ELEC 377 Lab 1 – Group 146

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Program Description

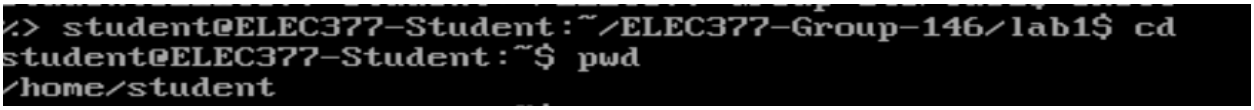
The program is a simplified replication of a standard shell and its commands. The shell acts as an interpreter between an operating system and a user's inputs carrying out commands or running programs depending on the characters inputted. In this replication of a shell, four commands were implemented: *exit*, exits the "shell"; *pwd*, prints the current working directory; *ls*, prints the contents of the current directory excluding hidden files unless the parameter "-a" is passed; *cd*, changes the current directory to the specified directory or the home directory if no directory is specified. If the user inputs an unrecognized command, the shell will print an appropriate error message. To accomplish this, pointers were used to allow character arrays to be passed and modified in functions as well as different entries in directories. The main problem that arose when creating the program was utilizing the dispatch table and implementing the commands themselves.

Program Testing

Each of the four commands (*exit, pwd*, *ls*, and *cd*) were tested individually and compared to the output of the shell itself to verify its functionality along with various bad inputs.

Testing *pwd* and *cd*

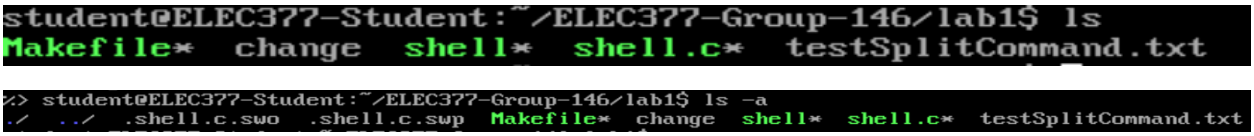
The commands *pwd* and *cd* were used in the real shell to determine what the correct outputs are supposed to be. *pwd* should print the current working directory while *ls* lists all the entries in the current directory. These commands will be tested simultaneously to show that the directories and the entries are the same in different directories.



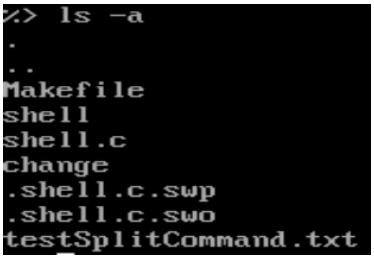
Upon running the program, the same commands were used in the same order to verify that the program functions the same way the shell does. Bad inputs were also used to test the error handling capabilities.

Testing *ls*

The command *ls* was used in the real shell to list the entries in the current directory and the hidden files if given the "-a" parameter.



Upon running the program, the *ls* command was used in the same directories to verify if the correct entries were shown given specific parameters.



Testing *exit*

The *exit* command was tested using only the program to demonstrate the program exiting back to the shell.

Script Testing

The script first tests the *pwd*, *cd* without arguments, *cd* with arguments, *ls* without arguments and *ls* with "-a" argument. This step is necessary, as it demonstrates what the appropriate behaviour of our shell should be. The script then runs shell.c, it tests inputting an invalid command to receive an appropriate error message. Next the script tests *pwd* which shows the current directory. Then the script tests *cd* without arguments, which sends the user to the home directory, and this is demonstrated through a subsequent *pwd* command. After this, *cd* is tested with an invalid argument to test error handling, and subsequently a valid directory is used as an argument for *cd*. Then, the script tests *ls* with an invalid argument to demonstrate appropriate error handling, then *ls* is tested without arguments to show non hidden files, finally *ls* is tested with "-a" argument to show hidden files. The script finishes by exiting.