

Pooja kisan Nichit

## Concepts of Operating System

### Assignment 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.

Ans:

for navigating home directory we can use following command

**cd or cd ~** : it used show back to home directory from anywhere in the directory.

for listing the content we can use following command:

**ls** : it list the content.

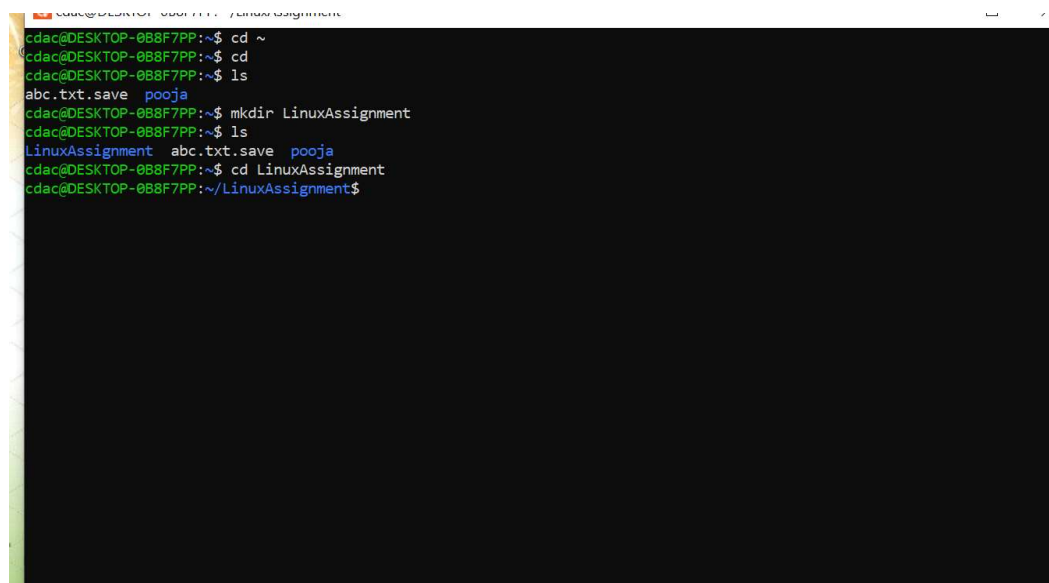
first create the directory by using following command:

mkdir LinuxAssignment

if already exists then directly move to this directory by using following command:

cd LinuxAssignment

Output:



```
cdac@DESKTOP-0B8F7PP:~$ cd ~
cdac@DESKTOP-0B8F7PP:~$ cd
cdac@DESKTOP-0B8F7PP:~$ ls
abc.txt.save  pooja
cdac@DESKTOP-0B8F7PP:~$ mkdir LinuxAssignment
cdac@DESKTOP-0B8F7PP:~$ ls
LinuxAssignment  abc.txt.save  pooja
cdac@DESKTOP-0B8F7PP:~$ cd LinuxAssignment
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$
```

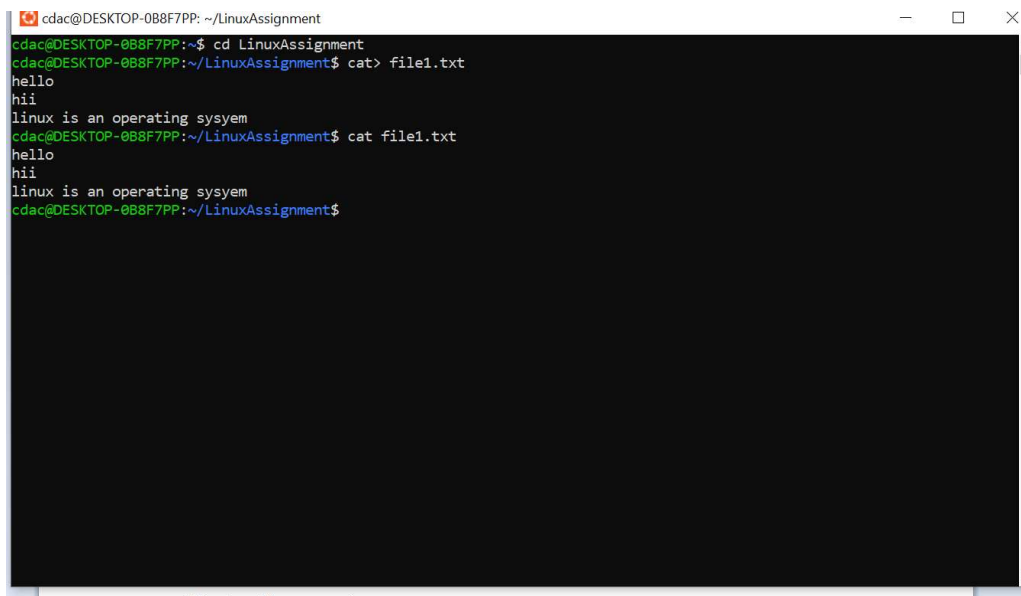
b) File Management:

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

Ans:

first we can check present working directory by using pwd command  
after that if we are not in LinuxAssignment directory then we can directly write  
cd LinuxAssignment command to move that directory.  
for creating a new file there is so many options like touch,cat,nano,vi editor etc.  
we can create file using any one comand which we want  
Touch is create empty file.  
cat is used to create file as well as contentof file but we cannot modify.  
in nano & vi editor we can create as well as modify the data.

Output:

A terminal window titled 'cdac@DESKTOP-0B8F7PP: ~/LinuxAssignment' with standard window controls. The terminal shows the following commands and output:

```
cdac@DESKTOP-0B8F7PP:~$ cd LinuxAssignment
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ cat > file1.txt
hello
hii
linux is an operating sysyem
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ cat file1.txt
hello
hii
linux is an operating sysyem
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$
```

c) Directory Management:

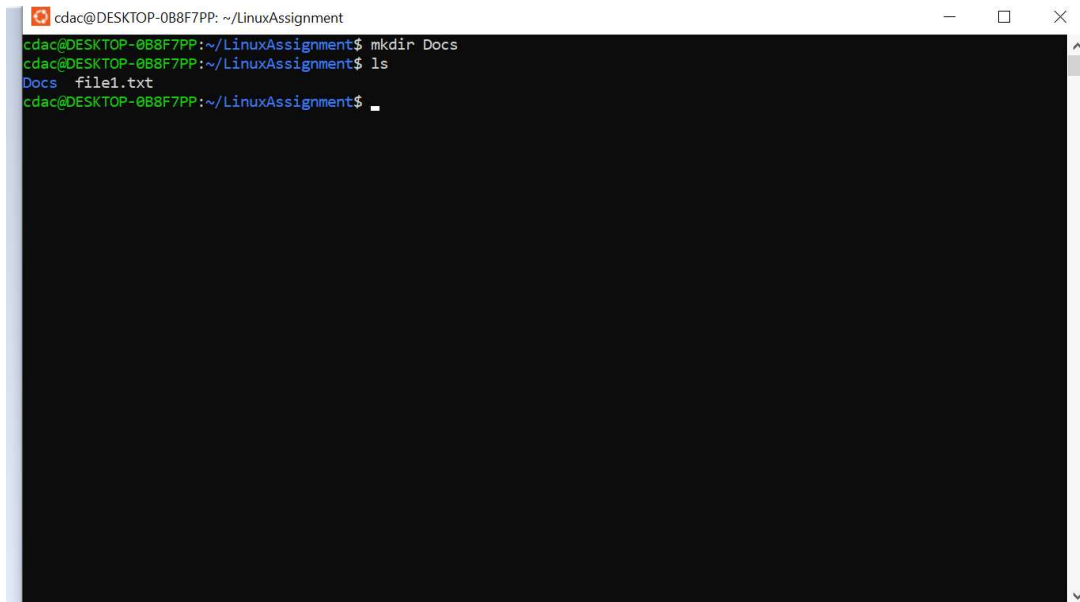
a. Create a new directory named "docs" inside the "LinuxAssignment" directory

first we can check present working directory by using pwd command  
after that if we are not in LinuxAssignment directory then we can directly write  
cd LinuxAssignment command to move that directory.

create the directory by using following command:

## mkdir Docs

Output:

A terminal window with a black background and green text. The window title is 'cdac@DESKTOP-0B8F7PP: ~/LinuxAssignment'. The commands and their outputs are: 'mkdir Docs' followed by a new line, 'ls' followed by 'Docs file1.txt', and a final prompt line.

```
cdac@DESKTOP-0B8F7PP: ~/LinuxAssignment
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ mkdir Docs
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ ls
Docs  file1.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$
```

d) Copy and Move Files:

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

Ans:

**cp file1.txt Docs/file2.txt**

Output:

```
cdac@DESKTOP-0B8F7PP: ~/LinuxAssignment/Docs
cdac@DESKTOP-0B8F7PP:~$ cd LinuxAssignment
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ cp file1.txt Docs/file2.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ ls
Docs  file1.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ cd Docs
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ ls
file2.txt
cdac@DESKTOP-0B8F7PP:~/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.

Ans:

for changing the permission of file we need to use the chmod command.

chmod command is used to change the file or directory access **permissions**.

standard permissions is 755

read - 4

write - 2

execute - 1

this are the permissins of files.

777 means all the permissions to that file

according to question we need all permisssions to user and only read permissin to others.

**chmod 704 file2.txt**

OR

chmod u=rwx,o=r file2.txt

to change the user of file we can use chown command

**chown \$(whoami) file2.txt**

output:

```
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ chmod 704 file2.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ ls -l
total 4
-rwx---r-- 1 cdac cdac 39 Feb 27 09:02 file2.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ chmod u=rwx,o=r file2.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ ls -l
total 4
-rwx---r-- 1 cdac cdac 39 Feb 27 09:02 file2.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ chown $(whoami) file2.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ ls
file2.txt
cdac@DESKTOP-0B8F7PP:~/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.

Ans:

```
cdac@DESKTOP-0B8F7PP: ~  
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ ls -l  
total 4  
-rw-r--r-- 1 cdac cdac 39 Feb 27 09:02 file2.txt  
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ cd ..  
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ ls -l  
total 8  
drwxr-xr-x 2 cdac cdac 4096 Feb 27 08:59 Docs  
-rw-r--r-- 1 cdac cdac 39 Feb 27 08:43 file1.txt  
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ cd ~  
cdac@DESKTOP-0B8F7PP:~$ ls -l  
total 20  
-rw-r--r-- 1 cdac cdac 223 Feb 26 19:59 All.zip  
drwxr-xr-x 3 cdac cdac 4096 Feb 27 08:54 LinuxAssignment  
-rw-r--r-- 1 cdac cdac 60 Feb 26 19:39 abc.txt  
-rw-r--r-- 1 cdac cdac 142 Feb 26 20:20 data.txt  
drwxr-xr-x 2 cdac cdac 4096 Feb 26 09:54 pooja  
cdac@DESKTOP-0B8F7PP:~$
```

g) File Searching:

- a. Search for all files with the extension ".txt" in the current directory and its subdirectories.
- b. Display lines containing a specific word in a file (provide a file name and the specific word to search)

Ans:

a. for searching files extensionwise we can use **ls -X**  
for **ls -R**

is used to display content of subdirectory recursively.

b.

to print specific word in file we can use grep command

**grep "is"(any word you want to search) abc.txt**

Output:

```
cdac@DESKTOP-0B8F7PP: ~  
cdac@DESKTOP-0B8F7PP:~$ ls -X  
LinuxAssignment pooja abc.txt data.txt All.zip  
cdac@DESKTOP-0B8F7PP:~$ ls -R  
.:  
All.zip LinuxAssignment abc.txt data.txt pooja  
  
./LinuxAssignment:  
Docs file1.txt  
  
./LinuxAssignment/Docs:  
file2.txt  
  
./pooja:  
cdac@DESKTOP-0B8F7PP:~$ nano xyz.txt  
cdac@DESKTOP-0B8F7PP:~$ grep "is"xyz.txt  
^Z  
[1]+  Stopped                  grep --color=auto "is"xyz.txt  
cdac@DESKTOP-0B8F7PP:~$ cat xyz.txt  
hello  
linux is free of cost  
linux is easy and simple  
  
cdac@DESKTOP-0B8F7PP:~$ grep "is" xyz.txt  
linux is free of cost  
linux is easy and simple  
cdac@DESKTOP-0B8F7PP:~$
```

h) System Information:

a. Display the current system date and time.

Ans

we can use **date** command

Output:

```
cdac@DESKTOP-0B8F7PP: ~  
cdac@DESKTOP-0B8F7PP:~$ date  
Thu Feb 27 09:39:02 UTC 2025  
cdac@DESKTOP-0B8F7PP:~$ date "+%H-%M-%S"  
09-39-07  
cdac@DESKTOP-0B8F7PP:~$ date "+%d-%m-%Y"  
27-02-2025  
cdac@DESKTOP-0B8F7PP:~$
```

i) Networking:

- a. Display the IP address of the system.
- b. Ping a remote server to check connectivity (provide a remote server address to ping).

Ans:

a.

To display Ip address of system we can use **hostname -i** command

b.

**ping** command is used to check remote server is running or not

Output:



```
cdac@DESKTOP-0B8F7PP: ~  
cdac@DESKTOP-0B8F7PP:~$ hostname -i  
127.0.1.1  
cdac@DESKTOP-0B8F7PP:~$ ping -c 4 127.0.1.1  
PING 127.0.1.1 (127.0.1.1) 56(84) bytes of data.  
64 bytes from 127.0.1.1: icmp_seq=1 ttl=64 time=0.058 ms  
64 bytes from 127.0.1.1: icmp_seq=2 ttl=64 time=0.073 ms  
64 bytes from 127.0.1.1: icmp_seq=3 ttl=64 time=0.087 ms  
64 bytes from 127.0.1.1: icmp_seq=4 ttl=64 time=0.077 ms  
  
--- 127.0.1.1 ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3082ms  
rtt min/avg/max/mdev = 0.058/0.073/0.087/0.010 ms  
cdac@DESKTOP-0B8F7PP:~$
```

j) File Compression:

- a. Compress the "docs" directory into a zip file.
- b. Extract the contents of the zip file into a new directory.

Ans:

for compressing file we can use **zip** command.

for extract the content of zip file we can use **unzip** command.

Output:

```
cdac@DESKTOP-0B8F7PP: ~/LinuxAssignment
cdac@DESKTOP-0B8F7PP:~$ ls
All.zip  LinuxAssignment  abc.txt  data.txt  pooja  xyz.txt
cdac@DESKTOP-0B8F7PP:~$ cd LinuxAssignment
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ ls
Docs  file1.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ zip -r Docs.zip Docs
  adding: Docs/ (stored 0%)
  adding: Docs/file1.txt (deflated 26%)
  adding: Docs/file2.txt (stored 0%)
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ ls
Docs  Docs.zip  file1.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ unzip Docs.zip -d Docs
Archive: Docs.zip
  creating: Docs/Docs/
  inflating: Docs/Docs/file1.txt
  extracting: Docs/Docs/file2.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ ls
Docs  Docs.zip  file1.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ unzip Docs.zip -d Docs1
Archive: Docs.zip
  creating: Docs1/Docs/
  inflating: Docs1/Docs/file1.txt
  extracting: Docs1/Docs/file2.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ ls
Docs  Docs.zip  Docs1  file1.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$
```

k) File Editing:

- a. Open the "file1.txt" file in a text editor and add some text to it.
- b. Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with).

Output:

```
cdac@DESKTOP-0B8F7PP: ~/LinuxAssignment/Docs
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment$ cd Docs
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ ls
file2.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ nano file1.txt
cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ cat file1.txt
hii
hello
welcome
linux is free
linux is open source
linux is simple

cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$ sed 's/simple/easy/' file1.txt
hii
hello
welcome
linux is free
linux is open source
linux is easy

cdac@DESKTOP-0B8F7PP:~/LinuxAssignment/Docs$
```

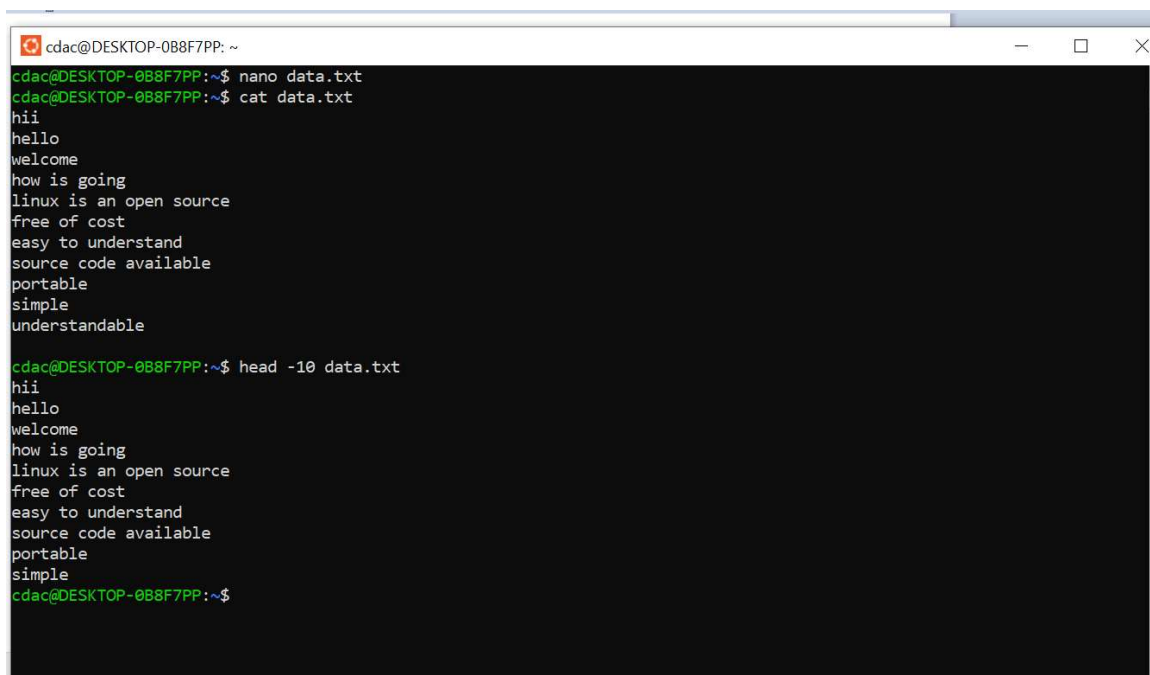
## Problem 2:

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.

Ans:

by using **head** command we can print first 10 lines.

Output:



```
cdac@DESKTOP-0B8F7PP: ~  
cdac@DESKTOP-0B8F7PP:~$ nano data.txt  
cdac@DESKTOP-0B8F7PP:~$ cat data.txt  
hii  
hello  
welcome  
how is going  
linux is an open source  
free of cost  
easy to understand  
source code available  
portable  
simple  
understandable  
  
cdac@DESKTOP-0B8F7PP:~$ head -10 data.txt  
hii  
hello  
welcome  
how is going  
linux is an open source  
free of cost  
easy to understand  
source code available  
portable  
simple  
cdac@DESKTOP-0B8F7PP:~$
```

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

by using **tail** command we can print last n lines.(here we can print last 5 lines)

Output:

```
cdac@DESKTOP-0B8F7PP: ~  
hii  
hello  
welcome  
how is going  
linux is an open source  
free of cost  
easy to understand  
source code available  
portable  
simple  
understandable  
  
cdac@DESKTOP-0B8F7PP:~$ head -10 data.txt  
hii  
hello  
welcome  
how is going  
linux is an open source  
free of cost  
easy to understand  
source code available  
portable  
simple  
  
cdac@DESKTOP-0B8F7PP:~$ tail -5 data.txt  
source code available  
portable  
simple  
understandable  
  
cdac@DESKTOP-0B8F7PP:~$
```

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.

Output:

```
cdac@DESKTOP-0B8F7PP:~$ head -15 Number.txt  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
cdac@DESKTOP-0B8F7PP:~$
```

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

Output:

```
cdac@DESKTOP-0B8F7PP:~$ head -15 Number.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-0B8F7PP:~$ tail -3 Number.txt
18
19
29
cdac@DESKTOP-0B8F7PP:~$
```

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."

Output:

```

Linux is open source
free of Cost
cdac@DESKTOP-0B8F7PP:~$ sed 's/[A-Z] / \U & g/' image.txt
hii
hello
HELlo
BY
Linux is open source
free of Cost
cdac@DESKTOP-0B8F7PP:~$ cat image.txt | tr 'a-z' 'A-Z' > output.txt
cdac@DESKTOP-0B8F7PP:~$ cat output.txt
HII
HELLO
HELLO
BY
LINUX IS OPEN SOURCE
FREE OF COST
cdac@DESKTOP-0B8F7PP:~$ cat image.txt | tr 'a-z' > output.txt
tr: missing operand after 'a-z'
Two strings must be given when translating.
Try 'tr --help' for more information.
cdac@DESKTOP-0B8F7PP:~$ cat image.txt | tr 'A-Z' 'a-z' > output.txt
cdac@DESKTOP-0B8F7PP:~$ cat output.txt
hii
hello
hello
by
linux is open source
free of cost
cdac@DESKTOP-0B8F7PP:~$

```

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."

Output:

```

linux is an oprating system

cdac@DESKTOP-0B8F7PP:~$ uniq -c duplicate.txt
  1 hello
  2 linux is an oprating system
  1
cdac@DESKTOP-0B8F7PP:~$ uniq -d duplicate.txt
linux is an oprating system
cdac@DESKTOP-0B8F7PP:~$ uniq -u duplicate.txt
hello

cdac@DESKTOP-0B8F7PP:~$ nano duplicate.txt
cdac@DESKTOP-0B8F7PP:~$ uniq -u duplicate.txt
hello
free
open source
easy
cdac@DESKTOP-0B8F7PP:~$

```

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."

Output:

```
cdac@DESKTOP-0B8F7PP: ~  
cdac@DESKTOP-0B8F7PP:~$ cat fruit.txt  
apple  
banana  
strawberry  
watermelon  
grapes  
apple  
pineapple  
orange  
banana  
grapes  
cdac@DESKTOP-0B8F7PP:~$ sort fruit.txt | uniq -c  
  2 apple  
  2 banana  
  2 grapes  
  1 orange  
  1 pineapple  
  1 strawberry  
  1 watermelon  
cdac@DESKTOP-0B8F7PP:~$
```