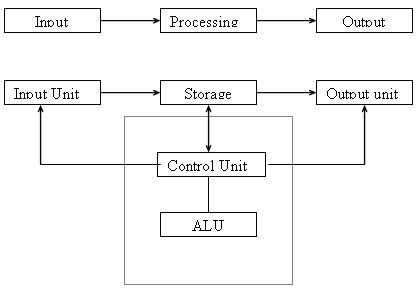
**CPU (Central Processing Unit):**

CPU or central processing unit is an electronic circuitry that carries out the instruction given by a computer program. CPU execute instruction by performing basic arithmetic, logical, control and I/O operations as required per instruction. CPU is considered to be the brain of the computer. The speed and efficiency of a computer mostly depends that of it's CPU.

Traditionally, the term "CPU" refers to a **processor**, more specifically to its processing unit and [control unit](https://en.wikipedia.org/wiki/Control_unit) (CU), distinguishing these core elements of a computer from external components such as [main memory](https://en.wikipedia.org/wiki/Main_memory) and I/O circuitry. Most modern CPUs are [microprocessors](https://en.wikipedia.org/wiki/Microprocessor), meaning they are contained on a single [integrated circuit](https://en.wikipedia.org/wiki/Integrated_circuit) (IC) chip.



Block diagram of Computer

### CPU Clock Speed

The clock speed of a processor is the number of instructions it can process in any given second, measured in gigahertz (GHz).

For example, a CPU has a clock speed of 1 Hz if it can process one piece of instruction every second. Extrapolating this to a more real-world example: a CPU with a clock speed of 3.0 GHz can process 3 billion instructions each second.

CPU further divided into two parts:

### Control unit

### Arithmetic logic unit

**Comparison Chart**

|  |  |  |
| --- | --- | --- |
|  | **ALU** | **CU** |
| **Definition** | ALU (Arithmetic Logical Unit) is a circuit component of CPU that deals with the mathematical calculations, data processing and deducting all the logical conclusions and outputs. | CU (Control Unit) is one of the two main components of the CPU. It deals with the coordination between the hardware devices attached with each either, works as an interactive bridge between software and hardware of the computer system.  The Control Unit (CU) controls and guides the interpretation, flow and manipulation of all data and information. The CU sends control signals until the required operations are done properly by ALU and memory. Another important function of CU is the program execution that is, carrying out all the instructions stored in the program. The CU gets program instructions from memory and executes them one after the other. After getting the instructions from memory in CU, the instruction is decoded and interpreted that is, which operation is to be performed. Then the asked operation is carried out. After the work of this instruction is completed, control unit sends signal to memory to send the next instruction in sequence to CU.  The control unit even controls the flow of data from input devices to memory and from memory to output devices. |
|  |  |  |

## The Four Primary Functions of the CPU:

The CPU processes instructions it receives in the process of decoding data. In processing this data, the CPU performs four basic steps:

1. **Fetch** Each instruction is stored in memory and has its own address. The processor takes this address number from the program counter, which is responsible for tracking which instructions the CPU should execute next.
2. **Decode** All programs to be executed are translated to into Assembly instructions. Assembly code must be decoded into binary instructions, which are understandable to your CPU. This step is called decoding.
3. **Execute** While executing instructions the CPU can do one of three things: Do calculations with its ALU, move data from one memory location to another, or jump to a different address.
4. **Store** The CPU must give feedback after executing an instruction and the output data is written to the memory.