CDAC MUMBAI

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.

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

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

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

f) **Final Checklist:**
   a. Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly.

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).

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

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).

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

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@Neha:~$ su
Password:
su: Authentication failure
cdac@Neha:~$ su
Password:
su: Authentication failure
cdac@Neha:~$ sudo nano /etx.sudoers
[sudo] password for cdac:
cdac@Neha:~$
cdac@Neha:~$ ls
cdac@Neha:~$ pwd
/home/cdac
cdac@Neha:~$ cd /home/
cdac@Neha:/home$ ls
cdac
cdac@Neha:/home$ cd linuxassignment
-bash: cd: linuxassignment: No such file or directory
cdac@Neha:/home$ cd linuxassignment
-bash: cd: linuxassignment: No such file or directory
cdac@Neha:/home$ cd cdac
cdac@Neha:~$ mkdir linuxassignment
cdac@Neha:~$ ls
linuxassignment
cdac@Neha:~$ cd linuxassignment
cdac@Neha:~/linuxassignment$ mkdir docs
cdac@Neha:~/linuxassignment$ ls
docs
cdac@Neha:~/linuxassignment$ touch file1.txt
cdac@Neha:~/linuxassignment$ nano file1.txt
cdac@Neha:~/linuxassignment$ ls
docs  file1.txt
cdac@Neha:~/linuxassignment$ cp file1.txt
cp: missing destination file operand after 'file1.txt'
Try 'cp --help' for more information.
cdac@Neha:~/linuxassignment$ cp file1.txt docs/file2.txt
cdac@Neha:~/linuxassignment$ ls
docs  file1.txt
cdac@Neha:~/linuxassignment$ chmod 744 docs/file2.txt
cdac@Neha:~/linuxassignment$ chown $(whoami) docs/file2.txt
cdac@Neha:~/linuxassignment$ ls -l docs/file2.txt
-rwxr--r-- 1 cdac cdac 0 Feb 27 12:33 docs/file2.txt
```
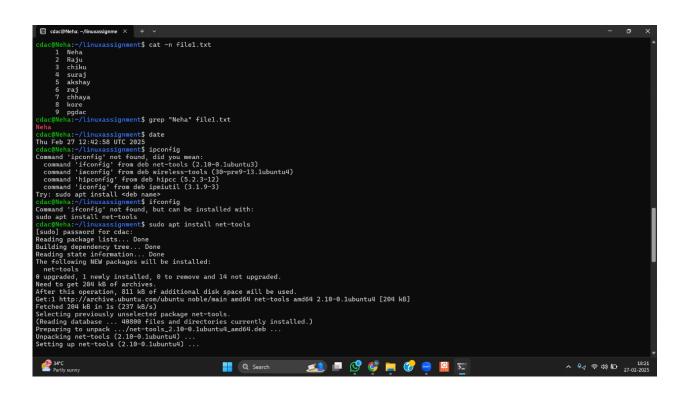


```
cdac@Neha:~/linuxassignment$ ls -l docs/file2.txt
-rwxr--r-- 1 cdac cdac 0 Feb 27 12:33 docs/file2.txt
cdac@Neha:~/linuxassignment$ ls -l LinuxAssignment
ls: cannot access 'LinuxAssignment': No such file or directory
cdac@Neha:~/linuxassignment$ ls -l linuxAssignment
ls: cannot access 'linuxAssignment': No such file or directory
cdac@Neha:~/linuxassignment$ ls -l /
total 2448
lrwxrwxrwx   1 root root       7 Apr 22  2024 bin -> usr/bin
drwxr-xr-x   2 root root    4096 Feb 26  2024 bin.usr-is-merged
drwxr-xr-x   2 root root    4096 Apr 22  2024 boot
drwxr-xr-x  16 root root    3580 Feb 27 05:51 dev
drwxr-xr-x  88 root root    4096 Feb 27 12:20 etc
drwxr-xr-x   3 root root    4096 Feb 27 12:10 home
-rwxrwxrwx   1 root root 2424984 Feb 12 00:59 init
lrwxrwxrwx   1 root root       7 Apr 22  2024 lib -> usr/lib
drwxr-xr-x   2 root root    4096 Apr  8  2024 lib.usr-is-merged
lrwxrwxrwx   1 root root       9 Apr 22  2024 lib64 -> usr/lib64
drwx------   2 root root   16384 Feb 24 12:05 lost+found
drwxr-xr-x   2 root root    4096 Jan  6 20:13 media
drwxr-xr-x   7 root root    4096 Feb 24 12:06 mnt
drwxr-xr-x   2 root root    4096 Jan  6 20:13 opt
dr-xr-xr-x 202 root root       0 Feb 27 05:51 proc
drwx------   5 root root    4096 Feb 26 16:10 root
drwxr-xr-x  19 root root     580 Feb 27 06:37 run
lrwxrwxrwx   1 root root       8 Apr 22  2024 sbin -> usr/sbin
drwxr-xr-x   2 root root    4096 Mar 31  2024 sbin.usr-is-merged
drwxr-xr-x   2 root root    4096 Feb 24 12:06 snap
drwxr-xr-x   2 root root    4096 Jan  6 20:13 srv
dr-xr-xr-x  11 root root       0 Feb 27 05:51 sys
drwxrwxrwt  12 root root    4096 Feb 27 06:37 tmp
drwxr-xr-x  12 root root    4096 Jan  6 20:13 usr
drwxr-xr-x  13 root root    4096 Feb 24 12:06 var
cdac@Neha:~/linuxassignment$ ls -lah linuxAssignment
ls: cannot access 'linuxAssignment': No such file or directory
cdac@Neha:~/linuxassignment$ ls -lah /
total 2.4M
drwxr-xr-x  22 root root 4.0K Feb 27 12:21 .
drwxr-xr-x  22 root root 4.0K Feb 27 12:21 ..
lrwxrwxrwx   1 root root    7 Apr 22  2024 bin -> usr/bin
drwxr-xr-x   2 root root 4.0K Feb 26  2024 bin.usr-is-merged
```

```
drwxr-xr-x    2 root root 4.0K Feb 26  2024 bin.usr-is-merged
drwxr-xr-x    2 root root 4.0K Apr 22  2024 boot
drwxr-xr-x   16 root root 3.5K Feb 27 05:51 dev
drwxr-xr-x   88 root root 4.0K Feb 27 12:20 etc
drwxr-xr-x    3 root root 4.0K Feb 27 12:10 home
-rwxrwxrwx    1 root root 2.4M Feb 12 00:59 init
lrwxrwxrwx    1 root root    7 Apr 22  2024 lib -> usr/lib
drwxr-xr-x    2 root root 4.0K Apr  8  2024 lib.usr-is-merged
lrwxrwxrwx    1 root root    9 Apr 22  2024 lib64 -> usr/lib64
drwx------    2 root root  16K Feb 24 12:05 lost+found
drwxr-xr-x    2 root root 4.0K Jan  6 20:13 media
drwxr-xr-x    7 root root 4.0K Feb 24 12:06 mnt
drwxr-xr-x    2 root root 4.0K Jan  6 20:13 opt
dr-xr-xr-x  203 root root    0 Feb 27 05:51 proc
drwx------    5 root root 4.0K Feb 26 16:10 root
drwxr-xr-x   19 root root  580 Feb 27 06:37 run
lrwxrwxrwx    1 root root    8 Apr 22  2024 sbin -> usr/sbin
drwxr-xr-x    2 root root 4.0K Mar 31  2024 sbin.usr-is-merged
drwxr-xr-x    2 root root 4.0K Feb 24 12:06 snap
drwxr-xr-x    2 root root 4.0K Jan  6 20:13 srv
dr-xr-xr-x   11 root root    0 Feb 27 12:38 sys
drwxrwxrwt   12 root root 4.0K Feb 27 06:37 tmp
drwxr-xr-x   12 root root 4.0K Jan  6 20:13 usr
drwxr-xr-x   13 root root 4.0K Feb 24 12:06 var
cdac@Neha:~/linuxassignment$ find . -type f -name "*.txt"
./docs/file2.txt
./file1.txt
cdac@Neha:~/linuxassignment$ grep "Neha" file1.txt
cdac@Neha:~/linuxassignment$ nano file1.txt
cdac@Neha:~/linuxassignment$ cat file1.txt
Neha
Raju
chiku
suraj
akshay
raj
chhaya
kore
pgdac
cdac@Neha:~/linuxassignment$ cat -n file1.txt
     1  Neha
```

```
cdac@Neha:~/linuxassignment$ cat -n file1.txt
     1  Neha
     2  Raju
     3  chiku
     4  suraj
     5  akshay
     6  raj
     7  chhaya
     8  kore
     9  pgdac
cdac@Neha:~/linuxassignment$ grep "Neha" file1.txt
Neha
cdac@Neha:~/linuxassignment$ date
Thu Feb 27 12:42:58 UTC 2025
cdac@Neha:~/linuxassignment$ ipconfig
Command 'ipconfig' not found, did you mean:
  command 'ifconfig' from deb net-tools (2.10-0.1ubuntu3)
  command 'iwconfig' from deb wireless-tools (30~pre9-13.1ubuntu4)
  command 'hipconfig' from deb hipcc (5.2.3-12)
  command 'iconfig' from deb ipmiutil (3.1.9-3)
Try: sudo apt install <deb name>
cdac@Neha:~/linuxassignment$ ifconfig
Command 'ifconfig' not found, but can be installed with:
sudo apt install net-tools
cdac@Neha:~/linuxassignment$ sudo apt install net-tools
[sudo] password for cdac:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  net-tools
0 upgraded, 1 newly installed, 0 to remove and 14 not upgraded.
Need to get 204 kB of archives.
After this operation, 811 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 net-tools amd64 2.10-0.1ubuntu4 [204 kB]
Fetched 204 kB in 1s (237 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 40800 files and directories currently installed.)
Preparing to unpack .../net-tools_2.10-0.1ubuntu4_amd64.deb ...
Unpacking net-tools (2.10-0.1ubuntu4) ...
Setting up net-tools (2.10-0.1ubuntu4) ...
```

```
Processing triggers for man-db (2.12.0-4build2) ...
cdac@Neha:~/linuxassignment$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.226.211  netmask 255.255.240.0  broadcast 192.168.239.255
        inet6 fe80::215:5dff:fec7:6706  prefixlen 64  scopeid 0x20<link>
        ether 00:15:5d:c7:67:06  txqueuelen 1000  (Ethernet)
        RX packets 5574  bytes 4097425 (4.0 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 2574  bytes 168932 (168.9 KB)
        TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 42  bytes 7638 (7.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 42  bytes 7638 (7.6 KB)
        TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

cdac@Neha:~/linuxassignment$ ping -c 4 google.com
PING google.com (142.250.183.110) 56(84) bytes of data.
64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=1 ttl=119 time=7.24 ms
64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=2 ttl=119 time=7.53 ms
64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=3 ttl=119 time=6.09 ms
64 bytes from bom12s13-in-f14.1e100.net (142.250.183.110): icmp_seq=4 ttl=119 time=7.78 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3025ms
rtt min/avg/max/mdev = 6.087/7.158/7.779/0.647 ms
cdac@Neha:~/linuxassignment$ zip -r docs.zip docs/
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
cdac@Neha:~/linuxassignment$ mkdir extract
cdac@Neha:~/linuxassignment$ ls
docs  docs.zip  extract  file1.txt
cdac@Neha:~/linuxassignment$ unzip docs.zip -d extract/
Archive:  docs.zip
   creating: extract/docs/
 extracting: extract/docs/file2.txt
cdac@Neha:~/linuxassignment$ ls -l docs_extracted/
```

```
cdac@Neha:~/linuxassignment$ ls -l docs_extracted/
ls: cannot access 'docs_extracted/': No such file or directory
cdac@Neha:~/linuxassignment$ ls -l extract/
total 4
drwxr-xr-x 2 cdac cdac 4096 Feb 27 12:33 docs
cdac@Neha:~/linuxassignment$ nano file1.txt
cdac@Neha:~/linuxassignment$ y
y: command not found
cdac@Neha:~/linuxassignment$ sed -i 's/kore/Shinde/g' file1.txt
cdac@Neha:~/linuxassignment$ cat file1.txt
Neha
Raju
chiku
suraj
akshay
raj
chhaya
Shinde
pgdac
cdac@Neha:~/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.

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

    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.

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

    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."

    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."

Submission Guidelines:
- Document each step of your solution and any challenges faced.
- Upload it on your GitHub repository

Additional Tips:
- Experiment with different options and parameters of each command to explore their functionalities.

```
cdac@Neha:~/linuxassignment$
cdac@Neha:~/linuxassignment$
cdac@Neha:~/linuxassignment$
cdac@Neha:~/linuxassignment$ touch data.txt
cdac@Neha:~/linuxassignment$ ls
data.txt   docs   docs.zip   extract   file1.txt
cdac@Neha:~/linuxassignment$
cdac@Neha:~/linuxassignment$ nano file1.txt
cdac@Neha:~/linuxassignment$
cdac@Neha:~/linuxassignment$ nano data.txt
cdac@Neha:~/linuxassignment$ cat data.txt
My name is neha
I am from pune
delhi
aurangabad
nashik
nagar
raygad
suraj
delhi
aurangabad
kharda
cdac@Neha:~/linuxassignment$ cat -n data.txt
     1  My name is neha
     2  I am from pune
     3  delhi
     4  aurangabad
     5  nashik
     6  nagar
     7  raygad
     8  suraj
     9  delhi
    10  aurangabad
    11  kharda
cdac@Neha:~/linuxassignment$ head -n 10 data.txt
My name is neha
I am from pune
delhi
aurangabad
nashik
nagar
```

```
nagar
raygad
suraj
delhi
aurangabad
cdac@Neha:~/linuxassignment$ cat -10 data.txt
cat: invalid option -- '1'
Try 'cat --help' for more information.
cdac@Neha:~/linuxassignment$ cat -10 d^Ca.txt
cdac@Neha:~/linuxassignment$ head -n 5 data.txt
My name is neha
I am from pune
delhi
aurangabad
nashik
cdac@Neha:~/linuxassignment$ touch numbers.txt
cdac@Neha:~/linuxassignment$ ls
data.txt   docs   docs.zip   extract   file1.txt   numbers.txt
cdac@Neha:~/linuxassignment$ nano numbers.txt
cdac@Neha:~/linuxassignment$ cat numbers.txt
a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
```

```
u
cdac@Neha:~/linuxassignment$ tail -n 3 numbers.txt
t
u
cdac@Neha:~/linuxassignment$ tail -n 3 numbers.txt
t
u
cdac@Neha:~/linuxassignment$ tail -n 4 numbers.txt
s
t
u
cdac@Neha:~/linuxassignment$ nano numbers.txt
cdac@Neha:~/linuxassignment$ cat numbers.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
```

```
z
cdac@Neha:~/linuxassignment$ tail -n 3 numbers.txt
x
y
z
cdac@Neha:~/linuxassignment$ touch input.txt
cdac@Neha:~/linuxassignment$ ls
data.txt   docs   docs.zip   extract   file1.txt   input.txt   numbers.txt
cdac@Neha:~/linuxassignment$ nano input.txt
cdac@Neha:~/linuxassignment$ cat input.txt
asb
asdf
a
werdfg
herthdf
x;lfkgjepr
wperoitu
qpwoeut
,cmmnbn
cdac@Neha:~/linuxassignment$ touch output.txt
cdac@Neha:~/linuxassignment$ ls
data.txt   docs.zip   file1.txt   numbers.txt
docs       extract    input.txt   output.txt
cdac@Neha:~/linuxassignment$ nano output.txt
cdac@Neha:~/linuxassignment$ cat output.txt
qqq
www
eee
rrr
ttt
uuu
iii
ooo
ppp
aaa
sss
ddd
fff
ggg
hh
jjj
```

```
kkk
lll
zzz
xxx
ccc

cdac@Neha:~/linuxassignment$ cat input.txt | tr 'a-z' 'A-Z' > output.txt
cdac@Neha:~/linuxassignment$ ls
data.txt   docs.zip  file1.txt   numbers.txt
docs       extract   input.txt   output.txt
cdac@Neha:~/linuxassignment$ touch duplicate.txt
cdac@Neha:~/linuxassignment$ nano duplicate.txt
cdac@Neha:~/linuxassignment$ cat duplicate.txt
123
145
185
169
895
669
999
675
3214
35654
6576321
3546

cdac@Neha:~/linuxassignment$ uniq duplicate.txt
123
145
185
169
895
669
999
675
3214
35654
6576321
3546

cdac@Neha:~/linuxassignment$ sort duplicate.txt | uniq
```

```
kkk
lll
zzz
xxx
ccc

cdac@Neha:~/linuxassignment$ cat input.txt | tr 'a-z' 'A-Z' > output.txt
cdac@Neha:~/linuxassignment$ ls
data.txt   docs.zip  file1.txt   numbers.txt
docs       extract   input.txt   output.txt
cdac@Neha:~/linuxassignment$ touch duplicate.txt
cdac@Neha:~/linuxassignment$ nano duplicate.txt
cdac@Neha:~/linuxassignment$ cat duplicate.txt
123
145
185
169
895
669
999
675
3214
35654
6576321
3546

cdac@Neha:~/linuxassignment$ uniq duplicate.txt
123
145
185
169
895
669
999
675
3214
35654
6576321
3546

cdac@Neha:~/linuxassignment$ sort duplicate.txt | uniq
```

```
wert
gfhty
wert
dfgsd
gfhty
fghfgh
yuioyui
khjkyui
tyrytur
adfser
agsdfhd
asdfs

cdac@Neha:~/linuxassignment$ uniq duplicate.txt
dasd
wert
gfhty
wert
dfgsd
gfhty
fghfgh
yuioyui
khjkyui
tyrytur
adfser
agsdfhd
asdfs

cdac@Neha:~/linuxassignment$ sort duplicate.txt | uniq

adfser
agsdfhd
asdfs
dasd
dfgsd
fghfgh
gfhty
khjkyui
tyrytur
wert
yuioyui
```

```
3214
3546
35654
6576321
669
675
895
999
cdac@Neha:~/linuxassignment$ nano duplicate.txt
cdac@Neha:~/linuxassignment$ uy
uy: command not found
cdac@Neha:~/linuxassignment$ rm duplicate.txt
cdac@Neha:~/linuxassignment$ ls
data.txt    docs.zip   file1.txt   numbers.txt
docs        extract    input.txt   output.txt
cdac@Neha:~/linuxassignment$ nano duplicate.txt
cdac@Neha:~/linuxassignment$ cat duplicate.txt
wert
dfgsd
gfhty
fghfgh
yuioyui
khjkyui
tyrytur
adfser
agsdfhd
asdfs

cdac@Neha:~/linuxassignment$ uniq duplicate.txt
wert
dfgsd
gfhty
fghfgh
yuioyui
khjkyui
tyrytur
adfser
agsdfhd
asdfs

cdac@Neha:~/linuxassignment$ nano duplicate.txt
```

```
yuioyui
cdac@Neha:~/linuxassignment$ sort duplicate.txt | uniq -u

adfser
agsdfhd
asdfs
dasd
dfgsd
fghfgh
khjkyui
tyrytur
yuioyui
cdac@Neha:~/linuxassignment$ touch fruit.txt
cdac@Neha:~/linuxassignment$ nano fruit.txt
cdac@Neha:~/linuxassignment$ nano fruit.txt
cdac@Neha:~/linuxassignment$ sort fruit.txt | uniq -c
      1 banana
      1 beetroot
      2 chiku
      1 greps
      2 mango
      1 orange
      1 papaya
cdac@Neha:~/linuxassignment$ nano fruit.txt
cdac@Neha:~/linuxassignment$ cat fruit.txt
mango
chiku
mango
chiku
papaya
greps
beetroot
banana
orange
cdac@Neha:~/linuxassignment$ sort fruit.txt | uniq -c
      1 banana
      1 beetroot
      2 chiku
      1 greps
      2 mango
      1 orange
```