

# OS Project 1 – CPU Scheduler

**Deadline: 2014/11/2 23:59, No late submission accepted**

## Description

In this project, you should implement a program that manipulates the CPU scheduler. Your program should support three kinds of scheduling algorithm: **FCFS** (First-Come, First-Served), **SRTF** (Shortest-Remaining-Time-First) and **RR** (Round Robin).

## Implement Details

Your program should read the specified text file (testdata.txt) which contains the workload for a set of processes, and then output a text file (.txt) which contains the record of context switching according to the information conveyed by the input file. The format of the input file and output file will be given next.

## Input Format

The following is an example of input file named testdata.txt which you need to deal with:

Scheduling Algorithm: FCFS

P1

Arrival Time: 0

Burst Time: 24

P2

Arrival Time: 0

Burst Time: 3

P3

Arrival Time: 0

Burst Time: 3

The first line indicates which scheduling algorithm should be used. There are only three possible cases as mentioned above: FCFS, SRTF and RR. As for RR, it will be followed by a number indicating the time quantum (e.g., Scheduling Algorithm: RR 5

)

Then, for each process, the process name, arrival time and burst time are given. According to these information and the algorithm, your program should generate an output file which indicates the records of context switching, average waiting time and average turnaround time. **The processes will be given in the order of arrival time, and there are at most 9 processes in a single input file. The time quantum of RR is also no larger than 9.** An example of output format is given as follow.

### **Output Format**

The following is an example of output file when given the above input file example as input. **Noted that the file name of the output file your program generates should be the same as your student ID ( ex: 00XXXXXX.txt ).**

|                             |         |
|-----------------------------|---------|
| P1                          | 0 - 24  |
| P2                          | 24 - 27 |
| P3                          | 27 - 30 |
| Average Waiting Time: 17    |         |
| Average Turnaround Time: 27 |         |

At the beginning, you should list the **process name** and **time interval** of the process controlling the CPU in time order. Average waiting time and average turnaround time should also be calculated and printed at the end of the file.

### **Hand in**

**Your source code should be implemented using C or C++. Hand in your source code to E3, as well as an one-page report to describe your design.** Do not copy and paste the code directly. You can include your thought or the difficulties encountered in this project.

Both files should be put into one single compressed folder and the folder name should be the same as your student ID ( ex: 00XXXXXX.rar or 00XXXXXX.zip ).

### **Scoring**

The scoring of this project is as follows:

- FCFS (30%)
- SRTF (30%)
- RR (30%)
- Report (10%)

For each scheduling algorithm, the TAs will prepare a set of testing files. If you can pass all the testing files, then you can get full credit on that part. **Noted that the testing files we used to grade your project will not be the same as the example files**

given on E3.