CSc 332 (6X) - Operating Systems

Lab – Spring 2017

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Task 4 - System Calls Summary

March 17, 2017

Max Points: 30 **Due**: March 30, 2017 11:59 PM

*(**Max Points**: 20 **Due**: April 6, 2017 11:59 PM)*

PART 1 Simple Command Interpreter

Recall: In Task 3, we worked with `exec()` system calls for specific commands such as `date`, and `ls`.

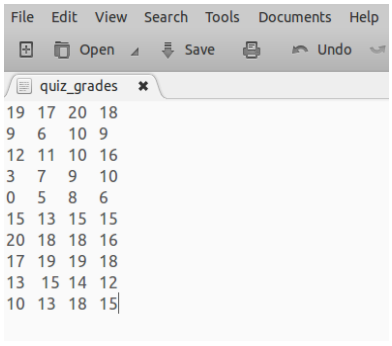
Write a special simple command interpreter that takes a command and its arguments. This interpreter is a program where the main process creates a child process to execute the command using `exec()` family functions. After executing the command, it asks for a new command input (i.e., parent wait for child).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

PART 2 Average Grade Calculator

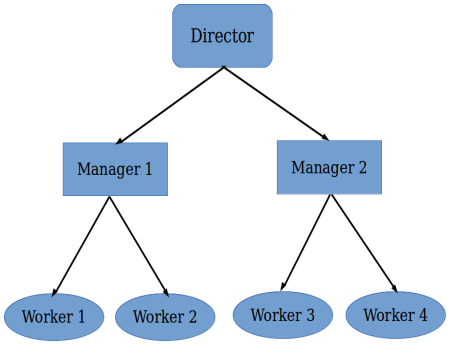
There are 10 students enrolled in a course. The course covers x number of chapters from a textbook ($x > 1$). In each chapter y number of homework(s) are assigned ($y \geq 1$). The average grade for each homework in all the chapters need to be found out.

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 one homework 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. For example, the input text file and the process tree for $x = 2$ and $y = 2$ will look like the following:



(a)



(b)

The Director process is responsible for opening and closing the input text file. It stores the values in a two dimensional integer array with 10 rows. You may need to use the following C functions (in addition to the necessary file & process management system calls): `fopen()`, `fscanf()`, `fseek()`, `fclose()`.

Submission Instructions

- Save your programs in a single folder and zip as: *task4_lastname.zip*. Make sure your programs compile and run without any errors.
- Email your code with subject line "Task 4 – CSc 332 (6X) – *lastname*"

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