

# Operating System

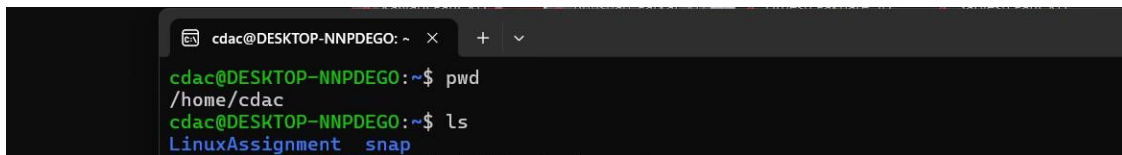
## Assignment 1

**Problem 1: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.**

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

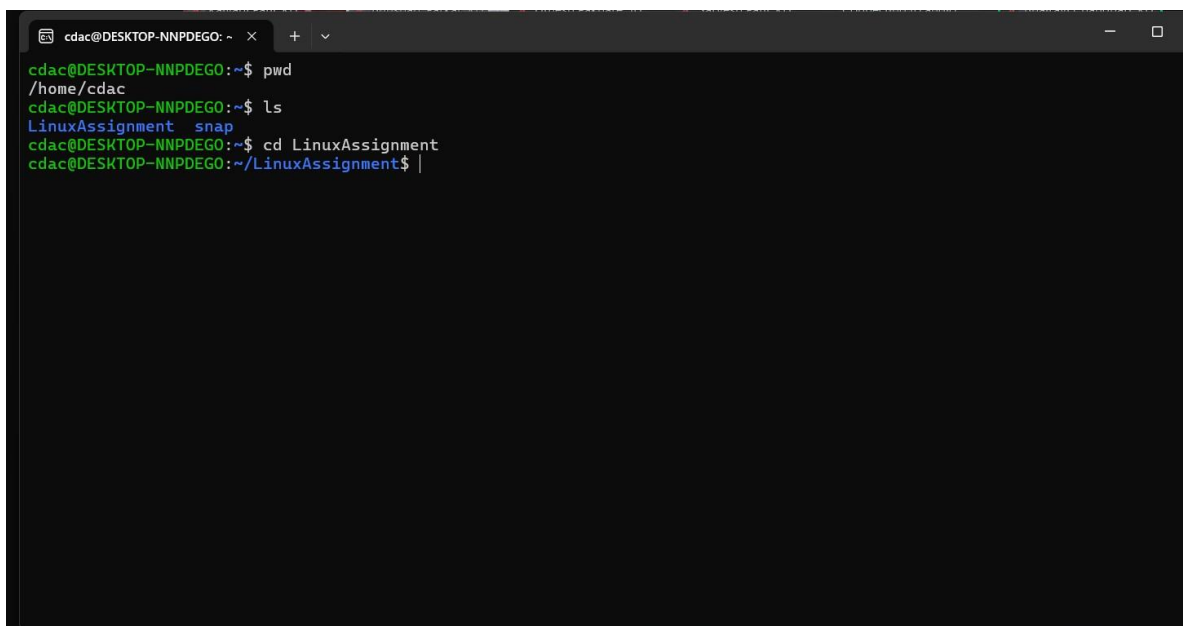
Ans: 1. Open Ubuntu and get started with password and going to cdac as a user.

2. Used pwd command to show the present directory.

A terminal window with a dark background. The title bar shows 'cdac@DESKTOP-NNPDEGO: ~'. The terminal text is: 

```
cdac@DESKTOP-NNPDEGO:~$ pwd
/home/cdac
cdac@DESKTOP-NNPDEGO:~$ ls
LinuxAssignment  snap
```

3. Use ls command to go into directory.
4. Since I have directory named “LinuxAssignment” I will not make new directory.
5. After that cd command to go into directory named “LinuxAssignment”.

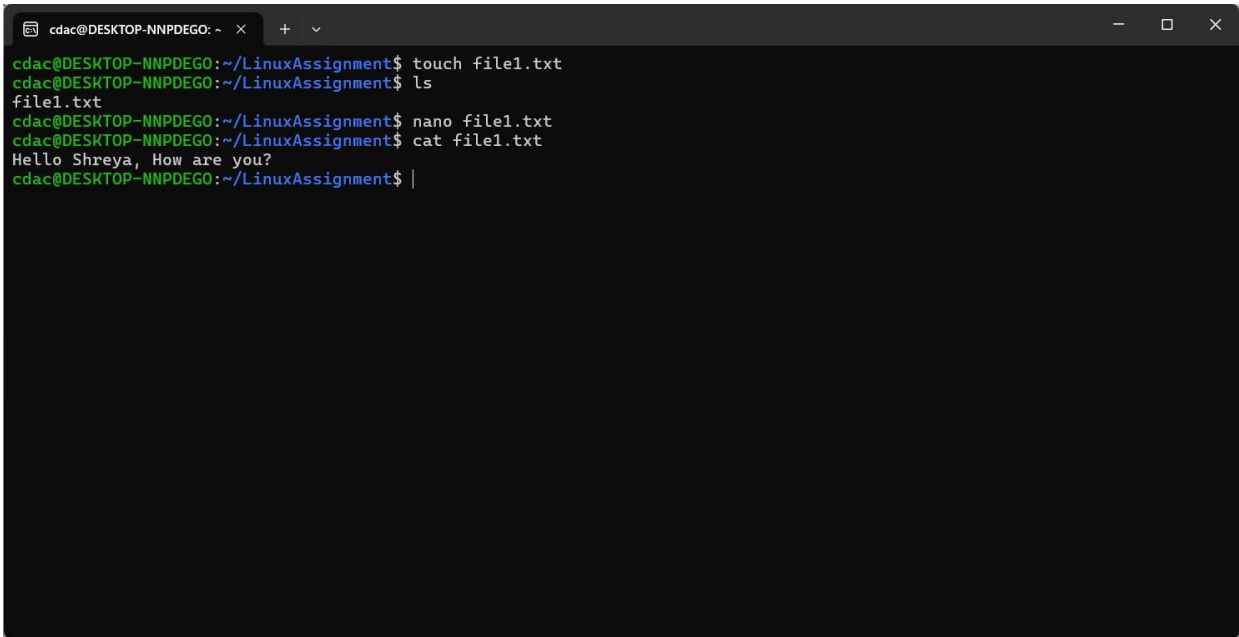
A terminal window with a dark background. The title bar shows 'cdac@DESKTOP-NNPDEGO: ~'. The terminal text is: 

```
cdac@DESKTOP-NNPDEGO:~$ pwd
/home/cdac
cdac@DESKTOP-NNPDEGO:~$ ls
LinuxAssignment  snap
cdac@DESKTOP-NNPDEGO:~$ cd LinuxAssignment
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ |
```

**b. File Management: Inside the "LinuxAssignment" directory, create a new file named "file1.txt". Display its contents.**

Ans:

1. To create a file we have many methods I am using 'touch' command which is used to create a file named 'file1.txt' Another method can be to use 'nano' to create and write the contents in that file.
2. To show the contents of file use 'cat' command.

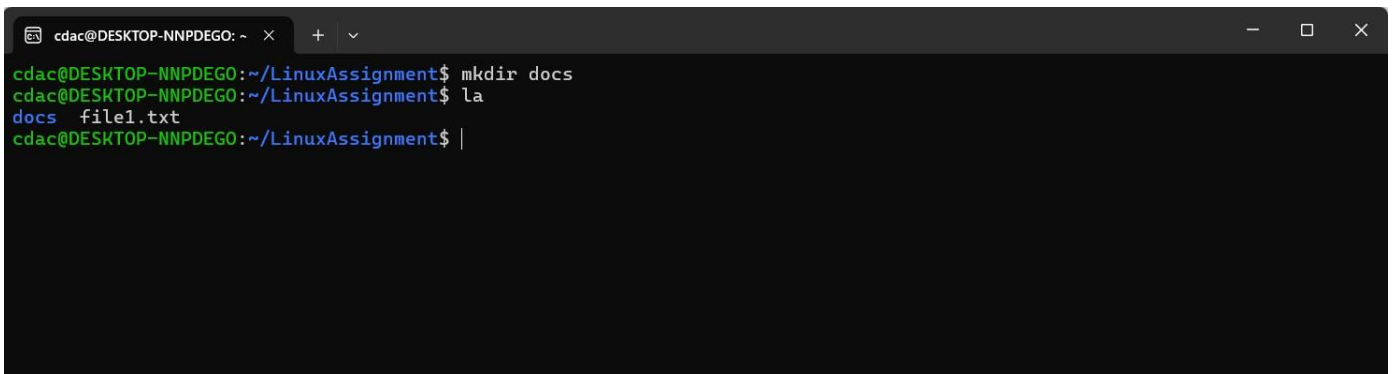
A terminal window with a dark background and light green text. The window title is 'cdac@DESKTOP-NNPDEGO: ~'. The commands and output are as follows:

```
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ ls
file1.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ cat file1.txt
Hello Shreya, How are you?
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ |
```

**c. Directory Management: Create a new directory named "docs" inside the "LinuxAssignment" directory.**

Ans:

1. Used 'mkdir' command to make a new directory inside "LinuxAssignment" directory.

A terminal window with a dark background and light green text. The window title is 'cdac@DESKTOP-NNPDEGO: ~'. The commands and output are as follows:

```
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ la
docs  file1.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ |
```

**d. Copy and Move Files:** a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt". Ans:

1. To copy the file contents use 'cp' command to copy the content of file1 to file2.
2. To rename the file use 'mv<oldname><newname>' command.

```
cdac@DESKTOP-NNPDEGO: ~  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ cp -r file1.txt. file2.txt  
cp: cannot stat 'file1.txt.': No such file or directory  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ cp file1.txt docs  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ cd docs  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ ls  
file1.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ rename file1.txt file2.txt  
Command 'rename' not found, but can be installed with:  
sudo apt install rename  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ mv file1.txt file2.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ ls  
file2.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ cat file2.txt  
Hello Shreya, How are you?  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$
```

**e. Permissions and Ownership:** 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:

1. Use chmod command to change the permissions for the file.
2. Since I can not visit my root folder I am unable to change the ownership.

```
cdac@DESKTOP-NNPDEGO: ~  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ ls -l  
total 4  
-rwxr--r-- 1 cdac cdac 27 Aug 30 15:38 file2.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ chmod g-r o+r file2.txt  
chmod: cannot access 'o+r': No such file or directory  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ chmod g-r file2.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ chmod a+r file2.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ ls -l  
total 4  
-rwxr--r-- 1 cdac cdac 27 Aug 30 15:38 file2.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ chmod g-r file2.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ ls -l  
total 4  
-rwx---r-- 1 cdac cdac 27 Aug 30 15:38 file2.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$
```

f. **Final Checklist:** Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly.

Ans:

```
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment/docs$ cd
cdac@DESKTOP-NNPDEGO:~$ ls -l
total 8
drwxr-xr-x 3 cdac cdac 4096 Aug 30 15:29 LinuxAssignment
drwx----- 3 cdac cdac 4096 Aug 29 22:02 snap
cdac@DESKTOP-NNPDEGO:~$
```

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:

1. Use "find -type f -name "\*.txt" command this Is a combination of various commands in this 'find' command is used to search. "-type f" command is the type of file and '- name "\*.txt"' is to search for a file with extension txt.

```
cdac@DESKTOP-NNPDEGO: ~$ find -type f -name "*.txt"
./LinuxAssignment/file1.txt
./LinuxAssignment/docs/file2.txt
cdac@DESKTOP-NNPDEGO:~$ grep "a" file2.txt
```

h. **System Information:** a. Display the current system date and time. Ans: 1. Use 'date' to view the current date and time.

```
cdac@DESKTOP-NNPDEGO: ~$ date
Fri Aug 30 16:07:42 IST 2024
```

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:

1. Use 'hostname -I' command to get the Ip address of the system.

```
cdac@DESKTOP-NNPDEGO:~$ hostname -I
cdac@DESKTOP-NNPDEGO:~$ ping "www.google.com"
```

2. Use 'ping' command to ping a remote server.

```
cdac@DESKTOP-NNPDEGO:~$ ping "www.google.com"
PING www.google.com (142.250.183.132) 56(84) bytes of data:
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=1 ttl=118 time=4.99 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=2 ttl=118 time=7.10 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=3 ttl=118 time=7.70 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=4 ttl=118 time=7.07 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=5 ttl=118 time=6.64 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=6 ttl=118 time=7.30 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=7 ttl=118 time=7.88 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=8 ttl=118 time=7.51 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=9 ttl=118 time=7.36 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=10 ttl=118 time=8.54 ms
64 bytes from bom07s31-in-f4.1e100.net (142.250.183.132): icmp_seq=11 ttl=118 time=5.44 ms
^C
--- www.google.com ping statistics ---
11 packets transmitted, 11 received, 0% packet loss, time 10018ms
rtt min/avg/max/mdev = 4.989/7.054/8.538/0.987 ms
cdac@DESKTOP-NNPDEGO:~$
```

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: 1. To zip a directory use 'zip -r '.

```
cdac@DESKTOP-NNPDEGO: ~ |
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ zip -r docs . -i filedocs
Command 'zip' not found, but can be installed with:
sudo apt install zip
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ zip -r docs. -i filedocs
Command 'zip' not found, but can be installed with:
sudo apt install zip
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ zip -r file2.txt -i filedocs
Command 'zip' not found, but can be installed with:
sudo apt install zip
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ zip -r docs -i filedocs
Command 'zip' not found, but can be installed with:
sudo apt install zip
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-NNPDEGO:~/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).

Ans:

1. Used 'sed' which is Stream Editor(SED).
2. The syntax is "sed -i 's/old-text/new-text/g'".
3. The -i tells to update the file. The / is the default delimiter, but it can be any character other than a backslash (\) or newline (\n) can be used instead of a slash (/) to delimit the regex and the replacement.

```
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ sed -i 's/shreya/shreyaa/g' file1.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ sed -i 's/nice/glad/g' file1.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ cat file1.txt
Hello
Shreya,
glad
to
meet
you

cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$
```

**Problem 2: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.**

- 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:

1. Use 'head' command to display first 10 lines of any file. The default is 10 lines but can be modified to user requirements by 'head -'

```
cdac@DESKTOP-NNPDEGO: ~  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ nano data.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ head data.txt  
This  
is  
a  
practice  
question  
of  
assignment  
number  
1  
of  
cdac@DESKTOP-NNPDEGO:~/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.

Ans:

- Use 'tail' command to display last 10 lines of any file. The default is 10 lines but can be modified to user requirements by 'tail -'

```
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ tail -5 data.txt  
assignment  
number  
1  
of  
os  
cdac@DESKTOP-NNPDEGO:~/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.

Ans:

'head -<number of lines> <filename.txt>' used.

```
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ nano numbers.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ head -10 numbers.txt  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ tail -2 numbers.txt
```

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

Ans:

'tail - ' used.

```
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ tail -3 numbers.txt
14
15
```

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."

Ans:

1. Use 'tr' command which is used for translating and deleting characters.
2. 'a-z A-Z < ./input.txt' is to show that file is to be converted from lower case to upper case of file input.txt.
3. '>>' is used to store that files output into output.txt.

```
cdac@DESKTOP-NNPDEGO: ~/LinuxAssignment$ tr a-z A-Z < ./input.txt >> output.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ ls
data.txt  docs  file1.txt  input.txt  numbers.txt  output.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ cat output.txt
Hello Shreya
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ |
```

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."

Ans:

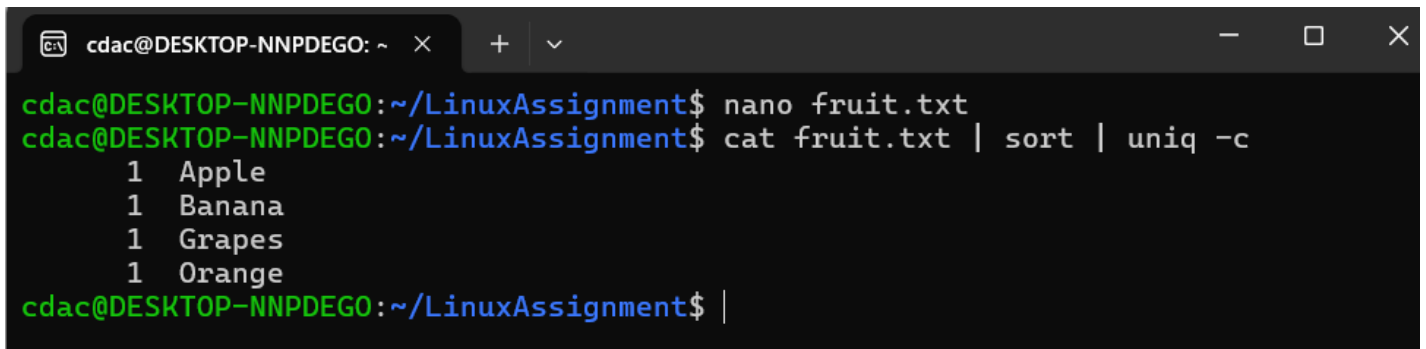
1. '|' pipe command is used to join commands.
2. 'sort' is used to sort the file.
3. 'uniq' is used to find unique in the file.

```
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ nano duplicate.txt
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ cat duplicate.txt | sort | uniq
Apple
Banana
Grapes
Guava
Orange
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ |
```

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."

Ans:

1. 'unqi -c ' is used to count the unique in the file.



```
cdac@DESKTOP-NNPDEGO: ~ × + ▾  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ nano fruit.txt  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ cat fruit.txt | sort | uniq -c  
1 Apple  
1 Banana  
1 Grapes  
1 Orange  
cdac@DESKTOP-NNPDEGO:~/LinuxAssignment$ |
```