

BBA Sem -2
Classification of Computer

Generally, computers can be divided into 3 types.

1. Analog Computers
2. Digital Computers
3. Hybrid Computers

ANALOG COMPUTERS :

In this type of computers, numerical magnitudes are represented by physical quantities such as electric current, voltage, or resistance, mechanical movements, etc. These are machines which are designed to perform arithmetical functions upon numbers where the numbers are represented by physical quantity.

Analog computers are widely used in manufacturing units where temperatures, pressure or flow of liquids are to be monitored continuously. It is also used at petrol pump where petrol pump contains an analog processor that connects fuel flow measurements into quantity and price values.

Among the various drawbacks of using Analog computers are: They do not have the ability to store data in large quantities; They do not have the logical facilities; They can perform only arithmetical functions but are more costlier.

DIGITAL COMPUTERS :

A digital computer operates on data in the form of digits, rather than the physical quantities used in analog computers. That is, its input must be discrete rather than continuous and may consist of combinations of numbers, characters and special symbols, written in appropriate programming language.

Digital computers can be classified into two parts:

General Purpose Digital Computers

They are also known as all purpose digital computers. Theoretically they can be used for any type of applications, e.g., computers that are used for payroll, graphs, analysis, etc.

Special Purpose Digital Computers

A digital computer is 'designed to solve problems of a restricted type. That is, special purpose digital computer is designed to be especially efficient in a certain class of applications, e.g., computers installed in washing machines.

HYBRID COMPUTERS :

This type of computers are hybrid of the above two types. A hybrid computer may use or produce analog data or digital data. It can be obtained either by interconnecting a digital and analog computer via a hybrid interface or the analog unit is integrated as a part of central processor of a digital computer which ultimately helps in getting input/output directly.

Hybrid computers are generally used in scientific applications or in controlling industrial processes, in both situations the user is able to exploit the machine's ability to process both discrete and continuous data using accurate digital subroutines where necessary and the analog machines for fast integration functions.

CLASSIFICATION BY SIZE :

If we classify the computers by their sizes, we would have the following classification

1. Super Computers
2. Mainframe Computers
3. Super Mini Computers
4. Mini Computers
5. Micro Computers or Personal Computer

Super Computers :

A supercomputer contains a number of processing units which operate in parallel to make it faster. They are in fact, very large computers and are thus used for bigger applications. In India, there are many super computers, in which one such computer which is used by the Meteorological department weather forecasting.

Mainframe Computer :

It is again a large computer but where it differs from super computer is that it can be connected to various computers to share facilities. For example, a System/370 can be attached to several personal computers so that they can share programs and data. Mainframe computers are used in research organizations, large industrial banks, airlines, and railway reservations where large data base is required.

A typical application is the airline reservation system. The airlines have a main framecomputer at their head office where information of all the flights is stored. Small computers installed at booking offices, are attached to the central data bank so that upto date information of all the flights is available.

The structural configuration of the main frame consists of :

1. Data communication equipment.
2. Interface equipment for a variety of high speed and low speed input/output devices.
3. Primary storage.
4. Secondary storage.
5. Central processors with multiprogramming facilities.

The main frame computers have following characteristics :

1. They are big general purpose computers capable of handling all kinds of problems whether scientific or commercial.
2. They can accept and transfer data from I/O devices at the rate of millions of bytes per second.
3. They can accept all types of high level languages.
4. They can support a large number of terminals say up to 100 or more.
5. They usually have instruction sets that give them the flexibility to operate automatically on 2 bytes (half-word) or 8 bytes (double word).
6. They have large on-line storage capacities and can support a number and variety of peripheral devices like magnetic tape drives, hard disk drives, visual display units, printers, and telecommunication terminals.
7. They routinely have high speed cache memory, which enables them to process applications faster than mini or micro computers.

The limitations of main frame computers are due to their high cost, large in size, high power consumption, requirement of skilled workers and expensive peripherals like requirement of air-conditioning etc.

Super Mini Computers :

These are cross between minicomputers and super computers. They are commonly used as dedicated computers, for one processing function at a time.

Mini Computers :

They are inferior to mainframe computers both in speed and storage. They can also support various terminals. In fact, they can support upto 100 terminals. Minicomputers have operating systems with multitasking and network capabilities enabling them to serve more than one user. They find applications in organizations having a heavy work load but finding the main-frame expensive to buy.

The most important advantage of a mini computer over the main-frame is that it is cheaper in cost, smaller in size, very rugged and reliable. It does not require air-conditioning and can be operated at room temperatures. The main use of these

systems in education, in local government bodies, and also as a front end processors to a main-frame computer. It is also being used in word processing. In business, they are being used for invoicing, stock control, pay roll, sales analysis etc.

The mini computers have following characteristics :

1. They can accept and transfer data from I/O devices at the maximum speed of 4 MB per second.
2. They can support up to a maximum of 100 terminals.
3. They usually employ micro-processors in the CPU, both for data storage as well as data manipulation.
4. They have operating systems with multitasking and network capabilities enabling them to serve more than one user.
5. As per size, price and capabilities to support the number and variety of peripherals and terminals, they are further sub classified as (a) mini mini computers, (b) midi mini computers, and (c) maxi mini computers.

Compared to main-frame computers, mini computers are comparatively slow and their capabilities are limited.

MICRO COMPUTERS AND PERSONAL COMPUTERS

Microcomputers are digital computers whose processing unit consist of one or more microprocessors, one or more input/output units and sufficient memory to execute instructions.

They are usually desktop or portable devices with a display, a keyboard and tape disk and diskette storage. They are designed primarily for stand-alone operation but can be used as workstation in terminal emulation mode.

The advantages of micro-computers are :

1. They use very little power.
2. They are less costly.
3. They are portable.
4. They are stable and reliable, once tested and proved to work, they can go on working for years. Compared to main-frame and mini computers, they are slow and have limited capabilities but they provide good value for money.

Personal computer is a type of microcomputer primarily intended for stand-alone use by an individual. PCs are designed primarily to give independent computing power to a single user and are inexpensively priced for purchase by individuals or small business. IBM introduced the first personal computer called IBM-PC on 12/02/1981.

Types of Micro Computers

- **Desktop micro computers.**
- **Notebook or laptop micro computers**
- **Tablet and Smartphone micro computers**
- **Personal digital assistant and Palmtop micro computers**
- **Workstation and Server micro computers**
- **Mini Tower and Full Tower micro computers**

Desktop microcomputer plays the major role in the user's life because users can perform several complicated tasks in few times without getting any hindrance. This computer is placed on the table, and it is connected to various components through wires such as keyboard, **mouse**, and **monitor** and system unit. With the help of these components, users can insert their commands, and get output according to given input instructions. These computers are capable to link internet through Wi-Fi or LAN cable. But it has some drawbacks such as bigger size compare to other Desktop Micro computers (Laptops, PDA, Smartphone, and Notebook). It is not portable because it needs fixed area.

Laptop is also known as "Notebook", and it is designed like as stylish briefcase. They can also perform various complex functions like as Desktop Computer, and they able to run on their in-built battery as well as wall outlet supply. These micro computers are more expensive to desktop computers because in which various small size components are in built such as keyboard, touchpad LCD display, and other internal parts (Motherboard, CPU, Hard disk, and more). Its best advantage is portability.

Tablet microcomputers are handheld portable devices along with touch screen interface, and they are small size than notebooks devices but bigger to Smartphone. In which, users can perform both activities (Input/output) on its LCD screen. They are enabled to Wi-Fi and other cellular network for using the internet. On the Tablet, several applications such as **word processing** and spreadsheets can be run. Sometimes, users can get problems due to lack of its keyboard, but they can use external keyboard if more needed. Some types of Tablets are available in the market such as Apple's iPad, Microsoft's Surface or Amazon's Kindle Fire.

PDA stands for "Personal Digital Assistant", and it is handheld device with great portability as well as smaller in size similar to tablet, palmtop and Smartphone. It

has small LCD screen for performing both tasks input/output. PDA is able to make communication with other computers like as laptops, desktops, and other through LAN cable, infrared (IR), Bluetooth, radio beams, Wi-Fi, and radio waves. Users mostly use PDA for maintaining the record to appointment calendars, to-do lists, address books, and for taking notes.

Palmtop microcomputer is known as “Pocket computer”. It is smaller computer than PDA, and it consumes less power due to small size as well as great portable device. Palmtop computers use stylus pen stick instead of keyboard for inserting the input. Due to their smaller size, mostly palmtops do not contain the disk drives, but they use PCMCIA slots for enabling disk drives, several modems, memory management, and another terminal. Mostly, Windows CE operating systems are used in the palmtop computer and other handheld computers.

Workstation microcomputer is also known as powerful one-side computer, and it consist the multiple **microprocessors** CPUs. Mostly, this microcomputer is designed by one user to operate for particular applications, which is needed the more power compare to ordinary PC.

Server microcomputer likes as computer but it contains the different powerful functionalities, which help to render data to another terminal over the several networks such as local area network (LAN) and wide area network (WAN). Every type of servers are designed for specific objectives such as Web server run Apache HTTP server for operating the all web pages on the internet, and Mail server is used for sending and receiving emails.

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