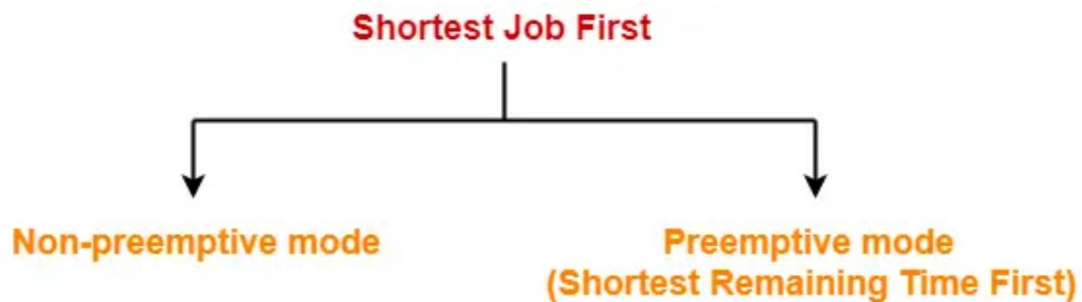


SJF Scheduling-

In SJF Scheduling,

- Out of all the available processes, CPU is assigned to the process having smallest burst time.
- In case of a tie, it is broken by **FCFS Scheduling**.



- SJF Scheduling can be used in both preemptive and non-preemptive mode.
- Preemptive mode of Shortest Job First is called as **Shortest Remaining Time First (SRTF)**.

Advantages-

- SRTF is optimal and guarantees the minimum average waiting time.
- It provides a standard for other algorithms since no other algorithm performs better than it.

Disadvantages-

- It can not be implemented practically since burst time of the processes can not be known in advance.
- It leads to starvation for processes with larger burst time.
- Priorities can not be set for the processes.
- Processes with larger burst time have poor response time.

1. Problem 1 has example of the solution.

2. Add Gantt Charts for the problems 2 ~ 5.

Problem-01:

Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	3	1
P2	1	4
P3	4	2
P4	0	6
P5	2	3

If the CPU scheduling policy is SJF non-preemptive, calculate the average waiting time and average turn around time.

Solution-

Gantt Chart-



Gantt Chart

Now, we know-

- Turn Around time = Exit time – Arrival time
- Waiting time = Turn Around time – Burst time

Also read- [Various Times of Process](#)

Process Id	Exit time	Turn Around time	Waiting time
P1	7	$7 - 3 = 4$	$4 - 1 = 3$
P2	16	$16 - 1 = 15$	$15 - 4 = 11$
P3	9	$9 - 4 = 5$	$5 - 2 = 3$
P4	6	$6 - 0 = 6$	$6 - 6 = 0$
P5	12	$12 - 2 = 10$	$10 - 3 = 7$

Now,

- Average Turn Around time = $(4 + 15 + 5 + 6 + 10) / 5 = 40 / 5 = 8$ unit
- Average waiting time = $(3 + 11 + 3 + 0 + 7) / 5 = 24 / 5 = 4.8$ unit

Problem-02:

Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	3	1
P2	1	4
P3	4	2
P4	0	6
P5	2	3

If the CPU scheduling policy is SJF preemptive, calculate the average waiting time and average turn around time.

Problem-03:

Consider the set of 6 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	0	7
P2	1	5
P3	2	3
P4	3	1
P5	4	2
P6	5	1

If the CPU scheduling policy is shortest remaining time first, calculate the average waiting time and average turn around time.

Problem-04:

Consider the set of 3 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	0	9
P2	1	4
P3	2	9

If the CPU scheduling policy is SRTF, calculate the average waiting time and average turn around time.

Problem-05:

Consider the set of 4 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	0	20
P2	15	25
P3	30	10
P4	45	15

If the CPU scheduling policy is SRTF, calculate the waiting time of process P2.