

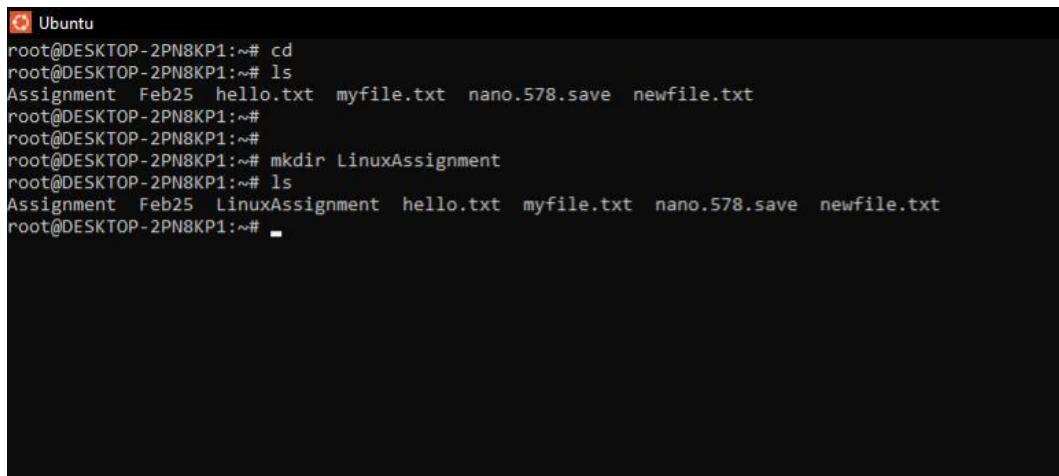
## COS Assignment 1

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**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:

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.

A terminal window titled 'Ubuntu' showing a series of commands and their outputs. The user is in the root directory of a virtual machine named 'DESKTOP-2PN8KP1'. The commands and outputs are as follows:

```
root@DESKTOP-2PN8KP1:~# cd
root@DESKTOP-2PN8KP1:~# ls
Assignment Feb25 hello.txt myfile.txt nano.578.save newfile.txt
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~# mkdir LinuxAssignment
root@DESKTOP-2PN8KP1:~# ls
Assignment Feb25 LinuxAssignment hello.txt myfile.txt nano.578.save newfile.txt
root@DESKTOP-2PN8KP1:~#
```

## b) File Management:

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

```
Ubuntu
root@DESKTOP-2PN8KP1:~# ls
Assignment Feb25 LinuxAssignment hello.txt myfile.txt nano.578.save newfile.txt
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~# touch file1.txt
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~# cat file1.txt
root@DESKTOP-2PN8KP1:~# nano file1.txt
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~# cat file1.txt
Hi
Hello
Hey
root@DESKTOP-2PN8KP1:~#
```

## c) Directory Management:

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

```
Ubuntu
root@DESKTOP-2PN8KP1:~# ls
Assignment Feb25 LinuxAssignment file1.txt hello.txt myfile.txt nano.578.save newfile.txt
root@DESKTOP-2PN8KP1:~# cd LinuxAssignment/
root@DESKTOP-2PN8KP1:~/LinuxAssignment#
root@DESKTOP-2PN8KP1:~/LinuxAssignment# mkdir docs
root@DESKTOP-2PN8KP1:~/LinuxAssignment# ls
docs
root@DESKTOP-2PN8KP1:~/LinuxAssignment#
```

d) Copy and Move Files:

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

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment# touch file11.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment#
root@DESKTOP-2PN8KP1:~/LinuxAssignment# ls
docs  file1.txt  file11.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# cp file11.txt docs/file2.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# cd docs/
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# ls -l
total 0
-rw-r--r-- 1 root root 0 Feb 28 08:58 file1.txt
-rw-r--r-- 1 root root 0 Feb 28 09:01 file2.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# ls
file1.txt  file2.txt
root@DESKTOP-2PN8KP1:~/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.

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# cd ..
root@DESKTOP-2PN8KP1:~/LinuxAssignment# chmod 744 docs/file2.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment#
root@DESKTOP-2PN8KP1:~/LinuxAssignment# chown $USER docs/file2.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment#
root@DESKTOP-2PN8KP1:~/LinuxAssignment# ls -l file2.txt
ls: cannot access 'file2.txt': No such file or directory
root@DESKTOP-2PN8KP1:~/LinuxAssignment# cd docs/
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# ls -l file2.txt
-rwxr--r-- 1 root root 0 Feb 28 09:01 file2.txt
root@DESKTOP-2PN8KP1:~/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.

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# cd ..
root@DESKTOP-2PN8KP1:~/LinuxAssignment# ls -l
total 4
drwxr-xr-x 2 root root 4096 Feb 28 08:59 docs
-rw-r--r-- 1 root root  0 Feb 28 08:56 file1.txt
-rw-r--r-- 1 root root  0 Feb 28 09:00 file11.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# ls /
bin          boot  etc   init  lib.usr-is-merged  lost+found  mnt  proc  run  sbin.usr-is-merged  srv  tmp  var
bin.usr-is-merged  dev  home  lib  lib64             media       opt  root  sbin  snap               sys  usr
root@DESKTOP-2PN8KP1:~/LinuxAssignment# cd ..
root@DESKTOP-2PN8KP1:~# ls
Assignment Feb25 LinuxAssignment file1.txt hello.txt myfile.txt nano.578.save newfile.txt
root@DESKTOP-2PN8KP1:~#
```

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).

```
Ubuntu
root@DESKTOP-2PN8KP1:~# find . -type f -name "*.txt"
./myfile.txt
./newfile.txt
./hello.txt
./LinuxAssignment/file11.txt
./LinuxAssignment/file1.txt
./LinuxAssignment/docs/file1.txt
./LinuxAssignment/docs/file2.txt
./file1.txt
root@DESKTOP-2PN8KP1:~# nano hello.txt
root@DESKTOP-2PN8KP1:~# grep hello hello.txt
hello
root@DESKTOP-2PN8KP1:~#
```

## h) System Information:

### a. Display the current system date and time

```
Ubuntu
root@DESKTOP-2PN8KP1:~# find . -type f -name "*.txt"
./myfile.txt
./newfile.txt
./hello.txt
./LinuxAssignment/file11.txt
./LinuxAssignment/file1.txt
./LinuxAssignment/docs/file1.txt
./LinuxAssignment/docs/file2.txt
./file1.txt
root@DESKTOP-2PN8KP1:~# nano hello.txt
root@DESKTOP-2PN8KP1:~# grep hello hello.txt
hello
root@DESKTOP-2PN8KP1:~# date
Fri Feb 28 10:59:47 UTC 2025
root@DESKTOP-2PN8KP1:~#
```

## 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).

```
Ubuntu
root@DESKTOP-2PN8KP1:~# ip a
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: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:7c:2c:e5 brd ff:ff:ff:ff:ff:ff
    inet 172.24.112.198/20 brd 172.24.127.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe7c:2ce5/64 scope link
        valid_lft forever preferred_lft forever
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~# ping -c 4 google.com
PING google.com (142.250.192.110) 56(84) bytes of data:
64 bytes from bom12s17-in-f14.1e100.net (142.250.192.110): icmp_seq=1 ttl=113 time=89.2 ms
64 bytes from bom12s17-in-f14.1e100.net (142.250.192.110): icmp_seq=2 ttl=113 time=71.3 ms
64 bytes from bom12s17-in-f14.1e100.net (142.250.192.110): icmp_seq=3 ttl=113 time=85.8 ms
64 bytes from bom12s17-in-f14.1e100.net (142.250.192.110): icmp_seq=4 ttl=113 time=87.4 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3244ms
rtt min/avg/max/mdev = 71.271/83.402/89.209/7.109 ms
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~#
root@DESKTOP-2PN8KP1:~#
```

j) File Compression:

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

```
Ubuntu
root@DESKTOP-2PN8KP1:~# cd LinuxAssignment/
root@DESKTOP-2PN8KP1:~/LinuxAssignment# cd docs/
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# zip -r docs.zip docs
zip warning: name not matched: docs

zip error: Nothing to do! (try: zip -r docs.zip . -i docs)
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# zip -r docs.zip . -i docs
zip warning: zip file empty
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# ls
docs.zip file1.txt file2.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# cat

^C
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# nano docs
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# zip -r docs.zip docs
adding: docs (stored 0%)
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# unzip -l docs.zip
Archive:  docs.zip
  Length      Date    Time    Name
  -----
      11  2025-02-28  11:46   docs
  -----
      11
               1 file
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs#
```

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).

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# nano file1.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# cat file1.txt
Hey
Im Mansi
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# sed -i "s/Im Mansi/Its me/g" file1.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs# cat file1.txt
Hey
Its me
root@DESKTOP-2PN8KP1:~/LinuxAssignment/docs#
```



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

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

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment# touch data.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# ls
data.txt docs file1.txt file11.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# nano data.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# head -n 10 data.txt
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:
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.
b) File Management:
a. Inside the "LinuxAssignment" directory, create a new file named "file1.txt". Display its
contents.
c) Directory Management:
a. Create a new directory named "docs" inside the "LinuxAssignment" directory.
root@DESKTOP-2PN8KP1:~/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

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment# tail -n 5 data.txt
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).
root@DESKTOP-2PN8KP1:~/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.

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment# touch numbers.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# ls
data.txt docs file1.txt file11.txt numbers.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# nano numbers.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
root@DESKTOP-2PN8KP1:~/LinuxAssignment#
```

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

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment# nano numbers.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# tail -n 3 numbers.txt
28
29
30
root@DESKTOP-2PN8KP1:~/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."

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment# touch input.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# ls
data.txt docs file1.txt file11.txt input.txt numbers.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# nano input.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# tr '[:lower:]' '[:upper:]' < input.txt > output.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# cat output.txt
CDAC MUMBAI
CONCEPTS OF OPERATING SYSTEM
root@DESKTOP-2PN8KP1:~/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."

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment# nano duplicate.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# sort duplicate.txt | uniq
CDAC MUMBAI
Hello World
Hey Its Me
unique line
root@DESKTOP-2PN8KP1:~/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."

```
Ubuntu
root@DESKTOP-2PN8KP1:~/LinuxAssignment# ls
cleaned_duplicate.txt  duplicate.txt  fruit.txt  output.txt
data.txt               file1.txt     input.txt
docs                   file11.txt    numbers.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# nano fruit.txt
root@DESKTOP-2PN8KP1:~/LinuxAssignment# sort fruit.txt | uniq
Apple
Banana
Grapes
Kiwi
Mango
Orange
Papaya
Pineapple
Strawberry
Watermelon
root@DESKTOP-2PN8KP1:~/LinuxAssignment# sort fruit.txt | uniq -c
sort: cannot read: fruit.txt: No such file or directory
root@DESKTOP-2PN8KP1:~/LinuxAssignment# sort fruit.txt | uniq -c
1
2 Apple
2 Banana
2 Grapes
1 Kiwi
2 Mango
2 Orange
1 Papaya
1 Pineapple
1 Strawberry
1 Watermelon
root@DESKTOP-2PN8KP1:~/LinuxAssignment#
```