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@SANKET:~$ ls

cdac@SANKET:~$ mkdir LinuxAssignment

cdac@SANKET:~$ ls

LinuxAssignment

cdac@SANKET:~$
```

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

```
cdac@SANKET:~$ pwd
/home/cdac
cdac@SANKET:~$ cd LinuxAssignment/
cdac@SANKET:~/LinuxAssignment$ nano file1.txt
cdac@SANKET:~/LinuxAssignment$ cat file1.txt
Sanket Dagadu Ahire
C-DAC Kharghar
```

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

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

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

```
cdac@SANKET:~/LinuxAssignment$ touch docs/file2.txt
cdac@SANKET:~/LinuxAssignment$ head file1.txt > docs/file2.txt
cdac@SANKET:~/LinuxAssignment$ cat docs/file2.txt
Sanket Dagadu Ahire
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```

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@SANKET:~/LinuxAssignment/docs$ ls -l
total 4
-rw-r--r-- 1 cdac cdac 35 Aug 28 18:22 file2.txt
cdac@SANKET:~/LinuxAssignment/docs$ chmod u+rwx file2.txt
cdac@SANKET:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 35 Aug 28 18:22 file2.txt
cdac@SANKET:~/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@SANKET:~/LinuxAssignment/docs$ ls
file2.txt
cdac@SANKET:~/LinuxAssignment/docs$ cd ..
cdac@SANKET:~/LinuxAssignment$ ls
docs  file1.txt  nano  touch
cdac@SANKET:~/LinuxAssignment$ cd ..
cdac@SANKET:~$ ls
LinuxAssignment
cdac@SANKET:~$ cd ..
cdac@SANKET:/home$ ls
cdac
cdac@SANKET:/home$  cd ..
cdac@SANKET:/$ ls
bin   dev  home  lib   lib64   lost+found  mnt  proc  run   snap  sys  usr
boot  etc  init  lib32  libx32  media      opt  root  sbin  srv   tmp  var
cdac@SANKET:/$
```

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@SANKET:~/LinuxAssignment$ find *.txt
file1.txt
cdac@SANKET:~/LinuxAssignment$ grep "Sanket" file1.txt
Sanket Dagadu Ahire
cdac@SANKET:~/LinuxAssignment$
```

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

```
cdac@SANKET:~/LinuxAssignment$ date
Wed Aug 28 18:31:51 IST 2024
```

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@SANKET:~/LinuxAssignment$ hostname
SANKET
cdac@SANKET:~/LinuxAssignment$ hostname -i
127.0.1.1
cdac@SANKET:~/LinuxAssignment$
```

j) File Compression: a. Compress the "docs" directory into a zip file. b. Extract the contents of the zip file into a new directory.

```
cdac@SANKET:~/LinuxAssignment$ zip -r docs.zip docs
Command 'zip' not found, but can be installed with:
sudo apt install zip
cdac@SANKET:~/LinuxAssignment$ sudo apt install zip
[sudo] password for cdac:
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It iWaiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is held by process 6135 (unattended-upgr)
Waiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It iWaiting for cache lock: Could not get lock /var/lib/dpkg/lock-frontend. It is held by process 6135 (unattended-upgr)
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Reading package lists... 0%
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 128 not upgraded.
Need to get 350 kB of archives.
After this operation, 930 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 6.0-26ubuntu3.2 [175 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 zip amd64 3.0-12build2 [176 kB]
Fetched 350 kB in 1s (261 kB/s)
Selecting previously unselected package unzip.
(Reading database ... 24208 files and directories currently installed.)
Preparing to unpack .../unzip_6.0-26ubuntu3.2_amd64.deb ...
Unpacking unzip (6.0-26ubuntu3.2) ...
Selecting previously unselected package zip.
```

```
Preparing to unpack .../zip_3.0-12build2_amd64.deb ...
Unpacking zip (3.0-12build2) ...
Setting up unzip (6.0-26ubuntu3.2) ...
Setting up zip (3.0-12build2) ...
Processing triggers for man-db (2.10.2-1) ...
cdac@SANKET:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)

cdac@SANKET:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
cdac@SANKET:~/LinuxAssignment$ mkdir new
cdac@SANKET:~/LinuxAssignment$ unzip docs.zip -d new_docs
Archive:  docs.zip
   creating: new_docs/docs/
 extracting: new_docs/docs/file2.txt
cdac@SANKET:~/LinuxAssignment$
```

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@SANKET:~/LinuxAssignment$ nano file1.txt
cdac@SANKET:~/LinuxAssignment$ sed -i 's/Thank/HELLOSANKET/g' file1.txt
cdac@SANKET:~/LinuxAssignment$ cat file1.txt
Sanket Dagadu Ahire
C-DAC Kharghar
New Text Added by me
HELLOSANKET You
cdac@SANKET:~/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@SANKET:~/LinuxAssignment$ nano data.txt

cdac@SANKET:~/LinuxAssignment$ head -n 10 data.txt

Sanket

Ahire

C-DAC

Thank You
```

```
Best Luck
Thank you
Be positive
Happy
Good Thought
Demo Code
```

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@SANKET:~/LinuxAssignment$ tail -n 5 data.txt
Kharghar C-DAC
Linux Module
Thank you Sanket
How are yuo?
Good Bye
```

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@SANKET:~/LinuxAssignment$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
```

```
14
15
```

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

```
cdac@SANKET:~/LinuxAssignment$ tail -3 numbers.txt
18
19
20
```

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@SANKET:~/LinuxAssignment$ cat data.txt
Sanket
Ahire
C-DAC
Thank You
Best Luck
Thank you
Be positive
Happy
Good Thought
Demo Code
Hello Sanket
Computer Systems
Operating Syatems
Ubantu
Kharghar C-DAC
Linux Module
Thank you Sanket
How are yuo?
Good Bye
```

```
cdac@SANKET:~/LinuxAssignment$ tr 'a-z' 'A-Z' < data.txt > output.txt
cdac@SANKET:~/LinuxAssignment$ cat output.txt
SANKET
AHIRE
C-DAC
THANK YOU
BEST LUCK
THANK YOU
BE POSITIVE
HAPPY
GOOD THOUGHT
DEMO CODE
HELLO SANKET
COMPUTER SYSTEMS
OPERATING SYATEMS
UBANTU
KHARGHAR C-DAC
LINUX MODULE
THANK YOU SANKET
HOW ARE YUO?
GOOD BYE
```

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@SANKET:~/LinuxAssignment$ sort fruit.txt | uniq
Apricot
Banana
Berry
Blueberry
Cherry
Grapefruit
Lemon
```

```
Mango
Orange
Papaya
Strawberry
```

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@SANKET:~/LinuxAssignment$ sort fruit.txt | uniq -c
      1 Apricot
      3 Banana
      1 Berry
      1 Blueberry
      1 Cherry
      1 Grapefruit
      1 Lemon
      3 Mango
      3 Orange
      1 Papaya
      1 Strawberry
```