

### ASSIGNMENT 1

#### Problem-01:

Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	3	4
P2	5	3
P3	0	2
P4	5	1
P5	4	3

If the CPU scheduling policy is FCFS, calculate the average waiting time and average turn around time.

Ans →

DATE: \_\_\_\_\_

Problem - 1

$TAT = (Compile\ time) - (Arrival\ time)$   
 $WT = (TAT) - (Burst\ time)$

Gantt chart

0	2	3	7	10	13	14
P3	/	P1	P5	P2	P4	

Process No	C.T	TAT	WT
P1	7	$7 - 3 = 4$	$4 - 4 = 0$
P2	13	$13 - 5 = 8$	$8 - 3 = 5$
P3	2	$2 - 0 = 2$	$2 - 2 = 0$
P4	14	$14 - 5 = 9$	$9 - 1 = 8$
P5	10	$10 - 4 = 6$	$6 - 3 = 3$

Avg TAT =  $(4 + 8 + 2 + 9 + 6) / 5 = 5.8$  unit

Avg WT =  $(0 + 5 + 0 + 8 + 3) / 5 = 3.2$  unit

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**Problem-02:**

Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	3	1
P2	1	4
P3	4	2
P4	0	6
P5	2	3

If the CPU scheduling policy is SJF preemptive, calculate the average waiting time and average turn around time.

Ans→

Problem - 2

$$TAT = CT - AT$$
$$WT = TAT - BT$$

Gantt chart

P4	P1	P3	P5	P2	
0	6	7	9	12	16

P.NO.	CT	TAT	WT
P1	7	$7 - 3 = 4$	$4 - 1 = 3$
P2	16	$16 - 1 = 15$	$15 - 4 = 11$
P3	9	$9 - 4 = 5$	$5 - 2 = 3$
P4	6	$6 - 0 = 6$	$6 - 6 = 0$
P5	12	$12 - 2 = 10$	$10 - 3 = 7$

Avg TAT =  $(4 + 15 + 5 + 6 + 10) / 5 = 8$  unit

Avg WT =  $(3 + 11 + 3 + 0 + 7) / 5 = 4.8$  unit

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**Problem-03:**

Consider the set of 6 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	0	7
P2	1	5
P3	2	3
P4	3	1
P5	4	2
P6	5	1

If the CPU scheduling policy is shortest remaining time first, calculate the average waiting time and average turn around time.

Ans→

Problem - 3

$TAT = CT - AT$   
 $WT = TAT - BT$   
Gantt chart

P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>3</sub>	P <sub>6</sub>	P <sub>5</sub>	P <sub>2</sub>	P <sub>1</sub>	
0	1	2	3	4	6	7	9	13	19

P. No	CT	TAT	WT
P <sub>1</sub>	19	$19 - 0 = 19$	$19 - 7 = 12$
P <sub>2</sub>	13	$13 - 1 = 12$	$12 - 5 = 7$
P <sub>3</sub>	6	$6 - 2 = 4$	$4 - 3 = 1$
P <sub>4</sub>	4	$4 - 3 = 1$	$1 - 1 = 0$
P <sub>5</sub>	9	$9 - 4 = 5$	$5 - 2 = 3$
P <sub>6</sub>	7	$7 - 5 = 2$	$2 - 1 = 1$

Avg TAT =  $(19 + 12 + 4 + 1 + 5 + 2) / 6 = 7.17$  unit

Avg WT =  $(12 + 7 + 1 + 0 + 3 + 1) / 6 = 4$  unit

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**Problem-04:**

Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	0	5
P2	1	3
P3	2	1
P4	3	2
P5	4	3

If the CPU scheduling policy is Round Robin with time quantum = 2 unit, calculate the average waiting time and average turn around time.

Ans →

Problem - 4

$$TAT = CT - AT$$
$$WT = TAT - BT$$

Grantt chart

P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>1</sub>	P <sub>4</sub>	P <sub>5</sub>	P <sub>2</sub>	P <sub>1</sub>	P <sub>5</sub>
0	2	4	5	7	9	11	12	13

P.NO.	CT	TAT	WT
P <sub>1</sub>	13	$13 - 0 = 13$	$13 - 5 = 8$
P <sub>2</sub>	12	$12 - 1 = 11$	$11 - 3 = 8$
P <sub>3</sub>	5	$5 - 2 = 3$	$3 - 1 = 2$
P <sub>4</sub>	9	$9 - 3 = 6$	$6 - 2 = 4$
P <sub>5</sub>	14	$14 - 4 = 10$	$10 - 3 = 7$

Avg TAT =  $(13 + 11 + 3 + 6 + 10) / 5 = 8.6$  unit

Avg WT =  $(8 + 8 + 2 + 4 + 7) / 5 = 5.8$  unit.