



Assignment 5

Overview

The objective of this assignment is to give you practice simulating various scheduling algorithms so that you better understand them. You must complete this assignment before its **deadline**, which is **Sunday, November 22, at 9:00 P.M. EST.**

Instructions

1. You will apply three different scheduling algorithms to the process mix described by the table below. Smaller numerical values are higher priorities.

Process ID	Arrival Time	Service Time	Priority
P_1	0	14	4
P_2	4	9	3
P_3	4	7	6
P_4	5	3	5
P_5	8	2	1
P_6	8	5	2

The scheduling algorithms are:

- (a) Round-Robin with Quantum =3
- (b) Shortest-Remaining-Time-First
- (c) Preemptive Priority Scheduling (without round-robin)

For each algorithm, you must create a table like the ones from the Chapter 5 slides, containing the columns shown below, as well as a final row containing the means of the waiting time, turnaround time, and normalized turnaround time.

Process ID	Arrival Time	Service Time	Priority	Waiting Time	Turnaround Time	Normalized Turnaround Time
P_1	0	14	4			
P_2	4	9	3			
P_3	4	7	6			
P_4	5	3	5			
P_5	8	2	1			
P_6	8	5	2			
mean						

The Form of Your Submitted Work

You will create a plain text file in the exact format specified below. If the file is not plain ASCII or UTF-8 text, it will not be graded.

1. The file must be a comma-separated-values (CSV) file with exactly 26 lines and 7 columns.



- (a) The first 8 lines are for the Round-Robin results (heading line, 6 process lines, means)
 - (b) The next line is a blank line
 - (c) The next 8 lines are for the Shortest-Remaining-Time-First results (heading line, 6 process lines, means)
 - (d) The next line is a blank line
 - (e) The next 8 lines are for the Priority Scheduling results (heading line, 6 process lines, means)
2. Except for the lines containing column headings, there can be no spaces on any line. Commas separate the fields. The words on the first line can have space between them.
 3. The blank lines shall consist of exactly 6 commas and nothing else.
 4. The process names in the first column shall be written P1, P2, ... P6.
 5. The next 5 columns shall have non-negative integer values, excluding the bottom row, described below.
 6. The last column shall have fixed decimal values with exactly two decimal digits of precision to the right of the decimal place, such as 12.30 or 1.00.
 7. In the last row, the three columns for waiting time, turnaround time, and normalized turnaround time shall have fixed decimal values with exactly two decimal digits of precision to the right of the decimal place. All other columns are empty.
 8. The first field in each heading line shall be the algorithm name, written as one of **RR**, **SRTF**, or **PS**.

Given the above constraints, your initial file should look like this one, except that the first line abbreviates the last column so that it fits on the page. This file is available on the server, and named `hwk5_initial.csv`:

```
RR,Arrival Time,Service Time,Priority,Waiting Time,Turnaround Time,NTT
P1,0,14,4,,
P2,4,9,3,,
P3,4,7,6,,
P4,5,3,5,,
P5,8,2,1,,
P6,8,5,2,,
mean,,,,
,,,,
SRTF,Arrival Time,Service Time,Priority,Waiting Time,Turnaround Time,NTT
P1,0,14,4,,
P2,4,9,3,,
P3,4,7,6,,
P4,5,3,5,,
P5,8,2,1,,
P6,8,5,2,,
mean,,,,
,,,,
PS,Arrival Time,Service Time,Priority,Waiting Time,Turnaround Time,NTT
P1,0,14,4,,
P2,4,9,3,,
P3,4,7,6,,
P4,5,3,5,,
P5,8,2,1,,
P6,8,5,2,,
mean,,,,
```



Submitting the Assignment

1. Login to `eniac` using your Computer Science Department Network username and password. If you cannot do this, then this is the first problem you have to solve. Everyone in the class has an account on the network and therefore has a username and password. Contact our system administrator by sending email to `cstechsp@hunter.cuny.edu` if you cannot login. *Do not send email to any other address!*
2. If you login successfully, then **`ssh` to any cslab host. You cannot complete this assignment on eniac!**
3. The instructions below arbitrarily assume that you have logged into `cslab12`.
4. Change directory to `/data/biocs/b/student.accounts/cs340_sw/hwks/`
5. Copy the file `hwk5_initial.csv` to your home directory. It is a plain ASCII file.
6. Once you have finished the assignment and all data is in the file, you will use the `submithwk_cs340` command to submit it. Remember that it requires two arguments: the number of the assignment (5 in this case) and the pathname of your homework file. **You can name the file anything you like, but it must have a `.csv` extension. To submit a plain text file, which is what your `hwk5.csv` file is, however, you give it the `-t` option.**

Thus, to submit this assignment, assuming that your current working directory is your home directory, you will type

```
submithwk_cs340 -t 5 my_hwk5.csv
```

The program will copy your `my_hwk5.csv` file into the directory

```
/data/biocs/b/student.accounts/cs340_sw/hwks/hwk5/
```

and if it is successful, it will display the message, “File `hwk5_username.csv` successfully submitted.”

where `username` is your username. You will not be able to read this file, nor will anyone else except for me. But you can double-check that the command succeeded by typing the command

```
ls -l /data/biocs/b/student.accounts/cs340_sw/hwks/hwk5
```

Grading Rubric

This assignment is worth 3% of your final grade. It will be graded out of 90 points. You will receive full credit if each file has all correct answers and has been submitted by the assignment deadline, which is stated above. You will receive partial credit in case some answers are not correct. If it is not submitted by the deadline, you receive no credit.