

## CDAC MUMBAI

### Concepts of Operating System

#### 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:

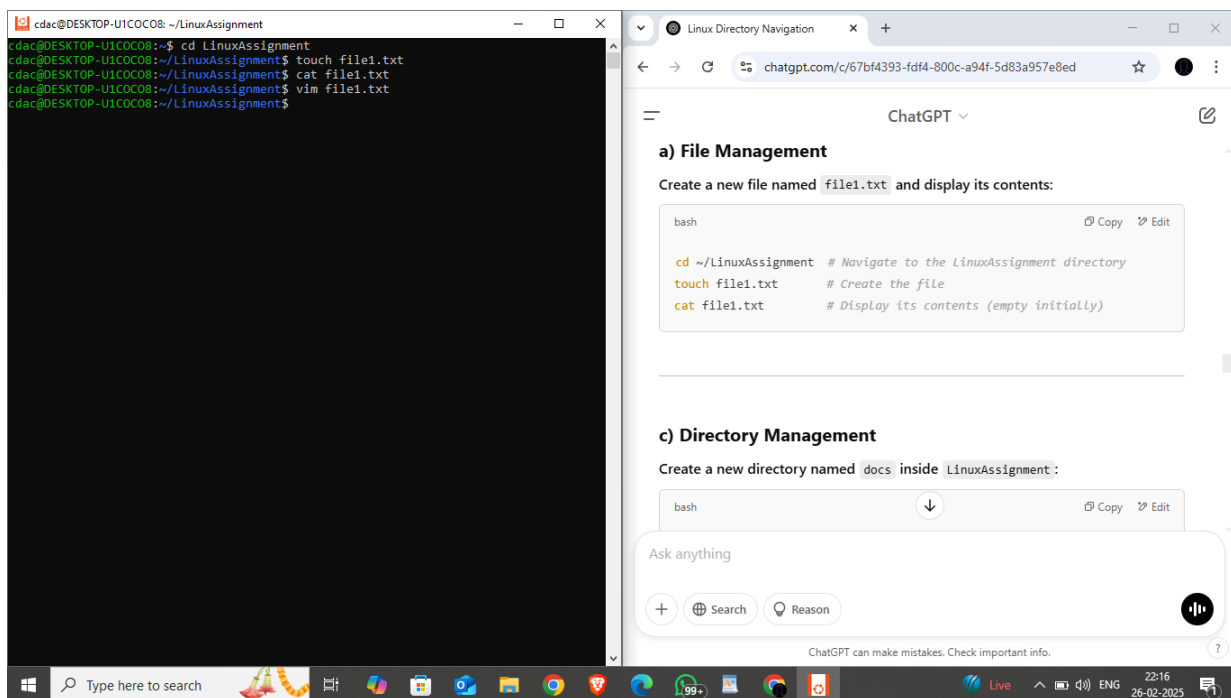
a. Start by navigating to your home directory and list its contents. Then, move into a directory named "LinuxAssignment" if it exists; otherwise, create it.

 cdac@DESKTOP-U1COC08: ~/LinuxAssignment

```
cdac@DESKTOP-U1COC08:~$ pwd
/home/cdac
cdac@DESKTOP-U1COC08:~$ cd
cdac@DESKTOP-U1COC08:~$ ls
abc.txt  xyz.txt
cdac@DESKTOP-U1COC08:~$ mkdir LinuxAssignment
cdac@DESKTOP-U1COC08:~$ ls
LinuxAssignment  abc.txt  xyz.txt
cdac@DESKTOP-U1COC08:~$ cd LinuxAssignment
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ _
```

## File Management:

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



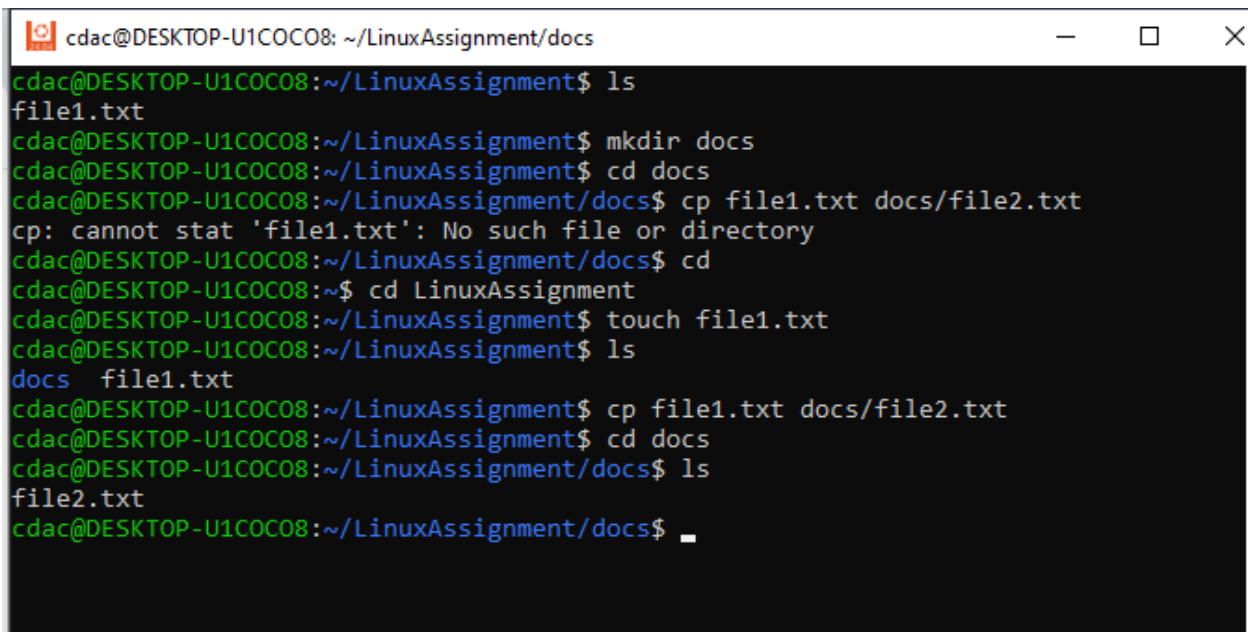


c) Directory Management:

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

d) Copy and Move Files:

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

A terminal window titled "cdac@DESKTOP-U1COC08: ~/LinuxAssignment/docs" with standard window controls. The terminal shows a sequence of commands and their outputs. The user starts in the ~/LinuxAssignment directory, lists files (showing file1.txt), creates a 'docs' directory, moves into it, attempts to copy file1.txt to docs/file2.txt (failing with an error), moves back to the parent directory, creates file1.txt with 'touch', lists files (showing docs and file1.txt), copies file1.txt to docs/file2.txt, moves into docs, lists files (showing file2.txt), and finally moves back to the parent directory.

```
cdac@DESKTOP-U1COC08: ~/LinuxAssignment/docs
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ ls
file1.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ cd docs
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ cp file1.txt docs/file2.txt
cp: cannot stat 'file1.txt': No such file or directory
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ cd
cdac@DESKTOP-U1COC08:~$ cd LinuxAssignment
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ cd docs
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-U1COC08:~/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.

```
cdac@DESKTOP-U1COC08: ~/LinuxAssignment/docs
cdac@DESKTOP-U1COC08:~$ ls
LinuxAssignment  data.txt  duplicate.txt  fruit.txt  myfile.txt  output.txt
abc.txt          docs      file1.txt     input.txt  numbers.txt  xyz.txt
cdac@DESKTOP-U1COC08:~$ cd LinuxAssignment
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ cd LinuxAssignment
-bash: cd: LinuxAssignment: No such file or directory
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ cd docs
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ ls -l
total 4
-rw-r--r-- 1 cdac cdac 99 Feb 27 07:07 file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ chmod u+x file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 99 Feb 27 07:07 file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ u-w file2.txt
Command 'u-w' not found, did you mean:
  command 'ufw' from snap ufw (0.36.2)
  command 'ufw' from deb ufw (0.36.2-1)
See 'snap info <snapname>' for additional versions.
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ chmod u-w file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ ls -l
total 4
-r-xr--r-- 1 cdac cdac 99 Feb 27 07:07 file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ chmod 6 file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ ls -l
total 4
-----rw- 1 cdac cdac 99 Feb 27 07:07 file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ chmod 666 file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ ls -l
total 4
-rw-rw-rw- 1 cdac cdac 99 Feb 27 07:07 file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ chmod 766 file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ ls -l
total 4
-rwxrwxrwx- 1 cdac cdac 99 Feb 27 07:07 file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ chmod g-w,o-w file2.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 99 Feb 27 07:07 file2.txt
cdac@DESKTOP-U1COC08:~/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.

```
cdac@DESKTOP-U1COC08: ~/LinuxAssignment
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ ls
docs docs.zip file1.txt files new_docs
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ cd docs
cdac@DESKTOP-U1COC08:~/LinuxAssignment/docs$ cd ..
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ ls -l ~/LinuxAssignment
total 20
drwxr-xr-x 2 cdac cdac 4096 Feb 27 07:07 docs
-rw-r--r-- 1 cdac cdac 403 Feb 27 07:19 docs.zip
-rw-r--r-- 1 cdac cdac 93 Feb 27 09:58 file1.txt
drwxr-xr-x 2 cdac cdac 4096 Feb 27 07:20 files
drwxr-xr-x 3 cdac cdac 4096 Feb 27 07:21 new_docs
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ ls -l /
total 2448
lrwxrwxrwx 1 root root 7 Apr 22 2024 bin -> usr/bin
drwxr-xr-x 2 root root 4096 Feb 26 2024 bin.usr-is-merged
drwxr-xr-x 2 root root 4096 Apr 22 2024 boot
drwxr-xr-x 16 root root 3560 Feb 27 16:15 dev
drwxr-xr-x 90 root root 4096 Feb 27 16:35 etc
drwxr-xr-x 3 root root 4096 Feb 25 17:50 home
-rwxrwxrwx 1 root root 2424984 Feb 12 00:59 init
lrwxrwxrwx 1 root root 7 Apr 22 2024 lib -> usr/lib
drwxr-xr-x 2 root root 4096 Apr 8 2024 lib.usr-is-merged
lrwxrwxrwx 1 root root 9 Apr 22 2024 lib64 -> usr/lib64
drwx----- 2 root root 16384 Feb 25 17:47 lost+found
drwxr-xr-x 2 root root 4096 Jan 6 20:13 media
drwxr-xr-x 6 root root 4096 Feb 25 17:47 mnt
drwxr-xr-x 2 root root 4096 Jan 6 20:13 opt
dr-xr-xr-x 208 root root 0 Feb 27 16:15 proc
drwx----- 5 root root 4096 Feb 27 07:25 root
drwxr-xr-x 18 root root 540 Feb 27 16:15 run
lrwxrwxrwx 1 root root 8 Apr 22 2024/sbin -> usr/sbin
drwxr-xr-x 2 root root 4096 Mar 31 2024/sbin.usr-is-merged
drwxr-xr-x 10 root root 4096 Feb 27 07:25 snap
drwxr-xr-x 2 root root 4096 Jan 6 20:13 srv
dr-xr-xr-x 11 root root 0 Feb 27 16:15 sys
drwxrwxrwt 11 root root 4096 Feb 27 16:33 tmp
drwxr-xr-x 12 root root 4096 Jan 6 20:13 usr
drwxr-xr-x 13 root root 4096 Feb 25 17:47 var
cdac@DESKTOP-U1COC08:~/LinuxAssignment$
```

**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).

```
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ find . -type f -name "*.txt"
./file1.txt
./docs/file2.txt
```

```
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ cat file1.txt
Operating System
Microprocessor
Data Structures
PG-DAC
Database Management System
Machine Learning
cdac@DESKTOP-U1COC08:~/LinuxAssignment$ grep "Operating System" file1.txt
Operating System
cdac@DESKTOP-U1COC08:~/LinuxAssignment$
```

**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.

```
Select cdac@DESKTOP-U1COC08: ~  
cdac@DESKTOP-U1COC08:~$ ls  
LinuxAssignment abc.txt docs file1.txt xyz.txt  
cdac@DESKTOP-U1COC08:~$ cat data.txt  
cat: data.txt: No such file or directory  
cdac@DESKTOP-U1COC08:~$ touch data.txt  
cdac@DESKTOP-U1COC08:~$ cat data.txt  
cdac@DESKTOP-U1COC08:~$ vim data.txt  
cdac@DESKTOP-U1COC08:~$ cat data.txt  
Hello  
Namaste  
Linux  
Ubuntu  
CDAC  
PG-DAC  
LAPTOP  
KEYBOARD  
SCREEN  
MOUSE  
cdac@DESKTOP-U1COC08:~$
```



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

```
cdac@DESKTOP-U1COC08: ~  
cdac@DESKTOP-U1COC08:~$ ls  
LinuxAssignment abc.txt docs file1.txt xyz.txt  
cdac@DESKTOP-U1COC08:~$ cat data.txt  
cat: data.txt: No such file or directory  
cdac@DESKTOP-U1COC08:~$ touch data.txt  
cdac@DESKTOP-U1COC08:~$ cat data.txt  
cdac@DESKTOP-U1COC08:~$ vim data.txt  
cdac@DESKTOP-U1COC08:~$ cat data.txt  
Hello  
Namaste  
Linux  
Ubuntu  
CDAC  
PG-DAC  
LAPTOP  
KEYBOARD  
SCREEN  
MOUSE  
cdac@DESKTOP-U1COC08:~$ tail -n 5 data.txt  
PG-DAC  
LAPTOP  
KEYBOARD  
SCREEN  
MOUSE  
cdac@DESKTOP-U1COC08:~$
```

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

```
cdac@DESKTOP-U1COC08:~$ ls
LinuxAssignment abc.txt data.txt docs file1.txt xyz.txt
cdac@DESKTOP-U1COC08:~$ touch numbers.txt
cdac@DESKTOP-U1COC08:~$ cat numbers.txt
cdac@DESKTOP-U1COC08:~$ vim data.txt
cdac@DESKTOP-U1COC08:~$ vim numbers.txt
cdac@DESKTOP-U1COC08:~$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

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

```
cdac@DESKTOP-U1COC08:~$ touch numbers.txt
cdac@DESKTOP-U1COC08:~$ cat numbers.txt
cdac@DESKTOP-U1COC08:~$ vim data.txt
cdac@DESKTOP-U1COC08:~$ vim numbers.txt
cdac@DESKTOP-U1COC08:~$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-U1COC08:~$ tail -n 3 numbers.txt
18
19
20
cdac@DESKTOP-U1COC08:~$
```

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."

```
cdac@DESKTOP-U1COC08:~$ ls
LinuxAssignment abc.txt data.txt docs file1.txt numbers.txt xyz.txt
cdac@DESKTOP-U1COC08:~$ touch input.txt
cdac@DESKTOP-U1COC08:~$ cat input.txt
cdac@DESKTOP-U1COC08:~$ vim input.txt
cdac@DESKTOP-U1COC08:~$ cat input.txt
Algorithms
Data Structures
Operating Systems
Machine Learning
TensorFlow
cdac@DESKTOP-U1COC08:~$ tr 'a-z' 'A-Z'

^C
cdac@DESKTOP-U1COC08:~$ tr 'a-z' 'A-Z' <input.txt> output.txt
tr: missing operand after 'a-zA-Z'
Two strings must be given when translating.
Try 'tr --help' for more information.
cdac@DESKTOP-U1COC08:~$ tr 'a-z' 'A-Z' <input.txt> output.txt
cdac@DESKTOP-U1COC08:~$ cat output.txt
ALGORITHMS
DATA STRUCTURES
OPERATING SYSTEMS
MACHINE LEARNING
TENSORFLOW
```

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."

```
cdac@DESKTOP-U1COC08:~$ touch duplicate.txt
cdac@DESKTOP-U1COC08:~$
cdac@DESKTOP-U1COC08:~$ cat duplicate.txt
cdac@DESKTOP-U1COC08:~$ vim duplicate.txt
cdac@DESKTOP-U1COC08:~$ cat duplicate.txt
Robert Oppenhiemer was a Scientist who worked behind atomic bombing
Linus Torvalds was the founder of Linux
Virat Kohli may score his 52nd century against New Zealand
Metallica and Iron Maiden are two legendary Metal Bands
Robert Oppenhiemer was a Scientist who worked behind atomic bombing
Malkeet Sir knows Operating System thoroughly
Virat Kohli may score his 52nd century against New Zealand
cdac@DESKTOP-U1COC08:~$ sort duplicate.txt | uniq
Linus Torvalds was the founder of Linux
Malkeet Sir knows Operating System thoroughly
Metallica and Iron Maiden are two legendary Metal Bands
Robert Oppenhiemer was a Scientist who worked behind atomic bombing
Virat Kohli may score his 52nd century against New Zealand
```

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."

```
cdac@DESKTOP-U1COC08:~$ touch fruit.txt
cdac@DESKTOP-U1COC08:~$ cat fruit.txt
cdac@DESKTOP-U1COC08:~$ vim fruit.txt
cdac@DESKTOP-U1COC08:~$ cat fruit.txt
Mango
Banana
Pineapple
Mango
Orange
Grapes
Kiwi
Kiwi
Dragonfruit
Pineapple
GreenApple
Pomogranate
cdac@DESKTOP-U1COC08:~$ sort fruit.txt | uniq -c
  1 Banana
  1 Dragonfruit
  1 Grapes
  1 GreenApple
  2 Kiwi
  2 Mango
  1 Orange
  2 Pineapple
  1 Pomogranate
```