Questions

1. Compute the response time and turnaround time when running three jobs of length 200 with SJF and FIFO schedulers.

ARG policy SJF

ARG jlist 200,200,200

Execution trace:

[ time 0 ] Run job 0 for 200.00 secs ( DONE at 200.00 )

[ time 200 ] Run job 1 for 200.00 secs ( DONE at 400.00 )

[ time 400 ] Run job 2 for 200.00 secs ( DONE at 600.00 )

Final statistics:

Job 0 -- Response: 0.00 Turnaround 200.00 Wait 0.00

Job 1 -- Response: 200.00 Turnaround 400.00 Wait 200.00

Job 2 -- Response: 400.00 Turnaround 600.00 Wait 400.00

Average -- Response: 200.00 Turnaround 400.00 Wait 200.00

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ARG policy FIFO

ARG jlist 200,200,200

Final statistics:

Job 0 -- Response: 0.00 Turnaround 200.00 Wait 0.00

Job 1 -- Response: 200.00 Turnaround 400.00 Wait 200.00

Job 2 -- Response: 400.00 Turnaround 600.00 Wait 400.00

Average -- Response: 200.00 Turnaround 400.00 Wait 200.00

1. Now do the same but with jobs of different lengths: 100, 200, and 300.

SJF will provide the same results, indifferent to the order of jobs

ARG policy SJF

ARG jlist 100,200,300

Final statistics:

Job 0 -- Response: 0.00 Turnaround 100.00 Wait 0.00

Job 1 -- Response: 100.00 Turnaround 300.00 Wait 100.00

Job 2 -- Response: 300.00 Turnaround 600.00 Wait 300.00

Average -- Response: 133.33 Turnaround 333.33 Wait 133.33

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FIFO provides best results when low-length jobs come first. Here is the best and worst case scenarios:

ARG policy FIFO

ARG jlist 100,200,300

Final statistics:

Job 0 -- Response: 0.00 Turnaround 100.00 Wait 0.00

Job 1 -- Response: 100.00 Turnaround 300.00 Wait 100.00

Job 2 -- Response: 300.00 Turnaround 600.00 Wait 300.00

Average -- Response: 133.33 Turnaround 333.33 Wait 133.33

ARG jlist 300,200,100

Final statistics:

Job 0 -- Response: 0.00 Turnaround 300.00 Wait 0.00

Job 1 -- Response: 300.00 Turnaround 500.00 Wait 300.00

Job 2 -- Response: 500.00 Turnaround 600.00 Wait 500.00

Average -- Response: 266.67 Turnaround 466.67 Wait 266.67

1. Now do the same, but also with RR scheduler and a time-slice of 1.

RR gives slightly better, but still quite similar results when low-length jobs come first, same as FIFO. Best and worst case scenarios:

ARG policy RR

ARG jlist 100, 200, 300

Final statistics:

Job 0 -- Response: 0.00 Turnaround 298.00 Wait 198.00

Job 1 -- Response: 1.00 Turnaround 499.00 Wait 299.00

Job 2 -- Response: 2.00 Turnaround 600.00 Wait 300.00

Average -- Response: 1.00 Turnaround 465.67 Wait 265.67

ARG jlist 300, 200, 100

Final statistics:

Job 0 -- Response: 0.00 Turnaround 600.00 Wait 300.00

Job 1 -- Response: 1.00 Turnaround 500.00 Wait 300.00

Job 2 -- Response: 2.00 Turnaround 300.00 Wait 200.00

Average -- Response: 1.00 Turnaround 466.67 Wait 266.67

1. For what types of workloads does SJF deliver the same turnaround times as FIFO?

When jobs have the same or growing execution time.

1. For what types of workloads and quantum lengths does SJF deliver the same response times as RR?

When jobs have the same execution time and quantum length is >= this execution time.

1. What happens to response time with SJF as job lengths increase? Can you use the simulator to demonstrate the trend?

It is increasing, because jobs start later.

ARG policy SJF

ARG jlist 100,100,100

Final statistics:

Job 0 -- Response: 0.00 Turnaround 100.00 Wait 0.00

Job 1 -- Response: 100.00 Turnaround 200.00 Wait 100.00

Job 2 -- Response: 200.00 Turnaround 300.00 Wait 200.00

Average -- Response: 100.00 Turnaround 200.00 Wait 100.00

ARG jlist 300,300, 300

Final statistics:

Job 0 -- Response: 0.00 Turnaround 300.00 Wait 0.00

Job 1 -- Response: 300.00 Turnaround 600.00 Wait 300.00

Job 2 -- Response: 600.00 Turnaround 900.00 Wait 600.00

Average -- Response: 300.00 Turnaround 600.00 Wait 300.00

1. What happens to response time with RR as quantum lengths increase? Can you write an equation that gives the worst-case response time, given N jobs?

It is increasing, because jobs will wait more before they can start. Worst case scenario for a job response time, is when the process is at the end of the queue and quantum length is smaller than job length. Then:

, where Q – is a quantum length.