

Operating System :- Operating system is a system software.

It works as an interface between user and hardware.

→ It provides convenience to the users.

* Throughput :-

→ No. of task executed per unit time.

→ Linux is most used in throughput.

Functionalities of OS

- ① Resource Management (used CPU scheduling)
- ② Process Management (used CPU scheduling)
- ③ Storage Management (HD → file system).
- ④ Memory management (RAM).
- ⑤ Security and privacy.

Types of operating systems

- ① BATCH OPERATING SYSTEM
- ② Multi Programmed OS
- ③ Multitasking OS.
- ④ Real time OS
- ⑤ Distributed OS
- ⑥ Clustered OS
- ⑦ Embedded OS

* Multiprogramming OS :-

- In multiprogramming, it is generally non-preemptive.
- CPU should not be Idle.

* Multi-tasking / time sharing OS :-

- In multi-tasking, it is generally preemptive.
- It is also called time sharing.

Multiprogramming

features

Basic It allows multiple programs to utilize the CPU simultaneously.

Multi-tasking

A supplementary of the multiprogramming system also allows for user interaction.

Mechanism. Based on the context switching mechanism.

Based on the time-sharing mechanism.

Objective. It is useful for reducing/decreasing CPU idle time and increasing throughput as much as possible.

It is useful for running multiple processes at the same time, effectively increasing CPU and system throughput.

Execution. When one job or process completes its execution or switches to an I/O in a multiprogrammed system, the system momentarily suspends that process. It selects another process from the process scheduling pool (waiting queue) to run.

In a multiprocessing system, multiple processes can operate simultaneously by allocating the CPU for a fixed amount of time.

CPU switching. In a multiuser environment, the CPU switches between programs/processes quickly.

In a single-user environment, the CPU switches between the processes of various programs.

Timing. It takes maximum time to execute the process.

It takes minimum time to execute the process.

Real Time O.S.

- Hard → Time constraints
→ missile system (eg).
- NO delays
- soft → based on application
→ NO critical situation.
- Time matters a lot

Distributed O.S.

- processing environment is distributed.

clustered O.S.

- They are connected through the local network.
- Increased processing power.
- Load balancing is possible.
- computational power is increased.

Embedded operating system

- Embedded O.S. are those which works on fixed functionalities.
- e.g. microwaves, A.C., washing machines, etc.
- changes can't be made.
- System functionalities cannot be enhanced.