Reading Assignment - 5

Abhinav Saini — 19114001

1 Various Scheduling Algorithms

1.1 First Come First Serve Method

It is the easiest and simplest CPU algorithm. It simply executes queued processes in order of their arrival. It works on simple basis of FIFO.

1.1.1 Characteristics

- It supports non-preemptive and pre-emptive scheduling algorithm.
- Jobs are always executed on a first-come, first-serve basis.
- It is easy to implement and use.
- This method is poor in performance, and the general wait time is quite high.

1.2 Shortest-Job-Next (SJN) Scheduling

It is also known as SJF preemptive scheduling. In this method, the process will be allocated to the task, which is closest to its completion. This method prevents a newer ready state process from holding the completion of an older process.

1.2.1 Characteristics

- This method is mostly applied in batch environments where short jobs are required to be given preference.
- This is not an ideal method to implement it in a shared system where the required CPU time is unknown.
- Associate with each process as the length of its next CPU burst. So that operating system uses these lengths, which helps to schedule the process with the shortest possible time.

1.3 Priority Based Scheduling

Priority scheduling is a method of scheduling processes based on priority. In this method, the scheduler selects the tasks to work as per the priority.

Priority scheduling also helps OS to involve priority assignments. The processes with higher priority should be carried out first, whereas jobs with equal priorities are carried out on a round-robin or FCFS basis. Priority can be decided based on memory requirements, time requirements, etc.

1.4 Round-Robin Scheduling

Round robin is the oldest, simplest scheduling algorithm. The name of this algorithm comes from the round-robin principle, where each person gets an equal share of something in turn. It is mostly used for scheduling algorithms in multitasking. This algorithm method helps for starvation free execution of processes.

1.4.1 Characteristics

- Round robin is a hybrid model which is clock-driven
- Time slice should be minimum, which is assigned for a specific task to be processed. However, it may vary for different processes.
- It is a real time system which responds to the event within a specific time limit.

1.5 Multiple-Level Queues Scheduling

This algorithm separates the ready queue into various separate queues. In this method, processes are assigned to a queue based on a specific property of the process, like the process priority, size of the memory, etc.

However, this is not an independent scheduling OS algorithm as it needs to use other types of algorithms in order to schedule the jobs.

1.5.1 Characteristics

- Multiple queues should be maintained for processes with some characteristics.
- Every queue may have its separate scheduling algorithms.
- Priorities are given for each queue.

1.6 General purpose OS will use priority based, round robin, preemptive Real Time OS will use priority, no preemption.

2 Windows

Round-robin technique with a Multi-level feedback queue

3 Linux

Preemptive priority and biased time slicing

4 Unix

Round robin with Priority queue