CSC 369 Worksheet 4 Solution

August 17, 2020

1. The following assumptions are made before calculation:

    - Each job runs for the same amount of time
    - All jobs arrive at the same time
    - Once started, each job runs to completion
    - All jobs only use the CPU (i.e they perform no I/O)
    - The run-time of each job is known

First, I need to calculate the turnaround time when running three job of length 200 with the SJF and FIFO schedulers.

I will do so in parts.

- **Part 1:** Calculating turnaround time with FIFO schedulers

$$\frac{200 + 400 + 600}{3} = 400 \tag{1}$$

    seconds.
- **Part 2:** Calculating turnaround time with SJF schedulers

$$\frac{200 + 400 + 600}{3} = 400 \tag{2}$$

    seconds.

Second, I need to calculate the response time when running three job of length 200 with the SJF and FIFO schedulers.

I will do so in parts

- **Part 1:** Calculating response time with FIFO schedulers

$$\frac{0 + 200 + 400}{3} = 200 \tag{3}$$

  seconds.
- **Part 2:** Calculating response time with SJF schedulers

$$\frac{0 + 200 + 400}{3} = 200 \tag{4}$$

  seconds.

Notes

- **Scheduling:**
  - Is a process at which allows one process to use the CPU while another is on hold, to make full use of CPU

- **Turnaround Time:**
  - Is a performance metric
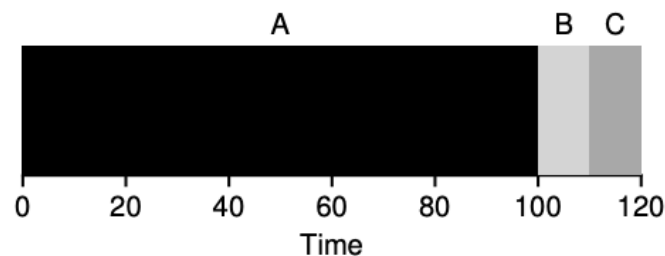 - Is amount of time to execute a particular process [1]

$$T_{turnaround} = T_{completion} - T_{arrival} \tag{5}$$

  - $T_{completion} \rightarrow$ Time at which the job completes
  - $T_{arrival} \rightarrow$ Time at which the job arrived in the system

- **FIFO scheduling algorithm:**
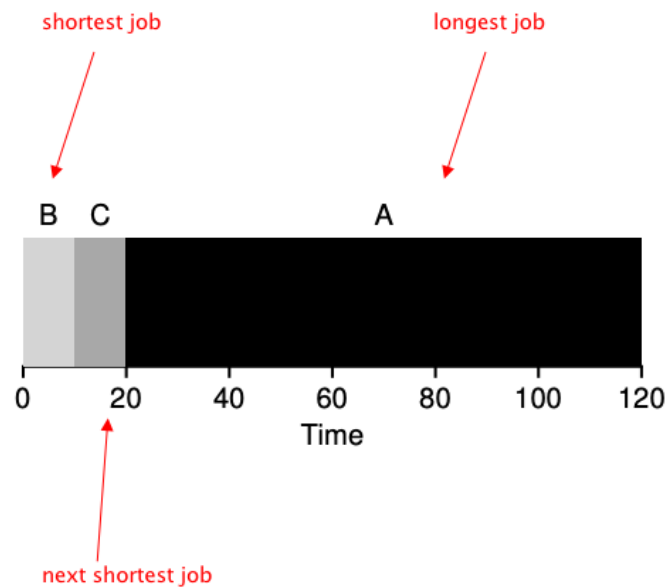 - Is the most basic scheduling algorithm

Example

Here, the average turnaround time is:

$$\frac{100 + 110 + 120}{3} = 110 \tag{6}$$

- **SJF scheduling algorithm:**
  - Is a schduling policy where the shortest job is run first, then the next shortest and so on.

Example

Here, the average turnaround time is:
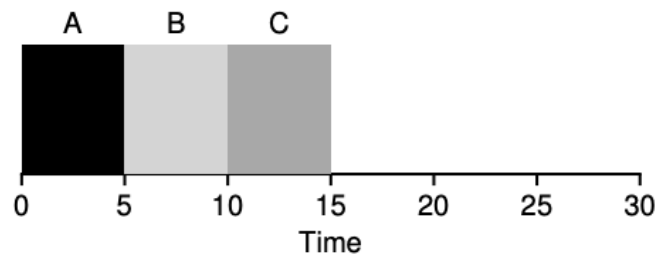
$$\frac{10 + 20 + 120}{3} = 50 \tag{7}$$

- **Response Time:**
  - Is amount of time from when a request was submitted until the first response is produced [1]

$$T_{response} = T_{firstrun} - T_{arrival} \tag{8}$$

  - $T_{firstrun} \rightarrow$ First time a job is scheduled
  - $T_{arrival} \rightarrow$ Time at which the job arrived in the system

Example

Here, the average response time is

$$\frac{0 + 5 + 10}{3} = 5 \tag{9}$$

References

1) Old Dominion University, CPU Scheduling link