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TECHNOLOGY, RESEARCH, SOCIAL INNOVATION & PARTNERSHIPS

# **CET2011A -Operating Systems**

**School of Computer Engineering and technology**

## Lab Assignment 3

### FCFS CPU Scheduling

#### **Problem Statement : FCFS CPU Scheduling**

Write a program to simulate the First Come First Serve ( Non Pre-emptive) CPU Scheduling algorithm

# First Come First Serve (FCFS) ( Non Pre-emptive)

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## First Come First Serve (FCFS) ( Non Pre-emptive)

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### Processes with arrival times and burst time

Given n processes with their burst times and arrival times.

The task is to find average waiting time and average turn around time using FCFS scheduling algorithm.

FCFS simply queues processes in the order they arrive in the ready queue.

Here, the process that comes first will be executed first and next process will start only after the previous gets fully executed.

## First Come First Serve (FCFS) ( Non Pre-emptive)

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### Completion Time

Time at which process completes its execution.

### Turn Around Time

Time Difference between completion time and arrival time.

**Turn Around Time = Completion Time - Arrival Time**

### Waiting Time(W.T)

Time Difference between turn around time and burst time.

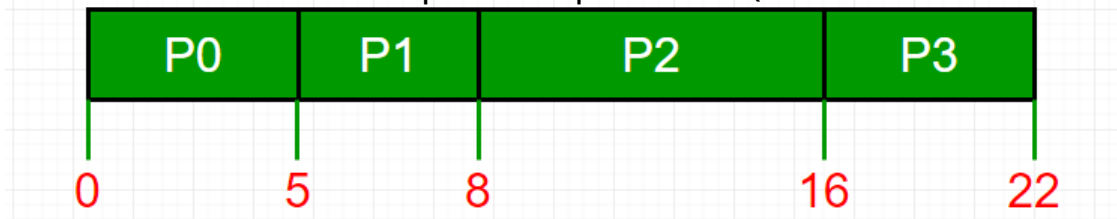
**Waiting Time = Turn Around Time - Burst Time**

## First Come First Serve (FCFS) ( Non Pre-emptive)

Processes	Burst time	Arrival Time	Service Time
P0	5	0	0
P1	3	1	5
P2	8	2	8
P3	6	3	16

**Service Time** : Service time means amount of time after which a process can start execution.

It is summation of burst time of previous processes (Processes that came before)



## First Come First Serve (FCFS) ( Non Pre-emptive)

Processes	Burst time	Arrival Time	Service Time
P0	5	0	0
P1	3	1	5
P2	8	2	8
P3	6	3	16

**To find waiting time:**

Time taken by all processes before the current process to be started

(i.e. burst time of all previous processes) - arrival time of current process

$$\text{wait\_time}[i] = (\text{bt}[0] + \text{bt}[1] + \dots + \text{bt}[i-1]) - \text{arrival\_time}[i]$$

Process                      Wait Time : **Service Time** - **Arrival Time**

P0                              0 - 0 = 0

P1                              5 - 1 = 4

P2                              8 - 2 = 6

P3                              16 - 3 = 13

Average Wait Time:  $(0 + 4 + 6 + 13) / 4 = 5.75$

## First Come First Serve (FCFS) ( Non Pre-emptive)

### Implementation

- 1) Input the processes along with their burst time (bt) and arrival time (at).
- 2) Find **waiting time (wt)** for all processes. i.e. for a given process i:  
$$wt[i] = (bt[0] + bt[1] + \dots + bt[i-1]) - at[i] .$$
- 3) Now find **turnaround time** = waiting\_time + burst\_time for all processes.
- 4) Find **average waiting time** = total\_waiting\_time / no\_of\_processes.
- 5) Similarly, find **average turnaround time** = total\_turn\_around\_time / no\_of\_processes.



## First Come First Serve (FCFS) ( Non Pre-emptive)

### Output

Processes	Burst time	Arrival Time	Waiting time	Turn-around time	Completion Time
P0	5	0	0	5	5
P1	9	3	2	11	14
P2	6	6	8	14	20

Average waiting time = 3.33333

Average turn around time = 10.0