**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.**

1. **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@SOHEL:~$ pwd

/home/cdac

cdac@SOHEL:~$ ls

file1 file2 pgm.sh pgm.sh.save shp1.sh

cdac@SOHEL:~$ cd file1

cdac@SOHEL:~/file1$ ls

file1.1

cdac@SOHEL:~/file1$ cd file1.1/

cdac@SOHEL:~/file1/file1.1$ ls

a.txt

cdac@SOHEL:~/file1/file1.1$ cd ..

cdac@SOHEL:~/file1$ cd

cdac@SOHEL:~$ mkdir LinuxAssignment

cdac@SOHEL:~$ ls

LinuxAssignment file1 file2 pgm.sh pgm.sh.save shp1.sh

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

>>>cdac@SOHEL:~/LinuxAssignment$ touch file1.txt

cdac@SOHEL:~/LinuxAssignment$ nano file1.txt

cdac@SOHEL:~/LinuxAssignment$ cat file1.txt

hii

welcome to Linuxx

1. **Directory Management**: a. Create a new directory named "docs" inside the "LinuxAssignment" directory.

>>cdac@SOHEL:~/LinuxAssignment$ mkdir docs

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

>>>cdac@SOHEL:~/LinuxAssignment$ **cp file1.txt docs/file2.txt**

**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@SOHEL:~/LinuxAssignment/docs$ ls -l

total 4

-rw-r--r-- 1 cdac cdac 22 Aug 30 22:04 file2.txt

cdac@SOHEL:~/LinuxAssignment/docs$ **chmod u+wx file2.txt**

cdac@SOHEL:~/LinuxAssignment/docs$ ls -l

total 4

**-rwxr--r-- 1 cdac cdac 22 Aug 30 22:04 file2.txt**

cdac@SOHEL:~/LinuxAssignment/docs$ ls -l

total 4

-rwxr--r-- 1 **cdac** cdac 22 Aug 30 22:04 file2.txt

cdac@SOHEL:~/LinuxAssignment/docs$ chown user2 file2.txt

chown: changing ownership of 'file2.txt': Operation not permitted

cdac@SOHEL:~/LinuxAssignment/docs$ sudo chown user2 file2.txt

[sudo] password for cdac:

cdac@SOHEL:~/LinuxAssignment/docs$ ls -l

total 4

-rwxr--r-- 1 **user2** cdac 22 Aug 30 22:04 file2.txt

cdac@SOHEL:~/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@SOHEL:~/LinuxAssignment/docs$ cd ..

cdac@SOHEL:~/LinuxAssignment$ ls -l

total 8

drwxr-xr-x 2 cdac cdac 4096 Aug 30 22:04 docs

-rw-r--r-- 1 cdac cdac 22 Aug 30 22:01 file1.txt

cdac@SOHEL:~/LinuxAssignment$ 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

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

>>> cdac@SOHEL:~/LinuxAssignment$ **find . -type f -name "\*.txt"**

./file1.txt

./docs/file2.txt

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

cdac@SOHEL:~/LinuxAssignment$ ls

docs file1.txt

cdac@SOHEL:~/LinuxAssignment$ cat file1.txt

hii

welcome to Linuxx

cdac@SOHEL:~/LinuxAssignment$ **grep "to" file1.txt**

welcome to Linuxx

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

>>>>>cdac@SOHEL:~/LinuxAssignment$ **date**

Fri Aug 30 22:33:58 IST 2024

cdac@SOHEL:~/LinuxAssignment$ **date "+%Y-%m-%d"**

2024-08-30

cdac@SOHEL:~/LinuxAssignment$ **date "+%H:%m:%s"**

22:08:1725037543

**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@SOHEL:~/LinuxAssignment$ **ip addr show**

1: lo: <LOOPBACK,UP,LOWER\_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000

link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00

inet 127.0.0.1/8 scope host lo

valid\_lft forever preferred\_lft forever

inet6 ::1/128 scope host

valid\_lft forever preferred\_lft forever

2: eth0: <BROADCAST,MULTICAST,UP,LOWER\_UP> mtu 1500 qdisc mq state UP group default qlen 1000

link/ether 00:15:5d:13:e8:2c brd ff:ff:ff:ff:ff:ff

inet 172.18.199.227/20 brd 172.18.207.255 scope global eth0

valid\_lft forever preferred\_lft forever

inet6 fe80::215:5dff:fe13:e82c/64 scope link

valid\_lft forever preferred\_lft forever

cdac@SOHEL:~/LinuxAssignment$ **ping www.google.com**

PING www.google.com (142.251.42.36) 56(84) bytes of data.

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=1 ttl=60 time=12.7 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=2 ttl=60 time=13.7 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=3 ttl=60 time=14.4 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=4 ttl=60 time=11.5 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=5 ttl=60 time=12.9 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=6 ttl=60 time=62.5 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=7 ttl=60 time=11.7 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=8 ttl=60 time=12.8 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=9 ttl=60 time=22.1 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=10 ttl=60 time=11.0 ms

64 bytes from bom12s20-in-f4.1e100.net (142.251.42.36): icmp\_seq=11 ttl=60 time=12.1 ms

^C

--- www.google.com ping statistics ---

11 packets transmitted, 11 received, 0% packet loss, time 10016ms

rtt min/avg/max/mdev = 11.024/17.953/62.524/14.389 ms

**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@SOHEL:~/LinuxAssignment$ **zip -r docs.zip docs**

updating: docs/ (stored 0%)

updating: docs/file2.txt (stored 0%)

cdac@SOHEL:~/LinuxAssignment$ ls

docs docs.zip file1.txt

cdac@SOHEL:~/LinuxAssignment$ mkdir unzip\_doc

cdac@SOHEL:~/LinuxAssignment$ ls

docs docs.zip file1.txt unzip\_doc

cdac@SOHEL:~/LinuxAssignment**$ unzip docs.zip -d unzip\_doc**

Archive: docs.zip

creating: unzip\_doc/docs/

extracting: unzip\_doc/docs/file2.txt

**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).

**Problem 2: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.**

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.

>>>>**head data.txt**

1. Now, to check the end of the file for any recent additions, display the last 5 lines of "data.txt" using another command.

>>>>**tail -5.txt**

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.

>>>>>>>>>**head -15 num.txt**

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

>>>>>>>>>>**tail -3 num.txt**

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@SOHEL:~/LinuxAssignment$ **tr '[:lower:]' '[:upper:]' < in.txt > out.txt**

cdac@SOHEL:~/LinuxAssignment$ cat in.txt

abs sdf

cdfv

cdac@SOHEL:~/LinuxAssignment$ cat out.txt

ABS SDF

CDFV

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@SOHEL:~/LinuxAssignment$ cat duplicate.txt

one

two

two

three

three

three

cdac@SOHEL:~/LinuxAssignment$ **sort duplicate.txt | uniq**

one

three

two

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@SOHEL:~/LinuxAssignment$ nano fruit.txt

cdac@SOHEL:~/LinuxAssignment$ cat fruit.txt

apple

apple

mango

mango

mango

lemon

cdac@SOHEL:~/LinuxAssignment$ sort fruit.txt | uniq -c

2 apple

1 lemon

3 mango