CDAC MUMBAI

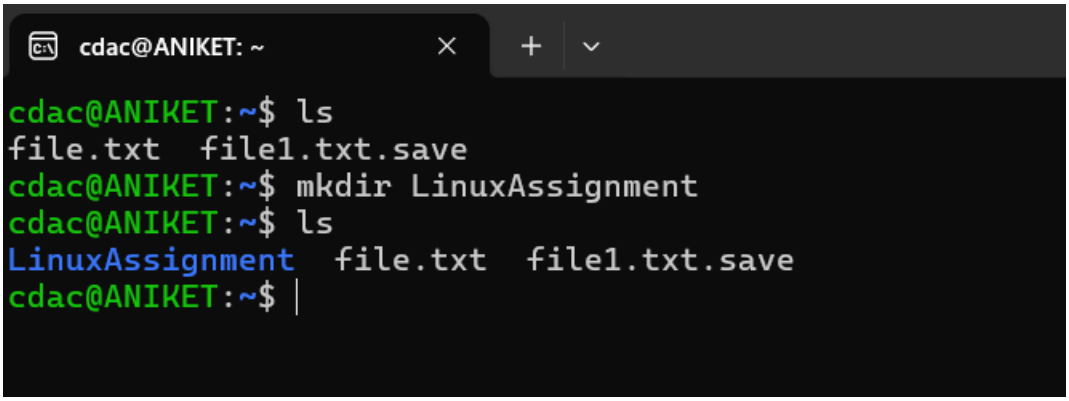
CONCEPT OF OPERATING SYSTEM

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:

Start by navigating to your home directory and list its contents. Then, move into a directory named "LinuxAssignment" if it exists; otherwise, create it.



- Blue color represents directories and white represents file

- **ls** command is used to list the files and directories.

- **mkdir** command is used to create new directories.

b) File Management:

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

```
cdac@ANIKET:~$ cd LinuxAssignment
cdac@ANIKET:~/LinuxAssignment$ ls
cdac@ANIKET:~/LinuxAssignment$ touch file1.txt
cdac@ANIKET:~/LinuxAssignment$ ls
file1.txt
cdac@ANIKET:~/LinuxAssignment$ nano file1.txt
cdac@ANIKET:~/LinuxAssignment$ bash file.txt
bash: file.txt: No such file or directory
cdac@ANIKET:~/LinuxAssignment$ cat file.txt
cat: file.txt: No such file or directory
cdac@ANIKET:~/LinuxAssignment$ cat file1.txt
Linux
Windows
iOS
Blackberry
Nokia
Eminem
Snoop Dogg
Bruce Lee
John Wick
cdac@ANIKET:~/LinuxAssignment$
```

- cd command is used to change directory.

- touch command is used to create new file.

- nano command is used to add and edit contents in the file. After editing to save the file Press **Ctrl + X** to save the file.

- cat command is used to view the contents in the file.

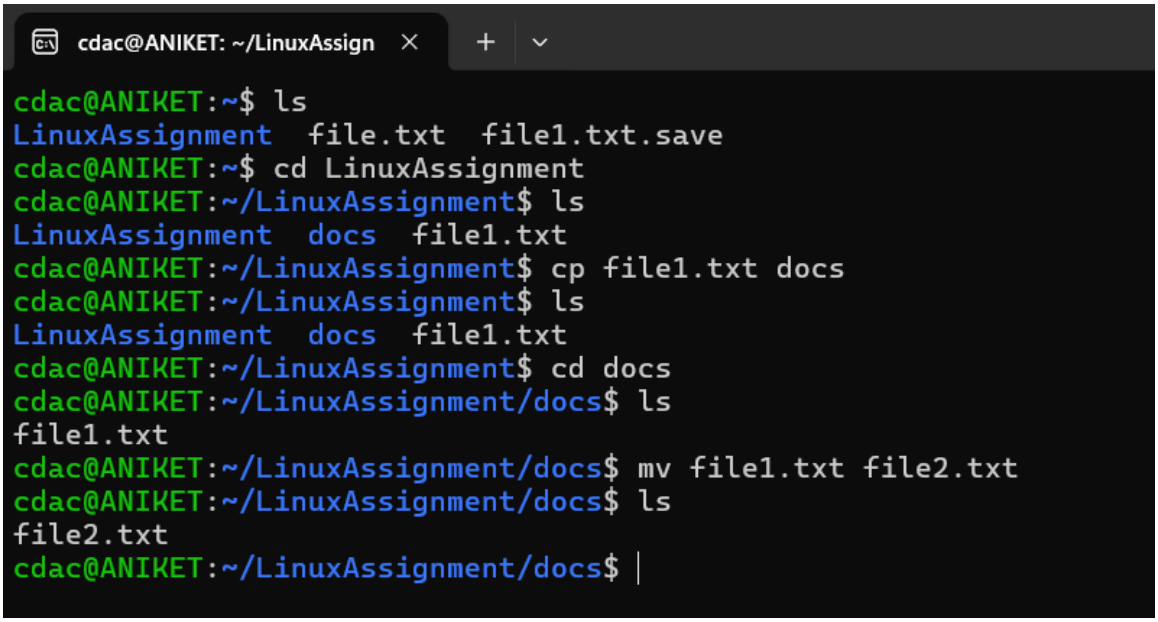
c) Directory Management:

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

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

d) Copy and Move Files:

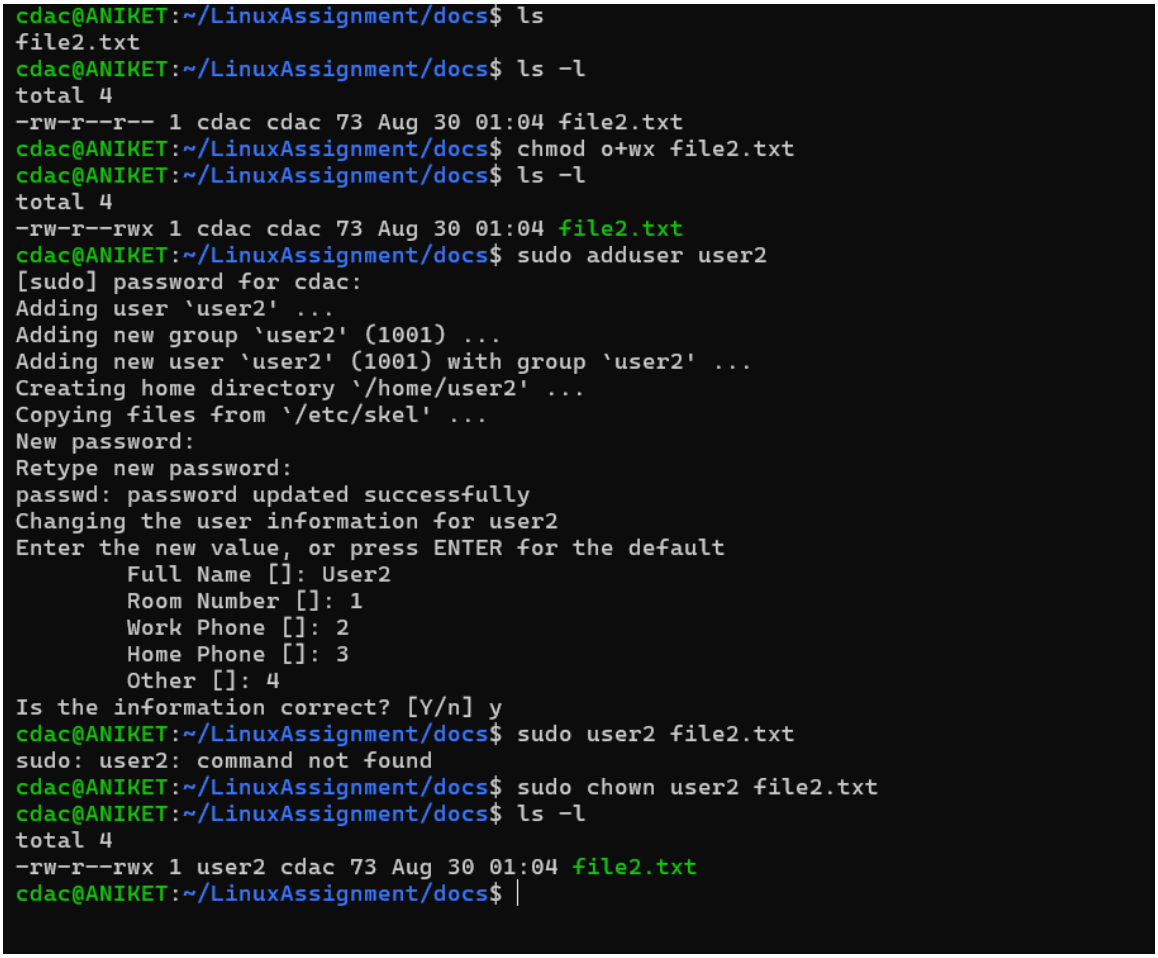
a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".



- cp command is used to copy the file from a path to another path.
Syntax : cp <Source> <Destination>.

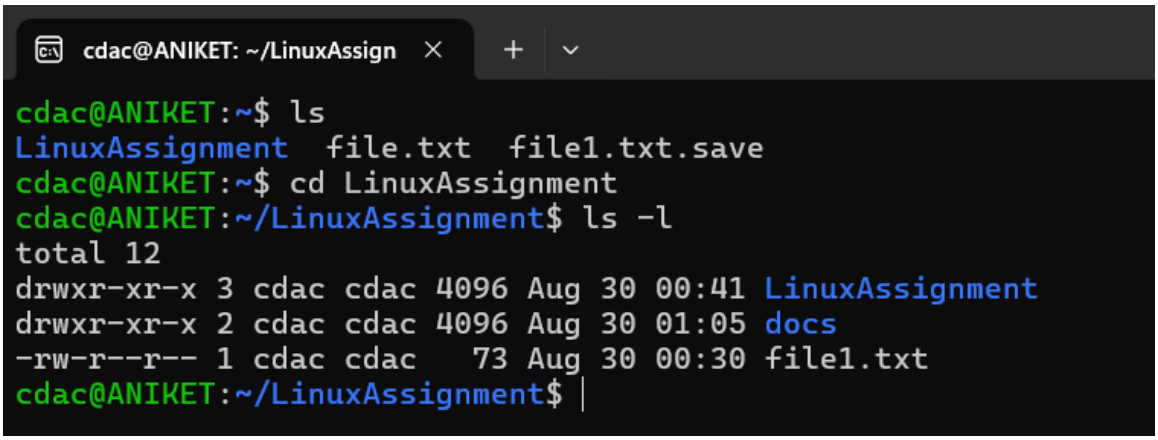
- mv command is used to move files and rename also.
Syntax: mv <Source> <Destination>.

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.



-ls -l command is used to list the files and see their permissions.
-sudo command is used to give root access.
- adduser command is used to add new users.
- chmod command is used to give permission to gain or revoke permissions for owner, group and others.
-chown command is used to change ownership of the file.

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).

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

- **find** command is used to search.
- **'-type f'** command means the type of file
- **"*.txt"** command is used to specify txt file.

```
cdac@ANIKET:~/LinuxAssignment/docs$ grep "a" file2.txt
Blackberry
Nokia
cdac@ANIKET:~/LinuxAssignment/docs$
```

h) System Information:

a. Display the current system date and time.

```
cdac@ANIKET:~/LinuxAssignment/docs$ date
Sat Aug 31 00:04:12 IST 2024
cdac@ANIKET:~/LinuxAssignment/docs$
```

i) Networking:

a. Display the IP address of the system.

```
cdac@ANIKET:~/LinuxAssignment/docs$ hostname -I
172.31.191.25
```

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

```
cdac@ANIKET:~/LinuxAssignment/docs$ ping www.google.com
PING www.google.com (142.250.182.228) 56(84) bytes of data.
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=1 ttl=55 time=3.78 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=2 ttl=55 time=9.23 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=3 ttl=55 time=8.60 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=4 ttl=55 time=3.67 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=5 ttl=55 time=8.04 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=6 ttl=55 time=3.08 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=7 ttl=55 time=6.65 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=8 ttl=55 time=10.3 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=9 ttl=55 time=8.57 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=10 ttl=55 time=10.4 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=11 ttl=55 time=9.31 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=12 ttl=55 time=12.9 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=13 ttl=55 time=8.74 ms
64 bytes from bom07s29-in-f4.1e100.net (142.250.182.228): icmp_seq=14 ttl=55 time=13.4 ms
^C
--- www.google.com ping statistics ---
14 packets transmitted, 14 received, 0% packet loss, time 13023ms
rtt min/avg/max/mdev = 3.079/8.331/13.431/3.046 ms
```

j) File Compression:

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

```
cdac@ANIKET:~/LinuxAssignment/docs$ zip -r docs . -i filedocs
Command 'zip' not found, but can be installed with:
sudo apt install zip
cdac@ANIKET:~/LinuxAssignment/docs$ 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
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 350 kB of archives.
After this operation, 929 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 unzip amd64 6.0-26ubuntu3.1 [174 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 zip amd64 3.0-12build2 [176 kB]
Fetched 350 kB in 2s (153 kB/s)
Selecting previously unselected package unzip.
(Reading database ... 24208 files and directories currently installed.)
Preparing to unpack .../unzip_6.0-26ubuntu3.1_amd64.deb ...
Unpacking unzip (6.0-26ubuntu3.1) ...
Selecting previously unselected package zip.
Preparing to unpack .../zip_3.0-12build2_amd64.deb ...
Unpacking zip (3.0-12build2) ...
Setting up unzip (6.0-26ubuntu3.1) ...
Setting up zip (3.0-12build2) ...
Processing triggers for man-db (2.10.2-1) ...
cdac@ANIKET:~/LinuxAssignment/docs$ zip -r docs . -i filedocs
        zip warning: zip file empty
cdac@ANIKET:~/LinuxAssignment/docs$ ls
docs.zip  file2.txt
cdac@ANIKET:~/LinuxAssignment/docs$
```

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

```
cdac@ANIKET:~/LinuxAssignment/docs$ unzip docs.zip -d newdocs
Archive:  docs.zip
warning [docs.zip]:  zipfile is empty
cdac@ANIKET:~/LinuxAssignment/docs$ ls
docs.zip  file2.txt  newdocs
cdac@ANIKET:~/LinuxAssignment/docs$ cd newdocs
cdac@ANIKET:~/LinuxAssignment/docs/newdocs$ ls
cdac@ANIKET:~/LinuxAssignment/docs/newdocs$
```

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@ANIKET:~$ ls
LinuxAssignment  file.txt  file1.txt.save
cdac@ANIKET:~$ cd LinuxAssignment
cdac@ANIKET:~/LinuxAssignment$ cat file1.txt
Linux
Windows
iOS
Blackberry
Nokia
Eminem
Snoop Dogg
Bruce Lee
John Wick
cdac@ANIKET:~/LinuxAssignment$ sed -i 's/Nokia/Microsoft/g' file1.txt
cdac@ANIKET:~/LinuxAssignment$ cat file1.txt
Linux
Windows
iOS
Blackberry
Microsoft
Eminem
Snoop Dogg
Bruce Lee
John Wick
cdac@ANIKET:~/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@ANIKET:~/LinuxAssignment$ nano data.txt
cdac@ANIKET:~/LinuxAssignment$ head data.txt
This
is
Linux
Shell
and
This
is
a
pratice
to
cdac@ANIKET:~/LinuxAssignment$
cdac@ANIKET:~/LinuxAssignment$ nano data.txt
cdac@ANIKET:~/LinuxAssignment$ head data.txt
This
is
Linux
Shell
and
This
is
a
pratice
to
cdac@ANIKET:~/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@ANIKET:~/LinuxAssignment$ tail -5 data.txt
to
become
expert
in
linux
cdac@ANIKET:~/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@ANIKET:~/LinuxAssignment$ nano numbers.txt
cdac@ANIKET:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@ANIKET:~/LinuxAssignment$
```

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

```
cdac@ANIKET:~/LinuxAssignment$ tail -3 numbers.txt
18
19
20
cdac@ANIKET:~/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@ANIKET:~/LinuxAssignment$ nano input.txt
cdac@ANIKET:~/LinuxAssignment$ tr a-z A-Z < ./input.txt >> output.txt
cdac@ANIKET:~/LinuxAssignment$ ls
LinuxAssignment  data.txt  docs  file1.txt  input.txt  numbers.txt  output.txt
cdac@ANIKET:~/LinuxAssignment$ cat output.txt
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
```

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@ANIKET:~/LinuxAssignment$ nano duplicate.txt
cdac@ANIKET:~/LinuxAssignment$ cat duplicate.txt | sort | uniq

Delhi
Goa
Mumbai
Orissa
Pune
Satara
cdac@ANIKET:~/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@ANIKET:~/LinuxAssignment$ nano fruit.txt
cdac@ANIKET:~/LinuxAssignment$ cat fruit.txt | sort | uniq -c
      2 apple
      2 banana
      1 blueberry
      1 dragonfruit
      2 grapes
      2 orange
cdac@ANIKET:~/LinuxAssignment$
```