

CDAC MUMBAI

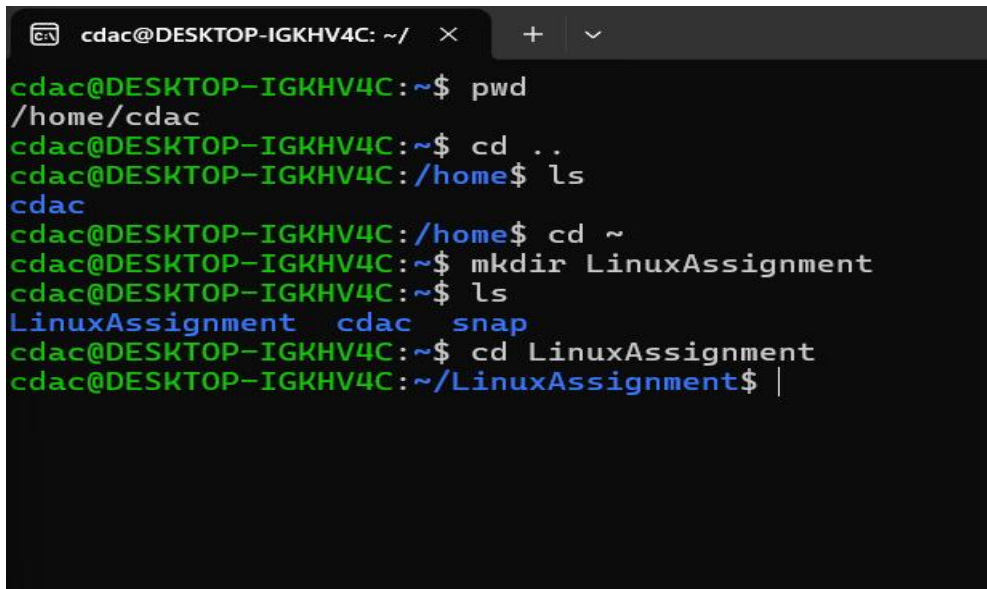
Concepts of Operating System

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:

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

A terminal window with a dark background and light-colored text. The window title bar shows 'cdac@DESKTOP-IGKHV4C: ~/'. The terminal output shows a series of commands and their results: 'pwd' returns '/home/cdac', 'cd ..' returns '/home', 'ls' lists 'cdac', 'cd ~' returns to the home directory, 'mkdir LinuxAssignment' creates the directory, 'ls' lists 'LinuxAssignment', and 'cd LinuxAssignment' moves into the directory. The prompt is now '~/LinuxAssignment\$'.

```
cdac@DESKTOP-IGKHV4C: ~$ pwd
/home/cdac
cdac@DESKTOP-IGKHV4C:~$ cd ..
cdac@DESKTOP-IGKHV4C:~/home$ ls
cdac
cdac@DESKTOP-IGKHV4C:~/home$ cd ~
cdac@DESKTOP-IGKHV4C:~$ mkdir LinuxAssignment
cdac@DESKTOP-IGKHV4C:~$ ls
LinuxAssignment cdac snap
cdac@DESKTOP-IGKHV4C:~$ cd LinuxAssignment
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ |
```

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

```
cdac@DESKTOP-IGKHV4C: ~/ × + ∨  
cdac@DESKTOP-IGKHV4C:~$ pwd  
/home/cdac  
cdac@DESKTOP-IGKHV4C:~$ ls  
LinuxAssignment cdac snap  
cdac@DESKTOP-IGKHV4C:~$ cd LinuxAssignment  
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ cat > file1.txt  
hey there!!!  
how are u doing?  
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ cat file1.txt  
hey there!!!  
how are u doing?  
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-IGKHV4C: ~/ × + ∨  
cdac@DESKTOP-IGKHV4C:~$ pwd  
/home/cdac  
cdac@DESKTOP-IGKHV4C:~$ ls  
LinuxAssignment cdac snap  
cdac@DESKTOP-IGKHV4C:~$ cd LinuxAssignment  
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ mkdir docs  
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ ls  
docs file1.txt  
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-IGKHV4C: ~/ + ~
cdac@DESKTOP-IGKHV4C:~$ ls
LinuxAssignment  s10.sh  s12.sh  s14.sh  s16.sh  s3.sh  s5.sh  s7.sh  s9.sh
cdac             s11.sh  s13.sh  s15.sh  s2.sh  s4.sh  s6.sh  s8.sh  snap
cdac@DESKTOP-IGKHV4C:~$ cd LinuxAssignment
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ cp file1.txt docs
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ cd docs
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment/docs$ ls
file1.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-IGKHV4C:~/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-IGKHV4C:~/LinuxAssignment/docs$ ls -l
total 4
-rw-r----- 1 cdac cdac 30 Aug 20 16:16 file2.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment/docs$ chmod u+rw ,g+r,o+r file2.txt
chmod: cannot access ',g+r,o+r': No such file or directory
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment/docs$ chmod u+rw,g+r,o+r file2.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 30 Aug 20 16:16 file2.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment/docs$ cd ..
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ chown cdac docs/file2.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Aug 20 16:19 docs
-rw-r--r-- 1 cdac cdac 30 Aug 19 13:14 file1.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ cd docs
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 30 Aug 20 16:16 file2.txt
cdac@DESKTOP-IGKHV4C:~/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-IGKHV4C: ~/LinuxAssignment/docs$ cd ..
cdac@DESKTOP-IGKHV4C: ~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Aug 20 16:19 docs
-rw-r--r-- 1 cdac cdac 30 Aug 19 13:14 file1.txt
cdac@DESKTOP-IGKHV4C: ~/LinuxAssignment$ ls -l /
total 2740
lrwxrwxrwx 1 root root 7 Apr 22 2024 bin -> usr/bin
drwxr-xr-x 2 root root 4096 Feb 26 2024 bin.usr-is-merged
drwxr-xr-x 2 root root 4096 Apr 22 2024 boot
drwxr-xr-x 15 root root 3860 Aug 20 16:13 dev
drwxr-xr-x 88 root root 4096 Aug 20 16:13 etc
drwxr-xr-x 3 root root 4096 Aug 18 16:24 home
-rwxrwxrwx 1 root root 2724480 Jul 31 14:56 init
lrwxrwxrwx 1 root root 7 Apr 22 2024 lib -> usr/lib
drwxr-xr-x 2 root root 4096 Apr 8 2024 lib.usr-is-merged
lrwxrwxrwx 1 root root 9 Apr 22 2024 lib64 -> usr/lib64
drwx----- 2 root root 16384 Aug 18 16:22 lost+found
drwxr-xr-x 2 root root 4096 Aug 5 16:55 media
drwxr-xr-x 6 root root 4096 Aug 18 16:23 mnt
drwxr-xr-x 2 root root 4096 Aug 5 16:55 opt
dr-xr-xr-x 247 root root 0 Aug 20 16:13 proc
drwx----- 3 root root 4096 Aug 5 16:57 root
drwxr-xr-x 19 root root 560 Aug 20 16:13 run
lrwxrwxrwx 1 root root 8 Apr 22 2024/sbin -> usr/sbin
drwxr-xr-x 2 root root 4096 Mar 31 2024/sbin.usr-is-merged
drwxr-xr-x 6 root root 4096 Aug 19 03:53 snap
drwxr-xr-x 2 root root 4096 Aug 5 16:55 srv
dr-xr-xr-x 13 root root 0 Aug 20 16:13 sys
drwxrwxrwt 8 root root 4096 Aug 20 16:33 tmp
drwxr-xr-x 12 root root 4096 Aug 5 16:55 usr
drwxr-xr-x 13 root root 4096 Aug 18 16:23 var
cdac@DESKTOP-IGKHV4C: ~/LinuxAssignment$ |
```

g) 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-IGKHV4C: ~/LinuxAssignment$ cd docs
cdac@DESKTOP-IGKHV4C: ~/LinuxAssignment/docs$ ls *.txt
file2.txt
cdac@DESKTOP-IGKHV4C: ~/LinuxAssignment/docs$ cat > file2.txt
hello everyone
how r u??
complete the assignmentcdac@DESKTOP-IGKHV4C: ~/LinuxAssignment/docs$
cdac@DESKTOP-IGKHV4C: ~/LinuxAssignment/docs$ grep "the" file2.txt
complete the assignment
cdac@DESKTOP-IGKHV4C: ~/LinuxAssignment/docs$ |
```

h) System Information: a. Display the current system date and time. 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-IGKHV4C: ~  
cdac@DESKTOP-IGKHV4C:~$ date  
Wed Aug 20 17:10:29 UTC 2025  
cdac@DESKTOP-IGKHV4C:~$ |
```

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-IGKHV4C: ~/LinuxAssignment  
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ ls  
data.txt docs file1.txt  
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ head -n 10 data.txt  
hey there  
how r u doing  
are u doing good  
hope u r doing good  
did u complete ur assignment  
deadline is of friday  
its necessary to complete the assignment  
work hard and complete  
the assignment is based on linux  
run the commands  
cdac@DESKTOP-IGKHV4C:~/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-IGKHV4C: ~/LinuxAssignment  
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ tail -n 5 data.txt  
the assignment is based on linux  
run the commands  
and prepare a word file having all screenshots  
ok  
else it will become more hassle  
cdac@DESKTOP-IGKHV4C:~/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-IGKHV4C: ~/LinuxAssignment$ ls
data.txt docs file1.txt numbers.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ head -n 15 numbers.txt
11
22
44
11
66
88
65
74
885
353
7785
357
896
43
72
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ tail -n 3 numbers.txt
43
72
47
cdac@DESKTOP-IGKHV4C:~/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@DESKTOP-IGKHV4C:~/LinuxAssignment$ ls
data.txt docs file1.txt input.txt numbers.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ cat input.txt
Former Trump National Security Adviser John Bolton has questioned the US decision to impose a 25% penalty on India for purchasing oil from Russia, while China faces no such sanctions, calling Washington's policy "confused" in an interview with Hindustan Times
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ tr 'a-z' 'A-Z' <input.txt> output.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ ls
data.txt docs file1.txt input.txt numbers.txt output.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ cat output.txt
FORMER TRUMP NATIONAL SECURITY ADVISER JOHN BOLTON HAS QUESTIONED THE US DECISION TO IMPOSE A 25% PENALTY ON INDIA FOR PURCHASING OIL FROM RUSSIA, WHILE CHINA FACES NO SUCH SANCTIONS, CALLING WASHINGTON'S POLICY "CONFUSED" IN AN INTERVIEW WITH HINDUSTAN TIMES
cdac@DESKTOP-IGKHV4C:~/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@DESKTOP-IGKHV4C: ~/LinuxAssignment$ ls
data.txt  duplicate.txt  input.txt  output.txt
docs      file1.txt     numbers.txt
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ cat duplicate.txt
hello
how
are
hello
yello
yellow
blue
blue
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ sort duplicate.txt | uniq
are
blue
hello
how
yello
yellow
```

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@DESKTOP-IGKHV4C:~/LinuxAssignment$ cat fruit.txt
banana
apple
banana
grapes
apple
apple
orange
grapes
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$ sort fruit.txt | uniq -c
  3 apple
  1 banana
  1 banana
  2 grapes
  1 orange
cdac@DESKTOP-IGKHV4C:~/LinuxAssignment$
```