and practical work:** Computers can supplement laboratory and practical work especially in science and technology subject.
- k. **Training through stimulate techniques:** The computer can be used to give training to the students through stimulated and gaming techniques.

2.2.3 Computer-Based Teaching and Learning

Computers are used to provide the methods of teaching in different ways. There are number of methods in which educational institutions can use computer to educate the students. Much computer-based educational software are available, which students can learn to read, to count, or to speak a foreign language. Software that combines the thrills of games with real information content is becoming most popular. Some organizations are using information technology in their employee training programs.

Remarks**Computer Aided Learning (CAL)**

Computer Aided Learning could be described as the use of information technology to assist in the teaching and enhance learning process. Information technology may be able to aid us in reducing the time spent on creation and maintenance of teaching materials (power point presentations, Lectures in word documents, Flash media files etc). It is also reducing the administrative load associated with teaching and research.

Computer Based Training (CBT)

Computer based training is a difficult term to adequately define because it encompasses various modes of instruction and has evolved from the simplest definition, an interactive learning experience between the learner and computer in which the computer provides the majority of the stimulus, the learner must respond, and the computer analyzes the response and provides feedback to the learner.

Computer-based training is about using computers to help train people. It is not necessarily about training people to use computers. Computer based training works, compared with traditional techniques; it can bring many additional benefits to any organization, their training department and their students. For example:

- Students can readily acquire new skills at their own pace and at times that do not conflict with their work schedules.
- Training times can usually be reduced.
- Retention of course material is usually greater.
- Interactive, visually stimulating, easily absorbed and easily available material encourages students to undertake training.
- Planning and timetabling problems can be reduced or eliminated.
- Essential skills can be taught and refreshed whenever and whenever needed.
- The quality and consistency of the training material of students, locally or at remote places.
- Timely and high quality training on demand leads to increased efficiency.

Compared to traditional classroom training methods, students using computer based training absorb similar material faster and retain more of the information they are taught. CBT is a low cost solution for educating people. You can train a large number of people easily.

Benefits of CBT

Some benefits of CBT are as follows:

1. The students can learn new skills at their own pace. They can easily acquire knowledge in any available time of their own choice.
2. Training time can be reduced.
3. Training materials are interactive and easy to learn. It encourages students to learn the topic.
4. Planning and timing problems are reduced or eliminated.
5. The skills can be taught at any time and at any place.
6. It is very cost effective way to train a large number of students.
7. Training videos and audios are available at affordable prices.

Computer Aided Learning (CAL)

Computer aided learning is the process of using information technology to help teaching and enhance the learning process. The use of computer can reduce the time that is spent on preparing teaching material. It can also reduce the administrative load of teaching and research. The use of multimedia

projector and PowerPoint presentations has improved the quality of teaching. It has also helped the learning process.

Distance Learning

Distance learning is a new learning methodology. Computer plays the key role in this kind of learning. Many institutes are providing distance learning programs. The student does not need to come to the institute. The institute provides the reading material and the student attends virtual classroom. In virtual classroom, the teacher delivers lecture at his own workplace. The student can attend the lecture at home by connecting to a network. The student can also ask questions to the teacher.

Online Examination

The trend of online examination is becoming popular. Different examination like GRE, GMAT and SAT are conducted online all over the world. The questions are marked by computer. It minimizes the chance of mistakes. It also enables to announce the result in time.

2.3 COMPUTER APPLICATIONS IN COMMERCE AND MARKETING

The use of computer technology in business provides many facilities. Businessmen are using computers to interact with their customers anywhere in the world. Many business tasks are performed more quickly and efficiently. Computers also help them to reduce the overall cost of their business. Computer can be used in business in the following ways.

2.3.1 Marketing

An organization can use computers for marketing their products. Marketing applications provide information about the products to customers. Computer is also used to manage distribution system, advertising and selling activities. It can also be used in deciding pricing strategies. Companies can know more about their customers and their needs and requirements etc.

Marketing applications provide information about the organization's products, its distribution system, its advertising and personal selling activities, and its pricing strategies. Marketing applications help managers to develop strategies that combine the four major elements of marketing: Products, Promotions, Place and Price.

Marketing is the process by which goods are sold and purchased. The aim of marketing is to acquire, retain, and satisfy customers. Modern marketing has evolved into a complex and diverse field. This field includes a wide variety of special functions such as advertising, mail-order business, public relations, retailing and merchandising, sales, market research, and pricing of goods.

Computers play a significant role in inventory control, processing and handling orders, communication between satellite companies in an organization, design and production of goods, manufacturing, product and market analysis, advertising, producing the company newsletter, and in some cases, complete control of company operations.

In today's extremely competitive business environment businesses are searching for ways to improve profitability and to maintain their position in the marketplace. As competition becomes more intense the formula for success becomes more difficult.

Remarks

Remarks

Two particular things have greatly aided companies in their quests to accomplish these goals. These are :

- a) CAD/CAM and
- b) World Wide Web.

CAD/CAM

An important program has aided companies all over the world. Computer-aided design and computer-aided manufacturing (CAD/CAM) is the integration of two technologies. It has often been called the new industrial revolution. In CAD, engineers and designers use specialized computer software to create models that represent characteristics of objects. These models are analyzed by computer and redesigned as necessary. This allows companies needed flexibility in studying different and daring designs without the high costs of building and testing actual models, saving millions of dollars. In CAM, designers and engineers use computers for planning manufacturing processes, testing finished parts, controlling manufacturing operations, and managing entire plants. CAM is linked to CAD through a database that is shared by design and manufacturing engineers.

The major applications of CAD/CAM are mechanical design and electronic design. Computer-aided mechanical design is usually done with automated drafting programs that use interactive computer graphics. Information is entered into the computer to create basic elements such as circles, lines, and points. Elements can be rotated, mirrored, moved, and scaled, and users can zoom in on details. Computerized drafting is quicker and more accurate than manual drafting. It makes modifications much easier.

Desktop manufacturing enables a designer to construct a model directly from data which is stored in computer memory. These software programs help designers to consider both function and manufacturing consequences at early stages, when designs are easily modified.

More and more manufacturing businesses are integrating CAD/CAM with other aspects of production, including inventory tracking, scheduling, and marketing. This idea, known as computer-integrated manufacturing (CIM), speeds processing of orders, adds to effective materials management, and creates considerable cost savings.

World Wide Web

The World Wide Web is a hypertext based information service. It provides access to multimedia, complex documents, and databases. The Web is one of the most effective vehicles to provide information because of its visual impact and advanced features. It can be used as a complete presentation media for a company's corporate information or information on all of its products and services.

The recent growth of the world wide web (WWW) has opened up new markets and shattered boundaries to selling to a worldwide audience. For marketers the world wide web can be used to create a client base, for product and market analysis, rapid information access, wide scale information dissemination, rapid communication, cost-effective document transfers, expert advice and help, recruiting new employees, peer communications, and new business opportunities. The usefulness of the Internet or WWW depends directly on the products or services of each business. There are

different benefits depending upon the type of business and whether you are a supplier, retailer, or distributor.

Remarks

2.3.2 Business Processes

In every organization there are major business processes that provide the critical tasks such that customer bills, analyzing sales of various products in different locations etc. in business, computers are used as given:

a) **Stock Exchange**

Stock markets around the world are in transition. Brokers interconnected through a data communication network submit and receive bids using their computer workstations or interconnected computer display screens, where brokers match buyers with sellers, so that neither trading floor nor slips of paper are necessary.

b) **Banks**

Computerized banking have several benefits such as save the time and convenience for customer. International banking and the abilities to handle trading in multiple currencies are critical for international trade. The cheques are read by MICR (Magnetic Ink Character Reader). Banks use mainframe computer to maintain their customer accounts by dealing with the transaction generated as a result of withdrawals and deposits.

c) **Departmental Store**

People at the store level, cashiers enter sales data into sale terminals by waving a bar code scanner across a package's bar-coded prices and stock numbers. Bar codes are read by bar code readers, photoelectric scanners that translate the bar code symbols into digital forms. The price of a particular item is set with the store's computer and appears on the sales-clerk's point of sale terminal and on our receipt. Store and department manager who received report of store and department sales and inventory levels are indirect end users. Record of sales are input to the store's computer and used for accounting, restocking store inventory, and weeding out products that sell well. A security VCR (video cassette recorder) is widely used in department stores and other locations where aesthetics are priority. It is virtually impossible to tell where the camera is pointed, which makes it difficult for would-be camera avoiders to stay out of the camera's view range; that are equipped with a camera, and lens can be augmented with dummy cameras. VCRs use the tapes, hook up the same way, and have all of the standard features of today's consumer VCRs. Most importantly, they are just as easy to use. Security cameras are everywhere these days and the reason is quite clear; there is simply no better way to monitor home or business operations and ensures safety.

d) **Office Automation**

Office Automation (OA) refers to the movements toward automating office tasks. An office where workers performs different tasks. The management and administrative tasks performed in an office five general categories of activities like decision-making, data manipulation, document handling, communication, and storage. Offices have used advance computer technologies to perform various tasks in an office system such as for document management system, message handling system, and office support systems.

Remarks

e) Document Management System (DMS)

DMS include word processing, desktop publishing, reprographic, image processing, and archival storage applications. Word processing enable documents to be created and edited electronically as well as help to produce high quality memos, letters, proposals, reports, newsletters and brochures etc. which are used to send business community. Desktop publishing enables to make document in attractive form by the use of photos, artwork, graphical illustrations etc. spreadsheet is software package used to create a table of columns and rows used by people responsible for tracking revenues, expenses, profits, loses, statistical, mathematical and logical processing etc. Reprographics is the process of reproducing multiple copies of a document. Image processing allow document to be scanned and stored in image oriented data bases.

f) Message-handling system

It enables to send messages or documents from one location to other location through facsimile (FAX), electronic-mail (E-Mail), Voice Mail etc.

g) Office Support System

It enables to coordinate and manage the activities of work group. Groupware and desktop organizers are some examples of office support systems.

2.3.3 E-Commerce

E-commerce (electronic commerce) describes buying, selling, and exchanging of products, services, and information via computer network. The term e-commerce describes transactions conducted between business partners. There are many applications of e-commerce, such as home banking, shopping in electronic malls, buying stocks, finding a job, conducting an auction, collaborating electronically with business partners around the globe, marketing & advertising and providing customer service.

There are several types e-commerce like collaborative commerce, business to commerce, consumer to commerce, and Mobile commerce etc. Mobile satellite communications also promise to extend the global reach of voice, data and other services.

The following services of e-commerce are used most frequently in e-business.

a) Electronic Mail (E-mail)

The e-mail is a service that transports text messages (with attachments of videos, audio, documents) from sender to one or more receivers via computer. Voice mail systems capture, store, and transmit spoken messages.

b) Video Conferencing

Video conferencing is a type of conferencing in which video transmission over networks. It is an advance form of teleconferencing. Video conferencing should provide a complete simulation of a normal meeting environment, enabling both parties to see, hear and present material, just as if they were in the same room. It can speed up business process and procedures in the same way that the fax and e-mail have revolutionized the way we share information. Tangible benefits are most easily related to actual cost savings. The most obvious quantifiable saving is the cost of travel and the cost of the time wasted during travel.

c) **Electronic Shopping (E-Shopping)**

Almost all businesses now have website that allow Internet users to buy their goods or services. Shopping can take place using a computer at home, from work or at a cyber café and e-shop can be anywhere in the world working 24hours a day.

d) **Electronic Banking**

An electronic banking is also known as cyber-banking or online includes various banking activities conducted from home, a business, or on the road instead of a physical bank location.

2.3.4 Industry

Computers are used to control manufacturing system and continuous running of the machinery. These are also help in monitoring temperature, pressure, and also check the quality and accuracy, measurement needed in the manufacturing process.

2.3.5 Robots

A robot is an automatic programmable machine that moves and performs mechanical tasks. Robots are used in hundreds of applications from assembling and spray-painting cars, carrying out maintenance on overhead power cables, to testing blood samples, outer space experimental programs, in artificial satellites, and radioactive environments etc. robots can work in environment that are hazardous to humans, it can perform repetitive and boring task continuously without a break at high level of accuracy than human.

2.3.6 CAD (Computer Aided Design)

CAD (Computer Aided Design) are used for display designs and build production prototypes in software, test them as a computer object according to following given parameters:

- Compile Parts and quantities lists.
- Outline production and assembly procedures

Transmit the final different applications some of them like designing new car or aircraft, bridge and building. Making changes to a design requires a large number of complex calculations. A CAD system needs a high resolution monitors, input devices (mouse, keyboard, graphic tables, and scanners etc) and output devices (printers and plotters). CAD use often has the capability of displaying a three dimensional object and speedily rotating it in any direction using controls on the keyboard.

2.3.7 CAM (Computer Aided Manufacturing)

CAM (Computer Aided Manufacturing) is used to control all the part of a manufacturing process. CAM software uses digital design output, such as that from a CAD system, to directly control production machinery. CAM systems are manufactured following goods.

- Product can be made very accurately and consistently.
- Around the clock production is much cheaper.
- A product's design can be modified without the need of bringing production to a computer standstill.

Remarks

Remarks

2.3.8 Simulations

A computer simulation is a special type of computer model, which recreates a system that might exist outside the computer. Simulations are often used to train people how to deal with situations that are too difficult, expensive or dangerous to recreate and practice using for real. For example a flight simulation, which is used to train pilots how to deal with situation that would be expensive and dangerous to practice using a real aircraft. A flight simulator consists of a working replica of the flight deck of an airplane.

2.4 COMPUTER APPLICATIONS IN MANAGEMENT

In every business, a computer is an essential tool for running the day-to-day operations, enhancing productivity and communicating with customers, suppliers and the public. Managers use computers for a variety of reasons, including keeping their teams on track, budgeting and planning projects, monitoring inventory and preparing documents, proposals and presentations.

2.4.1 Functions of Management

Effective management and leadership involve creative problem solving, motivating employees and making sure the organization accomplishes objectives and goals. There are five functions of management and leadership:

- planning,
- organizing,
- staffing,
- coordinating and
- controlling.

These functions separate the management process from other business functions such as marketing, accounting and finance.

a) *Planning*

The planning function of management controls all the planning that allows the organization to run smoothly. Planning involves defining a goal and determining the most effective course of action needed to reach that goal. Typically, planning involves flexibility, as the planner must coordinate with all levels of management and leadership in the organization. Planning also involves knowledge of the company's resources and the future objectives of the business.

b) *Organizing*

The organizing function of leadership controls the overall structure of the company. The organizational structure is the foundation of a company; without this structure, the day-to-day operation of the business becomes difficult and unsuccessful. Organizing involves designating tasks and responsibilities to employees with the specific skill sets needed to complete the tasks. Organizing also involves developing the organizational structure and chain of command within the company.

c) Staffing

The staffing function of management controls all recruitment and personnel needs of the organization. The main purpose of staffing is to hire the right people for the right jobs to achieve the objectives of the organization. Staffing involves more than just recruitment; staffing also encompasses training and development, performance appraisals, promotions and transfers. Without the staffing function, the business would fail because the business would not be properly staffed to meet its goals.

d) Coordinating

The coordinating function of leadership controls all the organizing, planning and staffing activities of the company and ensures all activities function together for the good of the organization. Coordinating typically takes place in meetings and other planning sessions with the department heads of the company to ensure all departments are on the same page in terms of objectives and goals. Coordinating involves communication, supervision and direction by management.

e) Controlling

The controlling function of management is useful for ensuring all other functions of the organization are in place and are operating successfully. Controlling involves establishing performance standards and monitoring the output of employees to ensure each employee's performance meets those standards. The controlling process often leads to the identification of situations and problems that need to be addressed by creating new performance standards. The level of performance affects the success of all aspects of the organization.

2.4.2 Use of IT in Management

The use of computers and Information Technology (IT)-based systems in mainstream businesses has redefined workplace practices, operational metrics and business models. Top management and key business executives have been able to leverage the various capabilities of computer-based systems and productivity software technologies to get a better handle on business operations, channelize employee productivity and address strategic goals. The importance of computers in management cannot be overstated.

Organisations that understand the strategic potential of information technology (IT) integrate it into everything they do. Their IT investments advance their business goals and work seamlessly with current people and processes.

Managers need to understand not only the basic functions of the corporate software tools used in the office but also the Internet and other external computing tools that can improve the way they manage their departments.

1. Business Planning

Business planning can take up a lot of a manager's time, but computer programs make it easier. From using email programs like Outlook or Google Mail to set appointments, tasks and deadlines to using financial tools to develop budgets and project proposals, using computers to

Remarks

Remarks

plan the day-to-day activities of a business is essential. Managers also use the Internet to research their industries, the competition and to look for ideas to help them create plans to engage customers, win more business and succeed in the competitive world of business.

2. Record Keeping

Managers keep track of a lot of information that is vital to the company's success. From customer records to financial records to employee records, the data a company has to store are seemingly endless. Using computers to store and manage documents, files and records reduces the amount of physical storage a company needs and also allows managers to have easy access to their files using simple document search methods. Additionally, by keeping records, managers can easily share information about an employee's history and job performance with other managers in the company.

3. Communication

One of the most common uses for computers in business is communication. Communication is essential not only between employees but with customers as well. Many customer service departments use computers to log service issues and make a record of their resolutions. Using email and instant messaging programs allows employees to gather information from one another that they need to complete their jobs. It also allows managers to delegate work tasks and follow up on projects.

Computer networks connected over an intranet-based system or Web-based environment can communicate with one another. In modern businesses, business owners and enterprise decision makers need employees to communicate instantly with each other, collaborate and share files, information and relevant documents quickly in order to execute work-related tasks and pursuits. Use of e-mail systems, instant messaging tools and more recently social networking applications has also enhanced swifter communication with business partners, customers, suppliers and other key external stakeholders.

4. Transactions Management

Organizations and businesses perform thousands of transactions at varied customer and business partner –facing interfaces. Purchase managers, inventory system professionals and accounts and financial personnel need to keep track of invoices, purchase orders, payment gateways on organization websites and all transactions at the operational level.

Computer systems integrate varied transaction processes and activities and facilitate real-time tracking of transactions. IT applications speed the process of transaction activities and help in calculations, generation of accurate summaries and reports.

5. Decision Making

Computers, IT systems and allied software programs help companies to classify, arrange, systematize and analyze information. Use of CRM solutions, Enterprise Resource Planning (ERP) systems, Management Information Systems (MIS) and database systems enable companies to operationally manage business processes and functional areas. Market intelligence, sales reports and customer insights generated from such systems aid business managers, top management and project heads in important decision making processes.

Document Preparation

For creating spreadsheets, presentations, memos and other corporate documents, computers are essential in business. Managers need to have a basic understanding of common workplace productivity software such as Microsoft Office, but specialized industries such as advertising and marketing also require managers to work with more advanced programs like Adobe Photoshop and Illustrator to create visual materials for clients.

6. Improve Productivity

One of the primary purposes of deploying large-scale computer systems, software, networking and IT tools is to gain productivity on all levels in an organization. All departments, manufacturing and production facilities and offshore centers should be able to leverage the capabilities and of modern IT systems and technologies and function more effectively and efficiently. Used strategically, computers streamline employee workflows, operational activities and functional processes, ensure better control in business management and impact the bottom-line.

7. Role in Innovation Management

As the global economic crisis forces businesses to operate leaner, competition continues to accelerate at lightning speed. Simultaneously, consumers are clamping down on discretionary spending and demanding more value and options in the purchases they make.

Innovation management — or finding and realizing new sources of value — is key to helping businesses keep up with this constantly changing economic and competitive landscape.

With careful thought, planning, and ingenuity, IT can help businesses move from a closed innovation model to an open one, playing a pivotal role in capturing an increasingly elusive competitive advantage.

- Innovation management is a technology matter
- Innovation management—the long and short of it
- Harnessing technology for innovation is a strategy that makes sense

SUMMARY OF THE LESSON

You learnt the following in this lesson:

- Computers are used in so many fields in our daily life. From Engineers to Doctors, Students, Teachers, and Government Organization they all use computers to perform specific tasks, for entertainment or just to finish office work. Computers have made our life easier.
- Computers have taken the education systems in the entire world to a different level altogether. It is now used in education sector in various ways and has changed the way it earlier looked to a great degree.
- The traditional classes have become modern and high-tech with the advent of computers. Students now see multimedia presentations, clips, images, etc. with the help of computers.
- Computers not only strengthen the traditional education system but also provide a new mode of pursuing educational courses and degrees. This mode is called as **online distance learning** mode of education.
- Computers help students of schools, colleges and universities in their research work
- Computers not only are useful in education sector but are also the reason for some fields of education.

Remarks

Remarks

- Education today is no more confined to the walls of a classroom. It has rather gone global.
- Computers are helping the teachers in the several areas classification of pupils, preparing time-table, maintenance of progress cards, tutorial and dialogue, and education to physically challenged.
- Computers are used to provide the methods of teaching in different ways.
- Computer Aided Learning could be described as the use of information technology to assist in the teaching and enhance learning process
- Computer-based training is about using computers to help train people. It is not necessarily about training people to use computers.
- Compared to traditional classroom training methods, students using computer based training absorb similar material faster and retain more of the information they are taught.
- Computer aided learning is the process of using information technology to help teaching and enhance the learning process.
- Distance learning is a new learning methodology. Computer plays the key role in this kind of learning. Many institutes are providing distance learning programs.
- An organization can use computers for marketing their products. Marketing applications provide information about the products to customers
- Marketing is the process by which goods are sold and purchased. The aim of marketing is to acquire, retain, and satisfy customers.
- In every organization there are major business processes that provide the critical tasks such that customer bills, analyzing sales of various products in different locations etc. in business
- E-commerce (electronic commerce) describes buying, selling, and exchanging of products, services, and information via computer network. The term e-commerce describes transactions conducted between business partners.
- CAM (Computer Aided Manufacturing) is used to control all the part of a manufacturing process. CAM software uses digital design output, such as that from a CAD system, to directly control production machinery.
- A computer simulation is a special type of computer model, which recreates a system that might exist outside the computer.
- In every business, a computer is an essential tool for running the day-to-day operations, enhancing productivity and communicating with customers, suppliers and the public.
- There are five functions of management and leadership - planning, organizing, staffing, coordinating and controlling.

SELF ASSESSMENT QUESTIONS AND EXERCISES

1. What are computer applications in education?
2. What are different uses of computers in education?
3. How computers may be helpful to teachers?
4. What is computer-based teaching (CBT)? What are its benefits?
5. How computers may help in learning?
6. What are computer applications in commerce?
7. What is e-commerce? How is it useful?
8. How computers help in marketing?
9. What are business processes?
10. What do you understand by CAD (computer aided design) and CAM (computer aided manufacturing)?
11. What are Simulations?
12. What are computer applications in management?
13. What are major functions of management?
14. Discuss the use of IT in management?

CHAPTER - 3

WINDOWS OPERATING SYSTEM

OBJECTIVES OF THIS LESSON

This lesson is aimed to make you understand the basic concepts of windows. Readers will be able to understand the following:

- Windows operating system, its common features, Windows Explorer.
- Control Panel, Print Manager and other elements of Windows GUI

STRUCTURE OF THIS LESSON

- 3.1 Windows Operating System
 - 3.1.1 Common Features of Windows GUI
 - 3.1.2 Windows Explorer
 - 3.1.3 Print Manager and Installing Printers
 - 3.1.4 Control Panel
 - 3.1.5 Using Paint Brush
 - 3.1.6 Using Clipboard in Windows
 - 3.1.7 My Computer

Summary of the Lesson

Self Assessment Questions and Exercises

3.1 WINDOWS OPERATING SYSTEM

Microsoft Windows (or simply **Windows**) is a metafamily of graphical operating systems developed, marketed, and sold by Microsoft. It consists of several families of operating systems, each of which cater to a certain sector of the computing industry.

The Windows operating system is developed and maintained by Microsoft, the company founded by Bill Gates. The first version was released in 1985. Since then, it has grown significantly, and it now dominates the market. Windows uses a graphical user interface to make it easier for people to use their computers. The primary ways that people navigate are through icons on the desktop and the Start menu.

As of April 2014, the most recent versions of Windows for personal computers, smartphones, server computers and embedded devices are respectively Windows 8.1, Windows Phone 8.1, Windows Server 2012 R2 and Windows Embedded 8. A specialized version of Windows runs on the Xbox One game console.

The next version of Windows is Windows 10 and is currently available as a technical preview; it is set for release for phones, tablets, laptops, and PCs in late 2015.

However, versions of Windows operating system with its date of release are provided in **Table 3.1**.

Table 3.1: Windows Operating System Versions

Remarks

Date	Version
1981 Sept.	Interface Manager
1983	Windows was announced
1985 Nov.	Windows 1.0 for 8088 CPUs released
1987 Dec.	Windows 2.0 for 386 CPUs, up to 16 mbyte RAM addressable
1988/89	Windows 2.1 for 286/386
1990	Windows 3.0
1992 April	3.1 (janus) includes MS-DOS 5.0
1993 Nov.	Windows for Workgroups 3.11 (snowball) rudimentarily networkable
1995 Aug.	Windows 95 4.0 Codename "Chicago" was released
1996 Feb.	Windows 95 Version A (OSR1)
1996 Aug.	Windows 95 (detroit) Version B (OSR2) first time with FAT-32 support
1997 April	Windows 95 Version B (OSR2.1)
1997 Nov.	Windows 95 Version C (OSR2.5)
1998 June	Windows 98 (memphis) about 5,000 bugs fixed
1999 May	Windows 98 SE (Second Edition)
2000 Sept.	Windows Me (Millenium)
1980 Aug.	XENIX OS cooperation with SCO
1982 Feb.	XENIX 2.3 cooperation with SCO
1983 April	XENIX 3.0 cooperation with SCO
1987	MS OS/2 1.0 cooperation with IBM
1988	OS/2 1.1 cooperation with IBM
1991	OS/2 1.3 cooperation with IBM
1992	OS/2 2.0 cooperation with IBM
1993 July	Windows NT 3.1 & Advanced Server; 3.1 million lines of source code, supports HPFS
1994 Sept.	Windows NT 3.5 (daytona), Workstation and Server, with opengl and Netware client; 9 million lines of source code
1995 May	Windows NT 3.51, updae, transparent compression with NTFS file system, PCMCIA support, for Power-PCs available too
1996 Aug.	Windows NT 4.0 (cairo) 16 million lines of source code, no support for HPFS anymore
1996	Windows NT Terminal Server Edition (hydra)
1997	Windows NT Server 4.0 Enterprise Edition
1998	Windows NT Server 4.0 Terminal Server Edition
2000 Feb.	Windows 2000, Windows version 5.0; 30 million lines of source code, about 10,000 bugs fixed
2000 Sept.	2000 Datacenter Server
2001 Oct.	Windows XP (whistler), Windows version 5.1
2002	Windows XP Media Center Edition, Windows XP Tablet PC Edition
2003 April	Windows Server 2003 version 5.2 (whistler server)

2006	Windows Vista, Windows version 6.0, Codename Longhorn (Client)
2006 June	Windows Compute Cluster Server 2003 (Windows CCS 2003)
2008 Feb.	Windows Server 2008 (Codename Longhorn)
2007 July	Windows Home Server 1.0
2009 Oct.	Windows 7 (Codename Vienna)
2012 Oct. 26	Windows 8
2013 Oct. 18	Windows 8.1 (Codename Blue)

Remarks

3.1.1 Common Features of Windows GUI

Desktop view of GUI of Windows 7 Home Premium is shown in **Fig. 3.1.**



Fig. 3.1: Desktop View of Windows 7 Home Premium

A present day GUI has the following common features:

- a) **Pointing device(s)**: These allow users to point at different parts of the screen as well as can be used to initiate a command. Besides, these can also be used to manipulate objects on the screen by:
 - *selecting objects on the screen*
 - *moving objects around the screen, or*
 - *merging several objects into another object*

Examples: Mouse, light pen, joystick, touch sensitive screen, touch pad and so on.
- b) **Windows** : It graphically display the progress of the action initiated. When a screen is divided into several independent regions, each one of these is called a window. Each window can highlight results related to the action fired in the respective window.
- c) **Switching capability** : Windows system offers the switching capability from one application to another or for sharing of data among various applications.
- d) **Resizing and Movement** : Windows system also support resizing as well as moving around feature of windows.
- e) **Graphical Bit-mapped Displays** : Bit-mapped display are made up of small pixels and offer a very high resolution. Bit-mapped displays have almost replaced character-based displays. Bit-

Remarks

mapped displays wonderful support graphic manipulation. This feature of these displays is also called WYSIWYG i.e. What You See Is What You Get.

- f) Functionality to support graphics along with height-parameters, color attributes, video-attributes, etc.
- g) **Icon** : Icons provide a symbolic representation of any system-entity or user-defined object, etc. such as file, folder, address, table, book, applications and so on. A folder icon consists a group of files or other folder icons. Double clicking on the folder icon causes a window to be opened displaying a list of icons and folder icons representing the folder's contents.
- h) **Dialog box** : Dialog box is used to capture user information or to present information to the user. Normally, a dialog box is displayed to get additional information. Dialog boxes are also used to indicate error messages in the form of alert boxes. Dialog boxes also use a wide range of screen control elements to communicate with the user.
- i) **Check box** : Such a box is used to capture the information intending confirmation pertaining to any kind of actions desired by the end-user.
- j) **Sliders** : These are used to show the relative position of the contents or to move to a different position.
- k) **Desktop Metaphors** : In desktop graphical metaphor, users are not aware of applications and they deal with files, folder, drawers, clipboard and an out-box. For example, merely clicking the mouse on an icon representing the Report cause word processor to get started and to load the report file automatically.
- l) **Menus** : The functionality on a GUI system must be arranged in the form of structured menus such as horizontal menus, pull-down menus, etc. From the menu, the end-user can select any operation of his choice such as File, Edit, Search, Tool and so on. Rather than remembering commands at each stage, a menu can be used to provide a list of items. Each menu element can be either a word or an icon representing a command or a function. Menu item can be invoked by moving the cursor on the menu item and selecting the item by clicking the mouse.

3.1.2 Windows Explorer

Windows Explorer displays the hierarchical structure of files, folders, and drives on your computer. It also shows any network drives that have been mapped to drive letters on your computer.

Windows Explorer is automatically launched any time you open a folder in **Windows XP**.

Using Windows Explorer, you can copy, move, rename, and search for files and folders. For example, you can open a folder that contains a file you want to copy or move, and then drag the file to another folder or drive.

There are other places in Windows where you can view and work with files and folders. My Documents is a convenient place to store documents, graphics, or other files you want to access quickly.

You can also view My Network Places, which lists other computers that are connected to your local area network (LAN). When you delete files or folders from your hard disk, Windows places them in the Recycle Bin, where you can retrieve them, until you empty the Recycle Bin. Files or folders deleted from a floppy disk or a network drive are permanently deleted and are not sent to the Recycle Bin.

To open Windows Explorer, click **Start**, point to **All Programs**, point to **Accessories**, and then click **Windows Explorer**.

3.1.3 Print Manager and Installing Printers

Both in Windows 7 and Windows 8, the *Print Management* console is part of *Administrative Tools*. However, it is not available in all editions of Windows. Only users of Windows 7 Professional, Ultimate and Enterprise will be able to use it. In Windows 8 it is available in Windows 8 Pro and Enterprise.

While a search for the term *Print Management* in Windows 7's *Start Menu* will return the appropriate result, doing the same in Windows 8's *Start* screen will not. That's why, to make sure you find it, it is best to open the *Control Panel* and go to *System and Security* -> *Administrative Tools*.

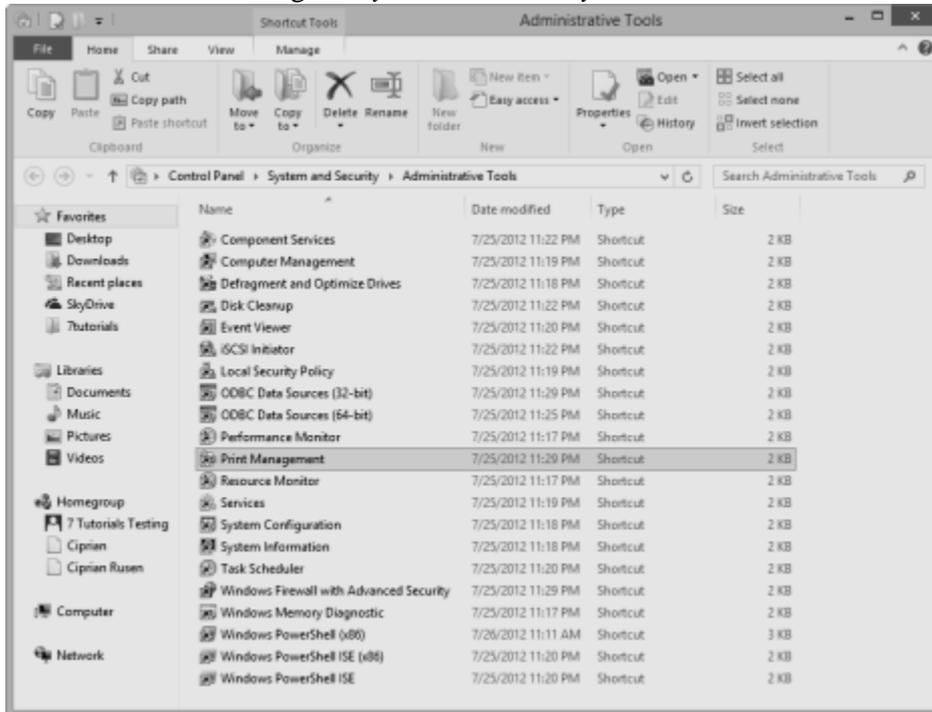


Fig. 3.2: Administrative Tools Menu

This will work both in Windows 7 and Windows 8.

When you first launch *Print Management*, its window will look similar to the screenshot below.

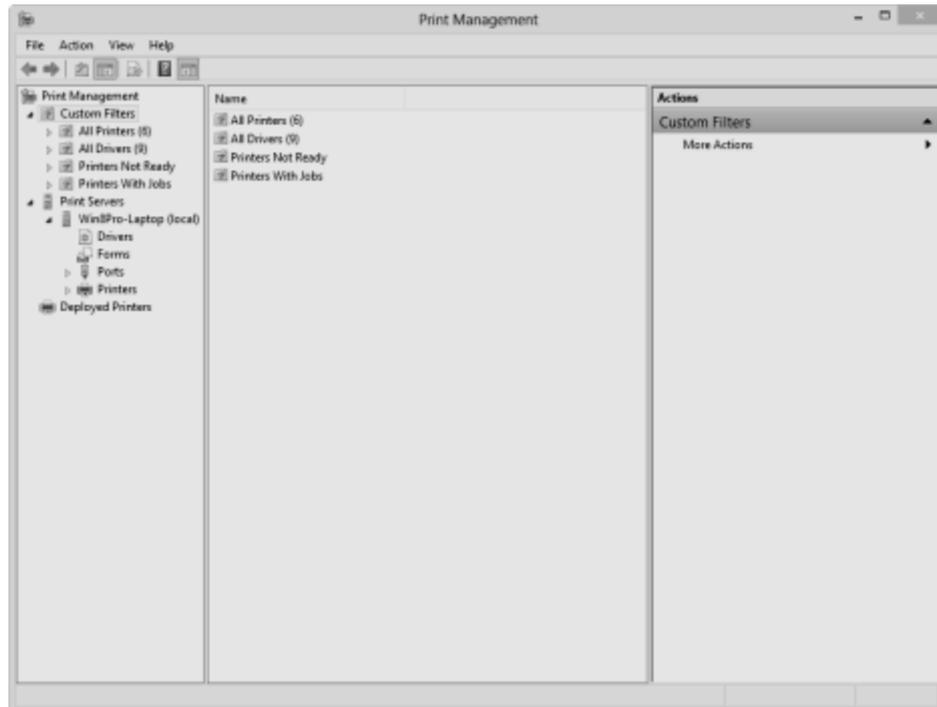


Fig. 3.3: Print Management Menu

Installing Printer in Windows 7 - Step by Step Guide

- Click on **Start** and then click on “**Device & Printers**” – Then you get the Printers page.
- Then go top and find “**add a printer**” menu, Click on “**add a printer**”.
- Now you got a **printer setup wizard** front of you and asking to “how do you want to install your printer” with **USB cable** (Local printer) or **Wireless / Network**.
- Under Local printer you can Install printer with **LPT** port and with the **USB** cable.
- Select the USB port and select “**USB001 (Virtual port for USB printer)**” and then click on **next**.
- Now in the next windows pick your appropriate **drivers** for this particular printer.
- After that you get your printer driver successfully installed

3.1.4 Control Panel

The Control Panel is a part of the Microsoft Windows graphical user interface which allows users to view and manipulate basic system **settings** and controls via applets, such as adding hardware, adding and removing software, controlling user accounts, and changing accessibility options.

To open the Control Panel, click the Start button on the taskbar and then click Control Panel on the Start menu. Windows 7 gives you three different views for looking at your computer’s Control Panel: To switch views, click the View By drop-down button (labelled Category by default) in the upper-right corner of the Control Panel and then choose one of the views from the button’s drop-down menu.

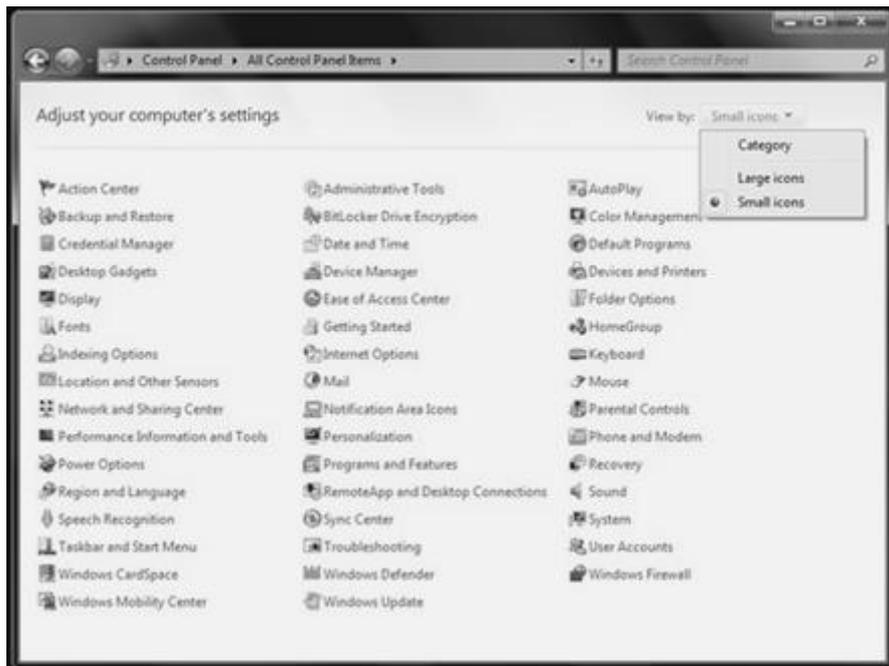


Fig. 3.4: Control Panel Menu

By default, the Control Panel is displayed in Category view, which is separated into eight categories, ranging from System and Security to Ease of Access. To open a window with the Control Panel options for any one of these categories, simply click the category's hyperlink.



Fig. 3.5: Control Panel Menu

3.1.5 Using Paint Brush

Paint formerly known as Paintbrush for Windows is a simple graphics painting program that has been included with almost all versions of Microsoft Windows since its first release. It is often referred to as MS Paint or Microsoft Paint.

The program opens and saves files as Windows bitmap (24-bit, 256 color, 16 color, and monochrome, all with the .bmp extension), JPEG, GIF, PNG, and TIFF. The program can be in color mode or two-color black-and-white, but there is no gray scale mode. For its simplicity, it rapidly became one of the most used applications in the early versions of Windows—introducing many to painting on a computer for the first time—and still has strong associations with the immediate usability of the old Windows workspace.

Steps to Start the Paint Brush

- 1).Click on the Start Button.
- 2).Click Programs.
- 3).Click Accessories.
- 4).Click on Paint.

Then you will screen as shown below:

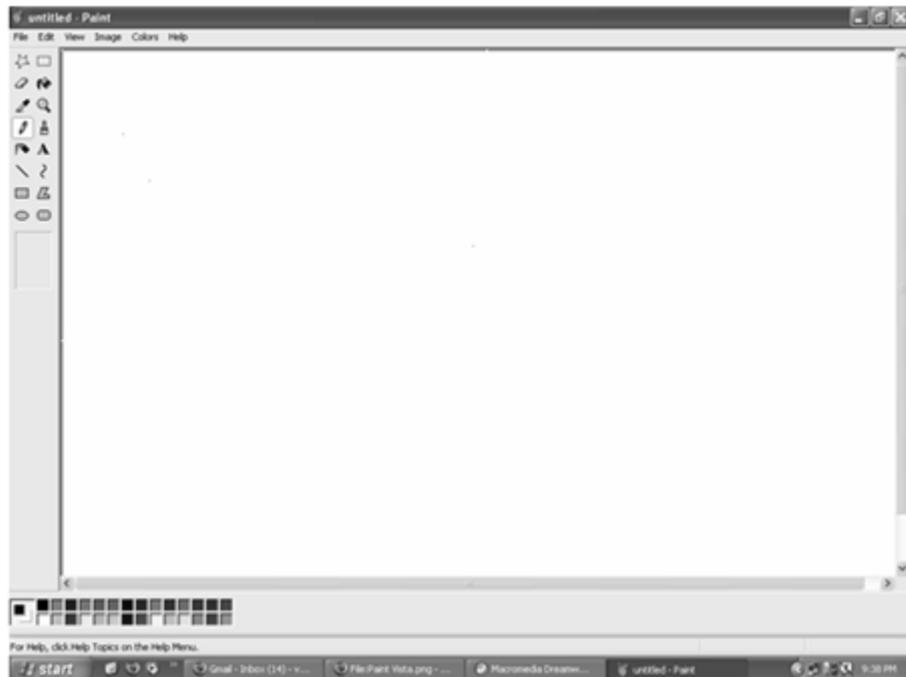


Fig. 3.6: Paint Screen

Menus

Four of the Paint menus—File, Edit, View and Help—are common to almost all Windows programs. Menus that are special to Windows Paint are Image and Colors. The menu of greatest interest is the Image Menu.

File Edit View Image Colors Help

Fig. 3.7: Paint Menu

Toolbox

All the little grey boxes down the left are called the tools and together they make the toolbox. The individual tools will each be explained separately further down. Under the toolbox is a small area where you see different options according to which tool you're using.



Fig. 3.8: Paint Toolbox

Paste Options

In this picture, with the selection tool active, you have a choice between paste opaque and paste transparent (selected, as you can tell by the dark background).



Fig. 3.9: Paint Paste Options

The Colour Palette

Under the main window is the colour palette. The two squares set apart from the rest at the left end of the palette show the active colours; the colours presently in use. When you click on a colour in the palette with the left mouse button, that colour will be the primary or foreground colour, here shown as pink. The colour you click on with the right mouse button will be the secondary or background colour, here shown as white.

3.1.6 Using Clipboard in Windows

In Windows and other operating systems, the *Clipboard* is a short-term storage area for all kinds of information that you have copied from one place and you plan to use in another place. You can copy just about anything to the *Clipboard*: strings of text, images, video, files, folders, shortcuts, etc.

Remarks

When you copy (or cut) something, it is stored in the *Clipboard*. When you copy (or cut) something else that piece of information overwrites the previous contents. This is because Windows provides support for a single clipboard transaction.

When you paste the contents of the *Clipboard*, the contents remains available for further pasting operations. It is overwritten only when you copy or cut something else.

What Can You Copy to the Clipboard?

Just about anything that can be selected in Windows: text of all kinds, graphics, files (including shortcuts) or folders.

What Can You Paste from the Clipboard?

Pasting the contents of the *Clipboard* depends on where you want to perform the paste. For example, if you are working with text, you can paste text only in apps and programs that work with text. Following the same rule, you can paste graphics only in apps and programs that work with graphics, and so on.

If the contents of the *Clipboard* cannot be pasted where you want to, it will not be pasted there but the contents of the *Clipboard* will remain intact.

How to Manage the Clipboard in Windows?

Windows XP had a *Clipboard Viewer* that allowed users to view the contents of the local clipboard, clear the clipboard or save copied and cut items.

Unfortunately, this program was removed from Windows Vista and subsequent versions of Windows, including Windows 8.1.

Therefore, if you want to view the contents of the clipboard and manage it, you must use third-party programs developed by companies other than Microsoft.

Windows XP had **clipbrd.exe**, referred to as the **Clipboard Viewer** or the **ClipBook Viewer**, which could be used to see what was saved on your clipboard. If you try to search for this exe file in Windows Vista, Windows 7 or Windows 8, you will be unable to find clipbrd.exe.

Clipboard in Windows 7 / 8

In Windows XP this file was situated in *C:\Windows\System32\clipbrd.exe*. It is now missing as a part of the Windows 7 | 8 installation. You can try to copy it from a Windows XP installation, if you have access to it, and paste it in your System32 folder. In most cases this is known to work.

Clipboard Viewer

If you wish, you can download Windows Clipboard Viewer but if it does not work or if you are confronted with a message of sorts: *Entry Point Not Found*, then you may try to run it in Windows XP/SP2 compatibility mode and see if it works.

The Windows Clipboard is very basic in nature and does not offer many features. As a result, many free Clipboard alternatives like ArchiveClipboard, Enhanced Clipboard Manager, CopyCat, Clipboardic, Orange Note, Ditto, Clipboard Magic, etc, are available on the Internet.

3.1.7 My Computer

The 'My Computer' icon gives us easy access to our hard drives, removable flash drives and other network-related locations. But if you're one who enjoys a **clutter-free desktop**, then maybe you can use this tweak to remove the many program and folder shortcuts on your desktop.

Remarks

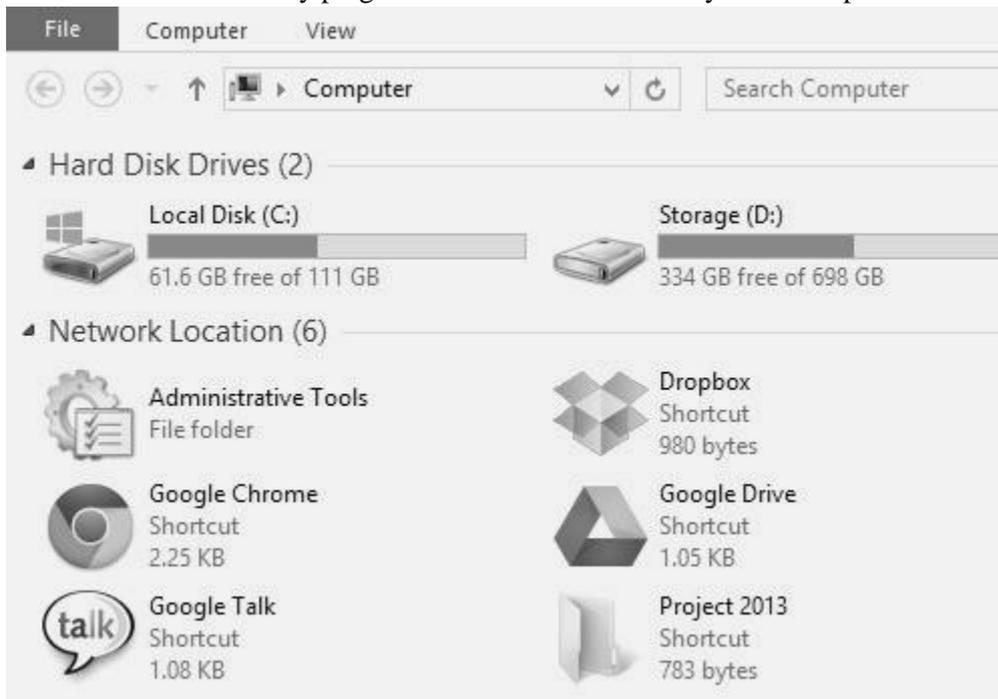


Fig. 3.10: My Computer

Here's a way to get more usefulness out of "My Computer" by adding the shortcuts that you need to it. This also gives you **quick access** to the program or folder and works very well with Windows Explorer tabs tweak like Clover.

SUMMARY OF THE LESSON

You learnt the following in this lesson:

- Operating System (OS) is a collection of software written to provide the fundamental instructions that a computer needs to manage resources, such as memory, the file system, and processes.
- Windows Explorer displays the hierarchical structure of files, folders, and drives on your computer. It also shows any network drives that have been mapped to drive letters on your computer.
- Both in Windows 7 and Windows 8, the *Print Management* console is part of *Administrative Tools*.
- The Control Panel is a part of the Microsoft Windows graphical user interface which allows users to view and manipulate basic system **settings** and controls via applets, such as adding hardware, adding and removing software, controlling user accounts, and changing accessibility options.
- Paint formerly known as Paintbrush for Windows is a simple graphics painting program that has been included with almost all versions of Microsoft Windows since its first release. It is often referred to as MS Paint or Microsoft Paint.

Remarks

- In Windows and other operating systems, the *Clipboard* is a short-term storage area for all kinds of information that you have copied from one place and you plan to use in another place.
- The 'My Computer' icon gives us easy access to our hard drives, removable flash drives and other network-related locations.

SELF ASSESSMENT QUESTIONS AND EXERCISES

1. What is an operating system ?
2. Discuss the important functions of an operating system.
3. What is a File Manager ? Outline its responsibilities.
4. Chart the family of operating system.
5. What is Windows operating system? List its important versions.
6. What is the purpose of a clipboard?
7. What is Print Manager?
8. What is 'My Computer'?
9. What is Paint program/Paint Brush?
10. What are main features of Windows operating system?
11. What is Control Panel? How is it useful?

CHAPTER - 4

Remarks

INTRODUCTION TO MICROSOFT EXCEL

OBJECTIVES OF THIS LESSON

MS-Excel is a spreadsheet package which organizes various types of data. It offers enormous features. This lesson is aimed to make you understand the following:

- Introduction of MS Excel
- Features of MS Excel
- Basic concepts of MS- Excel i.e. Rows, Columns, Cell etc.
- Applications of Spreadsheet
- Various Menu and Toolbar options
- Creating worksheet
- Opening worksheet
- Saving worksheet
- Basic operations on worksheet

STRUCTURE OF THIS LESSON

- 4.1 Introduction
- 4.2 Features of Ms-Excel
- 4.3 Applications of a Spreadsheet
- 4.4 Starting Ms-Excel
- 4.5 Basic Terms in Excel
- 4.6 Ms- Excel Window Elements
- 4.7 Menu
 - 4.7.1 File Menu
 - 4.7.2 Edit Menu
 - 4.7.3 View Menu
 - 4.7.4 Insert Menu
 - 4.7.5 Format Menu
 - 4.7.6 Tools Menu
 - 4.7.7 Data Menu
 - 4.7.8 Windows Menu
 - 4.7.9 Help Menu
- 4.8 Creating, Opening and Saving Workbook/Worksheet
 - 4.8.1 Creating a New Workbook
 - 4.8.2 Opening a Workbook
 - 4.8.3 Saving a Workbook
 - 4.8.4 Closing a Workbook
- 4.9 Basic Operations on Worksheet

Summary of the Lesson

Self Assessment Questions and Exercises

Remarks

4.1 INTRODUCTION

Microsoft Excel is a spreadsheet package, which organizes all types of data especially numerical data. It is a tool for not only storing or managing data but also analyzing and querying data. A spreadsheet offers considerable ease of performing such tasks by automating all arithmetic calculations and making it easier to change certain numerical values. Spreadsheet is a primary document which consists of cells that are organized into columns and rows. Excel not only does accounts related work but it is cool graphical user interface and user friendliness, even while doing some sophisticated tasks. Working in spreadsheets saves a lot of time.

4.2 FEATURES OF MS-EXCEL

Some of the features of MS-Excel are:

1. Data can be manipulated in tabular form.
2. Excel contains workbooks, in which worksheets are present. Each worksheet consists of 256 columns and 65536 rows.
3. Data from excel can be exported to other compatible software.
4. Excel supports charts and graphs for pictorial representation of data.
5. Excel provides built-in functions to perform calculations.
6. This spreadsheet package offers many features that helps to handle complex data like goal seek, what-if analysis.
7. Allows to automate the work using macros.
8. Support powerful printing features.
9. Allows to sort the data on one or more columns.
10. Provides features like autolist, find and replace etc for effective data entry.

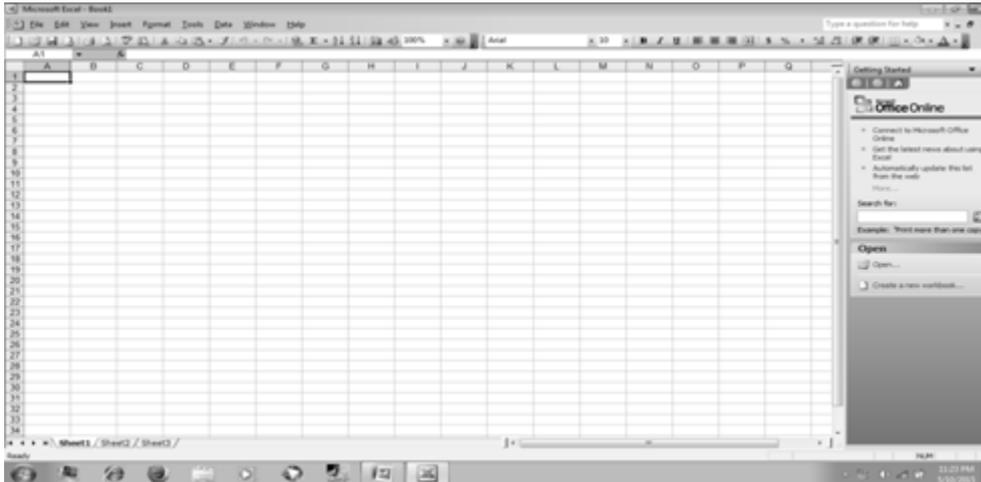
4.3 APPLICATIONS OF SPREADSHEET

Some of the applications of spreadsheet are:

1. Payroll management.
2. Inventory management.
3. Income statements preparation.
4. Financial institution can use such spreadsheet packages to manage their receipts and payments.
5. Budget control.
6. Annual report of an organization
7. Scientific Calculation.
8. Educational Institutions use spreadsheet to keep the records of different students.
9. Banking and other financial services.
10. Cost- effective analysis.

4.4 STARTING MS-EXCEL

- Click on Start button
- Select the option Programs
- Click on Microsoft Excel
MS-Excel window will appear



4.5 BASIC TERMS IN EXCEL

(a) ROWS

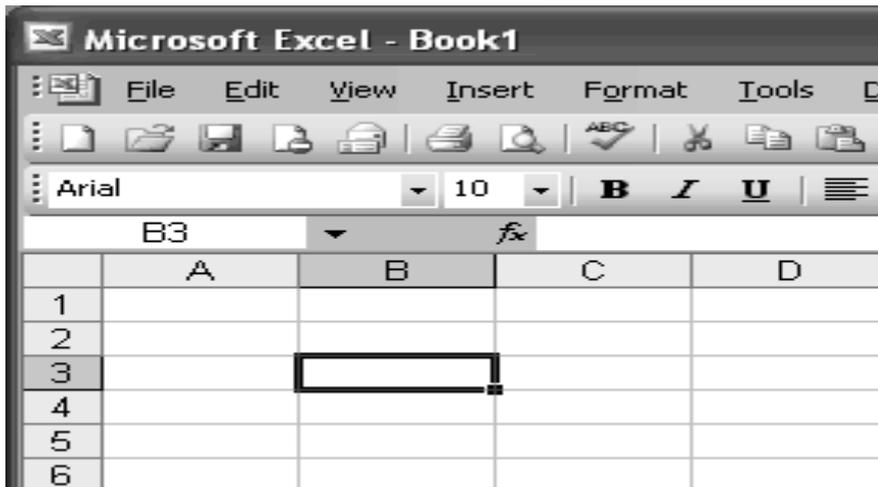
All the rows are numbered numerically i.e. 1, 2, 3.... and so on. There are 65536 rows in each spreadsheet. We can insert a new row by clicking on insert menu. We can also do formatting on rows.

(b) COLUMNS

All the Columns are labeled alphabetically i.e. A, B, C..... and so on. There are 256 columns in each worksheet. We can change the width of column. We can also do formatting on columns.

(c) Cell

Intersection of a row and a column is called cell. It contains Text or Numbers. We can apply formatting on cells. We can also insert or delete cells. The active cell has a dark outline. When a cell is active, data can be typed into it.



(d) Range Of Cells

Many spreadsheet operations consists a range of cells instead of a single cell. A range of cells may involve many cells and entering every individual cell address for performing an

Remarks

operation on them may be time taking. To resolve this problem, the concept of cell ranges is used. These are of following types:

1. **Row Range:** It includes a set of adjacent cells in the same row. For example, the range B5..D5 refers to the cells B5, C5 and D5.
2. **Column Range:** It includes a set of adjacent cells in same column. For example, the range C5..C9 refers to the cells C5, C6, C7, C8, and C9.
3. **Block Range:** It includes a set of adjacent cells in a rectangular group of cells. For example, the range B5.. D9 refers to the cells B5, B6, B7, B8, B9, C5, C6, C7, C8, C9, D5, D6, D7, D8, and D9.

(e) Cell Contents

In spreadsheets, different types of data can be entered in a cell. The four commonly used types of cell data are:

1. **Label:** A label is any string of alphanumeric text. Label can be used to enter either alphanumeric values in cells, or descriptive data or titles to make the contents easier to understand.
2. **Numeric value:** A numeric value is a number on which spreadsheet can perform calculations.
3. **Formula:** A formula may include numbers, mathematical operators, mathematical functions supported by spreadsheet and cell addresses.
4. **Date and time:** Date and/or time contents type in a spreadsheet are used to display the actual date and time.

(f) Cell Referencing

Reference to a cell can be done in three ways:

1. Relative referencing

The copied formula presents the positional relationship among the cells and this type of referencing is called Relative referencing. For example, suppose the cell E5 contain the formula = B5+ C5 + D5. Excel provides the facility to copy the content of a cell or group of cells. If the formula in E5 is copied to E10, Excel copies it as B5 +C5 +D5.

2. Absolute referencing

Referring to the value in a cell rather than the position of the cell is called Absolute referencing. For example, suppose D5 contain the formula = C3*12. We wish to copy the formula to cell D6, such that it appears as =C3*12 in this cell. If C3 is taken as a relative address then the copy of the formula to the cell D6 will be C4*12.

MS-Excel uses \$ (dollar) symbol to distinguish absolute and relative referencing. To make the relative reference "C3" as absolute "\$C\$4" will have to be typed in formula in D5. So we type the formula in D5 as = \$C\$3* 12. Absolute reference remains unchanged when that is copied.

3. Mixed referencing

In the example of absolute referencing, "\$C\$4" makes both the row and column absolute. On the other hand "C\$4" or "\$C4" are treated as half relative and half absolute and this type of referencing is known as Mixed referencing.

(g) Column Headings

	A	B	C	D	E	F
--	---	---	---	---	---	---

Each Excel spreadsheet contains 256 columns. Each column is named by a letter or combination of letters.

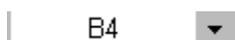
(h) Row Headings

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1
2
3
4
5

Each spreadsheet contains 65,536 rows. Each row is named by a number.

(i) Name Box



This shows the address of the current selection or active cell.

(j) Workbooks and Worksheets

A **workbook** automatically shows in the workspace when you open Microsoft Excel 2003. Each workbook contains three **worksheets**. A worksheet is a grid of cells consisting of 65,536 rows by 256 columns. Spreadsheet information-text, numbers, or mathematical formulas is entered in the different cells.

	A	B	C	D	E	F
1						
2						
3						
4						
5						

(h) Navigation Buttons And Sheet Tabs

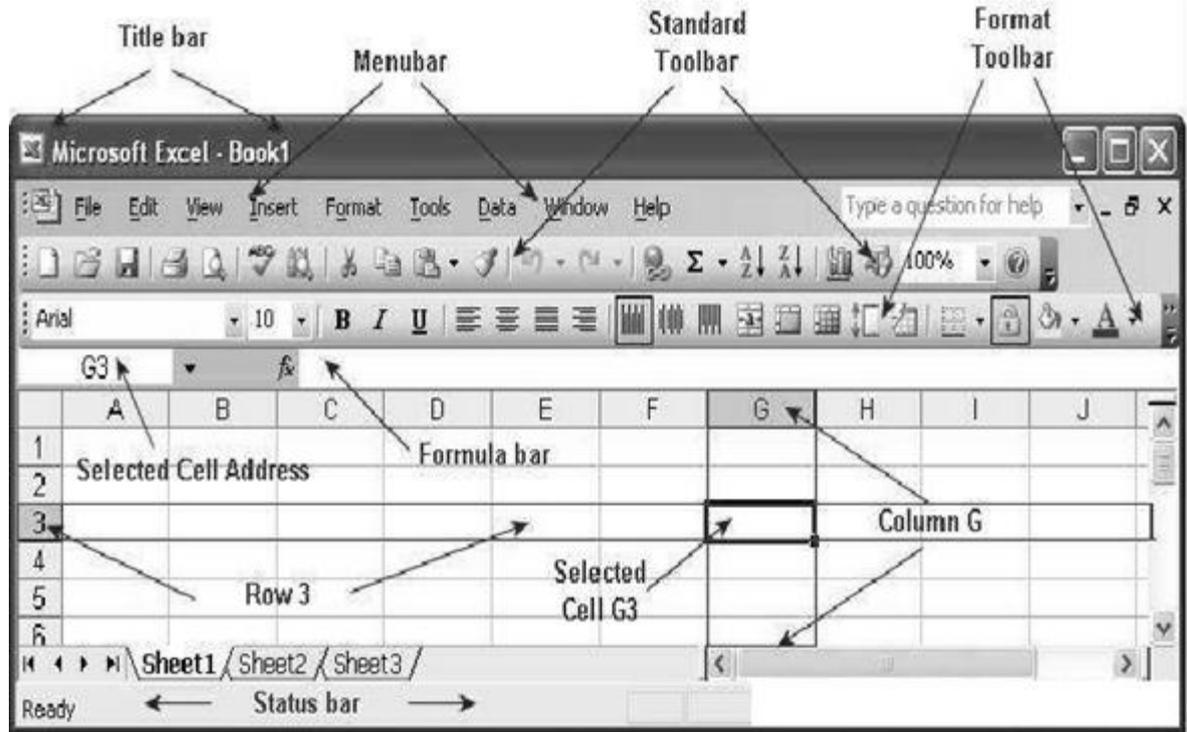


Navigation buttons allow you to move to another worksheet in an Excel workbook. They are used to display the first, previous, next, or last worksheets in a workbook. Sheet tabs separate a workbook into specific worksheets. A workbook defaults to three worksheets. Each workbook must contain at least one worksheet.

4.6 MS- EXCEL WINDOW ELEMENTS

The following figure shows the various components of MS Excel.

Remarks



Excel Screen Elements

Title bar



Excel Title bar

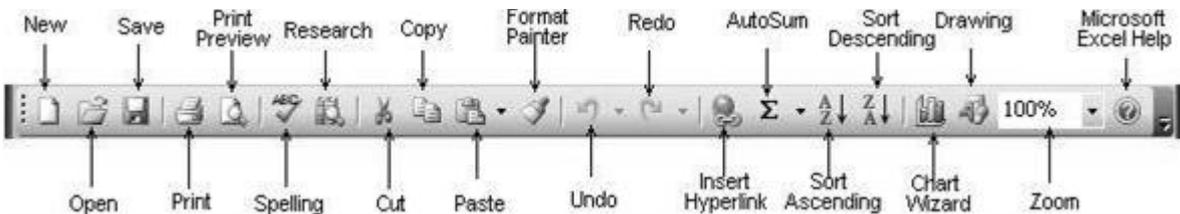
Title bar is located on the top of the Excel Screen. Excel displays the name of the workbook (i.e. file) being used currently.

Menu bar



Excel Menu bar Menu bar is located directly below the 'Title bar'. Menu bar contains Menu tabs File, Edit, View, Insert, Format, Tool, Data, Window and Help. The first letter of menu tabs is underlined. Typing 'Alt + the underlined letter' or a click on the 'Menu tab' will open the drop-down menu associated with the tab. Menus are used to give commands to the software.

Standard Toolbar



Excel Standard Toolbar

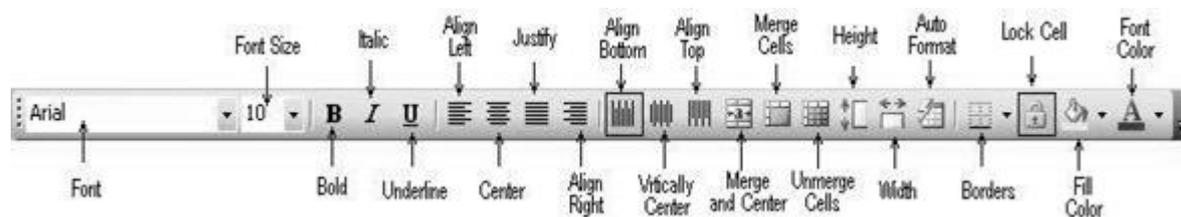
The Standard Toolbar provides shortcuts to various 'commands' being used frequently by the user like opening or a creating workbook (file), opening, Saving, printing a workbook, Print preview, Cut, Copy, Paste, Undo, Redo, Sum, Sort Ascending, Sort Descending the contents of selected cells, Zoom

etc. On moving the mouse over the icons on the tool bar, the command associated with the icon is displayed in a pop up.

Remarks

- New: to create a new workbook.
- Open: to open an existing workbook.
- Save: to save a workbook. If it is for first time, excel will ask for file name and location to save.
- Print: to print a excel file. Print command could print worksheet or workbook.
- Print preview: using this, we can preview worksheet/workbook before printing.
- Spell Check: spell check feature is used to correct errors.
- Research: this feature is used to find words and their meaning.
- Cut : used to Cut the current selection of text.
- Copy: used to make Copy of the selected text.
- Paste: Pastes the text that has currently cut or copy by the user.
- Format Painter: used to copy formatting of selected text.
- Undo And Redo: undo will cancel last action and redo will cancel the undo action.
- Insert hyperlink: used to create hyperlink.
- AutoSum and Sorting: by clicking on auto sum, we can have sum of selected range of data and sorting button will sort the data.
- Zoom: helps to change the size of worksheet.

Format Toolbar



Excel Format toolbar

Format toolbar provides commands for formatting the cells and its contents, merging / de merging cells, increasing or decreasing height of rows and width of columns, horizontal and vertical aligning of cell contents etc. A user can add or remove icons (commands) to the toolbar as per requirements.

Functionality of commonly used buttons			
	Changes the font of the selected text		Changes the size of selected text and numbers
	Makes selected text and numbers bold		Makes selected text and numbers italic
	Underlines selected text and numbers		Aligns to the left with a ragged right margin
	Centers the selected text		Aligns to the right with a ragged left margin
	Merge and Center - Merges two or more selected cells and centers the entry		Currency Style - Formats selected text to display currency style

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	Percent Style - Formats selected cells to display percent		Comma Style - Formats selected cells to display commas in large numbers
	Increase Decimal - Increases the number of decimals displayed after the decimal point		Decrease Decimal - Decreases the number of decimals displayed after the decimal point
	Decreases the indent to the previous tab stop		Indents the selected paragraph to the next tab stop
	Adds or removes a border around selected text or objects		Marks text so that it is highlighted and stands out
	Formats the selected text with the color you click		

Formula Bar



Excel Formula Bar

Formula bar has Name box on the left to display the address of the selected cell. The other box on the formula bar displays number, text, formula or other contents of the selected cell. You can enable or disable display of the **Formula bar** by clicking on **View** followed adding or removing check mark against **Formula bar**.

Status bar



Excel Status bar

The Status bar is located at the bottom of the Excel screen. The bar displays status of the window on the left. The word 'Ready' indicates that Excel is in the Ready mode and is awaiting your next command. Other indicators appear on the Status bar in the lower right corner of the screen are:

- The letters "NUM" on the Status bar in the lower right corner of the screen indicate that the **Num Lock** is on.
- The letters "CAPS" on the Status bar in the lower right corner of the screen indicate that the **Caps Lock** is on.
- The letters "SCRL" on the Status bar in the lower right corner of the screen indicate that the **Scroll Lock** is on.
- The letters "END" on the Status bar in the lower right corner of the screen indicate that the **End** key is on.
- The letters "EXT" on the Status bar in the lower right corner of the screen indicate that the **Extension** of selected cell / range is on. Pressing F8 key anchors a cell / range for extension by pressing arrow keys and repressing F8 key removes the anchor.

A right click on the **Status bar** displays Sum, Average, Count, Maximum or Minimum of the selected cells. You can enable or disable display of the **Status bar** by clicking on **View** followed adding or removing check mark against **Status bar**.

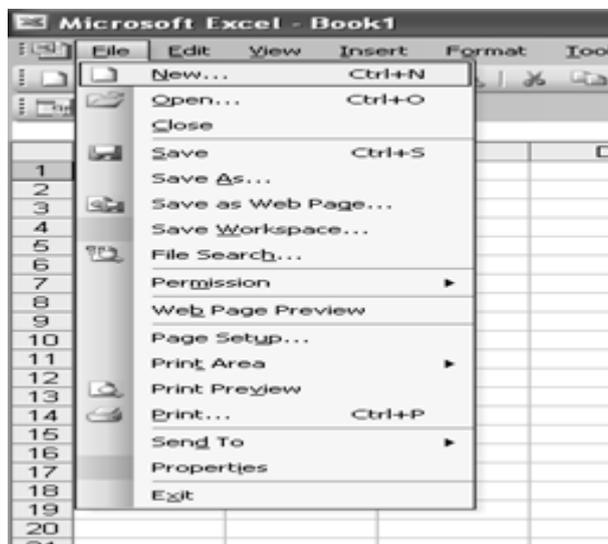
4.7 Menu

The Menu Bar is directly below the Title bar and displays the menu. The menu begins with the word File and continues with the following: Edit, View, Insert, Format, Tools, Data, Window, and Help. You use the menu to give instructions to the software. Point with your mouse to a menu option and click the left mouse button. A drop-down menu will appear. You can now use the left and right arrow keys on your keyboard to move left and right across the Menu bar options. You can use the up and down arrow keys to move up and down the drop-down menu. To select an option, highlight the item on the drop-down menu and press Enter.

4.7.1 File Menu

The File menu contains a number of options, which are following:-

- New - Opens a new document.
- Open - Opens a previously saved document.
- Close - Closes the active document but does not quit the application.
- Save - Saves the active document with its current file name, location and format.
- Save As - Saves by opening a window which gives the opportunity to change the file name, location or format.
- Page Setup - Sets margins, paper size, orientation and other layout options
- Print Preview - Shows how the file will look when you print it.
- Print - Prints the active file, also gives the opportunity to change print options.
- Exit - Closes Microsoft Excel



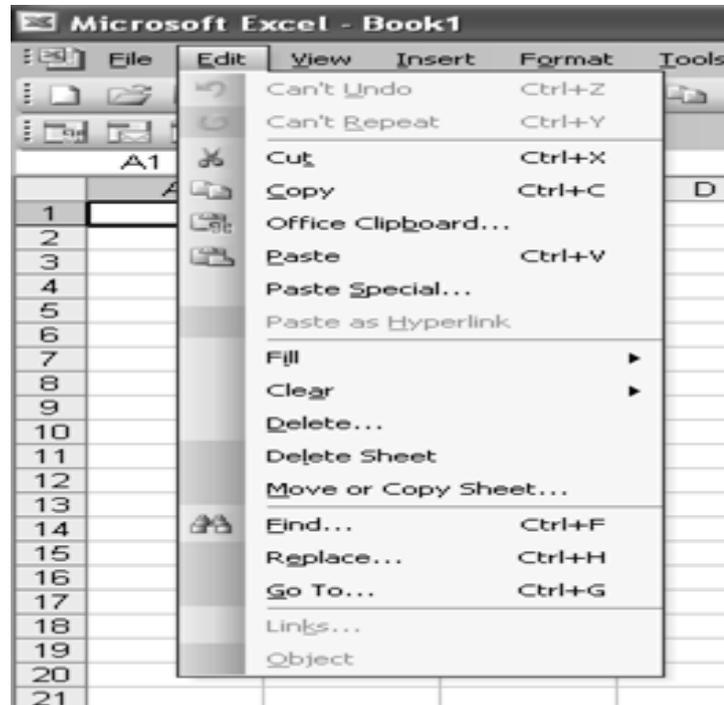
4.7.2 Edit Menu

The edit menu contains a number of options, which are following:-

- Undo - The actual entry of this item will depend on what you did last. As an example something is typed, so that was displayed. This selection can be repeated several times.
- Redo - After an action has been undone, it can be reinstated in the document.
- Cut - Removes the selection from the active document and places it on the clipboard.
- Copy - Copies the selection to the clipboard, the cell from which information is copied remains highlighted.
- Paste - Inserts the contents of the clipboard at the insertion point (cursor) or whatever is selected.

Remarks

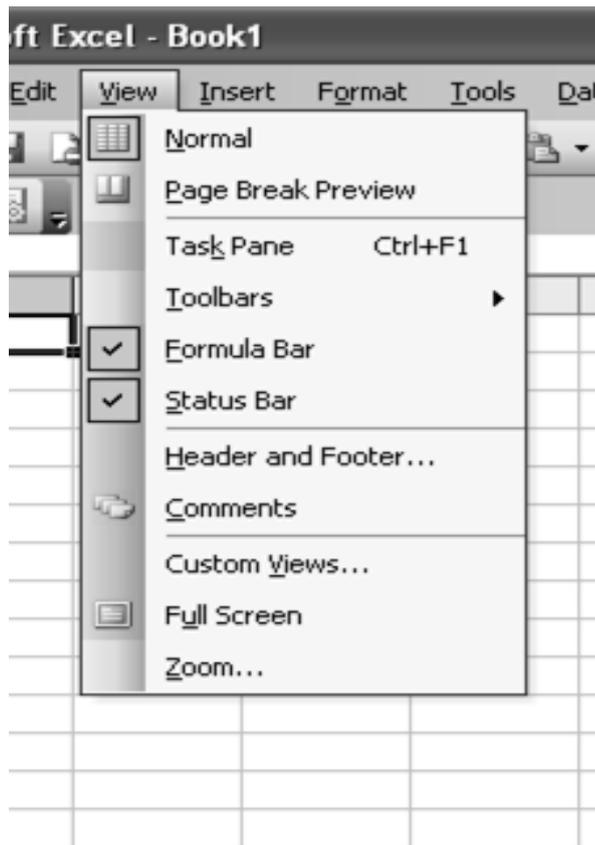
- Paste Special - Ten choices are available when making this selection; examples include pasting formulas, values, and comments.
- Fill - Fill contents of a selected cell Up, Down, Left or Right
- Clear - Deletes the selected object or text, but does not place it on the clipboard. Four choices are available; All, Format, Contents or Comments
- Delete - This menu entry can be used to delete entire rows or columns.
- Find - Searches for specified text in the active document
- Replace - Searches for and replaces specified text and formatting.



4.7.3 View Menu

The View menu contains a number of options, which are following:-

- Normal - The default document view for most word processing tasks.
- Page Break Preview - Before printing, make sure the page breaks appear where you want them
- Toolbars - Displays or hides toolbars. The right pointing arrow indicates a list of toolbars. To add one slide down to the name of the toolbar and click to select.
- Formula Bar - Remove or display the bar which displays cell address and data entered into the active cell
- Header and Footer - Adds or changes the text that is displayed at the top or bottom of every page of the document
- Comments - Hidden comment give further information about cell contents. Comments are displayed when you move the cursor into the cell, however this command causes all comments on a page to be displayed.
- Full Screen - Hides most screen elements so you can see more of your document
- Zoom - Controls how large, or small, the current document appears on the screen.

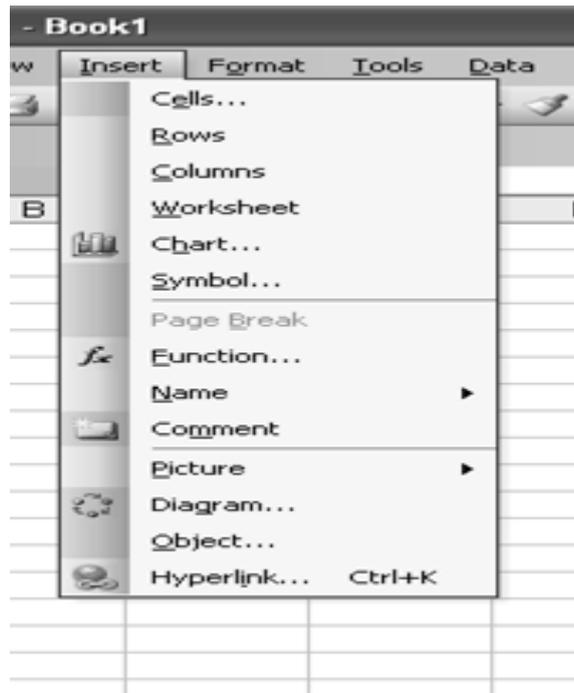


Remarks

4.7.4 Insert Menu

The Insert menu contains a number of options, which are following:-

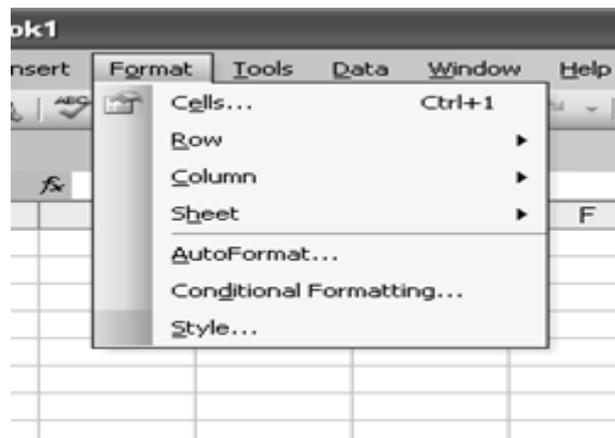
- Cells - Use this command to insert a cell. A pop-up window allows you to move existing data down or to the right. You can also insert rows or columns with this window.
- Rows - Inserts a new row in the spreadsheet, above the row that contains the active cell.
- Columns - Inserts a new column in the spreadsheet, to the left of the column that contains the active cell.
- Worksheet - By default, an Excel workbook is made up of three worksheets. we can insert as many additional sheets as required. Sheets are inserted in front of the current worksheet.
- Chart - This adds a chart of the selected data, or of the entire worksheet if you have no data selected.
- Page Break - Inserts page breaks above and to the left of the active cell. To avoid adding a page break to the left, make sure a cell in Column A is selected before inserting the break.
- Function - Opens the Paste Function window allowing the selection of a specific equation to go in the active cell.
- Comment- Have something to say about the contents of a cell? Add a small note with the appearance of a Post-It note.
- Picture - Insert pictures from clip art or a file. You can also insert auto shapes, word art, or a chart.
- Object - Insert an object such as clip art, word art, an equation or much more.
- Hyperlink – it is used to link worksheet to another worksheet or document.



4.7.5 Format Menu

The Format menu contains a number of options, which are following:-

- Cells - Format the way a number is displayed, alignment of data in the cell(s), font (size, color, style, etc.), borders and colors for the selected cells, and you may also lock the contents of a cell here.
- Row - Specify a row height, choose auto-fit, and hide or un - hide the selected row.
- Column - Specify a column width, choose auto-fit, hide or un - hide the selected column, or choose the standard width for a column.
- Sheet - Here we can rename the sheet if sheet 1 is not descriptive enough (and it's not), you can hide or un - hide a sheet, or you can tile an image in the background of the entire sheet.
- Auto Format- There are sixteen pre-designed formats to change the look of your spreadsheet. You may apply the format to the entire sheet or only to selected cells.
- Style – Opens a Style window which will lead to the Format Cells window if you wish to Modify the format.

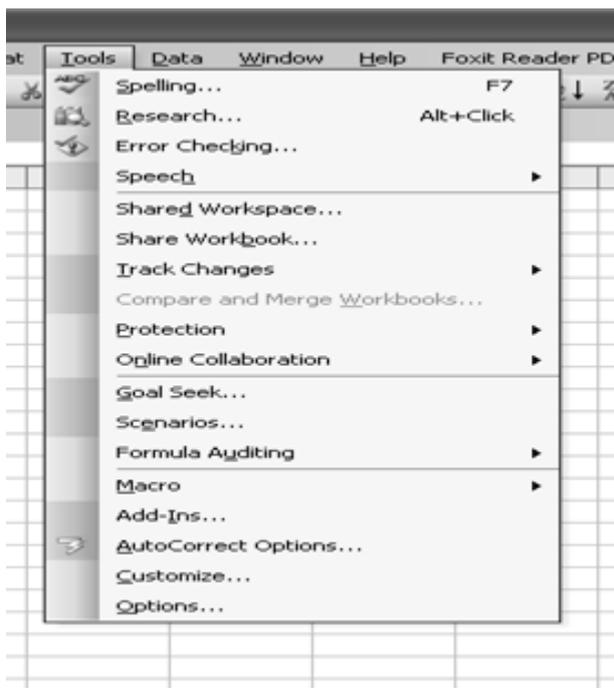


4.7.6 Tools Menu

Remarks

The Tool menu contains a number of options, which are following:-

- Spelling... - Check spelling in your document
- AutoCorrect... - Define, or turn off automatic corrections.
- Share Workbook... - Choose this option if we want several users to work on the data in the same workbook simultaneously. Make it available on network and anyone with access can make changes.
- Protection - we can password protect a single sheet of a workbook, or the entire workbook. One obvious application would be to protect a worksheet which you are using as your grade book.
- Customize... - Select/Deselect toolbars to be displayed within workbook, or add buttons to existing toolbars.
- Options... - This is where you turn those features on or off.



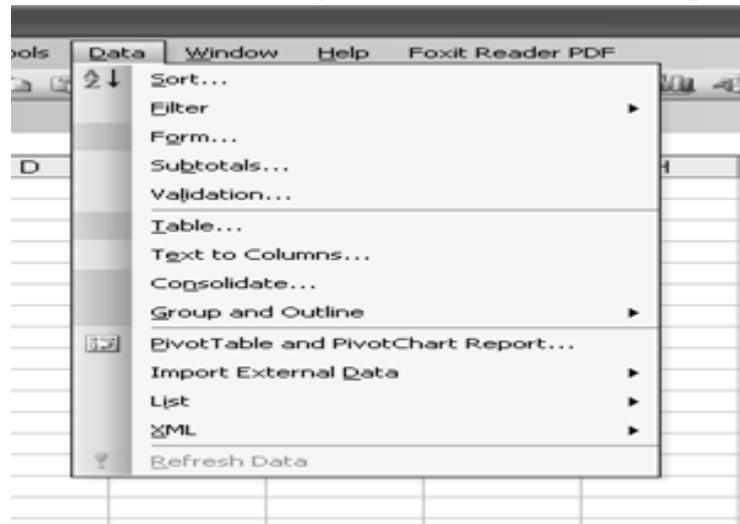
4.7.7 Data Menu

- Sort – the sort command is very important as it allows you to sort (rearrange) your data either in ascending or descending order making it an important command especially when you want to analyze your data.
- Filter – use this command to extract data or a range of data you want from your worksheet. There are two types of filters, normal filter and advanced filter.
- Form – this command turns the selected data into a form that you can use for printing or that can be used online.
- Subtotals – we can use this command to calculate the subtotals of subtitles you may be having and the grand total of your data.
- Validation – this command is used for setting restrictions on the data type that can be entered in a worksheet, for instance you can set a validation criteria where the data entered will be

Remarks

between 20 and 100. This will imply that only numbers between 20 and 100 can be entered on the restricted cells.

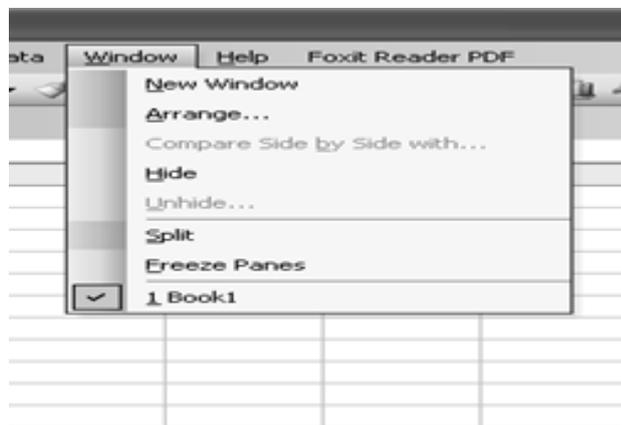
- Text to columns – we will not believe this, that this command can be used to convert text to column in an Excel sheet. The text will be split into individual columns.
- Consolidate - this command is useful in combining values from several ranges of data into a unified place.
- Group and online – We can use this command to modify your data by grouping data together and also outlining you data.
- Pivot table and pivot chart report – pivot tables and pivot reports are used to generate a report that summarizes and analyzes data.
- Import export data – use this command to import data from data sources, use it to create a web query, and use it to create a new database query.
- List – use this command to create a list and publish it.
- XML – use this command while working with XML (Extensible Markup Language) data.



4.7.8 Windows Menu

The Window menu provides different options to move between documents, and these are following:

- New Window – used to open new window with same content as the active document consists. So different parts of document can be viewed at the same time.
- Arrange All – used to show all open files in separate windows on the screen that makes easy dragging between files.
- Split – used to define a split into two panes or removes the split.
- Freeze Pane – used to freeze screen.

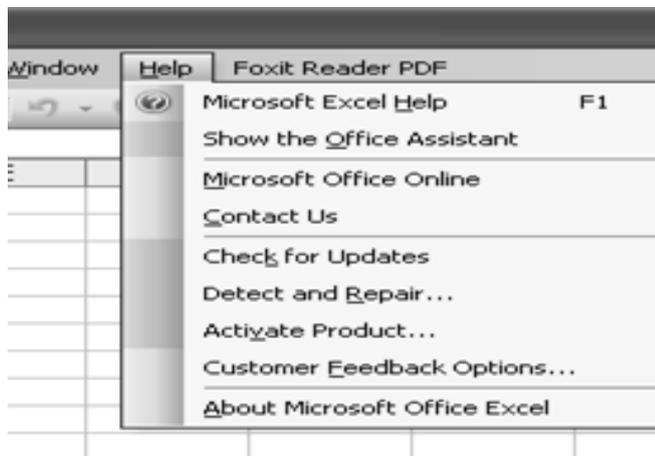


4.7.9 Help Menu

The Help menu gives the idea to do something in Excel or how something works. This menu has following options:

Remarks

- Microsoft Excel Help –used to provide the possible topics related to answer of query typed in subject of question.
- Show Office Assistant – it shows an animated paperclip that gives suggestions about what the computer thinks related to the work performed by user on document.
- Microsoft Office Online – used to take the user to website with tips on MS Office software.
- About Microsoft Excel – it specifies information about Excel i.e license information etc.

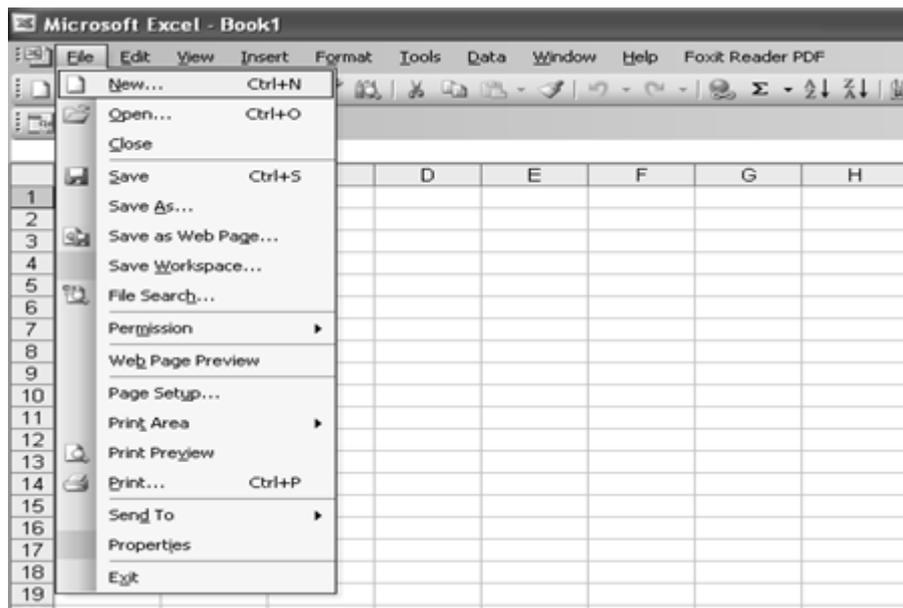


4.8 CREATING, OPENING AND SAVING WORKBOOK/WORKSHEET

4.8.1 Creating a New Workbook

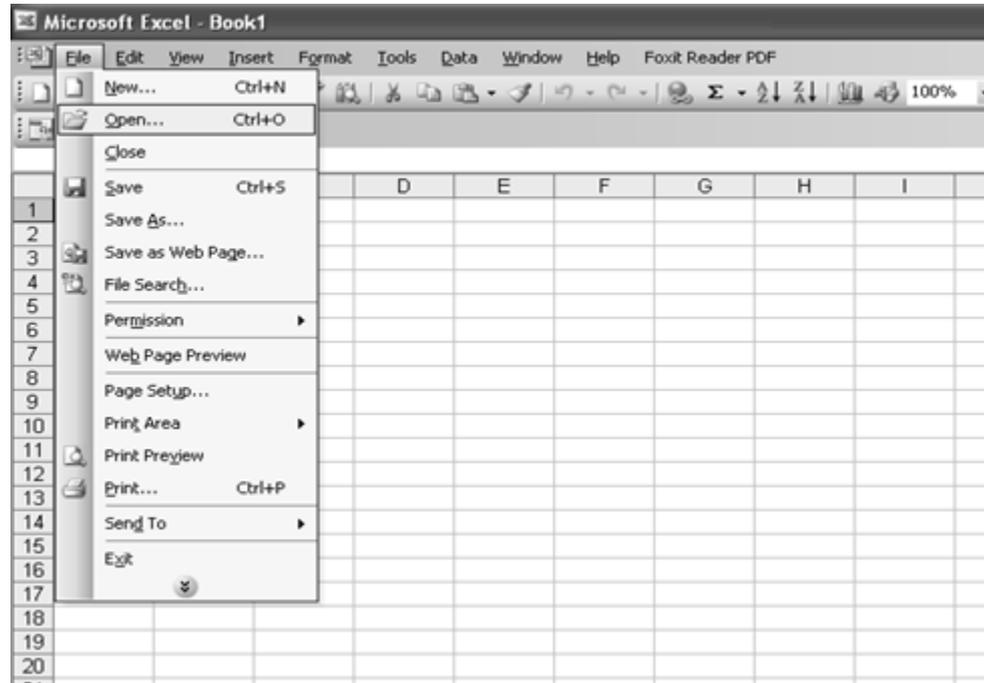
By default, excel document is called a workbook. Workbooks are named as Book1, Book2 and so on. Every workbook contains 3 worksheets. New worksheets can be added anytime in a workbook.

- To create a new workbook, click New button  on standard toolbar.
- You can also select New from File menu.
- You can also press Ctrl+ N.



4.8.2 Opening a Workbook

- To Open an existing workbook, click Open button  on standard tool bar.
- You can also select Open from File menu.
- You can also press Ctrl+ O.

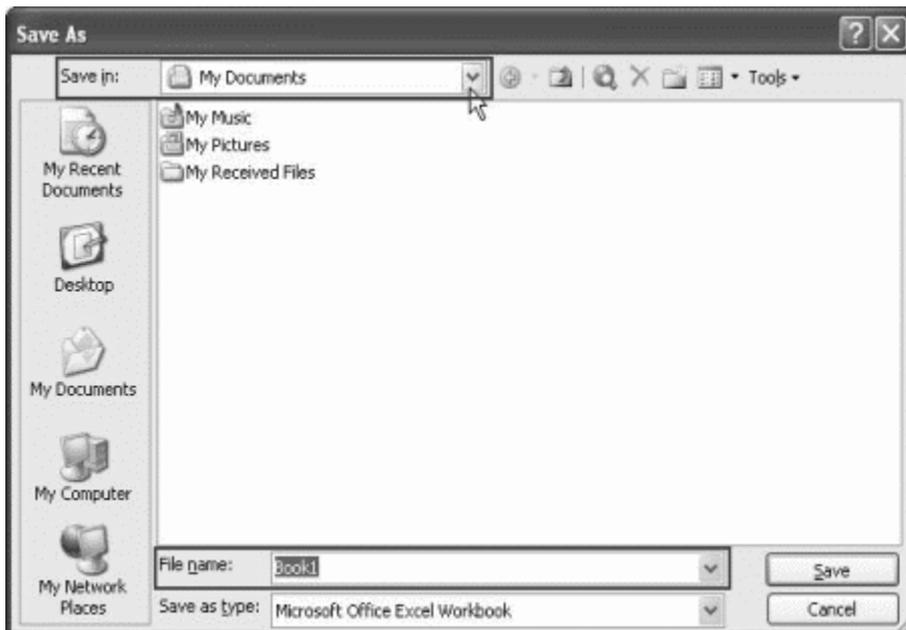


4.8.3 Saving a Workbook

- To save the document, click Save button  on standard tool bar.
- You can also click Save from File menu.
- You can also press Ctrl+S.
- A dialog box will appear.
- Save the document with name and extension.

Following are the extensions for excel document saving:

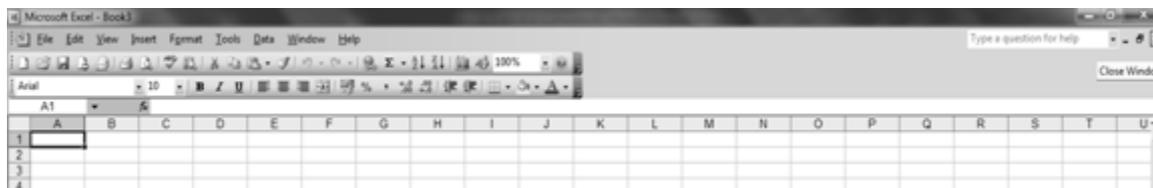
1. .xls: saving a workbook.
2. .xlw: saving workspace.
3. .xlt: template.
4. .xlb: backup file.



4.8.4 Closing a Workbook

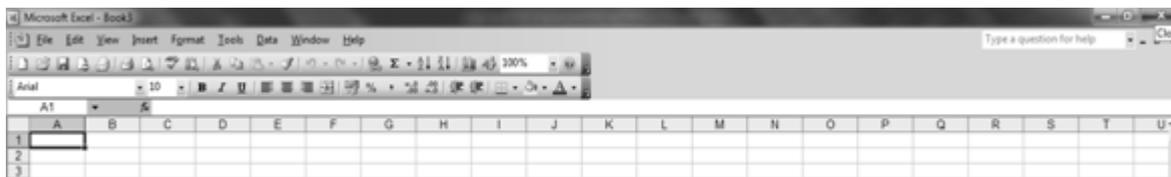
Steps to close a workbook are:

- Choose close from File menu to close active workbook.
- We can also press close on right side of menu bar.



Steps to close excel are:

- To quit excel, choose Exit from File menu.
- We can also click on close button on right side of title bar.



4.9 BASIC OPERATIONS ON WORKSHEET

Moving through cells

While working in the worksheet we can use mouse to select a specific cell or row. We can also use keyboard to move through cells in a worksheet.

- To move to the next cell, press the Arrow Keys.
- To move to the next cell to the right, press TAB.

Remarks

- To move to the next cell to the left, press SHIFT + TAB.
- To move to the edge of a data region, press CONTROL + Arrow Keys.
- To move to the first cell in the row, press HOME.
- To move to the first cell, press CONTROL + HOME.
- To move to the last cell, press CONTROL + END.
- To scroll down, press PAGE DOWN.
- To scroll up, press PAGE UP.
- To scroll to the right, press ALT + PAGE DOWN.
- To scroll to the left, press ALT + PAGE UP.
- To move to the next worksheet, press CONTROL + PAGE DOWN.
- To move to the previous worksheet, press CONTROL + PAGE UP.
- To go to a cell using the "Go To" dialog box, press F5 to open the "Go To" dialog box, type the cell co-ordinates in the Reference box and press ENTER.

Adding Worksheets

- Click on Insert menu → Worksheet.
- Rename new worksheet.

Adding Rows

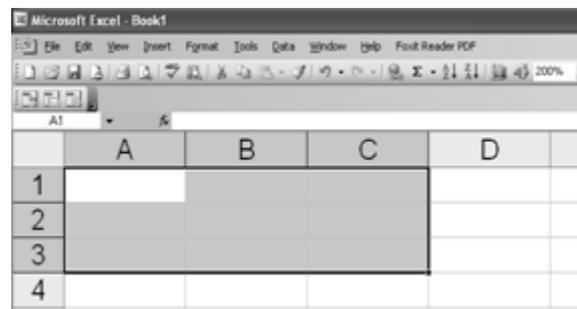
- Select the cell.
- Click on Insert menu → Row
- A new row will be inserted above the selected cell.

Adding Columns

- Select the cell.
- Click on Insert menu → Column
- A new column will be inserted before the selected cell.

Selecting Cells

A cell is to be selected before it is to be used. Single cell can be selected using mouse or keyboard. A group of cells selected is called a range. A range is a rectangular group of cells is referred to by its diagonal corners(top-left cell address and bottom-right cell address separated by a colon). Example A1:C3 implies a rectangle covering all the 9 cells from A1 to C3, i.e. A1, B1, C1, A2, B2, C2, A3, B3 and C3.



Moving cell contents

The contents of a cell can be moved using cut and paste. For this, following are the steps:

- Choose the cell to be moved.
- Click on Edit menu → Cut.
- Now, go to that position where data is to be moved.
- Click on Edit menu → Paste.

Copying cell contents

The contents of a cell can be moved using copied and paste. For this, following are the steps:

- Choose the cell to be copied.
- Click on Edit menu → Copy.
- Now, go to that position where data is to be copied.
- Click on Edit menu → Paste.

Drag and Drop Option

This option can be used to move the cell contents to a short distance. To perform Drag and Drop, simply drag the highlighted border of the selected cell to the destination cell using mouse.

Freeze Panes

To make the heading visible at all times in big worksheet, where the heading will disappear as the worksheet is scrolled, freeze panes feature is used. It can be performed by following steps:

- Click the label of the row below the row that should remain frozen at the top of the worksheet.
 - For adding Frozen panes, select Window → Freeze Panes from menu bar
 - To remove the Frozen Panes, select Window → Unfreeze Panes from menu bar
- The freeze panes will remain stationary while the remaining rows and column will move when worksheet is scrolled.

SUMMARY OF THE LESSON

You learnt the following in this lesson:

- MS-Excel is spreadsheet package used to organize data and to perform calculations.
- MS-Excel is used to create the simple database as well as prepare the document for WWW.
- In MS-Excel, a workbook, by default contains three worksheets.
- MS-Excel worksheet has a grid of cells arranged in rows which are numbered and columns which are named with letters for organizing data and performing mathematical operations.
- The content of cell can be activated by double clicking on the cell or by clicking once in the cell and then pressing function key F2.
- Different types of Menu, toolbar and their options are used to format the worksheet.
- Excel toolbars help to use various options such as opening, creating, renaming, merging, moving, formatting, analyzing, saving and printing a worksheet.

Remarks

Remarks

SELF ASSESSMENT QUESTIONS AND EXERCISES

1. Discuss the features of MS-Excel.
2. How a worksheet can be created?
3. How rows and columns can be added in Excel worksheet?
4. Differentiate absolute, reference and mixed referencing in Excel using examples.
5. Explain the steps to create, save, open and close workbook.
6. State the steps for opening and saving of worksheet.
7. How can the content of a cell in MS-Excel be activated?
8. State the steps to Move Cells content.
9. State the steps to Copy Cells content.
10. Write the steps to fill color in a cell.

CHAPTER - 5

WORKING WITH MICROSOFT EXCEL

OBJECTIVES OF THIS LESSON

This lesson is aimed to make you understand the advanced features of MS-Excel. At the end of this lesson the learner should be able to carry out the following the following:

- Formatting and printing of worksheet
- Linking of different worksheets
- Creation and printing of charts or graphs
- Recording and Playing Macros
- Using built-in functions

STRUCTURE OF THIS LESSON

- 5.1 Introduction
- 5.2 Formatting Worksheet
 - 5.2.1 Standard Formatting
 - 5.2.2 Conditional Formatting
 - 5.2.3 Auto Formatting
- 5.3 Printing Worksheet
- 5.4 Establishing Worksheet Link
- 5.5 Creating a Table
- 5.6 Charts (Graphs) in Excel
 - 5.6.1 Standard Chart Types
 - 5.6.2 Creating a Chart
 - 5.6.3 Adding Graphics
- 5.7 Printing a Chart
- 5.8 Macro
 - 5.8.1 Recording a Macro
 - 5.8.2 Running a Macro
- 5.9 Built in Functions

Summary of the Lesson

Self Assessment Questions And Exercises

5.1 INTRODUCTION

Previous lesson introduced various components of MS-Excel along with the basic operations that you can perform while working on a worksheet. However, MS Excel provides lot of other features which are very useful for preparing professional worksheets. Such features include formatting, printing, charts, macros and built-in-functions. All these features are discussed in detail in the subsequent sections of this lesson.

5.2 FORMATTING WORKSHEET

You can give professional look to worksheet by formatting it in many ways. Formatting is a process of presenting the data in an effective manner with respect to alignment, font, font size, font color, border pattern etc. There are many ways of formatting the worksheet; few commonly used methods are discussed as follows:

5.2.1 Standard Formatting

To change the font used in a cell or range of cells

- Select the cell or range of cells you wish to change.
- On the Excel **Formatting toolbar** choose a font from the **Font** drop down list.

To change other font characteristics

- Select the cell or range you wish to change.
- From the **Format** menu, click **Cells**.
- From the **Format Cells** dialog box displayed, select the **Font** tab to change the **Font**, **font style**, or **size**.
- Select the **Underline**: drop down list box to select a style of underline or **None** to remove the underlining.
- Select the **Color**: drop down list box to choose a font color.
- In the **Effects** section, you can tick **Strike through**, **Superscript**, or **Subscript**.
- To change all the settings in the dialog box back to the Normal style which is set in the **Style** dialog box, tick the **Normal font** check box.
- Select **OK** to close the **Format Cells** dialog box.

To align data between the left and right sides of a cell

- Select the cell, or cells, you wish to align.
- On the Excel **Formatting toolbar**, click on the **Align Left** icon to align data with the left edge of the cell.
- Click on the **Align Right** icon to align data with the right edge of the cell.
- Click on the **Center** icon to center data in the cell.

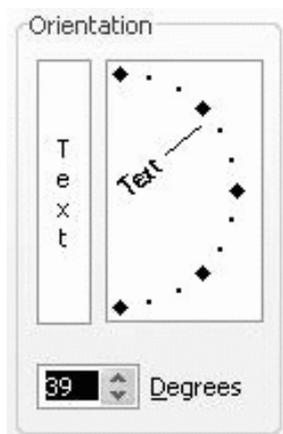
To align data between the top and bottom of a cell

- Select the cell, or cells, you wish to align.
- From the **Format** menu, click **Cells**.
- From the **Format Cells** dialog box displayed, click on the **Alignment** tab.
- In the **Text alignment** section, choose the **Top**, **Center**, or **Bottom** option in the **Vertical** area to align the data in the cell.
- To make the lines of data fit evenly within the height of a cell, tick the **Justify distributed** option and click on **OK**.

To change the orientation of data cells

- Select the cell, or cells, you wish to change.

- From the **Format** menu, click **Cells**.
- From the **Format Cells** dialog box displayed, click on the **Alignment** tab.
- In the **Orientation** section, you can change the **Degrees** of the text or use the mouse to drag the 'red small diamond' up or down. When satisfied, click on **OK**.



To wrap multiple lines of data in a cell

- Type the data you require into the cell and press **Enter**. The entry will appear as one long line. Select the cell, or cells, you wish to format.
- From the **Format** menu, click **Cells**.
- From the **Format Cells** dialog box displayed, click on the **Alignment** tab.
- In the **Text control** section, tick the **Wrap text** check box and click on **OK**.

To shrink the text into one cell

- Type the data you require into the cell and press **Enter**.
- From the **Format** menu, click **Cells**.
- From the **Format Cells** dialog box displayed, click on the **Alignment** tab.
- In the **Text control** section, tick the **Shrink to fit** check box and click on **OK**.

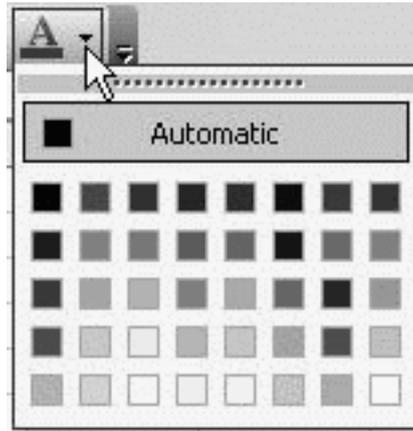
To merge several cells

- Select the cells that you wish to merge to become one cell.
- Right-click on the selected cells, click **Format Cells**.
- From the **Format Cells** dialog box displayed, click on the **Alignment** tab.
- In the **Text control** section, tick the **Merge cells** check box and click on **OK**.
Note: You also can use the **Merge and Center** icon on the Excel **Formatting** toolbar.

To change the color of text

- Select the cells containing the data you want to change the color.
- On the Excel **Formatting** toolbar, click the down arrow next to the **Font Color** icon.

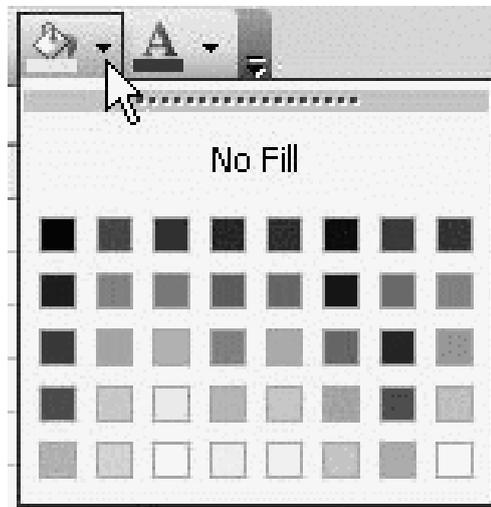
Remarks



- Choose a color from the **Font Color** palette.
- The color you selected from the **Font Color** palette will be displayed on the new icon face. Click on the icon face to apply the new color to the cell.

To apply colors to cell(s)

- Select the cell or range of cells you wish to color.
- On the Excel **Formatting** toolbar, click the down arrow next to the **Fill Color** icon.
- Choose a color from the **Fill Color** palette.



To turn off the cell(s) color

- Select the cell or range of cells you wish to color.
- On the Excel **Formatting** toolbar, click the down arrow next to the **Fill Color** icon.
- Choose **No fill**.

To change number formatting using the formatting icons

- We can quickly change the formatting of a cell or selected range by using the following icons on the **Formatting** toolbar.

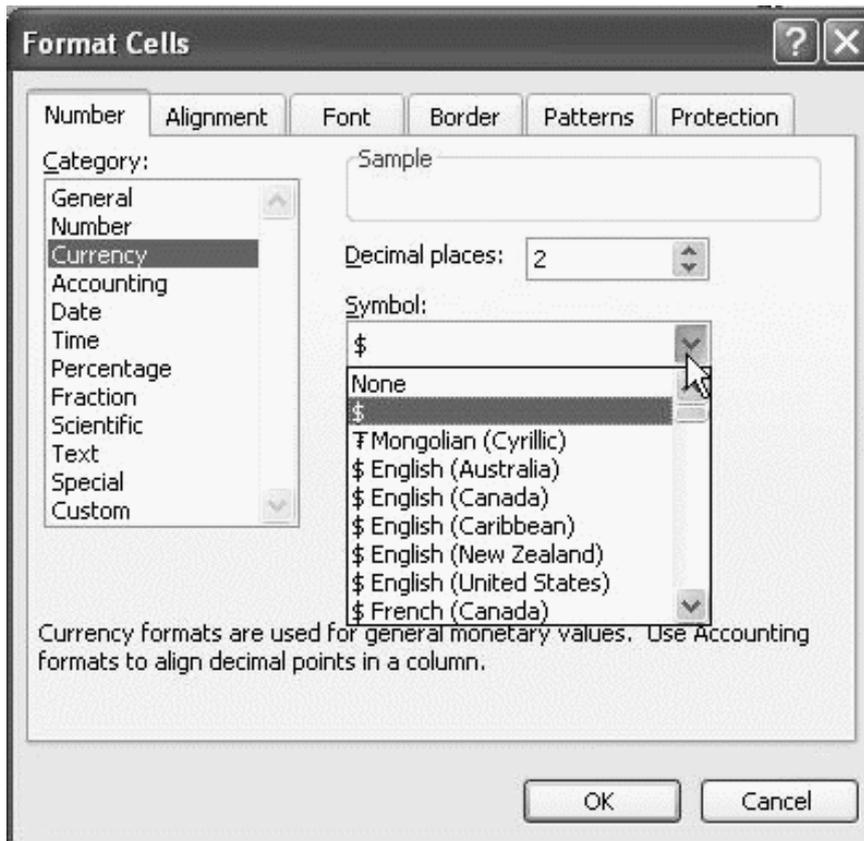


Currency	12345 will become \$12,345.00
Percent	.25 will become 25%
Comma	98765 will become 98,765.00
Increase Decimal	12,345.00 will become 12,345.000
Decrease Decimal	98,765.00 will become 98,765.0

Remarks

To format a number as a currency

- Select the cell or range of cells you want to format.
- From the **Format** menu, click **Cells**.
- From the **Format Cells** dialog box displayed, select the **Number** tab.
- In the **Category:** section, select **Currency**.



- Select the number of decimal places you require by using the **Decimal places:** spin box arrows.
- In the **Symbol:** section drop down list, select the type of currency.
- Click **OK**.

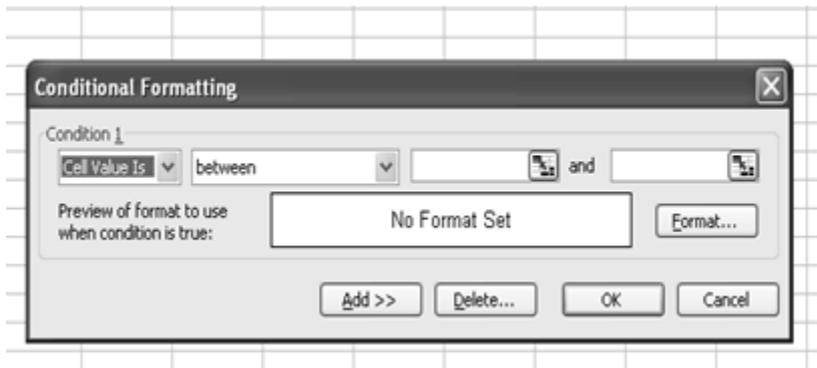
To format a number as a percentage

- Select the cell or range of cells you wish to format.
- From the **Format** menu, click **Cells**.
- From the **Format Cells** dialog box displayed, select the **Number** tab.
- In the **Category:** section, select **Percentage**.
- Select the number of decimal places you require by using the **Decimal places:** spin box arrows.
- Click **OK**

5.2.2 Conditional Formatting

This feature helps to copy the formatting style from a selected cell to another. To do this, simply copy the cell and paste its format to another cell. We can also copy format to a range of cells. Following are the steps:

- Select the range of cells in the worksheet to which conditional format is to be copied. The cell is to be copied must be the part of the range.
- Select Format menu → Conditional Formatting.
- A dialog box will appear.



- Fill the required details.

5.2.3 Auto Formatting

This feature is helpful to obtain professional-quality format for data. Auto formats are combinations of formats, such as lines and fills, that Excel applies to the indicated range of cells. Steps for Auto formatting are :

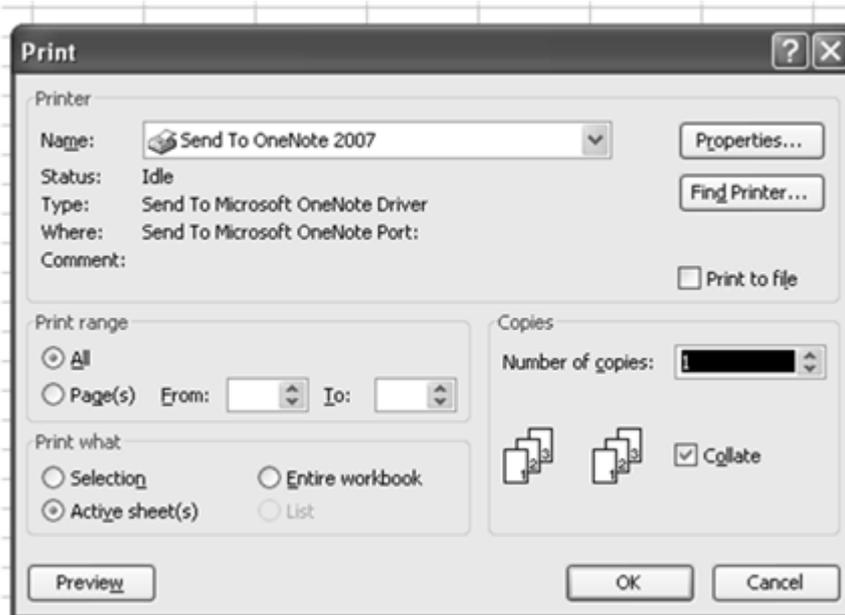
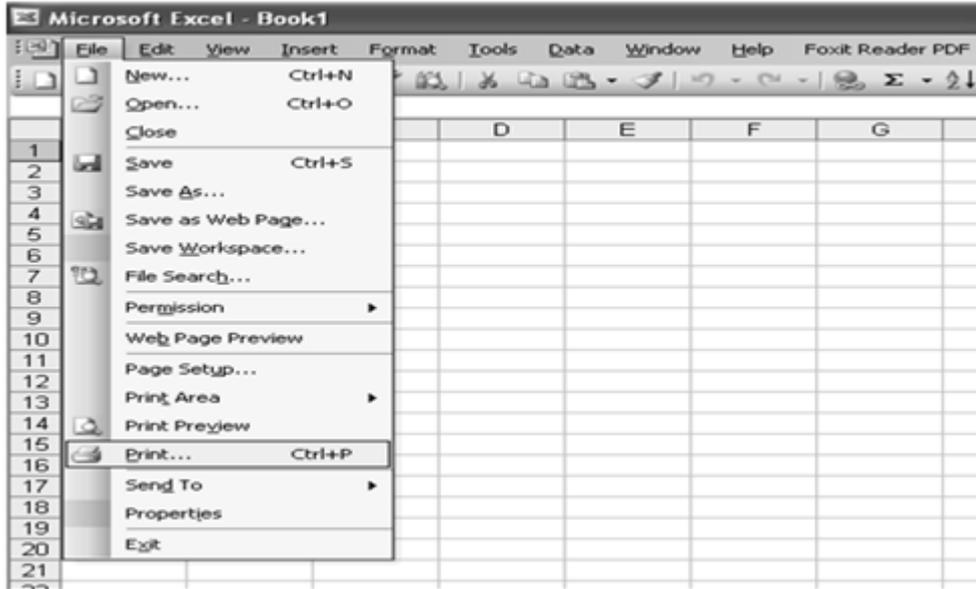
- Select cell(s) in table.
- Click **Format** menu, then click **AutoFormat**.
- Click Premade format in **Table Formats** list, to select the appropriate format.
- Click Ok when done.

5.3 PRINTING WORKSHEET

Before printing the worksheet one needs to make sure that it will appear presentable. For this printout orientation, scaling, margins, header and footer, and page numbering should be setup.

- To Print an active document, click Print button  on standard toolbar.
- You can also click Print on File menu.

- You can also press Ctrl+P.
- A dialog box will appear.
- Fill all the necessary information and press OK.

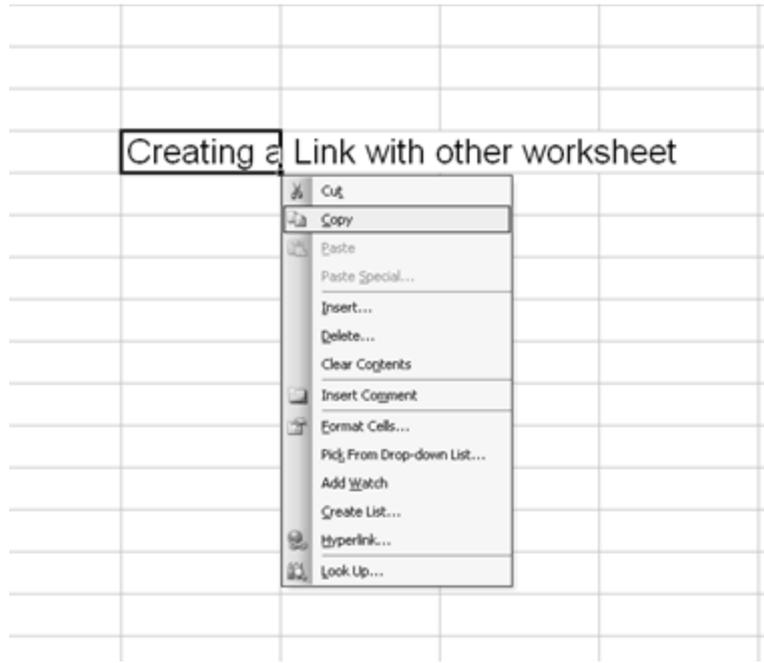


5.4 ESTABLISHING WORKSHEET LINK

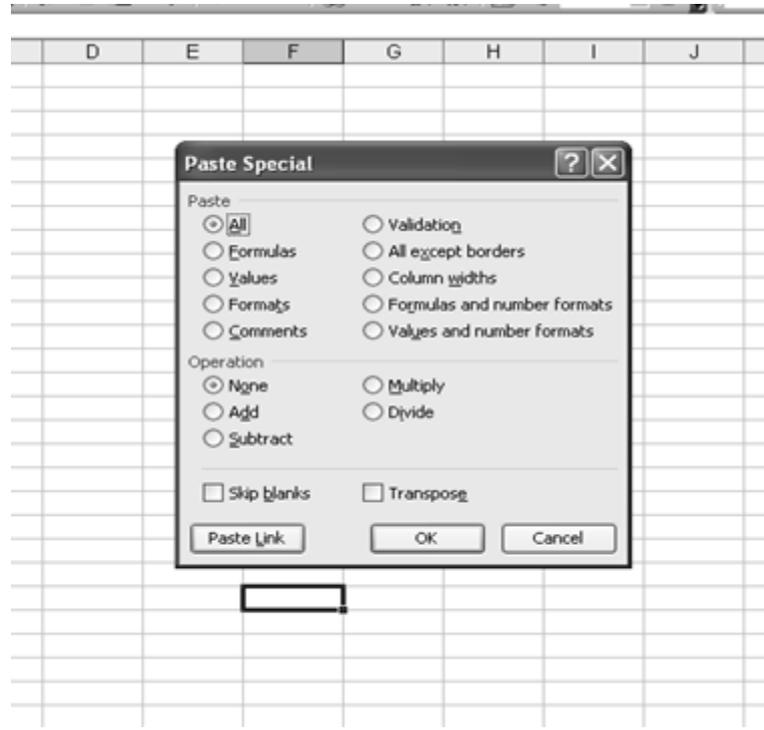
Before creating the link, *format the cell containing the link formula in the destination worksheet to equal the format of the source data.*

1. In the source worksheet, select the cell you want to link to and click the Copy button on the Edit menu. Or press Ctrl+C, or right-click and select Copy.

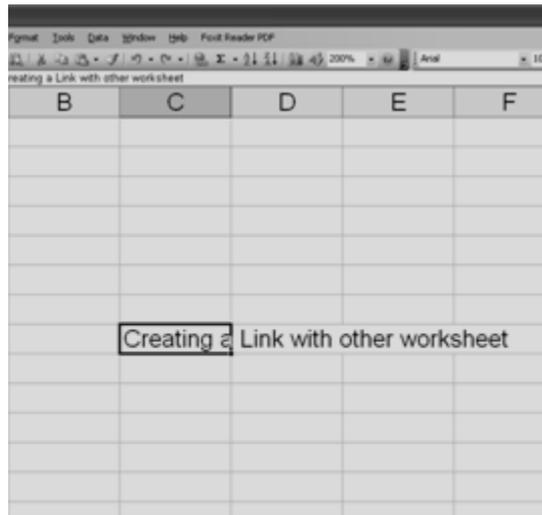
Remarks



2. Switch to the destination spreadsheet and click the cell where you want the link. Then, on the Edit menu, click Paste Special, and then click Paste Link.

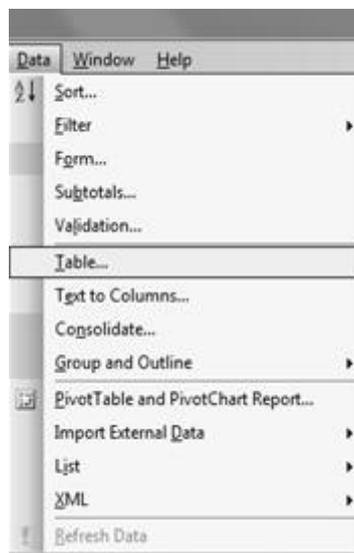


3. Return to the source worksheet and press ESC to remove the animated border around the cell.

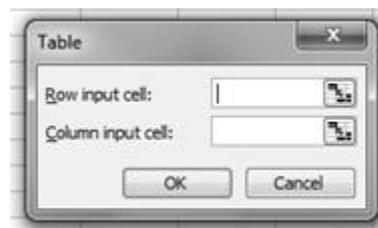


5.5 CREATING A TABLE

- Select a range of rows and columns. This range may contain values or it may be empty.
- Click on Data menu and then choose table.



- A dialog box will appear. Specify number of rows and columns.



5.6 CHARTS (GRAPHS) IN EXCEL

A chart is a graphical representation of the data in your worksheet. You can create an embedded chart, which appears on the worksheet beside the data, or, you can create a chart sheet as a separate sheet in the workbook so that it can be displayed apart from its associated data. Whichever method you choose your chart data is automatically linked to the worksheet from which it was created. If you change the data on the worksheet, the chart will change accordingly.

Excel offers many different chart types, each of which has several subtypes or variations:

- Column
- Bar
- Line
- Pie
- XY (scatter)
- Area
- Doughnut
- Radar
- Surface
- Bubble
- Stock
- Cone
- Cylinder
- Pyramid

5.6.1 Standard Chart Types

The main chart types are as follows (arranged in alphabetical order):

- **Area chart**

An area chart shows the relative importance of values over a period of time. It is similar to a line chart but emphasizes the amount of change (Magnitude of values) rather than time and the rate of change.

- **Bar chart**

Bar charts illustrate comparisons between items. Although they are similar to column charts, the categories on a bar chart are displayed vertically and the values are organized horizontally. This concentrates on comparing values and places less emphasis on time. A stacked bar chart shows the relationship of individual items to the whole.

- **Bubble chart**

A bubble chart is a variation on an xy scatter plot. The size of the bubble (data marker) indicates the value of a third variable. Arrange the data with x values in one column (or row) and the corresponding y values and bubble size in the adjacent columns (rows).

- **Column chart**

Column charts can be used to illustrate how data changes over a period of time, and to compare various items. Categories are displayed horizontally, values vertically.

- **Doughnut chart**

Doughnut charts are similar to pie charts but, unlike pie charts, can show more than one data series. Each ring represents one data series. These charts are widely used in the Far East.

- **Line chart**

This shows trends or changes in data over a period of time, at even intervals. A line chart emphasizes time flow and rate of change rather than the amount of change. If you need to show trends or changes in data at uneven or clustered intervals, an xy (scatter) chart is more appropriate.

- **Pie chart**

A pie chart can only show one data series. It compares the size of individual items with the sum of them all.

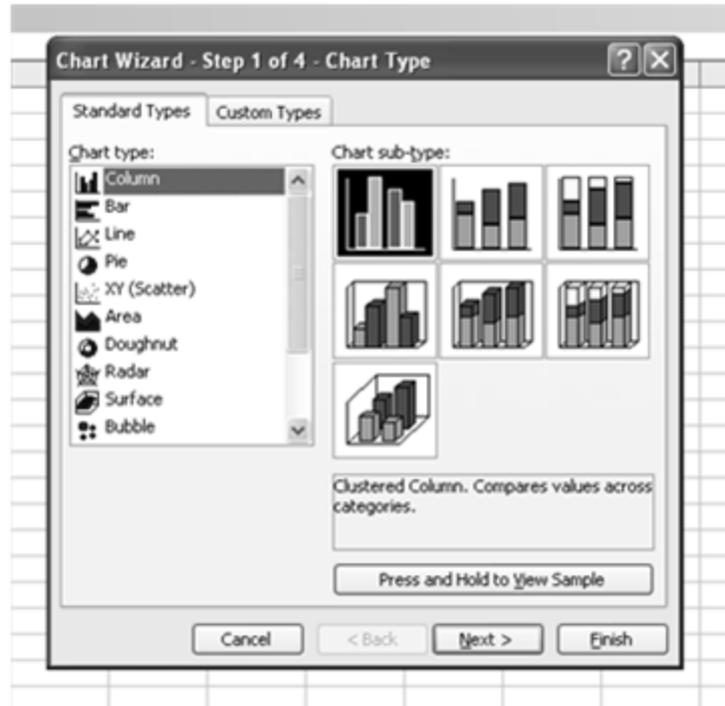
Remarks

5.6.2 Creating a Chart

- Choose a range of data for which we want to make a chart.
- Either Click on the Chart Wizard button on the toolbar
Or
Select Chart from the Insert menu.

The first Chart Wizard dialog box will appear. The Chart Wizard –
Step 1 of 4 – Chart Type dialog box that appears has two tabs. The popular built-in chart types can be found on the Standard Types tab. Chart types designed by us, the user, and combination charts designed by Excel, can be found on the Custom Types tab.

Remarks



Step 2 of 4 – Specify the data to be plotted i.e. the source of data for which chart is to be created.

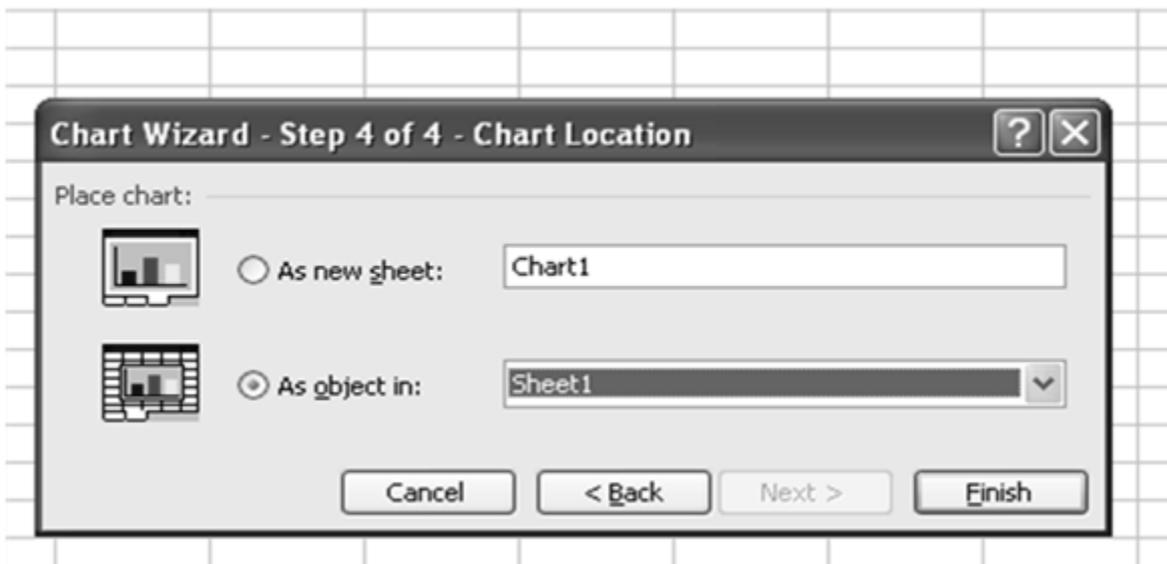


Step 3 of 4 – The number of tabs displayed in the Step 3 – Chart Options window varies, depending on the chart type. Here we have three options— Titles, Legend and Data Labels.

Remarks



Step 4 of 4 – Specify chart location in window, we can specify where this new chart is to go. You can choose to place the chart.



- As new sheet in which case a chart sheet containing just the chart will be entered in workbook — type a name for the sheet in the adjacent box.
- As object is so that the chart will be placed in an existing worksheet — the current one where our data is, or a different one (click on the down-arrow to select one).

5.6.3 Adding Graphics

Graphics can easily be added to charts and are a useful way to draw attention to a particular feature or to provide an explanation. We may decide to add an arrow and some text to chart. Whatever we are doing, you should first make sure that the Drawing toolbar is visible:

Remarks

Select View | Toolbars | Drawing

There are two possible scenarios:

- The graphics are confined to the area of the chart
- The graphics are partly/completely outside the chart area

Adding graphics

- Click on the chart to select it.
- Click on the Arrow button on the Drawing toolbar.
- Draw an arrow on your chart.

If the graphics are confined to the area of the chart, we can move the chart and the arrow will move with it. If the graphics are partly outside the chart area, the arrow will not move with the chart unless we also:

- Select the chart, arrow and text box (using Shift+click).
- Right-click on this selection.
- Select Grouping | Group.
- Click away from the selection.

5.7 PRINTING A CHART

- To print a chart that is on a separate chart sheet, Activate the chart sheet and print as usual.
 - To print a chart that is an object on a worksheet
1. Select the chart and choose File | Print — the chart will be printed on its own. Or
 2. Select an area of the worksheet containing the chart; choose File | Print and change the Print what setting to Selection — the chart will be printed together with the worksheet cells that were selected.

5.8 MACRO

A macro is a set of instructions that tells Microsoft Excel to perform one or more actions as per user requirements. Macros are like computer programs, but they run completely within Excel. We can use them to automate tedious or frequently repeated tasks.

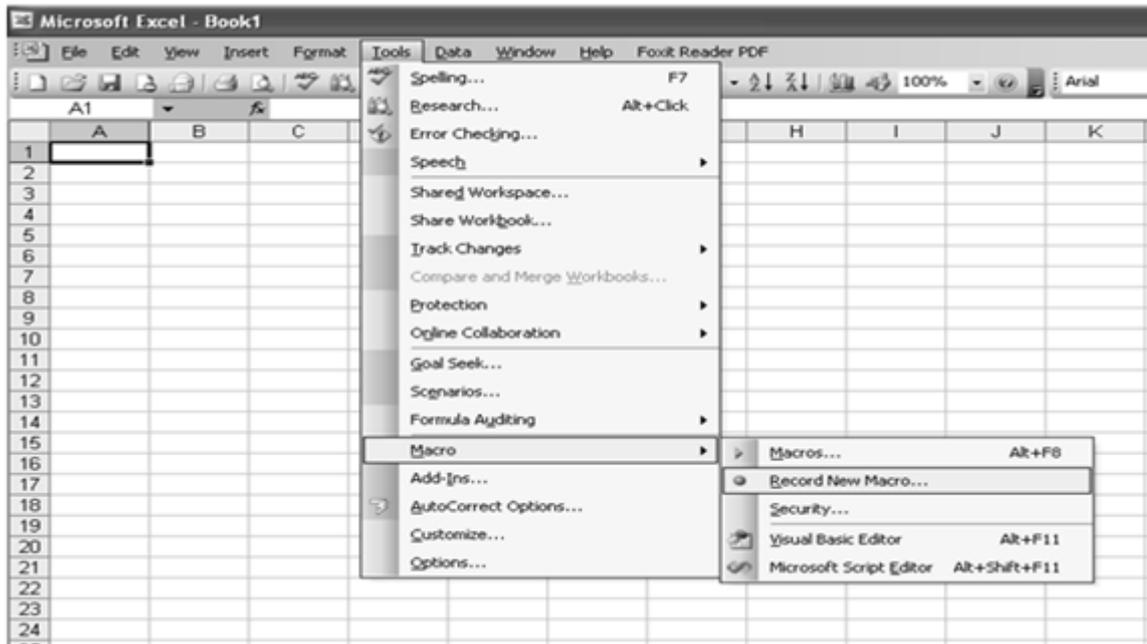
Macros can carry out sequences of actions much more quickly. For example, we can create a macro that enters a series of dates across one row of a worksheet, centers the date in each cell, and then applies border format to the row. Or we can create a macro that defines special print settings in the Page Setup dialog box and then prints the document.

Macros can be simple or extremely complex. They can also be interactive; that is, we can write macros that request information from the user and then act on that information.

There are two ways to create a macro: we can record it, or we can build it by entering instructions in a module. Either way, the instructions are encoded in the programming language Microsoft Visual Basic for Applications (VBA).

5.8.1 Recording a Macro

- On the Tools menu, point to Macro, and then select Record New Macro.
- In the Macro name box, enter the name of the macro. Click Ok.
- A Stop Recording toolbar will appear. Drag it to a new position if it is in the way.
- Perform actions we want to record.
- Press stop recording on toolbar. A macro will be saved.



5.8.2 Running a Macro

- Click on Tools menu, select Macro.
- A list of macros, earlier saved will appear. Choose macro we want to run.
- Click Run.



5.9 BUILT IN FUNCTIONS

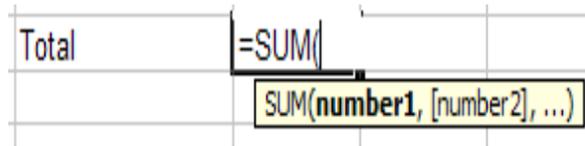
Functions are power tools which help to perform calculations on data. FUNCTIONS are predefined formulas that will calculate selected data. The user has to simply provide the values based upon which calculations are to be done. All Excel functions consist of three (3) parts: The = sign, the function name, and an argument or range enclosed in parentheses.

A FUNCTION is always identified by the =SIGN preceding the function name. The FUNCTION NAME indicates which function is being used. The ARGUMENT or RANGE is enclosed in parentheses and specifies the range of cells on which the function will act. The ARGUMENT can be a real number, a reference to a cell, a reference to a group of cells, a formula, or another function. A function can be added to the worksheet by two methods:

1. Place the cursor where you want the function result to appear and select Function from Insert menu.

Remarks

2. Manually type the function at desired place.



Functions are characterized by purpose. There are 9 function categories.

1. Mathematical Functions

With math and trigonometry functions, we can perform simple and complex mathematical calculations

- **SUM (Range)**- Sum of a group of numbers
- **SQRT(X)** - Displays the square root of a number (X)
- **PRODUCT (range)** – multiplication of given values
- **MODE (argument 1, argument 2)** – will give remainder after dividing argument 1 by argument 2

2. Statistical Functions

Statistical worksheet functions perform statistical analysis on ranges of data. This includes average, highest and lowest values, standard deviation, median, and other statistics.

- **AVERAGE (Range)** - Gives the average of a group of numbers
- **COUNT (Range)** - Counts the items in a list
- **MIN (Range)** - Displays the smallest number in the range
- **MAX (Range)** - Displays the largest number in the range

3. Financial Functions

Financial functions perform common business calculations, such as determining the payment for a loan, the future value or net present value of an investment, the principle and interest etc.

- **FV** – To calculate future value of investment
- **IPMT** – to find interest payment

4. Logical Functions

Logical functions are used to see whether a condition is true or false or to check for multiple conditions. Like,

- **AND**
- **OR**
- **NOT**
- **IF**

5. Lookup Functions

When we need to find values in lists or tables or when you need to find the reference of a cell, we can use the lookup and reference worksheet functions.

- **ADDRESS** - returns a cell reference as text
- **COLUMN** – returns the column number of reference
- **COLUMNS** – returns number of columns in a array of reference

6. Text Functions

With text functions, we can manipulate text strings in formulas. For example, we can change the case or determine the length of a text string. We can also join, or concatenate, a date to a text string. To manipulate the text, excel provides many functions like

- **CHAR**
- **CODE**
- **FIND**
- **LEFT**
- **LEN**
- **LOWER**
- **REPLACE**
- **RIGHT**
- **SEARCH**

7. Date & Time Functions

With date and time functions, we can analyze and work with date and time values in formulas. For example, if we need to use the current date in a formula, use the TODAY worksheet function, which returns the current date based on computer's system clock. There are other main function like

- **DATE**
- **DAY**
- **MONTH**
- **NOW**
- **TIME**
- **YEAR**

8. Engineering Functions: The engineering worksheet functions perform engineering analysis.

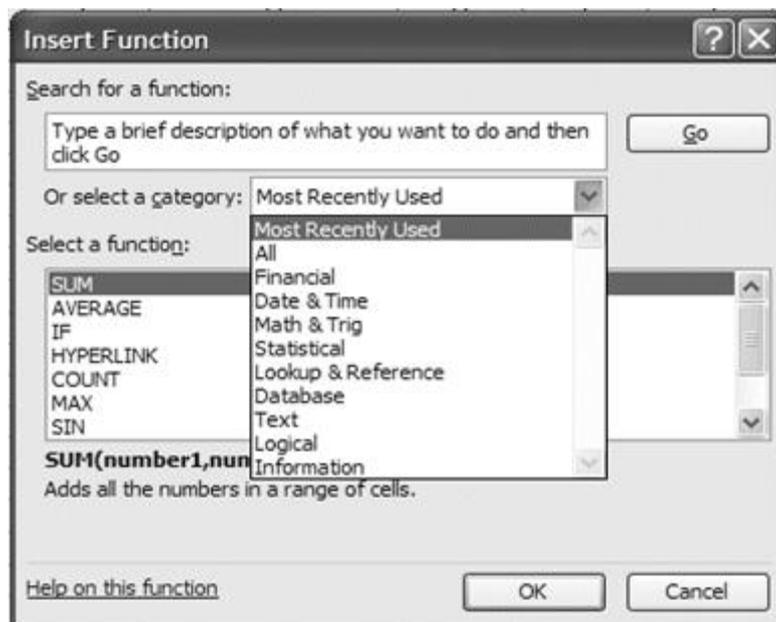
9. Database Functions: A set of functions that allows calculations on database. Following are the functions:

DAVERAGE – returns the average of values in a list or database.

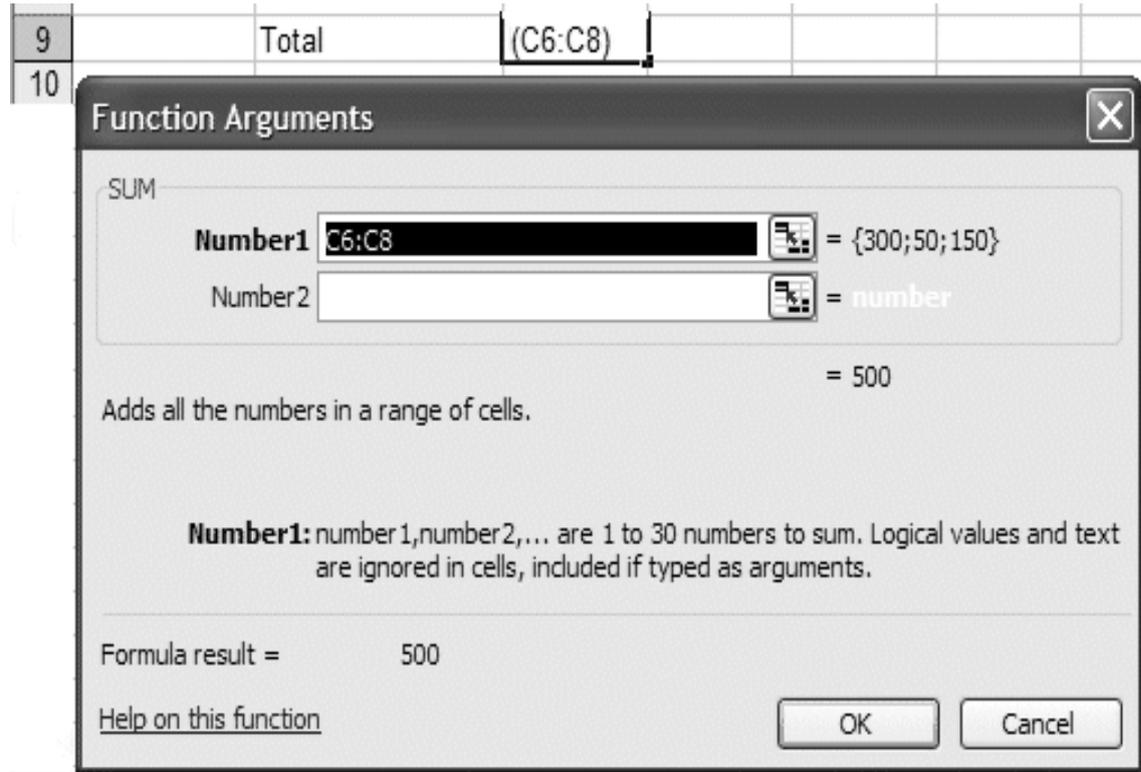
DCOUNT – counts the cells in a record that matches a specified condition

DMAX – returns the maximum value from the list or database

DMIN – returns the minimum value from the list or database



Remarks



SUMMARY OF THE LESSON

You learnt the following in this lesson:

- Formatting is done to give the professional look to worksheet.
- Charts can be created easily with the help of chart wizard.
- In Excel all formula begin with the (=) equal sign.
- Function is a built in formula in Excel.
- All elements of a chart can be alter after creating it.
- Macro facility is also available in MS-Excel. These are called to speed up any general editing sequence that a user executes in Excel spreadsheet.
- Data can be represented in graphical format using chart or graph option.
- Worksheets can be linked using hyperlink command.
- MS-Excel provides various built-in functions for different purposes such as mathematical functions, statistical functions, logical functions etc.
- Numbers can be formatted in date, time, currency and scientific notations.

SELF ASSESSMENT QUESTIONS AND EXERCISES

Remarks

11. How different worksheets can be linked with each other?
12. How worksheet functions can be categorized?
13. Write the structure of the Function.
14. Discuss various logical and statistical functions.
15. State the purpose of different mathematical functions.
16. How charts or graphs can be created in MS-Excel?
17. Write the steps to print a graph or chart.
18. What is the use of 'Macros' in MS-Excel?
19. Explain the steps to Record and Run a Macro.
20. What is the advantage of using keyboard shortcuts?
21. What is column chart?
22. What do you mean by sum function?
23. What is count function?
24. Write the steps to use Average() function.
25. What is the purpose of SQRT () function?