CS431 Operating Systems

Project

(100 points)

Due Date: 7/19

The purpose of this project is to write a java program that simulates the CPU Scheduler (also known as Short-Term Scheduler) of an operating system.

The program implements the following CPU scheduling algorithms.

1. First-Come-First-Serve (FCFS)
2. Shortest-Job-First (SJF)
3. Round-Robin with time slice = 2 (RR-2)
4. Round-Robin with time slice = 5 (RR-5)

The program will read process burst times from a file (job.txt) - this file will be provided by the instructor.

A sample input file of four jobs is given as follows (burst time in ms).:

```
[Begin of job.txt]
Job1
5
Job2
3
Job3
8
Job4
6
[End of job.txt]
```

Note: You can assume that
(1) there are no more than 30 jobs in the input file (job.txt).
(2) processes arrive in the order they are read from the file for FCFS, RR-2 and RR-5.
(3) all jobs arrive at time 0 for SJF.

Compare the average completion times of all jobs for each scheduling algorithm.
Output the details of each algorithm's execution. You need to show which jobs are selected at what
times as well as their starting and stopping burst values. You can choose your display format, but it is recommended that you display the results in terms of a Gantt chart.

Turn in:

(1) Soft copy of the program (using Blackboard)
(2) A printout of the program file with proper documentation and the test runs using the given input files
from the instructor.
(You can download test cases from the class web)
(3) A report (at least two pages) of this programming assignment including:
- software and hardware tools you used
- strength and weakness of your program
- do you prefer to read Gantt chart as an output of a processor schedule? or you like the other methods such as tables? explain why.
- if you need to simulate the whole operating system (instead of just the CPU Scheduler here), explain how you can modify your program to do that.