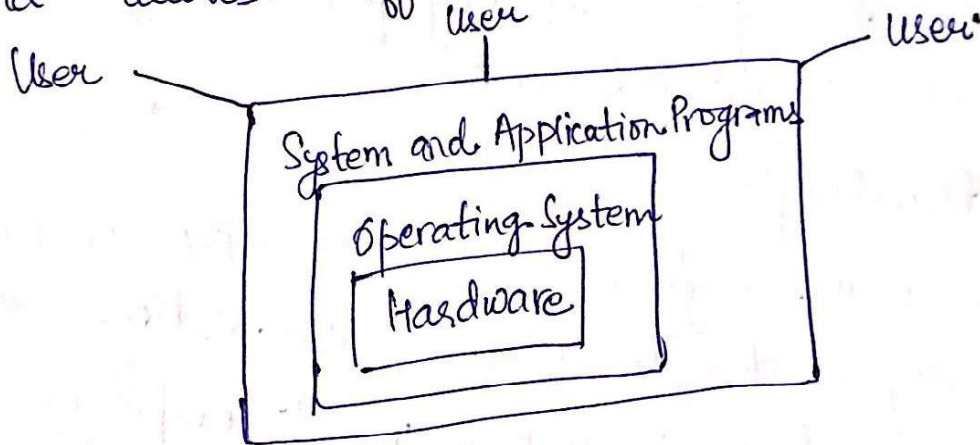


Basics of Operating Systems

Definition of OS It is a software or a program that acts as an interface between a user (Applications) and the Computer Hardware.

It allows the computer system to be used more conveniently and allows effective resource utilization.



Users: People, other computers, machines, etc.

Application Programs: Compilers, Videogames, web-browsers

System Programs: - Shells, editors, Compilers.

Hardware: CPU, Disk, Memory, I/O Devices.

Services of OS

① Program Execution or Process Management:

OS loads a program into memory, executes the program, handles program's execution and provides a mechanism for process synchronization.

② I/O operation

An OS manages the communication b/w users and device drivers. I/O operation means R/W operation.

with any files or specific I/O device. OS provides access to required I/O device when reqd.

③ File System manipulation:

File represents a collection of related information. OS gives the permission to program for operation on a file. The permission may vary from read-only, read-write, denied and so on.

④ Error Handling:-

Errors can occur anytime anywhere in CPU or in memory. OS constantly checks for possible errors & takes an appropriate action to ensure correct computing.

⑤ Protection: Considering a computer system having multiple resources and concurrent execution of multiple processes, various processes must be protected from each other's activities.

Types of Operating Systems

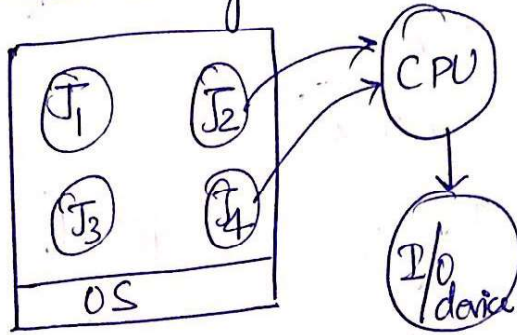
① Uniprogramming OS:- This OS allows only one user process to reside into Main Memory.

It gives decreased CPU utilization.



Main Memory

2. Multi-programming OS:- This OS allows multiple processes to reside into main memory. at the same time and CPU is multiplexed among them to increase CPU utilization.



The OS picks and executes one of job in memory. When this job is in execution needs an I/O operation to complete. Instead of waiting for job to complete I/O, it switches to subset of jobs waiting for CPU. It forms the basis of Scheduling of processes.

Types of Multi-programming OS:-

① Non-preemptive A running process cannot leave the CPU only with its own wish.

② Preemptive: Because of any external reason, a running process can be taken out of CPU forcefully.

③ Multi-Tasking OS:- It is a logical extension of multi-programming. Multiple jobs are executed by CPU. switching between them in a round-robin fashion and switching is so fast that it seems to user that all processes are running in parallel.

