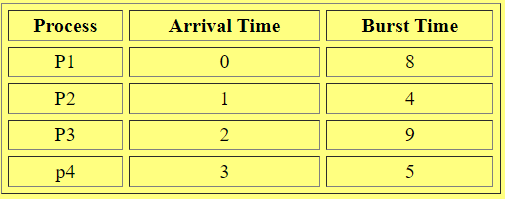
**Class Activity**

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

**Task 1**



**NON-PREEMPTIVE:**

P1 p2 p4 p3

0 8 12 17 26

**Average waiting time:**

P1 0 – 0 = 0

P2 8 – 1 = 7

P3 17 – 2 = 15

P4 12 – 3 = 9

Average waiting time = 0 + 7 + 15 + 9 = 31/4

Average waiting time = 7.75

**Average turn around time:**

P1 0 + 8 = 8

P2 7 + 4 = 11

P3 15 + 9 = 24

P4 9 + 5 = 14

Average turn around time = 8 + 11 + 24 + 14 = 57/4

Average turn around time = 14.25

**PREEMPTIVE:**

P1 p2 p4 p1 p3

0 1 5 10 17 26

T1 ----- p1(7), p2(4)

T2 ----- p1(7), p2(3), p3(9)

T3 ----- p1(7), p2(2), p3(9) , p4(5)

T5 ----- p1(7), p3(9), p4(5)

T10 ----- p1(7), p3(9)

**Average waiting time:**

P1 (0 – 0) + (10 – 1) = 9

P2 (1 – 1) = 0

P3 (17 – 2) = 15

P4 (5 – 3) = 2

Average waiting time = 9 + 0 + 15 + 0 = 25 = 24/4

Average waiting time = 6

**Average turn around time:**

P1 9 + 8 = 17

P2 0 + 4 = 4

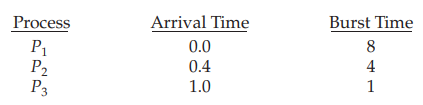
P3 15 + 9 = 24

P4 2 + 5 = 7

Average turn around time = 17 + 4 + 24 + 7 = 52/4

Average turn around time = 13

**Task 2**



**NON-PREEMPTIVE**:

P1 p3 p2

0 8 9 13

**Average waiting time:**

P1 0 – 0 = 0

P2 9 – 0.4 = 8.6

P3 8 – 1 = 7

Average waiting time = 0 + 8.6 + 7 = 15.6/3

Average waiting time = 5.2

**Average turn around time:**

P1 0 + 8 = 8

P2 8.6 + 4 = 12.6

P3 7 + 1 = 8

Average turn around time = 8 + 12.6 + 8 = 28.6/3

Average turn around time = 9.53

**PREEMPTIVE:**

P1 p2 p3 p2 p1

0 0.4 1 2 5.4 13

T0.4 ----- p1(7.6), p2(4)

T1 ----- p1(7.6), p2(3.4), p3(1)

T2 ----- p1(7.6), p2(3.4)

**Average waiting time:**

P1 (0 – 0) + (5.4 – 0.4) = 5

P2 (0.4 – 0.4) + (2 - 1) = 1

P3 (1 – 1) = 0

Average waiting time = 5 + 1 + 0 = 6/3

Average waiting time = 2

**Average turn around time:**

P1 5 + 8 = 13

P2 1 + 4 = 5

P3 0 + 1 = 1

Average turn around time = 13 + 5 + 1 = 19/3

Average turn around time = 6.3

**Task 3**

|  |  |  |
| --- | --- | --- |
| Process | Arrival Time | Burst Time |
| P1 | 0 | 20 |
| P2 | 25 | 25 |
| P3 | 30 | 25 |
| P4 | 60 | 15 |
| P5 | 100 | 10 |

**NON-PREEMPTIVE**:

P1 p2 p3 p4 p5

0 20 25 50 75 90 100 110

**Average waiting time:**

P1 0 – 0 = 0

P2 25 – 25 = 0

P3 50 – 30 = 20

P4 75 – 60 = 15

P5 100 – 100 = 0

Average waiting time = 0 + 0 + 20 + 15 + 0 = 35/5

Average waiting time = 7

**Average turn around time:**

P1 0 + 20 = 20

P2 0 +25 = 25

P3 20 + 25 = 45

P4 15 + 15 = 30

P5 0 + 10 = 10

Average turn around time = 20 + 25 + 45 + 30 + 10 = 130/5

Average turn around time = 26

**PREEMPTIVE**:

P1 p2 p3 p4 p5

0 20 25 50 75 90 100 110

T30 ----- p2(20), p3(25)

T60 ----- p3(15), p4(15)

T75 ----- p4(15)

**Average waiting time:**

P1 0 – 0 = 0

P2 25 – 25 = 0

P3 50 – 30 = 20

P4 75 – 60 = 15

P5 100 – 100 = 0

Average waiting time = 0 + 0 + 20 + 15 + 0 = 35/5

Average waiting time = 7

**Average turn around time:**

P1 0 + 20 = 20

P2 0 +25 = 25

P3 20 + 25 = 45

P4 15 + 15 = 30

P5 0 + 10 = 10

Average turn around time = 20 + 25 + 45 + 30 + 10 = 130/5

Average turn around time = 26

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

b. What is the average waiting time for these processes with the SJF scheduling algorithm?