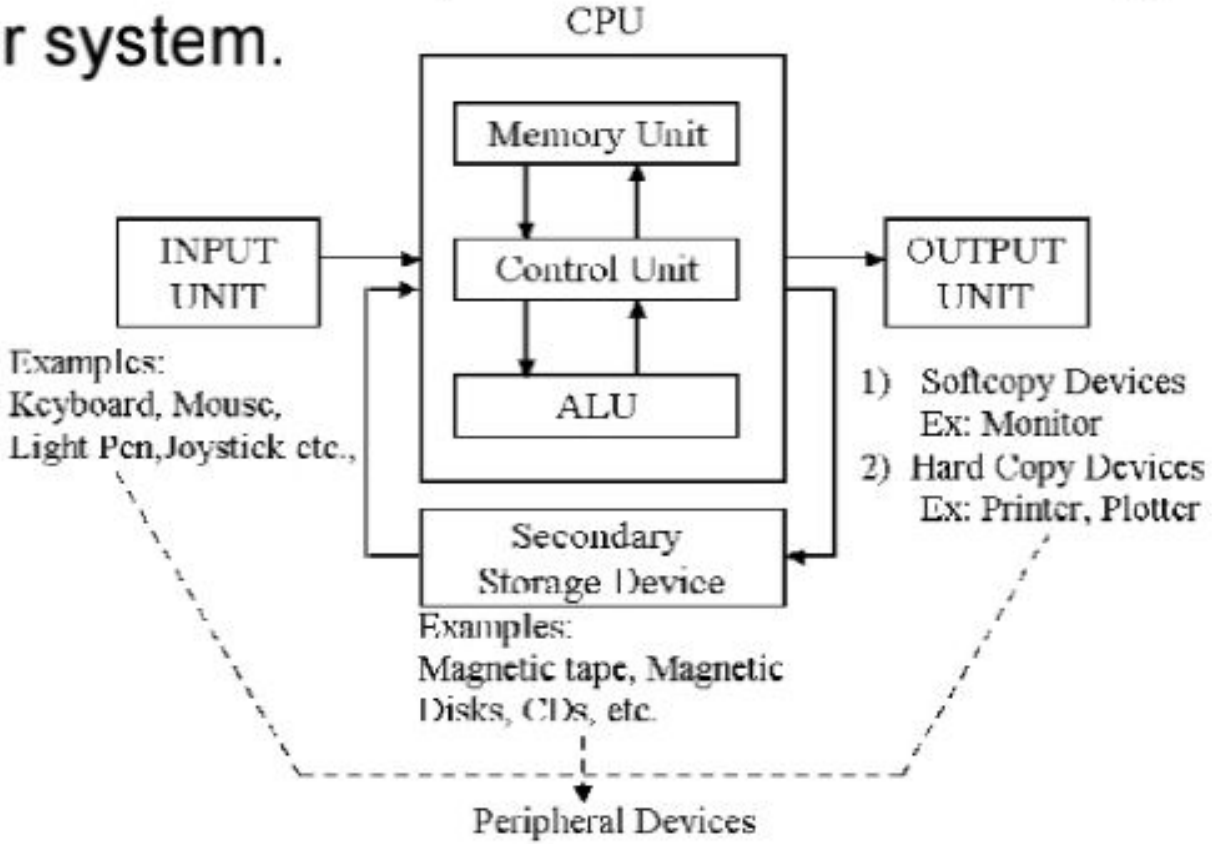
What is Computer?

- The term "computer" is derived from Latin word "computare" which means to calculate.
- Computer is a programmable electronic device that accepts raw data as input and processes it with set of instructions to produce result as output.
- It gives output just after performing mathematical and logical operations.
- The device also has memory that stores the data, programs and result of processing.
- It is believed that Analytical Engine was the first computer and was invented by Charles Babbage in 1837.
- Charles Babbage is also considered as the father of computer.

Block Diagram of A Computer

- There are different hardware components (categorized under different types or unit) playing their roles to support the overall processing of a computer system.
- The figure below explains the block diagram of computer system.

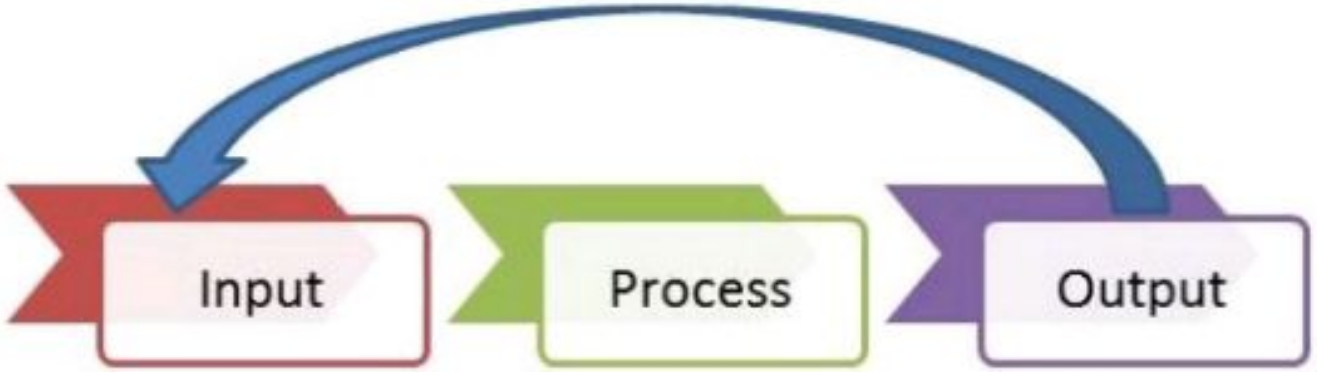


CPU: Basic Operations

- The basic operations performed by CPU are listed below:
  - A Computer accepts the data or instruction from input devices.
  - Computer processes the data as per the requirement of the user.
  - After processing the result is obtained, which is then sent to the user.
  - It stores the data for the future purpose.

A Working Principal of Computer

- A computer is known as an information processing machine.
  - It takes in raw data from input devices.
  - After it takes data, it processes the data according to the given instruction using processing unit.
  - Finally, the result is displayed to the user and stored in secondary storage devices.



Components of Computer

❖ Input Unit:

- The input unit consists of different input devices.
- The role of an input unit is to give data to the computer.
- A Computer takes input from input devices in the form of clicks, drags and drops, pointing, alphanumeric characters etc depending upon the device used.
- Input can be either a data or an instruction.
- The Keyboard is a type of input device that gives data as input to the computer whereas mouse usually gives instructions through clicks.

❖ Processing Unit:

- Processing unit consists of various parts like CU, ALU, Registers and is often referred to as an electronic brain of a computer system.
- This unit is responsible for performing overall operations of a computer system.
- After the input device provides raw data to the computer system, CPU performs specific operations like, Addition, Subtraction, Division etc. and produces a result which we call an output.
- CPU can also access data from secondary storage of computer via primary memory.
- To carry out any operations the CPU assigns tasks to its component.

Processing Unit: Arithmetic Logical Unit (ALU)

- ALU is a logical unit of CPU. This unit is responsible for the processing of the data and instructions.
- When the CU encounters instructions which are related to performing logical or arithmetic operation on data, it passes that instruction to ALU.
- It carries out arithmetic operations like additions, subtraction, multiplication, divisions, and modulus.
- The comparison operations that arithmetic logical unit performs are comparison like less than (<), greater than(>), less than or equal to (<=), greater than or equal to (>=), not equal to (!=/<>/~=).
- Logical operations includes OR, AND, NOT.
- The data on which ALU performs operations are fetched from memory unit.
- After the processing completes, the information or result is sent back to the storage or an output device.

Processing Unit: Control Unit (CU)

- Control unit is another part of CPU.
- It supervises the overall operations of other units of the computer.
- The CU acts as the central nervous system and controls the processing of data according to the instruction given to the computer.
- It fetches instructions and data from the memory unit and executes the instructions one at a time using time signal.
- Control unit also determines the sequences of program and instruction's execution.

❖ Output Unit:

- The output unit of a computer system are the collections of hardware components that show output to the user either in hardcopy or a softcopy format.
- After CPU completes the processing on the data, the outcome of processing also known as output or a result is passed to this unit.
- The output unit is responsible for translating the result in human understandable format and displaying it.

❖ Memory Unit:

- The Memory unit of a computer system is what provides the data that CPU needs for processing.
- There is a primary and secondary memory in the computer system.
- Primary memory holds the data so that CPU can process it.
- The data that CPU process should be pulled to primary memory(RAM) from secondary storage device.

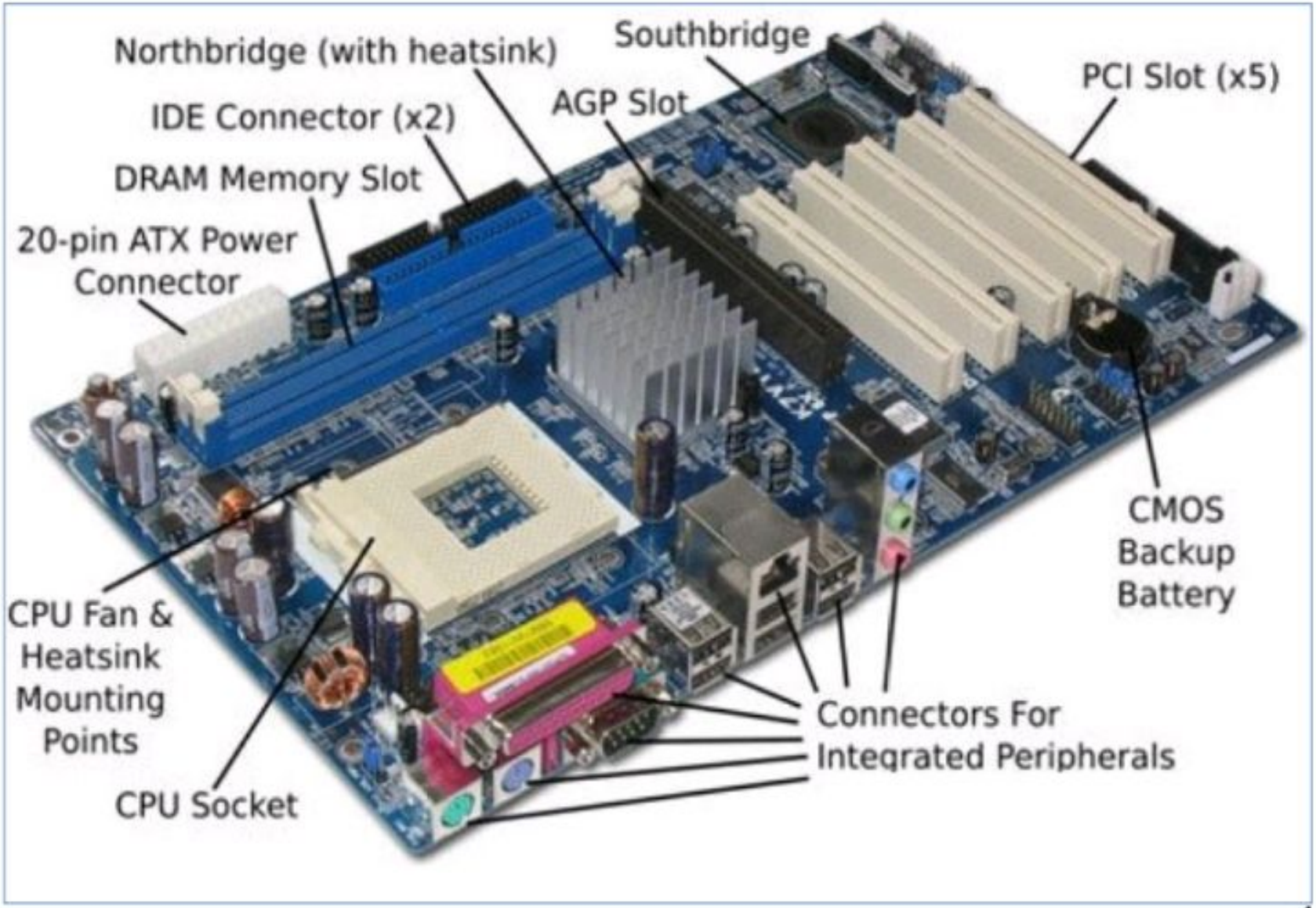
❖ **Storage Unit:**

- The Storage unit is also a part of a block diagram of computer.
- Storage unit or secondary storage unit is a non-volatile device that holds programs, files, documents.
- It provides facilities to store a large volume of data. CPU executes the data stored on storage devices indirectly.
- The data are transferred to RAM first and after an execution, the data can be again written to Storage unit.

Motherboard

- A small or large circuit board inside a cabinet containing most of the electronic components.
- Everything connected to the computer is directly or indirectly plugged into motherboard. Components like CPU, BIOS, ROM, RAM, chips, and CMOS setup information.
- Expansion slots for installing different cards like video, sound, graphics, and NIC.
- Also contains RAM slots, system chipset, controllers and underlying circuit to tie it together.

Motherboard



Types of Motherboard

❖ Non-integrated:

- Assemblies such as I/O port connectors, hard drive connectors, CD drive connectors etc installed as expansion boards.
- Takes lot of free space inside the case because of expansion slots.
- If something goes wrong such as bend or broken pin or defective controller can be repaired with minor cost.
- Cheap and easy to produce.
- Most of the olden motherboards were non-integrated.

Types of Motherboard

❖ Integrated:

- Assemblies are integrated or built right onto the board.
- Serial and parallel ports, IDE, CD drive are directly connected to the motherboard.
- This tends to free some space inside case and better accessibility to the components.
- Cheaper to produce but are expensive to repair.
- Fast, powerful, feature rich motherboard at reasonable price.