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OPERATING SYSTEM

ASSIGNMENT-1

Q1. Explain advantages and disadvantages of all the scheduling algorithms studied.

Ans. The following are the benefits and drawbacks of each scheduling algorithm:

1) First Come First Serve (FCFS) The simplest scheduling method that arranges processes based on their arrival timings.

Advantages:

1) It is straightforward and simple to grasp.

Disadvantages:

1) The procedure with the shortest execution time suffers, i.e., the waiting time is frequently fairly long.

2) Prefers CPU-bound processes over I/O-bound processes.

3) In this case, the first process will receive the CPU first, and subsequent processes will receive the CPU only after the current process has completed its execution. If the initial process has a long burst time and the subsequent processes have a short burst time, the processes will have to wait longer than necessary, resulting in a longer average waiting time, i.e., the Convey effect.

4) This effect results in lower CPU and device utilization.

5) The FCFS method is especially problematic for time-sharing systems, because it is critical that each user receive a piece of the CPU at regular intervals.

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2. Shortest Job First (SJF) Processes with the least burst time are prioritised.

Advantages:

1) The shortest jobs are preferred.

2) It is provably optimum in the sense that it provides the shortest average waiting time for a given collection of processes.

Disadvantages:

1) SJF may cause hunger if shorter processes continue to be produced. Aging solves this difficulty.

2) It cannot be done at the short-term CPU scheduling level.

3. Round Robin (RR) In a cyclic manner, each process is allotted a set time.

Advantages:

1) Each process receives an equal amount of the CPU.

2) Because RR is cyclic, there is no famine.

Disadvantages:

1) Setting the quantum too short adds overhead and reduces CPU efficiency, while setting it too long may result in poor responsiveness to short tasks.

2) The average waiting time under the RR policy is frequently lengthy.

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4. Priority Bases (PB)Processes are planned according to their priorities under this scheduling, thus the highest priority process is scheduled first. When the priorities of two processes coincide, scheduling is possible.

Advantages:

1) This gives an excellent framework for clearly defining the relative significance of each process

based on the arrival time

Disadvantages:

1) If high priority operations consume a large amount of CPU time, lower priority activities may suffer and be delayed forever. A condition in which a procedure is never completed.

5. Multilevel Queue Scheduling (MQS)Processes are assigned to one of several queues based on their priority. In general, high-priority processes are put at the head of the queue.

Advantages:

1) It is feasible to use distinct scheduling for different types of processes.

- *FCFS System Process*
- *SJF Interactive Process*
- *RR Batch Process*
- *PB Student Process*

Disadvantages:

1) The lowest level process is threatened by hunger.

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6. Multilevel Feedback Queue Scheduling (MFQS) It enables the process to switch across queues. The objective is to classify processes based on the characteristics of their CPU bursts. If a process consumes too much CPU time, it is terminated. relegated to a lower-priority queue

Advantages:

1) Minimal scheduling overhead.

2) Allows for ageing, resulting in no starving.

Disadvantages:

1) It is not adaptable.

2) It also necessitates some method of picking values for all of the parameters in order to design the ideal scheduler, making it the most difficult.