

MANIPAL UNIVERSITY JAIPUR

Faculty of Engineering | School of Computing and Intelligent Systems

Department of IoT & IS

Session: Jan 2024 – May 2024 | **Program:** B. Tech. IoT & IS | **Semester:** IV

IS2201 Operating System Group Assignment 2

Note:

1. Answer all the questions and **upload the solution on MS-Teams**. Include screen-shots to justify your answers.
2. On top right of all the sheets of your answer sheet, write your name and registration number, class and section of all the group members.
3. Each group can have 4-6 members and all of them should be from same section.
4. Assignment will neither be accepted after the due date nor in any other mode.

Last date of submission: 11:59 PM, 14th April 2024

Process Scheduling

Consider the following source codes:

program My_Pgm

read(i)

for n = 1 to 15 x = i + n

next

end

Compile the above source code using **CPU-OS Simulator** and load it in the main memory and run this code. To enter the OS simulator:

- 1. Click on the OS O... button in the current window. The OS window opens.
 2. You should see an entry titled as the program name given above, in the PROGRAM LIST view.
 3. Now that this program is available to the OS simulator, we can create as many instances,

i.e. processes, of it as we like. You do this by clicking on the CREATE NEW PROCESS button.

Refer to following video links on CPU OS Simulator

1. https://www.youtube.com/watch?v=_9JeRt4s_cQ
2. <https://www.youtube.com/watch?v=ncStt2pCjcc>

PART-A

- - Select the **First-Come-First-Served (FCFS)** option in the SCHEDULER/Policies view
 - Time slice should be considered as **seconds**.
 - Create four processes P1, P2, P3 and P4 from source code respectively (Use the Priority drop-down list in the PROGRAM LIST / Process View):
3, 2, 4, 1

- Slide the Speed selector half-way down and then hit the START button.
- **Arrival delay** should be considered in **seconds** in the OS simulator

Now, give answer for the following:

1. What is the order in which processes are executed?

P1 - P2 - P3 - P4

What is the Elapsed time , Average Process Waiting Time and Average Burst Period

and of each process? (To see this, Click on VIEWS button available on the left of your OS control, the click VIEW LOG)

	<i>Arrival</i>	<i>Elapsed Time</i>	<i>Average Process</i>	<i>Average Burst</i>
Process	<i>Time/Delay</i>	<i>(sec)</i>	<i>Waiting Time (sec)</i>	<i>Period</i>
P1	0	160	0.32	125
P2	0	158	160.21	125
P3	0	158	318.59	125
P4	0	158	476.97	125
Avg. Process Waiting Time =				239.02

PART-B

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- Select the **Shortest Job First (SJF)** option in the SCHEDULER/Policies view
- Select the Priority (static) as **Pre-emptive** option in the SCHEDULER/Policies view
- Time slice should be considered as **seconds**.
- Create four processes P1, P2, P3 and P4 from source codes respectively (Use the Priority drop-down list in the PROGRAM LIST / Process View):
3, 2, 4, 1
- Slide the Speed selector half-way down and then hit the START button.
- **Arrival delay** should be considered in **seconds** in the OS simulator

Now, give answer for the following:

1. What is the order in which processes are executed?

P1 - P2 - P3 - P4

What is the Elapsed time , Average Process Waiting Time and Average Burst Period

and of each process? (To see this, Click on VIEWS button available on the left of your OS control, the click VIEW LOG)

	<i>Arrival</i>	<i>Elapsed Time</i>	<i>Average Process</i>	<i>Average Burst</i>
Process	<i>Time/Delay</i>	<i>(sec)</i>	<i>Waiting Time (sec)</i>	<i>Period</i>
P1	0	160	0.32	125
P2	0	158	160.21	125
P3	0	158	318.6	125
P4	0	158	476.98	125
Avg. Process Waiting Time =				239.03

PART-C

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- Select the **Round Robin (RR) with 5 seconds as time slice** option in the SCHEDULER/Policies view.
- Select the Priority (static) as **Pre-emptive** option in the SCHEDULER/Policies view
- Time slice should be taken in terms of **seconds** instead of **ticks**
- Create four processes P1, P2, P3 and P4 from source codes respectively (Use the Priority drop-down list in the PROGRAM LIST / Process View):
3, 2, 4, 1
- Slide the Speed selector half-way down and then hit the START button.
- **Arrival delay** should be considered in **seconds** in the OS simulator

Now, give answer for the following:

1. What is the order in which processes are executed?

P3 - P1 - P2 - P4

1. What is the *Elapsed time* , *Average Process Waiting Time* and *Average Burst Period* and of each process? (To see this, Click on VIEWS button available on the left of your OS control, the click VIEW LOG)

Process	<i>Arrival</i>	<i>Elapsed Time</i>	<i>Average Process</i>	<i>Average</i>
	<i>Time/Delay</i>	<i>(sec)</i>	<i>Waiting Time (sec)</i>	<i>Burst Period</i>
P1	0	345	5.49	3
P2	0	501	10.26	3
P3	0	173	0.73	3
P4	0	645	251.04	62
Avg. Process Waiting Time =				179.16

PART-D

- a) Plot a graph from the results obtained by FCFS, SJF and Round Robin scheduling and

explain which algorithm is better among these with proper justification.