CECS 326-01 Assignment 1 (10 points)

Due: 9/22/2022 on BeachBoard (This is an updated due date)

This assignment is about fork(), exec(), and wait() system calls, and commandline arguments on Linux. Syntax of these system calls and their use can be found using the man pages on Linux by typing the following command:

>man fork (or any other system call of interest)

Write two C++ programs, to be named *parent.cc* and *child.cc* and compiled into executable *parent* and *child*, respectively that, when run, will work as follows:

parent
1. takes in a list of gender-name pairs from the commandline arguments
2. creates as many child processes as there are in the gender-name pairs and passes to each child process a child number and a gender-name pair
3. waits for all child processes to terminate
4. outputs "All child processes terminated. Parent exits." And terminates.

child
1. receives a child number and one gender-name pair arguments from parent
2. outputs "Child # x, I am a boy (or girl), and my name is xxxxxx."
3. Note: content of output depends on data received from parent

Sample run

To invoke the execution:
>*./parent* girl Nancy boy Mark boy Joseph

parent process does the following:
1. outputs "I have 3 children." -- Note: the number 3 comes from the number of gender-name pairs in the commandline arguments
2. creates 3 child processes, and have each execute *child* and passes to it an integer that represents the child number and one gender-name pair arguments
3. waits for all child processes to terminate, then
4. outputs "All child processes terminated. Parent exits."

Output from *child* processes
From first child process:
Child # 1: I am a girl, and my name is Nancy.
From second child process:
Child # 2, I am a boy, and my name is Mark.
From third child process:
Child # 3, I am a boy, and my name is Joseph.

Output from *parent* process
All child processes terminated. Parent exits.

Submit on BeachBoard the source programs *parent.cc* and *child.cc*, a screenshot that shows successful compile of both programs as well as a successful run, and a cover page that provides your name, your student ID, course # and section, assignment #, due date, submission date, and a clear program description detailing what the programs are about. Format of the cover page should follow the cover page template posted on BeachBoard. The programs must be properly formatted and adequately commented to enhance readability and understanding. Detailed documentation on <u>all</u> system calls are especially needed.