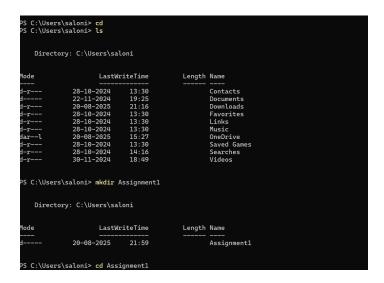# CDAC MUMBAI

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.

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ cd docs
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ rm -rf docs
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ mkdir docs1
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ ls
docs1   file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ mkdir -p docs
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ ls
docs   docs1   file2.txt
```

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

```
 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

This message is shown once a day. To disable it please create the
/home/saloni/.hushlogin file.
saloni@DESKTOP-CO3LGOI:~$ pwd
/home/saloni
saloni@DESKTOP-CO3LGOI:~$ ls
LinuxAssignment  LinuxAssignment.sh  s1.sh
saloni@DESKTOP-CO3LGOI:~$ cd LinuxAssignment
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ cp file1.txt docs/file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ ls docs
file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$
```

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.

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ ls docs
file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ chmod 744 docs/file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ chown $USER docs/file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ ls -l docs/file2.txt
-rwxr--r-- 1 saloni saloni 14 Aug 21 02:53 docs/file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ chown $USER docs/file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ chmod 744 docs/file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ ls -l docs/file2.txt
-rwxr--r-- 1 saloni saloni 14 Aug 21 02:53 docs/file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ whoami
saloni
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ |
```

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

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ ls -l
total 12
drwxr-xr-x 2 saloni saloni 4096 Aug 20 17:34 docs
drwxr-xr-x 2 saloni saloni 4096 Aug 20 17:33 docs1
-rw-r--r-- 1 saloni saloni   14 Aug 20 17:16 file1.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ ls /
bin             boot   etc   init   lib.usr-is-merged   lost+found   mnt   proc   run   sbin.usr-is-merged   srv   tmp   var
bin.usr-is-merged   dev    home   lib    lib64                              media         opt   root   sbin   snap                      sys   usr
saloni@DESKTOP-CO3LGOI:~/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).

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ find. -name"*.txt"
Command 'find.' not found, did you mean:
  command 'find' from deb findutils (4.9.0-5)
  command 'findv' from deb polylib-utils (5.22.5-4+dfsg)
  command 'findg' from deb ncl-ncarg (6.6.2.dfsg.1-3)
Try: sudo apt install <deb name>
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$
```

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

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ date & time
[1] 1249

real    0m0.000s
user    0m0.000s
sys     0m0.000s
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ Thu Aug 21 16:32:52 UTC 2025

[1]+  Done                    date
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$
```

i) Networking:
    a. Display the IP address of the system.

```
saloni@DESKTOP-CO3LGOI:~/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:21:60:43 brd ff:ff:ff:ff:ff:ff
    inet 172.17.165.240/20 brd 172.17.175.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe21:6043/64 scope link
       valid_lft forever preferred_lft forever
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$
```

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

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ ping -c 4 google.com
PING google.com (142.251.43.14) 56(84) bytes of data.
64 bytes from pnbomb-bo-in-f14.1e100.net (142.251.43.14): icmp_seq=1 ttl=113 time=153 ms
64 bytes from pnbomb-bo-in-f14.1e100.net (142.251.43.14): icmp_seq=2 ttl=113 time=132 ms
64 bytes from pnbomb-bo-in-f14.1e100.net (142.251.43.14): icmp_seq=3 ttl=113 time=142 ms
64 bytes from pnbomb-bo-in-f14.1e100.net (142.251.43.14): icmp_seq=4 ttl=113 time=630 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 131.813/263.996/629.811/211.330 ms
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$
```

j) File Compression:

a. Compress the "docs" directory into a zip file.

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ zip -r docs.zip docs
Command 'zip' not found, but can be installed with:
sudo apt install zip
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ sudo apt install zip
[sudo] password for saloni:
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 184 not upgraded.
Need to get 350 kB of archives.
After this operation, 933 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 unzip amd64 6.0-28ubuntu4.1 [174 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 zip amd64 3.0-13ubuntu0.2 [176 kB]
Fetched 350 kB in 5s (68.1 kB/s)
Selecting previously unselected package unzip.
(Reading database ... 40766 files and directories currently installed.)
Preparing to unpack .../unzip_6.0-28ubuntu4.1_amd64.deb ...
Unpacking unzip (6.0-28ubuntu4.1) ...
Selecting previously unselected package zip.
Preparing to unpack .../zip_3.0-13ubuntu0.2_amd64.deb ...
Unpacking zip (3.0-13ubuntu0.2) ...
Setting up unzip (6.0-28ubuntu4.1) ...
Setting up zip (3.0-13ubuntu0.2) ...
Processing triggers for man-db (2.12.0-4build2) ...
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$
```

b. Extract the contents of the zip file into a new directory.

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ unzip docs.zip -d docs_extracted
Archive:  docs.zip
   creating: docs_extracted/docs/
 extracting: docs_extracted/docs/file2.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$
```

k) File Editing:

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

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ nano file1.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$
```

b. Replace a specific word in the "file1.txt" file with another word (provide the
original word and the word to replace it with).

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ sed -i 's/file1/document/g' file1.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ cat file1.txt
This is document
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ grep "file1" file.txt
grep: file.txt: No such file or directory
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ grep "file1" file1.txt
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment$ grep "document" file1.txt
This is document
saloni@DESKTOP-CO3LGOI:~/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.

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ for i in {1..20}; do echo "This is line $i" >> data.txt; done
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ head -n 10 data.txt
This is line 1
This is line 2
This is line 3
This is line 4
This is line 5
This is line 6
This is line 7
This is line 8
This is line 9
This is line 10
```

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

```
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ for i in {1..30}; do echo $i >> numbers.txt; done
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$ tail -n 5 data.txt
This is line 16
This is line 17
This is line 18
This is line 19
This is line 20
saloni@DESKTOP-CO3LGOI:~/LinuxAssignment/docs$
```

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.

```
saloni@DESKTOP-CO3LGOI:~$ for i in {1..20}; do echo $i >> numbers.txt; done
saloni@DESKTOP-CO3LGOI:~$ head -n 15 numbers.txt
hello world this is linux
1
2
3
4
5
6
7
8
9
10
11
12
13
14
saloni@DESKTOP-CO3LGOI:~$
```

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

.

```
saloni@DESKTOP-CO3LGOI:~$ tail -n 3 numbers.txt
18
19
20
saloni@DESKTOP-CO3LGOI:~$
```

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."

```
saloni@DESKTOP-CO3LGOI:~$  echo "HELLO THIS IS SALONI" >> input.txt;
saloni@DESKTOP-CO3LGOI:~$  tr 'a-z' 'A-Z' < output.txt > input.txt
saloni@DESKTOP-CO3LGOI:~$ cat output.txt
HELLO WORLD THIS IS LINUX
NUMBER A
NUMBER B
NUMBER C
NUMBER D
NUMBER E
NUMBER F
NUMBER G
NUMBER H
NUMBER I
NUMBER J
NUMBER K
NUMBER L
NUMBER M
NUMBER N
NUMBER O
NUMBER P
NUMBER Q
NUMBER D
```

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."

```
saloni@DESKTOP-CO3LGOI:~$ echo "a b c d s d a b cc dd ee ff h g h" >> duplicate.txt
saloni@DESKTOP-CO3LGOI:~$ sort | uniq duplicate.txt
apple\nbanana\napple\norange\nbanana
a b c d s d a b cc dd ee ff h g h
```

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."

```
saloni@DESKTOP-CO3LGOI:~$ sort fruit.txt

Apple
Apple
Banana
Banana
Grapes
Mango
Mango
Mango,Apple,orange,Apple,Grapes
saloni@DESKTOP-CO3LGOI:~$
```

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.