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CMSC 421 Section 1
HW2P1

- (a) Exercise 5.12 from OSC, page 220. [20 points]

FCFS(avg wait time: 9.6)

Process	Arrival	Burst	Finish	Priority	Wait	Turnaround
P1	0	10	10	3	0	10
P2	0	1	11	1	10	11
P3	0	2	13	3	11	13
P4	0	1	14	4	13	14
P5	0	5	19	2	14	19

SJF(avg wait time: 3.2)

Process	Arrival	Burst	Finish	Priority	Wait	Turnaround
P1	0	10	19	3	9	19
P2	0	1	1	1	0	1
P3	0	2	4	3	2	4
P4	0	1	2	4	1	2
P5	0	5	9	2	4	9

Nonpreemptive priority(avg wait time: 8.2)

Process	Arrival	Burst	Finish	Priority	Wait	Turnaround
P1	0	10	16	3	6	16
P2	0	1	1	1	0	1
P3	0	2	18	3	16	18
P4	0	1	19	4	18	19
P5	0	5	6	2	1	6

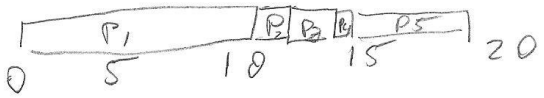
Round Robin(quantum = 1) (avg wait time: 5.4)

Process	Arrival	Burst	Finish	Priority	Wait	Turnaround
P1	0	10	19	3	9	19
P2	0	1	2	1	1	2
P3	0	2	7	3	5	7
P4	0	1	4	4	3	4
P5	0	5	14	2	9	14

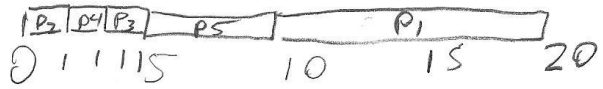
A) On Image
B) On tables above
C) On tables above
D) Shortest job first resulted in the min avg waiting time.

A

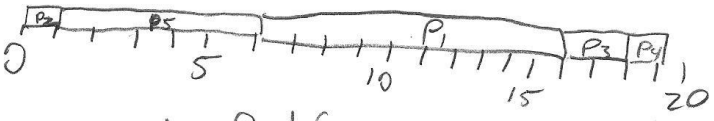
FCFS



SJF



Nonpreemptive Priority



Round Robin

- (b) Exercise 5.15 from OSC, page 221. [10 points]

Consider a system running ten I/O-bound tasks and one CPU-bound task. Assume that the I/O-bound tasks issue an I/O operation once for every milisecond of CPU computing and that each I/O operation takes 10 miliseconds to complete. Also, assume that the context-switching overhead is 0.1 milisecond and that all processes are long-running tasks. Descrie the CPU utilization for a round-robin scheduler when:

a) The time quantum is 1 milisecond

   With ten I/O bound tasks and one cpu-bound task. Assuming 1 milisecond of CPU computing there is 100 miliseconds of I/O operations, divided between 10 tasks, to complete. With a quantum of 1 milisecond there will be 101 swaps on the processor. With 0.1 milisecond overhead per swap there exists 10.1 miliseconds spent on overhead and 101 seconds spent on cpu computing. A total of 111.1 seconds of time spent where approximately 10% is spent on overhead.

b) The time quantum is 10 miliseconds
   With ten I/O bound tasks and one cpu-bound task. Assuming 1 milisecond of CPU computing there is 100 miliseconds of I/O operations, divided between 10 tasks, to complete. With a quantum of 10 milisecond there will be 11 swaps on the processor. As a result there will be only 1 milisecond of time spent on overhead and 101 seconds spent on cpu computation. Which results in 102 total time and less than 1% time spent on overhead.