CSC 33200 (L) - Operating Systems – Spring 2022

Lab 4: Working with Process
Date: 03/18/2022

DUE: 04/07/2022

PART 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

PART 2 Average Grade Calculator

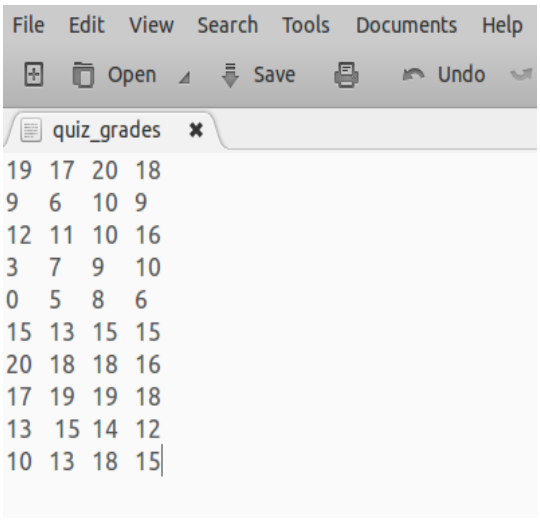
There are **n (n>1) students** enrolled in a course. The course covers ***x*** number of chapters from a textbook ($x > 1$).

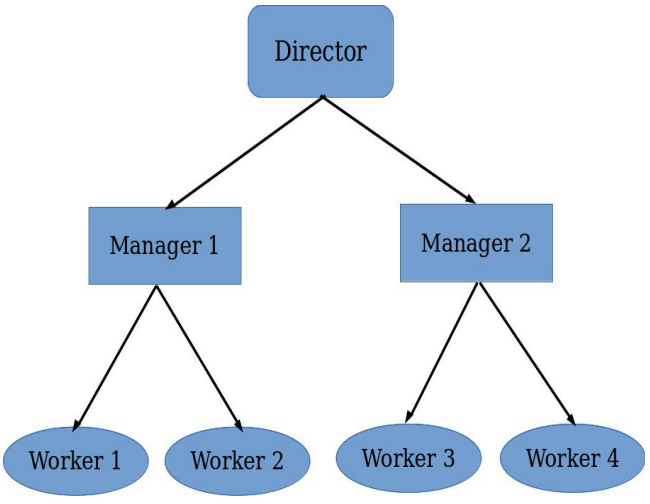
In each chapter ***y*** number of homeworks are assigned ($y>=1$). The average grade for each homework in all the chapters need to be found out.

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





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 6X(41557)-*lastname***"
- Email: sdebnath@ccny.cuny.edu

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Office Hour: Wednesday 11:00 AM – 12:00 PM
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Dial by your location
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