Tyler Malone
Homework 3-4
2/6/2020

1. See included code.

2. Simple Scheduling

a) FIFO

JOB	START TIME	END TIME	RESPONSE TIME	TURNAROUND TIME
1	0	10	0	10
2	10	25	10	15
3	25	30	25	5
4	30	52	30	22

Average turnaround time: 29.25 seconds
Average response time: ~16.25 seconds

b) Shortest Job First

JOB	START TIME	END TIME	RESPONSE TIME	TURNAROUND TIME
1	30	55	30	55
2	15	30	15	30
3	0	5	0	5
4	5	15	5	15

Average turnaround time: 26.25 seconds
Average response time: 12.5 seconds

c) Shortest to Completion First

JOB	START TIME	END TIME	RESPONSE TIME	TURNAROUND TIME
1	30	55	30	55
2	0	30	0	30
3	5	10	0	5
4	10	20	0	10

Average turnaround time: 25 seconds
Average response time: 7.5 seconds

d) Round Robin

JOB	START TIME	END TIME	RESPONSE TIME	TURNAROUND TIME
1	0	48	0	48
2	0	30	0	30
3	6	21	1	15
4	13	49	3	36

Average turnaround time: 32.25 seconds
Average response time: 1 second

3a) MLFQ

i) With no specified boost time:

JOB	RESPONSE TIME	TURNAROUND TIME
0	0	84
1	7	153
2	15	81
3	18	70

ii) With varying boost times:

BOOST TIME	AVERAGE RESPONSE TIME	AVERAGE TURNAROUND TIME
0	10	97
1	2.25	99.75
5	5.25	101.75
10	7.50	106.50
25	10	106.25
40	10	98.25
60	10	99.75
80	10	97.50
100	10	97

It seems that as the boost time increases towards ~20, average turnaround time increases. However, as boost time increases past ~20, the average turnaround decreases again. Just looking at these numbers, I don't see any rhyme or reason to the connection between boost time and average turnaround time. WIth a boost time of zero, the average response time is 10. As soon as you increase the boost time to 1, average response time goes down and, from there, as boost time increases, boost time increases to a limit of 10.

3b) Lottery

i) with no specified time slice:

JOB	TURNAROUND TIME	RESPONSE TIME
0	13	2
1	23	0
2	18	1
3	27	4

ii) with varying time slice:

TIME SLICE	AVERAGE TURNAROUND TIME	AVERAGE RESPONSE TIME
2	3.5	23.25
3	4.5	22.5
4	10	26
5	10	23.75

Clearly, the lower the time slice, the better the overall performance. Interestingly, time slices of both 4 and 5 produce the same average turnaround time. Also, it's interesting that average response time increases until a time slice of 5, at which point the average response time went back down.