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December 8, 2017

# Operating System Project 2

## Writing Our Own Shell

In this project, we were asked to implement our own shell in C which has some several custom commands and specifications.

### A

Our shell is capable of executing the existing commands of UNIX by searching directories in the PATH environment variable. We do that using `execv()` function in `executeCommand()` function by taking the command as arguments array from the user and determine if it's a custom command or not. If it's not a custom command, then we look for the appropriate path for this command to be able to execute it.

```
myshell:/Users/yusufkamilak/Projects/MyShell$ ls
LICENSE      P2.pdf      README.md   compile.sh   err.txt      mainSetup.c  myShell
myshell:/Users/yusufkamilak/Projects/MyShell$ ls -l
total 928
-rw-r--r--@ 1 yusufkamilak  staff   35147 Dec  3 11:49 LICENSE
-rwxr-xr-x@ 1 yusufkamilak  staff  387346 Dec  3 11:49 P2.pdf
-rw-r--r-- 1 yusufkamilak  staff    150 Dec  3 11:49 README.md
-rwxr-xr-x 1 yusufkamilak  staff     74 Dec  4 12:18 compile.sh
-rw-r--r--@ 1 yusufkamilak  staff     5 Dec  8 21:25 err.txt
-rwxr-xr-x@ 1 yusufkamilak  staff  15466 Dec  8 23:13 mainSetup.c
-rwxr-xr-x 1 yusufkamilak  staff  19332 Dec  8 23:15 myShell
myshell:/Users/yusufkamilak/Projects/MyShell$ pwd
/Users/yusufkamilak/Projects/MyShell
myshell:/Users/yusufkamilak/Projects/MyShell$ cd ..
myshell:/Users/yusufkamilak/Projects$ cd ..
myshell:/Users/yusufkamilak$
```

We also support `cd` command thanks to an extra arrangement for this command called `chdir()`.

## B

We have built a complete linked list structure with its utility functions to achieve **bookmark** goals such as inserting commands into the linked list, deleting them, listing them and executing them by calling their IDs, as requested in documentation.

```
myshell:/Users/yusufkamilak/Projects/MyShell$ bookmark ls
myshell:/Users/yusufkamilak/Projects/MyShell$ bookmark ls -l
myshell:/Users/yusufkamilak/Projects/MyShell$ bookmark pwd
myshell:/Users/yusufkamilak/Projects/MyShell$ bookmark chmod 400 t.txt
myshell:/Users/yusufkamilak/Projects/MyShell$ bookmark -l
0 -> ls
1 -> ls -l
2 -> pwd
3 -> chmod 400 t.txt
myshell:/Users/yusufkamilak/Projects/MyShell$ bookmark -d 2
1
2
myshell:/Users/yusufkamilak/Projects/MyShell$ bookmark -l
0 -> ls
1 -> ls -l
2 -> chmod 400 t.txt
myshell:/Users/yusufkamilak/Projects/MyShell$ bookmark -i 0
LICENSE      P2.pdf      README.md   compile.sh   err.txt      mainSetup.c  myShell
myshell:/Users/yusufkamilak/Projects/MyShell$
```

We also support **codesearch** custom command with its recursive property. Its example usage as below;

```
myshell:/Users/yusufkamilak/Projects/MyShell$ codesearch search

mainSetup.c:247:// MARK: Codesearch Manipulation
mainSetup.c:249:void callCodesearch(char *args[]) {
mainSetup.c:311:     strcmp(commandName, "codesearch") == 0 ||
mainSetup.c:331: else if (strcmp(args[0], "codesearch") == 0) { callCodesearch(args); }
myshell:/Users/yusufkamilak/Projects/MyShell$ codesearch -r search

./mainSetup.c:247:// MARK: Codesearch Manipulation
./mainSetup.c:249:void callCodesearch(char *args[]) {
./mainSetup.c:311:     strcmp(commandName, "codesearch") == 0 ||
./mainSetup.c:331: else if (strcmp(args[0], "codesearch") == 0) { callCodesearch(args); }
./subdirectory/test.c:1:search
myshell:/Users/yusufkamilak/Projects/MyShell$
```

Their internal implementations can be found in

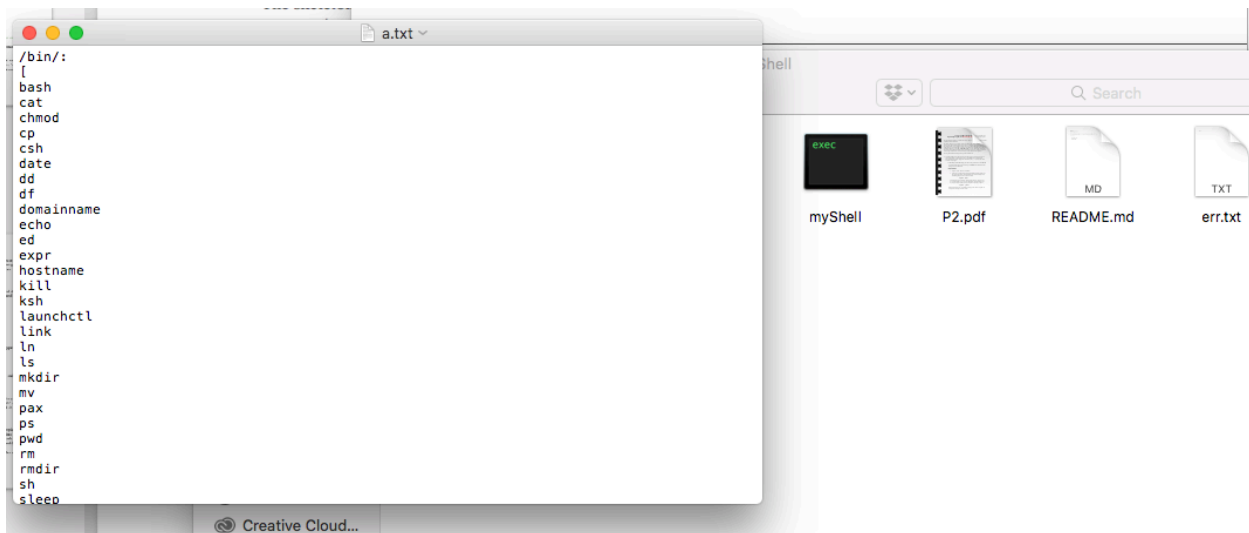
**p2\_yusufKamilAk\_bilgehanNal\_150116827\_150114038.c** file.

## C

We have organised our structure to be able to support **I/O Redirection** with output, input, append,error and simultaneous redirections.

```
myshell:/Users/yusufkamilak/Projects/MyShell$ ls < err.txt
err.txt

/bin/:
[
bash      chmod      date      domainname  expr      ksh        ln
cat       cp         dd         echo        hostname  launchctl  ls
cat       csh        df         ed          kill      link       mkdir
myshell:/Users/yusufkamilak/Projects/MyShell$ myshell:/Users/yusufkamilak/Projects/MyShell$ ls -l
total 928
-rw-r--r--@ 1 yusufkamilak  staff   35147 Dec  3 11:49 LICENSE
-rwxr-xr-x@ 1 yusufkamilak  staff  387346 Dec  3 11:49 P2.pdf
-rw-r--r--  1 yusufkamilak  staff    150 Dec  3 11:49 README.md
-rwxr-xr-x  1 yusufkamilak  staff    74 Dec  4 12:18 compile.sh
-rw-r--r--@ 1 yusufkamilak  staff     5 Dec  8 21:25 err.txt
-rwxr-xr-x@ 1 yusufkamilak  staff  15466 Dec  8 23:13 mainSetup.c
-rwxr-xr-x  1 yusufkamilak  staff  19332 Dec  8 23:26 myShell
drwxr-xr-x  4 yusufkamilak  staff   128 Dec  8 23:23 subdirectory
myshell:/Users/yusufkamilak/Projects/MyShell$ ls > a.txt
myshell:/Users/yusufkamilak/Projects/MyShell$ ls < err.txt > a.txt
myshell:/Users/yusufkamilak/Projects/MyShell$ myshell:/Users/yusufkamilak/Projects/MyShell$ err.txt
```



Source code file should be compressed with this report. Thank you!