

TOPIC: Operating Systems (OS)

Lesson Objectives

By the end of this lesson, students should be able to:

- **Define an Operating System (OS)**
 - **List and explain the functions of an Operating System**
 - **Identify and classify types of Operating Systems (GUI and CLI)**
 - **Compare and contrast GUI and CLI operating systems with examples**
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1. What is an Operating System?

Definition:

An **Operating System (OS)** is a **system software** that **controls and manages all activities of a computer**. It serves as a **link between the user and the computer hardware**.

It allows the computer to **start (boot)**, **manage files**, **run applications**, and **control devices** like printers, keyboards, and storage.

Simple Explanation:

Think of the OS as the **manager of a factory (the computer)**:

- It **supervises every activity**
 - It **controls workers (hardware components)**
 - It **takes instructions from the owner (the user)**
 - It ensures **everything works together smoothly**
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2. Functions of an Operating System

Function	Explanation	Example
1. Resource Management	Allocates CPU time, memory, and storage space to different programs	Ensures one program doesn't use all the memory
2. File Management	Organizes files in folders, allows saving, retrieving, or deleting files	Saves documents to specific locations
3. Device Control	Manages input/output devices like printers, keyboards, etc.	Allows printer or USB connection
4. Security and Access Control	Protects the computer with passwords, firewalls, and permissions	Login screens, admin controls
5. User Interface	Provides a way for the user to interact with the computer	Desktop, icons, command prompt
6. Program Execution	Loads and runs application software	Opens Word, Excel, or games
7. Error Detection and Handling	Detects hardware or software errors and gives messages	Displays "Low Battery" or "Disk Full" alerts

3. Types of Operating Systems Based on Interface

Operating systems can be **classified based on how users interact with them**:

A) Graphical User Interface (GUI)

Definition:

A **GUI (Graphical User Interface)** allows users to interact with the computer by **clicking icons, menus, and buttons**, usually with a **mouse or touchscreen**.

Features of GUI:

- Uses **pictures, icons, and windows**
- Users **click or tap** to open programs
- **Easy to use** for beginners
- Supports **multitasking** (running many programs at once)

Examples of GUI Operating Systems:

GUI OS	Device/Usage
Windows (e.g., Windows 10/11)	Laptops, desktops
macOS	Apple computers
Android	Smartphones, tablets
Ubuntu (Linux with GUI)	Personal computers

B) Command Line Interface (CLI)

Definition:

A **CLI (Command Line Interface)** is an OS that requires users to **type text commands** to perform tasks.

Features of CLI:

- No graphics or icons
 - Only uses the **keyboard**
 - Requires **memorization of commands**
 - **Faster** for experts but **difficult for beginners**
 - Commonly used by **system administrators, programmers, and hackers**
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Examples of CLI Operating Systems:

CLI OS	Usage
MS-DOS (Microsoft Disk Operating System)	Early computers
Unix	Servers, technical tasks
Linux (CLI Mode)	Servers, programming environments

CLI OS	Usage
Command Prompt (CMD)	Part of Windows

4. Differences Between GUI and CLI

Feature	GUI (Graphical User Interface)	CLI (Command Line Interface)
Interaction Method	Uses icons, windows, menus	Uses typed commands
Ease of Use	Easy for beginners	Hard for beginners
Input Device	Uses mouse, touchpad, keyboard	Uses keyboard only
Speed	Slower for some tasks	Faster for experts
Learning Curve	Simple to learn	Requires training
Examples	Windows, macOS, Android	MS-DOS, Unix, Linux CLI

Summary of the Comparison

GUI	CLI
Visual interaction	Text-based interaction
Friendly for all users	Best for advanced users
Slower for batch tasks	Faster for repetitive tasks

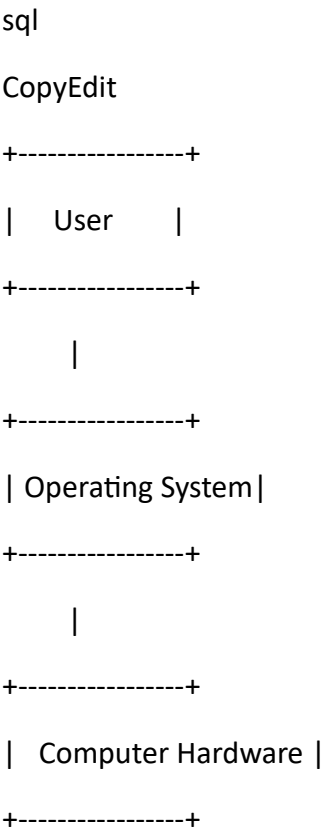
5. Importance of the Operating System

- Controls the **entire computer system**
- Manages **hardware and software resources**
- Provides **security** and **file management**
- Allows users to **run applications easily**
- Makes computing **more efficient and user-friendly**

6. Real-Life Examples of OS Use

Activity	OS Used
Using a phone	Android, iOS
Using a laptop	Windows, macOS, Linux
Browsing the internet	Runs through an OS interface
Managing files	OS handles file storage
Printing documents	OS manages printer drivers

7. Diagram of Operating System Role



8. Summary of Key Points

- The **Operating System (OS)** is essential for running a computer.
- It manages **hardware, software, and user interaction**.
- There are **two main types** of OS interfaces:
 - **GUI (Graphical User Interface)**
 - **CLI (Command Line Interface)**
- **GUI is easy to use, while CLI is faster for experts.**