New York University
Tandon School of Engineering
Department of Electrical & Computer Engineering

Introduction to Operating Systems (CS-GY6233)
Spring 2020

Assignment 2

1. If you create a main() routine that calls fork() three times, i.e. if it includes the following code:
   pid_t pid1, pid2, pid3;
   pid1 = fork();
   pid2 = fork();
   pid3 = fork();
   Draw the process tree, clearly indicating the value pid1,pid2 and pid3 for each process in the tree.
2. Write a function that populates a given array of length n with a Fibonacci sequence (https://en.wikipedia.org/wiki/Fibonacci_number), where n is a integer parameter passed to the function, and an array pointer is also passed to the function. Initialize the first two elements of the array to a value of 1.

   Then create the main routine of your program, in which an integer array of length n is dynamically created, then the Fibonacci function (you just created) is called. Following that call, your program should invoke the `fork()` system call to create a child process that then prints the contents of the buffer created earlier and then exits.

   The length of the sequence `n` is obtained from the user as a parameter that is passed to your program when it started (i.e. when you invoke your program from the shell, you pass it one parameter, `n`).
   The parent process should wait for the child process to exit and then print the message "parent exiting…" .

3. In the program you created:
   How did n and the populated array contents reach the child process?
   If the child process modifies the array contents, would the parent see those changes?

What to hand in (using NYU Classes):

- Your ".c" and ".h" files (with appropriate comments). Do not attach project or make files.
- A file containing you answers in word of pdf format.
- A screen shot of your terminal window (possibly in the same file) showing the current directory, the command used to compile your program, the command used to run your program and the output of your program.

RULES:

- You may consult with other students about GENERAL concepts or methods, but copying code (or code fragments) or algorithms is NOT ALLOWED and is considered cheating (whether copied form other students, the internet or any other source).

- If you are having trouble, please ask your teaching assistant for help.
- You must submit your assignment prior to the deadline.