# 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.

```
cdac@DESKTOP-E556B3K:~$ ls
home
cdac@DESKTOP-E556B3K:~$ mkdir LinuxAssignment
cdac@DESKTOP-E556B3K:~$ ls
LinuxAssignment  home
```

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

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ ls
file1.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ cat file1.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment$
```

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ cat file1.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ vi file1.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ cat file1.txt
My name is Faisalkhan pathan
I am from Gujarat
I am 2022 passout from Gujarat Technological University.
currently i am doing PG-DAC from C-DAC, Mumbai.
cdac@DESKTOP-E556B3K:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ cp file1.txt docs/
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ cd docs
cdac@DESKTOP-E556B3K:~/LinuxAssignment/docs$ ls
file1.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-E556B3K:~/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@DESKTOP-E556B3K:~/LinuxAssignment/docs$ ls -l file2.txt
-rw-r--r-- 1 cdac cdac 155 Feb 27 06:54 file2.txt
```

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment/docs$ chmod u+x file2.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 155 Feb 27 06:54 file2.txt
```

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment/docs$ chown $(whoami) file2.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 155 Feb 27 06:54 file2.txt
cdac@DESKTOP-E556B3K:~/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@DESKTOP-E556B3K:~/LinuxAssignment/docs$ cd ..
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ ls
docs  file1.txt  file1.txt.save
```

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

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment/docs$ cd
cdac@DESKTOP-E556B3K:~$ ls
LinuxAssignment  home
cdac@DESKTOP-E556B3K:~$ find . -type f -name "*.txt"
./LinuxAssignment/docs/file2.txt
./LinuxAssignment/file1.txt
```

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

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ grep "am" file1.txt
My name is Faisalkhan pathan
I am from Gujarat
I am 2022 passout from Gujarat Technological University.
currently i am pursuing PG-DAC from C-DAC, Mumbai.
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ grep -n "am" file1.txt
1:My name is Faisalkhan pathan
2:I am from Gujarat
3:I am 2022 passout from Gujarat Technological University.
4:currently i am pursuing PG-DAC from C-DAC, Mumbai.
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ grep -ni "i" file1.txt
1:My name is Faisalkhan pathan
2:I am from Gujarat
3:I am 2022 passout from Gujarat Technological University.
4:currently i am pursuing PG-DAC from C-DAC, Mumbai.
```

h) System Information:

a. Display the current system date and time.

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ date
Thu Feb 27 07:39:28 IST 2025
cdac@DESKTOP-E556B3K:~/LinuxAssignment$
```

i) Networking:

a. Display the IP address of the system.

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ ip a
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:3f:e6:6e brd ff:ff:ff:ff:ff:ff
    inet 172.24.175.122/20 brd 172.24.175.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe3f:e66e/64 scope link
       valid_lft forever preferred_lft forever
cdac@DESKTOP-E556B3K:~/LinuxAssignment$
```

b. Ping a remote server to check connectivity (provide a remote server address to ping). j) File Compression:

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ ping youtube.com
PING youtube.com (142.251.42.46) 56(84) bytes of data.
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=1 ttl=55 time=44.8 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=2 ttl=55 time=61.6 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=3 ttl=55 time=82.9 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=4 ttl=55 time=40.0 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=5 ttl=55 time=55.2 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=6 ttl=55 time=46.9 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=7 ttl=55 time=65.9 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=8 ttl=55 time=65.0 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=9 ttl=55 time=43.0 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=10 ttl=55 time=42.3 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=11 ttl=55 time=40.0 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=12 ttl=55 time=60.8 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=13 ttl=55 time=48.6 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=14 ttl=55 time=73.2 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=15 ttl=55 time=85.8 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=16 ttl=55 time=54.0 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=17 ttl=55 time=59.6 ms
^C
--- youtube.com ping statistics ---
17 packets transmitted, 17 received, 0% packet loss, time 16026ms
rtt min/avg/max/mdev = 40.015/57.040/85.750/13.864 ms
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ ping -c 2 google.com
PING google.com (142.250.77.46) 56(84) bytes of data.
64 bytes from bom07s26-in-f14.1e100.net (142.250.77.46): icmp_seq=1 ttl=114 time=48.7 ms
64 bytes from bom07s26-in-f14.1e100.net (142.250.77.46): icmp_seq=2 ttl=114 time=47.7 ms

--- google.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 47.686/48.186/48.687/0.500 ms
cdac@DESKTOP-E556B3K:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ zip -r docs.zip docs

Command 'zip' not found, but can be installed with:

sudo apt install zip

cdac@DESKTOP-E556B3K:~/LinuxAssignment$ sudo apt install zip
Reading package lists... Done
Building dependency tree
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 0 not upgraded.
Need to get 335 kB of archives.
After this operation, 1231 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 unzip amd64 6.0-25ubuntu1.1 [168 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal/main amd64 zip amd64 3.0-11build1 [167 kB]
Fetched 335 kB in 2s (199 kB/s)
Selecting previously unselected package unzip.
(Reading database ... 32701 files and directories currently installed.)
Preparing to unpack .../unzip_6.0-25ubuntu1.1_amd64.deb ...
Unpacking unzip (6.0-25ubuntu1.1) ...
Selecting previously unselected package zip.
Preparing to unpack .../zip_3.0-11build1_amd64.deb ...
Unpacking zip (3.0-11build1) ...
Setting up unzip (6.0-25ubuntu1.1) ...
Setting up zip (3.0-11build1) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for mime-support (3.64ubuntu1) ...
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (deflated 19%)
cdac@DESKTOP-E556B3K:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ unzip docs.zip -d newdoc
Archive:  docs.zip
   creating: newdoc/docs/
  inflating: newdoc/docs/file2.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt  file1.txt.save  newdoc
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ cd newdoc
cdac@DESKTOP-E556B3K:~/LinuxAssignment/newdoc$ ls
docs
cdac@DESKTOP-E556B3K:~/LinuxAssignment/newdoc$ cd docs
cdac@DESKTOP-E556B3K:~/LinuxAssignment/newdoc/docs$ ls
file2.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment/newdoc/docs$
```

k) File Editing:

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

```
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ cat file1.txt
My name is faisalkhan pathan.
I am from Gujarat.
I am 2022 passout from Gujarat Technological University.
currently i am pursuing the PG-DAC from C-DAC Mumbai.
some extra taxt is added to file1.
```

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@DESKTOP-E556B3K:~/LinuxAssignment$ sed -i 's/faisalkhan/Mohammad/g' file1.txt
cdac@DESKTOP-E556B3K:~/LinuxAssignment$ cat file1.txt
My name is Mohammad pathan.
I am from Gujarat.
I am 2022 passout from Gujarat Technological University.
currently i am pursuing the PG-DAC from C-DAC Mumbai.
some extra taxt is added to file1.
```

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.

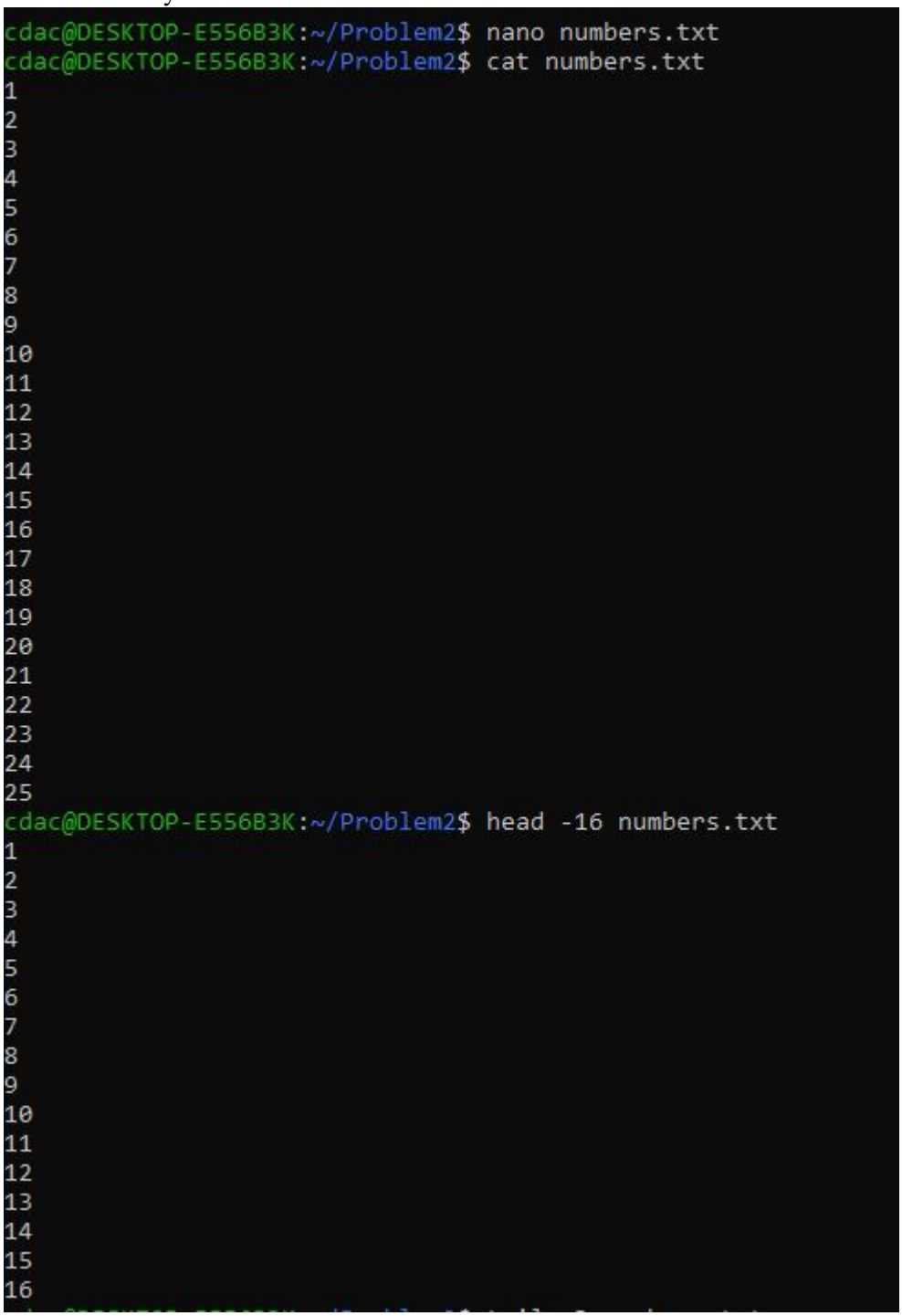
```
cdac@DESKTOP-E556B3K:~/Problem2$ cat -n data.txt
     1  India
     2  Pakistan
     3  china
     4  Bangladesh
     5  Bhutan
     6  Afghanistan
     7  Russia
     8  Srilanka
     9  South- Africa
    10  Turky
    11  Austria
    12  England
    13  Argentina
    14  Brazil
    15  West - indies
    16  Netherland
    17  Newzealand
    18  Japan
```

```
cdac@DESKTOP-E556B3K:~/Problem2$ head -n 10 data.txt
India
Pakistan
china
Bangladesh
Bhutan
Afghanistan
Russia
Srilanka
South- Africa
Turky
```

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@DESKTOP-E556B3K:~/Problem2$ tail -5 data.txt
Brazil
West - indies
Netherland
Newzealand
Japan
```

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.



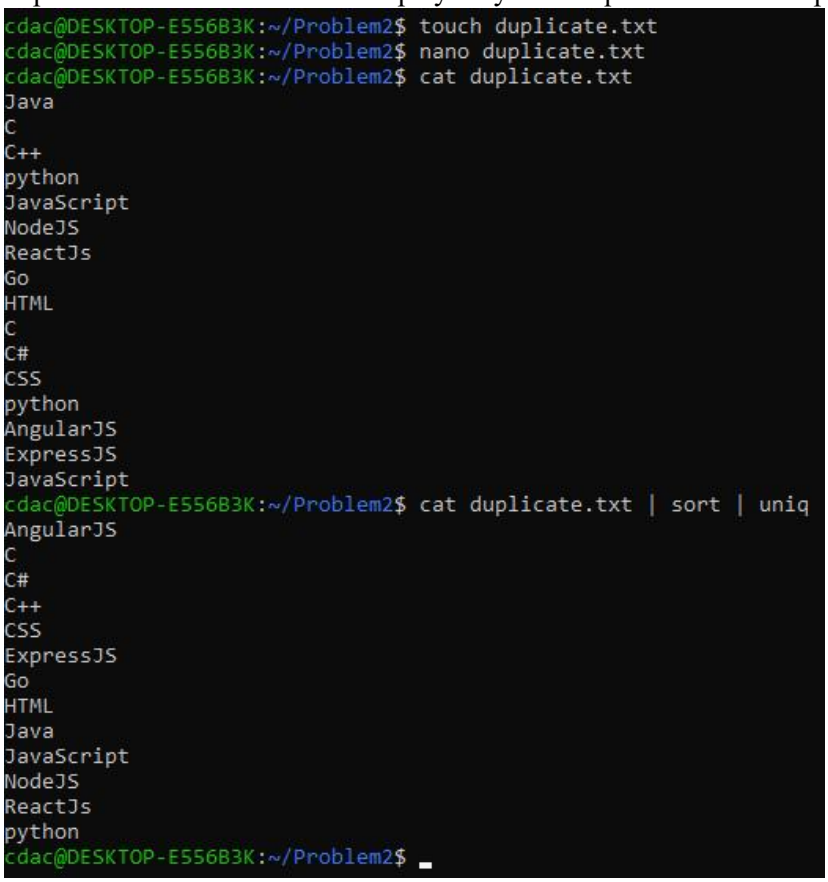
d. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt".

```
cdac@DESKTOP-E556B3K:~/Problem2$ tail -3 numbers.txt
23
24
25
```

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@DESKTOP-E556B3K:~/Problem2$ nano input.txt
cdac@DESKTOP-E556B3K:~/Problem2$ cat input.txt
Faisalkhan
Mohammad
Shahidkhan
Pathan
cdac@DESKTOP-E556B3K:~/Problem2$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@DESKTOP-E556B3K:~/Problem2$ ls
data.txt  input.txt  numbers.txt  output.txt
cdac@DESKTOP-E556B3K:~/Problem2$ cat input.txt
Faisalkhan
Mohammad
Shahidkhan
Pathan
cdac@DESKTOP-E556B3K:~/Problem2$ cat output.txt
FAISALKHAN
MOHAMMAD
SHAHIDKHAN
PATHAN
cdac@DESKTOP-E556B3K:~/Problem2$
```

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."

```
cdac@DESKTOP-E556B3K:~/Problem2$ touch fruits.txt
cdac@DESKTOP-E556B3K:~/Problem2$ nano fruits.txt
cdac@DESKTOP-E556B3K:~/Problem2$ cat fruits.txt
Banana
Mango
Pineapple
Watermelon
Guavava
Grapes
Blueberry
Apple
Orange
Kiwi
Papaya
Apple
Grapes
Mango
Kiwi
Apple
Pineapple
Banana
```

```
cdac@DESKTOP-E556B3K:~/Problem2$ cat fruits.txt | sort | uniq -c
      1
      3 Apple
      2 Banana
      1 Blueberry
      2 Grapes
      1 Guavava
      2 Kiwi
      2 Mango
      1 Orange
      1 Papaya
      2 Pineapple
      1 Watermelon
```

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.