

CS314 Operating System

Spring 2024

Exercise Questions on January 25th, 2024

EXERCISE #1

For the following processes, show the results of the processor scheduling using FCFS, RR, SJF, and SRTF.

Processes	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

EXERCISE #2

An I/O-bound process is one that, if run alone, would spend more time waiting for I/O operations than using the processor. A processor-bound process is the opposite.

Q1: Given the two processes, one I/O-bound and one process-bound, which should be given a higher priority by a short-term scheduler?

Q2: Justify your choice.

Note: Your solution will be graded based on how well you justify your choice. Selecting the correct choice (I/O-bound or processor-bound process) account for only 10% of the credit and the rest of 90% credit comes from your justification. The grading your justification will focus on the idea(s) you emphasize and clarity in your explanation (i.e., “nothing wrong” in your explanation will not earn much credit without adequate emphasis on the correct idea(s) and clarity in your reasoning).

EXERCISE #3

The term, “embedded systems”, mean computer systems that are included in a part of some hardware appliances or electric systems, such as factory automation and automated air conditioners. For handling emergency events in such embedded systems, which of preemptive and non-preemptive scheduling should be used to guarantee the timeliness of performing such emergency processes? Justify your solution.

EXERCISE #4

Which performance factor(s) will FCFS (a.k.a., “FIFO”) process scheduling algorithm optimize (select all that apply)? Justify your choice(s).

- (a) Throughput
- (b) Response time
- (c) Turnaround time
- (d) Fairness

EXERCISE #5

Which performance factor(s) will Round-Robin process scheduling algorithm optimize (select all that apply)? Justify your choice(s).

- (a) Throughput
- (b) Response time
- (c) Turnaround time
- (d) Fairness

EXERCISE #6

Which performance factor(s) will SJF process scheduling algorithm optimize (select all that apply)? Justify your choice(s).

- (a) Throughput
- (b) Response time
- (c) Turnaround time
- (d) Fairness