

Computer Knowledge

To know the work of computer, some important terms are as follows.

Data - The word data has been derived from Latin word 'datum' means fact. It is a collection of facts and figures which are not in directly usable form.

Processing – This is an act of performing some actions to convert it into usable form.

Information – It is processed data or final result which is in directly usable form and conveys some meaningful results.

Instruction – It is a type of action to be taken on data.

Basic Operations – Input, storing, processing, output, control.

Components of a Computer

Input Unit

- It accepts data and instructions from the user.
- It converts the accepted instructions into the machine language.
- It gives converted instructions to CPU for processing.

Central Processing Unit (CPU)

- It performs all processing work of computer.
- It is also known as brain of computer.
- It controls all the parts of computer system.

CPU has three components:-

Arithmetic and Logic Unit

It performs all arithmetic and logic operations. It consists of number of small locations, termed as registers. It has two parts.

- (a) **Arithmetic Section** – All complex arithmetic expressions are performed by repetitive combination of these operations.
- (b) **Logic Section** – It performs all logic operations like comparing, selecting and merging of data.

Control Unit

It gives command to transfer data from the input devices to memory and from memory to arithmetic logic unit. It transfers the results from memory to output unit.

Memory

It temporarily/permanently holds the data received from input device. It holds the data being processed and intermediate result being generated. It holds the system software and the application software in use.

Memory is mainly classified into two types

- (a) **Random Access Memory (RAM)** - All active programs and data are stored in RAM so that they may readily available and easily accessed by the CPU.
- (b) **Read Only Memory (ROM)** – The data stored on ROM cannot be changed. It is non-volatile which means that it can keep its contents even without a power source.

Output Unit.

- It accepts processed data from CPU.
- It converts result from machine language into simple language.
- It displays results to user.

Software

It is a set of instructions that directs the computer to process information. It can be classified into three types.

System Software

It coordinates the operation of the various hardware components of the computer, eg, DOS, Windows 95/98/2000/ME and UNIX.

Application Software

It is a set of program designed for specific uses or applications, eg, MS Word, MS Excel, etc.

Utilities Software - Utility programs are those that are very often requested by many applications programs. It is used to debug the software errors, correct the data through the editor, sort data, eg, Pkzip, Antivirus software, etc.

Bits, Bytes and Words

Unit	Size	Description
Bit	One binary digit	Stores either a binary 0 or 1
Byte	Eight bits	One character
Word	16 to 64 bits	One character
Kilobyte (KB)	1 thousand bytes	About one page of double-spaced text
Megabyte (MB)	1 million bytes	About the size of a short book
Gigabyte (GB)	1 billion bytes	1000 short books
Terabyte (TB)	1 trillion bytes	An entire library
Petabyte (PB)	1 quadrillion bytes	Just about all the libraries in the US

Historical Overview of Computer

Year	Inventor	Invention
16 th Century	China	Abacus
1617	John Napier	Napier's Bones
1642	Blaise Pascal	First Calculating Machine
1671	Gottfried Von Leibnitz	Calculator (Modified Pascal's machine)
1801	Joseph Jacquard	Card of holes for weaving patterns
1823-34	Charles Babbage	Difference Engine and Analytical Engine
1880	Herman Hollerith	Tabulating machine using punch cards
	Lady Ada Lovelace	Binary Number System
1930	Howard Aitken and Grace Hopper (IBM)	MARK-I
1937-38	Dr. John Vircent Atanassoff	ABC (Atanasoff-Berry-Computer)
1946	JP Eckert and JW Muchly	ENIAC (electronic Numeric Integrated And Calculator)
1940s	H Goldshine, AQ Burks and John Non-Neumann	Stored Program Concept
1947-49	John Von Nerumann	EDSAC (Electronic Delayed Storage Automatic Computer)
1950	Moor School in USA	EDVAC (Electronic Discrete Variable Automatic Computer)
1951	Eckert and JW Mauchly	UNIVAC-I (Universal Automatic Computer)

Computer Generations

Genera-tion	Year	Switching Device	Storage	Speed	Operating System	Language	Application
First	1949-54	Vacuum Tubes Electronic Valves	Acoustic delay lines and later magnetic drum, 1 KB memory	333 micro seconds	Mainly batch	Machine and assembly languages. Simple Monitors	Mostly Scientific later simple business systems
Second	1654-64	Transistors	Magnetic core, main memory, tape and disk peripheral memory 100 KB main memory	10 micro seconds	Multi-bag remaining , Time sharing	High level languages Fortran, Cobol, Algol, Batch, Operating system.	Extensive business applications. Engineering design optimisation scientific research.
Third	1964-80	Integrated Circuits	High speed magnetic cores large disks 100 MB, 1 MB main memory	100 nano seconds	Real time, Time sharing	Fortran IV, Cobol 68PI/I, Time sharing Operating system	Database management systems, On-line systems.
Fourth	1980-till now	Large scale integrated circuits Microprocessors (LSI)	Semi-conductor memory, Winchester disk, 10 MB main memory, 1000 MB disks	300 nano seconds	Time sharing, networks	Fortran 77, Pascal, ADA, Cobol-74	Personal computers, Distributed systems Integrated CAD/CAM Real time control, Graphics oriented system.

Types of Computer

Based on Users

Computers can be classified based on their uses in following ways.

Analog Computer

It measures pressure, temperature, length, etc, of physical quantities and converts into its numerical values. They are mainly used for scientific and engineering purposes.

Digital Computer

It is used in counting of numbers, words or other special symbols. It is also used in fuel control of automobiles and banking processes.

Hybrid Computer

It is the combined form of analog and digital computer. Informations are continuously converted into data that are received in the form of input. Output may be in form of analog and digital. They are used in factories and machines.

Based on Sizes

Computers can be classified based on their size in following ways:-

Micro Computer

It is the smallest computer in which ALU and CPU are based on the same chip.

Personal Computer

It is single user system used generally in business.

Mini Computer

It is more powerful than micro computer and can be used by many users at the same time. It processes data very fast.

Mainframe Computer

They are giant in size and of highly storage capacity. They can process an ample amount of data very rapidly. They are used in banks, large organizations and public sectors.

Super computer

They are capable of processing the huge amount of data in fraction of seconds. They are used in very complex calculations.

Hardware

All the components of computer, parts and devices that we can touch are known as Hardware. Computer is composed of several physical parts of the computer hardware on which a number of softwares are installed to do the desired work of operating system and operator.

A modern computer has the following hardware:

- (i) Motherboard
- (ii) Electric Supply
- (iii) Video Display Controller
- (iv) Removable Media Devices
- (v) Secondary Storage
- (vi) Sound Card
- (vii) Peripherals

Input Devices

We give unprocessed data to computer with the help of input devices and get output after the data has been processed. We can understand that output. The input devices may be hand operated or automated.

The act of processing is mainly regulated by CPU.

Hand Operated Input Devices

Keyboard and **Mouse** are the most commonly used hand operated input devices.

Some of the hand operated input devices along with keyboard and mouse are as follows:

Concept Keyboard

Concept keyboard is related to a special functions or item. The labels of picture or text may reside above its buttons.

Track Ball

It is used as an alternate of mouse. The user has to move its ball in order to utilize it that causes the pointer to move on the screen.

Joystick

It is very popular among the people fond of computer games, but today different types of game controller are replacing them gradually. Joystick is used to control the machine such as crane in the process of building constructions.

Digital Camera

Digital camera can take the images and also records the videos. The images and videos take by digital cameras are recorded in files. These files can get copied into the computer that can be further edited for many purposes.

Microphone

Microphone is used to input the sound. It can be used to enter text in any word processing application with voice recognition software in the computer.

Touch Screen

There is a network of light rays in touch sensitive visual display unit or its screen that recognizes the touch. Touch screen is used in many mobile phones. They are often used in cash machines and shopping centers.

Video Digital

Video digital takes the images from video camera or television and stores it into the computer for further use. The video sequences taken by video digital are mainly used in multimedia presentation.

Scanner

Scanner is used to convert an image into its digital form. It is similar to photocopier but it makes digital copy of an image instead of its hard copy. It is used to scan the text with the software optical character recognition.

Graphic Tablet

There is a flat pad on the graphic tablet upon which an user writes with the help of a special pen. Pictures can also be drawn on the screen using that pen in this way.

Keyboard

Keyboard is the most commonly used input device in computer. There are three types of keys on the keyboard:-

- (a) Alphanumeric Keys
- (b) Special Keys
- (c) Function Keys

Alphanumeric Keys include the whole alphabets from A to Z and digits from 0 to 9 and different characters such as space, / X ' : ! @ # \$ % ^ & - + = { } [].

Special Keys include ENTER, Backspace, Delete, Shift, Capslock, Ctrl, Alt, etc.

Keys from F1 to F12 in the keyboard are known as **Function keys**.

Mouse

It is the most popular point and draw input devices which is connected to a terminal or microcomputer through a cable wire.

Output Devices

The means through which computer gives output are known as Output Devices.

Some of the most popular output devices are as follows:

1. Monitor
2. Printer
3. Projector
4. Sound Card
5. Speaker
6. Video Card

Monitor

Video display screen fixed in hard layer and computer is also known as **Monitor** or **Video Display Terminal**. Monitor means only those devices in which there is no any electronic device other than the device required for showing the image.

Printer

Printer is that external hardware device which gives the output in printed formal after receiving data from computer. This is such an operated external devices used with computer that prints text, image or photo.

Projector

Projector is that hardware device which projects in image on the flat surface like computer screen. These devices are generally used in meeting, seminars and presentations because each person can easily see the image projected by it sitting in a big room.

Sound Card

It is also known as **Sound Board** or **Audio Card**. Sound card is an expansion card or unified circuit that enables computer to produce sound through speaker or headphone.

Speaker

It is the device which present the sound produced during any programme. This is connected to sound card and gives the sound produced by card n the form of output.

Video Card

It is also known as **Graphics Card, Video Board** or **Videos Controller**. This is an internal circuit board that allows the image displaying devices like monitor to display the images.

Internet

- An Internet is a global connection of computers link together by cables and telephones and makes the communication possible among them.
- For such communication, the address of the destination and a safe means of moving data are required.

- The rules governing the sending and receiving of data on the Internet are implemented in two parts of '**Transmission Control Protocol**' (TCP) and **Internet Protocol** (IP).
- Transmission Control Protocol divides the data into little data packs.
- The rule of Internet Protocol here is to put destination addressing information on such packets.
- Hosts are in general, individual machines at a particular location.
- Domains are general category that a computer on the internet belongs to.
- E-mail is mainly used for sending electronic piece of text.
- Use net and news groups are set up by people sharing common interests ranging from current topics to cultural heritages.
- **Telnet** is a program that allows an Internet host computer to become a terminal of another host on the Internet.
- Gopher displays a set of resources on the Internet in the form of menus or lists of items.
- **Hypertext Markup Language** (HTML) is language is create documents for World Wide Web.
- **Standard Generalised Markup Language** (SGML) is used to define the structure and manage the content of digital document.
- **World Wide Web** (www) is a giant collection of hypertext pages on the Internet.
- **Hyper Text Transfer Protocol** (HTTP) is used for manage all the linkings between one hypertext documents and another.
- On the Internet, a home page may be related to a single person a specific subject, or to a corporation.
- **Uniform Resource Locator** (URL) is a way to avail of Internet resources.
- **Browser** is an application program which is used for exploring Internet resources.
- **File Transfer Protocol** (FTP) is used to access a remote Internet host.
- **Modem** is a device allowing a computer to transoms information over a telephone line. It acts as a modulator and demodulator while the process of transmitting and receiving.
- **Wide Area Information Service** (WAIS) is a type of service to access text databases or libraries on the Internet.

Computer Virus

A computer virus is a computer program that can copy itself and infact a computer. A Virus can spread from one computer to another when its host is taken to the target computer, for instance because a user sent it

over a network or the Internet, or carried it on a removable medium such as a floppy disk, CD, DVD or USB drive. Viruses can increase their chances of spreading to other computers by infecting files on a network file system or a file system that is accessed by another computer.

Important Facts Related to Computer Virus

- The Creeper virus was first detected on ARPANET, the forerunner of the Internet, in the early 1970s.
- The Reaper Program was created to delete creeper.
- The actual term 'virus' was first used in David Gerrold's 1972 novel when HARLIE was one.
- A program called "Elk Coloner" was the first computer virus to appear "In the wild" that is, outside the single computer or lab where it was created.
- It attached itself to the APPLE DOS 3.3 operating system and spread via floppy disk.
- The first PC virus in the world was a boot sector virus "Brain" created in 1986.
- With the spread of personal computer, traditional computer viruses emerged in 1980. Bulletin board-driven software sharing contributed directly to the spread of Trojan horse programs. Shareware and boot leg software were equally common vectors are written in the scripting languages for Microsoft Programs such as word and Excel and spread throughout Microsoft Office by infecting documents and spreadsheets.
- Viruses that spread using cross site scripting were first reported in 2002 and were academically demonstrated in 2005. There have been multiple instances of the cross site scripting viruses in the world, exploiting websites such as **My Space** and Yahoo.

The most popular five computer virus came into light so far as follows:-

- (i) **I Love You (2000)** It spreads through e-mail.
- (ii) **Code Red (2001)** It affects windows server.
- (iii) **Nimada (2001)** It is the most rampant virus.
- (iv) **Melissa (1999)** It spreads through Word Macro and e-mails.
- (v) **Sasser (2004)** It spreads by attaching to port 445 on the network windows system.

Antivirus Software and Other Preventive Measures

Antivirus software can destroy the viruses by finding them. The antivirus software uses two common methods in order to detect viruses.

1. By using the Virus Signature Definitions list
2. By using Heuristics Algorithm

Some antivirus programs are capable of 'On the Fly' scanning of received e-mails along with scanning of the open files. This process is known as 'On – Access' scanning.

Antivirus software does not alter the efficiency of the host software for the communication of viruses. These softwares need to be updated regularly so that the new viruses can be detected.

The loss incurred by the viruses can also be negated by the regular backup of data on other mediums. If any data get misplaced due to this virus then we can retrack it by backup.