

CDAC MUMBAI

Concepts of Operating System

Assignment 1

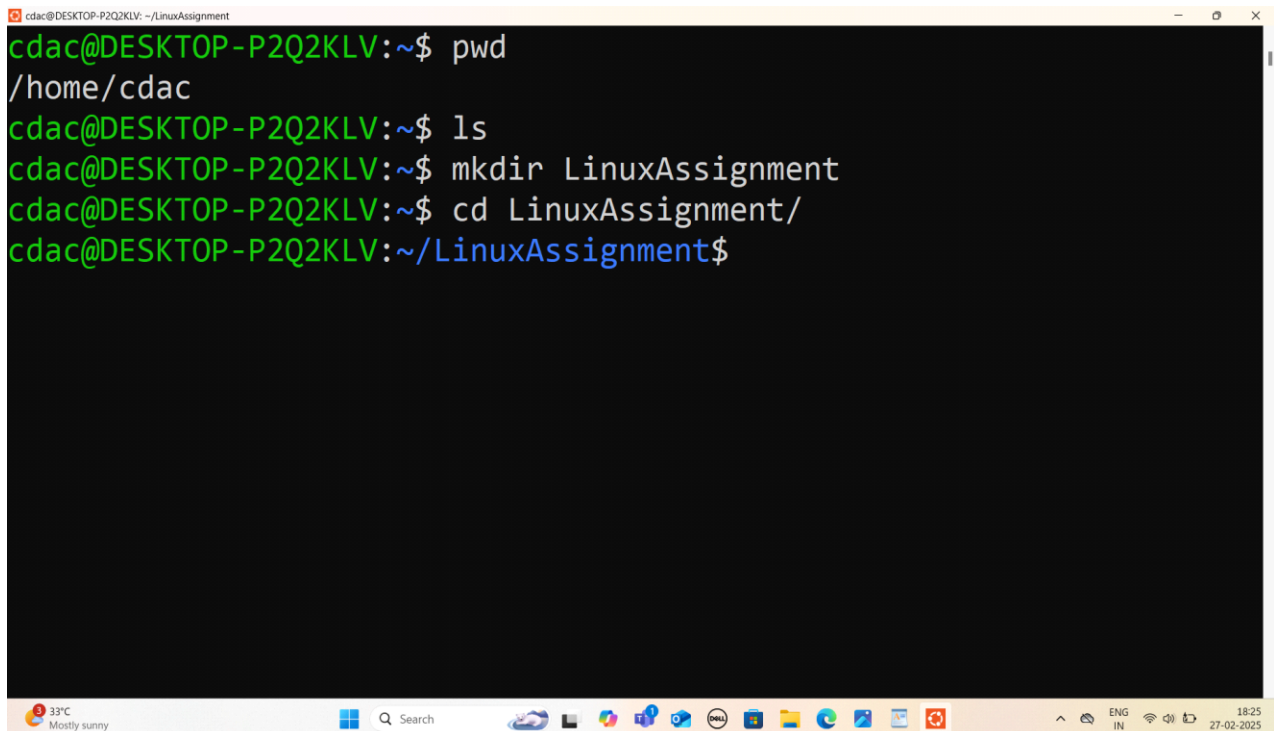
Problem 1: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

- **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 :

```
cdac@DESKTOP-P2Q2KLV:~$ pwd
/home/cdac
cdac@DESKTOP-P2Q2KLV:~$ ls
cdac@DESKTOP-P2Q2KLV:~$ mkdir LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~$ cd LinuxAssignment/
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

A screenshot of a Windows terminal window with a black background and green text. The window title bar shows 'cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment'. The terminal displays the following commands and their outputs: 'pwd' returns '/home/cdac', 'ls' shows the contents of the home directory, 'mkdir LinuxAssignment' creates the directory, and 'cd LinuxAssignment/' moves the user into that directory. The final prompt is 'cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment\$'. The Windows taskbar is visible at the bottom, showing the date and time as 18:25 on 27-02-2025.

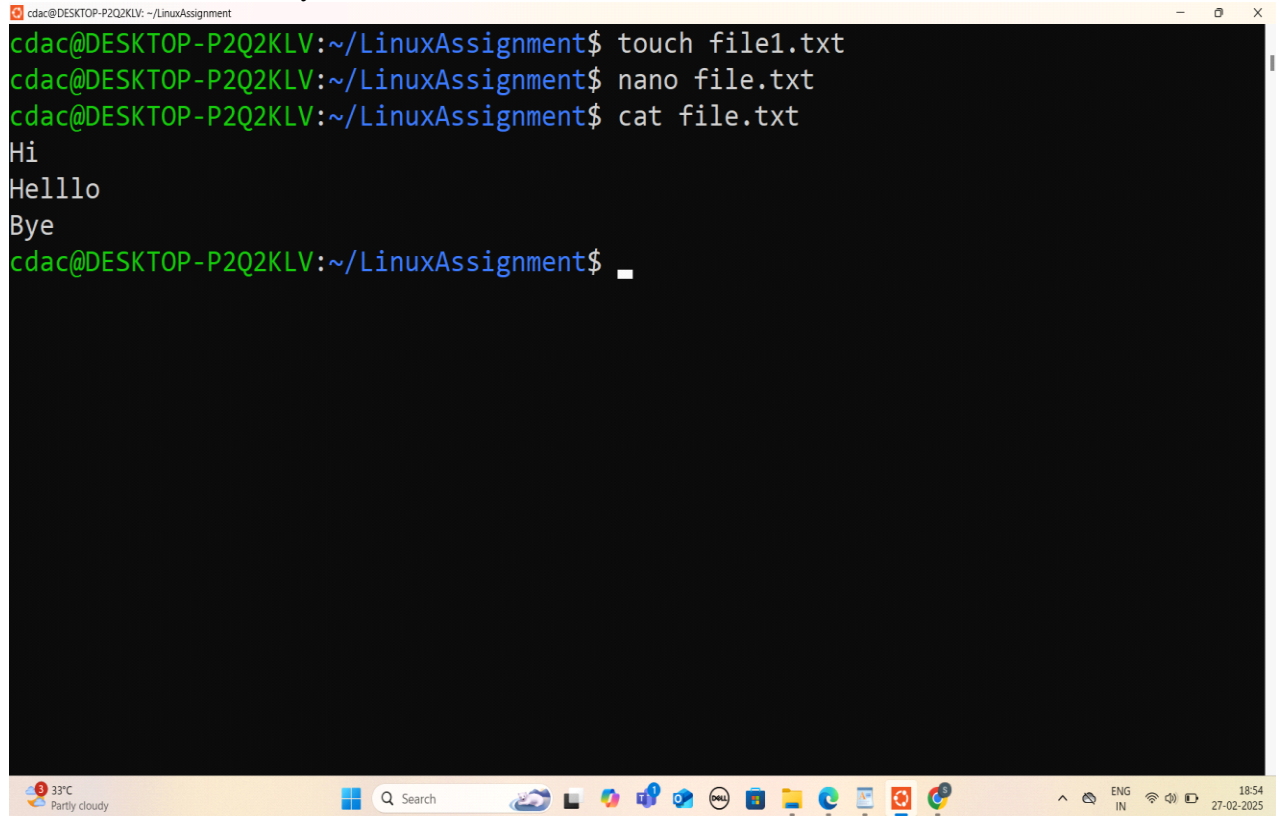
```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~$ pwd
/home/cdac
cdac@DESKTOP-P2Q2KLV:~$ ls
cdac@DESKTOP-P2Q2KLV:~$ mkdir LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~$ cd LinuxAssignment/
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

- **File Management:**

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

ANS:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ nano file.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat file.txt
Hi
Hello
Bye
```

A screenshot of a terminal window titled "cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment". The terminal shows the following commands and their output: "touch file1.txt", "nano file.txt", "cat file.txt" which outputs "Hi", "Hello", and "Bye". The prompt "cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment\$" is visible at the bottom. The terminal is overlaid on a Windows desktop environment. The taskbar at the bottom shows the Start button, a search bar, and several application icons including File Explorer, Microsoft Edge, and various utility apps. The system tray on the right shows the date and time as "18:54 27-02-2025".

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ nano file.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat file.txt
Hi
Hello
Bye
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

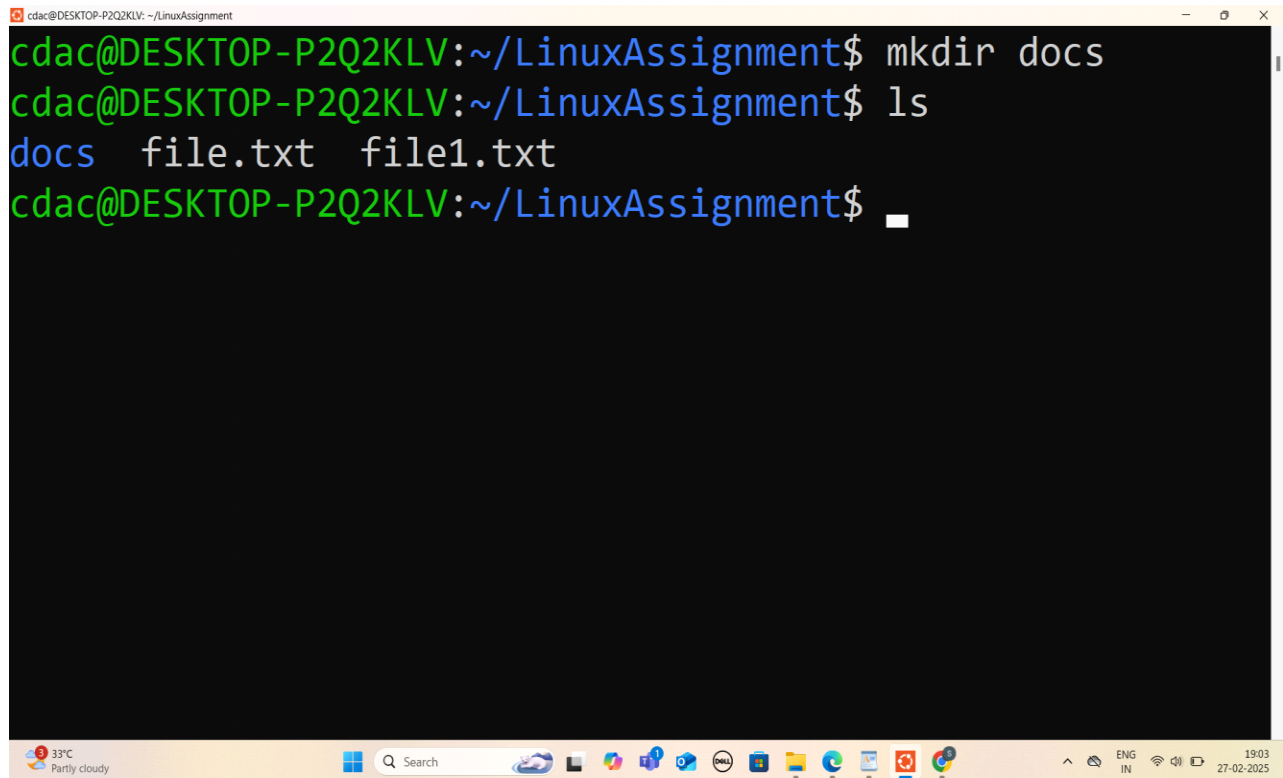
- **Directory Management:**

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

ANS:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ ls
docs  file.txt  file1.txt
```

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ ls
docs  file.txt  file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```



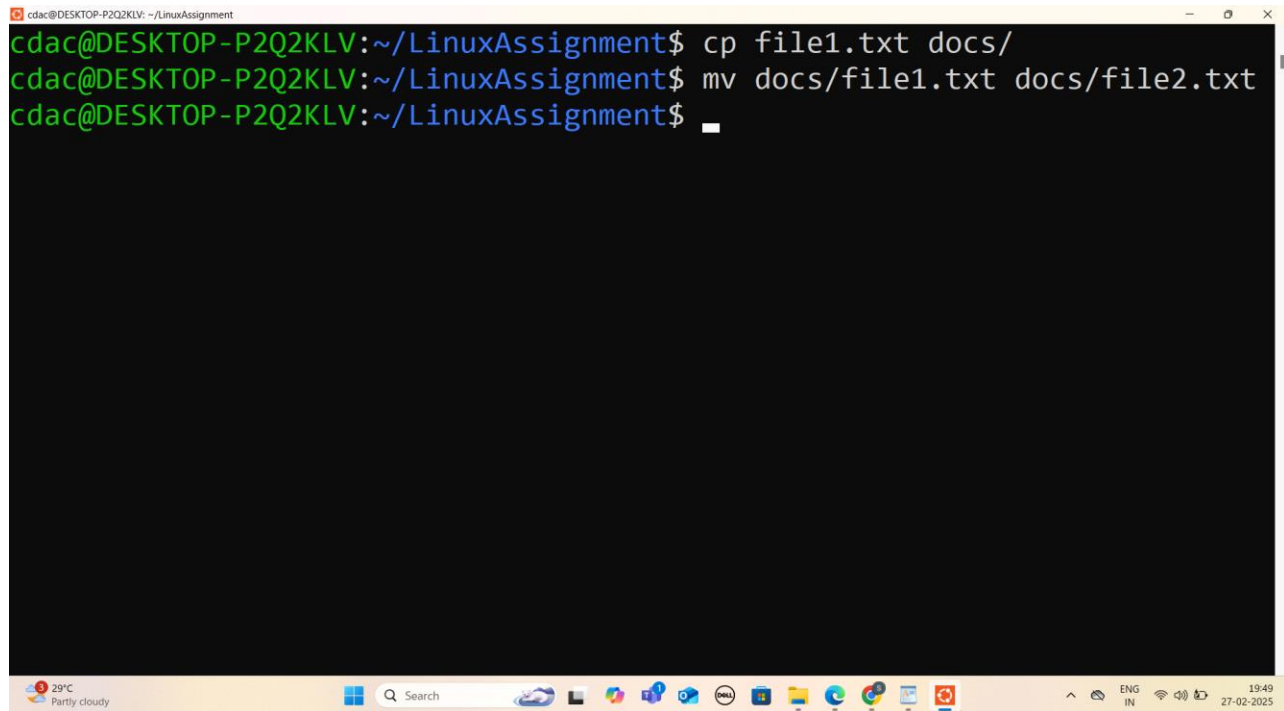
- **Copy and Move Files:**

- Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".
ANS:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cp file1.txt docs/
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ mv docs/file1.txt
```

docs/file2.txt

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cp file1.txt docs/
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ mv docs/file1.txt docs/file2.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```



- **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:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ chmod 744 docs/file2.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ sudo chown $(whoami) docs/file2.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ ls -l docs/file2.txt
-rwxr--r-- 1 cdac cdac 0 Feb 27 14:14 docs/file2.txt
```

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ chmod 744 docs/file2.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ sudo chown $(whoami) docs/file2.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ ls -l docs/file2.txt
-rwxr--r-- 1 cdac cdac 0 Feb 27 14:14 docs/file2.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

- **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-P2Q2KLV:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 14:15 docs
-rw-r--r-- 1 cdac cdac 14 Feb 27 13:24 file.txt-rw-r--r-- 1 cdac cdac 0
```

Feb

27 13:23 file1.txt

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ sudo ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 14:15 docs
-rw-r--r-- 1 cdac cdac 14 Feb 27 13:24 file.txt-rw-r--r-- 1 cdac cdac 0
```

Feb

27 13:23 file1.txt

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 14:15 docs
-rw-r--r-- 1 cdac cdac 14 Feb 27 13:24 file.txt-rw-r--r-- 1 cdac cdac 0 Feb 27 13
:23 file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ sudo ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 14:15 docs
-rw-r--r-- 1 cdac cdac 14 Feb 27 13:24 file.txt-rw-r--r-- 1 cdac cdac 0 Feb 27 13
:23 file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ _
```

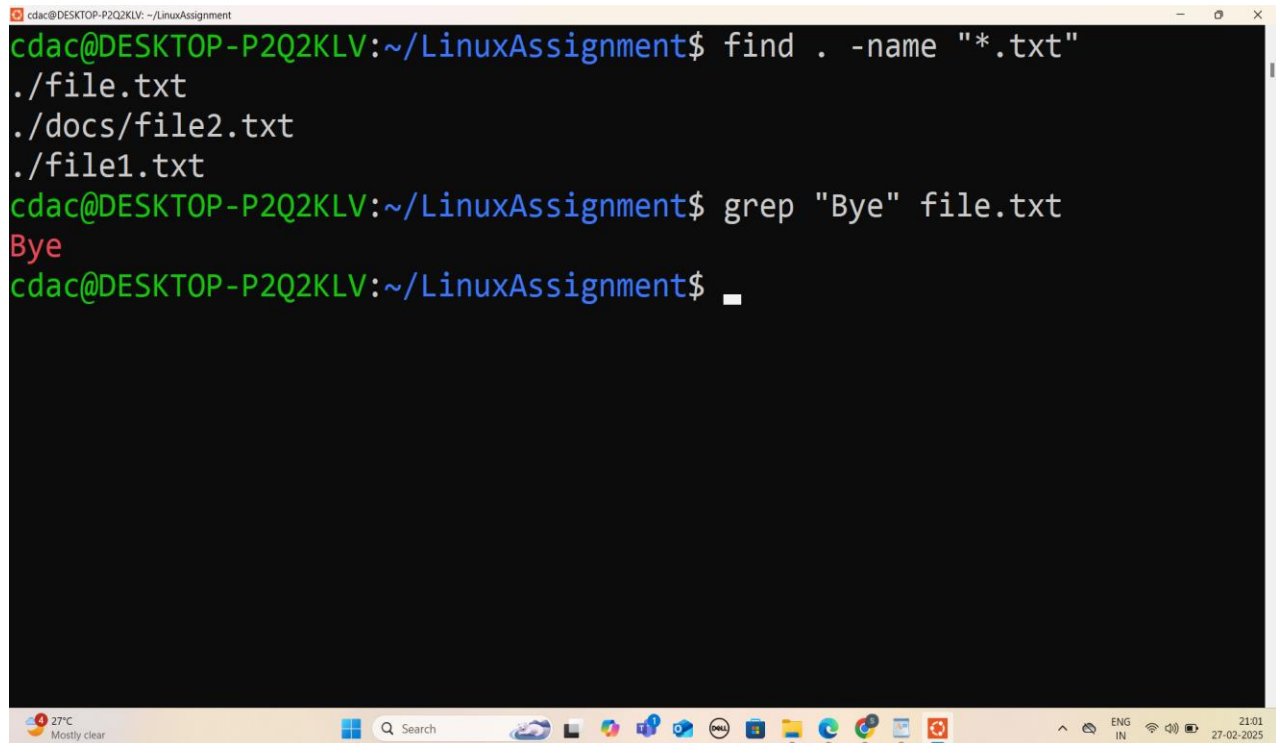
- **File Searching:**

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

ANS:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ find . -name "*.txt"
./file.txt
./docs/file2.txt
./file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ grep "Bye" file.txt
Bye
```

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment$ find . -name "*.txt"
./file.txt
./docs/file2.txt
./file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ grep "Bye" file.txt
Bye
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

A screenshot of a Windows desktop environment. At the top, a terminal window titled 'cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment' is open. It shows the execution of a 'find' command to locate all '.txt' files in the current directory and its subdirectories, resulting in three paths: './file.txt', './docs/file2.txt', and './file1.txt'. Subsequently, a 'grep' command is used to search for the string 'Bye' in 'file.txt', which returns the output 'Bye'. The terminal prompt is now ready for the next command. The desktop background is a light blue gradient. The taskbar at the bottom contains the Start button, a search bar, and several application icons including File Explorer, Microsoft Edge, and various utility apps. The system tray on the right shows the date and time as 21:01 on 27-02-2025, along with icons for network, volume, and power.

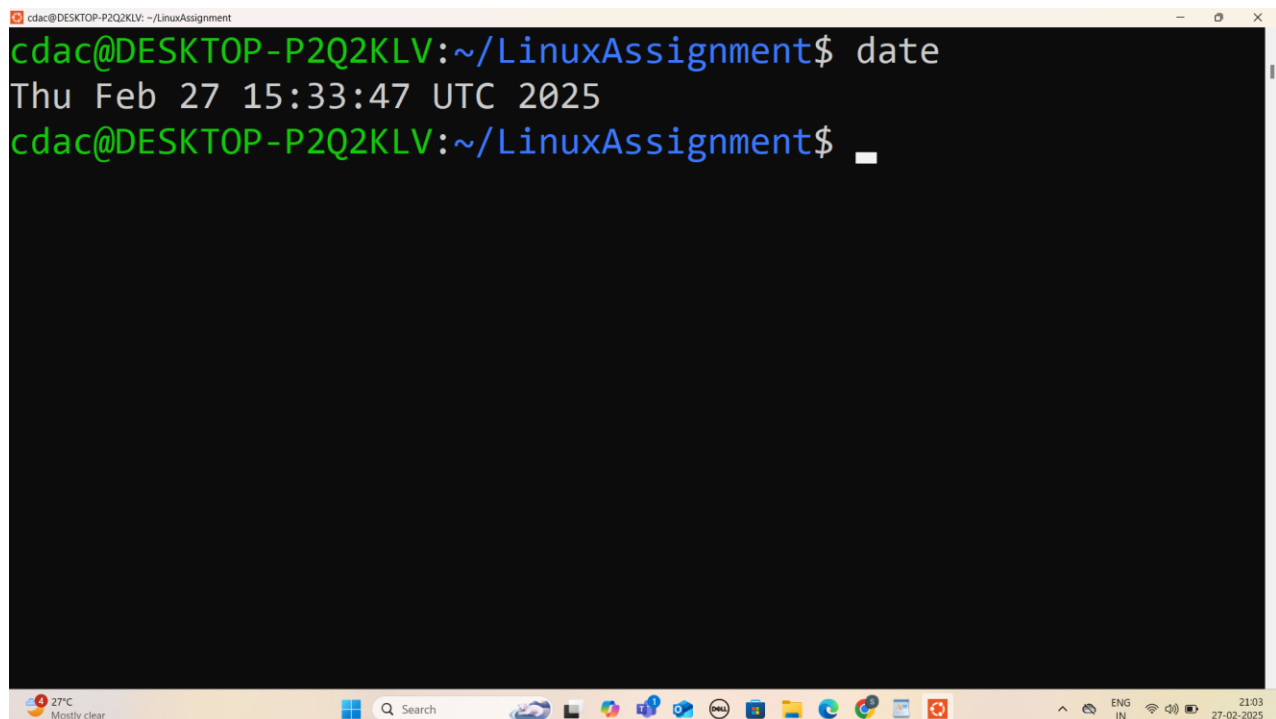
- **System Information:**

- Display the current system date and time.

ANS:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ date
Thu Feb 27 15:33:47 UTC 2025
```

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ date
Thu Feb 27 15:33:47 UTC 2025
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

A screenshot of a Windows desktop environment, similar to the one above. The terminal window shows the execution of the 'date' command, which displays the current system date and time: 'Thu Feb 27 15:33:47 UTC 2025'. The desktop background, taskbar, and system tray are consistent with the previous image, showing the same application icons and system information (21:03 on 27-02-2025).

- **Networking:**

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

ANS:

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ ip addr show
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
   inet 10.255.255.254/32 brd 10.255.255.254 scope global
lo
   valid_lft forever preferred_lft forever
   inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc m
q state UP group default qlen 1000
   link/ether 00:15:5d:2b:60:e6 brd ff:ff:ff:ff:ff:ff
   inet 172.30.83.214/20 brd 172.30.95.255 scope global et
h0
   valid_lft forever preferred_lft forever
   inet6 fe80::215:5dff:fe2b:60e6/64 scope link
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ ping google.com
PING google.com (142.250.182.206) 56(84) bytes of data.
64 bytes from bom07s28-in-f14.1e100.net (142.250.182.206):
```

- **File Compression:**

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

ANS:

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



```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ zip -r docs.zip docs/
updating: docs/ (stored 0%)
updating: docs/file2.txt (stored 0%)
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ unzip docs.zip -d extracted_docs/
Archive:  docs.zip
replace extracted_docs/docs/file2.txt? [y]es, [n]o, [A]ll, [N]one, [r]ename
: y
  extracting: extracted_docs/docs/file2.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

- **File Editing:**

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

ANS:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat file1.txt
Hello
Guys
Nice to paris train
```

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ sed -i 's/paris train/meet
you/g' file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat file1.txt
Hello
Guys
Nice to meet you
```

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat file1.txt
Hello
Guys
Nice to paris train

cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ sed -i 's/paris train/meet you/g' file1.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat file1.txt
Hello
Guys
Nice to meet you

cdac@DESKTOP-P2Q2KLV:~/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:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ nano data.txt
```

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat data.txt
```

hi

i

am

shubhada

subhash

aher

from

pune

B.E

computer

2024

passout

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ head -10 data.txt
```

hi

i

am

shubhada

subhash

aher

from

pune

B.E

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ nano data.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat data.txt
hi
i
am
shubhada
subhash
aher
from
pune
B.E
computer
2024
passout
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ head -10
data.txt
hi
i
am
shubhada
subhash
```

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

ANS: cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment\$ tail -5 data.txt

pune

B.E

computer

2024

passout

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment$ tail -5 data.txt
pune
B.E
computer
2024
passout
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

- 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:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ nano numbers.txt
```

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat numbers.txt
```

```
1
2
3
4
5
6
7
8
9
10
```

11

12

13

14

15

16

17

18

19

20

cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment\$ head -15 numbers.txt

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ nano numbers.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
```

```
Select cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

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

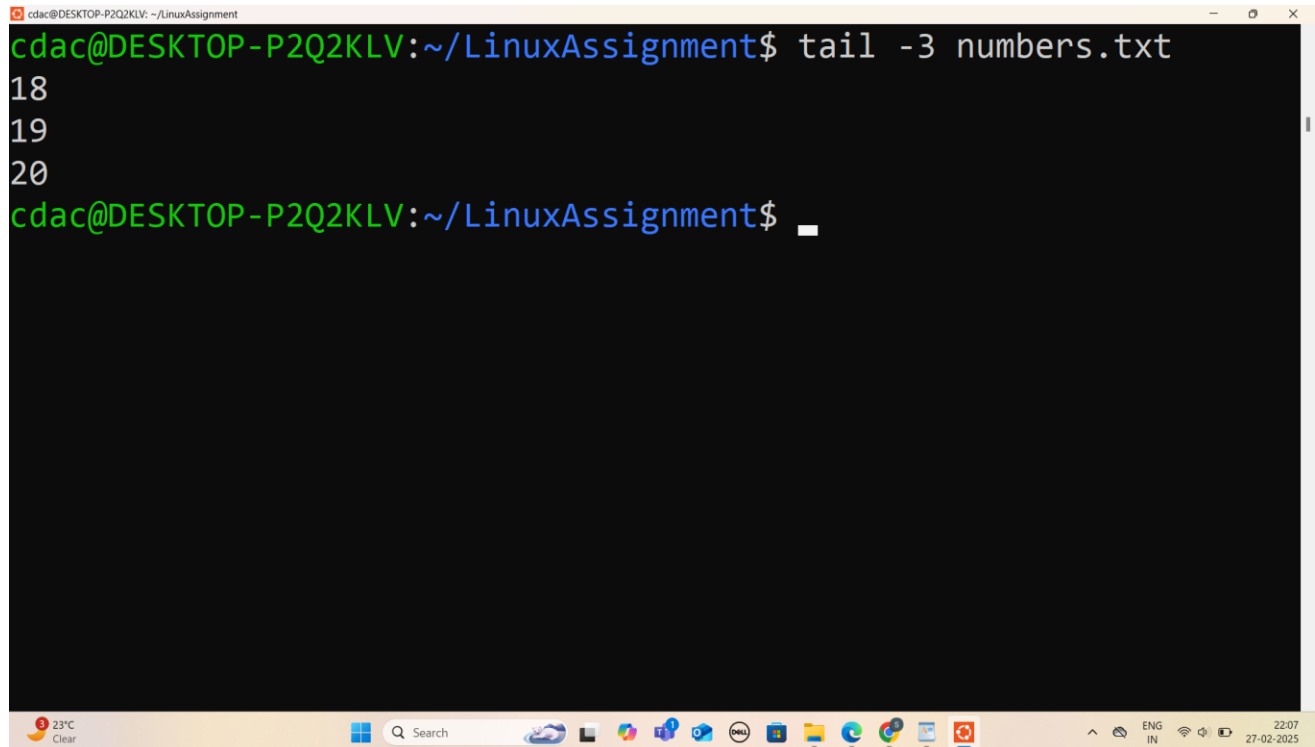
ANS:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ tail -3 numbers.txt
```

18

19

20



```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ tail -3 numbers.txt
18
19
20
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

- 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:

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat input.txt
```

Hii i am Shubhada Aher

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ touch output.txt
```

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ tr '[:lower:]' '[:upper:]' <input.txt> output.txt
```

```
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat output.txt
```

HII I AM SHUBHADA AHER


```
cdac@DESKTOP-P2Q2KLV: ~/LinuxAssignment
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ nano numbers.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat input.txt
Hii i am Shubhada Aher
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ touch output.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ tr '[:lower:]' '[:upper:]' <input.txt> output.txt
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$ cat output.txt
HII I AM SHUBHADA AHER
cdac@DESKTOP-P2Q2KLV:~/LinuxAssignment$
```

- 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:

```
cdac@DESKTOP-P2Q2KLV:~$ nano duplicates.txt
cdac@DESKTOP-P2Q2KLV:~$ cat duplicates.txt
hello
hi
hi
i am shubhada aher
i am shubhada aher
bye

cdac@DESKTOP-P2Q2KLV:~$ cat duplicates.txt | uniq
hello
hi
i am shubhada aher
bye
```

```
Select Ubuntu
cdac@DESKTOP-P2Q2KLV:~$ nano duplicates.txt
cdac@DESKTOP-P2Q2KLV:~$ cat duplicates.txt
hello
hi
hi
i am shubhada aher
i am shubhada aher
bye

cdac@DESKTOP-P2Q2KLV:~$ cat duplicates.txt | uniq
hello
hi
i am shubhada aher
bye

cdac@DESKTOP-P2Q2KLV:~$
```

- 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:

```
cdac@DESKTOP-P2Q2KLV:~$ nano fruit.txt
```

```
cdac@DESKTOP-P2Q2KLV:~$ cat fruit.txt
```

apple

mango

mango

pineapple

cherry

cherry

cherry

pear

watermelon

```
cdac@DESKTOP-P2Q2KLV:~$ cat fruit.txt | sort | uniq -c
```

1

1 apple

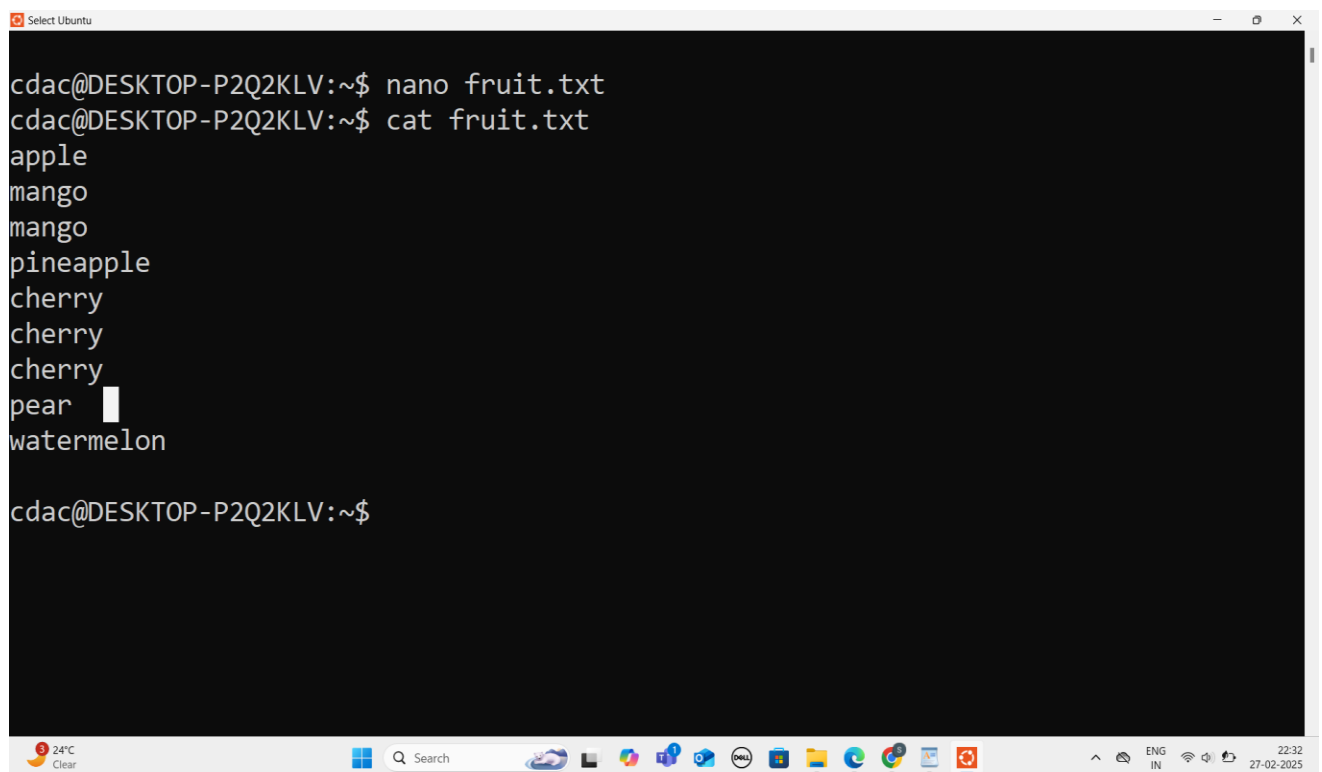
3 cherry

2 mango

1 pear

1 pineapple

1 watermelon

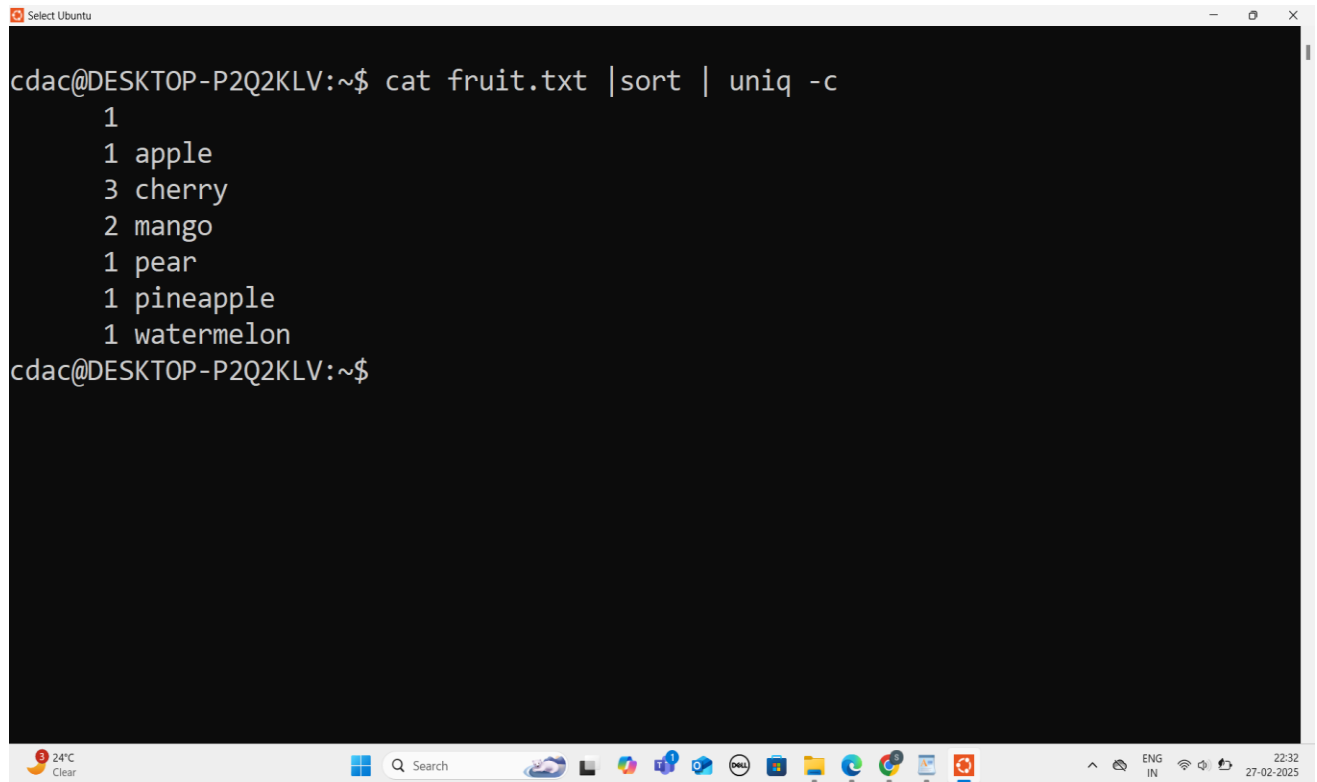
A screenshot of a terminal window titled "Select Ubuntu". The terminal shows the following commands and output:

```
cdac@DESKTOP-P2Q2KLV:~$ nano fruit.txt
cdac@DESKTOP-P2Q2KLV:~$ cat fruit.txt
apple
mango
mango
pineapple
cherry
cherry
cherry
pear
watermelon

cdac@DESKTOP-P2Q2KLV:~$
```

The terminal window is open on a Windows desktop. The taskbar at the bottom shows the Start button, a search bar, and several application icons including File Explorer, Microsoft Edge, and various utility apps. The system tray on the right shows the date and time as 22:32 on 27-02-2025, along with icons for network, volume, and language (ENG IN).

```
Select Ubuntu
cdac@DESKTOP-P2Q2KLV:~$ cat fruit.txt |sort | uniq -c
1
1 apple
3 cherry
2 mango
1 pear
1 pineapple
1 watermelon
cdac@DESKTOP-P2Q2KLV:~$
```

A screenshot of a Windows 10 desktop environment. A terminal window titled "Select Ubuntu" is open, displaying the command `cdac@DESKTOP-P2Q2KLV:~$ cat fruit.txt |sort | uniq -c` and its output: `1`, `1 apple`, `3 cherry`, `2 mango`, `1 pear`, `1 pineapple`, and `1 watermelon`. The terminal window is positioned over a dark desktop background. At the bottom of the screen, the Windows taskbar is visible, showing the Start button, a search bar, and several pinned application icons including File Explorer, Microsoft Edge, and the Ubuntu installer. The system tray on the right shows the date and time as 22:32 on 27-02-2025, along with icons for network, volume, and power.

Submission Guidelines:

- Document each step of your solution and any challenges faced.
- Upload it on your GitHub repository

Additional Tips:

- Experiment with different options and parameters of each command to explore their functionalities.