

# OS Process Scheduler Simulation - Analysis of Algorithms

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## Assumptions:

- Each “cycle” is based on a set Round Robin time being added to various PCB and analysis values. Based on whether or not process finishes, io burst starts, process re-enters queues, etc, aforementioned values will be updated.
- CPU Utilization is a percentage based on the Sim Time and the CPU Idle Time.
- CPU Idle Time is defined as the amount of time spent with at least one core in an idle state. Not to be confused with Core Idle Time, which is the total idle time accumulated across all cores.

## Algorithms Tested: two different RR time quantum and FCFS

The cpu\_burst times were set to range from 15 to 30 ms, and our Round Robin Reset time was set to be either less than cpu burst min, between cpu burst min and max, and equal to the max. The first two represent Round Robin scheduling while the last one represents FCFS. This is because no process will ever get cut off by the Round Robin Reset and be forced back into a ready queue.

RRL - Round Robin Low. RRTIME set to 12.

RRM - Round Robin Mid. RRTIME set to 22.

FCFS - First Come First Serve. RRTIME set to 30.

## Throughput and CPU Utilizations:

### 4 cores:

Throughput (processes / ms):

RRL - 0.061

RRM - 0.053

FCFS - 0.056

### 12 cores:

RRL - 0.076

RRM - 0.078

FCFS - 0.077

CPU Utilization:

RRL - 97.15%

RRM - 97.23%

FCFS - 96.18%

RRL - 22.08%

RRM - 29.32%

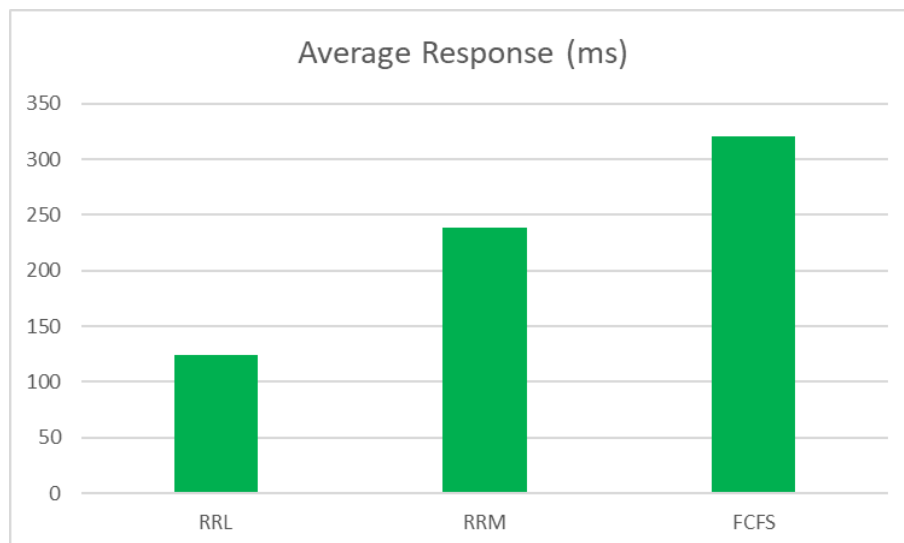
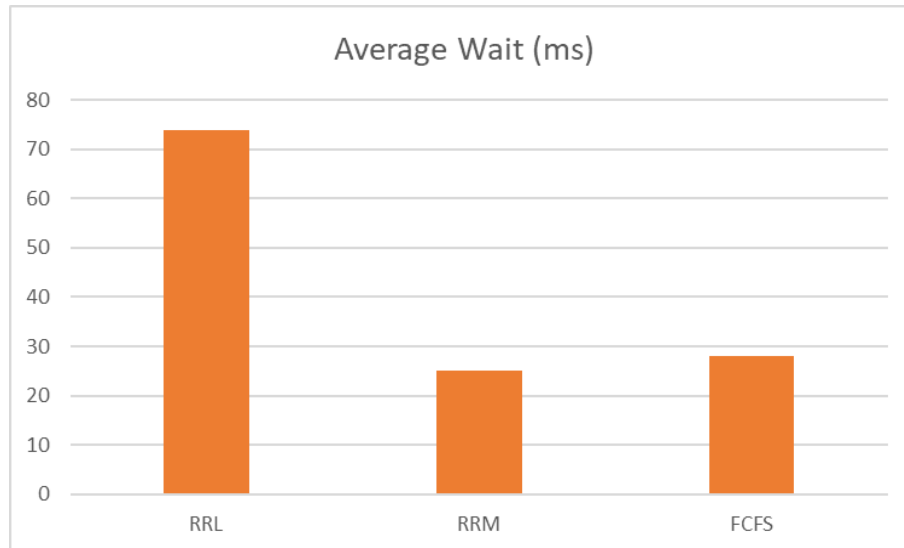
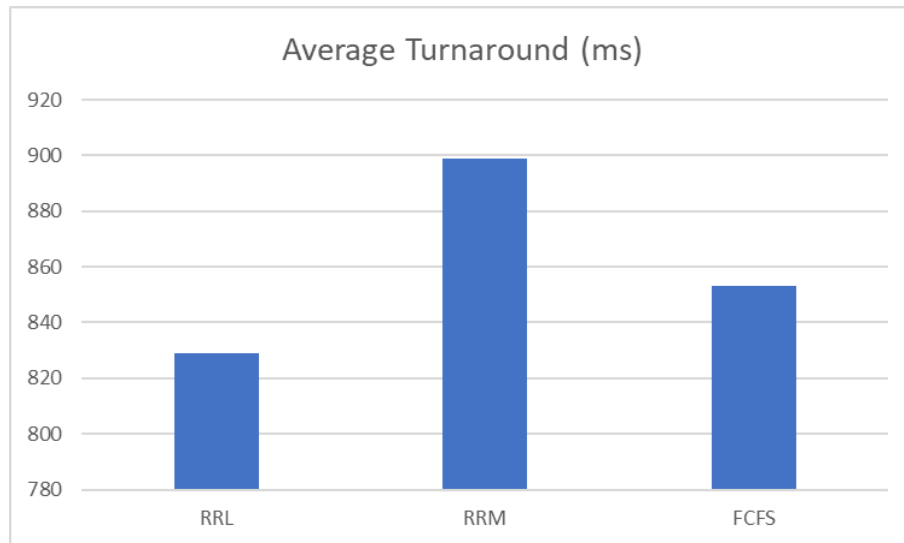
FCFS - 25.08%

## Speedups (using Amdahl's Law):

4-core processor - RRL : 3.88, RRM : 3.94, FCFS : 3.87

12-core processor - RRL : 4.90, RRM : 5.80, FCFS : 5.27

#### 4 Core Processor:



## 12 Core Processor:

