Computer Systems & The Flow of Data

Class	Computer Science

TABLE OF CONTENTS

Input: tells the computer what to do

Memory: stores information

Output: shows what the computer has done

- Shows information processed from memory by microprocessor

Microprocessors

Registers: memory devices in the microprocessors that store data

- Too small to show in CPU

Central Processing Unit (CPU): “brain” of the computer

- **Arithmetic & Logic Unit (ALU)**
- **Control Unit**

The ALU performs *addition* and *logical comparisons*.

Example of the **flow of data**:

```
graph TD
  Input --> Memory
  Memory --> |Microprocessor| Register
  Register --> |CPU| ALU
  ALU --> Control.Unit --> Output
  Memory --> Output
```

Input & Output Devices

Examples of input and output devices:

Input Devices	Output Devices
keyboard	monitor
microphone	projector
mouse	printer
camera	speaker
remote control (R.C.)	headphones

Peripheral Devices: input & output devices

- Devices outside of the actual computer

Memory Devices

Memory devices are **NOT** peripheral.

Non-Volatile Memory Devices

- Retained when computer is shut down
- Slower to access

1. Hard Drive (HD)

- Uses electromagnetic means to store data (revolving disk)

2. CD / DVD / BlueRay / Disks
    - Optical
    - Structured with lasers
3. Flash Drives
    - Use small flat chips inside the drive
4. ROM (Read-Only Memory)
    - Embedded in the motherboard
    - Used for boots
    - Firmware (not software application)

The *Electrically-Erasable Programmable Read-Only Memory (EEPROM)* is a version of ROM that can be programmed.

Computer Boots

Basic Input Output System (BIOS): old version, checks to make sure that peripheral devices are attached

Universal Extensive Firmware Interface (UEFI): newer version, doesn't require peripheral devices (replaced BIOS)

Volatile Memory Devices

- Reset when computer is shut down
- Faster to access

1. Random Access Memory (RAM)
    - Main memory that the microprocessor uses

In a smaller area, current gets heated up.