**Operating system (OS)**

**What is Operating system (OS)?**

* An Operating System or OS is the program which provides an environment to run other applications.
* It is a collection of software that manages computer hardware resources and provides common services for computer programs.
* OS interacts with hardware which means it acts as mediator between hardware and user interface.
* It manages hardware, software and memory resources.
* Examples of Operating Systems are Windows, Linux, Mac OS, Ubuntu etc.

**Why we required Operating System?**

* Operating system plays a crucial role in computer system, it allows us to interact with computers without knowing how to speak in computer's language.
* It helps in improving the computer software as well as hardware.
* It works as a communication channel between system hardware and system software.
* It acts as interpreter or translator as it translates human readable (high level) language into machine level (binary or low level in 0's or 1's format) language.

**Types of Operating System**

**1) Desktop OS:**

* Operates in Desktop Machines.
* Used for general purpose tasks such as making presentation, gaming etc.
* Serve for single user at time.
* Examples- Ubuntu-desktop, Windows 10,8, Kali Linux

**2) Server OS:**

* Operates in Server Machines.
* Used for hosting purpose.
* Multiple clients can handle at same time.
* Serves multiple user devices.
* Examples- Windows 1.3 Server, 1.9 Server, Linux, Ubuntu, Centos, Fedora

**Server**

* A server is a computer or system that provides resources, data, services, or programs to other computers, known as clients, over a network.

**Functions of the Operating System**

* **Resource Management:** The operating system manages and allocates memory, CPU time, and other hardware resources among the various programs and processes running on the computer.
* **Process Management:** The operating system is responsible for starting, stopping, and managing processes and programs. It also controls the scheduling of processes and allocates resources to them.
* **Memory Management:** The operating system manages the computer’s primary memory and provides mechanisms for optimizing memory usage.
* **Security:** The operating system provides a secure environment for the user, applications, and data by implementing security policies and mechanisms such as access controls and encryption.
* **Job Accounting:** It keeps track of time and resources used by various jobs or users.
* **File Management:** The operating system is responsible for organizing and managing the file system, including the creation, deletion, and manipulation of files and directories.
* **User Interface:** The operating system provides a user interface that enables users to interact with the computer system. This can be a Graphical User Interface (GUI), a Command-Line Interface (CLI), or a combination of both.

**Development of OS**

* Single user and single tasking at same time.
* Single user and multiple tasking at same time.
* Multiple user and multiple tasking at same time.