

# CSC 33200 (L) - Operating Systems – Spring 2022

## Lab 4: Working with Process

Date: 03/18/2022

DUE: 04/07/2022

### TASK 1 Simple Command Interpreter

Write a special simple command interpreter that takes a command and its arguments. This interpreter is a program where the main process creates a child process to execute the command using **exec()** family functions. After executing the command, it asks for a new command input (parent waits for child). The interpreter program will get terminated when the user enters exit.

Example:

./interpreter

command: pwd

⇒ output

command: ls -la

⇒ output

command: date

⇒ output

command: ls -lr /foldername

⇒ output

command: tail /etc/passwd | grep username

⇒ output

command: ps -u username | grep firefox

⇒ output

command: cat /etc/passwd

⇒ output

command: exit

⇒ terminates the program.

**Marks: 15**

## TASK 2 Average Grade Calculator

There are **n** ( $n > 1$ ) **students** enrolled in a course. The course covers **x** number of chapters from a textbook ( $x > 1$ ).

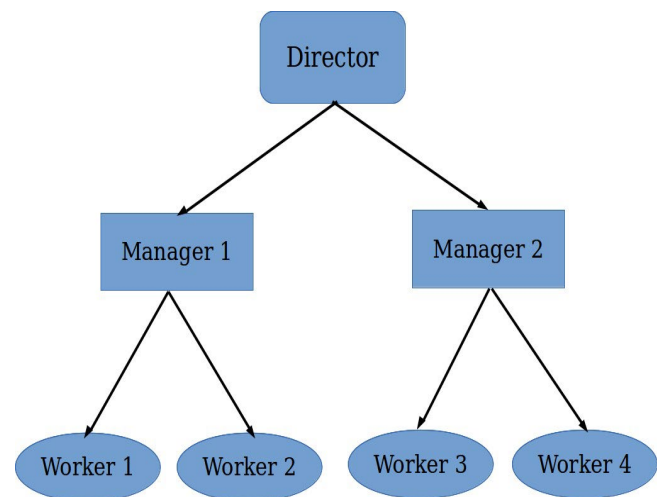
In each chapter **y** number of homeworks are assigned ( $y \geq 1$ ). The average grade for each homework in all the chapters need to be found out.

To solve this, write program which has the main process as **Director** process, which reads a file containing grades of all homeworks of all chapters and creates **x** number of **Manager** processes. Each **Manager** process will take care of solving a chapter. Each manager process will create **y** number of **Worker** process and pass marks of **n** students to each of them and they calculate and print the average.

The input file should contain the data according to the value of **x** and **y** and **n**. For example, the input text file and the process tree for  $x = 2$  and  $y = 2$  and  $n = 10$  will look like the following:

	X1Y1	X1Y2	X2Y1	X2Y2
Student1	19	17	20	18
Student2	9	6	10	9
Student3	12	11	10	6
Student4	3	7	9	10
Student5	0	5	8	6
Student6	15	13	15	15
Student7	20	18	18	16
Student8	17	19	19	18
Student9	13	15	14	12
Student10	10	13	18	15
Output:	avg	avg	avg	avg

```
File Edit View Search Tools Documents Help
+ Open Save Undo
quiz_grades x
19 17 20 18
9 6 10 9
12 11 10 16
3 7 9 10
0 5 8 6
15 13 15 15
20 18 18 16
17 19 19 18
13 15 14 12
10 13 18 15
```



**Marks: 15**

## Submission Instructions

- All the programs MUST be clearly indented and internally documented
- Make sure your programs compile and run without any errors
- Only include c files or txt files for submission. Do not include any executables.
- Save all your programs with meaningful names and zip into a single folder as: Lab4\_[your last name here].zip (e.g., Lab4\_Xyz.zip)
- Email your code with the subject line, "**Task4-CSC33200–Section G(41559)-lastname**"
- Email: [sdebnath@ccny.cuny.edu](mailto:sdebnath@ccny.cuny.edu)

\*\*\*\*\*

**Office Hour: Thursday 11:00 AM – 12:00 PM**

**Zoom Link:** <https://ccny.zoom.us/j/82938095199>

Meeting ID: 829 3809 5199

One tap mobile

+16465588656,,82938095199# US (New York)

+13126266799,,82938095199# US (Chicago)

Dial by your location

+1 646 558 8656 US (New York)

+1 312 626 6799 US (Chicago)

+1 301 715 8592 US (Washington DC)

+1 253 215 8782 US (Tacoma)

+1 346 248 7799 US (Houston)

+1 669 900 6833 US (San Jose)

Meeting ID: 829 3809 5199

Find your local number: <https://ccny.zoom.us/u/kMsO3gJtK>

**IMPORTANT NOTE: Please connect with zoom with a valid CCNY or CITYMAIL email id. Please sign up with the CITYMAIL or CCNY email address at :**

<https://www.ccny.cuny.edu/it/zoom>