FUNDAMENTALS OF COMPUTER SYSTEMS LECTURE NOTES

(Subject Code: BBIT 110**)**

for

Bachelor of Science

in

Business Information Technology

COLLEGE OF TECHNOLOGY

KCA UNIVERSITY

Nairobi,kenya

Lecture Note Prepared by:

Janvan Munyoki

1. Computer Fundamentals

1.1 Introduction to Computer

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

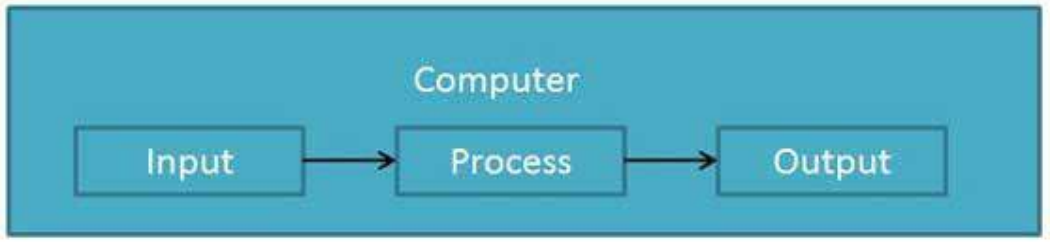
This Computer Fundamentals tutorial covers a foundational understanding of computer hardware, software, operating systems, peripherals etc.

These notes provide a general introduction to computers systems. A computer system is made up of both hardware and software. Software is another term for computer program. Software controls the computer and makes it do useful work. Without software a computer is useless. Hardware refers to the physical components that make up a computer system. These include the computer's processor, memory, monitor, keyboard, mouse, disk drive, printer and so on. In these notes we take a brief look at the functions of the different hardware components. In addition we describe the some of the essential software required for the operation of a computer system.

1.1.1 Functionalities of a computer

Any digital computer carries out five functions in gross terms:

- Takes data as input.
- Stores the data/instructions in its memory and use them when required.
- Processes the data and converts it into useful information.
- Generates the output
- Controls all the above four steps.



Definition

Computer is an electronic data processing device which

- accepts and stores data input,
- processes the data input, and
- generates the output in a required format.

1.1.3 Advantages

Following list demonstrates the advantages of computers in today's arena.

1) High Speed

- Computer is a very fast device.
- It is capable of performing calculation of very large amount of data.
- The computer has units of speed in microsecond, nanosecond, and even the picosecond.
- It can perform millions of calculations in a few seconds as compared to man who will spend many months for doing the same task.

2)Accuracy

- In addition to being very fast, computers are very accurate.
- The calculations are 100% error free.
- Computers perform all jobs with 100% accuracy provided that correct input has been given.

3)Storage Capability

- Memory is a very important characteristic of computers.
- A computer has much more storage capacity than human beings.
- It can store large amount of data.
- It can store any type of data such as images, videos, text, audio and many others.

4)Diligence

- Unlike human beings, a computer is free from monotony, tiredness and lack of concentration.
- It can work continuously without any error and boredom.
- It can do repeated work with same speed and accuracy.

5)Versatility

- A computer is a very versatile machine.
- A computer is very flexible in performing the jobs to be done.
- This machine can be used to solve the problems related to various fields.
- At one instance, it may be solving a complex scientific problem and the very next moment it may be playing a card game.

6)Reliability

- A computer is a reliable machine.
- Modern electronic components have long lives.
- Computers are designed to make maintenance easy.

7)Automation

- Computer is an automatic machine.
- Automation means ability to perform the given task automatically.
- Once a program is given to computer i.e., stored in computer memory, the program and instruction can control the program execution without human interaction.

8)Reduction in Paper Work

- The use of computers for data processing in an organization leads to reduction in paper work and results in speeding up a process.
- As data in electronic files can be retrieved as and when required, the problem of maintenance of large number of paper files gets reduced.

9)Reduction in Cost

- Though the initial investment for installing a computer is high but it substantially reduces the cost of each of its transaction.

1.1.4 Disadvantages

Following list demonstrates the disadvantages of computers in today's arena

1) No I.Q

- A computer is a machine that has no intelligence to perform any task.
- Each instruction has to be given to computer.
- A computer cannot take any decision on its own.

2) Dependency

- It functions as per a user's instruction, so it is fully dependent on human being

3) Environment

- The operating environment of computer should be dust free and suitable.

4) No Feeling

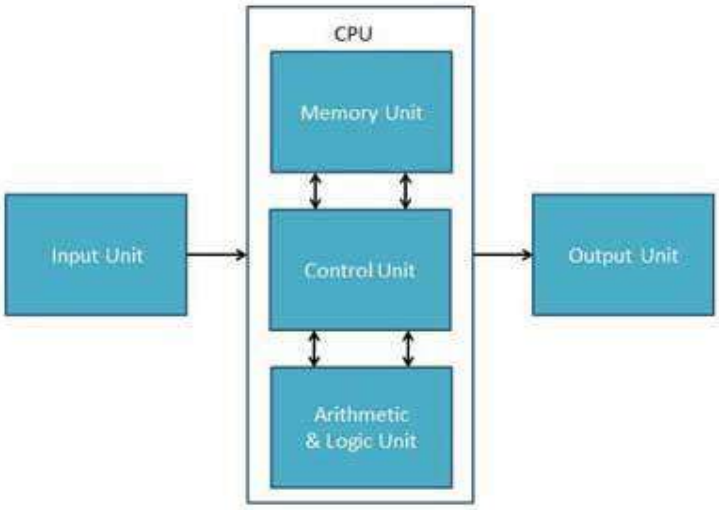
- Computers have no feelings or emotions.
- It cannot make judgement based on feeling, taste, experience, and knowledge unlike a human being.

1.1.5 Components of computer

All types of computers follow a same basic logical structure and perform the following five basic operations for converting raw input data into information useful to their users.

Sr.No.	Operation	Description
1	Take Input	The process of entering data and instructions into the computer system

2	Store Data	Saving data and instructions so that they are available for processing as and when required.
3	Processing Data	Performing arithmetic, and logical operations on data in order to convert them into useful information.
4	Output Information	The process of producing useful information or results for the user, such as a printed report or visual display.
5	Control the workflow	Directs the manner and sequence in which all of the above operations are performed.



Input Unit

This unit contains devices with the help of which we enter data into computer. This unit makes link between user and computer. The input devices translate the information into the form understandable by computer.

CPU (Central Processing Unit)

CPU is considered as the brain of the computer. CPU performs all types of data processing operations. It stores data, intermediate results and instructions(program). It controls the operation of all parts of computer.

CPU itself has following three components

- ALU(Arithmetic Logic Unit)
- Memory Unit
- Control Unit

Output Unit

Output unit consists of devices with the help of which we get the information from computer. This unit is a link between computer and users. Output devices translate the computer's output into the form understandable by users.

1.1.6 Types of Computer

Computers can be broadly classified by their speed and computing power.

Sr.No.	Type	Specifications
1	PC (Personal Computer)	It is a single user computer system having moderately powerful microprocessor
2	WorkStation	It is also a single user computer system which is similar to personal computer but have more powerful microprocessor.
3	Mini Computer	It is a multi-user computer system which is capable of supporting hundreds of users simultaneously.
4	Main Frame	It is a multi-user computer system which is capable of supporting hundreds of users simultaneously. Software technology is different from minicomputer.
5	Supercomputer	It is an extremely fast computer which can execute hundreds of millions of instructions per second.

1) PC (Personal Computer)

A PC can be defined as a small, relatively inexpensive computer designed for an individual user. PCs are based on the microprocessor technology that enables manufacturers to put an entire CPU on one chip. Businesses use personal computers for word processing, accounting, desktop publishing, and for running spreadsheet and database management applications. At home, the most popular use for personal computers is playing games and surfing Internet.

Although personal computers are designed as single-user systems, these systems are normally linked together to form a network. In terms of power, now-a-days High-end models of the Macintosh and PC offer the same computing power and graphics capability as low-end workstations by Sun Microsystems, Hewlett-Packard, and Dell.

2) Workstation

Workstation is a computer used for engineering applications (CAD/CAM), desktop publishing, software development, and other such types of applications which require a moderate amount of computing power and relatively high quality graphics capabilities.

Workstations generally come with a large, high-resolution graphics screen, large amount of RAM, inbuilt network support, and a graphical user interface. Most workstations also have a mass storage device such as a disk drive, but a special type of workstation, called a diskless workstation, comes without a disk drive.

Common operating systems for workstations are UNIX and Windows NT. Like PC, Workstations are also single-user computers like PC but are typically linked together to form a local-area network, although they can also be used as stand-alone systems.

3) Minicomputer

It is a midsize multi-processing system capable of supporting up to 250 users simultaneously.

4) Mainframe

Mainframe is very large in size and is an expensive computer capable of supporting hundreds or even thousands of users simultaneously. Mainframe executes many programs concurrently and supports many simultaneous execution of programs

5) Supercomputer

Supercomputers are one of the fastest computers currently available. Supercomputers are very expensive and are employed for specialized applications that require immense amount of mathematical calculations (number crunching). For example, weather forecasting, scientific simulations, (animated) graphics, fluid dynamic calculations, nuclear energy research, electronic design, and analysis of geological data (e.g. in petrochemical prospecting).

1.2 Computer System Hardware

Hardware represents the physical and tangible components of a computer i.e. the components that can be seen and touched.

Examples of Hardware are following:

Input devices -- keyboard, mouse etc.

Output devices -- printer, monitor etc.

Secondary storage devices -- Hard disk, CD, DVD etc.

Internal components -- CPU, motherboard, RAM etc.

1.2.1 Relationship between Hardware and Software

- Hardware and software are mutually dependent on each other. Both of them must work together to make a computer produce a useful output.
- Software cannot be utilized without supporting hardware.
- Hardware without set of programs to operate upon cannot be utilized and is useless.
- To get a particular job done on the computer, relevant software should be loaded into the hardware
- Hardware is a one-time expense.
- Software development is very expensive and is a continuing expense.
- Different software applications can be loaded on a hardware to run different jobs.
- A software acts as an interface between the user and the hardware.
- If hardware is the 'heart' of a computer system, then software is its 'soul'. Both are complimentary to each other.

1.3 Computer Memory

- Memory is used to store the information (programs and data) that the computer is currently using. It is sometimes called main or primary memory. One form of memory is called
- **RAM** - random access memory. This means that any location in memory may be accessed in the same amount of time as any other location. Memory access means one of two things, either the CPU is reading from a memory location or the CPU is writing to a memory location. When the CPU reads from a memory location, the contents of the memory location are copied to a CPU register. When the CPU writes to a memory location, the CPU copies the contents of a CPU register to the memory

location, overwriting the previous contents of the location. The CPU cannot carry out any other operations on memory locations.

- **RAM** is a form of short term or volatile memory. Information stored in short term storage is lost when the computer is switched off (or when power fails e.g. if you pull out the power lead!). There is therefore a requirement for permanent or long term storage which is also referred to as secondary storage or auxiliary storage. This role is fulfilled by disk and tape storage.

1.3.1 Random Access Memory (RAM)

RAM(Random Access Memory) is the internal memory of the CPU for storing data, program and program result. It is read/write memory which stores data until the machine is working. As soon as the machine is switched off, data is erased.

Access time in RAM is independent of the address that is, each storage location inside the memory is as easy to reach as other locations and takes the same amount of time. Data in the RAM can be accessed randomly but it is very expensive.

RAM is volatile, i.e. data stored in it is lost when we switch off the computer or if there is a power failure. Hence a backup uninterruptible power system(UPS) is often used with computers. RAM is small, both in terms of its physical size and in the amount of data it can hold.

RAM is of two types

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

1) Static RAM (SRAM)

The word **static** indicates that the memory retains its contents as long as power is being supplied. However, data is lost when the power gets down due to volatile nature. SRAM chips use a matrix of 6-transistors and no capacitors. Transistors do not require power to prevent leakage, so SRAM need not have to be refreshed on a regular basis.

Because of the extra space in the matrix, SRAM uses more chips than DRAM for the same amount of storage space, thus making the manufacturing costs higher. So SRAM is used as cache memory and has very fast access.

Characteristic of the Static RAM

- It has long life
- There is no need to refresh
- Faster
- Used as cache memory
- Large size
- Expensive
- High power consumption

2) Dynamic RAM (DRAM)

DRAM, unlike SRAM, must be continually **refreshed** in order to maintain the data. This is done by placing the memory on a refresh circuit that rewrites the data several hundred times per second. DRAM is used for most system memory because it is cheap and small. All DRAMs are made up of memory cells which are composed of one capacitor and one transistor.

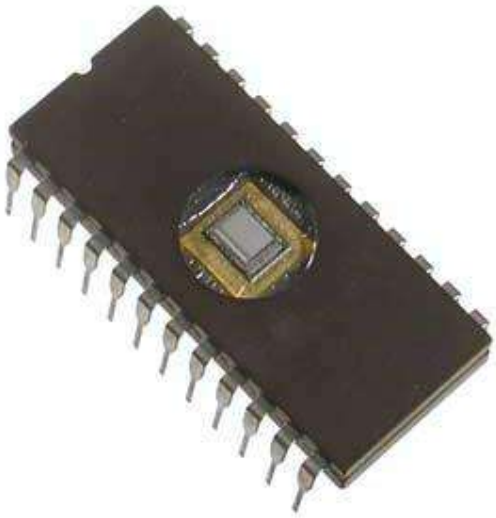
Characteristics of the Dynamic RAM

- It has short data lifetime
- Need to be refreshed continuously
- Slower as compared to SRAM
- Used as RAM
- Lesser in size
- Less expensive
- Less power consumption

1.3.2 - Read Only Memory (ROM)

ROM stands for Read Only Memory. The memory from which we can only read but cannot write on it. This type of memory is non-volatile. The information is stored permanently in such memories during manufacture. A ROM, stores such instructions that are required to start a computer. This operation is referred to as bootstrap. ROM chips are not only used in the

computer but also in other electronic items like washing machine and microwave



oven.

Following are the various types of ROM

1) MROM (Masked ROM)

The very first ROMs were hard-wired devices that contained a pre-programmed set of data or instructions. These kind of ROMs are known as masked ROMs which are inexpensive.

2) PROM (Programmable Read only Memory)

PROM is read-only memory that can be modified only once by a user. The user buys a blank PROM and enters the desired contents using a PROM program. Inside the PROM chip there are small fuses which are burnt open during programming. It can be programmed only once and is not erasable.

3) EPROM(Erasable and Programmable Read Only Memory)

The EPROM can be erased by exposing it to ultra-violet light for a duration of up to 40 minutes. Usually, an EPROM eraser achieves this function. During programming, an electrical charge is trapped in an insulated gate region. The charge is retained for more than ten years because the charge has no leakage path. For erasing this charge, ultra-violet light is passed through a quartz crystal window(lid). This exposure to ultra-violet light dissipates the charge. During normal use the quartz lid is sealed with a sticker.

4) EEPROM(Electrically Erasable and Programmable Read Only Memory)

The EEPROM is programmed and erased electrically. It can be erased and reprogrammed about ten thousand times. Both erasing and programming take about 4 to 10 ms (milli second). In EEPROM, any location can be selectively erased and programmed. EEPROMs can be erased one byte at a time, rather than erasing the entire chip. Hence, the process of re-programming is flexible but slow.

Advantages of ROM

The advantages of ROM are as follows:

- Non-volatile in nature
- These cannot be accidentally changed
- Cheaper than RAMs
- Easy to test
- More reliable than RAMs
- These are static and do not require refreshing
- Its contents are always known and can be verified

1.4 Input/Output Devices:

1.4.1 Input Devices

Following are few of the important input devices which are used in a computer:

- Keyboard
- Mouse
- Joy Stick
- Light pen
- Track Ball
- Scanner
- Graphic Tablet
- Microphone
- Magnetic Ink Card Reader(MICR)
- Optical Character Reader(OCR)
- Bar Code Reader
- Optical Mark Reader(OMR)

1)Keyboard

Keyboard is the most common and very popular input device which helps in inputting data to the computer. The layout of the keyboard is like that of traditional typewriter, although there are some additional keys provided for performing additional functions.

Keyboards are of two sizes 84 keys or 101/102 keys, but now keyboards with 104 keys or 108 keys are also available for Windows and Internet.

The keys on the keyboard are as follows:

Sr.No	Keys	Description
1	Typing Keys	These keys include the letter keys (A-Z) and digit keys (0-9) which generally give same layout as that of typewriters.
2	Numeric Keypad	It is used to enter numeric data or cursor movement. Generally, it consists of a set of 17 keys that are laid out in the same configuration used by most adding machines and calculators.
3	Function Keys	The twelve function keys are present on the keyboard which are arranged in a row at the top of the keyboard. Each function key has unique meaning and is used for some specific purpose.
4	Control keys	These keys provide cursor and screen control. It includes four directional arrow keys. Control keys also include Home, End, Insert, Delete, Page Up, Page Down, Control(Ctrl), Alternate(Alt), Escape(Esc).
5	Special Purpose Keys	Keyboard also contains some special purpose keys such as Enter, Shift, Caps Lock, Num Lock, Space bar, Tab, and Print Screen.

2) Mouse

Mouse is most popular pointing device. It is a very famous cursor-control device having a small palm size box with a round ball at its base which senses the movement of mouse and sends corresponding signals to CPU when the mouse buttons are pressed.

Generally it has two buttons called left and right button and a wheel is present between the buttons. Mouse can be used to control the position of cursor on screen, but it cannot be used to enter text into the computer.

Advantages

- Easy to use
- Not very expensive
- Moves the cursor faster than the arrow keys of keyboard.

3) Joystick

Joystick is also a pointing device which is used to move cursor position on a monitor screen. It is a stick having a spherical ball at its both lower and upper ends. The lower spherical ball moves in a socket. The joystick can be moved in all four directions.

The function of joystick is similar to that of a mouse. It is mainly used in Computer Aided Designing(CAD) and playing computer games.

4) Light Pen

Light pen is a pointing device which is similar to a pen. It is used to select a displayed menu item or draw pictures on the monitor screen. It consists of a photocell and an optical system placed in a small tube. When the tip of a light pen is moved over the monitor screen and pen button is pressed, its photocell sensing element detects the screen location and sends the corresponding signal to the CPU.

5) Track Ball

Track ball is an input device that is mostly used in notebook or laptop computer, instead of a mouse. This is a ball which is half inserted and by moving fingers on ball, pointer can be moved. Since the whole device is not moved, a track ball requires less space than a mouse. A track ball comes in various shapes like a ball, a button and a square.

6) Scanner

Scanner is an input device which works more like a photocopy machine. It is used when some information is available on a paper and it is to be transferred to the hard disc of the computer for further manipulation. Scanner captures images from the source which are then converted into the digital form that can be stored on the disc. These images can be edited before they are printed.

7) Digitizer

Digitizer is an input device which converts analog information into digital form. Digitizer can convert a signal from the television or camera into a series of numbers that could be stored in a computer. They can be used by the computer to create a picture of whatever the camera had been pointed at. Digitizer is also known as Tablet or Graphics Tablet because it converts graphics and pictorial data into binary inputs. A graphic tablet as digitizer is used for doing fine works of drawing and image manipulation applications.

8) Microphone

Microphone is an input device to input sound that is then stored in digital form. The microphone is used for various applications like adding sound to a multimedia presentation or for mixing music.

9) Magnetic Ink Card Reader(MICR)

MICR input device is generally used in banks because of a large number of cheques to be processed every day. The bank's code number and cheque number are printed on the cheques with a special type of ink that contains particles of magnetic material that are machine readable. This reading process is called Magnetic Ink Character Recognition (MICR). The main advantages of MICR is that it is fast and less error prone.

Optical Character Reader(OCR)

OCR is an input device used to read a printed text. OCR scans text optically character by character, converts them into a machine readable code and stores the text on the system memory.

10) Bar Code Readers

Bar Code Reader is a device used for reading bar coded data (data in form of light and dark lines). Bar coded data is generally used in labelling goods, numbering the books etc. It may be a hand held scanner or may be embedded in a stationary scanner. Bar Code Reader scans a bar code image, converts it into an alphanumeric value which is then fed to the computer to which bar code reader is connected.

1.4.2 Output Devices

Following are few of the important output devices which are used in a computer.

- Monitors
- Graphic Plotter
- Printer

1.4.3 Monitors

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

There are two kinds of viewing screen used for monitors.

- Cathode-Ray Tube (CRT)
- Flat- Panel Display

1) Cathode-Ray Tube (CRT) Monitor

The CRT display is made up of small picture elements called pixels. The smaller the pixels, the better the image clarity, or resolution. It takes more than one illuminated pixel to form whole character, such as the letter 'e' in the word help.

A finite number of characters can be displayed on a screen at once. The screen can be divided into a series of character boxes - fixed location on the screen where a standard character can be placed. Most screens are capable of displaying 80 characters of data horizontally and 25 lines vertically. There are some disadvantages of CRT:

- Large in Size
- High power consumption

2) Flat-Panel Display Monitor

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

The flat-panel display is divided into two categories:

- **Emissive Displays -** The emissive displays are devices that convert electrical energy into light. Example are plasma panel and LED(Light-Emitting Diodes).
- **Non-Emissive Displays -** The Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns. Example is LCD(Liquid-Crystal Device)

1.4.4 Printers

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

There are two types of printers:

- Impact Printers
- Non-Impact Printers

A) Impact Printers

The impact printers print the characters by striking them on the ribbon which is then pressed on the paper.

Characteristics of Impact Printers are the following:

- Very low consumable costs
- Very noisy
- Useful for bulk printing due to low cost
- There is physical contact with the paper to produce an image

These printers are of two types

- Character printers
- Line printers

Character Printers

Character printers are the printers which print one character at a time.

These are further divided into two types:

- Dot Matrix Printer(DMP)
- Daisy Wheel

1) Dot Matrix Printer

In the market one of the most popular printers is Dot Matrix Printer. These printers are popular because of their ease of printing and economical price. Each character printed is in form of pattern of dots and head consists of a Matrix of Pins of size (5*7, 7*9, 9*7 or 9*9) which come out to form a character that is why it is called Dot Matrix Printer.

Advantages

- Inexpensive
- Widely Used
- Other language characters can be printed

Disadvantages

- Slow Speed
- Poor Quality

2) Daisy Wheel

Head is lying on a wheel and pins corresponding to characters are like petals of Daisy (flower name) that is why it is called Daisy Wheel Printer. These printers are generally used for word-processing in offices which require a few letters to be sent here and there with very nice quality.

Advantages

- More reliable than DMP
- Better quality
- The fonts of character can be easily changed

Disadvantages

- Slower than DMP
- Noisy
- More expensive than DMP

3) Line Printers

Line printers are the printers which print one line at a time.

These are of further two types

- Drum Printer
- Chain Printer

4) Drum Printer

This printer is like a drum in shape so it is called drum printer. The surface of drum is divided into number of tracks. Total tracks are equal to size of paper i.e. for a paper width of 132 characters, drum will have 132 tracks. A character set is embossed on track. The different character sets available in the market are 48 character set, 64 and 96 characters set. One rotation of drum prints one line. Drum printers are fast in speed and can print 300 to 2000 lines per minute.

Advantages

- Very high speed

Disadvantages

- Very expensive
- Characters fonts cannot be changed

5) Chain Printer

In this printer, chain of character sets are used so it is called Chain Printer. A standard character set may have 48, 64, or 96 characters.

Advantages

- Character fonts can easily be changed.
- Different languages can be used with the same printer.

Disadvantages

- Noisy

B) Non-impact Printers

Non-impact printers print the characters without using ribbon. These printers print a complete page at a time so they are also called as Page Printers.

These printers are of two types

- Laser Printers
- Inkjet Printers

Characteristics of Non-impact Printers

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

1) Laser Printers

These are non-impact page printers. They use laser lights to produce the dots needed to form the characters to be printed on a page.

Advantages

- Very high speed
- Very high quality output
- Give good graphics quality
- Support many fonts and different character size

Disadvantages

- Expensive.
- Cannot be used to produce multiple copies of a document in a single printing.

2) Inkjet Printers

Inkjet printers are non-impact character printers based on a relatively new technology. They print characters by spraying small drops of ink onto paper. Inkjet printers produce high quality output with presentable features.

They make less noise because no hammering is done and these have many styles of printing modes available. Colour printing is also possible. Some models of Inkjet printers can produce multiple copies of printing also.

Advantages

- High quality printing
- More reliable

Disadvantages

- Expensive as cost per page is high
- Slow as compared to laser printer

1.5 Interaction between User and Computer

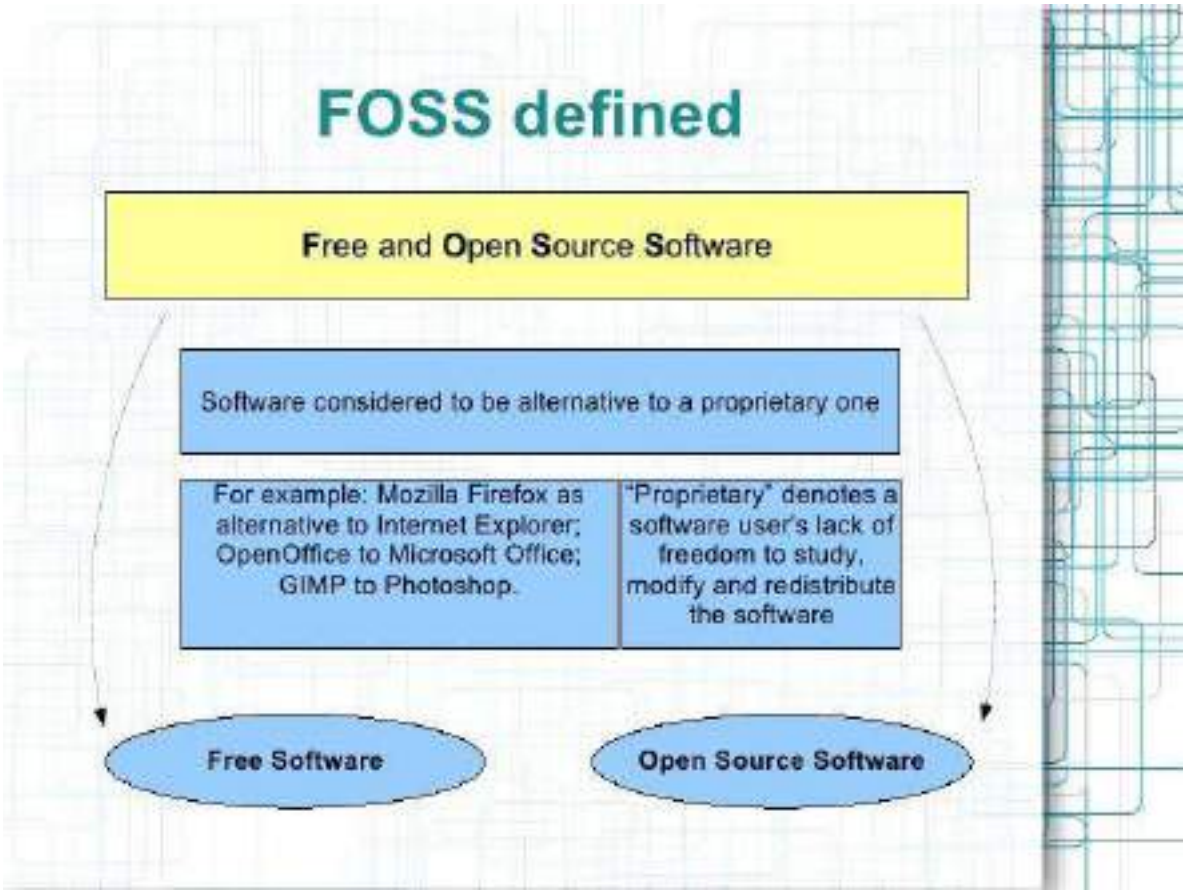
Human–computer interaction (HCI) involves the study, planning, design and uses of the interfaces between people (users) and computers.

HCI (human-computer interaction) is the study of how people interact with computers and to what extent computers are or are not developed for successful interaction with human beings.

HCI is a very broad discipline that encompasses different specialties with different concerns regarding computer development: computer science is concerned with the application design and engineering of the human interfaces; sociology and anthropology are concerned with the interactions between technology, work and organization and the way that human systems and technical systems mutually adapt to each other; ergonomics is concerned with the safety of computer systems and the safe limits of human cognition and sensation; psychology is concerned with the cognitive processes of humans and the behavior of users; linguistics is concerned with the development of human and machine languages and the relationship between the two.

1.6 Introduction to free and open source software

Open Source Software:
Software for which:
The source code is available to the end-user;
The source code can be modified by the end-user;
There are no restrictions on redistribution or use;
The licensing conditions are usually intended to facilitate continued re-use and wide availability of the software, in both commercial and non-commercial contexts;
The cost of acquisition to the end-user is often minimal.



2. Application Of Computers In Various Fields

Business

A computer has high speed of calculation, diligence, accuracy, reliability, or versatility which has made it an integrated part in all business organizations.

Computer is used in business organizations for:

- Payroll calculations
- Budgeting
- Sales analysis
- Financial forecasting
- Managing employee database
- Maintenance of stocks, etc.

Banking

Today, banking is almost totally dependent on computers.

Banks provide the following facilities:

- Online accounting facility, which includes checking current balance, making deposits and overdrafts, checking interest charges, shares, and trustee records.

- ATM machines which are completely automated are making it even easier for customers to deal with banks.

Insurance

Insurance companies are keeping all records up- to-date with the help of computers. Insurance companies, finance houses, and stock broking firms are widely using computers for their concerns.

Insurance companies are maintaining a database of all clients with information showing:

- Procedure to continue with policies
- Starting date of the policies
- Next due installment of a policy
- Maturity date
- Interests due
- Survival benefits
- Bonus

Education

The computer helps in providing a lot of facilities in the education system.

- The computer provides a tool in the education system known as CBE (Computer Based Education).
- CBE involves control, delivery, and evaluation of learning.
- Computer education is rapidly increasing the graph of number of computer students.
- There are a number of methods in which educational institutions can use a computer to educate the students.
- It is used to prepare a database about performance of a student and analysis is carried out on this basis.

Marketing

In marketing, uses of the computer are following:

- **Advertising** - With computers, advertising professionals create art and graphics, write and revise copy, and print and disseminate ads with the goal of selling more products.
- **Home Shopping** - Home shopping has been made possible through the use of computerized catalogues that provide access to product information and permit direct entry of orders to be filled by the customers.

Healthcare

Computers have become an important part in hospitals, labs, and dispensaries. They are being used in hospitals to keep the record of patients and medicines. It is also used in scanning and diagnosing different diseases. ECG, EEG, ultrasounds and CT scans, etc. are also done by computerized machines.

Following are some major fields of health care in which computers are used.

- **Diagnostic System** - Computers are used to collect data and identify the cause of illness.

- **Lab-diagnostic System** - All tests can be done and the reports are prepared by computer.
- **Patient Monitoring System** - These are used to check the patient's signs for abnormality such as in Cardiac Arrest, ECG, etc.
- **Pharma Information System** - Computer is used to check drug labels, expiry dates, harmful side effects, etc.
- **Surgery** - Nowadays, computers are also used in performing surgery.

Engineering Design

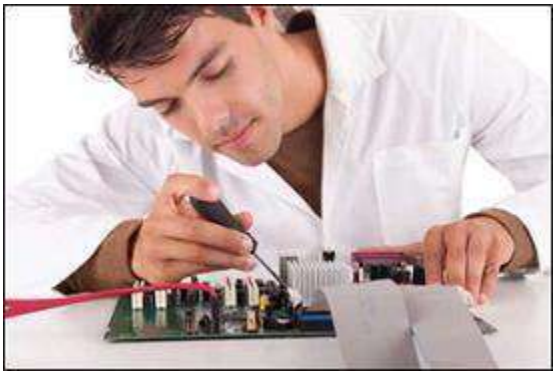
Computers are widely used for Engineering purpose.

One of the major areas is CAD (Computer Aided Design) that provides creation and modification of images. Some of the fields are:

- **Structural Engineering** - Requires stress and strain analysis for design of ships, buildings, budgets, airplanes, etc.

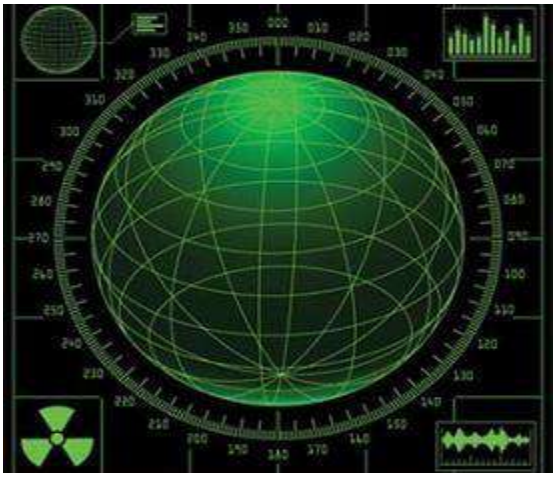
- **Industrial Engineering** - Computers deal with design, implementation, and improvement of integrated systems of people, materials, and equipment.

- **Architectural Engineering** - Computers help in planning towns, designing buildings, determining a range of buildings on a site using both 2D and 3D drawings.



Military

Computers are largely used in defence. Modern tanks, missiles, weapons, etc. Military also employs computerized control systems. Some military areas where a computer has been used are:



- Missile Control
- Military Communication
- Military Operation and Planning
- Smart Weapons

Communication

Communication is a way to convey a message, an idea, a picture, or speech that is received and understood clearly and correctly by the person
for whom it is meant. Some main areas in this category are:

- E-mail
- Chatting
- Usenet
- FTP
- Telnet
- Video-conferencing

Government

Computers play an important role in government services. Some major fields in this category are:

- Budgets
- Sales tax department
- Income tax department
- Computation of male/female ratio
- Computerization of voters lists
- Computerization of PAN card
- Weather forecasting

3 .Basics Of Operating System

2.1 Definition of Operating System:

"An Operating system is a program that controls the execution of application programs and acts as an interface between the user of a computer and the computer hardware."
A more common definition is that the operating system is the one program running at all times on the computer (usually called the kernel), with all else being applications programs.

An Operating system is concerned with the allocation of resources and services, such as memory, processors, devices and information. The Operating System correspondingly includes programs to manage these resources, such as a traffic controller, a scheduler, memory management module, I/O programs, and a file system.

2.2 Types Of Operating Systems:

Operating systems are there from the very first computer generation. Operating systems keep evolving over the period of time.
Following are few of the important types of operating system which are most commonly used.

1)Batch Operating System

The users of batch operating system do not interact with the computer directly. Each user prepares his job on an off-line device like punch cards and submits it to the computer operator. To speed up processing, jobs with similar needs are batched together and run as a group. Thus, the programmers left their programs with the operator. The operator then sorts programs into batches with similar requirements.
The problems with Batch Systems are following.

- Lack of interaction between the user and job.
- CPU is often idle, because the speeds of the mechanical I/O devices are slower than CPU.
- Difficult to provide the desired priority.

2)Time Sharing Operating System

Time sharing is a technique which enables many people, located at various terminals, to use a particular computer system at the same time. Time-sharing or multitasking is a logical extension of multiprogramming. Processor's time which is shared among multiple users simultaneously is termed as time-sharing. The main difference between Multiprogrammed

Batch Systems and Time-Sharing Systems is that in case of multiprogrammed batch systems, objective is to maximize processor use, whereas in Time-Sharing Systems objective is to minimize response time.
Multiple jobs are executed by the CPU by switching between them, but the switches occur so frequently. Thus, the user can receive an immediate response. For example, in a transaction processing, processor execute each user program in a short burst or quantum of computation. That is if n users are present, each user can get time quantum. When the user submits the command, the response time is in few seconds at most.
Operating system uses CPU scheduling and multiprogramming to provide each user with a small portion of a time. Computer systems that were designed primarily as batch systems have been modified to time-sharing systems.
Advantages of Timesharing operating systems are following

- Provide advantage of quick response.
- Avoids duplication of software.
- Reduces CPU idle time.

Disadvantages of Timesharing operating systems are following.

- Problem of reliability.
- Question of security and integrity of user programs and data.
- Problem of data communication.

3) Distributed Operating System

Distributed systems use multiple central processors to serve multiple real time application and multiple users. Data processing jobs are distributed among the processors accordingly to which one can perform each job most efficiently.
The processors communicate with one another through various communication lines (such as high-speed buses or telephone lines). These are referred as loosely coupled systems or distributed systems. Processors in a distributed system may vary in size and function. These processors are referred as sites, nodes, and computers and so on.
The advantages of distributed systems are following.

- With resource sharing facility user at one site may be able to use the resources available at another.
- Speedup the exchange of data with one another via electronic mail.
- If one site fails in a distributed system, the remaining sites can potentially continue operating.
- Better service to the customers.
- Reduction of the load on the host computer.
- Reduction of delays in data processing.

4) Network Operating System

Network Operating System runs on a server and and provides server the capability to manage data, users, groups, security, applications, and other networking functions. The primary purpose of the network operating system is to allow shared file and printer access among multiple computers in a network, typically a local area network (LAN), a private network or to other networks. Examples of network operating systems are Microsoft Windows Server 2003, Microsoft Windows Server 2008, UNIX, Linux, Mac OS X, Novell NetWare, and BSD.
The advantages of network operating systems are following.

- Centralized servers are highly stable.
- Security is server managed.
- Upgrades to new technologies and hardware can be easily integrated into the system.
- Remote access to servers is possible from different locations and types of systems.

The disadvantages of network operating systems are following.

- High cost of buying and running a server.
- Dependency on a central location for most operations.
- Regular maintenance and updates are required.

5) Real time Operating System

Real time system is defines as a data processing system in which the time interval required to process and respond to inputs is so small that it controls the environment. Real time processing is always on line whereas on line system need not be real time. The time taken by the system to respond to an input and display of required updated information is termed as response time. So in this method response time is very less as compared to the online processing.

Real-time systems are used when there are rigid time requirements on the operation of a processor or the flow of data and real-time systems can be used as a control device in a dedicated application. Real-time operating system has well-defined, fixed time constraints otherwise system will fail. For example Scientific experiments, medical imaging systems, industrial control systems, weapon systems, robots, and home-appliance controllers, Air traffic control system etc.

There are two types of real-time operating systems.

Hard real-time systems

Hard real-time systems guarantee that critical tasks complete on time. In hard real-time systems secondary storage is limited or missing with data stored in ROM. In these systems virtual memory is almost never found.

Soft real-time systems

Soft real time systems are less restrictive. Critical real-time task gets priority over other tasks and retains the priority until it completes. Soft real-time systems have limited utility than hard real-time systems. For example, Multimedia, virtual reality, Advanced Scientific Projects like undersea exploration and planetary rovers etc.

2.3 Functions of an Operating System:

Following are some of important functions of an operating System

- Memory Management
- Processor Management
- Device Management
- File Management
- Security
- Control over system performance
- Job accounting
- Error detecting aids
- Coordination between other software and users

1) Memory Management

Memory management refers to management of Primary Memory or Main Memory. Main memory is a large array of words or bytes where each word or byte has its own address. Main memory provides a fast storage that can be access directly by the CPU. So for a program to be executed, it must in the main memory. Operating System does the following activities for memory management.

- Keeps tracks of primary memory i.e. what part of it are in use by whom, what part are

not in use.

- In multiprogramming, OS decides which process will get memory when and how much.
- Allocates the memory when the process requests it to do so.
- De-allocates the memory when the process no longer needs it or has been terminated.

2) Processor Management

In multiprogramming environment, OS decides which process gets the processor when and how much time. This function is called process scheduling. Operating System does the following activities for processor management.

- Keeps tracks of processor and status of process. Program responsible for this task is known as traffic controller.
- Allocates the processor (CPU) to a process.
- De-allocates processor when processor is no longer required.

3) Device Management

OS manages device communication via their respective drivers. Operating System does the following activities for device management.

- Keeps tracks of all devices. Program responsible for this task is known as the I/O controller.
- Decides which process gets the device when and for how much time.
- Allocates the device in the efficient way.
- De-allocates devices.

4)File Management

A file system is normally organized into directories for easy navigation and usage. These directories may contain files and other directions. Operating System does the following activities for file management.

- Keeps track of information, location, uses, status etc. The collective facilities are often known as file system.
- Decides who gets the resources.
- Allocates the resources.
- De-allocates the resources

5)Other Important Activities

Following are some of the important activities that Operating System does.

- **Security** -- By means of password and similar other techniques, preventing unauthorized access to programs and data.
- **Control over system performance** -- Recording delays between request for a service and response from the system.
- **Job accounting** -- Keeping track of time and resources used by various jobs and users.
- **Error detecting aids** -- Production of dumps, traces, error messages and other debugging and error detecting aids.
- **Coordination between other software and users** -- Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

Icons are small pictures that represent files, folders, programs, and other items. When

2.4 Working With Windows Operating System

The Desktop :

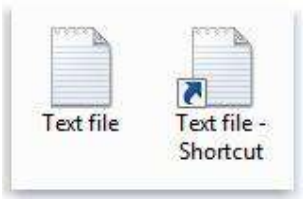
The **desktop** is the main screen area that you see after you turn on your computer and log on to Windows. When you open programs or folders, they appear on the desktop. You can also put things on the desktop, such as files and folders, and arrange them as you want.

Working with desktop icons

you first start Windows, you'll see at least one icon on your desktop: The Recycle Bin. Some examples of desktop icons are shown in picture.

Double-clicking a desktop icon starts or opens the item it represents.

Adding and removing icons from the desktop



You can choose which icons appear on the desktop—you can add or remove an icon at any time. If you want easy access from the desktop to your favorite files or programs, you can create shortcuts to them. A shortcut is an icon that represents a link to an item, rather than the item itself. When you double-click a shortcut, the item opens. If you delete a shortcut, only the shortcut is removed, not the original item. You can identify shortcuts by the arrow on theiricon.

Common desktop icons include Computer, your personal folder, the Recycle Bin, and Control Panel.

1. Right-click an empty area of the desktop, and then click **Personalize**.
2. In the left pane, click **Change desktop icons**.
3. Under **Desktop icons**, select the check box for each icon that you want to add to the desktop, or clear the check box for each icon that you want to remove from the desktop, and then click **OK**.

To move a file from a folder to the desktop

1. Open the folder that contains the file.
2. Drag the file to the desktop.

Moving icons around

Windows stacks icons in columns on the left side of the desktop. But you're not stuck with that arrangement. You can move an icon by dragging it to a new place on the desktop.

You can also have Windows automatically arrange your icons. Right-click an empty area of the desktop, click **View**, and then click**Auto arrange icons**. Windows stacks your icons inthe upper-left corner and locks them in place. To unlock the icons so that you can move them again, click **Auto arrange icons** again, clearing the check mark next to it.

Selecting multiple icons

To move or delete a bunch of icons at once, you must first select all

of them. Click an empty area of the desktop and drag the mouse. Surround the icons that you want to select with the rectangle that appears. Then release the mouse button. Now youcan drag the icons as a group or delete them.

Hiding desktop icons

If you want to temporarily hide all of your desktop icons without removing them, right-click an empty part of the desktop, click **View**, and then click **Show desktop icons** to clear thecheck mark from that option. Now no icons are displayed on the desktop. You can get them back by clicking **Show desktop icons** again.

Windows Explorer:

Windows Explorer is the file management application in windows. Windows explorer can be used to navigate your hard drive and display the contents of the folders and subfolders youuse to organize your files on your hard drive. Windows Explorer is automatically launched any time you open a folder in windows XP.

The Recycle Bin

When you delete a file or folder, it doesn't actually get deleted,it goes to the Recycle Bin. That's a good thing, because if you want that deleted file, you can getit back.

If you won't need the deleted items again, you can empty the Recycle Bin. Doing that will permanently delete the items and reclaim any disk space they were using.

Start Menu:

The Start menu is the main gateway to your computer's programs, folders, and settings. It's called a **menu** because it provides a list of choices.

Use the Start menu to do these common activities:

- Start programs
- Open commonly used folders
- Search for files, folders, and programs
- Adjust computer settings
- Get help with the Windows operating system
- Turn off the computer
- Log off from Windows or switch to

a different user account.

Getting started with the Start menu

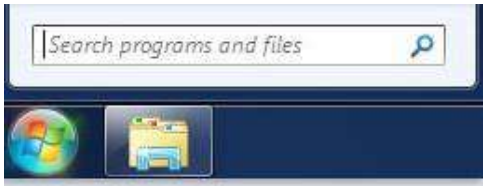
To open the Start menu, click the **Start** button in the lower-left corner of your screen. Or, press the Windows logo key on your keyboard.
The Start menu has three basic parts:

- The large left pane shows a short list of programs on your computer. Clicking **All Programs** displays a complete list of programs.
- At the bottom of the left pane is the search box, which allows you to look for programs and files on your computer by typing in search terms.
- The right pane provides access to commonly used folders, files, settings, and features. It's also where you go to log off from Windows or turn off your computer.

Opening programs from the Start menu

1. Start menu is used to open programs installed on your computer. To open a program in the left pane of the Start menu, click it.
2. Clicking **All Programs**, The left pane displays a long list of programs.
3. Clicking one of the program icons starts the program, and the Start menu closes.
4. Move the pointer over its icon or name, a box appears that contains a description of the program.

The search box



The search box is one of the most convenient ways to find things on your computer. The exact location of the items doesn't matter. It will also search your e-mail messages, saved instant messages, appointments, and contacts.

To use the search box, open the Start menu and start typing. You don't need to click inside the box first. As you type, the search results appear above the search box in the left pane of the Start menu.

A program, file, or folder will appear as a search result if:

- Any word in its title matches or begins with your search term.
- Any text in the actual contents of the file matches or begins with your search term.
- Any word in a property of the file, such as the author, matches or begins with your search term.

Click any search result to open it. Or, click the Clear button to clear the search results and return to the main programs list. You can also click **See more results** to search your entire computer. Search box also searches your Internet favorites and the history of websites you've visited. If any of these webpages include the search term, they appear under a heading called "Files."

The right pane includes

1. **Personal folder.** This folder, in turn, contains user-specific files, including the My Documents, My Music, My Pictures, and My Videos folders.
2. **Documents.** Opens the Documents library, where you can access & open text files, spreadsheets, etc.
3. **Pictures.** Opens the Pictures library, where you can access and view digital pictures and graphics files.
4. **Music.** Opens the Music library, where you can access and play music and other audio files.
5. **Games.** Opens the Games folder, where you can access all of the games on your computer.
6. **Computer.** Opens a window where you can access disk drives, cameras, printers, scanners, and other hardware connected to your computer.
7. **Control Panel.** Opens Control Panel, where you can customize the appearance and functionality of your computer, install or uninstall programs, set up network connections, and manage user accounts.
8. **Devices and Printers.** Opens a window where you can view information about the printer, mouse, and other devices installed on your computer.
9. **Default Programs.** Opens a window where you can choose which program you want Windows to use for activities such as web browsing.
10. **Help and Support.** Opens Windows Help and Support, where you can browse and search Help topics about using Windows and your computer.

    At the bottom of the right pane is the Shut down button. Click the Shut down button to turn off your computer. Clicking the arrow next to the Shut down button displays a menu with additional options for switching users, logging off, restarting, or shutting down.

Taskbar:

The taskbar is the long horizontal bar at the bottom of your screen. It has three main sections:

- The Start button , which opens the Start menu.
- The middle section, which shows you which programs & files you have open & allows you to quickly switch between them.
- The notification area, which includes a clock and icons (small pictures) that communicate the status of certain programs and computer settings.

Keep track of your windows

If you open one or more program/file at a time, it's hard to see what else is what you've already opened.

Whenever you open a program, folder, or file, Windows creates a corresponding button on the taskbar.

The button shows an icon that represents the open program. In the picture below, two programs are open—Calculator and Minesweeper—and each has its own button on the taskbar. It also highlights the icon whose window is active. Click a taskbar button to switch to that window

The notification area

The notification area, at the right of the taskbar, includes a clock and a group of icons. These icons communicate the status of something on your computer or provide access to certain settings.

When you move your pointer to a particular icon, you will see that icon's name or the status of a setting. Double-clicking an icon in the notification area usually opens the program orsetting associated with it. For example, double-clicking the volume icon opens the volume controls.

Windows hides icons in the notification area when you haven't used them in a while. If icons become hidden, click the **Show hidden icons** button to temporarily display the hidden icons.

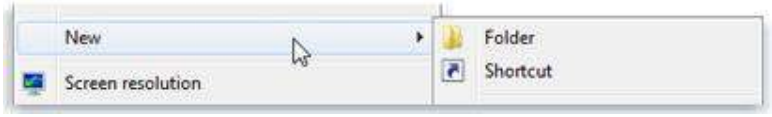
Click the Show hidden icons button to display all icons in the notification area

Using menus, buttons, bars, and boxes

Menus, buttons, scroll bars, and check boxes are examples of **controls** that you operate with your mouse or keyboard. These controls allow you to select commands, change settings, orwork with windows.

Menus:

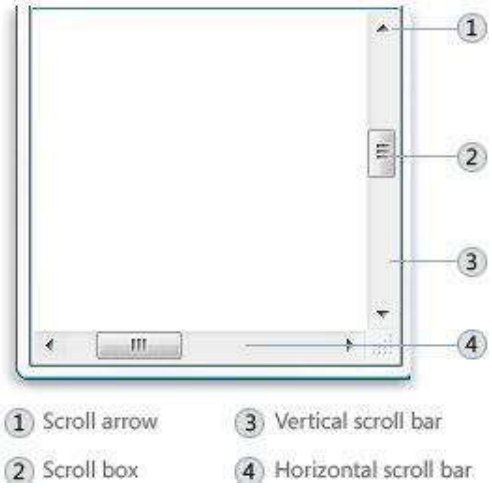
Most programs contain hundreds of **commands** that you use to work the program. Many of these commands are organized under **menus**. A program menu shows you a list of choices.To choose one of the commands listed in a menu, click it. Sometimes menus show submenus.



Recognizing menus isn't always easy, because not all menu controls look same or even appear on a menu bar. When you see an arrow next to a word or picture, you're probably looking at a menu control.

Scroll bars

When a document, webpage, or picture exceeds the size of its window, scroll bars appear to allow you to see the information that is currently out of view. The following picture shows the parts of a scroll bar.

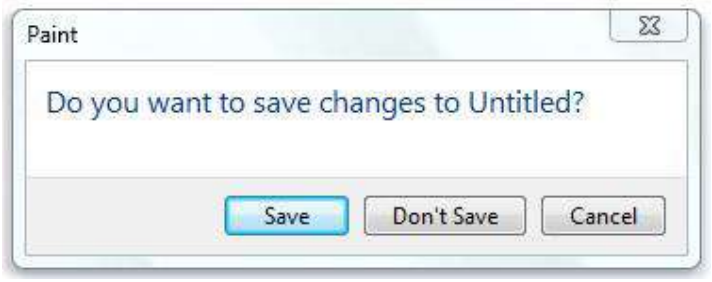


To use a scroll bar:

- Click the up or down scroll arrows to scroll the window's contents up or down in small steps. Hold down the mouse button to scroll continuously.
- Click an empty area of a scroll bar above or below the scroll box to scroll up or down one page.
- Drag a scroll box up, down, left, or right to scroll the window in that direction.

Command buttons

A **command button** performs a command when you click it. You'll most often seethem in dialog boxes, which are small windows that contain options for completing a task. For example, if you close a Paint picture without saving it first, you might see a dialog box like this.



Outside of dialog boxes, command buttons vary in appearance.

If a button changes into two parts when you point to it, you've discovered a **split button**. Clicking the main part of the button performs a command, whereas clicking the arrow opens a menu with more options.

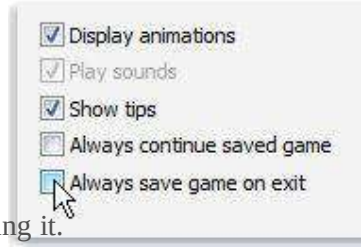
Option buttons

Option buttons

allow you to make one choice among two or more options. They frequently appear in dialog boxes. The following picture shows two option buttons. The "Color" option is selected.

Check boxes

Check boxes allow you to choose multiple options at the same time. Click an empty check box to select that option



To use check boxes:

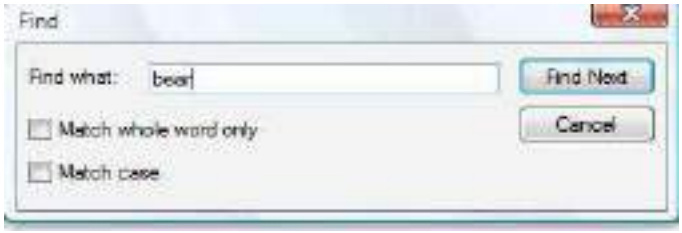
- Click an empty square to select that option. A check mark will appear in the square, indicating that the option is selected.
- To turn off an option, clear (remove) its check mark by clicking it.
- Options that currently can't be selected or cleared are shown in gray.

Sliders :

A **slider** lets you adjust a setting along a range of values. To use a slider, drag the slider toward the value that you want.

A slider along the bar shows the currently selected value. In the example shown above, the slider is positioned midway between Slow and Fast, indicating a medium pointer speed.

Text boxes:



A **text box** allows you to type information, such as a search term or password. The following picture shows a dialog box containing a text box. We've entered "bear" into the text box.

Text boxes that require you to enter a passwordwill usually hide your password as you type it, in case someone else is looking at your screen.

Drop-down lists:

Drop-down lists are similar to menus. Instead of clicking a command, though, you choose an option. When closed, a drop-down list shows only the currently selected option. The other available options are hidden until you click the control, as shown below.

To open a drop-down list, click it. To choose an option from the list, click the option.

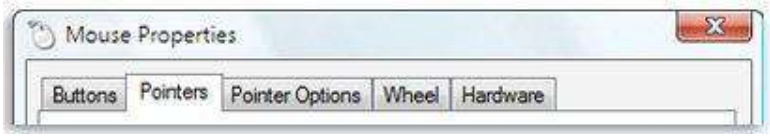
List boxes:

A **list box** displays a list of options that you can choose from. Unlike a drop-down list, some or all of the options are visible without having to open the list.

To choose an option from the list, click it. If the option you want isn't visible, use the scroll bar to scroll the list up or down. If the list box has a text box above it, you can type the name or value ofthe option instead.

Tabs :

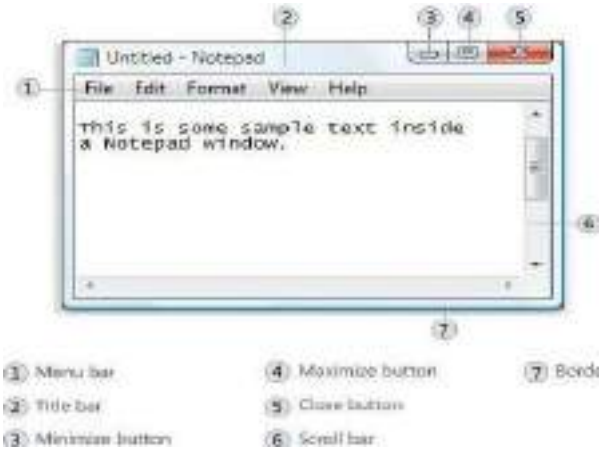
In some dialog boxes, options are divided into two or more **tabs**. Only one tab, or set ofoptions, can be viewed at a time. The currently selected tab appears in front of the other tabs.To switch to a different tab, click the tab.



Whenever you open a program, file, or folder, it appears on your screen in a box or framecalled a **window**.

Parts of a window

Although the contents of every window are different, all windows share some things in common. For one thing, windows always appear on the desktop—the main work area of your screen. In addition, most windows have the same basic parts.

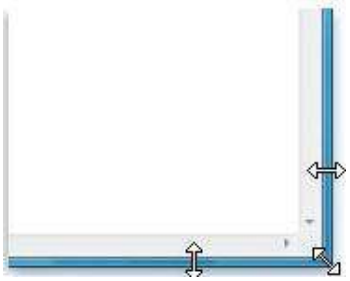


Parts of a typical window

- Title bar. Displays the name of the document and program
- Minimize, Maximize, and Close buttons. These buttons hide the window, enlarge it to fill the whole screen, and close it, respectively
- Menu bar. Contains items that you can click to make choices in a program.
- Scroll bar. Lets you scroll the contents of the window to see information that is currently out of view.

- Borders and corners. You can drag these with your mouse pointer to change the size of the window.

Changing the size of a window



- To maximize window, click its **Maximize** button or double-click the window's title bar.
- To return a maximized window to its former size, click its **Restore** button or, double-click the window's titlebar.
- To resize a window (make it smaller or bigger), point to any of the window's borders or corners. When the mouse pointer changes to a two-headed arrow (as in picture), drag the border or corner to shrink/enlarge the window.
- Drag a window's border or corner to resize it.

Minimizing a window:

To minimize a window, click its **Minimize** button . The window disappears from the desktop and is visible only as a button on the taskbar, the long horizontal bar at the bottom of your screen.

To make a minimized window appear again on the desktop, click its taskbar button. The window appears exactly as it did before you minimized it.

Closing a window

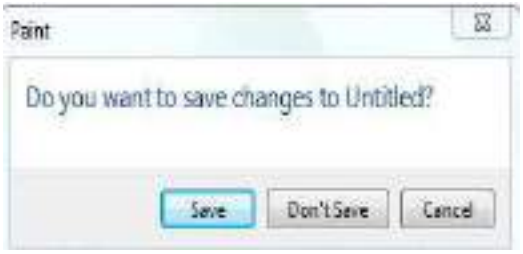
Closing a window removes it from the desktop and taskbar. To close a window, clickits **Close** button .

The taskbar provides a way to organize all of your windows. Each window has a corresponding button onthe taskbar. To switch to another window, just click its taskbar button. The window appears in front of all other windows, becoming the **active** window—the one you're currently working in.

To easily identify a window, point to its taskbar button.

When you point to a taskbar button, you'll see a thumbnail-sized preview of the window. This preview is especially useful if you can't identify a window by its title alone.

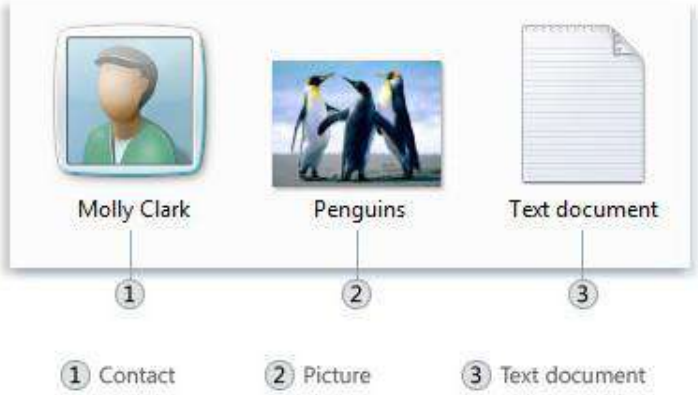
Dialog boxes:



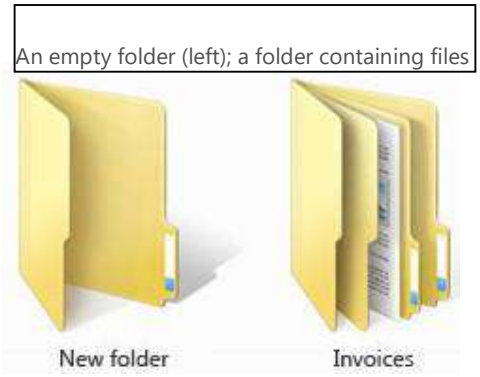
A dialog box is a special type of window that asks you a question, allows you to select options to perform a task, or provides you with information. Most dialog boxes can't be maximized, minimized, or resized. They can be moved.

Working with files and folders

A file is an item that contains information. On your computer, files are represented with icons; this makes it easy to recognize a type of file by looking at its icon. Here are some common file icons:

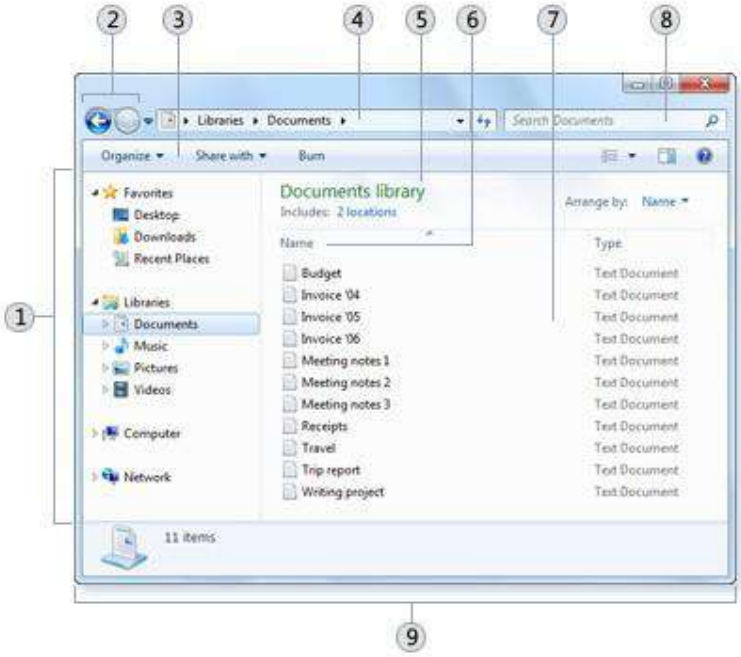


A folder is a container you can use to store files in. If you had thousands of paper files on your desk, it would be nearly impossible to find any particular file when you needed it. That's why people often store paper files in folders inside a filing cabinet. Folders can also store other folders.You can create any number of subfolders, and each can hold any number of files and additional subfolders.



Understanding the parts of a window

When you open a folder or library, you see it in a window. The various parts of this window are designed to help you navigate around Windows or work with files, folders, and libraries more easily. Here's a typical window and each of its parts:

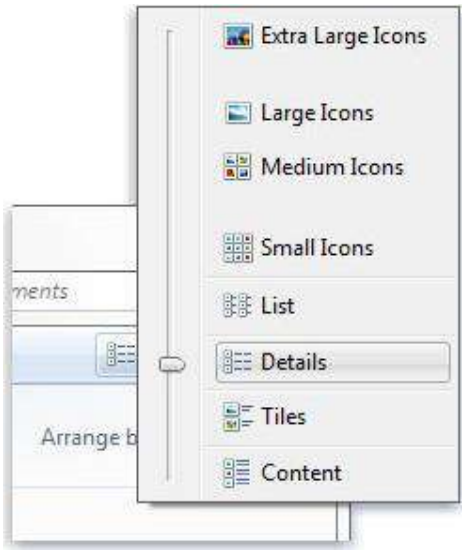


Window part	What it's useful for
Navigation pane	Use the navigation pane to access libraries, folders, saved searches, and even entire hard disks. Use the Favorites section to open your most commonly used folders and searches. You can also expand Computer to browse folders and subfolders.
Back and Forward button	Use the **Back** button and the **Forward** button to navigate to other folders or libraries you've already opened without closing the current window. These buttons work together with the address bar; after you usethe address bar to change folders, you can use the Back button to return to the previous folder.
Toolbar	Use the toolbar to perform common tasks, such as changing the appearance of your files and folders, burning files to a CD, or starting a digital picture slide show. The toolbar's buttons change to show only the tasks that are relevant.
Address bar	Use the address bar to navigate to a different folder or library or to go back to a previous one.
Library pane	The library pane appears only when you are in a library (such as the Documents library). Use the library pane to customize the library or to arrange the files by different properties.

Column headings	Use the column headings to change how the files in the file list are organized.
File list	This is where the contents of the current folder or library are displayed. If you type in the search box to find a file, only the files that match your current view (including files in subfolders) will appear.
Search box	Type a word or phrase in the search box to look for an item in the current folder or library. The search begins as soon as you begin typing—so if you type "B," for example, all the files with names starting with the letter B will appear in the file list.
Details pane	Use the details pane to see the most common properties associated with the selected file. File properties are information about a file, such as the author, the date you last changed the file, and any descriptive tags you might have added to the file.
Preview pane	Use the preview pane to see the contents of most files. If you select an e-mail message, text file, or picture, for example, you can see its contents without opening it in a program. If you don't see the preview pane, click the**Preview pane** button in the toolbar to turn it on.

Viewing and arranging files and folders

When you open a folder or library, you can change how the files look in the window. For example, you might prefer larger (or smaller) icons or a view that lets you see different kinds of information about each file. To make these kinds of changes, use the **Views** button in the toolbar.



Each time you click the left side of the Views button, it changes the way your files and folders are displayed by cycling through five different views: Large Icons, List, a view called Details that shows several columns of information about the file, a smaller icon view called Tiles, and a view called Content that shows some of the content from within the file.

Windows Applications – Notepad, WordPad, Paint ,Calculator.

Start/Accessories menu is used to access convenient tools (application programs) included in Windows XP that can be used to perform many everyday tasks.

Notepad

Notepad is a text editor, which is a program similar to a word processor but cannot perform any special editing. No embedded codes are inserted into the document. Text files also called: unformatted text files and ASCII (American Standard Code for Information Interchange).

With Notepad, you can:

- Create simple text documents
- Multi-tasking/create/edit batch files
- Print a file

Formatting with Page Setup and Printing in Notepad

To print a Notepad document, you can locate the document with Explorer or My Computer. Open the file. Print file by using:

- File/Print command from the menu bar.
- Select Print from the shortcut menu that comes up when you right-click the file.
- Can also drag and drop to a printer shortcut.

You can also open Notepad first and then open the document from Notepad's File/Open command. Once the document is opened you can print it. Advantage of opening Notepad prior to locating file:

- Can apply page formatting before you print.
- Can add a header or footer.
- Can adjust the margins.

Features of Notepad:

1. Notepad has minimal editing features.
2. Notepad has word wrap which prevents text from running over into the margins and automatically moves text to the next line.
3. Used to create/save/open/edit file.
4. Can create time log.
5. Within Notepad – cut, copy, and paste text.
6. Copy data to Notepad from other files.
7. Copy Notepad text to other word processing text or database document.

WordPad

WordPad is a simple word processor.

WordPad allows simple formatting:

- Change fonts.
- Character level formatting.
- Margins can be changed/created.
- Insert bulleted charts/graphic and sound files.

Has menu bar and toolbar.

WordPad lacks the powerful features of other word processors such as creating columns, tables, and spell checking.

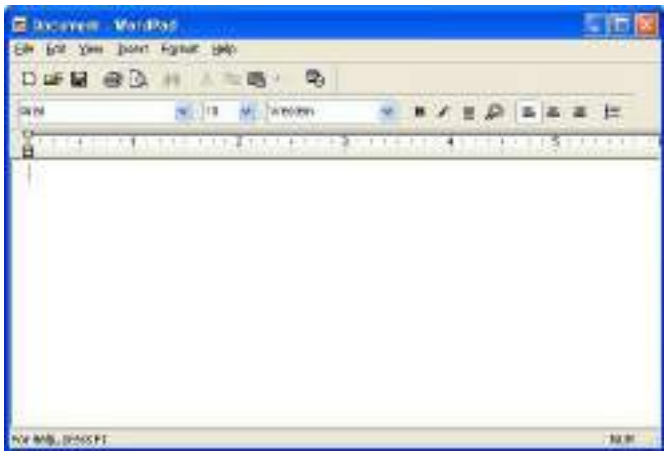
You do not need to press <Enter> when you reach the right margin. Word processors will move to the next line automatically. This is called a **soft return**. The only time you need to press <Enter> is to create a new paragraph. This is called a **hard return**.

Paragraphs:

Traditional English style paragraph includes a topic sentence, supporting sentences, and a concluding sentence. Indented by one tab.

A paragraph, in word processing terms, is all the text between paragraph marks (¶). It can be one character, one page, or several pages of text.

To indent a paragraph you use the <Tab> key.



- **Features of WordPad**:

Title bar/Name of document first (docucentric approach)
Menu Bar
Toolbar
Format Bar
Document Ruler
Selection Bar: unmarked column along left edge of document window.
Insertion Point: is where you begin keying in text. 2 modes – Insert mode (Default) and Typeover -Press Insert to toggle between modes.
Status Bar: tells you the status of the document.
WordPad and Microsoft Word both claim .RTF extension.
Rich text format (RTF) allows the exchange of text files between different word processors in different OS.
Problems can occur when any registered file extension is claimed by more than one program.
The default extension for WordPad documents is .doc. This extension is also used by Word for Windows, so if Word is installed, a document you create in WordPad might not open with WordPad when you double-click it.

- **Editing a Document in WordPad**

To edit text you need to move the insertion point to the correct position.
You can move the insertion point with either the mouse or the keyboard. The keyboard is usually used for keying in data. The mouse is usually used for editing.
There are several key combinations that can be used to quickly move the insertion point.
The Format Toolbar offers shortcuts to menu commands.

- **Formatting Paragraphs and Using Tabs :**

You can change paragraph alignment so that it is left-justified, centered, or right-justified.
Left-aligned or left-justified means that the selected paragraph(s) will line up on the left margin. Right-aligned or right-justified means that the selected paragraph(s) will line up on the right margin.
Centered means that each line in the paragraph(s) will be centered between the left and right margins.
The first line of a paragraph can be indented by pressing the <Tab> key. The <Tab> key moves the first line a preset number of spaces from the left margin.

- **Printing and Page Setup in WordPad**

You can use the same techniques to print a document from WordPad that you used to print a document from Notepad.
In WordPad, the only formatting that you can apply to the document (Page Setup) is to alter the margins.
Headers and Footers are not supported

- **Paint**

Paint is a graphics application program used to create drawings or images.
Can only create/edit bitmap graphics (.bmp)
Bitmap Graphics:

- Screen divided into pixels (pels)
- Drawing = turning pixels on or off in different colors
- Detailed
- Take up lots of disk space
- Resolution is fixed

If installed programs (such as Office) have correct graphic filters, Paint can read TIFF, JPEG, GIF, PCX, Targa and Kodak Photo CD files. Save Paint files in GIF and JPEG format.
Images created can stand alone or be copied to other documents.
Graphics files are identified by file extensions.

- **Paint Window**

The Paint window has many components, some are common to all windows programs, others are not.

1. **Menu Bar** – location of choices consistent:

    • Choices available depend on program's purpose.
    • Paint choices different than word processing – task different.
    • New choice – Image.

2. **Tool Box** - is actually a toolbar that you select your drawing tools from.

Below the Tool Box is an area called the Tool Options box where the options available for the selected tool are displayed.

3. **Color Box** - contains the colors you can use in Paint. The foreground color is the color you draw with. The background color is the color of your drawing area.
4. **Drawing area** - is like a canvas and is the area where you draw. Default drawing tool – pencil. Cursor assumes shape of selected drawing tool.

The Tools:

1. Free-Form Select – Selects a free form cutout in a drawing.
2. Select – Selects a rectangular cutout.
3. Erase/Color Eraser – Changes the foreground color to the background color.
4. Fill With Color – Fills a bordered area with the selected foreground color.
5. Pick Color – Picks a color in your drawing and uses it as your foreground color or background color.
6. Magnifier – Magnifies a selected area.
7. Pencil – Creates a free-form line.
8. Brush – Draws a free-form brush stroke.
9. Airbrush – Creates a spray can effect.
10. Text – Places text in the drawing.
11. Line – Draws a straight line.
12. Curve – Draws a straight line, then curves it.
13. Rectangle – Creates a rectangle or square.
14. Polygon – Draws a shape with an unlimited number of sides.
15. Ellipse – Creates a circle or ellipse.
16. Rounded Rectangle – Creates a round-cornered rectangle or square.

- **Fill Styles:**

When you select a shape tool, three choices appear in the Tool Options area. Each of these choices is a fill style.
The effect of each of the fill styles depends on the mouse button used to draw the shape.

- **Using the Left mouse button:**

Top: Outline in foreground color. No fill color.
Middle: Outline in foreground color. Fill in background color.
Bottom: Solid shape in background color. Has no outline.

- **Using the Right mouse button:**

Top: Outline in background color. No fill color.
Middle: Outline in background color. Fill in foreground color.
Bottom: solid shape in foreground color. Has no outline.

- **Picture Characteristics**

Paint used to view existing picture.
Paint can be used to create a new picture.

- Standard settings for new picture.
- Creates picture with default settings.

You can change these default settings.

- **The Shape Tools**

The Shape tools let you work with pre-defined shapes unlike the free-form tools.
Shape tools include Rectangle, Ellipse, Polygon, and Rounded Rectangle.
Less color means a smaller file.

- **Importing and Exporting Graphics**

To import is to bring a drawing into your picture from a graphic file.
To export is to save to file a graphic image.
Clip art is a collection of many, usually small, images that you can add to your graphics.

- Clip art can be purchased.
- Can alter clip art and save it as new drawing.

- **Using Text and Other Pictures in a Drawing**

You can also add text to your pictures.
You can choose different fonts and styles for your text line in a word processor.
Characters from the font Wingdings can be imported to add pictures to your drawing.

- **Printing in Paint**

You can print any picture that you create or view in Paint.
Graphics take much longer to print than text and the quality of the printout will depend on the quality of the printer.
If the printer is not a color printer, the picture will print in shades of gray.

- **Using Drawings as Background**

Any drawing you create in Paint can be used as desktop background.

1. Using Windows XP Calculator

Like a calculator you keep in a desk drawer, the Windows Calculator is small but saves you time by performing all the calculations common to a standard calculator.
The Standard Windows Calculator, works so much like a pocket calculator that you need little help getting started.

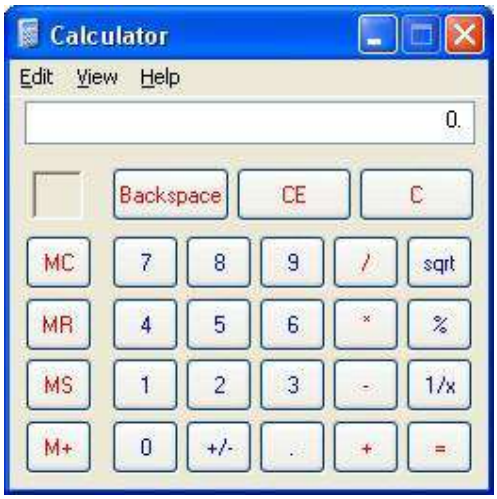
To display the Calculator, open the Start menu and choose Programs, Accessories, Calculator. The Calculator opens in the same view (Standard or Scientific) in which it was displayed the last time it was used.

To close the Calculator, click the Close button in the title bar. If you use the Calculator frequently, however, don't close it; click the Minimize button to minimize the Calculator to a button on the taskbar.

The Calculator has only three menus: Edit, View, and Help. The Edit menu contains two simple commands for copying and pasting; the View menu switches between the Standard and Scientific views; and the Help menu is the same as in all Windows accessories.

2.Operating the Calculator

To use the Calculator with the mouse, just click the appropriate numbers and sign keys, like you would press buttons on a desk calculator. Numbers appear in the display window as you select them, and the results appear after the calculations are performed. To enter numbers from the keyboard, use either the numbers across the top of the keyboard or those on the numeric keypad (you must first press the NumLock key if the NumLock feature is not enabled). To calculate, press the keys on the keyboard that match the Calculator keys.



3 Introduction to Business Communication Tools

Introduction

Microsoft Office is a collection of different application programs that were originally designed to be used to perform many of the tasks that are completed every day in an office setting, but they can also be useful in your personal life as well.

Microsoft Word is a word processing program that can be used to type documents, from simple letters to illustrated newsletters.

Microsoft Excel is a spreadsheet program that can be used to track of lists, numbers and statistics, such as might be used in accounting.

Microsoft Access is a database program that can be used to track of diverse but related information, such as customer orders, customer billing information, customer shipping information, and product inventories.

Microsoft PowerPoint is presentation software that can be used for making fully animated computer presentations.

Microsoft Publisher is publication design software that can be used for creating greeting cards, business cards, calendars and more.

3.1 Microsoft Word

1. Introduction

A word processor is a type of computer program that is used to create a variety of documents, from simple letters to fully illustrated newsletters and fliers. Word Processing applications display text on a computer screen and allow users to easily add, remove, and change the style, size, and placement of text in a document without having to retype the entire document as they would with a typewriter. Microsoft Word is one of the most popular word-processing software applications in use today.

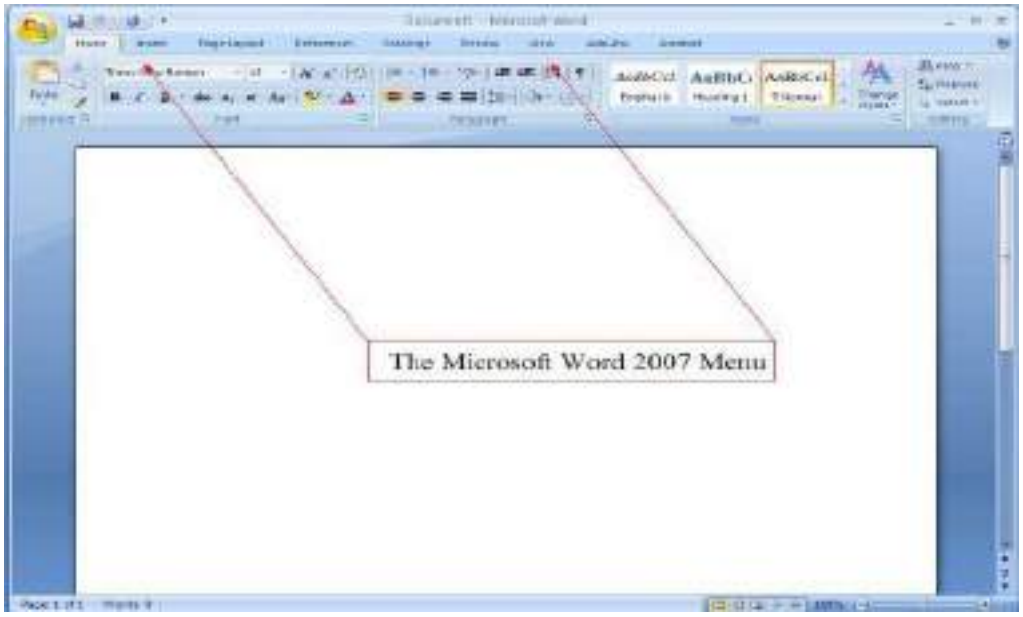
2. Starting MS-Word 2007

Opening Microsoft Word To open Word, do either one of the following:

• Click once on the Start button on the bottom left corner of the screen. Click on Programs. Move the cursor to the new menu on the right and then click on Microsoft Office 2007. Move the cursor to the next menu that opens and click Microsoft Office Word 2007. A blank document will appear on the screen.

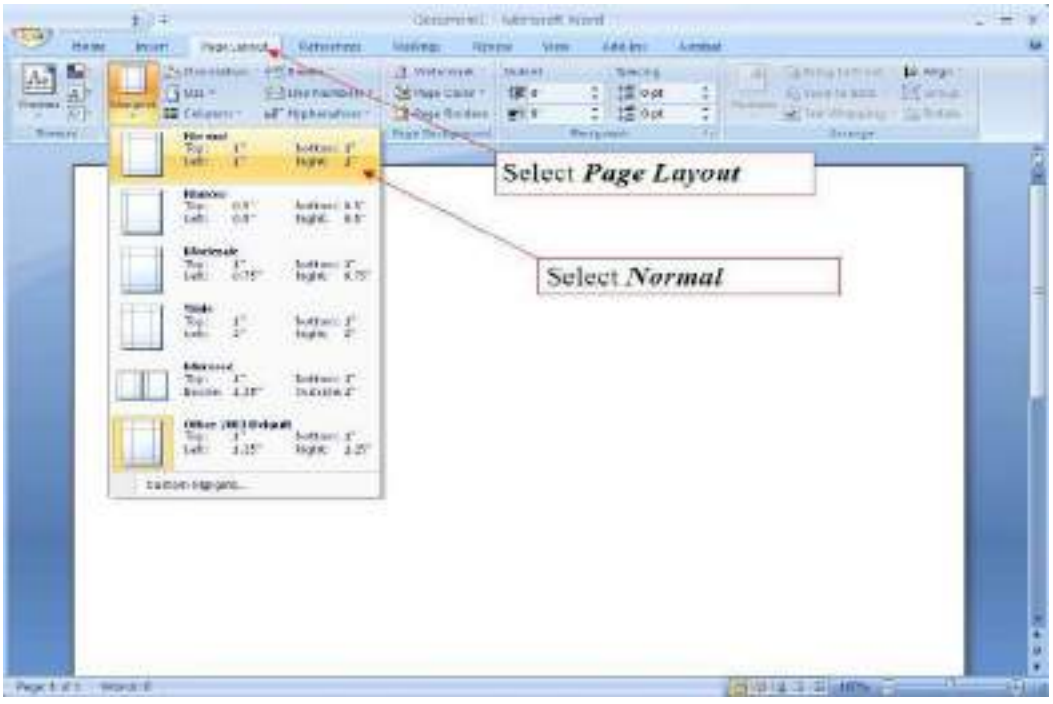
- **Main screen of a Microsoft Word 2007 Document**

The screenshot below is the opening screen for Microsoft Word 2007. Here we will review screenshots and documentation on how to navigate some of the basic menus and the steps necessary to format a basic paper correctly.



- **Page Setup and Margin Formatting**

The screenshot below displays the menu path to change the margins in a paper. According to APA, all margins are set at 1 inch.

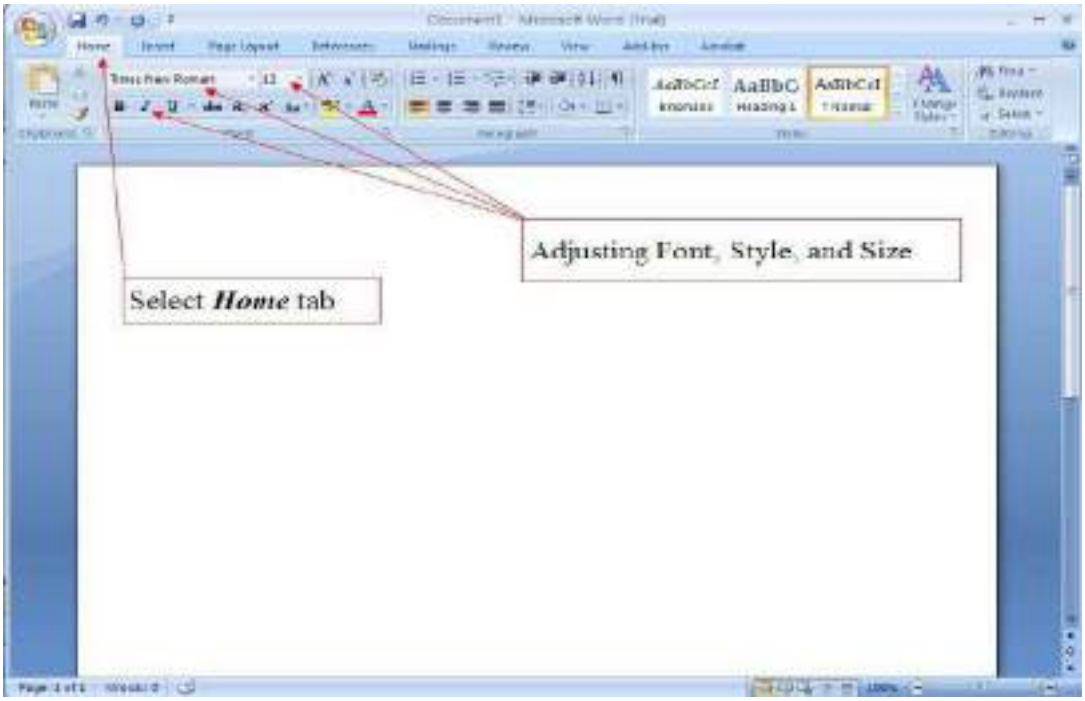


1. From the menu tab at the top of Word, select *Page Layout*.
2. In the *Page Layout* menu, the margins button will allow you to change the margins to the correct format.

3. Select *Normal* to set all margins to one inch.

- **Formatting Font**

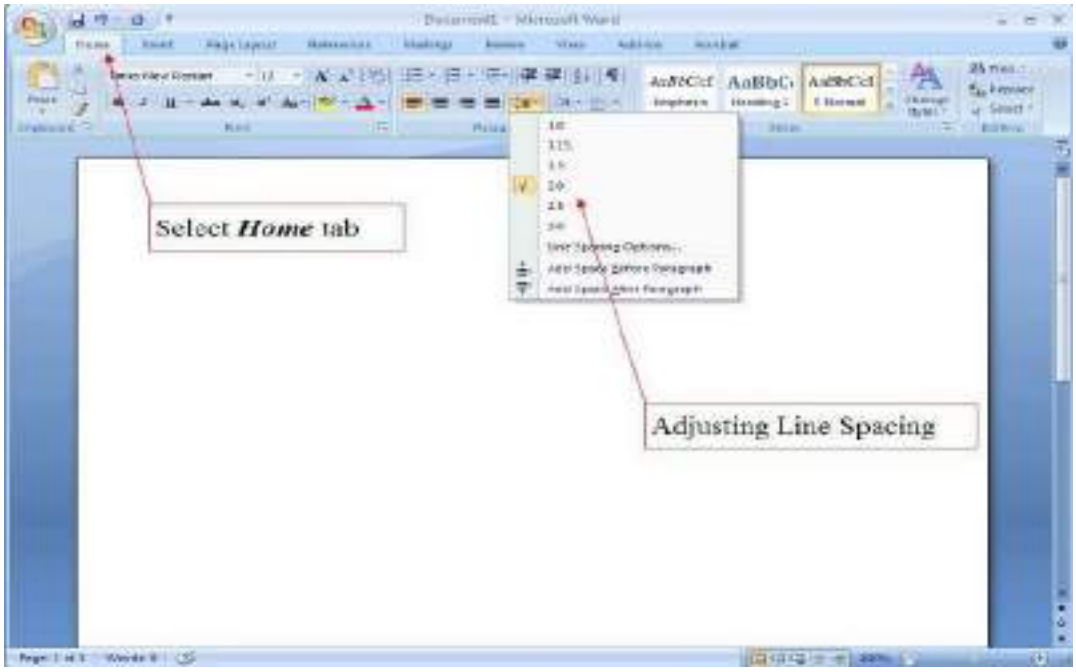
The screenshot below displays the menu path to change the font. Use a traditional font such as Times New Roman or Courier in 12-point size.



1. Select the *Home* tab.
2. From the *Font* menu, you may adjust the font, style, and size to the correct format.

- **Formatting Spacing**

The standard spacing format for a paper is double-spacing. Double-space the entire document, including the reference page. The screenshot below displays the menu path to change the spacing format to double.



1. Select the *Home* tab.
2. From the *Paragraph* menu, you may adjust the line spacing from the *Line Spacing* dropdown menu.

(Note: Word 2007 places extra space between paragraphs. You will need to adjust this by selecting the *Page Layout* menu. Then access *Paragraph* and *Indents and Spacing*. Under the *Spacing* heading, set the spacing option to 0 pt. before and 0 pt. after. Click *OK*.)

- **Page Headers**

Identify each page with the first two or three words of the title and with the page number placed on the upper right hand corner of the page. Use five spaces between the title and the page number. Do not use your name to identify each page. Be sure the font type and size are the same as that used in the document.

To create a correct APA header with a page number in Word 2007, use the following guidelines:

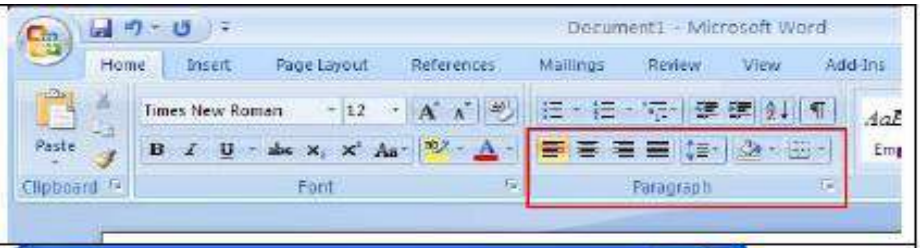
1. Click on the *Insert* tab.
2. Click on the *Header* tab.

1. Click on the *Blank* header tab from the drop-down menu. This will put the curser inside the header.
2. Click on the *Page Number* tab.
3. Place the curser on the drop-down menu over *Top of Page* to bring up another drop-down menu.
4. Click on *Plain Number 3* on the drop-down menu (the third choice). This will place a page number inside the header at the right margin.
5. Type the portion of the title to go in the header and add five spaces. Your header is complete.
6. Click on Close Header and Footer on the far right.

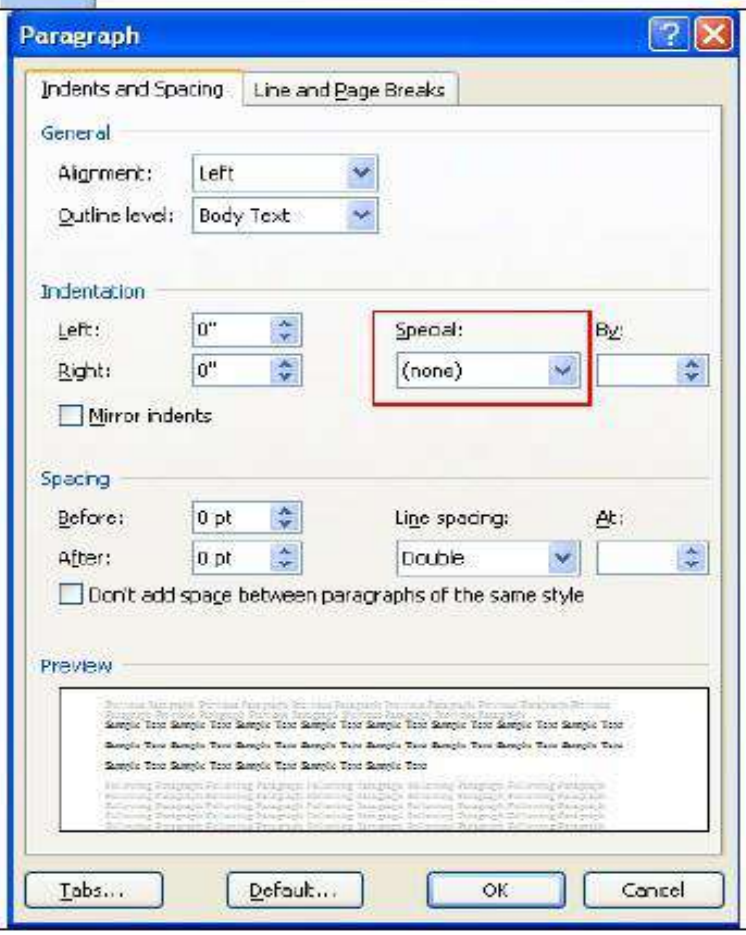
- **Hanging Indent**

Select the text that requires a hanging indent OR create a hanging indent before typing the text. From the *Home* menu, click on the *Paragraph* command (see Picture One). This will bring up the *Indents and Spacing* tab (see Picture Two). Under *Indentation* in the *Special* box, click on *Hanging* and *OK*.

Picture One

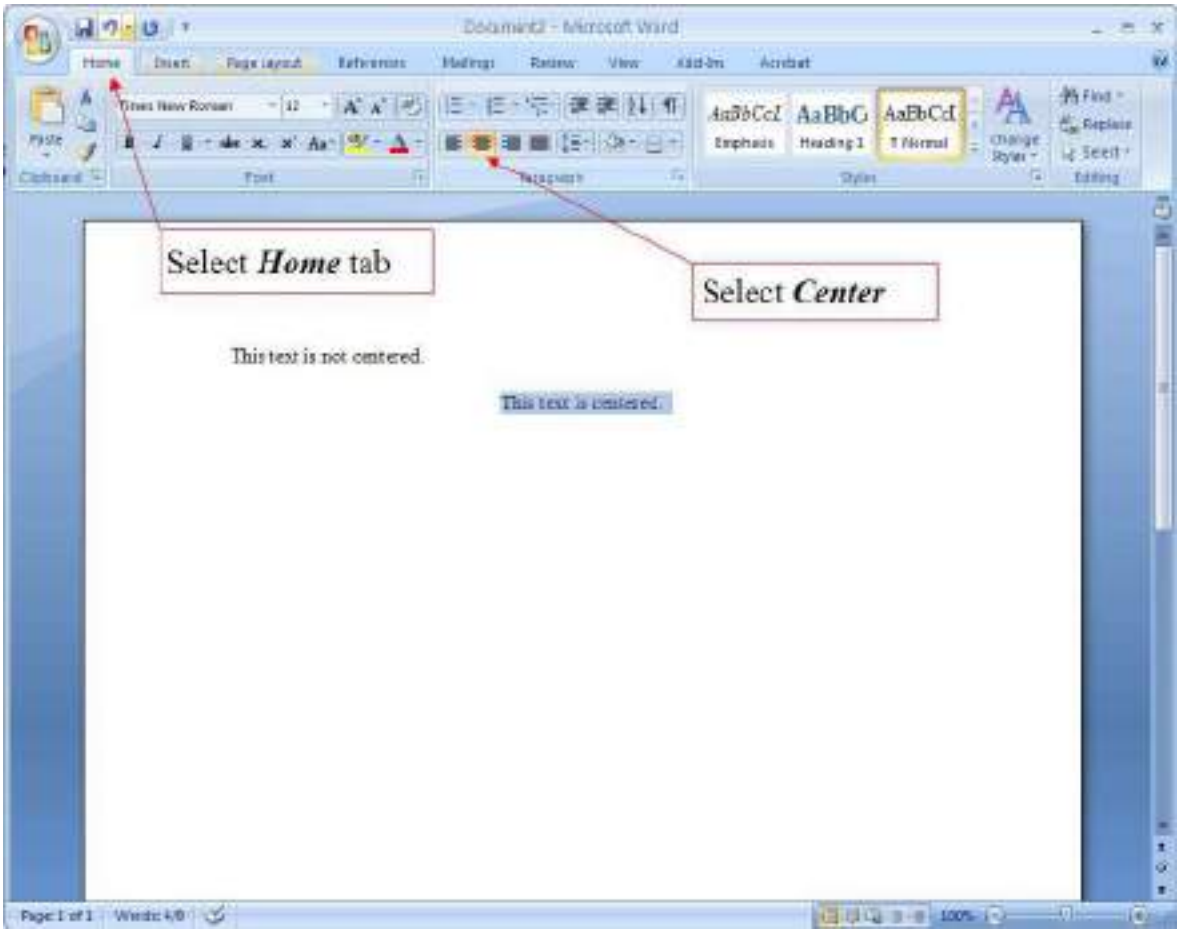


Picture Two



- **Centering Text**

The screenshot below is an example of text that is centered and that is not centered. In order to center text highlight the text that requires centering and select the icon in the formatting toolbar as shown.



1. Select the *Home* tab.
2. Highlight the text to be centered.
3. Click the button to center the text on the *Paragraph* toolbar.

3.2 Microsoft Excel

1.Introduction to Microsoft Excel 2007

Microsoft Excel is a very powerful tool for you to use for numeric computations and analysis. Excel can also function as a simple database but that is another class. Today we will look at how to get starting with Excel and show you around the neighborhood sort of speak.

2. Starting MS-Word 2007

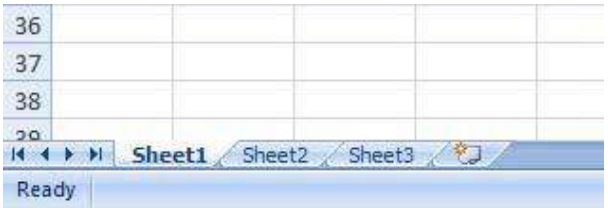
To start Microsoft Excel :

• Click once on the Start button on the bottom left corner of the screen. Click on Programs. Move the cursor to the new menu on the right and then click on Microsoft Office 2007. Move

the cursor to the next menu that opens and click Microsoft Office excel 2007. A blank document will appear on the screen.

Main screen of a Microsoft Excel 2007 Document

This is a workbook. A workbook is a collection of worksheets (spreadsheets) and macros. By default, Excel creates 3 worksheets in a new workbook. The worksheets are designated at the bottom part of the window where you see the file folder-like tabs. The tabs are named Sheet1, Sheet2, and Sheet3. If you click on Sheet2, you will be in Sheet2 and not Sheet1 so you need to
be aware of which worksheet you are in.



Office Fluent user interface

In Excel 2007, the new Office Fluent user interface replaces the traditional menus and toolbars
from previous versions of Excel with a single mechanism designed to help users find the right features more efficiently. The interface contains three main components; The Office Button, The
Quick Access Toolbar, and The Ribbon.

Open a New Workbook

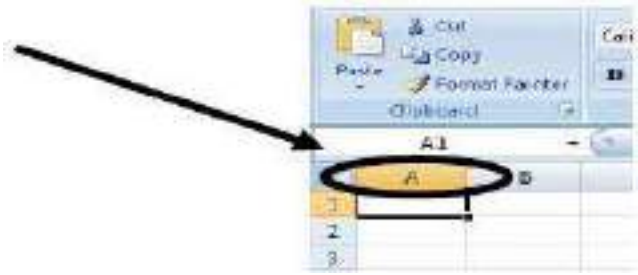
Some times you have to create a new workbook.

1. Click on the Office Button

2. Click on New

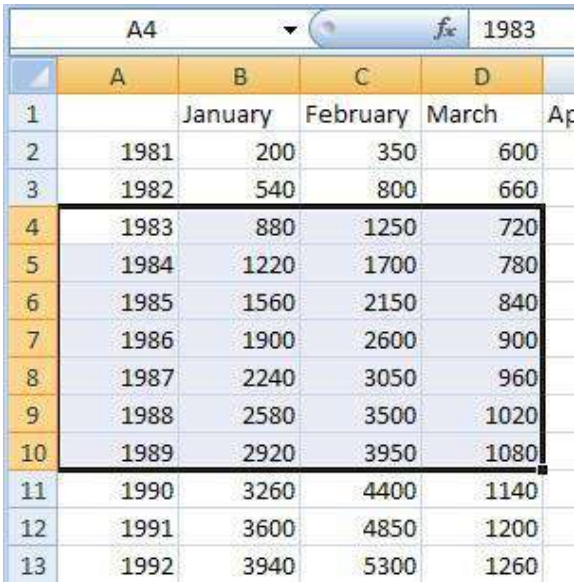
You are now able to open recently used or new workbooks from this panel. You can also open up templates that are available with Excel or ones that you create. If you click on Blank workbook, Excel will create a new workbook for you.

What are Columns, Rows, and Cells?
Columns are the vertical markers in the worksheet and are denoted by the alphabet i.e. A, B, C.
The rows are the horizontal markers in the worksheet and are denoted by numbers i.e. 1, 2, 3.
Cells are the single box that you get where the column and row intersect i.e. A1, B3, and C2.
You will often need to know the cell reference. The cell reference is the cell's name and you can
find that by looking at the toolbar. This means that the cell that is selected is named C28.



selecting a cell
1. We are going to select C28. Look for the C column.
2. Look for the Row number 28.
3. You may use your finger to follow the column C down to where row 28 is.
4. Once you have located it, click on it.
5. Look at the toolbar; the cell reference box should say C28. If it does not, try again.
6. After you have done this, click on a different cell and note the cell reference box.

selecting a group of cells A4 to D10
1. Click on the first cell A4
2. Click and Hold the mouse button down. Drag the cursor down to D10.
3. Let go of the mouse button.
4. If you did it correctly, you should see a Highlighted box around those cells. If not, try again. Please see the picture on the next page.



	A	B	C	D
1		January	February	March
2	1981	200	350	600
3	1982	540	800	660
4	1983	880	1250	720
5	1984	1220	1700	780
6	1985	1560	2150	840
7	1986	1900	2600	900
8	1987	2240	3050	960
9	1988	2580	3500	1020
10	1989	2920	3950	1080
11	1990	3260	4400	1140
12	1991	3600	4850	1200
13	1992	3940	5300	1260

Selecting cells A4 to D10

Basic data entry, fill handle

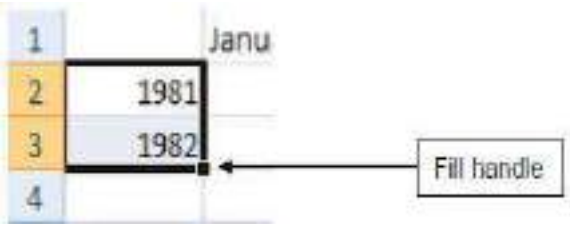
From the example above, we have numeric (year, numbers) and text (months) entered as data in our worksheet. Let us practice by re-creating the example on our own.

Method 1

1. Click on cell A2 to select it.
2. Type in 1981 and hit Enter. Notice by hitting Enter, we automatically move down to the next row. (we can also do the same by hitting the down arrow)
3. Click on cell B1 to select it.
4. Type in January and hit Tab. By hitting Tab (or right arrow), we move to the next column. We can continue to doing this to enter the data from 1981 to 1992 and so on, but Excel provides
us with a tool to complete sequences.

Method 2

1. Click on cell A2 to select it.
2. Type in 1981 and hit Enter.
3. Type in 1982, and then select both cells A2 and A3.
4. Move your mouse cursor over the fill handle (small black box on the bottom right of the active cell) so that the cursor turns into a cross.
5. Click and drag the fill handle down to the cell desired.



Copy, Cut, Paste

You can Copy, Cut and Paste anything into your worksheet. You can copy from one worksheet
to another worksheet in another book. Let's concentrate on the basics. We are going to copy cells D4 to H9.

Cut/Copy and Paste to the same worksheet

1. Using the same worksheet, select cells A4 to D10.
2. Use CTRL-c to copy and CTRL-x to cut the selected cells.
3. Click on cell E29. It should be blank
4. Use CTRL-v to paste the data. You can also use the toolbar shortcuts for cut/copy/paste as the functionality is the same.

Insert & delete columns, rows, and cells

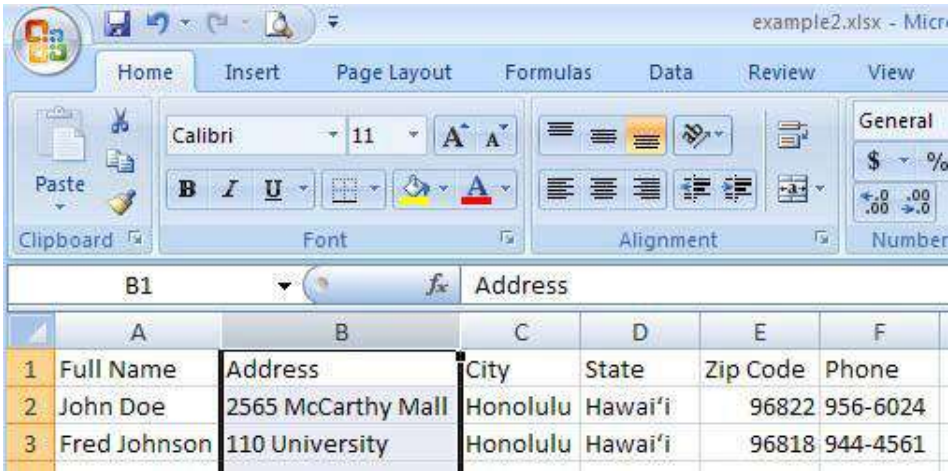
Have you ever entered all of your data and realized that you are missing an entry in the middle
of the worksheet? If yes and you did not know how to add columns or rows, it would be really
difficult to fix. Well, there is an easier method.
You can insert columns, rows, or cells in any spot on your worksheet.

Exercise 9: Insert columns

Before you can insert a column or row, you need to know how Excel inserts a column or a row.

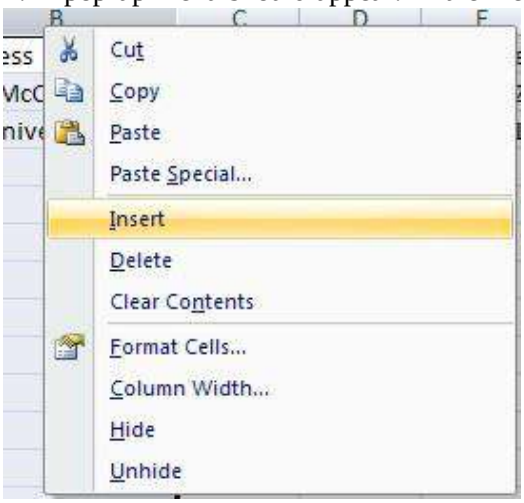
• For columns, Excel inserts new column(s) to the left of the selected column(s).
• For rows, Excel inserts new row(s) above the selected row.

1. We want to insert a new column for Last Name between Full Name *and Address.*



2. Since Excel inserts to the left, you need to click on the column letter B. Column B should
   be highlighted.
3. Point (do not left click) the arrow at the B column and then **right** click.

4. 4. A pop-up menu should appear. In the menu you should see Insert.



5. Click on the word **Insert**. Excel will insert a blank column between Full Name and Address.
6. Click on B1 and type in **Last Name**..

Insert rows
1. We want to insert a new row for Anne Frank's contact information between John Doe and Fred Johnson.

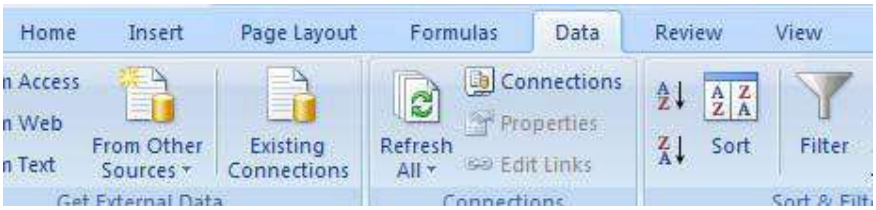
2. Since Excel inserts rows above the selection, you need to click on row number 3. Row 3 should be highlighted.
3. **Right** click while pointing at the number 3
4. A pop-up menu should appear. In the menu you should see Insert.
5. Click on the word **Insert**. Excel will insert a blank row between John Doe and Fred Johnson.
   5. Click on A3 and type in Anne Frank's contact information

<u>Using the sort feature</u>
1. We want to insert a new row for Anne Frank's contact information between John Doe
   1. and Fred Johnson but this time we will create her record in line 5.

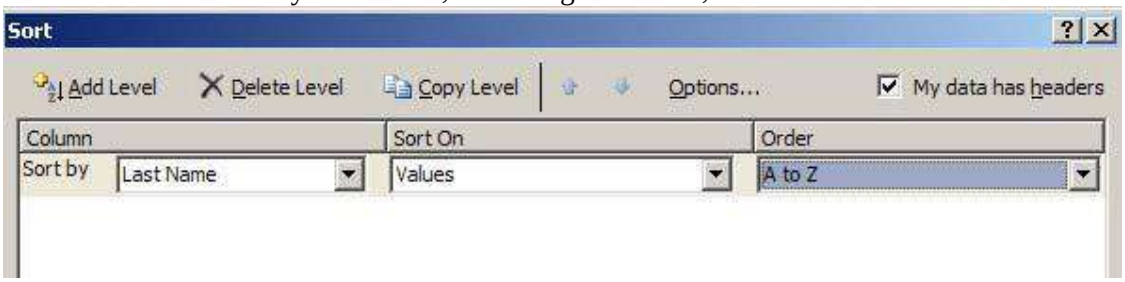
	A	B	C	D	E	F	G
1	Full Name	Last Name	Address	City	State	Zip Code	Phone
2	John Doe	Doe	2565 McCarthy Mall	Honolulu	Hawai'i	96822	956-6024
3	Fred Johnson	Johnson	110 University	Honolulu	Hawai'i	96818	944-4561
4							
5	Anne Frank	Frank	21-215 Hilo Road	Hilo	Hawai'i	96714	757-4444

2. Select cells A1 to G5

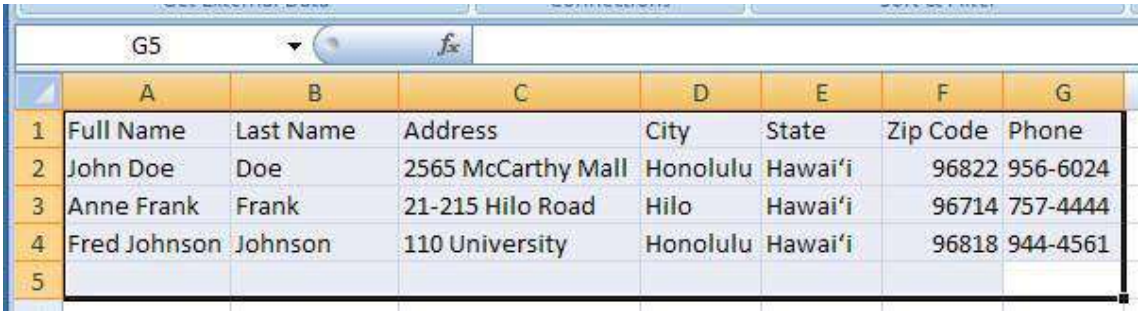
3. Go to the Data tab, then click on Sort



3. In the sort option window, use the pull down boxes to select the sort criteria. In this case we want to sort by Last Name, ascending order A-Z, then click on OK.



4. Your data should look like this.



	A	B	C	D	E	F	G
1	Full Name	Last Name	Address	City	State	Zip Code	Phone
2	John Doe	Doe	2565 McCarthy Mall	Honolulu	Hawai'i	96822	956-6024
3	Anne Frank	Frank	21-215 Hilo Road	Hilo	Hawai'i	96714	757-4444
4	Fred Johnson	Johnson	110 University	Honolulu	Hawai'i	96818	944-4561
5							

Delete columns and rows

We all make mistakes. It is very easy to remove a column or rows.

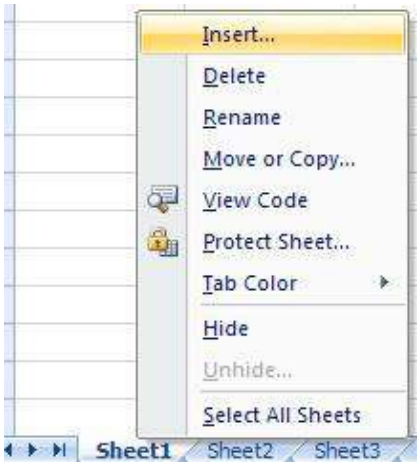
1. Select the column or row that you want to delete.
2. Point at the highlighted column name or row name and **right** click.
3. A pop-up menu should appear
4. Select **Delete**
5. The column or row should be gone.

Inserting & deleting new worksheets

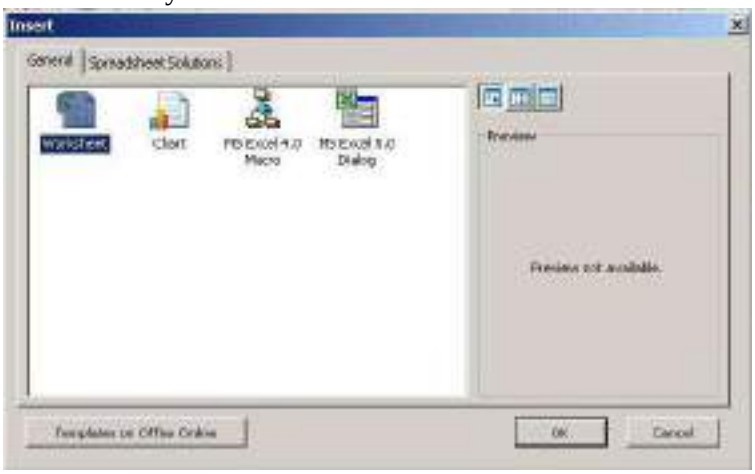
There will be many times when you need to add a whole worksheet rather than columns or rows.

Exercise 14: Insert a worksheet

1. **Right** Click on the tabs where the name of the worksheets are.
2. Click on **Insert**



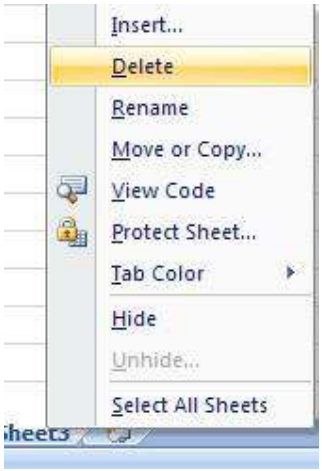
2. Select what kind of insert you want from the window.



4. To move the worksheet, click and hold the left mouse button on the worksheet tab. Drag the tab to where you want it to be placed. Note: you can only move the worksheet tabs to the left or right.

Delete a worksheet

1. Click on the tab of the worksheet that you want to delete.
2. **Right** Click on the same tab of the worksheet
3. Click on **Delete**



Printing

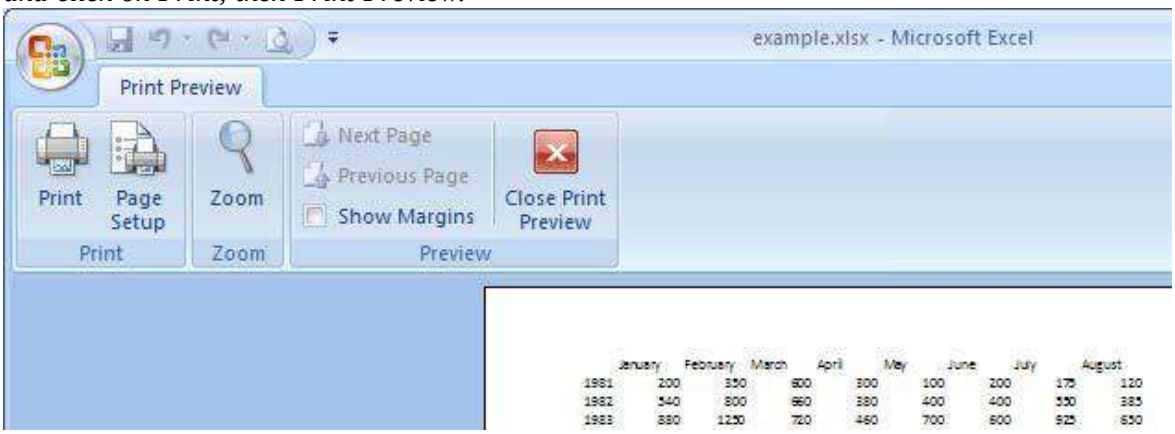
Printing your worksheets out to a printer would be a nice thing to know how to do. If the information that you have on the worksheet fits on an 8.5”x11” paper, you have no trouble printing your worksheet out. The problem arises when you have a larger worksheet. You may have noticed that your worksheet has dashed lines running down and across it; this is your print
area.

Setting the print area

1. On your worksheet, click on the Page Layout tab.
2. Click and drag to select the range of cells that you would like to print.
3. Under Page Layout, click on Print Area, then Set Print Area.

How to print with Print Preview

1. *You may click on the paper with the magnifying glass icon or click on the Office Button*
   and click on Print, then Print Preview.



2. The menu at the top is important because there are many print functions that you can use for your worksheet. Here are some examples, turn on the gridlines, shrink to fit one page, print headers or footers.
*3. Click on **Print**. You will be at the Print menu.*
*4. Click **Page Setup**. You will see a control panel that will allow you to make some cosmetic changes to the way the worksheet prints.*

3.3 Microsoft Powerpoint

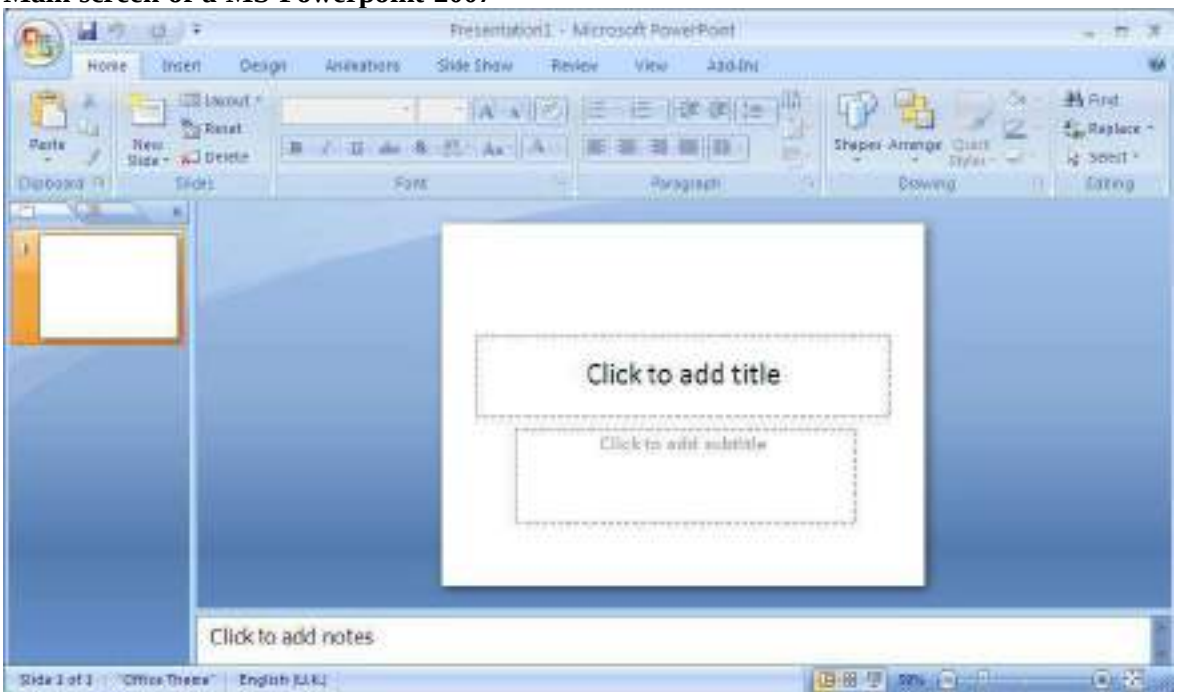
Introduction to Microsoft Office Powerpoint 2007

PowerPoint enables anyone to produce, with a little practice, beautifully laid out presentations, either as on-screen shows, or as OHP slides. The aim of these notes is to introduce you to the basics of PowerPoint. It will tell you how to create attractive animated presentations that include animation, images, charts, tables, and links to other software.
Users of previous versions of PowerPoint will notice that the user interface has changed dramatically, but, these changes give PowerPoint a lot more features, in a very intuitive layout.
Files produced in PowerPoint 2007 have the file extension ".pptx", and the files themselves are very different from previous file formats. If you wish to use an old PowerPoint presentation in PowerPoint 2007, PowerPoint will switch to compatibility mode, to let you work on the old file with no problems.

Starting MS-Powerpoint 2007

To use PowerPoint:
Click the **Start** button and select **All Programs,** then from the sub-menu, select **Microsoft Office**, then select **Microsoft Office PowerPoint 2007**. When PowerPoint loads you will see the following screen.

Main screen of a MS-Powerpoint 2007



The area in the centre displays the slide layout. The area on the left displays the structure of your presentation as it builds. The area below the slide is labeled **Click to add notes**. You can use this area to write notes, which you can read from as you deliver your presentation, these notes can be printed out and are not visible whilst you show the slides.

The three buttons on the bottom left of the screen offer you different views of the presentation.

 The normal view shows all elements of the PowerPoint screen as above.

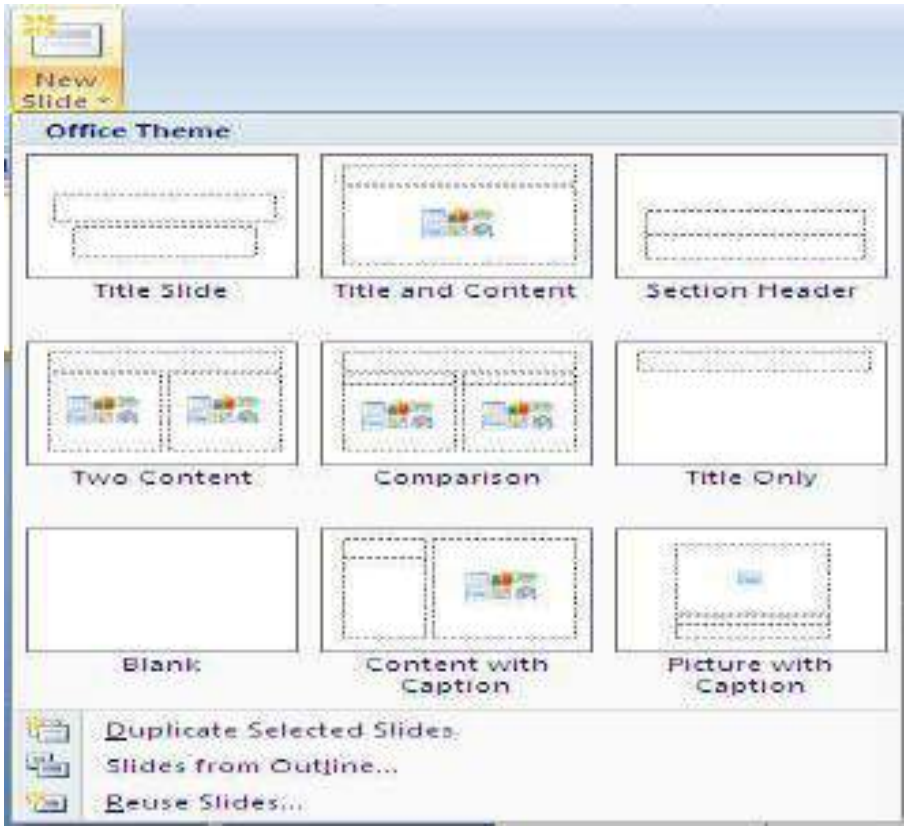
 Slide sorter view shows all slides together, allowing you to re-order the slides.

 Presentation view lets you see each slide as it will appear in the presentation.

Building Slides

- PowerPoint presentations consist of a series of slides. In building up a presentation you construct each slide adding titles, list points, and graphics as necessary. You can either start with a blank slide, or start with a template with ready-made entries for titles, lists and graphics.
- With PowerPoint loaded, you can build your first slide. To add a title to your slide click on the text labeled **Click to add title**. As soon as you click, the text will disappear and be replaced by a flashing insertion point. Type in text from the keyboard, using the **Backspace** and **Delete** keys to correct mistakes. When you have entered the title you can click on the next area of the slide to enter a subtitle in the same way.
- To add a new slide to your presentation, from the **Slides** group on the **Home** tab, click the top of the **New Slide** button to add a general slide.

click the bottom of the **New Slide** button to reveal a menu of slide designs.You will see a collection of slide themes, which contain various combinations of titles and content.Content is represented as a large, rectangular box, with a dotted border, containing a palette of coloured icons. The dotted box is used to create a bulleted list, and each icon can used to include a table, picture, or media clip. In creating each slide, you use whichever content element that you require and ignore the other tools, the icons and dotted line do not appear on the finished presentation.



Text

Text on PowerPoint slides, needs to be formatted to be easily visible to all audience members.

• To enter text in a title field, click inside the field and type in your text.

• To change the appearance or colour of any text, select the text, then use either the tools in the Font and Paragraph groups on the Home tab.

• To add an additional text area to your document, click the Insert tab, then from the Text group, click the Text Box button. Drag a box onto the slide using the mouse.

• To reposition text on your slide click the border of the text area, then drag it to its new position.

• To remove a text area from your slide, click the border of the text area, then press the **Delete** key.

Bulleted Lists

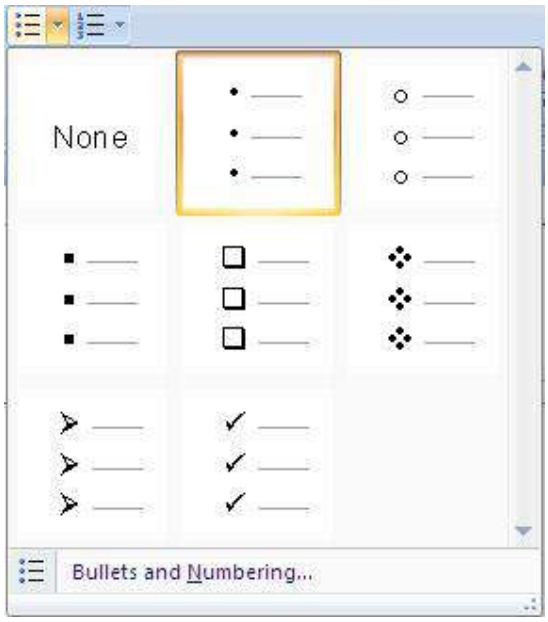
- Most presentations use bulleted lists to summarise points that the speaker can elaborate upon. To use bulleted lists it is best to choose a slide theme that includes a bulleted list area.
- When you click inside the bulleted list area you get a single bullet point and a flashing insertion point. Type in the text for your first point and apply formatting if necessary. To create subsequent bullet points, simply press the **Enter** key to start a new line with a new bullet point.
- If you wish for any of your text lines to be displayed without a bullet you can click in the line, then click the bulleted list button to remove the bullet point.To create multi-level bulleted lists, type in the text lines as usual. Click at the start of any lines that you wish to appear as a lower level list then press the **Tab** key from the keyboard.

The selected lines will receive an additional indent and will get a different bullet symbol. Using the **Backspace** key produces the opposite effect.

- To change the bullet symbols used, first click in one text line of the list level that you wish to change.

Next, click the down arrow to the right of the bulleted list button in the **Paragraph** group on the **Home** tab. Choose a bullet design from the displayed collection.

- To choose a different button, click the **Bullets and Numbering** option, then in the dialog box that appears, click the **Customize** button.



Pictures

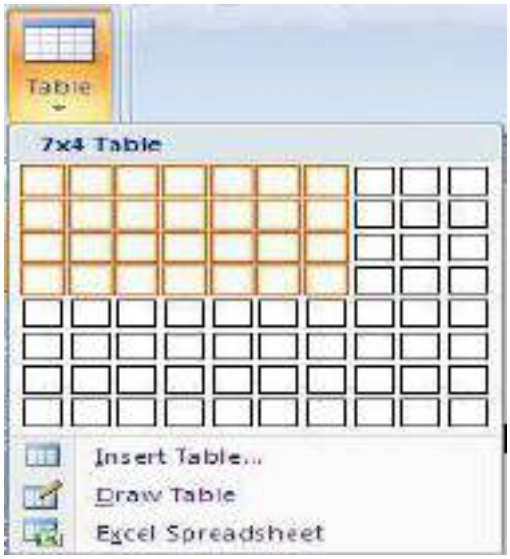

To place a picture in a new slide, choose a slide theme which contains a content area, then click the **Insert picture from file** icon. To add a picture to an existing slide, go to the **Insert** tab and in the **Illustrations** group click **Picture**. In the dialog box, locate and select your image file, then click the **Insert** button.

A small version of the picture will appear in the current slide. You can click and drag any of the circles located in each corner of the picture, to change the size of the picture, or you can click anywhere within the picture and drag it to a new position.


To put a clipart image into your document, click the **Clip Art** button on a new slide, or in the **Illustrations** group on the **Insert** tab for an existing slide. In the pane that appears on the right, type in a keyword to search through the clipart gallery.

Tables

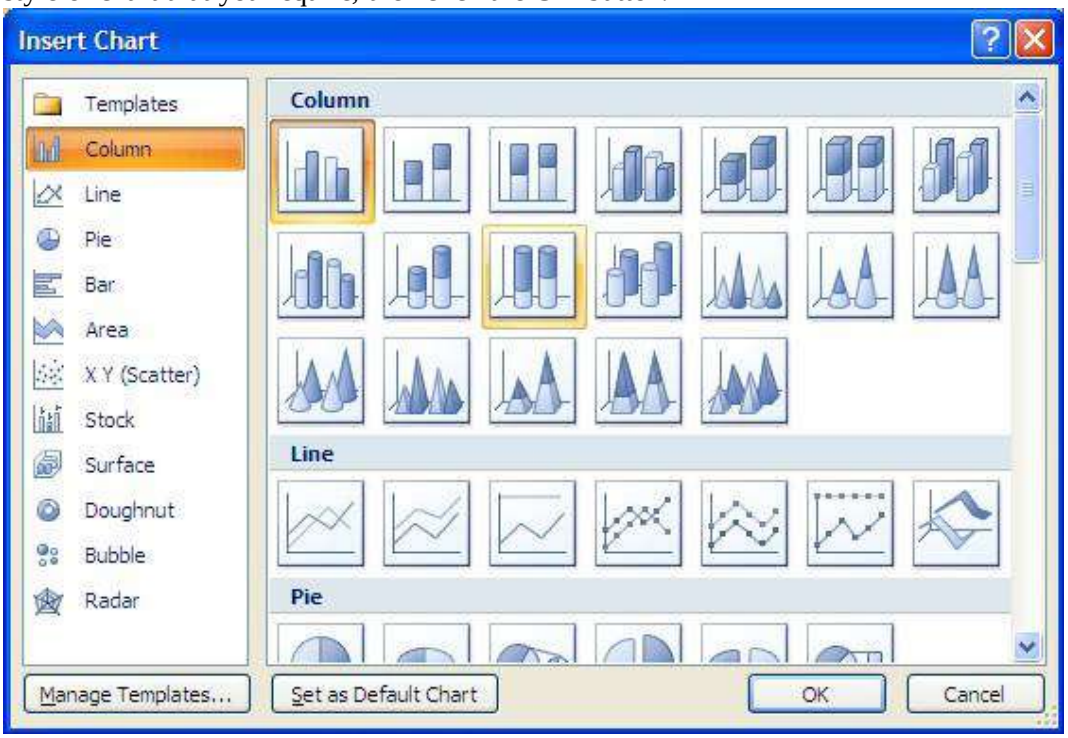
To place a table in a new slide, choose a slide theme which contains a content area, then click the **Insert able** icon. To add a table to an existing slide, go to the **Insert** tab, and from the **Tables** group, click the **Table** button.



Use your mouse on the grid to select the number of rows and columns that your table will have, here a 7x4 table is being created. As you select cells in the grid the corresponding table will be drawn in your document. When you release the mouse button the table will be Created

Graphs

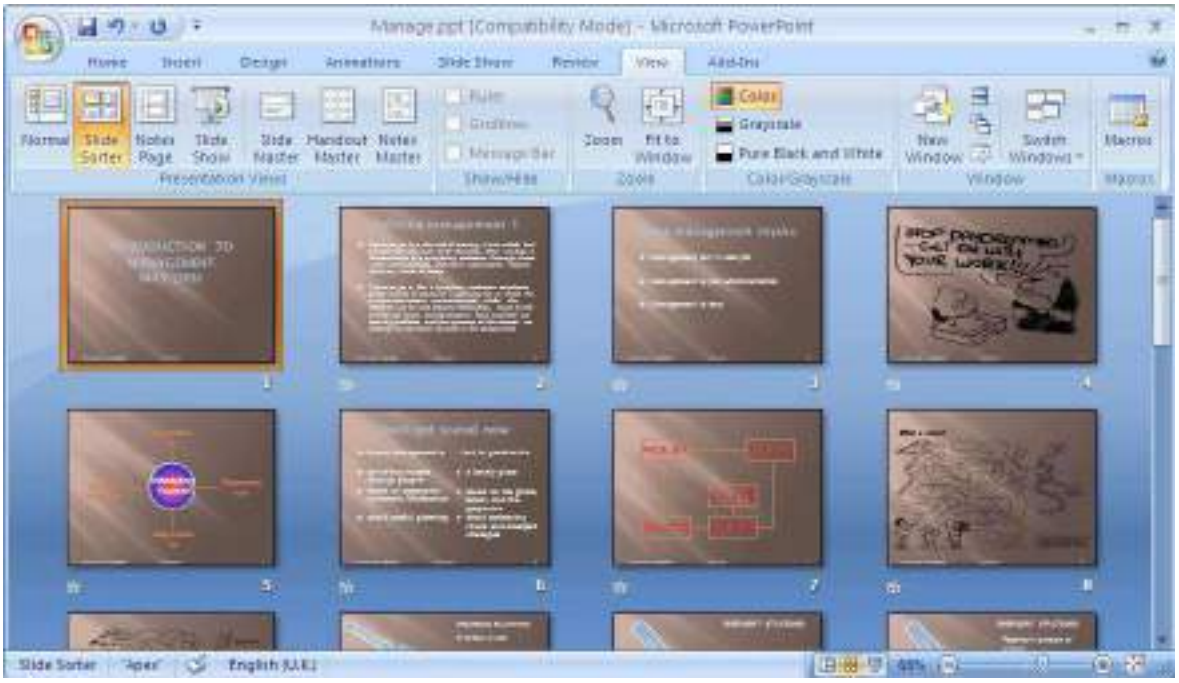
To place a graph in a new slide, choose a slide theme which contains a content area,
then click the **Insert Chart** icon. To add a graph to an existing slide, go to the **Insert** tab and in the **Illustrations** group click the **Chart** button. In the dialog box that appears, click the style of chart that you require, then click the **OK** button.



Microsoft Excel 2007 will then start up and you can input data in the Excel Spreadsheet, which will then form a chart in your PowerPoint presentation

Re-Ordering your Slides

To change the order of your slides, or insert a new slide into the middle of a presentation, it is worth switching to slide sorter view. Go to the **View** tab and in the **Presentation Views** group, click the **Slide Sorter** button, or click the Slide Sorter View button at the bottom of the screen to see the following layout:



From here you can delete any slide by clicking it then pressing the **Delete** key. You can re-order slides by dragging any slide to a new position, and you can add a new slide anywhere by clicking between two existing slides and clicking the **New Slide** button, from the **Slides** group on the **Home** tab.

Animation and Design

Now that we have covered the construction of slides, we can transform the information into an elegant presentation. Whilst doing this it is useful to click the **Slide Show** tab to check how the slides would appear in a real slide show.

- To look at the current slide, as it would appear in the show, click the **From Current Slide** button in the **Start Slide Show** group.

- To view all slides from the beginning click the **From Beginning** button in the **Start Slide Show** group.
- When you wish to return to the normal view press the **Esc** key.

Design Templates

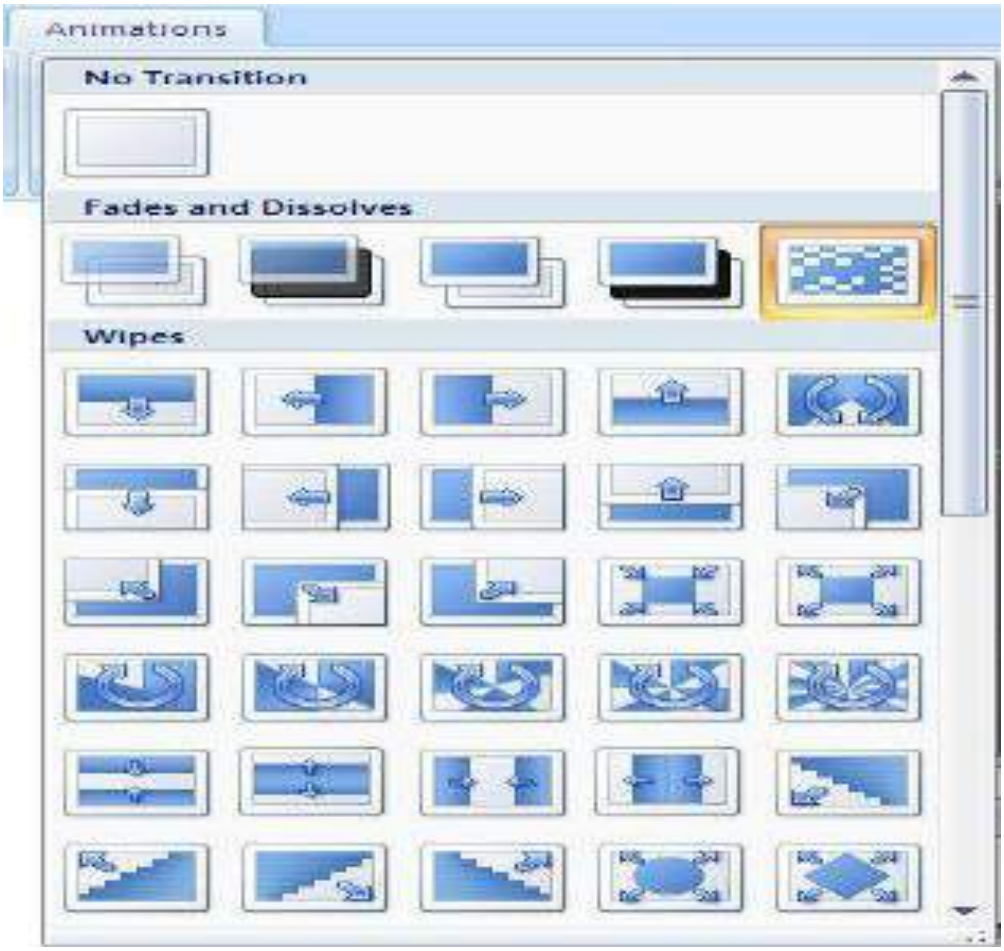
To apply a design template to your presentation, go to the **Design** tab. In the **Themes** group, click the bottom button in the column of three to see the available designs.

Click any theme to apply it to all slides in your presentation.

Transitions Between Slides

As you move from slide to slide during the presentation, you can have PowerPoint display an animated effect. To choose an effect, go to the **Animations** tab.

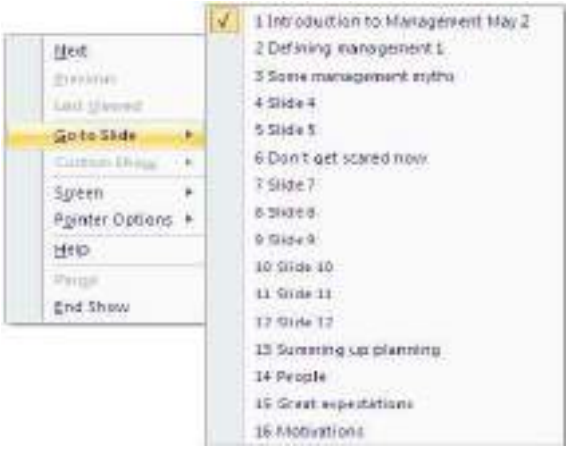
In the **Transition to This Slide** group, click the bottom button in the column of three to the right of the palette. Click any transition to see the effect played out on your presentation slides in the background. When you have chosen an effect it will work when you move to this current slide. You can have the effect work on every slide in your presentation by clicking the **Apply to All** button.



The Presentation

To deliver your presentation to an audience from the computer, start PowerPoint andload your presentation file. Click the **Slide Show** tab, click the **From Beginning** button in the **Start Slide Show** group.

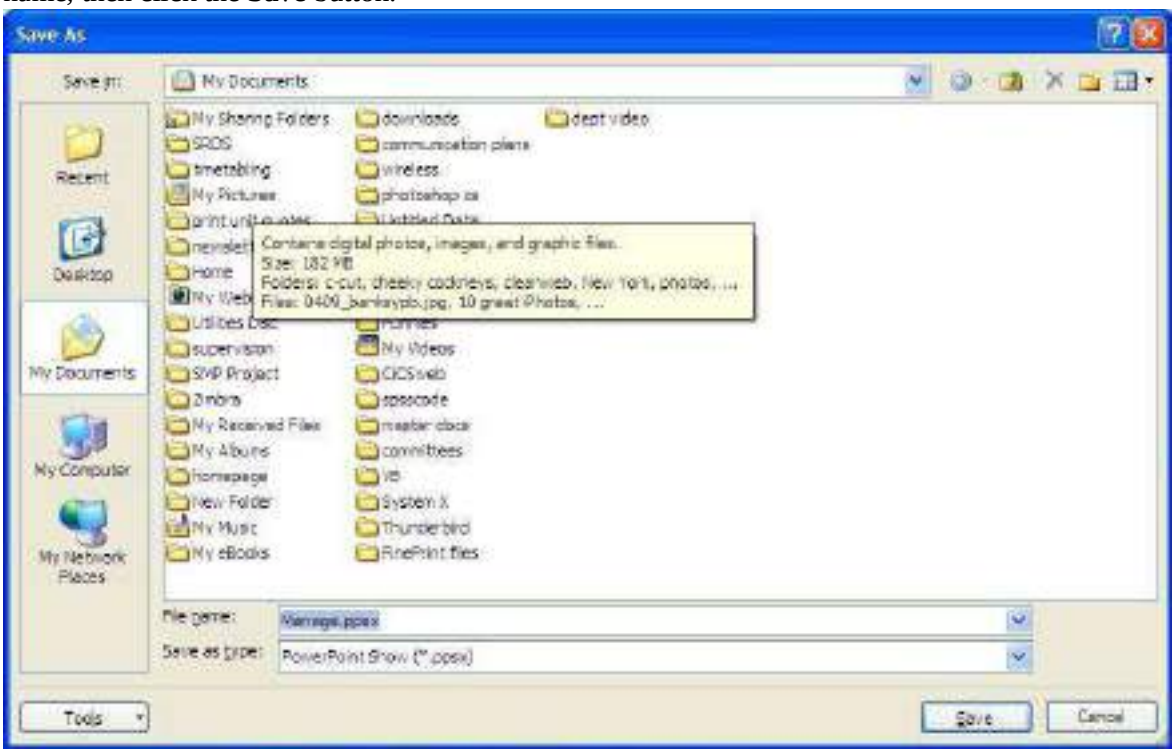
Use the left mouse button, **Enter** key, **Page Down** key to advance through the slides, use the **Backspace**, **Page Up** keys to retreat through the slides. To jump to a specific slide, right-click the presentation, select **Go to Slide** then from the submenu select the required slide.



If you wish to emphasise a point you can use the **Pointer Options** entry from this menu to change the cursor into a pencil and you can underline or circle any part of a slide, without changing the underlying file.

Creating a Show

When your presentation is complete you can save it as a show. When it is opened it starts directly in a slide show, independent of the PowerPoint environment. To save your presentation as a show, click the Office button, then from the menu position the mouse cursor over **Save As**. In the submenu that appears select the **PowerPoint Show** option. Provide a name, then click the **Save** button.



4 Importance of networking

4.1 Introduction

Information and communication are two of the most important strategic issues for the success of every enterprise.
While today nearly every organization uses a number of computers and communication tools (like telephone or fax), they are often still isolated. While managers today are able to use applications like wordprocessors or spreadsheets, not very many of them use computer-based tools to communicate with other departments or information retrieval programs.
To overcome these obstacles in an effective usage of information technology, computer networks are necessary. They are a new kind of organization of computer systems produced by the need to merge computers and communications. Computer networks can manage to put down the barriers between information held on several systems. Only with the help of computer networks can a borderless communication and information environment be built.

4.2 Importance of Networking

Computer networks allow the user to access remote programs and remote databases either of the same organization or from other enterprises or public sources. Computer networks provide communication possibilities faster than other facilities. Because of these optimal information and communication possibilities, computer networks may increase the organizational learning rate

there are other reasons why any organization should have a computer network

- cost reduction by sharing hardware and software resources
- high reliability by having multiple sources of supply
- cost reduction by downsizing to microcomputer-based networks instead of using mainframes
- greater flexibility because of possibility to connect devices from various vendors

A network is two or more computers connected together to share information and files between them. Businesses aren't the only ones that can benefit from creating a network. Home users can enjoy sharing music, movies and printers from any computer.

File Sharing **:** Computers connected to a network can share files and documents with each other. Personal computers connected to a business network can choose which files and folders are available to share on the network.

Printers **:** Computers can print pages to another computer with a printer on the network. Additionally, printers can be connected using a print server, which allows direct printing from all computers.

4.3 Computer Network

4.3.1 Types of Networks

A) Local Area Networks

Local area networks (LANs) are used to connect networking devices that are in a very close geographic area, such as a floor of a building, a building itself, or a campus environment.

B) Wide Area Networks

C) Wide area networks (WANs) are used to connect LANs together. Typically, WANs are used when the LANs that must be connected are separated by a large distance.

D) Metropolitan Area Networks

A **metropolitan area network (MAN)** is a hybrid between a LAN and a WAN.

.
A computer network is an interconnection of various computer systems located at different places.
In computer network two or more computers are linked together with a medium and data communication devices for the purpose of communicating data and sharing resources. The computer that provides resources to other computers on a network is known as server In the network the individual computers, which access shared network resources, are known as workstations or nodes.

Computer Networks may be classified on the basis of geographical area in two broad categories.
1. Local Area Network (LAN)
2. Wide Area Network (WAN)

I. Local Area Network:
Networks used to interconnect computers in a single room, rooms within a building or buildings on one site are called Local Area Network (LAN).
LAN links computers, i.e., software and hardware, in the same area for the purpose of sharing information. Usually LAN links computers within a limited geographical area because they must be connected by a cable, which is quite expensive.

Major Characteristics of LAN are as follows:

1 Every computer has the potential to communicate with any other computers of the network
2 High degree of interconnection between computers
3 Easy physical connection of computers in a network
4 Inexpensive medium of data transmission

5 High data transmission rate

Advantages of LAN are as follows:

- The reliability of network is high because the failure of one computer in the network does not

effect the functioning for other computers.

- Addition of new computer to network is easy.
- High rate of data transmission is possible.
- Peripheral devices like magnetic disk and printer can be shared by other computers.

Disadvantages of LAN is

- If the communication line fails, the entire network system breaks down.

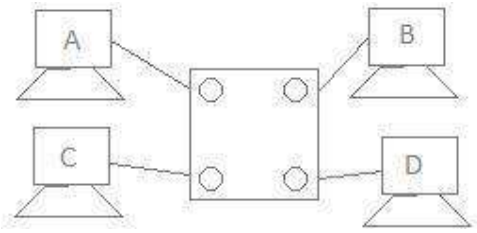
Use of LAN : Followings are the major areas where LAN is normally used

- File transfers and Access
- Word and text processing
- Electronic message handling
- Remote database access
- Personal computing
- Digital voice transmission and storage

4.4 Network Components

1)Hub

A hub works in the physical layer of the OSI model. It is basically a non-intelligent device, and has no decision making capability. What a Hub basically does is take the input data from one of the ports and broadcast the information to all the other ports connected to the network.



Port network

To demonstrate its working, consider a 4 port network as shown in Fig 1. There are 4 computers connected to the 4 ports. Suppose, if Computer A wants to send some data to Computer B using a Hub, then, Computer A broadcasts the data on the network, and Computer B, being connected to the network, has access to the data. But, in this case all the other ports connected to the network has access to the data that is being transmitted by Computer A. This happens because, the Hub works in the Physical Layer and hence it does not know about the MAC addresses of the ports connected to the network. So, there is a lack of security in the Hub.

USB Hub

The picture shows a USB Hub, wherein the data is fed into the input port and is broadcasted to all the other 4 ports. The Network Hubs are outdated and are out of the market.

2) Switch

A switch is an intelligent device that works in the data link layer. The term intelligent refers to the decision making capacity of the Switch. Since it works in the Data link layer, it has knowledge of the MAC addresses of the ports in the network.

Switch

Hence, in the Fig 1, if data has to be sent from Computer A to Computer B, then, the data is transferred to the Computer B only, and not to any other computers connected on the network. Hence, it establishes a link between the sender and the receiver based on the MAC addresses. This also means that when data is being sent from A to B, Computer C can establish a link with Computer D and communication can take place between them. So, simultaneous data transfer is possible in a switch. Also, Hub divides bandwidth, but a Switch does not.

It is also to be noted that a switch is a secure device, because it sends information only to the desired destinations, and also certain security features such as firewalls can be implemented in the Switches.

3) Bridge

A bridge is also a device which works in the Data Link Layer, but is more primitive when compared to a switch. Initial bridges were used to connect only 2 LAN's, but the most recent ones perform similar operation as the switches. It also works on the principle of transfer of information using the MAC addresses of the ports.

Bridge

It can be noted is that the normal ADSL modem can be connected via bridging also. The only difference is that, when bridging is used, each time the device has to be connected to the internet, it has to dial to the internet and establish a connection. Also, a bridge alone cannot be used to connect to the internet, because, the bridge works in the Data Link Layer, and has no knowledge of the IP Addresses, which are used in the Internet.

4) Router

Any computer can be connected to the internet via MODEM, which performs the MODulation and the DEModulation operations. But, when there are more than one computer at home or in an organization, and you have a single internet connection, you need a Router. Router is a device which is used when multiple devices need to connect to the Internet using the same IP.

Any Internet Service Provider (ISP) provides a single IP, and especially for personal use, the IP address is assigned dynamically. This is done because, suppose, an ISP has 1000 IP addresses, it does not mean that it has 1000 customers. An ISP assumes that not all devices will be connected to the internet at the same time. Hence, when a user wants to access the internet, any IP address from the pool of IP addresses from the ISP will be assigned to connect the user to the internet.

Router

Hence, the router does the job of connecting multiple devices in a LAN to the internet using the same IP address. Since the router works in the Network Layer, it does forwarding on the basis of IP addresses.

Functionality:

When a router receives the data, it determines the destination address by reading the header of the packet. Once the address is determined, it searches in its **routing table** to get know how to reach the destination and then forwards the packet to the higher hop on the route. The hop could be the final destination or another router.

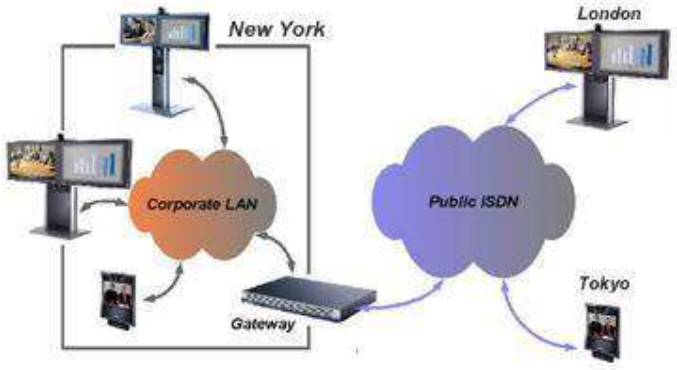
Routing tables play a very pivotal role in letting the router makes a decision. Thus a routing table is ought to be *updated* and *complete*. The two ways through which a router can receive information are:

- Static Routing: In static routing, the routing information is fed into the routing tables manually. It does not only become a time-taking task but gets prone to errors as well. The manual updating is also required in case of statically configured routers when change in the topology of the network or in the layout takes place. Thus static routing is feasible for tinniest environments with minimum of one or two routers.

- Dynamic Routing: For larger environment dynamic routing proves to be the practical solution. The process involves use of peculiar routing protocols to hold communication. The purpose of these protocols is to enable the other routers to transfer information about to other routers, so that the other routers can build their own routing tables.

5) Gateway

The Gateway devices work in the Transport layer and above, where the different network technologies are implemented. A gateway is necessary when there are different technologies implemented by the different LAN's which are to be connected together.



Gateway function

The Fig shows the working of a gateway. Consider 2 networks, say in New York, and a network in London. If data has to be sent from one place to another, we need to ensure that

the network technologies that are being used by both the networks are the same. If not, we need to use a Gateway.

In the more common example, we use a telephone network and internet networks, which works on different technologies. The telephone network follows the ISDN, and the Internet follows the IP. Here, 2 different technologies are being used. In this case, the router fails to work, since the router cannot understand the functionalities of both the networks. Hence, we require a Gateway, which acts as a translator in communicating between the 2 networks.

6) Modems

Modem is a device which converts the computer-generated digital signals of a computer into analog signals to enable their travelling via phone lines. The 'modulator-demodulator' or modem can be used as a dial up for LAN or to connect to an ISP. Modems can be both external, as in the device which connects to the USB or the serial port of a computer, or proprietary devices for handheld gadgets and other devices, as well as internal; in the form of add-in expansion cards for computers and PCMCIA cards for laptops.

Configuration of a modem differs for both the external and internal modem. For internal modems, IRQ – Interrupt request is used to configure the modem along with I/O, which is a memory address. Typically before the installation of built-in modem, integrated serial interfaces are disabled, simultaneously assigning them the COM2 resources.

For external connection of a modem, the modem assigns and uses the resources itself. This is especially useful for the USB port and laptop users as the non-complex and simpler nature of the process renders it far much more beneficial for daily usage.

Upon installation, the second step to ensure the proper working of a modem is the installation of drivers. The modem working speed and processing is dependent on two factors:

- Speed of UART – Universal Asynchronous Receiver or Transmitter chip (installed in the computer to which the modem connection is made)
- Speed of the modem itself

4.5 Network Topology

Topology refers to the way in which the network of computers is connected. Each topology is suited to specific tasks and has its own advantages and disadvantages. The choice of topology is dependent upon type and number of equipment being used, planned applications and rate of data transfer required, response time, and cost. Topology can also be defined as the *geometrically interconnection pattern* by which the stations (nodes/computers) are connected using suitable transmission media (which can be point-to-point and broadcast).

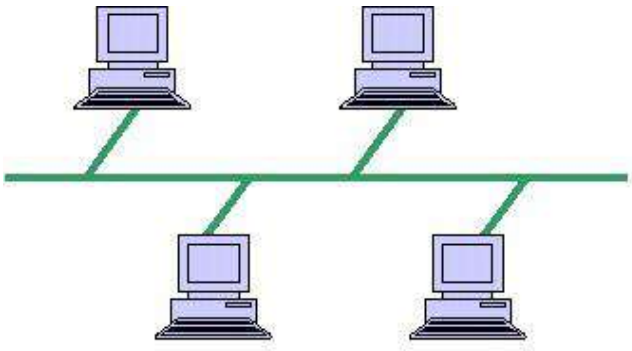
Think of a topology as a network's virtual shape or structure. This shape does not necessarily correspond to the actual physical layout of the devices on the network. For example, the computers on a home LAN may be arranged in a circle in a family room, but it would be highly unlikely to find a ring topology there. Network topologies are categorized into the following basic types:

- bus
- ring
- star
- tree
- mesh

More complex networks can be built as hybrids of two or more of the above basic topologies.

1) Bus Topology

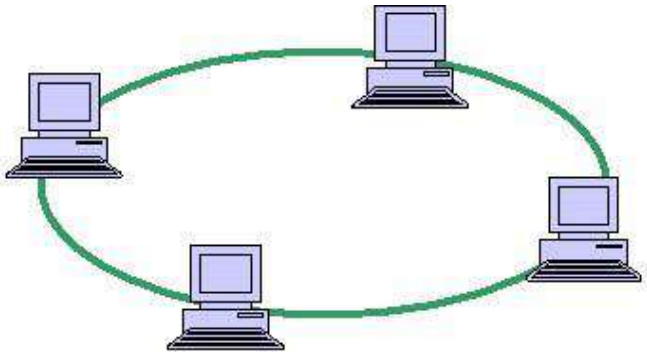
Bus networks (not to be confused with the system bus of a computer) use a common backbone to connect all devices. A single cable, the backbone functions as a shared communication medium that devices attach or tap into with an interface connector. A device wanting to communicate with another device on the network sends a broadcast message onto the wire that all other devices see, but only the intended recipient actually accepts and processes the message.
bus networks work best with a limited number of *Networking made it easy* 2 *Compiled by* devices. If more than a few dozen computers are added to a network bus, performance problems will likely result. In addition, if the backbone cable fails, the entire network effectively becomes unusable



Bus Topology Diagram

2) Ring Topology

In a ring network, every device has exactly two neighbors for communication purposes. All messages travel through a ring in the same direction (either "clockwise" or "counterclockwise"). A failure in any cable or device breaks the loop and can take down the entire network. To implement a ring network, one typically uses FDDI, SONET, or Token Ring technology. Ring topologies are found in some office buildings or school campuses.



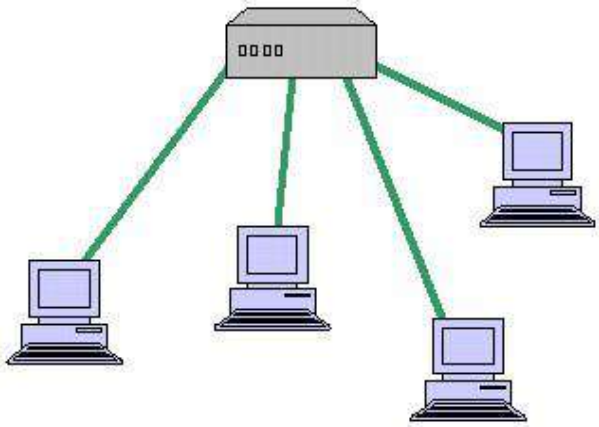
Definition: Token Ring is a data link technology for local area networks (LANs). It operates at layer 2 of the OSI model.

How Token Ring Works
Unlike all other standard forms of LAN interconnects, Token Ring maintains one or more common data frames that continuously circulates through the network. These frames are shared by all connected devices on the network as follows:
• a frame (packet) arrives at the next device in the ring sequence

that device checks whether the frame contains a message addressed to it. If so, the device removes the message from the frame. If not, the frame is empty (called a *token frame*).
• the device holding the frame decides whether to send a message. If so, it inserts message data into the token frame and issues it back onto the LAN. If not, the device releases the token frame for the next device in sequence to pick up
• the above steps are repeated continuously for all devices in the token ring

3) Star Topology

Many home networks use the star topology. A star network features a central connection point called a "hub" that may be a hub, switch or router. Devices typically connect to the hub with Unshielded Twisted Pair (UTP) Ethernet. Compared to the bus topology, a star network generally requires more cable, but a failure in any star network cable will only take down one computer's network access and not the entire LAN. (If the hub fails, however, the entire network also fails.)

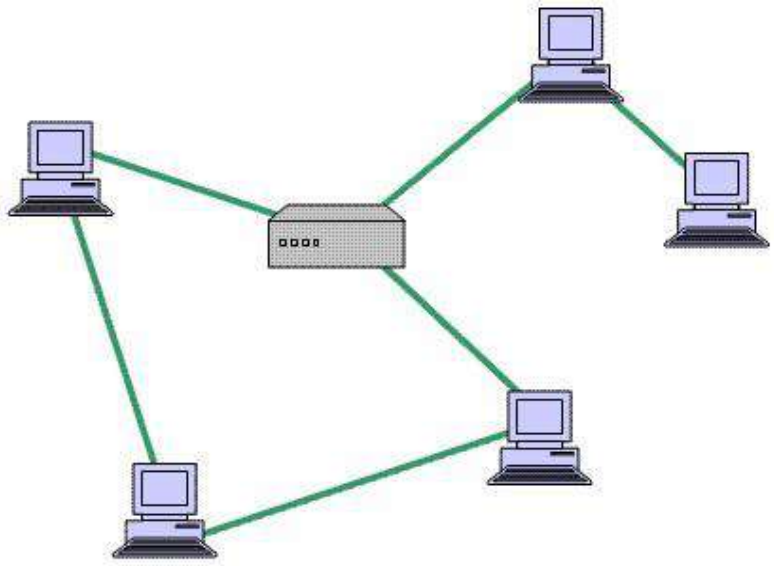


4) Tree Topology

Tree topologies integrate multiple star topologies together onto a bus. In its simplest form, only hub devices connect directly to the tree bus, and each hub functions as the "root" of a tree of devices. This bus/star hybrid approach supports future expandability of the network much better than a bus (limited in the number of devices due to the broadcast traffic it generates) or a star (limited by the number of hub connection points) alone.

5) Mesh Topology

Mesh topologies involve the concept of routes. Unlike each of the previous topologies, messages sent on a mesh network can take any of several possible paths from source to destination. (Recall that even in a ring, although two cable paths exist, messages can only travel in one direction.) Some WANs, most notably the Internet, employ mesh routing. A mesh network in which every device connects to every other is called a full mesh. As shown in the illustration below, partial mesh networks also exist in which some devices connect only indirectly to others.

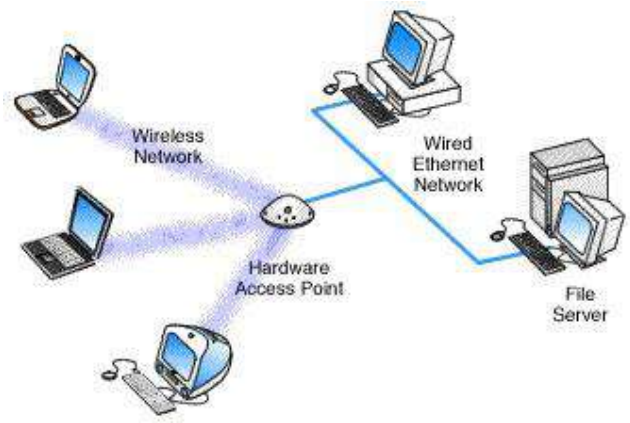


Mesh Topology Diagram

4.5.1Wireless networking

Wireless networking is a method by which homes, telecommunications networks and enterprise (business) installations avoid the costly process of introducing cables into a building, or as a connection between various equipment locations.

• Do not require physical cabling
• Particularly useful for remote access for laptop users
• Eliminate cable faults and cable breaks.
• Signal interference and security issue.



Moving data through a wireless network involves three separate elements: the radio signals, the data format, and the network structure. Each of these elements is independent of the other two. In terms of the OSI reference model, the radio signal operates at the physical layer, and the data format controls several of the higher layers. The network structure includes the wireless network interface adapters and base stations that send and receive the radio signals. In a wireless network, the network interface adapters in each computer and base station convert digital data to radio signals, which they transmit to other devices on the same network, and they receive and convert incoming radio signals from other network elements back to digital data.

A **wireless network** enables people to communicate and access applications and information without wires. This provides freedom of movement and the ability to extend applications to different parts of a building, city, or nearly anywhere in the world. Wireless networks allow people to interact with e-mail or browse the Internet from a location that they prefer.

Many types of wireless communication systems exist, but a distinguishing attribute of a wireless network is that communication takes place between computer devices. These devices include personal digital assistants (PDAs), laptops, personal computers (PCs), servers, and printers. Computer devices have processors, memory, and a means of interfacing with a particular type of network. Traditional cell phones don't fall within the definition of a computer device; however, newer phones and even audio headsets are beginning to incorporate computing power and network adapters. Eventually, most electronics will offer wireless network connections.

As with networks based on wire, or optical fiber, wireless networks convey information between computer devices. The information can take the form of e-mail messages, web pages, database records, streaming video or voice. In most cases, wireless networks transfer data, such as e-mail messages and files, but advancements in the performance of wireless networks is enabling support for video and voice communications as well.

Types of Wireless Networks

WLANS: Wireless Local Area Networks

WLANS allow users in a local area, such as a university campus or library, to form a network or gain access to the internet. A temporary network can be formed by a small number of users without the need of an access point; given that they do not need access to network resources.

WPANS: Wireless Personal Area Networks

The two current technologies for wireless personal area networks are Infra Red (IR) and Bluetooth (IEEE 802.15). These will allow the connectivity of personal devices within an area of about 30 feet. However, IR requires a direct line of site and the range is less.

WMANS: Wireless Metropolitan Area Networks

This technology allows the connection of multiple networks in a metropolitan area such as different buildings in a city, which can be an alternative or backup to laying copper or fiber cabling.

WWANS: Wireless Wide Area Networks

These types of networks can be maintained over large areas, such as cities or countries, via multiple satellite systems or antenna sites looked after by an ISP. These types of systems are referred to as 2G (2nd Generation) systems.Comparison of Wireless Network Types

Type	Coverage	Performance	Standards	Applications
Wireless PAN	Within reach of a person	Moderate	Wireless PAN Within reach of a person Moderate Bluetooth, IEEE 802.15, and IrDa Cable replacement for peripherals	Cable replacement for peripherals
Wireless LAN	Within a building or campus	High	IEEE 802.11, Wi-Fi, and HiperLAN	Mobile extension of wired networks
Wireless MAN	Within a city	High	Proprietary, IEEE 802.16,and WIMAX	Fixed wireless between homes and businesses and the Internet
Wireless WAN	Worldwide	Low	CDPD and Cellular 2G, 2.5G, and 3G	Mobile access to the Internet from outdoor areas

5 Use of Computer in Commerce

5.1 Data Processing
Data is collection of facts- unorganized but able to organized in to useful information. Information is data arranged in an order.So Data Processing is a series of actions and operations that convert data into useful information. In the commercial world, data processing refers to the processing of data required to run organizations and businesses.

5.2 Files- a file is considered as a sequence of bytes, the operating system supplies routines that can read/write a specified number of bytes. file is a sequence of records of the same type.

Records-
file is a sequence of records of the same type. A record is a sequence of data bytes together with control information about the record's size and maybe some attributes.the unit of I/O operations is one or more record(s).

File organization and access methods are separate but related concepts,organization refers to the internal structure, access method is an "allowed method" to read/write from/to the file. It may be possible to access a file in an access method other than the "natural" one.
Possible file organizations are:

1) Sequential - The info in file can be accessed only in the order it was written. The writing order defines the "natural" order of data, in simple cases the data will reside on the disk in consecutive locations.

2) Relative - The file is a sequence of equal-sized "data cells" you can access any "cell" you want using its serial number, and the system will calculate the offset. Relative files are just like arrays [of structures] but instead of residing in main memory, they are recorded on a magnetic media.

3) Indexed - The file is made of "data cells", not necessarily of the same size, and contain "indexes", lists of "pointers" to these cells arranged by some order. Standard FORTRAN 77 doesn't require that indexed files are to be implemented, but some vendors supply this nice extension.

5.2 Computer application in Business:
Needs and Scope:-
It has great need to use computer applications in business. because world become a global market and everyone want to buy a good quality product and ideas. we can share our ideas through computer aplicantion sell our ideas and discuse about new product.

5.3 Computer Application in various fields of Commerce:
Almost every business uses computers to complete daily tasks. From making contact with clients to inputting data for reports, computers allow businesses a more efficient way to manage affairs when compared to traditional paper and manila folders. Businesses use a variety of different types of computers such as desktops, laptops, servers, smartphones and tablets, depending on their needs. With computers, employees are able to work anytime, anywhere.

Communication

Communication is key when gaining and maintaining clients and other important contacts. Computers give businesses access to email, instant messaging and custom customer contact systems. Computerized phone systems allow for automated support during off hours and a virtual operator can quickly direct callers to the correct department for faster support.

1. **Marketing**

Computers allow businesses to create websites, stunning ads and complete marketing campaigns. Marketing videos can be edited and custom ads created in-house with the use of specialized software. Businesses can completely develop and manage websites with their own servers or connect remotely to a third-party business to upload their latest content such as articles, product images and blog posts.

2. **Accounting**

Accounting without computers presents a high risk for human error. Accounting software allows businesses to simply input their financial data and instantly see gains and losses. All necessary tax reports are available the moment the data is entered. Using computers for invoicing, managing expenses and calculating payroll is vital for ensuring financial data is as accurate as possible.

3. **Storage**

Instead of filing cabinets, businesses are able to store millions of files using computers and servers. Data can be stored centrally for easy access from multiple computers or stored locally for individual use. Computerized storage saves space and provides a far more efficient organization strategy. With encryption, passwords and replace keys, data remains secure.

4. **Documents and Reports**

Most businesses have some sort of productivity software which typically includes a word processor and spreadsheet application. These two programs allow businesses to create reports, memos, tutorials and even colorful ads for company events. Spreadsheet applications give businesses the chance to organize, manage and calculate both numeric and alphabetic data. With charts and graphs, reporting becomes visual instead of text-based.

5. **Education**

Businesses use computers to help educate employees on software, company policy, standard procedures and safety. Instead of hiring teachers, computers can be used to educate employees at their own pace or through an online webinar with live questions and answers. This form of education fits the busy schedules of businesses without sacrificing the quality of the education.

5.3.1 Personal Administration (Human Resources)

Personnel Administration, commonly known as Human Resources or HR, handles a great many issues in the workplace. The primary function is the recruiting selecting and hiring of new employees, but goes way beyond that in most companies. Human Resources is also responsible to see that workplace standards meet legal and ethical criteria, including the manner in which employees are treated by their supervisors. In some companies, HR is responsible for employee training, although this is often done by the department hiring the new employee. HR also administers employee benefits programs and keeps track of sick time and vacations. Employee guides are also created by Human Resources, usually with the assistance of an attorney knowledgeable in personnel law.

Accounting

Definition -The Systematic recording ,reporting and analysis of financial transactions of a business.

Cost and Budgetary management:-

Preparing a budget is an integral part of establishing the business case for a project. An evaluation of the financial requirements is central to establishing whether the project is viable or not. In cases where external funding is being applied for, the budget will form an important element of the bid and the **benefits model**. At the most fundamental level, budgeting should answer the questions:

- 'What is the cost of undertaking this project?'
- 'Is any external funding sufficient to cover the costs?'
- 'Where there is competition for resources, is this project a priority?', and
- 'To what degree do cost and benefit balance up?'

Purchasing:-

The activity of acquiring goods or services to accomplish the goals of an organization.
The major objectives of purchasing are to
(1) maintain the quality and value of a company's products,
(2) minimize cash tied-up in inventory,
(3) maintain the flow of inputs to maintain the flow of outputs, and
(4) strengthen the organization's competitive position.

Purchasing may also involve

(a) development and review of the product specifications,
(b) receipt and processing of requisitions,
(c) advertising for bids,
(d) bid evaluation,
(e) award of supply contracts,
(f) inspection of good received, and
(g) their appropriate storage and release.

Stock-Broking:-

The process of investing in the share market, either individually or through a broker is known as stock broking, in simple terms. This is primarily done by opening a Demat account. If done through a broker, he opens an account, helping you to operate through online stock broking facility. Going ahead the broker suggests investment ideas and strategies suiting individual requirements and based on his objective of investment. Tenure of investment, the selected financial instruments and their respective companies, the schemes, the risk taking ability, the sum available for investment, all are considered while forming investment choices. After the amount is invested, the broker tracks and monitors the investments, changes or reinvests depending on the performance and generates reports for them. This entire process is known as stock broking.

Banking:

Banking is a business of accepting deposits and lending money. It is carried out by financial intermediaries, which performs the functions of safeguarding deposits and providing loans to the public.

In other words, Banking means accepting for the purpose of lending or investment of deposits of money from public repayable on demand and can be withdrawn by cheque, draft order and so on.

Banking Company: Any company, which transacts the business of banking

Banking System is a principal mechanism through which the money supply of the country is created and controlled. The banking system enables us to understand Commercial Banks, Secondary Banks, Central Banks, Merchant Bank or Accepting Houses and Discount Houses but to exclude the Saving Banks and Investment and other intermediaries.

Insurance:

Insurance is a contract between the insurer and the insured wherein against receipt of certain amount, called premium, the insurer agrees to make good any financial loss that may be suffered by the insured, due to the operation of an insured peril on the subject matter of insurance.
The Life is full of uncertainties.. People opt for insurance purely for the reasons of uncertainties in life. Insurance gives the insured a kind of peace of mind as he is assured to making up the loss in the event of such uncertainties in life happen.

Insurance business is divided into four classes , namely :

1) Life Insurance. Popular Products in Life insurance are Endowment Assurance (Participating), and Money Back (Participating). More than 80% of the life insurance business is from these products

2) Fire Insurance

3) Marine Insurance

4) Miscellaneous Insurance. Fire and Miscellaneous insurance businesses are predominant. Motor Vehicle insurance is compulsory.

Life Insurers transact life insurance business; General Insurers transact the rest i.e. Fire Insurance, Marine Insurance and Miscellaneous Insurance.

Definition E-governance-

Electronic governance or e-governance is the application of information and communication technology (ICT) for delivering government services, exchange of information communication transactions, integration of various stand-alone systems and services between government-to-customer (G2C), government-to-business (G2B)

E-Governance : Focus

- Greater attention to improve service delivery mechanism
- Enhancing the efficiency of production
- Emphasis upon the wider access of information

Why eGovernance?

eGovernment can transform citizen service, provide access to information to empower citizens, enable their participation in government and enhance citizen economic and social opportunities, so that they can make better lives, for themselves and for the next generation.

5.4 Introduction to E-commerce

The exchange or buying and selling of commodities on a large scale involving transportation from place to place is known as commerce. When all this is done electronically, it is known as
"e-commerce". E-commerce from communication perspective is the delivery of information, products or services, or payments via telephone lines, computer networks, or any other means-commerce from business perspective, is the application of technology toward the automation of business transaction and workflows.
Ecommerce from online perspective provides the capability of buying and selling products and information on the Internet and other online services.

5.4.1 Features of e-Commerce

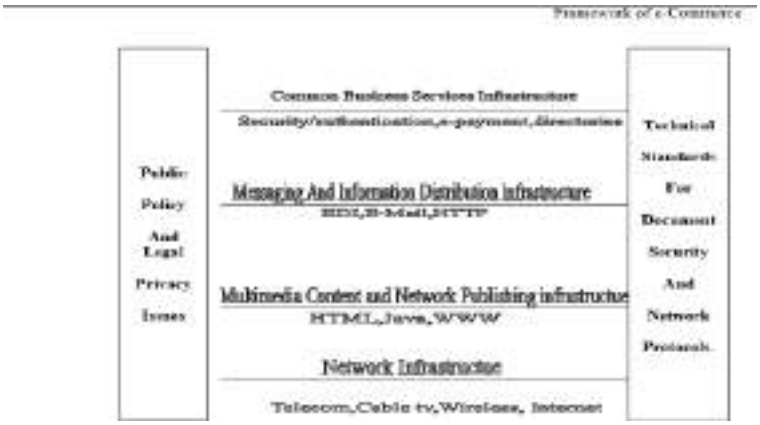
- e-Commerce is doing business online and electronically
- e-Commerce is about buying and selling products and services on the Internet.
- The sellers are individuals, small businesses or large corporations.
- The buyers are consumers or businesses.
- Payment can be made by credit or debit card, money order, cash, check, services or trade.
- The ranges of things that can be sold using e-commerce is enormous and include art, apartment, antennas, batteries ,bicycles, books, cars, cells phones, computer, cosmetics and whatever.

5.4.2 Role of E-Commerce

1. E-commerce is one of the cheapest means of doing business as it is e-commerce development that has made it possible to reduce the cost of promotion of products and services.
2. E-commerce reduces delivery time and labor cost thus it has been possible to save the time of both – the vendor and the consumer.
3. You can do your e-payments with the help of e-commerce.
4. You can pick up the pace of your online business with the help of e-commerce application
5. There is no time barrier in selling the products. One can log on to the internet even at midnight and can sell the products at a single click of mouse.
6. E-Commerce provide facility - on-time alerts are meant for the convenience of the consumers and inform the consumers about new products.

5.5 E-commerce Framework:

The e-commerce framework offers a set of options to the customers. Most of the electronic commerce plans have different strategies for security and privacy, their skill to deal with the payments, and their usability to different transactions
Framework tells about the detail of how e-commerce can take place. It defines actually how e-commerce implemented, how online trading or business can be done. It defines important components that should be present to do some transaction. Framework of e-commerce can be viewed as shown below:-



The important components of this framework are:

1. Network Infrastructure is called as "INFORMATION SUPERHIGHWAY" - is the path through which actual information flows and moves between sender and receiver. Information Superhighway consists of telecommunication companies that provide telephone lines.

2. Multimedia Contents And Network Publishing- The Information Superhighway is the transportation foundation that enables the transmission of content. The most prevalent architecture that enables networking publishing is the World Wide Web. The web allows small businesses and individuals to develop content in the form of Hypertext Markup Language (HTML) and publish it on a web server. Web provides a means to create product information (content) and a means to publish it in a distribution center. (network server).

3. Messaging And Information Distribution Infrastructure- The information content transferred over the network consists of text, numbers, pictures, audio and video. But the network does not differentiate among content as everything is digital, that is, combinations of zero's and one's. Once contents has been created and stored on a server, messaging and information distribution methods carry that content across the network. Messaging vehicle is called middleware software. Messaging and information distribution include translators that interpret and transforms data formats.

4. Common Business Services Infrastructure - This infrastructure includes the different methods for facilitating online buying and selling processes. In online commerce, the buyers sends an electronic payment as well as some remittance information to the seller. Settlement occurs when the payment and remittance information are authenticated by the seller and accepted as valid. In order to enable online payment for information and ensure its safe delivery, the payment services infrastructure needs to develop encryption (making contents indecipherable except for the intended recipient) and authentication (making sure that customers are who they say they are) methods that ensure security of contents traveling on the network.

5. Public Policy And Technical Standards- Public Policy And Technical Standards are two support pillars for all e-commerce applications and infrastructure. Public policy related to e-commerce encompasses such issues as universal access, privacy and information pricing. Technical Standards dictate the specifics of information publishing tools, user interfaces and transport. Standards are essential to ensure compatibility across the entire network of world.

5.6 E-Commerce Categories-

The two most common participants in ecommerce are businesses and consumers. Based on this we can come up with four primary ecommerce types:

1. **Business to Business Ecommerce (B2B Ecommerce)**
   In this type of ecommerce, both participants are businesses. As a result, the volume and value of B2B ecommerce can be huge. An example of business to business ecommerce could be a manufacturer of gadgets sourcing components online.

2. **Business to Consumer Ecommerce (B2C Ecommerce)**
   When we hear the term ecommerce, most people think of B2C ecommerce. That is why a name like Amazon.com pops up in most discussions about ecommerce. Elimination of the need for physical stores is the biggest rationale for business to consumer ecommerce. But the complexity and cost of logistics can be a barrier to

B2C ecommerce growth.

3. **Consumer to Business Ecommerce (C2B Ecommerce)**
   On the face of it, C2B ecommerce seems lop-sided. But online commerce has empowered consumers to originate requirements that businesses fulfill. An example of this could be a job board where a consumer places her requirements and multiple companies bid for winning the project. Another example would be a consumer posting his requirements of a holiday package, and various tour operators making offers.

4. **Consumer to Consumer Ecommerce (C2C Ecommerce)**
   The moment you think of C2C ecommerce eBay.com comes to mind. That is because it is the most popular platform that enables consumers to sell to other consumers. Since eBay.com is a business, this form of ecommerce could also be called C2B2C ecommerce (consumer to business to consumer ecommerce).

1. Internet and Internet Application

1.1 Introduction

It is a worldwide system which has the following characteristics:

- Internet is a world-wide / global system of interconnected computer networks.
- Internet uses the standard Internet Protocol (TCP/IP)
- Every computer in internet is identified by a unique IP address.
- IP Address is a unique set of numbers (such as 110.22.33.114) which identifies a computer's location.
- A special computer DNS (Domain Name Server) is used to give name to the IP Address so that user can locate a computer by a name.
- For example, a DNS server will resolve a name **http://www.tutorialspoint.com** to a particular IP address to uniquely identify the computer on which this website is hosted.
- Internet is accessible to every user all over the world.

1.1.1 Evolution of the Internet

The structure and makeup of the Internet has adapted as the needs of its community have changed. Today's Internet serves the largest and most diverse community of network users in the computing world. A brief chronology and summary of significant components are provided in this chapter to set the stage for understanding the challenges of interfacing the Internet and the steps to build scalable internetworks.

Origins of the Internet

The Internet started as an experiment in the late 1960s by the Advanced Research Projects Agency (ARPA, now called DARPA) of the U.S. Department of Defense. DARPA experimented with the connection of computer networks by giving grants to multiple universities and private companies to get them involved in the research.

In December 1969, the experimental network went online with the connection of a four-node network connected via 56 Kbps circuits. This new technology proved to be highly reliable and led to the creation of two similar military networks, MILNET in the U.S. and MINET in Europe. Thousands of hosts and users subsequently connected their private networks (universities and government) to the ARPANET, thus creating the initial "ARPA Internet." ARPANET had an Acceptable Use Policy (AUP), which prohibited the use of the Internet for commercial use. ARPANET was decommissioned in 1989.

By 1985, the ARPANET was heavily used and congested. In response, the National Science Foundation (NSF) initiated phase one development of the NSFNET. The NSFNET was composed of multiple regional networks and peer networks (such as the NASA Science Network) connected to a major backbone that constituted the core of the overall NSFNET.

In its earliest form, in 1986, the NSFNET created a three-tiered network architecture. The architecture connected campuses and research organizations to regional networks, which in turn connected to a main backbone linking six nationally funded super-computer centers. The original links were 56 Kbps.

The links were upgraded in 1988 to faster T1 (1.544 Mbps) links as a result of the NSFNET 1987 competitive solicitation for a faster network service, awarded to Merit Network, Inc. and its partners MCI, IBM, and the state of Michigan. The NSFNET T1 backbone connected a total of 13 sites that included Merit, BARRNET, MIDnet, Westnet, NorthWestNet, SESQUINET, SURANet, NCAR (National Center of Atmospheric Research), and five NSF supercomputer centers.

In 1990, Merit, IBM, and MCI started a new organization known as Advanced Network and Services (ANS). Merit Network's Internet engineering group provided a policy routing database and routing consultation and management services for the NSFNET, whereas ANS operated the backbone routers and a Network Operation Center (NOC).

The history of the Internet begins with the development of electronic computers in the 1950s. Initial concepts of packet networking originated in several computer science laboratories in the United States, Great Britain, and France. The US Department of Defense awarded contracts as early as the 1960s for packet network systems, including the development of the ARPANET (which would become the first network to use the Internet Protocol.) The first message was sent over the ARPANET from computer science Professor Leonard Kleinrock's laboratory at University of California, Los Angeles (UCLA) to the second network node at Stanford Research Institute (SRI).

Packet switching networks such as ARPANET, Mark I at NPL in the UK, CYCLADES, Merit Network, Tymnet, and Telenet, were developed in the late 1960s and early 1970s using a variety of communications protocols. The ARPANET in particular led to the development

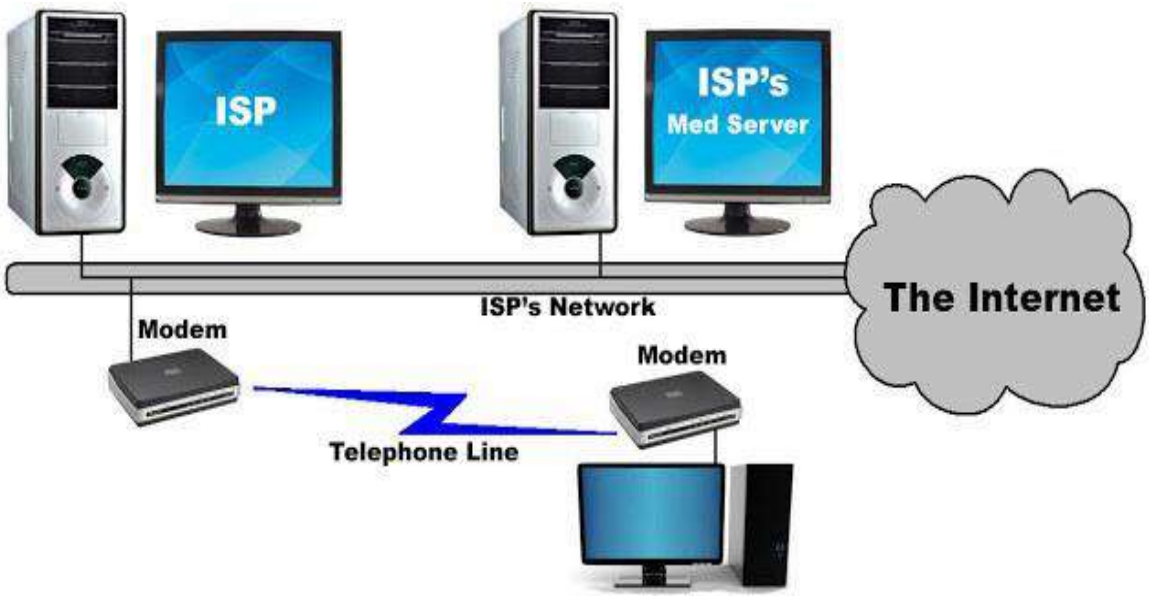
of protocols for internetworking, in which multiple separate networks could be joined into a network of networks.

Access to the ARPANET was expanded in 1981 when the National Science Foundation (NSF) funded the Computer Science Network (CSNET). In 1982, the Internet protocol suite (TCP/IP) was introduced as the standard networking protocol on the ARPANET. In the early 1980s the NSF funded the establishment for national supercomputing centers at several universities, and provided interconnectivity in 1986 with the NSFNET project, which also created network access to the supercomputer sites in the United States from research and education organizations. Commercial Internet service providers (ISPs) began to emerge in the late 1980s. The ARPANET was decommissioned in 1990. Private connections to the Internet by commercial entities became widespread quickly, and the NSFNET was decommissioned in 1995, removing the last restrictions on the use of the Internet to carry commercial traffic.

Since the mid-1990s, the Internet has had a revolutionary impact on culture and commerce, including the rise of near-instant communication by electronic mail, instant messaging, voice over Internet Protocol (VoIP) telephone calls, two-way interactive video calls, and the World Wide Web with its discussion forums, blogs, social networking, and online shopping sites. The research and education community continues to develop and use advanced networks such as NSF's very high speed Backbone Network Service (vBNS), Internet2, and National LambdaRail. Increasing amounts of data are transmitted at higher and higher speeds over fiber optic networks operating at 1-Gbit/s, 10-Gbit/s, or more. The Internet's takeover of the global communication landscape was almost instant in historical terms: it only communicated 1% of the information flowing through two-way telecommunications networks in the year 1993, already 51% by 2000, and more than 97% of the telecommunicated information by 2007.[1] Today the Internet continues to grow, driven by ever greater amounts of online information, commerce, entertainment, and social networking.

1.1.2 Working of Internet:

The internet is the network of networks around the world. It is a global network of computer. It consists of millions of private, public, academic, business, and government networks. The Internet connects millions of computers. These computers are called *hosts*. The communication protocol used for Internet is TCP/IP. The computers on Internet are linked through different communication media. The commonly used communication media are telephone lines, fiber optic cables, microwave and satellite.



A large number of books, newspapers, magazines, encyclopedia, and other types of materials are available in electronic from on the Internet. We can find information or news on about almost any thing of the world. We can also access latest information or news on any topic. It means that Internet is an ocean of knowledge.In addition of finding information, we can communicate with other people around the world. Due to Internet our world has become a "global village".

Working of the InternetThere is no particular organization that controls the Internet. Different networks of private companies, government agencies, research organizations, universities etc. are interconnected together. You can say that the Internet is a collection of millions of computers, all linked together.

A personal computer can be linked to the Internet using a phone-line modem, DSL or cable modem. The modem is used to communicate with the server of an Internet Server Provider (ISP). ISP is a company that provides the Internet connections to the users. There are many ISP companies in each country of the world. The user has to get an Internet connection from any ISP company to connect to the Internet.

A computer in a business or university is usually connected with LAN using Network Interface Card (or LAN card). The LAN of university or business is connected to the server of ISP using a high-speed phone line such as TI Line. A TI Line can handle approximately 1.5 million bits per second. A normal phone line using a modem can handle 30,000 to 50,000 bits per second.

The user's computer connects to ISP's server makes its connection to larger ISP. The largest ISPs maintain fiber-optic lines, under sea cables or satellite links. In this way, every computer on the Internet is connected to every other computer on the Internet.

1.1.3 Use of Internet:

Internet is today one of the most important part of our daily life. There are large numbers of things that can be done using the internet and so it is very important. You can say that with the progress in the internet we are progressing in every sphere of life as it not only makes our tasks easier but also saves a lot of time. Today internet is used for different purposes depending upon the requirement. Here in this very article we have mentioned then ten best uses of the internet. Here goes the list.

Internet has been the most useful technology of the modern times which helps us not only in our daily lives, but also our personal and professional lives developments. The internet helpsus achieve this in several different ways.

For the students and educational purposes the internet is widely used to gather information so as to do the research or add to the knowledge of any sort of subject they have. Even the business personals and the professions like doctors, access the internet to filter the necessary information for their use. The internet is therefore the largest encyclopedia for everyone, in all age categories.

The internet has served to be more useful in maintaining contacts with friends and relatives who live abroad permanently. The easiest communication means like the internet chatting systems and the emails are the best and the most common for the maintaining contacts with the people around the world.

Not to forget internet is useful in providing with most of the fun these days. May it be all the games, and networking conferences or the online movies, songs, dramas and quizzes, internet has provided the users with a great opportunity to eradicate the boredom from their lives.

Internet is also used to upgrade the internet and use special software to work on the projects and documentation works as the internet enables the user to download a myriad of different software for a variety of different purposes, making it much easier than buying the costly software cds.

1. Communication

Easiest thing that can be done using the internet is that we can communicate with the people living far away from us with extreme ease. Earlier the communication used to be a daunting

task but all that chanced once internet came into the life of the common people. Now people can not only chat but can also do the video conferencing. It has become extremely easy to contact the loved ones who are in some other part of the world. Communication is the most important gift that the internet has given to the common man. Email, social networking sites are some of the prime example of it. This is one such gift of the internet which is cherished by everyone and has made our life easier to much extent.

2. Research

Now the point that has been placed next is research. In order to do research you need to go throughhundreds of books as well as the references and that was one of the most difficult jobs to do earlier.Since the internet came into life, everything is available just a click away. You just have to search for the concerned topic and you will get hundreds of references that may be beneficial for your research. And since internet is here to make your research public, you can then benefit a large amount of people from the research work that you have done. Research is one such thing which hasgot lots of benefit from this evolution of internet. Research process has now got wings and has gained the most due to the internet.

Education

The next point that we have in this list is education. Yes you read it right. Education is one of the best things that the internet can provide. There are a number of books, reference books, online help centres, expert's views and other study oriented material on the internet that can make the learning process very easier as well as a fun learning experience. There are lots and lots of websites which are related to different topic. You can visit them and can gain endless amount of knowledge that you wish to have. With the use of internet for education, you are non-longer dependent on some other person to come and teach you. There are various number of tutorials available over the internet using which you can learn so many thing very easily. There can't be any excellent use of the internet other than education as it is the key to achieve everything in life.

4. Financial Transaction

Mentioned here is financial transaction. Financial transaction is the term which is used when there is exchange of money. With the use of internet in the financial transaction, your work has become a lot easier. Now you don't need to stand in the queue at the branch of your particular bank rather you can just log in on to the bank website with the credential that has been provided to you by the bank and then can do any transaction related to finance at your will. With the ability to do the financial transaction easily over the internet you can purchase

or sell items so easily. Financial transaction can be considered as one of the best uses of resource in the right direction.

5. Real Time Updates

Real time updates have been placed at the number fifth position here. This has been mentioned here in regards to the news and other happenings that may be on-going in different parts of the world but with the use of internet we come to know about it very easily and without any difficulty. There are various websites on the internet which provides you with the real time updates in every field be it in business, sports, finance, politics, entertainment and others. Many a time the decisions are taken on the real time updates that are happening in various parts of the world and this is where internet is very essential and helpful.

1.2 Overview of World Wide Web(Web Server and Client)

The term WWW refers to the World Wide Web or simply the Web. The World Wide Web consists of all the public Web sites connected to the Internet worldwide, including the client devices (such as computers and cell phones) that access Web content. The WWW is just one of many applications of the Internet and computer networks.

The World Wide Web (WWW, W3) is an information system of interlinked hypertext documents that are accessed via the Internet. It has also commonly become known simply as the Web. Individual document pages on the World Wide Web are called web pages and are accessed with a software application running on the user's computer, commonly called a web browser. Web pages may contain text, images, videos, and other multimedia components, as well as web navigation features consisting of hyperlinks.

The "**Web**", short for "World Wide Web" (which gives us the acronym www), is the name for one of the ways that the Internet lets people browse documents connected by hypertext links.

The concept of the Web was perfected at CERN (Centre EuropÃ©en de Recherche NuclÃ©aire) in 1991 by a group of researchers which included Tim-Berners Lee, the creator of the hyperlink, who is today considered the father of the Web.

The principle of the Web is based on using hyperlinks to navigate between documents (called "web pages") with a program called a browser. A web page is a simple text file written in a markup language (called HTML) that encodes the layout of the document, graphical elements, and links to other documents, all with the help of tags.

Besides the links which connect formatted documents to one another, the web uses the HTTP protocol to link documents hosted on distant computers (called web servers, as opposed to the client represented by the broswer). On the Internet, documents are identified with a unique address, called a URL, which can be used to locate any resource on the Internet, no matter which server may be hosting it.

- **http://** indicates that we want browse the web using the HTTP protocol, the default protocol for browsing the Web. There are other protocols for other uses of the Internet.
- **www.commentcamarche.net** corresponds to the address of the server that hosts the web pages. By convention, web servers have a name that begins with www., to make it clear that they are dedicated web servers and to make memorising the address easier. This second part of the address is called the domain name. A website can be hosted on several servers, each belonging to the same name: www.commentcamarche.net www2.commentcamarche.net, intranet.commentcamarche.net, etc.
- **/www/www-intro.php3** indicates where the document is located on the machine. In this case, it is the file www-intro.php3 situÃ© located in the directory www.

1.3 Introduction to Search engine and Searching the Web

1.3.1 Introduction to Search engine

A **search engine** is a software system that is designed to search for information on the World Wide Web. The search results are generally presented in a line of results often referred to as search engine results pages (SERPs). The information may be a mix of web pages, images, and other types of files. Some search engines also mine data available in databases or open directories. Unlike web directories, which are maintained only by human editors, search engines also maintain real-time information by running an algorithm on a web crawler.

1) Web Crawling

Matthew Gray's World Wide Web Wanderer (1993) was one of the first efforts to automate the discovery of web pages Gray's **web crawler** would download a web page, examine it for links to other pages, and continue downloading links it discovered until there were no more links left to be discovered. This is how web crawlers, also called spiders, generally operate today.

Because the Web is so large, search engines normally employ thousands of web crawlers that meticulously scour the web day and night, downloading pages, looking for links to new pages, and revisiting old pages that might have changed since they were visited last. Search engines will often revisit pages based on their frequency of change in order to keep their index **fresh**. This is necessary so search engine users can always find the most up-to-date information on the Web.

Maintaining an accurate "snap shot" of the Web is challenging, not only because of the size of the Web and constantly changing content, but also because pages disappear at an alarming rate (a problem commonly called **linkrot**). Brewster Kahle, founder of the Internet Archive, estimates that web pages have an average life expectancy of only 100 days And some pages cannot be found by web crawling. These are pages that are not linked to others, pages that are password-protected or are generated dynamically when submitting a web form. These pages reside in the **deep Web**, also called the hidden or invisible Web

Some website owners don't want their pages indexed by search engines for any number of reasons, so they use the **Robots Exclusion Protocol** (robots.txt) to tell web crawlers which URLs are off-limits. Other website owners want to ensure certain web pages are indexed by search engines, so they use the **Sitemap Protocol**, a method supported by all major search engines, to provide a crawler with a list of URLs they want indexed Sitemaps are especially useful in providing the crawler URLs it would be unable to find with web crawling.

Figure 1 below shows how a web crawler pulls from the Web and places downloaded web resources into a local repository. The next section will examine how this repository of web resources is then indexed and retrieved when you enter a query into a search engine.

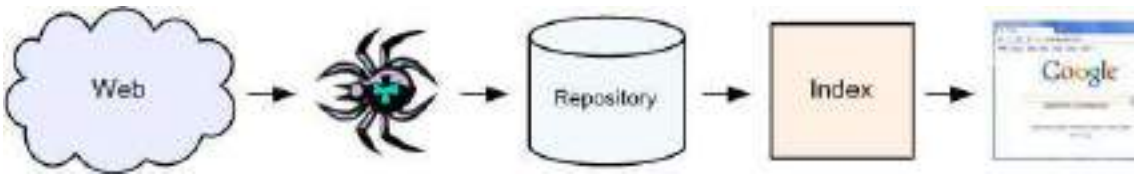


Figure 1 - The Web is crawled and placed into a local repository where it is indexed and retrieved when using a search engine.

2) Indexing and Ranking

When a web crawler has downloaded a web page, the search engine will index its content. Often the **stop words**, words that occur very frequently like a, and, the, and to, are ignored. Other words might be stemmed. **Stemming** is a technique that removes suffixes from a word to improve the content of the index. For example, eating, eats, and eaten may all be stemmed to eat so that a search for eat will match all its variants.

An example index (usually called an **inverted index**) will look something like this where the number corresponds to a web page that contains the text:

cat > 2, 5
dog > 1, 5, 6
fish > 1, 2
bird > 4

So a query for *dog* would result in pages 1, 5, and 6. A query for *cat dog* would only result in page 5 since it is the only page that contains both search terms. Some search engines provide advanced search capabilities, so a search for *cat OR dog and NOT fish* would be entered which would result in pages 1, 5, and 6.

The search engine also maintains multiple weights for each term. The weight might

correspond to any number of factors that determines how relevant the term is to its host web page. **Term frequency** is one such weight which measures how often a term appears in a web page. For example, if someone wanted to search the Web for pages about dogs, a web page containing the term dog five times would likely be more relevant than a page containing dog just once. However, term frequency is susceptible to spamming (or **spamdexing**), a technique which some individuals use to artificially manipulate a web page's ranking, so it is only one of many factors which are used

Another weight that is given to a web page is based on the context in which the term appears in the page. If the term appears in a large, bold font or in the title of the page, it may be given more weight than to a term that appears in a regular font. A page might also be given more weight if links pointing to the page use the term in its anchor text. In other words, a page that is pointed to with the link text "see the dogs" is more likely about dogs since the term dogs appears in the link. This functionality has left search engines susceptible to a practice known as **Google-bombing**, where many individuals collude to produce the same anchor text to the same web page for humorous effect. A popular Google bomb once promoted the White House website to the first result when searching Google for "miserable failure". Google has recently implemented an algorithmic solution capable of diffusing most Google bombs

A final weight which most search engines will use is based on the web graph, the graph which is created when viewing web pages as nodes and links as directed edges. Sergey Brin and Larry Page were graduate students at Stanford University when they noted just how important the web graph was in determining the relevancy of a web page. In 1998, they wrote a research paper about how to measure the importance of a web page by examining a page's position in the web graph, in particular the page's in-links (incoming links) and out-links (outgoing links). Essentially, they viewed links like a citation. Good pages receive many citations, and bad pages receive few. So pages that have in-links from many other pages are probably more important and should rank higher than pages that few people link to. Weight should also be given to pages based on who is pointing to them; an in-link from a highly cited page is better than an in-link from a lowly cited page. Brin and Page named their ranking algorithm **PageRank**, and it was instrumental in popularizing their new search engine called Google. All search engines today take into account the web graph when ranking results.

Figure 2 shows an example of a web graph where web pages are nodes and links from one page to another are directed edges. The size and color of the nodes indicate how much PageRank the web pages have. Note that pages with high PageRank (red nodes) generally have significantly more in-links than do pages with low PageRank (green nodes).

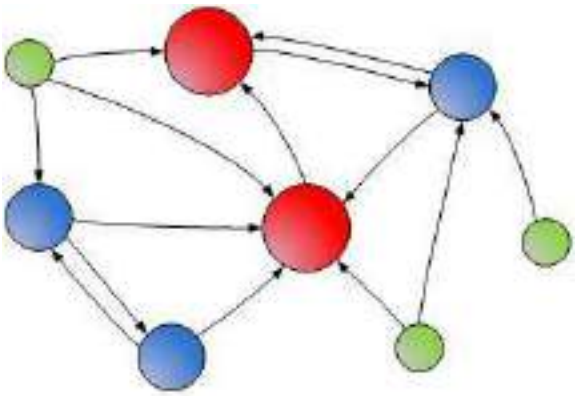


Figure 2 – Example web graph. Pages with higher PageRank are represented with

larger nodes.

3) Rank Optimization

Search engines guard their weighting formulas as a trade secret since it differentiates their service from other search engines, and they do not want content-producers (the public who produces web pages) to "unfairly" manipulate their rankings. However, many companies rely heavily on search engines for recommendations and customers, and their ranking on a **search engine results page (SERP)** is very important. Most search engine users only examine the first screen of results, and they view the first few results more often than the results at the bottom of the page. This naturally pits content-producers in an adversarial role against search engines since the producers have an economic incentive to rank highly in SERPs. Competition for certain terms (e.g., *Hawaii vacation* and *flight to New York*) is particularly fierce. Because of this, most search engines provide paid-inclusion or **sponsored results** along with regular (**organic**) results. This allows companies to purchase space on a SERP for certain terms.

An industry based on **search engine optimization (SEO)** thrives on improving their customer's rankings by designing their pages to maximize the various weights discussed above and to increase the number and quality of incoming links. Black hat SEOs may use a number of questionable techniques like spamdexing and **link farms**, artificially created web pages designed to bolster the PageRank of a particular set of web pages, to increase their ranking. When detected, such behavior is often punished by search engines by removing the pages from their index and embargoing the website for a period of time

Vertical Search

Search engines like Google, Yahoo!, and Bing normally provide specialized types of web search called **vertical search** [. A few examples include:

1. **Regular web search** is the most popular type of search which searches the index based on any type of web page. Other on-line textual resources like PDFs and Microsoft Office formats are also available through regular web search.
2. **News search** will search only news-related websites. Typically the search results are ordered based on age of the story.
3. **Image search** searches only images that were discovered when crawling the web. Images are normally indexed by using the image's filename and text surrounding the image. Artificial intelligence techniques for trying to discover what is actually pictured in the image are slowly emerging. For example, Google can now separate images of faces and line drawing from other image types.
4. **Video search** searches the text accompanied by videos on the Web. Like image search, there is heavy reliance on people to supply text which accurately describes the video.

Other specialty searches include blog search, newsgroup search, scholarly literature search, etc. Search engines also occasionally mix various types of search results together onto the same SERP. Figure 3 below shows how Ask.com displays news and images along with regular web search results when searching for *harding*. The blending of results from different vertical search offerings is usually called **universal search** .

Figure 3 - Ask.com's universal search results.

Personalized Search

In order to provide the best possible set of search results for a searcher, many search engines today are experimenting with techniques that take into account personal search behavior. When searching for *leopard*, a user who often queries for technical information is more likely to want to see results dealing with Leopard the operating system than leopard the animal. Research has also shown that one third of all queries are repeat queries, and most of the time an individual will click on the same result they clicked on before [14]. Therefore a search engine should ideally present the previously-selected result close to the top of the SERP when recognizing the user has entered the same query before.

Figure 4 below shows a screen shot of personalized search results via Google's SearchWiki [15], an experiment in search personalization that Google rolled-out in late 2008. The user was able to promote results higher in the list, remove poor results from the list, and add comments to specific results. The comment and removal functions are no longer available today, but Google does allow users to star results that they like, and these starred results appear prominently when the user later searches for the same content.

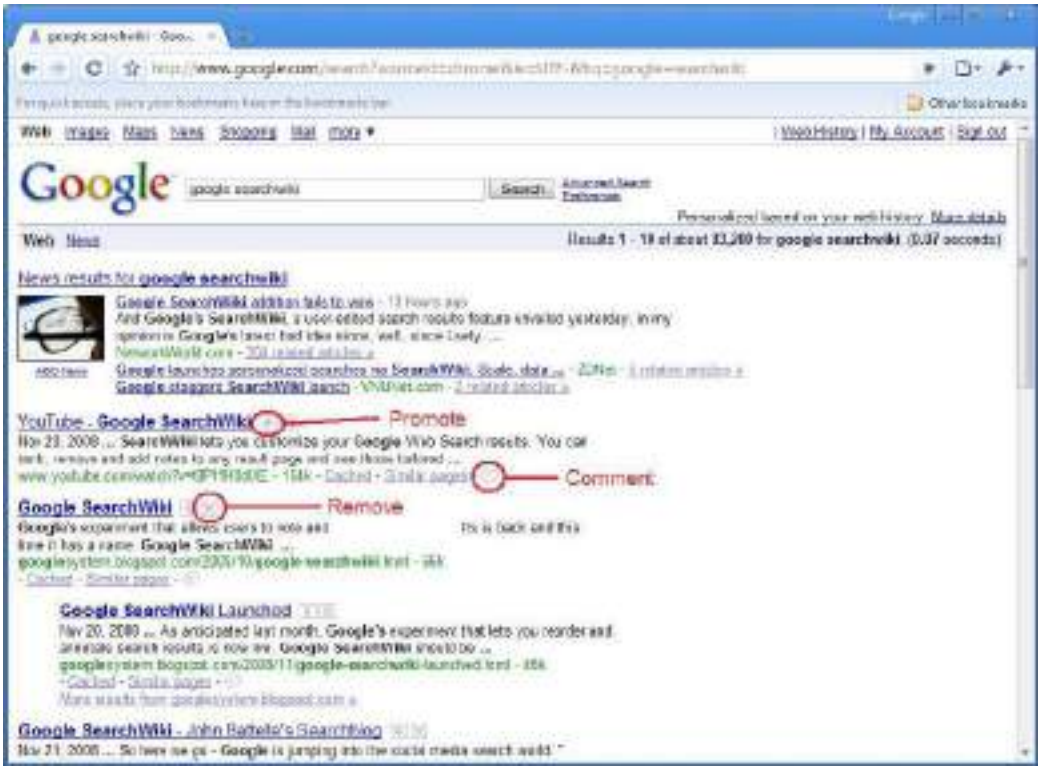


Figure 4 – Example of Google's SearchWiki.

As smartphones have become increasingly popular, search engines have started providing search results based on the user's location A **location-aware search engine** recognizes that when a user searches for *restaurants* on their mobile device, they are likely wanting to find restaurants in their near vicinity.

List of search engines:

- Metasearch engines
- Geographically limited scope
- Semantic
- Accountancy
- Business
- Computers
- Enterprise
- Fashion
- Food/Recipes
- Genealogy
- Mobile/Handheld
- Job
- Legal
- Medical
- News
- People
- Real estate / property
- Television

- Video Games

1.3.2Downloading Files:

The term downloading is distinguished from the related concept of streaming, which indicates the receiving of data that is used nearly immediately as it is received, while the transmission is still in progress and which may not be stored long-term, whereas in a process described using the term downloading, this would imply that the data is only usable when it has been received in its entirety.

Increasingly, websites that offer streaming media or media displayed in-browser, such as YouTube, and which place restrictions on the ability of users to save these materials to their computers after they have been received, say that downloading is not permitted. In this context, download implies specifically "receive and save" instead of simply "receive". However, it is also important to note that downloading is not the same as "transferring" (i.e., sending/receiving data between two storage devices would be a transferral of data, but receiving data from the Internet would be considered a download).

Downloading is the transmission of a file from one computer system to another, usually smaller computer system. From the Internet user's point-of-view, to download a file is to request it from another computer (or from a Web page on another computer) and to receive it.

When you download a file, you transfer it from the Internet to your computer. The most commonly downloaded files are programs, updates, or other kinds of files such as game demos, music and video files, or documents. Downloading can also mean copying information from any source to a computer or other device, such as copying your favorite songs to a portable music player.

To copy data (usually an entire file) from a main source to a peripheral device. The term is often used to describe the process of copying a file from an online service or *bulletin board service (BBS)* to one's own computer. Downloading can also refer to copying a file from a network file server to a computer on the network.

In addition, the term is used to describe the process of loading a font into a laser printer. The font is first copied from a disk to the printer's local memory. A font that has been downloaded like this is called a *soft font* to distinguish it from the *hard fonts*that are permanently in the printer's memory.The opposite of download is *upload*, which means to copy a file from your own computer to another computer.

1.4 Introduction to web browser

A web browser is a software application which enables a user to display and interact with text, images, videos, music, and other information that could be on a website. Text and images on a web page can contain hyperlinks to other web pages at the same or different website. Web browsers allow a user to quickly and easily access information provided on many web pages at many websites by traversing these links. Web browsers format HTML information for display so the appearance of a web page many differ between browsers.

Purpose:

Web browser is used to run the software application that allows retrieving, presenting and traversing the information from one place to another.

- Web browser provides the resources using the WWW (World Wide Web) this can be identified by URI (Uniform Resource Identifier).

- Web browser fetches the data like web page, image, video or other piece of content from the server and displays it accordingly.

- Web browser uses hyperlinks to display the resources and allow the users to navigate their browsers according to the resources.

- Web browser defines the application software that is designed for the user to access and retrieve the documents using the Internet.

Protocols and Standards

Web browsers communicated with web servers primarily using HTTP (hypertext transfer protocol) to fetch web pages. HTTP allows web browsers to submit information to web servers as well as fetch web pages from them. Pages are identified by means of a URL (uniform resource locater), which is treated as an address, beginning with "http://" for HTTP access.

The file format for a web page is usually HTML (hyper-text markup language) and is identified in the HTTP protocol. Most web browsers also support a variety of additional formats, such as JPEG, PNG, and GIF image formats, and can be extended to support more through the use of plugins. The combination of HTTP content type and URL protocol specification allows web page designers to embed images, animations, video, sound, and streaming media into a web page, or to make them accessible through the web page.

Popular Browsers

1)Firefox

Firefox is a very popular web browser. One of the great things about Firefox is that it is supported on all different OSs. Firefox is also open source which makes its support group a very large community of open source developers. Firefox is also known for its vast range of plugins/add-ons that let the user customize in a variety of ways. Firefox is a product of the Mozilla Foundation. The latest version of Firefox is Firefox 3.

Some of Firefox's most prominant features include: tabbed browsing, a spell checker, incremental find, live bookmarking, a download manager, and an integrated search system that uses the user's favorite search engine. Like mentioned before, one of the best things about Firefox is its vast amount of plugins/add-ons. Some of the most popular include NoScript (script blocker), FoxyTunes (controls music players), Adblock Plus (ad blocker), StumbleUpon (website discovery), DownThemAll! (download functions), and Web Developer (web tools).

2) Internet Explorer

Internet Explorer (IE - created by Microsoft) is a very prominant web browser for the Windows OS. IE is the most popular web browser. It comes pre-installed on all Windows computers. The latest version of IE is IE7 with IE8 in beta. IE was designed to view a broad range of web pages and to provide certain features within the OS.

IE almost fully supports HTML 4.01, CSS Level 1, XML 1.0, and DOM Level 1. It has introduced a number of proprietary extensions to many of the standards. This has resulted in a number of web pages that can only be viewed properly using IE. It has been subject to many security vulnerabilities just like Windows has. Much of the spyware, adware, and viruses across the Internet are made possible by exploitable bugs and flaws in the security architecture of IE. These are were drive-by downloads come into play (see computer security lesson for more details on that).

3) Others

Safari (created by Apple) is a very popular web browser among Apple computers. Safari is also the native browser on the iPhone and iPod touch. Safari is available for Windows, but has not reached a very high level of Windows users since. In May 2008 Safari controlled 6.25% of marketshare among all web browsers.

Opera (created by the Opera Software company) is another fairly popular web browser. It handles common Internet-related tasks. Opera also includes features such as tabbed browsing, page zooming, mouse gestures, and an integrated download manager. Its security features include phishing and malware protection, strong encryption when browsing secure web sites, and the ability to easily delete private data such as cookies and browsing history. Opera runs on Windows, OS X, and Linux.

The browser's main functionality

The main function of a browser is to present the web resource you choose, by requesting it from the server and displaying it in the browser window. The resource is usually an HTML document, but may also be a PDF, image, or some other type of content. The location of the resource is specified by the user using a URI (Uniform Resource Identifier).

The way the browser interprets and displays HTML files is specified in the HTML and CSS specifications. These specifications are maintained by the W3C (World Wide Web Consortium) organization, which is the standards organization for the web. For years browsers conformed to only a part of the specifications and developed their own extensions. That caused serious compatibility issues for web authors. Today most of the browsers more or less conform to the specifications.

Browser user interfaces have a lot in common with each other. Among the common user interface elements are:

- Address bar for inserting a URI
- Back and forward buttons

- Bookmarking options
- Refresh and stop buttons for refreshing or stopping the loading of current documents
- Home button that takes you to your home page

Strangely enough, the browser's user interface is not specified in any formal specification, it just comes from good practices shaped over years of experience and by browsers imitating each other. The HTML5 specification doesn't define UI elements a browser must have, but lists some common elements. Among those are the address bar, status bar and tool bar. There are, of course, features unique to a specific browser like Firefox's downloads manager.

The browser's main components are

1. **The user interface**: this includes the address bar, back/forward button, bookmarking menu, etc. Every part of the browser display except the window where you see the requested page.
2. **The browser engine**: marshals actions between the UI and the rendering engine.
3. **The rendering engine** : responsible for displaying requested content. For example if the requested content is HTML, the rendering engine parses HTML and CSS, and displays the parsed content on the screen.
4. **Networking**: for network calls such as HTTP requests, using different implementations for different platform behind a platform-independent interface.
5. **UI backend**: used for drawing basic widgets like combo boxes and windows. This backend exposes a generic interface that is not platform specific. Underneath it uses operating system user interface methods.
6. **JavaScript interpreter**. Used to parse and execute JavaScript code.
7. **Data storage**. This is a persistence layer. The browser may need to save all sorts of data locally, such as cookies. Browsers also support storage mechanisms such as localStorage, IndexedDB, WebSQL and FileSystem.

1.5 Working with E-mail:

E-mail (electronic mail) is the exchange of computer-stored messages by telecommunication. (Some publications spell it email; we prefer the currently more established spelling of e-mail.) E-mail messages are usually encoded in ASCII text. However, you can also send non-text files, such as graphic images and sound files, as attachments sent in binary streams. E-mail was one of the first uses of the Internet and is still the most popular use. A large percentage of the total traffic over the Internet is e-mail. E-mail can also be exchanged between online service provider users and in networks other than the Internet, both public and private.

E-mail can be distributed to lists of people as well as to individuals. A shared distribution list can be managed by using an e-mail reflector. Some mailing lists allow you to subscribe by sending a request to the mailing list administrator. A mailing list that is administered automatically is called a list server.

E-mail is one of the protocols included with the Transport Control Protocol/Internet Protocol (TCP/IP) suite of protocols. A popular protocol for sending e-mail is Simple Mail Transfer

Protocol and a popular protocol for receiving it is POP3. Both Netscape and Microsoft include an e-mail utility with their Web browsers.

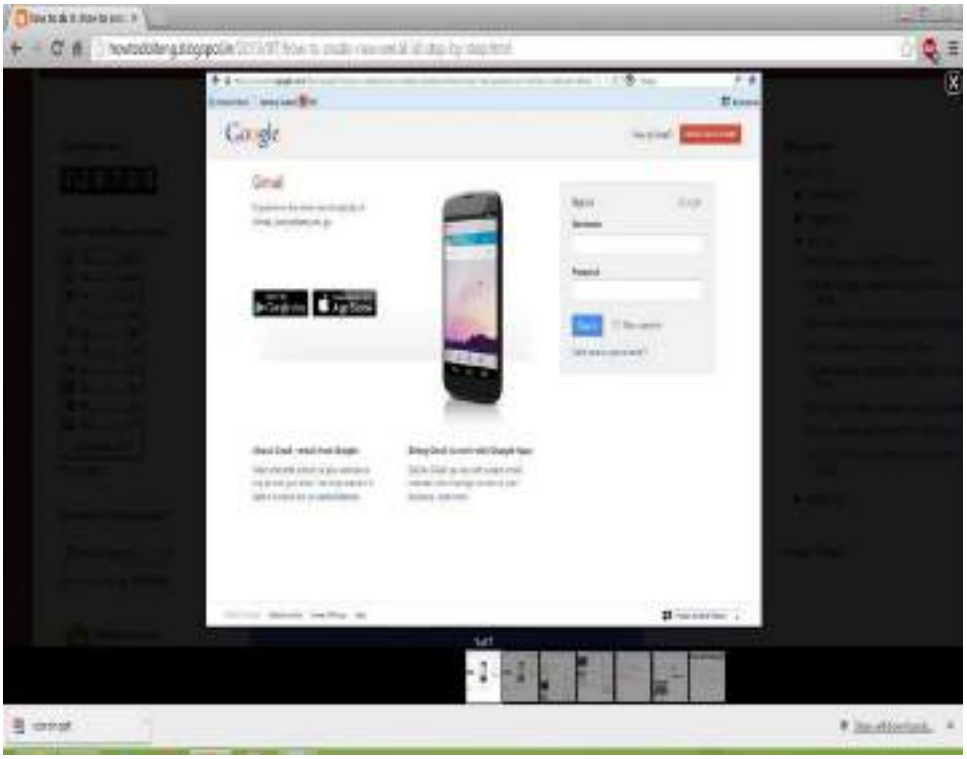
1.5.1 How to Create a Email

Gmail has been increasing in popularity since it was first introduced in 2004. With the decline of Yahoo!, AOL, and Hotmail, more and more people are moving to Google's services. Creating a Gmail account is quick and easy, and also provides you access to other Google products such as YouTube, Google Drive, and Google Plus.

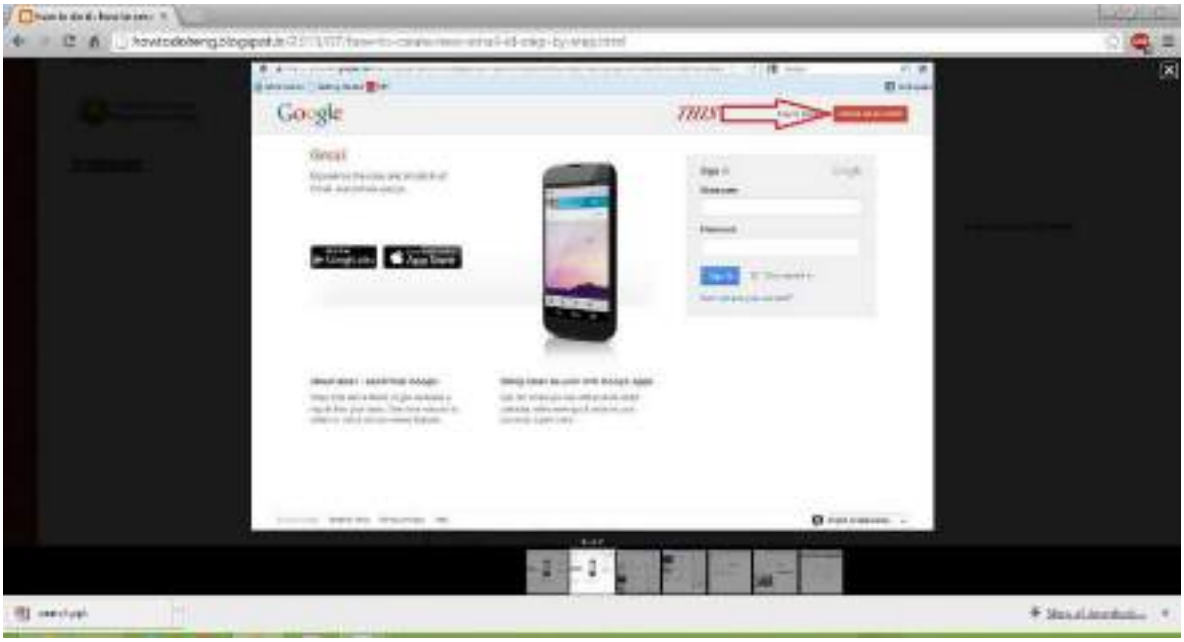
1 . Creating Your Account

Suppose If u want to open your account on gmail.com. then follow the steps given below
Open a Web browser (internet explorer or google chrome or mozilla etc)

write in address bar www.gmail.com and you will get below image



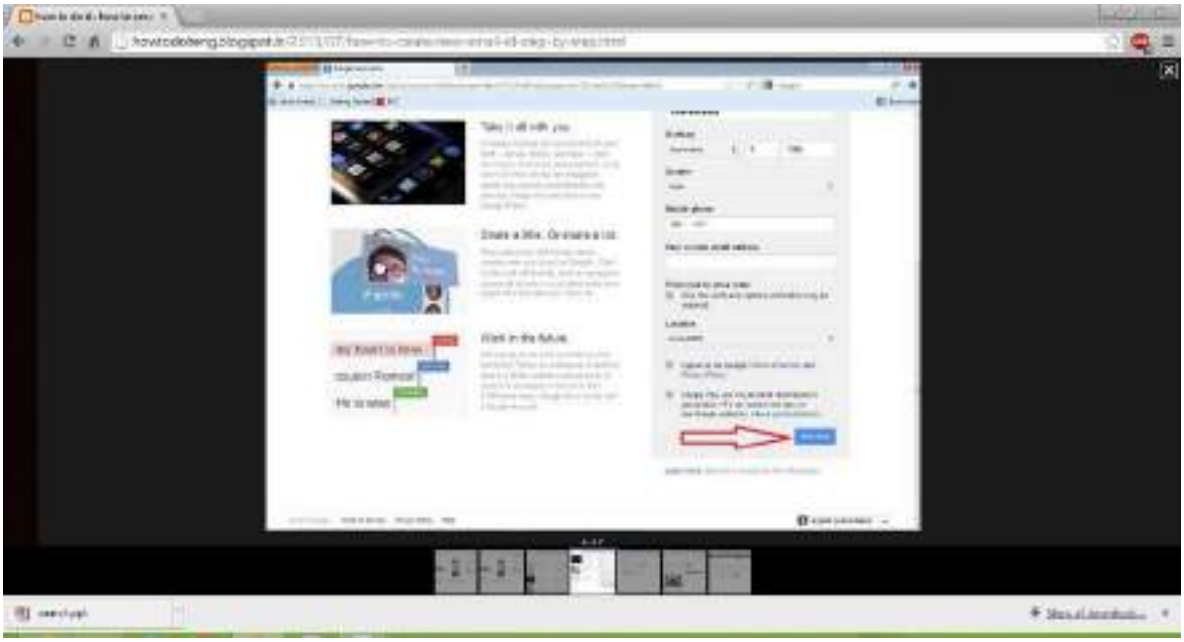
Now click on "CREATE AN ACCOUNT", as shown in below (check the red arrow) .



After clicking on "CREATE AN ACCOUNT " button you will get a window as shown in below image

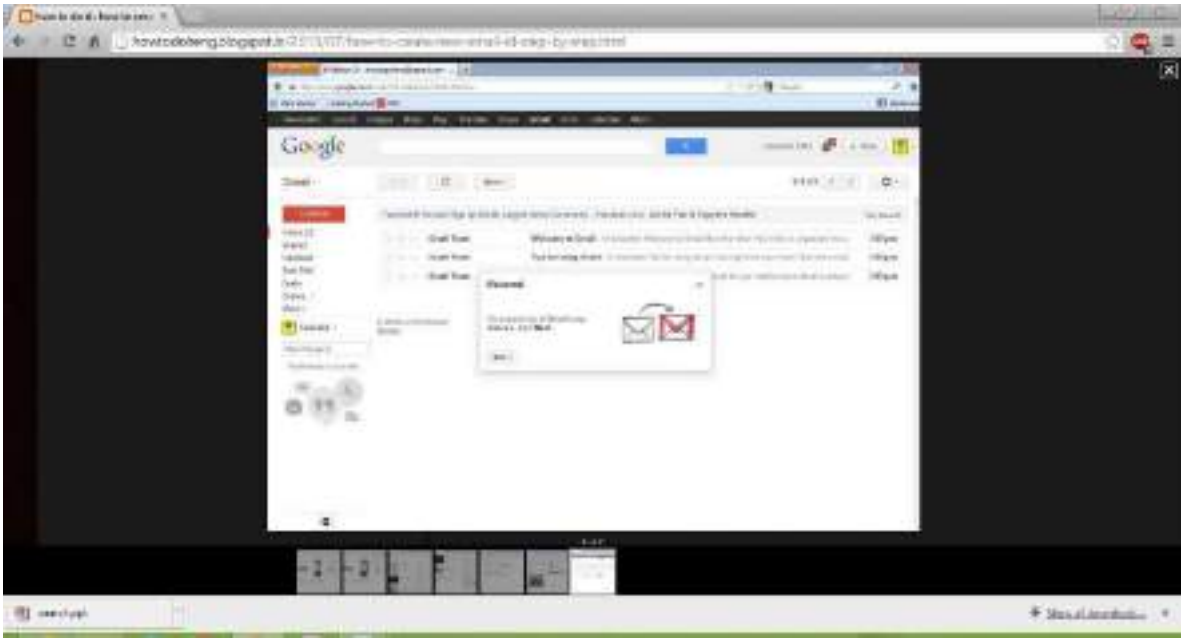
Fill all the details, here the user name is the desired user ID which you want to create.

after felling all the details click on "Next step" Button (check the red arrow)



after next step it will ask for Phone number for verification, enter cell phone number and click on next

now click on "next step " button and you will get you inbox .



Congs you have created your new gmail ID.

Enjoy your new Gmail account. You're finished! Click on "Continue to Gmail" to access your inbox, read your emails, and write new ones.

1.5 Use of Email

Email is one of the most important forms of communication in today's digital age. It's the way that millions (if not billions) of people stay in touch with each other. Luckily, this form of near-instant communication is completely free. Make a free email account today to start sending and receiving email immediately. Read on below the jump for detailed instructions on registering a new email account with several of the internet's most popular email providers.
Go to Gmail.com. The first step to creating an email account with Gmail, Google's free email service, is to visit Gmail's main site. Type "gmail.com" into your browser's navigation bar, or, alternatively, type "Gmail" into your search engine of choice and click the relevant result.

The email is actually used to transfer messages between one to another. It is also used for :-

1. Group discussion by making groups in hotmail, yahoo, etc
2. Stay in touch with users attached in the group.
3. Transmitting documents through attachments
4. Group email to multiple users
5. Convineint way of sending job application.
6. Easy method of advertisement.
7. Receiving conformation of service.
8. Service subscription