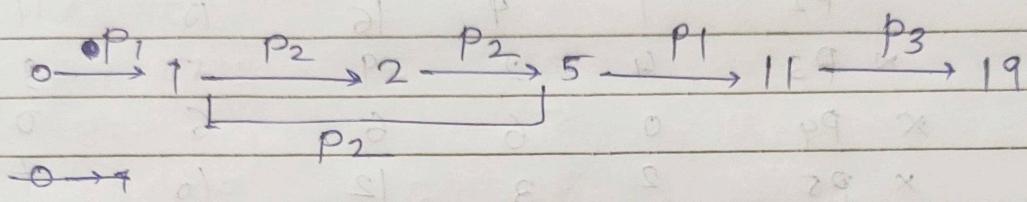
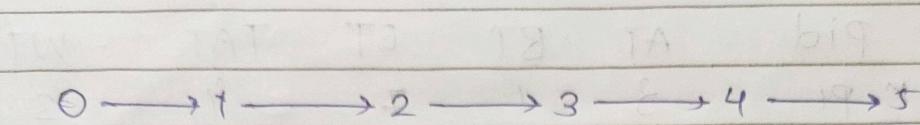


P₁ 0 76
 P₂ 1 480
 P₃ 2 8



[0-1] [1-5] [5-11] [11-19]

pid AT BT ET TAT WT

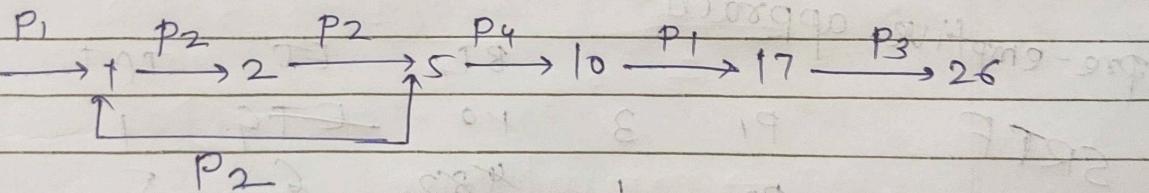
pid	AT	BT	ET	TAT	WT
P ₁	0	87	17	17	89

pid	AT	BT	ET	TAT	WT
P ₂	1	43	5	4	0

pid	AT	BT	ET	TAT	WT
P ₃	2	9	261	24	15

pid	AT	BT	ET	TAT	WT
P ₄	3	5	10	7	2

$$26/4 = 6.5$$



AT BT ET TAT WT

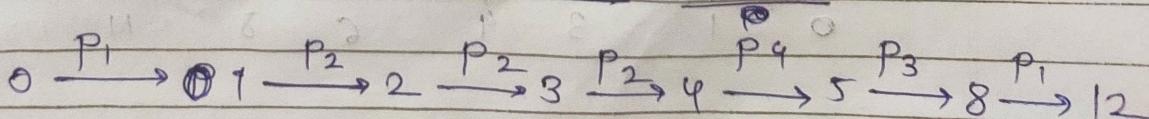
pid	AT	BT	ET	TAT	WT
P ₁	0	54	12	12	7

pid	AT	BT	ET	TAT	WT
P ₂	9	3240	4	32	0

pid	AT	BT	ET	TAT	WT
P ₃	2	3	8	6	3

pid	AT	BT	ET	TAT	WT
P ₄	4	12	5	19	0

$$10/4 = 2.5$$



$$\text{Avg TAT} = 22/4 = 5.5$$

* Convoy effect:

* Shortest job first scheduling (SJFS):

pid	AT	BT	ET	TAT	WT
x P1	3	1	7	4	3
P2	1	4	16	15	11
x P3	4	2	9	5	3
x P4	0	6	6	6	0
x P5	2	3	12	10	7

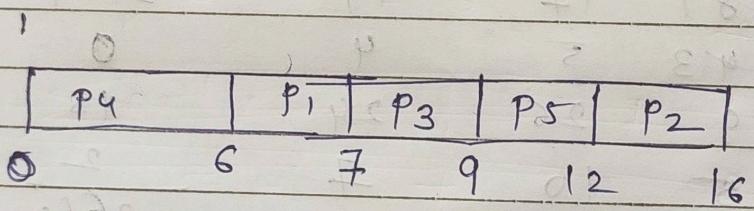
Avg =

40/5 = 24/5

Shortest job first scheduling (non-pre-emptive)

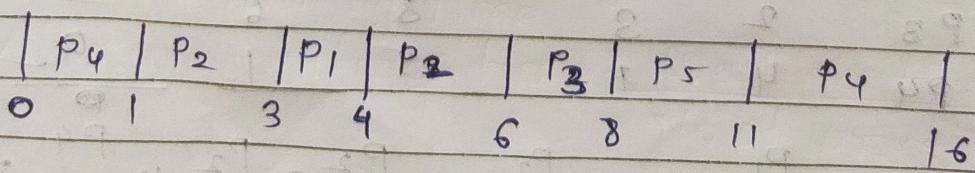
Shortest remaining time first (SRTF) (pre-emptive)

non-pre-emptive
version



pre-emptive approach

SRTF	P1	3	10	ET 9	TAT	WT = TAT - BT
P2	1	4	8	2	6	5
P3	4	7	10	8	4	2
P4	0	8	5	16	16	10
P5	2	3	11	12	9	6



22 = TAT - WT

① Burst time ② Waiting time

③ Arrival time

④ Exit time

① Waiting time (WT) = TAT - BT

② Burst time (BT) / execution time

③ Arrival time (AT)

④ Turnaround time (TAT) = AT + ET - AT

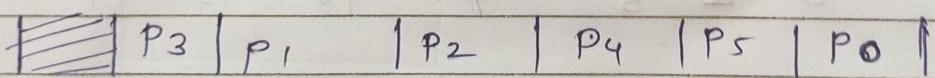
⑤ Exit time (ET)

P. No	AT	BT	ET	TAT = ET - AT	WT = TAT - BT
P ₀	10	6	14	22	12
P ₁	2	5	7	15	0
P ₂	3	3	10	7	4
P ₃	1	1	2	10	0
P ₄	4	2	12	18	6
P ₅	5	6	18	13	7

Aug

50/6

29/6



0 1 2 7 10 12 18 22

AT BT ET TAT = ET - AT WT = TAT - BT

P₀ 0 14 14 14 14 0

P₁ 1 5 17 17 16 13

P₂ 2 1 18 18 16 15

P₃ 3 2 20 20 17 15

P₄ 4 5 15 25 21 16
84/5 59/5

P₀ P₁ P₂ P₃ P₄

0 14 17 18 20 25

FIFO

↓ process id

Pid AT BT

* First comes first serve:

exit time

TAT-BT

$$\text{Pid } T_B - A_T = B_T \quad TAT = E.T - A.T \quad WT = \underline{\underline{0}}$$

$$A \quad 3 \quad 3 \quad 3 \quad 7 - 3 = 4 \quad 4 - 4 = 0$$

$$B \quad 5 \quad 3 \quad 8 \quad 13 - 5 = 8 \quad 8 - 3 = 0.5$$

$$C \quad 0 \quad 2 \quad 2 \quad 2 - 0 = 0.2 \quad 2 - 2 = 0$$

$$D \quad 5 \quad 1 \quad 9 \quad 14 - 5 = 9 \quad 9 - 1 = 8$$

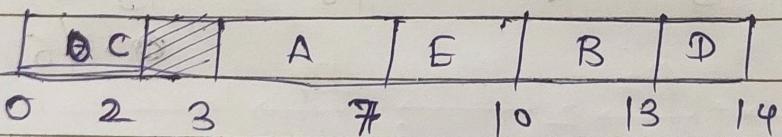
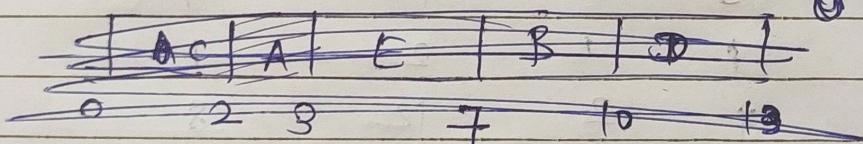
$$E \quad 4 \quad 3 \quad 6 \quad 10 - 4 = 6 \quad 6 - 3 = 3$$

Gantt chart:

$$\text{AT} \quad 0 \quad 3 \quad 4 \quad 5 \quad 10 \quad \text{TA} \quad 18 \quad \text{AWT} = \frac{16}{5} = 3.2$$

C A E B D

$$\text{Avg TAT} = \frac{29}{5} = 5.8$$



AT → arrival time

BT → Bustime

ET → exit time

TAT → Turn around time

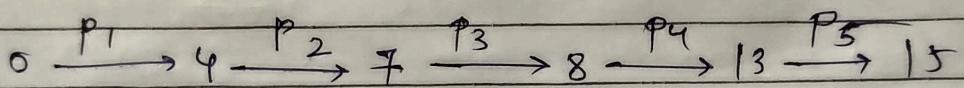
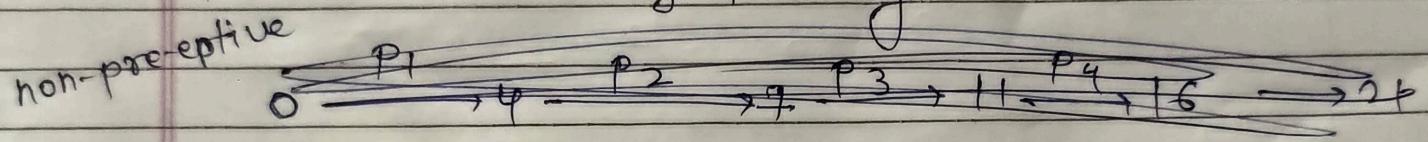
WT → waiting time

Average waiting time = Waiting time
No of processes

Priority algorithm

PID	AT	BT	Priority	TAT	WT
P1	0	4.3	2	$4 - 0 = 4$	0
P2	1	3.2	3	$7 - 1 = 6$	3
P3	2	1.0	4	$8 - 2 = 6$	5
P4	3	5	5	$13 - 3 = 10$	5
P5	4	2	5	$15 - 4 = 11$	9

low number → high priority



pre-emptive

