

CSC 521 Operating Systems

Project 2 – Short Term Scheduling

Due March 27, 2024, 6:30 pm

This project is to implement the CPU scheduling policies, First-Come-First-Served (FCFS), Round-Robin (RR), Shortest Process Next (SPN) and Shortest Remaining Time (SRT) described in the textbook.

1. Your program named “mydispatcher” must accept two command-line arguments
 - (a) input.dat
 - (b) a scheduling policy (i.e. one of FCFS, RR, SPN and SRT)

For example,
> ./mydispatcher input.dat FCFS

If it is run with the wrong arguments or no arguments, it should print out the usage instructions and exit.

For RR, you need to give an option for user to select default quantum size (1 second) or user input.

2. The format of the input file *input.dat* on the class website is a pair of integers, for example,

```
0 3
2 6
4 4
6 5
8 2
```

The first integer value represents the arrival time of a process and the second integer value represents the service time (burst time) in seconds. The *process id* is given by the line number, starting at 1. Arrival times are sorted in increasing order.

3. For each completed process, your program will produce the output with arrival time (A), service time (S), waiting time (W), finish time (F), and turnaround time (T). For example, the time values corresponding to the SRT must be stored into the output file *ouput.dat* as follows:

```
1 runs 0-3: A=0, S=3, W=0, F=3, T=3
2 runs 3-4
3 runs 4-8: A=4, S=4, W=0, F=8, T=4
5 runs 8-10: A=8, S=2, W=0, F=10, T=2
2 runs 10-15: A=2, S=6, W=7, F=15, T=13
4 runs 15-20: A=6, S=5, W=9, F=20, T=14
```

This output should not be displayed on the screen.

4. After handling all the process events, *your program should display* the global average turnaround time, global average normalized turnaround time (average of turnaround times divided by service times) and global average waiting time *on the screen as below*.

Average turnaround time = 7.20

Average normalized turnaround time = 1.59

Average waiting time = 3.20

5. You have to include graphs in jpeg or ps format using any graphic tools you choose based on turn around times, normalized turnaround times, and waiting times.

Programming Language and Environment:

- Language: C
- Platform: Clipper/Sloop/MCT263 machines
- Shell: tcsh

Submission:

Make the followings as `f24csc521p2_lastname.tar.gz` and then submit it to `ship.drlee@gmail.com`. The subject of your email is `f24 csc521 p2 lastname`.

- makefile
- readme
- source code
- any extra files needed to run your scheduling program
- image files (even if you put these in your documentation, you should include them in gz file)
- typescript
- output.dat
- documentation.doc
 - description of the program
 - algorithm
 - analysis of your algorithm and output
 - performance description
 - figures

Your file should include student, course, and instructor information.

Marking Criteria (100 marks total):

- Submission of required files only, with the information of student, instructor, and course on all submitted files (5 marks)
- Warning free compilation and linking of executable with proper name (5 marks)
- CPU scheduling policies (50 marks)
- Readability, suitability & maintainability of source code and makefile (10 marks)
- Documentation including graphs (30 marks)