

## **Operating Systems Concepts**

### **CSE 4001**

#### **Scheduler Implementation**

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**Design:** Explain how your scheduler works (e.g., diagrams) and under what conditions it performs better (or worse) than the other scheduling algorithm(s).

- Implementation of the First Come First Serve scheduling algorithm which is an adaptation of the Round Robin algorithm. Also implementation of the Multi-Level Feedback Queue as per the assignment details.

Implementation: Specify what information you need to maintain to implement your scheduler, what data structures you used.

**Benchmark:** for each of the programs

in `testbin/` (`add`, `matmul`, `hog`, `farm`, `schedpong`)

- When comparing the round robin scheduler vs the FCFS scheduler we see no major difference in the times taken by the different scheduling techniques. But this could be because the OS seems to keep running out of memory and some tests don't actually work such as the matmul test. The differences, however, seem to be less than .01 of a second meaning, no significant difference. In the schedpong test, however, which I was able to rerun successfully, it seems the round robin scheduler is somewhat faster.
- The other scheduling algorithms was the MLFQ however I was unable to debug it to work therefore I have not included the tests here but the broken code is in GitHub.

### Default Round Robin:

Tests for: matmul, add, hog, farm, schedpong respectively.

```
OS/161 kernel [? for menu]: p testbin/matmul
Running program testbin/matmul failed: No such file or directory
Program (pid 2) exited with status 1
Operation took 0.208102877 seconds
OS/161 kernel [? for menu]: p testbin/add
testbin/add: Usage: add num1 num2
Program (pid 3) exited with status 1
Operation took 0.207527149 seconds
OS/161 kernel [? for menu]: p testbin/hog
Program (pid 4) exited with status 0
Operation took 8.550974986 seconds
OS/161 kernel [? for menu]: p testbin/farm
testbin/farm: fork: Out of memory
Program (pid 5) exited with status 1
Operation took 0.207615886 seconds
OS/161 kernel [? for menu]: p testbin/schedpong
Running program testbin/schedpong failed: Out of memory
Program (pid 7) exited with status 1
Operation took 0.216266846 seconds
OS/161 kernel [? for menu]: |
```

### First Come First Serve:

```
OS/161 kernel [? for menu]: p testbin/add
testbin/add: Usage: add num1 num2
Program (pid 2) exited with status 1
Operation took 0.207532773 seconds
OS/161 kernel [? for menu]: p testbin/matmul
Running program testbin/matmul failed: No such file or directory
Program (pid 3) exited with status 1
Operation took 0.208111320 seconds
OS/161 kernel [? for menu]: p testbin/hog
Program (pid 4) exited with status 0
Operation took 8.540904155 seconds
OS/161 kernel [? for menu]: p testbin/farm
testbin/farm: fork: Out of memory
Program (pid 5) exited with status 1
Operation took 0.207491233 seconds
OS/161 kernel [? for menu]: p testbin/schedpong
Running program testbin/schedpong failed: Out of memory
Program (pid 7) exited with status 1
Operation took 0.216240727 seconds
OS/161 kernel [? for menu]: p testbin/schedpong
```

```
OS/161 kernel [? for menu]: p testbin/schedpong
Running with 2 thinkers, 0 grinders, and 1 pong groups of size 6 each.
testbin/schedpong: fork: Out of memory
iPersotgbrianm/ s(cphieddp 2ong:) fork: 0eutx oif tmemeodr yw
th status 1
Operation took 0.428237113 seconds
```