**Project Assignment 2**

***System Programming and Process Management***

**CS4352 Operating Systems**

Fall 2018

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Due Date: 11/27, 11:59 pm, soft copy via Blackboard.

Late submissions are accepted till 11/30, 11:59 pm, with 10% penalty each day.

No submissions accepted after 11/30, 11:59 pm

You are asked to experience basic system programming including process creation (creating multiple children processes to work under one parent process) and termination on a Linux platform in this. In theory, children processes can do their own work separately or cooperatively to accomplish a task. In this assignment, these children processes perform independent tasks: simply print out a “my id:” message together with their PIDs (process IDs) and the Fibonacci result on modulo **20** of their PIDs and exit.

**Details:**

1. Prompt “Please enter an integer: ” to ask the users to input an integer number ***n*** (no checking, assume that users input a valid integer from 0 to 10).
2. The parent process creates ***n*** children processes. It should print out an error message if creation fails.
3. Each child process prints out a “my id: ” message together its PID.
4. Each child process prints out a “my Fibonacci modulo **20**: ” message together the Fibonacci result on modulo **20** of its PID then exit.
5. The parent process waits for all children processes to finish, print a message “All child processes are now done!” and then exit.

Hints: You should consider using *fork()* and *wait()* system calls to implement this program and *getpid()* system call that returns a process ID.

**Expected Submission:**

You should submit a single zipped file through the Blackboard containing the following:

* Source codes
* Provide 3 examples for your program (for example ***n****=2*, ***n****=5, and* ***n****=9*)*:* Capture (screenshots are fine) the example inputs and outputs of your programs.

**Grading Criteria:**

|  |  |
| --- | --- |
| Percentage % | Criteria |
| 2% | Inline comments to briefly describe your code |
| 3% | Correct use of system calls/library procedures of creating processes, check process ID. |
| 3% | Correctness of results. Source code can be compiled and executed. |
| 4% | Successfully carry out test cases (with different numbers of ***n***) |

This project assignment is **12**% of your final score.

**Reference Materials:**

* Linux system programming:

Book: *Linux System Programming*

Online:

Tutorial for Beginners, <http://www.ee.surrey.ac.uk/Teaching/Unix/>

Advanced Linux Programming, <http://www.advancedlinuxprogramming.com/alp-folder/advanced-linux-programming.pdf>

Stack Overflow, <http://stackoverflow.com/>

[www.unix.com](http://www.unix.com/answers-frequently-asked-questions/13774-unix-tutorials-programming-tutorials-shell-scripting-tutorials.html)

The Geek Stuff, <http://www.thegeekstuff.com/>