

Exercise 1.2 MyOwnShell

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You have to write “make” in the Answer2 directory to successfully start the shell.
The shell line says “MyOwnShell>”

Assumptions:

1. Since some of the functions required the exact path for proper running in all directories, the path in the code will have to be changed for running in any other system. (execv and history-related lines contain the path.)
2. The syntax for all commands will be as mentioned below for each. No other syntax would work.
3. No built-in shell variables are provided.
4. Special characters like parenthesis and * are allowed. However, spaces are not.

Errors:

1. Forking is done for external commands. Whenever fork() returns a value -1 there is an error in forking so *peror* is thrown.
2. While taking the input if getline() function returns -1 and the file has not ended then an error is thrown.
3. If an incorrect statement is given to the shell. The shell ignores it and takes a new input.
4. Rest of the errors are handled in individual commands.

The options and commands that MyOwnShell takes are described in detail below:

EXTERNAL COMMANDS:

1. mkdir
Usage: mkdir [OPTION]... DIRECTORY...
Any number of directories can be given as an input there is no limit on that.
Options: -v, --help
Errors handled:
 - If no directory name is provided then an error is thrown.
 - If directory couldn't be created due to some reason then an error is thrown.
2. cat
Usage: cat [OPTION]... [FILE]..
Any number of files can be given as an input there is no limit on that.
Options: -n, --help
Errors handled:
 - If the given file doesn't open or doesn't exist then an error will be thrown.

3. date

Usage: date [OPTION]...

Options: -u, --help

Assumptions: The default time will be according to the time in the system.

4. ls

Usage: ls [options][dir]

Options : -l, -a

Assumptions:

→ If no directory is provided then the files of the current directory will be printed.

→ The shell continues in the same line.

5. rm

Usage: rm [OPTION]... [FILE]...

Options: -v, --help

Any number of files can be given as an input there is no limit on that.

Errors handled:

→ If the given file doesn't exist then an error will be thrown.

INTERNAL COMMANDS:

1. exit

This command will simply exit the shell, no more inputs will be taken unless the shell is started again.

2. cd

Usage: cd [option][dir]

Options:

--help, -L

Errors handled:

→ if no arguments are passed with cd an error warning will be thrown.

→ If chdir is not able to change directory then it return a non zero value and an error will be thrown.

Assumptions: cd ~ is not a valid command.

3. Pwd

Usage: pwd [option]

Options:

--help, -P

Assumptions: No symbolic links will be printed. The physical address will be printed.

4. Echo

Usage: echo [OPTION][text]

Options: -E, --help

Assumptions: no echo "string" cases are considered. Echo will simply display the text that has been provided.

5. history

Usage: history [options]

Options: -c, --help

Errors handled:

→ If the history file doesn't open then an error will be thrown.

Assumptions: The entire history is cleared with -c option.

SOME SAMPLE TEST CASES:

1. For mkdir,rm,ls,cd

```
mansisinghal@ubuntu: ~/Desktop/OS1_2019370/Answer2
File Edit View Search Terminal Help
MyOwnShell>ls
hooo MyOwnShell>mkdir pls2
child forking error: No such file or directory
MyOwnShell>exit
mansisinghal@ubuntu:~/Desktop/OS1_2019370/Answer2$ make
gcc mkdir.c -o mkdir
gcc shell.c
./a.out
MyOwnShell>ls -l
shell.c
rm.c
rm
mkdir.c
mkdir
ls.c
ls
history.txt
dir101
date.c
date
cat.c
cat
b
a.out
a
Makefile
MyOwnShell>cd b
MyOwnShell>ls -l
hooo
MyOwnShell>mkdir new1 new2
hooo new1 new2
MyOwnShell>rm hooo
MyOwnShell>ls -l
new2
new1
MyOwnShell>
```

2. For Date, history

```
mansisinghal@ubuntu: ~/Desktop/OS1_2019370/Answer2
File Edit View Search Terminal Help
new2
new1
MyOwnShell>date
Wed Sep 30 11:02:26 2020
MyOwnShell>date -u
Wed Sep 30 18:02:29 2020
MyOwnShell>history
1) ls
2) pwd
3) history
4) exit
5) pwd
6) pwd -P
7) pwd --help
8) pwd
9) cd ~
10) pwd
11) cd ..
12) pwd
13) exit
14) echo mansi is aws
    pid = fork();
    if (pid == 0) {
```

3. For cat,echo,pwd,exit

```
mansisinghal@ubuntu: ~/Desktop/OS1_2019370/Answer2
File Edit View Search Terminal Help
13
14 mansisinghal@ubuntu:~$ cd Desktop
15 mansisinghal@ubuntu:~/Desktop$ cd OS1_2019370
16 mansisinghal@ubuntu:~/Desktop/OS1_2019370$ cd Answer2
17 mansisinghal@ubuntu:~/Desktop/OS1_2019370/Answer2$ make
18 gcc mkdir.c -o mkdir
19 gcc shell.c
20 ./a.out
21 MyOwnShell>pwd
22 /home/mansisinghal/Desktop/OS1_2019370/Answer2
23 MyOwnShell>cd b
24 MyOwnShell>cat t1.txt t2.txt
25 test file 1
26 text file2
27
28 thank you
29 MyOwnShell>echo hey guys os
30 hey guys os MyOwnShell>exit
31 mansisinghal@ubuntu:~/Desktop/OS1_2019370/Answer2$
32
33
34
35
36
37
38
39 printf("Change the shell working directory to //,
40 printf("Change the current directory to DIR. The default DIR is the value of the HOME
41
```

