

# 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.

```
cdac@LAPTOP-73J7ISDV:~$ pwd
/home/cdac
cdac@LAPTOP-73J7ISDV:~$ ls -l
total 20
drwxr-xr-x 2 cdac cdac 4096 Aug 28 19:26 LinuxAssignment
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:53 dir3
-rw----- 1 cdac cdac  20 Aug 28 18:10 file.txt.save
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:39 yog1
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:02 yogesh
cdac@LAPTOP-73J7ISDV:~$
```

**b) File Management:**

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

```
cdac@LAPTOP-73J7ISDV:~$ cd LinuxAssignment
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ ls -l
total 4
-rw-r--r-- 1 cdac cdac 15 Aug 28 19:29 file1.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$
```

**c) Directory Management:**

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

```
-rw-r--r-- 1 cdac cdac 15 Aug 28 19:29 file1.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ mkdir docs
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Aug 28 19:45 docs
-rw-r--r-- 1 cdac cdac  15 Aug 28 19:29 file1.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$
```

d) Copy and Move Files: a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".

```
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ cd docs
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/docs$ ls
file1.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/docs$ ls
file2.txt
cdac@LAPTOP-73J7ISDV:~/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@LAPTOP-73J7ISDV:~/LinuxAssignment/docs$ whoami
cdac
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/docs$ chown cdac file2.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/docs$ ls
file2.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 15 Aug 28 22:03 file2.txt
cdac@LAPTOP-73J7ISDV:~/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@LAPTOP-73J7ISDV:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Aug 28 22:09 docs
-rw-r--r-- 1 cdac cdac 15 Aug 28 19:29 file1.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ cd docs
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 15 Aug 28 22:03 file2.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/docs$
```

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.

```
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ find *.txt
file1.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ find *.txt type d
file1.txt
find: 'type': No such file or directory
find: 'd': No such file or directory
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ date
Wed Aug 28 23:08:41 IST 2024
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$
```

- 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).

```
cdac@LAPTOP-73J7ISDV:~$ ip address
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 mq state UP group default qlen 1000
    link/ether 00:15:5d:0a:83:db brd ff:ff:ff:ff:ff:ff
    inet 172.25.5.245/20 brd 172.25.15.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe0a:83db/64 scope link
        valid_lft forever preferred_lft forever
```

- j) File Compression: a. Compress the "docs" directory into a zip file. b. Extract the contents of the zip file into a new directory.

```
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ zip docs.zip docs
adding: docs/ (stored 0%)
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ ls -l
total 12
drwxr-xr-x 2 cdac cdac 4096 Aug 28 22:09 docs
-rw-r--r-- 1 cdac cdac 160 Aug 28 23:45 docs.zip
-rw-r--r-- 1 cdac cdac 15 Aug 28 19:29 file1.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ unzip -d dir3 docs.zip
```

```
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ unzip docs.zip -d dir3
Archive:  docs.zip
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ ls -l
total 16
drwxr-xr-x 3 cdac cdac 4096 Aug 28 23:53 dir3
drwxr-xr-x 2 cdac cdac 4096 Aug 28 22:09 docs
-rw-r--r-- 1 cdac cdac 160 Aug 28 23:45 docs.zip
-rw-r--r-- 1 cdac cdac 15 Aug 28 19:29 file1.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ cd dir3
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/dir3$ ls -l
total 4
drwxr-xr-x 2 cdac cdac 4096 Aug 28 22:09 docs
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment/dir3$ |
```

- 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).

“Linux is good” is changed to “Linux is better”.

```
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ sed 's/good/better/' file1.txt
Hello
linux is better
cdac@LAPTOP-73J7ISDV:~/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@LAPTOP-73J7ISDV:~$ cd LinuxAssignment
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ nano data.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ head data.txt
heeyyy
itss me
good morning
do best
eat best
rest
sleep
wake up
study
study
cdac@LAPTOP-73J7ISDV:~/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@LAPTOP-73J7ISDV:~/LinuxAssignment$ tail -5 data.txt
study
keep studying
win
or
lose
cdac@LAPTOP-73J7ISDV:~/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@LAPTOP-73J7ISDV:~/LinuxAssignment$ nano numbers.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ head -15 data.txt
heeyyy
itss me
good morning
do best
eat best
rest
sleep
wake up
study
study
keep studying
win
or
lose
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ |
```

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

```
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ tail -5 data.txt
study
keep studying
win
or
lose
cdac@LAPTOP-73J7ISDV:~/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@LAPTOP-73J7ISDV:~/LinuxAssignment$ cat input.txt
yogesh
cdac
kharghar
mumbai
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ tr a-z A-Z < input.txt >> output.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ ls
data.txt  dir3  docs  docs.zip  file1.txt  input.txt  numbers.txt  output.txt
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ cat output.txt
YOGESH
CDAC
KHARGHAR
MUMBAI
cdac@LAPTOP-73J7ISDV:~/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."

```
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ cat duplicate.txt
yogesh
mumbai
mumbai
pawar
cdac
cdac
mumbai
yogesh
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ uniq -u duplicate.txt
yogesh
pawar
mumbai
yogesh
cdac@LAPTOP-73J7ISDV:~/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."

```
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ cat fruit.txt
apple
apple
mango
banana
banana
orange
lemon
lemon
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ sort fruit.txt | uniq -uc
      1 mango
      1 orange
cdac@LAPTOP-73J7ISDV:~/LinuxAssignment$ |
```