**Assignment**

Experiment Name : Round Robin Scheduling Algorithm

**Course Title: Operating System Lab**

**Course Code : CSE 328**

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**Introduction**

The Round Robin (RR) scheduling algorithm is one of the most extensively used algorithms for manner scheduling in running structures. It is a preemptive scheduling technique in which every manner is assigned a set time slice (quantum) all through which it is able to execute. If a technique does no longer end inside its assigned time slice, it's miles preempted and located at the quit of the ready queue. The next manner within the queue is then given the CPU for its time slice. This cycle repeats till all tactics are finished. The Round Robin scheduling set of rules is thought for its equity, as every manner is given same interest and assets.

**Key Features:**

* Time Quantum: The constant time slice each manner gets to execute earlier than being preempted.
* Fairness: Each system inside the equipped queue receives the CPU in a circular fashion.
* Preemption: If a procedure does not whole within its time quantum, it's miles preempted and placed lower back inside the ready queue.

**Objective**

The objective of this experiment is to enforce the Round Robin scheduling algorithm, simulate its behavior on a fixed of tactics, and calculate performance metrics which include average ready time and average turnaround time.

**Procedure**

Input Data:

The user is requested to input the range of processes.

* For each manner, the person inputs:
* The method call (e.G., P1, P2, P3).
* The burst time (execution time required for the procedure).
* The arrival time (the time when the technique enters the machine).
* The consumer also inputs the time quantum, that's the constant time slice allotted to every technique.

Round Robin Algorithm Execution:

* Initialize the time as 0.
* Use a queue to manipulate the strategies. At the begin of the simulation, all techniques which have arrived are introduced to the queue.
* Each method is assigned a time quantum to execute. If a procedure completes inside its time quantum, it's far removed from the queue; if now not, it's far preempted and placed on the end of the queue.
* This keeps till all strategies are finished.
* Track the waiting time, turnaround time, and generate a Gantt chart displaying the scheduling order.

Performance Metrics Calculation:

* Waiting Time: The quantity of time a procedure spends inside the geared up queue ready to execute.
* Turnaround Time: The overall time taken for a system to complete, from its arrival time to its crowning glory time.

**Code:**

**Output:**

**Conclusion**

In this test, we successfully implemented and simulated the Round Robin (RR) scheduling algorithm. The consequences established the algorithm’s truthful distribution of CPU time to all approaches, ensuring that each method turned into given an identical opportunity to execute.

The performance metrics, inclusive of common ready time and average turnaround time, showed that the RR set of rules gives exact fairness however might not usually be the most green in phrases of minimizing ready or turnaround instances, particularly if the time quantum isn't always optimally chosen. The Gantt chart provided a visual representation of the scheduling order, helping to understand the preemption and rotation behavior of the Round Robin algorithm.

In precis, the Round Robin set of rules is particularly powerful in environments in which fairness and time-sharing are vital, together with in multi-user structures. However, its performance may be impacted by way of an beside the point time quantum, and further optimization may be explored by adjusting the time quantum or combining it with different scheduling techniques.

Github link :