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:**
b) **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@ZEROBOOK13:~$ pwd

/home/cdac

cdac@ZEROBOOK13:~$ ls

new_directory

cdac@ZEROBOOK13:~$ mkdir LinuxAssignment

cdac@ZEROBOOK13:~$ ls

LinuxAssignment new_directory

b) File Management:

a. Inside the "LinuxAssignment" directory, create a new file named "file1.txt". Display its contents.

cdac@ZEROBOOK13:~$ cd LinuxAssignment

cdac@ZEROBOOK13:~/LinuxAssignment$ touch file1.txt

cdac@ZEROBOOK13:~/LinuxAssignment$ nano file1.txt

cdac@ZEROBOOK13:~/LinuxAssignment$ cat file1.txt

Information

Memory

Operation

Program

Result

Control

Output

Speed

c) Directory Management:

a. Create a new directory named "docs" inside the "LinuxAssignment" directory.

cdac@ZEROBOOK13:~/LinuxAssignment$ mkdir docs

cdac@ZEROBOOK13:~/LinuxAssignment$ ls

docs file1.txt

d) Copy and Move Files:

a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".

cdac@ZEROBOOK13:~/LinuxAssignment$ cp file1.txt docs/

cdac@ZEROBOOK13:~/LinuxAssignment$ ls

docs file1.txt

cdac@ZEROBOOK13:~/LinuxAssignment$ cd docs

cdac@ZEROBOOK13:~/LinuxAssignment/docs$ ls

file1.txt

cdac@ZEROBOOK13:~/LinuxAssignment/docs$ rename 's/file1/file2/' file1.txt

cdac@ZEROBOOK13:~/LinuxAssignment/docs$ ls

cdac@ZEROBOOK13:~/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@ZEROBOOK13:~/LinuxAssignment/docs$ ls -l

total 4

-rw-r--r-- 1 cdac cdac 65 Feb 26 16:59 file2.txt

cdac@ZEROBOOK13:~/LinuxAssignment/docs$ chmod u+x file2.txt

cdac@ZEROBOOK13:~/LinuxAssignment/docs$ ls -l

total 4

-rwxr--r-- 1 cdac cdac 65 Feb 26 16:59 file2.txt

cdac@ZEROBOOK13:~/LinuxAssignment/docs$ chown cdac file2.txt

cdac@ZEROBOOK13:~/LinuxAssignment/docs$ ls -l

total 4

-rwxr--r-- 1 cdac cdac 65 Feb 26 16:59 file2.txt

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@ZEROBOOK13:~/LinuxAssignment/docs$ cd ..

cdac@ZEROBOOK13:~/LinuxAssignment$ pwd

/home/cdac/LinuxAssignment

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@ZEROBOOK13:~/LinuxAssignment$ find . -type f -name "*.txt"

./file1.txt

./docs/file2.txt

cdac@ZEROBOOK13:~/LinuxAssignment$ grep -rw 'file1.txt' -e 'result'

cdac@ZEROBOOK13:~/LinuxAssignment$ grep -rw 'file1.txt' -e 'Result'

Result

cdac@ZEROBOOK13:~/LinuxAssignment$ grep -rw 'file1.txt' -e 'ro'

cdac@ZEROBOOK13:~/LinuxAssignment$ grep -r 'file1.txt' -e 'ro'

Program

Control

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

cdac@ZEROBOOK13:~/LinuxAssignment$ date "+%D%T"

02/26/2518:20:38

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@ZEROBOOK13:~/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

inet 10.255.255.254/32 brd 10.255.255.254 scope global 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:b8:52:de brd ff:ff:ff:ff:ff:ff

inet 172.20.198.178/20 brd 172.20.207.255 scope global eth0

cdac@ZEROBOOK13:~/LinuxAssignment$

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

cdac@ZEROBOOK13:~/LinuxAssignment$ 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=116 time=48.3 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=2 ttl=116 time=14.8 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=3 ttl=116 time=29.8 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=4 ttl=116 time=38.2 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=5 ttl=116 time=2214 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=6 ttl=116 time=1210 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=7 ttl=116 time=519 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=8 ttl=116 time=528 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=9 ttl=116 time=411 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=10 ttl=116 time=77.2 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=11 ttl=116 time=235 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=12 ttl=116 time=140 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=13 ttl=116 time=68.9 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=14 ttl=116 time=103 ms

64 bytes from bom07s32-in-f4.1e100.net (142.250.183.164): icmp_seq=15 ttl=116 time=74.8 ms

^C

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

15 packets transmitted, 15 received, 0% packet loss, time 14157ms

rtt min/avg/max/mdev = 14.818/380.724/2214.144/578.190 ms, pipe 3

cdac@ZEROBOOK13:~/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@ZEROBOOK13:~/LinuxAssignment/docs$ cd ..

cdac@ZEROBOOK13:~/LinuxAssignment$ zip -r docs.zip docs

  adding: docs/ (stored 0%)

  adding: docs/file2.txt (deflated 3%)

cdac@ZEROBOOK13:~/LinuxAssignment$ unzip docs.zip -d zip_file_cont

ent

Archive: docs.zip

```
  creating: zip_file_content/docs/
 inflating: zip_file_content/docs/file2.txt
cdac@ZEROBOOK13:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt  zip_file_content
cdac@ZEROBOOK13:~/LinuxAssignment$ cd zip_file_content
cdac@ZEROBOOK13:~/LinuxAssignment/zip_file_content$ ls
docs
cdac@ZEROBOOK13:~/LinuxAssignment/zip_file_content$ cd docs
cdac@ZEROBOOK13:~/LinuxAssignment/zip_file_content/docs$ ls
file2.txt
cdac@ZEROBOOK13:~/LinuxAssignment/zip_file_content/docs$
```

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@ZEROBOOK13:~/LinuxAssignment$ sed -i 's/instruction/answer/g'
 file1.txt
cdac@ZEROBOOK13:~/LinuxAssignment$ cat file1.txt
Information
Memory
Operation
Program
Result
Control
Output
Speed
Read the answer carefully
cdac@ZEROBOOK13:~/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@ZEROBOOK13:~/LinuxAssignment$ touch data.txt
cdac@ZEROBOOK13:~/LinuxAssignment$ ls
data.txt  docs  docs.zip  file1.txt  zip_file_content
cdac@ZEROBOOK13:~/LinuxAssignment$ nano data.txt
cdac@ZEROBOOK13:~/LinuxAssignment$ head -10 data.txt
suppose
you
have
file
data
containing
important
information
display
quickly
cdac@ZEROBOOK13:~/LinuxAssignment$ cat data.txt
suppose
you
have
file
data
containing
important
information
display
quickly
```

glance

command

now

check

end

recent

cdac@ZEROBOOK13:~/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@ZEROBOOK13:~/LinuxAssignment$ tail -5 data.txt

command

now

check

end

recent

cdac@ZEROBOOK13:~/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@ZEROBOOK13:~/LinuxAssignment$ touch numbers.txt

cdac@ZEROBOOK13:~/LinuxAssignment$ nano numbers.txt

cdac@ZEROBOOK13:~/LinuxAssignment$ head -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@ZEROBOOK13:~/LinuxAssignment$ tail -4 numbers.txt

18

19

20

cdac@ZEROBOOK13:~/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@ZEROBOOK13:~/LinuxAssignment$ mkdir transform

cdac@ZEROBOOK13:~/LinuxAssignment$ cd transform

cdac@ZEROBOOK13:~/LinuxAssignment/transform$ touch input.txt

cdac@ZEROBOOK13:~/LinuxAssignment/transform$ nano input.txt

cdac@ZEROBOOK13:~/LinuxAssignment/transform$ awk '{ print toupper($0) }' input.txt > output.txt

cdac@ZEROBOOK13:~/LinuxAssignment/transform$ cat output.txt

A B C D

E F G H

I J K L

M N O P

Q R S T

U V W X

X Y

cdac@ZEROBOOK13:~/LinuxAssignment/transform$

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@ZEROBOOK13:~/LinuxAssignment/transform$ cat duplicate.txt

help

exit

writeout

read file

replace

where

cut

paste

help

exit

writeout

replace

cut

paste

location

location

location

cut

cut

cut

copy

copy

cdac@ZEROBOOK13:~/LinuxAssignment/transform$ sort duplicate.txt | uniq

copy

cut

exit

help

location

paste

read file

replace

where

writeout

cdac@ZEROBOOK13:~/LinuxAssignment/transform$

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@ZEROBOOK13:~/LinuxAssignment/transform$ touch fruit.txt

cdac@ZEROBOOK13:~/LinuxAssignment/transform$ nano fruit.txt

cdac@ZEROBOOK13:~/LinuxAssignment/transform$ cat fruit.txt

apple

banana

apple

banana

chiku

chiku

mango

grapes

orange

grapes

orange

mango

apple

banana

grape

mango

mango

```
cdac@ZEROBOOK13:~/LinuxAssignment/transform$ sort fruit.txt | uniq -c
      3 apple
      3 banana
      2 chiku
      1 grape
      2 grapes
      4 mango
      2 orange
cdac@ZEROBOOK13:~/LinuxAssignment/transform$
```