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Elements Of A Computer System (Classification, Characteristic, Limitations)

https://hmhub.in/elements-of-a-computer-system-classification-characteristic-limitations/

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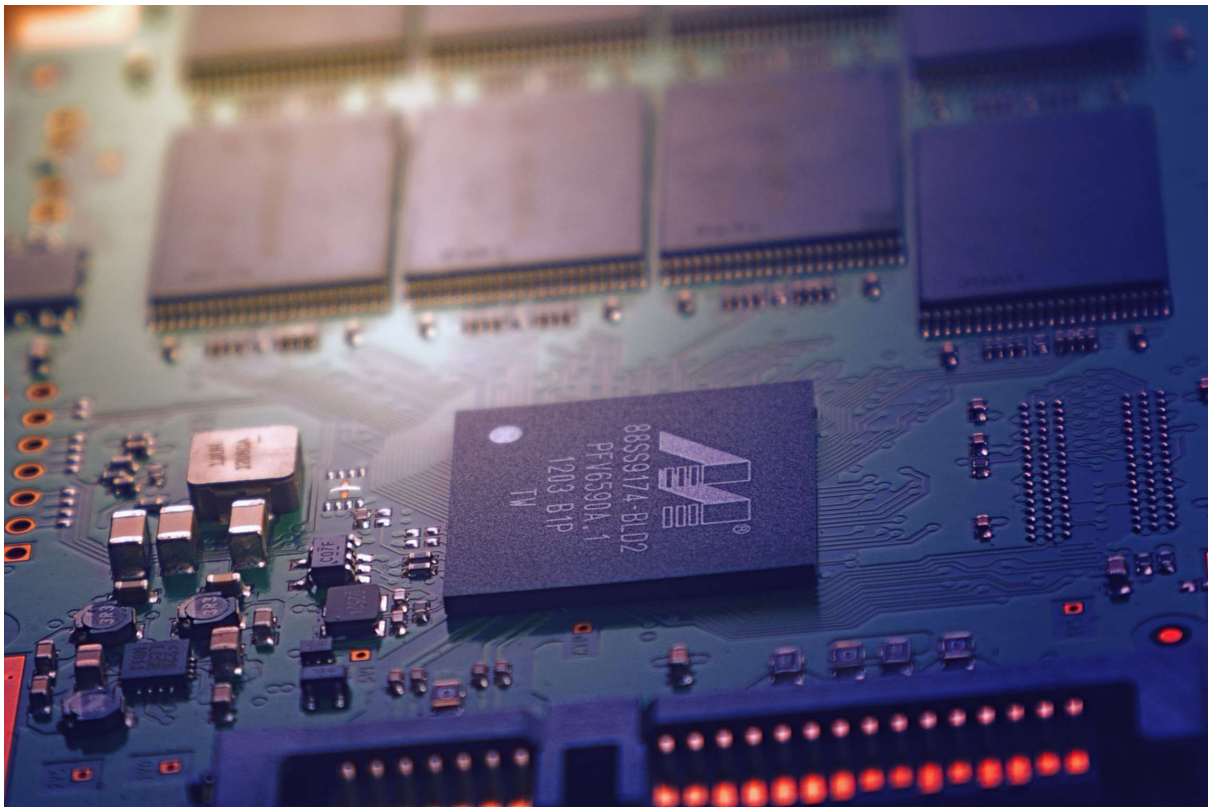
Categories: 1st Sem Computer Notes



Definition of a Computer:

- A computer is an electronic device that operates under the control of a set of instructions that is stored in its memory unit.
- A computer is a collection of hardware and software components that help you complete many different tasks.
- A computer can be more accurately defined as an electronic device that takes data as input, stores, and processes it, and displays the output according to the given

instructions.

Characteristics of computer

- **Computers of all sizes have common characteristics:–**
  Speed
  Reliability
  Multitasking
  Diligence
  Accuracy
  Memory capacity

Speed

- It works at very high speeds and can much faster than humans.
- It is equivalent to one million mathematicians working 24 hours a day.

Reliability

- Computers are extremely reliable as well. Most errors are caused by humans, not computers.
- Computers are capable of storing enormous amounts of data that must be located and retrieved very quickly.

Multitasking

- Modern computers can perform multiple tasks at once. i.e. they can perform a set of works simultaneously.
  Example – at the same time it can play a game & printing your document.

Diligence

- Unlike a human, a computer simply does not get bored or tired.
- Repetitive work does not affect the computer.

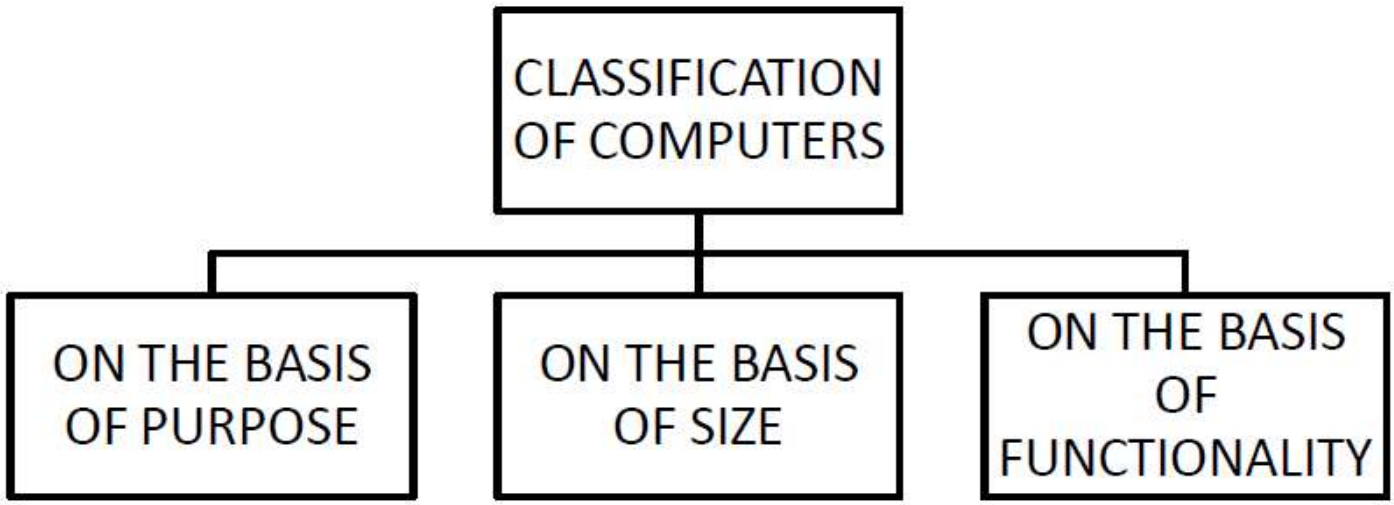
Accuracy

- Computers rarely make mistakes.
- Most computer errors are caused by human faults

Storage capacity

- It stores a huge amount of data/information

Classification of Computers



On The Basis Of Purpose

General Purpose Computers

These are designed to perform a range of tasks. They have the ability to store numerous programs, but lack in speed and efficiency comparatively.

Special Purpose Computers

Specific purpose computers are designed to handle a specific problem or to perform a specific task. A set of instructions is built into the machine.

On The Basis Of Size

Microcomputers

- Microcomputers are connected to networks of other computers.
- The price of a microcomputer varies from each other depending on the capacity and features of the computer.
- Microcomputers make up the vast majority of computers.
- A single user can interact with this computer at a time.
- It is a small and general-purpose computer.

Mini Computer

- Mini Computer is a small and general-purpose computer.
- It is more expensive than a microcomputer.
- It has more storage capacity and speed.
- It designed to simultaneously handle the needs of multiple users.

Mainframe Computer

- Large computers are called Mainframes.
- Mainframe computers process data at very high rates of speed, measured in the millions of instructions per second.
- They are very expensive than the microcomputer and minicomputers.
- Mainframes are designed for multiple users and process vast amounts of data quickly.
- Examples:- Banks, insurance companies, manufacturers, mail-order companies, and airlines are typical users.

Super Computers

- The largest computers are Super Computers.
- They are the most powerful, the most expensive, and the fastest.
- They are capable of processing trillions of instructions per second.

On The Basis Of Functionality/ Data Handling

Analog Computers

- An Analog Computer is a form of computer that uses continuous physical phenomena such as electrical, hydraulic, or mechanical quantities to model the problem being solved.
- They work on the principles of measuring in which the measurements obtained are translated into data.
- Modern Analog Computers usually employ electrical parameters such as voltages, resistances or currents to represent the quantities being manipulated.
- They measure continuous physical magnitudes

Digital Computers

- A computer that performs calculations and logical operations with quantities represented as digits, usually in the binary number system.
- They process data into a digital value (0s and 1s).
- They give results with more accuracy at a faster rate.

Hybrid Computers

- A combination of computers, those who are capable of inputting and outputting in both digital and analog signals.
- A Hybrid computer system set up offers a cost-effective method of performing complex simulations.
- They incorporate the measuring feature of an analog computer and counting feature of a digital computer.
- For computational purposes, these computers use analog components and store digital memories are used.

Limitations of Computer

The computer cannot operate without the instructions given by humans. It is programmed to work effectively, fast, and accurately. The computer cannot think by itself and does not have common sense. It is totally dependent on humans.

- Depend on the user's input.
- The computer has no imagination.
- Cannot detect an error in logic.
- An only an expert user can work on it.
- Cannot take its own decisions.

Some of the limitations of the computer are as follows*:*

No Self-Intelligence

The computer does not have an intelligence of its own to complete the tasks. They give wrong output if the input given by humans is wrong. It works according to the instructions given to it by the user.

No Thinking and Decision Making Power

The computer cannot think of itself. The concept of artificial intelligence shows that a computer can think. But still, this concept is dependent on a set of instructions. It cannot take any decision. It can only perform the tasks that are instructed by the users.

No Feeling

Lack of feeling is another limitation of the computer. A computer cannot feel like us. It does not have emotions, feelings, knowledge etc. It does not get tiring and keep on

doing its tasks. It can do very risky works that are not capable of human beings.

No Learning Power

The computer has no learning power. The computer cannot perform the tasks without instructions. It cannot read the same instructions time and again. Once the instructions are given it will work for one time. It can solve the problems but it cannot learn the problems. It can only work according to the instructions given.