Process Scheduling

Week 4 Exercise

Instructions:

1. Create Gantt charts of the process scheduling.
2. Compute average waiting time and turnaround time, *assuming that context switching time is insignificant*.
3. Discuss and answer questions.

Group Members:

1. _____ ID: _____
2. _____ ID: _____

Part 1: The Basics

Process	Arrival Time	CPU Time	Priority
A	0	20	2
B	2	5	1
C	7	3	4
D	8	7	3
E	9	4	1

Gantt Chart:

Please create a new page for this. You can draw this using paper and pen, an iPad, or an excel sheet (see example in MyCourse).

Result:

P	Turnaround Time					Wait Time				
	FCFS	SJF	STCF	Priority	RR(2)	FCFS	SJF	STCF	Priority	RR(2)
A										
B										
C										
D										
E										
AVG										

Questions:

1. In this situation, what algorithm does achieve the best average waiting time? Do you think this is always the case? What is the disadvantage of this algorithm?

2. For the situations below, if your goal is to optimize responsiveness for a user, which algorithm will you choose? Give a reason why it is better than other algorithms.

   (a) Assume that all processes interact with the user.

   (b) Assume that only processes C and D interact with the user (You may change the priority.).

   (c) [Optional] If you choose different algorithms on (a) and (b), propose a new one that gets the best of both of them.

3. Select a suitable algorithm for each situation.

   (a) _____: Fair shopping cart checkout (the processes are shopping carts).

   (b) _____: Context switching takes very long time.

   (c) _____: Best waiting time when the process remaining time is not available.

Part 2: Multilevel Feedback Queue

Process	Arrival Time	CPU Time	I/O Time
A	0	10	None
B	0	8	None
C	0	8	After this process runs (CPU) for 3s, it has to run the I/O task for 1s. Then, for every 1 CPU time, it has 1s of I/O time.

- RR has a quantum time of 2
- MLFQ have 2 queues with quantum time of 2 and 4
- The first queue MLFQ has a time limit of 2 for each process
- MLFQ priority boost every 6 seconds

Gantt Chart:

Please create a new page for this.

Result:

Process	Turnaround Time		Wait Time	
	RR(2)	MLFQ	RR(2)	MLFQ
A				
B				
C				
Average				

Questions:

4. Compared to RR, what kind of processes that MLFQ prefers? Do you think it is fair?