CS & IT ENGINEERING



CPU Scheduling
DPP 03 Discussion Notes



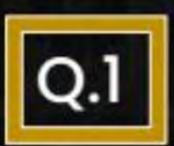
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TOPICS TO BE COVERED

01 Question

02 Discussion



Consider the following statements:

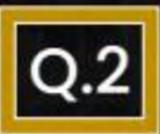


- SJF is the most optimal algorithm among all other scheduling algorithms.
- (ii) SRTF is practically non-implementable because it is preemptive in nature.
- (iii) SJF is practically implementable because of it's nonpremptive nature. False

Which of the following is CORRECT?

- A. Only (i) and (ii). ×
- B. Only (ii) and (iii).
- c. All (i), (ii), and (iii).
- D. None of these.

(ii) Mini. Avg. Waiting time (iii) Min. Avg. T.A.T.



Consider the set of processes.



| Process | Arrival Time | Burst Time | |
|---------|--------------|-------------------|--|
| A | 2 | 3 | |
| В | 4 | 17 | |
| С | 2 | 4 | |
| D | 1 | 2 | |
| Е | 7 | 5 | |

Assume that the processes are scheduled using the non-preemptive Shortest Job First(SJF) algorithm. What are the average turnaround time and average waiting time?

A.

13.5, 5.25

В.

10.0, 3.8

C.

12.2, 5.6

D.

8.75, 4.25



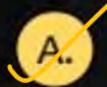
| Process | A.T | BT | C·T | T.A.T | WIT | |
|---------------|-----|----|-----|-------|-----|---|
| A | 2 | 30 | 6 | 4 | 1 | |
| B | 4 | AO | 32 | 28 | 11 | |
| C | 2 | 40 | 10 | 8 | 4 | 1 |
| \mathcal{D} | l | 20 | 3 | 2 | 0 | |
| E | 7 | 70 | 15 | 8 | 3 | |
| | | _ | | | | |

| H | ig.1. H. 1 - |
|---|--------------|
| 4 | +28+8+2+8 |
| | 5 |



A Scheduler that selects partially executed processes from a secondary storage device is called____. [MCQ]





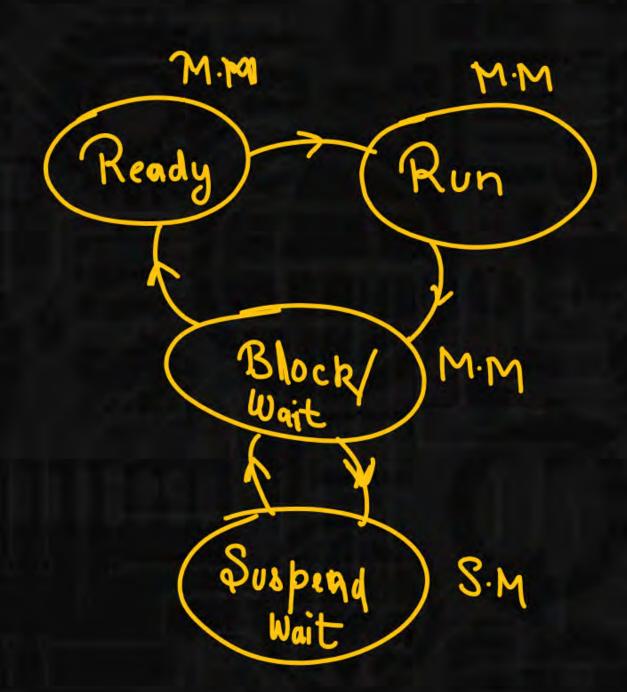
Medium-term scheduler.

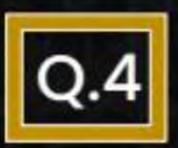
- B.
- Short term scheduler.
- C.

Long Term scheduler.

D.

None of these.





Consider arrival time and execution time for the following [NAT] processes that need to be scheduled on a single CPU.



| Process | Arrival Time | Burst Time | |
|---------|--------------|-------------------|--|
| P0 | 0 | 3 | |
| P1 | 2 | 5 | |
| P2 | 3 | 4 | |
| Р3 | 4 | 2 | |
| P4 | 6 | 1 | |
| P5 | 6 | 2 | |

What is the sum of throughput of the system and average waiting time if SRTF Scheduling is used? (upto 2 decimal)

| Process | A.T | BIT | C.T | T.A.T | W·T |
|----------------|-----|-----|-----|-------|-----|
| Po. | 0 | 3°x | 3 | 3 | 0 |
| Pi | 2 | 5 | 17 | 15 | 10 |
| P2 | 3 | 430 | 12 | 9 | 5 |
| P ₃ | 4 | 20 | 6 | 2 | 0 |
| 74 | 6 | XO | 7 | 1 | 0 |
| P ₅ | 6 | 70 | 9 | 3 | 1 |





Consider the given process table:



| Process | Arrival Time | Burst Time | |
|---------|--------------|-------------------|--|
| P0 | 6 | 8 | |
| P1 | 0 | 6 | |
| P2 | 2 | 4 | |
| P3 | 3 | 6 | |
| P4 | 4 | 1 | |
| P5 | 5 | 2 | |

Consider the context switching overhead of 1 unit. What is the percentage of CPU overhead activity while using SRTF scheduling for the processes given in the above table? Include the context switching to load the first process, and save the last process.



20.5%

в. 23.5%



25%

D.

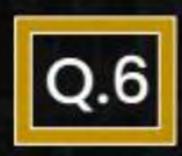
27.6%

| | | + | BTICIT |
|---------------------|---------|---|--------|
| Process A.T B.T C.T | Process | | 6.1 |



| Process | A.T | B.T | C· |
|----------------|-----|-------|----|
| Po | 6 | 80 | |
| Pi | 0 | & sto | |
| P2 | 2 | 4% | |
| P3 | 3 | Ko | |
| P4 | 4 | Xo | |
| P ₅ | 5 | 7 | 0 |

$$\frac{91}{-364}$$
 = 0.25

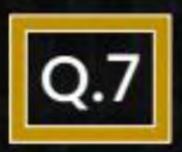


Which of the following statement(s) is/are correct in the context of CPU scheduling?



- A. Turnaround time includes waiting time.
 - SRTF can be used even when the CPU time required by each of the processes is not known apriori.
- Implementing preemptive scheduling may need hardware support.
- The goal is to only maximize CPU utilization and minimize throughput.





Consider the following five processes, with their arrival times and execution times given in milliseconds.



| Process | Arrival Time | Burst Time | |
|---------|--------------|-------------------|--|
| P0 | 1 | 3 | |
| P1 | 0 | 2 | |
| P2 | 4 | 4 | |
| P3 | 3 | 6 | |
| P4 | 6 | 2 | |

2.6 msec

Using Non-pre-emptive Shortest Job First, what will be the average waiting time? [upto 1 decimal point]



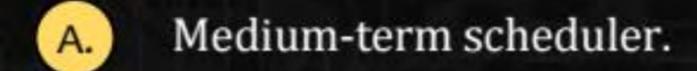
| Process | A.T | B.T | C·T | TAT | W.T |
|----------------|-----|------------|-----|-----|-----|
| P. | 2 | 80 | 5 | 4 | 1 |
| Pi | 0 | 70 | 2 | 2 | 0 |
| P2 | 4 | Æ O | 9 | 5 | 1 |
| Ps | 3 | % 0 | 17 | 14 | 8 |
| P ₄ | 6 | 70 | 11 | 5 | 3 |

Avg. W.T =>
$$1+0+1+8+3 => 13 => 2.6 \text{ m sec}$$
.



Which of the following scheduler can control degree of multiprogramming?





- B. Short term scheduler.
- C. Long Term scheduler.
 - D. None of these.

