

## Assignment 3 – Simple Shell with Pipes

### Description:

The assignment was to create a simple shell with pipes in C which took commands from the command line and displayed the output of the commands.

### Approach:

(Provide details as to your logic/approach to the assignment. The steps you need to complete the assignment, your thought process)

1. I first started by reviewing an old simple shell I created a while ago in a different class, it was in a different programming language, and tried to replicate the same thing in C
2. From there I started doing checks from the input, making sure I was doing the input checks correctly
3. After I was able to get the input to display on the program prompt, I started to create the exit check to help me do the rest of the assignment as doing the exit would be the same, just for different commands as well as checks.
4. From there i started working on actually processing the input and tokenizing and storing them properly to save and check and splitting them
5. Once I started tokenizing the inputs, I started splitting them. Depending on if they were spaces/tabs or pipelines, it had its separate process
6. Implementing the pipeline was quite hard. I had a check to see if the input contained a pipeline and split the commands into separate commands and processed them individually and spat out two separate childs for each process.

### Issues and Resolutions:

1. My first issue was repeating the prompt message when i first started implementing the input.
  - a. I resolved it by instead of doing stdin using fgets and also doing a check on whether it was null or not and also did exit(0) once it reached the EOF
2. My second issue was when I was handling the commands, i wasn't giving a big enough size for the limit, which kept prompting me "Too many arguments"
  - a. I bumped the size originally from 5 to 6 which fixed that, but i also put the warning inside the token loop
3. My third issue was that the childs were printing commands not found for valid commands. It seemed like execvp was executing on success but when it failed it wouldnt enter the array
  - a. I fixed it by using fprintf and checked that arg was null
4. My fourth issue was when running the commands.txt file, the command cat Makefile | wc -l -w was giving me cat: invalid option.

- a. I wasn't processing the pipelines, i.e. i wasn't splitting them correctly and just taking the only first part of the input and not processing the rest. I split the pipelines into two and processed them separately.
5. Even after fixing my fourth issue, i was still encountering the cat: invalid option
  - a. I realized that I had put a space in the splitting process
    - i. `char *pipeCheck = strtok(inputLine, '\')`
  - b. so i had to get rid of it, i'm not entirely sure why it was causing, or if it was, an issue but that fixed the issue. It could have been something else, but nothing worked until the space was gone.
6. When processing the pipelines and doing a loop to do the checks and stuff, I was iterating my counter more than once and returning an error
  - a. Stopping the iteration every time the check was happening stopped the error.

### Analysis:

Assignment description mentions nothing of analysis

### Screenshot of compilation:

```
student@student:~/Git Repositories/csc415-assignment-3-simpleshell-smvckerz$ make
gcc -c -o Munoz_Eduardo_HW3_main.o Munoz_Eduardo_HW3_main.c -g -I.
gcc -o Munoz_Eduardo_HW3_main Munoz_Eduardo_HW3_main.o -g -I. -l pthread
student@student:~/Git Repositories/csc415-assignment-3-simpleshell-smvckerz$
```

### Screen shot(s) of the execution of the program:

```
student@student:~/Git Repositories/csc415-assignment-3-simpleshell-smvckerz$ make run < commands.txt
./Munoz_Eduardo_HW3_main "Prompt> "
commands.txt Makefile Munoz_Eduardo_HW3_main Munoz_Eduardo_HW3_main.c Munoz_Eduardo_HW3_main.o PID Prompt README.md
Prompt> Child 3739 exited with 0
"Hello World"
Prompt> Child 3740 exited with 0
total 76
drwxrwxr-x 3 student student 4096 Jun 18 15:09 .
drwxrwxr-x 5 student student 4096 Jun 17 19:32 ..
-rw-rw-r-- 1 student student 66 Jun 18 15:09 commands.txt
drwxrwxr-x 8 student student 4096 Jun 18 15:09 .git
-rw-rw-r-- 1 student student 1866 Jun 17 19:32 Makefile
-rwxrwxr-x 1 student student 18600 Jun 18 15:09 Munoz_Eduardo_HW3_main
-rw-rw-r-- 1 student student 8770 Jun 18 15:09 Munoz_Eduardo_HW3_main.c
-rw-rw-r-- 1 student student 15824 Jun 18 15:09 Munoz_Eduardo_HW3_main.o
-rw-rw-r-- 1 student student 0 Jun 17 19:52 PID
-rw-rw-r-- 1 student student 0 Jun 17 19:52 Prompt
-rw-rw-r-- 1 student student 7317 Jun 17 19:32 README.md
Prompt> Child 3741 exited with 0
PID TTY TIME CMD
3312 pts/0 00:00:00 bash
3736 pts/0 00:00:00 make
3737 pts/0 00:00:00 sh
3738 pts/0 00:00:00 Munoz_Eduardo_H
3742 pts/0 00:00:00 ps
Prompt> Child 3742 exited with 0
Prompt> Child 3743 exited with 0
64 304
Child 3744 exited with 0
ls: cannot access 'foo': No such file or directory
Prompt> Child 3745 exited with 2
Prompt> Empty line, please try again.
Reached the end of the file exiting.
student@student:~/Git Repositories/csc415-assignment-3-simpleshell-smvckerz$
```