This homework focuses on learning how to create processes in Linux/Unix.

1. Using Fork() and Exec() or Clone(), create four child processes. Load the Hello” program in each process after creation (same program). Each child program should print its own PID or some other parameters distinguishing its execution.

2. Each process should run and return to the parent process where the parent is waiting to terminate. The parent should only terminate after all children returned from execution.

Run your program, capture its output and create single PDF file with source code and its output and submit in Blackboard. You can run it on CYGWIN, or any Linux system. The code should be written in C.

**Source Code (Linux)**

/\* Hello World program Homework #3- Linux GCC\*/

#include<stdio.h>

#include<stdlib.h>

#include<sys/types.h>

#include<unistd.h>

#include<sys/wait.h>

/\*

\* How to create multiple child processes

\* http://stackoverflow.com/questions/10909011/how-to-use-fork-to-create-only-2-child-processes

\* http://www.linuxquestions.org/questions/programming-9/create-n-child-processes-fork-629832/

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\* How to make the parent wait on the child process

\* http://stackoverflow.com/questions/19099663/how-to-correctly-use-fork-exec-wait

\*/

int main()

{

pid\_t pid\_parent;

int i;

pid\_parent = getpid();

printf("\nParent process PID: %d\n", pid\_parent);

for (i = 0; i < 4; i++){

//fork child process

pid\_t pid = fork();

if (pid < 0){ // error

printf(stderr, "Fork failed");

exit(1);

} else if (pid == 0){ //child

printf("\nHello World! I'm the CHILD! My PID is: %d\n", getpid());

exit(0);

} else {

}

wait(NULL);

}

printf("\nHello World! I'm the PARENT! My PID is: %d\n", getpid());

exit(EXIT\_SUCCESS);

}

**Output**

\* The output was run 3 times in order to ensure that Parent process would always terminate last.

**Test#1**

Parent process PID: 11340

Hello World! I'm the CHILD! My PID is: 11345

Hello World! I'm the CHILD! My PID is: 11346

Hello World! I'm the CHILD! My PID is: 11347

Hello World! I'm the CHILD! My PID is: 11348

Hello World! I'm the PARENT! My PID is: 11340

**Test#2**

Parent process PID: 11531

Hello World! I'm the CHILD! My PID is: 11536

Hello World! I'm the CHILD! My PID is: 11537

Hello World! I'm the CHILD! My PID is: 11538

Hello World! I'm the CHILD! My PID is: 11539

Hello World! I'm the PARENT! My PID is: 11531

**Test#3**

Parent process PID: 11549

Hello World! I'm the CHILD! My PID is: 11551

Hello World! I'm the CHILD! My PID is: 11552

Hello World! I'm the CHILD! My PID is: 11554

Hello World! I'm the CHILD! My PID is: 11556

Hello World! I'm the PARENT! My PID is: 11549