

# 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.**

- 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.
- d) **Copy and Move Files:**
  - a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".
- 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.
- f) **Final Checklist:**
  - a. Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly.
- 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).
- h) **System Information:**
  - a. Display the current system date and time.
- 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).
- j) **File Compression:**
  - a. Compress the "docs" directory into a zip file.
  - b. Extract the contents of the zip file into a new directory.
- 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).

```

cdac@DESKTOP-Q08D40U:~$ vi abc.txt
cdac@DESKTOP-Q08D40U:~$ pwd
/home/cdac
cdac@DESKTOP-Q08D40U:~$ ls
Dir1 Dir2 abc.txt file1.txt test11.txt
cdac@DESKTOP-Q08D40U:~$ mkdir LinuxAssignment
cdac@DESKTOP-Q08D40U:~$ touch file.txt
cdac@DESKTOP-Q08D40U:~$ mkdir LinuxAssignment/docs
cdac@DESKTOP-Q08D40U:~$ mv file.txt docs
cdac@DESKTOP-Q08D40U:~$ mv file.txt file2.txt
mv: cannot stat 'file.txt': No such file or directory
cdac@DESKTOP-Q08D40U:~$ mv docs file2.txt
cdac@DESKTOP-Q08D40U:~$ chmod u=rwx, o=r file2.txt
chmod: invalid mode: 'u=rwx,'
Try 'chmod --help' for more information.
cdac@DESKTOP-Q08D40U:~$ chmod 744 file2.txt
cdac@DESKTOP-Q08D40U:~$ chown $(whoami) file2.txt
cdac@DESKTOP-Q08D40U:~$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 0 Aug 19 20:13 file2.txt
cdac@DESKTOP-Q08D40U:~$ ls -l LinuxAssignment
total 4
drwxr-xr-x 2 cdac cdac 4096 Aug 19 20:18 docs
cdac@DESKTOP-Q08D40U:~$ ./LinuxAssignment
-bash: ./LinuxAssignment: Is a directory
cdac@DESKTOP-Q08D40U:~$ ./LinuxAssignment/file2.txt
-bash: ./LinuxAssignment/file2.txt: No such file or directory
cdac@DESKTOP-Q08D40U:~$ ./docs/file2.txt
-bash: ./docs/file2.txt: No such file or directory
cdac@DESKTOP-Q08D40U:~$ ./docs/readme.txt
-bash: ./docs/readme.txt: No such file or directory
cdac@DESKTOP-Q08D40U:~$ date
Tue Aug 19 20:34:57 UTC 2025
cdac@DESKTOP-Q08D40U:~$ ip

```

```

cdac@DESKTOP-Q08D40U:~$ 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 1400 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:02:33:cb brd ff:ff:ff:ff:ff:ff
    inet 172.31.235.195/20 brd 172.31.239.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe02:33cb/64 scope link
        valid_lft forever preferred_lft forever
cdac@DESKTOP-Q08D40U:~$ ping 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=111 time=25.1 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=2 ttl=111 time=41.5 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=3 ttl=111 time=25.8 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=4 ttl=111 time=26.1 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=5 ttl=111 time=43.2 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=6 ttl=111 time=27.3 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=7 ttl=111 time=27.3 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=8 ttl=111 time=57.3 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=9 ttl=111 time=47.8 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=10 ttl=111 time=27.2 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=11 ttl=111 time=38.8 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=12 ttl=111 time=32.6 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=13 ttl=111 time=28.0 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=14 ttl=111 time=42.4 ms
 64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=15 ttl=111 time=38.8 ms
^C

```

```
cdac@DESKTOP-Q08D40U:~$ ls
Dir1  LinuxAssignment  file1.txt  test11.txt
Dir2  abc.txt           file2.txt
cdac@DESKTOP-Q08D40U:~$ mv Dir1 docs
cdac@DESKTOP-Q08D40U:~$ ls
Dir2          abc.txt  file1.txt  test11.txt
LinuxAssignment docs     file2.txt
cdac@DESKTOP-Q08D40U:~$ ls file2.txt
file2.txt
cdac@DESKTOP-Q08D40U:~$ zip -r docs.zip docs/
Command 'zip' not found, but can be installed with:
sudo apt install zip
cdac@DESKTOP-Q08D40U:~$ sudo apt install zip
[sudo] password for cdac:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  unzip
The following NEW packages will be installed:
  unzip zip
```

```
cdac@DESKTOP-Q08D40U:~$ ls
Dir2          abc.txt  file1.txt  test11.txt
LinuxAssignment docs     file2.txt
cdac@DESKTOP-Q08D40U:~$ zip -r docs.zip docs/
adding: docs/ (stored 0%)
cdac@DESKTOP-Q08D40U:~$ unzip docs.zip -d newdocs
Archive:  docs.zip
creating: newdocs/docs/
cdac@DESKTOP-Q08D40U:~$ ls
Dir2          abc.txt  docs.zip  file2.txt  test11.txt
LinuxAssignment docs     file1.txt newdocs
cdac@DESKTOP-Q08D40U:~$ vi file1.txt
cdac@DESKTOP-Q08D40U:~$ sed -i 's/hello/hey/g' file1.txt
cdac@DESKTOP-Q08D40U:~$ cat file1.txt
hey its me doing ubuntu code heheheheh
cdac@DESKTOP-Q08D40U:~$ |
```

**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.
- b. 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@DESKTOP-Q08D40U:~$ cat > data.txt
names
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
cdac@DESKTOP-Q08D40U:~$ head -n 10 data.txt
names
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
cdac@DESKTOP-Q08D40U:~$ tail -n 5 data.txt
6th
7th
8th
9th
10th
cdac@DESKTOP-Q08D40U:~$
```

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

```
cdac@DESKTOP-Q08D40U: ~$ cat > numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
cdac@DESKTOP-Q08D40U: ~$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-Q08D40U: ~$ tail -n 3 numbers.txt
16
17
18
cdac@DESKTOP-Q08D40U: ~$
```

- d. 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-Q08D40U: ~$ cat > input.txt
hello my name is madhuri
I AM FROM NASHIK AND LIVING IN PUNE
PURSUING CDAC
```

```
cdac@DESKTOP-Q08D40U: ~$ tr 'a-z' 'A-Z' < input.txt
HELLO MY NAME IS MADHURI
I AM FROM NASHIK AND LIVING IN PUNE
PURSUING CDAC
```

```
PURSUING CDAC
cdac@DESKTOP-Q08D40U: ~$ cat input.txt > output.txt
cdac@DESKTOP-Q08D40U: ~$ cat output.txt
hello my name is madhuri
I AM FROM NASHIK AND LIVING IN PUNE
PURSUING CDAC
cdac@DESKTOP-Q08D40U: ~$
```

- e. 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."
- f. 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-Q08D40U:~$ cat > duplicates.txt
hello my name is madhuri
and idk how many time i have to erite that my name is madhuri
i am very proud of my self
cdac@DESKTOP-Q08D40U:~$ uniq duplicate.txt
uniq: duplicate.txt: No such file or directory
cdac@DESKTOP-Q08D40U:~$ uniq duplicates.txt
hello my name is madhuri
and idk how many time i have to erite that my name is madhuri
i am very proud of my self
cdac@DESKTOP-Q08D40U:~$ sort duplicates.txt | uniq
and idk how many time i have to erite that my name is madhuri
hello my name is madhuri
i am very proud of my self
cdac@DESKTOP-Q08D40U:~$ |
```

**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.