

CS333 OS

Lab #01

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Code Organization:

- * code is divided to 6 sections (classes):
 - **main**: contain main loop of shell
 - **command_parser**: contain parsing of commands
 - **commands**: contain implementation of “echo”, “export” and “cd”
 - **file_processing**: contain functions that deal with log, history and batch files
 - **variables**: contain functions that handle variables operations
 - **stringOperations**: contain functions to manipulate strings
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Main Functions:

1- **main** section:

- ***main()** : start the program
 - ***start()** : start the shell
 - ***shell_loop()**: loop until exit
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2- **command_parser** section:

- ***parse_command()**: parse every command
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3- **commands** section:

- ***getCurrentPath()**: returns current working path
 - ***getUserDir()**: return user directory in device
 - ***cd()**: to change directory
 - ***echo()**: to display variables
 - ***myExport()**: to export variables
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4- **file_processing** section:

- **each file has these functions:
 - ***open_file()**: to open the file
 - ***get_file()**: returns the file pointer
 - ***close_file()**: close the file
 - ***printHistoryFile()**: to print history file in colnsole
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5- **varialbes** section:

- ***lookup_variable()**: to search for a variable
 - ***set_variable()**: to set a variable
 - ***print_all_variables()**: prints all variables
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6- **stringOperations** section:

- ***copyString()**: make copy of a string
- ***catString()**: concatenate two strings
- ***trimString()**: trim a string

***getNumOfChar()**: get number of character's existence in a string

***substring()**: get sub-string

***replaceSubString()**: replace a sub string from orig with mod -modification-

***stringToPath()**: remove non-alphabet and non-digit characters from string keeping only '/'

***getStringSize()**: return size of a string

Code Running:

1- Run Linux terminal in project directory

2- Type “make” as follow:

A terminal window with a dark purple background. The title bar shows 'yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engieneering/C/Shell-'. The prompt is 'yousef@yousef-Inspiron-3542:/media/yousef/01D3143E7D223CC0/Engieneering/C/Shell-OS\$' and the command 'make' is entered with a cursor at the end.

```
yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engieneering/C/Shell-
yousef@yousef-Inspiron-3542:/media/yousef/01D3143E7D223CC0/Engieneering/C/Shell-
OS$ make
```

3- This made a runnable file called shell. However, now you can type “./shell” to run the shell in **interactive mode**, or “./shell [batch file path]” to run it in **batch mode**.

A terminal window with a dark purple background. The title bar shows 'yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engieneering/C/Shell-'. The prompt is 'Shell:/home/yousef>' and the cursor is at the end.

```
yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engieneering/C/Shell-
Shell:/home/yousef>
```

Sample runs:

```
yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engieneering/C/Shell-
OS$ ./shell
Shell:/home/yousef> ls
commandTest.txt  Documents          historyFile.txt  Pictures  Templates
cs333            Downloads          logFile.txt      Public    Videos
Desktop          examples.desktop  Music            snap
Shell:/home/yousef> ls -l
total 112
-rw-rw-r-- 1 yousef yousef    24  ١٦:٢٦ 6 16:26 commandTest.txt
drwxrwxr-x 2 yousef yousef  4096  ٢٣:٥٩ 6 23:59 cs333
drwxr-xr-x 2 yousef yousef  4096  ٠١:٥٣ 7 01:53 Desktop
drwxr-xr-x 2 yousef yousef  4096  ٢٠:٥٧ 17 20:57 Documents
drwxr-xr-x 2 yousef yousef  4096  ١٨:١١ 3 18:11 Downloads
-rw-r--r-- 1 yousef yousef  8980  ٢٠:٣٥ 17 20:35 examples.desktop
-rw-rw-r-- 1 yousef yousef 11130  ٠١:٥٥ 7 01:55 historyFile.txt
-rw-rw-r-- 1 yousef yousef 42369  ٠١:٥٥ 7 01:55 logFile.txt
drwxr-xr-x 2 yousef yousef  4096  ٢٠:٥٧ 17 20:57 Music
drwxr-xr-x 2 yousef yousef  4096  ٢٠:٥٧ 17 20:57 Pictures
drwxr-xr-x 2 yousef yousef  4096  ٢٠:٥٧ 17 20:57 Public
drwxr-xr-x 3 yousef yousef  4096  ٠٩:١٥ 29 09:15 snap
drwxr-xr-x 2 yousef yousef  4096  ٢٠:٥٧ 17 20:57 Templates
drwxr-xr-x 2 yousef yousef  4096  ٢٠:٥٧ 17 20:57 Videos
Shell:/home/yousef>
```

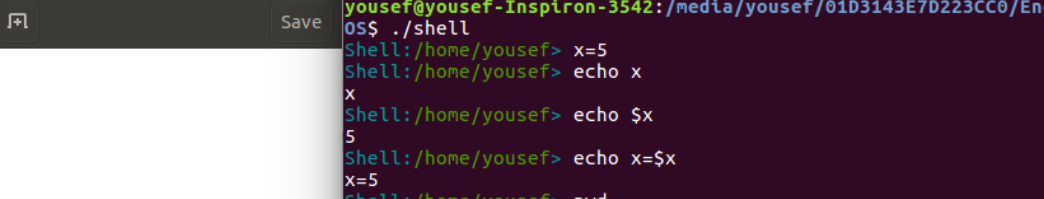
```
yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engieneering/C/Shell-
OS$ ./shell
Shell:/home/yousef> x=5
Shell:/home/yousef> echo x
x
Shell:/home/yousef> echo $x
5
Shell:/home/yousef> echo x=$x
x=5
Shell:/home/yousef> pwd
/home/yousef
Shell:/home/yousef> cd ~
Shell:/home/yousef> cd ../
Shell:/home> cd ../
Shell:/> cd ../
Shell:/> ls
bin      dev      initrd.img  lib64      mnt      root     snap      tmp      vmlinuz
boot    etc      initrd.img.old  lost+found  opt      run      srv      usr      vmlinuz.old
cdrom   home    lib         media      proc     sbin     sys      var
Shell:/> vim
```

```
yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engineeering/C/Shell-  
~  
~  
~  
~  
VIM - Vi IMproved  
  
version 7.4.1689  
by Bram Moolenaar et al.  
Modified by pkg-vim-maintainers@lists.alioth.debian.org  
Vim is open source and freely distributable
```

```
Become a registered Vim user!  
type :help register<Enter>   for information
```

```
type :q<Enter>                to exit  
type :help<Enter> or <F1>    for on-line help  
type :help version7<Enter>  for version info
```

```
0.0-1          All
```



```
yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engineering/
OS$ ./shell
Shell:/home/yousef> x=5
Shell:/home/yousef> echo x
x
Shell:/home/yousef> echo $x
5
Shell:/home/yousef> echo x=$x
x=5
Shell:/home/yousef> pwd
/home/yousef
Shell:/home/yousef> cd ~
Shell:/home/yousef> cd ../
Shell:/home> cd ../
Shell:/> cd ../
Shell:/> ls
bin      dev      initrd.img      lib64      mnt      root      snap      tmp      vmlinuz
boot    etc      initrd.img.old  lost+found  opt      run      srv      usr      vmlinuz
cdrom    home     lib             media      proc     sbin     sys      var

Shell:/> vim
Shell:/> wrongInput
Error in execution:: No such file or directory
Shell:/> gedit &
Shell:/>
```

```
yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engineering/C/Shell-
Shell: /> cd ~
Shell: /home/yousef> cd ~/cs333
Shell: /home/yousef/cs333> ls -a
.  ..  lab1.txt
Shell: /home/yousef/cs333> exit
yousef@yousef-Inspiron-3542: /media/yousef/01D3143E7D223CC0/Engineering/C/Shell-
OS$
```