

Department of Computer Science and Engineering

**FACULTY OF ENGINEERING AND TECHNOLOGY
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CS-501

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FIRST-COME, FIRST-SERVED (FCFS) SCHEDULING

FCFS Scheduling

- Non-preemptive.
- FCFS is the simplest CPU scheduling algorithm.
- The process, that request the CPU first, is allocated to the CPU firstly .
- The implementation of FCFS policy is easily managed by the FIFO queue.

FCFS Question 1

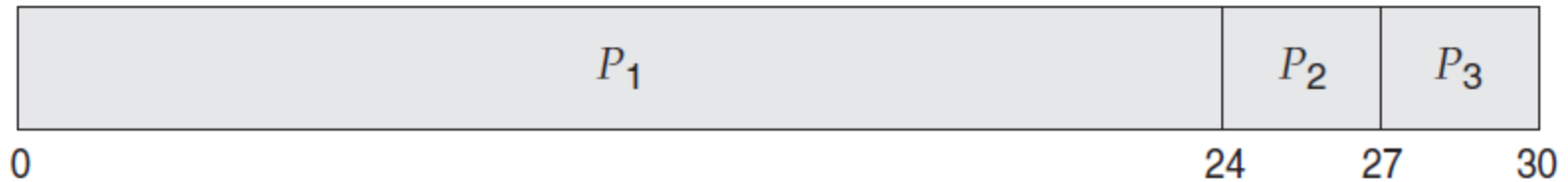
Process	Burst Time
P_1	24
P_2	3
P_3	3

Suppose that the processes arrive, at time 0, in the order: P_1 , P_2 , P_3

Find:

1. *Waiting Time*
2. *Average Waiting Time*
3. *Turnaround Time*
4. *Average Turnaround Time*

FCFS Question 1: Solution^{1/2}



- *Waiting Time*

- $P_1 \text{wt} = 0 \text{ unit time}$

- $P_2 \text{wt} = 24 \text{ unit time}$

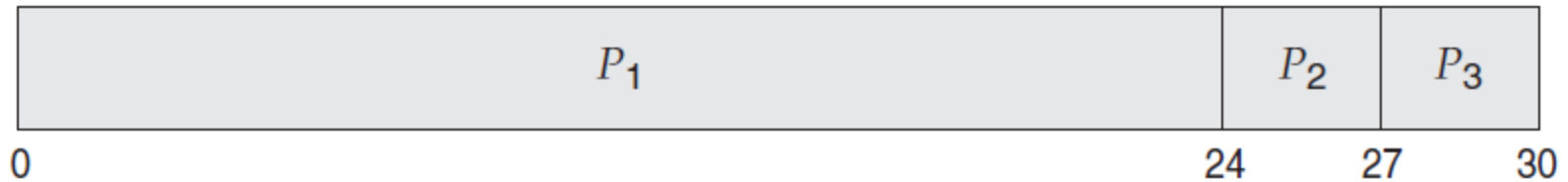
- $P_3 \text{wt} = 27 \text{ unit time}$

- *Average Waiting Time*

$$AWT = (P_1 \text{wt} + P_2 \text{wt} + P_3 \text{wt}) / 3$$

$$AWT = (0 + 24 + 27) / 3 = 17 \text{ unit time}$$

FCFS Question 1: Solution^{2/2}



- *Turnaround Time*

- $P1tt = (24 - 0) = 24$ unit time

- $P2tt = (27 - 0) = 27$ unit time

- $P3tt = (30 - 0) = 30$ unit time

- *Average Turnaround Time*

- $ATT = (P1tt + P2tt + P3tt) / 3$

- $ATT = (24 + 27 + 30) / 3 = 27$ unit time

FCFS Question 2

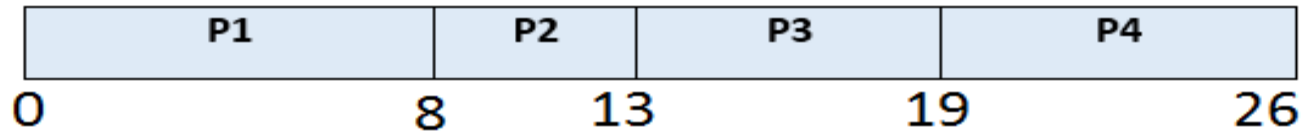
Process	Burst Time
P_1	8
P_2	5
P_3	6
P_4	7

Suppose that the processes arrive , at time 0, in the order: P_1 , P_2 , P_3 , and P_4

Find:

1. *Waiting Time*
2. *Average Waiting Time*
3. *Turnaround Time*
4. *Average Turnaround Time*

FCFS Question 2: Solution^{1/2}



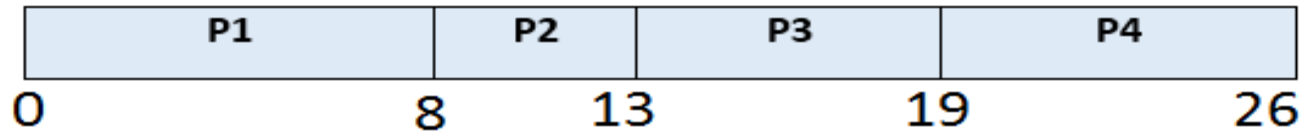
- *Waiting Time*

- $P1wt=0$ unit time
- $P2wt=8$ unit time
- $P3wt=13$ unit time
- $P4wt=19$ unit time

- *Average Waiting Time*

- $AWT=(P1wt+P2wt+P3wt+P4wt)/4$
- $AWT=(0+8+13+19)/4= 10$ unit time

FCFS Question 2: Solution^{2/2}



- *Turnaround Time*

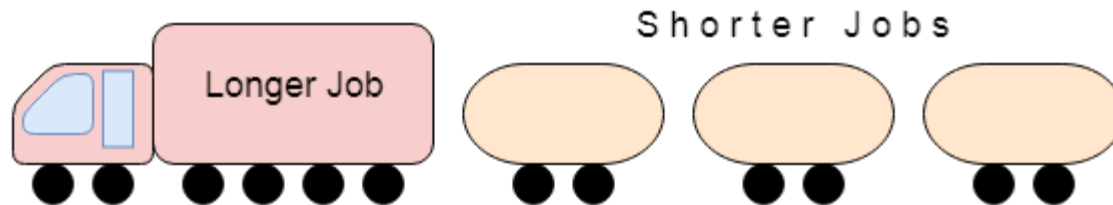
- $P1tt = (8 - 0) = 8$ unit time
- $P2tt = (13 - 0) = 13$ unit time
- $P3tt = (19 - 0) = 19$ unit time
- $P4tt = (26 - 0) = 26$ unit time

- *Average Turnaround Time*

- $ATT = (P1tt + P2tt + P3tt + P4tt) / 4$
- $ATT = (8 + 13 + 19 + 26) / 4 = 16.5$ unit time

FCFS Scheduling: Issue

- **Convoy effect**
 - Short process behind long process



FCFS Question 1 Revisited

Process	Burst Time
P_1	24
P_2	3
P_3	3

Suppose that the processes arrive , at time 0, in the order: P_2, P_3, P_1

Find:

1. *Waiting Time*
2. *Average Waiting Time*
3. *Turnaround Time*
4. *Average Turnaround Time*

References

1. Silberschatz, Galvin and Gagne, “Operating Systems Concepts”, Wiley.
2. William Stallings, “Operating Systems: Internals and Design Principles”, 6th Edition, Pearson Education.
3. D M Dhamdhere, “Operating Systems: A Concept based Approach”, 2nd Edition, TMH.

Thank You.

