**Purpose of an operating system**

With rapidly changing requirements, computer systems are also evolving to cater to these changes. Hardware is becoming all the more robust and is increasingly being able to perform complex functions. However, the equipment is nothing but firmly designed machinery. It is the software, namely the Operating System, that makes this machinery work.

**Basic Concept of Operating System**

* An operating system is the component of the computer, which makes all the other components function.
* It is a program that acts as an interface between the user and the hardware, i.e., the computer resources.
* Components of a computer:
  + The Hardware
  + The Operating System
  + The Application Program Routines (for instance, linkers, compilers, database management system, and such)
  + Human-ware (Users)

While the hardware provides the necessary computing resources, the application program routines define the method in which the funds are used to solve the user's instructions. The operating system controls, as well as coordinates the use of hardware and application programs.

**Role of the Operating System**

It provides certain services to programs as well as to the users of these programs. Some common functions are:

* Execution of the program
* Handling of the input and output operations
* File system manipulation
* Error detection as well as error handling
* Resource allocation
* Accounting
* Information and resource protection
* Proving the user interface

**Parts of an Operating System**

An operating system has two components, namely kernel, and shell. The core is responsible for handling and interacting with the hardware while the round deals with interacting with the user. The shell interprets the commands from the user and according to takes actions. Shell also provides user interfaces.

**Need for Operating System**

As we discussed earlier, the hardware is nothing but finely designed machinery. A computer is just a machine until it has its operating system telling it what it needs to do. The user of the laptop passes his/her order to the operating system, which then decides how to execute the order and carries it out.

The primary goal of the operating system is to make the entire system easy to use, and its secondary goal is to utilize computer hardware most efficiently. Thus, to summarize, an operating system acts as an interface between the computer resources and the user to do the following:

* Provide convenient access to the hardware: By giving the facility to the user to interact with the system in their language while providing the best user-friendliness features.
* Enhance the efficiency of the system: By managing various resources collectively, including the memory and CPU, among others, thereby giving optimal performance.
* Providing security of the system: The system includes its programs, applications, hardware, and data. The operating system has numerous authentication and verification protocols in place to maintain the security and privacy of the system and its contents.
* Emulate the features not available in the hardware: These include providing the impression of the presence of a feature that is not physically present in the system — for instance, having more memory, i.e., virtual memory.

Thus, to summarize, the operating system is required to carry out processor management, memory management, file management, device management, and providing a user interface.