Introduction to Operating Systems (OS)

Introduction
An Operating System (OS) is system software that manages computer hardware, software resources, and provides common services for computer programs. It acts as an intermediary between users and the computer hardware.

History of OS
Early computers had no OS, and users interacted directly with hardware. The first OS appeared in the 1950s to simplify batch processing. Over time, OS evolved to support multitasking, multiprocessing, networking, and user-friendly interfaces.

Key Functions of OS

- **Process Management:** Handles creation, scheduling, and termination of processes.
- **Memory Management:** Manages allocation and deallocation of memory space.
- **File System Management:** Organizes files and directories on storage devices.
- **Device Management:** Controls hardware devices via drivers.
- **Security and Access Control:** Protects resources and data from unauthorized access.
- **User Interface:** Provides command-line or graphical user interfaces for interaction.

Types of Operating Systems

- **Batch Operating Systems:** Execute batches of jobs without user interaction.
- **Time-Sharing Systems:** Multiple users share system resources concurrently.
- **Distributed Systems:** Manage a group of distinct computers as a single system.
- **Real-Time Systems:** Provide immediate processing for time-critical tasks.
- **Mobile OS:** Designed for smartphones and tablets (e.g., Android, iOS).

Applications
OS is essential for all modern computers and devices, including desktops, servers, mobile devices, and embedded systems.

Conclusion
Understanding operating systems is fundamental to computing, as they control all hardware and software interactions, enabling efficient and secure computing environments.