

Concepts of Operating System

ASSIGNMENT No 1

Problem 1:

a) Navigate and List:

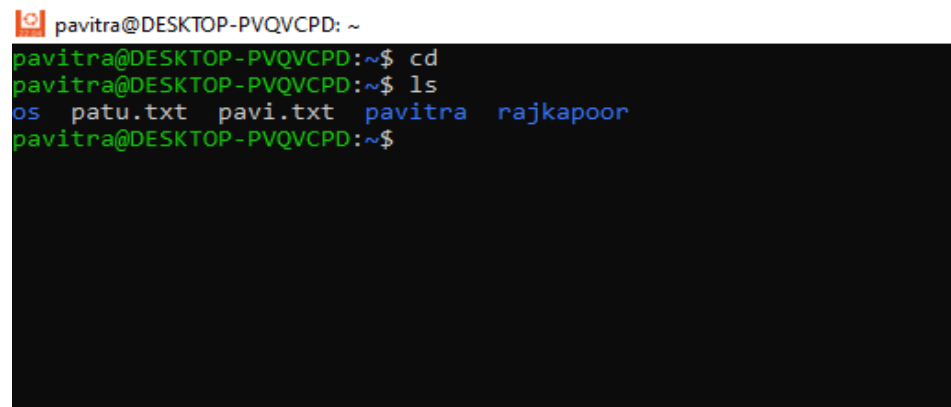
a. Start by navigating to your home directory and list its contents. Then, move into a directory named "LinuxAssignment" if it exists; otherwise, create it.

Solution:-

To navigate to your home directory and list its contents use the following commands:

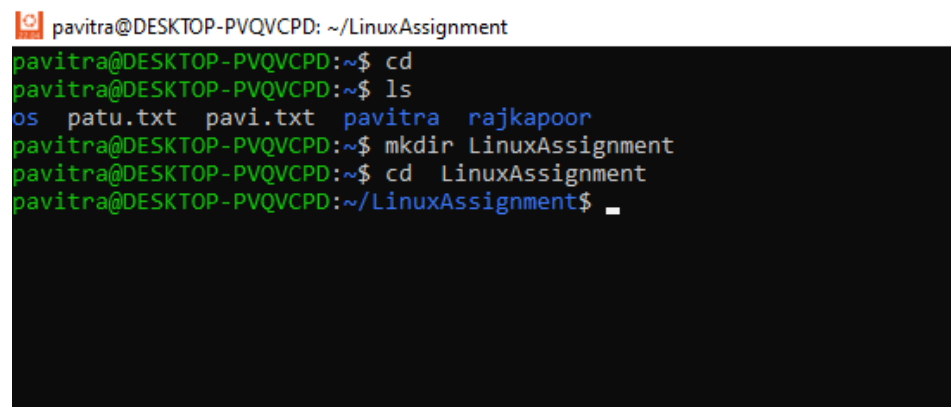
```
cd
```

```
ls
```



```
pavitra@DESKTOP-PVQVCPD: ~  
pavitra@DESKTOP-PVQVCPD:~$ cd  
pavitra@DESKTOP-PVQVCPD:~$ ls  
os  patu.txt  pavi.txt  pavitra  raj Kapoor  
pavitra@DESKTOP-PVQVCPD:~$
```

To create LinuxAssignment directory we used `mkdir` command and for moving into that directory we used `cd` command



```
pavitra@DESKTOP-PVQVCPD: ~/LinuxAssignment  
pavitra@DESKTOP-PVQVCPD:~$ cd  
pavitra@DESKTOP-PVQVCPD:~$ ls  
os  patu.txt  pavi.txt  pavitra  raj Kapoor  
pavitra@DESKTOP-PVQVCPD:~$ mkdir LinuxAssignment  
pavitra@DESKTOP-PVQVCPD:~$ cd LinuxAssignment  
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ _
```

b) File Management:

a. Inside the "LinuxAssignment" directory, create a new file named "file1.txt". Display its contents.

Solution:-

to create new file we use following command:

touch

```
pavitra@DESKTOP-PVQVCPD: ~/LinuxAssignment
pavitra@DESKTOP-PVQVCPD:~$ cd
pavitra@DESKTOP-PVQVCPD:~$ ls
os patu.txt pavi.txt pavitra raj Kapoor
pavitra@DESKTOP-PVQVCPD:~$ mkdir LinuxAssignment
pavitra@DESKTOP-PVQVCPD:~$ cd LinuxAssignment
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ touch file1.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$
```

To displaying files content we use following command:

cat

```
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ cat file1.txt
International Women's Day (IWD) is a holiday celebrated annually on March 8 as a focal point in the women's rights movement. IWD gives focus to issues such as gender equality, reproductive rights, and violence and abuse against women.[3][4] Spurred by the universal female suffrage movement, IWD originated from labor movements in North America and Europe during the early 20th century.[5][6][7]

The earliest version reported was a "Women's Day" organized by the Socialist Party of America in New York City on February 28, 1909. This inspired German delegates at the 1910 International Socialist Women's Conference to propose "a special Women's Day" be organized annually, albeit with no set date;[8] the following year saw the first demonstrations and commemorations of International Women's Day across Europe. After the Russian Revolution in 1917, IWD was made a national holiday on March 8;[9] it was subsequently celebrated on that date by the socialist movement and communist countries. The holiday was associated with far-left movements and governments until its adoption by the global feminist movement in the late 1960s. IWD became a mainstream global holiday following its promotion by the United Nations in 1977.
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$
```

c) Directory Management:

a. Create a new directory named "docs" inside the "LinuxAssignment" directory.

Solution :- to creating new directory inside the "LinuxAssignment" directory

We used following command

Cd LinuxAssignment

mkdir docs

```
pavitra@DESKTOP-PVQVCPD: ~/LinuxAssignment
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ cd
pavitra@DESKTOP-PVQVCPD:~$ cd LinuxAssignment
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ cd docs
-bash: cd: docs: No such file or directory
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ mkdir docs
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ ls
docs  file1.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$
```

d) Copy and Move Files:

a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt"

Solution :

To copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt"

We used following command

`cp file1.txt docs/file2.txt`

```
docs file1.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ cp file1.txt docs/file2.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ ls
docs file1.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ cd docs
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment/docs$ ls
file2.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment/docs$
```

e) Permissions and Ownership:

a. Change the permissions of "file2.txt" to allow read, write, and execute permissions for the owner and only read permissions for others. Then, change the owner of "file2.txt" to the current user.

Solution :

To change the permissions of "file2.txt" to allow read, write, and execute permissions for the owner and only read permissions for others, and then change the owner of "file2.txt" to the current user used following command

```
chmod 744 docs/file2.txt
```

```
chown $(whoami) docs/file2.txt
```

1. **chmod 744 docs/file2.txt**: This command sets the permissions of "file2.txt" to allow read (4), write (2), and execute (1) permissions for the owner, and read-only (4) permissions for the group and others. The total numeric mode is 7 (owner) + 4 (group) + 4 (others) = 744.
2. **chown \$(whoami) docs/file2.txt**: This command changes the owner of "file2.txt" to the current user (**\$(whoami)** provides the username of the current user).

```
pavitra@DESKTOP-PVQVCPD: ~/LinuxAssignment/docs
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ cd
pavitra@DESKTOP-PVQVCPD:~$ cd LinuxAssignment
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ cd docs
-bash: cd: docs: No such file or directory
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ mkdir docs
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ ls
docs  file1.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ cp file1.txt docs/file2.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ ls
docs  file1.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ cd docs
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment/docs$ ls
file2.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment/docs$ chmod 744 docs/file2.txt
chmod: cannot access 'docs/file2.txt': No such file or directory
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment/docs$ chown $(whoami) docs/file2.txt
chown: cannot access 'docs/file2.txt': No such file or directory
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment/docs$ chmod 744 file2.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment/docs$ chown $(whoami) file2.txt
Command 'whomi' not found, did you mean:
  command 'whoami' from deb coreutils (8.32-4.1ubuntu1)
  command 'whom' from deb mailutils-mh (1:3.14-1)
  command 'whom' from deb mmh (0.4-4)
  command 'whom' from deb nmh (1.7.1-11)
Try: sudo apt install <deb name>
chown: missing operand after 'file2.txt'
Try 'chown --help' for more information.
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment/docs$ chown $(whoami) file2.txt
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment/docs$
```

f) Final Checklist:

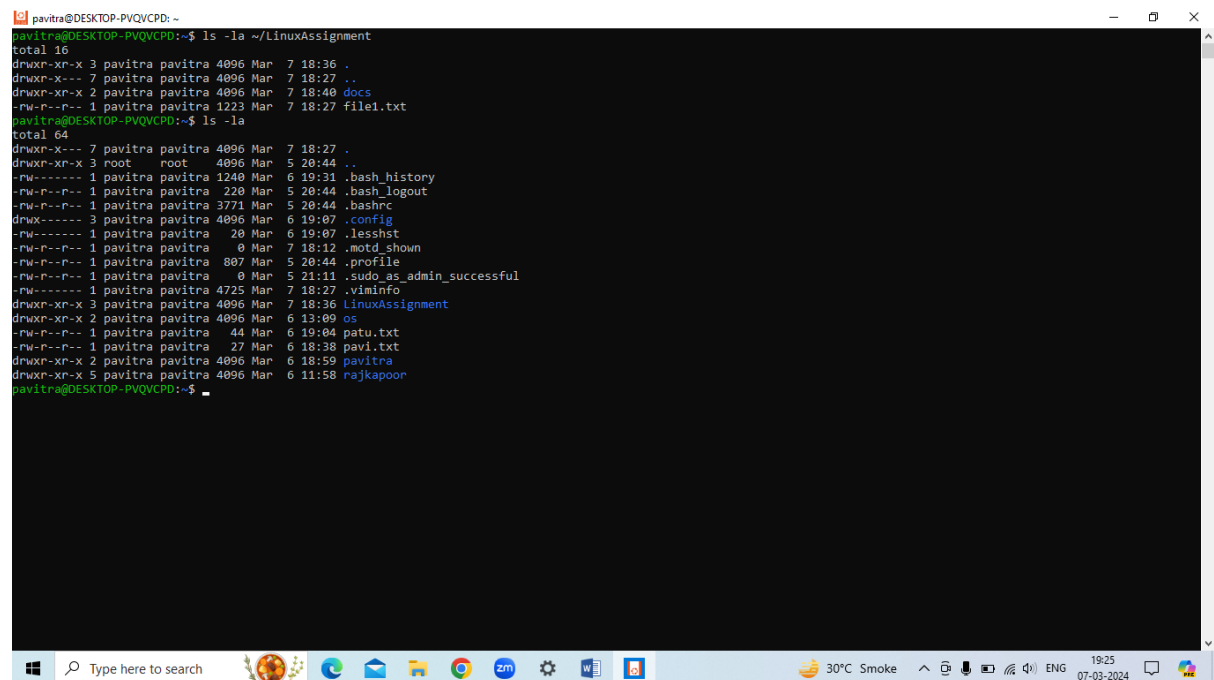
a. Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly.

Solution :

To list the contents of the "LinuxAssignment" directory and the root directory, you can use the following commands:

```
ls -la ~/LinuxAssignment
```

```
ls -la /
```



```
pavitra@DESKTOP-PVQVCPD: ~  
pavitra@DESKTOP-PVQVCPD:~$ ls -la ~/LinuxAssignment  
total 16  
drwxr-xr-x 3 pavitra pavitra 4096 Mar 7 18:36 .  
drwxr-xr-x 7 pavitra pavitra 4096 Mar 7 18:27 ..  
drwxr-xr-x 2 pavitra pavitra 4096 Mar 7 18:40 docs  
-rw-r--r-- 1 pavitra pavitra 1223 Mar 7 18:27 file1.txt  
pavitra@DESKTOP-PVQVCPD:~$ ls -la  
total 64  
drwxr-xr-x 7 pavitra pavitra 4096 Mar 7 18:27 .  
drwxr-xr-x 3 root root 4096 Mar 5 20:44 ..  
-rw-r--r-- 1 pavitra pavitra 1240 Mar 6 19:31 .bash_history  
-rw-r--r-- 1 pavitra pavitra 220 Mar 5 20:44 .bash_logout  
-rw-r--r-- 1 pavitra pavitra 3771 Mar 5 20:44 .bashrc  
drwx----- 3 pavitra pavitra 4096 Mar 6 19:07 .config  
-rw-r--r-- 1 pavitra pavitra 20 Mar 6 19:07 .lessht  
-rw-r--r-- 1 pavitra pavitra 0 Mar 7 18:12 .motd_shown  
-rw-r--r-- 1 pavitra pavitra 807 Mar 5 20:44 .profile  
-rw-r--r-- 1 pavitra pavitra 0 Mar 5 21:11 .sudo_as_admin_successful  
-rw-r--r-- 1 pavitra pavitra 4725 Mar 7 18:27 .viminfo  
drwxr-xr-x 3 pavitra pavitra 4096 Mar 7 18:36 LinuxAssignment  
drwxr-xr-x 2 pavitra pavitra 4096 Mar 6 13:09 os  
-rw-r--r-- 1 pavitra pavitra 44 Mar 6 19:04 patu.txt  
-rw-r--r-- 1 pavitra pavitra 27 Mar 6 18:38 pavi.txt  
drwxr-xr-x 2 pavitra pavitra 4096 Mar 6 18:59 pavitra  
drwxr-xr-x 5 pavitra pavitra 4096 Mar 6 11:58 rajkapoor  
pavitra@DESKTOP-PVQVCPD:~$
```

g) File Searching:

a. Search for all files with the extension ".txt" in the current directory and its subdirectories.

To search for all files with the extension ".txt" in the current directory and its subdirectories, you can use the **find** command

```
pavitra@DESKTOP-PVQVCPD: ~  
pavitra@DESKTOP-PVQVCPD:~$ find . -type f -name "*.txt"  
./pavi.txt  
./pavitra/pavi-backup.txt  
./LinuxAssignment/docs/file2.txt  
./LinuxAssignment/file1.txt  
./raj Kapoor/rishik Kapoor/riddima.txt  
./raj Kapoor/rishik Kapoor/ranbirkapoor.txt  
./raj Kapoor/randhirkapoor/kareenakapoor.txt  
./raj Kapoor/randhirkapoor/karishmakapoor.txt  
./patu.txt  
pavitra@DESKTOP-PVQVCPD:~$
```

b. Display lines containing a specific word in a file (provide a file name and the specific word to search).

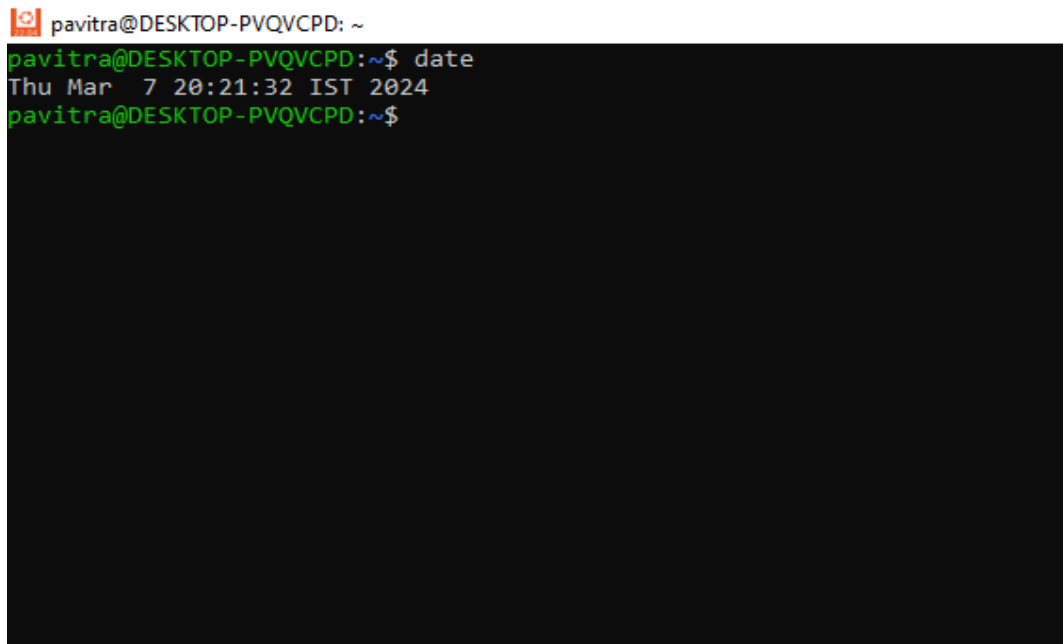
To display lines containing a specific word in a file we used following command
grep "specific_word" filename

```
ne is my brother  
pavitra@DESKTOP-PVQVCPD:~$ grep "pratik" patu.txt  
patu is nickname of pratik  
pavitra@DESKTOP-PVQVCPD:~$
```

h) System Information:

a. Display the current system date and time.

To display current system date and time we used following command
date

A terminal window with a black background and green text. The prompt is 'pavitra@DESKTOP-PVQVCPD: ~'. The command 'date' is entered, and the output is 'Thu Mar 7 20:21:32 IST 2024'. The prompt is then shown again.

```
pavitra@DESKTOP-PVQVCPD: ~  
pavitra@DESKTOP-PVQVCPD:~$ date  
Thu Mar 7 20:21:32 IST 2024  
pavitra@DESKTOP-PVQVCPD:~$
```


i) Networking:

a. Display the IP address of the system.

To display the IP address of the system we used following command

ifconfig or ip addr

```
pavitra@DESKTOP-PVQVCPD: ~
pavitra@DESKTOP-PVQVCPD:~$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 172.25.192.238 netmask 255.255.240.0 broadcast 172.25.207.255
    inet6 fe80::215:5dff:fe6a:1488 prefixlen 64 scopeid 0x20<link>
    ether 00:15:5d:6a:14:88 txqueuelen 1000 (Ethernet)
    RX packets 802 bytes 348953 (348.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 83 bytes 5851 (5.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

pavitra@DESKTOP-PVQVCPD:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: bond0: <BROADCAST,MULTICAST,MASTER> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 8a:b0:e4:98:c1:93 brd ff:ff:ff:ff:ff:ff
3: dummy0: <BROADCAST,NOARP> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 12:97:a0:a2:e0:1c brd ff:ff:ff:ff:ff:ff
4: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:6a:14:88 brd ff:ff:ff:ff:ff:ff
    inet 172.25.192.238/20 brd 172.25.207.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe6a:1488/64 scope link
        valid_lft forever preferred_lft forever
5: tunl0@NONE: <NOARP> mtu 1480 qdisc noop state DOWN group default qlen 1000
    link/ipip 0.0.0.0 brd 0.0.0.0
6: sit@NONE: <NOARP> mtu 1480 qdisc noop state DOWN group default qlen 1000
    link/sit 0.0.0.0 brd 0.0.0.0
pavitra@DESKTOP-PVQVCPD:~$
```

b. Ping a remote server to check connectivity (provide a remote server address to ping).

```
pavitra@DESKTOP-PVQVCPD: ~
pavitra@DESKTOP-PVQVCPD:~$ ping www.google.com
PING www.google.com (142.250.70.36) 56(84) bytes of data.
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=1 ttl=57 time=8.55 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=2 ttl=57 time=8.41 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=3 ttl=57 time=8.13 ms
^C
```

j) File Compression:

a. Compress the "docs" directory into a zip file.

To Compress the "docs" directory into a zip file. We used following command

```
zip -r docs.zip -i docs
```

- **zip**: Command used to compress files and directories into a zip archive.
- **-r**: Recursively include all files and subdirectories within the "docs" directory.
- **docs.zip**: Name of the zip file to create.
- **docs**: Name of the directory to compress.

```
pavitra@DESKTOP-PVQVCPD:~$ zip -r docs.zip . -i docs
zip warning: zip file empty
pavitra@DESKTOP-PVQVCPD:~$
```

b. Extract the contents of the zip file into a new directory.

To Extract the contents of the zip file into a new directory. We used following command

```
unzip docs.zip -d extracted_docs
```

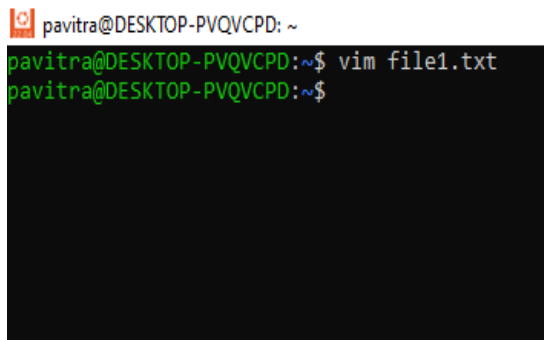
```
pavitra@DESKTOP-PVQVCPD:~$ zip -r docs.zip . -i docs
zip warning: zip file empty
pavitra@DESKTOP-PVQVCPD:~$ unzip docs.zip -d extracted_docs
Archive: docs.zip
warning [docs.zip]: zipfile is empty
pavitra@DESKTOP-PVQVCPD:~$
```

k) File Editing:

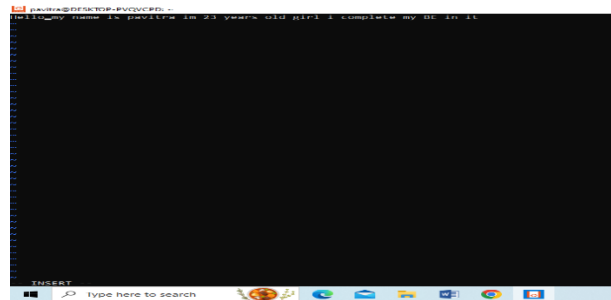
a. Open the "file1.txt" file in a text editor and add some text to it.

To edit the file we used following command

vim file name



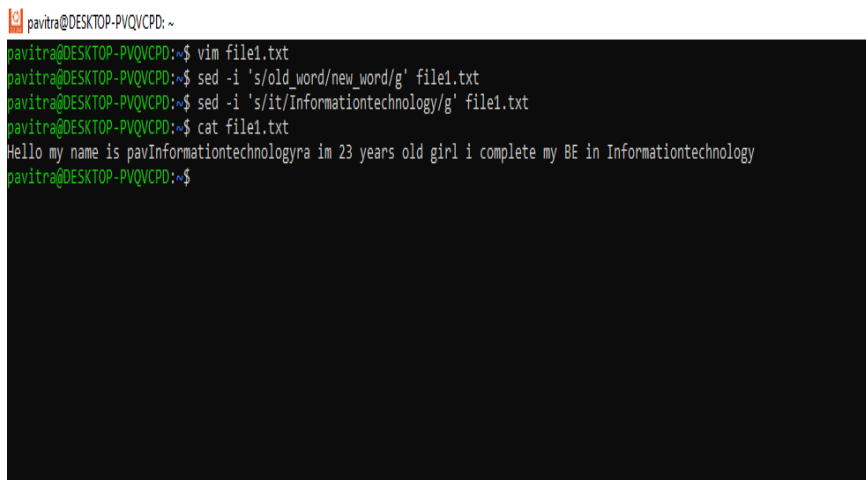
```
pavitra@DESKTOP-PVQVCPD: ~  
pavitra@DESKTOP-PVQVCPD:~$ vim file1.txt  
pavitra@DESKTOP-PVQVCPD:~$
```



b. Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with).

To replace a specific word in the "file1.txt" file with another word we used following command :-

sed -i 's/original_word/replacement_word/g' file1.txt



```
pavitra@DESKTOP-PVQVCPD: ~  
pavitra@DESKTOP-PVQVCPD:~$ vim file1.txt  
pavitra@DESKTOP-PVQVCPD:~$ sed -i 's/old_word/new_word/g' file1.txt  
pavitra@DESKTOP-PVQVCPD:~$ sed -i 's/it/Informationtechnology/g' file1.txt  
pavitra@DESKTOP-PVQVCPD:~$ cat file1.txt  
Hello my name is pavInformationtechnologyra im 23 years old girl i complete my BE in Informationtechnology  
pavitra@DESKTOP-PVQVCPD:~$
```

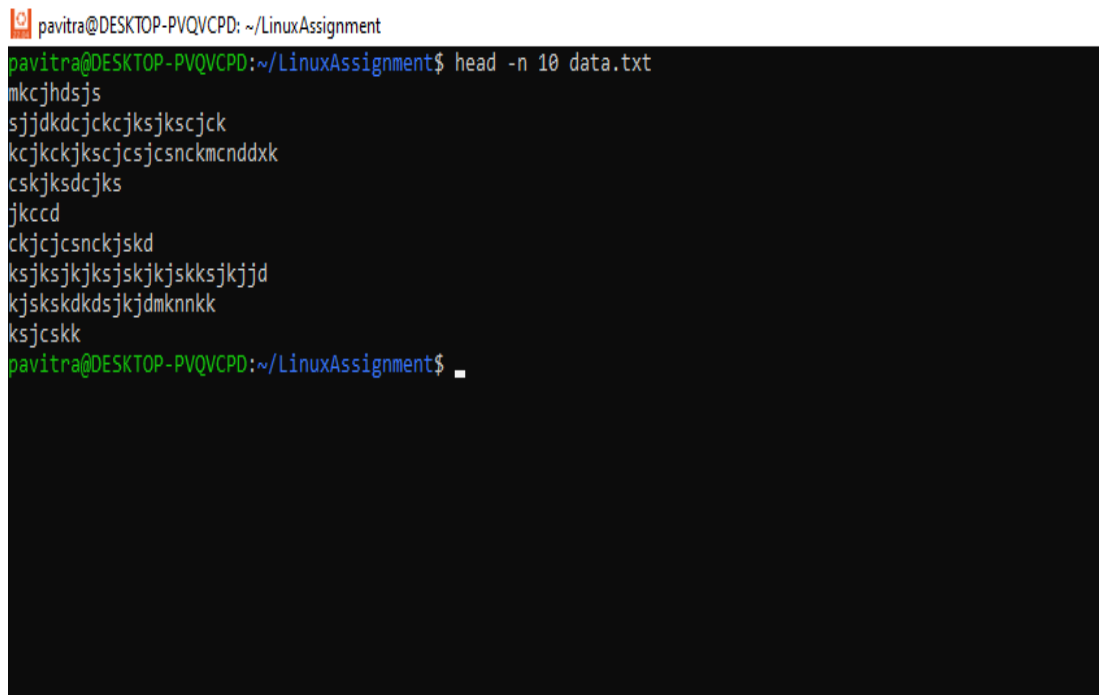
Problem 2:

- a. Suppose you have a file named "data.txt" containing important information. Display the first 10 lines of this file to quickly glance at its contents using a command.

Solution :-

To Display the first 10 lines of this file we used following command

`head -n 10 data.txt`



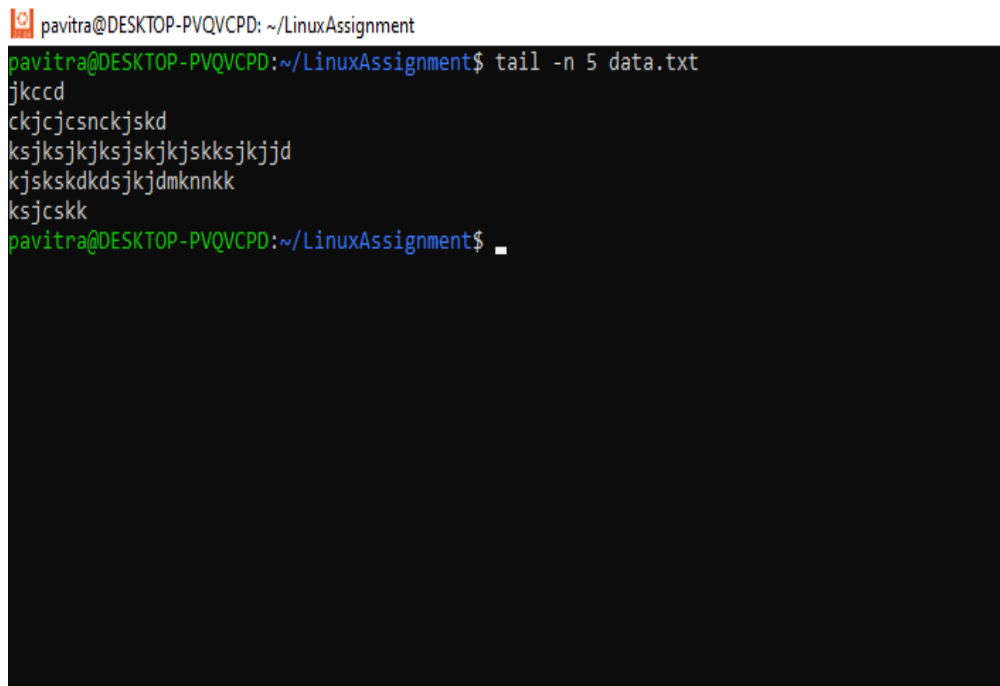
```
pavitra@DESKTOP-PVQVCPD: ~/LinuxAssignment
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ head -n 10 data.txt
mkcjhdjsj
sjjdkdcjckcjsjksjck
kcjkckjksjcsjcsnckmcnddxk
eskjksdcjks
jkccd
ckjcjcsnckjskd
ksjksjkjsjskjskksjkjkd
kjskskdksjkdmdknnkk
ksjcskk
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ .
```

b.Now, to check the end of the file for any recent additions, display the last 5 lines of "data.txt" using another command.

Solution:

To check the end of the file for any recent additions, display the last 5 lines of "data.txt" we used following command.

`tail -n 5 data.txt`



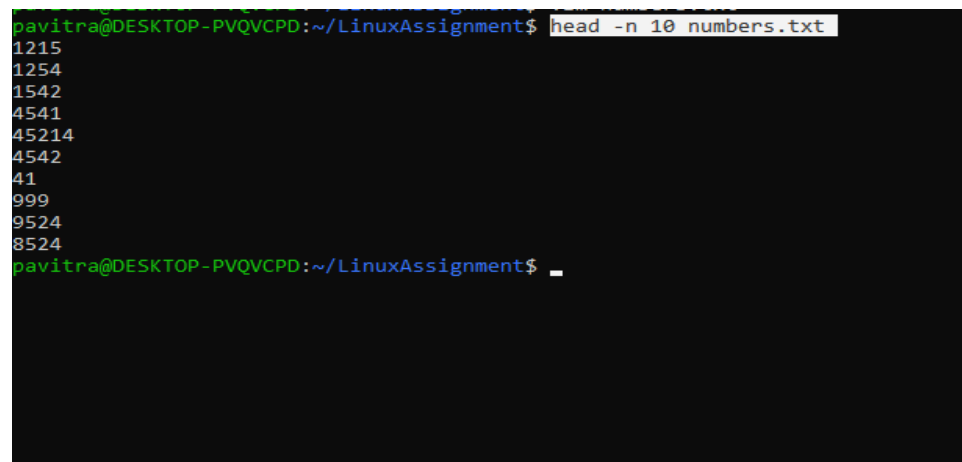
```
pavitra@DESKTOP-PVQVCPD: ~/LinuxAssignment
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ tail -n 5 data.txt
jkccd
ckjcjcsnckjskd
ksjksjkjsjskjskksjkjkd
kjskskdksjkjdmknkk
ksjcstk
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ _
```

c. In a file named "numbers.txt," there are a series of numbers. Display the first 15 lines of this file to analyze the initial data set.

Solution:

To. Display the first 15 lines of this file to analyze the initial data set we used following command

`head -n 10 numbers.txt`



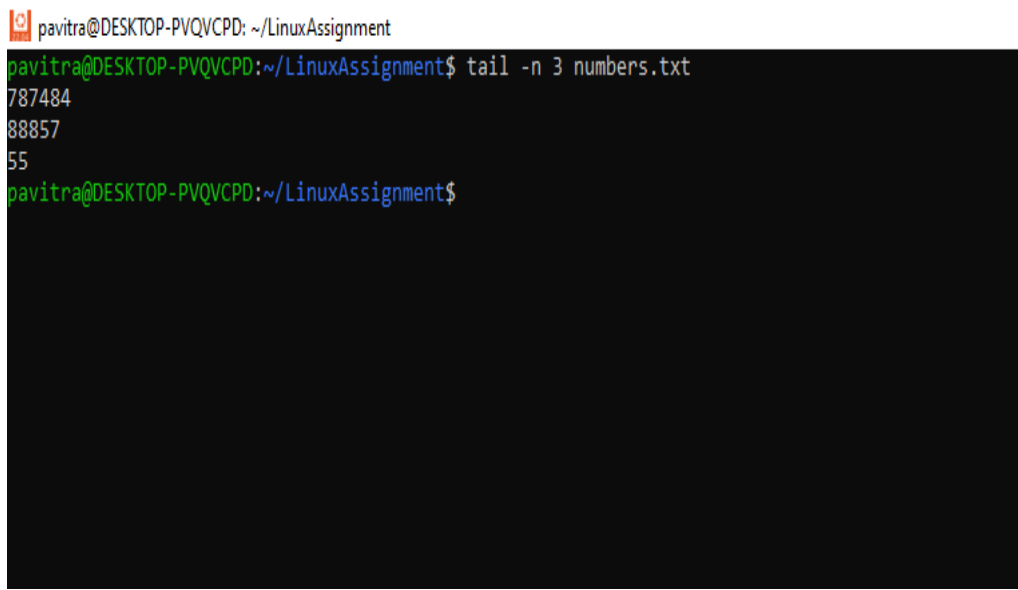
```
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ head -n 10 numbers.txt
1215
1254
1542
4541
45214
4542
41
999
9524
8524
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ _
```

d. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt".

Solution:-

To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt" we used following comma

`tail -n 3 numbers.txt`



```
pavitra@DESKTOP-PVQVCPD: ~/LinuxAssignment  
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$ tail -n 3 numbers.txt  
787484  
88857  
55  
pavitra@DESKTOP-PVQVCPD:~/LinuxAssignment$
```

e. Imagine you have a file named "input.txt" with text content. Use a command to translate all lowercase letters to uppercase in "input.txt" and save the modified text in a new file named "output.txt."

to translate lowercase letters to uppercase in a file. we used following command

```
tr '[:lower:]' '[:upper:]' < input.txt > output.txt
```

- **tr**: Command used for character translation.
- **'[:lower:]'**: Specifies the range of characters to be translated, in this case, all lowercase letters.
- **'[:upper:]'**: Specifies the characters to which the matched characters will be translated, in this case, uppercase letters.
- **< input.txt**: Takes input from the file "input.txt".
- **> output.txt**: Redirects the output to the file "output.txt".

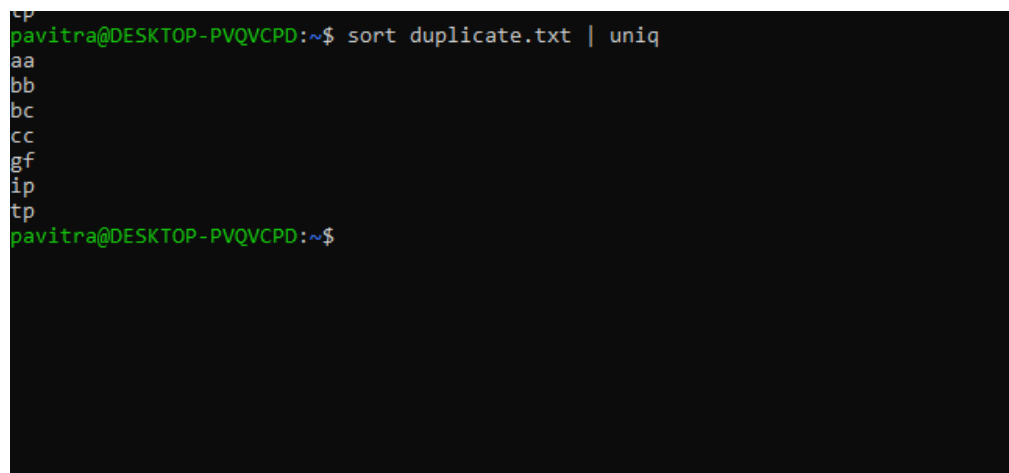
```
pavitra@DESKTOP-PVQVCPD:~$ tr '[:lower:]' '[:upper:]' < input.txt > output.txt
pavitra@DESKTOP-PVQVCPD:~$ cat output.txt
PAVITRA
PANDURANG
PATIL
SHWETA
PALVE
pavitra@DESKTOP-PVQVCPD:~$
```


f. In a file named "duplicate.txt," there are several lines of text, some of which are duplicates. Use a command to display only the unique lines from "duplicate.txt."

Solution:

To display only the unique lines from "duplicate.txt." we use following command

`sort duplicate.txt | uniq`



```
pavitra@DESKTOP-PVQVCPD:~$ sort duplicate.txt | uniq
aa
bb
bc
cc
gf
ip
tp
pavitra@DESKTOP-PVQVCPD:~$
```

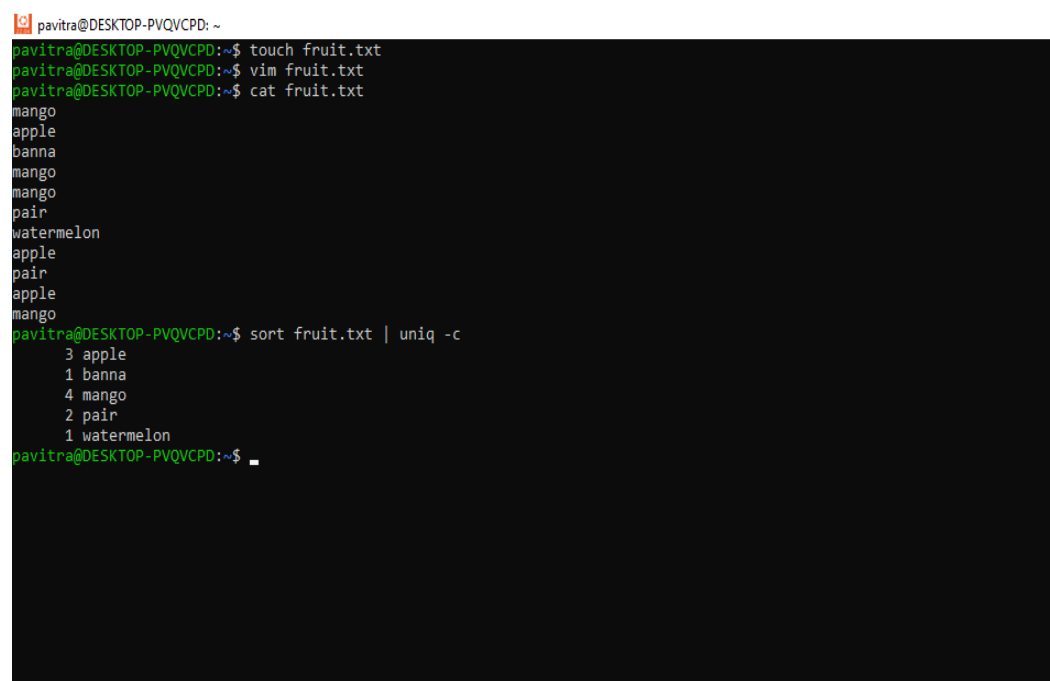
g. In a file named "fruit.txt," there is a list of fruits, but some fruits are repeated. Use a command to display each unique fruit along with the count of its occurrences in "fruit.txt."

Solution:

To display each unique fruit along with the count of its occurrences in "fruit.txt."

we used following command

```
sort fruit.txt | uniq -c
```



```
pavitra@DESKTOP-PVQVCPD: ~  
pavitra@DESKTOP-PVQVCPD:~$ touch fruit.txt  
pavitra@DESKTOP-PVQVCPD:~$ vim fruit.txt  
pavitra@DESKTOP-PVQVCPD:~$ cat fruit.txt  
mango  
apple  
banna  
mango  
mango  
pair  
watermelon  
apple  
pair  
apple  
mango  
pavitra@DESKTOP-PVQVCPD:~$ sort fruit.txt | uniq -c  
  3 apple  
  1 banna  
  4 mango  
  2 pair  
  1 watermelon  
pavitra@DESKTOP-PVQVCPD:~$
```