

# Computer Organization

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# What is a Computer?

- **Computer**

- A device capable of performing computations and making logical decisions.
- Computers process data under the control of sets of instructions called computer programs

- **Hardware**

- Various devices comprising a computer.
- Keyboard, screen, mouse, disks, memory, CD-ROM, and processing units

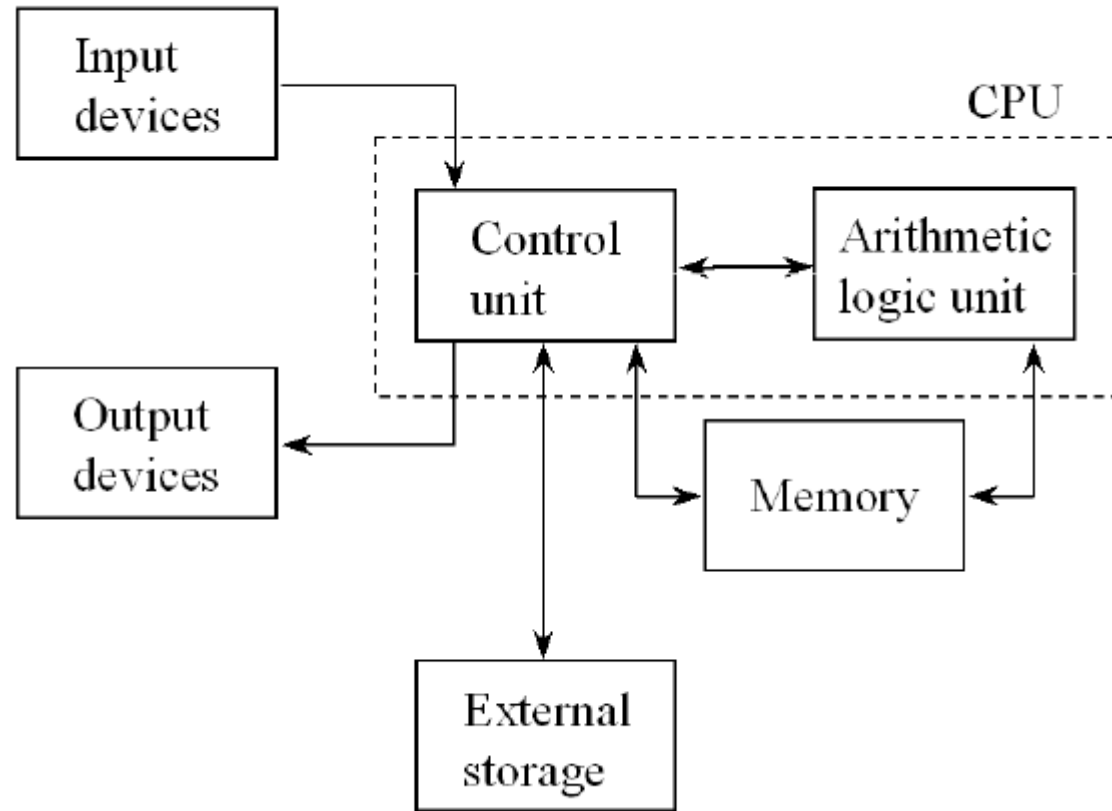
- **Software**

- Programs that run on a computer

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- Six units in every computer:
  - Input unit
  - Output unit
  - Memory unit
  - Arithmetic and logic unit (ALU)
  - The central processing unit (CPU)
  - Secondary storage unit






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- The memory unit - or random access memory (RAM)
  - stores instructions and/or data
  - Memory is divided into an array of "boxes" each containing a *byte* of information.
  - A *byte* consists of 8 bits.
  - A *bit* (binary digit) is either 0 (OFF) or 1 (ON).
  - The memory unit also serves as storage for intermediate and final results of arithmetic operations.
- Secondary storage unit
  - Cheap and high-capacity storage
  - Stores inactive programs

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- |           |   |                            |
|-----------|---|----------------------------|
| • 1 bit   |    | • bit (1 or 0)             |
| • 8 bits  |    | • byte (octet) ( $2^8$ )   |
| • 16 bits |   | • word ( $2^{16}$ )        |
| • 32 bits |   | • double ( $2^{32}$ )      |
| • 64 bits |  | • long double ( $2^{64}$ ) |