# EXPERIMENT 6 – PROCESS SCHEDULING

##### OBJECTIVES

* Learning process scheduling
* Comparing among FCFS and SJF scheduling algorithms through a simulation (pre-emptive and non- pre-emptive)

**TIME REQUIRED** : 3 hrs

**PROGRAMMING LANGUAGE** : C/C++/Java

**SOFTWARE REQUIRED** : Ubuntu/Fedora, gcc/gc, Windows, Dev, NetBeans

**HARDWARE REQUIRED** : Core i5 in Computer Labs

##### PROCESS SCHEDULERS:

Process schedulers are responsible for selecting which process to execute so that overall performance is increased.

##### PERFORMANCE METRICS:

Metrics include throughput, CPU overhead, response time, average wait time etc.

##### FIRST COME FIRST SERVED (FCFS) SCHEDULER:

This scheduler implements a FIFO Queue and schedules all process on their order of arrival.

##### SHORTEST JOB FIRST (SJF) SCHEDULER:

This scheduler priorities processes based on their CPU usage time.

##### COMPARISON OF SCHEDULERS:

Implement a queue of length 5 to hold processes for FCFS and SJF both and for different algorithms observe the throughput at each second. To observe throughput, you have to mark at each instant how many processes have been executed for each scheduler.

Assume that all processes arrive at initial time and burst time is available for each process.

|  |  |
| --- | --- |
| **Process ID** | **Burst Time (Seconds)** |
| P1 | 5 |
| P2 | 8 |
| P3 | 11 |
| P4 | 4 |
| P5 | 2 |

|  |  |
| --- | --- |
| **Process ID** | **Burst Time (Seconds)** |
| P1 | 5 |
| P2 | 10 |
| P3 | 15 |
| P4 | 20 |
| P5 | 25 |
| **Process ID** | **Burst Time (Seconds)** |
| P1 | 25 |
| P2 | 20 |
| P3 | 15 |
| P4 | 10 |
| P5 | 5 |

##### EXERCISE 6.1 [2]

Given the states in schedule using FCFS and SJF both techniques and plot throughput on a graph. The horizontal specifies the time and the vertical marks the total number of processes completed so far.

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| **EXERCISE 6.2 [3]** |
| Calculate average wait time for each algorithm and for all three states on Points 10, 11 and 12. Average wait time is the sum of waiting times by each process divided by the total number of processes  **EXERCISE 6.3 [5]** |
| What is your conclusion based on the throughput and average wait time as well as the type of input? |

##### RESOURCES

<http://www.cosmolearning.com/video-lectures/concurrency-processes-threads-and-address-spaces-7406/>

<http://cs.uttyler.edu/Faculty/Rainwater/COSC3355/Animations/fcfs.htm>