DEPARTMENT OF SOFTWARE ENGINEERING

THE UNIVERSITY OF LAHORE

Assignment 2

Due Date: Monday 07 November 2022

1- Round robin schedulers normally maintain a list of all runnable processes, with each process occurring exactly once in the list. What would happen if a process occurred twice in the list? Can you think of any reason for allowing this?

2- Most round robin schedulers use a fixed size quantum. Give an argument in favor of a small quantum. Now give an argument in favor of a large quantum.

3- Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time	Priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

(a) Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling.

(b) What is the turnaround time of each process for each of the scheduling algorithms in part (a)?

(c) What is the waiting time of each process for each of the scheduling algorithms in part (a)?

(d) Which of the schedules in part (a) results in the minimal average waiting time (over all processes)?

4- Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. In answering the questions, use non-preemptive scheduling and base all decisions on the information you have at the time the decision must be made.

Process	Arrival Time	Burst Time
P_1	0.0	8
P_2	0.4	4
P_3	1.0	1

(a) What is the average turnaround time for these processes with the SJF scheduling algorithm?

(b) The SJF algorithm is supposed to improve performance but notice that we chose to run process P1 at time 0 because we did not know that two shorter processes would arrive soon. Compute what the average turnaround time will be if the CPU is left idle for the first 1 unit and then SJF scheduling is used. Remember that processes P1 and P2 are waiting during this idle time, so their waiting time may increase. This algorithm could be known as future-knowledge scheduling.

5- Consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst
P1	10
P2	4
P3	8
P4	4
P5	7

The processes are assumed to have arrived in the order P1< P2 < P3< P4< P5

(a) Draw Gantt chart that illustrates the execution of these processes using FCFS scheduling algorithm.
(b) What is the turnaround and average waiting time in part (i)?
(c) If the processes execution change to P2< P3 < P4< P5< P1, what is the turnaround and average waiting time?
(d) If the processes execution change to P3< P1 < P5< P4< P2, what is the turnaround and average waiting time?
(e) Explain the optimal execution sequence from P1< P2 < P3< P4< P5, P2< P3 < P4< P5< P1 and P3< P1 < P5< P4< P2.