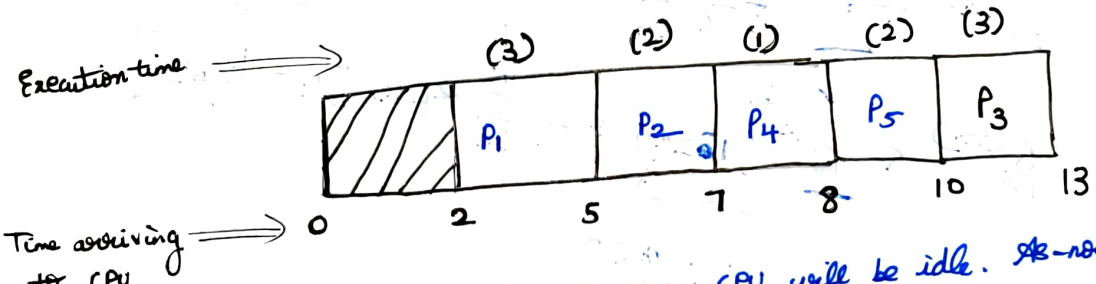
Shortest-Job First Scheduling algorithm [SJF]

[Non-preemptive scheduling algorithm]

Arrival time	Process	Burst time
2	P_1	3
3	P_2	2
4	P_3	3
6	P_4	1
8	P_5	2

RAM

8 — P_5 (2)
6 — P_4 (1)
4 — P_3 (3)
3 — P_2 (2)
2 — P_1 (3)



i) Since P_1 arrives at time 2, from 0 to 2 CPU will be idle. As now only P_1 is in RAM and no process has been arrived yet P_1 starts executing.

ii) While P_1 is executing at 3rd time interval P_2 } Arrive to the RAM
4th time interval P_3 }

But it has to wait till P_1 is executing.

iii) After P_1 finishes at 5th among P_2 and P_3 P_2 ⇒ given preference (least burst time). So at 5th, P_2 arrives to the CPU and P_1 goes off

iv) While P_2 is executing at 6th time ⇒ P_4 arrives to the RAM.

v) After P_2, among P_4 and P_3; P_4 ⇒ given preference (less burst time)

vi) P_4 finishes at 8th, at 8th P_5 arrives to RAM.

vii) Among P_5 and P_3; P_5 ⇒ given preference (less burst time)

viii) At last P_3 is remaining in RAM and it will execute.

Waiting time

Waiting time = Time at which the process arrived in CPU − Arrival time of the process in RAM

Waiting time for,

$P_1 \Rightarrow 2 - 2 \Rightarrow 0$

$P_2 \Rightarrow 5 - 3 \Rightarrow 2$

$P_3 \Rightarrow 10 - 4 \Rightarrow 6$

$P_4 \Rightarrow 7 - 6 \Rightarrow 1$

$P_5 \Rightarrow 8 - 8 \Rightarrow 0$

→ When P_4 ends at 8 and P_5 arrives at 8 with less burst time it doesn't wait at-all, Immediately it starts executing.

Turn-around time:

Turn-around time ⇒ Waiting time + Burst time + ~~I/O time~~ 0

[In this eg: assume that no process is doing I/O operation]

Turn-around time for

$P_1 \Rightarrow 0 + 3 \Rightarrow 3$

$P_2 \Rightarrow 2 + 2 \Rightarrow 4$

$P_3 \Rightarrow 6 + 3 \Rightarrow 9$

$P_4 \Rightarrow 1 + 1 \Rightarrow 2$

$P_5 \Rightarrow 0 + 2 \Rightarrow 2$

Through-put

↳ Number of process completed / Schedule length

$\Rightarrow \frac{5}{11}$ 5/11 process are completed in unit time

Scheduling time:

Completion time of the last process − Arrival time of the 1st process

$\Rightarrow 13 - 2 \Rightarrow 11$