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Operating Systems

Lab1

Linux shell

Description

A linux terminal by c programming and console that includes about all features of actual Linux Terminal.

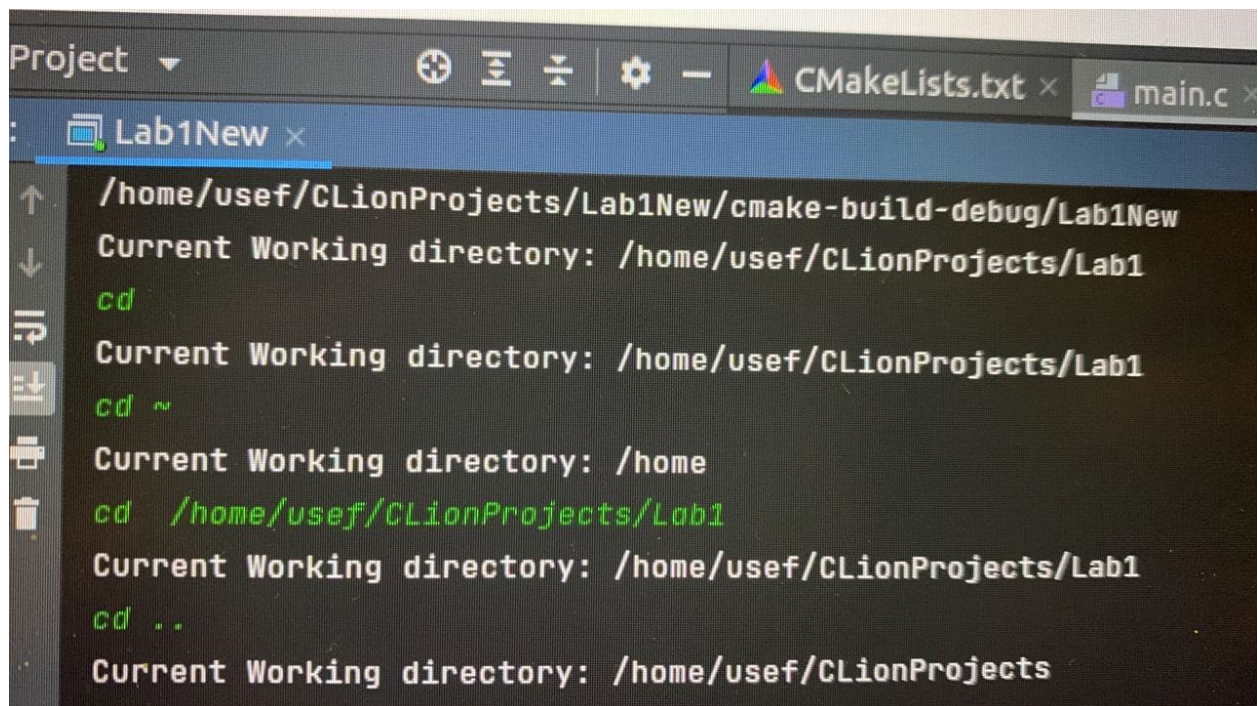
Overall code organization

- Environment is set up by current working directory
 - A signal is set for each parent to know exactly when child finished executing to kill zombies.
 - We, then run the shell
 - Input is taken from user as one line of command
 - Parsed so that all quotations are removed and get an array of split strings by space
 - Input is then evaluated so that any referenced pre-defined variable included by user is replaced by its value (if there is any)
 - Then we identify the type of command whether it's:
 - Built-in: each has its specific implementation in separate functions
 - cd
 - echo
 - export
 - Executable: we use multiprocessing here as we extract a child process from parent that does the command for us and for sure the parent has to wait for the child to complete execution.
 - All other Linux commands
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- The previous loop repeats till user enters exit command
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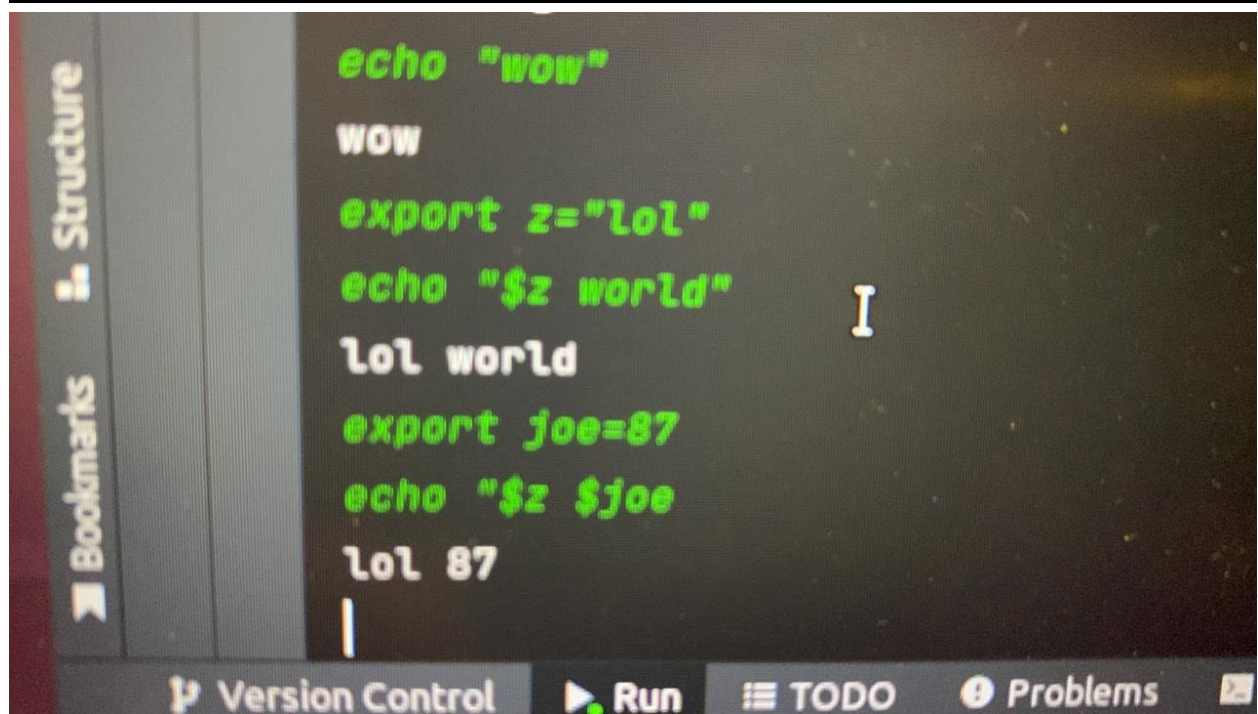
Major functions:

- **main()**
 - **shell()** → takes input, parses it, evaluates it, checks its command type, runs command accordingly
 - **parser()** → parses expression
 - **evalExp()** → evaluates expression
 - **builtinCommandCheck()** → checks if command is built in or implemented so that it can run its specified function
 - **runExe()** → uses multiprocessing to run linux commands
-

Sample runs:



```
Project ▾ CMakeLists.txt × main.c ×  
Lab1New ×  
/home/usef/CLionProjects/Lab1New/cmake-build-debug/Lab1New  
Current Working directory: /home/usef/CLionProjects/Lab1  
cd  
Current Working directory: /home/usef/CLionProjects/Lab1  
cd ~  
Current Working directory: /home  
cd /home/usef/CLionProjects/Lab1  
Current Working directory: /home/usef/CLionProjects/Lab1  
cd ..  
Current Working directory: /home/usef/CLionProjects
```



```
Structure  
Bookmarks  
echo "wow"  
wow  
export z="lol"  
echo "$z world"  
lol world  
export joe=87  
echo "$z $joe"  
lol 87  
|  
Version Control Run TODO Problems
```



```
ls -l
total 20
drwxrwxr-x 5 usef usef 4096 06:10 24 مار cmake-build-debug
-rw-rw-r-- 1 usef usef 108 05:42 24 مار CMakeLists.txt
drwxrwxr-x 2 usef usef 4096 15:47 24 مار lol
-rw-rw-r-- 1 usef usef 1703 06:10 24 مار main.c
drwxrwxr-x 2 usef usef 4096 15:44 24 مار 'test '
Waitpid received: pid=2512, status=0
Child Terminated
ls -a -l -h
total 32K
drwxrwxr-x 6 usef usef 4.0K 15:47 24 مار .
drwxrwxr-x 5 usef usef 4.0K 06:12 24 مار ..
drwxrwxr-x 5 usef usef 4.0K 06:10 24 مار cmake-build-debug
-rw-rw-r-- 1 usef usef 108 05:42 24 مار CMakeLists.txt
drwxrwxr-x 2 usef usef 4.0K 06:12 24 مار .idea
drwxrwxr-x 2 usef usef 4.0K 15:47 24 مار lol
-rw-rw-r-- 1 usef usef 1.7K 06:10 24 مار main.c
drwxrwxr-x 2 usef usef 4.0K 15:44 24 مار 'test '
Waitpid received: pid=2513, status=0
Child Terminated
export khaled="-l"
```

```
export tahan="-
export lol="-a"
ls lol
Waitpid received: pid=2547, status=0
Child Terminated
```

Version Control Run TODO Problems Terminal

Build finished in 228 ms (today م ٩:٢١)

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