

## Computers

- A **computer** is a machine capable of following the instructions of a **program**.
- A **program** is a set of instructions.
- **Computer Organization: Hardware** (von Neumann architecture)
  - The Central Processing Unit: (CPU)
    1. Carries out the instructions of the programs.
    2. Moves data from one part of machine to another part of the machine.
    3. Manipulates data (e.g., adds, compares, etc.).
  - Memory:
    1. Internal Memory: memory internal to the system printed circuit boards. Used to store programs and data that are currently being processed by the CPU.
      - a) RAM - Random Access Memory
      - b) ROM - Read Only Memory
    2. External Memory: memory external to the system printed circuit boards. Used for long term and mass storage of programs and data.
      - a) Floppy Disks
      - b) Hard Disks
      - c) Magnetic Tape
      - d) CD ROM
      - e) DVD ROM
  - Input/Output Devices:
    1. Input Devices: used to input programs and data into the computer.
      - a) Keyboard
      - b) Mouse or Trackball
      - c) Microphone
    2. Output Devices: used to receive output information from the computer.
      - a) Screen
      - b) Printer
      - c) Speaker

## ● Computer Organization: Software

- Program:  
A set of instructions that determines a computer's action.
- Software:  
A program or a collection of programs that are not 'built-in' to the hardware.
- The Operating System: (Windows, Unix, Linux, ...)  
The software that manages the entire computer system.
- Application Program:  
Software designed to carry out tasks in a particular application area (word processing, Web access, spreadsheets,...).
- Programming Language:  
A language with which programs are written.
- C, C + + , Java, JavaScript, Pascal, Visual Basic, ...:  
High-level programming languages.
- Assembly Language:  
A low-level programming language.
- Machine Language  
The "language" that the computer actually understands.  
(strings of 1s and 0s)
- Compiler:  
Software that translates programs written in high-level languages into machine language.