

L-2.3 First Come First Serve CPU scheduling (19)

Algorithm

Criteria : "Arrival time"

→ Process which arrives first is executed first

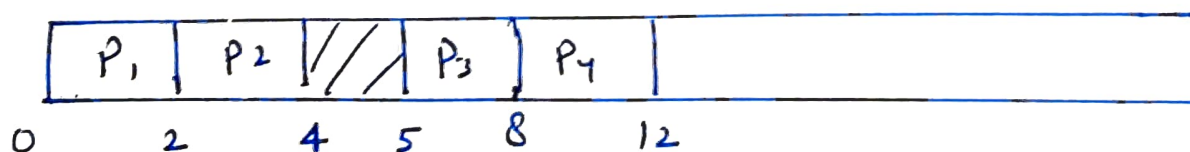
Mode : "Non-preemptive"

→ Process will get fully executed before another process is taken in.

given

Process Number	Arrival time	Burst time	Completion time	TAT	WT	RT
P1	0	2	2	2	0	0
P2	1	2	4	3	1	1
P3	5	3	8	3	0	0
P4	6	4	12	6	2	2

Gantt chart



- For non preemptive case, waiting time is equal to response time

$$\text{Average TAT} = \frac{2 + 3 + 3 + 6}{4} = 3.5$$

$$\text{Average WT} = \frac{6 + 1 + 0 + 2}{3} = 1$$

Shortest Job First Scheduling Algorithm

Criteria : "Burst time"

process with lowest burst time is taken first. after arrival time is checked.

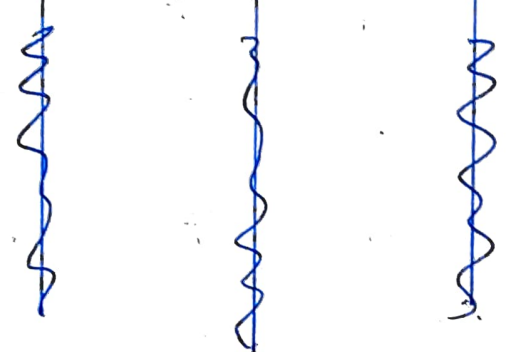
Mode : "Non-preemptive"

$$\text{TAT} = \text{CT} - \text{AT}$$

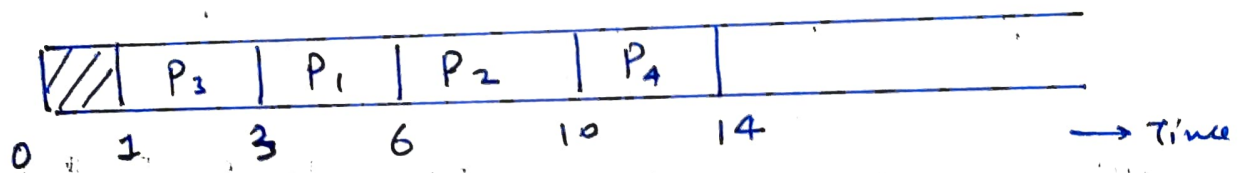
$$\text{WT} = \text{TAT} - \text{BT}$$

$$\text{RT} =$$

Process No.	Arrival Time	Burst time	Completion time	TAT	WT	RT
P ₁	1	3	6	5	2	2
P ₂	2	4	10	8	4	4
P ₃	1	2	3	2	0	0
P ₄	4	4	14	10	6	6



Gantt chart



When there is some arrival time, process with lower burst time is selected.

At time 3, P₁ and P₂ are ready queue, now we select process with lower burst time.

At time 6, P₂ and P₄ have some burst time, select one with earlier arrival time.

$$\text{Avg TAT} = \frac{25}{4} =$$

$$\text{Avg WT} = \frac{12}{4} = 3$$

L-2.5 Shortest Remaining Time First (SRTF with Preemption) scheduling algorithm (22)

Criteria: Burst time

Mode: preemptive.

$$TAT = CT - AT$$

$$WT = TAT - BT$$

$$RT = \{ \text{CPU first time} - AT \}$$

Process No.	Arrival time	Burst time	Completion time	TAT	WT	RT
P ₁	0	5	9	9	4	0
P ₂	1	3	4	3	0	0
P ₃	2	4	13	11	7	7
P ₄	4	1	5	1	0	0

Gantt chart =

P ₁	P ₂	P ₂	P ₂	P ₄	P ₁	P ₁	P ₁	P ₃
0	1	2	3	4	5	6	7	8
	P ₁ P ₂	P ₁ P ₂ P ₃	P ₁ P ₂ P ₃	P ₁ P ₃ P ₄	P ₁ P ₃			

Algorithm checks if there is a shorter burst time process in ready queue at every time.

For ex. at $t=1$, P₂ has remaining time = 4 but P₂ has burst time = 3, so it will start executing P₂.

$$\text{Avg TAT} = \frac{24}{4} = 6 \quad \text{Avg WT} = \frac{11}{4} = 2.75$$

$$\text{Avg RT} = \frac{7}{4} = 1.75$$

L-2.6, Question on SJF with Preemption

(23)

Process	Arrival Time	Burst time
P ₁	0	A 6
P ₂	1	A 3
P ₃	2	8

(Q) Gantt chart for Preemptive SJF scheduling is?

