

# 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, create it.

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~$ pwd
/home/cdac
cdac@vedant:~$ cd LinuxAssignment
cdac@vedant:~/LinuxAssignment$
```

### b) File Management:

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

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ cat > file1.txt
HELLO I AM AT CDAC MUMBAI KHARGHAR !!!
cdac@vedant:~/LinuxAssignment$ cat file1.txt
HELLO I AM AT CDAC MUMBAI KHARGHAR !!!
cdac@vedant:~/LinuxAssignment$
```

### c) Directory Management:

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

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ mkdir Docs
cdac@vedant:~/LinuxAssignment$ ls
Docs  file1.txt
cdac@vedant:~/LinuxAssignment$
```

### d) Copy and Move Files:

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

```
cdac@vedant: ~/LinuxAssignment/Docs
cdac@vedant:~/LinuxAssignment$ ls
Docs  file1.txt
cdac@vedant:~/LinuxAssignment$ cat file1.txt
HELLO I AM AT CDAC MUMBAI KHARGHAR !!!
cdac@vedant:~/LinuxAssignment$ cp file1.txt Docs/file2.txt
cdac@vedant:~/LinuxAssignment$ cd Docs
cdac@vedant:~/LinuxAssignment/Docs$ ls
file2.txt
cdac@vedant:~/LinuxAssignment/Docs$ cat file2.txt
HELLO I AM AT CDAC MUMBAI KHARGHAR !!!
cdac@vedant:~/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@vedant: ~/LinuxAssignment/Docs
cdac@vedant:~/LinuxAssignment/Docs$ chmod 704 file2.txt
cdac@vedant:~/LinuxAssignment/Docs$ ls -l
total 0
-rwx---r-- 1 cdac cdac 39 Aug 19 13:35 file2.txt
cdac@vedant:~/LinuxAssignment/Docs$ chown $USER file2.txt
cdac@vedant:~/LinuxAssignment/Docs$ ls -l
total 0
-rwx---r-- 1 cdac cdac 39 Aug 19 13:35 file2.txt
cdac@vedant:~/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@vedant: ~
cdac@vedant:~$ ls /
bin          boot  etc   init  lib.usr-is-merged  media  opt   root  sbin          snap  sys  usr
bin.usr-is-merged  dev   home  lib   lib64              mnt    proc  run   sbin.usr-is-merged  srv   tmp  var
cdac@vedant:~$ ls -l ~/LinuxAssignment
total 0
drwxr-xr-x 1 cdac cdac 512 Aug 19 13:35 Docs
-rw-r--r-- 1 cdac cdac 39 Aug 19 13:28 file1.txt
cdac@vedant:~$ ls -l ~/LinuxAssignment/Docs
total 0
-rwx---r-- 1 cdac cdac 39 Aug 19 13:35 file2.txt
cdac@vedant:~$
```

### g) File Searching:

- a. Search for all files with the extension ".txt" in the current directory and its subdirectories.

```
cdac@vedant: ~  
cdac@vedant:~/LinuxAssignment$ find . -type f -name "*.txt"  
./Docs/file2.txt  
./file1.txt  
cdac@vedant:~/LinuxAssignment$ cd ~  
cdac@vedant:~$ find . -type f -name "*.txt"  
./LinuxAssignment/Docs/file2.txt  
./LinuxAssignment/file1.txt  
cdac@vedant:~$
```

- b. Display lines containing a specific word in a file (provide a file name and the specific word to search).

```
cdac@vedant: ~/LinuxAssignment  
cdac@vedant:~/LinuxAssignment$ ls  
Docs  file1.txt  
cdac@vedant:~/LinuxAssignment$ grep -i "cDaC" file1.txt  
HELLO I AM AT CDAC MUMBAI KHARGHAR !!!  
cdac@vedant:~/LinuxAssignment$
```

### h) System Information:

- a. Display the current system date and time.

```
cdac@vedant: ~/LinuxAssignment  
cdac@vedant:~/LinuxAssignment$ date +"%d-%m-%y %H-%M-%S"  
19-08-25 22-51-41  
cdac@vedant:~/LinuxAssignment$ date  
Tue Aug 19 22:51:47 IST 2025  
cdac@vedant:~/LinuxAssignment$
```

## i) Networking:

- a. Display the IP address of the system.

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ hostname -I
192.168.0.102
cdac@vedant:~/LinuxAssignment$
```

- b. Ping a remote server to check connectivity (provide a remote server address to ping).

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ ping -c 4 google.com
PING google.com (142.250.183.110) 56(84) bytes of data.
64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=1 ttl=119 time=9.14 ms
64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=2 ttl=119 time=10.5 ms
64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=3 ttl=119 time=3.79 ms
64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=4 ttl=119 time=5.04 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3083ms
rtt min/avg/max/mdev = 3.786/7.124/10.528/2.790 ms
cdac@vedant:~/LinuxAssignment$
```

## j) File Compression:

- a. Compress the "docs" directory into a zip file.

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ ls
Docs  file1.txt  linux.txt
cdac@vedant:~/LinuxAssignment$ zip -r Docs.zip Docs
  adding: Docs/ (stored 0%)
  adding: Docs/file2.txt (stored 0%)
cdac@vedant:~/LinuxAssignment$ ls
Docs  Docs.zip  file1.txt  linux.txt
cdac@vedant:~/LinuxAssignment$
```

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

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ ls
Docs Docs.zip file1.txt linux.txt
cdac@vedant:~/LinuxAssignment$ mkdir NewDocs
cdac@vedant:~/LinuxAssignment$ ls
Docs Docs.zip NewDocs file1.txt linux.txt
cdac@vedant:~/LinuxAssignment$ unzip Docs.zip -d NewDocs
Archive: Docs.zip
  creating: NewDocs/Docs/
  extracting: NewDocs/Docs/file2.txt
cdac@vedant:~/LinuxAssignment$ ls NewDocs
Docs
cdac@vedant:~/LinuxAssignment$
```

### k) File Editing:

- a. Open the "file1.txt" file in a text editor and add some text to it.

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ ls
Docs Docs.zip NewDocs file1.txt linux.txt
cdac@vedant:~/LinuxAssignment$ cat file1.txt
HELLO I AM AT CDAC MUMBAI KHARGHAR !!!
I AM LEARNING JAVA !!!
I AM LEARNING LINUX !!!
I AM LEARNING OPERATING SYSTEMS !!!
cdac@vedant:~/LinuxAssignment$ vi file1.txt
cdac@vedant:~/LinuxAssignment$
cdac@vedant:~/LinuxAssignment$ file1.txt
file1.txt: command not found
cdac@vedant:~/LinuxAssignment$ cat file1.txt
HELLO I AM AT CDAC MUMBAI KHARGHAR !!!
I AM LEARNING JAVA !!!
I AM LEARNING LINUX !!!
I AM LEARNING OPERATING SYSTEMS !!!
I AM ENJOYING PG-DAC COURSE !!!
MY LOGIC IS BUILDING SLOWY !!!
cdac@vedant:~/LinuxAssignment$
```

b. Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with).

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ ls
Docs Docs.zip NewDocs file1.txt linux.txt
cdac@vedant:~/LinuxAssignment$ cat file1.txt
HELLO I AM AT CDAC MUMBAI KHARGHAR !!!
I AM LEARNING JAVA !!!
I AM LEARNING LINUX !!!
I AM LEARNING OPERATING SYSTEMS !!!
I AM ENJOYING PG-DAC COURSE !!!
MY LOGIC IS BUILDING SLOWY !!!
cdac@vedant:~/LinuxAssignment$ sed -i 's/LEARNING/LOVING/g' file1.txt
cdac@vedant:~/LinuxAssignment$ cat file1.txt
HELLO I AM AT CDAC MUMBAI KHARGHAR !!!
I AM LOVING JAVA !!!
I AM LOVING LINUX !!!
I AM LOVING OPERATING SYSTEMS !!!
I AM ENJOYING PG-DAC COURSE !!!
MY LOGIC IS BUILDING SLOWY !!!
cdac@vedant:~/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.

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ ls
Docs Docs.zip NewDocs data.txt file1.txt linux.txt
cdac@vedant:~/LinuxAssignment$ head -n 10 data.txt
RAM
ROM
THOR
IRONMAN
TOM
JERRY
LOKI
DBDA
MECHANICAL
IT
cdac@vedant:~/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.

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ ls
Docs Docs.zip NewDocs data.txt file1.txt linux.txt
cdac@vedant:~/LinuxAssignment$ tail -n 5 data.txt
JAVA
PYTHON
JAVASCRIPT
CSHARP
UNIX
cdac@vedant:~/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.

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ ls
Docs Docs.zip NewDocs data.txt file1.txt linux.txt numbers.txt
cdac@vedant:~/LinuxAssignment$ head -n 15 numbers.txt
11
22
33
232
43543
565
432
545
5656
7878
123
44
12
78
66
cdac@vedant:~/LinuxAssignment$
```

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

```
cdac@vedant: ~/LinuxAssignment
cdac@vedant:~/LinuxAssignment$ ls
Docs Docs.zip NewDocs data.txt file1.txt linux.txt numbers.txt
cdac@vedant:~/LinuxAssignment$ tail -n 3 numbers.txt
678
675
23
cdac@vedant:~/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."

```
cdac@vedant: ~/LinuxAssignment/Docs
cdac@vedant:~/LinuxAssignment/Docs$ ls
file2.txt  input.txt
cdac@vedant:~/LinuxAssignment/Docs$ tr 'a-z' 'A-Z' <input.txt> output.txt
cdac@vedant:~/LinuxAssignment/Docs$ ls
file2.txt  input.txt  output.txt
cdac@vedant:~/LinuxAssignment/Docs$ cat output.txt
HELLO I AM VEDANT
I LOVE CODING
MY FAVOURITE LANGUAGE IS JAVA
I AM DOING PG-DAC COURSE
I AM STUDYING AT CDAC KHARGHAR IN MUMBAI
THANK YOU
cdac@vedant:~/LinuxAssignment/Docs$
```

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@vedant: ~/LinuxAssignment/Docs
cdac@vedant:~/LinuxAssignment/Docs$ ls
Duplicate.txt  file2.txt  input.txt  output.txt
cdac@vedant:~/LinuxAssignment/Docs$ cat Duplicate.txt
hello
hi
cdac
hi
hello
cdac
hello
cdac@vedant:~/LinuxAssignment/Docs$ sort Duplicate.txt | uniq
cdac
hello
hi
cdac@vedant:~/LinuxAssignment/Docs$
```

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@vedant: ~/LinuxAssignment/Docs
cdac@vedant:~/LinuxAssignment/Docs$ ls
Duplicate.txt  file2.txt  fruits.txt  input.txt  output.txt
cdac@vedant:~/LinuxAssignment/Docs$ cat fruits.txt
MANGO
BANANA
GRAPES
APPLE
MANGO
BANANA
GRAPES
MANGO
APPLE
MANGO
cdac@vedant:~/LinuxAssignment/Docs$ sort fruits.txt | uniq -c
      2  APPLE
      2  BANANA
      2  GRAPES
      4  MANGO
cdac@vedant:~/LinuxAssignment/Docs$
```