Green University of Bangladesh
Department of Computer Science and Engineering (CSE)

Faculty of Sciences and Engineering

Semester: (Fall, Year: 2024), B.Sc. in CSE (Day)

KSA Assignment 02

Course Title: Operating System

Course Code: CSE 309 Section: 222_D5

Student Details

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Lab Report Status

Marks: …… **Signature:.....**

Comments:..... **Date:.....**

CSE - 309

KSA Test - 02

Ans To the que No 1

Applying Round Robin Algorithm with a time quantum of 5:

Time	process	Remaining Burst Time After Execution
0-5	P1	22
5-10	P6	15
10-15	P5	6
15-20	P2	9
20-25	P3	2
25-30	P4	8
30-35	P1	17
35-40	P6	10
40-45	P5	1
45-47	P3	0 (completed)
47-52	P2	4
52-57	P4	3
57-62	P1	12
62-67	P6	5
67-68	P5	0 (completed)

Time	Process	Remaining Burst Time After Execution
68-72	P2	0 (completed)
72-75	P4	0 (completed)
75-80	P1	7
80-85	P6	0 (completed)
85-92	P1	0 (completed)

We know,

Completion Time (CT) = The final time when the corresponding process completes execution

Turnaround Time (TAT) = completion Time - Arrival Time

Waiting Time (WT) = Turnaround Time - Burst Time.

* Data:

Process	Arrival Time	Burst Time	CT	TAT	WT
P1	0	27	92	92	65
P2	3	14	72	69	55
P3	5	7	47	42	35
P4	7	13	75	68	55
P5	2	11	68	66	55
P6	1	20	85	84	64

Now,

Average Waiting Time: $\frac{65+55+35+55+55+64}{6}$

$= 54.83$

Average Turnaround Time: $\frac{92+69+42+68+66+84}{6}$

$= 70.17$

* Gantt Chart:

P1	P6	P5	P2	P3	P4	P1	P6	P5	P3	P2	P4	P1	P6	P5	P2	P4	P1	P6	P1
0	5	10	15	20	25	30	35	40	45	47	52	57	62	67	68	72	75	80	85	92

* Comparison

Algorithm	Avg. Waiting Time	Average T.A.T	Verdict
FCFS	38.5	53.83	Good
SJF	42.83	58.17	Better
Round Robin	54.83	70.17	Best

From above discussion, it is imperative that Round Robin algorithm provides best output for multitasking. While Shortest Job First provides an appropriate environment for predictable batch processors. First come First serve is more applicable in simple, non-interactive scenarios.

Ans To the que No-2

Applying Priority Scheduling Algorithm (Non-Preemptive)

Time	Process	Remaining process in ready queue
0-27	P1	P3, P4, P5, P2, P6
27-34	P3	P4, P5, P2, P6
34-47	P4	P5, P2, P6
47-58	P5	P2, P6
58-72	P2	P6
72-92	P6	-

We know,

Completion Time : When a process completes execution

Turnaround Time (TAT) : Completion Time - Arival Time

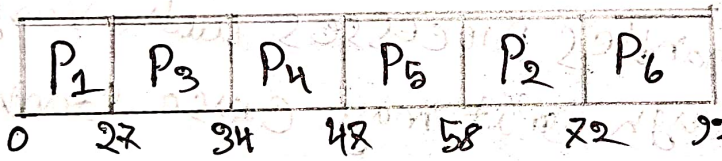
Waiting Time (WT) : Turnaround Time - Burst Time

P.T.O

*Data:

Process	Arrival Time	Burst Time	CT	TAT	WT
P1	0	27	27	27	0
P3	5	7	34	29	22
P4	7	13	47	40	27
P5	2	11	58	56	45
P2	3	14	72	69	55
P6	1	20	92	91	71

*Gantt Chart:



* Now,

Average Waiting Time: $\frac{0+22+27+45+55+71}{6}$

$= 36.67$

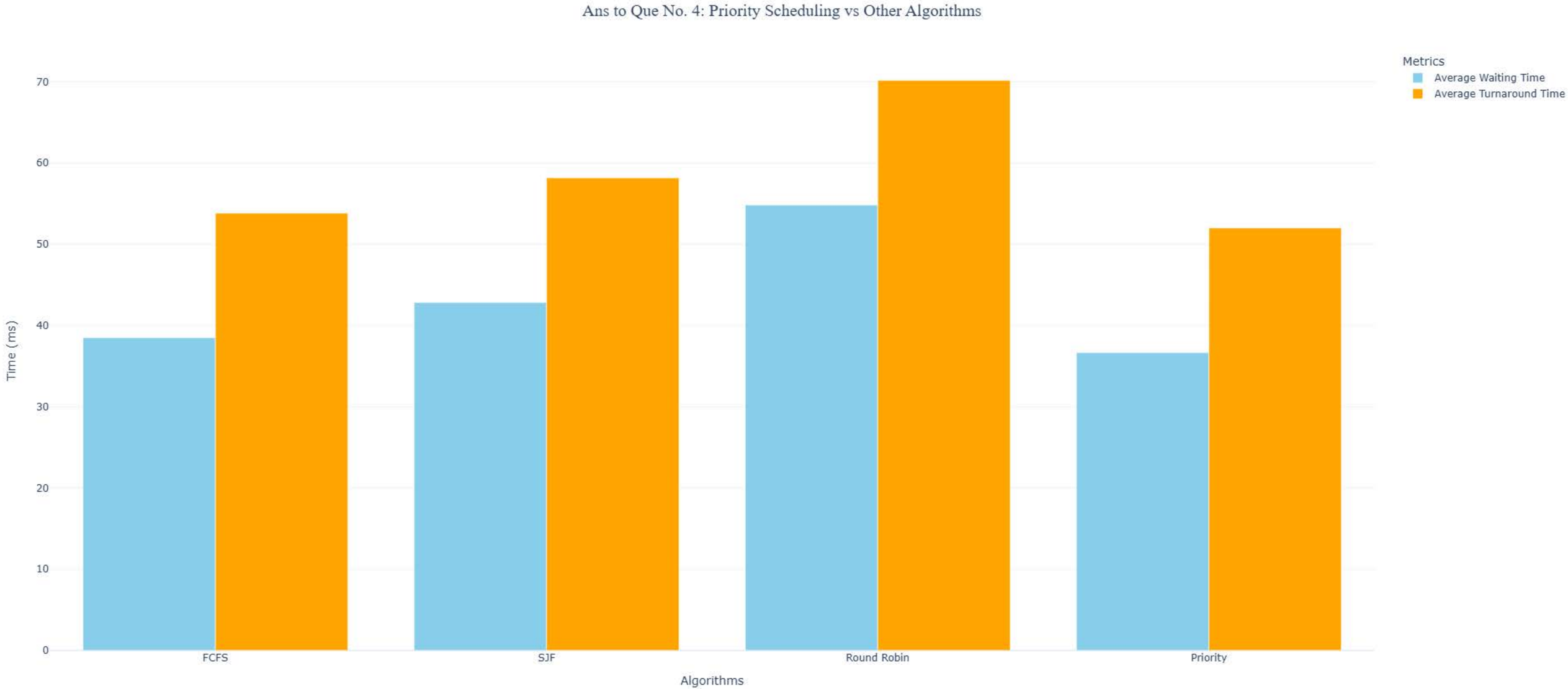
Average Turnaround Time = $\frac{27+29+40+56+69+91}{6}$

$= 52$

Comparison:

Algorithm	Avg. Waiting Time	Avg. Turnaround Time	verdict
FCFS	38.50	53.83	Fair
SJF	42.83	58.17	Good
R.R	54.83	70.17	Best
P.S	36.67	52.00	Better

Among the four scheduling Algorithms, Round Robin is best due to it's fairness, responsiveness, and suitability for multitasking. Priority scheduling ranks better as it efficiently handles processes with varying importance, although it may cause starvation. Shortest Job First is good for batch systems as it minimizes the waiting time and turnaround time. Lastly, First come First serve is the simplest but least efficient algorithm. It suffers from the convoy effect.


Ans to Que No. 4: Priority Scheduling vs Other Algorithms
Metrics
Average Waiting Time
Average Turnaround Time
Time (ms)
0
10
20
30
40
50
60
70
FCFS
SJF
Round Robin
Priority
Algorithms