

# Operating System

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# 1. Introduction

- An Operating System (OS) is system software that acts as an interface between the user and hardware.
  - It manages hardware resources like CPU, memory, and devices.
  - Provides a platform for application software to run.
  - Examples: Windows, Linux, macOS, Android.

# Objectives of Operating System

- Convenience – Makes computer system easy to use.
  - Efficiency – Manages system resources efficiently.
  - Ability to evolve – Allows new functions without disturbing service.

## 2. Types of Operating System

- Batch Operating System – Executes batches of jobs without user interaction.
  - Time-Sharing OS – Multiple users share system resources simultaneously.
  - Distributed OS – Manages multiple computers connected by a network.
  - Real-Time OS – Provides immediate processing and response.
  - Mobile OS – Designed for smartphones and tablets.

# Examples of Operating Systems

- Batch OS – Early IBM systems
  - Time-Sharing OS – UNIX
  - Real-Time OS – VxWorks
  - Mobile OS – Android, iOS

# 3. Working of an Operating System

- User gives input through input devices.
  - OS receives request via system calls.
  - Kernel processes the request.
  - CPU executes instructions.
  - Output is displayed to the user.

# Core Components of OS

- Kernel – Core part controlling system operations.
  - Shell – Interface between user and kernel.
  - File System – Manages files and directories.
  - Device Drivers – Communicate with hardware.

# 4. Ways to Deal with an Operating System

- Command Line Interface (CLI) – Text-based commands.
  - Graphical User Interface (GUI) – Visual interface using icons and menus.
  - Batch Interface – Execute batch files.
  - Touch Interface – Used in mobile operating systems.

# 5. Buffering

- Buffering is the temporary storage of data while transferring between devices.
  - Helps match speed difference between devices.
  - Example: Streaming videos while data loads.

# Spooling

- Spooling stands for Simultaneous Peripheral Operations Online.
  - Stores data temporarily on disk before sending to device.
  - Commonly used in printing systems.

# Buffering vs Spooling

- Buffering uses main memory (RAM).
  - Spooling uses disk storage.
  - Buffering is for speed matching.
  - Spooling is for managing multiple jobs.

# Conclusion

- Operating System is essential for computer functioning.
  - It manages hardware and software resources efficiently.
  - Buffering and Spooling improve system performance.