Central Processing Unit (C.P.U)

Tags: CPU,Control Unit,ALU, Registers,Machine Cycle

Central Processing Unit (CPU)

Has 3 crucial set of transistors that communicate with each other to process digital data

- **Control Unit (CU)
- **Arithmetic/Logic Unit(ALU)
- **Registers

Control Unit

- Controls all processes
- Sequentially accesses program instructions
- Decodes the instructions and acts
- Coordinates the flow of data in and out of the **ALU**, **Registers**, **Primary storage** as well as **secondary storage** and various output devices

Arithmetic/Logic Unit

- Performs mathematical calculations and makes logical comparisons

Registers

High-speed storage systems which hold small information and data temporarily.
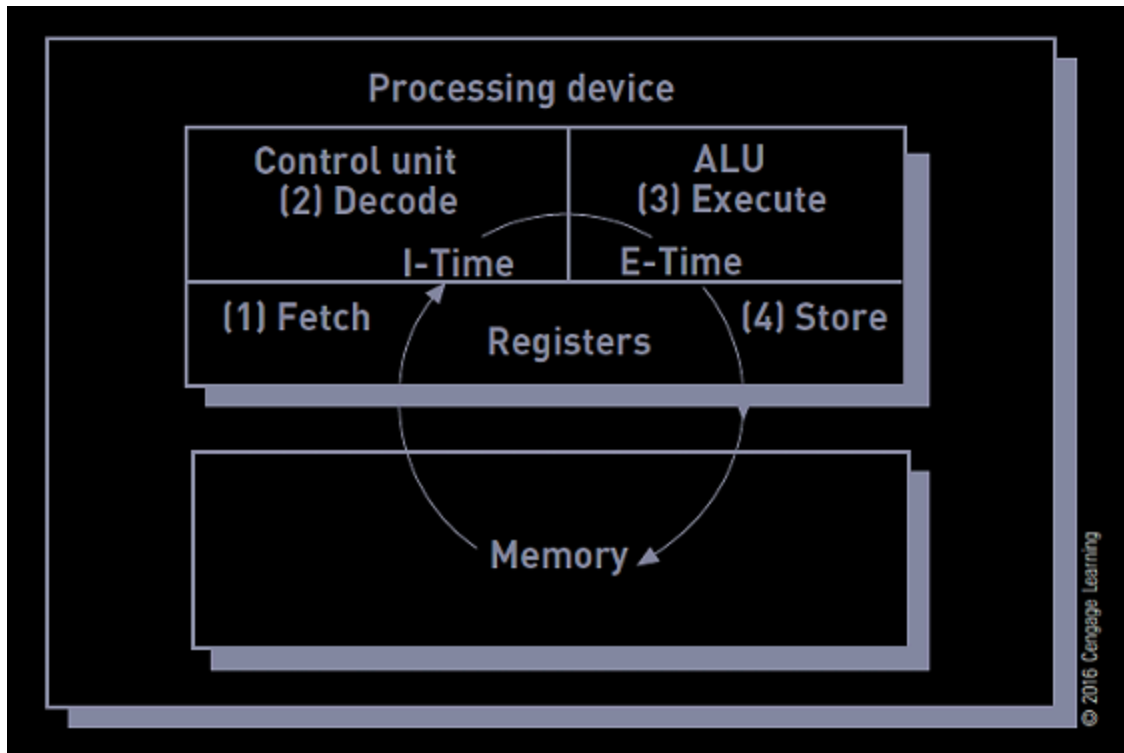
Machine cycle

Registers fetch the information from the memory and sends it to the **Control Unit**. **Control Unit** decodes the instructions and sends it to **Arithmetic/Logic Unit**. **Arithmetic/Logic Unit** executes the commands and sends it back to **Registers**. **
1 Hz = 1 cycle/second

Hardware Components in action

- **The instruction phase**
  step 1: fetch instruction (in **register**)
  step 2: decode instruction (in **Control unit**)

- **The execution phase**

  step 3: execute instruction(in ALU)

  step 4: store results (in **register**)
- instruction time (I - time)
- execution time (E - time)

If your CPU is powerful you can do lots of cycles in 1 second | you can do a lot of operations

CPU characteristics

Machine Cycle-time

- nanoseconds(1 billionth of a second)
- picoseconds (1 trillionth of a second)
- MIPS(millions of instructions per second)

Gigahertz(GHz)

How powerful our CPO - billions of cycle per second - a series of electronic pulses produced at a predetermined rate that affects machine cycle time.