Scheduling: Introduction

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

SJF Response time: $(0+200+400)/3 = 200$
FIFO Response time: $(0+200+400)/3 = 200$
SJF Turnaround time: $(200+400+600)/3 = 400$
FIFO Turnaround time: $(200+400+600)/3 = 400$

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

SJF Response time: $(0+100+300)/3 = 133.33$
FIFO Response time: $(0+100+300)/3 = 133.33$
SJF Turnaround time: $(100+300+600)/3 = 333.33$
FIFO Turnaround time: $(100+300+600)/3 = 333.33$

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

RR Response time: $(0+1+2)/3 = 1$
RR Turnaround time: $(298+499+600)/3 = 465.67$

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

SJF and FIFO deliver the same turnaround times when jobs arrive in order from shortest to longest where some or all can be equal in length.

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

SJF and RR can only deliver the same response times when all of the jobs are shorter than the quantum length.

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

SJF's response time increases proportionally with job lengths.

ARG policy SJF
ARG jlist 1,5,10
Average – Response: 2.33

ARG policy SJF
ARG jlist 10,50,100
Average – Response: 23.33

ARG policy SJF
ARG jlist 100,500,1000
Average – Response: 233.33

7 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?

As quantum lengths increase, RR's response times approach FIFO's. The Nth job's response time equals $(N - 1)SQ$, where SQ is the scheduling quantum.