**Operating Systems**

**CS4348**

**Project #3: OS Scheduling Algorithms**

**Due Date: Thursday, December 8, 2022**

## I. Project Organization

This project demonstrate three different scheduling algorithms.

You should do the following pieces to complete your project. Each piece is explained below:

* Code 60 points
* Output 30 points
* Summary 10 points

# Code

Your code should be nicely formatted with plenty of comments. The code should be easy to read, properly indented, employ good naming standards, good structure, etc.

# Output

Output will be graded by running your program. Each algorithm’s output is 10 points.

# Summary

The summary section should discuss your project experience. You should discuss how you approached the project, including anything difficult or interesting, and what was learned. This should be at least one page in length.

## II. Project Description

**Language/Platform/Approach**

This project must target a Unix platform and execute properly on our CS1 server.

The project must be written in C, C++, or Java.

### Problem Overview

This project will simulate a scheduler scheduling a set of jobs.

The project will allow the user to choose a scheduling algorithm from among three of the algorithms presented in the textbook. It will output a representation of how the jobs are executed.

**Design**

You may design your own implementation approach, but here are a few constraints.

Your program should read in a list of jobs from a tab-delimited text file named jobs.txt. The format of the text file should have one line for each job, where each line has a job name, an arrival time and a duration. The job name must be a letter from A-Z. The first job should be named A, and the remaining jobs should be named sequentially following the alphabet, so if there are five jobs, they are named A-E. The arrival times of these jobs should be in order, with the first job arriving at time zero.

The scheduler choice should be a command-line parameter that is one of the following: RR, SRT, FB, ALL. If ALL is input, the program should produce output for all three scheduling algorithms. RR and FB should use a quantum of one. FB should use three queues. If more than one job may run next, choose the one with the lowest job name alphabetically. For RR, if a job times out just as a new job arrives, the new job should go into the queue followed by the job that timed out.

Your output should be a graph as shown in the slides. The graph can be text or you can use a graphics package such as JavaFX to draw the graph. For text, you may draw the graph down the page rather than across.

Your program should be able to reproduce the sample shown in the book as well as any similar set of jobs.

**Sample Output**

Below is sample text-based output. For graphical output, you can make the graph look like the ones in the textbook and slides.

FCFS (Note: this is just an example, FCFS is not one of the three algorithms for the project)

A XXX

B XXXXXX

C XXXX

D XXXXX

E XX

FCFS (this is another way you may print the output instead of the one above)

A B C D E

X  
X  
X

X  
 X  
 X  
 X  
 X  
 X

X

X

X

X

X

X

X

X

X

X

X

Do not produce a single line of output, such as AAABBBBBBCCCCDDDDDEE, this will not be given credit.

## III. Project Guidelines

### Submitting

Submit your project on eLearning. Include in your submission the following files:

1. readme.txt. A readme file describing how to compile and run your project
2. summary.doc A Word document for the summary
3. Your source files

### Academic Honesty

All work must be your own. If cheating is suspected, you will be referred to the Judicial Affairs Office for further discussion. Copying may be detected in a number of ways, including by software which compares your code with all other students’ source code, by comparison with code on the Internet, or by a visual inspection of your source code.

### Resources

The slides and textbook describe the three algorithms to be used.