BASICS OF OPERATING SYSYTEM

Operating System (OS) – Simple Explanation

An **Operating System (OS)** is a special software that helps the computer work properly. It acts as a middleman between the computer's hardware and the user. The OS controls the computer's parts, makes sure programs run smoothly, and helps users interact with the computer.

Basic Functions of an Operating System

1. **Managing Programs (Process Management)**
    - The OS starts, runs, and closes programs.
    - It makes sure multiple programs can run without problems.
2. **Managing Memory (Memory Management)**
    - The OS controls the computer's memory (RAM).
    - It decides which program gets how much memory and prevents crashes.
3. **Managing Files (File System Management)**
    - The OS organizes and stores files.
    - It helps users create, open, edit, and delete files.
4. **Managing Devices (Device Management)**
    - The OS allows the computer to use devices like printers, keyboards, and USB drives.
    - It uses drivers (special software) to connect devices to the system.
5. **User Interface**
    - The OS provides a way for users to interact with the computer, either through a **graphical interface** (like Windows) or a **command-line interface** (like Linux Terminal).

Main Parts of an Operating System

- **Kernel** – The core part that controls everything in the computer.
- **Shell** – The part where users give commands to the OS.
- **File System** – Helps store and organize files on hard drives and other storage devices.
- **Device Drivers** – Small programs that help the OS communicate with different hardware devices.

Types of Operating Systems

1. **Batch OS**
    - Handles multiple tasks in groups (batches) without user interaction.
    - Example: Old mainframe systems like IBM's OS/360.
2. **Time-Sharing OS**
    - Allows multiple users to use the computer at the same time.
    - Example: UNIX, Linux.
3. **Distributed OS**
    - Connects multiple computers and makes them work together as one system.
    - Example: Google's Android OS (used on different devices).
4. **Network OS**
    - Manages computers connected through a network.
    - Example: Windows Server, Novell NetWare.
5. **Real-Time OS (RTOS)**
    - Works instantly without delay, often used in critical systems like medical devices.
    - Example: VxWorks, QNX.
6. **Embedded OS**
    - Used in small devices like cars, washing machines, and smart TVs.

- Example: FreeRTOS, Embedded Linux.

7. **Mobile OS**
    - Designed for smartphones and tablets, focusing on battery life and touchscreen support.
    - Example: Android, iOS.
8. **Cloud OS**
    - Runs on the internet and provides cloud services.
    - Example: Google Cloud, Microsoft Azure.