# COEN383 Advanced Operating System

## Project 2 Report


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The following is the final statistical output obtained from the 5 algorithms implemented. The average of the 5 runs of all algorithms is as follows:

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**First Come First Serve:**

**Average Response Time :** 32.2
**Average Wait Time** : 32.7
**Average Turnaround Time :**38.4
**Average throughput :**16.0

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**Shortest Job First Non Preemptive:**

**Average Response Time :** 3.4
**Average Wait Time :** 4.7
**Average Turnaround Time :**8.8
**Average throughput :**27.0

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**Shortest Remaining Time First Preemptive:**

**Average Response Time :** 5.5

**Average Wait Time :** 6.6

**Average Turnaround Time :**7.8

**Average throughput :**27.0

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**Round Robin Preemptive:**

**Average Response Time :** 25.1
**Average Wait Time :** 56.3

**Average Turnaround Time :**61.9
**Average throughput :**24.0

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**Highest Priority First Preemptive:**

**Average Response Time :** 3.6
**Average Wait Time :** 9.1
**Average Turnaround Time :**11.8
**Average throughput :**49.0

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**Highest Priority First Non Preemptive:**

**Average Response Time :** 5.6
**Average Wait Time :** 5.9
**Average Turnaround Time :**6.8

**Average throughput :**18.0

The provided statistical output presents the performance metrics of six implemented CPU scheduling algorithms. Here's a breakdown of the observations:

**1. First Come First Serve Policy:**

- High response time, wait time, and turnaround time.
- Decreased throughput due to newer processes waiting for older processes.

**2. Shortest Job First Non-Preemptive:**

- Significant reduction in response time.
- Potential starvation for processes requiring longer execution time.

**3. Shortest Remaining Time First Preemptive:**

- Similar results to Shortest Job First.
- Jobs with short execution times get preference.

**4. Round Robin Preemptive:**

- Equal time slices for all processes.
- Increased turnaround time, response time, and wait time.
- Reduced throughput compared to other algorithms.

**5. Highest Priority First Preemptive:**

- Minimal response time, wait time, and turnaround time.
- Higher throughput due to preemptive nature.
- Possibility of starvation for lower priority processes.

**6. Highest Priority First Non-Preemptive:**

- Low response for higher-priority processes.
- Potential starvation for lower-priority processes.
- Lowest throughput among all algorithms.

**Conclusion:**

- Highest Priority First Preemptive demonstrated the best performance.
- Provides low response time, wait time, and turnaround time.
- Maximises throughput.
- Possibility of starvation for lower-priority processes, but overall efficiency is higher.

Considering these observations, it is reasonable to conclude that the Highest Priority First Preemptive policy is the most effective among the implemented algorithms

```
(base) adityakanodia@Adityas-MacBook-Pro-3 ~ % cd Desktop
(base) adityakanodia@Adityas-MacBook-Pro-3 Desktop % cd Courses
(base) adityakanodia@Adityas-MacBook-Pro-3 Courses % cd COEN\ 383\ P2\ Group\ 3
(base) adityakanodia@Adityas-MacBook-Pro-3 COEN 383 P2 Group 3 % cd Source\ Code
(base) adityakanodia@Adityas-MacBook-Pro-3 Source Code % gcc -o main *.c
process.c:65:47: warning: non-void function does not return a value [-Wreturn-type]
process * get_copy_of_process(process * proc){}
                                              ^
1 warning generated.
utility.c:177:1: warning: non-void function does not return a value in all control paths [-Wreturn-type]
}
^
1 warning generated.
(base) adityakanodia@Adityas-MacBook-Pro-3 Source Code % ./main
```

```
The average of the 5 runs of all algorithms is as follows:

ALGORITHM: FIRST COME FIRST SERVE:

Average Response Time(RT) : 32.2
Average Wait Time(WT) : 32.7
Average Turn Around Time(TAT) :38.4
Average throughput(tr) :16.0

ALGORITHM: ROUND ROBIN PREEMPTIVE:

Average Response Time(RT) : 25.1
Average Wait Time(WT) : 56.3
Average Turn Around Time(TAT) :61.9
Average throughput(tr) :24.0

ALGORITHM: SHORTEST JOB FIRST NON PREEMPTIVE:

Average Response Time(RT) : 5.0
Average Wait Time(WT) : 5.5
Average Turn Around Time(TAT) :8.8
Average throughput(tr) :27.0

ALGORITHM: SHORTEST REMAINING TIME FIRST PREEMPTIVE:

Average Response Time(RT) : 3.4
Average Wait Time(WT) : 4.7
Average Turn Around Time(TAT) :7.8
Average throughput(tr) :27.0

ALGORITHM: HIGHEST PRIORITY FIRST PREEMPTIVE:

Average Response Time(RT) : 3.6
Average Wait Time(WT) : 9.1
Average Turn Around Time(TAT) :11.8
Average throughput(tr) :49.0

ALGORITHM: HIGHEST PRIORITY FIRST NON PREEMPTIVE:

Average Response Time(RT) : 5.6
Average Wait Time(WT) : 5.9
Average Turn Around Time(TAT) :8.7
Average throughput(tr) :18.0
```

***Fig1: Execution of Algorithms***