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DEPARTMENT OF MATHEMATICAL SCIENCES & INFORMATION TECHNOLOGY

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Course Name: **INTRODUCTION TO COMPUTER SCIENCE**
Course code: **CMP 111**
Pre-requisite:
Method of assessment: **40**% Continuous Assessment and 60% of Semester Examinations

Class tests and Assignments

Class tests and Assignments: At least two Class tests and one practical oriented Class assignment shall contribute 35% to the final mark.

Attendance at all lectures and tests is compulsory. This shall contribute 5% to the total final mark.

Semester Examinations: This shall be a set of sixty (60) multiple choice questions covering all areas taught in the course. The end of Semester Examination shall contribute 60% to the final mark.

Short course description:

This course is a foundation course for computer science students and a computer awareness course for all other students in the university. The course traces the history of computer and its evolution from stage to stage. It enumerates the benefits, the disadvantages of computer and enumerates the major component of a computer system.
The course introduces the student to the operation of computers and the first set of software they need to know to be able to use a personal computer. The idea of computer storage devices was also covered. Internet usage and the features which students need to know to search for academic information is also covered

Learning outcomes:
By the end of the course, students should be able to:

- Have sufficient information on the evolution of Computers.
- Identify major uses of computers.
- Interact with the Computer with minimal assistance.
- The awareness of the application packages that can be used in their respective field of life.
- Access the internet within the Campus and use the online platform available.

Teaching methods:
Class lectures, group discussions, take-home assignments and practical sessions.

Syllabus

1. Meaning, Definition and History of computer and computer generation … (2 weeks)
2. Computer and the Society … (1 week)
3. Computers for data processing and other types of platform of secretarial duties… (3 weeks)
   (2 week of lectures, 1week of practical orientation)
4. Interacting with your computer :component and devices in a computer system … (1 week)
5. Storing information in a computer: … (2 weeks)
6. Computer maintenance and security devices (1 week)
7. The Intranet, internet and online Resources: … (2Weeks)
8. Computer Applications and Problem Solving: (1 week)

CONTINUOUS ASSESSMENT TEST DATES:

Continuous Assessment (Online option) Test 1 ……..
Continuous Assessment (Face to face option) Test 2 ……..

Reading list:

Prescribed textbook:

Prescribed textbooks:

Computer studies for Beginners by

Adekunle O Eyitayo, Oduronke T. Eyitayo and Olufunmilayo M. Akejj

ISBN 9-78-330296-5

MODULE 1

Definition and meaning of computers:

A computer is an electronic device, use for manipulating data according to a list of instructions. A computer is a machine that is used to process data. In a more formal definition**, a computer is any machine or device which, under the control of a stored program, can accept data in a prescribed form, process the data, and supply the results as information in a specified form.**

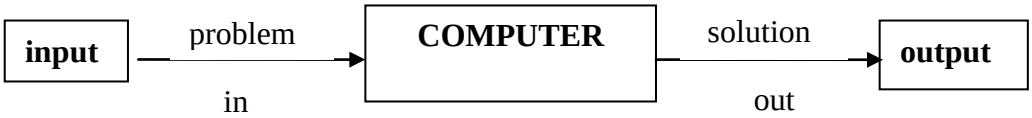
There are three points to note about the above definition, that:

Computer is a machine: It consists of electronic and electro mechanical parts working together, to process data. These machine parts are referred to as computer hardware.

Computer processes data: Essentially, a computer processes data, automatically. It performs three major functions, which include accepting data, often referred as **input,** processes data and supplies these data or information which is referred to as **output.**

Computer is controlled by a stored program: A program is a set of instructions which tells the computer what to do. The general term used to describe computer programs is software, in contrast to hardware. A program is normally stored in the computer's memory while the instructions are being carried out. Professionals trained in the art of instructing the computer to solve problems normally write these programs. The manufacturers permanently fix some programs, called firmware, into the computers. Software can be placed in the computer's memory, used, taken out, and re-used again whenever required.

When a computer is used, data must be presented to it in a prescribed form. This called **data input format**. The form, in which data is supplied to the computer, is that in which the program to be used by the computer is expecting it. A computer program is also used to determine the **format** in which the results are to be supplied. These processes of data in and out are shown in figure 1 below.



process

1.2 CHARACTERISTICS OF COMPUTERS.

The computer has some distinguishing characteristics that make it different form the tools mentioned above. Such characteristics include:

- Speed
- Capacity
- Versatility

- Programmability

Speed: Ability to process at very fast rate and accurately. The computer is faster than machines such as the adding machine, slide rule, cash register, calculators, etc.

Capacity: Ability to store and process large amounts of data than all the other machines that processes information.

Versatility: The computer can be used for many things, it can be used for all the things the other information processing tools can be used for, such as addition, subtraction, multiplication, division etc. It can also be used for the many other things these information processing tools cannot do, such as processing of examination results and keeping of student's records.

Programmability: The computer as the ability to be instructed on how to solve a given problem using programming languages like BASIC, FORTRAN etc.

1.3 TYPES OF COMPUTERS.

There are three main types of computers, they include

- Digital computers
- Analogue computers and
- Hybrid computers

These classifications are based on the way they operate.

i. Digital Computers

The word, "digital", as used here, means whole numbers (discrete); for example, the channel selector on the television set is a digital device because it restricts you to discrete set of channels; one cannot select channel 3.123. Another example is the digital wristwatch, which shows you the exact time in digits. Digital computers are the most common computers. They operate by being given a series of steps of instructions. Some examples of digital computers are IBM 360/370, PDP 11/34. Digital computers are used in offices and schools.

ii. Analogue Computers

Analogue devices have continuous values. For example, the volume control on our television set is an analogue device, because it allows us to adjust the volume continuously in one smooth continuous action. Other examples of analogue devices are thermometers, speedometers, and petrol dispensers at the petrol station, they operate in one smooth

continuous form. Analogue computers operate by accepting data as a quantity varying over a length of time. They are mostly used in industrial operations.

iii. Hybrid Computers

These combine some of the properties of both digital and analogue. For example, setting (programming) on a modern day television set involves both digital and analogue. You first select the channel (digital), then you tune the channel until it receives the station you want clearly (analogue); the station is then stored on that channel (digital). This is an example of a hybrid device; it involves different processes that combine both the properties of analogue and digital. Hybrid computers are not too common; they operate in a programmed form and combine the properties of analogue and digital. An example is a robot used in an industrial environment. The robot first allows the process to get to a particular temperature (analogue); it then does some other processes, which is either digital or analogue.

1.4 CLASSIFICATION OF COMPUTERS.

The following factors are used in classifying computers: size of its internal memory, processing capability, price range and speed of operation. Classification of computers according to their sizes includes:

- Supercomputers
- Mainframes
- Minicomputers, and
- Microcomputers

i. Supercomputers: These are the largest, fastest and most expensive computers. The cost is several millions of dollars, and the speed is between 600 million to 900 million instructions per second (MIPS). Scientists in weather forecasting, oil exploration, etc. Use these for complex calculations. Examples of supercomputers are CRAY X-MP and CRAY 2, which cost millions.

ii. Mainframes: A mainframe computer is a large computer in terms of price, size of internal memory and speed. Mainframe manufacturers tend to make a "family" or a range of computers, rather than a single computer, in much the same way as a car manufacturer produces a range of different cars. A mainframe also cost millions of dollars. It also has a variety of peripheral devices such as printers, plotters, terminals, etc. more than are found with small computers, and a large amount of external storage. Mainframe computers usually need a specialized environment in which to operate: with dust, temperature and humidity carefully controlled. The size of the internal memory is usually more than 256 megabytes of storage. They are used mostly in large establishments (e.g. universities, banks, commercial houses, etc.). Examples of mainframes are IBM 360/370 systems. NCR V-8800 system.

iii. Minicomputers: Minicomputers were developed in the 1970s for specialised tasks (i.e. they are special purpose computers). They are smaller and less powerful and less expensive than mainframes. Minis, as they are often called, are easier to install and operate and they require less floor space. Minicomputers do not require specialised environment to operate in, but care must always be taken to ward off dust from the equipment. They cost between $15,000 and $200,000. Internal storage capacity of a minicomputer is usually between 128 megabytes and 256 megabytes. Examples include VAX 750/6000, HEWLETT PACKARD 3000, PDP 11 and so on.

iv. Microcomputers: A microcomputer is a computer whose central processing unit (CPU) is based on the microprocessor. Microcomputers are at present the most popular of computers. They are very small (desktop to briefcase size). The capability is generally not as many and not as complex as minis or mainframes. They are easy to use. They can be linked with mainframes and minis, and their capabilities are gradually approaching those of minicomputers. Most microcomputers today generally have between 16 and 128 megabytes. The price ranges from about $400 to over $5,000. Examples include IBM PC and its compatible, Apple Macintosh, etc. They are often called PC's. There are very different kinds of microcomputer. All of them have a keyboard, which looks like the keyboard of a typewriter. They also have a screen of a television set.

2.0 HISTROY OF COMPUTERS AND COMPUTER GENERATIONS.

2.1 EARLY AIDS TO COMPUTING.

i. **Fingers and Toes**:

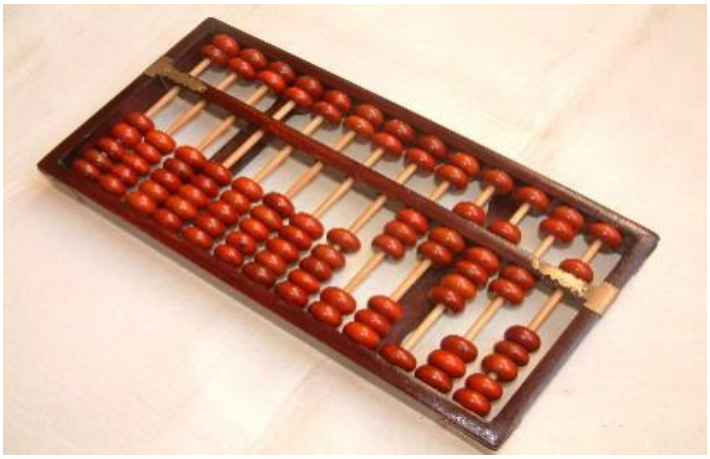
The first early aids of counting were the fingers and toes. Man uses his fingers to help him count, it was a very simple device which help man to carry out simple additions. But they are not very good when counting larger numbers more than twenty. So because of this, primitive man started to use stones instead of fingers to help him count.

ii. **Stones:**

In the early days, when man wants to count say the number of animals he owned, he built a pile of stones with one stone for every animal. After he had finished building the piles he needed, he then needed to look at it and see how many there were on the piles he gathered. This method was used to count larger numbers. The stones could be used to count hundreds of numbers.

iii. **Abacus**

The next idea was to use coloured beads threaded on a string. At first the beads were made of stones. Around the year 1200, the Chinese used this method to count. The beads were threaded on lines of wire frame. The beads on the first line counted the units. The beads on the second wire counted the hundreds and so on. By moving the beads back and forth along wires, numbers could be added and subtracted. This device was called an **ABACUS.** An Abacus is a wooden frame with strings on which colourful beads are strong, a picture of this is shown below.

Figure 2.1 

iv. **Pascaline**

Just over three hundred years ago, the first machines for helping with calculations were invented. These machines were mechanical. They had parts which moved. The power that caused the movement was provided by the person who was using the machine. One of the of these first mechanical devices was the Pascaline. A Frenchman called Blaise Pascal invented the first machine which could do both addition and subtraction, in 1642. The machine was named **PASCALINE.** It had a number of wheels with teeth on them. The first wheel counted units, the second the tens, the third the hundreds, and so on.

Every time the first wheel made one complete turn, the second wheel moved one position forward. Ten turns on the first wheel caused on complete turn on the second wheel. One hundred turns on the first wheel caused ten turns on the second wheel and one complete turn on the third wheel. A picture of the machine is shown in figure 2.2 below.

After a large number of turns, by looking at the position of each wheel you can read a number from them. This method is still used today in fuel and electricity meters; addition is done by moving the wheels forward, subtraction by moving them backwards.

Figure 2.2 PASCALINE MACHINE

v. **THE STEPPED RECKONER**

The next step was to invent a machine called **the Stepped Reckoner** which was able to do multiplication and division. It could also calculate square roots. This was done in 1671 by a German called **Gottfried von Leibnitz**. This machine also used wheels with teeth on them. The nineteenth century started with the idea of **information processing** which over rode the previous machine that can only do subtraction, addition, multiplication and division.

Information processing started with the Stepped Reckoner, the diagram of a Stepped Reckoner is shown below.

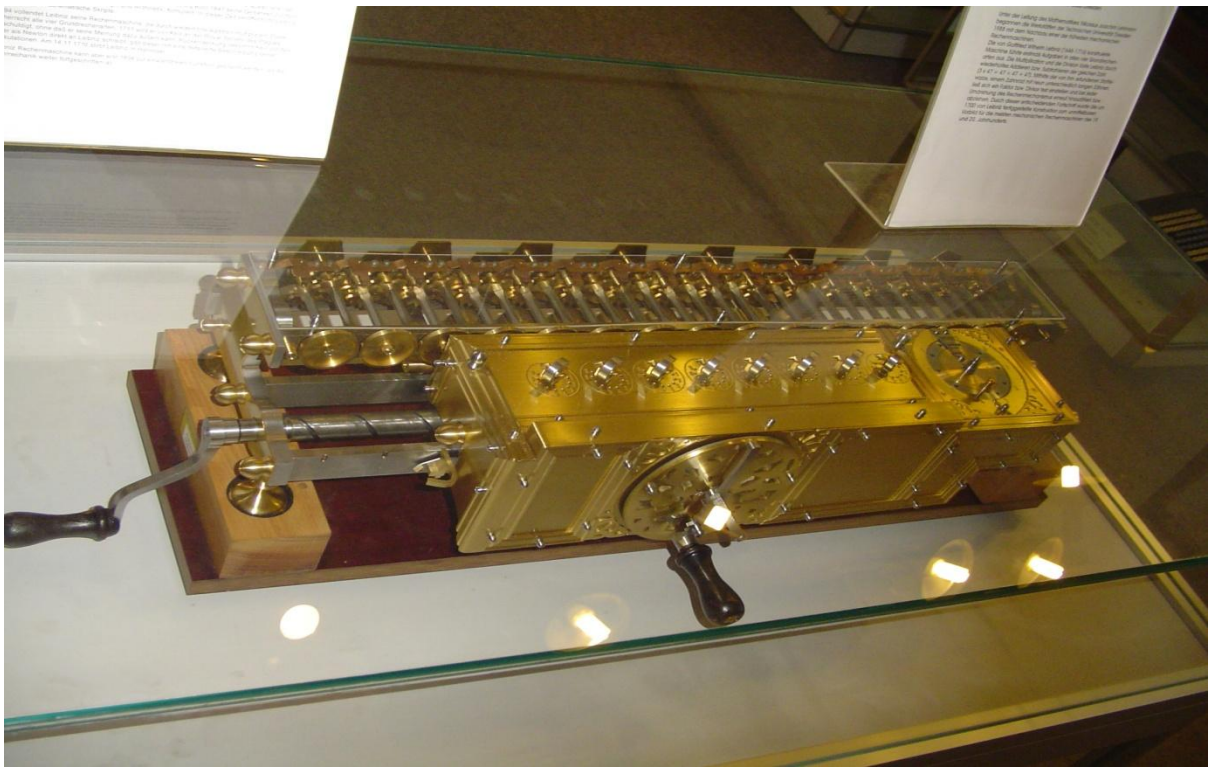


Figure 2.3. The Stepped Reckoner.

vi. **JACQUARD'S LOOM**

An early example of a machine which processed information was used by a French cloth manufacturer, called Joseph Jacquard. In 1802 he built a machine to help weave complicated patterns. When a pattern is woven, each of a number of threads must be raised or lowered. When this has been done the weaving loom pulls another thread between the raised and lowered threads. Then each of the threads is raised or lowered in a different way and the loom passes between them again. This is done very many times when a length of cloth is woven.

Jacquard's loom used lines of holes on a card to represent the weaving pattern. If there were ten threads there was space in each line for ten holes. The card was attached to a device on the loom which was able to look for holes in the card. The device looked at each line. If there was a hole in positions say 3, 4, and 9 then the third, fifth and ninth threads were raised and the rest lowered. After this was done the loom would start to weave. Then the device would look at the next line of holes on the card. It would raise and lower the threads and start weaving again. The information on the card was processed by the loom. A loom operator used to do these before the invention and it was a tedious and time consuming job. The Jacquare's loom is show in figure 4 below.

Figure 2. 4 The Jacquard's Loom

The Jacquard's loom invention emphasised three concepts:

That information could be coded on **punched cards**, **cards are linked in a series of instructions** and **programs could automate jobs**.

vii. **SIR CHARLES BABBAGE'S DIFFERENCE ENGINE**

In 1822, an Englishman called Sir Charles Babbage built a machine called a **Difference Engine**. In this, information on cards was supplied to the machine. The machine then used wheels with teeth on them to do some mathematical calculations.

Babbage later designed another machine called the **Analytical Engine,** shown in figure 5 below. He wanted to use this for more completed calculations. Babbage died before he could complete this difficult task. He was the first to exploit the concepts from Jacquard's loom in a computing machine. Charles Babbage is known as the father of computers because of the ideas he introduced.

A friend of Babbage called Ada, Countess of Lovelace, showed how the Analytical Engine could be used to do some particular calculations.

Sir Charles Babbage is often thought of as the inventor of the computer and the lady Lovelase is regarded as the first computer programmer. She is one of the few women to have been involved in the early history of computing. The analytical engine has four parts:

- a mill for calculating
- a store for holding instructions, intermediate and final results
- an operator for carrying out instructions
- a device for reading and writing data on punched cards

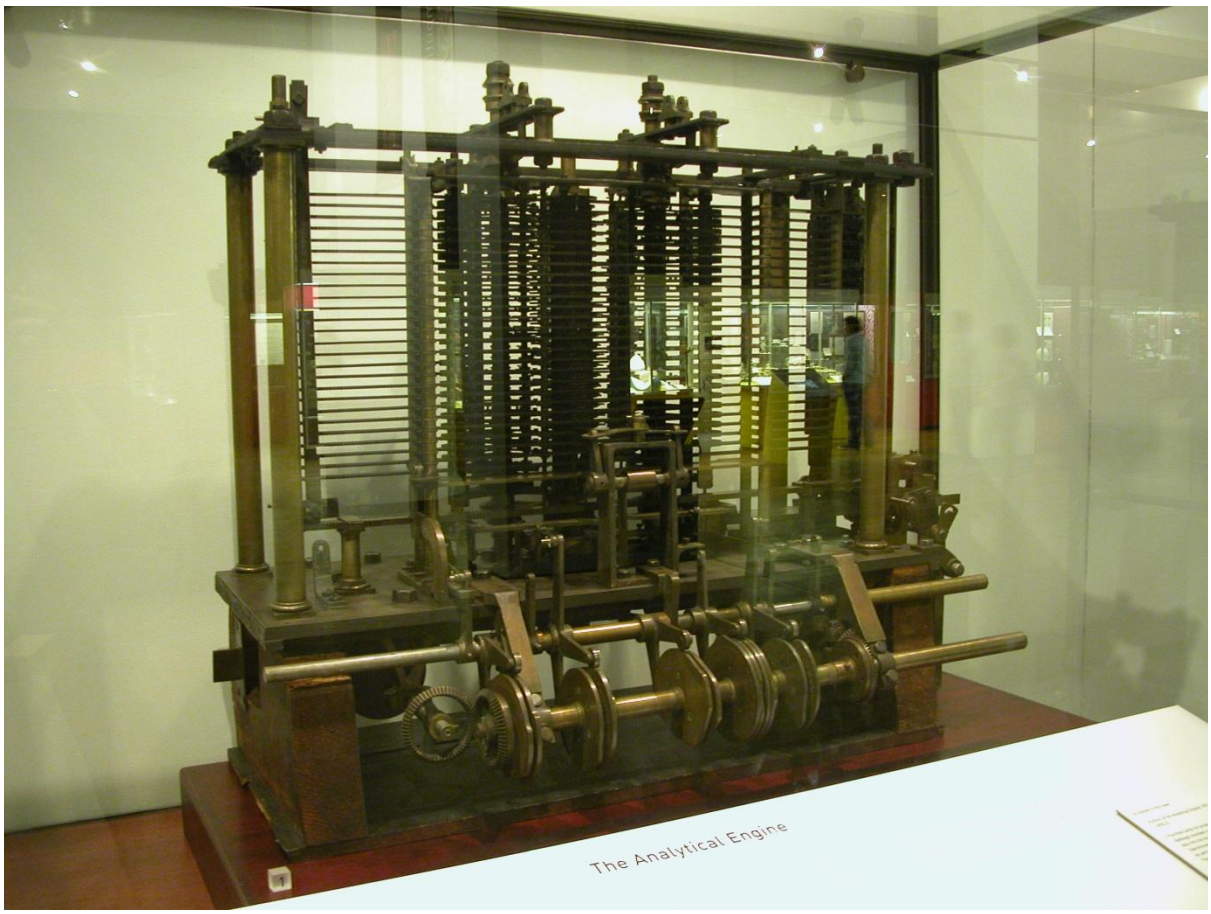


Figure 2.5 The Analytical Engine.

vii. HERMANN HOLLERITH'S MACHINE

During the rest of the nineteenth century more complicated mechanical devices were built. The most important was made by an American called Hermann Hollerith. He used it to process the information obtained in the census of the population carried out in the United States in 1890. With this machine, he was to do in three years what would have taken very many people seven years to do by hand.

At this time a major change was about to take place. It was made possible by the inventions in ELECTRONICS. We talk about these electronic machines in the proceeding sections.

Graphical History Of Computers

The history of computers is in fact an astonishing one. Within this section we'll investigate a number of the most important facts inside the historical past of computers and the computer science world.

Year	Inventions	Description of Event
1936 - 1938	Z1 Computer	The Z1 was the first freely programmable computer in the world which used Boolean logic and binary floating point numbers.
1943	ABC Computer	The Atanasoff–Berry Computer (ABC) was the first electronic digital computing device.
1944	Harvard Mark I Computer	The IBM Automatic Sequence Controlled Calculator (ASCC), called the Mark I by Harvard University, was an electro-mechanical computer history timeline.
1947	ENIAC 1 Computer	Electronic Numerical Integrator And Computer)[was the first general-purpose electronic computer.
19489	Manchester Baby Computer & The Williams Tube	The Manchester Small-Scale Experimental Machine (SSEM), nicknamed Baby, was the world's first stored-program computer.
1949/49	The Transistor	A *transistor* is a semiconductor device used to amplify and switch electronic signals.
1951	UNIVAC Computer	The UNIVAC I (UNIVersal Automatic Computer I) was the first commercial computer produced in the United States.
1952	IBM 701 EDPM Computer	IBM enters into 'The History of Computers'.
1953	FORTRAN Computer Programming Language	*FORTRAN* is considered to be the first widely used *programming language* supported across a variety of *computer* architectures..
1956	ERMA and MICR	The first production *ERMA* system, known as the GE-100, was installed in 1959.
1958	The Integrated Circuit	An *integrated circuit* or monolithic *integrated circuit* (also referred to as *IC*, chip, and microchip) is an electronic circuit manufactured by the patterned diffusion of trace elements.
1964	Computer Mouse & Windows	Douglas Engelbart changed the way computers worked, from specialized machinery that only a trained scientist could use, to a user-friendly tool that almost anyone can use.
1968	ARPAnet	The Advanced Research Projects Agency Network (ARPANET), was the world's first operational packet switching network and the core network of a

		set that came to compose the global Internet.
1970	Intel 1103 Computer Memory	In 1970, the newly formed Intel company publicly released the 1103, the first DRAM (Dynamic Random AccessMemory) chip.
1972	The "Floppy" Disk	A *floppy disk* is a data storage medium that is composed of a disk of thin, flexible ("floppy") magnetic storage medium sealed in a square or rectangular shape form
1974	The Ethernet Computer Networking	*Ethernet* is a physical and data link layer technology for local area *networks* (LANs). *Ethernet* was invented by engineer Robert Metcalfe.
1975/76	Scelbi & Mark-8 Altair & IBM 5100 Computers	The First Hobby and Home *Computers*: *Scelbi, Mark-8, Altair, IBM 5100.*
1977/78	Apple I, II & TRS-80 & Commodore Pet Computers	The personal *computer* became established as a consumer appliance rather than a hobbyist.
1979	VisiCalc Spreadsheet Software	*VisiCalc* was the first *spreadsheet* program available for personal computers.
1979	WordStar Software	*WordStar* was a text-based word processing *program*, meaning that it worked with files that were essentially text, with markup language-like formatting.
1980	The IBM PC - Home Computer	*The IBM Personal Computer*, commonly known as *the IBM PC*, is the original version.
1981	MS-DOS Computer Operating System	The "Microsoft Disk *Operating System*" or *MS-DOS* was based on QDOS.
1982	Apple Lisa Computer	The *Apple Lisa* was an amazing advancement in a user-friendly *computer* system, but Apple didn't invent the idea of the GUI.
1983	Apple Macintosh Computer	*Apple* has positioned the *Mac* as a higher-end personal *computer*.
1985	Microsoft Windows	*Microsoft Windows* is a series of operating systems produced by Microsoft.

Generation of Computers

Each generation of computer is characterized by a major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, more powerful and more efficient and reliable devices.

First Generation (1940-1956) Vacuum Tubes

The first computers used vacuum tubes for circuitry and magnetic drums for memory, and were often enormous, taking up entire rooms. They were very expensive to operate and in addition to using a great deal of electricity, generated a lot of heat, which was often the cause of malfunctions. First generation computers relied on machine language, the lowest-level programming language understood by computers, to perform operations, and they could only solve one problem at a time. Input was based on punched cards and paper tape, and output was displayed on printouts. The UNIVAC and ENIAC computers are examples of first-generation computing devices.

Second Generation (1956-1963) Transistors

Transistors replaced vacuum tubes and ushered in the second generation of computers. The transistor was invented in 1947 but did not see widespread use in computers until the late 1950s. The transistor was far superior to the vacuum tube, allowing computers to become smaller, faster, cheaper, more energy-efficient and more reliable than their first-generation predecessors. Though the transistor still generated a great deal of heat that subjected the computer to damage, it was a vast improvement over the vacuum tube. Second-generation computers still relied on punched cards for input and printouts for output.

Third Generation (1964-1971) Integrated Circuits

The development of the integrated circuit was the hallmark of the third generation of computers. Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers.

Instead of punched cards and printouts, users interacted with third generation computers through keyboards and monitors and interfaced with an operating system, which allowed the device to run many different applications at one time with a central program that monitored the memory. Computers for the first time became accessible to a mass audience because they were smaller and cheaper than their predecessors.

Fourth Generation (1971-Present) Microprocessors

The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip. What in the first generation filled an entire room could now fit in the palm of the hand. The Intel 4004 chip, developed in 1971, located all the components of the computer—from the central processing unit and memory to input/output controls—on a single chip.

In 1981 IBM introduced its first computer for the home user, and in 1984 Apple introduced the Macintosh. Microprocessors also moved out of the realm of desktop computers and into many areas of life as more and more everyday products began to use microprocessors.

As these small computers became more powerful, they could be linked together to form networks, which eventually led to the development of the Internet. Fourth generation computers also saw the development of Graphical user Interfaces (GUIs), the mouse and handheld devices.

Fifth Generation (Present and Beyond) Artificial Intelligence

Fifth generation computing devices, based on artificial intelligence, are still in development, though there are some applications, such as voice recognition, that are being used today. The use of parallel processing and superconductors is helping to make artificial intelligence a reality. The goal of fifth-generation computing is to develop devices that respond to natural language input and are capable of learning and self-organization.

Application of computers

Computers have a large number of applications in variety of fields. Computers have great applications in the field of Information Technology, Physics, Medical sciences, Artificial intelligence, Information Systems, Economics, Statistics, Financial Management, Nuclear Physics, Businesses, Human Resource Management etc. Computers are widely used by the businesses and organizations for effective management of information and resources in almost all departments.

a) Marketing and advertising agencies rely on computer databases of customers and various other tools to track the needs of the customers. Human Resource Management Information Systems help organizations to keep record about the employees. Computers are used in networks which help individuals in the organizations to communicate with each other by sharing files and important documents.

b) Education: One revolution in education is the advent of distance learning. This offers a variety of internet and video-based online courses. Electronic library has brought a lot of books within the reach of students

c) Health and Medicine :

Computer technology is radically changing the tools of medicine. Computer software exist that assist doctors in diagnosis. Scanning devices are controlled by embedded computer devices.

d) Science: Scientists have long been users of computers. A new adventure among scientists is the idea of "collaboration", an internet based collaborative laboratory, in which researchers from where ever around the world can work easily together even at a distance.

e) Business: Business clearly see the interest as a way to enhance productivity and competitiveness. Some areas of business that are undergoing rapid changes are sales and marketing, retailing, banking, stock trading, etc. Sales representatives not only need to be better educated and more knowledgeable about their customer's businesses, but also must be comfortable with computer technology. The internet has become a popular marketing tool. The world of cyber cash has come to banking – not only smart cards but internet banking, electronic deposit, bill paying, online stock

f) Recreation and Entertainment:

Our entertainment and pleasure-time have also been affected by computerization. For example:

i) In movies, computer generated graphics give freedom to designers so that special effects and even imaginary characters can play a part in making movies, videos, and commercials.

ii) In sports, computers compile statistics, sell tickets, create training programs and diets for athletes, and suggest game plan strategies based on the competitor's past performance.

g) Government:

Various departments of the Government use computer for their planning, control and law enforcement activities. To name a few – Traffic, Tourism, Information & Broadcasting, Education, Aviation and many others.

h) Defence:

There are many uses computers in Defence such as:

1) They are also used on Intercontinental Ballistic Missiles (ICBMs) that use Computers to help the missile get to the target.

2) Computers are used to track incoming missiles and help slew weapons systems onto the incoming target to destroy them.

3) Computers are used in helping the military find out where all their assets are (Situational Awareness) and in Communications/Battle Management Systems.

4) Computers are used in the logistic and ordering functions of getting equipments to and around the battlefield.

5) Computers are used in tanks and planes and ships to target enemy forces, help run the platform and more recently to help diagnose any problems with the platforms.

6) Computers help design and test new systems.

i) Sports:

In today's technologically growing society, computers are being used in nearly every activity.

1) Analyzing Movements

The best athletes pay close attention to detail. Computers can slow recorded video and allow people to study their specific movements to try to improve their tendencies and repair poor habits.

2) Scoreboard

While some scoreboards are manually updated, most professional sports venues have very modern scoreboards that are programmed to update statistics and information immediately after the information is entered into the computer.

Uses of Computers

- Computers have become indispensable in today's world. Let us take a look at some of the uses of computers.

  Word Processing - Word Processing software automatically corrects spelling and grammar mistakes. If the content of a document repeats, you don't have to type it each time. You can use the copy and paste features. You can print documents and make several copies. It is easier to read a word-processed document than a handwritten one. You can add images to your document.

- Internet - It is a network of almost all the computers in the world. You can browse through much more information than you could do in a library. That is because computers can store enormous amounts of information. You also have very fast and convenient access to information. Through E-Mail, you can communicate with a person sitting thousands of miles away in a few seconds. Chat software enables one to chat with another on a real-time basis. Video conferencing tools are becoming readily available to the common man.
- Digital video or audio composition - Audio or video composition and editing have been made much easier by computers. It no longer costs thousands of dollars of equipment to compose music or make a film. Graphics engineers can use computers to generate short or full-length films or even to create 3D models. Anybody owning a computer can now enter the field of media production. Special effects in science-fiction and action movies are created using computers.

- Desktop publishing - With desktop publishing, you can create page layouts for entire books on your personal computer.
- Computers in Medicine - You can diagnose diseases. You can learn the cures. Software is used in magnetic resonance imaging to examine the internal organs of the human body. Software is used for performing surgery. Computers are used to store patient data.
- Mathematical Calculations - Thanks to computers, which have computing speeds of over a million calculations per second we can perform the biggest of mathematical calculations.
- Banks - All financial transactions are done by computer software. They provide security, speed and convenience.
- Travel - One can book air tickets or railway tickets and make hotel reservations online.
- Telecommunications - Software is widely used here. Also all mobile phones have software embedded in them.
- Defense - There is software embedded in almost every weapon. Software is used for controlling the flight and targeting in ballistic missiles. Software is used to control access to atomic bombs.
- E-Learning - Instead of a book it is easier to learn from an E-learning software.
- Examinations - You can give online exams and get instant results. You can check your examination results online.
- Business - Shops and supermarkets use software, which calculate the bills. Taxes can be calculated and paid online. Accounting is done using computers. One can predict future trends of business using artificial intelligence software. Software is used in major stock markets. One can do trading online. There are fully automated factories running on software.
- Certificates - Different types of certificates can be generated. It is very easy to create and change layouts.
- ATM machines - The computer software authenticates the user and dispenses cash.

Advantages of using computers

1. It is the fastest medium of communication rendering postal and telegraphic communication almost worthless.

2. Through computer your message or any thing written or photograph can reach any part of the world using internet facilities.

3. You can download any amount of material through computer.

4. All your arithmetical problems can be easily sorted out through computer,

5. Through video conferencing you can not only see each other but also talk with any body living in any part of the world.

Disadvantages of computers:

- Computers can make the mind lazy. You get used to not reading a book, or researching something at the library. Just a few key-strokes and you have your answer.
- There are physical things like carpal tunnel syndrome and other repetititive strain disorders, and eye strain (often necessitating glasses).
- It takes one away from socializing with others in person.
- Spending too much time playing online games or chatting over the computer instead of reading books, taking walks, and doing homework.
- Being on a computer too much can also lead to anti-social behavior and depression.

MODULE 2

Interacting with your Computer: Common components and devices in a Computer system.

Introduction

Computers are made up of many components which must interact with one another to have a functional system. The components of a computer are classified into hardware, software and peopleware. The hardware refers to the physical parts which can be touched and felt. The software are the various programs (or instructions) that tell the computer how to perform its tasks. The peopleware in the other hand refers to people working with the computer. They include computer professionals who are trained to use computer such as computer programmers, engineers and educators. Peopleware also encompasses those in other fields who use computers to carry out their jobs such as lawyers, bankers and students.

Most of the components of a computer are internal (that is they are located inside the computer case). However, some are connected externally, using ports. A port is a kind of plug, usually located at the back of the computer. Components located outside the computer's case are referred to as peripheral devices.

Because computer use components, they are customizable. You can add internal or external components for specific tasks such as playing sound, and choose the most powerful components to make high performance computer. Conversely, you can specify less powerful, less expensive components for a basic office computer. This means that computer vary quite widely in terms of performance (the speed at which a computer performs different tasks), cost, and the sort of applications (software) that they can run.

Computer components can be divided into the following categories:

- Microprocessors – process instructions and perform calculations.
- Storage devices (memory and disks) – hold data.
- Input devices (mouse and keyboard) – let the user enter data.
- Output devices (monitor, speakers, and printer) – display data.
- Network devices (network card and modem) – allow computers to transfer data to and from other computers.

The Computer Hardware

The Motherboard: A motherboard or system board is a large printed circuit board with connections for all the other components in the computer. The motherboard allows the components to exchange data. It also houses the power supply. The type of motherboard determines the types of CPU, memory, and hard disk and other peripherals that can be installed in the computer.

The System Case: the motherboard and other internal components is housed within a protective case, usually made of metal and plastic and often referred to as the ‘’box’’. The design of the case can affect how many expansion cards and components can be added to the computer. Some cases are designed to be easy to open and access to make maintenance of the computer simpler.

The Ports: A hardware port is a socket designed to allow the connection of extra devices, often outside the system case. Such devices are referred to as peripherals (examples: mouse, keyboard, monitor and printer). Ports used to connect newest generation of USB memory devices are often referred to as slots. Ports and connecting cables are always of two genders: male connectors have pins; female connectors have holes. There are many different types of ports, each requiring a different type of connector.

The Central Processing Unit (CPU): The CPU is an advanced microprocessor. It is the part of the computer that processes and calculates data. You can think of the CPU as the brains of the computer. It is made up of the Control Unit (CU), Arithmetic and Logic Unit (ALU) and Main Memory (or Primary Memory, or Random Access Memory (RAM)).
The CU directs and coordinates all hardware operations in the computer. It is connected by a bus (collection of wires) to every other hardware component, and through this bus, it sends signal which are used to control these devices.
The ALU performs all the necessary arithmetic operations (e.g. +, -, *, /) and logical operations such as comparing two values (e.g. $>$, $<$, $\neq$, $\leq$, $\geq$)
The RAM is where data to be processed is being held. Data that come from the input device is first moved to the RAM. Information is also transferred from RAM to an output device where it then displayed. The characteristics of RAM are: expensiveness, small in size, fast, volatile, holds the data that is currently being processed, and its contents can be erased when necessary.

Input device: An input device is any device that is used to transfer data and instructions into the computer. Examples include keyboard, mouse, joystick, scanner, digital cameral, light pen, bar code reader, touch pad, trackball, graphics tablets, web cam and touch screen.

Output devices: display information from the computer to the user. The main output devices display data on screen, print data on paper and play data as sound. Examples include monitor, printer, speaker, plotter, touch screen, digital or video projector.

Auxiliary Storage (Secondary Storage) devices: store large amount of data for future use. Examples include floppy disk, hard disk, flash drive, Compact Disk Read Only Memory (CD ROM). The characteristics of auxiliary storage devices are: cheapness, large in size, slow, non – volatile, used to store data for future use, its contents can be erased when necessary (read/write memory like RAM).

Read Only Memory (ROM): stores instructions that are needed by the computer during start up. The instruction in ROM can not be erased hence it is termed 'read only'.

THE KEYBOARD

The keyboard is the primary input device for entering text and numbers. It is a relatively simple device, consisting of about 100 keys, each of which sends a different character code to the CPU. It was one of the first peripherals to be used with PCs, and it is still the most common; you will find a keyboard either built into or attached to every PC.

If you have not used computer keyboard or a typewriter, you will learn one important fact very quickly: you can use a computer much more effectively if you know how to type. The skill of typing, or keyboarding, as it is often called today, implies the ability to enter text by using all ten fingers- and without having to look at the keys. Certainly, you can use a computer without being able to type, and many people do. Some people claim that when computers can understand handwriting and speech, typing will become unnecessary. For now, however, keyboard is the fastest way to enter text or data into a computer.

The standard Keyboard Layout

Keyboards for personal computers come in many styles. The various models differ in size, shape, and feel, but except for a few special-purpose keys, most keyboard layout used today is the IBM Enhanced Keyboard. It has 101 keys arranged in five groups.

The **alphanumeric keys-** the parts of the keyboard that look like a typewriter- are arranged the same way on virtually every keyboard and typewriter. Sometimes this common arrangement is called the **QWERTY** layout because the first six keys on the top row of letters are Q, W, E, R, T, and Y. In addition to the letters and punctuation marks, the alphanumeric keys include the **modifier keys,** so named because they are used in conjunction with the other keys. You press a letter or number while holding down one of the modifier keys. On a PC, the modifier keys are Shift, Ctrl (an abbreviation of "Control"), and Alt (an abbreviation of "Alternate"). The modifier keys on a Macintosh are Shift, Ctrl, Option, and Command.

The **numeric keypad,** usually located on the right side of the keyboard, looks like an adding machine, with its ten digits and mathematical operators (+,-,*,and /).

The fourth part of the Keyboard consists of the **function keys.** The function keys (F1, F2, and so on) are usually arranged in a row along the top of the keyboard. They allow you to give the computer command without keyboarding long strings of characters. Each function keys purpose depends on the

program you are using. For example, in most programs F1 is the help key. When you press it, a screen displays information about the program you are using.

The fifth part of the keyboard is the set of **cursor- movement keys,** which let you change the position of the cursor on the screen. In a word processing program, there is a mark on the screen where all the characters you type will be entered. This mark, called the **cursor or insertion point,** can appear on the screen like a box, a line, or a symbol that looks like a capital **I,** known as the **I- beam cursor.**

Keyboards also feature four special- purpose keys, each of which performs a specialized function:

- Esc. This key's function depends on the program or environment you are using. Typically, the Esc key is used to "backup" one level in a multilevel environment. For example, if you open several dialogue boxes, one from the other, you can press Esc to close them in reverse order
- Print screen. This is key sends"image" of the screen's contents directly to the printer. The print screen key, however, works only when a text-mode display is on the screen; it does not work with graphics program or graphical environments.
- Scroll lock. Despite its name, the scroll lock key does not necessarily make the screen's content scroll. Although it does stop a scrolling screen in a DOS program (or a DOS command window), it may serve another purpose, depending on the program you are using. Usually, this key controls the functions of the cursor- movement keys. With some programs, Scroll Lock causes the cursor to remain stationary on the screen, and the document's contents move around it. When Scroll Lock is turned off, the cursor moves normally. This key does not function at all in some programs.
- Pause. In some programs, the pause key can be used to stop a command in progress.

Many variations have been made on the standard keyboard, primarily for the sake of comfort and to reduce repetitive stress injuries. People who types a great deal are susceptible to arm and hand fatigue and strain; new ergonomically correct keyboards can help reduce those problems.

THE MOUSE

If you had bought a personal computer in the early 1980s, a keyboard would probably have been the only output device that came with it. Today, all new PCs come with some kind of **pointing device** as standard equipment. If the computer is a desktop or tower model, the pointing device is usually a mouse. A mouse is an input device that rolls around on a flat surface (usually on a desk) and controls the pointer. The **pointer** is an on-screen object, usually an arrow, that is used to select text, access menus,, move files, or interact with programs, files, or data that appear on the screen.

The mouse first gained widespread recognition when It was packaged with the Apple Macintosh computer in 1984. Initially, some users scoffed at this simple tool, but it quickly became apparent that the mouse is very convenient for certain types of input. For example, a mouse lets you position the cursor anywhere on the screen quickly and easily without having to use the cursor-movement keys. You simply move the pointer to the on- screen position you want, press the mouse button, and the cursor appears there.

The mouse strengths are so numerous that its use changed the entire personal computing industry. Although the Macintosh operating system was\ the first widely available system to take advantage of the mouse, the tool's popularity grew rapidly. By the late 1980s, DOS programs were incorporating the mouse, and Windows would soon emerge as the new standard in mouse- aware computer interfaces.

Instead of forcing you to type or issue commands from the keyboard, the mouse and mouse-based operating systems let you choose commands from easy – to – use menus and dialogue boxes. The

result is a much more initiative way to use computers. Instead of remembering obscure command names, users can figure out (sometimes pretty easily) where commands and options are located.

A mouse also allows you to create graphic elements on the screen, such as lines, curves, and freehand shapes. With this new capability, the mouse helped establish the computer as a versatile tool for graphic designers, starting what has since become a revolution in that field.

OTHER INPUT DEVICES

Although the keyboard and the mouse are the input devices with which people work most often on the desktop, there are a number of other ways to get data into a computer. Sometimes the tool is simply a matter of choice. In many cases however, the usual tools may not be appropriate. For example, in a dusty factory or warehouse, a keyboard or mouse can become clogged with dirt pretty quickly. Also, alternative input devices are important parts of some special- purpose computers.

Pens

Pen- based system use an electronic pen as their primary input device. You hold the pen in your hand and write on a special pad or directly on the screen. You can also use the pen as a pointing device, like a mouse, to select commands. It is important to realize that the screen is the input device, not the pen. The screen detects pressure, light, or an electrostatic charge that comes from the pen and then stores the position of that signal.

Although pen- based systems would seem like a handy way to get text into the computer for word processing, perfecting the technology to decipher people's handwriting with 100 percent reliability is so complex that pens are not generally used to enter large amounts of text. They are more commonly used for data collection, where the touch of a pen might select a "yes" or "no" box, or to mark a box next to the part that must be ordered or a service that has been requested. Another common use is inputting signatures or messages that are stored and transmitted as a graphic image, such as a fax. The computer may not be able to decipher your scrawled note, but if it appears on your coworkers' screens and they can read it, that is all that is required. When delivery- service drivers make deliveries, they often have recipients sign their names on such a computer- based pad. As handwriting recognition technology becomes more reliable, pen-based systems will undoubtedly become more common.

Touch Screens

Touch screens allow the user to point directly at the computer display, usually to select from a menu of choices on the screen. Most touch- screen use sensors in, or near, the computer's screen that can detect the touch of a finger, sensing either the finger's pressure or warmth.
Touch screens are appropriate in environments where dirt or weather would render keyboards and pointing devices useless, and where a simple, intuitive interference is important. They are well suited for simple applications such as automated teller machines or public information kiosks. Touch screens have become common in department stores, drugstores and supermarkets, where they are used all kinds of purposes of purposes, from creating personalized greeting cards to selling lottery tickets. There are even computerized touch screens on slot machines in gambling casinos.

Microphones and Voice Recognition

Now that sound capabilities are a standard part of computers, microphones are becoming increasingly important as input devices. Sound is used often in multimedia, where the presentation

can benefit from narration, music, or sound effects. In software, sounds are used to alert the user to a problem or to prompt the user for input.

For this type of sound input, a digitalized recording is all that is required. All you need to make sure a recording are a microphone (or some other audio input device, such as a C D player) and a **sound card** that translates the electrical signal from the microphone into a digitalized form that the computer can store and process. Sound cards store and process. Sound cards can also translate digitalized sounds back into analog signals that can then be sent to the speakers.

There is also a demand for translating spoken words into text, much as there is a demand for translating handwriting into text. Translating voice to text is a capability known as b **voice recognition (or speech recognition).** With it, you can speak to the computer instead of typing, and you can control the computer with simple commands, such as "open" or "cancel".

Voice recognition software takes the smallest individual sounds in a language, called *phonemes*, and translates them into text or commands. Even though English uses only about 40 phonemes, a sound can have several different meanings ("two" versus 'too", for example) making reliable translation difficult. The challenge for voice- recognition software is to deduce a sound's meaning correctly from its context and to distinguish meaningful sounds from background noise.

Voice- recognition software has been used in commercial applications for years but traditionally has been extremely costly, as well as difficult to develop and use. Low-cost commercial versions of voice- recognition software are now available and promise to be a boon to users who cannot type or have difficulty using a keyboard. Commercial voice- recognition software packages have large stored "vocabularies" or words they can recognize. However, users often need to spend a great deal of time learning to use the software (speech must be clear and each word succinctly pronounced) and "training" the software to recognize their pronunciation. This process involves dictating to the software, stopping, and then going back and correcting the software's errors.

Video Input

With the growth of multimedia and the Internet, computer users are adding video input capabilities to their systems in great numbers. Applications such as videoconferencing enable users to use full- motion video images, captured by a **PC video camera**, and transmit them to a limited number of recipients on a network or to the world on the Internet.

The video cameras used with computers are similar to those used in production studios. PC video cameras, however, **digitalize** images by breaking them into individual pixels. Each pixel's color and other characteristics are stored as digital code. This code is then compressed (video images can be very large) so that it can be stored on disk or transmitted over a network.

Many PC video cameras attach to the top of the PC screen, enabling the user to "capture" images of himself or herself while working at the computer. This arrangement is handy for videoconferencing, where multiple users see and talk to one another in real time over a network or Internet connection.

Using **video cards,** the user can also connect other video devices, such as **VCRs** and camcorders, to the PC. This enables the user to transfer images from the video equipment to the PC, and vice versa. Affordable video cards are enabling home users to edit their videotapes like other professionals.

Digital Cameras

Digital cameras work in much the same way as PC video cameras, except digital cameras are portable, handheld devices that capture still images. Whereas normal film cameras captures

images on a specially coated film, digital cameras capture images on a specially coated film, digital cameras capture images electronically. To do this, the digital camera digitalizes the image, compresses it, and stores it on a special disk or **ROM** card. The user can then copy the information onto a PC, where the image can be edited, copied, printed, embedded in a document, or transmitted to another user. A wide range of digital cameras is available, from inexpensive home-use. A wide range of digital cameras is available, from inexpensive home- use models to professional versions costing several thousand dollars.

THE MONITOR

Although there are many kinds of input devices, there are currently just three common types of output devices: monitors, printers, and sound systems. Of the three, monitors are the most important because they are the output devices with which users interact most often.

Indeed, users often form opinions about a computer just from the look of the monitor alone. They want to know: Is the image crisp and clear? Does the monitor display colorful graphics? Two important elements determine the quality of the image a monitor displays: the monitor itself and the video controller. In this section, you will learn about both of these elements in detail and out how they work together to display text and graphics.

Two basic types of monitors are used with PCs. The first is the typical monitor that you see on a desktop computer – it looks a lot like a television screen and works the same way. This type uses a large vacuum tube, called a **cathode ray tube (CRT).** The second type, known as a **flat- panel display,** is used with notebook computers. Either of these types can be **monochrome,** displaying only one color against a contrasting background (often black); **grayscale,** displaying varying intensities of gray against a white background; or **color** displaying anywhere from four to millions of colors. Today, most new monitors display in color.

PRINTERS

Besides the monitor, the other important output device is the printer. Two principal types of printers have become the standard with PCs: laser printers and ink jet printers. In years past, the dot- matrix printer was also a popular choice because it was once far less expensive than the other types. However, ink jet printers now offer much higher quality for about the same price, so dot-matrix printers are used only when physical impact with the paper is important, such as when the user is printing to carbon- copy forms.

In evaluating printers, four criteria are most important:

1- Image quality. Image quality, also known as print resolution, is usually measured in dots per inch (dpi).
2- Speed. Printer speed is measured in the number of pages of text the printer can print each minute. Pages per minute are abbreviated as ppm. Most printers have different ppm ratings for text and graphics generally take longer to print.
3- Initial cost. The cost of new printers has fallen dramatically in recent years, while their capabilities and speed have improved just as dramatically. It is possible to buy a good- quality personal laser or ink jet printer for $300 or less. Professional- quantity, high- output systems can range in price from $1,000 to tens of thousands of thousands of dollars.
4- Cost of operation. The cost of ink or toner, and maintenance, varies with the type of printer.

TYPES OF STORAGE DEVICES

Two main technologies are used to store data today: magnetic and optical storage. Although devices that store data typically employ one or the other, some combine both technologies. The primary types of magnetic storage are:

- Diskettes
- Hard disks

- Removable hard disks
- Magnetic tape

The primary types of optical storage are:

- Compact Disk Read- only Memory (CD- ROM)
- Write Once, Read Many (WORM) drives
- Phase- Change Rewritable disks
- Magneto- optical disks
- Floptical drives

The Computer Software

Software can be divided into two important classes: system software and applications software.

System software includes all software that enables the computer to function. This is grouped into Operating Systems (OS), device drivers, language translators and utilities.

a. *Operating Systems (OS)*: The OS provides a set of basic features that all software applications must use. It is a collection of programs that manages computer resources. In doing so, it acts as an interface between the computer and the user. It is essential to the computer's function because it provides common environment for different software applications to work in and it controls the computer's hardware. It also provides its own interface to allow the user to configure the computer's components and to organise the storage of data. The OS sends instructions to the hardware, which processes and calculates the data and passes the result back up the chain. The basic features of OS include hardware management (provide shared access to computer hardware resources to applications software compatible with the OS); computer management (allow the user to install new hardware, applications, and files, customise the interface, manage multiple users of the system, and access common tools such as anti-virus and data backup utilities); file management (provide an interface to the user to organise data on the computer storage devices); network access (integrate with other computer systems); and integrate data (allow the user to work with different software applications at the same time). Examples of OS include Unix, Linux, Microsoft Windows and Microsoft Disk OS (MS DOS).

b. *Device Drivers*: These are specialised programs that allow input and output devices to communicate with the rest of the computer systems.

c. *Language Translators*: These are programs that convert high level language (such as C, C++, BASIC, Pascal, FORTRAN, COBOL, e.t.c) and low level languages (assembly language) to machine language form which the computer can execute directly. Three types of language translators are compilers (convert all the high level language instructions in a program to machine language before executing any of the instructions; interpreters (convert and execute high level language instruction line by line; and assemblers (convert assembly language programs to equivalent machine language programs).

d. *Utilities*: These are programs that provide services not supplied by other system software

programs. Examples include data compression programs, antivirus software, system backup and restore tools, and disk defragmenters.

Applications software

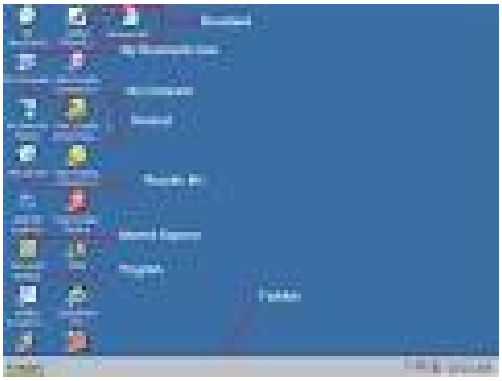
Application software has been developed to solve a particular problem of the user. They are written to help computer users solve particular business problems. Examples include:

a. Word processor for typing memos, letters, documents, etc. e.g. Microsoft Word (MS Word) and Word Perfect
b. Spreadsheets for performing calculations and financial analysis. e.g. Microsoft Excel and Lotus 1-2-3.
c. Database management systems for managing organizational or personal data. E.g. dBase, Microsoft Access and FoxPro.
d. Web browsers for viewing documents on the internet. e.g Microsoft Internet Explorer, Netscape Navigator and Mozilla Firefox.
e. Desktop publishers for manipulating graphics. E.g. Corel Draw and Page Maker.
f. Presentation packages which are useful for delivering lectures, seminar, e.t.c. e.g. Microsoft Power Point.

Booting: In computing, booting (also known as booting up) is the initial set of operations that a computer system performs when electrical power is switched on. The process begins when a computer that has been turned off is re-energized, and ends when the computer is ready to perform its normal operations. On modern general purpose computers, this can take tens of seconds and typically involves performing power-on self-test, locating and initializing peripheral devices, and then finding, loading and starting an operating system. One of the most common operating system in use today is Windows XP.

What is a desktop?

When you start your computer, the first thing you see is the desktop. The desktop is your work area.



Taskbar	By default, the taskbar is located on the bottom edge of the desktop. You can click the taskbar and drag it to other locations. The Start button, active program buttons, icons for

	quick access to programs, and the current time are located on the taskbar.
My Computer	The My Computer icon provides access to the resources on your computer. You can access your drives and other peripherals by clicking on the My Computer icon.
Internet Explorer	The Internet Explorer icon launches the Internet Explorer browser.
The Recycle Bin	When you delete an object, Windows XP sends it to the Recycle Bin. You can restore objects that are located in the Recycle Bin or you can permanently delete them.
Shortcut icon	Icons with an arrow in the lower left corner are shortcut icons. Click the icon for quick access to the object they represent (program, document, printer, and so on).
Program, folder, and document icons	Program, folder, and document icons do not have an arrow in the lower left corner. They represent the actual object and provide direct access to the object.

How do I shut down my computer?

To shut down your computer:

1. Click the Start button. The Start menu will appear.
2. Click Turn Off Computer. The Turn Off Computer dialog box will appear.
3. Click the Turn Off icon. Your computer will shut down.

How do I restart my computer?

You may need to shut down and restart your computer after installing a new program or if your system becomes unstable. To shut down and immediately restart your computer:

1. Click the Start button. The Start menu will appear.
2. Click Turn Off Computer. The Turn Off Computer dialog box will appear.
3. Click the Restart icon. Your computer will restart.

What is Standby mode?

When your computer is in the Standby mode, your computer consumes less electricity, but is ready for immediate use. However, if the computer loses electrical power while in the standby mode, any information you have not saved will be lost.

How do I put my computer in Standby mode?

To put your computer in Standby mode:

1. Click the Start button. The Start menu will appear.
2. Click Turn Off Computer. The Turn Off Computer dialog box will appear.
3. Click the Stand By icon.

How do I start a program?

To start a program:

1. Click the Start button, located in the lower left corner of your screen.
2. Highlight Programs. The Program menu will appear.
3. Move to the Program menu and highlight the program you want to start. If you see a right pointer next to your selection, a submenu will appear. Refine your choice by highlighting the appropriate selection on the submenu. Continue until you get to the final submenu.`
4. Click the program name to start the program.

CorelDRAW

Corel Draw provides you a platform where you can create design and graphics at basic level for the common usage. Usually the printing press utilizes this software for the designing of their ads and pamphlets.

There is a text application as well as designing. It divides the whole project in layers and at final stage collects all layers to make a powerful script. Usually the company logos and monograms are designed in Corel Draw. The learning Corel Draw tutorial is available online to assist in self training.

Uses of CorelDRAW
Uses of CorelDRAW

Create Dimension Lines with Ease

- This flexible design application can help you create complex drawings with multiple layers and details. One of the best ways to ensure your drawing is accurate and workable is to add dimension lines that let you know the exact distance between two points. As you adjust your drawing to your liking, your dimension lines will auto-correct, saving you the trouble of changing them yourself.

Fill in With the Mesh Tool

- You can add richness and a dimensional effect to your drawings by implementing the mesh tool. This tool has been refined through the various versions; it's easier than ever to create objects that are filled with a variety of colors. Smooth, flowing transitions between one color and the next are pleasing to the eye, and they are easy to achieve with the magic of the mesh tool.

Create Visually Appealing Logos

- Many graphic designers rely on the power of CorelDRAW when crafting company logos for their valued clientele. You can also make logos that embody the best attributes of any business. Building logos can be as easy as choosing shapes, coloring them in, adding lettering and symbols and tweaking your work with special effects. You can get creative with the myriad features of this product. Cropping, resizing and saving your work will also be a breeze.

COMPUTERS FOR DATA PROCESSING

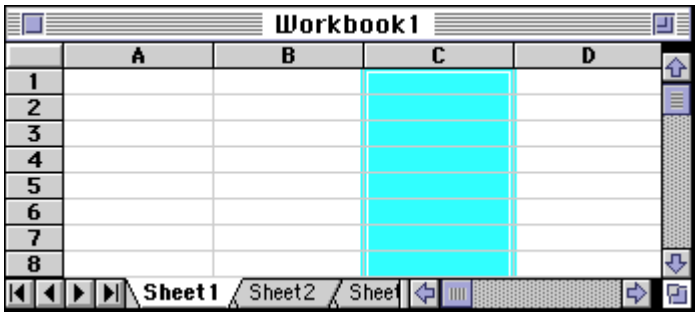
Computer is multitasking machine (that is, it can be programmed to do different jobs). There are software designed to perform these tasks, such software are called Application Software. This software is usually supplied by software designers. In some cases, users can produce their own application software called user programs e.g. payroll programs, stock control programs etc

Categories of Application Software

- Word processing software (packages)
- Spread Sheet Software /packages
- Database Management Software/ packages
- Graphical Software/packages
- Web browser Software/packages

Word processing packages: these are software used for typing and manipulating text. It is used in secretarial jobs for creating documents such as memos, minutes of meetings, letters, reports etc. examples of such software are Ms Word, Word Star, Word Perfect Works etc.

Spread Sheet Packages: are software used for accounting/ calculation purposes. E.g. it can be used to analyze students results. Examples of such software include: Lotus 1-2-3, Excel etc



Spreadsheets share many principles and traits of databases, but spreadsheets and databases are not the same thing. A spreadsheet is essentially just one table, whereas a database is a collection of many tables with machine-readable semantic relationships between them. Spreadsheets are often imported into databases to become tables within them. While it is true that a workbook that contains three sheets is indeed a file containing multiple tables that can interact with each other, it lacks the relational structure of a database.

Spreadsheets provide invaluable tools for collecting and calculating data of all types. Beyond arithmetic, they can be formatted to create clear, concise reports and can be sorted and updated with the touch of a button.

Uses of Spread sheet

Accounting

- Beyond sorting, spreadsheets are invaluable calculators. By entering the appropriate mathematical functions into cells, you can turn a simple spreadsheet into an accounting page. You can list credits in one column and debits in another. The auto-sum feature speeds calculations and can be set up to maintain running totals. And with the flexibility of spreadsheet programs, data used in equations can be anywhere on the sheet or in the workbook.

Database Use

- Although spreadsheets are not true relational databases, they can be designed and formatted to function as simplified ones. For example, if you need to track pricing of a particular product, enter its price only one time. For all subsequent references to that price, point to the original entry as opposed to re-entering the price. When you need to change the price, change it in its original cell and all corresponding references will update automatically.

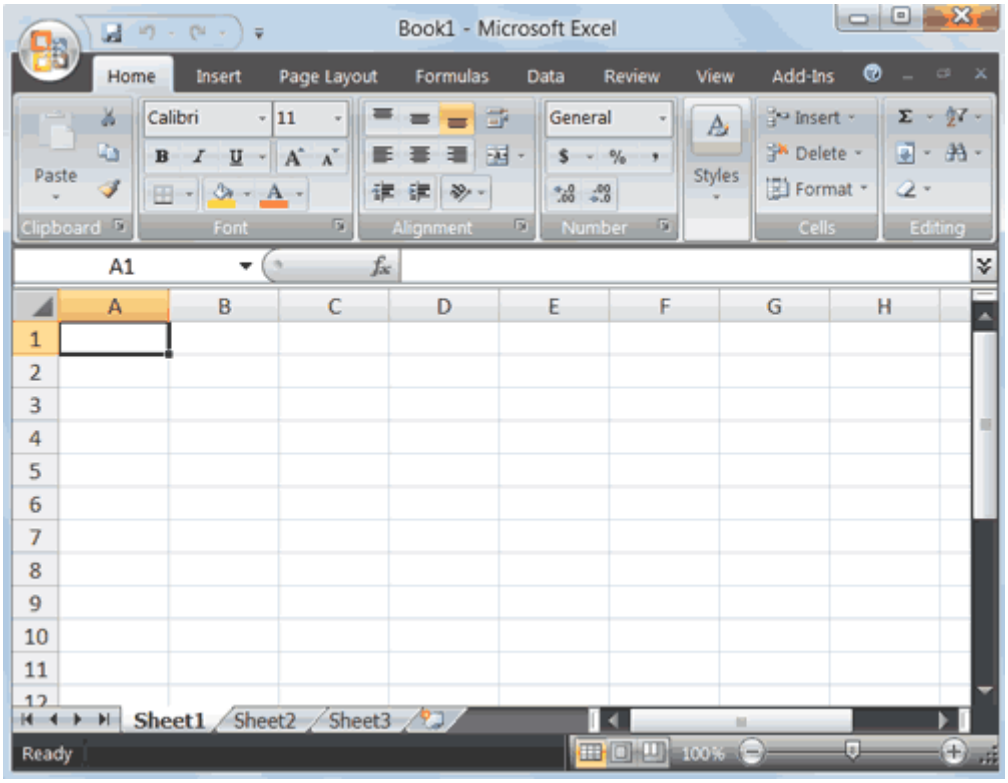
Chart Creation

- Charts and graphs create better depictions of trends and percentages than raw numbers. As they say, "A picture's worth a thousand words." Spreadsheet programs can automatically convert your data into the visual depiction of your choice, whether it's a pie chart, bar chart or line graph.

The Microsoft Excel Window – Example of Spreadsheet

Microsoft Excel is an electronic spreadsheet. You can use it to organize your data into rows and columns. You can also use it to perform mathematical calculations quickly.

This lesson will introduce you to the Excel window. You use the window to interact with Excel. To begin this lesson, start Microsoft Excel 2007. The Microsoft Excel window appears and your screen looks similar to the one shown here.



In Excel 2007, how a window displays depends on the size of your window, the size of your monitor, and the resolution to which your monitor is set. Resolution determines how much information your computer monitor can display. If you use a low resolution, less information fits on your screen, but the size of your text and images are larger. If you use a high resolution, more information fits on your screen, but the size of the text and images are smaller. Also, settings in Excel 2007, Windows Vista, and Windows XP allow you to change the color and style of your windows.

Database Management packages: are software used for creating and manintaing records of data. You can use database software to create and maintain students records. Examples Ms Access, Foxbase Oracle, dbase III and its successors.

Graphic Packages: are those software used mainly for designs/ drawings. Examples Corel draw, Power Point, Ms Publisher etc. it can be used to produce documents such as letter headed paper, invitation cards, complementary cards, technical drawings etc.

Web browser Packages: are software that allow users to view and download information from the internet. E.g. Internet Exploerer, Netscape Navigator Mozilla firefox, Opera etc.

Interacting with your computer

This is done by first booting the system (switching on the computer) booting is of two forms cold booting and warm booting. When a computer is switched on, the computer normally checks the hard disk (permanent storage area within the computer) and then loads the operating system from the hard

disk to memory (temporary storage area of the computer). Loading is the act of transferring a file or program from disk to memory.

Operating System (OS) is the software that gives life to the computer; it controls and manages the computer operations. Examples of operating systems are UNIX, MSDOS, NOVELL, LINUS, windows 95, windows 2000, windows XP, windows NT, windows vista, windows 7 etc.

Windows is a popular OS software written by the Microsoft corporation. It is a multi tasking graphical user interface designed for easy use. It has been designed to be fast efficient and user friendly. It is the most widely used OS in Nigeria.

Depending on how the computer is set up, various items appear on the desktop when you start windows. Here are four important ones:

A) My computer: to see the content of a computer
B) Network Neighbourhood: for network
C) Recycle Bin: temporary storage place for deleted files
D) Star Button: to provide easy access to programs

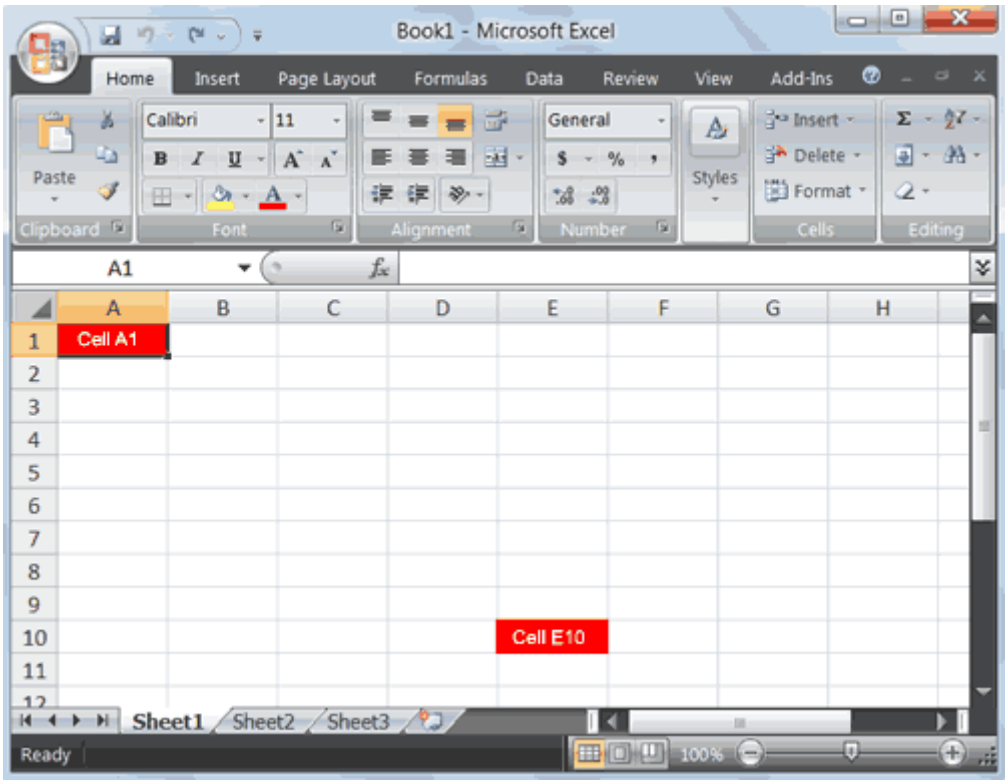
The Microsoft Office Button

In the upper-left corner of the Excel 2007 window is the Microsoft Office button. When you click the button, a menu appears. You can use the menu to create a new file, open an existing file, save a file, and perform many other tasks.

The Title Bar

Next to the Quick Access toolbar is the Title bar. On the Title bar, Microsoft Excel displays the name of the workbook you are currently using. At the top of the Excel window, you should see "Microsoft Excel - Book1" or a similar name.

Worksheets



Microsoft Excel consists of worksheets. Each worksheet contains columns and rows. The columns are lettered A to Z and then continuing with AA, AB, AC and so on; the rows are numbered 1 to 1,048,576. The number of columns and rows you can have in a worksheet is limited by your computer memory and your system resources.

The combination of a column coordinate and a row coordinate make up a cell address. For example, the cell located in the upper-left corner of the worksheet is cell A1, meaning column A, row 1. Cell E10 is located under column E on row 10. You enter your data into the cells on the worksheet.

The Formula Bar

Formula Bar

If the Formula bar is turned on, the cell address of the cell you are in displays in the Name box which is located on the left side of the Formula bar. Cell entries display on the right side of the Formula bar. If you do not see the Formula bar in your window, perform the following steps:

1. Choose the View tab.
2. Click Formula Bar in the Show/Hide group. The Formula bar appears.

Note: The current cell address displays on the left side of the Formula bar.

Move Around a Worksheet

By using the arrow keys, you can move around your worksheet. You can use the down arrow key to move downward one cell at a time. You can use the up arrow key to move upward one cell at a time. You can use the Tab key to move across the page to the right, one cell at a time. You can hold down the Shift key and then press the Tab key to move to the left, one cell at a time. You can use the right and left arrow keys to move right or left one cell at a time. The Page Up and Page Down keys move

up and down one page at a time. If you hold down the Ctrl key and then press the Home key, you move to the beginning of the worksheet.

Move Around the Worksheet

The Down Arrow Key

- Press the down arrow key several times. Note that the cursor moves downward one cell at a time.

The Up Arrow Key

- Press the up arrow key several times. Note that the cursor moves upward one cell at a time.

The Tab Key

1. Move to cell A1.
2. Press the Tab key several times. Note that the cursor moves to the right one cell at a time.

The Shift+Tab Keys

- Hold down the Shift key and then press Tab. Note that the cursor moves to the left one cell at a time.

The Right and Left Arrow Keys

1. Press the right arrow key several times. Note that the cursor moves to the right.
2. Press the left arrow key several times. Note that the cursor moves to the left.

Page Up and Page Down

1. Press the Page Down key. Note that the cursor moves down one page.
2. Press the Page Up key. Note that the cursor moves up one page.

The Ctrl-Home Key

1. Move the cursor to column J.
2. Stay in column J and move the cursor to row 20.
3. Hold down the Ctrl key while you press the Home key. Excel moves to cell A1.

Microsoft excell tutorials are fully available on line for comprehensive traning.

Microsoft Word Basic Features

This lesson covers typing, the Backspace key, the Delete key, inserting text, bolding, underlining, and italicizing. To begin this lesson, open Microsoft Word.

Typing and Using the Backspace Key

The exercises that follow will teach you how to enter and delete text. To enter text, simply type just as you would if you were using a typewriter. To capitalize, hold down the Shift key while typing the letter. Use the Backspace key to delete text. You do not need to press Enter to start a new line -- Microsoft Word automatically wraps at the end of the line. Press Enter to start a new paragraph.

Exercise 1

1. Type the following sentence:
   Joe has a very large house.
2. Now delete the word "house." Using either the arrow keys or the mouse, place the cursor between the period and the "e" in "house."
3. Press the Backspace key until the word "house" is deleted.
4. Type boat. The sentence should now read:
   "Joe has a very large boat."

The Delete Key

You can also delete text by using the Delete key. First, highlight the text you wish to delete; then press the Delete key.

Exercise 2

Delete the word "very" from the sentence you just typed.

1. Highlight the word "very." Place the cursor before the "v" in the word "very" and press the F8 key. Then press the right arrow key until the word "very" is highlighted.
2. Press the Delete key. The sentence should now read:
   "Joe has a large boat."

Alternate Method -- Setting Options by Using the Menu

You can also use the menu to change to the Overtype mode.

1. Choose *Tools* > *Options* from the menu. The Options dialog box opens.
2. Click the Edit tab to choose the Edit tab.
3. The Overtype Mode box should be blank. If the box is blank, click OK.
4. If the Overtype Mode box is not blank, click the box to remove the check mark. Then click OK.

Alternate Method -- Setting Options by Using Key

You can use the keyboard to change to the Overtype mode.

1. Press Alt-t, o.
2. Click Edit.
3. Press Alt-v (toggles between overtype and insert).
4. Press Enter.

Exercise 3

Make sure the letters "OVR" are gray before proceeding. You are going to insert the word "blue" between the words "large" and "boat."

1. Place the cursor after the dot between the words "large" and "boat."
2. Type the word blue.
3. Press the spacebar to add a space.
4. The sentence should now read:
   "Joe has a large blue boat."

Bold, Underline, and Italicize

You can bold, underline, or italicize when using Word. You also can combine these features -- in other words, you can bold, underline, and italicize a single piece of text. In the exercise that follows, you will learn three different methods for bolding, italicizing, or underlining when using Word. You will learn to bold, italicize, or underline by using the menu, an icon, or the keys.

Bold - Using the Menu

1. On the line that begins with Menu, highlight the word Bold. To do so, place the cursor before the letter "B" in "Bold." Press the F8 key; then press the right arrow key until the entire word is highlighted.
2. Choose *Format > Font* from the menu. The Font Dialog box opens.
3. Click Bold in the Font Style box.
   Note: You can see the effect of your selection in the Preview window. To turn off the bold, click Regular.
4. Click OK to close the dialog box.
5. Click anywhere in the text area to remove the highlighting. You have bolded the word bold.

Alternate Method -- Bold by Using an Icon

1. On the line that begins with "Icon," highlight the word "Bold." To do so, place the cursor before the letter "B" in "Bold." Press the F8 key; then press the right arrow key until the entire word is highlighted.
2. Click the Bold icon 

on the toolbar.
   Note: To turn off bold, highlight the text and press the Bold icon again.
3. Click anywhere in the Text area to remove the highlighting.

Alternate Method -- Bold by Using the Keys

1. On the line that begins with "Keys," highlight the word "Bold." To do so, place the cursor before the letter "B" in "Bold." Press the F8 key; then press the right arrow key until the entire word is highlighted.
2. Press Ctrl-b (hold down the Ctrl key while pressing b).
   Note: To turn off Bold, press Ctrl-b again. You can also remove formatting by pressing Ctrl-spacebar.
3. Click anywhere in the Text area to remove the highlighting.

Italicize - Using the Menu

1. On the line that begins with "Menu," highlight the word "Italicize." To do so, place the cursor before the letter "I" in "Italicize." Press the F8 key; then press the right arrow key until the entire word is highlighted.
2. Choose *Format > Font* from the menu.
3. Click Italic in the Font Style box.
   Note: You can see the effect of your selection in the Preview window. To turn off the italics, click Regular.
4. Click OK to close the dialog box.
5. Click anywhere in the Text area to remove the highlighting.

Alternate Method -- Italicize by Using an Icon

1. On the line that begins with "Icon," highlight the word "Italicize." To do so, place the cursor before the letter "I" in "Italicize." Press the F8 key; then press the right arrow key until the entire word is highlighted.
2. Click the Italic icon  on the toolbar.
   Note: To turn off italics, highlight the text and press the Italic icon again.
3. Click anywhere in the Text area to remove the highlighting.

Underline by Using the Icon

1. On the line that begins with "Icon," highlight the words "Underline these words."
2. Click the Underline icon  on the toolbar. You will get a single underline.
   Note: To turn off underlining, press the Underline icon again.
3. Click anywhere in the Text area to remove the highlighting.

Save File

You must save your files if you wish to recall them later. Before you can save, you must give your file a name. To save your file and close Word, follow the instructions given here:

1. Choose *File* > *Save As* from the menu.
2. Specify the correct folder in the Look In box.
3. Name your file by typing lesson3.doc in the File Name box.
4. Click Save.
5. Choose *File* > *Exit* from the menu.

SECRETARIAL DUTIES

Secretarial job duties mainly consist of organizing, filing and answering phones. Many secretaries are required to multi-task so they can keep up with the incoming calls and paper work at the same time. Some secretaries are also responsible for sorting and delivering mail to different departments. The level of responsibility depends on the individual company and job description. A paralegal is a legal secretary who is paid a handsome salary for handling legal documents and performing other standard secretarial duties.

Organize and Deliver Memos

- Memos are correspondence on paper that are physically delivered throughout the company. Some secretaries are responsible for creating and delivering memos throughout the firm. Some memos are also delivered electronically through the company email system.

Answer Phones

- Answering the phone is one of the most essential tasks for any secretary. Professionals are required to answer the phone with a standard company greeting and pleasant tone of voice. Secretaries are also responsible for taking messages and transferring calls. Most companies have phone hours to which the secretary must adhere. This means that she must answer all calls and return voice mails promptly.

File and Maintain Paperwork

- Secretaries also help keep the front office organized. Company paperwork is filed away in cabinets and some documents are kept in folders. Secretaries are responsible for keeping items labeled and organized to maintain an efficient work space.

Deliver Mail

- Secretaries deliver mail throughout the company. Mail is picked up at the front mail box of an office or the mailman delivers the mail directly the secretary. A person working at the front desk may sign for packages and mail from outside of the company

Handle Invoices

- Most secretaries don't handle invoices unless they have accounting backgrounds. Some small companies hire secretaries who are also accountants. These employees handle incoming and outgoing invoices, which helps maintain organization within the company.

Maintain Databases

- Secretarial job duties also consist of maintaining databases. Most companies have a directory or database filled with a list of employees and other information contained with the company. A paper filing system may go hand in hand with the database because paper files may contain some of the same information.

Operate Office Equipment

- All secretaries operate office equipment such as computers, faxes and other devices on a daily basis.

COMPONENTS OF COMPUTER

The hardware components of a computer system are the electronic and mechanical parts. The software components of a computer system are the intangible parts: the data and the computer programs.

Hardware

CPU: The CPU (Central Processing Unit) is the brains behind your computer. The CPU is responsible for performing calculations and tasks that make programs work. The faster the CPU, the quicker programs can process computations and commands.

Video Card: The video card is a board that plugs into the PC motherboard to give it display capabilities. New video cards come with their own RAM and processor to help speed up the graphics display. Many computers come with video chips built in. That makes a separate video card unnecessary, unless the computer is going to be used for high-end multimedia work or to play video games.

Sound Card: Like video cards, sound cards are expansion boards used for enabling a computer to manipulate sound. Most sound cards give you the power to plug in speakers and a microphone. Some even give you the jacks for hooking your computer up to a common stereo. As with video cards, many computers come with sound chips, making it unnecessary to buy a separate card, unless you need higher sound quality for your work.

Modem: The modem allows your computer to use a telephone line to communicate and connect to the Internet.

Network Card: A network card allows your computer to be connected either to other computers or to the Internet if you are using a fast Internet connection such as cable or dsl.

Fans: One or more fans inside the computer keep air moving and keep your computer cool.

Cables: Numerous wires and flat, ribbon-like cables provide power and communication to the various parts inside your computer.

Storage Devices: Computer data storage, often called storage or memory, refers to computer components and recording media that retain digital data. Data storage is a core function and fundamental component of computers.

In contemporary usage, 'memory' usually refers to semiconductor storage read-write random-access memory, typically DRAM (Dynamic-RAM). *Memory* can refer to other forms of fast but temporary storage. *Storage* refers to storage devices and their media not directly accessible by the CPU, (secondary or tertiary storage), typically hard disk drives, optical disc drives, and other devices slower than RAM but are non-volatile (retaining contents when powered down). Historically, *memory* has been called *core*, *main memory*, *real storage* or *internal memory* while storage devices have been referred to as *secondary storage*, *external memory* or *auxiliary/peripheral storage*.

Many different forms of storage, based on various natural phenomena, have been invented. So far, no practical universal storage medium exists, and all forms of storage have some drawbacks. Therefore a computer system usually contains several kinds of storage, each with an individual purpose.

Primary storage

Primary storage (or *main memory* or *internal memory*), often referred to simply as *memory*, is the only one directly accessible to the CPU. The CPU continuously reads instructions stored there and executes them as required. Any data actively operated on is also stored there in uniform manner. Read only Memory (RAM). It is small-sized, light, but quite expensive at the same time. (The particular types of RAM used for primary storage are also volatile, i.e. they lose the information when not powered).

As the RAM types used for primary storage are volatile (cleared at start up), a computer containing only such storage would not have a source to read instructions from, in order to start the computer. Hence, non-volatile primary storage containing a small startup program (BIOS) is used to bootstrap the computer, that is, to read a larger program from non-volatile *secondary* storage to RAM and start to execute it. A non-volatile technology used for this purpose is called ROM, for read-only memory Many types of "ROM" are not literally *read only*, as updates are possible; however it is slow and memory must be erased in large portions before it can be re-written.

Secondary storage (also known as external memory or auxiliary storage), differs from primary storage in that it is not directly accessible by the CPU. The computer usually uses its input/output channels to access secondary storage and transfers the desired data using intermediate area in primary storage. Secondary storage does not lose the data when the device is powered down—it is non-volatile.

In modern computers, hard disk drives are usually used as secondary storage. Hard disks are typically about a million times slower than memory.

Some other examples of secondary storage technologies are:.

Floppy Drive - The smallest and most portable of all the storage devices usually holds about 1.44 MB of storage. Use a floppy disk media.

Super Drive
The LS120 or SuperDisk is a drive which supports a special floppy diskette which can store up to 120MB or 240MB of information as well as being backwards compatible and still supporting the standard floppy diskettes.

Zip Drive
New generation similar to the floppy disk drive created by Iomega The Iomega Zip Drive was first released 1994 and today is becoming a popular solution for PC and Macintosh computers as a removable solution. Zip Drives Disks come in 100MB, 250MB and 750MB

CD Burner An optical storage device that holds data anywhere from 650MB to 700MB (74-80 minutes)

Dvd Burner - A newer optical storage device that holds data anywhere from 4.70-17.08GB

Flash Drive - A compact and portable device use for storing data anywhere from 128MB up to 4GB.

Tape Drives

Tape drives allow large companies as well as end users to backup large amounts of data. Tape drives are capable of backing up a couple hundred megabytes to several gigabytes of information without having to spend large sums of money on disks.

Software components

Software is *stored* on hardware such as hard disks or tape or can be recorded on a VCR tape. But the computer program (and the TV episode) is intangible. It is not the physical storage medium. This can be divided into two basic parts: System software which comprises of operating systems and device drivers and application software which comprises of all categories of software that meet users specific task requirements.

Information management (IM)

Is the collection and management of information from one or more sources and the distribution of that information to one or more audiences. This sometimes involves those who have a stake in, or a right to that information. Management means the organization of and control over the structure, processing and delivery of information.

In short, information management entails organizing, retrieving, acquiring and maintaining information. It is closely related to and overlapping with the practice of data management.

MODULE 3

Computer And Information Security

Computer security is a branch of computer technology known as information security as applied to computers and networks. The objective of computer security includes protection of information and property from theft, corruption, or natural disaster, while allowing the information and property to remain accessible and productive to its intended users. The term computer system security means the collective processes and mechanisms by which sensitive and valuable information and services are protected from publication, tampering or collapse by unauthorized activities or untrustworthy individuals and unplanned events respectively. The strategies and methodologies of computer security often differ from most other computer technologies because of its somewhat elusive objective of preventing unwanted computer behavior instead of enabling wanted computer behavior.

Information security means protecting information and information systems from unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction.[1]

The terms information security, computer security and information assurance are frequently used interchangeably. These fields are interrelated often and share the common goals of protecting the confidentiality, integrity and availability of information; however, there are some subtle differences between them.

These differences lie primarily in the approach to the subject, the methodologies used, and the areas of concentration. Information security is concerned with the confidentiality, integrity and availability of data regardless of the form the data may take: electronic, print, or other forms. Computer security can focus on ensuring the availability and correct operation of a computer system without concern for the information stored or processed by the computer. Information assurance focuses on the reasons for assurance that information is protected, and is thus reasoning about information security.

Governments, military, corporations, financial institutions, hospitals, and private businesses amass a great deal of confidential information about their employees, customers, products, research, and financial status. Most of this information is now collected, processed and stored on electronic computers and transmitted across networks to other computers.

Should confidential information about a business' customers or finances or new product line fall into the hands of a competitor, such a breach of security could lead to negative consequences. Protecting confidential information is a business requirement, and in many cases also an ethical and legal requirement.

For the individual, information security has a significant effect on privacy, which is viewed very differently in different cultures.

The field of information security has grown and evolved significantly in recent years. There are many ways of gaining entry into the field as a career. It offers many areas for specialization including: securing network(s) and allied infrastructure, securing applications and databases, security testing, information systems auditing, business continuity planning and digital forensics science, etc.

Below is the overview of information security and its core concepts.

Contents

Confidentiality

Confidentiality

Confidentiality is the term used to prevent the disclosure of information to unauthorized individuals or systems. For example, a credit card transaction on the Internet requires the credit card number to be

transmitted from the buyer to the merchant and from the merchant to a transaction processing network. The system attempts to enforce confidentiality by encrypting the card number during transmission, by limiting the places where it might appear (in databases, log files, backups, printed receipts, and so on), and by restricting access to the places where it is stored. If an unauthorized party obtains the card number in any way, a breach of confidentiality has occurred.

Breaches of confidentiality take many forms. Permitting someone to look over your shoulder at your computer screen while you have confidential data displayed on it could be a breach of confidentiality. If a laptop computer containing sensitive information about a company's employees is stolen or sold, it could result in a breach of confidentiality. Giving out confidential information over the telephone is a breach of confidentiality if the caller is not authorized to have the information.

Integrity

In information security, integrity means that data cannot be modified undetectably This is not the same thing as referential integrity in databases, although it can be viewed as a special case of Consistency as understood in the classic ACID model of transaction processing. Integrity is violated when a message is actively modified in transit. Information security systems typically provide message integrity in addition to data confidentiality.

Availability

For any information system to serve its purpose, the information must be available when it is needed. This means that the computing systems used to store and process the information, the security controls used to protect it, and the communication channels used to access it must be functioning correctly. High availability systems aim to remain available at all times, preventing service disruptions due to power outages, hardware failures, and system upgrades. Ensuring availability also involves preventing denial-of-service attacks.

Authenticity

In computing, e-Business, and information security, it is necessary to ensure that the data, transactions, communications or documents (electronic or physical) are genuine. It is also important for authenticity to validate that both parties involved are who they claim they are. . Authenticate Network Users

Make sure your user authentication system is appropriate for your system. If you are a private or home networked user, make sure you change your passwords at least every 90 days. If you run a small organization, make sure that you know who goes in and out of your workplace, virtually and physically. In larger organizations, it is recommended that passwords be combined with physical hardware and well-implemented biometric systems to ensure that computers are accessible only to authorized users.

Computer Maintenance

Computer maintenance is the practice of keeping computers in a good state of repair.

Contents
[hide]

Computer cleaning

Computer cleaning

Computer cleaning is the practice of physically cleaning the interior, and exterior, of a computer including the removal of dust and debris from cooling fans, power supplies, and hardware components.

Backup

Important data stored on computers may be copied and archived securely so that, in the event of failure, the data and systems may be reconstructed. When major maintenance such as patching is performed, a backup is recommended as the first step in case the update fails and reversion is required.

Disk maintenance

Disk storage, such as your hard drive, fills up with unwanted files over time. Disk cleanup may be performed as regular maintenance to remove these. Files may become fragmented and so slow the performance of the computer. Disk defragmentation may be performed to combine these fragments and so improve performance.

Dust

Dust and other cruft may accumulate as a result of air cooling. If filters are used to prevent this then they will need regular service and changes. If the cooling system is not filtered then regular Computer cleaning may be required to prevent short circuits and overheating.

Service intervals

Depending on your environment computers should be serviced at least once per quarter, though monthly service is optimal. This will ensure your computers run at their peak performance.

Software updates

Software packages and operating systems may require regular updates to correct software bugs and address security weaknesses. An automated or semi-automated program such as Windows update may be used for this.

Internet and Online resources

A *means of connecting a computer to any other computer anywhere in the world via dedicated routers and servers. When two computers are connected over the Internet, they can send and receive all kinds of information such as text, graphics, voice, video, and computer programs.*

A means of connecting a computer to any other computer anywhere in the world via dedicated routers and servers. When two computers are connected over the Internet, they can send and receive all kinds of information such as text, graphics, voice, video, and computer programs.

No one owns Internet, although several organizations the world over collaborate in its functioning and development. The high-speed, fiber-optic cables (called backbones) through which the bulk of the Internet data travels are owned by telephone companies in their respective countries. The development of hypertext based technology (called World Wide web, WWW, or just the Web) provided means of displaying text, graphics, and animations, and easy search and navigation tools that triggered Internet's explosive worldwide growth.
An internet browser is the program that you use to access the internet and view web pages on your computer. Some common internet browser examples include:

- Microsoft Internet Explorer
- Mozilla Firefox
- AOL Explorer
- Apple

What is Surf?

To move from place to place on the Internet searching for topics of interest. Web surfing has become a favorite pastime for many Internet users. The links on each page enable you to start virtually anywhere on the Web and eventually find interesting pages. The term *surfing* is generally used to describe a rather undirected type of Web browsing in which the user jumps from page to page rather whimsically, as opposed to specifically searching for specific information.

How the Internet Works

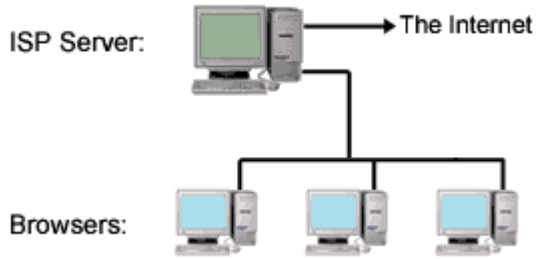
The internet is a world-wide network of computers linked together by telephone wires, satellite links and other means. For simplicity's sake all computers on the internet can be divided into two categories: *server*s and *browser*s.

Servers are where most of the information on the internet "lives". These are specialised computers which store information, share information with other servers, and make this information available to the general public.

When you connect your computer to the internet, you are connecting to a special type of server which is provided and operated by your Internet Service Provider (ISP). The job of this "ISP Server" is to

provide the link between your browser and the rest of the internet. A single ISP server handles the internet connections of many individual browsers - there may be thousands of other people connected to the same server that you are connected to.

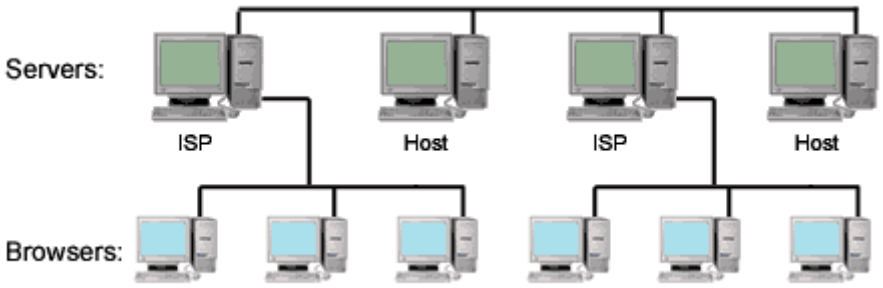
The following picture shows a small "slice" of the internet with several home computers connected to a server:



ISP servers receive requests from browsers to view webpages, check email, etc. Of course each server can't hold all the information from the entire internet, so in order to provide browsers with the pages and files they ask for, ISP servers must connect to other internet servers. This brings us to the next common type of server: the "Host Server".

Host servers are where websites "live". Every website in the world is located on a host server somewhere (for example, MediaCollege.Com is hosted on a server in Parsippany, New Jersy USA). The host server's job is to store information and make it available to other servers.

The picture below show a slightly larger slice of the internet:



To view a web page from your browser, the following sequence happens:

1. You either type an address (URL) into your "Address Bar" or click on a hyperlink.
2. Your browser sends a request to your ISP server asking for the page.
3. Your ISP server looks in a huge database of internet addresses and finds the exact host server which houses the website in question, then sends that host server a request for the page.
4. The host server sends the requested page to your ISP server.
5. Your ISP sends the page to your browser and you see it displayed on your screen.

INTRANET

An intranet is a computer network that uses Internet Protocol technology to share information, operational systems, or computing services within an organization. The term is used in contrast to *internet*, a network between organizations, and instead refers to a network within an organization. Sometimes, the term refers only to the organization's internal website, but may be a more extensive

part of the organization's information technology infrastructure, and may be composed of multiple local area networks.

An intranet may host multiple private websites and constitute an important component and focal point of internal communication and collaboration. Any of the well known Internet protocols may be found in an intranet, such as HTTP (web services), SMTP (e-mail), and FTP (file transfer protocol). etc

Benefits

- Workforce productivity: Intranets can help users to locate and view information faster and use applications relevant to their roles and responsibilities. With the help of a web browser interface, users can access data held in any database the organization wants to make available, anytime and — subject to security provisions — from anywhere within the company workstations, increasing employees' ability to perform their jobs faster, more accurately, and with confidence that they have the right information. It also helps to improve the services provided to the users.
- Time: Intranets allow organizations to distribute information to employees on an *as-needed* basis; Employees may link to relevant information at their convenience, rather than being distracted indiscriminately by electronic mail.
- Communication: Intranets can serve as powerful tools for communication within an organization, vertically and horizontally. From a communications standpoint, intranets are useful to communicate strategic initiatives that have a global reach throughout the organization. The type of information that can easily be conveyed is the purpose of the initiative and what the initiative is aiming to achieve, who is driving the initiative, results achieved to date, and who to speak to for more information. By providing this information on the intranet, staff have the opportunity to keep up-to-date with the strategic focus of the organization. Some examples of communication would be chat, email, and or blogs
- Business operations and management: Intranets are also being used as a platform for developing and deploying applications to support business operations and decisions across the internetworked enterprise.
- Enhance collaboration: Information is easily accessible by all authorised users, which enables teamwork.
- Built for one audience: Many companies dictate computer specifications which, in turn, may allow Intranet developers to write applications that only have to work on one browser (no cross-browser compatibility issues). Being able to specifically address your "viewer" is a great advantage. Since Intranets are user-specific (requiring database/network authentication prior to access), you know exactly who you are interfacing with and can personalize your Intranet based on role (job title, department) or individual
- Promote common corporate culture: Every user has the ability to view the same information within the Intranet.
- Supports a distributed computing architecture: The intranet can also be linked to a company's management information system, for example a time keeping system.

Application packages

Social sciences Package

SPSS is a computer program used for survey authoring and deployment (IBM SPSS Data Collection), data mining (IBM SPSS Modeler), text analytics, statistical analysis, and collaboration and deployment (batch and automated scoring services). Statistics included in the base software:

- Descriptive statistics: Cross tabulation, Frequencies, Descriptives, Explore, Descriptive Ratio Statistics
- Bivariate statistics: Means, t-test, ANOVA, Correlation (bivariate, partial, distances), Nonparametric tests
- Prediction for numerical outcomes: Linear regression
- Prediction for identifying groups: Factor analysis, cluster analysis

Scientific

LaTeX is complex software with a steep learning curve and for simple documents it's often much quicker to use Microsoft Word with the MathType and EndNote plugins, which will also give a very high quality of output. Posters, Brochures, Leaflets and other complex documents are normally easiest to produce using InDesign.

Mathematical packages

GAMS/BDMLP/MINOS/ZOOM

General Algebraic Modeling System for solving optimization problems, linear, non-linear and mixed integer.

GLIM

GLIM is a package designed to facilitate the fitting of generalised linear models.

DXML

Digital Extended Math Library (DXML) is a set of computationally intensive mathematical subroutines that is optimized for Alpha AXP platforms. It includes among other things LAPACK and BLAS routines.

To use the dxml library, add the option `-ldxml` to your fortan compiler statement.

MATHEMATICA

Interactive system to perform mathematical computation. Handles numeric, symbolic, and graphical calculations.

Accounting packages

Microsoft Access, Dbase packages, Excel are common accounting packages with features that can easily be learnt by users to program accounting jobs.