Data Structures and its Applications

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Queues – Implementation of CPU scheduler using Queue

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Different Scheduling Algorithms:

First Come First Serve CPU Scheduling:

- Simplest scheduling algorithm that schedules according to arrival times of processes.
- First come first serve scheduling algorithm states that the process that requests the CPU first is allocated the CPU.
- It is implemented by using the simple queue. When a process enters the ready queue, its PCB is linked onto the rear of the queue.
- When the CPU is free, it is allocated to the process at the front of the queue.
- The running process is then removed from the queue.

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Shortest Job First(Preemptive):

- In Preemptive Shortest Job First Scheduling, jobs are put into the ready queue as they arrive
- As a process with short burst time arrives, the existing process is preempted or removed from execution, and the shorter job is executed first

Shortest Job First(Non-Preemptive):

- In Non-Preemptive Shortest Job First, a process which has the shortest burst time is scheduled first.
- If two processes have the same bust time then FCFS is used to break the tie

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Longest Job First(Preemptive):

It is similar to an Shortest Job First scheduling(SJF) algorithm.

In this scheduling algorithm, priority is given to the process having the largest burst time remaining.

Longest Job First(Non-Preemptive):

- It is similar to an SJF scheduling algorithm. But, in this scheduling algorithm, priority is given to the process having the longest burst time.
- This is non-preemptive in nature i.e., when any process starts executing, can’t be interrupted before complete execution.

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Round Robin Scheduling:

- To implement Round Robin scheduling, The processes are kept in the queue of processes.
- New processes are added to the rear of the simple queue. The CPU scheduler picks the first process from the ready queue, sets a timer to interrupt after 1-time quantum, and dispatches the process.
- The process may have a CPU burst of less than 1-time quantum. In this case, the process itself will release the CPU voluntarily. The scheduler will then proceed to the next process in the ready queue.
- Otherwise, if the CPU burst of the currently running process is longer than 1-time quantum, the timer will go off and will cause an interrupt to the operating system.
- A context switch will be executed, and the process is put at the rear of the ready queue. The CPU scheduler will then select the next process in the ready queue.

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Premptive Priority Based Scheduling:

- In Preemptive Priority Scheduling, at the time of arrival of a process in the ready queue, its priority is compared with the priority of the other processes present in the ready queue as well as with the one which is being executed by the CPU at that point of time.

- The One with the highest priority among all the available processes will be given the CPU next.

Priority Based(Non-Preemptive) Scheduling:

- In the Non Preemptive Priority scheduling, The Processes are scheduled according to the priority number assigned to them.

- Once the process gets scheduled, it will run till the completion

THANK YOU

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