Operating System

An operating system is software that acts as an intermediary between a user and the hardware of a computer, smartphone, or similar electronic device. It is the backbone of the functionality and utility quality of these devices.

Operating systems vary depending on the device, manufacturer, and user preferences, and understanding Themis crucial for anyone working in or interested in the information technology field.

History of Operating Systems

▪ The history of operating systems dates back to the invention of the first computer, the Z1, in 1936-1938.

▪ However, Z1 was a motor-driven mechanical computer designed by Konrad Zuse which runs without an operating system. The first operating system was not developed until 1956.

▪ In the 1960s, Bell Labs began work on Unix, the first multitasking operating system. It was designed to allow multiple users to run different applications at the same time on a single machine.

▪ In 1977, the Apple series was launched, with Apple DOS 3.3 becoming the first disk operating system. It enables users to save and retrieve data from a hard disk.

▪ In 1981, Microsoft purchased the 86-DOS software from the Seattle company and created its first operating system called DOS. It is a command-line interface operating system that allows users to interact with the computer through text commands.

▪ The most famous Microsoft operating system, Windows, was introduced in 1985 when MS-DOS was coupled with the GUI, a graphics environment. It made it easier for users to interact with the computer through graphical icons and menus.

▪ Over the years, operating systems have undergone significant changes and advancements. Today, we have a variety of operating systems such as Windows, macOS, Linux, Android, and iOS, among others, each with its own features and capabilities.
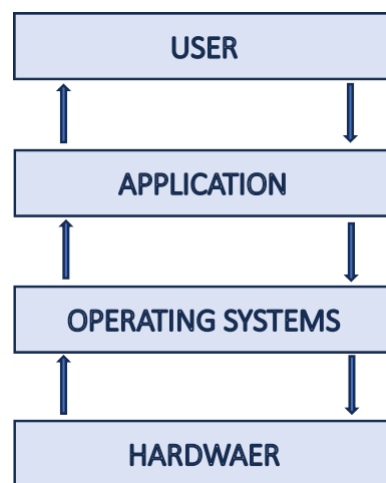
What are Operating Systems?

An operating system (OS) acts as a software interface that enables communication between the user and the device hardware. It allows users to interact with the device and perform desired functions. To manage computer programs and applications, the operating system uses two key components: Kernel, and Shell.

The Kernel

The Kernel is the main internal component that processes data at the hardware level. It handles input-output operations, as well as memory and process management.

The Shell

Shell is the outer layer that facilitates interaction between the user and the OS. The shell communicates with the operating system by accepting input from the user or from shell scripts. A shell script is a collection of system commands stored in a file.

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USER
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APPLICATION
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OPERATING SYSTEMS
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Functions of Operating Systems

An operating system has countless functions such as booting, memory management, data security, device control, and more. In this article, we will discuss each of these functions briefly.

1. Booting the Computer

The process of starting or restarting a computer is called booting. It can be either a cold boot, which occurs when the computer is turned on after being completely turned off, or a warm boot, which involves using the operating system to restart the computer.

2. Performs basic computer tasks

One of the primary functions of an operating system is to manage peripheral devices like mice, keyboards, and printers. Most modern operating systems are plug-and-play, meaning that they can automatically detect and configure devices like printers without any user intervention.

3.Provides a user interface

Another essential feature of an operating system is providing a user interface, which allows users to interact with software. There are two main types of user interfaces: command line and graphical user interfaces (GUIs). Command line interfaces involve users typing specific commands to perform tasks, while GUIs rely on using a mouse to access windows, icons, and menus.

4. Handles system resources

Operating systems also manage system resources such as memory, CPU time, and input/output bandwidth. Programs and input methods are in constant competition for these resources, but the operating system ensures that each application gets the resources it needs to maximize the overall system's functionality.

5. Provides file management

Finally, operating systems provide file management services, which involve organizing and tracking files and directories saved or retrieved from the computer's disk. File management allows users to create, rename, copy, move, and delete files. The operating system keeps track of where files are located on the hard drive using a file system.
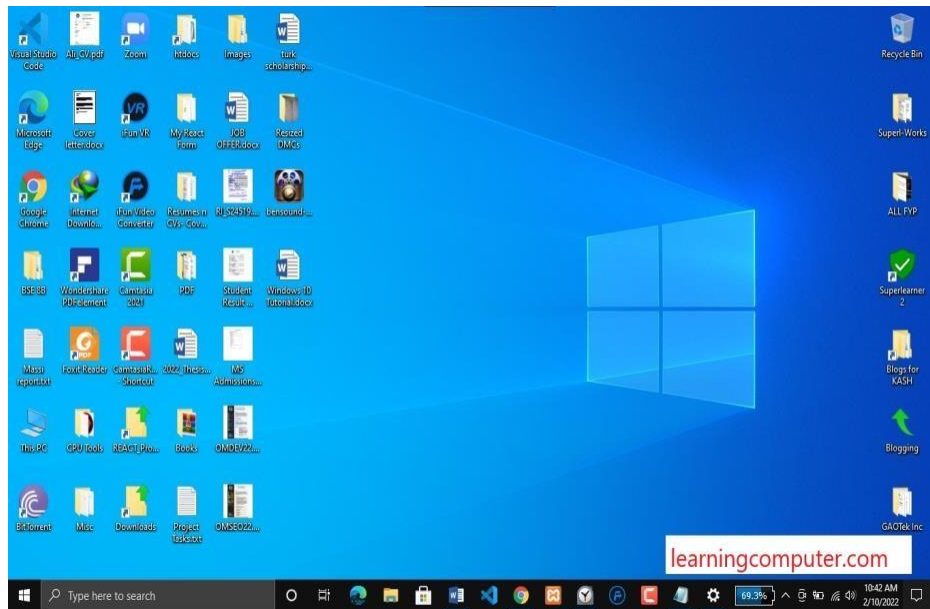
Types of operating systems

Operating systems usually come pre-loaded on any computer you buy. Most people use the operating system that comes with their computer, but it's possible to upgrade or even change operating systems. The three most common operating systems for personal computers are **Microsoft Windows, macOS, and Linux.**

Modern operating systems use a graphical user interface GUI. A GUI lets you use your mouse to click icons, buttons, and menus, and everything is clearly displayed on the screen using a combination of graphics and text.

Each operating system's GUI has a different look and feel, so if you switch to a different operating system it may seem unfamiliar at first. However, modern operating systems are designed to be easy to use, and most of the basic principles are the same.

Microsoft Windows

Microsoft created the Windows operating system in the mid-1980s. There have been many different versions of Windows, but the most recent ones are Windows 10 (released in 2015), Windows 8 (2012), Windows 7 (2009), and Windows Vista (2007). Windows comes pre-loaded on most new PCs, which helps to make it the most popular operating system in the world.

MacOS

macOS (previously called OS X) is a line of operating systems created by Apple. It comes preloaded on all Macintosh computers, or Macs. Some of the specific versions include Mojave (released in 2018), High Sierra (2017), and Sierra (2016).

According to StatCounter Global Stats, macOS users account for less than 10% of global operating systems—much lower than the percentage of Windows users (more than 80%). One reason for this is that Apple computers tend to be more expensive. However, many people do prefer the look and feel of macOS over Windows.

Linux

Linux (pronounced LINN-ux) is a family of open-source operating systems, which means they can be modified and distributed by anyone around the world. This is different from proprietary software like Windows, which can only be modified by the company that owns it. The advantages of Linux are that it is free, and there are many different distributions—or versions—you can choose from like as Ubuntu ,Debian, Gentoo, Fedora, Lubuntu.

According to StatCounter Global Stats, Linux users account for less than 2% of global operating systems. However, most servers run Linux because it's relatively easy to customize.
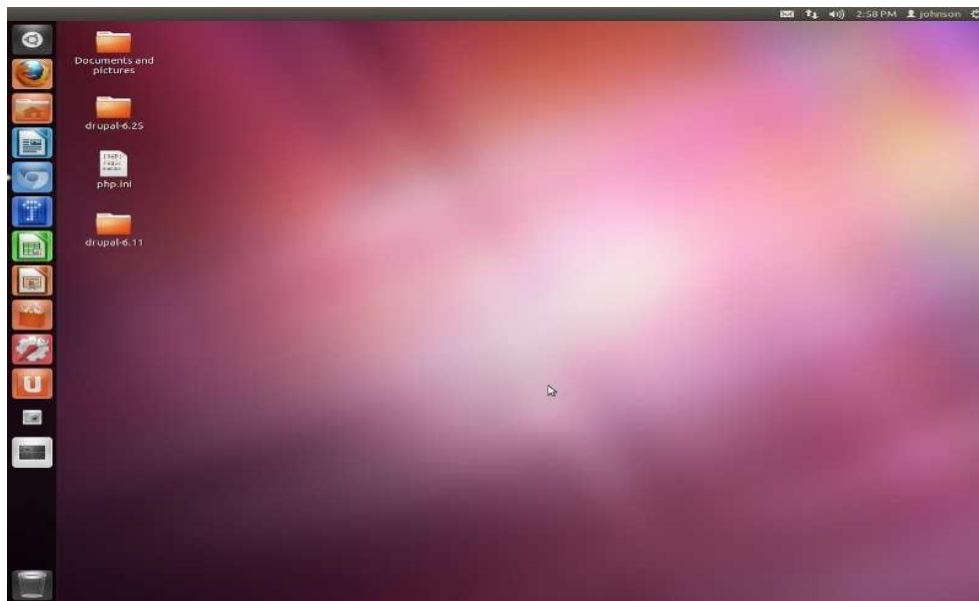
Operating systems for mobile devices

The operating systems we've been talking about so far were designed to run on desktop and laptop computers. Mobile devices such as phones, tablet computers, and MP3 players are different from desktop and laptop computers, so they run operating systems that are designed specifically for mobile devices. Examples of mobile operating systems include Apple iOS and Google Android.

Operating systems for mobile devices generally aren't as fully featured as those made for desktop and laptop computers, and they aren't able to run all of the same software. However, you can still do a lot of things with them, like watch movies, browse the Web, manage your calendar, and play games.

	Microsoft Windows	**MacOS**	**Linux**
Pre-loaded Devices	Microsoft Windows is pre-loaded on all computers except Apple products.	Mac OS is the pre-loaded OS on all Apple Mac computers.	Linux is not pre-loaded on many computers, but is free to download.
Customisability	Minimal changes.	Minimal changes.	Highly customisable as it is open source. Huge collaborative community building a range of applications.
Icon	Windows icon. This is the Start Menu and is located in the bottom left hand corner of the screen it allows you to access your 'Control Panel', 'Computer', programs, folders and more. You can also shut down your computer using this menu.	Apple icon. It is located in the top left hand corner of the screen and it is where you can access your 'System Preferences', 'Software Update', 'About This Mac' and more. You can also shut down your computer using this menu.	Different icons depending on what software interface you are using e.g. Redhat has a redhat symbol. Ubuntu has the Circle of Friends symbol. These symbols are located in the top left hand corner of the screen and it is where you can access all your computer applications.
Search Tool	Magnifying glass located in the Start Menu.	Magnifying glass located in the top right hand corner.	If using Ubuntu, click on the Circle of Friends icon.
Task Bar	Located at the bottom of the screen. It contains shortcuts to applications, the date and time, and more.	Located at the bottom of the screen. It contains shortcuts to applications, files and folders. Referred to as a 'Dock'.	Located on the left hand side of the screen with applications running in a vertical manner. It contains shortcuts to applications, files and folders.
Finding Programs	Start Menu. An application where you can view and organise files and folders.	Finder. An application where you can view and organise files and folders.	Dash. The dashboard of Ubuntu where you can view all applications and files.
Default Browser	Internet Explorer. (Now known as Microsoft Edge for Microsoft Windows 10 version and later)	Safari.	Firefox.