

Operating Systems : Project 4 - Multiprocess / IPC Programming

DUE DATE :

1. Completed Source Package : **CS SUBMIT PRJ4 by Friday 05/08 11:59PM**

1. Introduction:

The task for this project is to implement a command line shell to refine your understanding of multiprocess programming and interprocess communication (IPC). This project can be completed in teams of 1, 2, or 3 students. The command line shell's capabilities will include a set of basic functionalities to change directories (current working directory), list directory, and execute programs. Each student will be responsible for an additional command and an I/O redirection. There are no graduate or bonus tiers for this project. You may not use the **system** function calls for any commands.

Please review your textbook, class notes, IPC homework, the Man-Pages and the Blackboard linked online references.

2. Basic functionality:

The following basic functionalities are needed for the all command line shell submissions:

1. Print current working directory : **pwd**
2. Change Directory : **cd <path>**
3. List Directory : **ls** or **ls <file>**
4. Execute a program/script : **<executable_name>**

3. Per Student Capabilities:

1. Single Student Project (first student):
 - a. Simple substring line matching of an input file : **grep <substr> <file or stdin>**
 - b. Implement the pipe redirection : " | " in the shell for a command
2. Two-Student Project (second student)
 - a. Concatenate a file to standard output : **cat <from stdin to file>**
 - b. Implement the output redirection : " > " in the shell for a command
3. Three-Student Project (third student)
 - a. Paginate a file, 20 lines at a time : **more <file or stdin>**
 - b. Implement the input redirection : " < " in the shell for a command

Useful Man Pages:

- getcwd,
- chdir,
- readdir,
- exec* family (execl, execlp, etc.),
- pipe2

4. CODE SUBMISSION

Clean everything up with `make clean`, clean out your build directory.

Add a README text file that states any information you want to share with the TAs for grading.

Specifically, if this is a team project, please identify the team members and identify each team members contribution to the code command shell and their respective *per-student capability*.

Single:

```
cs_submit CS4520_01 PRJ4 pawprint1_prj4_directory/
```

Two-Student

```
cs_submit CS4520_01 PRJ4 pawprint1_pawprint2_prj4_directory/
```

Three-Student

```
cs_submit CS4520_01 PRJ4 pawprint1_pawprint2_pawprint3_prj4_directory/
```