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Module 2:

Hardware Installation and Configuration

Overview

- Discuss the assembling of a computer
- Discuss BIOS/UEIF Configuration
- Installing Operating Systems

Lesson 2.1

Assembling a Computer

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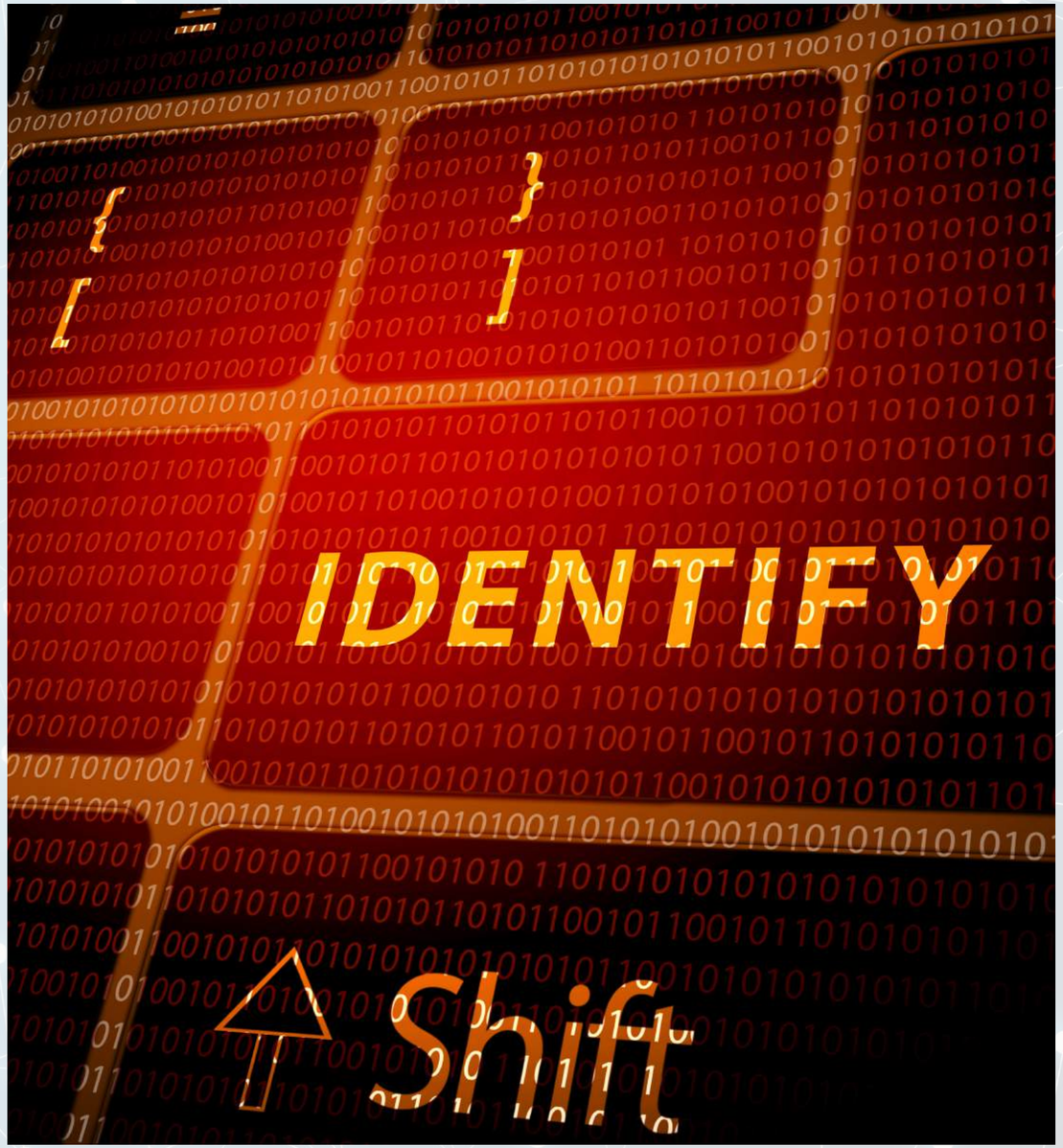
Identifying Computer Parts

- **Motherboard** - Main circuit board that connects all components
- **CPU (Processor)** - Executes instructions and processes data
- **RAM (Memory)** - Temporary storage for active programs and tasks
- **Storage Drive** - HDD or SSD for permanent data storage



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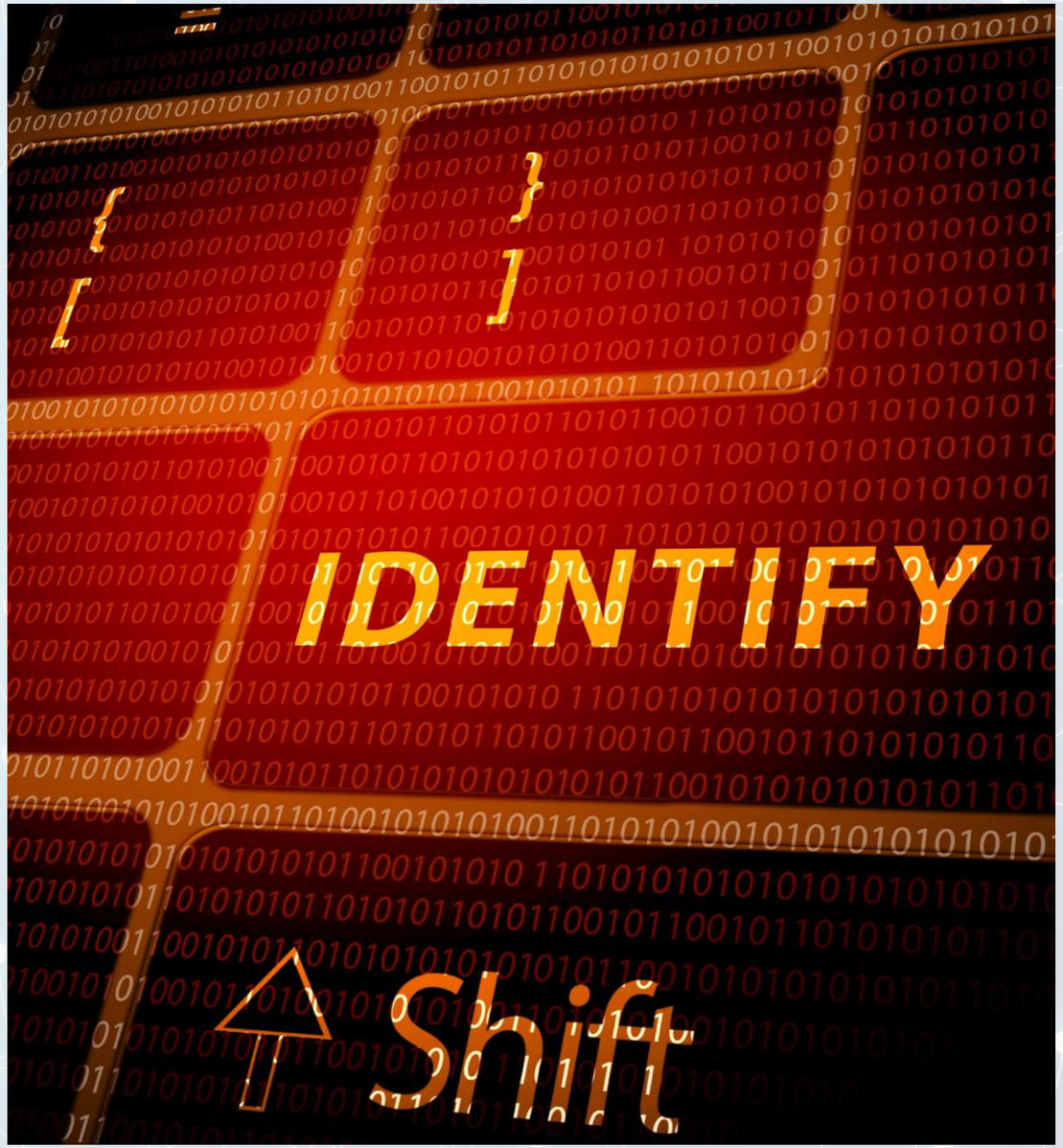
Identifying Computer Parts

- **Power Supply Unit (PSU)** - Converts electricity into usable power
- **GPU (Graphics Card) (optional)** - Renders images and video (essential for gaming/design)
- **PC Case** - Enclosure that holds and protects components
- **Cooling Fans / Heatsinks** - Prevents overheating



Step-by-Step Installation

1. Install the CPU
2. Install RAM
3. Install Storage (SSD/HDD)
4. Mount Motherboard into the Case
5. Install the Power Supply
6. Install GPU (if applicable)
7. Connect Front Panel Connectors
8. Plug in all Power and Data Cables

Cable Management

- Use cable ties or Velcro straps to bundle cables
- Route cables behind the motherboard tray (if case allows)
- Use modular PSU if possible to reduce unused cables
- Avoid blocking fans or vents with dangling cables

Lesson 2.2

BIOS/UEIF Configuration

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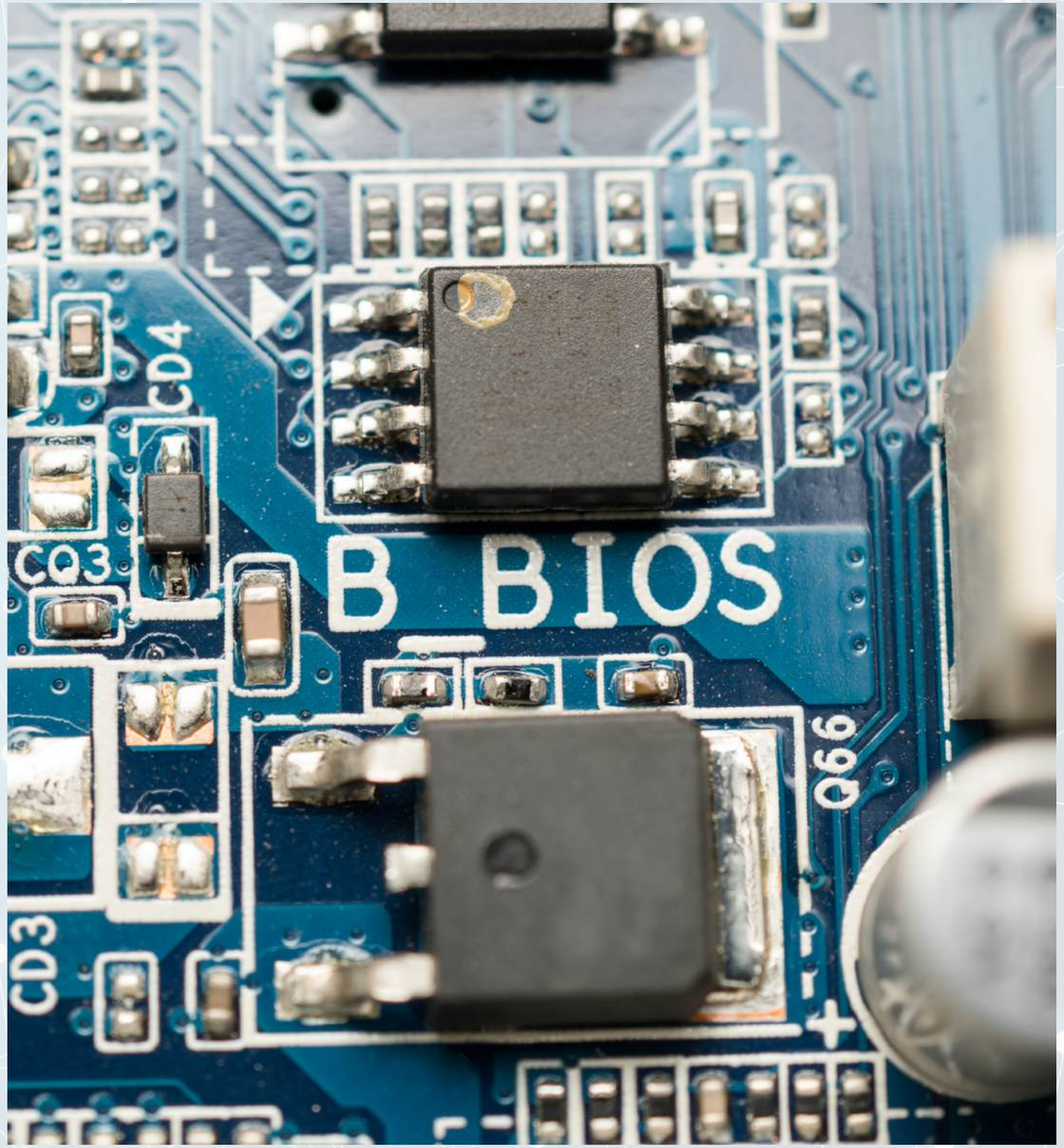
Basic Input/Output System Configuration

- refers to the process of accessing and changing settings in the BIOS (Basic Input/Output System) of a computer.
- control the fundamental operation of the system's hardware before the operating system loads.

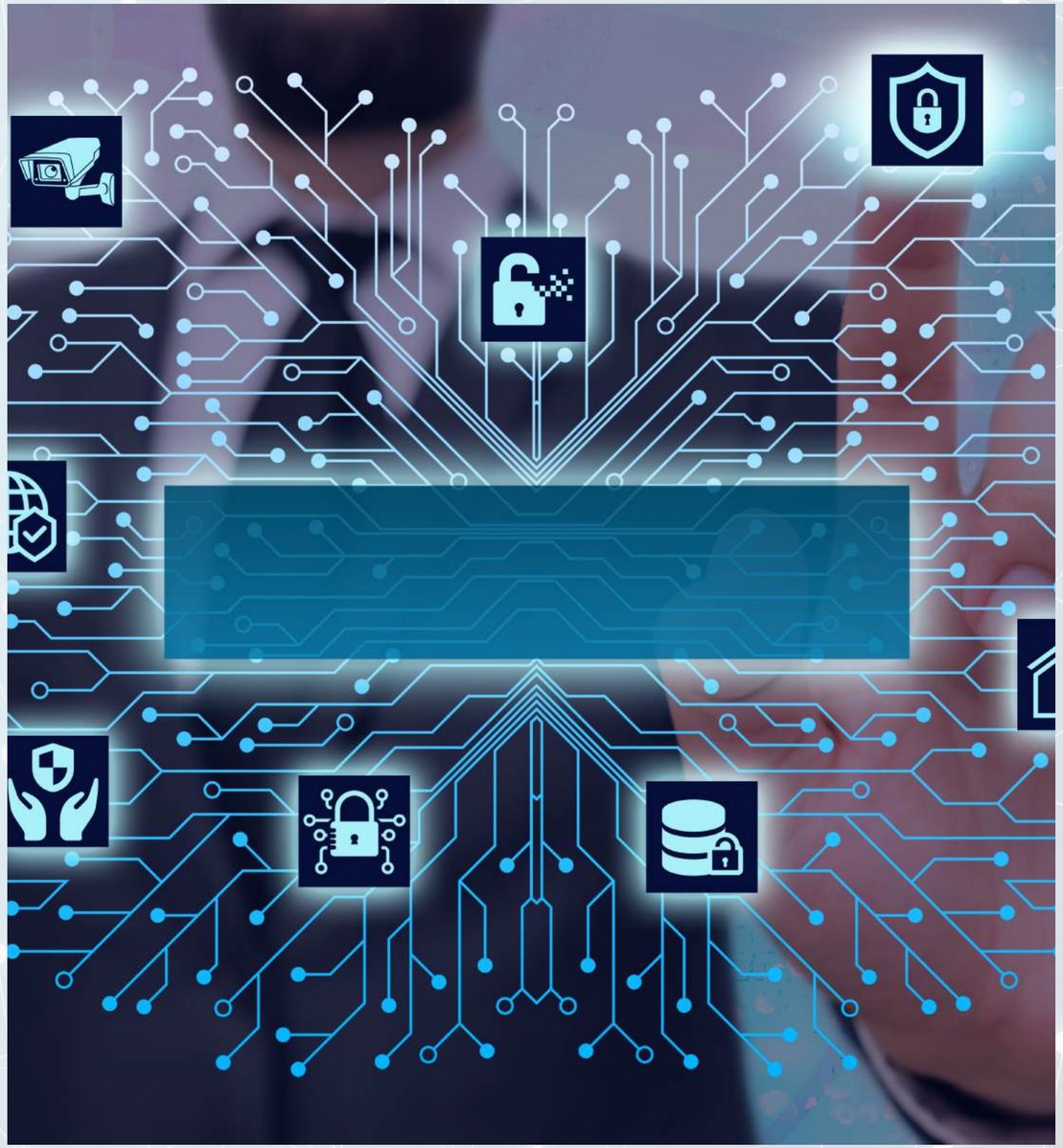
Purpose of BIOS configuration

- To set up or troubleshoot hardware components
- To change the order of devices used during startup (boot)
- To enable or disable system features like virtualization, USB ports, or onboard audio
- To improve system performance or compatibility
- To reset system settings (load defaults or clear password)



Common BIOS Configuration Options

- Boot Priority
- Date and Time
- Enable/Disable Devices
- Security Settings
- Power Management
- Hardware Monitoring

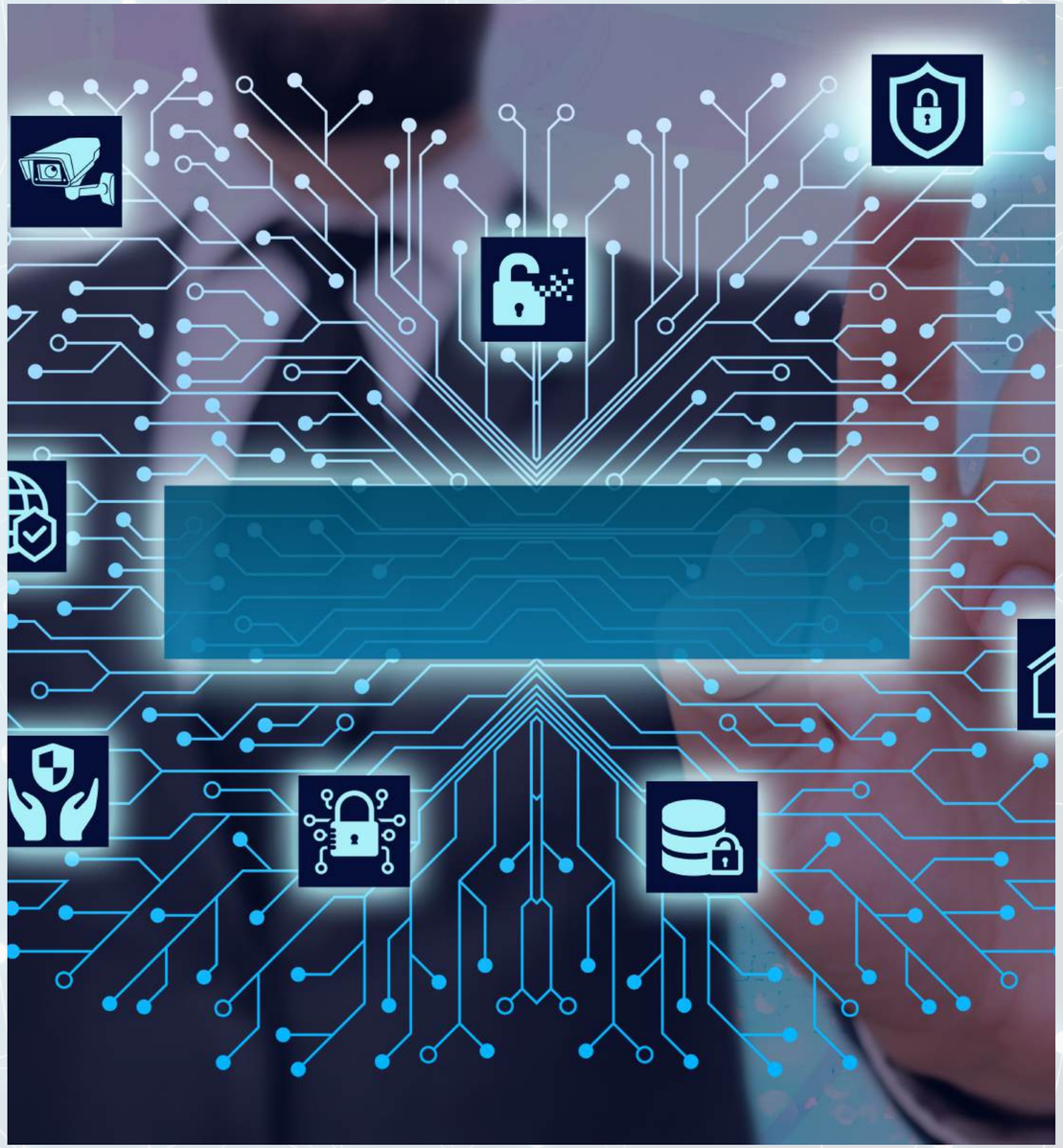


Unified Extensible Firmware Interface

- process of changing settings in a computer's UEFI firmware, which controls how the hardware starts up and how the operating system is loaded.
- it is the modern replacement for BIOS, offering more advanced features, a graphical interface, and better support for newer hardware.
- type of firmware interface found on most modern computers

Common UEFI Configuration Options

- Boot Order (Boot Priority)
- Secure Boot
- Fast Boot
- Enabling/Disabling Devices
- UEFI vs Legacy Boot Mode
- Advanced Settings



BIOS vs UEFI

Feature	BIOS	UEFI
Older or Newer	Older	Newer
Interface	Text-based	Graphical or text-based
Boot Speed	Slower	Faster
Disk Support	Up to 2TB (MBR)	Over 2TB (GPT)
Security	Minimal	Supports Secure Boot

Lesson 2.3

Installing Operating Systems

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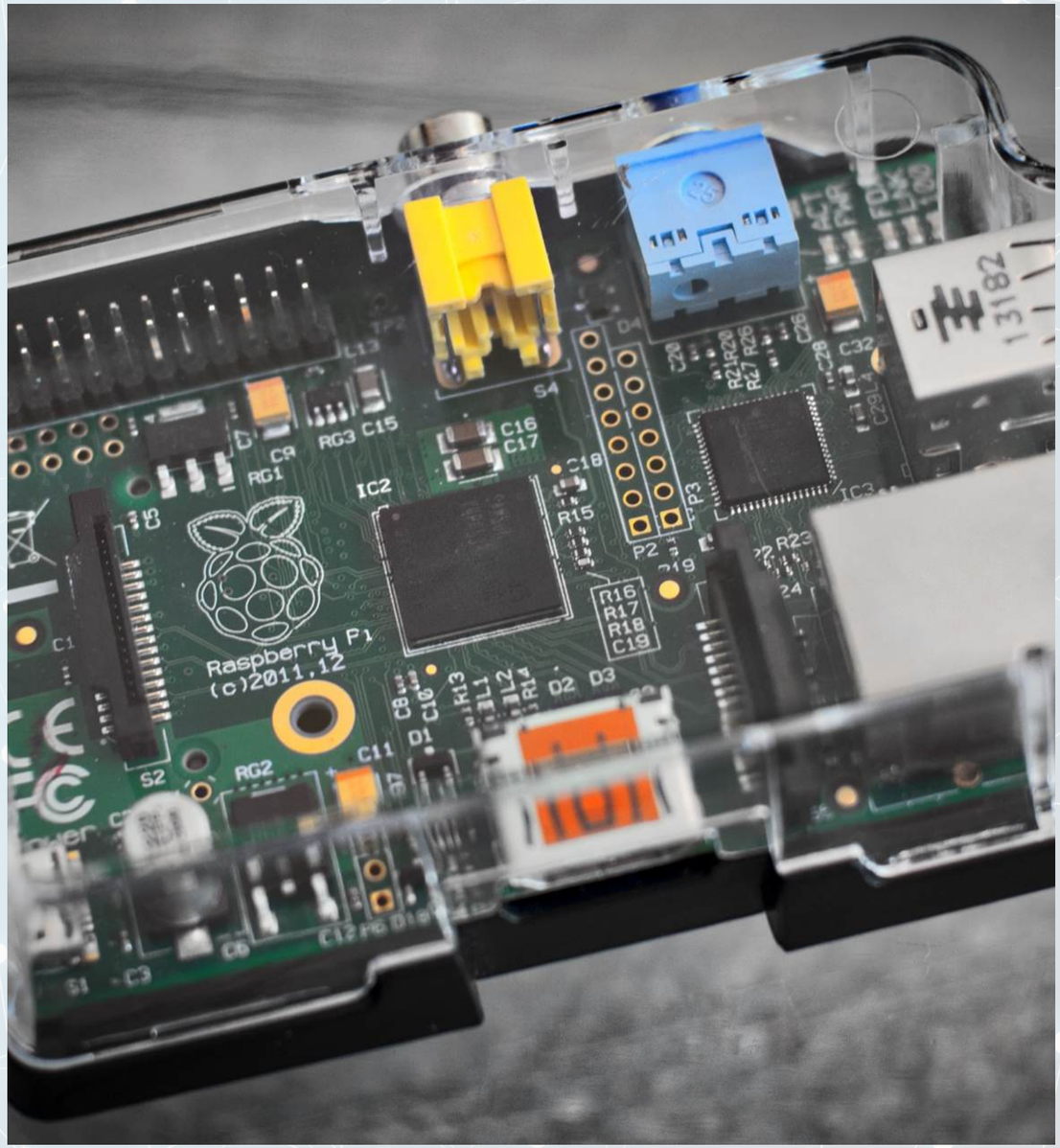
Windows and Linux Basics

- **Windows OS** - Most widely used OS in schools, offices, and homes
  - User-friendly graphical interface
  - Requires activation key and regular updates
  - Common versions: Windows 10, Windows 11
- **Linux OS** - Open-source and free to use
  - Lightweight and customizable
  - Popular distributions
  - Preferred for servers and programming environments



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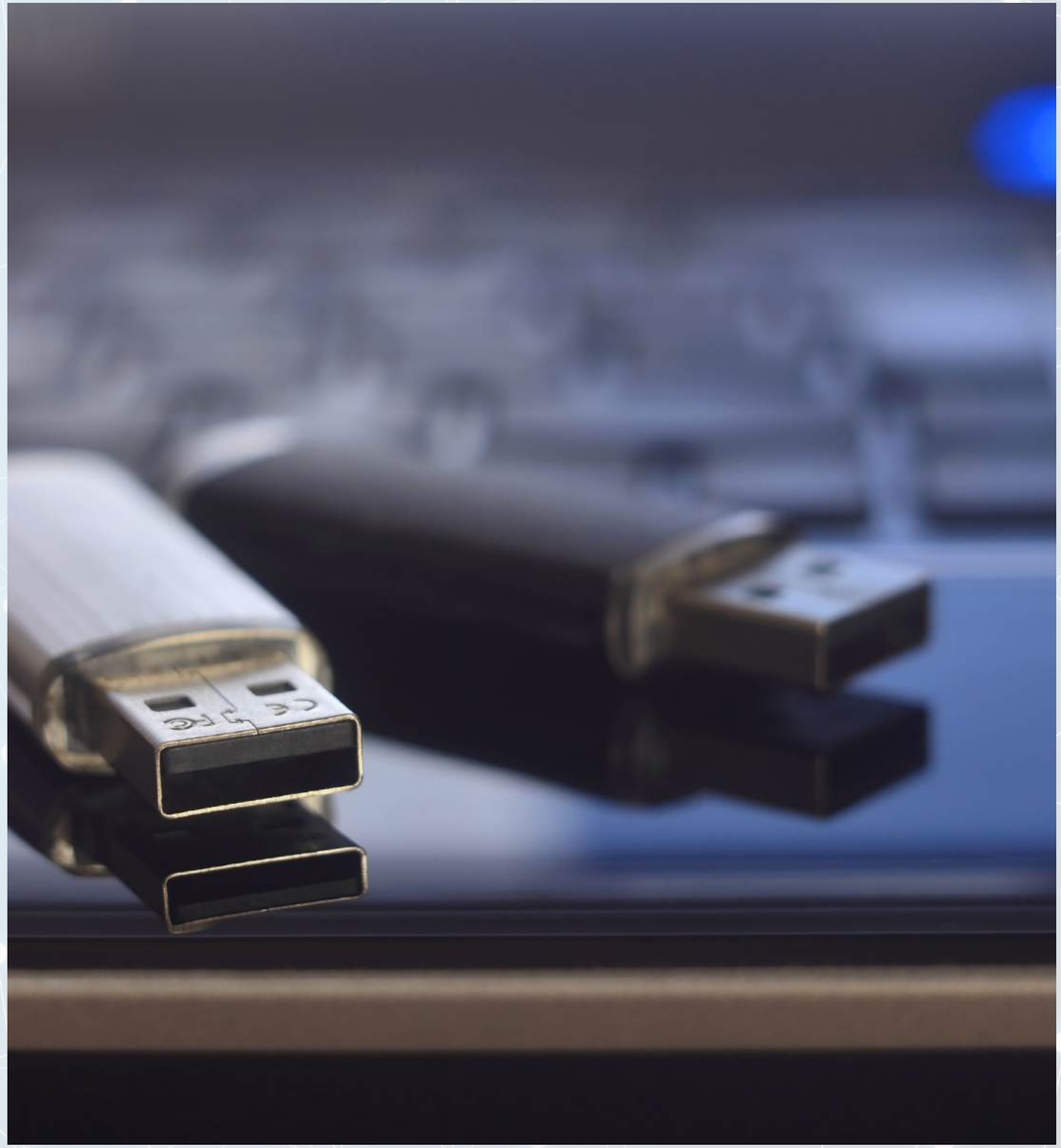
Bootable USB Creation

1. Download the ISO file (Windows or Linux)
2. Insert a USB drive (at least 8GB recommended)
3. Use tools like:
   - Rufus (Windows)
   - Balena Etcher (Linux & cross-platform)
4. Select the ISO and target USB
5. Click Start to create the bootable USB



Partitioning and Formatting

- Partitioning
  - Primary Partition: Where the OS is installed
  - Logical Partition: For personal files, backup, or dual-boot setup
  - You can partition manually or let the installer auto-partition
- Formatting
  - NTFS: Used for Windows installations
  - EXT4: Common format for Linux
  - Prepares the disk space for storing files in a specific file system