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YOUVA

* CPU Scheduling algorithms.
1. FCFS scheduling
2. SJF (Shortest Job first) Scheduling.
3. Priority Scheduling
4. RR Scheduling (Round Robin)

* Arrival Time :- The time when the process is arriving into ready state is called arrival time.

* Burst Time :- The time required for the process to execute is called burst time or CPU time.

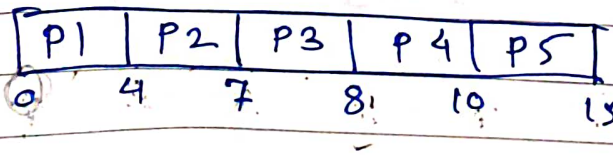
* Completion time :- The time when process complet its execution is called completion time

* Time Around time :- The time difference betn completion & arrival time is called turn around time

* FCFS - First Come first Serve :-
Criteria - Arrival time
mode - Non premptive - complete process first then next will execu

Process	AT	BT
P1	0	4
P2	1	3
P3	2	1
P4	3	2
P5	4	5

Gantt Chart



Waiting Time

AT

P1 = 0 - 0 = 0 ms
P2 = 4 - 1 = 3 ms
P3 = 7 - 2 = 5 ms
P4 = 8 - 3 = 5 ms
P5 = 10 - 4 = 6 ms

TWT = 19 ms

AWT = $\frac{19}{5}$ = 3.8 ms.

Turn around time =

P1 = completion time - arrival time
P1 = 4 - 0 = 4ms
P2 = 7 - 1 = 6ms
P3 = 8 - 2 = 6ms
P4 = 10 - 3 = 7ms
P5 = 15 - 4 = 11 ms

TAT = 34 ms

ATAT = $\frac{34}{5}$ = 6.8 ms.

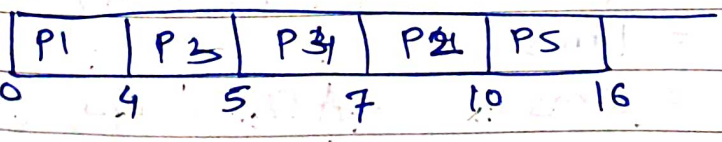
* SJF (Shortest Job first)

Non Preemptive (SJF) Preemptive (SJF)

criteria — Burst Time
mode — Non preemptive

Process	AT	BT
P1	0	4
P2	1	3
P3	2	1
P4	3	2
P5	4	6

Gantt Chart



P1	P3	P4	P2	P5
0	4	5	7	10	16

Waiting Time

P1 = 0 − AT = 0 − 0 = 0 ms

P2 = 7 − 1 = 6 ms

P3 = 4 − 2 = 2 ms ∴ TWT = 16 ms

P4 = 5 − 3 = 2 ms

P5 = 10 − 4 = 6 ms

$AWT = \frac{16}{5} = 3.2$ ms

Turn Around Time = Process Completion − AT

P1 = 4 − 0 = 4 ms

P2 = 10 − 1 = 9 ms

P3 = 5 − 2 = 3 ms

P4 = 7 − 3 = 4 ms

P5 = 16 − 4 = 12 ms

TAT = 32 ms

$ATAT = \frac{32}{5} = 6.4$ ms

* SRTF (Shortest Remaining Time first) / Premeptive SJF

Criteria = Burst Time

mode = Premptive

Process	AT	BT
P1	0	7
P2	1	5
P3	2	3
P4	3	1
P5	4	2
P6	5	1

Gantt Chart

P1	P2	P3	P4	P3	P3	P6	P5	P2	P1
0	1	2	3	4	5	6	7	8	13	19

Turn Around Time =

P1 = 19 − 0 = 19 ms

P2 = 13 − 1 = 12 ms

P3 = 6 − 2 = 4 ms

P4 = 4 − 3 = 1 ms

P5 = 9 − 4 = 5 ms

P6 = 7 − 5 = 2 ms

TTAT = 43 ms

$ATAT = \frac{43}{6} = 7.1$ ms

Waiting Time =

P1 = TAT − BT
= 19 − 7 = 12 ms
P2 = 12 − 5 = 87 ms
P3 = 4 − 3 = 1 ms
P4 = 1 − 1 = 0 ms
P5 = 5 − 2 = 3 ms
P6 = 2 − 1 = 1 ms

TWT = 24 ms

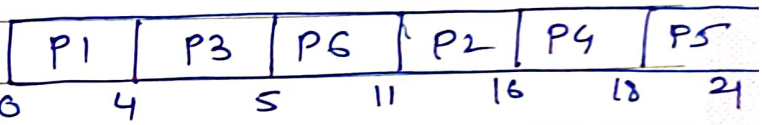
AWT = $\frac{24}{6}$ = 4 ms

* Priority Scheduling

Non preemptive Preemptive

Process	AT	BT	Priority
P1	0	4	4
P2	1	5	5
P3	2	1	7 (H)
P4	3	2	2
P5	4	3	1 (L)
P6	5	6	6

Gantt Chart



Turn Around Time
P1 = 4 − 0 = 4 ms
P2 = 16 − 1 = 15 ms
P3 = 5 − 2 = 3 ms
P4 = 18 − 3 = 15 ms
P5 = 21 − 4 = 17 ms
P6 = 11 − 5 = 6 ms

TTAT = 60 ms
ATAT = $\frac{60}{6}$ = 10 ms

Waiting time
P1 = 4 − 4 = 0 ms
P2 = 15 − 5 = 10 ms
P3 = 3 − 1 = 2 ms
P4 = 15 − 2 = 13 ms
P5 = 17 − 3 = 14 ms
P6 = 6 − 6 = 0 ms

TWT = 39 ms

AWT = $\frac{39}{6}$ = 6.5 ms

Premptive Priority Scheduling

Process	AT	BT	Priority	
P1	1	4	5	-3 2 X
P2	2	5	2 (4)	X
P3	3	6	6	-5 X
P4	0	1	4	X
P5	4	2	7	1 X
P6	5	3	8 (4)	0 X

Gantt Chart

P4	P1	P2	P3	P5	P6	P5	P3	P1	P2
0	1	2	3	4	5	6	9	14	16	21

Turn Around Time = Completion - AT

P1 = 16 - 1 = 15 ms
P2 = 21 - 2 = 19 ms
P3 = 14 - 3 = 11 ms
P4 = 1 - 0 = 1 ms
P5 = 9 - 4 = 5 ms
P6 = 8 - 5 = 3 ms

TTAT = 54 ms

ATAT = $\frac{54}{6}$ = 9 ms

Waiting Time = TAT - BT

P1 = 15 - 4 = 11 ms
P2 = 19 - 5 = 14 ms
P3 = 11 - 6 = 5 ms
P4 = 1 - 1 = 0 ms
P5 = 5 - 2 = 3 ms
P6 = 3 - 3 = 0 ms

TWT = 33 ms

AWT = $\frac{33}{6}$ = 5.5 ms

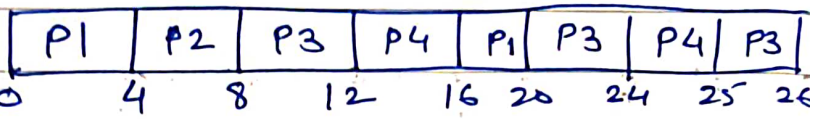
Round Robin Scheduling :-

Criteria = Time Slice, AT, BT

Process	AT	BT
P1	0	8
P2	1	4
P3	2	9
P4	3	5

(Slice = 4)

Gantt Chart



Turn Around Time = Completion Time - AT

P1 = 20 - 0 = 20 ms

P2 = 8 - 1 = 7 ms

P3 = 26 - 2 = 24 ms

P4 = 25 - 3 = 22 ms

TTAT = 73 ms

ATAT = $\frac{73}{4}$ = 18.25 ms

Waiting Time = TAT - BT

P1 = 20 - 8 = 12 ms

P2 = 7 - 4 = 3 ms

P3 = 24 - 9 = 15 ms

P4 = 22 - 5 = 17 ms

TWT = 47 ms

AWT = $\frac{47}{4}$ = 11.75 ms