

# Concepts of Operating System

## Assignment 1

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Problem 1-

- 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-150G8G6: ~/LinuxAssignment
cdac@DESKTOP-150G8G6:~$ pwd
/home/cdac
cdac@DESKTOP-150G8G6:~$ ls
Feb25
cdac@DESKTOP-150G8G6:~$ mkdir LinuxAssignment
cdac@DESKTOP-150G8G6:~$ ls
Feb25 LinuxAssignment
cdac@DESKTOP-150G8G6:~$ cd LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-150G8G6: ~/LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ cat file1.txt
Hello
Good Morning

cdac@DESKTOP-150G8G6:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-150G8G6: ~/LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-150G8G6: ~/LinuxAssignment/docs
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ cd docs
cdac@DESKTOP-150G8G6:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-150G8G6:~/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-150G8G6: ~/LinuxAssignment/docs
cdac@DESKTOP-150G8G6:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment/docs$ chmod 744 file2.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 20 Feb 27 16:34 file2.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment/docs$
```

```
cdac@DESKTOP-150G8G6: ~/LinuxAssignment/docs
cdac@DESKTOP-150G8G6:~/LinuxAssignment/docs$ chown cdac:cdac file2.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 20 Feb 27 16:34 file2.txt
cdac@DESKTOP-150G8G6:~/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-150G8G6: ~/LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls /
bin          etc          lib.usr-is-merged  opt          sbin         sys
bin.usr-is-merged  home        lib64              proc         sbin.usr-is-merged  tmp
boot         init         media              root         snap         usr
dev          lib          mnt                run          srv          var
cdac@DESKTOP-150G8G6:~/LinuxAssignment$
```

- g) File Searching: a. Search for all files with the extension ".txt" in the current directory and its subdirectories.

```
cdac@DESKTOP-150G8G6: ~
cdac@DESKTOP-150G8G6:~$ find . -name "*.txt"
./LinuxAssignment/docs/file2.txt
./LinuxAssignment/file1.txt
cdac@DESKTOP-150G8G6:~$
```

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

```
cdac@DESKTOP-150G8G6: ~/LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ grep "Good" file1.txt
Good Morning
cdac@DESKTOP-150G8G6:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-150G8G6: ~  
cdac@DESKTOP-150G8G6:~$ date  
Thu Feb 27 16:50:50 UTC 2025  
cdac@DESKTOP-150G8G6:~$
```

- i) Networking: a. Display the IP address of the system.

```
cdac@DESKTOP-150G8G6: ~  
cdac@DESKTOP-150G8G6:~$ ifconfig  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 1500  
    inet 127.0.0.1 netmask 255.0.0.0  
    inet6 ::1 prefixlen 128 scopeid 0xfe<compat,link,site,host>  
    loop (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  
  
wifio: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 192.168.0.112 netmask 255.255.255.0 broadcast 192.168.0.255  
    inet6 fe80::558d:f33d:1ca7:1b9c prefixlen 64 scopeid 0xfd<compat,link,site,host>  
    ether 68:14:01:b4:32:b5 (Ethernet)  
    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@DESKTOP-150G8G6:~$
```

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

```
cdac@DESKTOP-150G8G6: ~  
cdac@DESKTOP-150G8G6:~$ ping -c 4 134.23.2.3  
PING 134.23.2.3 (134.23.2.3) 56(84) bytes of data.  
  
--- 134.23.2.3 ping statistics ---  
4 packets transmitted, 0 received, 100% packet loss, time 3063ms  
  
cdac@DESKTOP-150G8G6:~$
```

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

```
cdac@DESKTOP-150G8G6: ~/LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-150G8G6: ~/LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ unzip docs.zip -d extra
Archive:  docs.zip
  creating: extra/docs/
  extracting: extra/docs/file2.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-150G8G6: ~/LinuxAssignment
cdac@DESKTOP-150G8G6:~$ ls
Feb25  LinuxAssignment
cdac@DESKTOP-150G8G6:~$ cd LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ ls
docs  docs.zip  extra  file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ cat file1.txt
Hello
Good Morning
Good to see you
Bye
Assignments
cdac@DESKTOP-150G8G6:~/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-150G8G6: ~/LinuxAssignment
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ cat file1.txt
Hello
Good Morning
Good to see you
Bye
Assignments
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ sed -i 's/Bye/Hey/g' file1.txt
cdac@DESKTOP-150G8G6:~/LinuxAssignment$ cat file1.txt
Hello
Good Morning
Good to see you
Hey
Assignments
cdac@DESKTOP-150G8G6:~/LinuxAssignment$
```

## Problem 2

- 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-150G8G6: ~
cdac@DESKTOP-150G8G6:~$ ls
Feb25  LinuxAssignment  data.txt
cdac@DESKTOP-150G8G6:~$ head -10 data.txt
Hello everyone
How are you
Cdac assignments
Hey
Good morning
Bye
Sanika
Engineering
College
Evening
cdac@DESKTOP-150G8G6:~$
```

- 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-150G8G6: ~  
  
cdac@DESKTOP-150G8G6:~$ ls  
Feb25  LinuxAssignment  data.txt  
cdac@DESKTOP-150G8G6:~$ tail -5 data.txt  
Sanika  
Engineering  
College  
Evening  
All the best  
cdac@DESKTOP-150G8G6:~$
```

- 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-150G8G6: ~  
  
cdac@DESKTOP-150G8G6:~$ head -n 15 numbers.txt  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
cdac@DESKTOP-150G8G6:~$
```

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

```
cdac@DESKTOP-150G8G6: ~  
  
cdac@DESKTOP-150G8G6:~$ tail -3 numbers.txt  
13  
14  
15  
cdac@DESKTOP-150G8G6:~$
```

- 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."

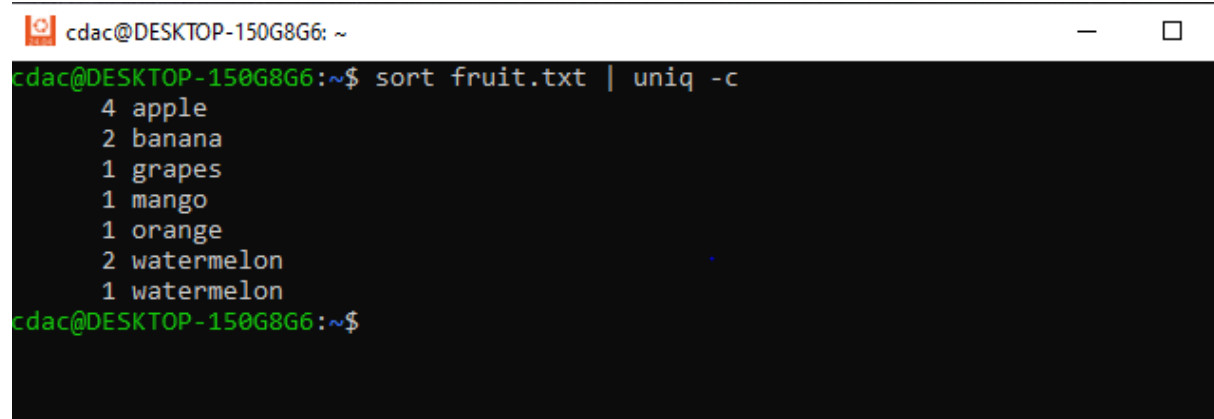
```
cdac@DESKTOP-150G8G6: ~  
cdac@DESKTOP-150G8G6:~$ tr 'a-z' 'A-Z' < input.txt > output.txt  
cdac@DESKTOP-150G8G6:~$ ls  
Feb25 LinuxAssignment data.txt input.txt numbers.txt output.txt  
cdac@DESKTOP-150G8G6:~$ cat output.txt  
HELLO  
HAVE A GOOD DAY  
BE KIND  
cdac@DESKTOP-150G8G6:~$
```

- 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-150G8G6: ~  
cdac@DESKTOP-150G8G6:~$ ls  
Feb25 data.txt input.txt output.txt  
LinuxAssignment duplicate.txt numbers.txt  
cdac@DESKTOP-150G8G6:~$ sort duplicate.txt | uniq  
Brazil  
Canada  
England  
France  
India  
Usa  
cdac@DESKTOP-150G8G6:~$
```



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-150G8G6: ~  
cdac@DESKTOP-150G8G6:~$ sort fruit.txt | uniq -c  
  4 apple  
  2 banana  
  1 grapes  
  1 mango  
  1 orange  
  2 watermelon  
  1 watermelon  
cdac@DESKTOP-150G8G6:~$
```

The image shows a terminal window with a black background and green text. The window title bar at the top reads "cdac@DESKTOP-150G8G6: ~" and includes standard window control buttons (minimize, maximize, close). The terminal content shows a user prompt "cdac@DESKTOP-150G8G6:~\$" followed by the command "sort fruit.txt | uniq -c". The output of the command is a list of fruits with their respective counts: "4 apple", "2 banana", "1 grapes", "1 mango", "1 orange", "2 watermelon", and "1 watermelon". The prompt "cdac@DESKTOP-150G8G6:~\$" appears again at the bottom, indicating the command has finished executing.