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CPSC 346 02

Project 5 Responses

**1. Compute the response time and turnaround time when running three jobs of length 200 with the SJF and FIFO schedulers. (FIFO works the same way as FCFS)**

SJF

A white sheet with black text

Description automatically generated

A screenshot of a computer

Description automatically generated

FIFO

A white paper with numbers and letters

Description automatically generated

A screenshot of a computer

Description automatically generated

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

SJF

A white sheet with black text

Description automatically generated

A screenshot of a computer

Description automatically generated

FIFO

A white sheet with numbers and numbers

Description automatically generated

A screenshot of a computer

Description automatically generated

**3. Now do the same (jobs in 2) but with the RR scheduler and a time slice of 1.**

RR

A white board with black writing

Description automatically generated

A computer screen with text

Description automatically generated

A screenshot of a computer screen

Description automatically generated

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

If the workloads arrive in non-deceasing order, then the turnaround times are the same for SJF and FIFO. SJF runs the jobs from shortest to longest time, so if the FIFO receives the jobs in the order of shortest to longest, then the two scheduling methods will handle the jobs in the same order. This means that the jobs will finish at the same time for both the scheduling methods, resulting in the same turnaround times for each process.

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

When workloads are small and quantum lengths are large, SJF will deliver similar response times as RR. To be exact, when the maximum process length is less than the time quantum and workloads arrive in the RR scheduler in non-decreasing order, then SJF will deliver the exact same response times as RR. When the maximum process length is less than the time quantum in RR, each job will finish before the scheduler preemptively switches the processes, much like SJF. In addition, when the RR jobs arrive in non-decreasing order, they will run in the same order as SJF. Since they are both running each process for the same amount of length and in the same order, they will have the same response time.

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

A screenshot of a computer

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A screenshot of a computer

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When the length of the jobs increases in SJF, the response time grows drastically. The first picture shows shorter job lengths (100, 200, 300) with an average response time of 133.33. The second picture shows longer job lengths (300, 400, 500) with an average response time of 333.33. It appears the response time grows by an increment of the average increase in job length for all processes, except the last. Since the first two jobs increased by 200, the average response time grew by 200.

The average response time grows as jobs get longer because the jobs scheduled to run later must wait a longer time before getting to run for the first time.

**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?**

The response times with RR grow longer as the time quantum lengths increase. Each process needs to wait for the other processes to run before getting its own time slice. If these time slices are larger, then that process would have to wait longer.

The worst-case response time in round robin is going to be the response time of the last process. So, that process must wait for each process to run before it gets to run for the first time (waits for N-1 processes). Assuming the jobs take longer than the time quantum, each process runs for a maximum amount of time equal to the time quantum. Therefore, the equation for the worst-case response time in round robin is equal to the product of the time quantum and the number of jobs minus one.