CDAC MUMBAI

Concepts of Operating System
Assignment 1

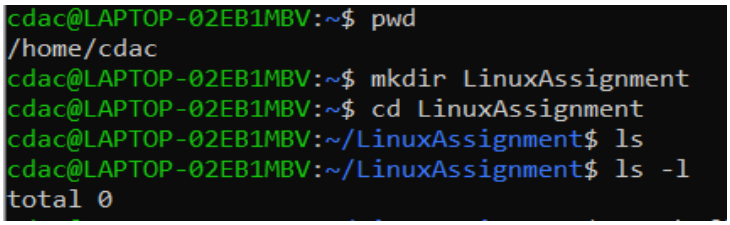
Problem 1: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

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.

- **Command:**

cdac@LAPTOP-02EB1MBV:~$ pwd
/home/cdac
cdac@LAPTOP-02EB1MBV:~$ mkdir LinuxAssignment
cdac@LAPTOP-02EB1MBV:~$ cd LinuxAssignment
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls -l

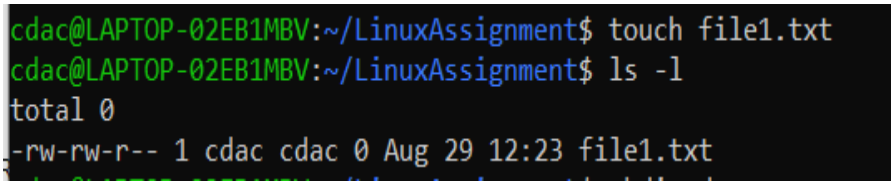


b) File Management:

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

- **Command:**

cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ touch file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls -l
total 0
-rw-rw-r-- 1 cdac cdac 0 Aug 29 12:23 file1.txt



c) Directory Management:

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

- **Command:**

cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ mkdir docs
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls -l

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ mkdir docs
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls -l
total 0
drwxrwxr-x 1 cdac cdac 4096 Aug 29 12:54 docs
-rw-rw-r-- 1 cdac cdac    0 Aug 29 12:54 file1.txt
```

d) Copy and Move Files:

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

Command:

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ cp file1.txt docs
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls
docs  file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ cd docs
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$  ls
file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ ls -l
total 0
-rw-rw-r-- 1 cdac cdac 0 Aug 29 13:33 file2.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ ls
file2.txt
```

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ cp file1.txt docs
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls
docs  file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ cd docs
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ ls
file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ ls -l
total 0
-rw-rw-r-- 1 cdac cdac 0 Aug 29 13:33 file2.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ ls
file2.txt
cdac@LAPTOP-02EB1MBV:~/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.

Command:

cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ chmod u+rwx file2.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ ls -l

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ chmod u+rwx file2.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ ls -l
total 0
-rwxrw-r-- 1 cdac cdac 0 Aug 29 13:33 file2.txt
cdac@LAPTOP-02EB1MBV:~/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.
Command:
ls -l ,
or
ls -l ~/LinuxAssignment

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ ls -l
total 0
-rwxrw-r-- 1 cdac cdac 0 Aug 29 13:33 file2.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$ la -l ~/LinuxAssignment
total 0
drwxrwxr-x 1 cdac cdac 4096 Aug 29 13:33 docs
-rw-rw-r-- 1 cdac cdac    0 Aug 29 12:54 file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment/docs$
```

the root directory:
commands: ls -l /

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls -l /
total 2080
lrwxrwxrwx  1 root root       7 Nov 23  2023 bin -> usr/bin
drwxr-xr-x  1 root root    4096 Apr 18  2022 boot
drwxr-xr-x  1 root root    4096 Aug 29 12:09 dev
drwxr-xr-x  1 root root    4096 Aug 29 13:17 etc
drwxr-xr-x  1 root root    4096 Aug 27 18:57 home
-rwxr-xr-x  1 root root 2127224 Apr 25 18:17 init
lrwxrwxrwx  1 root root       7 Nov 23  2023 lib -> usr/lib
lrwxrwxrwx  1 root root       9 Nov 23  2023 lib32 -> usr/lib32
lrwxrwxrwx  1 root root       9 Nov 23  2023 lib64 -> usr/lib64
lrwxrwxrwx  1 root root      10 Nov 23  2023 libx32 -> usr/libx32
drwxr-xr-x  1 root root    4096 Nov 23  2023 media
drwxr-xr-x  1 root root    4096 Aug 27 18:07 mnt
drwxr-xr-x  1 root root    4096 Nov 23  2023 opt
dr-xr-xr-x 12 root root       0 Aug 29 12:07 proc
drwx------  1 root root    4096 Aug 27 21:31 root
drwxr-xr-x  1 root root    4096 Aug 29 12:07 run
lrwxrwxrwx  1 root root       8 Nov 23  2023 sbin -> usr/sbin
drwxr-xr-x  1 root root    4096 Nov 23  2023 snap
drwxr-xr-x  1 root root    4096 Nov 23  2023 srv
dr-xr-xr-x 12 root root       0 Aug 29 12:07 sys
drwxrwxrwt  1 root root    4096 Aug 29 08:12 tmp
drwxr-xr-x  1 root root    4096 Nov 23  2023 usr
drwxr-xr-x  1 root root    4096 Nov 23  2023 var
```

g) File Searching:

a. Search for all files with the extension ".txt" in the current directory and its subdirectories.
Command:
find . -type f -name "*.txt"

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ find . -type f -name "*.txt"
./docs/file2.txt
./file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```

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

Command:
grep "Shweta" file1.txt

```
cdac@LAPTOP-02EB1MBV:~$ cd LinuxAssignment
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ grep "Shweta" file1.txt
My name is Shweta
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```

h) System Information:

a. Display the current system date and time.
Command: date

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ date
Thu Aug 29 19:24:24 IST 2024
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```

i) Networking:

a. Display the IP address of the system.

Command: ip a

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ip a
6: eth0: <> mtu 1500 group default qlen 1
    link/ether 5c:ba:ef:24:cd:c8
    inet 169.254.0.123/16 brd 169.254.255.255 scope global dynamic
       valid_lft forever preferred_lft forever
    inet6 fe80::642e:4b00:4a20:2db/64 scope link dynamic
       valid_lft forever preferred_lft forever
9: eth1: <BROADCAST,MULTICAST,UP> mtu 1500 group default qlen 1
    link/ether 84:2a:fd:d1:21:ac
    inet 192.168.0.181/24 brd 192.168.0.255 scope global dynamic
       valid_lft 74850sec preferred_lft 74850sec
    inet6 fe80::c6:e59f:9b11:15d6/64 scope link dynamic
       valid_lft forever preferred_lft forever
44: eth2: <BROADCAST,MULTICAST,UP> mtu 1500 group default qlen 1
    link/ether 00:15:5d:9c:1f:66
    inet 172.23.192.1/20 brd 172.23.207.255 scope global dynamic
       valid_lft forever preferred_lft forever
    inet6 fe80::8618:b72d:2a4d:90/64 scope link dynamic
       valid_lft forever preferred_lft forever
1: lo: <LOOPBACK,UP> mtu 1500 group default qlen 1
    link/loopback 00:00:00:00:00:00
    inet 127.0.0.1/8 brd 127.255.255.255 scope global dynamic
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host dynamic
       valid_lft forever preferred_lft forever
13: wifi0: <> mtu 1500 group default qlen 1
    link/ieee802.11 5c:ba:ef:24:cd:c7
    inet 169.254.98.232/16 brd 169.254.255.255 scope global dynamic
       valid_lft forever preferred_lft forever
    inet6 fe80::99a2:1ce0:e8a5:9a96/64 scope link dynamic
       valid_lft forever preferred_lft forever
14: wifi1: <> mtu 1500 group default qlen 1
    link/ieee802.11 5e:ba:ef:24:cd:c7
    inet 169.254.94.45/16 brd 169.254.255.255 scope global dynamic
       valid_lft forever preferred_lft forever
    inet6 fe80::85e4:11af:2d5d:6985/64 scope link dynamic
       valid_lft forever preferred_lft forever
19: wifi2: <> mtu 1500 group default qlen 1
    link/ieee802.11 de:ba:ef:24:cd:c7
    inet 169.254.9.93/16 brd 169.254.255.255 scope global dynamic
       valid_lft forever preferred_lft forever
    inet6 fe80::fe7f:531b:76e5:90ad/64 scope link dynamic
       valid_lft forever preferred_lft forever
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```

b. Ping a remote server to check connectivity (provide a remote server address to ping).
Command:
cd LinuxAssignment

```
cdac@LAPTOP-02EB1MBV:~$ cd LinuxAssignment
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ping google.com
PING google.com (142.250.70.46) 56(84) bytes of data.
64 bytes from pnbomb-aa-in-f14.1e100.net (142.250.70.46): icmp_seq=1 ttl=59 time=16.5 ms
64 bytes from pnbomb-aa-in-f14.1e100.net (142.250.70.46): icmp_seq=2 ttl=59 time=17.0 ms
64 bytes from pnbomb-aa-in-f14.1e100.net (142.250.70.46): icmp_seq=3 ttl=59 time=17.1 ms
64 bytes from pnbomb-aa-in-f14.1e100.net (142.250.70.46): icmp_seq=4 ttl=59 time=16.8 ms
64 bytes from pnbomb-aa-in-f14.1e100.net (142.250.70.46): icmp_seq=5 ttl=59 time=17.6 ms
^C
--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 16.464/16.971/17.610/0.376 ms
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```

j) File Compression:

a. Compress the "docs" directory into a zip file.
Command: zip -r docs.zip docs2

b. Extract the contents of the zip file into a new directory.
Command: unzip docs.zip

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file1.txt (stored 0%)
  adding: docs/file2.txt (stored 0%)
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls
data.txt.save  docs  docs.zip  file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ unzip docs.zip
Archive:  docs.zip
replace docs/file1.txt? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
 extracting: docs/file1.txt
replace docs/file2.txt? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
 extracting: docs/file2.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ ls
data.txt.save  docs  docs.zip  file1.txt
```

k) File Editing:

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

Command:

nano file1.txt

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

Command:

sed -i 's/Good/Morning/g' file1.txt

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ sed -i 's/Good/Morning/g' file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```

Problem 2: Read the instructions carefully and answer accordingly. If there isany need to insert some data then do that as well.

a. Suppose you have a file named "data.txt" containing important information. Display thefirst 10 lines of this file to quickly glance at its contents using a command.

Command: nano data.txt

head -10 data.txt

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano data.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ head -10 data.txt
City Names
Nagpur
Mumbai
Jaipur
Bangalore
Chennai
Hyderbad
Indore
Pune
Nashik
cdac@LAPTOP-02EB1MBV:~/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.

Command:

tail -5 data.txt

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ tail -5 data.txt
Chennai
Hyderbad
Indore
Pune
Nashik
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```

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

Commands :

nano numbers.txt

Head -15 numbers.txt

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano numbers.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ head -15 numbers.txt
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
```

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

Command:

tail -3 numbers.txt

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ tail -3 numbers.txt
23
24
25
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```

e. Imagine you have a file named "input.txt" with text content. Use a command to translateall lowercase letters to uppercase in "input.txt" and save the modified text in a new file named "output.txt."

Command:

cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano input.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ touch output.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano output.txt

```
cdac@LAPTOP-02EB1MBV:~$ cd LinuxAssignment
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano input.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ touch output.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano output.txt
```

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."

Commands:

cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano dublicates.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ sort dublicates.txt

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano dublicates.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ sort dublicates.txt

Hello World
Welcome
Welcome
Welcome to World
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```

g. In a file named "fruit.txt," there is a list of fruits, but some fruits are repeated. Use acommand to display each unique fruit along with the count of its occurrences in "fruit.txt."

Commands:

cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano fruits.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ sort fruits.txt | uniq -c

```
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ nano fruits.txt
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$ sort fruits.txt | uniq -c
      2 Apple
      1 Banana
      1 Grapes
      1 Mango
      2 Orange
      1 Pineapple
cdac@LAPTOP-02EB1MBV:~/LinuxAssignment$
```