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@DESKTOP-QGE8MLE:/home$
cdac@DESKTOP-QGE8MLE:/home$
cdac@DESKTOP-QGE8MLE:/home$ sudo mkdir LinuxAssignment
cdac@DESKTOP-QGE8MLE:/home$ ls
LinuxAssignment  cdac
cdac@DESKTOP-QGE8MLE:/home$ cd LinuxAssignment
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```

b) File Management:
a. Inside the "LinuxAssignment" directory, create a new file named "file1.txt". Display its contents.

```
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ touch file1.txt
touch: cannot touch 'file1.txt': Permission denied
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo touch file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ ls
file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo nano file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cat file1.txt
cdac
operating system
data structures
java
cpp
web programming

cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```

c) Directory Management:
a. Create a new directory named "docs" inside the "LinuxAssignment" directory.

```
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ ls
file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo mkdir Docs
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ ls
Docs   file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```

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

```
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cp file1.txt ~/Docs/file2.txt
cp: cannot create regular file '/home/cdac/Docs/file2.txt': No such file or directory
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cp file1.txt ~/Docs
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ ls
Docs  file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cd Docs
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ ls
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ ls
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ cp file1.txt ./Docs/file2.txt
cp: cannot stat 'file1.txt': No such file or directory
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ cd . ..
-bash: cd: too many arguments
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ cp file1.txt ./Docs/file2.txt
cp: cannot stat 'file1.txt': No such file or directory
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ cd ..
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cp file1.txt ./Docs/file2.txt
cp: cannot create regular file './Docs/file2.txt': Permission denied
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo cp file1.txt ./Docs/file2.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ ls
Docs  file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cd Docs
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ ls
file2.txt
cdac@DESKTOP-QGE8MLE:/home/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@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ ls
file2.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ chmod 644 file2.txt
chmod: changing permissions of 'file2.txt': Operation not permitted
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ sudo chmod 644 file2.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ -l
-l: command not found
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ ls
file2.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ ls -l
total 4
-rw-r--r-- 1 root root 64 Feb 27 17:28 file2.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ sudo chmod 777 file2.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ ls -l
total 4
-rwxrwxrwx 1 root root 64 Feb 27 17:28 file2.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ chown file2.txt
chown: missing operand after 'file2.txt'
Try 'chown --help' for more information.
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ chown cdac file2.txt
chown: changing ownership of 'file2.txt': Operation not permitted
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ sudo chown cdac file2.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ ls -l file2.txt
-rwxrwxrwx 1 cdac root 64 Feb 27 17:28 file2.txt
cdac@DESKTOP-QGE8MLE:/home/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@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ cat file1.txt
cat: file1.txt: No such file or directory
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ ls
file2.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment/Docs$ cd
cdac@DESKTOP-QGE8MLE:~$ cd ..
cdac@DESKTOP-QGE8MLE:/home$ ls
LinuxAssignment  cdac
cdac@DESKTOP-QGE8MLE:/home$ cat
^C
cdac@DESKTOP-QGE8MLE:/home$ cd
cdac@DESKTOP-QGE8MLE:~$ cd ..
cdac@DESKTOP-QGE8MLE:/home$ cd cdac
cdac@DESKTOP-QGE8MLE:~$ ls
CPP  Docs  nano.3971.save
cdac@DESKTOP-QGE8MLE:~$
```

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@DESKTOP-QGE8MLE:~$ cd
cdac@DESKTOP-QGE8MLE:~$ cd ..
cdac@DESKTOP-QGE8MLE:/home$ ls
LinuxAssignment  cdac
cdac@DESKTOP-QGE8MLE:/home$ find -name`*.txt`
*.txt: command not found
find: missing argument to `-name'
cdac@DESKTOP-QGE8MLE:/home$ *.txt
*.txt: command not found
cdac@DESKTOP-QGE8MLE:/home$ ls *.txt
ls: cannot access '*.txt': No such file or directory
cdac@DESKTOP-QGE8MLE:/home$ cd LinuxAssignment
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ ls *.txt
file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```

h) System Information:
a. Display the current system date and time.

```
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ date
Thu Feb 27 18:18:15 UTC 2025
cdac@DESKTOP-QGE8MLE:/home/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@DESKTOP-QGE8MLE:/home/LinuxAssignment$ hostname -
192.168.186.234
```

```
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ ping 192.168.186.234
PING 192.168.186.234 (192.168.186.234) 56(84) bytes of data.
64 bytes from 192.168.186.234: icmp_seq=1 ttl=64 time=0.059 ms
64 bytes from 192.168.186.234: icmp_seq=2 ttl=64 time=0.053 ms
64 bytes from 192.168.186.234: icmp_seq=3 ttl=64 time=0.048 ms
64 bytes from 192.168.186.234: icmp_seq=4 ttl=64 time=0.037 ms
64 bytes from 192.168.186.234: icmp_seq=5 ttl=64 time=0.042 ms
64 bytes from 192.168.186.234: icmp_seq=6 ttl=64 time=0.037 ms
64 bytes from 192.168.186.234: icmp_seq=7 ttl=64 time=0.035 ms
64 bytes from 192.168.186.234: icmp_seq=8 ttl=64 time=0.037 ms
^C
--- 192.168.186.234 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7609ms
rtt min/avg/max/mdev = 0.035/0.043/0.059/0.008 ms
```

j) File Compression:
a. Compress the "docs" directory into a zip file.

```
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ ls
Docs  file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ zip Docs file1.txt
zip I/O error: Permission denied
zip error: Could not create output file (Docs.zip)
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo zip Docs file1.txt
  adding: file1.txt (deflated 8%)
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```

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

```
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ unzip Docs.zip -d/path/to/new/directory
Archive:  Docs.zip
checkdir:  cannot create extraction directory: /path/to/new/directory
           No such file or directory
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ -d
-d: command not found
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ unzip Docs.zip -d
error:  must specify directory to which to extract with -d option
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ unzip Docs.zip -d extracted_files
Archive:  Docs.zip
checkdir:  cannot create extraction directory: extracted_files
           Permission denied
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo  unzip Docs.zip -d
docs1
Archive:  Docs.zip
  inflating: docs1/file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```

k) File Editing:
a. Open the "file1.txt" file in a text editor and add some text to it.

```
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ nano fil1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo nano file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo nano file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo nano file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```

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-QGE8MLE: /home/LinuxAssignment

  GNU nano 7.2                          file1.txt
cdac
operating system
data structures
java
cpp
web programming
```

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@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo nano file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cat file1.txt
cdac
operating system
data structures
java
cpp
python

cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo nano file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cat file1.txt
ncdac
operating system
data structures
java
cpp
mern stack


cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```

Type here to search

**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@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cd
cdac@DESKTOP-QGE8MLE:~$ cd ..
cdac@DESKTOP-QGE8MLE:/home$ ls
LinuxAssignment  cdac
cdac@DESKTOP-QGE8MLE:/home$ cd LinuxAssignment
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ cd file1.txt
-bash: cd: file1.txt: Not a directory
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ touch data.txt
touch: cannot touch 'data.txt': Permission denied
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ ls
Docs  Docs.zip  docs1  file1.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo
usage: sudo -h | -K | -k | -V
usage: sudo -v [-ABkNnS] [-g group] [-h host] [-p prompt] [-u user]
usage: sudo -l [-ABkNnS] [-g group] [-h host] [-p prompt] [-U user]
            [-u user] [command [arg ...]]
usage: sudo [-ABbEHkNnPS] [-r role] [-t type] [-C num] [-D directory]
            [-g group] [-h host] [-p prompt] [-R directory] [-T timeout]
            [-u user] [VAR=value] [-i | -s] [command [arg ...]]
usage: sudo -e [-ABkNnS] [-r role] [-t type] [-C num] [-D directory]
            [-g group] [-h host] [-p prompt] [-R directory] [-T timeout]
            [-u user] file ...
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ sudo nano data.txt
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ head -10 data.txt
a
b
c
d
b
g
u
i
o
p
cdac@DESKTOP-QGE8MLE:/home/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@DESKTOP-QGE8MLE:/home/LinuxAssignment$ tail -5 data.txt
i
o
p
q
w
cdac@DESKTOP-QGE8MLE:/home/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@DESKTOP-QGE8MLE:/home/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
1
5
67
7
4
5
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```

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

```
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$ tail -3 numbers.txt
5
5
5
cdac@DESKTOP-QGE8MLE:/home/LinuxAssignment$
```