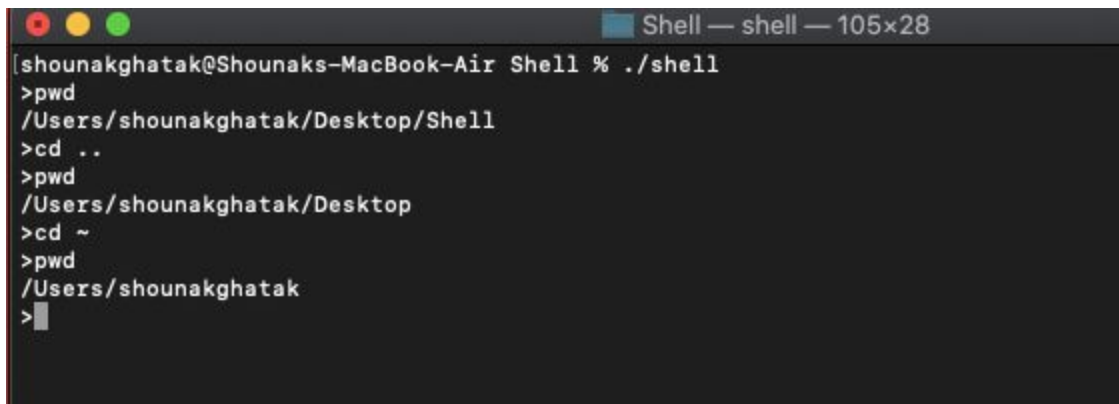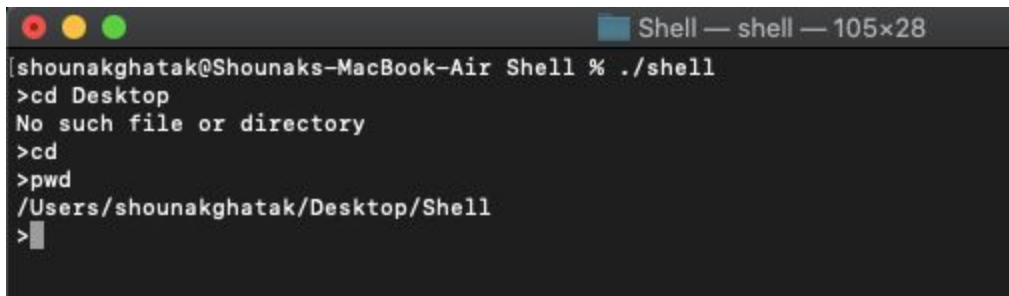# Commands:

1)cd

Options:
1) **cd ..**-Results in going one step backwards in the hierarchy
2) **cd ~-**Resets into the home directory

```
Shell — shell — 105×28
[shounakghatak@Shounaks-MacBook-Air Shell % ./shell
>pwd
/Users/shounakghatak/Desktop/Shell
>cd ..
>pwd
/Users/shounakghatak/Desktop
>cd ~
>pwd
/Users/shounakghatak
>
```

cd ~ resets to /Users/shounakghatak for this shell.

chdir func in <unistd.h> header file used for implementing.

```
Shell — shell — 105×28
[shounakghatak@Shounaks-MacBook-Air Shell % ./shell
>cd Desktop
No such file or directory
>cd
>pwd
/Users/shounakghatak/Desktop/Shell
>
```
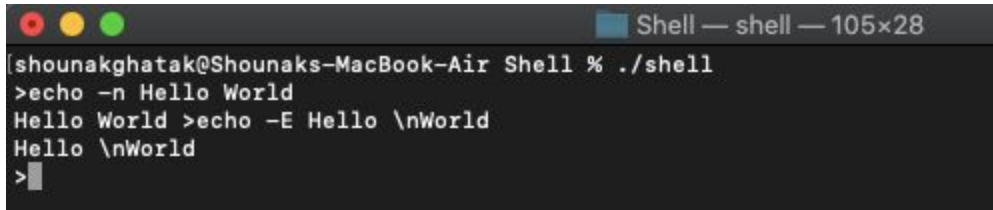
Corner cases:
1)Error is handled and appropriate error message displayed in case of **faulty addresses**.
2)When no arguments are passed to the cd program it doesn't crash and the working directory remains the same.(prevents segmentation fault).
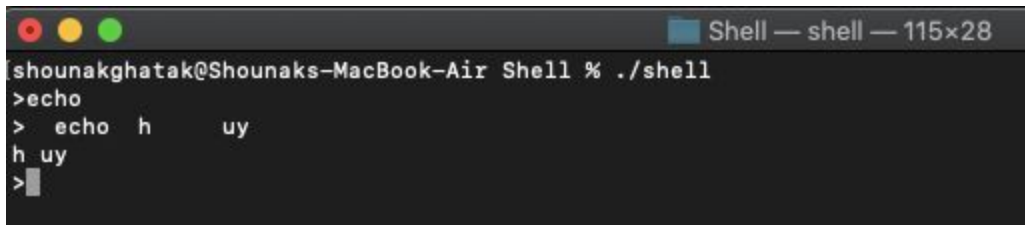
2)echo

Options:

1) **echo -n** Prompt appears on the same line as the output is printed.
2) **echo -E** Format specifiers are not identified.

Implemented by parsing and printf.

Corner cases:

1)When no arguments are passed to the echo program it doesn't crash and the working directory remains the same(prevents segmentation fault).
2)Extra Spaces are not counted and handled.
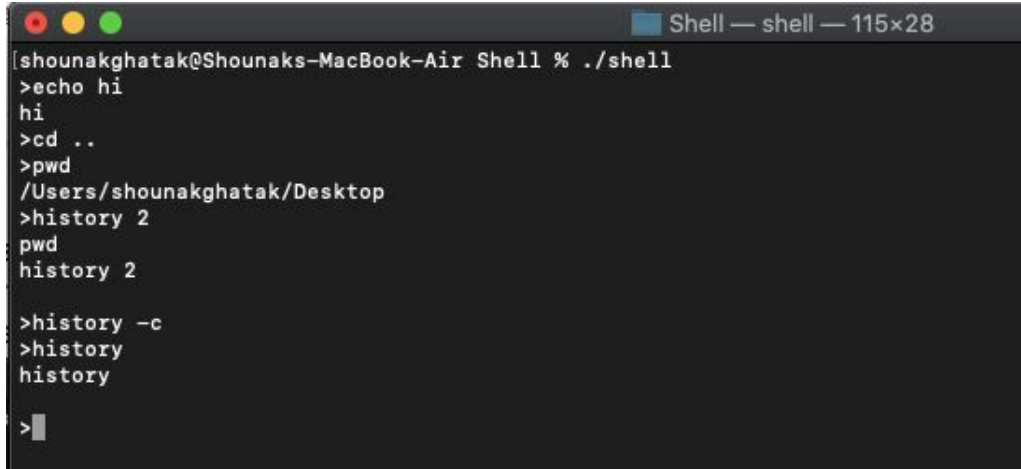
3)history

Options:

1)**history -c** clears the history file.
2)**history [number]** prints the latest [number] of commands.

Corner cases:
1)Does not crash for the case history 1.
2)Handles the case when the history file is cleared and history is called immediately after.
3)Does not crash for false flags.

Implemented by maintaining a text file which keeps track of all the commands(new text file each time shell is run).
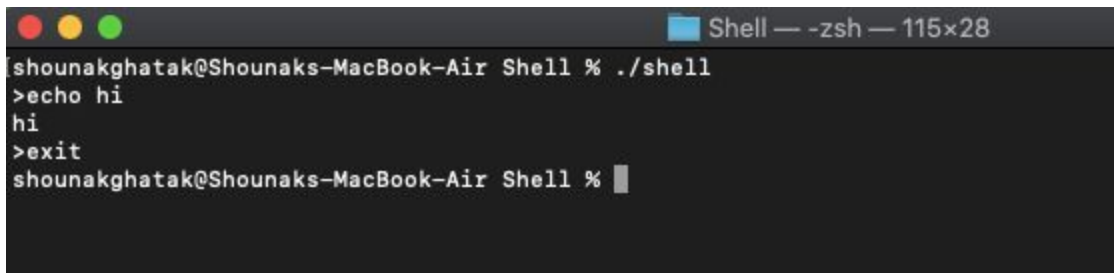
4)pwd

Just prints the current working directory.(refer cd screenshots).Implemented by using the getcwd() command from <unistd.h> header file.

There are no corner cases and options couldn't be found which were in the scope for this command.

5)exit

Exits the program.

6)date

Options:

      1)date -u:Displays date in universal time.

      2)date --debug Displays the date as an annotation.

Implemented using execl() system call from child process and time.h header file.

Corner cases:

1)Handles invalid flag options.
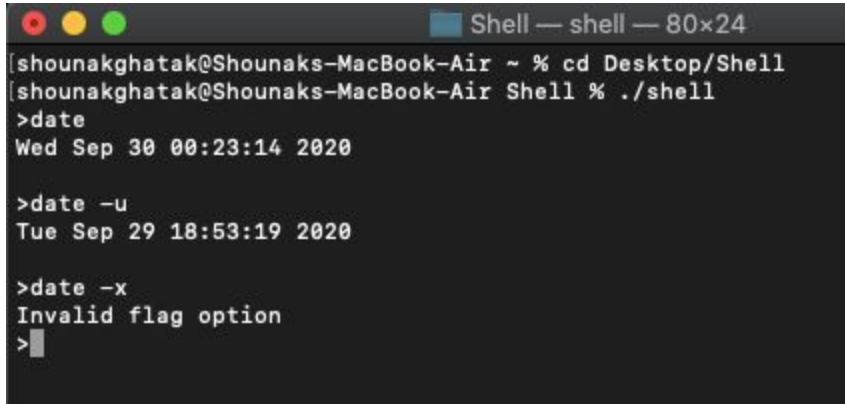
2)Takes care of extra spaces between the command and the flag.

```
Shell — shell — 80×24
[shounakghatak@Shounaks-MacBook-Air ~ % cd Desktop/Shell
[shounakghatak@Shounaks-MacBook-Air Shell % ./shell
>date
Wed Sep 30 00:23:14 2020

>date -u
Tue Sep 29 18:53:19 2020

>date -x
Invalid flag option
>
```

7)ls

Options:

1)ls -a-Displays hidden files

2) ls -i Displays INO numbers of files

Implemented using dirent.h header file and execl system call.

Corner cases:

1)Handles invalid flags.

2) Handles invalid addresses.

Notes:

1)All addresses are assumed to be relative to the current working directory.

2)Addresses if any should start with "\".

Screenshots of all cases on the next pages.

```
>ls -a
.
..
nano.save
.eclipse
.config
Music
.condarc
.DS_Store
eclipse
.CFUserTextEncoding
.tooling
.jssc
Pictures
.appinventor
.zsh_history
.p2
Desktop
Library
eclipse-workspace
.oracle_jre_usage
.emulator_console_auth_token
.android
```

```
>ls
nano.save
Music
eclipse
Pictures
Desktop
Library
eclipse-workspace
PycharmProjects
Public
Virtual Machines.localized
Movies
Applications
opt
Documents
Downloads
>
```

Shell — Shell — 80×24
```
.swt
.bash_profile
Downloads
.python_history
.lesshsQ
.bash_history
.conda
>ls -i
3788984 nano.save
1096913 Music
1139306 eclipse
1096916 Pictures
1096918 Desktop
1096894 Library
1144720 eclipse-workspace
1169351 PycharmProjects
1096966 Public
14078955 Virtual Machines.localized
1096970 Movies
1119566 Applications
4166284 opt
1096906 Documents
1096908 Downloads
```

```
>ls -x
Invalid argument
>ls /Desktop/Desktop
No such file or directory
>
```

8) cat

Options:

1)cat -n Prints file with row numbers.

2) cat -e Prints "$" at the end of each line.

Implemented using file pointers and then parsing the file.

Corner cases:

1)Handles invalid flags.

2) Handles invalid addresses.

Notes:

1)All addresses are assumed to be relative to the current working directory.

2)Addresses if any should **not** start with "\".

Here is a sample of a file t.txt in the Desktop.

```
shounakghatak@Shounaks-MacBook-Air Shell % ./shell
>cd ..
>cat t.txt
echo hi1
echo hi 23

>cat -n t.txt
1 echo hi1
2 echo hi 23

>cat -e t.txt
echo hi1$
echo hi 23$

>cat -x t.txt
No such file or directory
>cat
Missing file name
>
```

9)mkdir

Options:
1)mkdir -m777-Makes a directory with full read,write & execute permissions for all.
2)mkdir -v Creates a directory in the current location.

Implemented using mkdir() in <sys/stat.h> header file and execl system call.

Corner cases:
1)Handles the case when there is no directory name given .
2) Handles invalid addresses.

Notes:
1)All addresses are assumed to be relative to the current working directory.
2)Addresses if any should **not** start with "\".
3) Space separated names are not considered for name.

10)rm
Options:
1)rm -i-Asks for permission before deletion
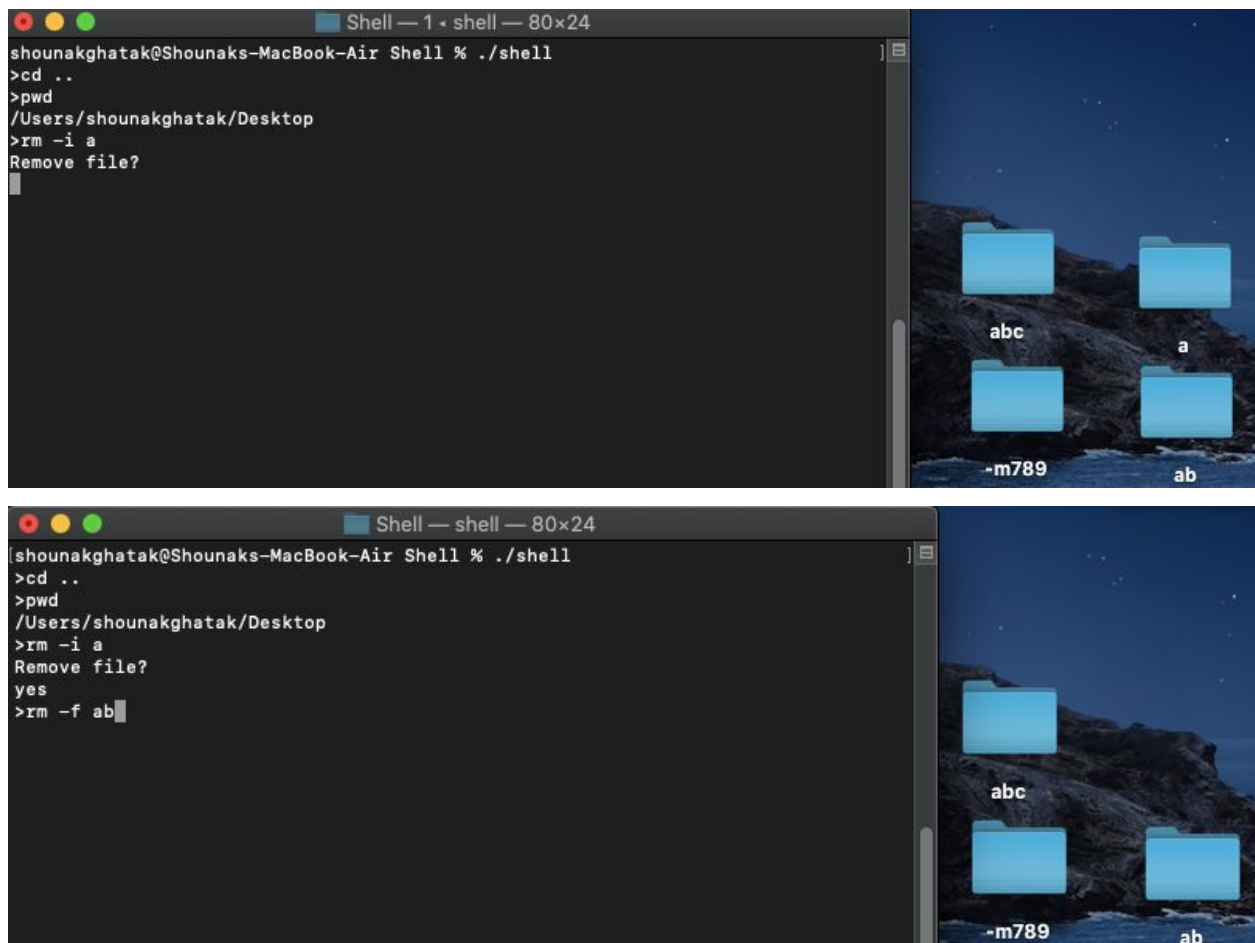**2)rm -f** Removes forcefully the file.(does not show error messages).

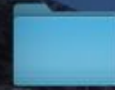Implemented using remove() function in <stdio.h> header file.

Corner cases:

1)Handles the case when there is no directory name given .

2) Handles invalid addresses.

Notes:

1)All addresses are assumed to be relative to the current working directory.

2)Addresses if any should **not** start with "\".

```
/Users/shounakghatak/Desktop
>rm -i a
Remove file?
yes
>rm -f ab
>rm
Missing file name
>
```


abc

-m789