

Kalyani Government Engineering College
Department of Computer Application



CA2 ASSIGNMENT

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Consider the following set of processes:

Process	Burst Time	Arrival Time
P1	8	0
P2	20	1
P3	3	2
P4	6	3
P5	12	4
P6	9	5

Q) Draw Gantt charts illustrating the execution of these processes using SRTF scheduling; find the average waiting time and average turnaround time.

The table of processes is given with process id , burst time and arrival time.

We need to show how the process are executing in **GNATT chart** using SRTF CPU Scheduling Algorithm and also need to calculate **the average waiting time** and **average turn around time**.

SRTF CPU Scheduling:

Introduction: In the **Shortest Remaining Time First (SRTF) scheduling algorithm**, the process with the smallest amount of time remaining until completion is selected to execute. Since the currently executing process is the one with the shortest amount of time remaining by definition, and since that time should only reduce as execution progresses, processes will always run until they complete or a new process is added that requires a **smaller amount of time**.

Key Characteristics:-

- **Preemptive:** SRTF is a preemptive algorithm, which means that the currently running process can be interrupted if a new process arrives with a shorter burst time. This helps in ensuring that the processes with the shortest burst times are executed first.
- **Dynamic:** SRTF is a dynamic algorithm, which means that it can adapt to changes in the arrival time and burst time of processes. It constantly re-evaluates the remaining burst time of each process and schedules the process with the shortest remaining time.
- **Low waiting time:** SRTF is known for its low waiting time. By selecting the process with the shortest remaining burst time, it ensures that the processes with the shortest burst times are executed first, which reduces the average waiting time of processes.
- SRTF has a higher complexity than other scheduling algorithms like FCFS (First Come First Serve) and RR (Round Robin), because it requires frequent context switches and preemptions.

Advantages:

- Short processes are handled very quickly.
- The system also requires very little overhead since it only makes a decision when a process completes or a new process is added.
- When a new process is added the algorithm only needs to compare the currently executing process with the new process, ignoring all other processes currently waiting to execute.

Disadvantages:

- Like shortest job first, it has the potential for process starvation.
- Long processes may be held off indefinitely if short processes are continually added.

Solution:-

GNATT Chart:-

P1	P3	P4	P1	P6	P5	P2	
0	2	5	11	17	26	38	58

	<u>Waiting Time</u>	<u>Turn Around Time</u>
P1	$(0 - 0) + (11 - 2) = 9$	$(17 - 0) = 17$
P2	$(38 - 1) = 37$	$(58 - 1) = 57$
P3	$(2 - 2) = 0$	$(5 - 2) = 3$
P4	$(5 - 3) = 2$	$(11 - 3) = 8$
P5	$(26 - 4) = 22$	$(38 - 4) = 34$
P6	$(17 - 5) = 12$	$(26 - 5) = 21$
AVG	$82/6 = 13.666$	$140/6 = 23.333$

