

# **Assignment O: Basic Linux/Unix shell**

Alka Bharti  
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We have designed a simple shell that can handle five internal and five external commands.

## **Internal commands were:**

- a) cd- command used to change the current directory.  
We have implemented cd, cd . and cd .. in our shell.  
cd . :remain in the current directory.  
cd .. : return to previous directory.
- b) echo- command used to display a line of text on file or terminal.  
We have implemented echo, echo -n and echo -e in our shell.  
echo -n: do not output the trailing newline.  
echo -e: enable interpretation of backslash escapes.
- c) history- command shows the lists of last executed commands.  
We have implemented history and history -c in our shell.  
history -c: to clear the history.
- d) pwd- command shows the full pathname of present working directory.  
We have implemented pwd, pwd -P in our code.  
pwd -P: avoid all symlinks.
- e) exit- command is used to terminate the shell or script.

## **External commands were:**

- a) ls- command will list all files present in current directory.  
We have implemented ls,ls -a and ls -s in our shell.  
ls -a: list all files including hidden files (entries starting with .)  
ls -s: list all file with allocated size of each file.
- b) cat- command used to display text files, concatenate contents of two files into a single file.  
We have implemented cat, cat -E and cat -n in our shell.  
cat -E: display \$ at the end of each file.  
cat -n: number all output lines.
- c) date- command used to display the current date and time.  
We have implemented date, date -u, date -R in our shell.  
date -u: print or set coordinated universal time(UTC).  
date -R: output date and time in RFC 2822 format.
- d) rm- command used to delete files not directories.  
We have implemented rm, rm -v, rm -d in our shell.  
rm -v: explain what is being done.  
rm -d: remove empty directories.
- e) mkdir- command used to create a directory or folder.  
We have implemented mkdir, mkdir -v and mkdir -m in our shell.  
mkdir -v: print a message for each created directory.  
mkdir -m: set file mode.

### Assumptions that we made are:

- a) The ls command will work with a dot operator at the end.
- b) The cat command will work for maximum of two files.
- c) The rm command will work for only one file.

### Error that we face is:

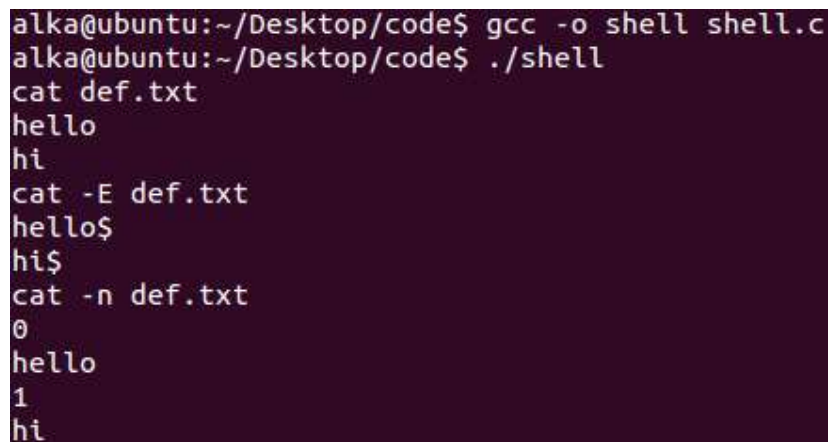
Segmentation fault (core dumped)

### Test cases:

- a) For cat command:

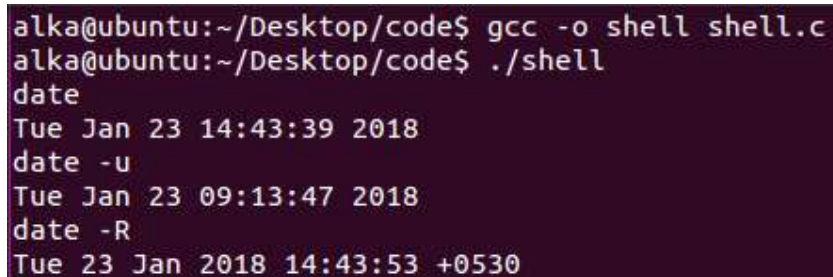


```
def.txt x
1 hello
2 hi
```



```
alka@ubuntu:~/Desktop/code$ gcc -o shell shell.c
alka@ubuntu:~/Desktop/code$ ./shell
cat def.txt
hello
hi
cat -E def.txt
hello$
hi$
cat -n def.txt
0
hello
1
hi
```

- b) For date command:



```
alka@ubuntu:~/Desktop/code$ gcc -o shell shell.c
alka@ubuntu:~/Desktop/code$ ./shell
date
Tue Jan 23 14:43:39 2018
date -u
Tue Jan 23 09:13:47 2018
date -R
Tue 23 Jan 2018 14:43:53 +0530
```

c) For history command:

```
alka@ubuntu:~/Desktop/code$ gcc -o shell shell.c
alka@ubuntu:~/Desktop/code$ ./shell
pwd
current working directory is : /home/alka/Desktop/code
cd .
pwd
current working directory is : /home/alka/Desktop/code
date
Tue Jan 23 19:40:32 2018
history
  pwd

  cd .

  pwd

  date

  history

history 2
  pwd

  cd .

history -c
history
  history
```

d) For cd command:

```
alka@ubuntu:~/Desktop/code$ gcc -o shell shell.c
alka@ubuntu:~/Desktop/code$ ./shell
pwd
current working directory is : /home/alka/Desktop/code
cd .
pwd
current working directory is : /home/alka/Desktop/code
cd abc
pwd
current working directory is : /home/alka/Desktop/code/abc
cd ..
pwd
current working directory is : /home/alka/Desktop/code
```

e) For echo command:

```
alka@ubuntu:~/Desktop/code$ gcc -o shell shell.c
alka@ubuntu:~/Desktop/code$ ./shell
echo hello world
hello world echo -n hey u
hey u echo -e \ a \ b

a
b
```

f) For ls command:

```
alka@ubuntu:~/Desktop/code$ gcc -o shell shell.c
alka@ubuntu:~/Desktop/code$ ./shell
cd abc
ls .
hello.txt
yayy
bye.txt
ls -a .
hello.txt
.
..
yayy
bye.txt
ls -s .
0
hello.txt
4096
4096
4096
yayy
0
bye.txt
```

g) For rm command:

```
alka@ubuntu:~/Desktop/code$ gcc -o shell shell.c
alka@ubuntu:~/Desktop/code$ ./shell
rm hello.txt
rm -v hello.txt
file could not be deleted
rm -d yayy
```

h) For mkdir command:

```
alka@ubuntu:~/Desktop/code$ gcc -o shell shell.c
alka@ubuntu:~/Desktop/code$ ./shell
cd abc
ls .
hello.txt
yayy
bye.txt
mkdir hello
ls .
hello.txt
yayy
hello
bye.txt
mkdir -v hello
directory exists
mkdir -m hello
```

i) For pwd and exit command:

```
alka@ubuntu:~/Desktop/code$ gcc -o shell shell.c
alka@ubuntu:~/Desktop/code$ ./shell
pwd
current working directory is : /home/alka/Desktop/code
cd .
pwd
current working directory is : /home/alka/Desktop/code
pwd -P
current working directory is : /home/alka/Desktop/code
exit 3
3
alka@ubuntu:~/Desktop/code$
```