

Assignment 3 - Simple Shell

Description:

The purpose of this assignment to famarilize reading user inputs, parse and execute those commands using fork() and understand the fork(), exec functions and wait.

Approach / What I Did:

I used fgetc function to read the user inputs and prevent buffer overflowing. I counted the spaces in the buffer to find out the the number substrings. After that, I used strtok() to divide up the substrings and I removed the “\n” at the end of each substring using strcspn function before storing them into the char pointer array. At the end, I used the char pointer array to fork(), execvp() and wait() to create new process.

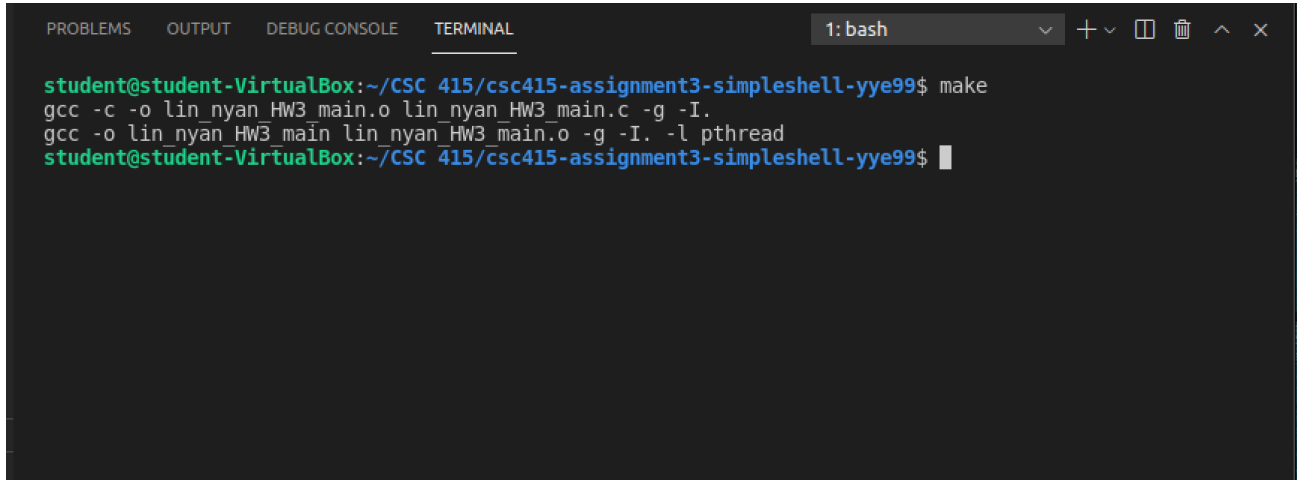
Issues and Resolutions:

I had a lot of issues while parsing the user inputs and storing them in the char pointer array. I kept getting segmentation fault while storing the substrings. I fixed this issues by counting the spaces first and then use the space count to accurately allocate the substrings in the char pointer array.

The second issues is not using the temp pointer to count the space and only last substring was getting stored in the char pointer array. This issues is easily fixed by using temp pointer.

The third issues is execvp() not working correctly and then I later found out there is a “\n” at the end of each substring. This issues was fixed by removing strcspn function before storing the substring to the char pointer array.

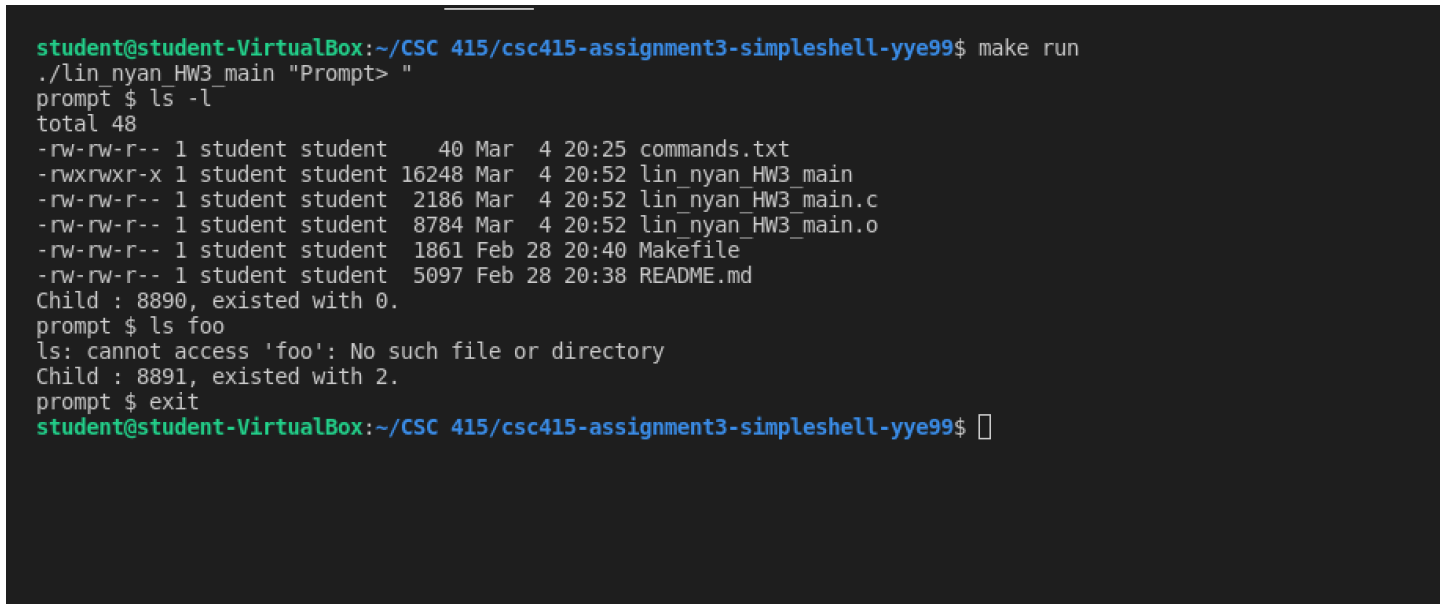
Screenshot of compilation:



A screenshot of a terminal window with a dark background. The terminal title bar shows '1: bash' and standard window controls. The prompt is 'student@student-VirtualBox:~/CSC 415/csc415-assignment3-simpleshell-yye99\$'. The user enters 'make', followed by two lines of gcc compilation commands: 'gcc -c -o lin_nyan_HW3_main.o lin_nyan_HW3_main.c -g -I.' and 'gcc -o lin_nyan_HW3_main lin_nyan_HW3_main.o -g -I. -l pthread'. The prompt returns after each command.

```
student@student-VirtualBox:~/CSC 415/csc415-assignment3-simpleshell-yye99$ make
gcc -c -o lin_nyan_HW3_main.o lin_nyan_HW3_main.c -g -I.
gcc -o lin_nyan_HW3_main lin_nyan_HW3_main.o -g -I. -l pthread
student@student-VirtualBox:~/CSC 415/csc415-assignment3-simpleshell-yye99$
```

Screenshot of the execution of the program:



A screenshot of a terminal window showing the execution of the program. The prompt is 'student@student-VirtualBox:~/CSC 415/csc415-assignment3-simpleshell-yye99\$'. The user enters 'make run', followed by './lin_nyan_HW3_main "Prompt> "'. The prompt changes to 'prompt\$'. The user enters 'ls -l', showing a directory listing of files in the current directory. The user then enters 'ls foo', resulting in an error message 'ls: cannot access 'foo': No such file or directory'. The user enters 'exit', and the prompt returns to the shell prompt.

```
student@student-VirtualBox:~/CSC 415/csc415-assignment3-simpleshell-yye99$ make run
./lin_nyan_HW3_main "Prompt> "
prompt$ ls -l
total 48
-rw-rw-r-- 1 student student  40 Mar  4 20:25 commands.txt
-rwxrwxr-x 1 student student 16248 Mar  4 20:52 lin_nyan_HW3_main
-rw-rw-r-- 1 student student  2186 Mar  4 20:52 lin_nyan_HW3_main.c
-rw-rw-r-- 1 student student  8784 Mar  4 20:52 lin_nyan_HW3_main.o
-rw-rw-r-- 1 student student  1861 Feb 28 20:40 Makefile
-rw-rw-r-- 1 student student  5097 Feb 28 20:38 README.md
Child : 8890, existed with 0.
prompt$ ls foo
ls: cannot access 'foo': No such file or directory
Child : 8891, existed with 2.
prompt$ exit
student@student-VirtualBox:~/CSC 415/csc415-assignment3-simpleshell-yye99$
```