I confirm that I will keep the content of this assignment confidential. I confirm that I have not received any unauthorized assistance in preparing for or writing this assignment. I acknowledge that a mark of 0 may be assigned for copied work. Jason Choquette 104337378

For the implementation of this project, my main function calls an external program (the Parent), that forks a child (the Child) which immediately exits and becomes a zombie, upon which the parent’s pid gets returned to the original main function.

The return value of the parent function is the pid of the parent. This pid is used in the kill system call to kill the parent.

At each step of the process, a process table is printed to standard out.

The implementation details are given below.

int main()

{

pid\_t forkReturn;

int retCode;

// call another C program to create a zombie

// this main() function is the Parent process

int parent = createZombie();

// spawn a child process from this process

forkReturn= fork();

if (forkReturn == -1)

{

printf ("Error - fork failed!\n");

exit (0);

}

else if (forkReturn == 0)  //   - this is the CHILD

{

sleep(1);

/\* when the child wakes, have it terminate the PARENT \*/

retCode = kill( parent, SIGKILL);

if(retCode == 0)    // termination occured

{

printf("\n(CHILD)  : Parent has been terminated ...\n\n");

sleep(1);

system("ps -l");

exit (0);

}

else

printf("(CHILD)  : Unable to terminate parent\n");

exit (0);

}

else // this is the PARENT

{

system("ps -l");

sleep(5);

}

exit (0);

}

The createZombie function is quite simple. It simply spawns a child which immediately returns and then the pid of the parent is returned to the calling main() function.

The implementation details are given below.

int createZombie(void)

{

switch (fork())

{

case -1:

perror("\nfork() failed.\n");

exit(1);

case 0:

// immediately exit to become zombie while parent sleeps

exit(0);

default:

sleep(1);

printf("\n\nCurrent processes: \n\n");

system("ps -l");

printf("\n");

printf("\nFound the following zombies: \n");

system(" ps aux | awk '\"[Zz]\" ~ $8 { printf(\"PID = %d\", $2); }' ");

printf("\n\n");

sleep(1);

return getpid();

}

}

Below I have provided three screen shots of the program.





