**PT101**

**OPERATING SYSTEM**

* Microsoft
* Apple
* Mac OS
* Linux

d

* Windows Server
* Ubuntu
* Acts as an intermediary between the user of a computer and the computer hardware. The purpose of an operating system is to provide an environment in which a user can execute programs in a convenient and efficient manner.
* An operating system is software that manages the computer hardware. The hardware must provide appropriate mechanisms to ensure the correct operation of the computer system and to prevent user programs from interfering with the proper operation of the system.
* lies in the category of system software. It basically manages all the resources of the computer.
* An operating system acts as an interface between the software and different parts of the computer or the computer hardware.
* The operating system is designed in such a way that it can manage the overall resources and operations of the computer.
* is a collection of software that manages computer hardware resources and provides common services for computer programs.
* **Mainframe 08** - are designed primarily to optimize utilization of hardware.
* **Personal computer (PC)** **operating systems** - support complex games, business applications, and everything in between.
* **Mobile handled operating systems**- are designed to provide an environment in which a user can easily interface with the computer to execute programs.

**WHY USE AN OPERATING SYSTEM?**

* An operating system brings powerful benefits to computer software and software development.
* Without an operating system, every application would need to include its own UI, as well as the comprehensive code needed to handle all low-level functionality of the underlying computer, such as disk storage, network interfaces and so on.
* The system software provides a consistent and repeatable way for applications to interact with the hardware without the applications needing to know any details about the hardware.
* The operating system helps in improving the computer software as well as hardware. Without OS, it became very difficult for any application to be user-friendly.
* provides a user with an interface that makes any application attractive and user-friendly.
* The operating System comes with a large number of device drivers that make OS services reachable to the hardware environment.

**FUNCTIONS OF OPERATING SYSTEM**

An Operating System provides three essential capabilities:

1 It offers a Ul through a CLI or GUI.

2. It launches and manages the application execution.

3. It identifies and exposes system hardware resources to those applications typically, through a standardized API.

**USER INTERFACE LUD**

* Every operating system requires a enabling users and administrators to interact with the OS in order to set up, configure and even troubleshoot the operating system and its underlying hardware.

**TWO TYPES OF UI**

1. **CLI** - or terminal mode window, provides a text-based interface where users rely on the traditional keyboard to enter specific commands, parameters and arguments related to specific tasks.
2. **GUI**- provides a visual interface based on icons and symbols where users rely on gestures delivered by human interface devices, such as touchpads, touchscreens and mouse devices.

**TYPES OF OPERATING SYSTEM AND EXAMPLES**

* **General Purpose Operating System**
* It represents an array of operating systems intended to run a multitude of applications on a broad selection of hardware, enabling a user to run one or
* more applications or tasks simultaneously.
* Ex: Windows, Unix, Linux
* **MOBILE OPERATING SYSTEM**
* Are designed to accommodate the unique needs of mobile computing and communication-centric devices, such as smartphones and tablets.
* Mobile devices typically offer limited computing resources compared to traditional PCs, and the OS must be scaled back in size and complexity in order to minimize its own resource use, while ensuring adequate resources for one or more applications running on the device.

**Example of MOBILE OS**

**1. ANDROID**

- Android Inc. was founded in 2003 by Andy Rubin, Rich Miner, Nick Sears, and Chris White. In 2005, Google acquired Android Inc.,

**2. IOS**

- It was developed by Apple Inc. and was first released in 2007 alongside the first iPhone

**3. Harmony OS**

- Developed by Huawei, HarmonyOS was introduced in 2019 as a response to US trade restrictions. Huawei aimed to create a versatile operating system that could be used across various device types.

**4. WINDOWS PHONE**

- Developed by Microsoft, Windows Mobile was first introduced in 2000, evolving into Windows Phone in 2010

**5. BlackBerry OS**

- BlackBerry OS was developed by Research In Motion (RIM), a Canadian company founded in 1984. BlackBerry OS was designed for smartphones and tablets, focusing on productivity and security

* **EMBEDDED OPERATING SYSTEM**
* Not all computing devices are general purpose. A huge assortment of dedicated devices - including home digital assistants, automated teller machines (ATMs), airplane systems, retail point of sale (POS) terminals and internet of things (IoT) devices.
* **NETWORK OPERATING SYSTEM**
* is another specialized OS intended to facilitate communication between devices operating on a local area network (LAN). A NOS provides the communication stack needed to understand network protocols in order to create, exchange and decompose network packets.
* Ex: Windows Server, Linux Server
* **REAL TIME OPERATING SYSTEM**
* When a computing device must interact with the real world within constant and repeatable time constraints, the device manufacturer may opt to use a real-time operating system (RTOS).
* **Example of REAL TIME OS:**
* An industrial control system may direct the operations of a sprawling factory or power plant. Such a facility will produce signals from myriad sensors and also send signals to operate valves, actuators, motors and countless other devices.

**OBJECTIVES OF OPERATING SYSTEM**

* **Convenient to use**: One of the objectives is to make the computer system more convenient to use in an efficient manner.
* **User Friendly**: To make the computer system more interactive with a more convenient interface for the users.
* **Easy Access**: To provide easy access to users for using resources by acting as an intermediary between the hardware and its users.
* **Management of Resources**: For managing the resources of a computer in a better and faster way.
* **Controls and Monitoring**: By keeping track of who is using which resource, granting resource requests, and mediating conflicting requests from different programs and users.
* **Fair Sharing of Resources**: Providing efficient and fair sharing of resources between the users and programs.