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# CMPUT 379 Assignment 1 Project Report

## Objectives:

The objective of the assignment is to learn various UNIX functions
especially functions that manage processes. The assignment also
teaches the students to read documentation about various functions and
the operating system.

## Design Overview:

- I created two .c files for this assignment. This way, there is
  separation of concerns and the design is modular. If the
  developer wants to add more commands for the user to run, we can
  just add it in the a1commands.c file.
  - a1commands.c contains all the commands that can be ran by
    the user
  - a1shell.c is the main program.

- Created an enum that contains all the error codes for the
  assignment. This helps the user and developer know which errors
  are occurring.

## Project Status:

At time of submission, the assignment is working as specified. I
n the beginning, I had difficulties terminating the child process when
the parent terminates. This was later fixed.
I also had difficulties parsing the user input for the bash command
and its arguments and also parsing the user input for the pathname.
This was also fixed later on.

# Testing and Results:

Since most of the difficulty came from parsing the user input, I tested a lot by printing variables and character buffers to the command line. This helped me slowly pinpoint where in the code I'm getting issues.

To help with monitoring the child process terminating, I downloaded an OSX program called 'pstree' that helps show which process is the child and which process is the parent. This helped me distinguish the two processes better and in turn, I was able to fix the issue of the child process not terminating.

To test real time, CPU time, and user time when executing a bash command, I would call sleep(5) as some commands does not require any time to run and would just return 0. I also tried to find commands that takes some CPU power to execute.

The 'cd' and 'pwd' commands were used together to test both. It was done manually and was fairly easy to test. I added some environment variables using 'export' and was verified using 'env' and 'grep'

At time of submission, testing was fairly successful and I found that the assignment is working as intended.

# Acknowledgements:

- Man pages ☺
- APUE 3rd Edition
- https://linux.die.net/
- Various stackoverflow threads