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Fundamentals of computers

Types of computer

1.Analogue Computer

Analogue computer process information of physical nature such as temperature, pressure etc.

Or you can says that an analogue computer is a computer that is used to operate with numbers represented by directly measurable quantities.

Examples of Analogue Computers

Thermometer is the example of analogue computer because it measures the length of a Mercury column continuously.

Traditional clock is also an example of analogue computer because the needle of clock covers the distance of dial continuously.

Weight machine and speedometer are other examples of analogue computers.

Characteristics of Analogue Computers

Here are some of the main characteristics of analogue computer:

- have no state
- fast speed
- not reliable
- base for digital computers
- difficult to operate and use
- easy to develop
- have a small memory

2.Digital computer

Digital computers process information which is essentially in the form of 0 and 1.

Almost everyone talks about digital computer while talking about computer.

Examples of Digital Computers

Digital watch, digital petrol stations, and the computer which we use nowadays are the examples of digital computers.

Characteristics of the Digital Computers

Here are some of the main characteristics of digital computers:

- have two states On (0) and Off (1)
- easy to use
- human being like to use digital computers

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- reliable
- have big memory
- working speed is slower as compared to analogue computers
- are further divided into different categories such as personal computers, mainframe computers, and supercomputers

There are 4 types of digital computers:

1. Micro computers
2. Mini computers
3. Mainframe computers
4. Supercomputers

Classification of computer on the basis of its size are categorize into following types:

- Microcomputers
- Minicomputers
- Mainframe Computers
- Super Computers

Now let's define all the above types of computer on the basis of its size.

a)Microcomputers

Desktop computers, laptops, gaming consoles, sound and navigation system of a car, personal digital assistant (PDA), tablets and smartphones are all types of microcomputers.

The microcomputers are widely used and the fastest growing computers. These computers are the cheapest among the other three types of computers.

The microcomputers are specially designed for general purpose usage life entertainment, education, and work purposes.

Well-known manufacturers of microcomputers are:

- Dell
- Apple
- Samsung
- Sony
- Toshiba
- HP

Here are the list of some main characteristics of desktop computers:

- Fast speed and accuracy
- Small in size
- Easy to operate
- Easy to move

- Cheaper
- We can use desktop computers as a single user and multi-user environment

b)Minicomputers

Minicomputers also called as mid-range servers, are more powerful computers than microcomputers in terms of processing power and capabilities.

Minicomputers are mainly multi-user systems where many user simultaneously work on the systems.

Minicomputers posses greater storage capacity and larger memories as compared to microcomputer. These are even capable of handling more input/output devices.

Examples of minicomputers are:

- PDP-11
- VAX
- 7500 MAGNUM

c)Mainframe computers

Mainframe computers are designed to handle huge volumes of data and information. These can support more than 100 users at same time. These very large and expensive computers have great processing speed and very large storage capacity and memory as compared to minicomputers.

These computers even posses and work with more than one processor at the same time. Thus one can say these are multi-user, multiprocessor systems.

For mainframe computers, very sophisticated operating systems are needed to control and supervise their operation.

Examples of Mainframe computers are:

- ICL39
- CDC 6600
- VAX 8842
- IBM 3090/600
- IBM 4381

Characteristics of Mainframe Computers

Here are the list of some main characteristics of mainframe computers:

- Run multiple programs concurrently
- Support many concurrent users
- Support new and legacy software
- Run many different kinds of operating systems
- Uninterrupted operation
- Have performance measured in millions of instructions per seconds (MIPS)
- Perform tasks on huge amounts of external data

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- Are flexible even to run many kinds of applications and tackle broad business task

d)Supercomputers

Supercomputers are the most powerful computers among digital computers. These consists of several processors running together thereby making them immensely faster and powerful.

These computers are capable of handling huge amounts of calculations that are beyond human capabilities.

Super computers can perform billions of instructions per second. Some of the today's supercomputers have the computing capability equal to that of 40000 microcomputers.

A Japanese supercomputer has calculated the value of Pi to 16 million decimal places.

Supercomputers are mainly used in following purposes or applications:

- Weather forecasting
- Nuclear science research
- Aerodynamic modelling
- Seismology
- Metrology

Examples of supercomputer are:

- CRAY X-MP-14
- CDC-205
- ETA GF-10
- FUJITSU VP-400
- NEC SX-2
- PARAM
- PACE

Characteristics of Supercomputers

Here are the list of some main characteristics of supercomputers:

- Focus processing power to execute a few programs or instruction as quickly as possible
- Focused on speed and accelerated performance
- Push boundaries of what hardware and software can accomplish
- Typically run a variant of Linux as their operating system
- Are typically run at maximum capability, putting the computer's full processing resources toward solving a particular problem
- Are often a cluster or grid of smaller computers working together on whatever problem they are looking to solve
- Have performance measured in floating point operations per seconds (FLOPS)
- Execute complicated computations using large internal memory
- Have dedicated purposes for tasks like scientific research or engineering models

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3.Hybrid Computers

The computers which have qualities of both digital and analogue computers are called hybrid computers.

Hybrid computer has the speed of analogue and the accuracy of digital computer.

Examples of Hybrid Computers

In ICU (Intensive Care Unit) of a hospital, hybrid computers are used. These computers analogue quality controls the temperature of the room digital quality inform the doctor about the blood pressure, temperature, and physical status of the patient.

In Cement factory a hybrid computer is used where all calculations are performed by the digital computers and actions like increase of material are performed by the analogue computers.

Characteristics of the Hybrid Computers

Here are the list of some main characteristics of hybrid computers:

- reliable and provide accurate result
- fast and speedy