

CDAC MUMBAI

Concepts of Operating System


Assignment 1

Samir Bharati (PG-DAC)

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@Samir: ~/LinuxAssignment

```
cdac@Samir:~$ cd ~
cdac@Samir:~$ ls
cdac@Samir:~$ mkdir LinuxAssignment
cdac@Samir:~$ ls
LinuxAssignment
cdac@Samir:~$ cd LinuxAssignment
cdac@Samir:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@Samir:~/LinuxAssignment$
```

b) File Management:

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

 cdac@Samir: ~/LinuxAssignment

```
cdac@Samir:~$ cd LinuxAssignment
cdac@Samir:~/LinuxAssignment$ touch file1.txt
cdac@Samir:~/LinuxAssignment$ cat file1.txt
cdac@Samir:~/LinuxAssignment$ ls
file1.txt
cdac@Samir:~/LinuxAssignment$
```

c) Directory Management:

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

```
cdac@Samir: ~/LinuxAssignment
```

```
cdac@Samir:~$ cd LinuxAssignment
cdac@Samir:~/LinuxAssignment$ mkdir docs
cdac@Samir:~/LinuxAssignment$ ls
docs  file1.txt
cdac@Samir:~/LinuxAssignment$
```

d) Copy and Move Files:

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

```
cdac@Samir: ~/LinuxAssignment
```

```
cdac@Samir:~$ cd LinuxAssignment
cdac@Samir:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@Samir:~/LinuxAssignment$ ls docs
file2.txt
cdac@Samir:~/LinuxAssignment$ ls
docs  file1.txt
cdac@Samir:~/LinuxAssignment$
```


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@Samir:~$ ls
LinuxAssignment  dir1      file2.txt  r2.sh    s16.sh   s4.sh    s7.sh    s9.sh
cdac1           file1.txt  r1.sh     s10.sh   s3.sh    s6.sh    s8.sh
cdac@Samir:~$ chmod 704 file2.txt && chown $(whoami) file2.txt
cdac@Samir:~$ ls -l file2.txt
-rwx---r-- 1 cdac samir 0 Aug 21 05:41 file2.txt
cdac@Samir:~$
```

f) Final Checklist:

a. Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly.

```
 Select cdac@Samir: ~/LinuxAssignment
cdac@Samir:~$ cd LinuxAssignment
cdac@Samir:~/LinuxAssignment$ ls -l
total 4
drwxr-xr-x 2 cdac samir 4096 Aug 18 13:48 docs
-rw-r--r-- 1 cdac samir 0 Aug 18 13:43 file1.txt
cdac@Samir:~/LinuxAssignment$ ls -l docs
total 0
-rwxr--rwx 1 cdac samir 0 Aug 18 13:48 file2.txt
cdac@Samir:~/LinuxAssignment$ ls -l
total 4
drwxr-xr-x 2 cdac samir 4096 Aug 18 13:48 docs
-rw-r--r-- 1 cdac samir 0 Aug 18 13:43 file1.txt
cdac@Samir:~/LinuxAssignment$
```

g) File Searching:

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

```
cdac@Samir:~$ cd cdac1
cdac@Samir:~/cdac1$ ls
A  AAA  ABC  a  aaa  aaaaa  dir1  dir3  dir5  duplicate.txt  file2.txt  files.txt  input.txt  output.txt
AA AB  ABCD aa  aaaa colors.txt dir2  dir4  dir6  file1.txt      file3.txt  fruit.txt  numbers.txt xyz.txt
cdac@Samir:~/cdac1$ ls -R | grep ".txt$"
colors.txt
duplicate.txt
file1.txt
file2.txt
file3.txt
files.txt
fruit.txt
input.txt
numbers.txt
output.txt
xyz.txt
cdac@Samir:~/cdac1$
```

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

```
cdac@Samir:~/cdac1$ cd ~
cdac@Samir:~$ cd LinuxAssignment
cdac@Samir:~/LinuxAssignment$ grep "IRON" file.txt
grep: file.txt: No such file or directory
cdac@Samir:~/LinuxAssignment$ grep "BATMAN" file.txt
grep: file.txt: No such file or directory
cdac@Samir:~/LinuxAssignment$ cd ~
cdac@Samir:~$ cd LinuxAssignment
cdac@Samir:~/LinuxAssignment$ grep "BATMAN" file1.txt
I am BATMAN MAN.
cdac@Samir:~/LinuxAssignment$
```

h) System Information:

a. Display the current system date and time.

```
cdac@Samir: ~  
cdac@Samir:~$ date  
Mon Aug 18 14:28:11 UTC 2025  
cdac@Samir:~$
```

i) Networking:

a. Display the IP address of the system.

```
cdac@Samir: ~  
cdac@Samir:~$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 172.18.112.42 netmask 255.255.240.0 broadcast 172.18.127.255  
    inet6 fe80::215:5dff:fe0e:4fc2 prefixlen 64 scopeid 0x20<link>  
    ether 00:15:5d:0e:4f:c2 txqueuelen 1000 (Ethernet)  
    RX packets 494 bytes 284416 (284.4 KB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 115 bytes 7918 (7.9 KB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
    inet 127.0.0.1 netmask 255.0.0.0  
    inet6 ::1 prefixlen 128 scopeid 0x10<host>  
    loop txqueuelen 1000 (Local Loopback)  
    RX packets 0 bytes 0 (0.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 0 bytes 0 (0.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
cdac@Samir:~$
```

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

```
cdac@Samir: ~  
cdac@Samir:~$ ping youtube.com  
PING youtube.com (142.251.43.110) 56(84) bytes of data.  
64 bytes from tzdela-bd-in-f14.1e100.net (142.251.43.110): icmp_seq=1 ttl=109 time=52.5 ms  
64 bytes from tzdela-bd-in-f14.1e100.net (142.251.43.110): icmp_seq=2 ttl=109 time=52.9 ms  
64 bytes from tzdela-bd-in-f14.1e100.net (142.251.43.110): icmp_seq=3 ttl=109 time=55.9 ms  
64 bytes from tzdela-bd-in-f14.1e100.net (142.251.43.110): icmp_seq=4 ttl=109 time=52.4 ms  
^C  
--- youtube.com ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3005ms  
rtt min/avg/max/mdev = 52.365/53.428/55.922/1.452 ms  
cdac@Samir:~$
```

j) File Compression:

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

```
cdac@Samir: ~/LinuxAssignment  
cdac@Samir:~$ cd LinuxAssignment  
cdac@Samir:~/LinuxAssignment$ zip -r docs.zip docs  
  adding: docs/ (stored 0%)  
  adding: docs/file2.txt (stored 0%)  
cdac@Samir:~/LinuxAssignment$ ls -l  
total 12  
drwxr-xr-x 2 cdac samir 4096 Aug 18 13:48 docs  
-rw-r--r-- 1 cdac samir  316 Aug 19 12:54 docs.zip  
-rw-r--r-- 1 cdac samir   32 Aug 19 12:48 file1.txt  
cdac@Samir:~/LinuxAssignment$
```

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


```
cdac@Samir: ~/LinuxAssignment
cdac@Samir:~/LinuxAssignment$ mkdir unzipped_docs
cdac@Samir:~/LinuxAssignment$ unzip docs.zip -d unzipped_docs
Archive:  docs.zip
  creating: unzipped_docs/docs/
  extracting: unzipped_docs/docs/file2.txt
cdac@Samir:~/LinuxAssignment$ ls -l unzipped_docs
total 4
drwxr-xr-x 2 cdac samir 4096 Aug 18 13:48 docs
cdac@Samir:~/LinuxAssignment$
```

k) File Editing:

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

```
Select cdac@Samir: ~
cdac@Samir:~$ cat >> ~/LinuxAssignment/file1.txt
I am IRON MAN.
I love you 3000.
cdac@Samir:~$ cat LinuxAssignment/file1.txt
I am IRON MAN.
I love you 3000.
cdac@Samir:~$
```


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@Samir: ~/LinuxAssignment

```
cdac@Samir:~$ cd LinuxAssignment
cdac@Samir:~/LinuxAssignment$ cat file1.txt
I am IRON MAN.
I love you 3000.
cdac@Samir:~/LinuxAssignment$ sed -i 's/IRON/BATMAN/g' file1.txt
cdac@Samir:~/LinuxAssignment$ cat file1.txt
I am BATMAN MAN.
I love you 3000.
cdac@Samir:~/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@Samir: ~/LinuxAssignment

```
cdac@Samir:~$ cd LinuxAssignment
cdac@Samir:~/LinuxAssignment$ cat > data.txt
Sohan
Mohan
Rohan
Samir
Gaurav
Tushar
Prabhat
Pranav
Ankit
Sumit
Keshri
Keshav
Yuvraj
Abhay
Rinku
Minku
Surya
Virat
Rohit
Mohit
cdac@Samir:~/LinuxAssignment$ head -10 data.txt
head: cannot open 'data.txt' for reading: No such file or directory
cdac@Samir:~/LinuxAssignment$ head -10 data.txt
Sohan
Mohan
Rohan
Samir
Gaurav
Tushar
Prabhat
Pranav
Ankit
Sumit
cdac@Samir:~/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@Samir:~/LinuxAssignment$ tail -n -5 data.txt
Minku
Surya
Virat
Rohit
Mohit
cdac@Samir:~/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@Samir:~/cdac1$ cat > numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
cdac@Samir:~/cdac1$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@Samir:~/cdac1$
```


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

```
cdac@Samir:~/cdac1$ tail -n -3 numbers.txt
18
19
20
cdac@Samir:~/cdac1$
```

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@Samir: ~/cdac1
cdac@Samir:~/cdac1$ cat > input.txt
i am samir bharati and i am currently enrolled at cdac in pg-dac course and i am really excited and motivated to enjoy the journey.
cdac@Samir:~/cdac1$ tr [:lower:] [:upper:] <input.txt> output.txt
cdac@Samir:~/cdac1$ cat output.txt
I AM SAMIR BHARATI AND I AM CURRENTLY ENROLLED AT CDAC IN PG-DAC COURSE AND I AM REALLY EXCITED AND MOTIVATED TO ENJOY THE JOURNEY.
cdac@Samir:~/cdac1$
```

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@Samir: ~/cdac1

```
cdac@Samir:~/cdac1$ cat > duplicate.txt
Samir
SAmir
samir
Samir
SAMIR
samir
saMir
cdac@Samir:~/cdac1$ sort -u duplicate.txt
SAMIR
SAmir
Samir
saMir
samir
cdac@Samir:~/cdac1$ _
```

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@Samir: ~/cdac1
cdac@Samir:~/cdac1$ cat > fruit.txt
Mango
Banana
Apple
Grapes
Mango
Pineapple
Kiwi
Banana
Pomegranante
Kiwi
Grapes
cdac@Samir:~/cdac1$ sort -u fruit.txt
Apple
Banana
Grapes
Kiwi
Mango
Pineapple
Pomegranante
cdac@Samir:~/cdac1$ grep -c "Apple" fruit.txt
1
cdac@Samir:~/cdac1$ grep -c "Banana" fruit.txt
2
cdac@Samir:~/cdac1$ grep -c "Grapes" fruit.txt
2
cdac@Samir:~/cdac1$ grep -c "Kiwi" fruit.txt
2
cdac@Samir:~/cdac1$ grep -c "Mango" fruit.txt
2
cdac@Samir:~/cdac1$ grep -c "Pineapple" fruit.txt
1
cdac@Samir:~/cdac1$ grep -c "Pomegranante" fruit.txt
1
cdac@Samir:~/cdac1$
```