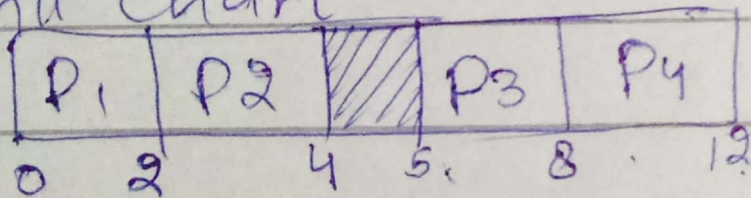


FCFS

P	At	Bt	Ct	TAT	WT	RT
P ₁	0	2	2	2	0	0
P ₂	1	2	4	3	1	1
P ₃	5	3	8	3	0	0
P ₄	6	4	12	6	2	2

Gantt Chart:



$$TAT = CT - AT$$

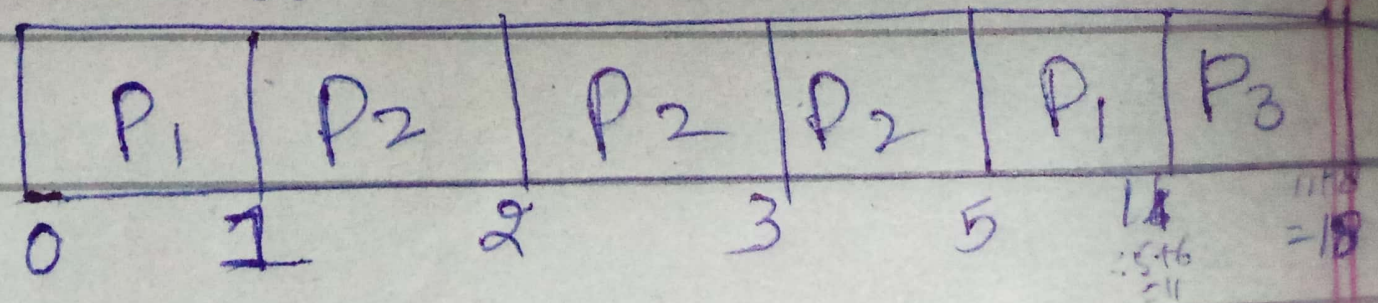
$$WT = TAT - BT$$

$$Avg. wt = \frac{0 + 1 + 0 + 2}{4} = \frac{3}{4} = 0.75$$

SRTF

P	A+	B+
P ₁	0	7 ⁶
P ₂	1	4 ³
P ₃	2	8

Gantt Chart

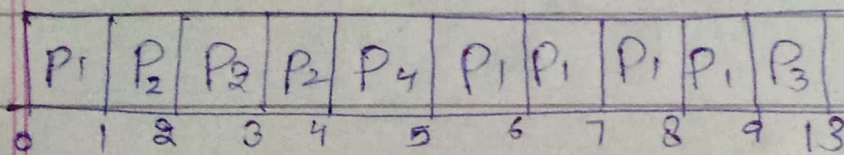


Shortest Remaining Job first

Criteria Burst time
mode. preemptive

P	At	Bt	Ct	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	1

Gantt chart



$$TAT = CT - AT$$

$$WT = TAT - BT$$

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

$$Avg. WT = \frac{4+0+7+0}{4} = \frac{11}{4} = 2.75$$

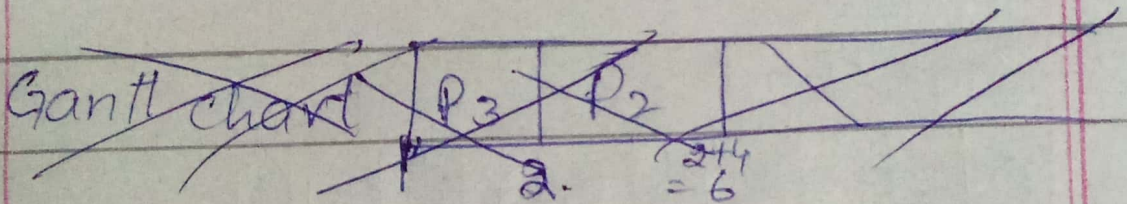
$$Avg. TAT = \frac{9+3+1+1}{4} = \frac{14}{4} = 3.5$$

shortest job first (SJF)

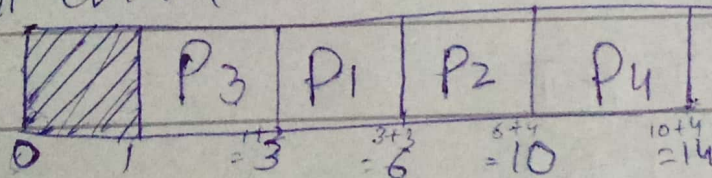
Criteria : Burst time

mode : Non Preemption.

P	At	Bt	ct	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



$$TAT = CT - AT$$

$$WT = TAT - BT$$

$$\text{Avg. } TAT = \frac{25}{4} = 6.25$$

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

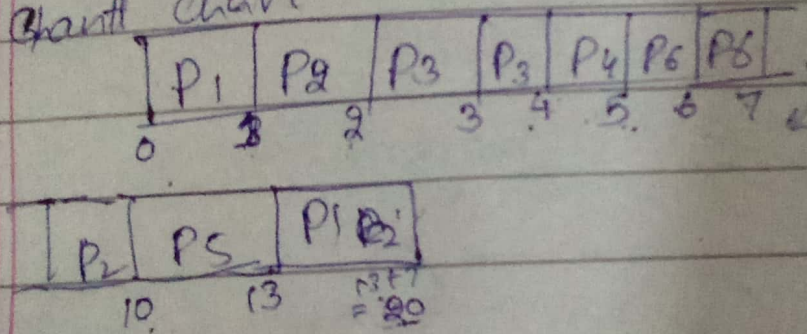
Remaining
Shorted job first (SJF)

(ii)

Criteria Burst Time
mode = Preemption

P-ID	AT	BT	CT	TAT	WT	RT
P ₁	0	8 ¹	20	20	12	0
P ₂	1	4 ³⁰	10	9	5	0
P ₃	2	9 ¹	4	2	0	0
P ₄	3	2 ¹	5	2	1	1
P ₅	4	3 ⁰	13	9	6	6
P ₆	5	2 ¹⁰	7	2	0	0

Gantt chart



∴ Preemption
means
K wo
process
Pura
execute
nahi
kory ga
or uski
vadine
mn chalo
jaye ga

$$TAT = CT - AT$$

$$WT = TAT - BT$$

$$\text{Avg WT} = \frac{12 + 5 + 0 + 1 + 6 + 0}{6}$$

$$= \frac{24}{6} = 4$$

②

Shortest job first (SJF)

①

Criteria = Burst time
mode = Non-Preemptive.

①

P-ID	AT	BT	CT	TAT	WT	RT
P ₁	2	6	9	7	1	1
P ₂	5	2	11	6	4	4
P ₃	1	8	23	22	14	14
P ₄	0	3	3	3	0	0
P ₅	4	4	15	11	7	7

Gantt Chart:

P ₄	P ₁	P ₂	P ₅	P ₃
0-3	3-9 3+6=9	9-11 9+2=11	11-15 11+4=15	15-23 15+8=23

$$TAT = CT - AT$$

$$WT = TAT - BT$$

$$\text{Avg. WT} = \frac{1+4+14+0+7}{5} = \frac{26}{5} = 5.2$$

- SJF is implemented through min heap data structure (means smallest will pop)
- It is greedy algorithm
- Time complexity - $O(n \log n)$

Example

SRTF

made = preemption

PID	AT	BT	CT	TAT	WT	RT
P ₁	0	8	20	20	12	0
P ₂	1	4	10	9	5	0
P ₃	2	2	4	2	0	0
P ₄	3	1	5	2	1	1
P ₅	4	3	13	9	6	6
P ₆	5	2	7	2	0	0

H Chart :	P ₁	P ₂	P ₃	P ₃	P ₄	P ₆	P ₆	P ₂	P ₅	P ₁
	0	1	2	3	4	5	6	7	8	9

$$\text{Avg WT} = \frac{12 + 5 + 0 + 1 + 6 + 0}{6}$$

$$= \frac{24}{6} = 4$$

① First come first serve FCFS.

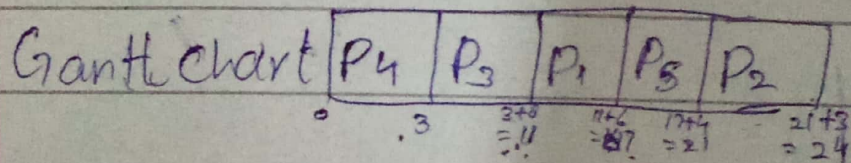
Criteria: Arrival Time

Mode: Non-Preemption

Calculate average waiting time

∴ gr non-preemptive case your WT is same as your RT.

Process	AT	BT	CT	TAT	WT	RT
P ₁	2	6	17	15	9	9
P ₂	5	3	24	19	16	16
P ₃	1	8	11	10	2	2
P ₄	0	3	3	3	0	0
P ₅	4	4	21	17	13	13



start waha se hogya k jo pehlay CPU mein sab say pehlay aaye hain criteria arrival time ka hai to P₄ sab say pehlay aaye ga

⇒ ① $TAT = CT - AT$
or

$TAT = WT + BT$

⇒ ② $WT = TAT - BT$

⇒ ③ $RT = \text{Process access CPU} - AT$

Taking first formula of TAT

$TAT = CT - AT$

⇒ ④ $\text{avg. WT} = \frac{9 + 16 + 2 + 0 + 13}{5}$
 $= \frac{40}{5} = 8$

∴ Non-preemption ka matlab hai k agr P₄ sab say pehlay diya hai to wo apna execution time jo k 3 ghanta hai wo puray lega