

Lab 3: Scheduling Algorithms

Total points: 100 points

Scheduling Algorithms (Programming Project P29)

This project involves implementing several different process scheduling algorithms. The scheduler will be assigned a predefined set of tasks and will schedule the tasks based on the selected scheduling algorithm. Each task is assigned a priority and CPU burst. The following scheduling algorithms will be implemented:

- First-come, first-served (FCFS), which schedules tasks in the order in which they request the CPU. **(20 points)**
- Shortest-job-first (SJF), which schedules tasks in order of the length of the tasks' next CPU burst. **(20 points)**
- Priority scheduling, which schedules tasks based on priority. **(20 points)**
- Round-robin (RR) scheduling, where each task is run for a time quantum (or for the remainder of its CPU burst). **(20 points)**
- Priority with round-robin, which schedules tasks in order of priority and uses round-robin scheduling for tasks with equal priority. **(20 points)**

Priorities range from 1 to 10, **where a lower numeric value indicates a higher relative priority**. For round-robin scheduling, the length of a time quantum is 10 milliseconds.

The schedule of tasks has the form [task name], [priority], [CPU burst], with the following example format:

T1, 4, 20

T2, 2, 25

T3, 3, 25

T4, 3, 15

T5, 10, 10

Thus, task T1 has priority 4 and a CPU burst of 20 milliseconds, and so forth. It is assumed that all tasks arrive at the same time, so your scheduler algorithms do not have to support higher-priority processes preempting processes with lower priorities.

File Schedule.txt:

T1, 4, 20

T2, 3, 25

T3, 3, 25

T4, 5, 15

T5, 5, 20

T6, 1, 10

T7, 3, 30

T8, 10, 25

Algorithm: FCFS

0 : T1 - Pri: 4 - Burst: 20 - Duration: 20
20 : T2 - Pri: 3 - Burst: 25 - Duration: 25
45 : T3 - Pri: 3 - Burst: 25 - Duration: 25
70 : T4 - Pri: 5 - Burst: 15 - Duration: 15
85 : T5 - Pri: 5 - Burst: 20 - Duration: 20
105 : T6 - Pri: 1 - Burst: 10 - Duration: 10
115 : T7 - Pri: 3 - Burst: 30 - Duration: 30
145 : T8 - Pri: 10 - Burst: 25 - Duration: 25