***What is a process?***

A computer program that is being run by one or more threads is referred to as a process in the context of computing. Both the program's activity and code are contained in it. An operating system (OS) may allow a process to consist of several threads of execution that carry out instructions simultaneously.

***What is CPU Scheduling?:***

It is the procedure that involves choosing which process will use the CPU to execute while another is put on hold. CPU scheduling's primary responsibility is to ensure that, if the CPU is idle, the operating system at least chooses one of the tasks that are waiting to be executed from the ready queue. The CPU scheduler will handle the selection procedure. It chooses a process from among those that are available for execution in memory. It ensures that CPU utilization is maximized so that the computer is more productive.

*Process Scheduling:* is the procedure by which the process management chooses a different process based on a predetermined strategy and removes an active process from the CPU.

There is three types of process schedulers: Long term or Job Scheduler

Short term or CPU Scheduler

Medium-term Scheduler

***What is the need for CPU scheduling algorithm?***

The process of choosing which process will use the CPU while another is suspended is known as CPU scheduling. The primary purpose of CPU scheduling is to guarantee that the operating system has at least chosen a process from the ready-to-use line whenever the CPU is idle.

If most operating systems change their status from performance to waiting then there may always be a chance of failure in the system. So in order to minimize this excess, the OS needs to schedule tasks in order to make full use of the CPU and avoid the possibility of deadlock.

**CPU Scheduling Criteria:**

A diagram of a schedule

Description automatically generated

**Maximize**

***CPU utilization:*** The primary function for which the operating system must ensure that the CPU is kept as busy as feasible is CPU usage. It can have a value between 0% and 100%. On the other hand, it might vary from 40 percent for low-level systems to 90 percent for high-level systems in the RTOS.

***Throughput:*** is the number of processes that complete their execution in a given amount of time. Thus, work is done when the CPU is occupied with carrying out the operation; the amount of work finished in a certain amount of time is referred to as throughput.

**Minimize**

**Waiting time:**The waiting time is the amount of time a specific process needs to wait in the ready queue.

**Response time:**It is the amount of time in which the request was submitted until the first response is produced.

**Turnaround Time:**Turnaround time is the length of time needed to complete a particular task. It is the computation of the total amount of time spent in line, waiting to enter memory, and using the CPU to execute. The turnaround time is the amount of time that passes between the process submission time and the completion time.

***What are the different terminologies to take care of in any CPU Scheduling algorithm?***

Arrival Time: Time at which the process arrives in the ready queue.

Completion Time: Time at which process completes its execution.

Burst Time: Time required by a process for CPU execution.

Turn Around Time: Time Difference between completion time and arrival time.

*Turn Around Time = Completion Time  –  Arrival Time*

*Waiting Time = Turn Around Time  –  Burst Time*

**Things to take care while designing a CPU Scheduling algorithm?**

The structures of various CPU scheduling algorithms vary, and a number of factors influence the decision when selecting an algorithm. There are numerous requirements to compare CPU scheduling algorithms.

**<https://www.geeksforgeeks.org/cpu-scheduling-in-operating-systems/>**

[**https://www.turing.com/kb/different-types-of-non-preemptive-cpu-scheduling-algorithms**](https://www.turing.com/kb/different-types-of-non-preemptive-cpu-scheduling-algorithms)

[**https://www.guru99.com/cpu-scheduling-algorithms.html**](https://www.guru99.com/cpu-scheduling-algorithms.html)