SIKSHA 'O' ANUSANDHAN
DEEMED TO BE UNIVERSITY

Laboratory Assignment #1

DESIGN OF OPERATING SYSTEMS
(CSE 4049)

Submitted By -

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Objective of this Assignment:

To study the basic commands such as who, who am i, date, cal, pwd, man, mkdir, cd, rmdir, cat, mv, cp, rm, wc, sort, head, tail, cmp, diff, ls, chmod, grep, echo for accessing files and directories.
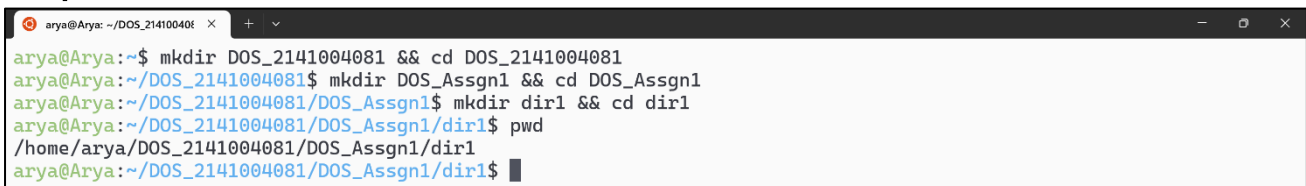
Q1. Write the commands to create the following directory hierarchy:

→ DOS_Regdno → DOSass1 → dir1

Command:

```
mkdir DOS_2141004081 && cd DOS_214100481
mkdir DOS_Assgn1 && cd DOS_Assgn1
mkdir dir1 && cd dir1
pwd
```
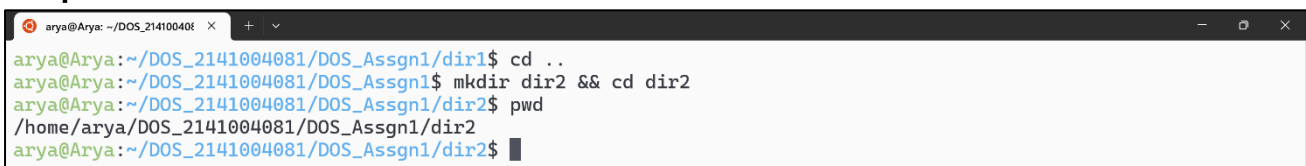
Output:

```
arya@Arya: ~/DOS_2141004081$ mkdir DOS_2141004081 && cd DOS_2141004081
arya@Arya:~$ mkdir DOS_2141004081 && cd DOS_2141004081
arya@Arya:~/DOS_2141004081$ mkdir DOS_Assgn1 && cd DOS_Assgn1
arya@Arya:~/DOS_2141004081/DOS_Assgn1$ mkdir dir1 && cd dir1
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ pwd
/home/arya/DOS_2141004081/DOS_Assgn1/dir1
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```

Q2. Write the commands to create another directory with name dir2 in directory DOSass1 and make dir2 as the current working directory.

Command:

```
cd ..
mkdir dir2 && cd dir2
pwd
```

Output:

```
arya@Arya: ~/DOS_2141004081
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cd ..
arya@Arya:~/DOS_2141004081/DOS_Assgn1$ mkdir dir2 && cd dir2
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir2$ pwd
/home/arya/DOS_2141004081/DOS_Assgn1/dir2
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir2$
```

Q3. Write the command to delete the directory dir2, when DOS_Regdno will be the current working directory.

Command:
```
cd ..
cd ..
rmdir DOS_Assgn1/dir2 && cd DOS_Assgn1
ls
```

Output:


```
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir2$ cd ..
arya@Arya:~/DOS_2141004081/DOS_Assgn1$ cd ..
arya@Arya:~/DOS_2141004081$ rmdir DOS_Assgn1/dir2
arya@Arya:~/DOS_2141004081$ cd DOS_Assgn1
arya@Arya:~/DOS_2141004081/DOS_Assgn1$ ls
dir1
arya@Arya:~/DOS_2141004081/DOS_Assgn1$
```
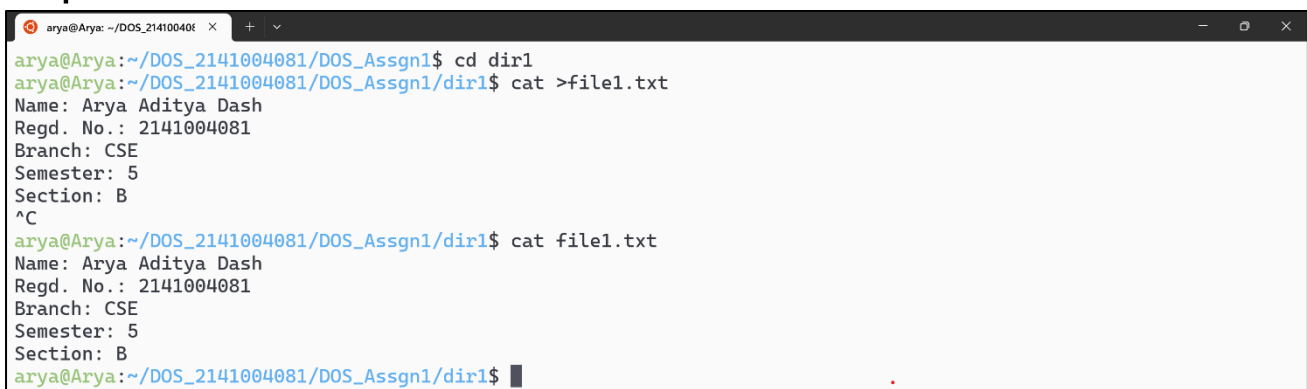
Q4. Write the command to create a file named as file1 using cat command inside dir1. Write your name, regdno, branch, semester and section in file1. Then display the content of the file.

Command:
```
cd dir1
cat > file1.txt
Name: Arya Aditya Dash
Branch: CSE
Semester: 5
Section: B
^C
```
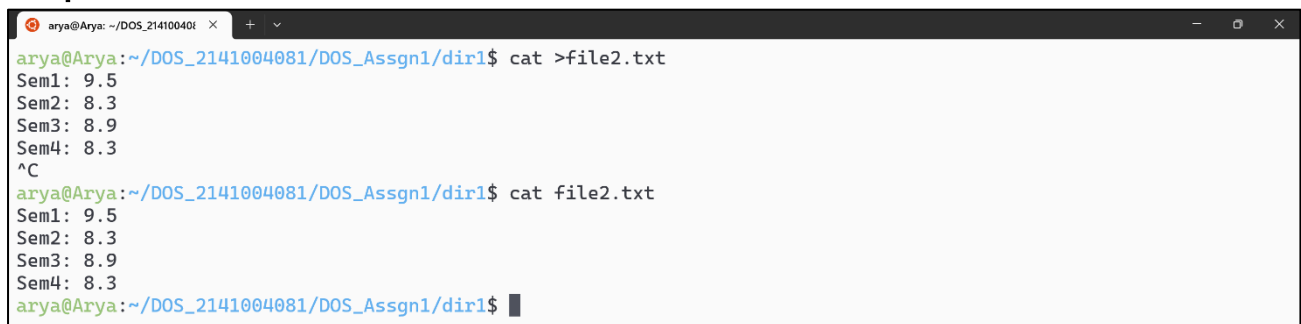
Output:


```
arya@Arya:~/DOS_2141004081/DOS_Assgn1$ cd dir1
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat >file1.txt
Name: Arya Aditya Dash
Regd. No.: 2141004081
Branch: CSE
Semester: 5
Section: B
^C
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat file1.txt
Name: Arya Aditya Dash
Regd. No.: 2141004081
Branch: CSE
Semester: 5
Section: B
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```

Q5. Write the command to create a file named as file2 using cat command inside dir1. Write your semester wise SGPA in file2.

Command:

```
cat file2.txt
Sem1: 9.5
Sem2: 8.2
Sem3: 8.9
Sem4: 8.3
^C
cat file2.txt
```

Output:

```
arya@Arya: ~/DOS_21410040{  ×    +   ∨                                                                        —   ▢   ✕
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat >file2.txt
Sem1: 9.5
Sem2: 8.3
Sem3: 8.9
Sem4: 8.3
^C
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat file2.txt
Sem1: 9.5
Sem2: 8.3
Sem3: 8.9
Sem4: 8.3
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ▮
```

Q6. Create a file named as file3 storing content of file1 merged with content of file2.

Command:

```
cat file1.txt file2.txt > file3.txt
cat file3.txt
```

Output:

```
arya@Arya: ~/DOS_21410040{  ×    +   ∨                                                                        —   ▢   ✕
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat file1.txt file2.txt >file3.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat file3.txt
Name: Arya Aditya Dash
Regd. No.: 2141004081
Branch: CSE
Semester: 5
Section: B
Sem1: 9.5
Sem2: 8.3
Sem3: 8.9
Sem4: 8.3
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ▮
```

Q7. Write the command to rename file2 as markinfo.

Command:
```
ls
mv file2.txt markinfo.txt
ls
```

Output:

```
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
file1.txt  file2.txt  file3.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ mv file2.txt markinfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
file1.txt  file3.txt  markinfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```

Q8. Write the command to copy the content of file1 to reginfo.

Command:
```
ls
cp file1.txt reginfo.txt
ls
cat reginfo.txt
```

Output:

```
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
file1.txt  file3.txt  markinfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cp file1.txt reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
file1.txt  file3.txt  markinfo.txt  reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat reginfo.txt
Name: Arya Aditya Dash
Regd. No.: 2141004081
Branch: CSE
Semester: 5
Section: B
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```

Q9. Write the command to display the inode values of file1, markinfo, reginfo.

Command:
```
ls -i
```

Output:

```
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls -i
26982 file1.txt  27004 file3.txt  27003 markinfo.txt  27005 reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```

Q10. Write the command to delete file1.

Command:
```
ls
rm file1.txt
ls
```

Output:
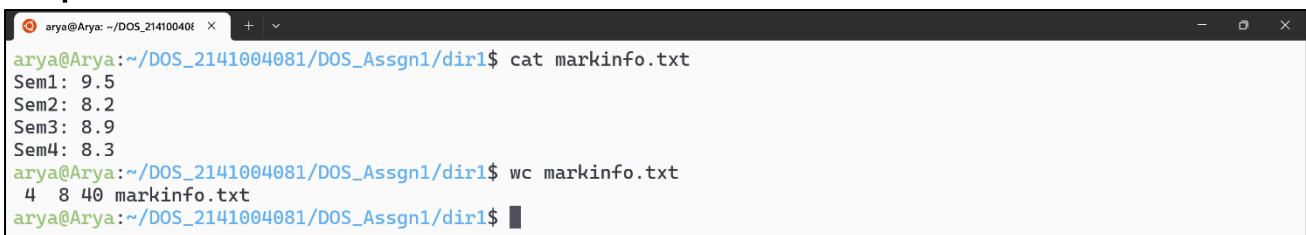
```
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
file1.txt  file3.txt  markinfo.txt  reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ rm file1.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
file3.txt  markinfo.txt  reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```

Q11. Write the command to count the number of lines, words, characters in markinfo.

Command:
```
cat markinfo.txt
wc markinfo.txt
```

Output:

```
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat markinfo.txt
Sem1: 9.5
Sem2: 8.2
Sem3: 8.9
Sem4: 8.3
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ wc markinfo.txt
 4  8 40 markinfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```

Q12. Write the command to create a file named as Personalinfo inside dir1. Write your name, regdno, address in the file.

Command:
```
cat > Personalinfo.txt
Name: Arya Aditya Dash
Regd. No.: 2141004081
Address: Old Town, Bhubaneswar, Odisha
^C
cat Personalinfo.txt
```

Output:

```
arya@Arya:~/DOS_21410040{  ×   +  ∨                                          —   ⊡   ×
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat >Personalinfo.txt
Name: Arya Aditya Dash
Regd. No.: 2141004081
Address: Old Town, Bhubaneswar, Odisha
^C
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
Personalinfo.txt  file3.txt  markinfo.txt  reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat Personalinfo.txt
Name: Arya Aditya Dash
Regd. No.: 2141004081
Address: Old Town, Bhubaneswar, Odisha
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ▌
```

Q13. Write the command to display the content of markinfo in reverse order.

Command:

```
ls
cat markinfo.txt
tac markinfo.txt
```

Output:

```
arya@Arya:~/DOS_21410040{  ×   +  ∨                                          —   ⊡   ×
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
Personalinfo.txt  file3.txt  markinfo.txt  reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat markinfo.txt
Sem1: 9.5
Sem2: 8.2
Sem3: 8.9                                                        .
Sem4: 8.3
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ tac markinfo.txt
Sem4: 8.3
Sem3: 8.9
Sem2: 8.2
Sem1: 9.5
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ▌
```

Q14. Check the output of the following command:

```
cmp reginfo personalinfo
diff reginfo personalinfo
```

Output:

```
arya@Arya:~/DOS_21410040{  ×   +  ∨                                          —   ⊡   ×
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cmp reginfo.txt Personalinfo.txt
reginfo.txt Personalinfo.txt differ: byte 46, line 3
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ diff reginfo.txt Personalinfo.txt
3,5c3
< Branch: CSE
< Semester: 5
< Section: B
---
> Address: Old Town, Bhubaneswar, Odisha
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ▌
```
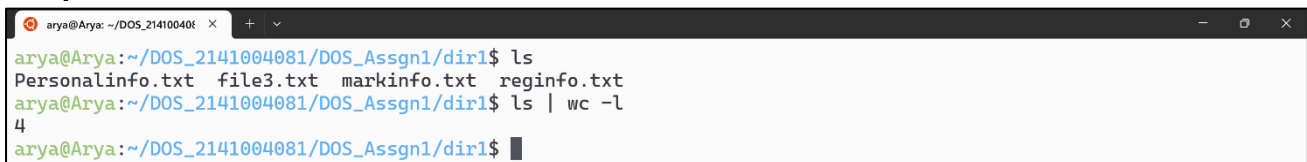
Q15. Write a command to count the number of files in the current working directory and display that number.
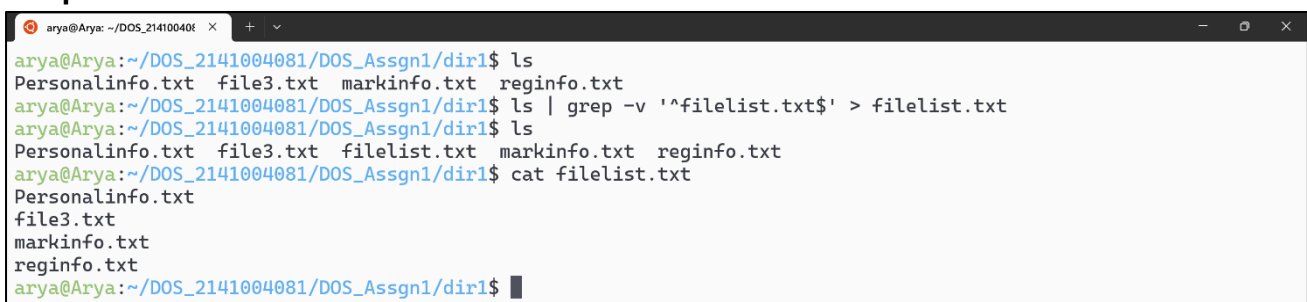
Command:

```
ls
ls | wc -l
```

Output:

```
arya@Arya: ~/DOS_214100408  ×   +  ∨                                                      —  □  ×
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
Personalinfo.txt  file3.txt  markinfo.txt  reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls | wc -l
4
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```

Q16. Write a command to include all the file names present in a current working directory in a file named as filelist without causing filelist to be included in the names.

Command:

```
ls
ls | grep -v '^filelist.txt$' > filelist.txt
ls
cat filelist.txt
```

Output:

```
arya@Arya: ~/DOS_214100408  ×   +  ∨                                                      —  □  ×
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
Personalinfo.txt  file3.txt  markinfo.txt  reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls | grep -v '^filelist.txt$' > filelist.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls
Personalinfo.txt  file3.txt  filelist.txt  markinfo.txt  reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ cat filelist.txt
Personalinfo.txt
file3.txt
markinfo.txt
reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```

Q17. Write a command to give write permission to all the users of file reginfo.

Command:

```
ls -l
chmod a+w reginfo.txt
ls -l
```

Output:


```
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls -l
total 20
-rw-r--r-- 1 arya arya  84 Oct  3 21:08 Personalinfo.txt
-rw-r--r-- 1 arya arya 120 Oct  3 20:54 file3.txt
-rw-r--r-- 1 arya arya  52 Oct  3 21:16 filelist.txt
-rw-r--r-- 1 arya arya  40 Oct  3 20:59 markinfo.txt
-rw-r--r-- 1 arya arya  80 Oct  3 21:01 reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ chmod a+w reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls -l
total 20
-rw-r--r-- 1 arya arya  84 Oct  3 21:08 Personalinfo.txt
-rw-r--r-- 1 arya arya 120 Oct  3 20:54 file3.txt
-rw-r--r-- 1 arya arya  52 Oct  3 21:16 filelist.txt
-rw-r--r-- 1 arya arya  40 Oct  3 20:59 markinfo.txt
-rw-rw-rw- 1 arya arya  80 Oct  3 21:01 reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ █
```

Q18. Write a command to discard write permission from group users group users of file reginfo.

Command:

```
ls -l
chmod g-w reginfo.txt
ls -l
```

Output:


```
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls -l
total 20
-rw-r--r-- 1 arya arya  84 Oct  3 21:08 Personalinfo.txt
-rw-r--r-- 1 arya arya 120 Oct  3 20:54 file3.txt
-rw-r--r-- 1 arya arya  52 Oct  3 21:16 filelist.txt
-rw-r--r-- 1 arya arya  40 Oct  3 20:59 markinfo.txt
-rw-rw-rw- 1 arya arya  80 Oct  3 21:01 reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ chmod g-w reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls -l
total 20
-rw-r--r-- 1 arya arya  84 Oct  3 21:08 Personalinfo.txt
-rw-r--r-- 1 arya arya 120 Oct  3 20:54 file3.txt
-rw-r--r-- 1 arya arya  52 Oct  3 21:16 filelist.txt
-rw-r--r-- 1 arya arya  40 Oct  3 20:59 markinfo.txt
-rw-r--rw- 1 arya arya  80 Oct  3 21:01 reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ █
```

Q19. Write the command to set rwx permissions for all the users of file reginfo.

Command:

```
ls -l
chmod a+rwx reginfo.txt
ls -l
```

Output:

```
 arya@Arya: ~/DOS_21410040f  ×    +  ∨                                                    —   □   ×
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls -l
total 20
-rw-r--r-- 1 arya arya  84 Oct  3 21:08 Personalinfo.txt
-rw-r--r-- 1 arya arya 120 Oct  3 20:54 file3.txt
-rw-r--r-- 1 arya arya  52 Oct  3 21:16 filelist.txt      .
-rw-r--r-- 1 arya arya  40 Oct  3 20:59 markinfo.txt
-rw-r--rw- 1 arya arya  80 Oct  3 21:01 reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ chmod a+rwx reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ls -l
total 20
-rw-r--r-- 1 arya arya  84 Oct  3 21:08 Personalinfo.txt
-rw-r--r-- 1 arya arya 120 Oct  3 20:54 file3.txt
-rw-r--r-- 1 arya arya  52 Oct  3 21:16 filelist.txt
-rw-r--r-- 1 arya arya  40 Oct  3 20:59 markinfo.txt
-rwxrwxrwx 1 arya arya  80 Oct  3 21:01 reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ▮
```

Q20. Differentiate between following commands:

```
date; pwd
date; pwd | wc -l
(date; pwd) | wc -l
```

Output:

```
 arya@Arya: ~/DOS_21410040f  ×    +  ∨                                                    —   □   ×
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ date; pwd
Tue Oct  3 21:28:26 IST 2023
/home/arya/DOS_2141004081/DOS_Assgn1/dir1
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ date; pwd | wc -l
Tue Oct  3 21:28:37 IST 2023
1
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ (date; pwd) | wc -l
2
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ ▮
```

Q21. Interpret the output of the following commmands:

```
echo *
echo ***
echo '***'
echo \***
echo \*\*\*
echo */
echo Don't do this
echo "Don't do this" (Quotes of one kind protect quotes
of other kind)
echo Hello # world
echo " Hello # world"
echo ' Hello # world'
echo date
echo 'date'
```

```
echo "date"
echo `date`
```

Output:

```
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo *
Personalinfo.txt file3.txt filelist.txt markinfo.txt reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo ***
Personalinfo.txt file3.txt filelist.txt markinfo.txt reginfo.txt
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo '***'
***
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo \***
***
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo \*\*\*
***
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo */*
*/*
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo Don't do this
> ^C
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo "Don't do this"
Don't do this
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo Hello # World
Hello
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo "Hello # World"
Hello # World
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo 'Hello # World'
Hello # World
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo date
date
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo 'date'
date
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo "date"
date
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$ echo `date`
Tue Oct 3 21:32:11 IST 2023
arya@Arya:~/DOS_2141004081/DOS_Assgn1/dir1$
```