Assignment 4 – Calculation of CPU Scheduling Algorithms (5%)

Introduction

Assignment 4 contributes 5% towards your final course grade and the assignment total is 20 marks. You should begin Assignment four after completing the materials in Module five; it is due at the end of Module six. Check your Course Schedule for the precise due date. Directions for submitting Assignment 4 to your Open Learning Faculty Member for grading can be found in the Assignments Overview tab. An assignment marking criteria and your assignment submission details follows at the end of this document.

In this assignment, you will calculate the turnaround time and the waiting time for various CPU scheduling algorithms. The efficiency of Operating System depends on two main factors:

- Algorithms used for scheduling; and
- The environment in which theses algorithms are implemented.

Questions:

1. CPU scheduling:

   Use the formulas

   Turnaround time per process = completion time – arrival time

   Wait time per process = turnaround time – burst time

   Note: A larger number indicates a higher priority

Process	Arrival Time	Burst Time	Priority
P1	0	16	8
P2	0	10	10

P3	3	5	6
P4	5	8	10
P5	8	12	5

For each of Round Robin, First Come First Serve, Priority Preemptive and Priority Non-Preemptive draw the Gantt chart to illustrate how these processes would be scheduled, and calculate turnaround time per process and the wait time per process. For Round Robin, quantum = 5.

2. CPU scheduling

Process	Arrival Time	Burst Time	Priority
P1	0	8	8
P2	0	4	10
P3	4	1	6

For each of Round Robin, First Come First Serve, Priority Preemptive and Priority Non-Preemptive draw the Gantt chart to illustrate how these processes would be scheduled, and calculate turnaround time per process and the wait time per process. For Round Robin, quantum = 5.

3. CPU scheduling

Process	Arrival Time	Burst Time	Priority
P1	0	8	8
P2	0	4	10
P3	4	1	6
P4	6	6	8

For Shortest Remaining Time draw the Gantt chart to illustrate how these processes would be scheduled, and calculate turnaround time per process and the wait time per process.

4. Starvation

   Indicate the algorithms, from those listed below, that could result in starvation and explain why. **Note:** You should assume that each process will use the CPU for a finite burst before performing I/O.

   i. First-come, First-Served
   ii. Round Robin (aka preemptive FCFS)
   iii. Shortest Job First
   iv. Shortest Remaining Time First (aka preemptive SJF)
   v. Priority

Report Submission Details

You need to submit a report that consists of answers to the listed questions.

Assignment Marking Criteria	Weighting
Q 1	/5
Q 2	/5
Q 3	/5
Q 4	/5
Total	/20