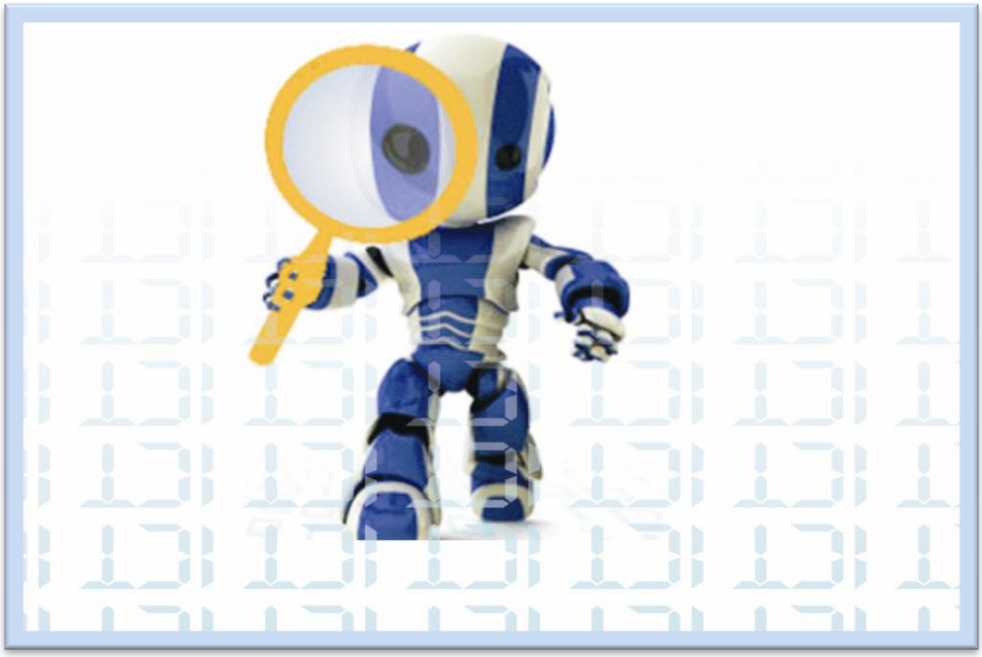


Chapter 1

INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

OBJECTIVES

After completing this chapter, you should be able to:

i. Explain the concept of ICT and its related terminologies.
ii. Describe the information processing cycle.
iii. Outline the uses of ICT for educational/social/economic purposes.
iv. Analyse the impact of ICT on educational, social and economic development
v. Identify career opportunities in ICT.

INTRODUCTION

Everyday in our waking lives we are invariably greeted by ICT. You were probably shaken off your bed by a mobile phone. What you used next is pretty much unknown to me, but I am sure you crossed the road on your way to school and probably saw a traffic light which kept you safe from "knocking over" a vehicle, a bicycle perhaps. You get to school, and if you are a fresh student, the secretary puts information/data about you on his/her computer. You might have used other gargets which fit into the category.

But one thing you have to know is as different as they are, they have one thing in common; they are

ACTIVITY

Let students brainstorm and come out with the meaning of ICT and its related terminologies

ICT gargets.

I am sure your first question is what makes these ICT gargets? Let's talk about that.

THE CONCEPT OF ICT

ICT stands for "**Information and Communications Technology**".
The term ICT refers to the combination of telephone networks with computer networks through a single cabling or link system. ICT should be read as "Information Technology and Communication Technology" literally to make clear its meaning.
The main concept of ICT is to link various devices and activities to the computer. Now the next question is how does ICT do that? Let us consider that.

ICT TERMINOLOGIES

ICTs

We have already talks about ICT being information and communications technology. ICTs on the other hand stands for information communications technologies. ICTs refers to the various devices and machines that come together to make clear the meaning of ICT. As we have discovered already ICT links the individual gadgetries together. Therefore, we can say that ICT links the various ICTs together.

Data

Data is anything in the form of numbers, text, images and sound that is suitable for processing and storage by a computer.
Before a computer can perform any function it must be fed with the required data. For example, if you want a computer to perform a calculation, you first have to feed it with the specific numbers say, *4 + 2*, and that is the data which the computer processes.
Examples of data:
The record of students in a school.
The stock of goods in a supermarket.
The amount of goods sold by a store.
The number hours that an employee is supposed to work.

Most data are meaningless unless fully processed. It is therefore important for the computer to understand the data it is fed with before it can process it. A processed data is known as information. A computer can only process a specific data when it has the appropriate program to run it with.

A collection of data organized for storage in a computer memory and designed for easy access by authorized users is known as database. Data is often confused with programs and information.

Program

A Computer Program is a set of instructions that directs a computer to perform some function or combination of functions.

In the above data (4 + 2), before the computer can give you an answer it has to get specific instructions.

For the instructions to be carried out, a computer must *execute* a program, that is, the computer reads the program, and then follows the steps encoded in the program in a precise order until completion. A program can be executed in many different times, with each execution producing a potentially different result depending on the options and data that the user gives the computer.

Information

Information is the answer given by the computer after a successful processing of data.

For example, in our above data, *4 + 2*, the expected answer will be *6*. Therefore, *6* is the information. For a user to get the expected information, they must enter a data which the computer understands. The information received can then be stored or distributed or yet still, be run on another program. In that case, the information becomes data again. For example the information we got above which is *6*, can become data if it is used again in another program to be *6 + 4*.

E-learning

Also known as electronic learning, E-learning refers to the acquisition of knowledge and skill using electronic technologies such as computer, the internet, intranet and extranet.

E-learning is basically the computer and network enabled transfer of skills and knowledge. E-learning comprises the use electronic applications and processes to learn. E-learning applications and processes include Web-based learning, computer-based learning, virtual classrooms and digital collaboration. Content is delivered through the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM. It can be self paced or instructor led and includes media in the form of text, image, animation, streaming video and audio.

Acronyms like CBT (*Computer-Based Training*), IBT (*Internet-Based Training*) or WBT (*Web-Based Training*) have been used as synonyms to e-learning. Today one can still find these terms being used, along with variations of e-learning such as elearning, Elearning and eLearning.

Fig. 1.0 Primary School children on their computers

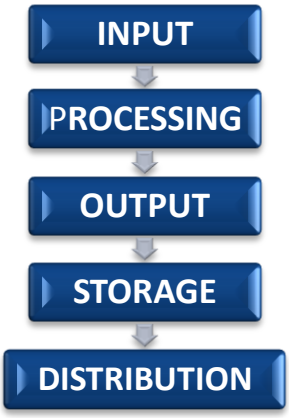
EXERCISE

Students to explain some of the basic ICT concepts and terminologies and show their differences e.g. ICT and ICTs Data and Information

INFORMATION PROCESSING CYCLE

Before a computer presents information from data, it must go through a set of systematic steps known as the **information processing cycle**.
By definition, information processing cycle could said to be the sequence of events that the computer goes through in processing information.
The information processing cycle includes:
input, processing, output, storage and distribution.

The following diagram illustrates the information processing cycle.



1. Input (Receiving data)

Input is the act of collecting and putting raw data from the outside world into the computer so that it can be put into an information system. Inputting data include:

- Putting the names of student onto a computer in order to know the number of student in the school.
- Collecting jokes for a joke book and typing jokes into a word processor.

Devices used to input data into a computer are known as **input devices**. Without input devices, a computer would only be a display device and not allow users to interact with it, much like a television set.

Typical input devices include:
keyboards
mice
scanners,
bar code readers
joysticks
web cam
MIDI keyboard
gamepad
digital camera
microphone

Fig. 1.1: input devices

2. Processing (of data)

Data processing is done by the central processing unit of a computer.

A central processing unit (CPU), microprocessor or sometimes simply processor, is the referred to as the brain of the computer. It is the key component in a digital computer capable of executing a program. It interprets computer program instructions and processes data.

The speed of the CPU is determined by clock speed. The higher the clock speed, faster the computer. The speed of the CPU is measured in megahertz (MHz). 100 MHz = 100 million cycles/second of information processing.

There are two typical components of a CPU. They are the:

- The **arithmetic logic unit** (ALU), which performs arithmetic and logical operations. In other words, the ALU takes care of all the computations or calculations in the computer.
- The **control unit** (CU), which extracts instructions from memory and decodes and executes them, calling on the ALU when necessary.

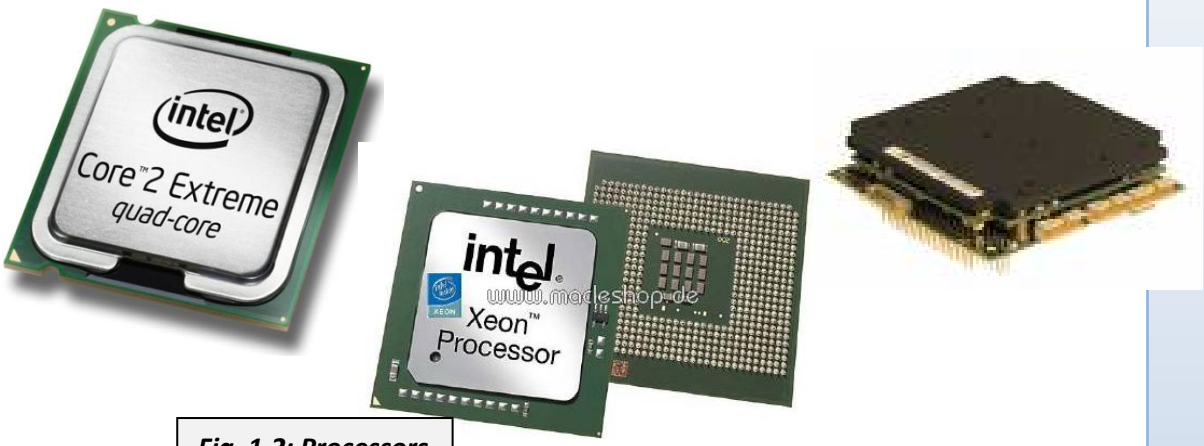


Fig. 1.2: Processors

3. Output

In information processing, output is the process of transmitting the processing information. Essentially, output is the presentation of any data exiting a computer system. This could be in the form of printed paper, audio or video. In the medical industry this might include CT scans or x-rays. Typically in computing, data is entered through various forms (input) into a computer, the data is often manipulated, and then information is presented to a human (output).

Devices which output information are known as output devices.

Example of output devices are:

Monitors
Printers
Speakers
LCD Projectors


LCD monitor


printer


speaker

Fig. 1.3: Some output devices

4. Storage

Storage or mass storage refers to various techniques and devices for storing large amounts of data. The earliest storage devices were punched paper cards, which were used as early as 1804 to control silk-weaving looms. Modern mass storage devices include all types of disk drives and tape drives. Mass storage is distinct from memory, which refers to temporary storage areas within the computer. Unlike RAM memory, mass storage devices retain data even when the computer is turned off.

The smallest unit of storage is a file that contains such data as a letter, budget, images or any one of the thousands of items that you may have saved for future reference. Additionally, files can be executable program files, or system files reserved for the operating system. Mass storage is measured in kilobytes (1,024 bytes), megabytes (1,024 kilobytes), gigabytes (1,024 megabytes) and terabytes (1,024 gigabytes).

Examples of some mass storage devices are:

- Floppy Disks
- Hard disks
- Optical storage: Examples: CD, CD-R, CD-RW, DVD or DVD-R
- Magnetic Tapes:
- Flash Memory (USB drive or pen drives)
- Zip drives

Floppy disk

Hard disk


Zip drive

USB drive

DVD

Fig. 1.4: Some storage devices

5. Distribution

The final stage in the information processing cycle is distribution. When the information is stored on a mass storage device, it can easily and conveniently be carried to anywhere. For example, a USB drive can be carried around in a trouser pocket without bulging out. Other media such as CDs and DVDs can be kept inside a book. In another instance, if the information is a poster printed on paper, its distribution will be done by pasting it on a wall.

The information processing cycle may contain some more steps or some steps will have to be omitted. For example, if the information is a poster, the storage could be left out if after printing the user does not need it again. In this case we will have four steps instead of five. But it is very essential for all vital information to be store for future reference.

EXERCISE

Students to list the devices used in the stages of information processing cycle and describe the process

---

USES OF ICT TOOL

Information and communication technology (ICT) has become, within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. ICT has been a real blessing to mankind in almost every area of our endeavor. The help provided by ICT in the field of education, economics and banking, social activities, etc is insurmountable. ICT is universally used. There is a high degree of inter-organizational ICT use.

Uses of ICT in education

- ICT helps students and teachers carry out their research effectively: with the advent of the internet, all necessary information is just a click away. The user just types in the search engine the keyword of what they want, and a vast array of information is displayed.
- Various ICT related gargets help teachers make clear their meanings of basic concepts.
- Electronic laboratories or E-labs help teachers and instructors perform laboratory experiments even in the absence of the appropriate equipments and

Fig. 1.5: ICT is an essential aid in education

materials. Teachers do this by rerunning a pre-recorded experiment.

- With a wide variety of presentation software on the market, students can easily present their ideas.
- E-learning helps students learn at their own pace even without a teacher or instructor.
- ICTs are used in classrooms to help students with physical disabilities grab some basic concepts talked about.

Uses of ICT in society

- ICTs such as mobile phones are used widely to communicate – send and receive messages (voice and text).
- Network-based traffic lights are used to monitor our roads and control the movements of traffic. This helps prevent road related accidents.
- ICT enables people to stay informed even when they are far away fro the source of the news. This is made possible by the internet and digital television.
- Meteorologists depend on ICT to be able to predict the weather make-up, thereby keeping the public safe from weather related casualties.
- Some common home appliances such as microwave ovens and refrigerators are fitted with some ICT gargets to make them work efficiently.

Uses of ICT for Economic Development

- ICT enables inter-departmental communication and information transfer within company or one company with another. This promotes productivity and efficiency.
- It enable people to access their banking information easily without the need to visit the bank this is made possible by Electronic Banking (E-banking) and the ATM.
- Policy makers use ICT related technologies to come out with economic forecasts - this ensures that all monetary issues are well planned and prepared for.
- Investors can easily keep track of their money and investment wherever they are in the world because of ICT. This has eased down the pressure on investors in trying to come out with proper investments; potential investors can easily learn the act of investment.
- ICT monitors the growth of the market. This helps to know how much a country, company or individual is making at a specific point in time.

GROUP DISCUSSION

In groups, students to discuss and come out with the educational, social and economic purposes of ICT

IMPACT OF ICT

Information and Communication Technology (ICT) has become an important tool for promoting a variety of public goals and policies. In the past years much attention has been given to the expected social benefits from using ICT in different fields such as transportation, education, public participation in planning etc. and to its potential to ease down on various current or emerging urban problems. The growing importance of ICT in daily life, business activities and governance prompts the need to consider ICT more explicitly in urban policies. Alongside the expectation that the private sector will play a major role in the ICT field, the expected benefits from ICT encourage also urban authorities to formulate proper public ICT policies. Against this background, various intriguing research questions arise. What are the urban policy-makers' expectations about ICT? And how do they assess the future implications of ICT for their city? An analysis of these questions will provide us with a better understanding of the extent to which urban authorities are willing to invest in and adopt a dedicated ICT policy.

ICT by all implications is here to stay is its impact on all sector are overwhelming. The following are some of the impact that ICT has had on some selected sectors.

On education

The first mass produced computers were introduced to schools in the 1980s. Since then, ICT has taken root in the educational field.

- Online distance education helps students to attend classes and submit assignments at the comfort of their own home.
- The internet is store house for all source of information. All that the student or teacher needs to do is to type in their questions or keyword, and every information on that subject will be displayed.
- Virtual classrooms helps students log on from home, school, etc into a special computer-based classroom where information is presented to them just as in a real classroom.
- Computer-aided teaching and learning helps students select subjects they want and also learn at their own pace.
- School authorities can easily assess the information of teachers and students from their data base.
- Students can also asses their WASSCE and BECE results online even before they become available at their school.

On society

Some of the impact ICT has had on society are:

- Availability of internet cafes which make assess to information online very convenient.
- Fast and effective communication through email, mobile/telephone, fax etc.
- Mp3 players, iPods, games etc helps people relax and pass their leisure whiles listening to music or playing games to ease tension.
- More traffic means more road congestion and traffic accidents. This is not very much the case as traffic lights regulate traffic movement and reduce congestion.
- What could be more comfortable than being in your sitting room or even bath room and yet able to buy or order things. E-shopping as it is called has made this possible.
- CCTVs and even web cams serve as security cameras. People can monitor their homes and parents, their children when they are away.
- Digital television make available hundreds of TV stations for the users; viewing comfort.

On economic development

Industries, banks and hospitals are some of the key beneficiaries of the powers of ICT.

In the supermarket:

- e-shopping and e-commerce do not only help customers buy what they want from anywhere, but also helps supermarkets and manufacturers reach a lot of customers all over the world, 24/7.
- Bar codes on products help supermarkets price their goods just by changing the prices on their database without the need to change the labels on the products. They can also easily take stock level of their good easily without counting and re-counting the product available.

In banks:

- Automated Teller Machines (ATMs) enable bank customers to withdraw money from their checking or savings accounts by inserting an ATM card and a private electronic code into an ATM. The ATMs enable bank customers to access their money 24 hours a day and seven days a week wherever ATMs are located, including in foreign countries.

Fig. 1.6: An ATM

- Banks also offer debit cards that directly withdraw funds from a customer's account for the amount of a purchase, much like writing a check.

- Banks also use electronic transfers to deposit payroll checks directly into a customer's account and to automatically pay a customer's bills when they are due. Many banks also use the Internet to enable customers to pay bills, move money between accounts, and perform other banking functions.

In the manufacturing industry:

- Computer –aided design/computer aided manufacture (CAD/CAM), helps engineers and designers develop and test new product easily before producing them. Cars, planes, ships and other machines are first designed and manufactured on computers before they go into production.

- Robot technology is relied on for the jobs which cannot be done by humans.

Fig. 1.7: An engineer on a computer model

In the offices:

- Video conferencing or teleconferencing enables people to hold meetings and do their presentations to others who are miles apart.
- Offices now resort to storing data on one central computer which is accessed by all departments through local and wide area networks.
- Telephone bill has reduced because information can easily be sent by email even much faster. Confidential documents, videos and audios can be sent from one office, city, town or country to another in a flash.via email.

In the medical field:

- Doctors and other medical officers can use the computed axial tomography (CAT) scan to study the internal part of a patient.
- The use of robotic arms enables surgeons to perform surgeries even when they are distance away from the patient. The patients appear on the surgeon's computer, whether in the same or distant hospital. The surgeon uses a specially adapted mouse control the actions of the robotic arms.

Fig. 1.8: ICT, a tool in medicine

- Computer diagnosis, where diseases are diagnosed by matching the symptoms illnesses; computer monitoring where people recovering from some diseases are followed; computer prediction, the use of computer to know the effect of drugs before they come out are all possible through ICT.

GROUP DISCUSSION

In groups, students to discuss and come out with the educational, social and economic purposes of ICT

CAREER OPPORTUNITIES

Careers in ICT are ever expanding due to increasing demand of ICT personnel. Career opportunities in ICT include;

- **Internet Café administrator:** A person who manages an internet café, makes sure that everything is working properly.
- **Programmer/ software engineer:** A person who writes and debugs computer programs. Depending on the size of the project and the work environment, a programmer might work alone or as part of a team, be involved in part or all of the process from design through completion, or write all or a portion of the program.
- **Database administrator:** A person who monitors a database, prevents it from being hacked into and keeps it up to date.
- **Network administrator:** A person responsible for configuring the network so that it runs efficiently. For example, the network administrator might need to connect computers that communicate frequently to reduce interference with other computers.
- **System Administrator:** The person or team of people responsible for configuring the computer and its software to use the network. For example, the system administrator may install network software and configure a server's file system so client computers can access shared files.
- **Hardware engineer/designer**: A person who makes computer parts such as system unit and its components, monitors, keyboards, mice etc.

Assignment:
Students to select ICT career of their choice and find out the requirements and job description and report in class.

TEST YOURSELF

Theory questions

1. a. What is the full meaning of ICT?
   b. Write a short note on ICT.

2. Explain the information processing cycle and state two devices used in each step.

3. Discuss the impact of ICT on the following areas:
a. Education
b. Medicine
c. Society
d. Banking
e. Supermarkets

4. Outline four careers related to ICT.

5. Write a short note on the following
a. ICTs
b. Data
c. Information
d. E-learning
e. Program

6. With the aid of a diagram, describe how input, processing, output, storage and distribution are connected in the information processing cycle.

7. Outline the uses of ICT in the following areas:
a. Education
b. Social
c. Economic development

8. Discuss the differences between data and information

9. a. What is the role of the Central Processing Unit in the information processing cycle?
   b. the central processing cycle is said to be he brain of the computer. Discuss that assertion.

10. Discuss how ICT can be used to save life.

Multiple choice questions

1. Which of the following is the full meaning of ICT?
   a. Information and Commissions Technology
   b. Information and Communication Technicality
   c. Informal and Communication Technology
   d. Information and Communications Technology

2. Which of the following is an input device?
   a. Monitor
   b. Keyboard
   c. Central Processing Unit
   d. Hard disk drive

3. The two components of the CPU are the Control Unit and …
   a. System Unit
   b. Arithmetic Local Unit
   c. Logical Unit
   d. Arithmetic Logic Unit

4. Which of the following is an input device?
   a. Barcode reader
   b. LCD projector
   c. USB Drive
   d. Zip drive

5. Devices which transmit processing data to the computer user are termed as..
   a. Output devices
   b. Input devices
   c. Processors
   d. Storage devices

6. If a person uses a printer he/she is using a/an….
   a. Output device
   b. Input device
   c. Processor
   d. Storage device

7. The information processing cycle always begins with….
   a. Storage
   b. Input
   c. Output
   d. Distribution

8. A computer's response to data could said to be a/an ..
   a. Raw material
   b. Input
   c. Information
   d. Program

9. A set of instructions that tells the computer what to do is …
   a. Data
   b. Information
   c. Instruction
   d. Program

10. Pick the odd one out.
    a. Input
    b. Instruction
    c. Distribution
    d. Storage

11. Pick the odd one out.
    a. Monitor
    b. Keyboard
    c. Trackball
    d. Gamepad

12. Pick the odd one out.
    a. Mouse
    b. Speaker
    c. Printer
    d. LCD projector

True or false questions

13. ICT and ICTs are the same.

14. Devices used for putting data onto the computer are known as input devices.

15. The part of the CPU which is responsible for all calculations is known as the ALU.

16. A joystick is an input device.

17. A processed data is known as a program.

18. Data is synonymous to information

19. A monitor is an input device.

20. A floppy disk can store information.

21. A stored information can be distributed.

22. A collection of data organized for storage in a computer memory is known as database.

Fill in the gaps with the words below.

Input output CPU monitor ALU storage web cam data CAD/CAM information

23. The ……. does the processing of data.

24. ……. helps engineers and designers develop and test new product.

25. A ……. displays processed data.

26. The component of the CPU which is responsible for computations is the ……

27. A processed data is known as …….

28. …….. devices enable a computer user issue a command to the computer.

29. Information …… is done by storage devices.

30. An example of input device is a ……..

31. The third stage of information processing cycle is ……..

32. A computer user always inputs …….

Answers

Multiple choice questions

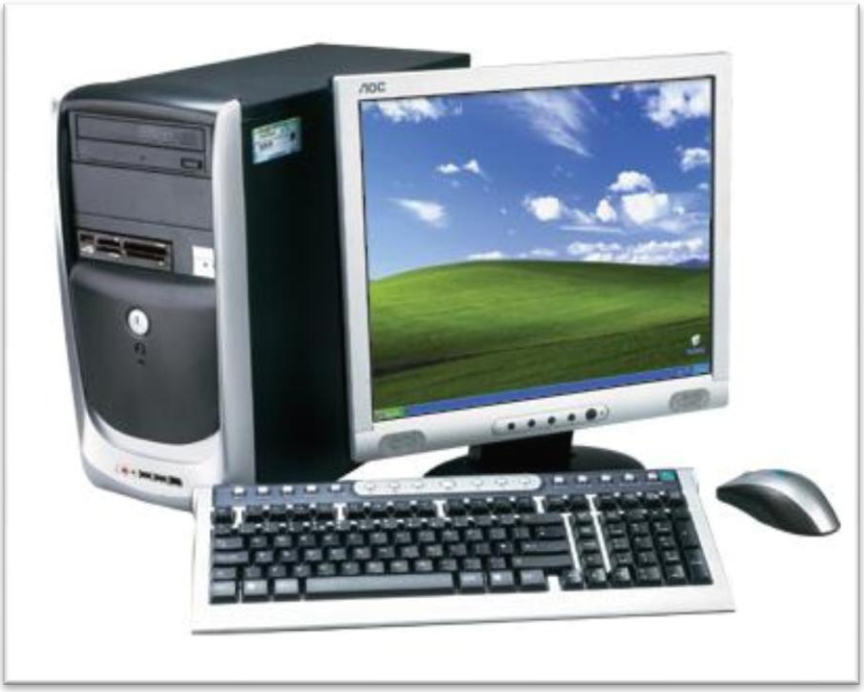
1. D
2. A
3. D
4. A
5. A
6. A
7. B
8. C
9. D
10. B
11. A
12. A

True or false questions

13. False
14. True
15. True
16. True
17. True
18. False
19. False
20. True
21. True
22. True

Fill In

23. CPU
24. CAD/CAM
25. monitor
26. ALU
27. information
28. Input
29. storage
30. web cam
31. output
32. data



Chapter 2

INTRODUCTION TO COMPUTERS

OBJECTIVES

After completing this chapter, you should be able to:

i. Identify types of computers.
ii. State the uses of computers.
iii. Identify the steps involved in booting, rebooting and shutting down computers.
iv. Identify the possible threats to computers and their users.
v. Demonstrate how to use the computer responsibly.

INTRODUCTION

A computer is an electronic device that accepts data, processes it and outputs it as human-understandable information.

It can also be defined as a programmable machine that performs tasks, such as calculations or electronic communication, under the control of a set of instructions called a program.

THE DEVELOPMENT OF COMPUTERS

Computers have come a long way. Actual computing began with an analog machine in 1623, when a German scientist Wilhelm Schikard invented a machine that used 11 complete and 6 incomplete sprocketed wheels that could add, multiply and divide.

French mathematician and physicist Blaise Pascal invented a machine in 1642 that added and subtracted, automatically carrying and borrowing digits from column to column. Seventeenth-century German mathematician Gottfried Leibniz designed a special gearing system to enable multiplication on Pascal's machine.

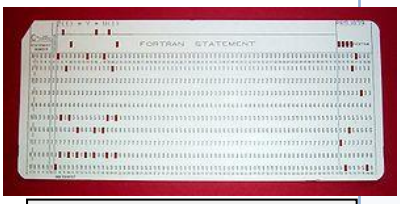


Fig. 1.9: A punched card

In the early 19th century French inventor Joseph-Marie Jacquard devised a specialized type of computer: a silk loom. Jacquard's loom used punched cards to program patterns that helped the loom create woven fabrics.

In the early 1820s British mathematician and scientist Charles Babbage, developed the Difference Engine. Although never completed by Babbage, the Difference Engine was intended to be a machine with a 20-decimal capacity that could solve mathematical problems. Babbage also made plans for another machine, the Analytical Engine, considered the mechanical precursor of the modern computer. The Analytical Engine was designed to perform all arithmetic operations efficiently.

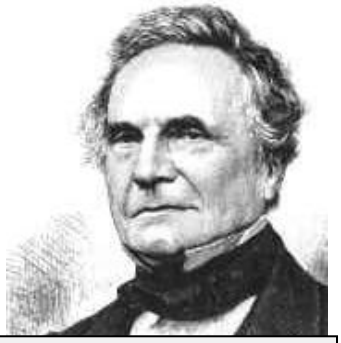


Fig. 2.0: Charles Babbage

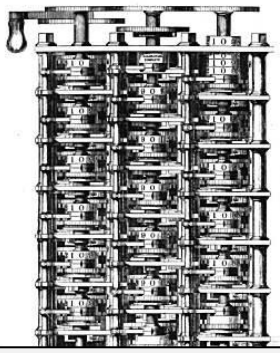


Fig. 2.1: the Difference Engine

Augusta Ada Byron, countess of Lovelace, was a personal friend and student of Babbage. She prepared extensive notes concerning Babbage's ideas and the Analytical Engine. Lovelace's conceptual programs for the machine led to the naming of a programming language (Ada) in her honor. Although the Analytical Engine was never built, its key concepts, such as the capacity to store instructions, the use of punched cards as a primitive memory, and the ability to print, can be found in many modern computers.

Herman Hollerith, an American inventor, used an idea similar to Jacquard's loom when he combined the use of punched cards with devices that created and electronically read the cards. Hollerith's tabulator was used for the 1890 U.S. census, and it made the computational time three to four times shorter than the time previously needed for hand counts. Hollerith's Tabulating Machine Company eventually merged with two companies to form the Computing-Tabulating-Recording Company. In 1924 the company changed its name to International Business Machines (IBM).

Fig. 2.2: Herman Hollerith

In 1936 British mathematician Alan Turing proposed the idea of a machine that could process equations without human direction. The machine (now known as a Turing machine) resembled an automatic typewriter that used symbols for math and logic instead of letters. Turing intended the device to be a "universal machine" that could be used to duplicate or represent the function of any other existing machine. Turing's machine was the theoretical precursor to the modern digital computer. The Turing machine model is still used by modern computational theorists.

Fig. 2.3: Alan Turing

In the 1930s American mathematician Howard Aiken developed the Mark I calculating machine, which was built by IBM. This electronic calculating machine used relays and electromagnetic components to replace mechanical components. In later machines, Aiken used vacuum tubes and *solid state transistors* (tiny electrical switches) to manipulate the binary numbers. Aiken also introduced computers to universities by establishing the first computer science program at Harvard University in Cambridge, Massachusetts. Aiken obsessively mistrusted the concept of storing a program within the computer, insisting that the integrity of the machine could be maintained only through a strict separation of program instructions from data. His computer had to read instructions from punched cards, which could be stored away from the computer.

Fig. 2.4: Howard Aiken

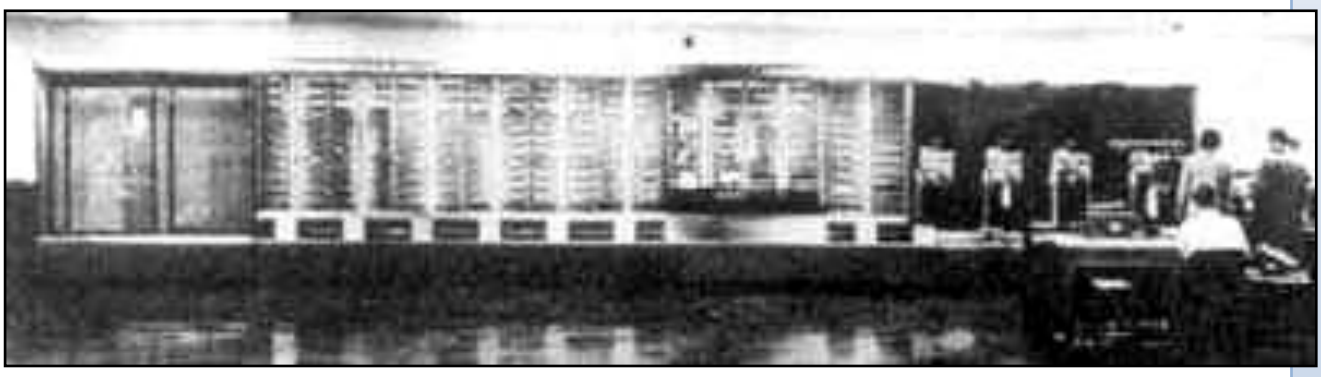


Fig. 2.5: Mark I calculating machine

At the Institute for Advanced Study in Princeton, New Jersey, Hungarian-American mathematician John von Neumann developed one of the first computers used to solve problems in mathematics, meteorology, economics, and hydrodynamics. Von Neumann's 1945 design for the Electronic Discrete Variable Automatic Computer (EDVAC)—in stark contrast to the designs of Aiken, his contemporary—was the first electronic computer design to incorporate a program stored entirely within its memory. This machine led to several others, some with clever names like ILLIAC, JOHNNIAC, and MANIAC.

Fig. 2.6: John von Neumann

American physicist John Mauchly proposed the electronic digital computer called ENIAC, the Electronic Numerical Integrator And Computer. He helped build it along with American engineer John Presper Eckert, Jr., at the Moore School of Engineering at the University of Pennsylvania in Philadelphia. ENIAC was operational in 1945 and introduced to the public in 1946. It is regarded as the first successful, general digital computer. It occupied 1,800 sq ft, weighed more than 27,000 kg and contained more than 18,000 vacuum tubes. Roughly 2,000 of the computer's vacuum tubes were replaced each month by a team of six technicians. Many of ENIAC's first tasks were for military purposes, such as calculating ballistic firing tables and designing atomic weapons. Since ENIAC was initially not a stored program machine, it had to be reprogrammed for each task.

Fig 2.7: ENIAC occupying 1,800 sq ft room

Eckert and Mauchly eventually formed their own company, which was then bought by the Rand Corporation. They produced the Universal Automatic Computer (UNIVAC), which was used for a broader variety of commercial applications. The first UNIVAC was delivered to the United States Census Bureau in 1951. By 1957, there were 46 UNIVACs in use.

Fig. 2.8: UNIVAC Computer System

Between 1937 and 1939, while teaching at Iowa State College, American physicist John Vincent Atanasoff built a prototype computing device called the Atanasoff-Berry Computer, or ABC, with the help of his assistant, Clifford Berry. Atanasoff developed the concepts that were later used in the design of the ENIAC. Atanasoff's device was the first computer to separate data processing from memory, but it is not clear whether a functional version was ever built. Atanasoff did not receive credit for his contributions until 1973, when a lawsuit regarding the patent on ENIAC was settled.

Walter Houser Brattain, John Bardeen, and William Bradford Shockley developed the transistor, a device that can act as an electric switch. The transistor had a tremendous impact on computer design, replacing costly, energy-inefficient, and unreliable vacuum tubes.

In the late 1960s integrated circuits (tiny transistors and other electrical components arranged on a single chip of silicon) replaced individual transistors in computers. Integrated circuits resulted from the simultaneous, independent work of Jack Kilby at Texas Instruments and Robert Noyce of the Fairchild Semiconductor Corporation in the late 1950s. As integrated circuits became miniaturized, more components could be designed into a single computer circuit. In the 1970s refinements in integrated circuit technology led to the development of the modern microprocessor, integrated circuits that contained thousands of transistors. Modern microprocessors can contain more than 40 million transistors.

Manufacturers used integrated circuit technology to build smaller and cheaper computers. The first of these so-called personal computers (PCs)—the Altair 8800—appeared in 1975, sold by Micro Instrumentation Telemetry Systems (MITS). The Altair used an 8-bit Intel 8080 microprocessor, had 256 bytes of RAM, received input through switches on the front panel, and displayed output on rows of light-emitting diodes (LEDs). Refinements in the PC continued with the inclusion of video displays, better storage devices, and CPUs with more computational abilities. Graphical user interfaces were first designed by the Xerox Corporation, then later used successfully by Apple Inc.. Today the development of sophisticated operating systems such as Windows, the Mac OS, and Linux enables computer users to run programs and manipulate data in ways that were unimaginable in the mid-20th century.

Several researchers claim the "record" for the largest single calculation ever performed. One large single calculation was accomplished by physicists at IBM in 1995. They solved one million trillion mathematical sub-problems by continuously running 448 computers for two years. Their analysis demonstrated the existence of a previously hypothetical subatomic particle called a glueball. Japan, Italy, and the United States are collaborating to develop new supercomputers that will run these types of calculations 100 times faster.

In 1996 IBM challenged Garry Kasparov, the reigning world chess champion, to a chess match with a supercomputer called Deep Blue. The computer had the ability to compute more than 100 million chess positions per second. In a 1997 rematch Deep Blue defeated Kasparov, becoming the first computer to win a match against a reigning world chess champion with regulation time controls. Many experts predict these types of parallel processing machines will soon surpass human chess playing ability, and some speculate that

massive calculating power will one day replace intelligence. Deep Blue serves as a prototype for future computers that will be required to solve complex problems. At issue, however, is whether a computer can be developed with the ability to learn to solve problems on its own, rather than one programmed to solve a specific set of tasks. Computers continues to develop, and more and more powerful computers are being built today – who knows where we will go from here?

TYPES OF COMPUTERS

Computers come in three types-

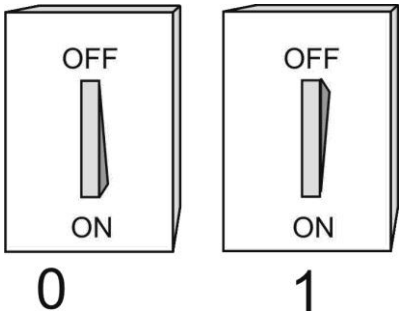
- Digital computers
- Analogue computers
- Hybrid computers

Digital computers

When you here the word digit, what come to your mind? Numbers (0,1,2,3……9).

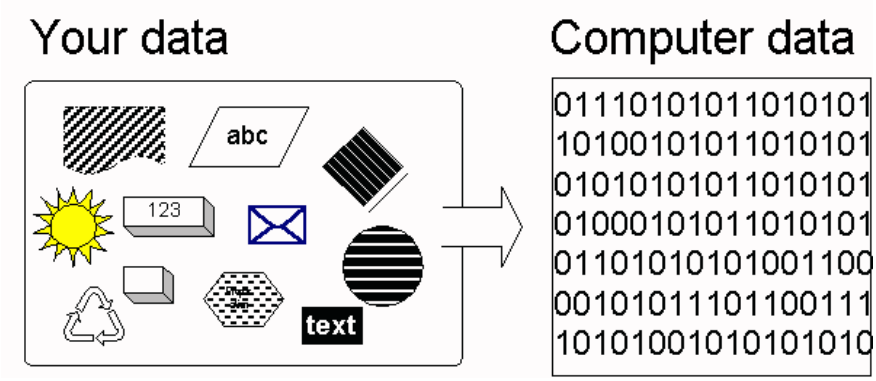
A digital computer is defined as **a computer that performs calculations and logical operations with quantities represented as digits (numbers), usually in the binary number system**.

The binary number system is made up of digits, just like our common *decimal* system (10 digit system). But, while the decimal system uses digits 0 through 9, the binary system only uses digits 0 and 1, also known as ON or OFF and the primary language that computers communicate in. You can compare with regular household switches. If the switch if off, the PC reads numeral 0 - if it is on, it is read as numeral 1. See the illustration below:



The PC is filled with these switches (in the form of transistors). There are literally millions of those in the electronic components. Each represents either a 0 or a 1, so we can process data with millions of 0's and 1's.

In digital computers, even letters, words and whole texts are represented digitally.



Each 0 or 1 is called a *bit*. Bit is an abbreviation of the expression **BI**nary digi**T**. It is called binary, since it is derived from the *binary number system.* A sequence of 8 bit is known as 1 byte.

0	**1 bit**
1	**1 bit**
0110	**4 bit**
01101011	**8 bit or 1 byte**

Types of digital computers

Digital computers come in various types and sizes. They can further be grouped as:

- Supercomputers
- Mainframe computers
- Minicomputers
- Microcomputers

Supercomputers

Supercomputers are designed to do high speed computations. They have large amount of main memory with high speed processor. They are normally referred to as parallel processors because they allow many instructions to be executed at the same time. Supercomputers are mostly used for scientific and engineering calculations. They are also used to create weather predictions. Large businesses and the military all rely on supercomputers. Examples of supercomputers are the Cray supercomputer, CM -5 supercomputer and the IBM Series 360.

Fig. 2.9: IBM Series 360

Fig. 3.0: Cray Supercomputer

Fig. 3.1: CM-5 supercomputer

Mainframe computers

Mainframe Computer are high-level computers designed for the most intensive computational tasks. They are usually shared by multiple users through a series of interconnected computers via a terminal. Mainframe computers require special air-conditioned rooms to keep them running. They control businesses and industrial facilities and are used by universities, banks etc. An example of mainframe is the IBM System 360 mainframe computer.

Fig. 3.2: IBM System/360 Mainframe Computer

Minicomputers

Minicomputers are mid-level computers built to perform complex computations while dealing efficiently with a high level of input and output from different users connected via terminals. Minicomputers also frequently connect to other minicomputers on a network and distribute processing among all the attached machines. Minicomputers are used heavily in transaction-processing applications and as interfaces between mainframe computer systems and wide area networks. Recent minicomputers perform most of the functions of mainframe computers.

Microcomputers

Microcomputers are computing device that uses a microprocessor as its central processing unit, or CPU. They are the commonest computers today. When we talk of personal computers, laptops, notebooks and even hand-held computers, we are referring to microcomputers. In common usage, the term *microcomputer* is equivalent to personal computer. When they first appeared, microcomputers were considered single-user devices, and they were capable of handling only 4, 8, or 16 bits of information at one time. Newer microcomputer models such as the workstations have increased the speed and data-handling capabilities of their CPUs into the 32-bit and 64-bit, multiuser range. They have become very powerful to the extent that they sometimes do the tasks of minicomputers and even mainframe computers.

Microcomputers come in different shapes and sizes with different functions. The following are some types of microcomputers.

Tower (desktop) computer

Laptop computer

All-in-one computer

Hand-held computer

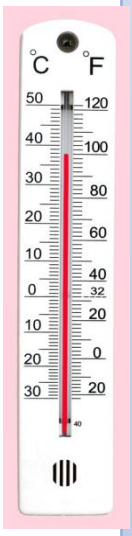
Fig. 3.2: Some microcomputers

ANALOGUE COMPUTERS

In contrast to digital computers, there are analogue computers. **An analogue computer is a computer that represents data in terms of physical measures or quantities such as time, voltage, temperature, speed etc in a continuous range.** Unlike digital computers, an analogue computer can perform only one specific function. For example a speedometer, which is an analogue computer, can only measure the speed of a moving object, and nothing else. The following are example of analogue computers.

Analogue watch

Speedometer



Thermometer

Fig. 3.3: Some analogue computers

HYBRID COMPUTER

We have discussed digital computers (which represent data by numbers) and analogue computers (which represent data by physical quantity). In between theses two classes of computers is the hybrid computer. **Hybrid computers are computers that combine the features of both digital and analogue computers.** The digital component normally serves as the controller and provides logical operations, while the analog component normally serves as a solver of differential equations. The integration from analogue to digital and vice versa, is obtained by digital to analog and analog to digital converter. A hybrid computer may use or produce analog data or digital data. It accepts a continuously varying input, which is then converted into a set of discrete values for digital processing. A hybrid computer system setup offers a cost-effective method of performing complex simulations.

ATM

Examples of analogue computers are automated teller machine (ATM) and money counting machine.


Money counting machine

USES OF COMPUTERS

"I think there is a world market for maybe five computers". That was a statement made in the 1940s by the then chairman of IBM, Thomas Watson. Had Mr. Watson being a little "long sighted" he would have known that the world really needs far more than five computers. Today, computers are in use in all walks of life. It is hard to imagine the world without computers. Usage of different types of computers has made life both smooth and fast paced.

People use computers in many ways.

In business

- Computers track inventories with bar codes and scanners.
- Check the credit status of customers.
- Transfer funds electronically.
- Communicate

At homes

- Tiny computers embedded in the electronic circuitry of most appliances control the indoor temperature,
- Operate home security systems,
- Tell the time.
- Turn videocassette recorders (VCRs) on and off.

- Computers in **automobiles** regulate the flow of fuel, thereby increasing gas fuel mileage,
- Computers are used in anti-theft systems.

Computers also **entertain**, creating digitized sound on stereo systems or computer-animated features from a digitally encoded laser disc.

Computer programs, or applications, exist to aid every level of **education**, from programs that teach simple addition or sentence construction to programs that teach advanced calculus. Educators use computers to track grades and communicate with students; with computer-controlled projection units, they can add graphics, sound, and animation to their communications.

Computers are used extensively in **scientific research** to solve mathematical problems investigate complicated data, model systems that are too costly or impractical to build, such as testing the air flow around the next generation of aircraft.

The military employs computers in sophisticated communications to encode and unscramble messages, and to keep track of personnel and supplies.

BOOTING, REBOOTING AND SHUTTING DOWN OF COMPUTERS

The computer is a complicated machine and should not be compared to any other electronic device we find at home, school or the office. The operation of computers follows systematic steps and rules which do not have to be ignored. Booting, rebooting and shutting down are the terms used to describe the process of starting, restarting and turning off the computer respectively. Now, let's take them one at a time.

Booting the computer

Booting the computer in general term means giving the computer a hard kick. Who will really wants to do that? Apart from hurting your foot, you should also know that your expensive computer might be damaged irreparably. You wouldn't want to do that. If that is not it then what does it mean to boot a computer?

Booting the computer is the step by step process of turning on the computer and loading the operating system.

The initial booting of the computer is normally referred to as **cold booting.**

Steps in booting a computer

Basically, a computer is made up of a systems unit with a keyboard and a mouse connected to it and a monitor, which is the display unit. The systems unit and the monitor need external power source, whiles the keyboard and the mouse get their power from the systems unit.

- First connect the video cable from the monitor to the serial port at the back of the systems unit.

- Connect the keyboard and the mouse to their appropriate ports.

Fig. 3.5: PS/2 mouse keyboard and ports

NOTE: The ports of the keyboard and the mouse are similar. Switching them will not work; therefore make sure you connect them correctly.

- Connect the AC power cable first to the rear of the systems unit and monitor before plugging into the mains. (To avoid damage to your computer as a result of power surge and voltage spikes it is recommended that you plug your devices into a power surge protector).
- At this point it is safe to turn on the computer. Press the power button in front of the system unit. You should hear the systems fan and the hard disk beginning to spin.
- Turn on the monitor. If it is on already you will see it flicker into life. If nothing happens switch off the systems unit and check all your connections and then retrace the entire steps. When your computer is on it will first check the system configurations and the *hardware* and then finally, load the operating system.

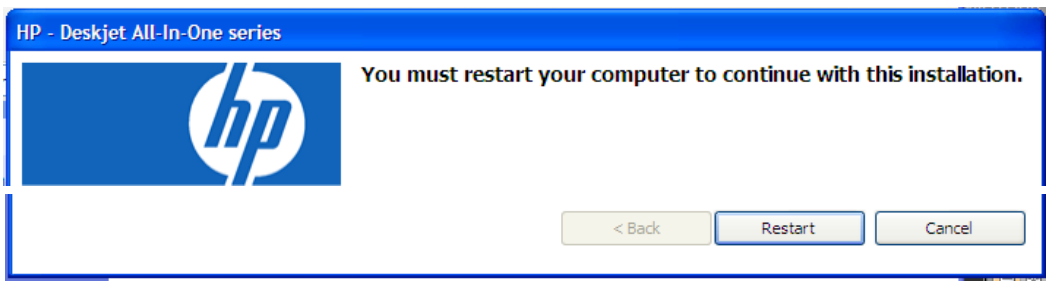
NOTE: Make sure to follow all instructions to the latter.

Rebooting the computer

Rebooting the computer means to restart it. That is to turn it off and then on again. Rebooting a computer involves more than just pressing the power button off and on. One has to follow some special procedure in order to reboot a computer. The actual turning off and on is done by the computer itself with a single instruction from the user. So by this we can say than rebooting is the process of restarting a computer after it has been on for some time. It is also known as warm booting.

The question is when is it necessary for a user to reboot a computer?

1. A request from the computer: Sometime after one installs a program, a message appears on the screen asking the user to restart the computer before the newly installed program will work. This is because during the installation of some programs not all the associated components of that program are installed until the computers restarts.



2. In another instance the user will see this message after making changes to the settings on the computer.

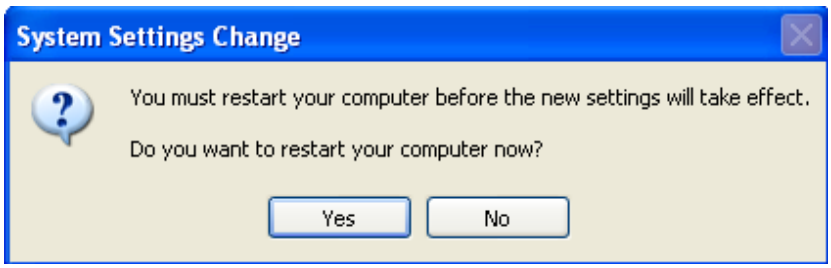


Fig. 3.6: a request from the computer to reboot

3. Non-response from the computer. This is the case when the computer stops responding to user command, in a state known as freezing. In this state neither the mouse nor the keyboard functions. Freezing may be caused by giving wrong command to the computer or running a lot of programs at the same time. In the latter case it often occurs to computers with lower system specifications.

4. Failure of the computer to load all the system components. When the computer starts it first loads Basic Input and Output Devices (BIOS) that is all the hardware; then the operating system and the individual software install on it. In some circumstances, the computer skips some of these steps, so when it starts it will warn you and might ask you to reboot.

There you are. Now, how is rebooting done? There are three main methods by which a computer can be restarted:

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i. Using the restart tab

To reboot the computer using the restart tab

1. Click the start button. 

This will cause the start menu to pop-up as shown below.

2. Click on the "Turn Off" tab. 

A different screen with "Stand By", "Turn Off" and Restart" tabs appears.

3. Click on the Restart tab. This will cause the computer to restart.

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ii. Using the CTRL-ALT-DEL

Pressing the Ctrl, Alt and DEL keys on the keyboard simultaneously will display the task manager from which you can select restart from the shut down tab to restart your computer. In the older versions of Microsoft Operating System (Windows), pressing this key combination twice will automatically restart the computer.

The Ctrl-Al-Del option is ideal if the computer freezes but the keyboard does not.

Fig. 3.7: the CTRL-ALT-DEL combination

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iii. Using the reset button

Some system units have a special button located near the "power on" button which is used to restart the computer. The reset button is the easiest and the quickest way of rebooting the computer. If is most ideal if the computer and the other hardware connected to it are all irresponsive.

Restarting the computer will close all open programs. The negative side is all unsaved works will be lost. Be advised that before you reboot your computer save and close all open programs, (if you have the option).

Shutting down the computer

Computers, like all electrical and electronic devices, need to be turn off when not in use, to safe energy and also reduce pressure on it. **The process of turning off the computer is known as shutting down.** Shutting down the computer is not as easy as turning off a television set; a lot goes into play. Most computers break down because of improper shut down procedure from users; while some just press the power button just as they do to their TV set, others go into the extreme of unplugging the power cable from the mains.

How does one shut down the computer without causing any damage to it? Follow the steps below.

1. Click on the start button. 

2. Click on "Turn Off Computer" button.

3. Click on the :Turn Off" button.

CAUTION: Turning off the computer will close all open programs. Make sure to save all projects before shutting down. Some programs will notify you to safe any unsaved changes made to it.

ASSIGNMENT

Students to write the procedure for booting, rebooting and shutting down a computer.

THREATS TO COMPUTERS AND USERS

A threat could said to be a person, animal or thing that is likely to cause harm, pain or damage. Computers and their users are plagued by numerous threats, both known and unknown. In this section will discuss some threats to computers and computer users, their causes and possible prevention and remedy.

COMPUTER THREATS

Computers, like most things in the world, are far from safe. Computers are always exposed to a variety of threat mostly as a result of negligence from the users. Computer threats are in two folds – there are threats which are focused on the programs and the operating system on the computer. We shall call them software related threats; and there are those which affect the physical components of the computer. We shall refer to them as hardware related threats.

Software-related threats

Software are programs or applications that can be run on the computer system, e.g. word processing, database packages etc. (more on software later).
If you ever thought that once a program is installed on a computer system it is safe, think again. There are a lot of malicious software on the cyber-market, the sole purpose of which is to make the genuine software on computer systems vulnerable. Software threats include
Viruses, worms, Trojans, spasm, spyware, phishing, IP spoofing, hackers, hijackers, adware, dialers, hoaxes and stranger-danger.

1. Viruses

Computer programs that copy themselves from one program or computer to another . They often disrupt your computer system or damage your data. Viruses are usually received by email attachments or downloads so be careful opening anything from a dubious source. They can affect anyone, for example, the destructive Mydoom worm affected one out of three small and mid-sized businesses. Like biological viruses, different computer viruses do different tasks some of which include:
Boot Sector: A virus which infects the boot sector or partition table of a disk. Computers are most often infected with this type of virus after being started with an infected boot floppy or CD.

Companion: Also known as a "Satellite" virus, this does not actually modify the code of the target program, but is hosted by an infected copy of the target which is placed ahead of it on the execution path. This is achieved by giving the infected version the same name as the target program, but with a file extension of higher priority. For example, if the user of a PC running Microsoft Windows attempts to run a file called *myprogram*, the computer will look to run a file called *myprogram.bat* or *myprogram.com* or *myprogram.exe* in that order. Therefore, a companion virus which targets the *myprogram.exe* file would create an infected copy called *myprogram.bat* or *myprogram.com* so that it gets run instead of the real program.

Cryptovirus: A virus that uses asymmetric encryption techniques and includes a public key in its payload. Usually, the private key of the asymmetric key pair will be retained by the virus author/attacker so that only he can decrypt the data that was encrypted with the corresponding public key contained in the virus. The concept could equally be applied to Worms or Trojan horse programs giving us "Cryptoworms" and "Cryptotrojans"

respectively. Such malware would commonly be used for extortion, whereby data on a victim's hard disk is encrypted and held to ransom.

File infector: The traditional type of virus which infects .com .exe or other executable files.

Macro: A virus, very often written in Visual Basic, which is triggered when a parent application performs some action on an infected document. A macro virus contained in a .doc file might be triggered when the parent application (Microsoft Word, say) opens, closes or saves the file, for example.

Multi-partite: A virus which has the capability to infect a computer's boot sector, partition table and/or its executable programs. It therefore has the characteristics of both "boot sector" and "file infector" viruses.

Polymorphic: A virus which has the ability to alter its appearance. The body of a polymorphic virus has two basic parts - the executable part (which is encrypted) and the decryptor (which is used to decrypt the executable part so that it can be run). By using a variety of techniques the appearance (but importantly, not the basic functionality) of the decryptor can be altered, greatly assisting the virus in evading detection by antivirus software.

2. Spyware

Like a spy, a spyware monitors a user's actions, and send all the information about the user and their computer to somebody else. Spyware may send the addresses of sites you have visited or worse still, transmit personal information. With today's concerns about identify theft this is a real worry. For example, CoolWebSearch may hijack web searches, home page, and other Internet Explorer settings. Spyware is normally received as part of *shareware* (a software made available for free download), downloaded from the web.

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3. Trojans or Trojan Horse

The name Trojan horse is taken from the legend in which the Greeks built a large wooden horse with the pretence that it was a peace offering for their foes, the Trojans. The Trojans accepted the gift and carried it into their, erstwhile impregnable, city of Troy. Little did they realize, until it was too late, that the wooden horse was hollow and that the Greek army was concealed inside! Just like the legend, a Trojan is a program which has some hidden, malign purpose, other than the one it purports to have. For example, a program which claimed to be a game but which also secretly installed some spyware or adware components on a user's computer would be considered to be a Trojan horse program, because the *real* purpose of the program was to install the malware and not to provide an entertaining game for the user. Commonly, a so-called Remote Access Trojan (or RAT) may open a backdoor on a

Fig. 3.8: the symbolic Trojan Horse

computer allowing an intruder to connect without the user's knowledge or consent.

4. Spam

An unwanted or unrequested mail often promoting products of a dubious financial or sexual nature. Don't leave your email address on websites and internet bulletin boards as they are harvested by spammers. Recent evidence suggests that some spammers have now teamed-up with virus writers so that even more spam can be sent, using the infected computer to send spam to all the email addresses contained in a user's address book for example.

5. IP/Address Bar Spoofing

A technique to gain unauthorized access to computers, whereby the intruder sends messages to a computer with an address indicating that the message is coming from a trusted host.

6. Adware

An adware is a program that puts advertisements on your screen. These take many forms including popups, popunders and advertisements that appear later, even if your browser is closed. Some are sent using the Windows Messenger service which allows a spammer to direct an advertisement straight to your computer by sequentially sending messages to IP addresses. Always irritating, they are also often of a pornographic nature. A generic term referring to a class of software that causes a victim's web browser to display annoying pop-up advertisements and advertising banners. Sometimes adware may be installed in conjunction with a companion spyware program. Whilst the spyware program tracks and reports on the user's web browsing behaviour, the adware program provides targeted advertisements based on that behaviour.

7. Phishing

Phishing (pronounced “fishing”) are emails purporting to come from reliable sources such as Paypal, Ebay or your bank. Often wanting you to verify your account details such as your password, oincode etc. they can look very realistic but are generally scams to harvest usernames and passwords. Always open a new browser winder and type the address there, rather than clicking on the link provided.

8. Hijackers

Hijackers take control of your web browser and may reset your home page, search bar and search pages. They can redirect you to undesirable sites or stop you going to particular sites.

9. Hackers

A hacker is a computer user who gains unauthorized access to a computer system or data belonging to somebody else. Even though some hackers known as ethical or white hackers break into computer system to check their vulnerability, most hackers normally the unethical

or black hackers hack for selfish gains. With so much personal data available online to anyone with a password you must be sure your password is secure. If you are using your mother's maiden name, your cat's name or your birthday then your password is at risk. Here are two tips for making a secure password. Method One - pick two random unrelated three letter words and two digits. Mix them up and what do you have? A secure password such as "red19cat" or "hotpin73". Method Two - pick a short sequence of words such as Now Is The Winter Of Our Discontent Made Glorious' and you have a password of "nitwoodmg". You could even change the I's and O's to digits.

10. Nigerian scam

Otherwise known as an Advanced Fee Fraud, the 419 scam takes its name from the section of Nigerian law which legislates for this kind of illegal activity, although the perpetrators of such scams are by no means any longer confined to Nigeria. There are several variations on the theme but the scam is generally conducted via the spamming of potential victims by email. These emails will often purport to come from a legal firm, financial institution, or perhaps the relative of a deceased political leader or wealthy businessman for example. The email will spin a beguiling story about the existence of a vast fortune which is tied up in some kind of legal or financial limbo but which can be liberated, so the scammers claim, with the victim's assistance (often the provision of details of a bank account in the victim's home country into which the fortune will supposedly be deposited). As a reward for their help the victim is promised that they can keep a substantial share of the loot! However, at some point during the proceedings the scammers will contact the victim claiming some kind of administrative problem which can be overcome if the victim will send them a sum of money to grease the wheels - this is where the "advanced fee" fraud comes in. If the victim falls for this the scammers will continue to make similar requests, often teasing the victim by claiming that just one more payment will be enough to liberate the fortune. Of course there is no fortune and the victim has lost their money!

There are hundreds of other software threats all over, mostly on the web. These threats have one purpose of breeching the security system of other people's computers. If you see any suspicious file on your computer, it might be virus, Trojan horse or any other malware. Do not open it, just get rid of it. how do you get rid of malware? While malware are software, there are other software which fight malware as vaccine fight infections. These software are known as **anti-virus**. There are a number of anti-viral software available, getting the right one is sure to make your system safe from all software related threats.

Fig. 3.9: Kaspersky antivirus

Hardware-related threats

Hardware threats, what are they? The next topic is exclusively on hardware; but before that let us try and get an idea of the term *hardware*. Hardware refers to all components of the computer that can be seen and touched, examples of which are monitors, keyboards, mice etc.

We can, therefore, say that hardware threats are threats which affect the touchable or physical components of the computer. There are quite a number of hardware threats, some of which are as follows:

1. Dust

A particle of dust is negligible, but a pile of it can simply not be looked over. The following are some of the effects of dust on computers:

i. Blocks ventilation: computers heat up easily due to continuous processing of data; and because of that all computers have fans in them to cool them down. If dust settle in the computer it causes the fan to work at a slower rate; this reduces the amount of air it blows. Less air means more heat in the computer, and that can easily break down the computer.

ii. Settle on the internal components: most of the components in the computer feel less comfortable with dust or dirt. If dust settle on them they give lower output if any at all. For example the RAM chips will stop working if their connection parts get dirty; and that means the computer too will not boot.

iii. Makes the computer dirty: who likes dirty stuff? A dirty computer, like any other thing, is a real eyesore; and that is exactly what dust does to the computer.

Because of these and other reasons, dust must be eliminated from computers by:

a. Cleaning the computer hardware regularly.
b. Locating computers away from open windows.
c. Covering computers up when not in use.

2. Power Fluctuation

How often do you feel that your electric light-bulb or fluorescent light looks brighter or dimmer than usual? That is as a result of the irregularities in the flow of electricity known as power fluctuation. Power fluctuations, voltage spike and electrical surge put pressure on the computer and all the other hardware connected to it, and may end up causing serious damage to the computer system. Power fluctuations mostly occur when the power is restored after an outage. Power fluctuations can hardly be avoided, but their impact on your computer system can be reduced or avoided. HOW? You might ask.

- Using a **voltage stabilizer**, an electrical device that keeps the voltage at a constant rate. This helps reduce the impact of voltage spike on the computer.
- Using a **surge protector** keeps your system safe from electrical surge.
- Using an uninterruptible power supply (UPS), a device that keeps your electrical and electronic devices on for some

Fig. 4.0: surge protector

time after a power outage. This will give you enough time to save all changes to your works and safely shut down your computer.

- Turn off all power outlets and unplug the computer' power cables from them when not in use.

3. Rodents

Rodents, the ubiquitous rodents; what will they not chew, books, shoes, clothes, and now computer cables? That is it. rodents like mice, rats and guinea pigs are always around and are trying to share everything we possess with us. If rodents chew parts of the power cables, the exposed wires can touch each other and short when the power is turned on. This can cause fire or do serious damage to you and your computer. It is therefore advisable to keep the computer and its surrounding tidy, and make sure to sweep out all food crumbs which easily invite rodents. If your computer room is already infested with rodent get a mouse trap or an exterminator to get rid of them.

Fig. 4.1: mouse

4. Liquids

Who ever thought that liquids such as water, tea and other drinks, which we humans can hardly do without, are actually enemies to the computer? YES, most liquids are good conductor or electricity and if they get into the computer, will link the parts of the main circuit which are not supposed to touch, and that will certainly cause fire apart from irreparably damaging your computer. So, to prevent this, keep all liquids away from your computer system.

5. Disasters

Disasters, whether natural or man-made, such as flood, earth quake, fire outbreak, are some of the most dangerous threats which affect computers. Most disasters are unpredictable and when they strike the type of computers they destroy most are the supercomputers and mainframes which contain a bulk of a company or organisation's information. Flood can be avoided by stationing mainframe computers away from low-lying areas. The impact of fire can be reduced if fire extinguishers and smoke detector are present at where the computer(s) are.

6. Theft and Robbery

Thieves are everywhere, and they are always looking for expensive things like computers to steal. They are ready to break into the most secure of all places to steal computers and other computer accessories. Laptops, notebooks and handheld computers are even easier to steal. Always keep all your computer systems in a safe and secure place. Do not leave potable computers near windows or in an unattended vehicle.

Fig. 4.2: computer theft is on the rise

THREATS TO COMPUTER USERS

Sitting down regularly at a single place in a single position and doing the very same thing routinely does not really look appealing; yet unfortunately, that is what computer users go through. Being confined to one posture day in and day out really has a lot of bodily problems which include vision problems, wrist pains, stress, backaches and repetitive strain injury. Let's consider what these do and how we can combat them.

1. Vision problems

Being in front of the display unit for a very long time can pose the threat of eyestrain of even headache. To prevent these or reduce potential problems in the future, observe the following simple guidelines:

- The screen should be positioned approximately an arm's length away.
- The room should be well lit.
- A copy or document holder should be positioned at screen level keep the eyes at stable position.
- The brightness and contrast of the screen should be adjustable and must be set at levels which are good for reading on the screen.
- Images on the screen should not flicker, but be stable.
- Get an anti-glare shield if necessary, to reduce the amount of light entering the eye from the display unit.
- Take frequent break, perhaps 15 – 20 minutes break after every hour.
- Keep the screen clean of dust.
- Position the computer at right-angle to the window to prevent reflected sunlight.
- Have regular eye tests.

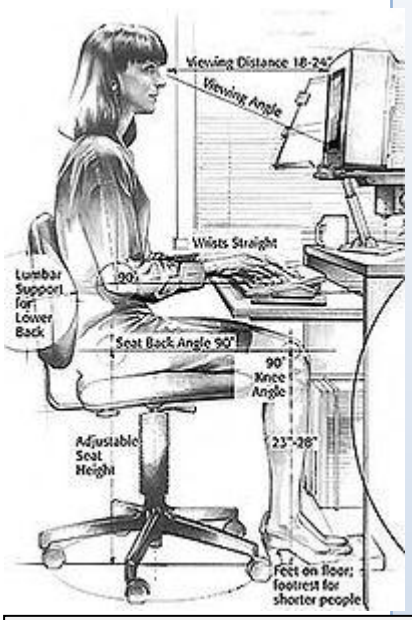

Fig. 4.3: the correct sitting posture

2. Wrist pains

The arms are required to hang by your side with the hands on the keyboard and or the mouse. This continuous position puts pressure on the wrists and results in wrist pains. Wrist pains can be reduced by:

- Keeping the keyboard at right-angle to your body.
- Acquiring keyboards with soft keys.
- Use a wrist-rest to support the wrist.
- Use ergonomic keyboards which keep the arms at a more natural angle than the standard keyboard.
- Taken regular breaks away from the keyboard and the mouse.

Fig. 4.4: ergonomic keyboard

3. Backache

Backache is caused by bad posture. The question is, how do you maintain a good posture?

- Get stable chairs which will also give you the freedom to move even whiles sitting.
- Acquire a foot stool if the your feet do not touch the ground
- The seat should be adjustable in height so that your eyes will at the same level with the top of the screen.
- The backrest of the seat should also be adjustable so that you will feel comfortably seated.
- Te desk should be at a correct height and should be big enough to accommodate all the various hardware.
- Regular breaks and exercises are sensible ways to help relieve or prevent backache.

---

4. Repetitive strain injury (RSI)

RSI is a physical symptoms caused by excessive and repetitive use of the body, (mostly the upper body). Repetitive stress injuries typically occur when tasks are performed under difficult conditions, using awkward postures and poorly designed equipment. One of the key cause of RSI is the prolonged use of the computer keyboard. RSI can affect the neck, upper limbs and the shoulders. Sufferers experience numbness and tingling in the upper body and in severe cases, have difficulties holding even a pen. To avoid RSI follow the guidelines above (on wrist pains and backache).

---

5. Stress

Computers help people work faster and much efficient than they used to. This has resulted in teachers and executives expecting more from their students and workers than usual. In trying to keep the pace people work at odd hour, having little time for themselves. This has made many people workaholics (i.e. not being able to stop working) because of their fear of being fired if they fail to meet demand. To reduce stress people will have to:

- Engage in more social activities.
- Have enough sleep and not go to bed with their works and worries.
- Be less anxious of the outcome of their work.

Fig. 4.5: take time to rest

Fig. 4.6: a disorganized office could cause an accident

RESPONSIBLE USE OF COMPUTERS

Computers have changed the fabric of the world in all sectors, and computer users have the luxury to do almost everything they want. While most people use the computer for good purposes, others have found a bad use for the computer. It has, thus become imperative for policy makers to strategize and come out with some rules which will not only guide the way computers are used, but also the way information is transmitted - known as computer ethics.

COMPUTER ETHICS

With their increasing power and versatility, computers make day-to-day life simple. Unfortunately, as computer use becomes more widespread, so do the opportunities for misuse. Computer hackers often violate privacy and can tamper with or destroy records. Viruses or worms can replicate and spread from computer to computer, erasing information or causing malfunctions. Other individuals have used computers to electronically embezzle funds. New ethical issues also have arisen, such as how to regulate material on the Internet and the World Wide Web. Long-standing issues, such as privacy and freedom of expression, are being re-examined in light of the digital revolution. Individuals, companies, and governments are working to solve these problems by instituting some regulatory laws such as copyright, privacy concerns and censorship.

Copyright

Copyright are exclusive rights granted to the author or creator of an original work, including the right to copy, distribute and make changes to their work. Copyright does not protect ideas, only their expression or fixation. The goal of copyright law is to encourage authors to invest effort in creating new works of art and literature. Copyright is one branch of the larger legal field known as intellectual property, which also includes trademark and patent law. Copyright law is the legal foundation protecting the work of many major industries, including book publishing, motion-picture production, music recording, and computer software development.

Not every work of authorship is eligible for copyright. To qualify for copyright protection, a work must be both *fixed* and *original*. The law considers a work to be fixed if it is recorded in some permanent format. Acceptable ways of fixing a work include writing it down, storing it on a computer floppy disk or compact disc (CD), recording it on videotape, or sculpting it in marble. If an musician thinks of a new song and sings it to an audience without writing it down or recording it on a CD or cassette, copyright does not protect the song because it is not fixed. To be original, the work must not be copied from previously existing material and must display at least a reasonable amount of creativity. For example, if an author writes the words "food is good" on a piece of paper, copyright does not protect the words because they lack sufficient creativity. Consequently, short phrases and titles are usually not protected by copyright.

Copyright only protects the words, notes, software or images that the creator has used. It does not protect any ideas or concepts revealed by the work. If, for example, a scientist publishes an article explaining a new process for turning water into wine, the copyright prevents others from copying the words of that article. It does not, however, prevent anyone else from using the process described to turn water into wine. To protect the process, the scientist must obtain a patent. Similarly, if a novelist writes a book about a man obsessed about walking on water, other people may write their own books on the same subject, as long as they do not use the exact words or a closely similar plot.

Privacy

When something is private to a *person*, it usually means there is something within them that is considered inherently special or personally sensitive. Privacy is the ability of an individual or group to seclude themselves or information about themselves and thereby reveal themselves selectively. The boundaries and content of what is considered private differ among cultures and individuals, but share basic common themes. The degree to which private information is exposed therefore depends on how the public will receive this information, which differs between places and over time.

Most of the time peoples right to privacy is invaded by some ICT related concept. In modern life the everyday use of digital technology creates numerous instances in which personal information—name, address, phone number, birthday, driver's license number, e-mail

address, or social security number—is collected from the consumer. Increasingly, people are unable to keep personal information private and are often unaware of how or when this information is being collected, utilized, sold, or otherwise manipulated. Everything from a doctor's visit to shopping to sending personal mail could present an opportunity for an unwanted invasion of privacy.

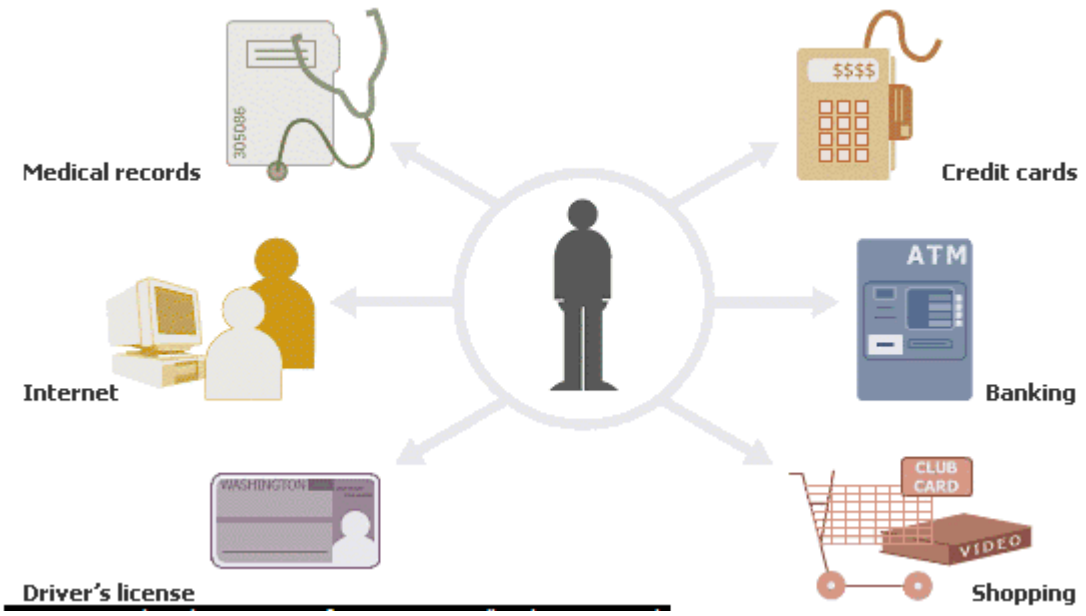

Fig. 4.7: computer and its related technology could deprive you of your privacy

Censorship

Censorship is the control of the information and ideas circulated within a society. The rationales for censorship have varied, with some censors targeting material deemed to be indecent or obscene; heretical or blasphemous; or seditious or treasonous. Censorship has been achieved through the examination of books, plays, films, television and radio programs, news reports, and other forms of communication for the purpose of altering or suppressing ideas found to be objectionable or offensive. Thus, the rationale for censorship is that it is necessary for the protection of three basic social institutions: the family, the church, and the state. In all these sectors the internet is the major culprit.

Censorship takes different forms and approach, for example, most religions abhor certain things and advise their followers to refrain from them. In other cases countries censor some materials which are considered threats to national security. Censorship in the above issues could vary from one country or society to another, but one area where there is total unanimity in censorship is in the display of pornographic and violent materials. Children are mostly the victim of pornography and violence, especially those on the internet and parents are, therefore, advised to monitor their children regularly and to check what they do online.

TEST YOURSELF

Theory questions

1. Write a short note on the following types of computers:
   a. Digital computer
   b. Analogue computer
   c. Hybrid computer

2. Describe how to boot, refresh and shut-down a computer.

3. Discuss computer threats

4. State and explain three computer ethics

5. How do the following threats affect the computer?
a. Power fluctuation
b. Rodents
c. Theft
d. Virus

6. State three uses of computers
   a. In education
   b. At home
   c. At the office

7. State three ways of preventing the following threats to computer users:
   a. Stress
   b. Vision problem
   c. Backache
   d. Repetitive strain injury
   e. Wrist pains

8. a.. Explain the necessity for rebooting a computer.
   b. describe three ways of rebooting a computer

9. Computers are essential part to human survival. Discuss.

10. Write a short note on the following types of digital computers
   a. Supercomputers
   b. Mainframe computers
   c. Minicomputers
   d. microcomputer

Multiple choice questions

1. Which of the following is not a type of computer?
   a. Keyboard
   b. Digital computer
   c. Hybrid computer
   d. Analogue computer

2. The type of computer that converts all data into digital format is known as….
   a. Analogue computer
   b. Digital computer
   c. Hybrid computer
   d. Convertor

3. A sequence of 8 bit is called…
   a. Bits b, Byte
   d. Kilobyte d. Digital

4. The Cray computer is an example of…
   a. Analogue computer
   b. Supercomputer
   c. Minicomputer
   d. Microcomputer

5. Which of the following types of digital computers is referred to as a parallel processor?
   a. Analogue computer
   b. Supercomputer
   c. Minicomputer
   d. Microcomputer

6. The process of turning on the computer is referred to as ….
   a. Running
   b. Kicking
   c. Shutting
   d. Booting

7. The type of computer which combines the functions of digital and analogue computers is referred to as…
   a. Hybrid computer
   b. Digital computer
   c. Analogue computer
   d. Data computer

8. The type of digital computer which uses microprocessor is known as…
   a. Super computer
   b. Minicomputer
   c. Microcomputer
   d. Mainframe computer

9. A laptop compute is an example of …
   a. Supercomputer
   b. Analogue computer
   c. Hybrid computer
   d. Microcomputer

10. Another name for restarting the computer is known as…
   a. Reshutting
   b. Rebooting
   c. Booting
   d. Shutting down

11. Which of the following is a hybrid computer?
   a. Thermometer
   b. Pen drive
   c. Automated teller machine
   d. Simple computer

12. Pick the odd one out.
   a. Supercomputer
   b. Mainframe computer
   c. Digital computer
   d. Microcomputer

13. Pick the odd one out.
   a. Digital computer
   b. Hybrid computer
   c. Analogue computer
   d. Laptop computer

Answers

1. A

2. B

3. B

4. B

5. B

6. D

7. A

8. C

9. D

10. B

11. C

12. C

13. D

Chapter 3

HARDWARE

OBJECTIVES

After completing this chapter, you should be able to:

i. Describe the categories of computer hardware.
ii. Identify the vital components of the computer.
iii. Describe commonly used Input/Output devices and their functions.
iv. Identify the main types of storage devices.
v. Identify devices which serve as both input and output.

INTRODUCTION

How do we identify a computer from other known electronic and mechanical devices? By the display unit or monitor, the system unit, the keyboard or keypad, the mouse etc. all these components can be identified because they can be seen and touched and because of that we refer to them as hardware. Thus, **hardware refers to the components of the computer which can be seen and touched.** The term hardware is sometimes substituted with **peripherals**.

CATEGORIES OF HARDWARE

Hardware falls into four man categories base on the functions of the components. The categories are:

- Input devices
- Output devices
- Storage devices
- System unit

1. Input devices

Input devices are the components of the computer which are used to enter data into the computer. Input devices play a vital role in the information processing cycle. They serve as the link between the computer and the computer user. There are various types of input devices – keyboard, mouse, joystick are al examples of input devices.

Fig. 4.7: Input devices

2. Output devices

Devices that present processed information from the computer to the user are referred to as output devices. Examples of output devices are printer, monitor, speakers and LCD projector. More on that later.

Fig. 4.8: output devices

3. Storage devices

Hard disk drives, USB flash drives, compact disks are all examples of storage devices. These are the devices that store or keep processed information for future use.

Fig. 4.9: storage device

4. System unit

All the above components are able to communicate to the computer because of one very important hardware – the system unit. The system unit is a box-like metal or plastic case which houses the other electronic components of a computer. The system unit is simply indispensable to the extent that it is sometimes referred to as the computer itself, though just a part of it.

In the proceeding sections we will discuss the various input devices in detail.

Fig. 5.0: system unit

THE VITAL COMPONENTS OF THE SYSTEM UNIT

Though computers come in many different forms, a typical personal computer's system unit consists of a case called chassis. There are different sizes, shapes and two distinct orientations of the chassis, even though they are basically rectangular. Some system units stand erect and are normally place on the computer table of under it. This type of system unit is called tower system unit. Another type lies flat on the computer table; this type is referred to as desktop system unit. even still, there is another type in which the system unit and the monitor are joined together. This type is known s all-in-one.

The system unit is sometimes referred to as the central processing unit or CPU or just processing unit because it houses the central processing unit, which is arguably the most important component in a computer. The system unit contains some other components such as the motherboard, the power supply unit, RAM and ROM chips, disk drives, ports etc.

These components normally appear or connected to the front, the back and some remain inside the system unit.

The front side of the system unit

From the front side of the system unit appears the power on switch or button, power switch light indicator, compact disk read only memory (CD ROM) drive(s) and the floppy disk drive. Some system unit also show universal serial bus (USB) ports, audio jack, zip disk drive and restart button at the front.

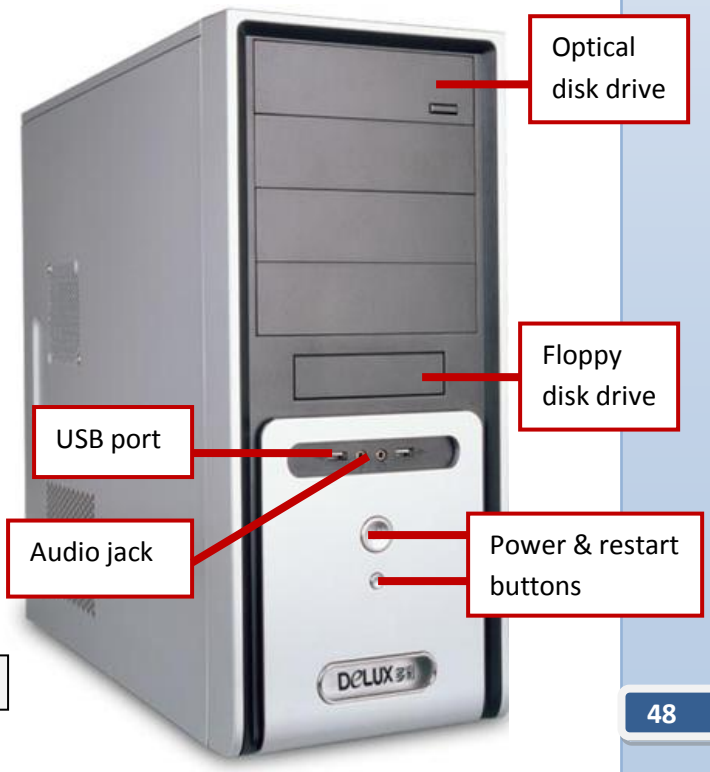

Fig. 5.1: front part of the system unit

The back side of the system unit

Most of the connectors or plugs for the input and output devices are found at the back of the system unit. Most of the connectors are ports. Ports are sockets which are used to attach hardware to the system unit. There are two types of ports – serial port and parallel port.

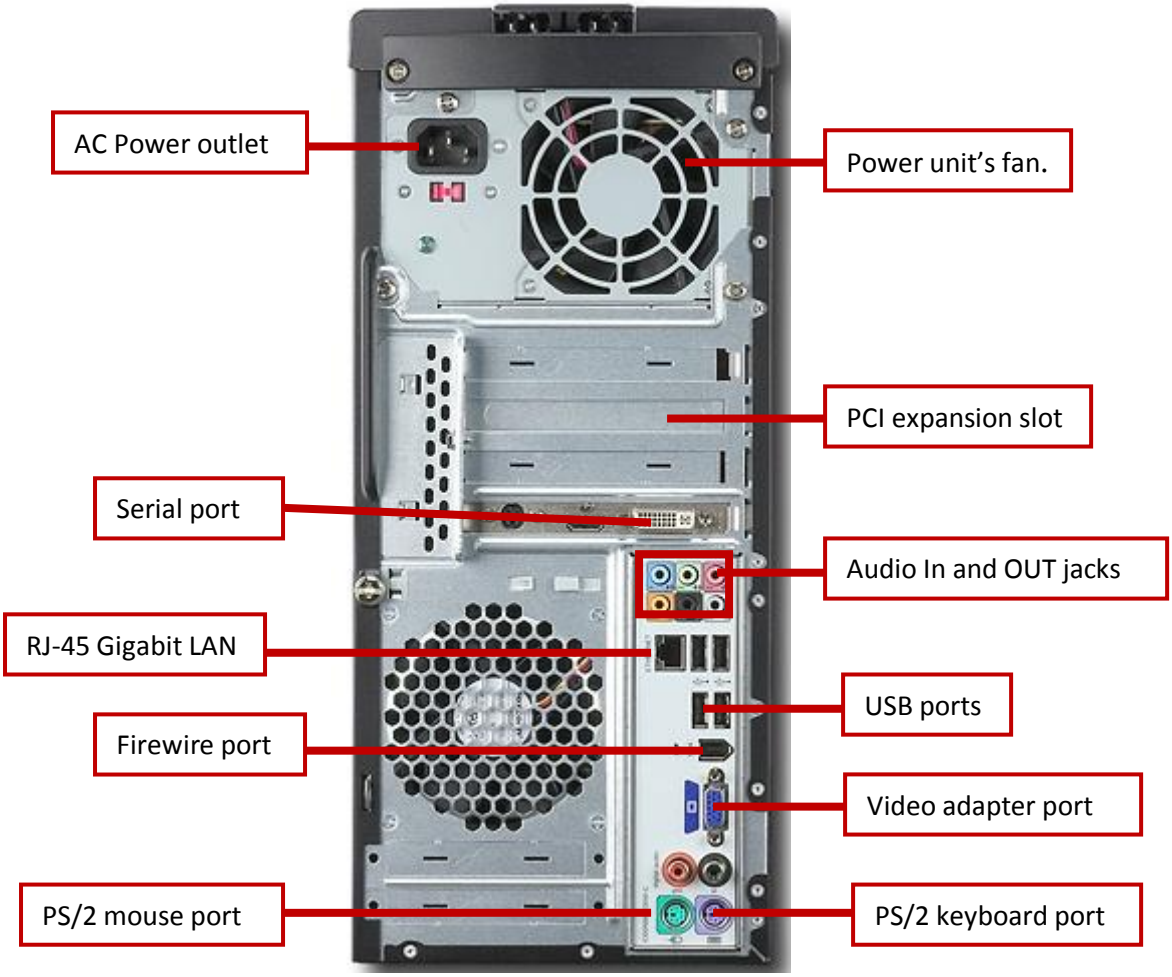

Fig. 5.2: front part of the system unit

The number of connectors at the back of the system unit could increase due to the number of optional components added.

Inside the system unit

Have you ever taken a peek inside a system unit before? We keep referring to the system unit as the central processing unit as thought the system unit is made up of one bulky CPU. But in actual the CPU occupies just a small space in the system unit. The CPU is implanted on a large circuit board known as mother board. There are other important components such as the power unit, the RAM chips, the ROM chips, the hard disk(s), and a host of others. Let us consider some of the components in details.

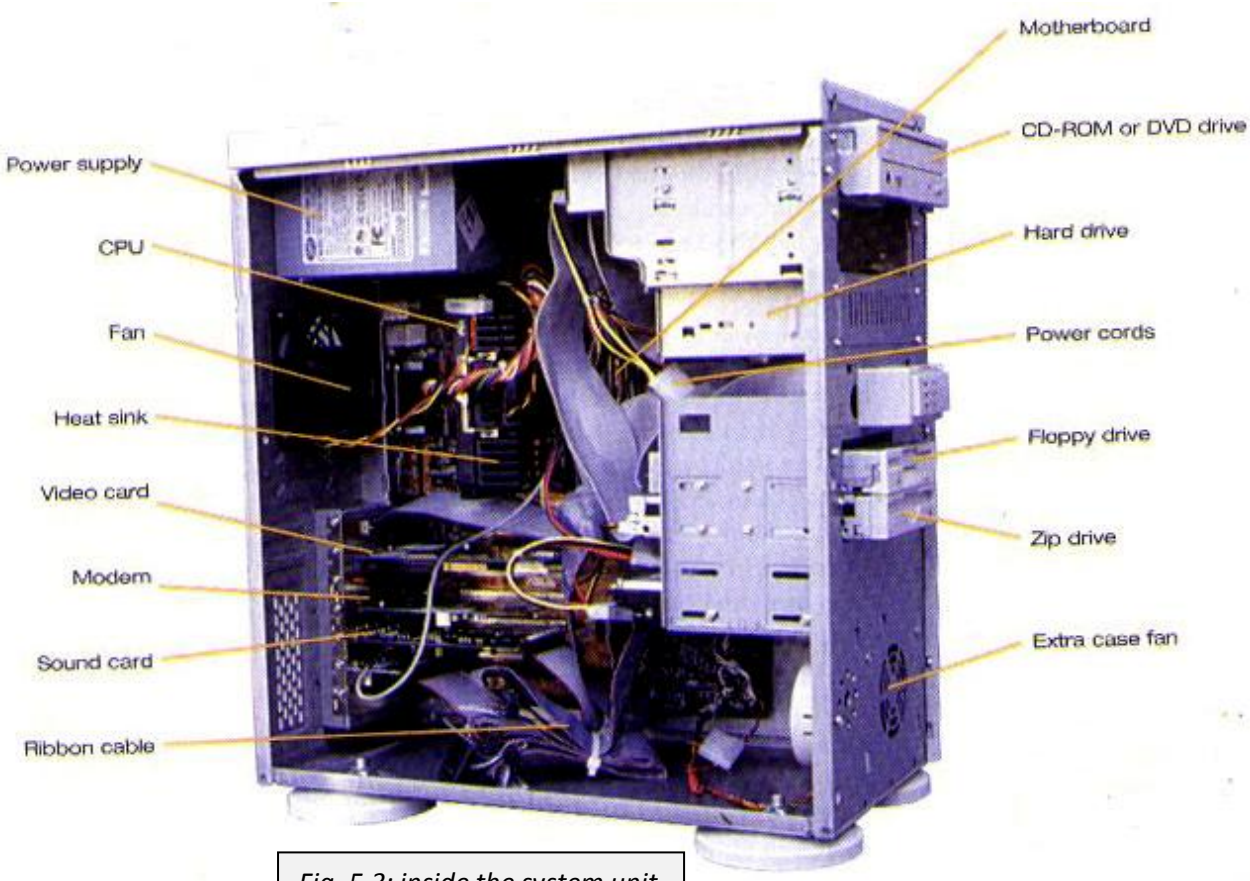

Fig. 5.3: inside the system unit

The central processing unit (CPU)

If you're in the market for a new computer, it's necessary to understand the function of a CPU. Also known as the Central Processing Unit or processor, the CPU is essentially the "brains" of your computer. Without the CPU, you wouldn't be able to play games, type research papers, or surf the Internet. Your computer would basically be a very expensive worthless junk.

Sometimes people mistakenly believe the case or chassis of a computer is the CPU. However, a CPU is an internal component of the computer. You can't see it from the outside of the system; you would have to peek inside and remove both the CPU heatsink (component used to lower the temperature of an electronic device by dissipating heat into the surrounding air) and fan to get a good look.

CPUs are sometimes called microprocessors, although these two terms are not quite interchangeable. The microprocessor, first introduced in the 1970s, reduces the word size of a CPU from 32 bits to 4 bits in an attempt to allow the transistors of the logic circuits to fit on a single part. Often, it takes more than one microprocessor to perform all of the functions of a CPU. Microprocessors are also commonly used in cell phones, automobiles, and children's electronic toys.

Fig. 5.4: CPU under a heatsink

Modern CPUs are small and square and contain multiple metallic connectors or pins on the underside. The CPU is inserted directly into a CPU socket, pin side down, on the motherboard. Each motherboard will support only a specific type or range of CPU so you must check the motherboard manufacturer's specifications before attempting to replace or upgrade a CPU.

Today, Intel is the best-known manufacturer of computer CPUs. Other manufacturers are AMD and Motorola. No matter what type of computer you have, however, your CPU works by executing a series of stored instructions known as a program. Most CPUs conform to the von Neumann architecture, which says that the CPU must fetch, decode, execute, and write-back the data in a fairly rapid succession.

Since the CPU is one of the most important parts of a computer, it should come as no surprise that it is also the most expensive. In fact, if your computer is more than three years old and your CPU has been damaged by static electricity or some other factor, you may want to consider upgrading to an entirely new computer. A newer, faster CPU will often provide enough additional computing power to make the purchase a wise investment.

Fig. 5.5: Some types of CPU

As we learnt earlier, there are two typical components of a CPU. They are:

Arithmetic-Logic Unit (**ALU**): ALU is a high-speed circuit part in the CPU. The *arithmetic-logic unit* (*ALU*) performs arithmetic (math) operations, logic (comparison) operations and related operations. The ALU retrieves alphanumeric data from memory and then does actual calculating and comparing. It sends the results of the operation back to memory again.

- A control unit is the circuitry that locates, retrieves, interprets and executes each instruction in the central processing unit. The control unit directs electronic signals between *primary storage* and the *ALU*, and between the *CPU* and *input/output devices*.

The motherboard

The motherboard is the main circuit board in a computer. The most important computer chips and other electronic components that give function to a computer are located on the motherboard. **The motherboard is a printed circuit board that connects the various elements on it**. The motherboard is sometimes referred to as the **main board**, **system board**, or, on Apple computers, the logic board. The motherboard is indispensable to the computer

and provides connector for other hardware; mind you, all the ports and sockets are extended from the motherboard.

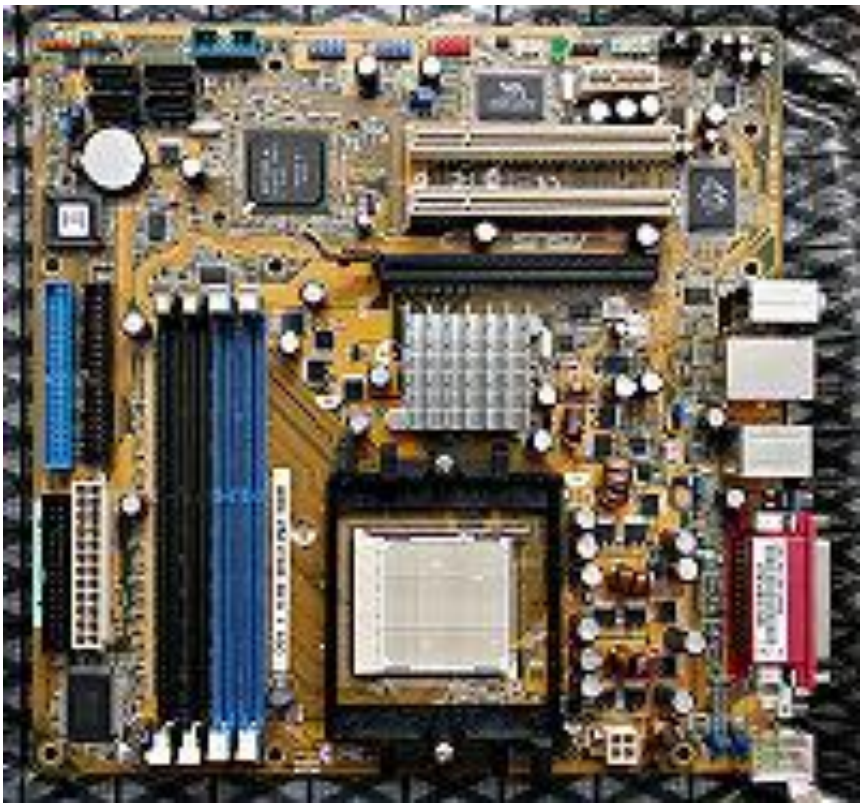

Fig. 5.6: Motherboard

The power supply unit (PSU)

The computer has got its own power supply unit which does not provide it with electricity, but pulls the required amount of power from electrical sockets and converts it from alternating current (AC) to low voltage direct current (DC). This is because the computer runs on DC and not the regular AC which comes from the power company.
A bad power supply could cause a lot of headache. To ensure that your power supply works efficiently to keep your computer running:

Fig. 5.7: power supply unit

- Clean the computer regularly .As the computer runs dust, lint and other particle collect inside the power unit and create more heat which is one of the major causes of power failure. Get a professional to clean it up for you if you are not very familiar with the architecture of the computer.
- Make sure the chassis is well ventilated. Ensure all fans are running in the computer and that no dust is collecting within the fins – disrupting air flow. Sometimes it helps to have

a professional inspect your computer, to confirm proper airflow and "safe" case temperatures.

- Use a surge protector. Lighting, power outages, power spikes etc, can cause your power supply to fail prematurely, if a surge protector is not used at all times.

- Buy a new power supply. Power supplies have a certain amount of "life-hours", and eventually fail. If your power supply is old and you start experiencing power related problems such as:
  Failure of your computer to boot fully
  You hear some strange from the power supply
  You smell "burnt" smells coming from your computer. (Which could spell burnt or burning PSU circuitry*)*

Then it is time to have your computer checked out by a. Many bad power supplies fail and destroy other components – motherboards, CPU etc.

Random Access Memory (RAM)

Next most critical element of a processing hardware is Random Access Memory (RAM), often referred to as "primary storage" or "main memory". RAM receives and temporarily stores data and program instructions from the CPU. This data bank communicates with the CPU, constantly exchanging information and constantly changing as long as the computer is on

RAM is an active, electronic state. When the power is on, RAM retains data. When the computer is turned off, all data in RAM is erased unless you have saved it to some mass storage device. Each time the computer boots, the computer goes through its startup routine and lastly loads operating system instructions into the RAM.

RAM temporarily stores information from your operating system, applications, and data in current use. This gives your processor easy access to the critical information that makes the programs run. The amount of RAM you have determines how many programs can be executed at one time and how much data can be readily available to a program. It also determines how quickly your applications perform and how many applications you can easily toggle between at one time. Simply put, the more RAM you have, the more programs you can run smoothly and simultaneously.

RAM is measured in hertz. Hence, kilohertz, megahertz and gigahertz.

Types of RAM

- DRAM (Dynamic RAM) This is the most common type of computer memory. DRAM needs refreshing and is refreshed hundreds of times each second in order to retain data. During recharging it cannot be accessed by the CPU.

- SRAM (Static RAM) SRAM is approximately 5 times faster (and twice as expensive, as DRAM). It does not have to be constantly refreshed.
- SDRAM (synchronous dynamic RAM) is the standard memory offering in the PC industry and is faster than DRAM because it's synchronized to the system clock. . It is designed for mainstream home and business applications, email, and basic audio and video streaming. It provides single-channel memory and is available on our mainstream and value desktop system.
- DDR SDRAM (double data rate synchronous dynamic RAM) takes all the features of ordinary SDRAM and increases the frequency bandwidth to improve system performance and speed.
- RDRAM (Rambus dynamic RAM) is able to load a new stream of data before the previous stream has completed, resulting in faster access speeds. The RDRAM memory features dual-channel processing which doubles data throughput to further enhance performance. This type of memory is optimized for high-end multimedia tasks involving video and audio. Dual Channel RDRAM is shipped on our performance desktop systems powered by Pentium 4 processors
- VRAM: Memory designed for storing the image to be displayed.
- CACHE RAM is a small block of high-speed memory located between the Processor and main memory and is used to store frequently requested data and instructions. When the processor requests data, it will check in the cache first.

Fig. 5.8: some types of RAM

Read Only Memory (ROM)

Read-only memory is the other type of internal memory. ROM memory is used to store items that the computer needs to execute when it is first turned on. For example, the ROM memory on a PC contains a basic set of instructions, called the basic input-output system (BIOS). The PC uses BIOS to start up the operating system. BIOS is stored on computer chips in a way that causes the information to remain even when power is turned off.

Information in ROM is usually permanent and cannot be erased or written over easily. A ROM is permanent if the information cannot be changed—once the ROM has been created, information can be retrieved but not changed. Newer technologies allow ROMs to be semi-permanent—that is, the information can be changed, but it takes several seconds to make the change. For example, a FLASH memory acts like a ROM because values remain stored

Fig. 5.9: ROM

in memory, but the values can be changed.

There are different variations of the ROM chip and include:

- **PROM** (**Programmable Read-Only Memory**): A permanent storage device that becomes a read-only memory after it is written once by the customer rather than by the chip manufacturer. For example, a software producer can write instructions onto the PROM using special equipment.
- **EPROM** (**Erasable Programmable Read-Only Memory**): EPROM is a reusable PROM-chip that can be erased by a special ultraviolet light. EPROM holds its content until erased and new instructions can be written on it.
- **EEPROM** (**Electrically Erasable Programmable Read-Only Memory**): EEPROM-chip can be erased, either within a computer or externally, by electric power. The process usually requires more voltage than the common +5 volts used in logic circuits.

Hard disk drive

The hard disk drive is the most important external memory of the computer. It is referred to as external memory or secondary storage (as oppose to primary storage – RAM and ROM) because the CPU cannot access it directly for data; more on that pretty shortly. The hard disk is a rigid rectangular box which is used to record computer data magnetically. A hard disk drive consists of a stack of inflexible magnetic disks mounted on a motor. Each surface of each disk is divided into a number of concentric circles. As the disks spin at high speeds, read/write heads at the end of a metal fork swing in and out to access sectors of the disks.

Fig. 6.0: hard disk

Hard disks provide faster access to data and are capable of storing much more information than the other known external memories. Because platters are rigid, they can be stacked so that one hard-disk drive can access more than one platter. Most hard disks have from two to eight platters.

Today, hard disk drives are measured in gigabytes (GB) and terabytes (TB); that is a move from the kilobytes (KB) and the megabytes (MB) they used to be measured in during the early days of computers. If you want to purchase a new hard disk drive you much make sure t go for the new ones since hard disk drive ware off with age, and an old hard disk drive may break down easily. When a hard disk breaks down, it is said to have crashed. You must also know the total data storage capacity of the hard disk drive. The total data capacity is always printed at the back of the case.

Fig. 6.1: inside the hard disk

Bus slot

You might think of a bus as a vehicle or mechanism for transporting something. That is very true just that in computer architecture, a bus is not a bulky machine on wheels which move from one town to another. A bus in this context is a system (usually a set of wires) that transfers data between the components in a computer system. A bus is essentially a shared highway that connects different parts of the system—including the central processing unit (CPU), disk-drive controller, memory, and input/output ports—and enables them to transfer information. Usually controlled by a microprocessor, the bus is, in computers such as the Apple Macintosh and IBM and compatible models, specialized for carrying different types of information. One group of wires (actually, traces on a printed circuit board), for example, carries data; another carries the addresses (locations) where specific information can be found; yet another carries control signals to ensure that the different parts of the system use their shared highway without conflict.

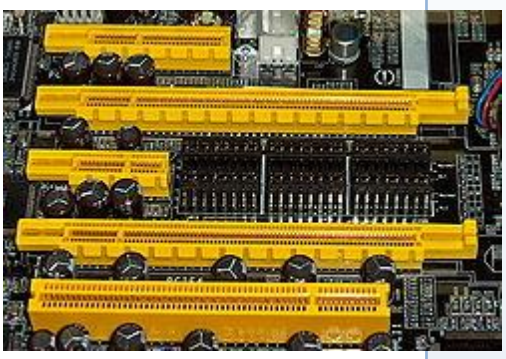

Fig. 6.2: PCI bus slots

Buses are characterized by the number of bits they can transfer at a single time. A computer with an 8-bit data bus, for example, transfers 8 bits of data at a time, and one with a 16-bit data bus transfers 16 bits at a time. Because the bus is integral to internal data transfer and yet computer users often need to add extra components to the system, most microcomputer buses allow for expansion through one or more expansion slots (connectors for add-on circuit boards). Such boards, when they are added, make an electrical connection to the bus and effectively become part of the system.

There are two main types of buses – the processor bus and the input/output bus

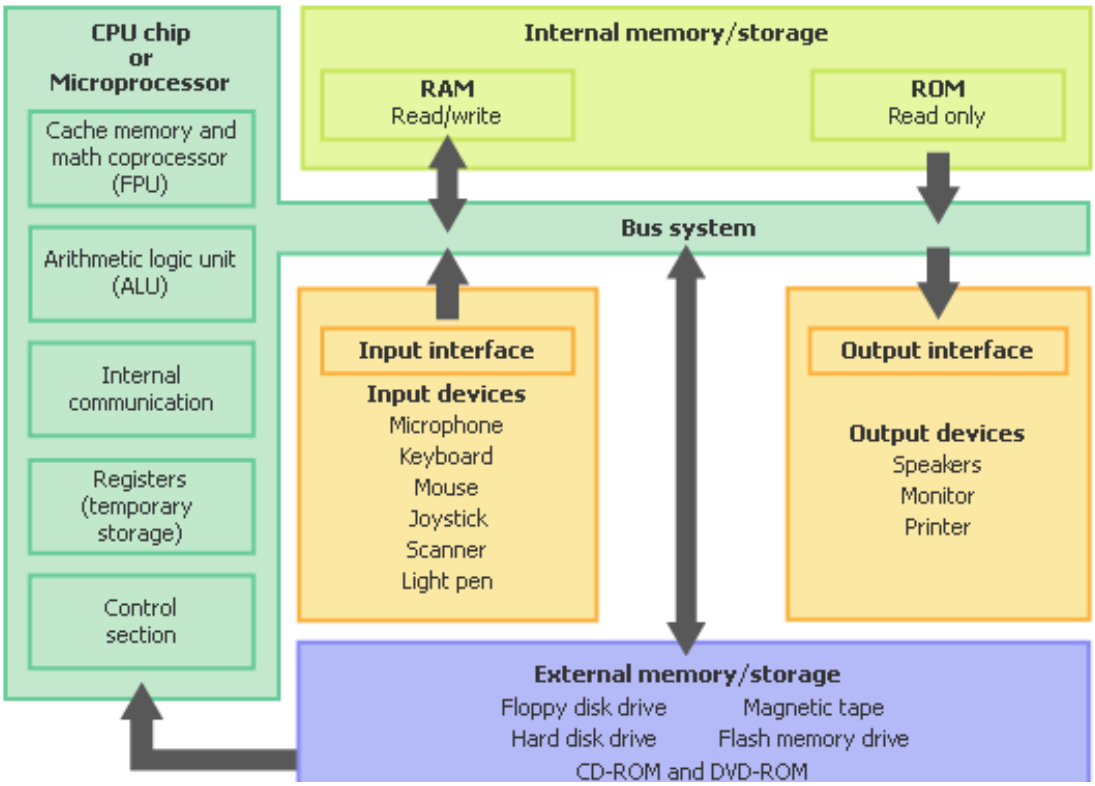

Fig. 6.3: how the bus system works

Expansion/optional slots

The compute allows for expansion. That is new hard ware to be added to it. This is done with the aid of the expansion slots. **Expansion slots are sockets inside a computer, designed to hold expansion boards and connect them to the system bus (data pathway).** The number of sockets, or slots, determines the amount of expansion allowed. Most personal computers have from three to eight expansion slots. Expansion slots provide a means of adding new or enhanced features or more memory to the system.

Fig. 6.4: expansion slots

INPUT DEVICES

I am sure by now based on the previous sections you are well acquainted with the term input devices. Let us refresh ourselves with the definition again; input devices are devices which allow the computer user to enter data into the computer. In other words they convert the user command into digital form (0s ans 1s) which the computer understands. Like all computer peripherals, input devices come in diverse varieties and for the sake of better understanding input devices have been categorized into groups or types based on their mode of data input. The groups are:

- Keyboards
- Pointing devices
- Composite devices
- Video and imaging input devices
- Audio input devices

Keyboard

A keyboard is a device with buttons or keys that a user presses to enter data characters and commands into a computer. Keyboards emerged from the combination of typewriter and computer-terminal technology. They are one of the basic pieces of personal computer (PC) hardware. There are two types of keyboards – the QWERTY keyboard and the Dvorak keyboard.

QWERTY keyboard

The QWERTY is the most common key pattern for typewriters and keyboards. It was named after the layout of the first six letters in the top row of its keys (from left to right). In the late 1860s, American inventor and printer Christopher Sholes invented the modern form of the typewriter. Sholes created the QWERTY keyboard layout by separating commonly used letters so that typists would type slower and not jam their mechanical typewriters. Subsequent generations of typists have learned to type using QWERTY keyboards, prompting manufacturers to maintain this key orientation on typewriters.

Computer keyboards copied the QWERTY key layout and have followed the precedent set by typewriter manufacturers of keeping this convention. Modern keyboards connect with the computer CPU by cable or by infrared transmitter. When a key on the keyboard is pressed, a numeric code is sent to the keyboard's driver software and to the computer's operating system software. The driver translates this data into a specialized command that the computer's CPU and application programs understand. In this way, users may enter text, commands, numbers, or other data. The term *character* is generally reserved for letters, numbers, and punctuation, but may also include control codes, graphical symbols, mathematical symbols, and graphic images. On the QWERTY keyboard, some keys have been grouped together based on what they do. They are:

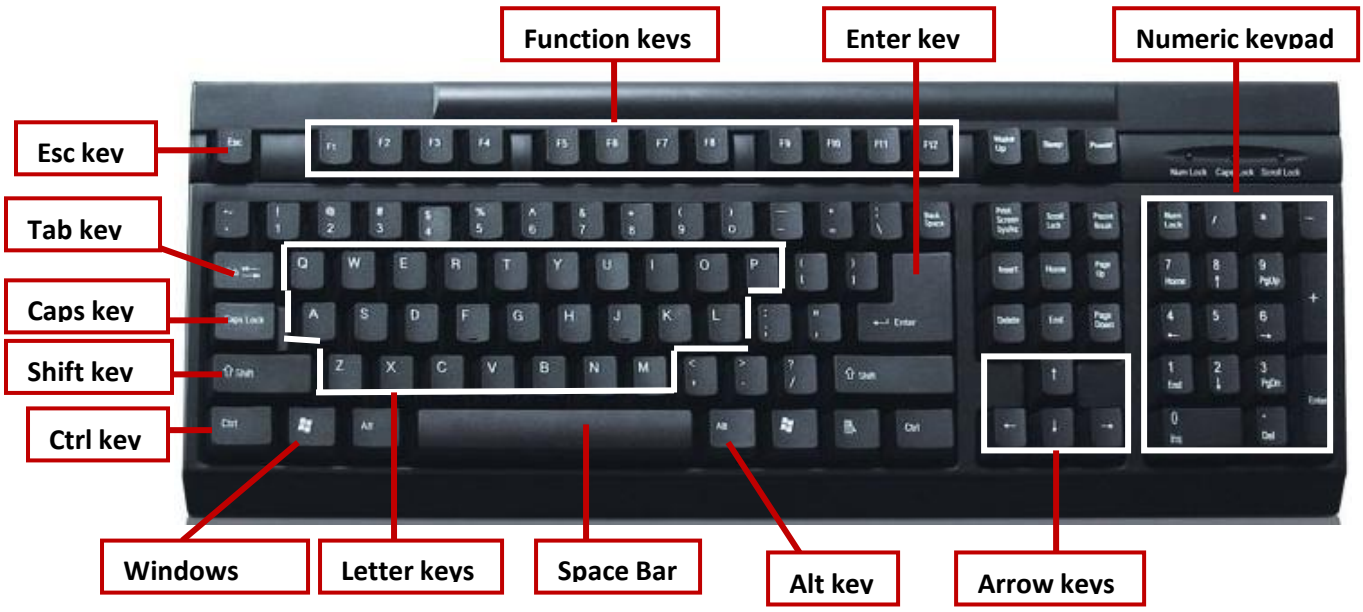

Fig. 6.5: the make-up of QWERTY keyboard

Function keys: these keys generate short, fixed sequences of character codes that instruct application programs running on the computer to perform certain actions. They are labeled F1 to F12.

Letter/Typewriter keys: these are the normal keys on the typewriter, hence the name typewriter keys. They are made up of letters, numbers, punctuation signs and some specials signs such as currency signs, ampersand etc.

Numeric keys: there is a separate numeric pad which contains numbers from 0 to 9 and some other characters, for entering numeric and arithmetic data.

Arrow keys: these are directional buttons for moving the screen cursor to left, right, up or down the screen.

Special purpose keys: As the name implies, these keys perform some other functions such as issuing a command, editing data etc. these keys include Ctrl for control; Alt for alternative; esc for Escape; Del for delete.

The Dvorak keyboard

An alternative keyboard design not yet widely used but broadly acknowledged for its speed advantages is the Dvorak keyboard. In the 1930s, American educators August Dvorak and William Dealy designed this key set so that the letters that make up most words in the English language are in the middle row of keys and are easily reachable by a typist's fingers. Common letter combinations are also positioned so that they can be typed quickly. Most keyboards are arranged in rectangles, left to right around the QWERTY layout. Newer, innovative keyboard designs are more ergonomic in shape. These keyboards have separated banks of keys and are less likely to cause carpal tunnel syndrome, a disorder often caused by excessive typing on less ergonomic keyboards.

Fig. 6.6: the make-up of Dvorak keyboard

Pointing devices

A **pointing device** is an input device used to control an on-screen cursor for such actions as "pressing" on-screen buttons in dialog boxes, choosing menu items, and selecting ranges of cells in spreadsheets or groups of words in a document. A pointing device is also often used to create drawings or graphical shapes. The most common pointing device is the mouse. Other pointing devices include the graphics tablet, the stylus, the light pen, the joystick, the puck, and the trackball.

Mouse

Mouse (computer), common pointing device used with personal computers that have a graphical user interface (GUI). A user typically operates a mouse with one hand in order to move a cursor over images or text on a computer screen. Clicking buttons on the mouse activates, opens, or moves icons or other graphical objects on the screen when they are displayed under the floating cursor.

A mouse is commonly attached to a personal computer by a cord that connects to a universal serial bus (USB) port. The rectangular USB interface allows the mouse to report its position at a very high rate. Other types of interfaces include a PS/2 port, which uses a smaller, round connector and reports the mouse's position at a lower rate. The PS/2 port is a dedicated mouse port built into the motherboard of the computer.

The basic features of a mouse are a casing with a flat bottom, designed to be gripped by one hand; one or more buttons on the top; a multidirectional detection device on the bottom; and a cable connecting the mouse to the computer. By moving the mouse on a surface (such as a desk), the user typically controls an on-screen cursor. A mouse is a relative pointing device because there are no defined limits to the mouse's movement and because its placement on a surface does not map directly to a specific screen location. To select items or choose commands on the screen, the user presses one of the mouse's buttons, producing a "mouse click."

Most computer mice now have a small vertical wheel between two buttons to allow easy scrolling up and down a screen. Left-handed people can also reprogram mouse buttons to switch functions

Fig. 6.7: mouse

Joystick

A joystick an input device that looks similar to a control device you would find on an arcade game at game centre. A **joystick** allows an individual to easily move an object in a game such as navigating a plane in a flight simulator. A joystick usually has a square or rectangular plastic base to which is attached a vertical stem. Control buttons are located on the base and sometimes on top of the stem. The stem can be moved in all directions to control the movement of an object on the screen. The buttons activate various software features, generally producing on-screen events.

Fig. 6.8: joystick

Trackball

Take a normal mechanical mouse and turn it upside down. What do you see? Yes, A small ball. Try turning the ball around. What happens on the monitor? Yes, the cursor moves in

correspondence with the movements of the ball. That is exactly what a trackball looks like. Trackball can be roughly described as a mouse on its back. A trackball consists of a ball resting on two rollers at right angles to each other, which translate the ball's motion into vertical and horizontal movement on the screen. A trackball also typically has one or more buttons to initiate other actions. The only functional difference between a mechanical mouse and a trackball is in how the ball is moved: With a mouse, the ball is rolled by moving the entire unit over a desktop or other surface; with a trackball, the housing is stationary, and the ball is rolled with the hand. A trackball is useful for fine work because the user can exert fingertip control. Another major advantage of a trackball is that it takes little desktop surface.

Fig. 6.9: trackball

Graphic/digitizing tablet & stylus

A graphic or digitizing tablet is a flat plastic rectangle with subsurface electronics, used in conjunction with a pointing device in many engineering and design applications as well as in illustration work. When the pointing device is moved on the surface of the tablet, the location of the device is translated to a specific on-screen cursor position. The pointing device used with a graphics tablet is usually a special pen called a stylus. The stylus is usually attached to the tablet by a cord, though are cordless types.

Light pen

A light pen is a pointing device in which the user holds a special pen, which is attached to the computer, up to the screen and selects items or chooses commands on the screen (the equivalent of a mouse click) either by pressing a clip on the side of the light pen or by pressing the light pen against the surface of the screen. The wand contains light sensors and sends a signal to the computer whenever it records a light, as during close contact with the screen. The light pen is not to be confused with a stylus, which is rather attached to a digitizing tablet and not directly the computer.

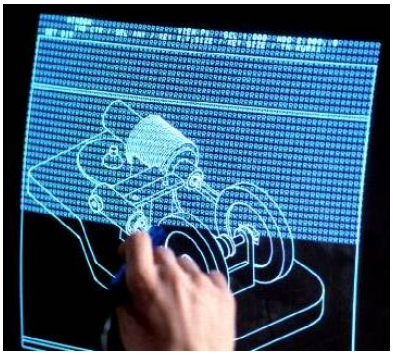

Fig. 7.0: light pen

Imaging and Video input devices

Imaging and video input devices are used to digitize images or video from the outside world into the computer. The information can be read in a variety of formats depending on the user's requirement. Some imaging and video input devices are:

Digital camera: A type of camera that stores the pictures or video it takes in electronic format instead of to film. There are several features that make **digital cameras** a popular choice when

Fig. 7.1: digital camera

compared to film cameras. First, the feature often enjoyed the most is the LCD display on the digital camera. This display allows users to view photos or video after the picture or video has been taken, which means if you take a picture and don't like the results, you can delete it; or if you do like the picture, you can easily show it to other people. Another nice feature with digital cameras is the ability to take dozens, sometimes hundreds of different pictures.

Fig. 7.2: webcam

Webcam: A camera connected to a computer that allows anyone connected to the Internet to view either a still pictures or motion video of a user or other object. Today, most webcams are either embedded into the display with laptop computers or connected to the USB or Firewire port on the computer.

Image scanner: A device that reads letters, numbers, symbols or other graphics from a printed page and translates them into digital signal that the computer can understand. Flatbed scanner is the most popular scanner. It mode of operation is similar to a photocopier. The images or texts are placed face down on the flat bed of the glass and the lid is closed. The sensor moves across below the glass reading the information. The scanned image or text can be edited on the computer. Another type of scanners is the handheld scanners. These scanners are small enough to fit in the hand and are rolled across the document or image to be scanned. Handheld scanners are not always the preferred choice because more time is spent in scanning a single document and also the quality of the images produced is poor as compared to the flatbed scanners.

Fig. 7.3: image scanner

Bar code reader: You might have come across bar codes a couple of times. These are series of parallel vertical lines, or bars, used to assign a unique identification code to an item. In a bar code, a number or character is represented in binary form by a short sequence of alternating black and white bars of varying width. A bar code combines several of these sequences to create a unique set of numbers or characters that identifies the item. Bar codes are normally found on products in supermarket, book stores and shops and show the prices of the products.

Fig. 7.4: barcode

A bar code reader is a device that is used to read bar codes. It uses a visible light to scan the bar codes, and the information is then transmitted to a computer for processing. Some types of bar code reader are:

- Wands
- Handheld scanners
- Projection/vertical scanners
- Built-in counter scanners

Fig. 7.4: barcode reader

Biometric systems

Methods for identifying a person on the basis of some biological or behavioral characteristic of the person. Many biological characteristics, such as fingerprints, and behavioral characteristics, such as voice patterns, are distinctive to each person. Biometric systems such as fingerprint identification scans the fingerprint and feed it to the computer for processing. Such systems are normally used as security measures to allow authorized persons to a room, place etc. other types of biometric systems include:

- Facial recognition
- Voice recognition
- Hand geometry
- Iris-base identification
- Retinal pattern recognition

Optical mark reader/recognition (OMR)

An optical mark reader is a device that reads pencil marks on a specially designed paper and converts into digital form for computer usage. Optical mark readers are used for multiple choice answer sheets, where it scans the answers to the computer for analysis and grading.

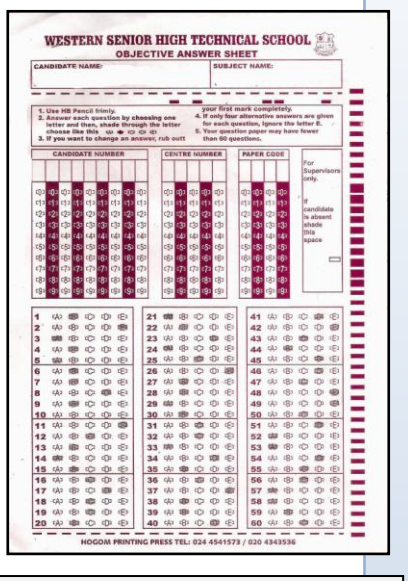

Fig. 7.5: multiple choice answer sheet

Optical character recognition (OCR)

In computer science, the process of examining printed characters on paper and determining their shapes by detecting patterns of dark and light. Once the scanner or reader has determined the shapes, character recognition methods—pattern matching with stored sets of characters—are used to translate the shapes into computer text. Sometimes OCR is done with special readers, but often it is done using a standard optical scanner and specialized software.

Audio input devices

Audio input devices are used to either capture or create sound. These devices digitize sound for the computer. Audio input devices include:

- Microphone
- MIDI devices

Microphone: Sometimes abbreviated as **mic**, a **microphone** is hardware peripheral that allows computer users to input audio into their computers. The audio could be a voice command from the user or sounds from other sources.

Fig. 7.6: microphone

MIDI devices: MIDI is an acronym for **Musical Instrument Digital Interface**, a serial interface standard that allows for the connection of musical instruments and computers. Computers have special ports known as MIDI in. Theses allow the musical instrument to be connected to the computer. The commonest MIDI device is the (MIDI) keyboard.

Sound card MIDI/game port

MIDI keyboard port

Fig. 7.7: MIDI ports

Composite (input) devices

Input devices, such as buttons and joysticks, can be combined on a single physical device that could be thought of as a composite device. Many gaming devices have controllers like this. Technically mice are composite devices, as they both track movement and provide buttons for clicking, but composite devices are generally considered to have more than two different forms of input. Examples of composite input devices are:

- Game controller
- Gamepad (or joypad)
- Paddle (game controller)
- Wii Remote

gamepad

Wii remote

paddle

Fig. 7.8: composite devices

OUTPUT DEVICES

Output devices are device that transmit processed information from the computer to the user. Information output is in two main forms:

Soft copy: Data or information which is shown on the display unit or stored on a storage device. Soft copy could be texts, videos, graphics or audio.

Hard copy: This refers to information that is printed out on paper.

Examples of output devices are:

- Monitor
- Printer
- Speaker

- LCD projector

Monitor

Also known as **video display unit (VDU)**, a **monitor** is a device connected to a computer that displays information on a screen. Modern computer monitors can display a wide variety of information, including text, icons (pictures representing commands), photographs, computer rendered graphics, video, and animation.
There are two type of monitors. They are the liquid crystal display (LCD) monitors and cathode-ray tube (CRT) monitors.

Liquid crystal display (LCD)

Liquid crystal display (LCD) monitor are normally referred to as flat panel monitors, because they are flat and occupy less space. LCD monitors also emit less heat and are easy to transport because of their relatively light weight. LCD monitors are made from liquid crystal, substance that behaves like both a liquid and a solid. The molecules in liquid crystals can move past each other relatively easily, much like molecules in a liquid. However, all the molecules in a liquid crystal tend to be oriented in the same manner, much like the molecular arrangement in a solid crystal. Liquid crystals retain their dual liquid and solid nature only over a certain range of temperatures and pressures. The liquid crystals are trapped between two glass plates to make them firm. LCDs are commonly found with the display unit of laptop computers

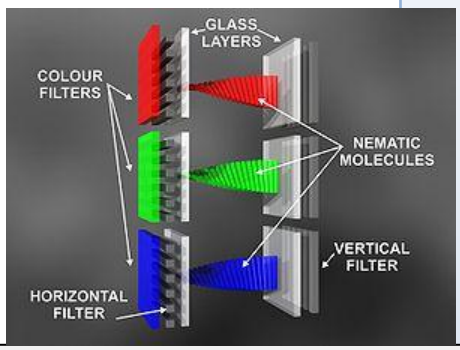

Fig. 7.9 liquid crystals between two glass plates

Fig. 8.0: LCD monitor

Cathode-ray tube (monitors)

Most computer monitors use a **cathode-ray tube (CRT)** as the display device. A CRT is a glass tube that is narrow at one end and opens to a flat screen at the other end. The CRTs used for monitors have rectangular screens, but other types of CRTs may have circular or square screens. The narrow end of the CRT contains a single electron gun for a monochrome, or single-color monitor, and three electron guns for a color monitor—one electron gun for each of the three primary colors: red, green, and yellow. The display screen is covered with tiny phosphor dots that emit light when struck by electrons from an electron gun.

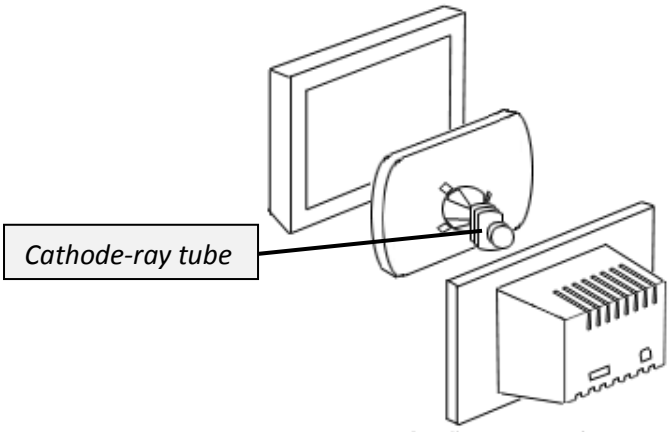

Fig. 8.1: CRT monitor

Monochrome monitors have only one type of phosphor dot while color monitors have three types of phosphor dots, each emitting either red, green, or blue light. One red, one green, and one blue phosphor dot are grouped together into a single unit called a **picture element**, or **pixel**. **A pixel is the smallest unit that can be displayed on the screen**. Pixels are arranged together in rows and columns and are small enough that they appear connected and continuous to the eye.

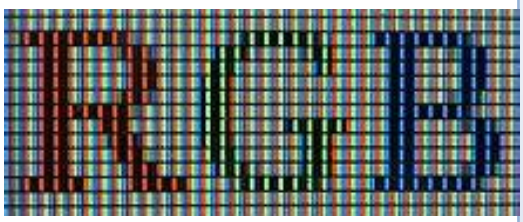

Fig. 8.2: phosphor dot

Electronic circuitry within the monitor controls an electromagnet that scans and focuses electron beams onto the display screen, illuminating the pixels. Image intensity is controlled by the number of electrons that hit a particular pixel. The more electrons that hit a pixel, the more light the pixel emits. The pixels, illuminated by each pass of the beams, create images on the screen. Variety of color and shading in an image is produced by carefully controlling the intensity of the electron beams hitting each of the dots that make up the pixels. **The speed at which the electron beams repeat a single scan over the pixels is known as the refresh rate**. Refresh rates are usually about 60 times a second.

Monochrome monitors display one color for text and pictures, such as white, green, or amber, against a dark color, such as black, for the background. Gray-scale monitors are a type of monochrome monitor that can display between 16 and 256 different shades of gray.
Manufacturers describe the quality of a monitor's display by **dot pitch**, **which is the amount of space between the centers of adjacent pixels.** Smaller dot pitches mean the pixels are more closely spaced and the monitor will yield sharper images. Most monitors have dot pitches that range from 0.22 mm (0.008 in) to 0.39 mm (0.015 in).

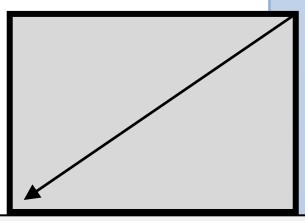

Fig. 8.3: measuring screen size

The screen size of monitors is measured by the distance from one corner of the display to the diagonally opposite corner. A typical size is 38 cm (15 in), with most monitors ranging in size from 22.9 cm (9 inches) to 53 cm (21 inches). Standard monitors are wider than they are tall and are called landscape monitors. Monitors that have greater height

than width are called **portrait monitors.**

The amount of detail, or resolution, that a monitor can display depends on the size of the screen, the dot pitch, and on the type of **display adapter** used. **The display adapter is a circuit board that receives formatted information from the computer and then draws an image on the monitor, displaying the information to the user.** Display adapters follow various standards governing the amount of resolution they can obtain. Most color monitors are compatible with **Video Graphics Array (VGA)** standards, which are 640 by 480 pixels (640 pixels on each of 480 rows), or about 300,000 pixels. VGA yields 16 colors, but most modern monitors display far more colors and are considered high resolution in comparison. **Super Video Graphics Array (SVGA)** monitors have 1024 by 768 pixels (about 800,000) and are capable of displaying more than 60,000 different colors. Some SVGA monitors can display more than 16 million different colors.

Printers

A printer is an output device that puts text or a computer-generated image on paper or on another medium, such as a transparency. Printers can be categorized in several ways based on the formation of images. Some of the categories are:

Fig. 8.4: printer

Print technology: Chief among these, with microcomputers, are pin dot-matrix, ink-jet, laser, thermal, and (although somewhat outdated) daisy-wheel or thimble printers. Pin dot-matrix printers can be further classified by the number of pins in the print head: 9, 18, 24, and so on.

Character formation: Fully formed characters made of continuous lines (for example, those produced by a daisy-wheel printer) vs. dot-matrix characters composed of patterns of dots (such as those produced by standard dot-matrix, ink-jet, and thermal printers). Laser printers, while technically dot-matrix, are generally considered to produce fully formed characters because their output is very clear and the dots are extremely small and closely spaced.

Method of transmission: parallel (byte-by-byte transmission) vs. serial (bit-by-bit transmission). These categories refer to the means by which output is sent to the printer rather than to any mechanical distinctions. Many printers are available in either serial or parallel versions, and still other printers offer both choices, yielding greater flexibility in installation options.

Method of printing: Character by character, line by line, or page by page. Character printers include standard dot-matrix, ink-jet, thermal, and daisy-wheel printers. Line printers include the band, chain, and drum printers that are commonly associated with large computer

installations or networks. Page printers include the electro-photographic printers, such as laser printers.

Print capability: Text-only vs. text-and-graphics. Text-only printers, including most daisy-wheel and thimble printers and some dot-matrix and laser printers, can reproduce only characters for which they have matching patterns, such as embossed type, or internal character maps. Text-and-graphics printers—dot-matrix, ink-jet, laser, and others—can reproduce all manner of images by "drawing" each as a pattern of dots

Based on the above categories, printers can be grouped into two:
Impact printers and Non-impact printers

Impact printers physically strike the paper and are exemplified by pin dot-matrix printers and daisy-wheel printers

Nonimpact printers include every other type of print mechanism, including laser, ink-jet, and thermal printers.

Plotters

A plotter is an output device that is used to draw high quality graphs and other pictorial images on paper. Plotters are used in conjunction with computer aided-design applications to produce technical drawing and architectural plans more quickly and efficiently. There are two types of plotters – the flat-bed plotter and drum or roller plotter. Drum plotters are often preferred over flat-bed plotters because they can produce neat and accurate drawings on large sheets of paper.

Fig. 8.5: plotter

Speakers

While microphones digitize audio for the computer, speakers convert digital signals to audio in the form of music, speech or (warning) beep for the outside world. Most computers come with small internal speakers that will beep to draw the users' attention to an error – for example if you hit a wrong key. To produce better quality sound additional speakers are attached to multimedia computers through a sound card.
One advantage of computer speakers is it allows the visually impaired to know what is happening on the computer.

Fig. 8.6: speakers

LCD Projectors

An **LCD projector** is a device for displaying video, images or computer data on a screen or other flat surface. To display images, LCD (liquid crystal display) projectors typically send light from a Metal halide lamp through a prism that separates light to three poly silicone panels – one each for the red, green, and blue components of the video signal. As polarized light passes through the panels (combination of polarizer, LCD panel and analyzer), individual pixels can be opened to allow light to pass or closed to block the light. The combination of open and closed pixels can produce a wide range of colors and shades in the projected image.

Fig. 8.7: LCD projector

Metal Halide lamps are used because they output an ideal color temperature and a broad spectrum of color. These lamps also have the ability to produce an extremely large amount of light within a small area.

TYPES OF STORAGE DEVICES

Another range of important peripheral devices aside input and output devices are storage devices. These are devices that are used to keep record of data and information.
Storage or mass storage refers to various techniques and devices for storing large amounts of data. Mass storage devices include all types of disk drives and tape drives. Mass storage is different from memory, which refers to temporary storage areas within the computer. Unlike RAM memory, mass storage devices retain data even when the computer is turned off.

Mass storage is measured in:

Kilobytes (1,024 bytes)

Megabytes (1,024 kilobytes, approximately 1 million bytes)

Gigabytes (1,024 megabytes, approximately 1 billion bytes)

Terabytes (1,024 gigabytes, approximately trillion bytes)

Storage devices have been grouped into two main levels such as primary and secondary storage devices. As discussed earlier, primary storage devices are the RAM and ROM. This discussion, though, will be centered on the secondary storage devices which include hard disk, floppy disk, flash memory (pen drive), optical storage, zip disk and tape. Now let us take them one after the other.

Hard disk

A hard disk or hard disk drive is a non-volatile storage device for digital data. By being volatile, hard disks retain the data or information stored on them even when the power is out.

Fig. 8.8: hard disk

It features one or more rotating rigid platters on a motor-driven spindle within a metal case. Data is encoded magnetically by read/write heads that float on a cushion of air above the platters.

Hard disk manufacturers quote disk capacity in SI-standard powers of 1000, wherein a terabyte is 1000 gigabytes and a gigabyte is 1000 megabytes. With file systems that measure capacity in powers of 1024, available space appears somewhat less than advertised capacity. For example you may see a capacity of 20 GB written on a hard disk case, but the actual capacity is less than 20 GB.

The first hard disk drive was invented by IBM in 1956. They have fallen in cost and physical size over the years while dramatically increasing capacity. Hard disk drives have been the dominant device for secondary storage of data in general purpose computers. They have maintained this position because advances in their areal recording density have kept pace with the requirements for secondary storage. Form factors have also evolved over time from large standalone boxes to today's desktop systems mainly with standardized 3.5" form factor drives, and mobile systems mainly using 2.5" drives. Today's hard disk drives operate on high-speed serial interfaces, i.e., Serial ATA (SATA) or Serial attached SCSI (SAS).

The presentation of an HDD to its host is determined by its controller. This may differ substantially from the drive's native interface particularly in mainframes or servers.

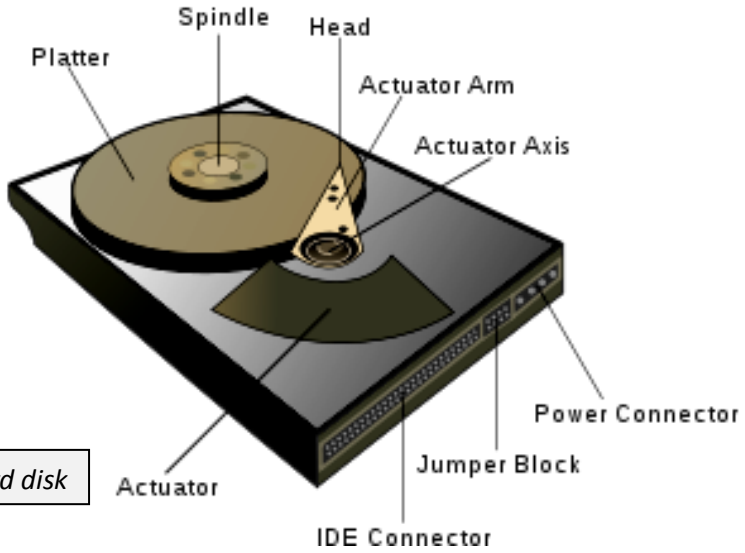

Fig. 8.9: structure of a hard disk

Floppy disk

A floppy disk is a data storage medium that is composed of a disk of thin, flexible ("floppy") magnetic storage medium called mylar encased in a square or rectangular plastic shell. Originally the floppy disk was created for storing audio tracks with greater clarity. As the computer boom began the floppy disk quickly replaced the punch card. There are two types of floppy disks:

5.25" - this type of disk can store anywhere from 100 kilobytes to 1.2 megabytes of data.

3.5" - this disk is capable of storing from 720 kilobytes to 1.4 MB of data.

Floppy disks are read and written by a **floppy disk drive** or **FDD**, A small motor in the drive rotates the disk at a regulated speed while a second motor-operated mechanism moves the magnetic read/write head,(or heads, if a double-sided drive) along the surface of the disk. To write data onto the disk, current is sent through a coil in the head. The magnetic field of the coil magnetizes spots on the disk as it rotates; the change in magnetization encodes the digital data. To read data, the tiny voltages induced in the head coil by the magnetization on the disk are detected, amplified by the disk drive electronics, and sent to the Floppy disk controller. The controller separates the data from the stream of pulses coming from the drive, decodes the data, tests for errors, and sends the data on to the host computer system.

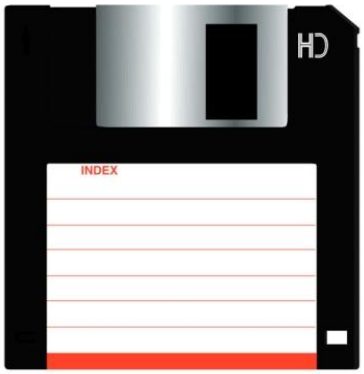

Fig. 9.0: 3.5 floppy disk

Computer manufacturers worldwide are no longer providing floppy disk drives on new computers as other forms of storage offer much higher capacity at little or no extra cost. In particular *USB flash drives* have become massively popular and are replacing the floppy disk as the entry level form of data storage on all home computers for users of all levels.

USB Flash Drive

A USB flash drive, commonly known as pen drive, consists of a flash memory data storage device integrated with a Universal Serial Bus (USB) interface. USB flash drives are typically removable and rewritable, and physically much smaller than a floppy disk. Most weigh less than 30 g. Storage capacities as of 2010 can be as large as 256 GB with steady improvements in size and price per capacity expected. Some allow 1 million write or erase cycles and have a 10-year data retention cycle.

Fig. 9.1 pen drive

USB flash drives are often used for the same purposes as floppy disks were. They are smaller, faster, have thousands of times more capacity, and are more durable and reliable because of their lack of moving parts.

Flash drives use the USB mass storage standard, supported natively by modern operating systems such as Windows, Mac OS X, Linux, and other Unix-like systems. USB drives with USB 2.0 support can store more data and transfer faster than a much larger optical disc drive and can be read by many other systems such as the Xbox 360, PlayStation 3, DVD players and in some upcoming mobile smartphones.

Nothing moves mechanically in a flash drive; the term *drive* persists because unlike floppy disk and optical disk computers read and write flash-drive data using the same system

commands as for a mechanical, with the storage appearing to the computer operating system and user interface as just another drive. Flash drives are very robust mechanically.

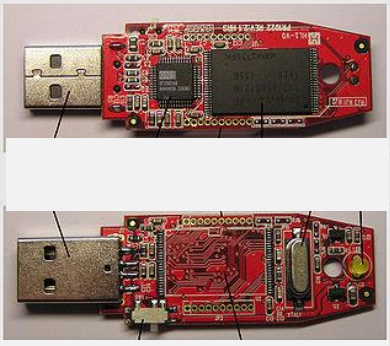

Fig. 9.1: inside a pen drive

A flash drive consists of a small printed circuit board carrying the circuit elements and a USB connector, insulated electrically and protected inside a plastic, metal, or rubberized case which can be carried in a pocket or on a key chain, for example. The USB connector may be protected by a removable cap or by retracting into the body of the drive, although it is not likely to be damaged if unprotected. Most flash drives use a standard type-A USB connection allowing plugging into a port on a personal computer, but drives for other interfaces also exist.

Most USB flash drives draw their power from the USB connection, and do not require a battery. Some devices that combine the functionality of a digital audio player with flash-drive-type storage require a battery for the player function.

Optical disk

An **optical disc** is a flat, usually circular disc which stores binary data on a special material (often aluminium) on one of its flat surfaces. The data sits on top of a thicker substrate which makes up the bulk of the disc. The data follows a continuous, spiral path covering the entire disc surface and extending from the innermost track to the outermost track. The data is stored on the disc with a laser or stamping machine, and can be accessed when the data path is illuminated with a laser diode in an optical disc drive.

Fig. 9.2: optical disk

An **optical disc drive** (**ODD**) is a device that uses laser light or electromagnetic waves to read or write data to or from optical discs. Some drives can only read from discs while others are commonly both **readers** and **recorders**. Recorders are sometimes called **burners** or **writers**. Compact discs, DVDs, HD DVDs and Blu-ray discs are common types of optical media which can be read and recorded by such drives.

Fig. 9.3: optical disk drive

When writing or reading an optical disks, ODD spins the disc at speeds of about 200 round per minute (RPM) up to 4000 RPM or more depending on the drive type, disc format, and the distance of the read head from the center of the disc (inner tracks are read at a faster disc speed).

The reverse side of an optical disc usually has a printed label, generally made of paper but sometimes printed or stamped onto the disc itself. This side of the disc contains the actual data and is typically coated with a transparent material, usually lacquer. Unlike the 3½-inch floppy disk, most optical discs do not have an integrated protective casing and are therefore susceptible to data transfer problems due to scratches, fingerprints, and other environmental problems.

Fig. 9.4: 51 GB DVD

Optical discs are usually between 7.6 and 30 cm (3 to 12 inches) in diameter, with 12 cm (4.75 inches) being the most common size. A typical disc is about 1.2 mm (0.05 inches) thick, while the track pitch (distance from the center of one track to the center of the next) is typically 1.6 µm (microns).

An optical disc is designed to support one of three recording types: read-only (eg: CD and CD-ROM), recordable (write-once, e.g. CD-R), or re-recordable (rewritable, e.g. CD-RW). Optical discs are most commonly used for storing music (e.g. for use in a CD player), video (e.g. for use in a DVD player), or data and programs for personal computers.

Compact disc drives store information on pits burned into the surface of a disc of reflective material (*see* CD-ROM). CD-ROMs can store up to 737 megabytes (MB) of data. A Compact Disc-Recordable (CD-R) or Compact Disc-ReWritable (CD-RW) drive can record data onto a specialized disc, but only the CD-RW standard allows users to change the data stored on the disc. A digital versatile disc (DVD) looks and works like a CD-ROM but can store up to 17.1 GB of data on a single disc. Like CD-ROMs, there are specialized versions of DVDs, such as DVD-Recordable (DVD-R) and DVD-ReWritable (DVD-RW), that can have data written onto them by the user. More recently Sony Electronics developed DVD technology called Blu-ray. It has much higher storage capacities than standard DVD media.

Magnetic tape

Fig. 9.5: magnetic tape

Magnetic tape use magnetic tape similar to the tape used in VCR cassettes. They are made up of a thin plastic strip with a magnetic coating to one side which is wound around a reel or cartridge. The tape is read or written to by a tape drive. Tape drives have a very slow read/write time, nonetheless, tapes have a very high capacity; in fact, their capacity is second only to hard disk drives. Tapes are mainly used to back up data.

Data access on tapes s known as serial access – meaning the tape must be run from one end to the other before you can locate the actual data you want. This is opposite the conventional direct access used by the computer to locate data on hard, floppy and optical disks.

Fig. 9.6: magnetic tape inside cartridge

Zip disk and drive

A Zip drive is a small, portable medium-capacity removable disk storage system used primarily for backing up and archiving personal computer files. It was introduced by Iomega Corporation. Zip drives and disks come in three sizes - the 100 MB size actually holds 100,431,872 bytes of data or the equivalent of 70 floppy diskettes, the 250 MB drive and disk and the 750 MB disk and drive.

Fig. 9.7: Zip disk in a drive

Zip drives became the most popular of the super-floppy type products which filled a niche in the late 1990s portable storage market. However it was never popular enough to replace the 3.5-inch floppy disk nor could ever match the storage size available on rewritable CDs and later rewritable DVDs. USB flash drives ultimately proved to be the better rewritable storage medium among the general public due to common availability of USB ports built into most models of personal computer. Zip drives fell out of favor for mass portable storage during the early 2000s.

DEVICES WHICH SERVE AS BOTH INPUT AND OUTPUT

We have discussed input and output devices at length; input devices send data from the computer user to the computer; whiles output devices send information from the computer to the user. There are other devices which are hybrid of input and output devices. That is they combine the functions of input and output devices by alternatively converting analogue signals from the user to the computer and vice versa. Examples of such devices are computer headset, modem.

Computer headset

A computer headset is basically a microphone and a speaker fused together. This means it can digitize audio input from the user to the computer and at the same time convert digital signal from the computer to an audio output.

Fig. 9.8: computer headset

Modem

A modem is an electronic device that allows computers to exchange information by connecting them via a telephone line. Modems consist of a modulator which converts computer information into telephone signal and a demodulator which converts telephone signal to digital signal for the computer.

TEST YOURSELF

Theory questions

1. Discuss the following categories of hardware;
   i. Input
   ii. Output
   iii. Storage
   iv. Processing

2. Describe the front, back, and the inside of a system unit.

3. Write a short note on the following:
   i. Motherboard
   ii. Bus
   iii. ROM
   iv. RAM

4. a. What are input devices?
   b. Write a short note on 4 input devices.

5. Describe the QWERTY keyboard.

6. Write a short note about the functions of the following input devices:
   i. Mouse
   ii. Joystick
   iii. Trackball
   iv. Digital camera
   v. Barcode reader
   vi. Optical mark reader

7. Describe the two types of computer monitor.

8. Write a short note on the following output devices:
   i. Printer
   ii. Plotter
   iii. Speaker
   iv. LCD projector

9. Identify four types of storage devices.

10. How do modems and computer headset work as both input and output devices.

Identify the following as input, output, processing or storage devices.
(Tick the hardware category to which each device belongs)

Device	Input	Output	Processing	Storage
Pen drive				
Trackball				
Modem				
Processor				
LCD projector				
Barcode reader				
Magnetic tape				
Plotter				
Zip disk				
Biometric systems				

Write the following abbreviations in full.

Abbreviation	Meaning
ATM	
SVGA	
GUI	
RAM	
DVD	
USB	
VDU	
MB	
RAM	
OCR	
OMR	

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Chapter 4

SOFTWARE

OBJECTIVES

After completing this chapter, you should be able to:

i. Identify types of software.
ii. Distinguish between Open Source and Proprietary Software
iii. Identify different types, examples and uses of Application software.
iv. Launch some Application software.
v. Identify devices which serve as both input and output.

INTRODUCTION

The last chapter was exclusively on hardware. Now, let us talk about the other brothers or perhaps, sister, software. In the actual sense, hardware and software complement each other, and that without one the other is as good as rubbish. You could think of software as food that the hardware eats to get energy to work. In a more technical sense, **a software is set of instructions that tell various hardware what to do or how to do a specific task**. From the above explanation it could be said that a computer system is made up of hardware and software, with hardware being the body (visible parts) and software, the soul (invisible part). Software is also known as programs, and they are interchangeable.

TYPES OF SOFTWARE PACKAGES

Software as a whole can be divided into a number of categories based on the types of work they do. The two primary software categories are **system software**, which control the workings of the computer, and **application software**, which addresses the number of tasks for which people use computers. Let us consider them in depth.

System software

System software is software designed to operate the computer hardware and to provide and maintain a platform for running application software.
The most basic types of system software are:

- **The operating system** which allows the parts of a computer to work together by performing tasks like transferring data between memory and disks or rendering output onto a display device. It also provides a platform to run high-level system software and application software.
- **The computer BIOS** and **device firmware**, which provide basic functionality to operate and control the hardware connected to or built into the computer.
- **Utility software**, which helps to analyze, configure, optimize and maintain the computer.

System software is normally preinstalled on the computer and is usually not what a user would buy a computer for. It helps use the operating system and computer system. It includes diagnostic tools, compilers, servers, windowing systems, utilities, language translator, data communication programs, data management programs and more. The purpose of system software is to insulate the applications programmer as much as possible from the details of the particular computer complex being used, especially memory and other hardware features, and such accessory devices as communications, printers, readers, displays, keyboards, etc.

The Operating system

An operating system (OS) is a software that runs on computers and manages the computer hardware and provides common services for efficient execution of various application software. In other words an operating system is a set of programs that control the basic functions of a computer.

The operating system has three major functions:

- It coordinates and manipulates computer hardware, such as computer memory, printers, disks, keyboard, mouse, and monitor
- It organizes files on a variety of storage media, such as floppy disk, hard drive, compact disc, digital video disc, and tape
- It manages hardware errors and the loss of data.

For hardware functions such as input and output and memory allocation, the operating system acts as an intermediary between application programs and the computer hardware, although the application code is usually executed directly by the hardware. Operating systems are either **single-tasking** or **multitasking**. The old fashion single-tasking operating systems can run only one process at a time. For instance, when the computer is printing a document, it cannot start another process or respond to new commands until the printing is completed. All modern operating systems are multitasking and can run several processes simultaneously. Operating systems are found on almost any device that contains a computer—from mobile phones and video game consoles to supercomputers and web servers.

Types of operating systems

There are a lot of operating systems on the market. Some popular operating systems for computers include DOS, Microsoft Windows, Macintosh, Linux and Unix.

DOS

DOS is an acronym for Dist Operating System; you might come across MS-DOS (which stands for MicroSoft DOS) in some books or other sources, they are the same thing. MS-DOS is a non-graphical command line operating system introduced by Microsoft in August 1981 for IBM compatible computers, and for many years was the most popular operating system. in use until the release of Windows operating system. DOS controls many internal computer functions such as how to process information, how to manage files and how interpret commands. For this reason it is described as *command led* system.

DOS commands are still used today even on the newest version of Microsoft's operating system, Windows 7. When the command is input, the command processor or interpreter receives it and carry it out. DOS commands follow a set of rules. The words in the commands are often abbreviated versions of the actual words, and may appear intangible to the outsider, but the DOS interpreter understands it. For example if you want display the contents of the hard disk you could type 'dir' in the command prompt and that will show the contents of the hard disk (*normally labeled drive C*) in DOS made. All DOS commands are entered with the keyboard.

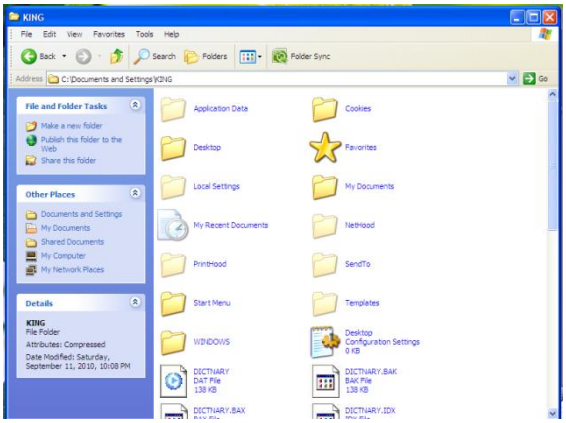

Fig. 10.0: content of drive C viewed in Windows

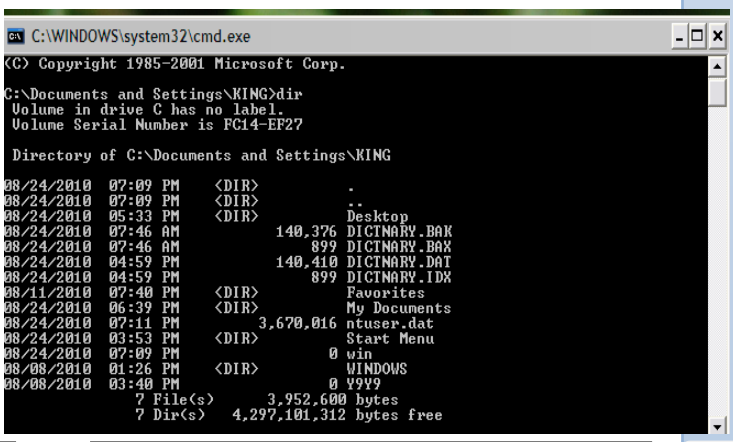

Fig. 10.1: content of drive C viewed in DOS

Windows

Windows was introduced in 1985 to better the performance of DOS. The name Windows comes from the computer term **'windowing environment'**, which is an operating system that can divide the screen into separate areas called windows. Each window is independent on the other and has its own features that can be used to manipulate it.
Unlike DOS, Windows allows users to enter commands with a point-and-click device, such as a mouse, instead of a keyboard only. The Windows operating system provides users with a **graphical user interface (GUI)**, which allows them to manipulate small pictures, called icons, on the computer screen to issue commands. Windows is the most widely used operating system in the world. It is an extension of and replacement for Microsoft's Disk Operating System (MS-DOS).

The Windows GUI is designed to be a natural, or intuitive, work environment for the user. With Windows, the user can move a cursor around on the computer screen with a mouse. By pointing the cursor at icons and clicking buttons on the mouse, the user can issue commands to the computer to perform an action, such as starting a program, accessing a data file, or copying a data file. Other commands can be reached through pull-down or click-on menu items. The computer displays the active area in which the user is working as a window on the computer screen. The currently active window may overlap with other previously active windows that remain open on the screen. This type of GUI is said to include *WIMP* features: *w*indows, *i*cons, *m*enus, and *p*ointing device (such as a mouse).

Fig. 10.2: Windows GUI

GUI concept was invented in 1970s by scientist at Xerox Corporation, but this innovation was not an immediate commercial success. In 1983 Apple Computer featured a GUI in its Lisa computer. This GUI was updated and improved in its Macintosh computer, introduced in 1984.

Microsoft began its development of a GUI in 1983 as an extension of its MS-DOS operating system. Microsoft's Windows version 1.0 first appeared in 1985. In this version, the windows were tiled, or presented next to each other rather than overlapping. Windows version 2.0, introduced in 1987, was designed to resemble IBM's OS/2 Presentation Manager, another GUI operating system. Windows version 2.0 included the overlapping window feature. The more powerful version 3.0 of Windows, introduced in 1990, and subsequent versions 3.1 and 3.11 rapidly made Windows the market leader in operating systems for personal computers, in part because it was prepackaged on new personal computers. It also became the favored platform for software development.

Windows NT

In 1993 Microsoft introduced Windows NT (New Technology). The Windows NT operating system offers 32-bit multitasking, which gives a computer the ability to run several programs simultaneously, or in parallel, at high speed. This operating system competes with IBM's

OS/2 as a platform for the intensive, high-end, networked computing environments found in many businesses.

Windows 95

In 1995 Microsoft released a new version of Windows for personal computers called Windows 95. Windows 95 had a sleeker and simpler GUI than previous versions. It also offered 32-bit processing, efficient multitasking, network connections, and Internet access.

In 1996 Microsoft debuted Windows CE, a scaled-down version of the Microsoft Windows platform designed for use with handheld personal computers.

Windows 98

Windows 98, a successor to Windows 95 was released to manufacturing on 15th May, 1998 and to the public exactly one month later. It was codenamed Memphis, and was an improved version of Windows 95. Like its predecessor, Windows 95, it is a hybrid and has a processing power of 16-bit/32-bit and compatible with MS-DOS based boot loader. Windows 98 ended on July 11, 2006.

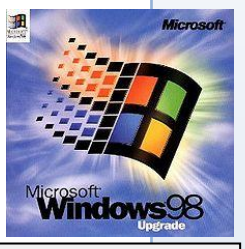

Fig. 10.3: Windows 98 logo

Windows 2000

Windows 2000, released on 17 February 2000, combined Windows NT technology with the Windows 98 graphical user interface. It was the successor to Windows NT 4.0, and is the final release of Microsoft Windows to display the "Windows NT" designation.

Windows ME

To grace the new millennium fully, Microsoft released a special edition of Windows known as Windows Millennium Edition (Windows Me) only a few months after Windows 2000, but Windows Me was not intended to be, nor did it serve as the replacement to Windows 2000. It rather provided a more stable version of the Windows 98 interface. Windows Me is designed for home use, while Windows 2000 is designed for business.

Windows XP

In 2001 Microsoft released a new operating system known as Windows e**XP**erience or Windows XP, the company's first operating system for consumers that was not based on MS-DOS. Windows XP, which is codename *Whistler*, is designed for both home and business use, and by this replaces both Windows 2000 and Windows ME. As of May, 2010 Windows XP is recorded to be the most widely used operating system with an approximate market share of 63.3%.

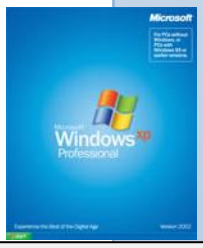

Fig. 10.4: Windows XP logo

Windows Vista

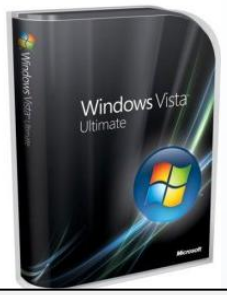

Fig. 10.5: Windows Vista package

On January 30, 2007, Microsoft released their much awaited Windows Vista worldwide, codename "Longhorn", and was made available for purchase and download from Microsoft's website. The release of Windows Vista came more than five years after the introduction of its predecessor, Windows XP, the longest time span between successive releases of Microsoft Windows desktop operating systems. Windows Vista is expressed in several variations developed for use on personal computers, including home and business desktops, laptops, tablet computers, and media center computers.

Windows Vista contains many changes and new features, including an updated graphical user interface and visual style dubbed Aero, a redesigned search function, multimedia tools including Windows DVD Maker, and redesigned networking, audio, print, and display sub-systems. Vista aims to increase the level of communication between machines on a home network, using peer-to-peer technology to simplify sharing files and media between computers and devices.

Windows 7

Less than three years after the release of Windows Vista, a new operating system, Windows 7 was released to the general public on 22nd October, 2009. Unlike its predecessor, Windows Vista, which introduced a large number of new features, Windows 7 was intended to be a more focused, incremental upgrade to the Windows line, with the goal of being compatible with applications and hardware with which Windows Vista is already compatible.

The windows family of operating systems is ever increasing, and a new version with new and improved features will hit the market very soon.

Fig. 10.6: Windows 7 logo

Macintosh Operating System (Mac OS)

The Macintosh Operating system or Mac OS is the name for a series of operating systems developed by Apple Inc. (formerly Apple Computer, Inc.) for their Macintosh computer systems. Like Windows, Mac OS has an attractive graphical user interface. Apple's first operating system, simply referred to as System Software was released in 1984, and was later succeeded by Mac OS. The early Macintosh operating system initially consisted of two pieces of software, called **"System"** and **"Finder"**, each with its own version number.

Like Windows, Macintosh operating system is a series of operating systems which have moved down the line from their introduction in 1984 to the present year. Mac OS was the first operating system to make use of Xerox Corporation's graphical user interface, with their Classic Mac OS in 1984.

Fig. 10.7: Mac OS logo

On 1999, Mac OS X, a new series of Apple's operating system was introduced to cut the long reign of Mac OS. Mac OS X is the successor to Mac OS 9, the final release of the "classic" Mac OS, which had been Apple's primary operating system since

1984. The first version released was Mac OS X Server 1.0 in 1999, and a desktop-oriented version, Mac OS X v10.0 "Cheetah" followed on March 24, 2001. Releases of Mac OS X are named after big cats: for example, the newest version of Macintosh operating system X, Mac OS X v10.6 is usually referred to as "Snow Leopard".
Apple also produces specialized versions of Mac OS X for use on four of its devices: the iOS for the iPhone, iPod Touch, and iPad, as well as an unnamed version for the Apple TV

UNIX

UNIX is an operating system originally developed in 1969 by a group of AT&T employees at Bell Labs for use on minicomputers. Today's Unix systems are split into various branches, developed over time by AT&T as well as various commercial vendors and non-profit organizations. In the early 1970s, many universities, research institutions, and companies began to expand on and improve UNIX. These efforts resulted in two main versions: BSD UNIX, a version developed at the University of California at Berkeley, and System V, developed by AT&T and its collaborators.

Many companies developed and marketed their own versions of UNIX in subsequent years. Variations of UNIX include AIX, a version of UNIX adapted by IBM to run on RISC-based workstations; A/UX, a graphical version for the Apple Macintosh; XENIX OS, developed by Microsoft Corporation for 16-bit microprocessors; SunOS, adapted and distributed by Sun Microsystems, Inc.; Mach, a UNIX-compatible operating system for the NeXT computer; and Linux, developed by Finnish computer engineer Linus Torvalds with collaborators worldwide.

UNIX operating systems are widely used in both servers and workstations. The UNIX environment and the client–server program model were essential elements in the development of the Internet and the reshaping of computing as centered in networks rather than in individual computers.

Linux

Linux, computer operating system using open source software. Linux is a UNIX-like operating system that is available as an alternative to commercial operating systems such as Windows, UNIX, or Macintosh OS. Because Linux is open source software, users have access to the source code and are allowed to use, modify, or redistribute the code.

The original version of Linux was not developed as a commercial product. The Finnish software engineer Linus Torvalds wrote the first version of Linux. He released it to a public Internet forum in 1991. Other software engineers worldwide later on worked on developing it. With thousands of minds focused on improving the software, Linux rapidly became a fast, reliable, and widespread operating system. Linux continues to be free.

Fig. 10.8: Linux logo

OS/2

OS/2 is an operating system developed for the personal computer in the mid-1980s by International Business Machines Corporation (IBM) and Microsoft Corporation. The name stands for "Operating System/2," because it was introduced as part of the same generation change release as IBM's "Personal System/2 (PS/2)" line of second-generation personal computers.

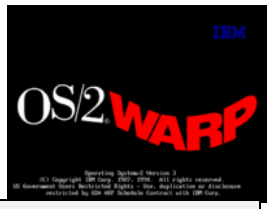

Fig. 10.9: OS/2 Warp logo

OS/2 is not as popular as other operating and is used only in a few sectors such as bank installations, especially Automated Teller Machines, run OS/2 with a customized user interface; Telecom companies such as Nortel use OS/2 in some voicemail systems. Nevertheless, OS/2 still maintains a small and dedicated community of followers.

Fig. 11.0: ATM running on OS/2

APPLICATION SOFTWARE

Application software, also known as application is a computer program designed to help people perform an activity such as word processing, gaming etc. An application thus differs from an operating system. Depending on the activity for which it was designed, an application can manipulate text, numbers, graphics, or a combination of these elements. Some application packages offer considerable computing power by focusing on a single task, such as word processing; others, called integrated software, offer somewhat less power but include several applications.

Fig. 11.1: application software

User-written software is software designed to meet the user's specific needs. User-written software include spreadsheet templates, word processor macros, scientific simulations, graphics and animation scripts. Even email filters are a kind of user software. The difference between system software such as operating systems and application software is not exact, however, and is occasionally the object of controversy. For example, one of the key questions in the United States v. Microsoft antitrust trial was whether Microsoft's Internet Explorer web browser was part of its Windows operating system or a separable piece of application software.

Types of application software

There are many types of application software:

Word processing software

Also known as **word processor,** word processing software is a software used for the production (including composition, editing, formatting, and possibly printing) of any sort of printable material.

Although features and design varied between manufacturers and models, with new features added as technology advanced, word processors for several years usually featured a *monochrome* (one colour) display and the ability to save documents on memory cards or diskettes. Later models introduced innovations such as spell-checking programs, increased formatting options, and dot-matrix printing

Word processors are descended from early *text formatting* tools (sometimes called *text justification* tools, from their only real capability). Word processing was one of the earliest applications for the personal computer in office productivity.

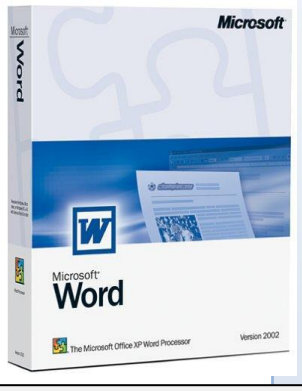

Fig. 11.2: Word processor

most modern word processors take advantage of a graphical user interface providing some form of What You See Is What You Get (WYSIWYG) editing Depending on the program and the equipment in use, word processors can display documents either in text mode, using highlighting, underlining, or color to represent italics, boldfacing, and other such formatting, or in graphics mode, wherein formatting and, sometimes, a variety of fonts appear on the screen as they will on the printed page. All word processors offer at least limited facilities for document formatting, such as font changes, page layout, paragraph indention, and the like. Some word processors can also check spelling, find synonyms, incorporate graphics created with another program, correctly align mathematical formulas, create and print form letters, perform calculations, display documents in multiple on-screen windows, and enable users to record macros that simplify difficult or repetitive operations

Microsoft Word is the most widely used word processing software. Microsoft estimates that over 500,000,000 people use the Microsoft Office suite, which includes Word. Many other word processing applications exist, including WordPerfect, OpenOffice.org Writer, AbiWord, KWord, LyX and web-based word processors, such as Google Docs.

Spreadsheet software

A **spreadsheet** is a computer application that simulates a paper, accounting worksheet. In a spreadsheet program, data and formulas to calculate those data are entered into ledger-like forms (spreadsheets or worksheets) for analysis, tracking, planning, or *"what-if"* evaluations of the impacts of real or proposed changes on an economic strategy. It is commonly used for budgets, forecasting, and other finance-related tasks. Spreadsheets are frequently used for financial information because of their ability to re-calculate the entire sheet automatically after a change to a single cell is made.

It displays multiple grids of rows and columns called cells, with each cell containing alphanumeric text, numeric values or formulas. Depending on the program, a single spreadsheet can contain anywhere from thousands to millions of cells. Some spreadsheet programs can also link one spreadsheet to another that contains related information, and can update data in linked spreadsheets automatically. Spreadsheet programs may also include macro facilities, and some can be used for creating and sorting databases. For printed output, spreadsheet programs usually provide graphing capabilities and a variety of formatting options for both printed pages and text, numeric values, and captions and legends in graphs.

Fig. 11.3: spreadsheet icon

To ease computation, these programs include built-in *functions* that perform standard calculations. A formula defines how the content of that cell is to be calculated from the contents of any other cell (or combination of cells) each time any cell is updated.

Visicalc is usually considered the first electronic spreadsheet (although this has been challenged), and it helped turn the App e II computer into a success and greatly assisted in their widespread application. Lotus 1-2-3 was the leading spreadsheet when DOS was the dominant operating system. Microsoft Excel now has the largest market share on the Windows and Macintosh platforms.

Database software (database management system)

A **database** consists of an organized collection of data stored in a computer memory and designed for easy access by authorized users. Since their first, experimental appearance in the 1950s, databases have become so important in industrial societies that they can be found in almost every field of information. Government, military, and industrial databases are often highly restricted, and professional databases are usually of limited interest. A wide range of commercial, governmental, and nonprofit databases are available to the general public, however, and may be used by anyone who owns or has access to the equipment that they require.

Fig. 11.4: DBMS icon

One way of classifying databases involves the type of their contents, for example: students' information, document-text, statistical. Digital databases are managed using database management systems (DBMS), which store database contents, allowing data creation and maintenance, and search and other access. A database management system (DBMS) consists of software that operates databases, providing storage, access, security, backup and other facilities. Database management systems can be categorized according to the database model that they support, such as relational or XML, the type(s) of computer they support, such as a server cluster or a mobile phone, the query language(s) that access the database, such as SQL or XQuery, performance trade-offs, such as maximum scale or

maximum speed or others. Some DBMS cover more than one entry in these categories, e.g., supporting multiple query languages. Examples of database management systems are Microsoft Access, Lotus, etc.

Presentation software

Presentation is the practice of showing and explaining the content of a topic to an audience or learner. It has become increasingly common for teachers and employers to ask their students or employees to give presentations on some selected topic. The purpose of these presentations is to demonstrate the students' or employees ability in handling him or herself and their knowledge in the selected topics. Presentation software have features which assist in planning and delivering presentations.

Fig. 11.5: presentation logo

Presentation **software** is a software package used to display information, normally in the form of a slide show. It typically includes three major functions: an editor that allows text to be inserted and formatted, a method for inserting and manipulating graphic images and a slide-show system to display the content.

A presentation program is supposed to help both: the speaker with an easier access to his ideas and the participants with visual information which complements the talk. There are many different types of presentations including professional (work-related), education, entertainment, and for general communication. Presentation programs can either supplement or replace the use of older visual aid technology, such as Pamphlets, handouts, chalkboards, flip charts, posters, slides and overhead transparencies. Text, graphics, movies, and other objects are positioned on individual pages or "slides" or "foils". Slides can be printed, or (more usually) displayed on-screen and navigated through at the command of the presenter. Transitions between slides can be animated in a variety of ways, as can the emergence of elements on a slide itself. Typically a presentation has many constraints and the most important being the limited time to present consistent information.

Fig. 11.6: PowerPoint logo

Many presentation programs come with pre-designed images (clip art) and/or have the ability to import graphic images. Custom graphics can also be created.

With the growth of digital photography and video, many programs that handle these types of media also include presentation functions for displaying them in a similar "slide show" format. For example, Apple's iPhoto allows groups of digital photos to be displayed in a slide show with options such as selecting transitions, choosing whether or not the show stops at the end or continues to loop, and including music to accompany the photos.

Certain presentation programs also offer an interactive integrated hardware element designed to engage an audience (e.g. audience response systems) or facilitate presentations across

different geographical locations (e.g. web conferencing). Other integrated hardware devices ease the job of a live presenter such as laser pointers and interactive whiteboards.

Some common presentation software includes Microsoft PowerPoint (the leading presentation software), Apple Keynote, Slide Effect and Open Office Impress.

Educational software

Educational software is a software, the primary purpose of which is teaching or facilitate self-learning.

Fig. 11.7: MindTwister Math

An immense number of educational software has been developed and released since the mid-1990's onwards, aimed primarily at the home education of younger children. The design of educational software for home use has been influenced strongly by computer gaming concepts – in other words, they are designed to be fun as well as educational. Hence the term *edutainment*. In a broader sense, the term *edutainment* describes an intentional merger of computer games and educational software into a single suite. In the narrower sense used here, the term describes educational software which is primarily about entertainment, but tends to educate as well and sells itself partly under the educational umbrella. Software of this kind is not structured towards school curricula, does not normally involve educational advisors, and does not focus on core skills such as literacy and numeracy.

Educational software is not only limited to homes, but are integrated to the academic curricula. Such software is called ***courseware***. *Courseware* is a term that combines the words 'course' with 'software'. Its meaning originally was used to describe additional educational material intended as kits for teachers or trainers or as tutorials for students, usually packaged for use with a computer. The term's meaning and usage has expanded and can refer to the entire course and any additional material when used in reference an online or 'computer formatted' classroom.

Fig. 11.8: Microsoft Encarta

A further category of educational software is software designed for use in school classrooms. Typically such software may be projected onto a large whiteboard at the front of the class and/or run simultaneously on a network of desktop computers in a classroom. This type of software is often called classroom management software.

Many publishers of print dictionaries and encyclopedias have been involved in the production of educational reference software. The first commercial reference software products were reformulations of existing content into CD-ROM editions, often supplemented with new multimedia content, including compressed video and sound. Now, some software like Microsoft Encarta and Encyclopedia Britannica help make researching for information pleasant. More recent products, such as Wikipedia, made use of internet technologies, to

supplement CD-ROM products, then, more recently, to replace them entirely. Other software, such as Mavis Beacon and Typing Tutor aims at teaching people how to use the computer.

Graphics software

Graphics software or **image editing software** is a program or collection of programs that enable a person to manipulate visual images on a computer. Computer graphics can be classified into two distinct types: raster graphics and vector graphics. Before learning about computer software that manipulates or displays these graphics types, you should be familiar with both.

Fig. 11.9: Corel Draw X4

Many graphics programs focus exclusively on either vector or raster graphics, but there are a few that combine them in interesting and sometimes unexpected ways. It is simple to convert from vector graphics to raster graphics, but going the other way is harder. Some software attempts to do this. Most graphics programs have the ability to import and export one or more graphics file formats

The use of a swatch is a palette of active colours that are selected and rearranged by the preference of the user. A swatch may be used in a program or be part of the universal palette on an operating system, it is used to change the colour of a project that may be text, image or video editing. Some popular graphics software include Adobe Photoshop and Corel Draw.

Browsers

Browser is a program that enables a computer to locate, download, and display documents containing text, sound, video, graphics, animation, and photographs located on computer networks. The act of viewing and moving about between documents on computer networks is called *browsing*. Users browse through documents on open, public-access networks called *internets*, or on closed networks called *intranets*. The largest open network is the Internet, a worldwide computer network that provides access to sites on the World Wide Web (WWW or simply, the Web).

Browsers allow users to access Web information by locating documents on remote computers that function as Web servers. A browser downloads information over phone lines to a user's computer through the user's modem and then displays the information on the computer. Most browsers can display a variety of text and graphics that may be integrated into such a document, including animation, audio and video. Examples of browsers are Netscape, Internet Explorer, and Mosaic.

Browsers can create the illusion of traveling to an actual location in virtual space (*hyperspace*) where the document being viewed exists. This virtual location in hyperspace is referred to as a *node*, or a Web site. The process of virtual travel between Web sites is called *navigating*.

Common features found in browsers include the ability to automatically designate a Web site to which the browser opens with each use, the option to create directories of favorite or useful Web sites, access to search engines (programs that permit the use of key words to locate information on the Internet, an internet or an intranet), and the ability to screen out certain types of information by blocking access to certain categories of sites.

A browser's performance depends upon the speed and efficiency of the user's computer, the type of modem being used, and the *bandwidth* of the data-transmission medium (the amount of information that can be transmitted per second). Low bandwidth results in slow movement of data between source and recipient, leading to longer transmission times for documents. Browsers may also have difficulty reaching a site during times of heavy traffic on the network or because of high use of the site.

Fig. 12.0: Safari logo

The most commonly used browsers for the Web such as Internet Explorer, Mozilla Firefox, Opera, Google Chrome and Safari are available for free or for a small charge and can be downloaded from the Internet. Browsers have become one of the most important tools—ranking with e-mail—for computer network users. They have provided tens of millions of people with a gateway to information and communication through the Internet.

Authoring software

Authoring software is an application development system designed primarily for creating programs, web pages, databases, and materials for computer-aided instruction. Authoring software is very technical, and like all technical software, a lot goes into it creation and usage. Common authoring software includes Microsoft FrontPage and Acrobat Dream Weaver.

Desktop publisher

Desktop Publishing is the use of a computer and specialized software to combine text and graphics to create a document that can be printed. Desktop publishing is a multiple-step process involving various types of software and equipment. The original text and illustrations are generally produced with software such as word processors and drawing and painting programs and with photograph-scanning equipment and digitizers. The finished product is then transferred to a page-makeup program,

Fig. 12.1: Desktop Publishing

which is the software most people think of as the actual desktop-publishing software. This type of program enables the user to lay out text and graphics on the screen and see what the results will be; for refining parts of the document, these programs often include word-processing and graphics features in addition to layout capabilities. As a final step, the finished document is printed either on a laser printer or, for the best quality, by typesetting equipment. Examples of desktop publishers are Microsoft Publisher and Adobe Page Maker.

Games

It is hard to talk of computer programs without talking of games. Games are a popular pastime for both children and adults. Categories include strategy games, sports games, adventure and exploration games, card and board games, puzzle games, fast-action arcade games, and flying simulations. Some software programs employ game-play elements to teach reading, writing, problem solving, and other basic skills. In computer games, players can use a keyboard to type in commands, a mouse to move a cursor around the screen, or sometimes both. Many computer games also allow the use of a joystick or game controller.

DIFFERENCES BETWEEN OPEN SOURCE AND PROPRIETARY SOFTWARE

Open Source Software is a type of software in which the original source code (the type of programming language and the method used) is openly available for users to examine and modify, and to use to run or to create computer programs. One of the best-known examples of open source software is Linux, which is widely used as an alternative to commercial operating system (OS). Open source software includes a license to use, modify, and redistribute the code. Commercially sold software products can be developed from open source software.

Open source software is considered distinct from free software, which is also open source but can be used for any purpose and without any costs or restrictions. Both open source software and free software are different from software provided for free (freeware) by commercial software manufacturers that do not allow access to the original source code.

A central features of open source software is that users can review the software, add features to it or hire programmers to add features, or fix errors known as bugs, rather than wait for the original software publisher or creator to bring out a new version. With open source software, programmers—many of them nonprofessionals—contribute to the computing community by making their improvements and bug fixes available to other users.

Fig. 12.3: open source logo

This type of peer review is open to community input, standards, and verification, and is thought to lead to more reliable software. It is also thought to speed up the software development process. In some cases, the peer review may be uninfluenced by deadlines or other commercial concerns. However, as open source software development has evolved, companies such as the International Business Machines Corporation (IBM), Sun Microsystems, Inc., Microsoft Corporation, Apple Inc., and others have offered an increasing number of open source products.

Growing segments of both government and business have adopted some open source software such as Linux. Other commonly used open source products include the Apache open source program for Web servers and the Web browser Mozilla Firefox. OpenOffice offers open source applications similar to commercial products such as Microsoft Office.

Potential drawbacks to using open source software include incompatibility with different applications or devices run with commercial software platforms such as Microsoft's Windows or Apple's Mac OS. Security features included in commercial software may also block some open source software. Similarly, open source software may lack security features, making it vulnerable to hacking or infection with harmful software such as computer viruses. Finding help in solving problems that occur with open source software may require much more effort, particularly if the user is not an expert with computer code.

Proprietary software

At the opposite end of open source software is proprietary software. Proprietary software is software licensed and sold under legal right of its owner. That is even though the owners sell the software, they still have right to it. The buyer, or licensee, is given the right to use the software under certain conditions, but restricted from other uses, such as modification, further distribution, or reverse engineering (remember all these can be done with open source software).

Fig. 12.4 proprietary software logo

Restrictions on proprietary software are enforced by either legal or technical means, or both. The most common form of technical restriction is by releasing "*closed-source*" programs that are only computer-readable (for example, in binary format), and withholding the human-readable source code. Legal means of enforcement include copyright (possibly with a restrictive software license) and patents. The source code of such programs is usually regarded as a trade secret by the owner. Access to source code by third parties commonly requires the party to sign a special agreement known as a *non-disclosure agreement* (NDA). Use of software is enforced by contract law.

Exclusive legal rights to software by a proprietor are not required for software to be

Semi-free software, as defined by the Free Software Foundation, is software that is not free software, but comes with permission for individuals to use, copy, distribute, and modify either for non-profit purposes only or with the prohibition to redistribute modified copies or derived works. Such software is also rejected by the Open Source Initiative and Debian. PGP and *Angband* are examples of semi-free programs. The Free Software Foundation classifies semi-free software as non-free software, but draws a distinction between semi-free software and proprietary software.

Free software licenses use the same laws used by proprietary software, but to preserve the rights to use, copy and modify the software. This technique is used with copyleft, but with other software as well. Free software companies and projects are also joining into patent pools like the Patent Commons and the Open Invention Network. See software patents and free software.

Well known examples of proprietary software include Microsoft Windows, Adobe Flash Player, PS3 OS, iTunes, Adobe Photoshop, Google Earth, Mac OS X, Skype, WinZip, and some versions of Unix.

LAUNCHING APPLICATION SOFTWARE

Alright, so much for the theory stuff. Now let us jump start the real stuff by *launching* some applications. To launch an application is to start or execute it and use it features. But, before you can launch a program it must be installed on your computer system. To install a program is to go through its setup process in order to fix it and all the files and folders accompanying it onto the hard disk. There are many ways of launching a program in Windows XP.

1. By using the start menu
2. By using the desktop icons
3. The fourth method which is not common to all programs is the use of the quick launch button on the task bar.
4. Using the system tray (also not common to all programs)

Let us try and launch the most popular word processor in the world, Microsoft Word using all the methods above.

Launching Microsoft Office Word

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1. using the star menu

There are three basic was of launching a program using the start menu.

i. By using the all programs menu

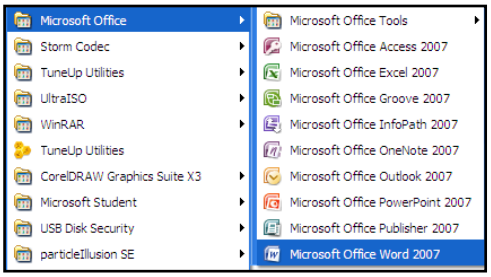
ii. By using the frequently used programs menu

iii. By using the recently used documents

i. using the all programs menu

- Click the (start) button. This displays the start menu.
- Point on all programs. (shows all the programs installed on the computer)

- Point on Microsoft Office (the arrow indicates that it is a folder and there are files within)
- Click on Microsoft Office Word (2003, 2007, 2010 etc. (the program loads and a blank document opens). There you are! Congratulations!

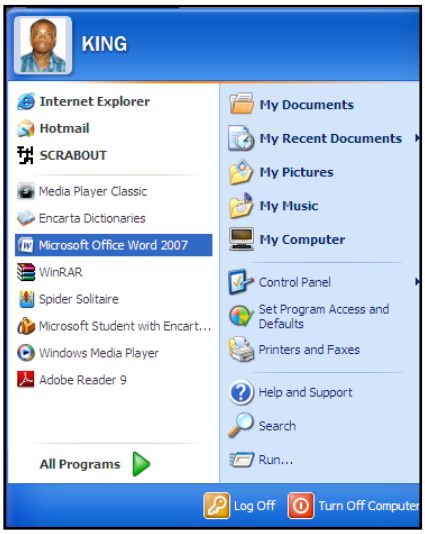


ii. Using the frequently used programs menu

Windows automatically put the programs used most in a special folder. To launch Microsoft Office through that:

- Click on the start button. 

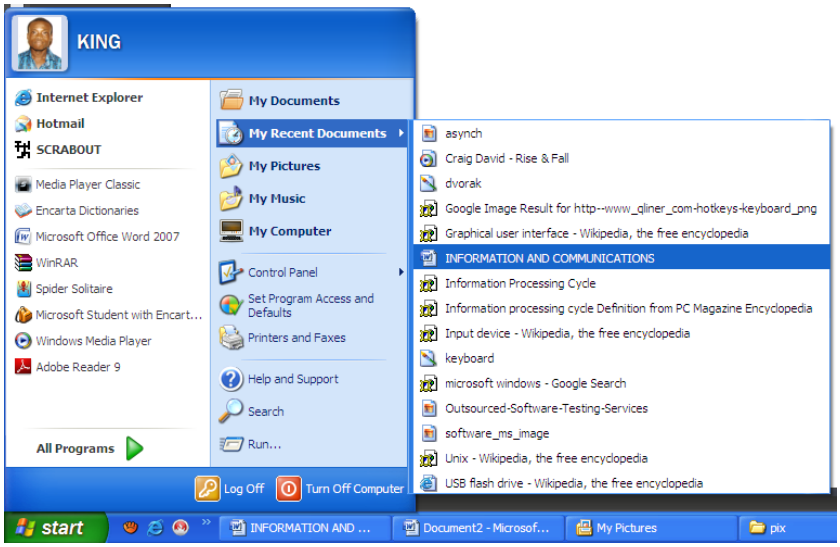
- Click on Microsoft Office Word. (The program loads and opens a document blank opens). Voila.



NOTE: *the program is only added to the frequently used program menu if it is used continuously.*

iii. Using the recent documents

- Click the start button. 
- Click on My Recent Documents. A drop-down menu appears with the programs used recently.



- Click on the name you assigned to the Microsoft Word document created when you last launched it. (The program loads and opens the document you created under that name).

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2. Using the desktop icons

When a program is installed, a picture representation of that program (called an icon) is automatically placed on the screen (desktop). The icon is known as a shortcut.

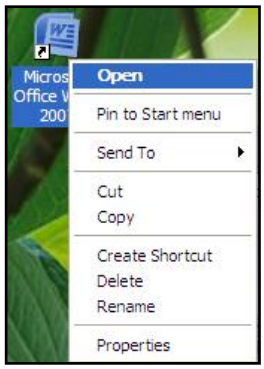
To launch Microsoft Office Word using the desktop icon,

i. Double-click (click in quick succession) on its icon the desktop.

Or

ii. Right-click (click the right mouse button) on the icon.

iii. Click open. (The program loads and opens a blank document).



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3. Using the quick launch toolbar

The quick launch buttons are the tiny icons found on the left hand corner of the taskbar next to the start button. Let us launch Internet Explorer using the quick launch toolbar.

- Locate the Internet Explorer icon on the Quick Launch toolbar at left-hand corner of the taskbar and click on it.

4. Using the system tray

The right-hand side of the taskbar is called a system tray. There are other small icons representing some programs which start when Windows starts. To launch any of those programs, just double-click that icon

TEST YOURSELF

1. Discuss the various types of software packages.
2. Briefly describe five known operating systems.
3. What is application software?
4. Identify five types of application software.
5. Discuss the differences between open source and proprietary software.
6. Describe how you will launch an application using:

    a. The All Programs menu

    b. The frequently used programs menu.

    c. The Recently Used Documents folder.

    d. Desktop shortcut.

Chapter 5

KEYBOARDING AND MOUSE SKILLS REVIEW

OBJECTIVES

After completing this chapter, you should be able to:

vi. Type 30 – 35 words per minute.
vii. Use mouse skills in document creation
viii. Use the numeric keypad.

INTRODUCTION

One of the most interesting and yet for some people, difficult things, especially for beginners in computing is the use of the keyboard. The keyboard as we discussed earlier is the most important input device, and as such can do some of the tasks of other input devices. The primary job of the keyboard is entering text data into the computer. Knowing how to use the keyboard to enter text data quickly is a plus to all computer users. While some people can type from forty to fifty words per minute, others spend a lot of valuable time trying to figure out exactly where the individual keys are located on the keyboard before they hit on it. but with constant practice they can improve their typing speed. Let us consider how we can improve our typing speed.

IMPROVING TYPING SPEED

When typing your fingers rest on the middle row of the keyboard – known as home row. The home row is the point from which all the other keys can be reached.

- Place your fingers on the home row.
- Put your left hand fingers on keys **A, S, D, F**. (ignore the thumb)
- Put your right hand fingers on keys **J, K, L, ;**
- Now, let the thumb rest on the space bar.
- Keep your wrists straight and your fingers curled.

Fig. 12.5 the home row

- Make sure that your fingers are on their home run keys.
- Move your left index finger from F upwards to T. your hand may move slightly to make it easier t reach.
- Click T and return the finger back to it home run key.

The diagram below shows the various keys that the fingers will reach from their home row keys. Try the individual moves on your keyboard.

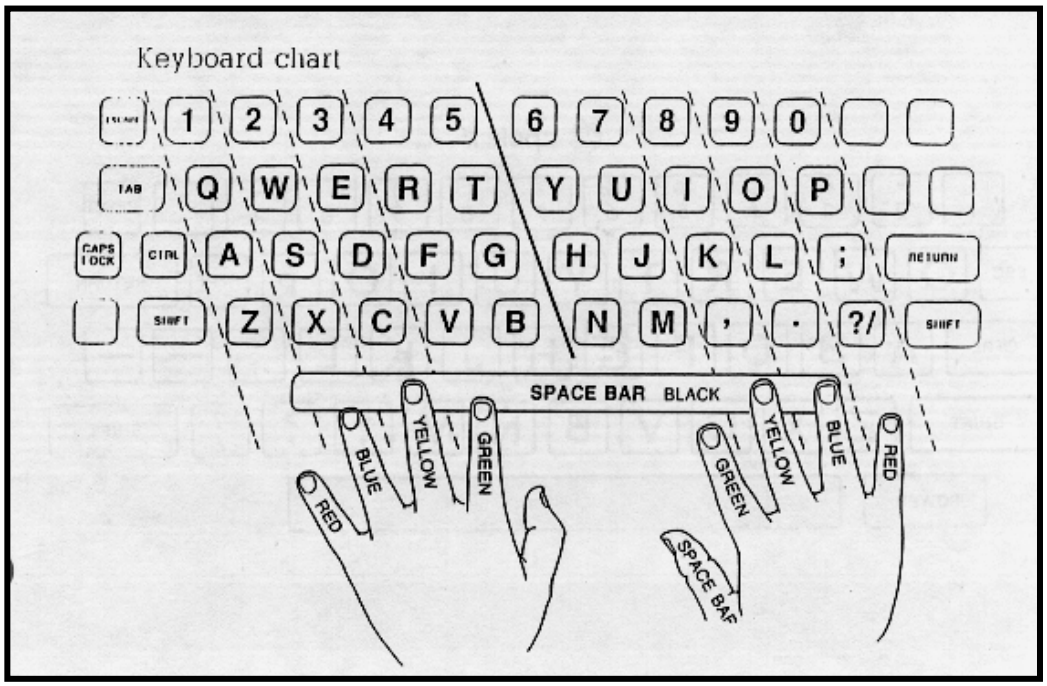


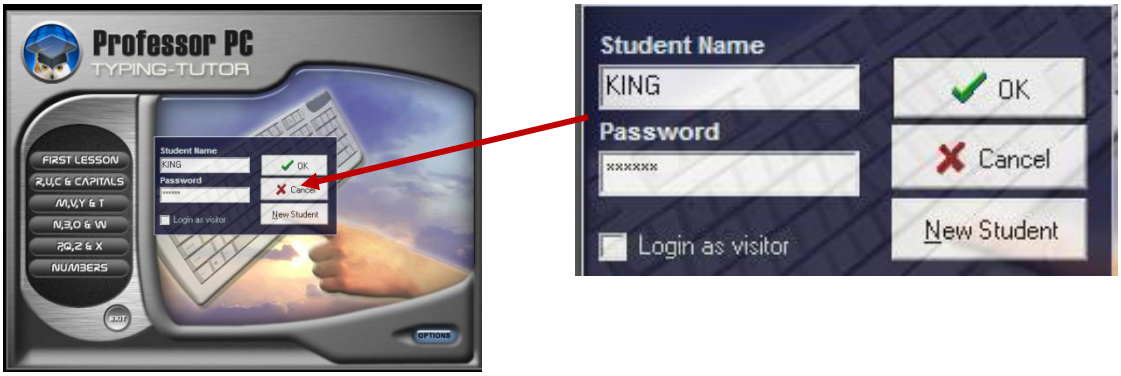
Fig. 12.6: keys to reach from the home row

There are some programs such as Mavis Beacon, Professor PC Typing Tutor and Typing Master which are ready to make a better typist out of any diligent computer user. Let us see how these programs can assist in speeding up our typing speed.

Professor PC Tying Tutor

Supposing it is installed on your computer, launch it as we did Microsoft Office Word in the previous chapter.
When you launch it will load and open a page and ask you to register.

1. **Type your Student Name and Password and click on "New Student"**

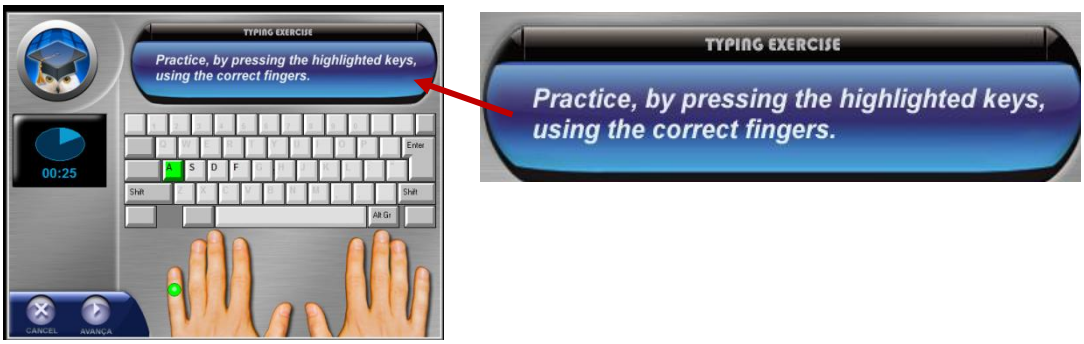


2. **Click on FIRST LESSON.**

3. Click on **Beginning - [a,s,d,f]**

4. That takes you to the main lesson area.

5. Click the start Button  and follow the instructions promptly.



You can download the free trial version of Professor PC Typing Tutor at typing-tutor.com.

USING MOUSE SKILLS IN DOCUMENTS

The next most important input device is the mouse. Most people got their first touch to the computer by holding the mouse. Holding and using the mouse correctly will not only help you work faster, but will also prevent mouse related strains to your body. To start with, let us know the various mouse buttons.

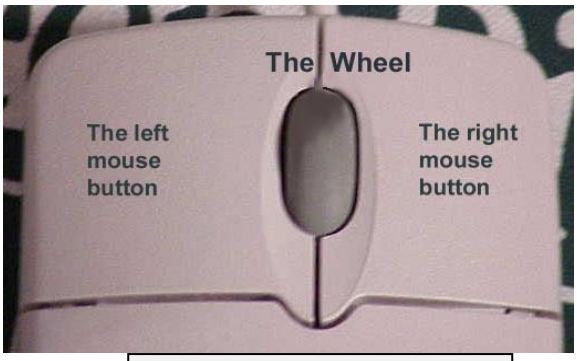


Fig. 12.7: the mouse buttons

The button at the left-hand side is known as the left mouse button. It is the most used and thus, the most important button on the mouse.
To the right-hand side is a button known as the right mouse button.

Now let us learn how to handle the mouse. The mouse is designed to be small enough to fit into the hand. When you hold the mouse:

- Put the heel of your hand on the table.
- Hold the mouse between thumb and the ring fingers.
- Put your index finger on the left mouse button.
- With the base of the mouse touching the table or mouse pad, move the mouse gently around. What happens? YES, the small arrow on the screen moves in the same direction. The small arrow is known as mouse pointer.

Fig. 12.8: how to hold the mouse

Let us try some of the frequent mouse actions.

Clicking

The act of pressing and releasing the **left mouse button** is term clicking. Sometime it is referred to as single-clicking.

Let us click some of the icons on the desktop.

- Move the mouse pointer to the My Computer icon on the desktop.
- Click it (i.e. press the left mouse button).
- What happens? That is right. The My computer icon is highlighted. That action is called selection.
- Click anywhere on the desktop to deselect the My Computer icon.

Double-clicking

The act of pressing the left mouse button twice in quick succession is known as double-clicking. Let us try that.

- Move the mouse pointer to the My Documents icon on the desktop.
- Double click it (i.e. click it twice quickly).
- What happens? The My Document folder opens to display it contents. This means that we double-click to open folders.
- Close the My Document folder by clicking on the **X** sign located at the top right hand corner of the window.
- Back to the desktop, double click on the Internet Explorer icon.
- It opens, right? Good. That means double-clicking also opens or launches programs.

Right-clicking

Pressing and releasing the right mouse button is referred to as right-clicking. This is different from clicking.

Now let us do some right-clicking.

- Right-click anywhere on the desktop. A menu pops out. Click out.
- Right-click on the My Computer icon. Another menu pops out.

Right clicking displays further options about a folder or icon.

Dragging

Dragging is the act of holding down the left mouse button and moving the pointer on the screen. If the mouse pointer is on top of an object at the time the mouse button is pressed, dragging the mouse can also move the object. In other circumstances, dragging the mouse can select blocks of text, move icons on a desktop, resize a window, and so on.

Let us drag some items around.

- Click on the Recycle Bin icon on the desktop.
- With your finger still on the left mouse button, slide it to a different position.

- What happens? The Recycle Bin icon moves to a new location.
- Open the Recycle Bin.
- Point to the title bar (i.e. the bar at the top of the window which displays the folders name).
- Drag it around. Lovely isn't it?

USING THE NUMERIC KEYPAD

The numeric keypad is located at the right hand side of the keyboard. It contains only numbers, mathematical symbols for addition, subtraction, multiplication, and division, a decimal point, and several function keys (e.g. End, Delete, etc.). They are often used to facilitate data entry with smaller keyboard-equipped laptops or with smaller keyboards that do not have a numeric keypad. A laptop does sometimes have a numeric pad, but not all the time. The numeric keypad consists of the following types of keys:

Fig. 12.9: numeric keypad

- arithmetic operators such as **+, -, *, /**
- numeric digits 0-9
- cursor arrow keys
- navigation keys such as Home, End, PgUp, PgDown, etc.
- Num Lock button, used to enable or disable the numeric pad

The primary importance of the numeric keypad is, it helps in entering numeric data quickly. Knowing how to use the keyboard fully including the use of the numeric keypad will save you more time.

Let us go back to Professor PC – Typing Tutor.

This time round after logging in select, 

and start the tutorials with the professor.

You can still learn typing if you have not downloaded the free-trial version of Professor PC – Typing Tutor yet, and do not have any typing tutor. Just follow the drills at the latter part of the book. It is tedious and not as interesting as computer based tutors, but it better than none.

Chapter 6

WORD PROCESSING

OBJECTIVES

After completing this chapter, you should be able to:

i. Identify Word Processing packages.
ii. State the importance and use of Word Processing
iii. Create a document using the Word Processor.
iv. Save a document using the Save command.

INTRODUCTION

During the bygone era, when computers were not or little head of, people had to go through a lot of hard labour to create a simple document. Type writer came to ease up the pressure a little, but did not give much room to one indispensable attribute of humans, mistakes. If you make an error getting to the end of a lengthy document, you will be left with no option but to start all over again.

The dawn of computers brought with it some kind of panacea for creating voluminous documents easily and almost stress-free. The panacea is word processors. Word processors, as we discussed under Software, are programs that are used to produce all sorts of documents.

WORD PROCESSING PACKAGES

There is countless number of word processing packages or word processors on the market, all committed to helping computer users create documents effectively. Not only do word processing packages help in document creation, but they also enable the user to add graphics to their work and select the type of colours and fonts they want for their works.
Word processing packages, though, relatively easy to use, yet some require a great deal of know how before thy can be used effectively. Let us consider some of the popular word processing packages available.

Microsoft Word

Microsoft Word is a word processor designed by Microsoft. It is sold separately and as part of Microsoft Office, an integrated software suite. It was first released in 1983 under the name Multi-Tool Word for Xenix computer systems. Subsequent versions were later written for several other platforms including IBM PCs running DOS (1983), the Apple Macintosh (1984), the AT&T Unix PC (1985), Atari ST (1986), SCO UNIX, OS/2, and Microsoft Windows (1989).

Fig. 13.0: Microsoft Word logo

Microsoft Word is the most popular word processor in the world, and is the preferred choice for creating, designing and typing books, memos, letters, resumes etc. Microsoft Word has some features of a graphics program as well as desktop publishing program, so it can also be used for carrying out some graphics and some desktop publishing-related jobs such as poster designing, flyers and what have you.

Writer

OpenOffice.org Writer is the word processor component of the OpenOffice.org software package. Writer is a word processor similar to Microsoft Word and Corel's WordPerfect, with some of their features. Writer can be used across a variety of platforms, including Mac OS X, Microsoft Windows, Linux, FreeBSD, Irix and Solaris. Writer is free software.

Writer provides a number of features not present in Word out of the box, including a word completion mechanism for predictive writing that is not available in Microsoft Word as of September, 2009. It has ability to export to the PDF format natively (also available in Microsoft Office 2010 and in Microsoft Word 2007 via a free download).

Grammar checking requires the installation of an extension. Document templates are also available as extensions for OpenOffice.org. Writer can do most of the tasks that Microsoft Word can do. An added benefit of Writer shows when saving work, the program has the ability to save documents in Microsoft Word format.

WordPad

WordPad is a basic word processor that is included with almost all versions of Microsoft Windows from Windows 95 upwards. WordPad can format and print text, but lacks intermediate features such as a spell checker, thesaurus, and support for tables. As such, it is suitable for writing letters or short pieces, but underpowered for work that relies heavily on graphics or longer works such as books. It can open Microsoft Word files, although it opens newer versions of the .DOC format with incorrect formatting.

Fig. 13.1: WordPad icon

Text editor

Text editor is a type of program used for making changes to plain text files. Text editors accompany operating systems or software development packages. Some text editors are small and simple, while others offer a broad and complex range of functionality.

Text editors made for professional computer users place no limit on the size of the file being opened; they rather start quickly even when editing large files, and are capable of editing files that are too large to fit the computer's main memory. Simpler text editors often just read files into an array in RAM. On larger files this is a slow process, and very large files often do not fit.

Corel WordPerfect

One of the founders of word processing software is Corel, and its WordPerfect suite contains several features essential for word processing for business and home users. WordPerfect's word processor allows users to save documents in a Microsoft Word format and to import Word documents.

Fig. 13.2: WordPerfect logo

IMPORTANCE OF WORD PROCESSING

Word processors are some of the most used applications in the world. There are a vast range of uses for word processing software. They are chiefly used in businesses to create all sorts of documents such as memos, letterheads, legal documents and agreements, reference materials, letters, reports writing and pay slips. Word processors are the backbone of some businesses such as the book and news paper production outfits.

Schools aim at training their students to fit into the world market, and what is the best way to do this, teaching them how to use the software that the businesses use most? For this reason schools and colleges use word processor to teach their students. Not only that, word processors are also used to produce some academic materials such as books, pamphlets, handouts, notices and students reports.

The uses of word processors are not limited to schools and businesses but are also used extensively at home. People, (i.e. students, teachers or business executive) spend most of their time a home. So if they have to produce any document at all, guess where they do start it. Yes, home. Many people even sleep with their computers just to be able to produce some documents.

Word processors are most of the time used as substitute for graphics software, and are, therefore used to design posters, flyers and packages designs. These products are normally pasted or given out in public places such as bus terminals and railway stations.

GROUP DISCUSSION

Teacher to guide students to discuss and come out with the importance of Word processing

CREATING DOCUMENT USING A WORD PROCESSOR

Now that you know the important of word processor, I know that you really want to get your hands to it. We will use Microsoft Word to create some documents, but before that let us get to know it better. First follow the steps below to launch Microsoft Word 2007:

- Click on the start button.
- Point to all programs.
- Point to Microsoft Office.
- Click on Microsoft Office Word 2007. Waite for it to load.

Let us examine the features of Microsoft Office Word 2007.

Features of Microsoft Word 2007

This is how a blank Microsoft Word 2007 document looks like. The features have been labeled to help you know them better.

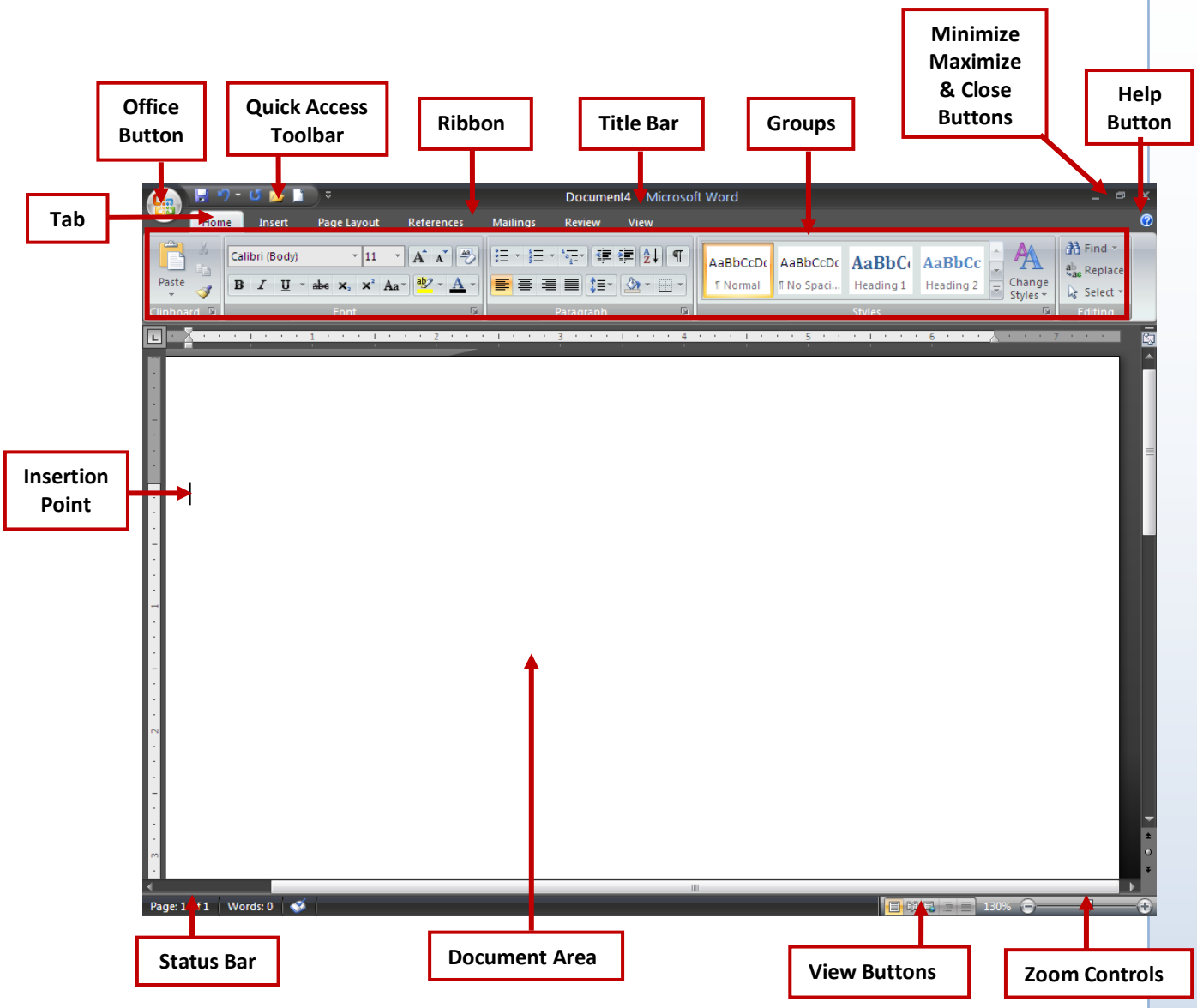


Fig. 13.3: Word 2007 Window

Office Button menu

Earlier versions of Word had various menus (such as File, Edit, View, and Format) in the menu bar. Word 2007 has only the Office Button menu. This menu contains some of the commands that used to appear on the File menu in earlier versions of Word. You can open this menu by clicking it or by pressing ALT and then F (ALT, F).

Quick Access Toolbar

The Quick Access Toolbar is a toolbar that provides quick access to the commands represented by the buttons you put on it. When you first start Word, the Quick Access Toolbar appears in its small version

---

Title bar

The title bar shows the document's name and the program's name. When you've just opened Word, and the document's name is Document1, this information is not much help. But when you've got many documents open, the name helps you distinguish one document from

another or one version of the same document from another. Word uses a separate window for each document you open, rather than opening each document as a smaller window within the main program window (as some other programs do).

Minimize button, Maximize/Restore Down button, and Close button
Use these buttons to resize or close the window. These buttons are standard on most Windows programs, so you're probably used to the way they work: Click the Minimize button to reduce the window to a button on the taskbar, click the Maximize/Restore Down button to flip between a maximized window and a "normal" (non-maximized) one, and click the Close button to close the window.

Status bar This bar across the bottom of the window provides a page readout, spell-check status, and other information about the document. Word displays different information on the status bar depending on what you're doing.

View buttons Click a button to change the view—for example, from Print Layout view (which shows each page approximately as it will print) to Outline view (which shows the document as an outline of different heading levels). You'll learn more about views toward the end of this chapter.

Zoom controls The readout at the left end of the zoom controls shows the current zoom percentage. You can zoom by dragging the slider or by clicking the – (minus) and + (plus) buttons.

Insertion point A slowly blinking thin vertical line, the insertion point marks the point at which characters you type will land in the document.

Document area This area is where you create your document. The insertion point indicates where text you type will appear in the document.

View buttons These buttons let you change quickly from one of Word's five main views to another.

Help Button Click this button to display the Help window, in which you can search for help on any Word topic.

NOTE: *the features above are quite different from the features of the previous Microsoft Word.*

Our next step is getting to know the frequently used keys on the keyboard for word processors and what they do.

Frequently used keys	**What they do**
ENTER	Moves the insertion point to the beginning of the next line
SPACE BAR	Deletes characters before the insertion point
BACK SPACE	Spaces up text by one step
DELETE	Deletes characters after the insertion point
TAB	Moves the insertion point several spaces to the right, for creating indent
CAPS LOCK	Turns letters to either upper-case or lower case
ALPHA-NUMERIC KEYS	Presents the pressed character to the document

Let us create our first Microsoft Word document, a letter to your ICT teacher, thanking him for helping you know ICT.

Follow the steps below.

i. Press the TAB key seven times to create an indent for your address. Always press the **ENTER** key to move to a new line. The inserting point returns to the beginning of every new line. Use the **TAB** key to create the indent.
Refer to the example below.

ii. Type your teacher's address. (ENTER twice)

iii. Type the salutation (ENTER)

iv. Press TAB to create an indent; press CAPS to capitalize the next characters.

v. Type the title of the letter. in CAPS, please (ENTER)

vi. Type the body of the letter. (ENTER)

vii. Press TAB to create indent for the subscription. WELL DONE!

Your document should look like this:

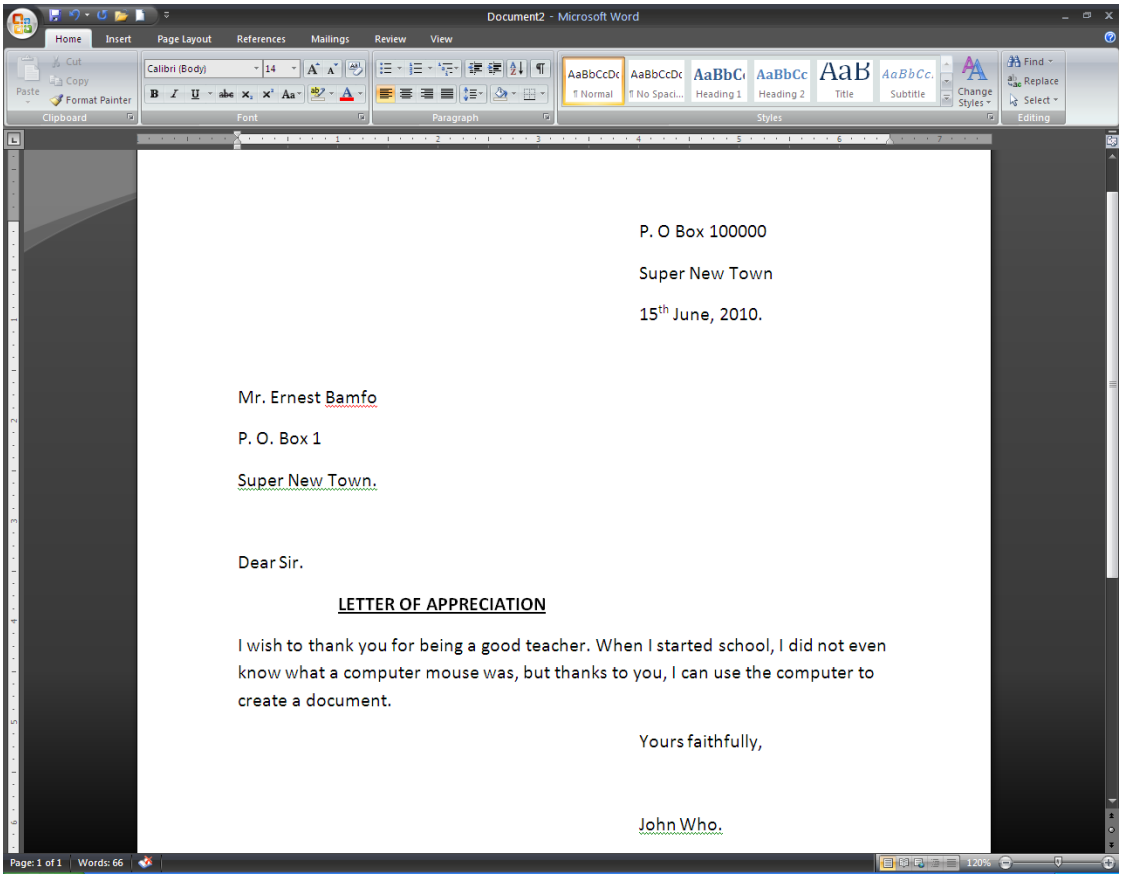


Fig. 13.4: your document looks like this one

If you document looks like this, bravo; otherwise make the corrections, and save it.

SAVING DOCUMENT USING THE "SAVE AS" COMMAND

It is very vital to save every project you do on the computer. This will cause the project to be stored on the specified storage device, principally, the hard disk. Saved project can be opened and edited in later.

Follow these steps to save your letter:

- Click on the office button at the top left corner of the window.
- Point on "Save As"
- Select Word Document.

A small window known as the Save AS dialogue box opens. (Look below).

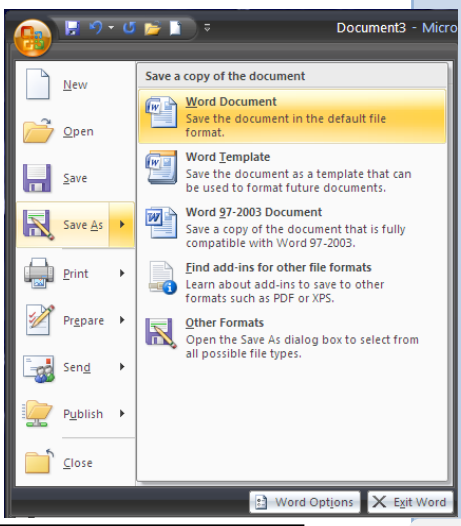


Fig. 13.5: Office menu

- Under File Name: type a desired name for your document, e.g. LETTER.
- Under Save in: select the location or directory you want your document to be stored. The default directory is "My Documents" folder.
- When you finish click on Save.

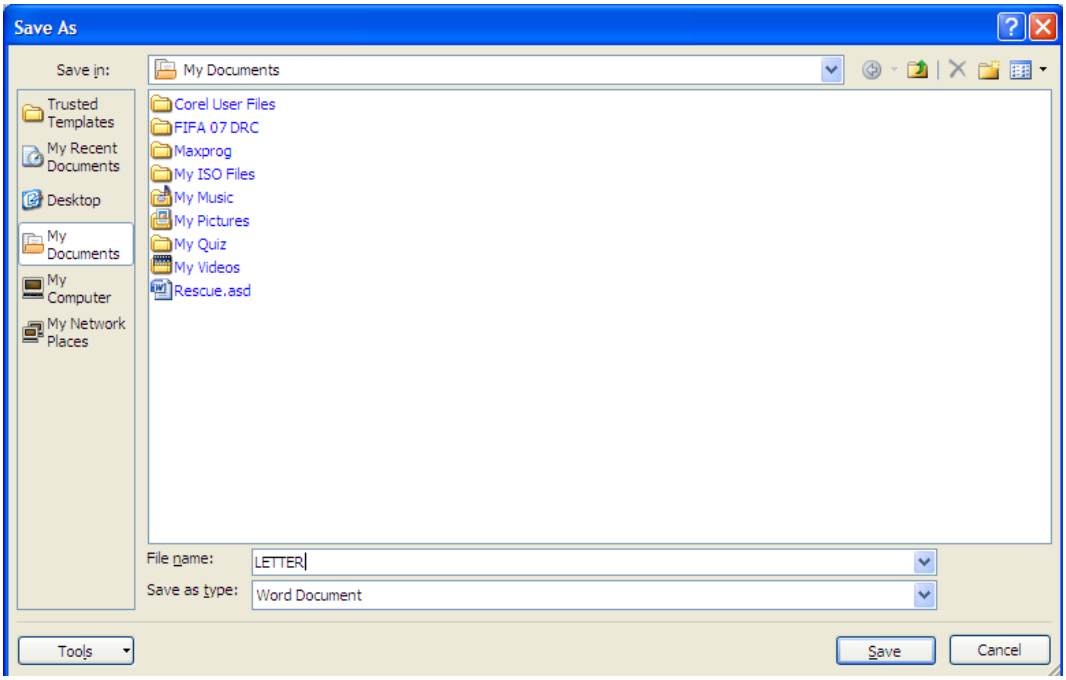


Fig. 13.6: the Save As dialogue box

That takes you back to where your document is. Look at the name on the Title bar. What has happened? Yes, the title of your document has changed to the file name you specified, LETTER.

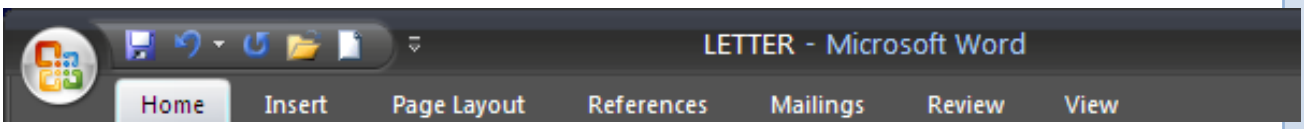
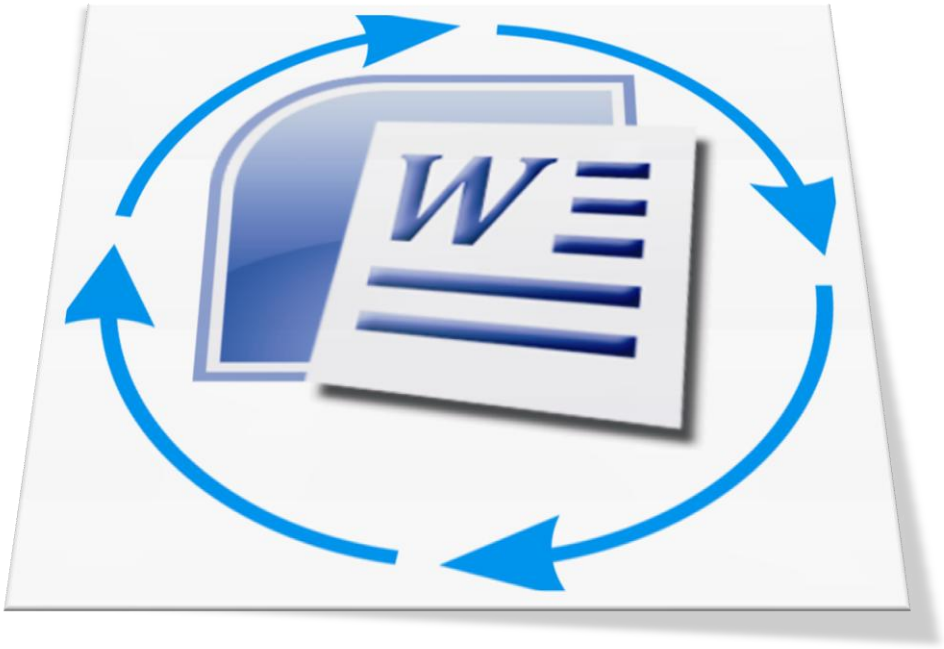


Fig. 13.7: new document name on the title bar

ACTIVITY

Students to type a letter using name and save in folder.



Chapter 7

EDITING TEXT IN WORD PROCESSING DOCUMENT

OBJECTIVES

After completing this chapter, you should be able to:

i. Edit and save Word document using editing tools.

INTRODUCTION

Editing is the act of opening a saved project and making changes to it. The first version of a document is referred to as a draft. Drafts do not always produce the desired effect, because they are normally produced in haste. Editing a document gives it the finishing that is wanted. Microsoft Word, like most software, makes it easy for documents to be retouched and resaved. In this chapter, we will edit the document we created in the last chapter, and to do that let us open it.

Do you remember the third method of launching software using the start button? You are right. Using the My Recently Documents. Since the letter we typed is our recent document,

we will the My Recent Documents option. Follow that step to open the document you created.
Another way of opening a saved document is by opening the directory in which you save it, and then double clicking on the document file.
You can also open the document by opening a blank document; clicking on the office button; and then selecting the document from the Recent Documents menu.

Editing word document using spell check functions

Microsoft Word underlines the words which are either wrongly spelt or are not in it dictionary. The feature known as Spell Check can be used to make the necessary corrections.
If you have opened the document you would see that the word *Bamfo* has been underlined with a red-wavy line. It means the computer does not understand it. We know that the word is correct, so to remove the red line, right-click on the word and select "ignore". That settles it, the red line is gone.
Now let us create some spelling mistakes and the correct them. In the document, remove the letter a from *teacher*. What happens? Red-line! The computer does not have *techer* in its dictionary.
Let us remove the red line.

- Right-click on *techer*.
- The computer gives you some spelling options.
- Select the correct option, *teacher*. Word corrected.

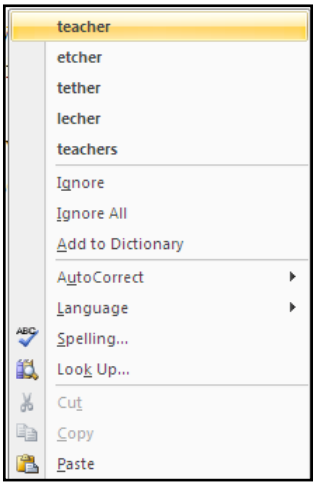


Fig. 13.8: spell check drop-down menu

There are some other cases where you might have more than one spelling mistake in your document. You can either use the above method to correct them one by one, or:

- Right click on the word.
- Click on spelling. A dialogue box opens.

Here the spelling mistakes are presented to you one after the other. Try the various options tabs there to see what they do.

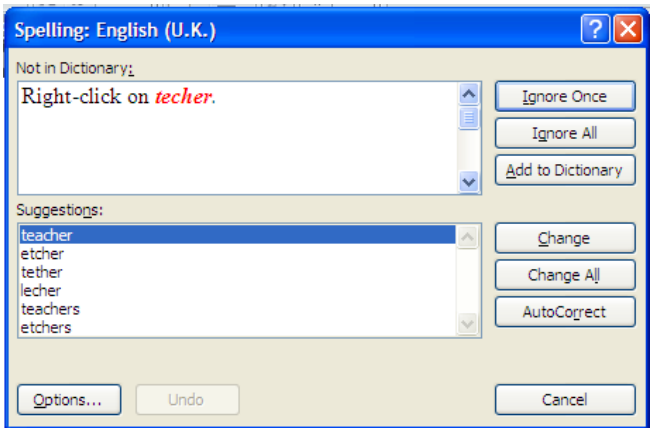


Fig. 13.9: spelling dialogue box

Take another look at the document. The words "Super New Town" has been give a green underline. Microsoft Word underlines a word or sentence with green wavy-line if the word is wrongly used or the sentence contains a grammatical error. To remove the green line:

- Right-click on the word or sentence.
- You can choose to ignore it or
- Click on Grammar. That opens another dialogue box similar to the one above. Choose the option you want.

Editing word document using copy, cut and paste

To copy or cut a group of texts, they must first be selected. To select a group of texts

- Click the beginning or ending of the group of texts.
- Drag to the right or left to highlight them.

Let us try that on our document. Select the words "computer mouse".

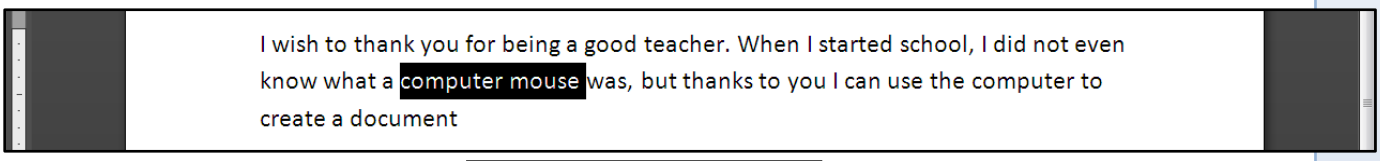


Fig. 14.0: selecting words

Now, let us copy the selected words. To do that:

- Right click on the selected words.
- Right-click on the selected words.
- Click on Copy.

The copied words are stored in a temporal memory known as clipboard. A clipboard stores a copy of the last information that was "copied" or "cut." A "paste" operation passes data from the clipboard to the current program. A clipboard allows information to be transferred from one program to another, provided the second program can read data generated by the first.

Let us paste our copied words to do that

- Right-click a blank portion of the document.
- Click on Paste. What happens?

We can use a similar approach to cut texts or word.

- Select the words you want to cut, e.g. "computer mouse" form our document.
- Right-click on it.

- Select Cut. Cutting texts, words or graphics moves them to the clipboard.
- Place the insertion point in front of "Dear Sir"
- Right-click and select paste.

Your letter should read like this:

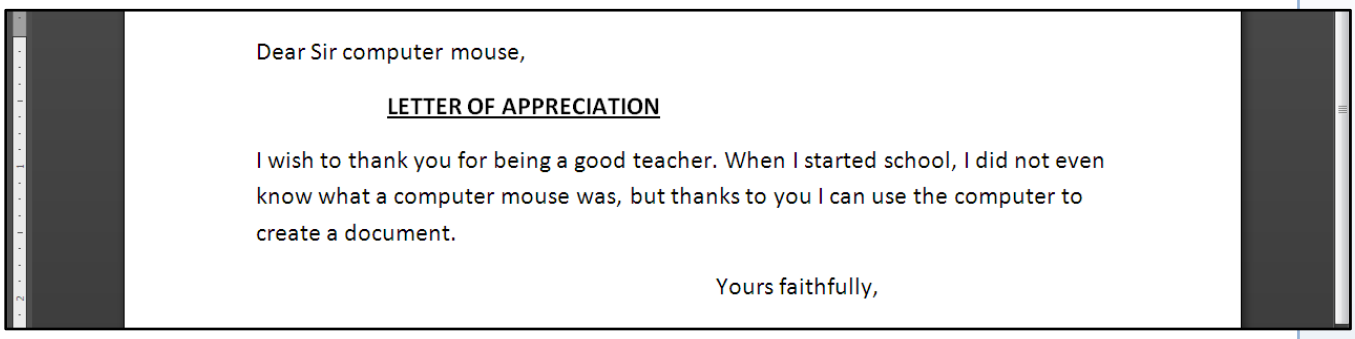


Fig. 14.1: edited letter

Editing Word Document using OVR

OVR stands for **overtype**. This is a feature in Word which makes it possible for an already typed word to be replaced by another word. To turn on OVR:

- Click on the office button
- Click on Word Options
- Click on Advanced
- Check Use overtype mode
- To be able to turn OVR on and off with the insert key, check "Use the Insert key to control overtype mode".
- Click OK.

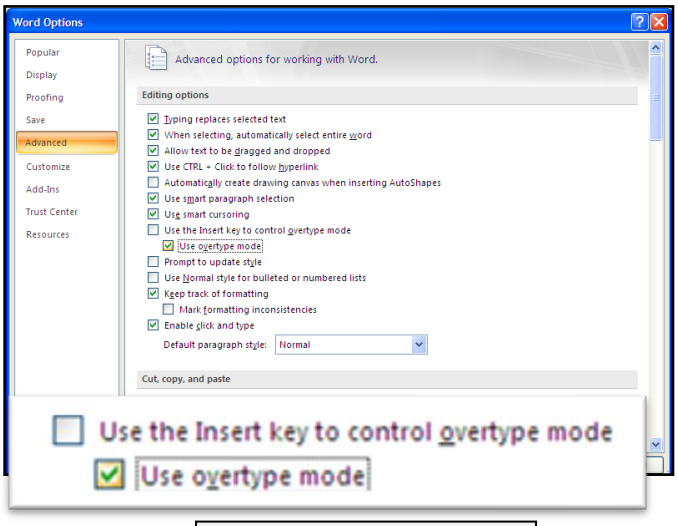


Fig. 14.2: applying OVR

Let us use OVR on our letter.

- Place the insertion point before the word "start"
- Type the word begun.

You will notice that each key you press replaces one word, so the word "began" replaces start.

Editing Word Document Using Undo and Redo buttons

Two new words to add to your vocabulary if you have not come across them already - undo and redo.

Undo
To undo an action is to reverse the last action—for example, to undo a deletion, thus restoring the text to a document.
To undo an action just click the undo button  located at the top left corner of the window.
That will undo the last action. To undo multiple actions, click on the small arrow next to the undo button. A drop-down menu of all the actions done recently on the document will be shown. You can then select the actions you want to undo from the list.
CAUTION: undoing an action at the base or in the middle of the list will undo all the other actions on top of it.

Let us practice Undo on our letter.
Do you remember our last action on the letter? Yes, we replace started with begun.
Undo that. (just click on the undo button).
What happens? The last letter is replace by the previous letter.

Now, let try multiple undo.
Click on the small arrow next to the undo button to display a list of our recent action.
Move the mouse printer down to "Typing b" and click on it.
What difference does it have on your document?

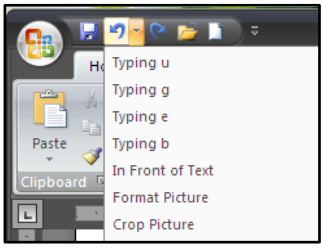


Fig. 14.3: undoing some actions

Redo

To redo an action is to repeat the action you just undid. The redo button  is located next to the undo button, and only becomes active when an action is undone. The number of actions undone determines the number of redo options available. For example, if you undo five actions, you can redo up to five actions.

Let us apply redo to our letter.

- Click the redo button. Notice the changes.
- Click it till it becomes inactive. What are the changes in the document?

Let us save our document.

- Click on the office button.
- Select Save.

Or

- Click on the save button on the ribbon. You can also save your document by using the short-cut keys – Ctrl + S.

Find and replace

Imagine working on a very lengthy document, and when you are about to finish you noticed that one name or word which you have been using throughout the document is actually the wrong one. You will surely have to scroll from page to page correcting that mistake, sounds like a really difficult task, but with the :Find and Replace" feature of Microsoft Word, this correction could be effected with a few mouse clicks and keyboard taps.

Find feature lets you quickly locate pretty much any part of a document, from a word or phrase to a special character (such as a paragraph mark), from direct formatting (such as bold) to style formatting, from text in a particular language to an object (such as a picture). Find's sister feature, Replace, lets you replace text, formatting, or styles, either one instance at a time or all instances in a single sweep.

Find Text

What you'll probably want to search for first is text—for example, a word that you know occurs in the part of the document to which you want to turn your attention. Word lets you search for text on its own or text with formatting.

To find text, follow these steps:

- Press CTRL-F or choose **Home | Editing | Find**. Word displays the Find And Replace
- dialog box with the Find tab foremost.
- In the Find What text box, type or paste the search text. To paste, right-click and then choose Paste from the context menu.

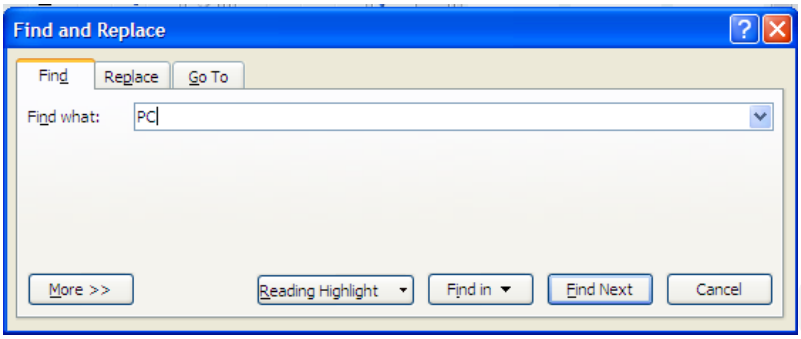


Fig. 14.4: Find and Replace dialogue box

Click on the Replace tab, and in the replace text box, type the word you to replace the found word with.

Word remembers the details of searches you've performed in this session. To retrieve an earlier search, click the drop-down arrow on the Find What text box and choose the search from the list. Word lists the searches in reverse order, so the latest search is first.

You can choose Replace to replace only the highlighted word, or Replace All to replace all instances of the found word.

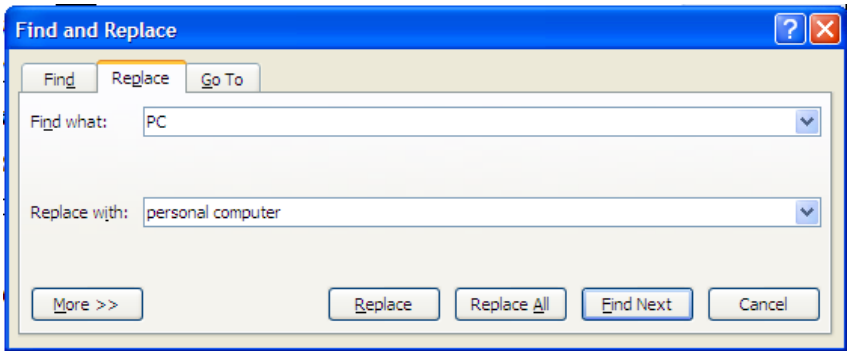


Fig. 14.5: replacing a word

Chapter 8

FORMATTING WORD PROCESSING DOCUMENT

OBJECTIVES

After completing this chapter, you should be able to:

i. Format Word document using formatting tools.

INTRODUCTION

One of the fascinating aspects in the use of word processors, especially Microsoft Word is the ability to give documents real, desired facelift. Apart from making it much easier to create and edit documents than typewriters do, word processors also make it easy to format documents—again, unlike typewriters. Word offers a wide variety of formatting that lets you make documents look pretty much exactly how you want them to: professional, casual, serious, fun, or anywhere in between. In fact, Word offers enough different formatting options to be confusing, as the effects of some options overlap with each other.

This means that you can often produce the same look by using formatting in different ways. Word starts off most new documents you create in its standard typeface, or *font*, which is called Calibri. Most people find Calibri much more appealing, but you can change the font at any time if you don't like it or if you want to make your document look different or easier to

read. You can also change the font size, font color, the alignment, the line spacing, and many more formatting options, most of which you'll meet in this chapter. Word 2007 adds several new formatting options to those in earlier versions of Word. First, every document has a *theme*, a set of colors, fonts, and graphical objects that are designed to work together. Second, Word provides Quick Styles, suites of styles derived automatically from the font and colors in the theme. By applying Quick Styles (with a single click), you can give a document a consistent look. You can also use Word's long-standing regular styles to apply predefined sets of formatting to characters, paragraphs, lists, or tables. Styles give you precise control over formatting while helping you avoid reinventing the wheel every time you apply or change formatting.

Formatting a Word document using change font

In this section we are going to work around with *fonts*. Fonts are a set of characters of the same typeface (such as Courier), style (such as italic), stroke weight (such as bold), and size. A font is not to be confused with a typeface. Font refers to all the characters available in a particular size, style, and weight for a particular design; *typeface* refers to the design itself.

There are varieties of fonts already installed on your computer. The default font for as said Word, as said earlier, is Calibri. That is the font we used in our document. Let us open our last saved document. You know the steps, right?

First let us change the font style.

- Select all the text, by dragging the insertion point from top to bottom of page or use the short-cut Ctrl + A.
- On the Tool Bar select Home.
- On the Font menu, click on the small arrow next to the font. A drop-down list of the available fonts is displayed.
- Scroll down and select "Times New Roman. What happens?

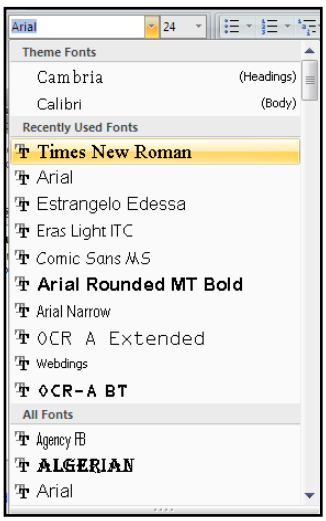
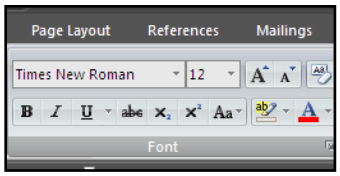


Fig. 14.6: a list of available fonts

Let us give some effects to the title of the letter.

BOLD

Select the title only.

- Click on the font size arrow, and select 16.
- With the title still selected, click on the  button or use the short-cut Ctrl + B. Notice the effect.

bold

Underline Let us underline the title of the letter.
Click on the underline button or use the shortcut Ctrl + U.

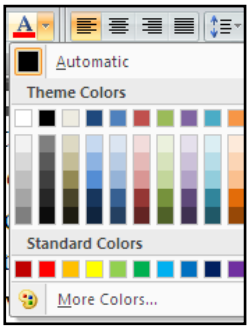


Fig. 14.8: Font Colour menu

Italic To italicize the title of the letter:

- Click on the Italic button or use the shortcut Ctrl + I

Text colour Let us give the title a colour. To do that:

- Click on the Font Colour button in the Font menu.
- Click on the red colour.

The above formatting styles are found on the Toolbar. There are some text formatting features which do not appear on the Toolbar; those can be found in the Font Dialogue Box. To assess the Font Dialogue Box, click on the Font Dialogue Box button or use the short-cut Ctrl + D.

Try the various font formatting styles there.

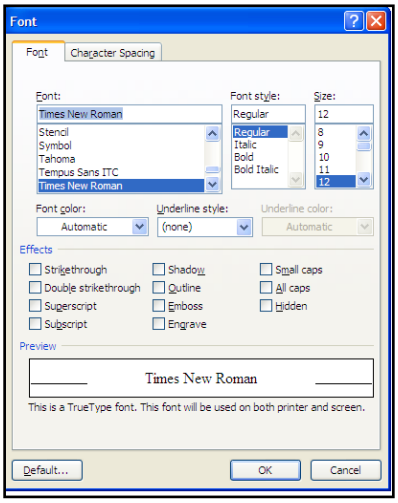
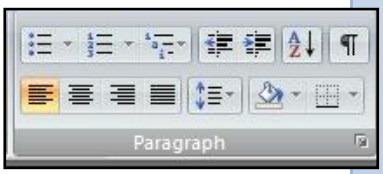


Fig. 14.9: Font dialogue box

Formatting Word document using text alignment

Font formatting changes the look of the characters, but you'll often need to change the paragraph layout as well from the way that Word sets it automatically. To change the paragraph layout, you use paragraph formatting.

Paragraph formatting tools are found on the Paragraph menu of the Toolbar. Like most word processors, Word offers left, right, centered, and justified alignment; increase and decrease indents.



Left alignment The words line up along the left margin of the page. Left is the alignment Word comes set with. You'll probably want to stick with left alignment for most text. (Shortcut Ctrl + L)
Right alignment The words line up along the right margin of the page. Right alignment is useful for putting text up against the right margin. For example, you might create letterhead with the sender's address right-aligned. (Shortcut Ctrl + R)
Centering The words flow left and right from the center of the page. Centering is good for display text, such as headings and poetry. Shortcut Ctrl + E)

Justified alignment This setting aligns the text with both the left margin and the right margin, except for the last line of the paragraph, which is allowed to fall short so that it does not require huge spaces between the words.(Shortcut Ctrl + J)

Indent the distance the text move in from the margin.

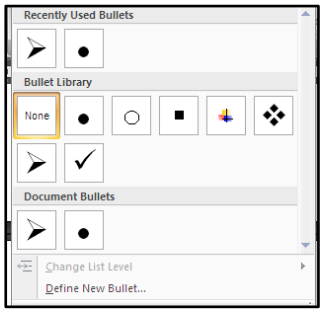
The Toolbar includes buttons for centering text and adjusting tabs, but most of the tools for formatting paragraphs are in the Paragraph dialogue box. To open the Paragraph dialogue box, click on the button below the paragraph menu on the Toolbar.

Other paragraph formatting tools include Numbers and Bulleting and Line Spacing.

Numbers are used to make a list or give figures to lines.
Bullet are similar to numbers, but unlike numbers, a bullets can be any character. The most common bullet in word is the filled in round. Numbers and numbers are used when listing items whose content is of similar importance.

There are variations of numbers and bullets. To see them click the small arrows located next to Numbering and Bullets.

Create a document and apply Numbering and Bullets



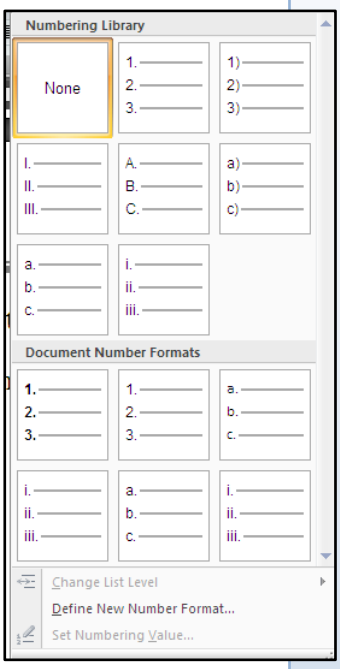


Fig. 15.0: Bullets and Numbers Libraries

Line spacing

To make a document easy to read, you may have to increase or decrease the *line spacing*, the amount of vertical space between one line and the next. Word starts a typical paragraph with *single spacing*—each line has enough space to accommodate the tallest character, and a little more space so that that character doesn't touch the line above or the line below. Single spacing is based on the font size, so if you increase the font size, or put in a taller character, Word increases the line space so that the characters don't touch.

Word lets you move the lines of each paragraph farther apart or closer together as much as you want. For example, you can move the lines apart to make the text easier to read, to leave space for editing on paper, or simply to make a short document look longer.

Let us practice line spacing.

- Select all text in your letter
- Click on the small arrow on the Line spacing button. That opens the line spacing options.
- Select 2.0; that doubles the line spacing of your document.

For further line spacing options, click on the Line Spacing Options. That opens a dialogue box with additional line spacing features

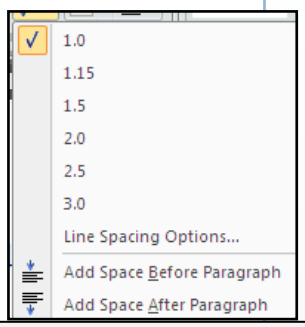


Fig. 15.1: Line Spacing options

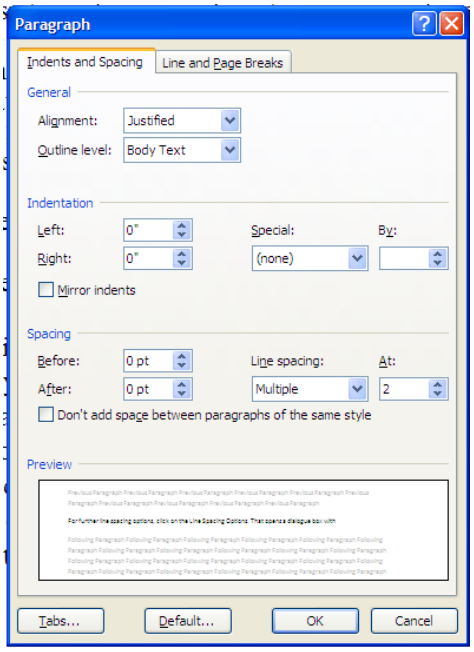


Fig. 15.2: Paragraph dialogue box

Change case

If you want text to appear in all capital letters, you can press CAPS LOCK and type the letters as capitals. But often it's easier to apply all-caps formatting to existing text. You can also apply small-caps formatting to make text appear as small capital letters. Any letters that were capitals remain full-size capitals.

To change the case of existing text:
Drag-select the text
Click on the home menu
On the Font tab click on Change case.
A drop-down menu appears; select the case you want to change to.

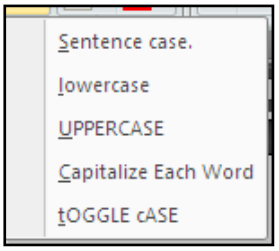
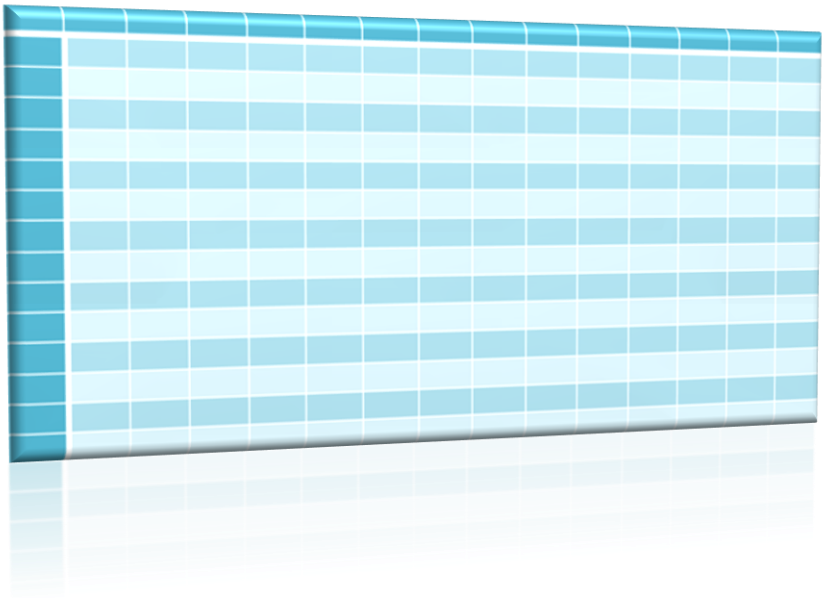


Fig. 15.3: Change case dialogue



Chapter 9

INSERTING TABLE AND SYMBOLS IN WORD PROCESSING DOCUMENT

OBJECTIVES

After completing this chapter, you should be able to:

i. Insert tables in Word Processing document.
ii. Insert symbols and pictures in Word Processing documents

INTRODUCTION

Word processing documents do not just allow the user to work with text only, but combines some of the features and capabilities of both spreadsheet and graphics applications. With this users can add, edit and even format tables, pictures and other graphics.

In this chapter we will consider how to insert tables, symbols and pictures in Microsoft Word document.

INSERTING TABLES IN WORD DOCUMENT

In you can create both simple and complex tables as needed: a table can consist of a single cell, but normally has multiple cells and columns. Word provides various predefined table styles for common items such as calendars, tabular lists, and tables that have subheads.

Microsoft Word allows you to create a table in four main ways:

- Creating a new table from scratch
- Converting existing text to a table
- Inserting one of Word's predefined Quick Tables
- Drawing a table manually by placing the lines where you need them.

Create a new table from scratch

To create a new standard table:

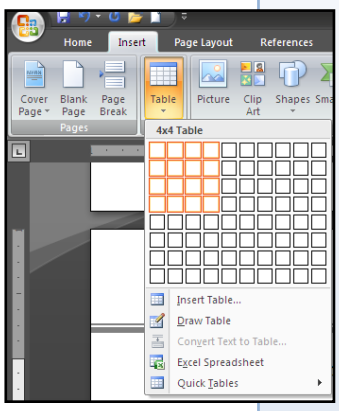


Fig. 15.5: choosing rows and columns

- On the Insert menu, on the Table tab, select Table.
- Choose the number of rows and columns from the Table panel. The readout at the top of the Table panel displays the number of rows and columns you've chosen.

Word inserts the table, adds the Table Tools section to the Ribbon, and displays the Design tab on that section,

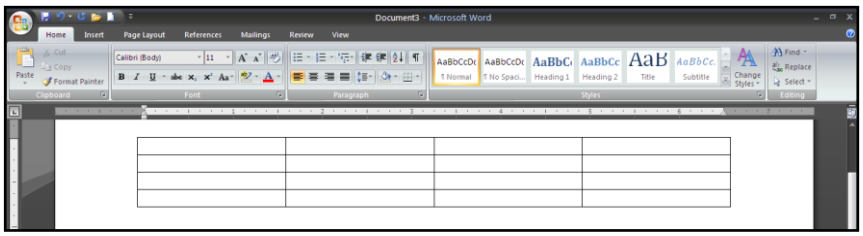


Fig. 15.6: the inserted table

If you need to insert a table that has more columns or rows (or both) than appear on the Table panel, or if you want to choose further options for your table, follow these steps:

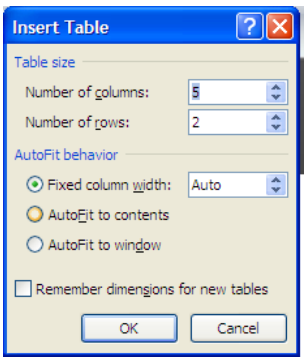


Fig. 15.7: Insert table dialogue box

- Place the insertion point where you want the table to appear.
- Choose Insert | Tables | Table | Insert Table. Word displays the Insert Table dialog box.
- In the Number Of Columns text box, type in the number of columns.
- In the Number Of Rows text box, type in the number of rows.

In the AutoFit Behavior area, decide whether to use a fixed column width or have Word automatically fit the table to its contents or the Word window:

Fixed Column Width *This option gives each column a fixed width. In the text box, choose Auto if you want Word to share out the available space equally among the columns. Alternatively, specify the standard width you want to use for each column.*

AutoFit To Contents *This option give adjusts the column width automatically to suit the amount of text each column contains. This behavior can be helpful, but it may mean that Word constantly adjusts column width while you're creating the first few rows in the table.*

AutoFit To Window *this option gives adjusts the column width to fit the width of the window. This option can be handy for making sure that the full width of the table is visible.*

- Select the Remember Dimensions For New Tables check box if you want Word to use the configuration you've just set as the default for new tables.
- Click the OK button. Word closes the Insert Table dialog box and inserts the table in the document. Word also adds the Table Tools section to the Ribbon and displays the Design tab on that section.

Converting Existing Text to a Table

Some times there would be a need to turn existing text into a table. For example, you may start laying out tabular data using tabs, and then realize that a table would be better.

To convert existing text to a table, follow these steps:

If the text is divided into columns using tabs, commas, or another character, make sure that each paragraph contains the same number of columns.
To see tab characters, select Home | Paragraph | Show/ Hide ¶. Or use the shortcut Ctrl + *

- Select the text you want to turn into the table. Include the paragraph mark at the end of the last paragraph.
- Click on Insert | Tables | Table | Convert Text To Table. The convert to text dialogue box is displayed
- In the Table Size area, make sure that the Number Of Columns text box is showing the number of columns you expect.

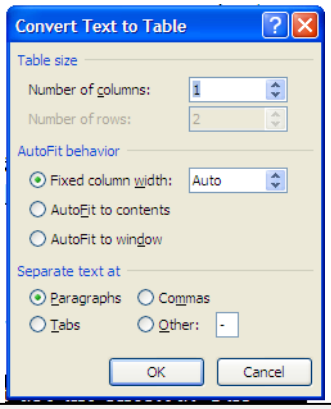


Fig. 15.8: Convert Text to Table dialogue box

Paragraphs *This option button turns each paragraph into a cell in the table. You may need to adjust the Number Of Columns setting manually, as Word normally sets it to 1.*

Commas ***T****his option button turns each section that's separated with commas into a cell in the table. Normally, you'll use this setting when dealing with a Comma Separated Values (CSV) file; for example, when you have exported spreadsheet or database data in CSV format.*

Tabs *This option button divides the text at each tab. This setting is very useful.*

Other *Select this option button to divide the text at another character and type the character in the text box. For example, you might need to divide the text at a character such as a brace ({) or an exclamation point (!). You can use only one character.*

- In the AutoFit Behavior area, choose the automatic-fitting option you want.
- Click the OK button. The Convert Text to Table dialogue box closes and the table is applied to the selected text. Word also adds the Table Tools section is added to the Ribbon and the Design tab is displayed on that section.
- Make sure that Word has divided your text as needed. If there's a problem, click the Undo button to remove the table. Fix the problem with the divisor character (for example, add a missing tab, or delete a surplus tab), and then convert the text to a table again.

Inserting one of Word's predefined Quick Tables

To create a new table based on one of Word's Quick Table designs:

- Place the insertion point where you want the table to be.
- Select Insert | Tables | Table | Quick Tables.
- Choose the design from the Quick Tables panel. The table is inserted and the Table Tools is added to the Ribbon and the Design tab is displayed on that section.
- Change the sample data in the Quick Table to the data you want the table to have.

ITEM	NEEDED
Books	1
Magazines	3
Notebooks	1
Paper pads	1
Pens	3
Pencils	2
Highlighter	2 colors
Scissors	1 pair

Fig. 15.9: A predefined table

Drawing a table manually by placing the lines where you need them

If you are not satisfied with any of the tables above, you might have to create one yourself. To do that:

- Select Insert | Tables | Table | Draw Table. The mouse pointer changes to a pen. If the window is in Draft view, Word switches it to Print Layout view.
- Click in the document where you want one corner of the table to appear, and then drag diagonally to the opposite corner. You can drag diagonally in any direction.
- After creating the first part of the table, the Table Tools section is added to the Ribbon and displays the Design tab.

Fig. 16.0: drag diagonally to create a table

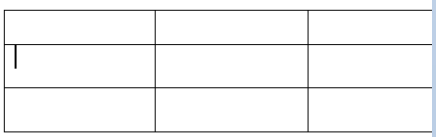
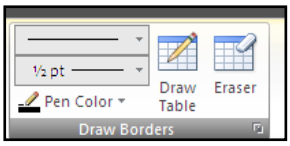


Fig. 16.1: draw needed lines

- Click and drag to draw other lines as needed to create the table layout you need.

To change the line style:

- Select Design | Draw Borders |Line Style.
- Select the style from the Line Style panel.



To change the line weight:

- Select Design |Draw Borders | Line Weight
- Select the weight from the Line Weight panel.

To change the pen color:

- Select Design | Draw Borders | Pen Color.
- Select the pen color from the Pen Color panel.

To erase an existing line:

- Select Design | Draw Borders | Eraser
- Click each line you want to erase with the eraser mouse pointer.
- To cancel the eraser, press ESC or choose Design | Draw Borders | Eraser again.

INSERTING SYMBOLS AND PICTURES IN WORD DOCUMENT

To give your documents more visual impact, or simply to make them more understandable, you'll often need to add pictures, shapes, diagrams, or other graphical objects. In this Section, we will learn about the wide variety of features that Word offers for adding graphical objects to your documents.

Inserting symbols

Symbols are characters that do not appear on the keyboard. There are two main ways of inserting symbols in your document – the Symbol Panel and the Symbol dialogue box.

Using the Symbol Panel

The Symbol Panel contains 20 symbol most used or recently used symbol. To insert a symbol with the Symbol Panel:

- Position the insertion point to where you want the symbol to appear.
- Select Insert | Symbols | Symbol. Word displays the Symbol panel.
- Click on the symbol you want. Word inserts it to where the insertion point is.

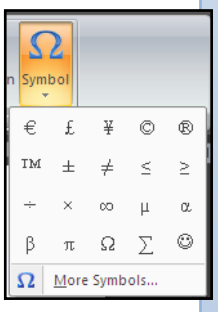


Fig. 16.2: The Symbols Panel

Using the Symbol dialogue box

The Symbol dialog box lets you browse through the available symbols. It also allows you to create or use keyboard shortcuts for symbols you use most. To insert a symbol using the Symbol dialogue box:

- Position the insertion point at where you want the symbol to be.
- Select Insert | Symbols | Symbol. Word displays the Symbol panel.
- Click on More Symbols. Word displays the Symbol dialogue box.

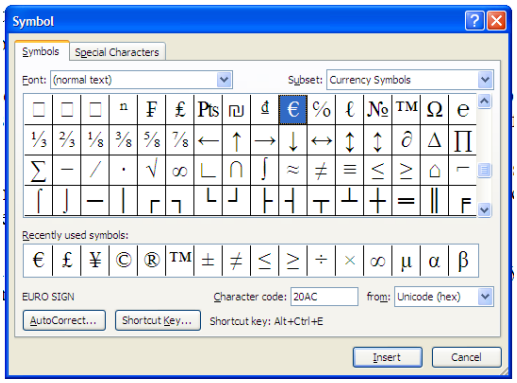


Fig. 16.3: Symbols dialogue box

- Click on the symbol you want. You can use the Font drop-down to choose the font style of the symbol you want. If the symbol you want does not appear, try the Special Characters tab.
- Double-click on the symbol or click the Insert button to insert it in your document, the close the dialogue box.

The Recently Used Symbols box at the bottom of the Symbols tab gives you quick access to the last 16 symbols you have used.

Inserting pictures to documents

To enhance your documents, you will often need to insert a picture, such as a custom illustration, photograph, or screen capture

To insert a picture:

- Position the insertion point at the beginning of the paragraph where you want the upper-left corner of the picture to appear. It's best to use an empty paragraph. You can move the picture later if you need to.
- Select Insert | Illustrations | Picture. The Insert Picture dialog box is displayed.

- Navigate to the picture you want to add, and then select it.
- Click the Insert button. The Insert Picture dialog box closes and the selected picture is inserted in the document.

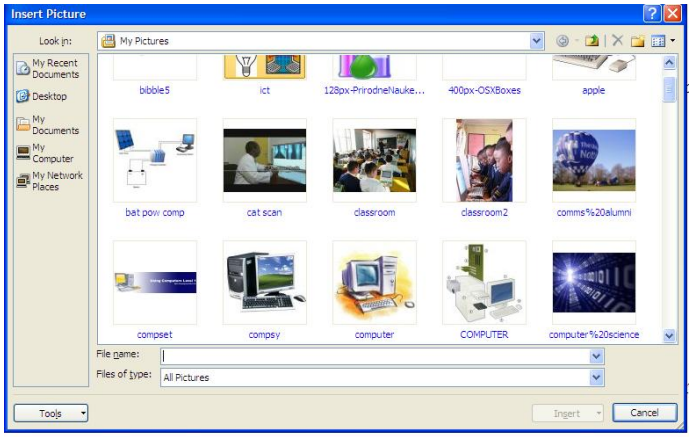


Fig. 16.4: Insert Picture dialogue box

The picture can be cropped or resized to suit the document.

To crop a picture:

- Double-click on the picture.
- On the Ribbon, select Crop.
- Hold the crop handle and crop the picture the way you want. You can crop a picture from left to right, top to bottom and vise versa.

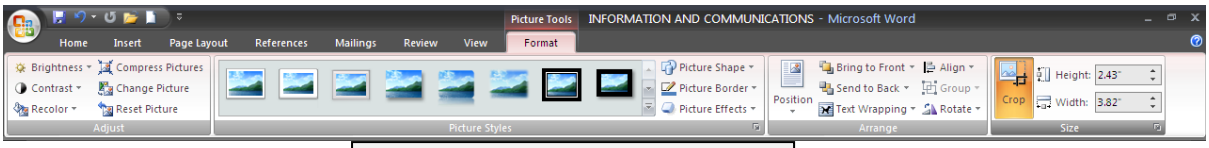


Fig. 16.5: selecting the Crop tool

Inserting Clip Art

Microsoft Office's Clip Art feature lets you easily access a wide selection of graphics, photographs, movie clips, and sounds that you can use freely in your documents, and insert them easily.

To insert a Clip Art in your document:

- Position the insertion point at the beginning of the paragraph where you want to position the upper-left corner of the item. It's best to use an empty paragraph. You can move the item later as needed.
- Select Insert | Illustrations | Clip Art. Word displays the Clip Art task pane.
- Type the keyword of the item you are looking for in the Search For box or in the Search In drop-down list choose Everywhere.
- In the Results Should Be drop-down list, choose the media types

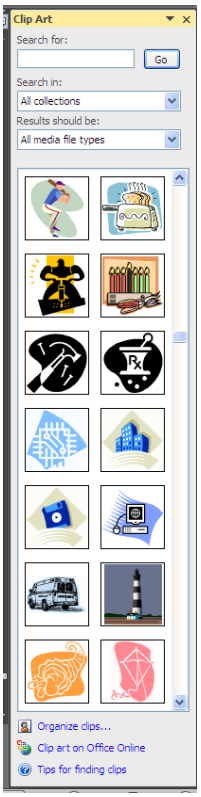


Fig. 16.6: Clip Art gallery

you're interested in: All Media File Types, Clip Art, Photographs, Movies, or Sounds.

- Click the Go button. Word searches for matching media types and displays them in the pane.
- If you find the clip you want click on it to be inserted in your document.

Inserting Word Art in your document

Fig. 16.7: selecting Word Art style

Another fascinating element you can add to documents is a WordArt object. WordArt is a Microsoft Office applet for creating text-based designs, such as logos, decorations or other designs. Though very appealing, Word Art should be used when necessary and in moderation since it can make your document quite difficult to read.

To insert a WordArt object in a document:

- Position the insertion point at the beginning of the paragraph where you want the WordArt item to appear.
- Select Insert | Text | Word Art. The Word Art Gallery is displayed.
- Click the style of WordArt item you want. Word displays the Edit WordArt Text dialog box.

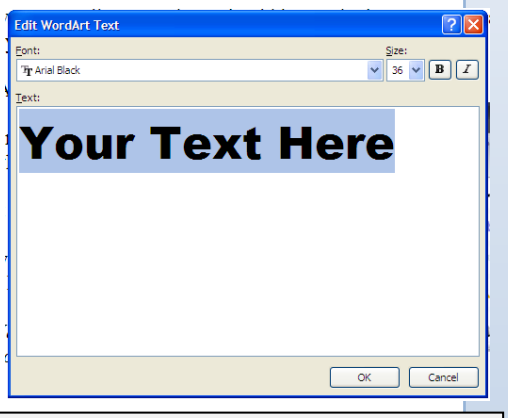
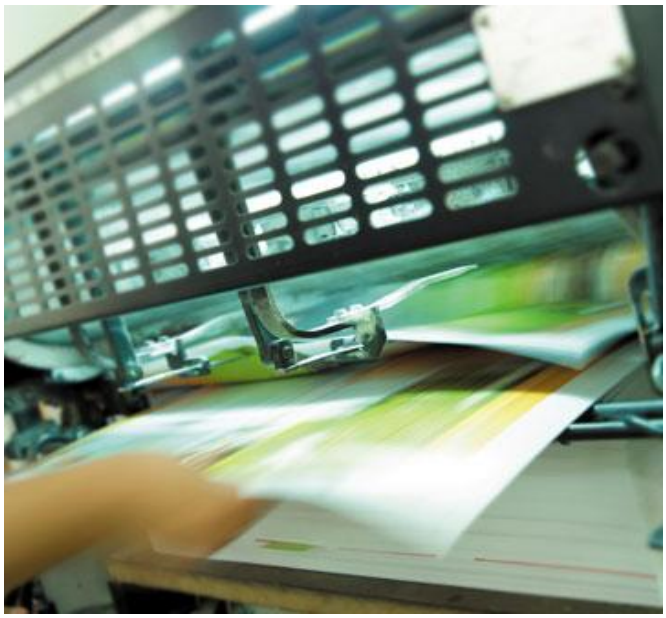


Fig. 16.8: Edit Word Art Text dialogue box

The "Your Text Here" text is sample text that Word provides so that you can see the current font in use.

- Type the text you want the Word Art to have over the sample text.
- Choose the font you want to use in the Font drop-down list,
- Choose the font size for the WordArt in the Size drop-down list,
- If you want, click the Bold button to apply boldface or the Italic button to apply italics.
- Click the OK button. Word closes the Edit WordArt Text dialog box, and inserts the WordArt item in your document and the WordArt Tools on the Ribbon.

Fig. 16.9: Inserted Word art item



Chapter 10

PRINTING

OBJECTIVES

After completing this chapter, you should be able to:

i. Print documents using various print options.

INTRODUCTION

For about a decade and a half, futurists have been predicting that computers will eliminate paper documents from the world.—but that's still nearly as far from happening as it's ever been. Almost every home with a computer has a printer, and most offices have many printers, all busy churning out many pages a minute and many documents an hour.
So you'll probably need to print some—perhaps many—of your Word documents.
This chapter shows you how to do so. The best place to start is by making sure that you have suitable printing options set. You'll then be ready to preview a document, print a document the conventional way, print directly from the Desktop or from a Windows Explorer window.

Printing Word Document with Various Print Options

Before you print at all, it's a good idea to verify that Word's printing options are set to print the document elements you need to print correctly. The default settings work well for many people, but you may need to change some of them to suit your need.

To set printing options:

- Click the Office Button, and then click Word Options. Word displays the Word Options dialogue box.
- In the left pane, click the Display category. Word shows the Display items.
- In the Printing Options area, choose options for all the documents you print.

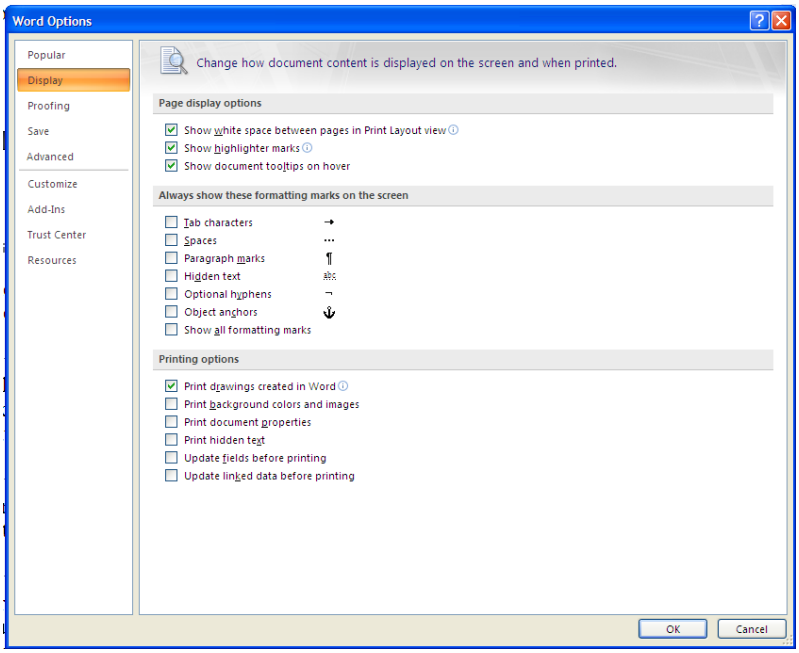


Fig. 17.0: Word Options dialogue box

Print Drawings Created In Word This option allows text boxes, graphics and shapes created in Word be included in the in the printout. You will normally want to include them. This option is selected by default.

Print Background Colours And Images This option allows background colours and images to be included in the printout. Printing these items lets you see the full document on paper, but it both consumes more ink and can make documents harder to read.

Print Document Properties This option allows document's property information such as subject, title and author to be printed on a separate sheet of paper.

Print Hidden Text This option allows hidden text in the document to be printed with the rest of the document.

Update Fields Before Printing This option allows Word to update all the fields in a document automatically when you issue a Print command.

Update Linked Data Before Printing This option allows Word to any linked information from other documents before printing. Such updating ensures that your document is up-to-date and is a good idea unless the linked documents may not be available to your computer

when you print. (For example, if you take a document home from the office, any linked documents on the office network may not be available.)

- Click the OK button. Word closes the Word Options dialog box and applies your choices.

Use Print Preview

Use Print Preview before you print to make sure that the document looks the way you want it to and (if appropriate) that it fits on the paper size you've chosen.

Open Print Preview

To display the active document in Print Preview:

- Click the Office Button.
- Highlight the Print item or click the arrow next to it to display the Preview And Print The Document submenu.
- Click Print Preview. Word displays only the Print Preview tab of the Ribbon, suppressing all the other tabs.

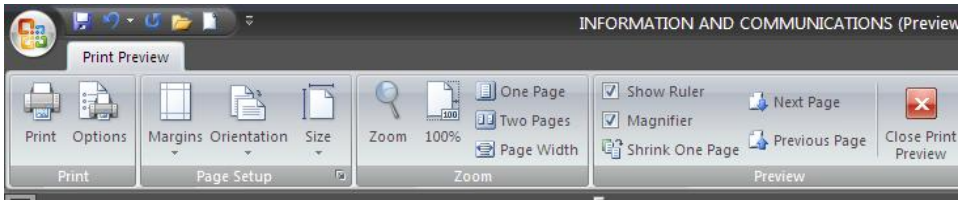


Fig. 17.1: Print Preview

You can also use the keyboard shortcut Ctrl + Alt + I to display the print preview.

Preview the Document

- Click the Next Page button or the Previous Page button to navigate to the previews next page or previous page. (These buttons have no effect if there is no next page or previous page.) You can also scroll or press PAGE DOWN or PAGE UP.
- Use the controls in the Zoom group and the Preview group of the Print Preview tab of the Ribbon to preview your document.
- Select the Show Ruler check box in the Preview group to display the ruler. (You can also click the Show Ruler button at the top of the vertical scroll bar.)

Change the Page Setup

If your document doesn't look the way you planned, use the controls in the Page Setup group on the Print Preview tab:

Margins Click this button, and then choose a preset margin from the panel. Alternatively, choose Custom Margins from the panel to display the Margins tab of the Page Setup dialog box.

Orientation Click this button, and then choose Portrait or Landscape, as needed.

Size Click this button, and then choose a preset size from the panel. For more choices or a custom size, click the More Paper Sizes item, and then work on the Paper tab of the Page Setup dialog box.

Printing a Document

When you are done with all the necessary corrections and adjustments on the page and the document is ready to print, you can print it with the Print dialogue box.
To do that:

- Click the Office Button.
- Click on Print. The Print dialogue box is displayed.

You can also display the Print dialogue box by using the keyboard shortcut Ctrl + P.

- Or, from Print Preview
- Choosing Print Preview | Print | Print.

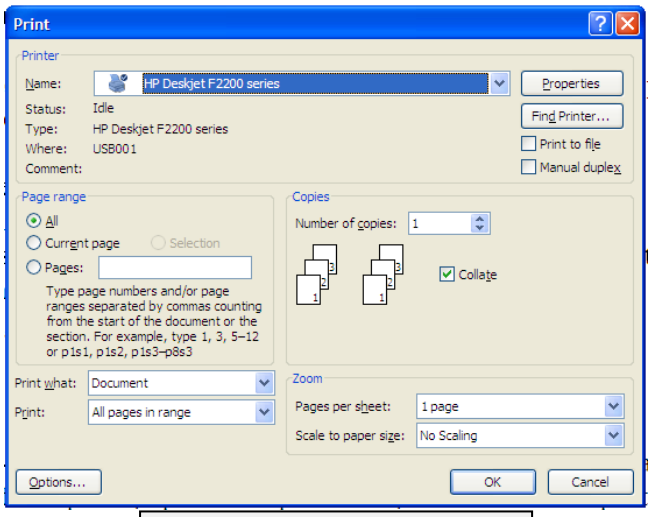


Fig. 17.2: Print dialogue box

Choose Which Printer to Use

The Name drop-down list shows the printer that Word will use unless you change the printer. To choose a different printer, open the drop-down list, and then click the printer.

Specify Which Pages to Print

In the Print Range group box, choose which pages to print:

All Choose this option button to print all the pages in the document. This is often convenient, and Word selects this option button by default.

Current Page Choose this option button to print the page on which the insertion point is currently positioned.

Selection Choose this option button to print the selection you made in the document before you displayed the Print dialog box. If you didn't make a selection in the document, this option button is unavailable.

Use the Print dialogue box to choose what to print, which printer to use, and whether to print multiple copies.

Pages Select this option button to print the range of pages you specify in the text box.
Range of Pages Type the starting and ending page numbers, separated by a hyphen, for example, 1 - 9.
Individual Pages Type each page number separated by a comma, for example, 1, 5, 7, 12.
Individual Pages and Ranges Type the page numbers and ranges separated by commas, for example, 2, 3, 7-10, 16.
Sections Use *s* and the number to represent each section. For example, s1, s4 means prints Section 1 and Section 4; s1, s5-s8, s11 prints Section 1, Sections 5 through 8, and Section 11, respectively.
Pages Within Sections Use *p* and the number to represent the page within the section, and *s* and the number to represent each section. For example, p2s5-p4s7 prints from Page 2 in Section 5 to Page 4 in Section 7.
Select Odd Pages or Even Pages in the Print drop-down list, if you need to print just the odd pages of the page range you've specified, or just the even pages.

Choose Which Items to Print

In the Print What drop-down list, select which item or items you want to print:
Document Select this item to print the document itself. This is the item you'll want most often. Word selects Document by default unless the document contains markup, in which case Word selects Document Showing Markup.
Document Properties Select this item to print a list of the document's properties, such as the title, subject, and author name.
Document Showing Markup Select this item to print the document showing all tracked changes, comments, and other markup. Word selects this item by default if the document contains markup. Word prints the markup using the formatting you've selected in the Track Changes Options dialog box.
List Of Markup Select this item to print only the markup from the document—tracked changes, comments, and other markup. (This is essentially a printout of the Reviewing pane.)
Styles Select this item to print a list of the styles used in the document.
Building Blocks Entries Select this item to print a list of the building blocks in the document's template.
Key Assignments Select this item to print a list of the custom key assignments in the document.

Choose the Number of Copies and How to Collate Them

Set the number of copies to print in the Number Of Copies box. The default is one copy.
If you print multiple copies, select the Collate check box to print the full set of each copy at once (followed by the next copy), or clear the Collate check box to print all of the copies of each page together (followed by all of the copies of the next page).

Print Multiple Pages on the Same Sheet of Paper

When creating some kinds of documents, you may need to print multiple pages of the document on the same physical sheet of paper. To do so, choose the number in the Pages Per Sheet drop-down list: 1 Page, 2 Pages, 4 Pages, 6 Pages, 8 Pages, or 16 Pages.

Print a Document on a Different Paper Size

To print the document on a different paper size than that used in its page setup, choose the paper size in the Scale To Paper Size drop-down list. This list offers a wide range of choices, from Post Card up to Legal. To print a document normally, make sure the No Scaling item is selected. (Word selects No Scaling by default.)

Print to a File

Sometimes, you may need to print a document to a print file rather than print it to paper. The print file is a file that describes how the printout should look—a file that contains a printed version of the Word document. You can then send or take the print file to another computer for printing. For example, you might use a specialist print shop for high-quality printouts.
To print to a file, select the Print To File check box. When you click the OK button in the Print dialog box, Word displays the Print To File dialog box. Type or paste the path and filename for the print file in the File Name text box, and then click the OK button.

Choose Further Options in the Printer Properties Dialog Box

You can choose further options by clicking the Properties button in the Print dialog box and working in the Properties dialog box for the printer. The contents of the Properties dialog box vary greatly depending on the printer (Figure 8-3 shows an example), but you'll often find options such as these:
Printing in back-to-front order instead of the default front-to-back order. (Back-to-front order is sometimes useful for photocopying tasks.)
Printing multiple pages on the same sheet of paper.
Using different paper trays. For example, you might need to print invoices on letterhead loaded into a different paper tray than plain paper.

Using different print quality—for example, 300 dpi (dots per inch) instead of 600 dpi.
After choosing options, click the OK button. Word closes the Properties dialog box.

You can also display the Properties dialog box for the printer by clicking the Options button on any of the tabs in the Page Setup dialog box.

Print on the Back and Front of Paper

If you need to produce documents printed on both sides, but you don't have a printer capable of duplexing (printing on both sides), you can use Word's Manual Duplex option. Follow these steps:

- In the Print dialog box, select the Manual Duplex check box.
- Check that you have suitable duplex options set:
- Click the Options button. Word displays the Word Options dialog box.
- Click the Advanced category. Word displays the Advanced options.

- In the Print area, select the Print On Front Of The Sheet For Duplex Printing check box. Make sure the Print On Back Of The Sheet For Duplex Printing check box is cleared.
- Click the Print button. Word prints the odd-numbered pages in reverse order and then displays the dialog box shown here.
- Take the printout from the printer, and then put the sheets in the printer's paper tray so that the side that wasn't printed will be printed this time. Most printers have an icon near the paper tray indicating which side of the paper the printer prints on—for example, an arrow pointing up or pointing down.
- Click the OK button. Word prints the even-numbered pages of the printout on the backs of the pages you reinserted.

Print Directly from the Desktop or a Windows Explorer Window

But if you need to quickly print a completed document, you can do so directly from your Desktop or Windows Explorer if the document is either stored in your Desktop or any other directory To print a document to your default printer:

- Right-click the document file on your Desktop or in the Windows Explorer window.
- Select Print from the context menu. Windows opens the document in Word, prints it, and then closes it automatically.

You can use a similar technique to print to different printers by creating Desktop shortcuts to the printers you want to use. To create Desktop shortcuts to printers:

- Open the Printers And Faxes window
- Select Start | Printers And Faxes.
- If no Printers And Faxes item appears on the Start menu
- Select Start | Control Panel
- Click the Switch To Classic View item in the Control Panel task pane if Control Panel is in Category view.

- Then double-click the Printers And Faxes item.
- Right-click the desired printer, and then choose Create Shortcut from the context menu.
- Windows XP tells you it cannot create a shortcut in the Printers And Faxes folder and asks if you want to create it on the Desktop instead.
- Click the Yes button.
- Repeat step 2 for each printer for which you need a shortcut.
- Click the Close button (the × button). Windows closes the Printers window or the Printers And Faxes window.

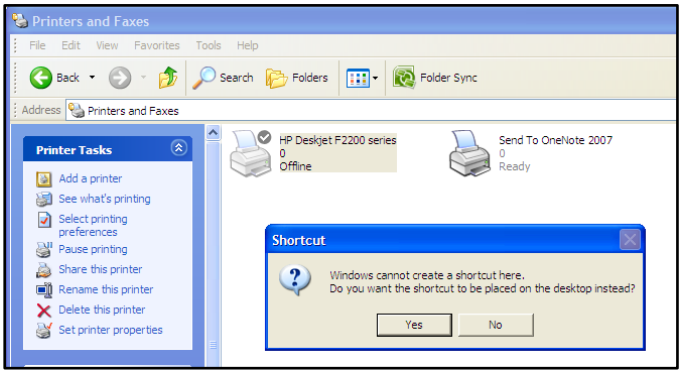


Fig. 17.3: creating printer shortcuts

You can now print by dragging a document from a Windows Explorer window (or the Desktop) to the printer shortcut on the Desktop. If you prefer not to create printer shortcuts on your Desktop, you can simply open the Printers And Faxes window and then drag documents to the printer entries in that window to print.

Chapter 11

THE INTERNET

OBJECTIVES

After completing this chapter, you should be able to:

i. Explain the basic concepts, requirements and terminologies of internet.
ii. Identify the features of browser window.
iii. Browse the internet with the help of some features of the Browser window.
iv. Apply the rules and regulations in the use of the internet.

INTRODUCTION

The birth of the Internet has broadened and in some respect, given a whole new meaning to the term, global village. The use of the internet has grown and keeps growing even faster than anticipated. In this section, we are going to consider the internet and everything connected with it. First let us have a look at the history of the internet.

CONCEPT, REQUIREMENTS AND TERMINOLOGIES OF THE INTERNET

The Internet is a computer-based global information system. The Internet is composed of many interconnected computer networks. It is thus referred to as the network of networks.

Each network may link tens, hundreds, or even thousands of computers, enabling them to share information and processing power. The Internet has made it possible for people all over the world to communicate with one another effectively and inexpensively. Unlike traditional broadcasting media, such as radio and television, the Internet does not have a centralized distribution system. Instead, an individual who has Internet access can communicate directly with anyone else on the Internet, post information for general consumption, retrieve information, use distant applications and services, or buy and sell products.

The internet is not owned by any person, organization or country and with this the Internet technology allows interconnection of any kind of computer network. No network is too large or too small, too fast or too slow to be interconnected. Thus, the Internet includes inexpensive networks that can only connect a few computers within a single room as well as expensive networks that can span a continent and connect thousands of computers.

INTERNET REQUIREMENTS

For a computer or computer network to be connected to the internet, it must get *internet access* and an internet *browser*.

1. Internet Access

The term internet access refers to the communication between a residence or a business and an *Internet Service Provider* that connects to the Internet. An internet Service Provider or ISP is a company that sells access to the internet to individuals and organisations.

Internet access falls into three broad categories:

- Dedicated Access
- Dial-up Access
- Wireless Access

Dedicated Access

With dedicated access, a subscriber's computer remains directly connected to the Internet at all times through a permanent, physical connection. Most large businesses have high-capacity dedicated connections; small businesses or individuals that desire dedicated access choose technologies such as digital subscriber line (DSL) or cable modems, which both use existing wiring to lower cost. A DSL sends data across the same wires that telephone service uses, and cable modems use the same wiring that cable television uses. In each case, the electronic devices that are used to send data over the wires employ separate frequencies or channels that do not interfere with other signals on the wires. Thus, a DSL internet connection can send data over a pair of wires at the same time the wires are being used for a telephone call, and cable modems can send data over a cable at the same time the cable is being used to receive television signals.

Dial-up Access

Dial-up is the least expensive access technology, but it is also the least convenient. To use dial-up access, a subscriber must have a telephone modem, a device that connects a computer to the telephone system and is capable of converting data into sounds and sounds back into data. The user's ISP provides software that controls the modem. To access the Internet, the user opens the software application, which causes the dial-up modem to place a telephone call to the ISP. A modem at the ISP answers the call, and the two modems use audible tones to send data in both directions. When one of the modems is given data to send, the modem converts the data from the digital values used by computers—numbers stored as a sequence of 1s and 0s—into tones. The receiving side converts the tones back into digital values. Unlike dedicated access technologies, a dial-up modem does not use separate frequencies, so the telephone line cannot be used for regular telephone calls at the same time a dial-up modem is sending data.

Wireless Access

Another internet access, though less-popular option, is the wireless or satellite internet access. In this internet access option a computer grabs an internet signal from orbiting satellites via an outdoor satellite dish. The user usually pays a fixed monthly fee for a dedicated connection. In exchange, the company providing the connection agrees to relay data between the user's computer and the internet.

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2. Browser

A browser is a program that enables a computer to locate, download, and display documents containing text, sound, video, graphics, animation, and photographs located on computer networks. The act of viewing and moving about between documents on computer networks is called ***browsing***.

Browsers allow users to access Web information by locating documents on remote computers that function as Web servers. A browser downloads information over phone lines to a user's computer through the user's modem and then displays the information on the computer. Most browsers can display a variety of text and graphics that may be integrated into such a document, including animation, audio and video. Examples of browsers are Internet Explorer, Mozilla Firefox, Google Chrome, Safari, Netscape and Mosaic, Most of these browsers are available for free or for a small charge and can be downloaded from the Internet

INTERNET TERMINOLOGIES

The internet is like a country with its own language. Though most of the terms used is English, they barely make any sense to the outsider. To be able to use the internet effectively, it is advisable to know the basic terminologies accompanying it. Some of the popular internet terminologies include:

World Wide Web (WWW)

World Wide Web (WWW) is a computer-based network of information resources that combines text and multimedia. The information on the World Wide Web can be accessed and searched through the Internet. The World Wide Web is often referred to simply as "the Web. The World Wide Web is mostly confused with the internet, but in actual sense the World Wide Web is just a section of the internet and depends on the extensively on the internet.

The World-Wide Web was developed to be a pool of human knowledge, and human culture, which would allow users in remote sites to share their ideas and all aspects of a common project. It offers a place where companies, universities and other institutions, and individuals can display information about their products, services, facilities, or research, or their private lives. The majority of Web pages are available to anyone who can access a computer that connects to the internet. Only a small percentage of information on the Web is restricted to subscribers or other authorized users. The Web has become a marketplace for many companies selling products or services, and a forum for people to exchange opinions and information.

Brief history of the World Wide Web

The World Wide Web was developed by British physicist and computer scientist Timothy Berners-Lee as a project within the European Organization for Nuclear Research (CERN) in Geneva, Switzerland. Berners-Lee combined several existing ideas into a single system to make it easier for physicists to use data on the internet. Most important, he added multimedia—the ability to include graphics—to the *hyperlink* concept found in a previous internet service known as *gopher*. Berners-Lee had begun working with hypertext in the early 1980s. An early prototype implementation of the Web became operational at CERN in 1989, and the idea quickly spread to universities in the rest of the world.

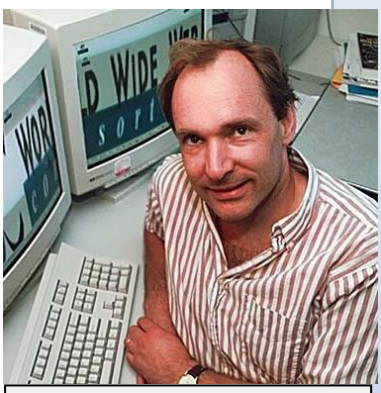


Fig. 17.4: Tim Berners-Lee

Groups at the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign researched and extended Web technology. They developed the first browser that was used at many sites, named Mosaic, in 1993. To allow the Web to be accessed from a wide variety of computer systems, researchers built multiple versions of Mosaic. Each version was designed to be used with a specific operating system, the software that controls the computer. Within a year, computer programmer Marc Andreessen had formed a commercial company, Netscape Communications Corporation, to build and sell Web technologies.

Hypertext Markup Language (HTML)

Hypertext Markup Language or HTML is the standard text-formatting language for documents on the World Wide Web. HTML documents are text files that contain two parts: content that is meant to be rendered on a computer screen; and *markup* or *tags*, encoded

information that directs the text format on the screen and is generally hidden from the user. HTML is a subset of a broader language called Standard Generalized Markup Language (SGML), which is a system for encoding and formatting documents, whether for output to a computer screen or to paper.

Some tags in an HTML document determine the way certain text, such as titles, will be formatted. Other tags cue the computer to respond to the user's actions on the keyboard or mouse. For instance, the user might click on an icon and that action might call another piece of software to display a graphic, play a recording, or run a short movie. Another important tag is a *link*, which may contain the *Uniform Resource Locator (URL)* of another document. The URL can be compared to an address where a particular document resides (more on URL later). The document may be stored on the same computer as the parent document or on any computer connected to the World Wide Web. The user can navigate from document to document simply by clicking on these links. HTML also includes markups for *forms*, that let the user fill out information and electronically send, or e-mail, the data to the document author, initiate sophisticated searches of information on the Internet, or order goods and services.
To be able to navigate the World Wide Web one must use a browser, which interprets the HTML tag in a document and format the content for screen display. Since HTML is an accepted standard, anyone can build a browser without concerning themselves with what form various documents will assume, unlike documents produced by typical word processors, which must be translated into a different format if another word processing application is used. Most sites on the World Wide Web adhere to HTML standards and, because HTML is easy to use, the World Wide Web has grown rapidly. HTML continues to evolve, however, so browsers must be upgraded regularly to meet the revised standards.

File Transfer Protocol (FTP)

File Transfer Protocol or FTP is a method of transferring files from one computer to another. The protocol is a set of rules that ensures a file is transmitted properly to the receiving computer. A computer that stores files that can be retrieved using FTP is called an FTP site or FTP server. FTP is part of the Transmission Control Protocol/Internet Protocol (TCP/IP), the system that enables different types of computers and networks on the Internet to communicate.

Transmission Transfer Protocol

TCP/IP or Transmission Control Protocol/Internet Protocol is a set of rules that enables different types of computers and networks on the Internet to communicate with one another. TCP/IP was originally developed by the United States Department of Defense for computers using the UNIX operating system, but it is now used by every computer, regardless of operating system, on the Internet. TCP defines how data are transferred across the Internet to their destination. IP defines how data are divided into chunks, called packets, for

transmission; it also determines the path each packet takes between computers.

Uniform Resource Locator (URL)

Uniform Resource Locator (URL) is an address that points to a particular document or other resource on the Internet, used most frequently on the World Wide Web (WWW). A computer user can visit an Internet document by typing its URL into a Web browser or similar application used to access the Internet.

For example, the URL for the main page of someone's private Web site is http://www.myself.net. The first part of the URL, the part before the colon, represents the scheme, or protocol, used to retrieve the document. In this case, http indicates that the document is a Web page viewable by a Web browser. Other schemes include ftp (for File Transfer Protocol), a way of moving individual files between Internet computers; news (for Usenet newsgroup), a forum where users can discuss topics by posting messages; and telnet (for Telnet), a means of logging on to an Internet computer and using it remotely.

The next part of the URL, in this case *www.myself.net*, is called the domain name. It represents the overarching Internet address used by a particular organization or individual. Each domain name includes an extension, in this case .net, which identifies the type of organization using the address. For example, a domain name with an extension .gov, indicates that the user is a government organization. Other common extensions include .com (for commercial) and .edu (for education—usually a school, college or university).

The domain name may be followed by the *path*, a list of additional names that identify subdirectories within that domain. On its own, the domain name *www.myself.net* identifies the main page of the person's Web site, but other pages on the site reside in various subdirectories branching off the domain. For example, a page describing the food the person likes best can be found at http://www.myself,net/favouritefood/, where favouritefood is a subdirectory.

The path may be followed by a specific document name. The URL http://www.myself.net/favouritefood/ identifies the first page within the favouritefood subdirectory, but there are other pages within that subdirectory. For example, a page describing the method of preparing that food resides at http://www.myself.net/favouritefood/preparation.html, where preparation.html is the document name.

URLs are case-sensitive, which means that uppercase and lowercase letters are considered different letters, so a user has to enter a URL with all letters in the correct case. URLs on the WWW are accessed with *browsers*, or computer programs that can connect to the Internet and display Web pages.

IP Address

Internet Address is the identifying number that enables any computer on the Internet to find any other computer on the network. It consists of four sets of numbers separated by periods—for example, 123.456.78.90. The Internet address, also called the IP address, is translated into a word-based address.

Email

E-Mail is an abbreviation of the term electronic mail which is a method of transmitting data, text files, digital photos, or audio and video files from one computer to another over an intranet or the Internet. E-mail enables computer users to send messages and data quickly through a local area network or beyond through the Internet. E-mail came into widespread use in the 1990s and has become a major development in business and personal communications.

Search engines

Search Engine is a software program that helps users find information stored on a personal computer, or a network of computers, such as the Internet. A user enters search terms, typically by typing a keyword or phrase, and the search engine retrieves a list of World Wide Web (WWW) sites, personal computer files, or documents, either by scanning the content stored on the computers or computer networks being searched or by *parsing* (analyzing) an index of their stored data.

Search engines are most often used to find pages, files, news, images, and other data on the Web. Some of the most popular Web search engines include Google Inc., Microsoft Network (MSN) Search, Yahoo! Inc and America Online (AOL). Each can be accessed from any Web browser, and each can be used for free.

These engines operate by building—and regularly updating—an enormous index of Web pages and files. This is done with the help of a Web *crawler*, or *spider*, a kind of automated browser that continuously trolls the Web, retrieving each page it finds. Pages are then indexed according to the words they contain, with special treatment given to words in titles and other headers. When a user inputs a query, the search engine then scans the index and retrieves a list of pages that seem to best fit what the user is looking for. Search engines often return results in fractions of a second.

Generally, when an engine displays a list of results, pages are ranked according to how many other sites link to those pages. The assumption is that the more useful a site is, the more often other sites will send users to it. But this is not the only way of ranking results. Dozens of other criteria are used, and these will vary from engine to engine.

Many times, search results will also include what are called sponsored links, links that are ranked high in the search results or are prominently displayed because third-party companies pay a fee to the search engine. More often than not, sponsored links are labeled as such, but inexperienced internet users often have trouble distinguishing between sponsored pages and unsponsored results. Sponsored links provide search engines with their primary source of revenue.

Blogs

Blogging is the frequent and chronological publication on the Web of personal thoughts and opinions for other internet users to read. The name, coined in the late 1990s, derives from "Web logging." The product of blogging is known as a "blog." There are millions of blogs on the Internet. In addition to thoughts and opinions, many bloggers also use their blogs to recommend books, music, and links to other sites on the World Wide Web.

Blogging predates the late 1990s. People kept blogs long before the term was coined, but the trend has gained momentum with the introduction of automated publishing services. Tens of thousands of people use these services to publish their blogs. Among the notable publishing services are Radio and Blogger and MSN Spaces.

The form of a blog is very much dependent on the individual who keeps it. Most blogs are a mix of what is happening in a person's life and what they feel about things they see on the Web. In this respect, they are a kind of hybrid diary and guide, although there are as many unique types of blogs as there are people who keep them. The popularity of blogging has given rise to a number of tools that can remind you about blogs you read or that generate more views of your blog.

For instance, Blogarithm is a service that lets users subscribe to blogs and be notified by e-mail when they have new content. Despite being open to public scrutiny, blogs are not really intended for mass consumption. The role of the blog is probably best expressed by Stefan

Glanzer, one of the founders of blogging system 20six: 'If you want to reach millions you book an ad on TV and if you want to reach one person you use e-mail or the telephone. But if you want to reach between 5 and 500 people a blog is the ideal tool to communicate.' However, some specialized search engines look principally at blogs, and as a result blogs are available to anyone on the Internet with access to a good search engine.

Many critics of the mainstream media use blogs to present information reported by international news or to critique what they see as the shortcomings or biases of the major media outlets. Many journalists also maintain blogs as a form of reporting or commentary. Academic experts have also adopted blogs to comment on developments in their fields or to offer their analysis of domestic and international news.

Although primarily for personal expression, there is a trend to use blogs in business as an informal discussion medium. Some companies have used blogs to provide a forum for discussion of new ideas and products.

Chats

Chats are text communication between two or more people via computer which are simultaneous. That is one person types a message on their keyboard, and the person or people with whom they are communicating see the message appear on their monitors and can respond. Unlike E-mail messages which may not be delivered, read and responded to until some time elapses, chats responses are immediate, and that decisions on something could be reached that very moment

Chat requires each user to have a computer connected to an electronic network. The network might be a local area network within a business, or it might be the Internet. Users also need a chat system, software that controls the connection between the computers of the people who are chatting. Many chat systems are free, though some of them a done over secure links.

Chat is most commonly used for social interaction. For example, people might use chat to discuss topics of shared interest or to meet other people with similar interests. Businesses and educational institutions are increasingly using chat as well. Some companies hold large online chat meetings to tell employees about new business developments. Such meetings are particularly useful for companies whose employees are spread out. Small workgroups within a company may use chat to coordinate their work. In education, teachers may use chat to help students practice language skills and to provide mentoring to students.

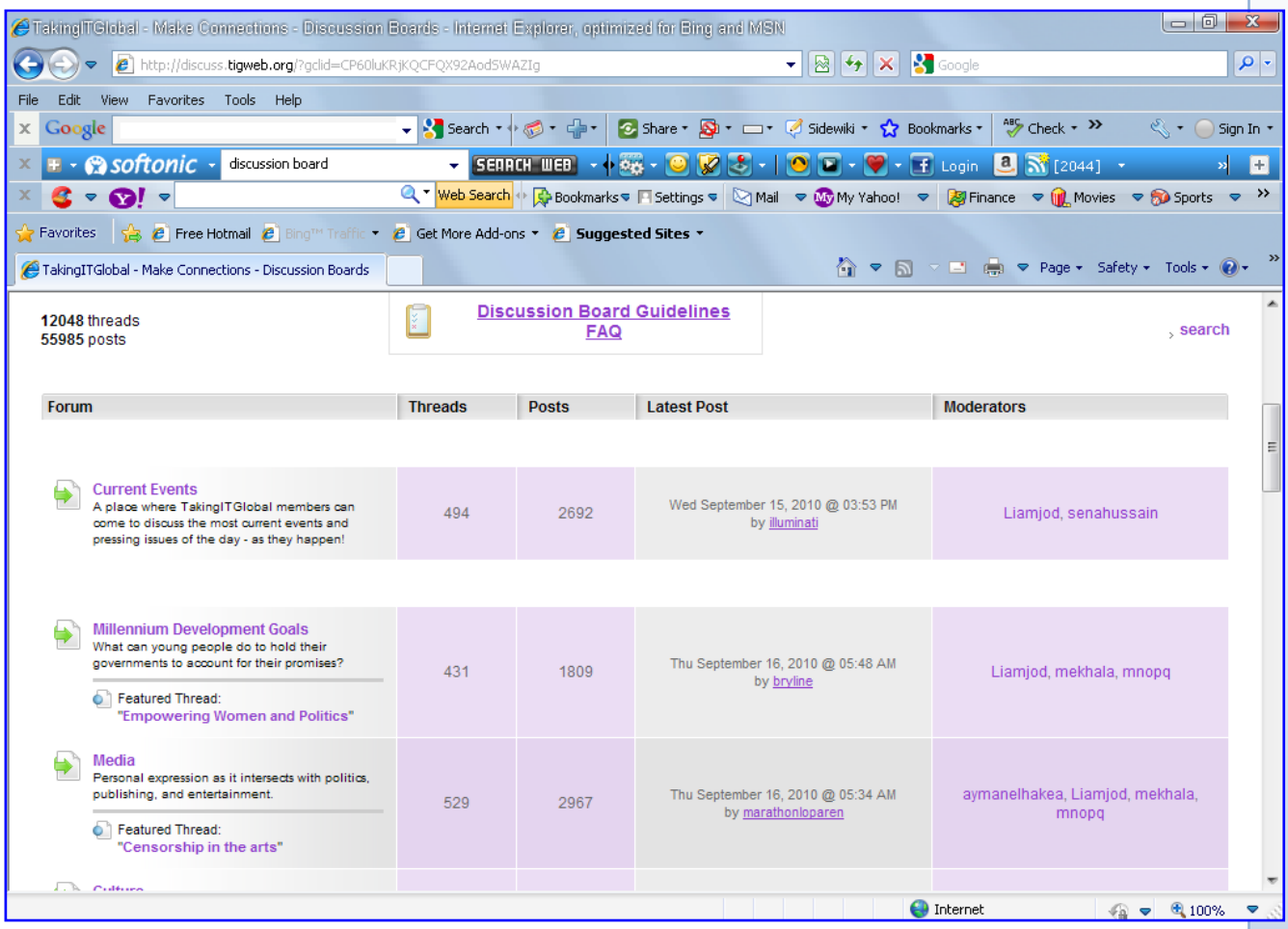
Discussion board

A discussion board also known as forum is an online discussion site where people can hold conversations in the form of posted messages. Unlike chats, the messages are not shown in the actual time they were posted, and to see new messages the forum page must be reloaded. Also, depending on the access level of a user and/or the forum set-up, a posted message

might need to be approved by a moderator before it becomes visible. Messages must conform to specific standards; otherwise the moderator will reject it.

Forums have their own language; e.g. A single conversation is called a 'thread'. A forum is hierarchical or tree-like in structure: forum - subforum - topic - thread - reply.

Depending on the forum set-up, users can be anonymous or have to register with the forum and then subsequently login in order to post messages. Usually you do not have to login to read existing messages. A discussion board can look like the one below.



Synchronous communication

When devices exchange data, there is a flow or stream of information between the two. In any data transmission, the sender and receiver must have a way to extract individual characters or blocks (frames) of information. Imagine standing at the end of a data pipe. Characters arrive in a continuous stream of bits, so you need a way to separate one block of bits from another. In asynchronous communications, each character is separated by the equivalent of a flag so you know exactly where characters are located. In synchronous communications, both the sender and receiver are synchronized (made to work at the same time) with a clock or a signal encoded into the data stream. In synchronous communications, the sender and receiver must synchronize with one another before data is sent.

Asynchronous communication

Asynchronous communication is a form of communication which does not require all parties involved in the communication to be present and available at the same time. In asynchronous communication, some amount of time may pass before a person responds to a message. In a discussion forum, which is a form of asynchronous communication, a message sits in a message queue for other people to read and respond to at any time, or until the message falls out of the queue. In the case of discussion forums and e-mail, delayed communication gives respondents time to think about their response and gather information from other sources before responding. Another form of asynchronous communication is text messaging over mobile phones.

Listserv

Listserv is a type of software that automatically manages computer mailing lists on the Internet. It consists of a set of email addresses for a group in which the sender can send one email and it will reach a variety of people These lists, sometimes called discussion groups, focus on specific topics and membership usually is open to anyone who requests it. Listserv replaces manual management and can add and remove members and distribute new messages posted to the list to all members through e-mail.

Electronic discussion

Electronic discussion occurs whenever a group of users come together to discuss a particular topic. This can happen in chat rooms, instant messaging, and listserv discussion lists. Although there are several methods of electronic discussion, the purpose of each method is to bring together persons of like interests to share ideas, opinions, problems and solutions. Generally they get started because someone decides to offer discussion on a particular topic. Then they find a networked computer that can "host" the discussion and put out an announcement that the discussion group exists. Interested network users can then "subscribe" to the discussion. From then on, any message sent to the discussion is automatically distributed as e-mail to all subscribers. When a person initially requests to subscribe to a listserv list, they will be sent an e-mail message that contains instructions on how to subscribe and unsubscribe, suspend (such as when a person is on vacation and doesn't wish to have their e-mail box clogged with messages in their absence), and other useful information. For every list to which you subscribe, these instructions should be printed and retained in a handy place for future reference.

Listserv lists can be "moderated" or "unmoderated." The distinction denotes whether messages are automatically forwarded to all subscribers (unmoderated) or whether messages are first screened and may be combined with other similar messages by a human being before being sent to subscribers (moderated). All other things being equal, moderated lists are by far more useful than unmoderated ones. When messages are automatically forwarded it is possible for subscribers to receive a lot of spurious messages (for example, replies mistakenly directed at the list rather than an individual, botched subscription or unsubscription messages, or "junk mail" from groups selling products you don't want.).

Electronic discussions can be extremely useful and professionally rewarding, but they can also be useless. They are guaranteed to be time consuming and can consume all of your time if you let them. Whether they are useful or useless depends upon a number of variables, only some of which are under your control.

Electronic discussions can also be "open" or "closed." Anyone can subscribe to an open discussion, whereas a closed discussion is constrained to a particular group of persons.

Voice Over Internet Protocol (VOIP)

Voice Over Internet Protocol (VOIP) is a method for making telephone calls over the Internet by sending voice data in separate packets, just as e-mail is sent. Each packet is assigned a code for its destination, and the packets are then reassembled in the correct order at the receiving end. Recent technological improvements have made VOIP almost as seamless and smooth as a regular telephone call.

Bandwidth

Bandwidth is the transmission capacity of the lines that carry the internet's electronic traffic. The greater the bandwidth, the more data that can be moved at one time. Lack of bandwidth can impose severe limitations on the ability of the internet to quickly deliver information.

DNS

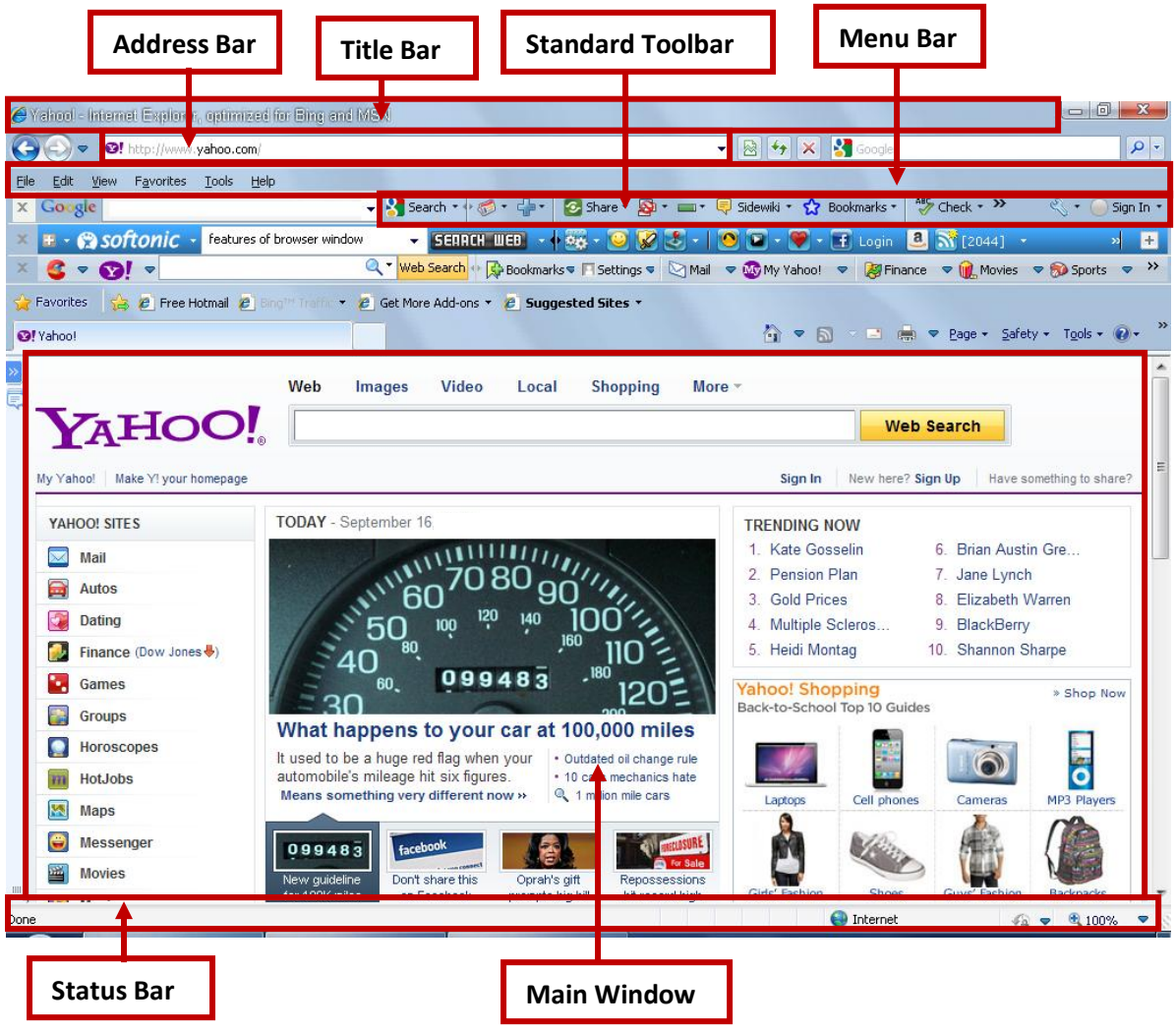
Domain Name System (DNS) is a method of translating Internet addresses so that computers connected in the Internet can find each other. A DNS server translates a numerical address assigned to a computer (such as 123.46.228.91) into a sequence of words, and vice versa. A DNS name, written in lowercase letters with words separated by periods, takes the form of username@computer.zonename (for example: king@home.com). *Username* is the name or account number used to log on. The *hostname* (home in the example above) is the name of the computer or Internet provider; it may consist of several parts. *Zonename* indicates the type of organization. Common zone names include com (commercial organization), edu (educational), gov (government), and net (networking organization).

FEATURES AND USE OF BROWSER WINDOW

The growth of the internet and consequently websites has resulted in the creation of more and more web browsers. Some popular web browsers such are Mozilla Firefox, Safari and Opera are very common on computer systems world wide, but one web browser which is almost ubiquitous is Internet Explorer. Internet Explorer is the most popular web browser in the world because it accompanies the most popular Operating System in the world – Windows; and whenever a person installs any Windows operating system, they automatically install Internet Explorer. For this reason we are going to consider the features of Internet Explorer.

A typical Internet Explorer window is made up of a:

- Title bar
- Menu bar
- Address bar
- Standard bar
- Main window
- Status bar



Title Bar

The title bar displays the logo of Internet Explorer, the name of the current web page, the name of the browser (Internet Explorer) the close, minimize and maximize buttons. The title bar takes the theme colour.

Menu Bar

Next to the title bar is the menu bar which contains a list of options from which the user can select in order to perform a desired action, such as choosing a command or applying a particular format to part of the browser.

Address Bar
The address bar contains the address that points to a particular document or other resource on web. A user can visit any website by typing its address into the address bar.

Standard Bar
The standard bar contains tools which are shortcuts to some common commands such as history, which automatically store web pages visited recently; favorites which contains bookmarks or pages stored by the user, back and previous which navigate to web page view before and after the current one etc.

Main Window
The main information of the web page is displayed in the main window. The main window normally contains tabs with names for navigating to various categories of the website. It may also contain scroll bars for scrolling to the parts of the page which extends the window.

Status Bar
This bar which is located at the bottom of the page displays the progress of file transfer from the internet to the computer. It also shows the current website and the various files as they are downloaded.

BROWSING THE INTERNET

One of the most interesting things to do when sitting behind your computer is flipping from one web page to another; this is referred to as browsing or surfing the internet. To be able to browse the internet with ease, you must be familiar with the features discussed above and how they work.

Using the address

It is easier to visit a web page if you know the web address. To use the address:

- Launch your web browser (such as Internet Explorer)
- In the Address Bar, type the web address. For example, **http://www.yahoo.com**, or you can choose to omit the **http://** and straight away type yahoo.com. some web address will require you to at least type the **www.**

- Press Enter. The web page loads and the various files (such as text, graphics and multimedia) are downloaded into the webpage.

Using the Standard Toolbar

The Standard Toolbar contains shortcuts to some web pages. To visit a page using the Standard Toolbar, just click on the appropriate shortcut.

Chapter **12**

USING THE INTERNET TO COMMUNICATE

OBJECTIVES

After completing this chapter, you should be able to:

i. Send and access e-mail messages with attachments.
ii. Use internet to chat.

INTRODUCTION

One of the fascinating parts of the internet is the communication tools attached to it, namely, e-mail, chats, discussion board, videoconferencing and a host of others. Indeed, the internet has really made communication much easier and effective.

It is more efficient, economical and reliable to send some vital information through e-mail than to do that through the post; and when a person receives a e-mail he or she will not be under any compulsion to answer the e-mail there and then, but is given the time to think over his exact words. For a much faster communication, on e could employ chats, where the flow of information from one person to another is relatively quick. Finally, what could be better

than seeing the person you are talking to face to face, even if you are oceans apart? That is made possible by another method of communication using the internet known as videoconferencing.
In this section we are going to consider how to use various methods of communication with the internet.

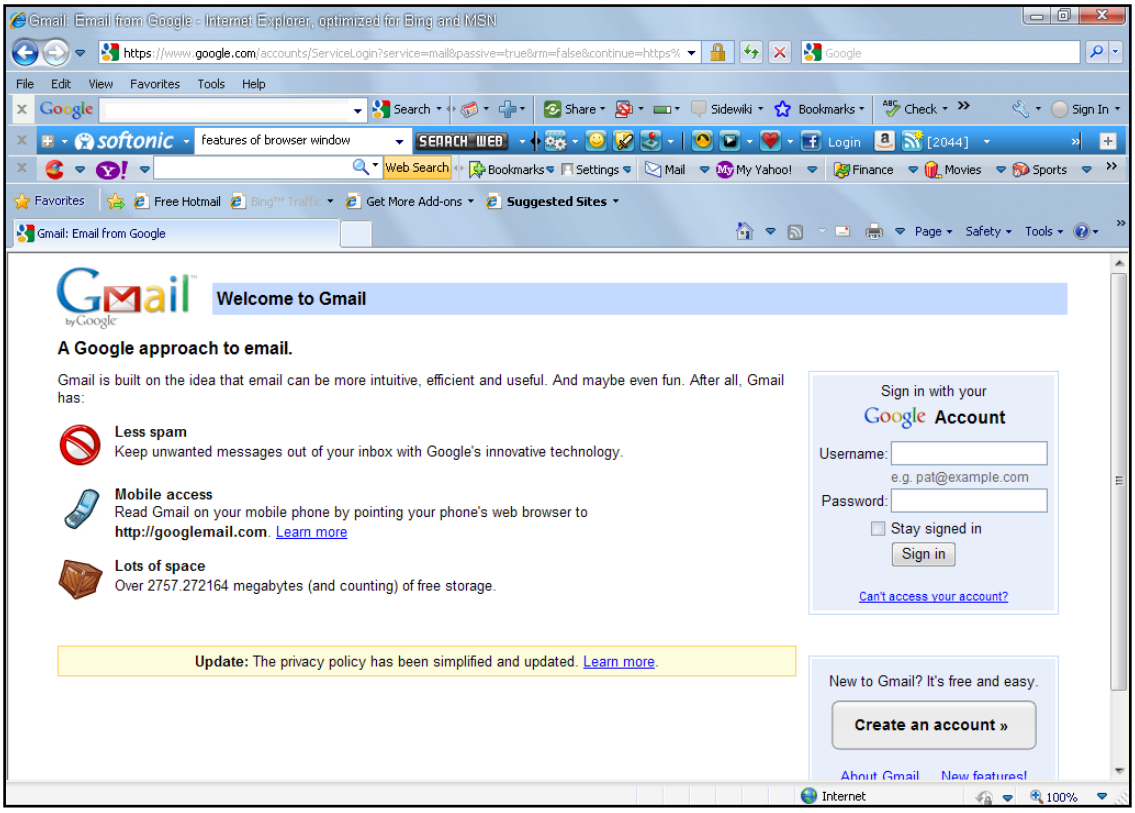
SENDING, ACCESSING E-MAILS MESSAGES

E-mails are the most common method of internet communication; and most people gain their acquaintance with communication over the internet with e-mails. Before we learn how to use e-mails, let us start off with knowing how it is created.

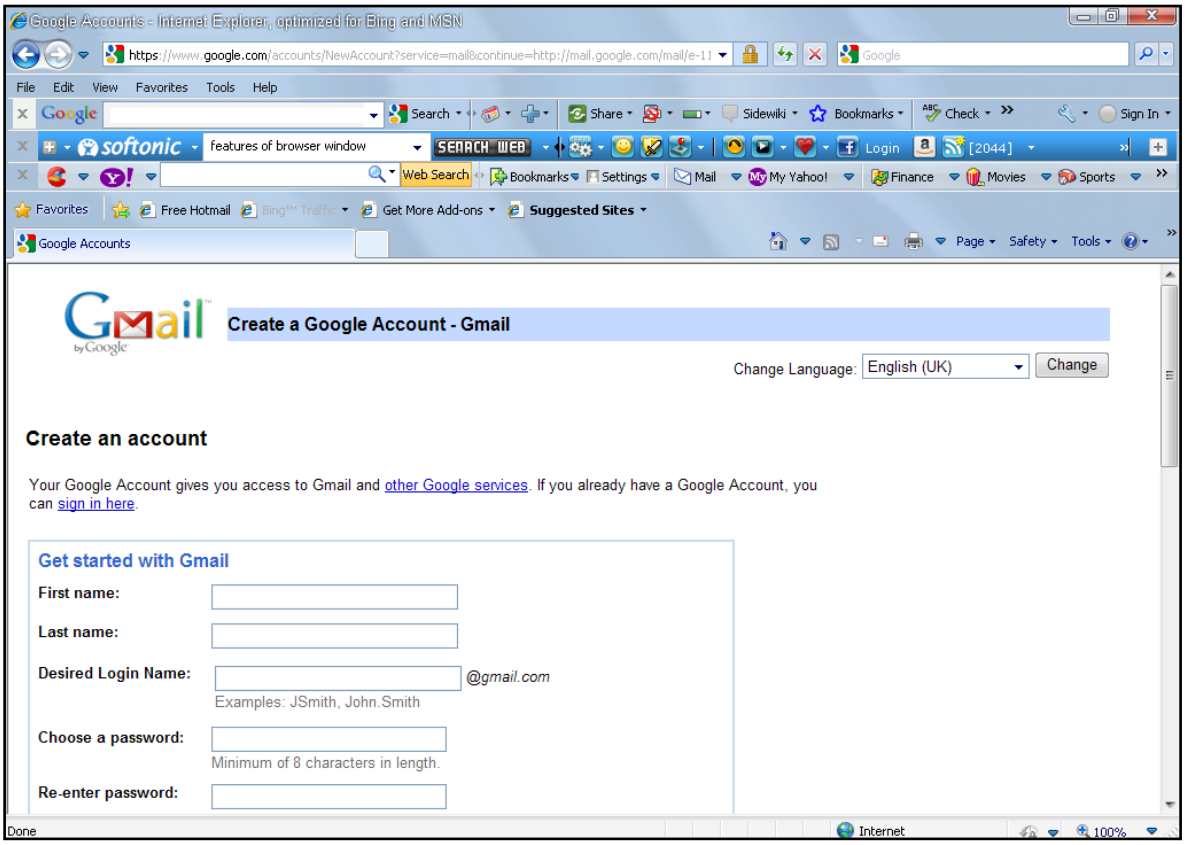
How to create an e-mail account

When we talk of e-mails, two names come to mind – Google and Yahoo. Let us consider how to create a e-mail account with the. Follow these steps to create a Google e-mail (googlemail or gmail) account:

- Launch the internet browser.
- In the address bar, type http://www.gmail.com. That opens the Google mail website. (see below)

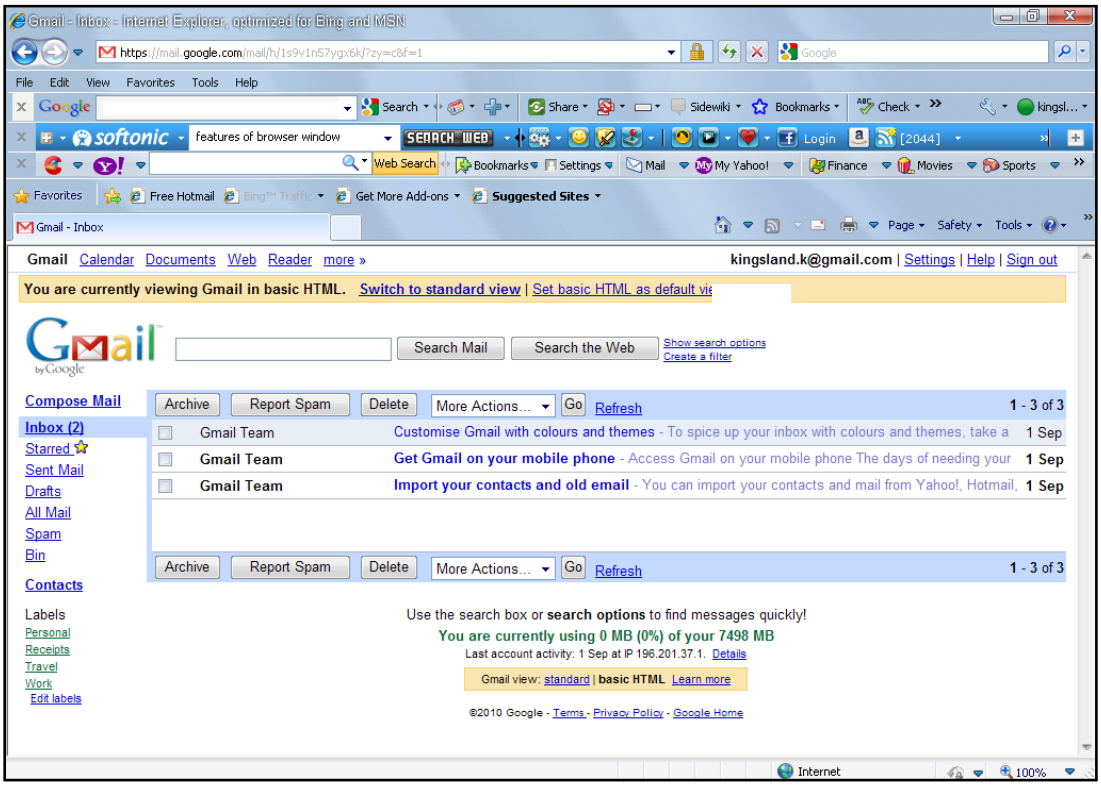


Click on Create an account. A questionnaire window appears.

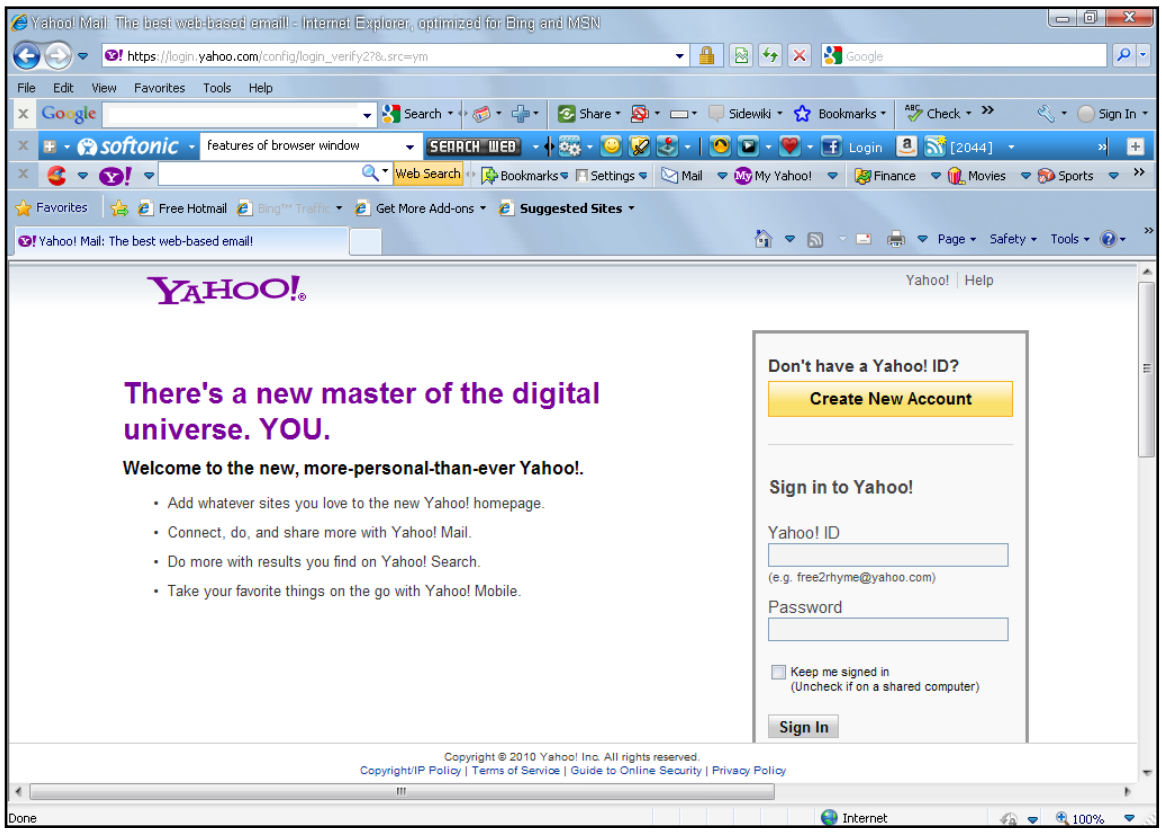


Fill it out. Once done, a confirmation page appears with the information you provided which is your sign in information. Print or copy that information and keep it safe and secure.

When you sign in for the first time, you will see some messages from the Gmail Team.

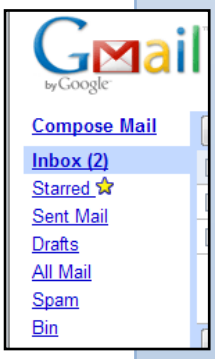


You have created a new e-mail account. If you are not a fun of Google and prefer another e-mail host instead, the method is very similar to the one above. Just enter the URL – for example, http://www.yahoomail.com. The Yahoo Mail website opens as below. Follow the next step to create a Yahoo mail account.

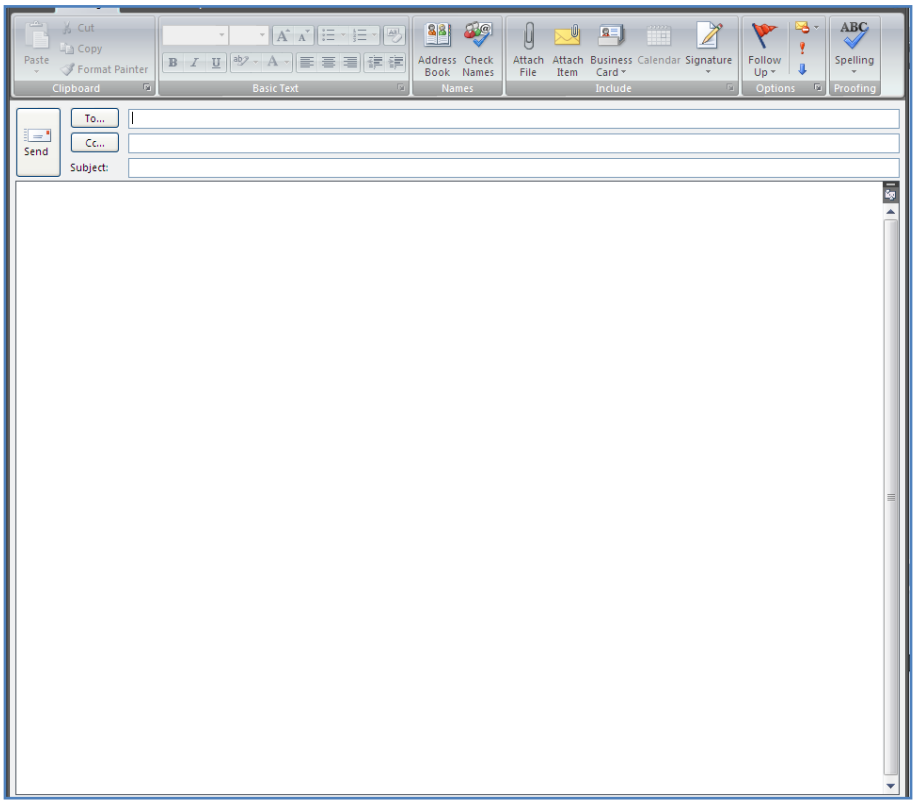


Once your e-mail account is created you can send and receive e-mail messages. Let us consider how to send an e-mail.

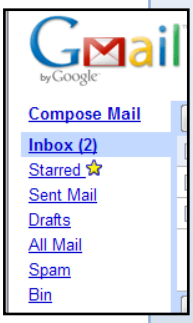
Sending E-mail Messages



- If you are using Gmail or Yahoo, after you have successfully signed in, you will see the Compose Mail link click on it. this opens the Compose Mail window like the one below.
- In the **To** text box, type in the email address of the recipient. If you want to send the mail to more than one recipient, click **Cc**, and type in the e-mail addresses of the other recipients.
- In the **Subject** text box, type in a keyword or phrase as an insight to the message you are about to send.
- In the main window, type your message. If you want to add attachments such as graphics, audio, video etc, click **Attach File**. This opens the **Insert File** dialogue box. search for the item you want to attach and then click Attach or OK.
- When you are done, click **Send**.

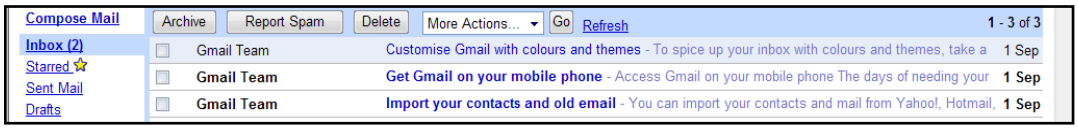


Accessing E-mail messages



To read an e-mail sent to you:

Click Inbox. All the messages you have received are presented by subjects. Click on one to read the full message. If the e-mail contains an attachment, you will see the attachment sign  Click on it to download or open the attached file.



Chapter **13**

ACCESSING INFORMATION FROM THE INTERNET

OBJECTIVES

After completing this chapter, you should be able to:

i. Use the uniform Resource Locator (URL) and search engines to access information.
ii. Download information from the internet.
iii. Access, copy and paste information form the internet to different application.

INTRODUCTION

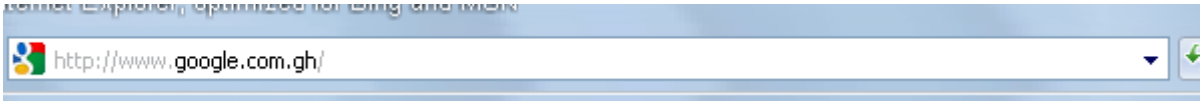
The internet presents a vast array of information to the public. No matter what the subject criteria of the user is, they are apt to get something on it. Accessible information on the internet could be text, video, audio, pictures and other graphics. While some information are free and easily accessible, other can only be accessed after payment of a fee. Some other information, though free, needs to be subscribed for before they can be access.

Some websites, especially news groups, continuously update available information, while others allow the information to become worn-out. Some information are based on facts while others are the opinions of some persons which could be slanderous.
The internet is very broad and there are a lot of ways of retrieving information from it. some of the ways of accessing information from the internet are by:

- Using Uniform Resource locator (URL).
- Using search engines.
- Subscribing to a mail list

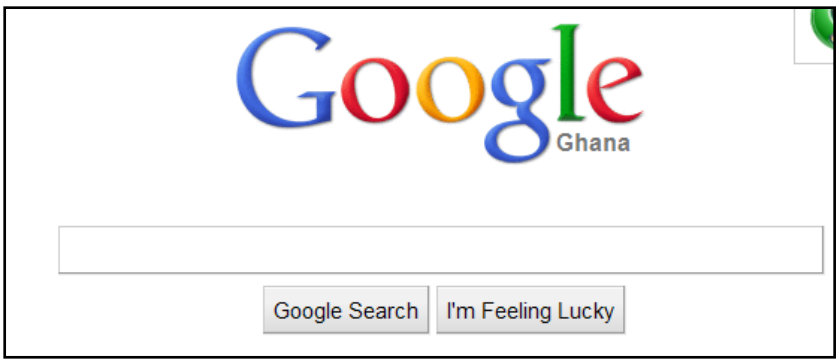
Using Uniform Resource Locator (URL)

Every website has got its own unique address also known as Uniform Resource Locator (URL). If you know the exact URL of the website, you can easily type it in the address bar and the website will open for you. Users must bear in mind that the URL no matter the number of separate words it contains is typed as a single word with no spacing or punctuation marks. You should also remember that any spelling mistake will either open a different website or generate an error message from the browser.



Using Search Engines

If you do not know the actual URL of the website you want you can type a word or phrase in the URL. The search engine gives you a wide array of websites which have information about the searched item. When researching for information on the Web, it is advisable to use the search engine since it presents a lot of sites with a lot of information concerning the searched item. You should also know that not all the information displayed after a search is needs. It is very necessary to read through the search result thoroughly in order to find the right information which matches you searched item.



Downloading information from the internet

Some items on the Web such as software, music etc. are free to download; others can be downloaded after meeting a particular requirement such as paying a fee. Some software, though not free, can be downloaded and tried for a few days or weeks. When downloading information from the internet, you must be sure that the information is coming from a

trustworthy source. Some diabolical people intentionally camouflage viruses, worms and other software-related threat as credible software and upload them on the internet. you already know what software-related threats do, don't you?

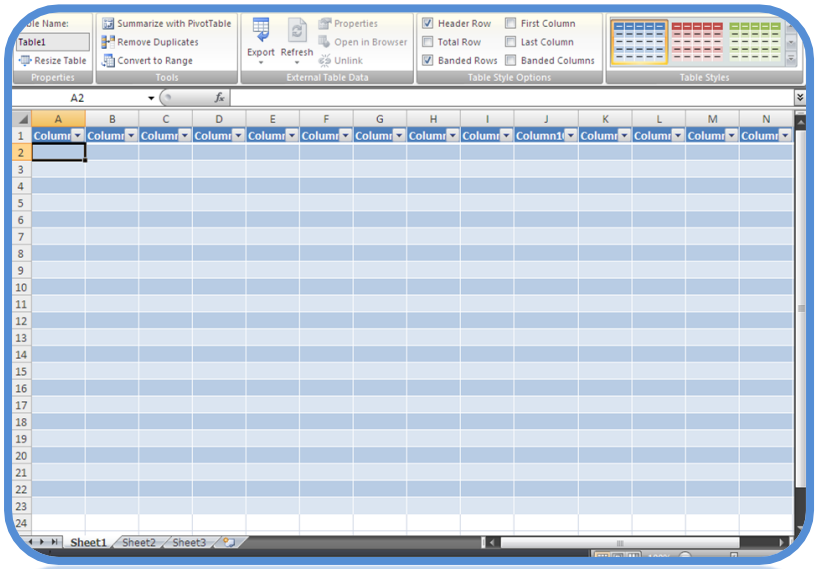
Copying and pasting information from the internet to a different application

Most of the information on the internet, especially text, can be copied and pasted into a third-party software, such as Microsoft Word. You can use he same method we used in copying or cutting and pasting information in Word –

- Drag-select the information, if it is text.
- Right-click on it and then select **Copy** from the pop-up menu or use the keyboard shortcut, **CTRL +C** to copy the information to the clipboard.
- Open the application in which you want to paste the information, e.g. Word.
- Right click the document area and select **Paste** from the pop-u menu or use the keyboard shortcut **CTRL +V** to paste the information.

If the information is a picture, clipart or any other graphic.

- Right-click it and select **Copy** from the pop-up menu.
- Open the third-party software and then select **Paste** to paste it there.



Chapter **14**

SPREADSHEET APPLICATION

OBJECTIVES

After completing this chapter, you should be able to:

i. Identify Spreadsheet Packages.
ii. Explain related concepts and terminologies.
iii. Identify features in spreadsheet window.
iv. Identify types of data and state their uses.
v. Launch and edit spreadsheet applications.
vi. Create and save Workbook.
vii. Construct and insert simple formula.

INTRODUCTION

Entering financial details and transactions in a ledger book is an arduous activity which most accountant would rather not do; and it is even more painful if a single mistake is committed. Software developers, in trying to find a remedy to this tiring process came out with a programme known as a *spreadsheet*.

A Spreadsheet is a program that looks like a paper, accounting worksheet, commonly used for budgets, forecasting, and other finance-related tasks. In a spreadsheet program, data and formulas to calculate those data are entered into ledger-like forms. Spreadsheet programs use rows and columns of cells; each cell can hold text or numeric data or a formula that uses values in other cells to calculate a desired result. To ease computation, these programs

include built-in functions that perform standard calculations. Spreadsheets are frequently used for financial information because of their ability to re-calculate the entire sheet automatically after a change to a single cell is made.

Depending on the program, a single spreadsheet can contain anywhere from thousands to millions of cells. Some spreadsheet programs can also link one spreadsheet to another that contains related information, and can update data in linked spreadsheets automatically.

SPREADSHEET PACKAGES

Spreadsheet applications have flooded the market, all with the aim of making the work of accountants easier. Some of the common spreadsheet packages have been discussed below.

Microsoft Excel

Microsoft Office Excel is a spreadsheet application written and distributed by Microsoft for Microsoft Windows and Mac OS X. It features calculation, graphing tools, pivot tables and a macro programming language called VBA (Visual Basic for Applications). It has been a very widely applied spreadsheet for these platforms. Excel forms part of Microsoft Office.

Microsoft Excel has the basic features of all spreadsheets, using a grid of *cells* arranged in numbered *rows* and letter-named *columns* to organize data manipulations like arithmetic operations. It has a battery of supplied functions to answer statistical, engineering and financial needs. In addition, it can display data as line graphs, histograms and charts, and with a very limited three-dimensional graphical display. It allows sectioning of data to view its dependencies on various factors from different perspectives (using *pivot tables* and the *scenario manager*). And it has a programming aspect, *Visual Basic for Applications*, allowing the user to employ a wide variety of numerical methods, for example, for solving differential equations of mathematical physics, and then reporting the results back to the spreadsheet. Finally, it has a variety of interactive features allowing user interfaces that can completely hide the spreadsheet from the user, so the spreadsheet presents itself as a so-called *application*, or *decision support system* (DSS), via a custom-designed user interface, for example, a stock analyzer, or in general, as a design tool that asks the user questions and provides answers and reports. In a more elaborate realization, an Excel application automatically can poll external databases and measuring instruments using an update schedule, analyze the results, make a Word report or Power Point slide show, and e-mail these presentations on a regular basis to a list of participants.

Lotus 1-2-3

Lotus 1-2-3 is a spreadsheet program which has three main capabilities, hence the name 1-2-3. Apart from being a spreadsheet program, it also does some database as well as word processing operations. Data features included sorting data in any defined rectangle, by order

of information in one or two columns in the rectangular area. The word processing capabilities come from its ability to justify text in a range into paragraphs.

VisiCalc

VisiCalc was the first spreadsheet that combined all essential features of modern spreadsheet applications, such as WYSIWYG interactive user interface, automatic recalculation, status and formula lines, range copying with relative and absolute references, formula building by selecting referenced cells. VisiCalc is the first application that turned the personal computer from a hobby for computer enthusiasts into a business tool. Though challenged, it is usually considered the first electronic spreadsheet. It was the leading spreadsheet when DOS was the dominant operating system.

Apple Numbers

Numbers is Apple Inc.'s spreadsheet software, part of iWork. It focuses on usability and the elegance of chart presentation. Numbers completed Apple's productivity suite, making it a viable competitor to Microsoft Office. It lacks features such as pivot table providing Table Categories as a simpler alternative.

OpenOffice.org Calc

OpenOffice.org Calc is a freely available, open-source program modelled after Microsoft Excel. Calc can both open and save in the Excel (XLS) file format. Calc can be acquired as both an installation file and a portable program, capable of being run from a device such as a USB memory drive. It can be downloaded from the OpenOffice.org website.

Gnumeric

Gnumeric is a free spreadsheet program that is part of the GNOME Free Software Desktop Project and has Windows installers available. It is intended to be a free replacement for proprietary spreadsheet programs such as Microsoft Excel, which it broadly and openly copies. Gnumeric has the ability to import and export data in several file formats.

Web based spreadsheets

With the advent of advanced web technologies such as Ajax circa 2005, a new generation of online spreadsheets has emerged. Equipped with a rich Internet application user experience, the best web based online spreadsheets have many of the features seen in desktop spreadsheet applications. Some of them have strong multi-user collaboration features. Some of them offer real time updates from remote sources such as stock prices and currency exchange rates.

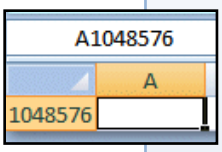
RELATED CONCEPTS AND TERMINOLOGIES

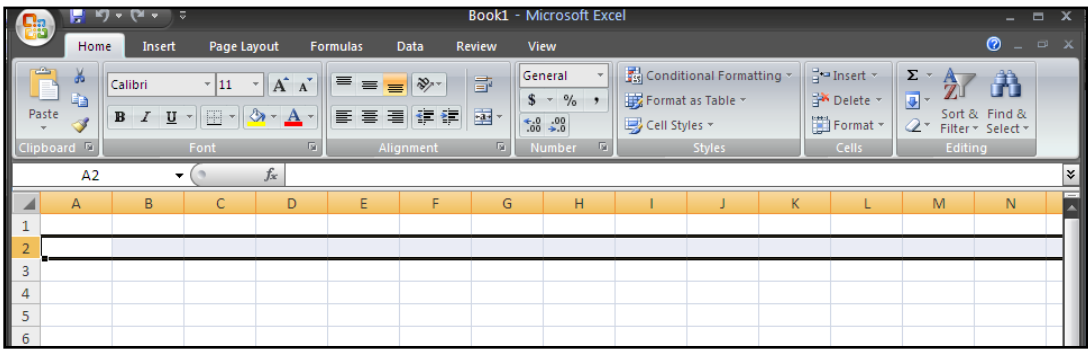
All spreadsheet applications are characterized by some features such as:

- Rows
- Columns
- Cells
- Work sheet
- Workbook

Rows

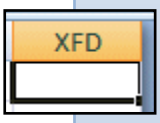
The horizontal space that runs across the spreadsheet window is referred to as a row. Rows are numbered from 1 to 1,048,576; with each row being assigned with a unique number. If you want to go to the last row at the bottom, hold down the Ctrl key and tap the down arrow key.

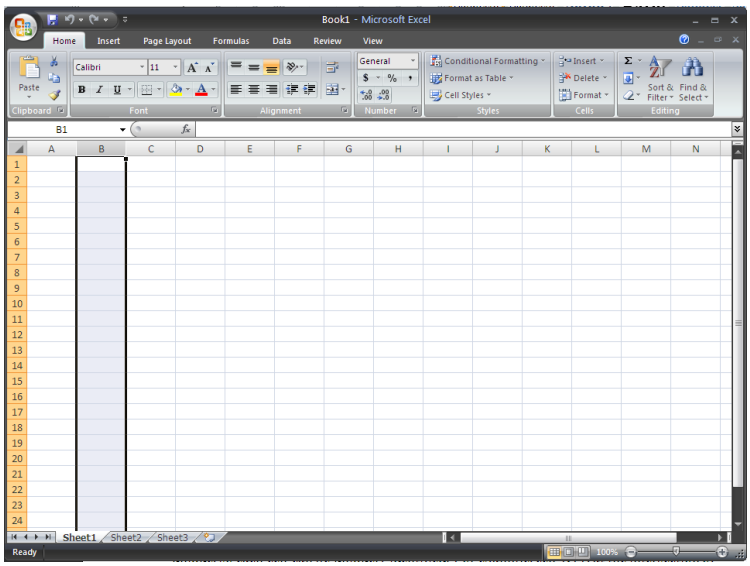




Columns

Columns are the vertical spaces tat run through a spreadsheet window. Each column has an assigned letter or letters. For example the first column is labeled A, while the 78th column is labeled CZ. If you want to go to the last column on the right, hold down the Ctrl key and tap the right arrow key.





Cells

Cells are the intersection of rows and columns. Each row and column in a spreadsheet is unique, so each cell can be uniquely identified. For example, cell B11, at the intersection of column B and row 11. Each cell is displayed as a rectangular space that can hold text, a value, or a formula. Similarly, although less familiarly, a cell is an addressable (named or numbered) storage unit for information. A binary cell, for example, is a storage unit that can hold 1 bit of information—that is, it can be either on or off.

Worksheet

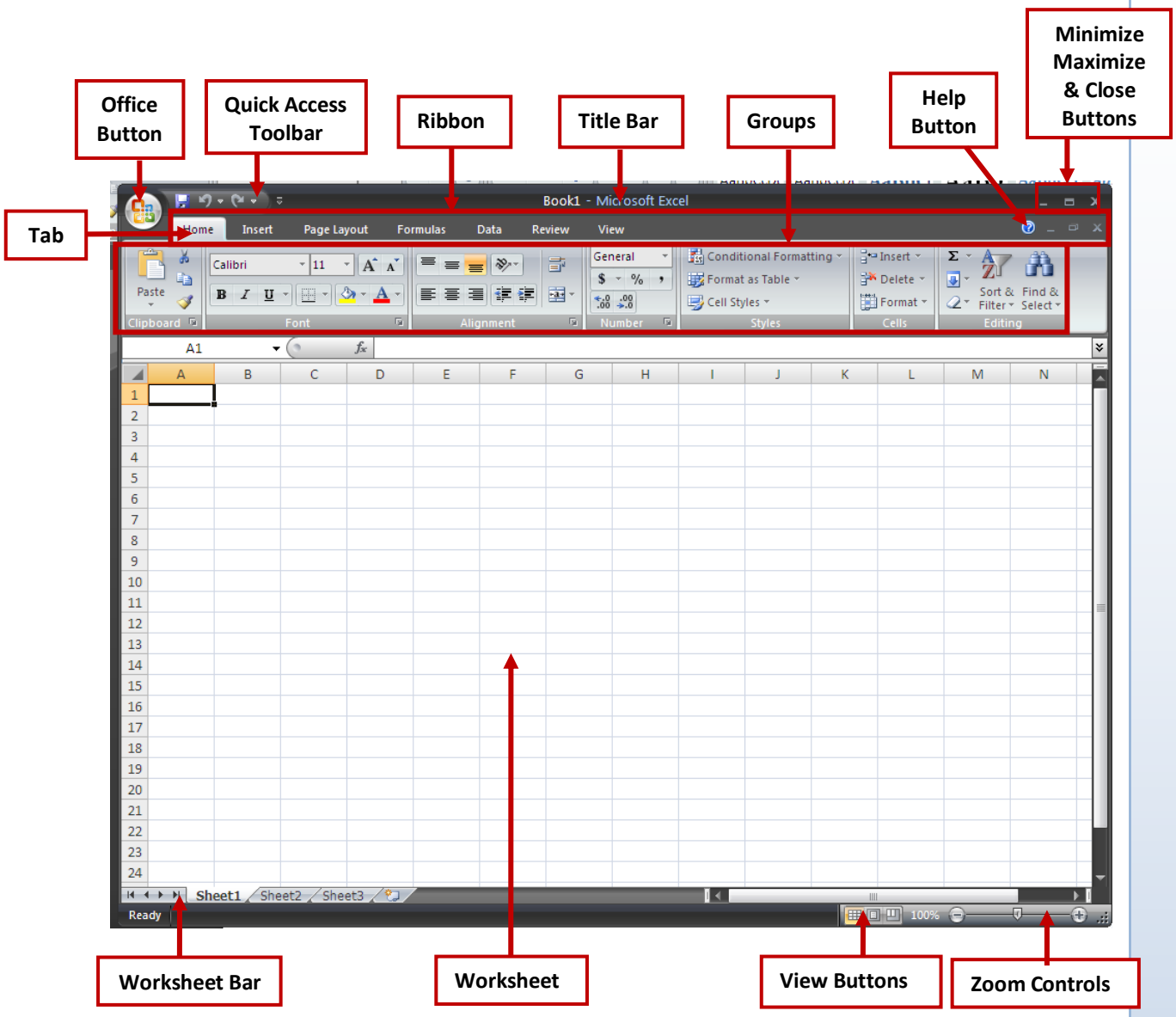
An array of cells is called a "sheet" or "worksheet". In most implementations, many worksheets may be located within a single spreadsheet. A worksheet is simply a subset of the spreadsheet divided for the sake of clarity. Functionally, the spreadsheet operates as a whole and all cells operate as global variables within the spreadsheet ('read' access only except its own containing cell).

Workbook

Microsoft Excel allows a use to work in more than one worksheet. A collection of worksheets is known as a workbook. Excel starts with a workbook of three worksheets. The user can add more sheets to the workbook by clicking on the “Insert Worksheet” button located below the main window.

FEATURES OF A SPREADSHEET WINDOW

As we have learnt from the previous topics, to understand spreadsheet fully, we must get a grip on the various features of a spreadsheet window and how they work. The spreadsheet application we are going to consider is Microsoft Office Excel 2007. To begin with, launch the application; after it has loaded you will see a window similar to the one below.



The Office Button

Office Button menu in Excel 2007 have replaced the various menus (such as File, Edit, View, and Format) in the Menu Bar just as in Word 2007. This menu contains some of the commands that used to appear on the File menu in earlier versions of Word. You can open this menu by clicking it.

Quick Access Panel

In the upper left corner – to the right of the Microsoft Office Button - you will see an area called the Quick Access Toolbar. This area is quite handy as it currently contains several of the most used buttons in Office applications – Save, Undo, Redo, Print and Print Preview. You can customize this toolbar by adding and removing as many Quick Access button choices as you desire.

Ribbons

This is the new term you hear a lot about in 2007 Office. Ribbons stretch across the top of your application screen with features to assist you as you click the Ribbon Tabs. The Ribbon replaces all the remaining menus and toolbars that previous versions of Word used. Each tab of the Ribbon contains a different set of controls that are linked thematically. Only one tab's contents can be displayed at a time. To switch tabs, you click the text label at the top

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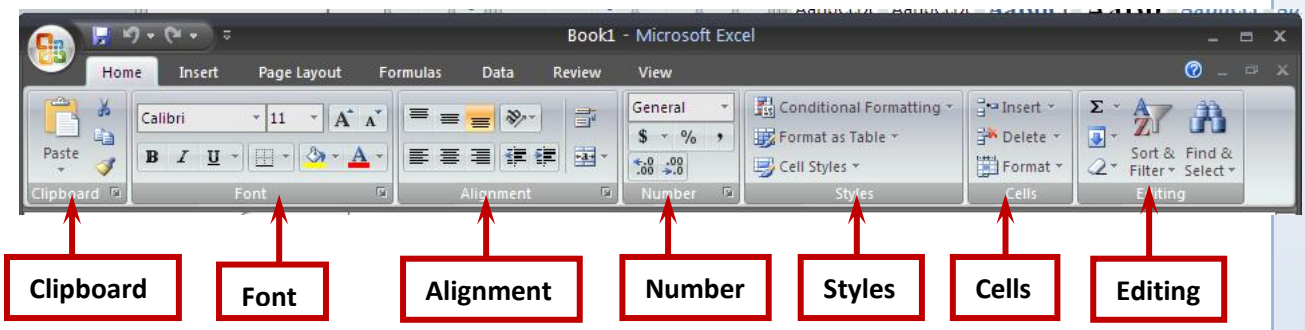
Tabs

Below the Microsoft Office Button and Quick Access Toolbar we see a series of Tabs/Ribbons. Tabs are similar to the Drop Down Menu choices in previous versions of Office. The Tabs are, logically.

Groups

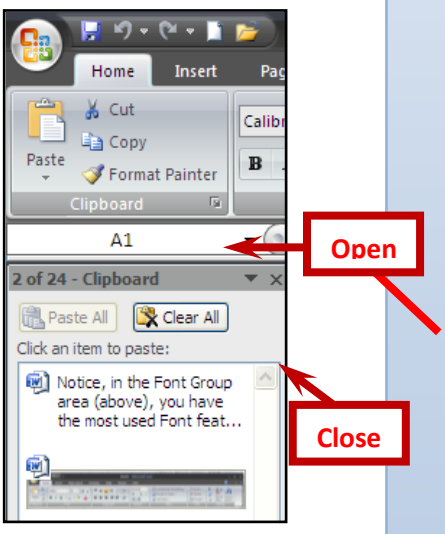
In the image below, the arrows point to a new topic – **Groups**.



Clipboard Group

Like Word, the groups in Excel begins with Clipboard. The Clipboard is the temporal storage for copied or cut data. To view data on the Clipboard, click the open button located at the lower right corner of the Clipboard Group. Refer to the image below.

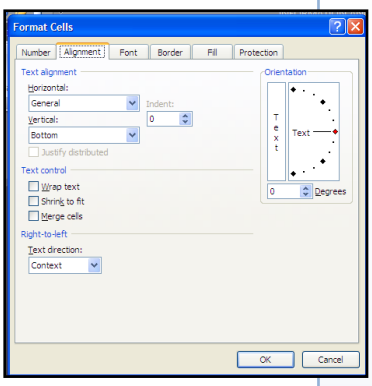
When you click the open button notice that the Clipboard appears on the left side of your screen and shows any text or images you have copied or cut. To close this group, click the "X" in the upper right corner of the Group. The clipboard allows up to 24 items.



Font

Notice, in the Font Group area (above), you have the most used Font features. However, if you desire all of the font features, just click the Open Group arrow to the right of Font.

Alignment



Excel replaces the Paragraph Group with the Alignment group, which is similar to the Paragraph Group in Word. Notice in the **Alignment Group** area you again have the most used Alignment features. However, if you d**esire all of the alignment features**, just **click** the **Open Group arrow** to the right of Alignment.

Numbers, Styles, Cell and Editing

Hang on! The last three groups in Excel are Numbers, Styles, Cells and Editing. We will get to know them as we go along, but in the mean time click opening each of them to see how they look and function.

Formulae Bar

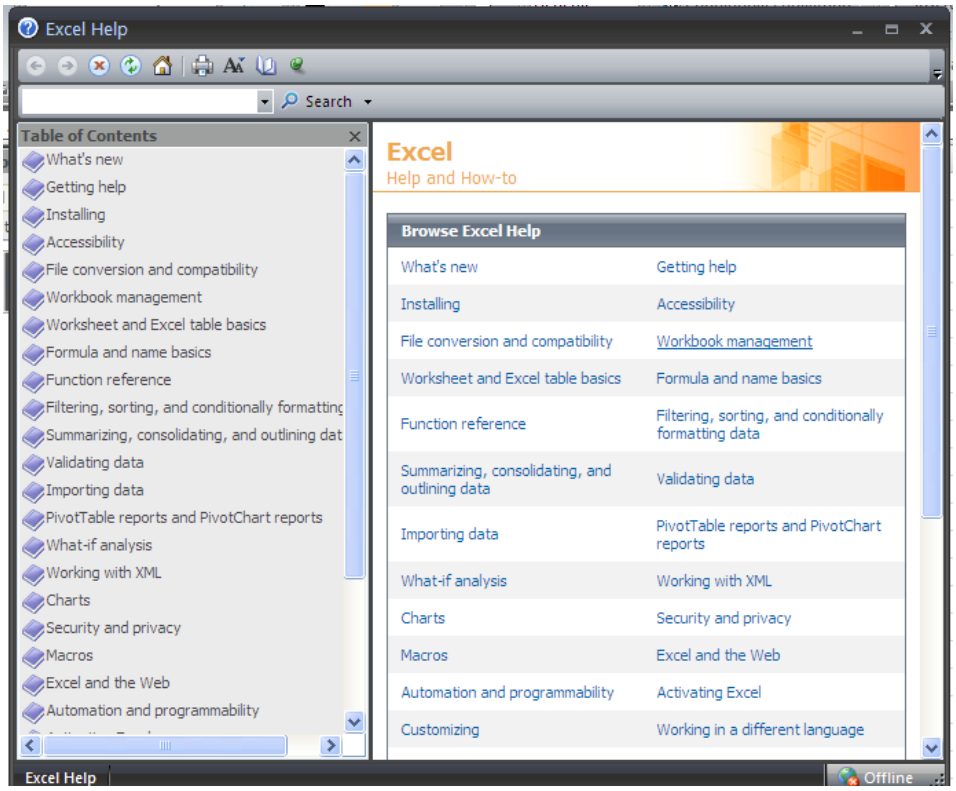
The formulae bar, as it name implies, enable formulae to be entered into the Worksheet. The Formula Bar comes in handy when one needs to use a special formula. We will have a need for it shortly.

Worksheet Bar

The bar just above the Status Bar is the Worksheet Bar, which displays the various Worksheet Tabs. Worksheet tabs represent the number of Worksheets available in the Workbook.

Help facilities

Having any difficulty with any of the features in Excel - look no further? Just click the Help button. The Help facilities assist a user to get around the Excel environment. To access the Help facilities click the Help button located at the extreme right-hand side of the Ribbon or press the Help facilities shortcut, F1. This opens the Excel Help. You can use the Table of contents or type a word or phrase to look for and then click Search.



TYPES OF DATA AND THEIR USES

Data in spreadsheet could be:

- Number
- Date
- Text
- Currency
- Fraction

Number

Use these options to change the format of numbers that are used on the value axis (i.e. The chart axis that displays scaled numerical values.) or in the data labels (i.e. The label that provides additional information about a data marker, which represents a single data point or value that originates from a datasheet cell.) of your chart. Numbers can be used in the following ways:

Category Click an option in the **Category** box, and then select the format that you want to apply.

Decimal places Specify up to 30 decimal places. This box is available only for the **Number**, **Currency**, **Accounting**, **Percentage**, and **Scientific** categories.

Use 1000 Separator (,) Select this check box to insert a thousand separator. This check box is available only for the **Number** category.

Negative numbers Specify the format in which you want negative numbers to be displayed. This option is available only for the **Number** and **Currency** categories.

Symbol Select the currency symbol that you want to use. This box is available only for the **Currency** and **Accounting** categories.

Type Select the display type that you want to use for a number. This list box is available only for the **Date**, **Time**, **Fraction**, **Special**, and **Custom** categories.

Locale (location) Select a different language that you want to use for the display type of a number. This option is available only for the **Date**, **Time**, and **Special** categories.

Format Code Allows you to create a custom number format. In the **Format Code** box, make the changes that you want to the currently selected number format, or select this number format, and then type your own custom number format. Click **Add** to apply the custom number format to the chart.

Add Allows you to apply a custom number format to the chart.

Delete Allows you to delete a custom number format. This option is available only after you create a custom number format.

Linked To Source Select this check box if you want to reference corresponding numbers on the worksheet.

Date

A date is made up of year, month and day.

Year The year argument can be one to four digits. Microsoft Excel interprets the year argument according to the date system you are using. By default, Excel uses the 1900 date system.

For the 1900 date system

- If year is between 0 (zero) and 1899 (inclusive), Excel adds that value to 1900 to calculate the year. For example, DATE(108,1,2) returns January 2, 2008 (1900+108).
- If year is between 1900 and 9999 (inclusive), Excel uses that value as the year. For example, DATE(2008,1,2) returns January 2, 2008.
- If year is less than 0 or is 10000 or greater, Excel returns the #NUM! error value.

For the 1904 date system

- If year is between 4 and 1899 (inclusive), Excel adds that value to 1900 to calculate the year. For example, DATE(108,1,2) returns January 2, 2008 (1900+108).
- If year is between 1904 and 9999 (inclusive), Excel uses that value as the year. For example, DATE(2008,1,2) returns January 2, 2008.
- If year is less than 4 or is 10000 or greater or if year is between 1900 and 1903 (inclusive), Excel returns the #NUM! error value.

Month is a positive or negative integer representing the month of the year from 1 to 12 (January to December).

- If month is greater than 12, month adds that number of months to the first month in the year specified. For example, DATE(2008,14,2) returns the serial number representing February 2, 2009.
- If month is less than 1, month subtracts that number of months plus 1 from the first month in the year specified. For example, DATE(2008,-3,2) returns the serial number representing September 2, 2007.

Day is a positive or negative integer representing the day of the month from 1 to 31.

- If day is greater than the number of days in the month specified, day adds that number of days to the first day in the month. For example, DATE(2008,1,35) returns the serial number representing February 4, 2008.
- If day is less than 1, day subtracts that number of days plus one from the first day in the month. For example, DATE(2008,1,-15) returns the serial number representing December 16, 2007.

Remarks

- Excel stores dates as sequential serial numbers so they can be used in calculations. By default, January 1, 1900 is serial number 1, and January 1, 2008 is serial number 39448 because it is 39,448 days after January 1, 1900.
- The DATE function is most useful in formulas where year, month, and day are formulas, not constants.

Inserting a date or time

- **Current date** Select a cell and press **CTRL+;**
- **Current time** Select a cell and press **CTRL+SHIFT+;**
- **Current date and time** Select a cell and press **CTRL+;** then SPACE then **CTRL+SHIFT+;**

Text

There are two ways to import data from a text file by using Microsoft Office Excel: You can open the text file in Excel, or you can import the text file as an external data range (external data range: A range of data that is brought into a worksheet but that originates outside of Excel, such as in a database or text file. In Excel, you can format the data or use it in calculations as you would any other data.). To export data from Excel to a text file, use the **Save As** command.

There are two commonly used text file formats:

- Delimited text files (.txt), in which the TAB character usually separates each field of text.
- Comma separated values text files (.csv), in which the comma character (,) usually separates each field of text.

You can change the separator character that is used in both delimited and .csv text files. This may be necessary to make sure that the import or export operation works the way that you want it to.

- You can import or export up to 1,048,576 rows and 16,384 columns.

Import a text file by opening it

You can convert a text file that you created in another program to an Excel workbook by using the **Open** command.

1. Click the **Microsoft Office Button**  , and then click **Open**.

   The **Open** dialog box appears.

2. In the **Files of type** box, select **Text Files**.

3. In the **Look in** list, locate and double-click the text file that you want to open:

   - If the file is a text file (.txt), Excel starts the Import Text Wizard.

     Follow the instructions in the Text Import Wizard. Click **Help** ? for more information about using the Text Import Wizard or see Text Import Wizard. When you are done with the Wizard, click **Finish**.

   - If the file is a .csv file, Excel automatically converts the text file and opens it.

     NOTE When Excel opens a .csv file, it uses the current default data format settings to interpret how to import each column of data. You may want more flexibility in converting columns to different data formats by using the Import Text Wizard. For example, the data format of a data column in the .csv file may

be MDY, but Excel's default data format is YMD, or you want to convert a column of numbers with leading zeros to text so you can preserve the leading zeros. To use the Import Text Wizard, you can change the file type to .txt before you open it, or Import a text file by connecting to it.

Importing a text file by connecting to it

You can import data from a text file as an external data range (external data range: A range of data that is brought into a worksheet but that originates outside of Excel, such as in a database or text file. In Excel, you can format the data or use it in calculations as you would any other data.).

1. Click the cell where you want to put the data from the text file.
2. On the **Data** tab, in the **Get External Data** group, click **From Text**.
3. In the **Look in** list, locate and double-click the text file that you want to import.

   Follow the instructions in the Text Import Wizard. Click **Help** for more information about using the Text Import Wizard, or see Text Import Wizard. When you are done with the Wizard, click **Finish**.
4. In the **Import Data** dialog box, do the following:
   - Optionally, click **Properties** to set refresh, formatting, and layout options for the imported data.
   - Under **Where do you want to put the data?**, do one of the following:
     - To return the data to the location that you selected, click **Existing worksheet**.
     - To return the data to the upper-left corner of a new worksheet, click **New worksheet**.
5. Click **OK**.

   Excel puts the external data range in the location that you specify.

If Excel does not convert a column to the format that you want, you can convert the data after you import it. For more information, see the following Help topics:

- Convert numbers stored as text to numbers
- Convert dates stored as text to dates
- TEXT
- VALUE

Exporting data to a text file by saving it

You can convert an Excel worksheet to a text file by using the **Save As** command.

1. Click the **Microsoft Office Button**  , and then click **Save As**. The **Save As** dialog box appears.

2. In the **Save as type** box, choose the text file format for the worksheet.

   NOTE The different formats support different feature sets. For more information about the feature sets that are supported by the different text file formats, see Excel formatting and features that are not transferred to other file formats.

3. In the **Save in** list, browse to the location where you want to save the new text file.

4. In the **File name** box, review the name that Excel proposes for the new text file, and change it if necessary.

5. Click **Save**.

6. A dialog box appears, reminding you that only the current worksheet will be saved to the new file. If you are certain that the current worksheet is the one that you want to save as a text file, click **OK**. You may save other worksheets as separate text files by repeating this procedure for each worksheet.

7. A second dialog box appears, reminding you that your worksheet may contain features that are not supported by text file formats. If you are only interested in saving the worksheet data into the new text file, click **Yes**. If you are unsure and would like to know more about which Excel features are not supported by text file formats, click **Help** for more information.

For more information about saving files in other formats, see Save a workbook in another file format.

Changing the delimiter that is used in a text file

For a delimited text file, you can change the delimiter from a TAB character to another character in step 2 of the Text Import Wizard. In step 2, you can also change the way that consecutive delimiters, such as consecutive quotes, are handled. For more information about using the Text Import Wizard, see Text Import Wizard.

Changing the separator in all .csv text files

1. Click the Windows **Start** menu.

2. Click **Control Panel**.

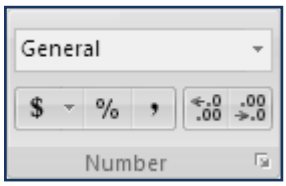
3. Open the **Regional and Language Options** dialog box.
4. Click the **Regional Options** tab.
5. Click **Customize**.
6. Type a new separator in the **List separator** box.
7. Click **OK** twice.

NOTE After you change the list separator character for your machine, all programs use the new character. You can change the character back to the default character by following the same procedure.

Fraction

Use the **Fraction** format to display or type numbers as actual fractions, rather than decimals.

1. Select the cells that you want to format.
2. On the **Home** tab, click the **Dialog Box Launcher** next to **Number**.



3. In the **Category** list, click **Fraction** in the **Category** list.
4. In the **Type** list, click the fraction format type that you want to use.

Available fraction formats

Fraction format	This format displays 123.456 as
Single-digit fraction	**123 1/2**, rounding to the nearest single-digit fraction value
Double-digit fraction	**123 26/57**, rounding to the nearest double-digit fraction value
Triple-digit fraction	**123 57/125**, rounding to the nearest triple-digit fraction value
Fraction as halves	**123 1/2**
Fraction as quarters	**123 2/4**
Fraction as eighths	**123 4/8**

Fraction as sixteenths	**123 7/16**
Fraction as tenths	**123 5/10**
Fraction as hundredths	**123 46/100**

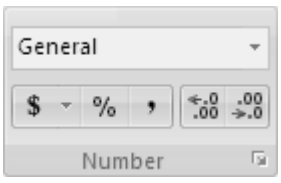
TIP The number in the active cell of the selection on the worksheet appears in the **Sample** box, so that you can preview the number formatting options that you select.

NOTES

- After you apply a fraction format to a cell, decimal numbers as well as actual fractions that you type in that cell will be displayed as a fraction. For example, typing **.5** or **1/2** results in **1/2** when the cell has been formatted with a fraction type of **Up to one digit**.
- If no fraction format is applied to a cell, and you type a fraction such as **1/2**, it will be formatted as a date. To display it as a fraction, apply a **Fraction** format, and then retype the fraction.
- If you don't need to perform calculations on fractions, you can format a cell as text before you type a fraction into it by clicking **Text** in the **Category** list. This way, the fractions that you type will not be reduced or converted to decimals. However, you cannot perform mathematical calculations on fractions that are displayed as text.
- To reset the number format, click **General** in the **Category** box (**Format Cells** dialog box) or in the **Number Format** box (**Home** tab**, Number** group). Cells that are formatted with the **General** format do not have a specific number format.

Currency

1. Select the cells that contain the numbers that you want to display with a currency symbol.
2. On the **Home** tab, click the **Dialog Box Launcher** next to **Number**.



3. In the **Category** box, click **Currency** or **Accounting**.

4. In the **Symbol** box, click the currency symbol that you want.

   NOTE If you want to display a monetary value without a currency symbol, you can click **None**.

5. In the **Decimal places** box, enter the number of decimal places that you want to display.

6. In the **Negative numbers** box, select the display style for negative numbers.

   NOTE The **Negative numbers** box is not available for the **Accounting** number format.

Tips

The number in the active cell of the selection on the worksheet appears in the **Sample** box, so that you can preview the number formatting options that you select.

To quickly display a number with the default currency symbol, select the cell or range of cells, and then click **Accounting Number Format** $ in the **Number** group on the **Home** tab. To use another currency, click the arrow next to **Accounting Number Format**, and then click the currency that you want.

To change the default currency symbol for Microsoft Office Excel and other Microsoft Office programs, you can change the default regional currency settings in Control Panel. Note that although the **Accounting Number Format** button $ image does not change, the currency symbol that you choose will be applied when you click this button.

To reset the number format, click **General** in the **Category** box (**Format Cells** dialog box) or in the **Number Format** box (**Home** tab, **Number** group). Cells that are formatted with the **General** format do not have a specific number format.

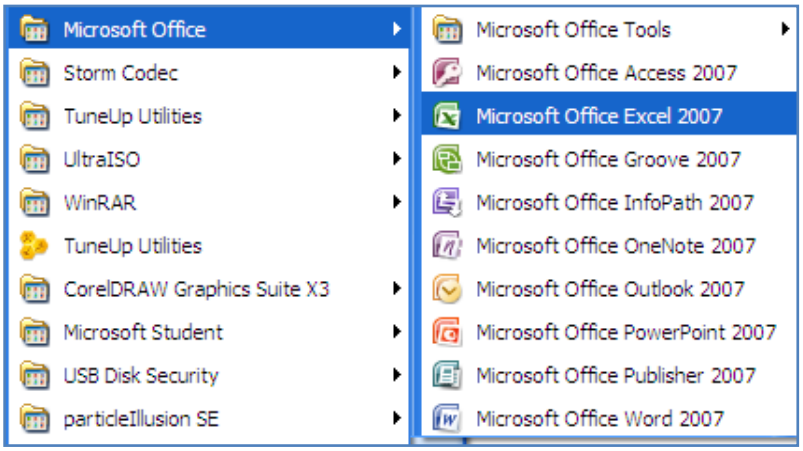
Launching and exiting spreadsheet application

To launch Microsoft Office Excel:

- Click the Start button 

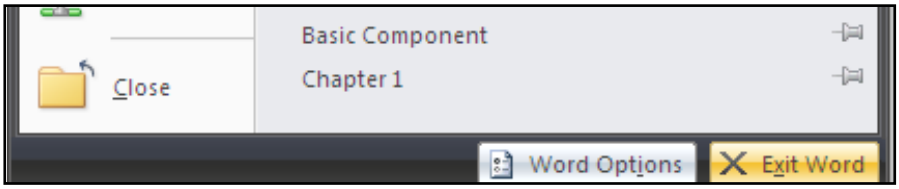
; this opens the start menu.
- Point on "All Programs to display the All programs menu.
- Point on Microsoft Office folder to display it contents.

- Click on Microsoft Office Excel 2007. Excel loads and opens.



When you are done with what you are doing, you will have to close Microsoft Excel. To exit Microsoft Excel:

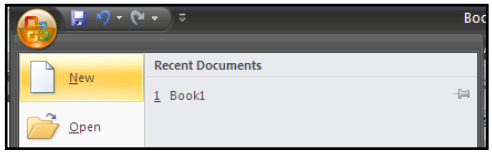
- Click the Microsoft Office Button in the upper left corner of your Excel window,
- Click Exit Excel. If you have not saved your spreadsheet, a reminder box will appear asking you to do so.



Alternative, you can use the close button, located at the top-right corner of the window to exit the Excel application. Again you will be notified to save any changes to your spreadsheet, if you have not done so.

CREATING AND SAVING WORKBOOK

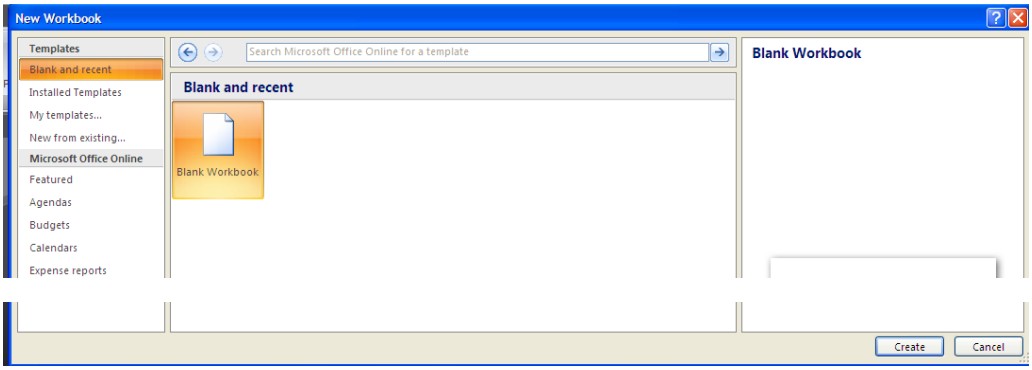
Microsoft Excel opens with a new, blank workbook with three worksheets of which more can be added. But if you want to create your own workbook you can ignore that and follow the steps below.



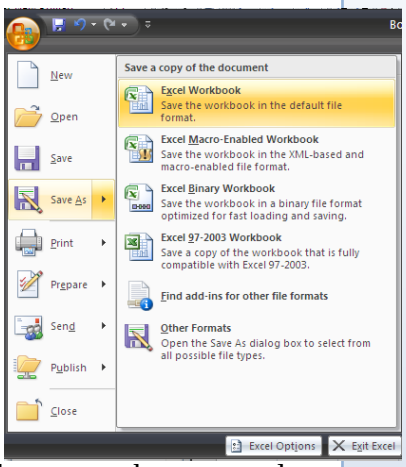
- Click the Office button
- Click New

The New Worksheet dialogue box appears with different pre-installed designs known as templates; and templates available online, with Blank Workbook selected. Since we want to create a whole new worksheet,

Click Create to create a new worksheet



Saving workbook for the first time



- To save a workbook for the first time:
- Click the Office button
- Point on Save As.
- Click excel workbook A Save As dialogue box appears.
- In the Save In box, select the directory you want your workbook to be saved in. the default directory is My Document.
- Type the appropriate name for your workbook in the File name box.
- Click save - notice that the name of the workbook changes to the name you specified.

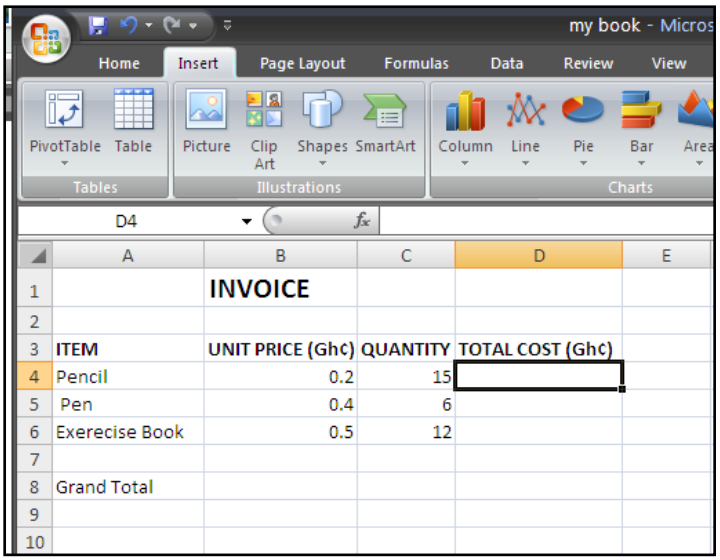
Once you have given your workbook a file name you can save any subsequent changes made to it by just clicking on the save button located on the Quick Launch bar, or clicking the Office button and then clicking on save. you can also use the keyboard shortcut Ctrl + S

CONSTRUCTING AND INSERTING SIMPLE FORMULA

A formula is a sequence of values (2,5,6,19), arithmetic operators (+, -, *, /), rational operators (>, =, <) cell references (e.g. A15), functions (percentage, sum, average) that produce a new value from existing values. A formula identifies the calculation needed to place the result in the cell it is contained within. A cell containing a formula therefore has two display components; the formula itself and the resulting value. The formula is normally only shown when the cell is selected by "clicking" the mouse over a particular cell; otherwise it contains the result of the calculation.

In Excel a formula starts with an equal sign (=). This tells the spreadsheet that a calculation needs to be done.

Let us do some simple calculations with formula. The diagram below an invoice from a stationary store showing items sold, the unit price and the quantity.



Let us calculate the total cost of each item sold.

Pencil

Unit price = 0.20 in cell B4

Quantity sold = 15 in cell C4

Therefore the total cost of the pencil = unit price * quantity.

You can use the values or the cells to calculate the total cost. Remember that a formula starts with an equal sign (=).

Hence, the total cost for the;

Pencil

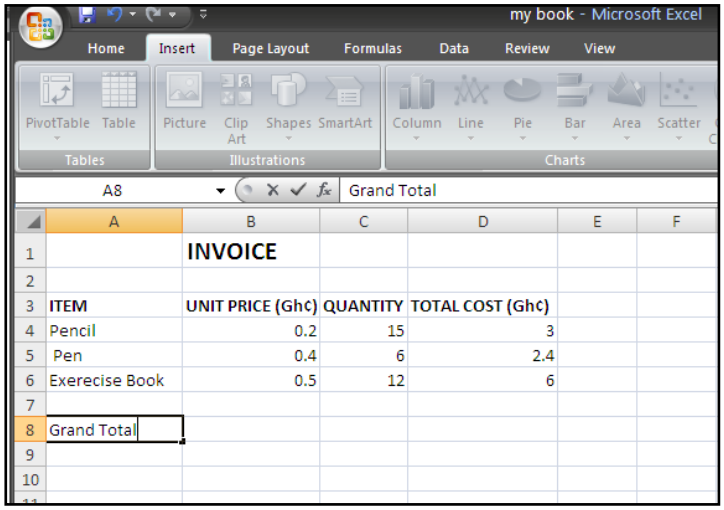
=B4*C4

Pen

=B5*C5

Book

=B6*C6



To find the Grand Total add cells D4, D5 ad D6.

=D4+D5+D6

Alternatively, you can use the function SUM. That is

=SUM(D4,D5,D6) (i.e. add cells D4, D5 and D6)

Or

=SUM(D4:D6) (i.e. add cells in the range D4 to D6) more on SUM later.

Chapter **15**

APPLICATION OF SELECTED FORMULA AND FUNCTIONS

OBJECTIVES

After completing this chapter, you should be able to:

i. Use functions common to arithmetic applications e.g. percentages, averages, count, maximum and minimum for simple calculation.

INTRODUCTION

As we observed earlier in the previous chapter, formulas and functions are used in Excel to perform calculations, no matter how simple or complex they may be. In this chapter, we are going to consider how to use formulae functions in various spreadsheet calculations.

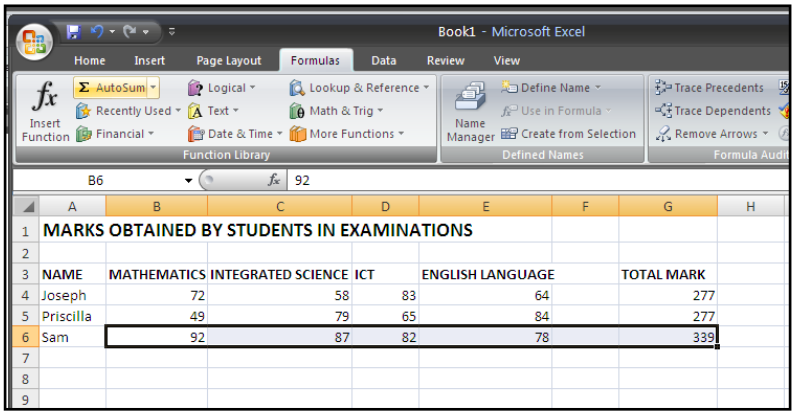
USING FUNCTIONS COMMON TO ARITHMETIC APPLICATIONS

We have already used one function – the Sum function. Sum is often required that it has its own button on the Ribbon. However, Microsoft Excel has hundreds of other useful functions. We are going to use six of these functions. They are:

- Sum
- Averages
- Percentages
- Count
- Maximum
- Minimum

Sum

Another way of using the Sum function is the AutoSum. If you wish to find the total of a column or row of figures, select the cell at the bottom of the column or left of the row and click on the AutoSum icon. The formula will be written for you. You must make sure that the range of cells you require have been selected. An of this is displayed below.



Average

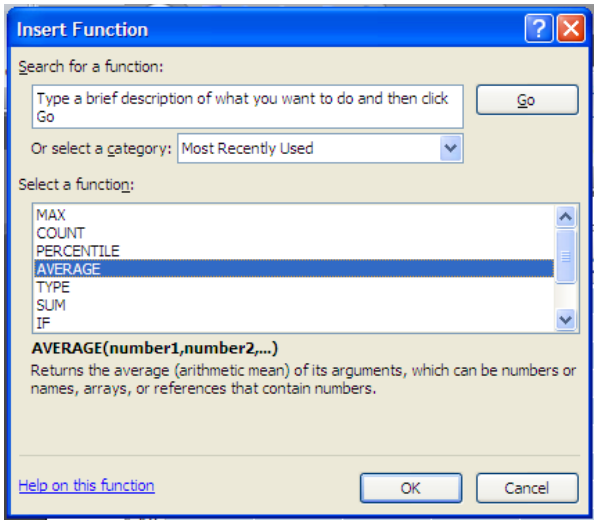
Average is used to find the relations of one group to the other, for example, in the examination data above, we can calculate each student's average by dividing their total mark by the number of subjects. To access the Average function,

Click on the cell

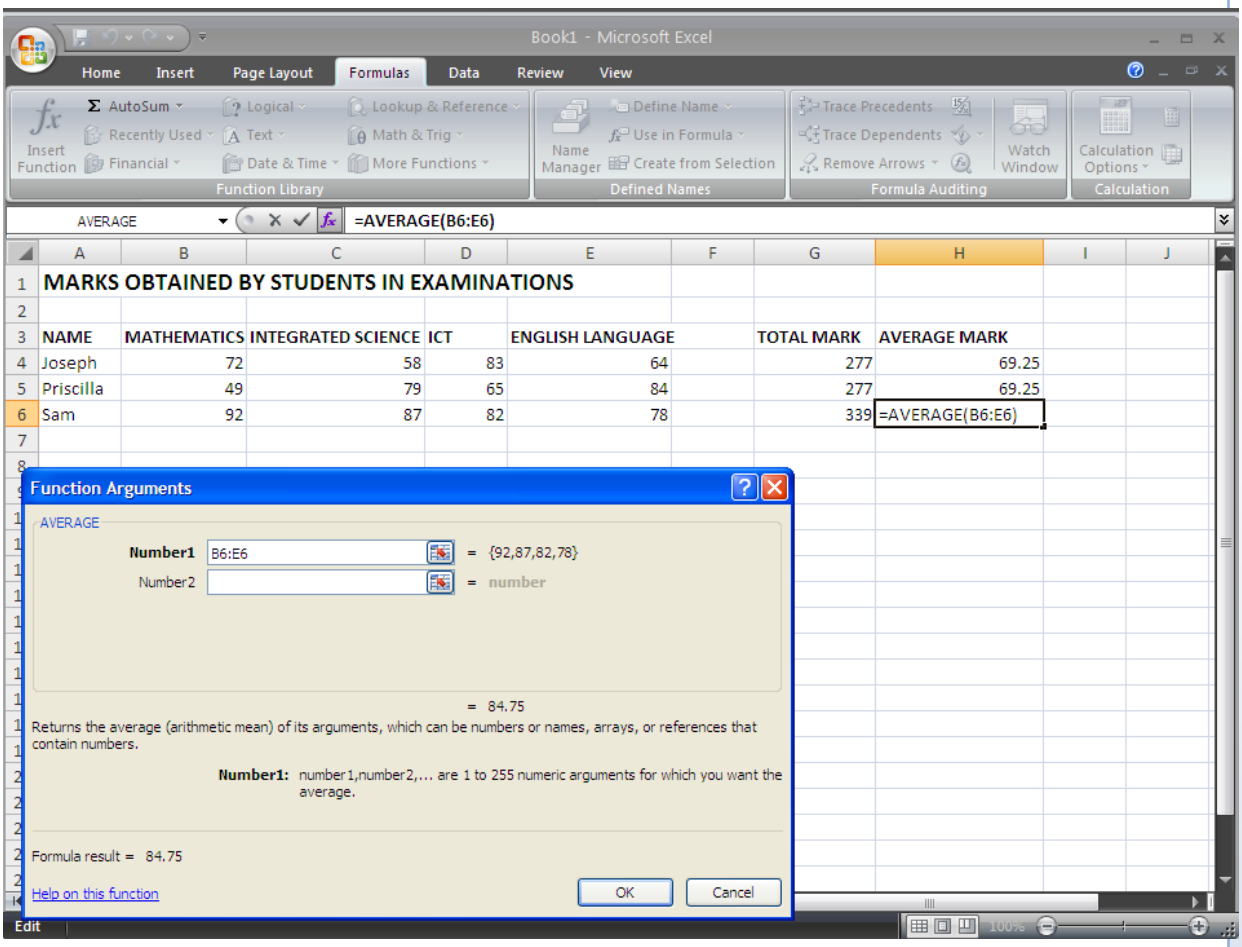
Click Insert function. 

The insert Function dialogue box opens.

Click on Average and then OK. The Function Argument dialogue box opens.



Type in the function (e.g. B4:E4) in Number text box, then click OK.



Alternatively, you can use the Average function by typing it directly into the function bar - for example, =AVERAGE(B6:E6).

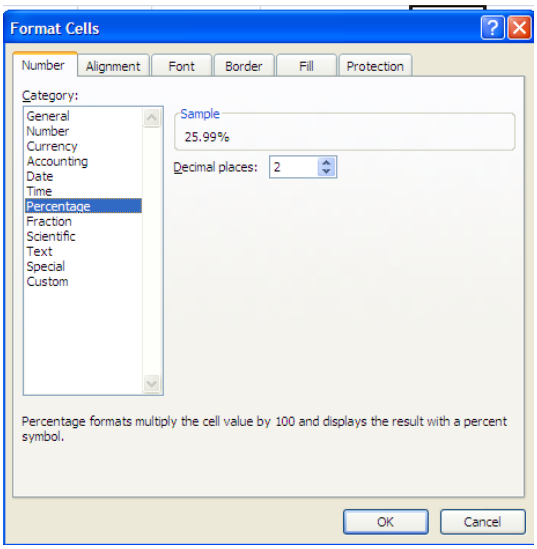
Percentage

We can find the percentage mark of each subject above by dividing it by the total mark. For example, the percentage of Joseph's Mathematics score can be calculated as follows: =(B4/E4). That will give you 0.259928.

Right-click on the answer

Select Format Cells. The Format Cells dialogue box opens.

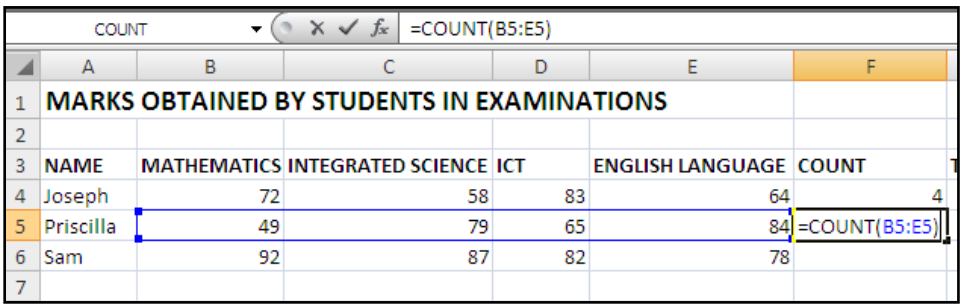
Click on Percentage and then OK. The Percentage function is applied.



Count

The count function can be used to find the range of cells containing values. The Count function could be used in the following way:

=COUNT(B5:E5)



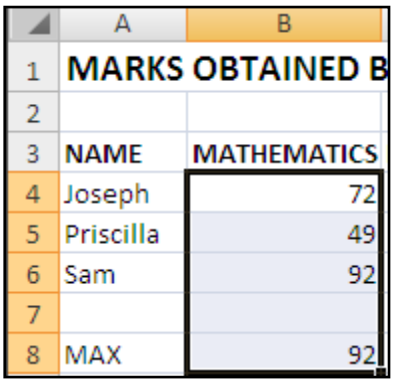
	A	B	C	D	E	F
1	MARKS OBTAINED BY STUDENTS IN EXAMINATIONS					
2						
3	NAME	MATHEMATICS	INTEGRATED SCIENCE	ICT	ENGLISH LANGUAGE	COUNT
4	Joseph	72	58	83	64	4
5	Priscilla	49	79	65	84	=COUNT(B5:E5)
6	Sam	92	87	82	78	
7						

It may seem unnecessary since you can easily count the number of columns containing values; but when you are faced with a huge chunk of data to deal with;

(e.g. =COUNT(A1:PQ1) the Count function becomes very necessary.

Maximum

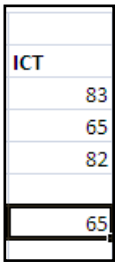
The maximum function is used to find the largest value in a range of cells. For example to find maximum mark obtained in Mathematics, you can type in the formula bar =MAX(B4:B6)



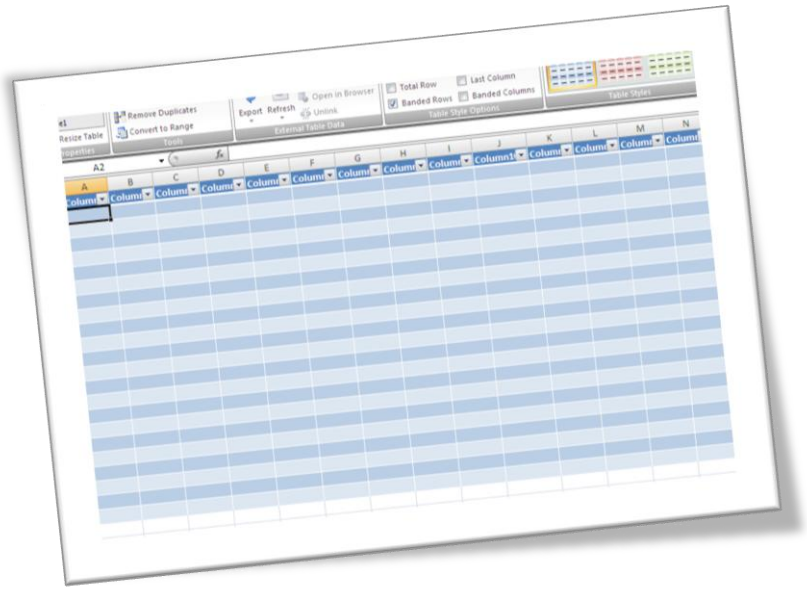
	A	B
1	MARKS OBTAINED B	
2		
3	NAME	MATHEMATICS
4	Joseph	72
5	Priscilla	49
6	Sam	92
7		
8	MAX	92

Minimum

While Max is used to find the maximum value in a range, the Minimum function is used to find the smallest value in a range. Use the formula =MIN(D4:D6) to find the minimum of ICT



ICT
83
65
82
65



Chapter 16

FORMATTING WORKSHEET

OBJECTIVES

After completing this chapter, you should be able to:

i. Format worksheet using formatting tools.

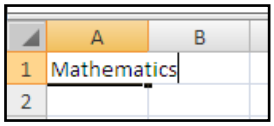
INTRODUCTION

In chapter eight, we learnt how to format a Microsoft Word document using various formatting tools. Like Word, Excel has a lot of formatting tools which can be used to make a worksheet have the desired appearance. Some of the formatting tools and methods we are going to use to format Microsoft Excel worksheet are similar to those we used to format Microsoft Word document.

FORMATTING WORKSHEET USING

Some of the formatting tools we are going to use are change column width and row height, insert columns, rows and cells; delete columns rows and cells; merge and centre cells; text wrap and cell alignment.

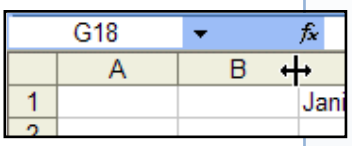
Changing column width



When the text you enter into a cell is longer than the width of the column, the text with spill into the next column. To deal with this

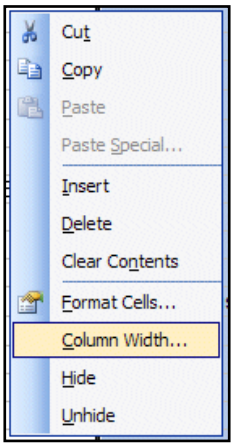
problem you will have to increase the width of the column. To increase the width of a column:

- Position the mouse pointer on the column label (the gray area) and move it to the edge of that column, as shown below. The mouse pointer will change to plus sign with arrows at either side.
- Drag to the right to widen the width or to the left to decrease the width of the column.



This is one way to change the width of a column. Here is another way.

- Point to the label of the column.
- Right click on it. a menu pops up.
- Select Column Width. The Column Width dialogue box open.
- Type in the width you want. The default width is 8.43; you can increase or decrease it. The column width must not exceed 255.
- Click OK. Notice the difference.



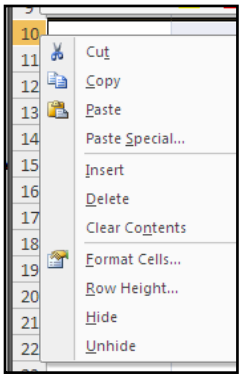
Changing row height

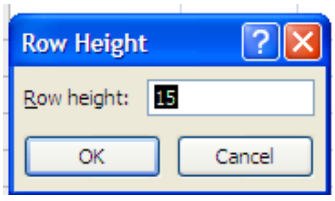
If it is required that you change the height of a row:

- Position the mouse pointer on the row label and move it to the edge of that ro. The mouse pointer will change to plus sign with arrows at either side.
- Drag to the top to increase the height or down to decrease the height of the row.

Another method is to:

- Right click on that row.
- Select Row Height.
- Type the desired figure in the text box.

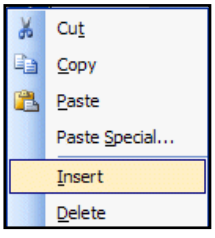




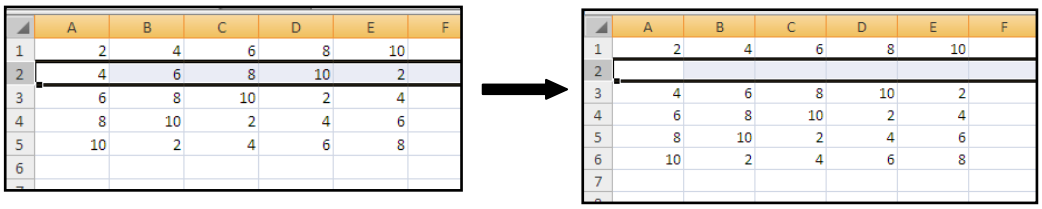
Inserting Rows

While you are busily working on your spreadsheet project you realize that you have left a row-of-text out. What do you do? Well, you can delete all you have done and start afresh, which is not convenient, especially if you have covered much, so I would not recommend that. Now, let consider the ideal method.

- Right-click on the label of the row above which you want the other row to be.



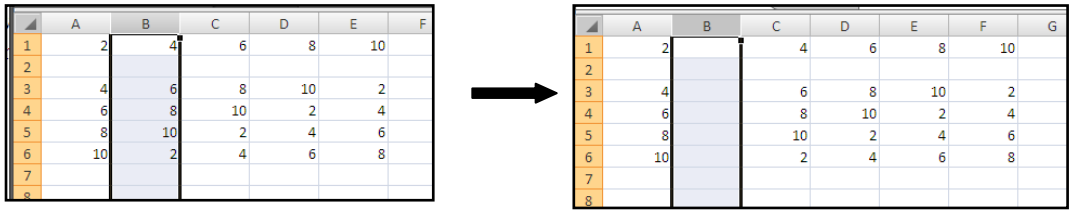
- Select Insert from the drop-down menu. A new row is inserted into the worksheet.



Inserting columns

We can in similar way insert a new column into a worksheet. To do that:

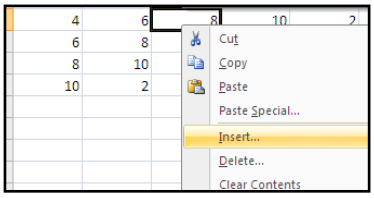
- Right-click the label of the column.
- Select Insert form the drop-down menu. A new column is inserted to the left of the selected column.

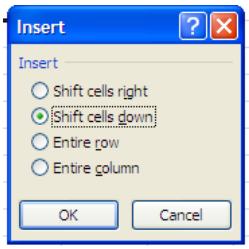


Inserting cells

There are times when you might mistakenly leave out a cell. To recover that you, you will have to insert a new cell. To insert a new cell:

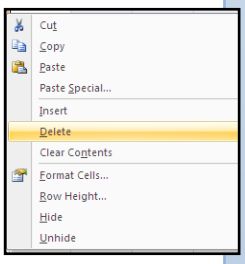
- Right-click on where that cell should be.
- Select Insert from the drop-down menu.
- The insert menu dialogue box opens. You can choose choose to shift the cells downwards or rightwards.





Deleting rows

Everything that can be made can be destroyed. There are cases where you may type a range of value in a wrong row, or some data may not be required anymore. In this case you will have to delete the entire row. To do that:



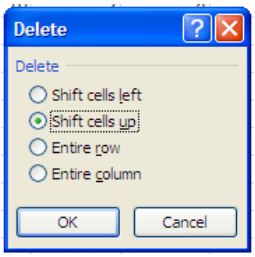
- Right-click on the label of that row.
- Select Delete from the drop-down menu. That row is deleted.

Deleting columns

To delete a column:

- Right-click on the label of that column
- Select delete, and off it goes.

Deleting cells



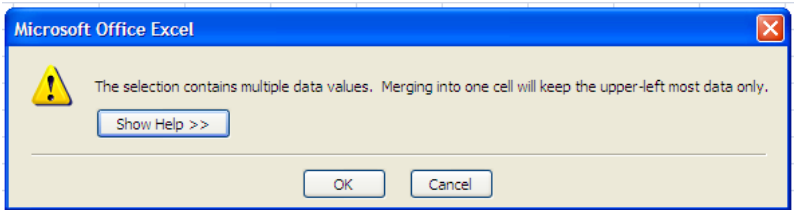
To delete a cell:

- Right-click on that cell
- Select delete from the drop-down menu. The Delete dialogue box opens. Here, you can choose to shift the cells left or up.

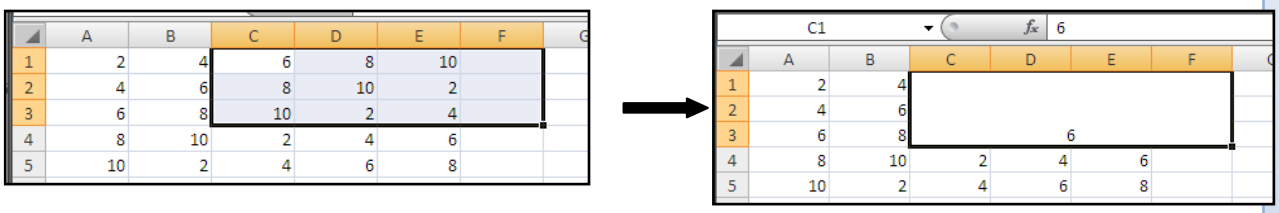
Merge and centre cells

Merging cells means fusing individual cells into one. To merge cells:

- Select the cells you want to merge
- In the Alignment tab, click on the Merge & Centre button.
- A dialogue box pops up with a caution that merging the cells will cause most of the data to vanish.
- Click OK if you want to merge the cells, otherwise, click Cancel. You can click on Show Help for additional information on this option.



For the effect of Merge and Centre, see below.



	A	B	C	D	E	F
1	2	4	6	8	10	
2	4	6	8	10	2	
3	6	8	10	2	4	
4	8	10	2	4	6	
5	10	2	4	6	8	

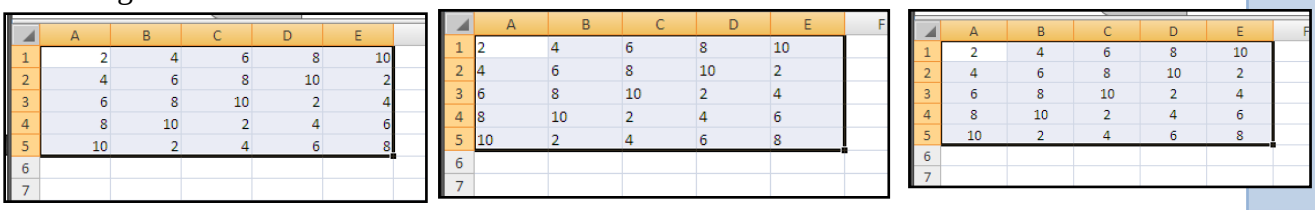
C1 fx 6

	A	B	C	D	E	F
1	2	4				
2	4	6				
3	6	8	6			
4	8	10	2	4	6	
5	10	2	4	6	8	

Cell alignment

You will see that all the values you enter are aligned to the right of the cells. You can keep them in the middle or to the right of each cell. To do that:

- Select the cells.
- On the Alignment tab, click on the Centre or Align to Left to align text to centre or right of the cells.

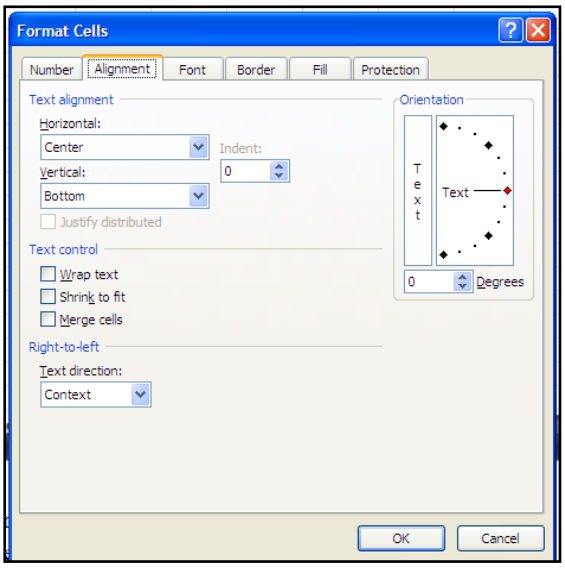


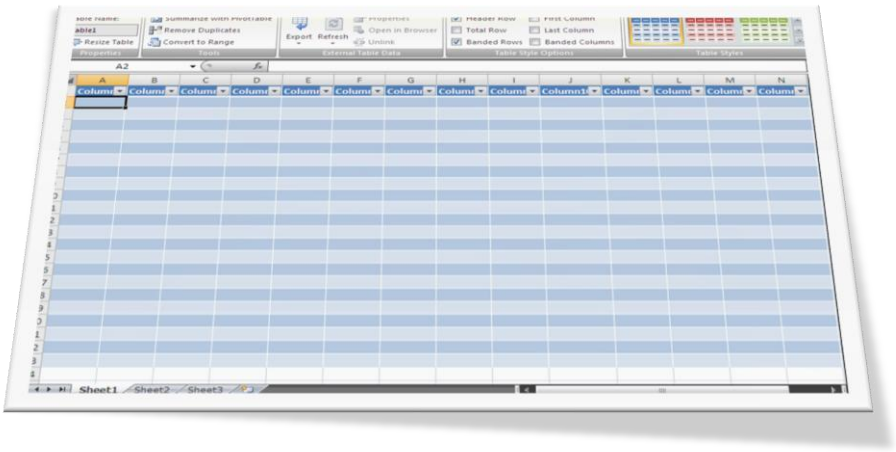
	A	B	C	D	E
1	2	4	6	8	10
2	4	6	8	10	2
3	6	8	10	2	4
4	8	10	2	4	6
5	10	2	4	6	8
6					
7					

Text aligned to the right **Text aligned to the left** **Text centered**

An alternate method of aligning text is to:

Select the open button  on the Alignment tab. The format Cells dialogue box opens. Try out the various Text alignment options there. Change the angle of the text to 45^{o} and see the result.





Chapter 17

EDITING AND PRINTING WORKSHEET

OBJECTIVES

After completing this chapter, you should be able to:

i. Demonstrate skills in editing and printing worksheet.
ii. Demonstrate skills in previewing and printing worksheet.

INTRODUCTION

When you are stuffed with a great deal of data to enter into your workbook and there are a lot of formulas to do, you might ignore some basic things such as spelling, page setup etc. The joy in using Microsoft Excel, like most spreadsheet applications, is that you can always go back and make the necessary changes. In this chapter, we are going to use various editing tools to edit our workbook.

EDITING AND PRINTING WORKSHEET

Before you finally print your workbook, there are a lot of thing you should check and be satisfied with. In this section we are going to:

- Check spelling
- Preview the layout
- Review page breaks
- Change page setup and sheet settings
- Set printing option

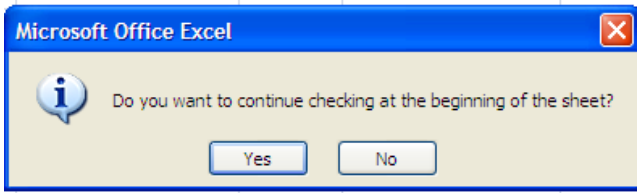
Spell check

Unlike Word, Excel does not underline wrong spellings. It is, therefore, very essential to run spell check to correct all spelling mistakes. You can either check the spelling of a cell or the entire workbook. To check the spelling of a cell:

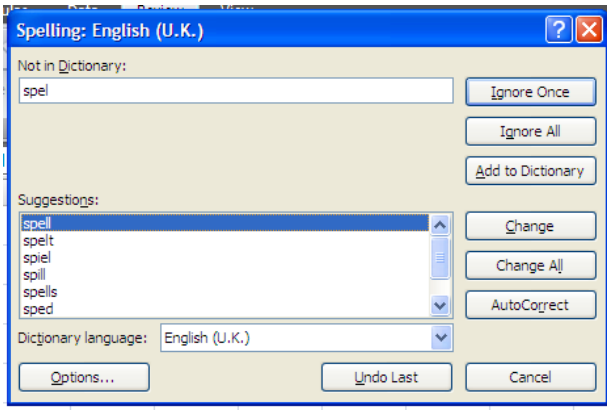
- Select the cell
- Click the Review tab on the Ribbon
- Click Spelling in the Proofing group. Excel presents spelling options, select the one you want.

To check the spelling of the entire worksheet:

- Click the select all button to select all cells.
- Click on Spelling.
- You can also click on any cell which does not contain any data, and then click on Spelling. Excel asks you whether you want to continue checking at the beginning.



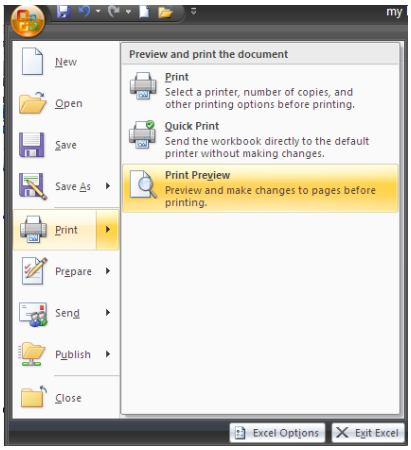
- Click Yes.



Preview layout

Preview your workbook will show you how the print out will look like. To preview your workbook:

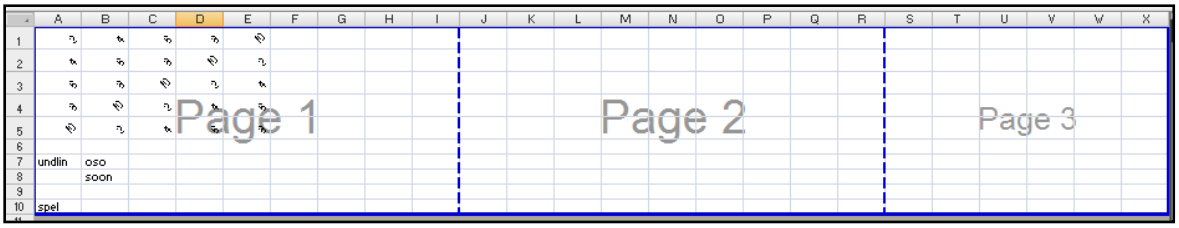
- Click the Office button
- Point on Print
- Click on Print Preview. Make the necessary adjustments and corrections to the layout and margins of the worksheet.



Review page breaks

If a worksheet exceeds the paper size specified, Excel automatically inserts a page break. A user can also insert page breaks to suit his needs. To insert a page break:

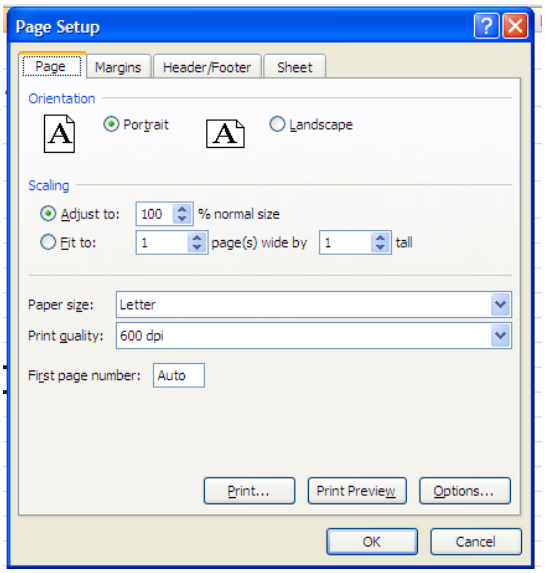
- Click on the View tab.
- On the View Workbooks group, click on Page Book Review. Excel inserts a new page break. You can increase or decrease the size of the page break by dragging them to new positions.



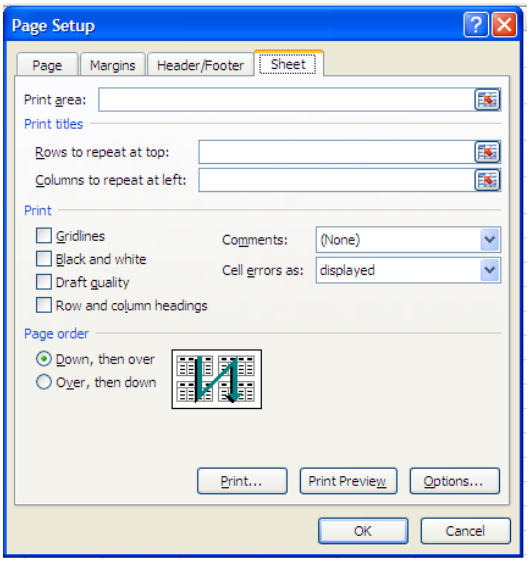
Change page setup and sheet settings

The setup of the page will determine it print out. It is very important to review the page setup to make sure that it really fit your worksheet. To adjust page setup:

- Click on the Page Layout tab
- In the Page Setup group, click on the open button to open the page setup dialogue box.
- Make all necessary changes to the page, margin, etc. make sure to select the right paper size and page orientation.



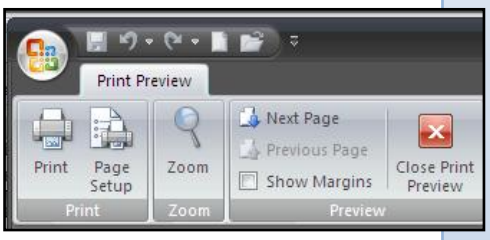
To change the setting of each worksheet in the workbook:
Click on the Sheet tab in the Page Setup dialogue box. Make the changes you desire and click OK.



PREVIEWING AND CHANGING PRINT OPTIONS

Do you remember the print options we set for Microsoft Word documents? We can in similar way set print options in Excel. The most important thing with printing is to tell the printer what to print and how to print it. Unlike a word processor, you **may need** to **highlight** what you want to print.

It's usually a good idea to **see** what our **printout will look like – before you print it**. First, we'll use a **Print Preview** to "**see**" what our spreadsheet looks like. You know the drill – click the Microsoft Office Button, point on Print, click Print Preview.

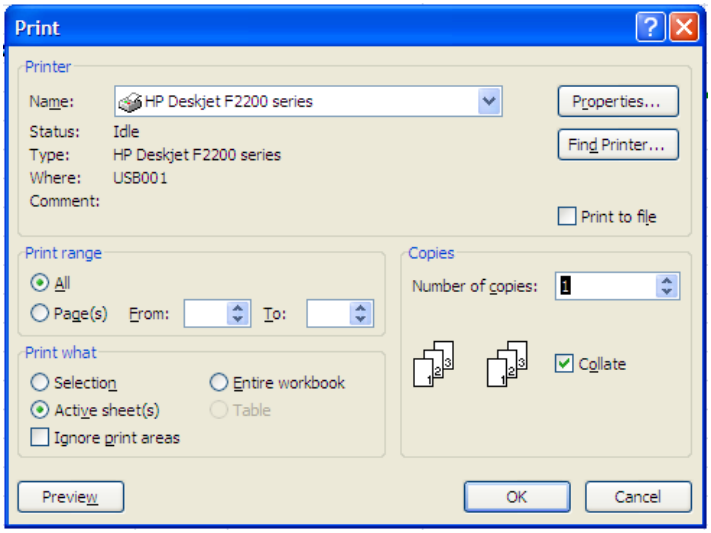


At the **top** of the **Print Preview screen** you will **see** the **Print Preview Tab**. We'll these buttons to assist us with our printing.

Notice that the **Next** and **Previous** buttons are **not highlighted** – they are just gray. This **means** that the buttons are **not "active."** This **indicates** that we are **OK** with our spreadsheet – it is **all on one page**. If we saw that the Next button was active, this would mean that there are other pages to our spreadsheet. If you'll **look** at the **lower left corner** of the **Print Preview screen** you'll **see: Preview: Page 1 of 1.** This **confirms** that our spreadsheet is **on one page**.

Once you are satisfied with how your spreadsheet would look in 

print, you can go ahead and click Print. This opens the Print dialogue box.



The options here, if you remember are the same as those in Microsoft Word and any other program. (Refer to the print options in Word).

Click OK to print your worksheet when you are done.

Chapter 18

INTRODUCTION TO PRESENTATION APPLICATION

OBJECTIVES

After completing this chapter, you should be able to:

i. State the importance of Presentation application.
ii. Explain the principles for designing presentations.
iii. Explain the terminologies in Presentation application.

INTRODUCTION

Presentation is the practice of showing and explaining the content of a topic to an audience or learner. A presentation program, such as Microsoft PowerPoint, is often used to generate the presentation content. A presentation program is a computer software package used to display information, normally in the form of a slide show. It typically includes three major functions: an editor that allows text to be inserted and formatted, a method for inserting and manipulating graphic images and a slide-show system to display the content. In this chapter we will consider presentation programs, their importance and the popular terminologies used in association with presentation.

IMPORTANCE OF PRESENTATION APPLICATION

There are many different types of presentations including professional (work-related), education, entertainment, and for general communication. These presentations are facilitated with the aid of presentation applications. Some specific importance of presentation applications are:

1. Presentation application help the speaker to access his/her ideas easily.

2. They help the participants to grasp the ideas of the speaker with visual information which complements the talk.

3. Presentation application supplement or replace the use of older visual aid technology, such as Pamphlets, handouts, chalkboards, flip charts, posters, slides and overhead transparencies.

4. With quick slide transitions, presentation applications help the speaker to overcome limited time to present his/her information.
5. Zooming presentation applications which have zoom user interface (ZUI) that are based on one infinite canvas on which all content is presented enables the presentation of richer detail of content, and gives a better overview and understanding of complex visual messages and relations.

6. Many presentation programs come with pre-designed images (clip art) and/or have the ability to import graphic images. Custom graphics can also be created in other programs such as Adobe Photoshop or Adobe Illustrator and then exported.

7. With the growth of digital photography and video, many programs that handle these types of media also include presentation functions for displaying them in a similar "slide show" format. For example, Apple's iPhoto allows groups of digital photos to be displayed in a slide show with options such as selecting transitions, choosing whether or not the show stops at the end or continues to loop, and including music to accompany the photos.

8. Similar to programming extensions for an operating system or web browser, "add-ons" or plug-in for presentation programs can be used to enhance their capabilities. For example, it would be useful to export a PowerPoint presentation as a Flash animation or PDF document. This would make delivery through removable media or sharing over the Internet easier. Since PDF files are designed to be shared regardless of platform and most web browsers already have the plug-in to view Flash files, these formats would allow presentations to be more widely accessible.

9. Certain presentation programs also offer an interactive integrated hardware element designed to engage an audience (e.g. audience response systems) or facilitate presentations across different geographical locations (e.g. web conferencing). Other

integrated hardware devices ease the job of a live presenter such as laser pointers and interactive whiteboards.

PRINCIPLES FOR DESIGNING PRESENTATIONS

A good presentation is the one that is well designed to suit the talk. There are some basic principles that have to be taken care of when planning and designing presentations. The principles are:

- For a clear and understandable presentation, plan the content of the presentation thoroughly. Get hold of all the material you will need.
- Know your audience. Many a presentation ends up being a mere fiasco because of the inability of the speaker to know his/her audience. Such presentations are often flooded with technical term and abbreviations which most of the audience have no idea of.
- Keep the content interesting and to the point – overloading your presentation with information may bore the audience.
- Use more pictures and graphics and ease down on the number of text used; besides, pictures are worth more than words.
- Avoid using capital letters throughout. Capital letters are more difficult to read, therefore combine upper and lower case letters. Also use large and legible fonts which can be read at a distance an in a glance.
- Use proper words and run spelling check to correct all spelling mistakes and grammatical errors. The intellectual capabilities of a speaker are often read from his/her choice of words.
- Be careful with the colours you use, since too many colours or colours which do not contrast well will make your slide difficult to view and read.
- If you are going to use preset timing for the transition of slides, make sure that it fits the pace – not too slow or too quick.

TERMINOLOGIES IN PRESENTATION APPLICATION

1. Slide - Slide Show

Each page of a presentation is called a slide. The default orientation of the slide is in landscape layout, which means that the slide is on a horizontal position with precise dimensions of 11" wide by 8 1/2" tall. Text, graphics and/or pictures are added to the slide to enhance its appeal. Slide shows can be comprised of text and graphic objects or be completely covered by a single picture, as in a photo album.

2. Bullet or Bulleted List Slide

Bullets are small dots, squares, dashes or graphic objects that begin a short descriptive phrase. The Bulleted List slide is used to enter key points or statements about your topic. When creating the list, hitting the Enter key on the keyboard adds a new bullet for the next point you want to add.

3. Design Template

Think of design templates as a coordinated packaged deal. When you decorate a room, you use colors and patterns that all work together. A design template acts in much the same way. It is created so that even though different slide types can have different layouts and graphics, the whole presentation goes together as an attractive package.

4. Slide Layouts - Slide Types

The terms *slide type* or *slide layout* can be used interchangeably. There are several different types of slides / slide layouts in presentation applications such as PowerPoint. Depending on the type of presentation you are creating you may use several different slide layouts or just keep repeating the same few.

Slide types or layouts include -

- title slides
- bulleted list slides
- content slides (for adding a chart, picture or table for example)

5. Slide Views

- **Normal View** - is also commonly known as *Slide View*. It is the main working window in the presentation. The slide is shown full size on the screen.
- **Outline View** - shows all the text of all slides, in a list on the left of the PowerPoint screen. No graphics are shown in this view. Outline View is useful for editing purposes and can be exported out as a Word document to use as a summary handout.
- **Slide Sorter View** - is a window in PowerPoint that displays thumbnail versions of all your slides, arranged in horizontal rows. This view is useful to make global changes to several slides at one time. Rearranging or deleting slides is easy to do in Slide Sorter view.
- **Notes View** - shows a smaller version of a slide with an area underneath for notes. Each slide is created on its own notes page. The speaker can print these pages out to use as a reference while making his presentation. The notes do not show on the screen during the presentation.

6. Task Pane

The Task Pane changes to show options that are available for the current task that you are working on. For example, when choosing a new slide, the *Slide Layout* task pane appears; when choosing a design template, the *Slide Design* task pane appears, and so on.

7. Transition

Slide transitions are the visual movements as one slide changes to another.

8. Animations and Animation Schemes

In Presentation applications, animations are visual effects applied to individual items on the slide such as graphics, titles or bullet points, rather than to the slide itself.
Preset visual effects can be applied to paragraphs, bulleted items and titles from a variety of animation groupings, namely *Subtle, Moderate and Exciting*. Using an animation scheme keeps your project consistent in the look, and is a quick way to enhance your presentation.

9. PowerPoint Viewer

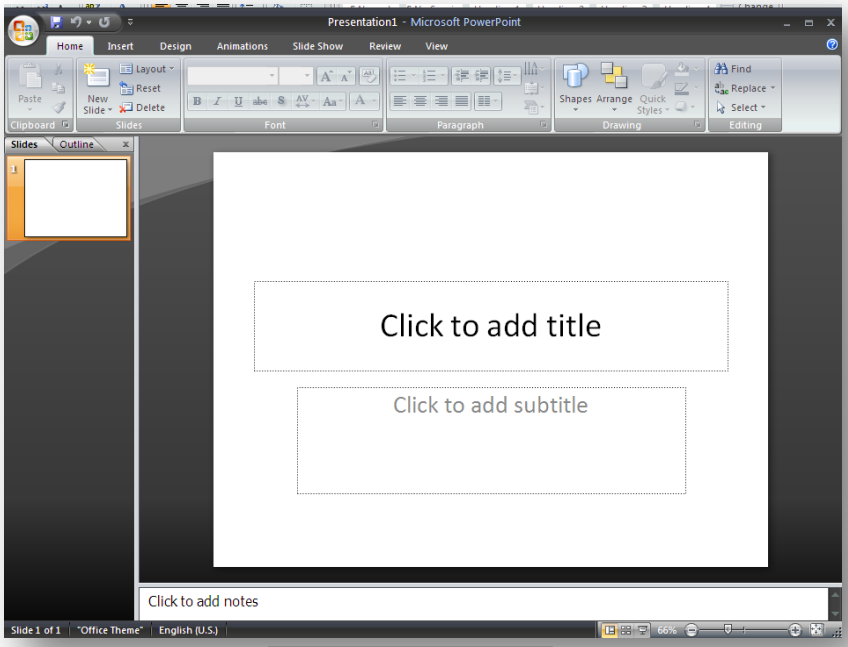
The PowerPoint Viewer is a small add-in program from Microsoft. It allows for a PowerPoint presentation to be played on any computer, even those that do not have PowerPoint installed. It can run as a separate program on your computer and can be added to the list of files when you choose to package your presentation to a CD.

10. Slide Master

Slide master is part of a template that stores information, including placements of text and objects on a slide, text and object placeholder sizes, text styles, backgrounds, color themes, effects, and animation.

11. Contextual Menus and Tabs

Contextual menus and tabs appear when an object is selected. These contextual menus / tabs contain information or options pertinent to that object only. For example; if you are working with photos, the contextual menus show all the options available just for working with photos.
In PowerPoint 2007, these contextual tabs are very much in view, unlike earlier versions, where these commands could be difficult to locate. This feature is an updated version of the "shortcut menus" used in earlier versions.
These contextual tabs do not appear unless they are relevant to the selected object.



Chapter 19

PRESENTATION APPLICATION WINDOW

OBJECTIVES

After completing this chapter, you should be able to:

iv. Identify the commonly used features of a Presentation application in development of presentation.
v. Demonstrate the use of the Help facility in Presentation application.

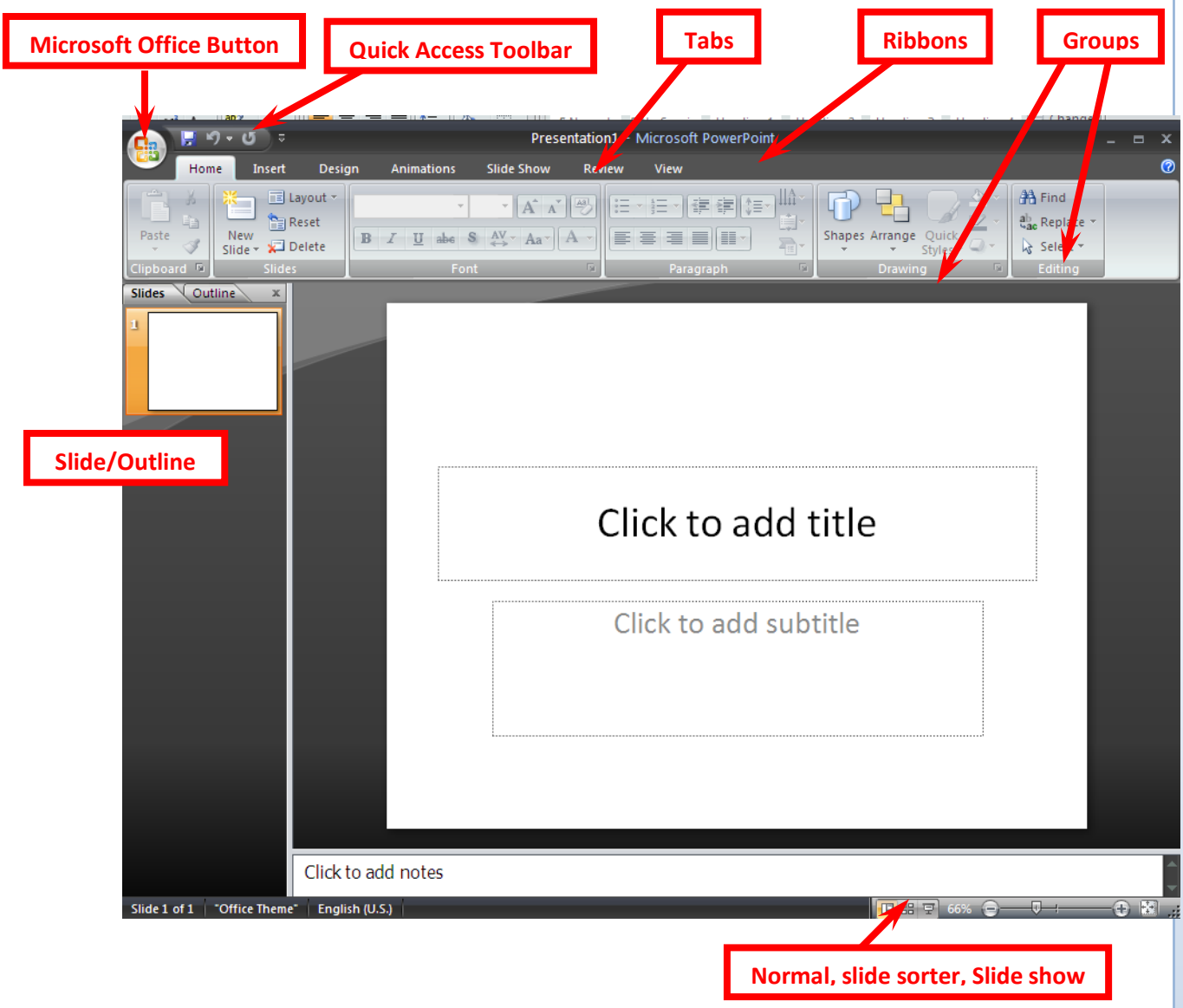
INTRODUCTION

Every application or program is built with features that makes it unique from any other program, and able to do what it is made for.

IDENTIFICATION OF COMMONLY USED FEATURES OF PRESENTATIONAPPLICATION WINDOW

Presentation applications, like all other applications have some basic features which distinguish them from other programs. In this section we ae going to base our discussion on the most popular presentation application – Microsoft PowerPoint (2007).

When you launch your PowerPoint 2007 aplication you will find the window below with the various features.



Microsoft Office Button

The Microsoft Office Button, as you might have known by now, is prevalent in most of the Microsoft Office applications. Clicking on it will display the same menu as the Microsoft Office Button in Word and Excel.

Quick Access Toolbar

Like the Microsoft Office Button, I am sure you now familiar with the Quick Access Button.

Tabs

The tabs in PowerPoint are quite different from the tabs in two Microsoft applications we have considered already. Whiles in Word you will meet the |Home| |Insert| |Page Layout| |References| |Mailings| |Review| and |View| tabs, in PowerPoint instead of |Page Layout| |References| and |Mailings| tabs you will find the |Design| | Animation| and Slide Show| tabs.

Slide and Outline

On the left side of the PowerPoint screen you'll see an area that indicates and Slides Outline at the top. The Slide and Outline tabs displays thumbnails or small versions of each slide as you create it. When you first open PowerPoint 2007 you'll notice that the Slides tab is white.

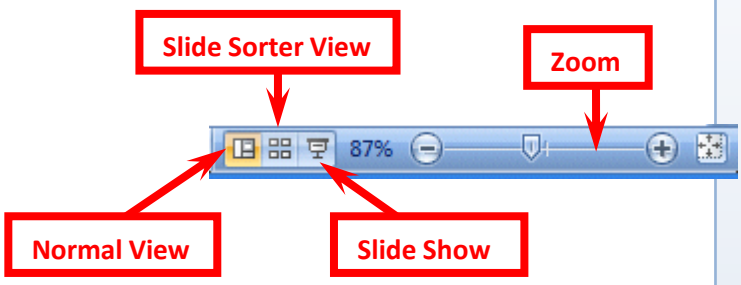
Normal, Slide Sorter and Slide Show

The area running down the left side of the screen, which contained "little" views of your slides, is called Normal View. This is the "default" view for PowerPoint.

Normal view, Slide Sorter View Slide Show

In the lower right corner of the screen you will see some "buttons" that look like the image on the right.

This is the PowerPoint View Toolbar. The Normal View gives you a view of the entire slide as well as the "mini-previews" of each slide in the area on the left. This is the one we have been using so far.



In Slide Sorter View you can see small images of each slide. In this view you can click on a slide and drag your slide to any position in your show that you desire. This view assists you in arranging your slides in the order that you desire for your presentation.

The last button is Slide Show. Anytime you want to view your presentation, click-on this button. If you click on it now, you will see how the slide, on which you are working, will look. When you are finished looking at your slide, tap the Esc button/key in the top-left part of your Keyboard. This will take you back to the View in which you were working.

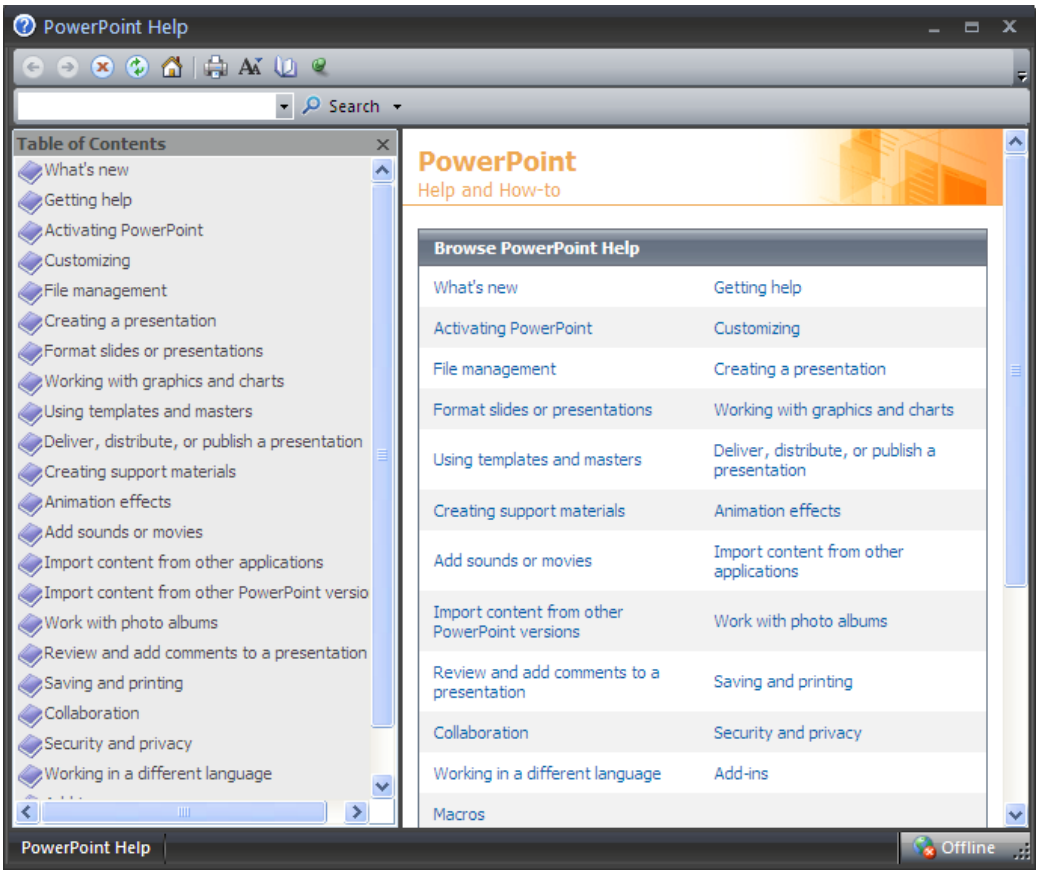
To the right of the buttons, you will see a Zoom area that will allow you to Zoom in or out to enlarge or decrease the size of your slides. You should know that already, by now.

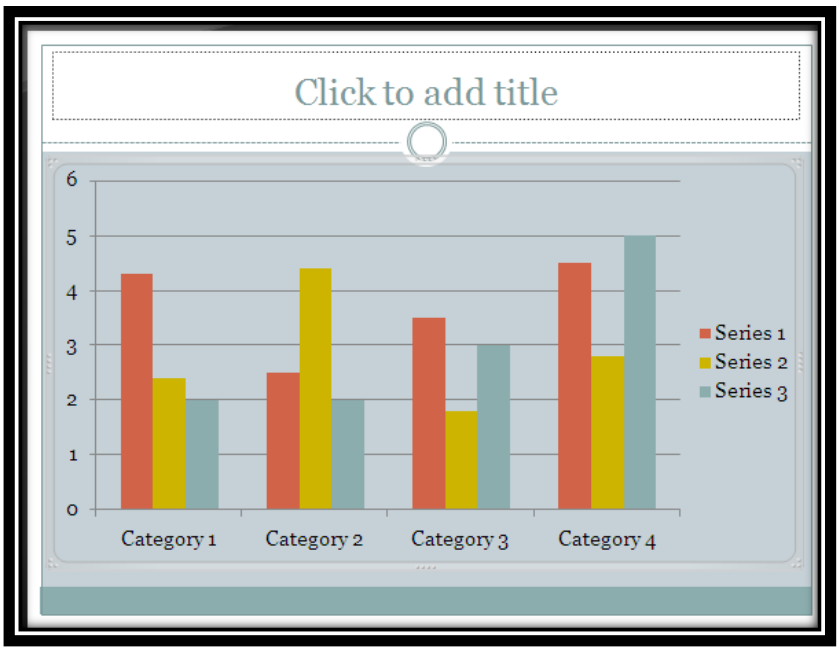
THE USE OF THE HELP FACILITY IN PRESENTATION APPLICATION

Does this symbol look familiar? Of course - we saw it in Word, Excel and now PowerPoint. It is the shortcut to the help facility in all Microsoft Office applications. Like in Word and Excel, the help PowerPoint presents additional support for users on how to use the program.

If you need any assistance with any feature in the application, the Help facility should be your first stop. It is an inbuilt teacher.

When you click on the Microsoft Office PowerPoint Help button, the PowerPoint Help window opens. You can browse PowerPoint or click on any topic in the table of Contents to display the needed information. You can also type in specific question or keyword to find with the Search button.


PowerPoint Help
Search
Table of Contents
What's new
Getting help
Activating PowerPoint
Customizing
File management
Creating a presentation
Format slides or presentations
Working with graphics and charts
Using templates and masters
Deliver, distribute, or publish a presentation
Creating support materials
Animation effects
Add sounds or movies
Import content from other applications
Import content from other PowerPoint versio
Work with photo albums
Review and add comments to a presentation
Saving and printing
Collaboration
Security and privacy
Working in a different language
PowerPoint
Help and How-to
Browse PowerPoint Help
What's new
Getting help
Activating PowerPoint
Customizing
File management
Creating a presentation
Format slides or presentations
Working with graphics and charts
Using templates and masters
Deliver, distribute, or publish a presentation
Creating support materials
Animation effects
Add sounds or movies
Import content from other applications
Import content from other PowerPoint versions
Work with photo albums
Review and add comments to a presentation
Saving and printing
Collaboration
Security and privacy
Working in a different language
Add-ins
Macros
PowerPoint Help
Offline



Chapter 20

WORKING WITH OBJECTS, IMAGES AND PICTURES IN PRESENTATION

OBJECTIVES

After completing this chapter, you should be able to:

i. Insert objects, images and pictures into a presentation.
ii. Edit, insert objects, images and pictures in presentation.

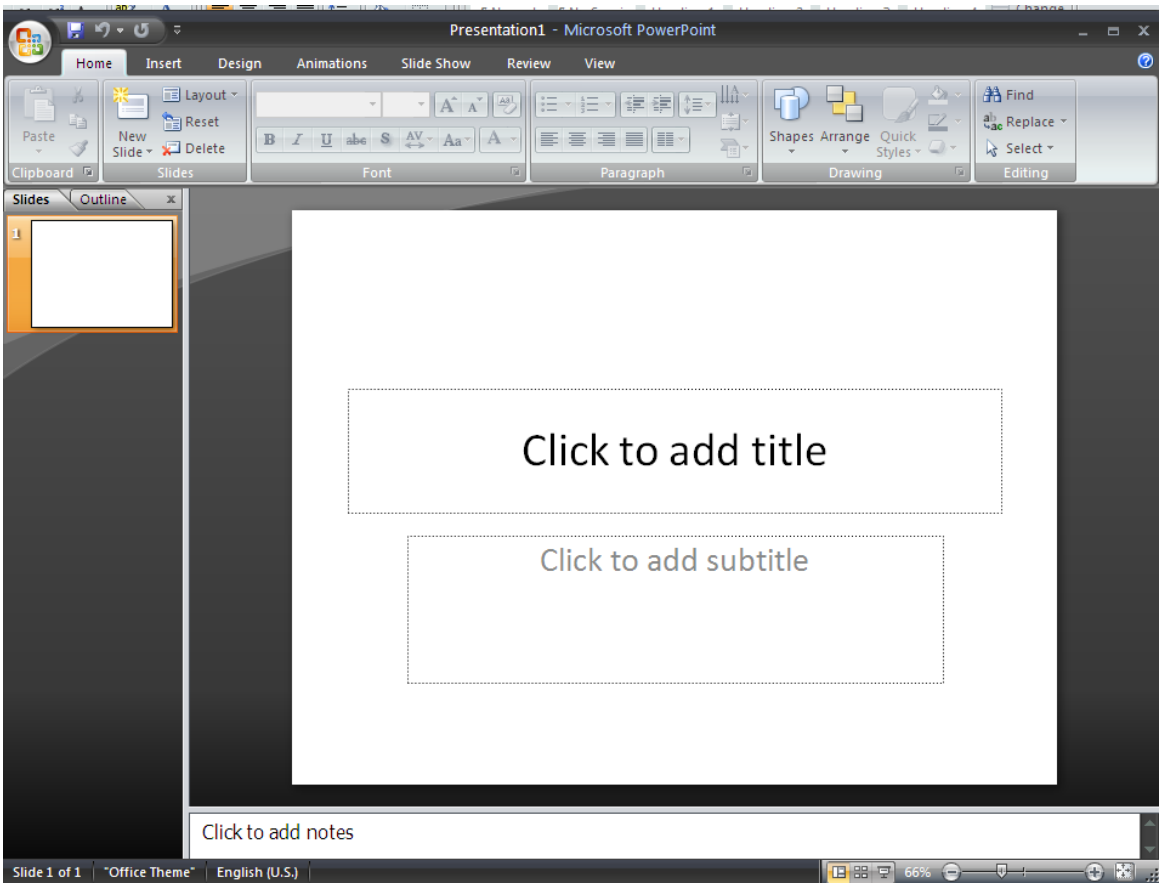
INTRODUCTION

A picture speaks a thousand words, so they say – and a good picture is worth more than a thousand words. There is an old Chines proverb which says that once seeing is about a thousand times talked about.

Being able to use pictures in your presentation will not only make it beautiful, but will make your idea so alive in the eyes, minds and ears of your audience. Nevertheless, care must be taken so as to not engulf your presentaton with inappropriate pictres and images. The graphics you use in your presentaion must only emphasize what you want your audience to know – unfrtunately, that is not the case in many presentation designs. In this chapter, we are going to consider how to insert graphics into our presentations and how to edit those graphics to mke them much more effective.

INSERTING OBJECTS, IMAGES AND PICTURES INTO A PRESENTATION

Microsoft PowerPoint Presentation allows you to add all kinds of graphics, charts, clip arts, pictures and animations into your presentation. Not only that, you can also change the colour scheme and the design template of the presentation window.

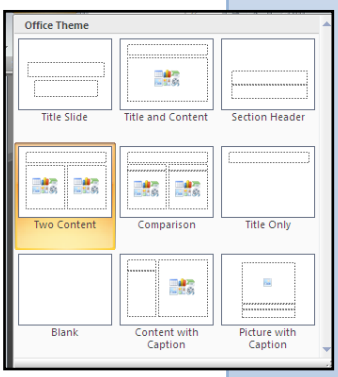


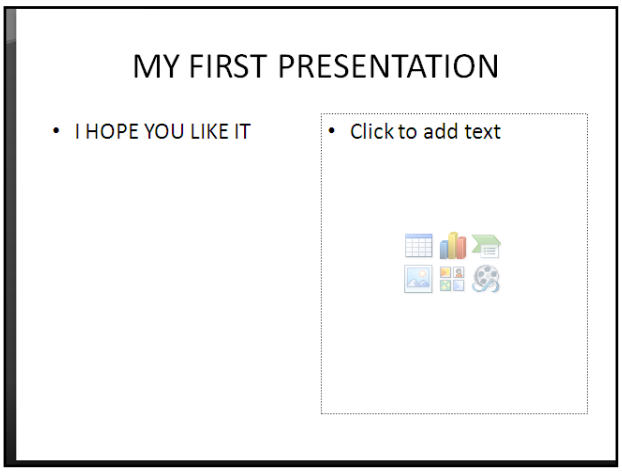
Adding text to your presentation

Click in the Click To Add Title text box and type “MY FIRST PRESENTATION”.

Click in the Click to Add Subtitle text box and type “I HOPE YOU LIKE MY PRESENTATION”.

On the Home tab, in the Slide group, select Layout. The Office Layout drops down. Your presentation should look like this:





Inserting clip arts into a presentation

To insert a clip art:

In the Click to Add Text box click on Clip Art. The clip art gallery opens.

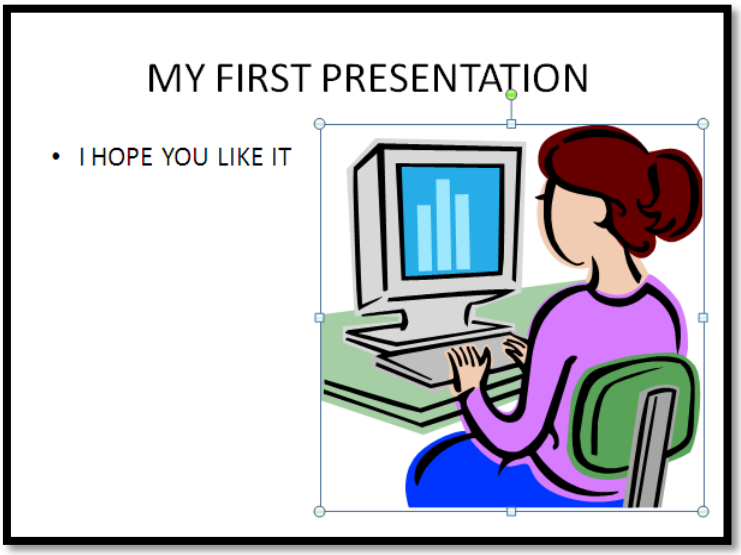
In the Search In text box, select Everywhere, in Result Should Be text box select All media File Type.

Click Go to open Clip Art. Click one to place it in the presentation.

EDITING INSERTED OBJECTS, IMAGES AND PICTURES IN A PRESENTATION

Graphics inserted in a presentation can be edited to fit into place in the presentation. Our clip art above looks too small - let us edit it.

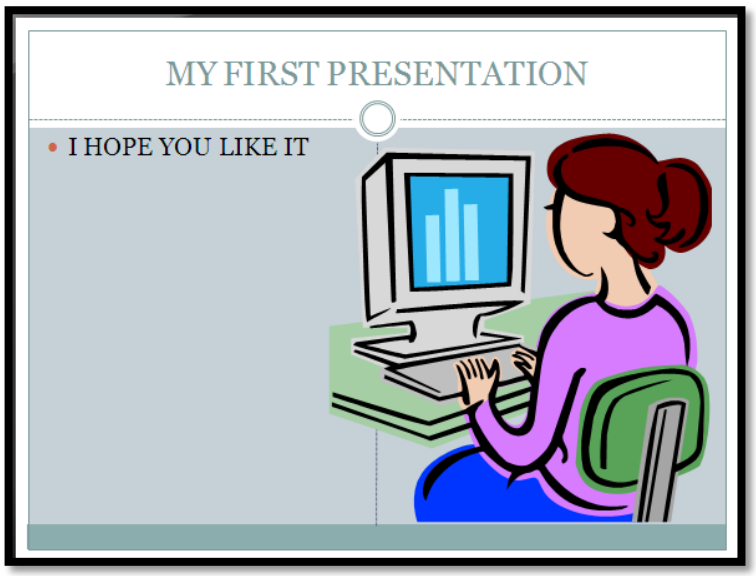
Hold the Resizing handles at the corners and drag the clip art into proportion.



Adding theme to your presentation

Themes are predesigned scheme of colours, mostly with background and layout, that you can employ in your presentation. To add a theme to your presentation:

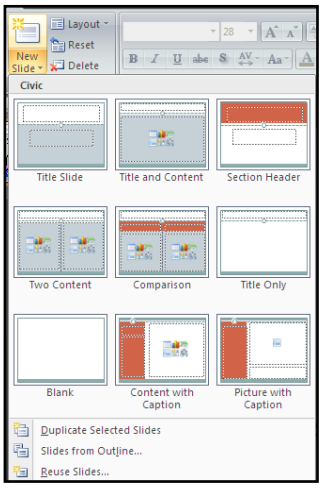
- Click the Design tab
- In the theme group, click the theme you like. You can click the scroll arrows to see more themes. The selected theme is automatically added to your presentation.



Inserting a new slide

To insert a new slide into your presentation:

On the Home tab, in the Slides group click on New Slide. That will insert a new slide with the theme you selected above. To insert a new slide with a different layout click the arrow under the New Slide button and select a different layout.



Inserting pictures into your presentation

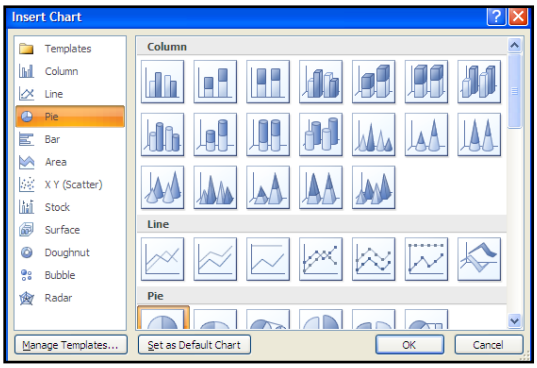
You can insert picture, mostly those about the talk, to your presentation. To do that:

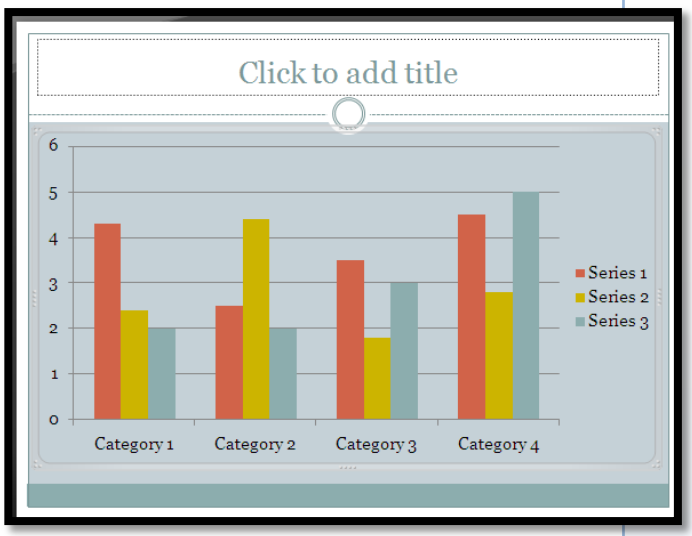
- Click the Insert tab in the Illustration group.
- Click Picture – the Insert Picture dialogue box opens. Navigate to the directory containing the picture and then click Open. The picture is inserted in your presentation.

Inserting charts into a presentation

To insert a chart into your presentation:

In the new slide window, click Insert Chart. The Insert Chart dialogue box opens, select your preferred chart and then click OK.


Insert Chart
Templates
Column
Line
Pie
Bar
Area
X Y (Scatter)
Stock
Surface
Doughnut
Bubble
Radar
Column
Line
Pie
Manage Templates...
Set as Default Chart
OK
Cancel


Click to add title
6
5
4
3
2
1
0
Category 1
Category 2
Category 3
Category 4
Series 1
Series 2
Series 3

Chapter 21

RUNNING A SLIDE SHOW

OBJECTIVES

After completing this chapter, you should be able to:

i. Run slide show.

INTRODUCTION

We now come to the interesting, part if the previous sections have not fascinated you yet – running slide show. What is a slide show? A slide show is a series of graphics and text that is mormally projected on a screen to educate or entertain people.

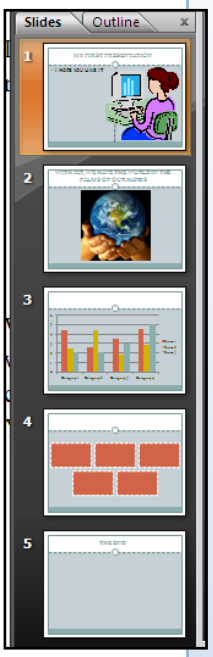
Six slides are the magic number for short presentations, and here is why: you want to stay on time, deliver a clear message, and keep other students and teachers interested. Limiting a show to six slides (plus a title slide) helps you to focus your message. That does not mean

that you cannot do more. In the previous chapter we created three slides, add three more to get the magic number and let us get started on running a slide show.

RUNNING A SLIDE SHOW

In this section we are going to view different presentations in different view modes. The view modes we are talking about here are:

- Slides
- Outline
- Slide sorter
- Note page
- Slide show

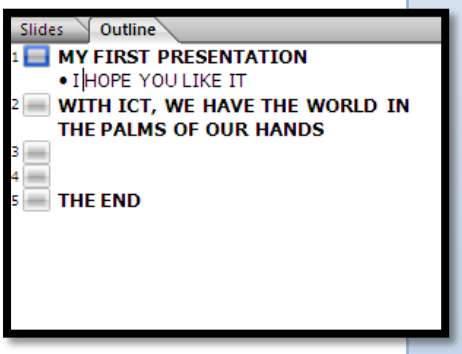


Slides

When you open PowerPoint Presentation, the Slides is always located to the left of the window in Normal view. The slide, as you might know already, contains small versions of every slide that is created. Any changes made to any slide are reflected on the small versions in the Slide pane. You can click on the various slides in the Slide pane to navigate through you presentation.

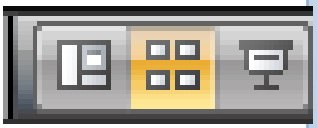
Outline

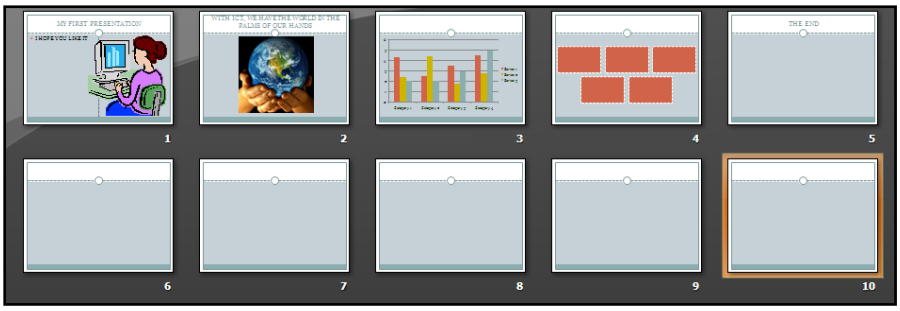
Next to the Slide is the Outline – unlike the Slide which shows small graphical versions of the slides, the Outline shows only the text in the individual slides. You can edit and make corrections to text in the slide in the Outline.



Slide Sorter

The Slide Sorter also list small graphical versions of the slides just like the Slides; but the Slide Sorter view switches from the Normal view which shows the Slide/Outline pane and the main slides in the window and instead presents all the individual sides in the entire presentation.





Note Page

You will notice a Click to add notes section at the bottom of the Normal View screen. This section is known as Note Page. In this area you can type "speaker notes" for each slide in the lower portion of the screen. When we cover printing, you will see that there is a print selection to print your speaker notes for each slide. Then, during your presentation, you can refer to your printed notes.

Slide Show

The last button in the PowerPoint view Toolbar is known as the Slide Show. Clicking the Slide Show will start the presentation – that is the individual slides will be maximized to fill the window and be presented one after the other. You can either pre-time the slides so that the will change at the specified time or you can change the slides with a click of the mouse. When you are done with the presentation you can click the Esc key on the keyboard to return to the Normal View. Try running your presentation now.

Chapter 22

THE MASTER SLIDES

OBJECTIVES

After completing this chapter, you should be able to:

i. Identify types of master slides.

INTRODUCTION

The Master Slide is the design template or design theme used for the slides within a presentation. Many colorful, preset design templates are included with PowerPoint to make your presentations more interesting. To make changes to your entire slides, edit the master slide rather than each individual slide. For example, if you are not interested in the choice of colour of the selected design template, you can make one quick change of colour in the slide master and that will affect all the slides available. The term master slide is often used *incorrectly* when referring to the slide master, which is only one of the master slides.

There are three different master slides:

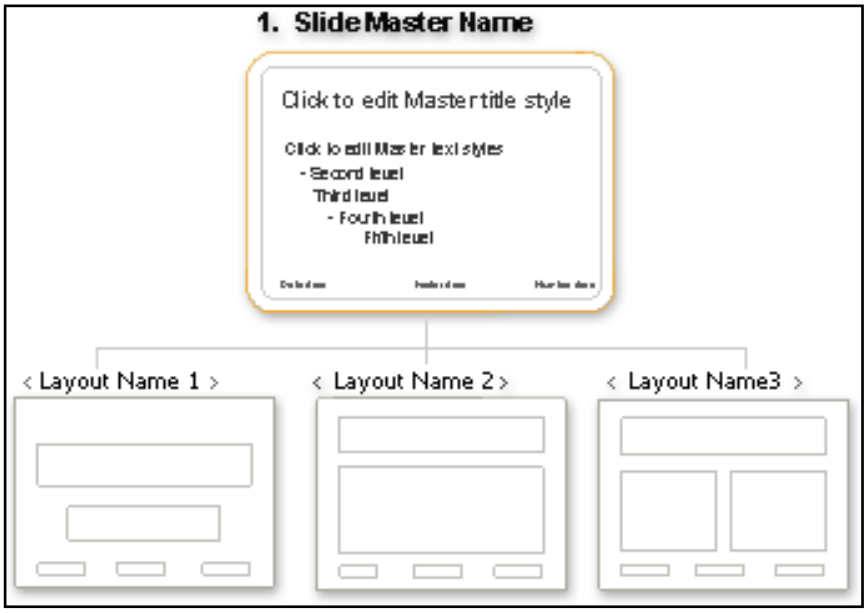
- Slide master
- Handout master
- Notes master

SLIDE MASTER

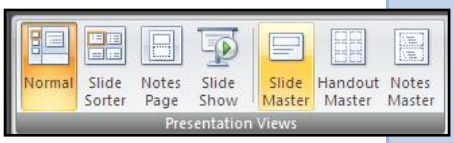
The default design template when starting a PowerPoint presentation, is a plain, white slide. This plain, white slide is the Slide Master. Slide master is part of a template that stores information, including placements of text and objects on a slide, text and object placeholder sizes, text styles, backgrounds, color themes, effects, and animation. All slides in a presentation are created using the fonts, colors and graphics in the Slide Master. Each new slide that you create takes on these aspects.

When you save one or more slide masters as a single template file (.potx), it creates a template that you can use to create new presentations. Each slide master contains one or more standard or custom sets of layouts.

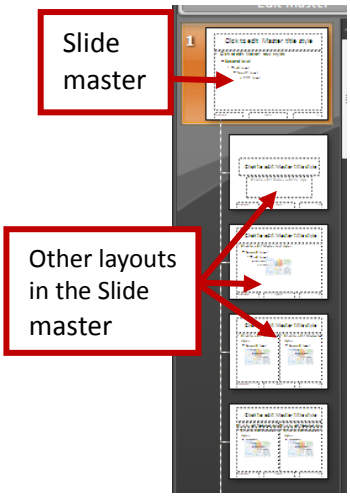
The following picture shows a single slide master that contains three layouts.



Adding a slide master to your presentation



- On the **View** tab, in the **Presentation Views** group, click **Slide Master**. Slide Master is automatically inserted. If it is not:
- On the **Slide Master** tab, in the **Edit Master** group, click **Insert Slide Master**.
- Do one or both of the following:



If you want to remove an unwanted, default *placeholder* (boxes with dotted or hatch-marked borders that are part of most slide layouts. These boxes hold title and body text or objects such as charts, tables, and pictures.), click the border of the placeholder, and then press DELETE.

If you want to add a placeholder, do the following:

Click a thumbnail slide layout below the slide master that you added.

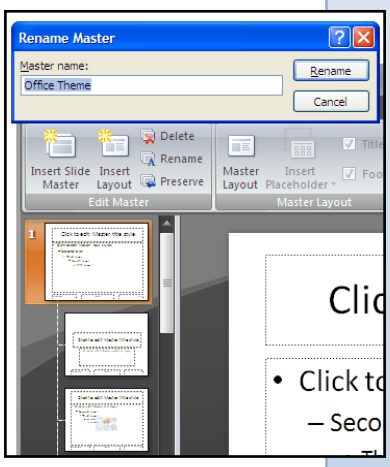
On the **Slide Master** tab, in the **Master Layout** group, click the arrow next to **Insert Placeholder**, and then click a placeholder.

1. Click a location on the slide master, and then drag to draw the placeholder.

TIP To resize a placeholder, drag one of its corner borders.

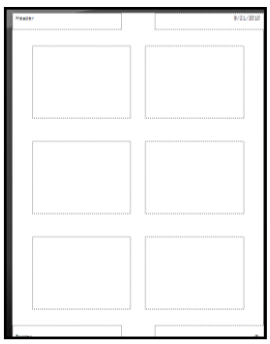
- Click the **Microsoft Office Button** , click **Save As**.
- In the **File name** box, type a file name, or do nothing to accept the suggested file name.
- In the **Save as type** list, click **PowerPoint Templates**, and then click **Save**.

Renaming a slide master



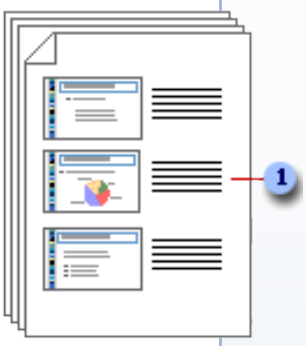
1. On the **View** tab, in the **Presentation Views** group, click **Slide Master**.
2. In the slide thumbnails on the left, click the slide master that you want to rename.
3. On the **Slide Master** tab, in the **Edit Master** group, click **Rename**.
4. In the **Rename Master** dialog box, in the **Master name** box, type a new name, and then click **Rename**.

HANDOUT MASTER



Changes that you can make to a handout include moving, resizing, and formatting the header and footer. You can also set the page orientation, and specify the number of slides to print per page.

1. On the **View** tab, in the **Presentation Views** group, click **Handout Master**.
2. Make the changes that you want.
3. On the **Handout Master** tab, in the **Close** group, click **Close Master View**.



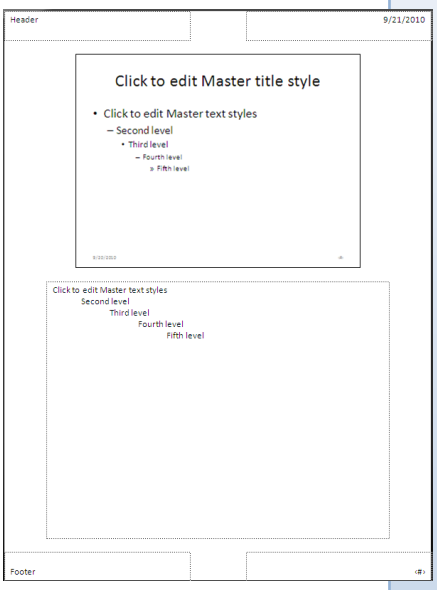
NOTE The changes that you make to a handout master also appear in your printed outline.

You can print your presentation in the form of handouts — with one, two, three, four, six, or nine slides on a page — that your audience can use to follow along as you give your presentation or keep for future reference.

NOTES MASTER

The Notes Master, not to be confused with the Handout Master, allows you to add and edit the notes in the Slide Master. To open Notes Master:

1. On the **View** tab, in the **Presentation Views** group, click **Notes Master**.

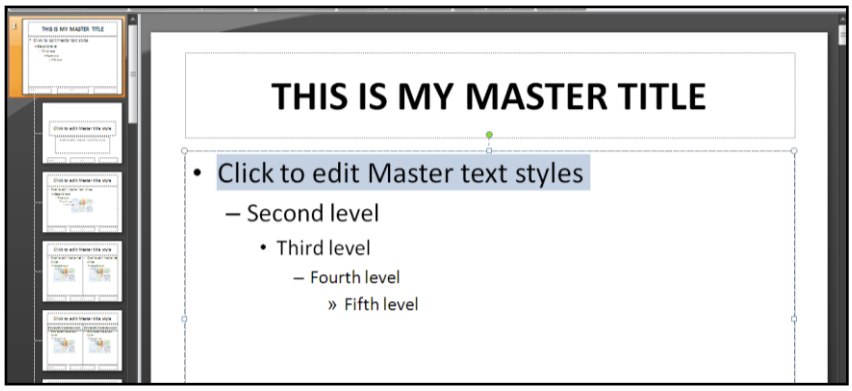


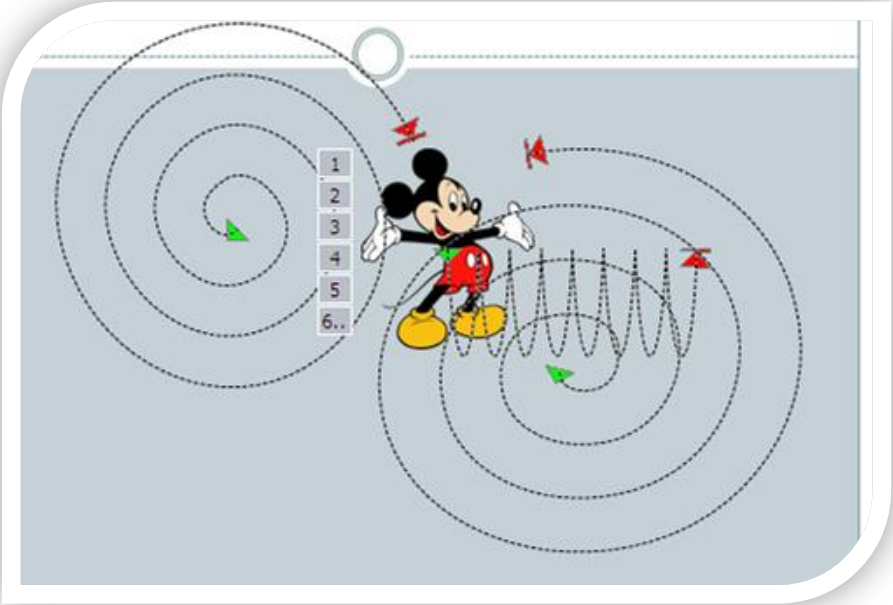
To edit Note Master:

Double -click the placeholder containing the note you want to edit.

You can use the Overtype mode or delete the existing notes and type your new notes in the place.

4. When you are done, on the **Slide Master** tab, in the **Close** group, click **Close Master View**.





Chapter 23

CUSTOMISING PRESENTATION

OBJECTIVES

After completing this chapter, you should be able to:

i. Format text input in master slides.
ii. Insert and edit pictures, images, drawn objects from a slide master.
iii. Remove pictures, images, drawn objects from a master slide.
iv. Apply preset text, image animation effect to slides.
v. Apply transition effect between slides.
vi. Apply animation effect to slide in normal view.
vii. Apply animation in the slide sorter.

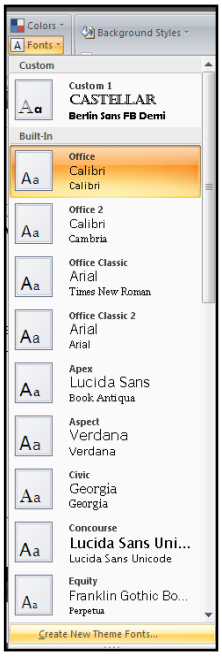
INTRODUCTION

To make your presentation interesting and suit the occasion or your audience, you can customise it. Customising a presentation means making change to it so that it will appear exactly the way you want it to.

In this chapter we will format text input in master slides; insert, edit and remove pictures in a master slide; apply transition and animation effects to slides etc. - so climb aboard and let us get started.

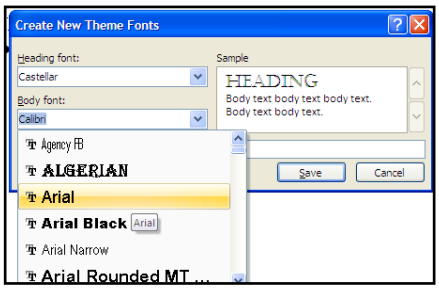
FORMATTING TEXT INPUT IN MASTER SLIDES

All the three types of master slides – Slide Master, Handout Master and Notes Master - give you the opportunity to make changes to the text input in them. Let us apply text formatting in each of the master slides.

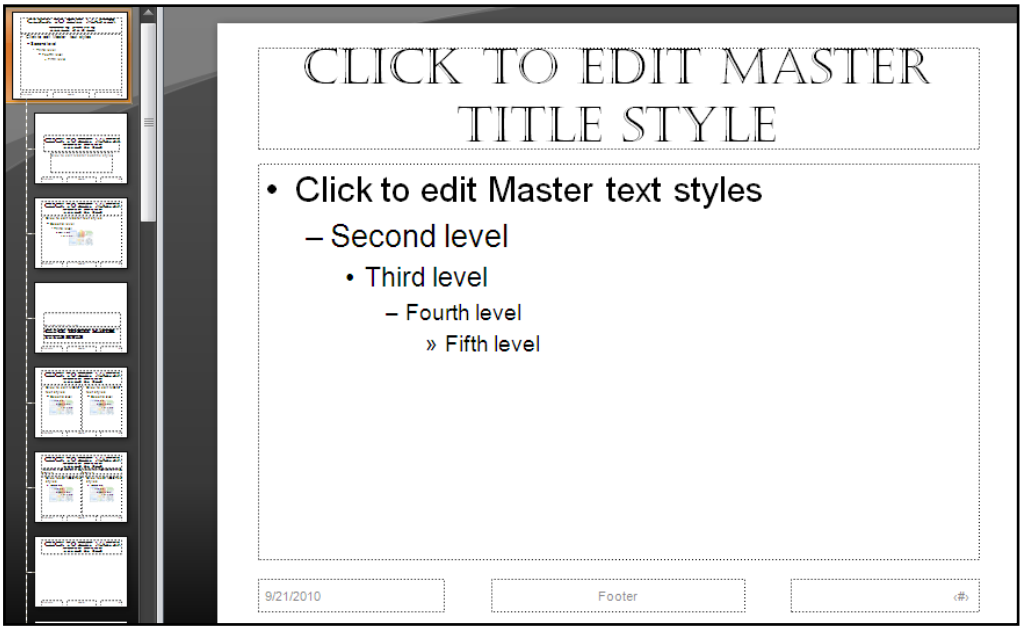


Formatting text input in Slide Master

- On the **View** tab, in the **Presentation Views** group, click **Slide Master**. The slide master with the other layouts opens at the left, in the *Slides/Outline* pane. You will see thumbnail images of the slide master and all the different slide layouts that are contained within the slide master.
- Select the first layout, which is the Slide Master layout. It contents are displayed in the main window.
- In the Slide Master tab, in the Edit Theme group, click Fonts - a menu appears. You can select any of the theme fonts, but let us do something else.
- Click Create New Theme Fonts. The Create New Fonts dialogue box appears.
- In the Heading Fonts textbox, scroll to and select CASTELLAR, and in the Body Font, select Ariel. The fonts you select are previewed at the textbox on the right of the dialogue box.



- In the Name box, type a name for your new theme font.
- Click Save. Notice the difference to the Slide Master. Click on each of the layouts under the Master Slide. What has happened? Yes, they have all taken the font them you specified.



Formatting text input in Note Master

You can format text input in Note Master. To do that:

- On the **View** tab, in the **Presentation Views** group, click **Notes Master**.
- Double-click the Slide Master, and make all the necessary changes to the text.

Inserting and editing with pictures, images, drawn objects from a master slide

To insert a picture into Slide Master:

On the **View** tab, in the **Presentation Views** group, click **Slide Master.**

On the Insert tab, in the **Illustration group**, click Picture**.** The Insert Picture dialogue box opens. Select the picture you want and then click Insert.

NOTE: If you insert the picture in Slide Master, the same picture will run throughout the available slides. But, if you want different picture in different slides, just select the individual slides and then insert the particular pictures.

You can use the same process to insert pictures, charts, clip art etc. in Slide Master and the other two types of Master Slides.

EDITING PICTURES IN A MASTER SLIDE

When you click on the inserted picture the resize handlers appear. You can use them to resize he picture. If you inserted the picture in Slide Master, you will only be able to resize the picture in Slide Master.

You can also crop the inserted picture – to do that:

On the Format tab, in the Size group, select Crop. The crop handlers appear on the picture, use them to crop the picture to the size you want.

You can try your hands on al the picture formatting tools in the Format tab.

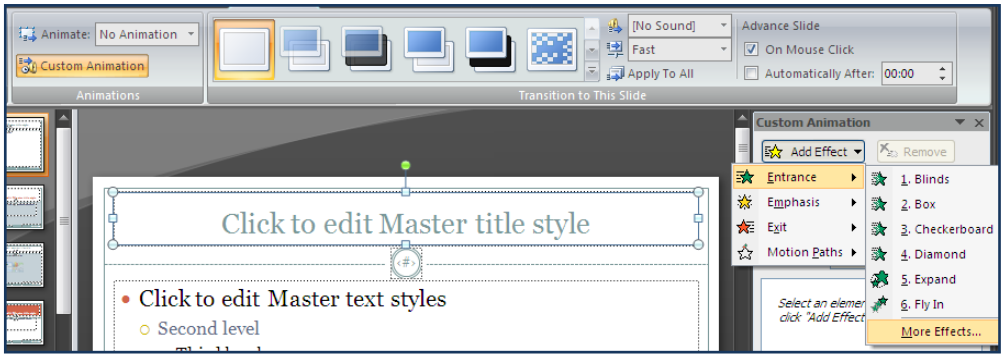
Removing Pictures, Images Etc from a Master Slide

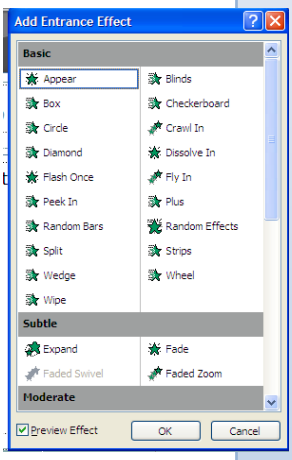
If you insert a wrong picture in a slide or you are no more interested in the picture you inserted, you can delete it. To do that, select the picture and then press the Delete key.

Applying Animation Effects to a Master Slide

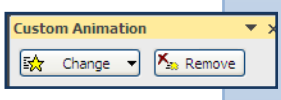
To make your presentation more interesting you can *build* it. Building is a term indicating how each line of the text (on a slide) will enter the screen. The lines, words, letters, pictures and charts can move in or appear from almost any direction. To Build the text on each slide, follow these directions.

1. On the **View** tab, in the **Presentation Views** group, select Master Slide.
2. On the Animations tab, in the Animations group, select Custom Animation. Thee Custom animation pane opens at the left of the screen.
3. Click the Master Slide, and then click the placeholder of the item you wan to animate.
4. In the Custom Animation pane, click Add Effect. A small menu rolls down.
5. Point on Entrance and then click on any of the effects. For more effects, click More Effects. This opens the Add Entrance Effect dialogue box.





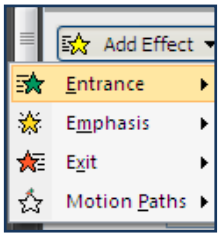
6. Select the effect you want and click OK.
7. To see how your effect plays, in the Custom Effect pane, click Play. If you are not interested in an animation effect you can either change or remove it



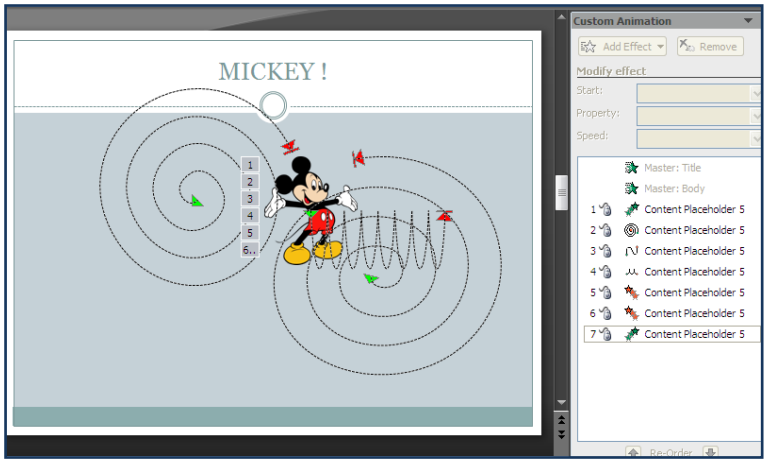
You can add animation effects to all the placeholders and in the presentation.

Applying animation Effects to Slides in Normal View.

1. In the Normal View, on the Animations tab, in the animations group, select Custom Animation.
2. Click on each of the placeholders and add an Animation Effect to it following the steps above.



Try your hands on other animation effects such as Emphasis, Exit, and I am sure you will love to work with Motions Paths.



Chapter 24

DELIVERING A PRESENTATION

OBJECTIVES

After completing this chapter, you should be able to:

i. Explain the things to consider when delivering a presentation.
ii. Edit presentation before delivering.
iii. Add presenter's notes to slides and deleting unwanted slides.
iv. Apply transition effects on screen slide presentations
v. Acquire show slides in a presentation

INTRODUCTION

After considering all that we have discussed above about presentations, we now come to the real thing – delivering our well planned and prepared presentation. But since nothing is really

perfect, a so called well planned presentation could be flooded with chunks of errors. In view of this before we stand up, chest high, and make our presentation, there are some basic things that we must be aware of.

THINGS TO CONSIDER BEFORE DELIVERING A PRESENTATION

i. Understand how audience size, room size, room lighting impacts on planning of a presentation: such as need for a microphone, need for a projector, need for adjust contrast between background and data for legibility.

ii. Understand how audience demography, knowledge of subject a presentation such as: need to present message differently based on age, educational background.

iii. Understand how choice of font colours, number of colours used may bring out different responses from members of an audience such as varying emotional responses, possible distraction from key points by excess use of colour.

iv. Be aware of colour blindness problems

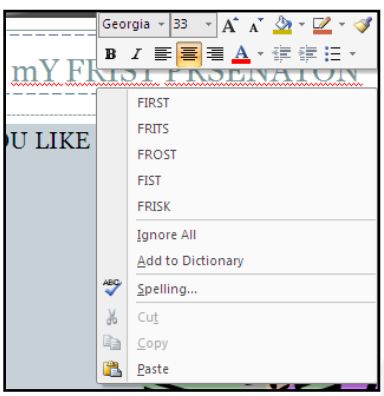
v. Understand some important planning and design concepts with delivering a presentation, such as:

- Ensuring slides follow a logical sequence
- Tailor contents to time available
- Consider likely attention span of audience.
- Consider an appropriate time interval for each slide in a presentation.

EDITING PRESENTATION BEFORE DELIVERING

As we did edit the Word documents and Excel workbooks we created in the previous chapters, we can in the same or similar way edit our presentations before we make them known to the public. We are going to consider how to spell-check a presentation and make changes.

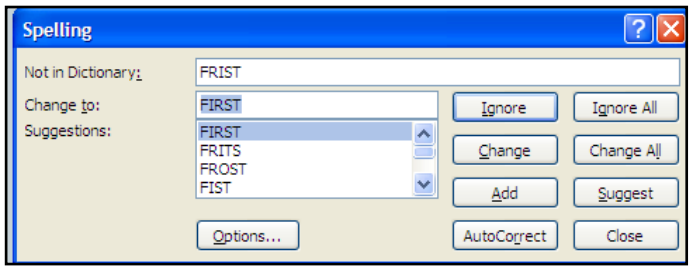
Do you remember how we used the spell-check function in Word? Let us open our previous presentation and mess around with the spelling. Try switching some of the letters in a word – for example, instead of MY FIRST PRESENTATION, make it **mY FRIST PRSENATON** . what happened? Good, the red-wavy underlines again. You know what to do, don't you?



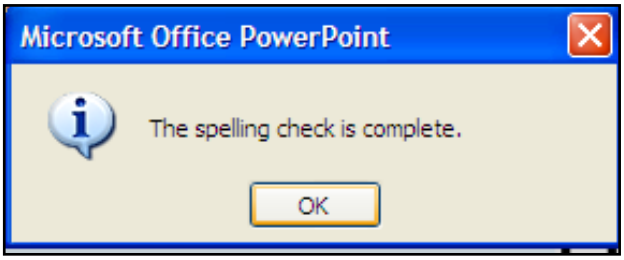
Right-click the problem word and select the correct word from the suggested options. That will remove the red-wavy underline

from the selected word, but to correct all spelling mistakes you may have in the presentation :

On the Review tab, in the Proofing group, click Spelling. A dialogue box, like the one below opens with some spelling suggestions of the problem words. When you accept or ignore a suggestion, another suggestion on the next word with a spelling mistake is presented.



When you finish correcting all spelling mistakes, a message box appears and tells you that there is no more spelling mistakes in your presentation.



ADDING PRESENTER'S NOTE TO SLIDES AND DELETING UNWANTED SLIDES

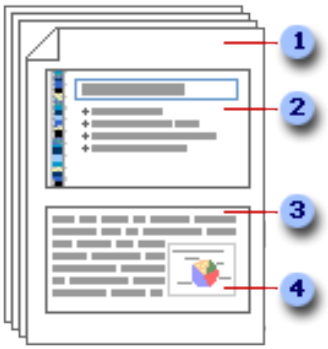
The presenter's notes are printed notes pages that accompany slides. Presenter's notes are further elaborations on the concepts in the main slides. These notes can be given to the audience to guide them through he presentation.

Create the notes pages

Use the notes pane in Normal view to write notes about your slides. Notes pane is the pane in normal view in which you type notes that you want to accompany a slide. You print these notes as notes pages or have them display when you save a presentation as a Web page.

You can type and format your notes as you work in Normal view, but to see how your notes pages will be printed and to see the full effect of any text formatting, such as font colors, switch to Notes Page view. You can also check and change the headers and footers of your notes in Notes Page view.

Each notes page shows an image of a slide, along with the notes that go with that slide. In Notes Page view, you can embellish your notes with charts, tables, or other illustrations.



- Notes pages include your notes and each slide in the presentation.
- Each slide is printed on its own notes page.
- Your notes accompany the slide.
- Data such as charts or pictures can be added to your notes pages.

A picture or that you add in Notes Page view will appear on your printed notes page, but not on your screen in Normal view. If you save your presentation as a Web page, the picture or object does not appear when you display your presentation in the Web browser, although your notes do.

The changes, additions, and deletions that you make on a notes page apply only to that notes page and to the note text in Normal view.

If you want to enlarge, reposition, or format the slide image area or notes area, go to Notes Page view and make the changes.

You can't draw or place pictures in the notes pane in Normal view. Switch to Notes Page view and draw or add the picture there.

Applying content and formatting to all notes pages

To apply content or formatting to all notes pages in a presentation, change the Notes Master. For example, to put a company logo or other piece of art on all of your notes pages, add the art to the Notes Master. Or, if you want to change the font style that is used for all notes,

change the style on the Notes Master. You can change the look and position of the slide area, notes area, headers, footers, page numbers, and date.

Displaying the notes pages on a Web page

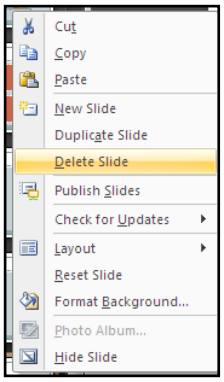
If you save your presentation as a Web page, your notes are automatically displayed unless you choose to hide them. The slide titles become a table of contents in the presentation, and your slide notes appear beneath each slide. Your notes can fill the role of the speaker, giving your audience the background and details that a speaker would provide during a live presentation.

If you don't want your notes to be displayed on the Web page, you can turn them off before you save the file as a Web page. For more information about displaying notes pages on a Web page, see Display notes pages on a Web page.

Deleting unwanted slides

After designing your presentation you may find tat some information is not needed anymore or appear one too many. The slides containing such information can be deleted. You can delete a slide in either the Normal View or the Slide Sorter View.

To delete a slide in Normal View, click on the thumbnail of that particular slide in the Slide/Outline pane, then press the Delete key.



Or, right-click the thumbnail and select Delete Slide from the roll-down menu.

To delete a slide in the Slide Sorter View, click the unwanted slide and then press the Delete key

Or, right-click the slide and select Delete Slide from the roll-down menu.

APPLYING TRANSITION EFFECT ON SCREEN SLIDE PRESENTATION

Slide transitions are the animation-like effects that occur in Slide Show view when you move from one slide to the next. You can control the speed of each slide transition effect, and you can also add sound.

Microsoft Office PowerPoint 2007 includes many different types of slide transitions, including (but not limited to) the following:

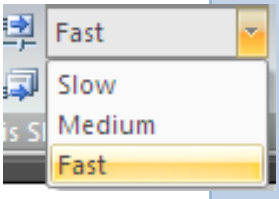
1. No transition
2. Blinds Horizontal
3. Blinds Vertical
4. Box In
5. Box Out
6. Checkerboard Across
7. Checkerboard Down
8. Comb Horizontal
9. Comb Vertical

To see more transition effects, in the Quick Styles list, click the **More** button , as shown in the diagram above.

Add the same slide transition to all of the slides in your presentation

1. In the pane that contains the Outline and Slides tabs, click the **Slides** tab.
2. On the **Home** tab, click a slide thumbnail.
3. On the **Animations** tab, in the **Transition To This Slide** group, click a slide transition effect.

   To see more transition effects, in the Quick Styles list, click the **More** button .
4. To set the slide transition speed, in the **Transition To This Slide** group, click the arrow next to **Transition Speed**, and then select the speed that you want.



5. In the **Transition To This Slide** group, click **Apply to All**.

Adding different slide transitions to the slides in your presentation

1. In the pane that contains the Outline and Slides tabs, click the **Slides** tab.
2. On the **Home** tab, click a slide thumbnail.
3. On the **Animations** tab, in the **Transition To This Slide** group, click the slide transition effect that you want for that slide.
4. To set the slide transition speed, in the **Transition To This Slide** group, click the arrow next to **Transition Speed**, and then select the speed that you want.
5. To add a different slide transition to another slide in your presentation, repeat steps 2 through 4.

Setting time interval between slides

You can control the time interval at which each slide is presented. To set the time interval:

1. In the Normal or Slide Sorter View, click on the thumbnail of the slide.
2. In the Animations tab, on the Transition to This Slide group, check the box next to Automatically After and select the time interval you want. You can set the same or different time intervals for each slide.

3. You can also choose to control the transitions on mouse click. To do that, uncheck Automatically After and check On Mouse Click.

Add sound to slide transitions

1. In the pane that contains the Outline and Slides tabs, click the **Slides** tab.
2. On the **Home** tab, click a slide thumbnail.
3. On the **Animations** tab, in the **Transition To This Slide** group, click the arrow next to **Transition Sound**, and then do one of the following:
   - To add a sound from the list, select the sound that you want.
   - To add a sound not found on the list, select **Other Sound**, locate the sound file that you want to add, and then click **OK**.
4. To add sound to a different slide transition, repeat steps 2 and 3.

Chapter 25

PRINTING PRESENTATION

OBJECTIVES

After completing this chapter, you should be able to:

i. Change slide setup.
ii. Select pint option for printing.

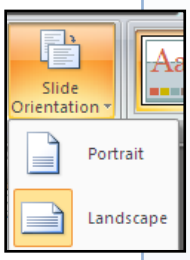
INTRODUCTION

Presentations are made to be displayed on a screen, mostly with the aid of a projector, but it is most of the time ideal, if not always, to keep a hard copy of your presentations. The hard copy version of the presentation serves as a backup in case power goes out. The paper version could also help you kno your way around in case you miss your way throught the on-scren version. The presenter's notes provides in depth view of what is projected on the screen and could can the presenter talk further on specific point. Given the audience a copy of the presenter's notes helps them follow the ideas and concepts displayed on the screen.

In this chapter, we are going to consider how to print your presentations.

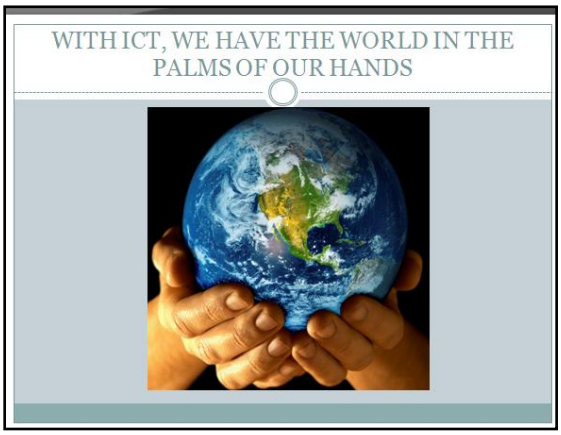
CHANGING SLIDE ORIENTATION

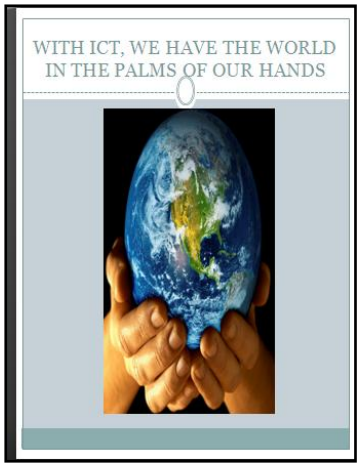
Slide orientation is mostly landscape, but when printing ou may want the printout to assume a portrait orientation, since since landscape printouts are mostly difficult to read. To chage the orientation of the slides in a presentation:



- On the Design tab, in the Page Setup group, click the more arrow below Slide Orientaion. This unfolds the two availbe orientations – Portrait and Landscape, with Landscape already selected.
- Click Portrait, to change th orientation to portrait.

If you are not interested in portrait orientation and prefer landcsape instead, you can reverse the process and this time around click Landscape.

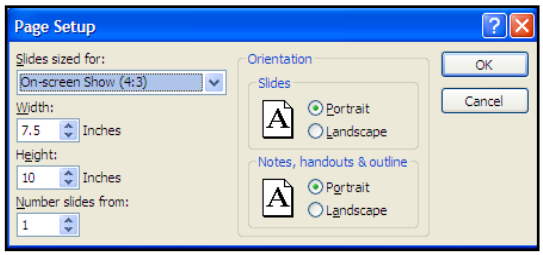




CHANGING PAPER SIZE

The printout will be on paper, and since the type of paper you use will determine the outcome of the printout, it will be convenient to set the size of the paper before you commence printing. To set paper size:

- On the Design tab, in the Page Setup group, clcik page Setup. The Page Setup dialogue box opens.
- In the Slides size For box, select A4 paper, which is the commonest paper size available, or you can specify the paper size you want form the Width and Height boxes, if it is not available in th Slides Size For box.
- When you are satisfied with the changes you have made, click OK.

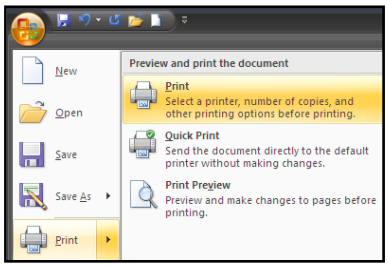


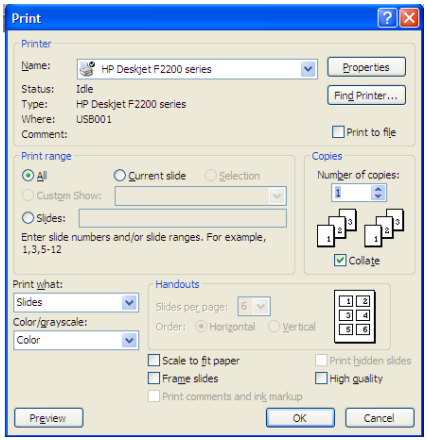
SELECTION OF PRINT OPTION

In Excel and Word, if you remember, we tried a couple of print options. We are going to use similar options in this section. As one commands the computer with its software to perform a task, choosing the print option is the user's command to the printer to do what the user wants and how he/she wants it.

Selection of print options for the entire presentation

- To print the whole presentation:
- Open the presentation you want to print.
- Click the **Microsoft Office Button** .
- Point on or click the arrow next to **Print** and click **Print** from the **Preview and Print the Document** menu. This opens the Print dialogue box.





- In the **Print range**, leave it on **All**, since we are printing the entire presentation.
- In the **Print What** text box, select **Slides**.
- Click **OK** to print the entire presentation.

Selection of print option for printing specific slides

- To print the whole presentation:
- Open the presentation you want to print.
- Click the **Microsoft Office Button** .
- Point on **Print** and click **Print** from the **Preview and Print the Document** menu. This opens the **Print** dialogue box.

- If you want to print the active slide select **Current Slide** in the **Print range**, but if you want to print some other slides, click on **Slides** and then type the slide range separated by comma, for example, 2,3,5,7,8.
- **Click OK** to print the selected slide range.

Selection of printing option for printing handouts

- To print the whole presentation:
- Open the presentation you want to print.
- Click the **Microsoft Office Button**  .
- Point on or click the arrow next to **Print** and click **Print** from the **Preview and Print the Document** menu. This opens the Print dialogue box.
- In the **Print What** text box, select **Handouts**.
- Click **OK** to print the entire handout.

Selection of printing option for printing handouts

- To print the whole presentation:
- Open the presentation you want to print.
- Click the **Microsoft Office Button**  .
- Point on or click the arrow next to **Print** and click **Print** from the **Preview and Print the Document** menu. This opens the Print dialogue box.
- In the **Print What** text box, select **Notes Pages**.
- Click **OK** to print the notes pages.

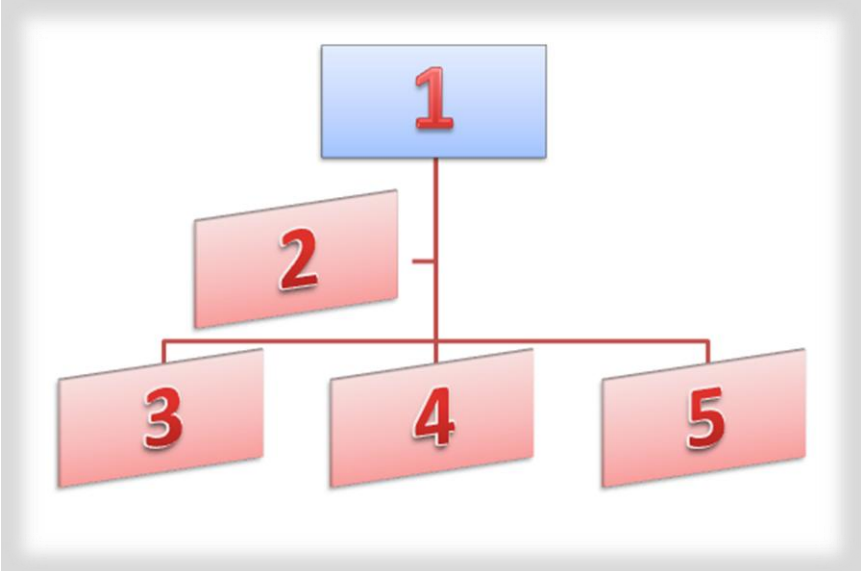
Selection of printing option for printing outline view of slides

- To print the whole presentation:
- Open the presentation you want to print.
- Click the **Microsoft Office Button**  .
- Point on or click the arrow next to **Print** and click **Print** from the **Preview and Print the Document** menu. This opens the Print dialogue box.
- In the **Print What** text box, select **Outline View**.
- Click **OK** to print.

NOTE:

- If you want your printout to be in color, in the Colour/grayscale, select **Colour**.

- In Copies, type in the number of copies you want to print. You can set other print options to meet your needs.



Chapter 26

DEVELOPING ORGANISATION CHART USING A PRESENTATION APPLICATION

OBJECTIVES

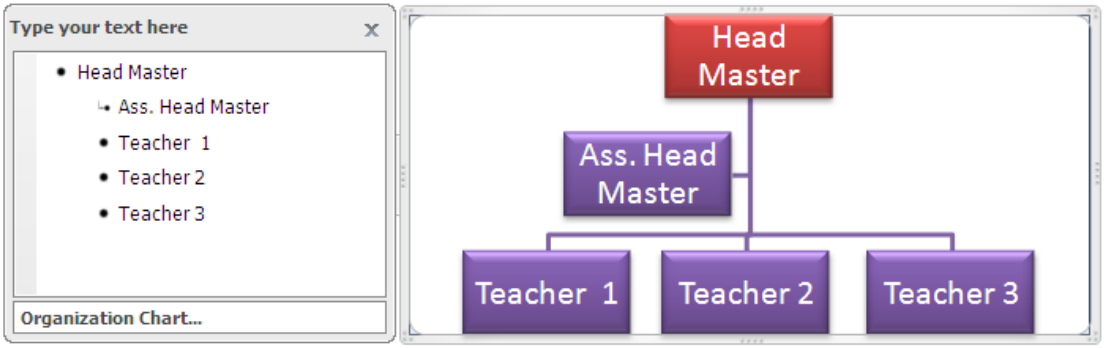
After completing this chapter, you should be able to:

i. Develop organization chart with labeled hierarchy using a presentation application.
ii. Change the hierarchical structure of an organization chart.

INTRODUCTION

An organization chart graphically represents the management structure of an organization, such as a school where you may have a head teacher, assistant head teacher, teachers school prefects etc. and also in a company - a department managers and non-management employees in that hierarchical order. Microsoft Office has Smart Art graphic which makes it possible for one to create organisation charts in Word, Excel, Outlook and PowerPoint. These organisation charts can be included in your worksheet, presentation, or document. To create an organization chart quickly and easily, you can type or paste text in your organization chart and then have the text automatically positioned and arranged for you.

When you add an assistant shape to an organization chart layout, such as **Organization Chart**, a bullet with a line attached indicates the assistant shape in the Text pane.

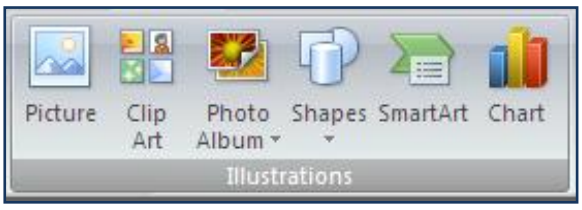


Although you can use other hierarchy layouts to create an organization chart, the assistant shape and the hanging layouts are available only with organization chart layouts.

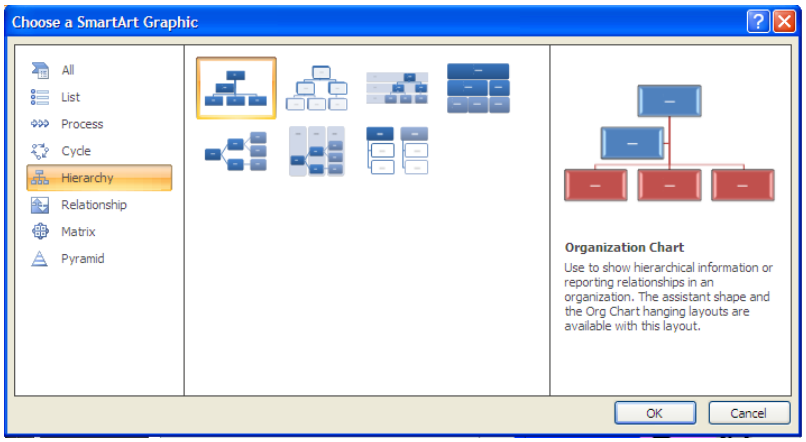
To quickly add a designer-quality look and polish to your SmartArt graphic, you can change the colors or apply a SmartArt Style to your organization chart. You can also add effects, such as glows, soft edges, or 3-D effects. In Office PowerPoint 2007 presentations, you can animate your organization chart.

Creating an organization chart

1. On the **Insert** tab, in the **Illustrations** group, click **SmartArt**.



2. In the **Choose a SmartArt Graphic** gallery.
3. Click **Hierarchy** from the left pane.
4. Click an organization chart layout (such as **Organization Chart**).
5. Click **OK**.



6. To enter your text, do one of the following:

   - Click in a shape in the SmartArt graphic, and then type your text.

NOTE For best results, use this option after you add all of the shapes that you want.

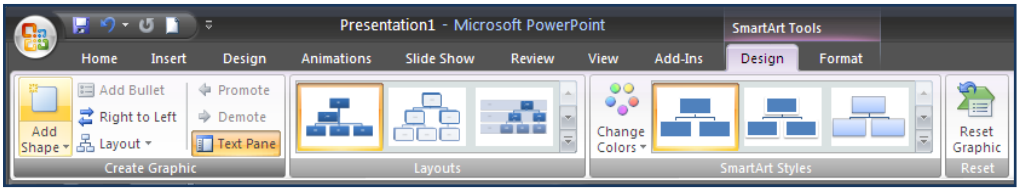
   - Click **[Text]** in the Text pane, and then type your text.
   - Copy text from another location or program, click **[Text]** in the Text pane, and then paste your text.

     If the Text pane is not visible

     1. Click the SmartArt graphic.
     2. Under **SmartArt Tools**, on the **Design** tab, in the **Create Graphic** group, click **Text Pane**.

Adding shapes to your organization chart

1. Click the SmartArt graphic that you want to add a shape to.
2. Click the existing shape that is located closest to where you want to add the new shape.
3. Under **SmartArt Tools**, on the **Design** tab, in the **Create Graphic** group, click the arrow under **Add Shape**, and then do one of the following:



   - To insert a shape at the same level as the selected shape but following it, click **Add Shape After**.
   - To insert a shape at the same level as the selected shape but before it, click **Add Shape Before**.
   - To insert a shape one level above the selected shape, click **Add Shape Above**.

     The new shape takes the position of the selected shape, and the selected shape and all of the shapes directly below it are each demoted one level.

   - To insert a shape one level below the selected shape, click **Add Shape Below**.

The new shape is added after the other shapes at the same level.

- To add an assistant shape, click **Add Assistant**.

  The assistant shape is added above the other shapes at the same level in the SmartArt graphic, but it is displayed in the Text pane after the other shapes at the same level.

  Add Assistant is available only for organization chart layouts. It is not available for hierarchy layouts, such as **Hierarchy**.

NOTES

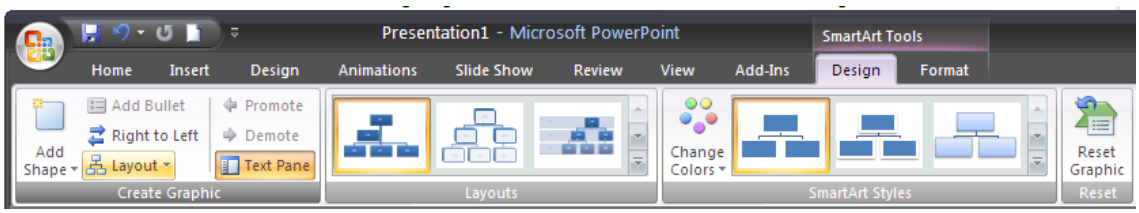
- Although you cannot automatically connect two top-level shapes with a line in the organization chart layouts, such as **Organization Chart**, you can imitate this look by adding a shape to your SmartArt graphic and then drawing a line to connect the shapes.
- To show a dotted-line reporting relationship between two shapes, right-click the line, and then click **Format Shape** on the shortcut menu. Click **Line Style**, and then click the **Dash type** that you want.
- To add a shape from the Text pane, place your cursor at the beginning of the text where you want to add a shape. Type the text that you want in your new shape, press ENTER, and then to indent the new shape, press TAB, or to negative indent, press SHIFT+TAB.

  To add an assistant shape, press ENTER while an assistant shape is selected in the Text pane.

Change the hanging layout of your organization chart

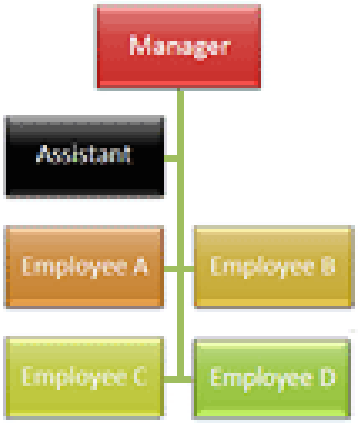
A hanging layout affects the layout of all shapes below the selected shape.

1. Click the shape in the organization chart that you want to apply a hanging layout to.
2. Under **SmartArt Tools**, on the **Design** tab, in the **Create Graphic** group, click **Layout**, and then do one of the following:



- To center all of the shapes below the selected shape, click **Standard**.

- To center the selected shape above the shapes below it and arrange the shapes below it horizontally with two shapes in each row, click **Both**.



- To arrange the selected shape to the right of the shapes below it and left-align the shapes below it vertically, click **Left Hanging**.

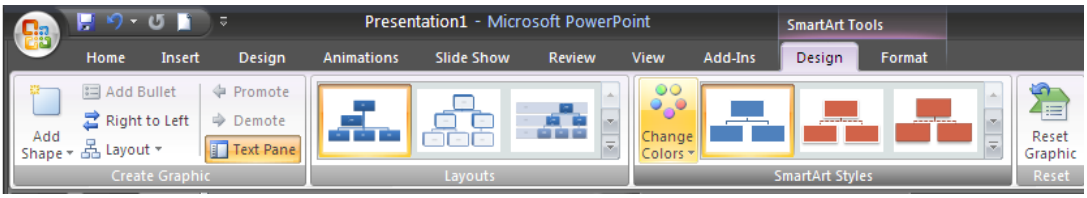
- To arrange the selected shape to the left of the shapes below it and right-align the shapes below it vertically, click **Right Hanging**.

Change the colors of your organization chart

You can apply color combinations that are derived from the theme colors (theme colors: A set of colors that is used in a file. Theme colors, theme fonts, and theme effects compose a theme.) to the shapes in your SmartArt graphic.

1. Click the SmartArt graphic whose color you want to change.

2. Under **SmartArt Tools**, on the **Design** tab, in the **SmartArt Styles** group, click **Change Colors**.



3. Click the color combination that you want.

TIP When you place your pointer over a thumbnail, you can see how the colors affect your SmartArt graphic.

Apply a SmartArt Style to your organization chart

A SmartArt Style is a combination of various effects, such as line style, bevel, or 3-D, that you can apply to the shapes in your SmartArt graphic to create a unique and professionally designed look.

1. Click the SmartArt graphic whose SmartArt Style you want to change.

2. Under **SmartArt Tools**, on the **Design** tab, in the **SmartArt Styles** group, click the SmartArt Style that you want.

   To see more SmartArt Styles, click the **More** button .

NOTES

- When you place your pointer over a thumbnail, you can see how the SmartArt Style affects your SmartArt graphic.
- You can also customize your SmartArt graphic by moving shapes, resizing shapes, and adding a fill or effect.

KEYBOARDING PRACTICE

DRILL #1: HOME ROW

1. aaa ;;; sss lll ddd kkk fff jjj
2. aa ss dd ff aa ss dd ff
3. ;; ll kk jj ;; ll kk jj
4. ad ad as as ask ask ad ad as as ask ask
5. ;;; lll kkk jjj ;;; lll kkk jjj
6. add add fad fad jak jak sad sad fall fall jak jak
7. add fad; add fad; add jak; add jak; sad fall; sad fall;
8. a a as as fad fad dad dad ;; ;; ja ja ka ka la la
9. jas jas kas kas las las jas jas kas kas las las jas jas
10. jf kd ls ;a jf kd ls ;a jf kd ls ;a jf kd ls ;a
11. fall fall sad sad all all all sad falls; all sad falls;
12. lad lad asks asks sas sas kass kass
13. lad asks sas kass; lad asks sas kass;
14. a a sad sad dad dad fall fall; a sad dad fall;
15. dad dad sad sad kad kad lad lad
16. dad dad; sad sad; kad kad; lad lad;
17. lad; dad; sad; lass; lad; dad; sad; lass;
18. fad fad; ads ads; all all; fad ads all lads;
19. ask a lad; a fall ad; ask a dad;
20. as a lad; as a dad; as a sad lass;

DRILL #2: H and E

1. a;sldkfj a;sldkfj aa ;; ss ll dd kk ff jj
2. as ad all jak fad fall lass as ad all jak fad fall lass
3. a lad; a dad; ask a dad; ask a lass; a fall fad;
4. jjj hhh jjj hhh jhj jhj jhj jhj aaa hhh aaa hhh ah ah ha ha
5. jhj hjh jhj hjh aha hah aha hah had had has as ash ash
6. ah ah ha ha; had had has ash; has had a hall; as had a hall;
7. ddd eee ddd eee ded ded ded ded el el led led eel eel eke eke
8. ede ede ede ede lee lee lee lee fed fed fed fed eke eke eke eke
9. a lake; a lake; a leek; a leek; a jade; a jade; a desk a desk;
10. he he she she shed shed heed heed held held he she shed heed held
11. he held a lash; she held a jade; he she held sash;
12. he has fled; he has a sale; she has a sale; he as ash;
13. ask ask has has lad lad all all fall falls
14. a sash; had all; a fall jak; a lad sash;
15. he he she she led led held held she she fell fell
16. he he led led; she she had had; she she fell fell;
17. a jade shelf; a jade desk shelf;; she had a shed;
18. he sells desks; she sells desks; he sells jade;
19. he led; she led; he as jade; she has jade;
20. she asked a lad; he asked a lass; she fell; he fell;

Drill #3: I and R

1. a;sldkfj fjdksla; a;sldkfj fjdksla; dad lad fad ask
2. jh jh jh jh hj hj hj hj hah hah has has had had sash sash
3. ed ed led led fled fled sled sled ed led fled sled
4. k k k k ik ik ik ik is is is is if if if if did did did did

5. aid aid aid aid kid kid kid kid hail hail hail hail
6. if if if if is is is is kid kid kid kid his his his his
7. a kid; a lie; he did aide his lie; if a kid lied;
8. fff rrr fff rrr fff rrr fff rrr frf frf frf frf rfr rfr rfr rfr
9. jar jar red red her her far far red jar her fare
10. rake lake lark jar hear her dark red air
11. rake rake lake lake lark lark jar jar hear hear her her
12. dark dark red red air air sir sir fir fir fire fire
13. he is; she is; if her; if his; her aide; his aide;
14. he he; if if; is is; ed ed; as as;
15. she she; her her; hah hah; red red; air air; hair hair;
16. shed shed; rake rake; hear hear; fare fare; lark lark;
17. he if is ed as; she her hah red air;
18. hair shed; rake hear; fare lark;
19. if he is did fir jak all fall jak did he is if
20. a red jak; he ask her; she ask her aide; if she fell;
21. she did; he did; he led her; she is her aide;
22. she had a red jar; she had a fire sale;

Drill #4: REVIEW

1. he he has has fir fir; she she had had jak jak;
2. he had a jade jar; she had a jade jar;
3. she had a leek sale; she had a leek sale;
4. if is ha lie rid die did sir fir lie led jar
5. ad has lad kid rah jak led her ask lid had
6. fall jeer hah all keel fire hall add iris
7. if he is she if as is if is she if is he
8. she did; a jak; he led; she has; he is; if he;
9. a lid jar; all her ads; a red fish; a jade ad;
10. if he;
11. as if she;
12. he had a desk;
13. she had a red jar;
14. he had a lead all fall;
15. she asked if he reads ads;
16. she sees all adds she reads;
17. her dad had a fall sales ad in red;
18. is is if if ah ah he he el el ad ad ha ha
19. if if fir fir did did eel eel jak jak are are
20. eel eel jak jak ire ire are are aid aid red red

Drill #5: O and T

1. had a fall; as a fall add; a sad dad fall; a dad dad;
2. he sees her aid; he irks her; a red fish; a red aid;
3. he sells red desks; she had a jar fall; he sells desks;
4. lll ooo lll ooo ooo lll ooo lll lol lol lol lol
5. ol ol ol ol of of of of or or or or for for for for
6. or or or or for for for for oak oak oak oak off off off off
7. do so; do so; of old; of old; of oak of oak; of old red oak;
8. fff ttt fff ttt ttt fff ttt fff ftf ftf ftf ftf
9. it it it it at at at at tie tie tie tie the the the the fit fit fit fit
10. tf tf tf tf fit fit fit fit sit sit hit hit kit kit tie tie

11. too too toe toe hot hot lot lot too too toe toe hot hot lot lot
12. too hot; odd fort; odd lot; jot a lot;
13. to rot; the lot; for this; dot it; for the lot;
14. sit kid jak kit old hit led is kid dot jak sit
15. he led she led had see held fled has jade leads
16. he asked her to led the fled fit tie sit kit
17. it fit tie sit kit its fits hits kits lit hit tie it
18. a fit is kit sits it fits a dit a tie sits hits fits
19. ooo rrr ooo rrr or or or or for for for for ore ore ore ore
20. he rode; a rod; a door; a rose; a rod; a rod door; a rose door;
21. or it do to of odd too for she the too
22. of all she is or the to do if he do so it is it if
23. if she asked a lad; the lad off to the lake;
24. he or she; off the old jet; she left the jet; a red salad;

Drill #6 : N and G

1. has a lad; a fall lad fad; has a red salad;
2. do it; do it; a tot; a tot; do a lot; do a lot; it is hot; it is hot;
3. to do; do to; a tot; tot a; do a lot; lot a do; dot it; it dot;
4. her skis; her kid; his aide; it is far; is a kid;
5. jjj nnn jjj nnn jjj nnn jjj nnn jnj jnj jnj jnj
6. nj nj nj nj jn jn jn jn an an an an and and and and
7. end end ant ant land land hand hand fan fan
8. fff ggg fff ggg fff ggg fff ggg fgf fgf fgf fgf
9. fg fg fg fg gf gf gf gf nj nj nj nj jn jn jn jn
10. he got; to the fog; he got to jog; he got to golf;
11. no nag ago gone long go on; a nag; no gain; long ago;
12. log in so soon; a fine sing; led a hand; no gain;
13. he got an old dog and she is gone;
14. she jogs in the fog;
15. she and he jog in the dense fog;
16. she and he go to golf in dense fog;
17. she and he golf a nine in the north area
18. he has an oar; he jogs; do a log for her; she left a red jar;
19. an an go go in in dig dig end end and and go go to to
20. he did it for her; he is to take the old jet;

Drill #7: LEFT SHIFT AND PERIOD

1. aa ;; ss ll dd kk ff jj gg hh ff jj dd kk ss ll aa ;;
2. hhh eee iii rrr ooo ttt nnn ggg hh ee ii rr oo tt nn gg
3. is he; an if; do or; go to; an oak; all of;
4. J J J J Ja Ja Ja Ja K K K K Ka Ka Ka Ka L L L L La La La La
5. Ha Ha Ha Ha Hal Hal Hal Hal Ja Ja Ja Ja Jan Jan Jan Jan
6. Kal did it; Hans is red; Jan at the fig;
7. I I I I Ia Ia Ia Ia Ian Ian Ian Ian
8. lll … lll … lll … lll … l.l l.l l.l l.l fl. Ed. Ft. hr. in.
9. I do too. Ian is not. Ola did it. Jan does this. Kent is gone.
10. Hal did it. I shall get on a train and do this.
11. J. L. Hanes skis on the lake. Larry also does it.
12. I said ft. is for feet and rd. is for road and fl. is for floor.
13. Lt. John let L. K. take the old gong to the lake.
14. Larry asked the old store kid for a kit.

15. I like Ike and John.
16. Ike said to take the old road to get to the lake.
17. if so it is to do it do to is he go do if it is to so if
18. Lars sent the log to the ski lodge.
19. do is the got if the for the ask the end
20. O. J. lost one of the logs off the train.
21. Ja Ja Ka Ka La La Ia Ia Oa Oa Ja Ja Ka Ka La Ia Ia Oa Oa

Drill #8: Review

1. J. L. O. I. ik rf ol ed nj gf hj tf .l ft. i. e. e.g.
2. is or to a go is he and got the for led kit
3. I got the ski. Jan led Nan. Hal is gone.
4. hj hj hj hj jh jh jh jh ed ed ed ed de de de de she she led led
5. Heidi had a lead the end of the set one.
6. sir sir ire ire ore ore his his risk risk fire fire ride ride
7. Kate is at high risk if he rides the horse.
8. so if of too of hot old the toe so if of too of hot old toe
9. Nan took the list to the food store.
10. nj nj nj nj hj hj hj hj go go go go an an an an got got got got
11. Lane sings nine songs.
12. J. K. is going to Idaho to sing the songs.
13. Nan took the train at nine.
14. Janet asked to take the ski to the lake.
15. Karl and Janet said he left the lake at noon.
16. Jan needs the data sheet too.
17. I felt ill just as the ski lift started up the hill.

Drill #9: U and C

1. fjdksla; fjdksla; a;sldkfj a;sldkfj he he he he ir ir ir ir
2. ot ot o tot ng ng ng ng L. L. L. L. he ir ot ng L
3. do so to go fan hen log tan son not sign and fan tan
4. Olga and Jena has the first skate slot.
5. jjj uuu jjj uuu jjj uuu jjj uuu uj uj uj uj ju ju ju ju us us us us
6. jug jug jug jug sue sue sue sue lug lug lug lug use use use use
7. due for us; the red fur; use it again; is it hers;
8. ddd ccc ddd ccc ddd ccc ddd ccc dcd dcd dcd dcd cod cod cod cod
9. cog cog cog tic tic tic can can can cot cot cot hot hot hot
10. ice ice can can doc doc tic tic dock dock cue cue cut cut
11. cues cues duck duck clue clue coat coat cut cut cake cake
12. I found a fur coat that had cake on it.

Drill #10: W and Right Shift

1. aaa ;;; sss lll ddd kkk fff jjj he ir ot ng l. uc he ir ot ng l.
2. us us cut cut sue sue cot cot nut nut lug lug ice ice can can
3. Janet took the lead in the race for the record.
4. sss www sss www sss www sws sws sws sow sow sow sow
5. wow wow wow lows lows lows lows shows how shows how
6. cows cows now now row row own own tows tows
7. how is; so low; to sow; to own; row now; go now;
8. aaa A A A aaa A A A ccc C C C ccc C C C fff F F F ddd D D D
9. Dan Del Dennis Fran Frank Francis Sue Stan Scott
10. Rio Rip Run Willa Will Wanda Alan Ali Ariel Cat Chris Curtis

11. Wil left the show which he won the award
12. Frank will go to Rio next fall.

Drill #11: B and Y

1. fff bbb fff bbb fff bbb fff bbb fib rib rob but big but bad fibs
2. bbb fff bbb fff bbb fff bbb fff bid bid bud bud rob rob lob lob
3. rib fib rub orb rob but bid a rib; to fib; it rubs; or rob; she bid;
4. jjj yyy jjj yyy jjj yyy jjj yyy jyj jyj jyj jyj jy jy jy jy yj yj yj yj
5. jay jay lay lay day day say say hay hay stay stay
6. yj yj yj yj jay jay eye eye dye dye yes yes yet yet
7. to say; jay eye; dye the eye; a dyed jay eye;
8. by and by; buy it; a byte; the boy, the buoy;
9. Jay and Janet went to the store to buy bread.
10. hhh eee iii rrr ooo ttt nnn ggg L J K … uuu ccc www R F W bbb yyy
11. he he it it rot rot now now go go us us wow wow by by
12. no in bow any cut ran bin cow deck any rain wow sub
13. See the baby cub that Cody went to buy.
14. Buy the big baby a sub sandwich.
15. for the hand such did cut now held furl eight ask now
16. to do to buy can go for all did ask her to buy bow wow
17. if she had to work and such for this she held the goal
18. The auburn hair flew in the light wind.
19. Bobby left the show and went to the city.

Drill #12: REVIEW

1. tf bf cd uj .l nj gf tf ol rf ik ed hj tf bf cd uj .l nj fg tf ol
2. by by jay jay lay lay hay hay say say buy buy boy boy yet yet
3. Fran and Jan knew about the red and gold truck.
4. clay when they than won sly den win den send tend won one
5. in a way | she was fine | to buy a hen | they will win
6. John can bid on the old clock he saw at the station.
7. I know she will be here soon.
8. Lt. John Sorensen and Nan went to Sol for the day.
9. Jana and Rod are in Sweden; Jane and Bo go in June.
10. Cody and Janet went to the lake to see the boat.
11. Work for us in Los Angeles then again in San Francisco.
12. Jana, Aida and Ross went off to the club to golf.
13. she owns dug buys cog job for yet ask led head red
14. of if | the all of | and do |cut it | he go | to do it | do it too
15. Lake Tahoe had a big ice show today.
16. Jack said to leave this job and find a new one.
17. Cindy left for work one hour ago.
18. Rudy and Judy have good jobs in town.
19. Allan and Allen and Jon and John and Peg and Peggy
20. John and Jan are going to work then to the sale.
21. Row the boat to the dock.
22. Carl has an old kayak and a canoe.
23. Stan told us to set goals and go for it.
24. She said for us to get going on our goals.
25. It is our job to go as high as we can go.
26. The big signs close to the area will go to Jake
27. The big boat dock has a lot of birds on it.

28. All left the club as the news ended.
29. Jeff left the club as the news started.
30. The goal was to lower cost and the task force did it.
31. Larry likes new stuff so this was not too rough.
32. I hike each day on the road side near the school.

Drill #13: M and X

1. ow bf if rf us by ik tf ik nj nj yj ik tf hj cd uj gf by us
2. bet you but bit dye fib yes by bye boy buy dye yes yet
3. I can win the gold but I must set a higher goal.
4. jjj mmm jjj mmm jmj jmj jmj jmj am am am am me me me me
5. mj mj mj mj jm jm jm jm me me me me may may may may
6. yam yam yam yam men men men men jam jam jam jam
7. sss xxx sss xxx sss xxx sss xxx sxs sxs sxs sxs sxs sx sx sx
8. ox ox ox ox fox fox fox fox fix fix fix fix nix nix nix nix
9. a fox; an ox; nix it; fix it; hit an ax; by six; by fixing it'
10. me ox am ax jam ham hem men lax fox mix lox
11. to lax; fix it; mix it; six men to fix; six men to hex;
12. Mix a ham salad for six; Max can fix tea; Max can fix ham for six;

Drill #14: P and V

1. no cad him bet no in we my be on ad on my ax bet him
2. just is | of work | to sign | of lace | to flex | a form | sign it
3. He won a medal at the show for sixth.
4. ;;; ppp ;;; ppp ;;; ppp ;;; ppp ;p; ;p; ;p; ;p; pen pen lap lap
5. pa pa pa pa pan pan pan pan nap nap nap nap paw paw paw paw
6. a pen and cap; pay then pick it up; plan to keep a promise;
7. fff vvv fff vvv fff vvv have have have have five five five five
8. vf vf vf vf vie vie vie vie van van van van view view view view
9. dive dive dive dive go via; vie for; has vim; a view; to live;
10. cup up vie pen van cap vim rap have keep plan live life
11. gave it up; pave it; save it; very apartment; give me a cup;
12. Vic plans to have the van pick us up at five or six.

Drill #15: Q and Comma

1. ask jam for own buy dig via fix all do dig
2. a map; an apt.; her plans; have five;
3. Sixty pints of jam will be sent to her.
4. aaa qqq aaa qqq aaa qqq aaa qqq qt. qt. qt. qt.
5. quad quad quad quad quit quit quit quit aqua aqua aqua aqua
6. quite quite quite quite squad squad squad squad
7. kkk ,,, kkk ,,, kkk ,,, kkk ,,, kit, kit, kit, kit, kite, kite, kite, kite
8. a kit, a kite, a bike, a hike, a kit, a kite, a bike, a hike
9. I see that Pam and Ike are here but Stan will be late.
10. Enter the words quote, quite, quo, aqua, and quit.
11. I think I will quit the squad along with Raquel.
12. We were quite quick to quit the movie.

Drill #16: Review

1. Virgil and Jack found the mosque at six.
2. Pam, Quinn, Carl, Van and Hope will be here at five.
3. Vic and Vim will aid the girl with her sign work.

Paragraph #1
When you strike the enter key at the end of a line it is called a hard return. If you just continue to key without striking the enter key the computer will automatically go to the next line. This is called a ***soft return***.

Paragraph #2
There is another phrase for soft return. It is called ***wordwrap***. It is much easier to use and saves you time and effort. Strike the enter key at the end of each paragraph.
4. I will fix the sign and charge them for it.
5. Jay, Jim, Julie, Janice will sit in the blue auto.
6. Todd will fish the docks for a big fish.
7. I want a big bowl of salad and a cup of chili.
8. Cal and Carl just won a big prize at the fair.
9. so so an an if if is is us us am am by by or or ox ox
10. is she in | pay in advance | if he may | in a firm
11. I will keep pens by my desk in a tan and yellow tray.
12. I will give the new toy to the little boy down the street.
13. J. V. M. S. Dr. or Mrs., Ph.D. or Ed.D., July, August, September
14. Mrs. Mr. Miss Mrs. Marnie Fowers, Dr. Mark V. Jensen, Mr. T. Ott
15. B. J. Smith has a birthday in March. Go to the party with her.
16. Mary has a Ph.D. from N.Y.C.; Dolly will get a Ed.D.
17. jam for pay got the lap ox cut run ran jam ham pan
18. make them move when both then their there that the
19. to sit | by me | by six | old oak | did go |for the air
20. to tie | I own | pay him | cut ties | for they
21. I may have six students who will do the job for free.
22. Vicky and John will pack a box lunch for the fair.
23. I plan to bike for five days with John.
24. You will find the best price for the tent at Big K.
25. qa qa qa qa bf bf bf bf by by by by qt. qt. qt. qt. ft. ft. ft. ft.
26. John is the brainy one and Jess is the brawny one.
27. sx sx sx sx sw sw sw sw dc dc dc dc de de de de fv fv fv fv fr fr fr fr
28. I keyed ox, mix, fox, fix, nix, six, and tricks.
29. ;p ;p ;p ;p lo lo lo lo ki ki ki ki ju ju ju ju
30. jn jn jn jn jm jm jm jm k, k, k, k, l. l. l. l.
31. jy jy jy jy jh jh jh jh fg fg fg fg ft ft ft ft fb fb fb fb
32. fv fv fv fr fr fr de de de dc dc dc sw sw sw sx sx sx aq aq aq

Drill #17: Z and Colon (:)
1. John won a diving trophy for six events at our state meet.
2. to busy | down town | by the city | with us
3. I have to go into town to sign a document with my mom.
4. aaa zzz aaa zzz aaa zzz aaa zzz aza aza aza aza zap zap zap zap
5. zoo zoo zoo zoo zip zip zip zip zag zag zag zag oz. oz. oz. oz.
6. zoo zoo zoo zoo zip zip zip zip maze maze maze maze
7. eight oz. twelve oz. twenty oz. fifteen oz. nineteen oz.
8. ;;; ::: ;;; ::: ;;; ::: To: File: Shift: Reply to: Dear Alan:
9. Leave two spaces after typing a colon.
10. Shift in opposition when keying capital letters at the beginning of names.
11. John, Jim, Larry, Ted, Janice, Steve, Paul, Tawna
12. Zoe, Zen, Liza, Quigg, Paul, Olga, Ivan, Yoda
13. You must shift with the left hand to get the colon to work.

14. hazy quad quit zone quay zeal quote zap qt. zoo Zen Zelda
15. Joey amazed us all when he won the state math contest.
16. apt six fix flex flax next harp rip open drop the pen
17. Lex and Lars are twin boys who like to fix apple pie for six friends.
18. mime mime mime mime mama mama move move move move
19. vamp vamp vamp vamp dive dive dive dive five five five five
20. Glena made the dog work extra hard before putting him in the kennel.
21. Six of the firms had to pay a large fee to the state.
22. See the quick red fox jump over the lazy tan dog.
23. Give me the six big tips to help me with my history quiz.

Paragraph 1
Always use good form when keying. It will help build speed and accuracy. Always look at what you are keying instead of the keyboard. Keep your wrists flat and fingers curved over the home keys.

Paragraph 2
Bouncing hands will cause more errors and slows the typist down. Stay in control and be firm when reaching for your keys.
24.fix it mix it key it tie it hit it bonk it drop it
25. Key the following: Oxen, exit, axle, sixty, and sixth.
26. qa qa qa qa aq aq aq aq ki ki ki ki ik ik ik ik qt. qt. qt. qt.
27. Key the following: Quit, aqua, equal, quiet, and quick.
28. Lazy Lucy liked to sleep during her first class of the day.
29. p: qa ;p aq zap zap zip zip size size lazy lazy
30. Put hot peppers in the zany zesty salsa and put it on his pizza.
31. Magic Marvin and marvelous Mavis vowed to move faster and with more vim and vigor.

INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

For Senior High Schools

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First edition

PREFACE

Why ICT?

Over the years, computer and its related technologies have changed the landscape of the world. Information and communication technology (ICT) has become, within a very short time, one of the basic building blocks of modern society. Many countries, including Ghana, now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education. It is with this respect that the policy makers of Ghana have introduced the study of Information and Communications Technology (ICT) into the Senior High School curricula of the country.

Who Is This Book For?

This book is based on the syllabus structured for Senior High Schools in Ghana, and with that, it is most suitable for Senior High School students. Notwithstanding, other people who are interested n learning ICT can as well use this book to get the best implanted herein. It deals with ICT in secondary schools, and with the changing competencies required of both students and teachers if they are to function effectively in today's society.

How This Book Is Structured And How It Can Help You.

This book is intermingled with text and explanatory graphics. it is filled with practical activities and assignment which the students will be required to do. It would be extremely helpful if users of this book follow the advice, hints and tricks in it. The book also addresses the concerns of those who might not have access to computers by providing paper versions of some practical activates stated in the syllabus.

DEDICATION

This book is dedicated to Miss Christiana Acheampong, the Senior House Mistress of Western Senior High Technical School, Takoradi, for her supports.

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