Concepts of Operating System

Assignment 1

Problem 1:
Steps:
1. Create new directory named "LinuxAssignment" using mkdir command.
   Command: mkdir LinuxAssignment

2.Inside the "LinuxAssignment" directory, create a new file named "file1.txt" using touch file1.text command.
   Command: touch file1.txt

3. Display content
   Command: cat file1.txt

4. Create a new directory named "docs" inside the "LinuxAssignment" directory. Navigate to LinuxAssignment directory and write the below command in terminal.
   Command: mkdir docs

5. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt"
   Command: cp file1.txt docs/file2.txt

6. Change the permissions of "file2.txt" to allow read, write, and execute permissions for the owner and only read permissions for others.
   Command: chmod 744 file2.txt

7.change the owner of "file2.txt" to the current user.
   Command: sudo chown cdac file2.txt

8. Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly
   Command for LinuxAssignment directory: ls -l LinuxAssignment
   Command for root directory: ls -l /

9. Search for all files with the extension ".txt" in the current directory and its subdirectories. Display lines containing a specific word in a file
   Command: find . -type f -name "*.txt"
   Command: grep "Lorem" file1.txt

10. Display the current system date and time.

Command: date

11. Display the IP address of the system.
   Command: ifconfig

12. Ping a remote server to check connectivity (provide a remote server address to ping).
   Command: ping www.google.com

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

14. Extract the contents of the zip file into a new directory.
   Command: unzip docs.zip -d docs1

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

16. 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/hello/hi/g' file1.txt

Problem 2:

1. 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.
   Command: head -n 10 data.txt

2. 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 -n 5 data.txt

3. 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.
   Command: head -n 15 numbers.txt

4. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt".
   Command: tail -n 3 numbers.txt

5. 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."
   Command: tr 'a-z' 'A-Z' < input.txt > output.txt

6. 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."
   Command: cat duplicate.txt | sort | uniq

7. 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."
   Command: cat fruit.txt | sort | uniq -c

Output:

```
cdac@Darshan:~$ find . -type f -name "*.txt"
./LinuxAssignment/docs/file2.txt
./LinuxAssignment/file1.txt
cdac@Darshan:~$ cd LinuxAssignment/
cdac@Darshan:~/LinuxAssignment$ grep "Lorem" file1.txt
Lorem Ipsum is simply dummy text of the printing and typesetting industry.
cdac@Darshan:~/LinuxAssignment$ date
Wed Feb 26 18:38:56 UTC 2025
cdac@Darshan:~/LinuxAssignment$ cd
cdac@Darshan:~$ ifconfig
Command 'ifconfig' not found, but can be installed with:
sudo apt install net-tools
cdac@Darshan:~$
```

```
cdac@Darshan:~$ 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

wifi0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.2  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::4734:4997:fd3b:e9  prefixlen 64  scopeid 0xfd<compat,link,site,host>
        ether 30:24:32:5b:e4:f1  (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@Darshan:~$ ping www.google.com
PING www.google.com (142.250.183.164) 56(84) bytes of data.
64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=1 ttl=59 time=10.5 ms
64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=2 ttl=59 time=10.3 ms
64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=3 ttl=59 time=9.61 ms
64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=4 ttl=59 time=9.80 ms
64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=5 ttl=59 time=9.87 ms
```

```
cdac@Darshan:~/docs$ touch xyz
cdac@Darshan:~/docs$ touch pqr
cdac@Darshan:~/docs$ ls
abc   docs.zip   pqr   xyz
cdac@Darshan:~/docs$ rm docs.zip
cdac@Darshan:~/docs$ ls
abc   pqr   xyz
cdac@Darshan:~/docs$ cd ..
cdac@Darshan:~$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/abc (stored 0%)
  adding: docs/pqr (stored 0%)
  adding: docs/xyz (stored 0%)
cdac@Darshan:~$ unzip docs.zip -d docs1
Archive:  docs.zip
   creating: docs1/docs/
 extracting: docs1/docs/abc
 extracting: docs1/docs/pqr
 extracting: docs1/docs/xyz
cdac@Darshan:~$ cd LinuxAssignment
cdac@Darshan:~/LinuxAssignment$ ls
docs   file1.txt
cdac@Darshan:~/LinuxAssignment$ nano file1.txt
cdac@Darshan:~/LinuxAssignment$ nano file1.txt
cdac@Darshan:~/LinuxAssignment$ sed -i 's/hello/hi/g' file1.txt
cdac@Darshan:~/LinuxAssignment$ cat file1.txt
Lorem Ipsum is simply dummy text of the printing and typesetting industry.
Lorem Ipsum is simply dummy text of the printing and typesetting industry.
hi
cdac@Darshan:~/LinuxAssignment$
```

```
hi
cdac@Darshan:~/LinuxAssignment$ nano file2.txt
cdac@Darshan:~/LinuxAssignment$ head -n 10 file2.txt
Cricket is a popular outdoor game played between two teams of 11 players.
The goal of cricket is to score more runs than the other team
Cricket is played on a pitch with two sets of three stumps, called wickets.
Cricket is played on a pitch with two sets of three stumps, called wickets.
The British introduced cricket to India in the early 1700s.
Cricket is played at both national and international levels.
Cricket is played in various formats, including Test matches and One-day internationals
Cricket is a bat-and-ball sport that involves batting, fielding, and bowling.
Cricket is played by males and females of all ages
Cricket is a global sport with a large following in stadiums and living rooms.
cdac@Darshan:~/LinuxAssignment$ tail -n 5 file2.txt
Cricket is played in various formats, including Test matches and One-day internationals
Cricket is a bat-and-ball sport that involves batting, fielding, and bowling.
Cricket is played by males and females of all ages
Cricket is a global sport with a large following in stadiums and living rooms.
Cricket is a contest between two teams, each consisting of eleven players
cdac@Darshan:~/LinuxAssignment$ nano numbers.txt
cdac@Darshan:~/LinuxAssignment$ head -n 15 numbers.txt
10
20
30
40
50
60
70
80
90
100
110
```

```
110
120
130
140
150
cdac@Darshan:~/LinuxAssignment$ tail -n 3 numbers.txt
180
190
200
cdac@Darshan:~/LinuxAssignment$ nano input.txt
cdac@Darshan:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@Darshan:~/LinuxAssignment$ cat output.txt
HELLO
cdac@Darshan:~/LinuxAssignment$ nano duplicate.txt
cdac@Darshan:~/LinuxAssignment$ cat duplicate.txt
Learn something new today
Learn something new today
cdac@Darshan:~/LinuxAssignment$ cat duplicate.txt | sort | uniq
Learn something new today
cdac@Darshan:~/LinuxAssignment$ nano fruit.txt
cdac@Darshan:~/LinuxAssignment$ cat fruit.txt | sort | uniq -c
      1
      5 Apple
      3 Bananas
      2 Lemon
cdac@Darshan:~/LinuxAssignment$
```