Operating Systems ClassWork 5 – Scheduling Page 1 of 2

Week \_\_\_\_\_\_\_\_\_\_\_ Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ID: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Consider a set of processes, which arrive at a system as follows:-

|  |  |  |
| --- | --- | --- |
| **Process Name** | **Arrival Time** | **Burst/ Service time**  **(amount of time it needs to complete its processing)** |
| P1 | 0 | 4 |
| P2 | 2 | 1 |
| P3 | 3 | 6 |
| P4 | 8 | 2 |
| P5 | 9 | 5 |
| P6 | 12 | 2 |

For each of the scheduling algorithms

* First Come First Server (FCFS)
* Shortest Process First

Answer the following questions (for each algorithm!):

**1. Show the order in which the processes would be selected for execution**

**2. Calculate the average response time for processes, for each algorithm.**

**3. Calculate the average turnaround time for processes , for each algorithm.**

**The following guidelines will help you to get the right answer for each of the algorithms below**.

* Mark on each grid the time at which the processes arrive at the system. (see ‘A’ in the grid).
* Processes cannot start executing before they arrive at the system so in each row of the grid you will never have any shaded cells before the ‘A’.
* Only one process can be executing at a time. So only one cell in each column will be shaded.
* As far as possible the system should never be idle. So, avoid empty columns.

1. **FCFS - First Come First Served**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time -> **0** | 1 | **2** | **3** | 4 | 5 | 6 | 7 | **8** | **9** | 10 | 11 | **12** | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| P1 A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P2 |  | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P3 |  |  | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P4 |  |  |  |  |  |  |  | A |  |  |  |  |  |  |  |  |  |  |  |  |
| P5 |  |  |  |  |  |  |  |  | A |  |  |  |  |  |  |  |  |  |  |  |
| P6 |  |  |  |  |  |  |  |  |  |  |  | A |  |  |  |  |  |  |  |  |

Turnaround time:

P1: 4 -0 = 4

P2: 5-2 = 3

P3: 11 – 3 = 8

P4: 13 – 8 = 5

P5: 18 – 9 =9

P6: 20 – 12 = 8

Average Turnaround time: (4 + 3 + 8 + 5 + 9 + 8 ) / 6 = 37/6 = 6.16 seconds

Response time:

P1: 0

P2: 2

P3: 2

P4: 3

P5: 4

P6: 6

Average response time: (0 + 2 + 2 + 3 + 4 + 6) / 6 = 17/6 = 2.83 seconds

1. **Shortest Process First**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | **3** | **4** | 5 | 6 | 7 | **8** | **9** | 10 | 11 | **12** | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| P1 A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P2 |  | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P3 |  |  | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P4 |  |  |  |  |  |  |  | A |  |  |  |  |  |  |  |  |  |  |  |  |
| P5 |  |  |  |  |  |  |  |  | A |  |  |  |  |  |  |  |  |  |  |  |
| P6 |  |  |  |  |  |  |  |  |  |  |  | A |  |  |  |  |  |  |  |  |

Average Turnaround time: (4 + 3 + 8 + 5 + 11 + 3) /6 = 5.66

Average Response time: (0 + 2 + 2 + 3 + 6 + 1)/ 6 = 2.33