Ivan Peric
cz9896
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Program #3

- Based upon the results of my program, I get the following data:
- SJF:
    - Average Turnaround Time = 7.625
    - Average Wait Time = 4.25
- SRTF:
    - Average Turnaround Time = 7.25
    - Average Wait Time = 3.875
- RR:
    - Average Turnaround Time = 9.875
    - Average Wait Time = 6.5

- Depending on a given situation, you could argue for each scheduling algorithm being better than another. However, in this particular scenario with our given burst times & arrival times, it seems that the Shortest Remaining Time First is the most optimal performer because it gives us the smallest average Turnaround Time and Waiting Time. SRTF works best here because we have a defined set of processes. If we had a potentially infinite queue of processes, SRTF will suffer from starvation, as it is constantly being fed the shortest possible burst times, never getting to the longer ones. However because we only have a defined set of processes, SRTF works optimally because upon each scheduling cycle, it picks the one with the shortest remaining time, finishes it, and moves onto the next one. Because the arrival times are so close to each other, the execution is highly efficient. It performs better than non-preemptive SJF because that algorithm only changes processes upon completion of the current process. There is no preemption, and because of that, it's performance is relatively weaker in this scenario. SRTF is also more efficient than RR because RR's turnaround time and waiting time is so much higher. While all processes get a fair amount of time to execute, their efficiency in this particular scenario is weaker than SRTF. RR might be a better algorithm when we have a large amount of processes in which we want to constantly chip away at their burst time while avoiding starvation. It might be a balance between a "safe" way to execute processes, and relative efficiency when compared to FCFS. **Overall, SRTF is our best algorithm for this particular scenario.**

- Other Work:

- **SJF:**
- Gantt Chart:
    - 0 | A | 1 | B | 5 | D | 6 | F | 7 | H | 9 | C | 12 | G | 15 | E | 27

- Note: Submission time = time entered at queue.
- **Turnaround Time = Completion Time - Submission Time**

- **Waiting Time = Turnaround Time - CPU Run Time (Burst Time)**
- Non-Preemptive SJF

Process	Burst Time	Completion Time	Submission Time	Turnaround Time	**Waiting Time**
A	1	1	0	**1**	**0**
B	4	5	0	**5**	**1**
C	3	12	2	**10**	**7**
D	1	6	2	**4**	**3**
E	12	27	3	**24**	**12**
F	1	7	4	**3**	**2**
G	3	15	5	**10**	**7**
H	2	9	5	**4**	**2**

- **SRTF (Shortest Remaining Time First -> Preemptive SJT)**

- Gantt Chart:
  - 0 | A | 1 | B | 2 | D | 3 | B | 4 | F | 5 | B | 7 | H | 9 | C | 12 | G | 15 | E | 27

- SRTF

Process	Burst Time	Completion Time	Submission Time	Turnaround Time	**Waiting Time**
A	1	1	0	**1**	**0**
B	4	7	0	**7**	**3**
C	3	12	2	**10**	**7**
D	1	3	2	**1**	**0**
E	12	27	3	**24**	**12**
F	1	5	4	**1**	**0**
G	3	15	5	**10**	**7**
H	2	9	5	**4**	**2**

- **Round Robin (q = 4)**

- Gantt Chart:

Rdy Q: A | B | C | D | E | F | G | H | E

- 0 | A | 1 | B | 5 | C | 8 | D | 9 | E | 13 | F | 14 | G | 17 | H | 19 | E | 23 | E | 27

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Process	Burst Time	Completion Time	Submission Time	Turnaround Time	**Waiting Time**
A	1	1	0	**1**	**0**
B	4	5	0	**5**	**1**
C	3	8	2	**6**	**3**
D	1	9	2	**7**	**6**
E	12	27	3	**24**	**12**
F	1	14	4	**10**	**9**
G	3	17	5	**12**	**9**
H	2	19	5	**14**	**12**