

# Assignment 1

## Problem 1:

### Navigate and List:

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@Harshal:~/myDir$ cd
cdac@Harshal:~$ ls
atharv  myDir
cdac@Harshal:~$ mkdir LinuxAssignment
cdac@Harshal:~$ cd LinuxAssignment
cdac@Harshal:~/LinuxAssignment$ _
```

### File Management:

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

```
cdac@Harshal:~$ cd LinuxAssignment
cdac@Harshal:~/LinuxAssignment$ touch file1.txt
cdac@Harshal:~/LinuxAssignment$ nano file1.txt
cdac@Harshal:~/LinuxAssignment$ cap file1.txt
Command 'cap' not found, but can be installed with:
sudo apt install capistrano
cdac@Harshal:~/LinuxAssignment$ cat file1.txt
Inside
file1.txt
cdac@Harshal:~/LinuxAssignment$ _
```

### Directory Management:

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

```
cdac@Harshal:~/LinuxAssignment$ mkdir docs
cdac@Harshal:~/LinuxAssignment$ cd docs
cdac@Harshal:~/LinuxAssignment/docs$ _
```

## Copy and Move Files:

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

```
cdac@Harshal:~/LinuxAssignment/docs$ cd ..
cdac@Harshal:~/LinuxAssignment$ cp file1.txt file2.txt
cdac@Harshal:~/LinuxAssignment$ ls
docs  file1.txt  file2.txt
cdac@Harshal:~/LinuxAssignment$ cat file2.txt
Inside
file1.txt

cdac@Harshal:~/LinuxAssignment$
```

```
cdac@Harshal:~/LinuxAssignment$ man mv
cdac@Harshal:~/LinuxAssignment$ mv file2.txt docs
cdac@Harshal:~/LinuxAssignment$ ls
docs  file1.txt
cdac@Harshal:~/LinuxAssignment$ cd docs
cdac@Harshal:~/LinuxAssignment/docs$ ls
file2.txt
cdac@Harshal:~/LinuxAssignment/docs$ cat file2.txt
Inside
file1.txt

cdac@Harshal:~/LinuxAssignment/docs$
```

## 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@Harshab: ~/LinuxAssignment
cdac@Harshab:~$ cd LinuxAssignment
cdac@Harshab:~/LinuxAssignment$ ls -l
total 36
drwxr-xr-x 3 cdac cdac 4096 Feb 27 19:02 Extract_unzip
drwxr-xr-x 2 cdac cdac 4096 Feb 27 19:08 docs
-rw-r--r-- 1 cdac cdac 334 Feb 27 19:01 docs.zip
-rw-r--r-- 1 cdac cdac 45 Feb 27 19:53 duplicate.txt
-rw-r--r-- 1 cdac cdac 107 Feb 27 19:24 file1.txt
-rw-r--r-- 1 cdac cdac 49 Feb 27 19:58 fruits.txt
-rw-r--r-- 1 cdac cdac 200 Feb 27 19:37 input.txt
-rw-r--r-- 1 cdac cdac 51 Feb 27 19:27 numbers.txt
-rw-r--r-- 1 cdac cdac 200 Feb 27 19:41 output.txt
cdac@Harshab:~/LinuxAssignment$ chmod 004 file2.txt
chmod: invalid mode: '004'
Try 'chmod --help' for more information.
cdac@Harshab:~/LinuxAssignment$ man chmod
cdac@Harshab:~/LinuxAssignment$ chmod uwx o-r file2.txt
chmod: cannot access 'o-r': No such file or directory
chmod: cannot access 'file2.txt': No such file or directory
cdac@Harshab:~/LinuxAssignment$ ls -l
total 36
drwxr-xr-x 3 cdac cdac 4096 Feb 27 19:02 Extract_unzip
drwxr-xr-x 2 cdac cdac 4096 Feb 27 19:08 docs
-rw-r--r-- 1 cdac cdac 334 Feb 27 19:01 docs.zip
-rw-r--r-- 1 cdac cdac 45 Feb 27 19:53 duplicate.txt
-rw-r--r-- 1 cdac cdac 107 Feb 27 19:24 file1.txt
-rw-r--r-- 1 cdac cdac 49 Feb 27 19:58 fruits.txt
-rw-r--r-- 1 cdac cdac 200 Feb 27 19:37 input.txt
-rw-r--r-- 1 cdac cdac 51 Feb 27 19:27 numbers.txt
-rw-r--r-- 1 cdac cdac 200 Feb 27 19:41 output.txt
cdac@Harshab:~/LinuxAssignment$ chmod 744 file2.txt
chmod: cannot access 'file2.txt': No such file or directory
cdac@Harshab:~/LinuxAssignment$ touch file2.txt
cdac@Harshab:~/LinuxAssignment$ chmod 744 file2.txt
cdac@Harshab:~/LinuxAssignment$ ls -l
total 36
drwxr-xr-x 3 cdac cdac 4096 Feb 27 19:02 Extract_unzip
drwxr-xr-x 2 cdac cdac 4096 Feb 27 19:08 docs
-rw-r--r-- 1 cdac cdac 334 Feb 27 19:01 docs.zip
-rw-r--r-- 1 cdac cdac 45 Feb 27 19:53 duplicate.txt
-rw-r--r-- 1 cdac cdac 107 Feb 27 19:24 file1.txt
-rw-r--r-- 1 cdac cdac 0 Feb 28 19:44 file2.txt
-rw-r--r-- 1 cdac cdac 49 Feb 27 19:58 fruits.txt
-rw-r--r-- 1 cdac cdac 200 Feb 27 19:37 input.txt
-rw-r--r-- 1 cdac cdac 51 Feb 27 19:27 numbers.txt
-rw-r--r-- 1 cdac cdac 200 Feb 27 19:41 output.txt
cdac@Harshab:~/LinuxAssignment$
```

```
cdac@Harshab: ~/LinuxAssignment
-m, --create-home      create the user's home directory
-M, --no-create-home   do not create the user's home directory
-N, --no-user-group     do not create a group with the same name as
                        the user
-o, --non-unique        allow to create users with duplicate
                        (non-unique) UID
-P, --password PASSWD  encrypted password of the new account
-r, --system            create a system account
-R, --root CHROOT_DIR   directory to chroot into
-p, --prefix PREFIX_DIR prefix directory where are located the /etc/* files
-s, --shell SHELL       login shell of the new account
-u, --uid UID           user ID of the new account
-U, --user-group         create a group with the same name as the user
-Z, --system-user SEUSER use a specific SEUSER for the SELinux user mapping
--extrausers            Use the extra users database

cdac@Harshab:~/LinuxAssignment$ su atharv
su: user atharv does not exist or the user entry does not contain all the required fields
cdac@Harshab:~/LinuxAssignment$ sudo useradd -m atharv
cdac@Harshab:~/LinuxAssignment$ su atharv
Password:
su: Authentication failure
cdac@Harshab:~/LinuxAssignment$ sudo passwd atharv
New password:
Retype new password:
passwd: password updated successfully
cdac@Harshab:~/LinuxAssignment$ su atharv
Password:
$ whoami
atharv
$ su cdac
Password:
cdac@Harshab:~/LinuxAssignment$ chown atharv file2.txt
chown: changing ownership of 'file2.txt': Operation not permitted
cdac@Harshab:~/LinuxAssignment$ sudo chown atharv file2.txt
cdac@Harshab:~/LinuxAssignment$ ls -l
total 36
drwxr-xr-x 3 cdac cdac 4096 Feb 27 19:02 Extract_unzip
drwxr-xr-x 2 cdac cdac 4096 Feb 27 19:08 docs
-rw-r--r-- 1 cdac cdac 334 Feb 27 19:01 docs.zip
-rw-r--r-- 1 cdac cdac 45 Feb 27 19:53 duplicate.txt
-rw-r--r-- 1 cdac cdac 107 Feb 27 19:24 file1.txt
-rw-r--r-- 1 atharv cdac 0 Feb 28 19:44 file2.txt
-rw-r--r-- 1 cdac cdac 49 Feb 27 19:58 fruits.txt
-rw-r--r-- 1 cdac cdac 200 Feb 27 19:37 input.txt
-rw-r--r-- 1 cdac cdac 51 Feb 27 19:27 numbers.txt
-rw-r--r-- 1 cdac cdac 200 Feb 27 19:41 output.txt
cdac@Harshab:~/LinuxAssignment$
```

## Final Checklist:

- Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly

```
cdac@Harshal:~/LinuxAssignment/docs$ cd ..
cdac@Harshal:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 18:03 docs
-rw-r--r-- 1 cdac cdac 18 Feb 27 17:42 file1.txt
cdac@Harshal:~/LinuxAssignment$ ls -l /
total 792
lrwxrwxrwx 1 root root 7 Jan 7 03:05 bin -> usr/bin
drwxr-xr-x 2 root root 4096 Apr 18 2022 boot
drwxr-xr-x 9 root root 2960 Feb 27 14:56 dev
drwxr-xr-x 81 root root 4096 Feb 27 14:56 etc
drwxr-xr-x 3 root root 4096 Feb 24 18:09 home
-rwxr-xr-x 3 root root 1440152 Feb 24 17:42 init
lrwxrwxrwx 1 root root 7 Jan 7 03:05 lib -> usr/lib
lrwxrwxrwx 1 root root 9 Jan 7 03:05 lib32 -> usr/lib32
lrwxrwxrwx 1 root root 9 Jan 7 03:05 lib64 -> usr/lib64
lrwxrwxrwx 1 root root 10 Jan 7 03:05 libx32 -> usr/libx32
drwx----- 2 root root 16384 Apr 10 2019 lost+found
drwxr-xr-x 2 root root 4096 Jan 7 03:05 media
drwxr-xr-x 6 root root 4096 Feb 24 18:08 mnt
drwxr-xr-x 2 root root 4096 Jan 7 03:05 opt
dr-xr-xr-x 168 root root 0 Feb 27 14:56 proc
drwx----- 2 root root 4096 Jan 7 03:07 root
drwxr-xr-x 6 root root 120 Feb 27 14:56 run
lrwxrwxrwx 1 root root 8 Jan 7 03:05 sbin -> usr/sbin
drwxr-xr-x 2 root root 4096 Oct 11 13:35 snap
drwxr-xr-x 2 root root 4096 Jan 7 03:05 srv
dr-xr-xr-x 11 root root 0 Feb 27 14:56 sys
drwxrwxrwt 2 root root 4096 Feb 26 16:22 tmp
drwxr-xr-x 14 root root 4096 Jan 7 03:05 usr
drwxr-xr-x 13 root root 4096 Jan 7 03:07 var
cdac@Harshal:~/LinuxAssignment$ _
```

## File Searching:

- Search for all files with the extension ".txt" in the current directory and its subdirectories.
- Display lines containing a specific word in a file (provide a file name and the specific word to search).

```
find: paths must precede expression: *.txt
cdac@Harshal:~/LinuxAssignment$ find . -type f -name "*.txt"
./docs/file2.txt
./file1.txt
cdac@Harshal:~/LinuxAssignment$ grep -n "Inside" file1.txt
1:Inside
cdac@Harshal:~/LinuxAssignment$ _
```

## System Information:

- Display the current system date and time.

```
cdac@Harshal:~/LinuxAssignment$ date
Thu Feb 27 18:22:05 IST 2025
cdac@Harshal:~/LinuxAssignment$
```

## Networking:

- Display the IP address of the system.
- Ping a remote server to check connectivity (provide a remote server address to ping)

```
cdac@Harshal:~/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: bond0: <BROADCAST,MULTICAST,MASTER> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 1a:c7:0f:94:70:5b brd ff:ff:ff:ff:ff:ff
3: dummy0: <BROADCAST,NOARP> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 6a:80:60:00:3a:f7 brd ff:ff:ff:ff:ff:ff
4: tunl0@NONE: <NOARP> mtu 1480 qdisc noop state DOWN group default qlen 1000
    link/ipip 0.0.0.0 brd 0.0.0.0
5: sit0@NONE: <NOARP> mtu 1480 qdisc noop state DOWN group default qlen 1000
    link/sit 0.0.0.0 brd 0.0.0.0
6: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:df:b8:f8 brd ff:ff:ff:ff:ff:ff
    inet 172.22.149.138/20 brd 172.22.159.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fedf:b8f8/64 scope link
        valid_lft forever preferred_lft forever
cdac@Harshal:~/LinuxAssignment$ hostname -i
127.0.1.1
cdac@Harshal:~/LinuxAssignment$ ping -c 4 google.com
PING google.com (142.250.192.110) 56(84) bytes of data.
64 bytes from bom12s17-in-f14.1e100.net (142.250.192.110): icmp_seq=1 ttl=111 time=95.5 ms
64 bytes from bom12s17-in-f14.1e100.net (142.250.192.110): icmp_seq=2 ttl=111 time=38.7 ms
64 bytes from bom12s17-in-f14.1e100.net (142.250.192.110): icmp_seq=3 ttl=111 time=56.4 ms
64 bytes from bom12s17-in-f14.1e100.net (142.250.192.110): icmp_seq=4 ttl=111 time=38.4 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 38.449/57.249/95.498/23.250 ms
cdac@Harshal:~/LinuxAssignment$
```



## File Compression:

- Compress the "docs" directory into a zip file.
- Extract the contents of the zip file into a new directory

```
cdac@Harshal:~/LinuxAssignment/docs$ zip -r docs.zip docs
zip error: Invalid command arguments (cannot write zip file to terminal)
cdac@Harshal:~/LinuxAssignment/docs$ zip -r docs.zip docs
zip warning: name not matched: docs

zip error: Nothing to do! (try: zip -r docs.zip . -i docs)
cdac@Harshal:~/LinuxAssignment/docs$ cd ..
cdac@Harshal:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
cdac@Harshal:~/LinuxAssignment$ mkdir Extract_unzip
cdac@Harshal:~/LinuxAssignment$ unzip docs.zip -d Extract_unzip
Archive:  docs.zip
caution: filename not matched:  -
caution: filename not matched:  d
caution: filename not matched:  Extract_unzip
cdac@Harshal:~/LinuxAssignment$ unzip docs.zip -d Extract_unzip
Archive:  docs.zip
  creating: Extract_unzip/docs/
  extracting: Extract_unzip/docs/file2.txt
cdac@Harshal:~/LinuxAssignment$ ls -l /Extract_unzip
ls: cannot access '/Extract_unzip': No such file or directory
cdac@Harshal:~/LinuxAssignment$ cd Extract_unzip
cdac@Harshal:~/LinuxAssignment/Extract_unzip$ ls -l
total 4
drwxr-xr-x 2 cdac cdac 4096 Feb 27 18:03 docs
cdac@Harshal:~/LinuxAssignment/Extract_unzip$
```

## File Editing:

- Open the "file1.txt" file in a text editor and add some text to it.
- Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with)

```
cdac@Harshal:~/LinuxAssignment$ nano file1.txt
cdac@Harshal:~/LinuxAssignment$ man replace
No manual entry for replace
cdac@Harshal:~/LinuxAssignment$ man sed
cdac@Harshal:~/LinuxAssignment$ ^C
cdac@Harshal:~/LinuxAssignment$ cat file1.txt
Inside
file1.txt
Hello World
cdac@Harshal:~/LinuxAssignment$ sed -i "s/Hello/Helo/g" file1.txt
cdac@Harshal:~/LinuxAssignment$ cat file1.txt
Inside
file1.txt
Helo World
cdac@Harshal:~/LinuxAssignment$
```

## Problem 2:

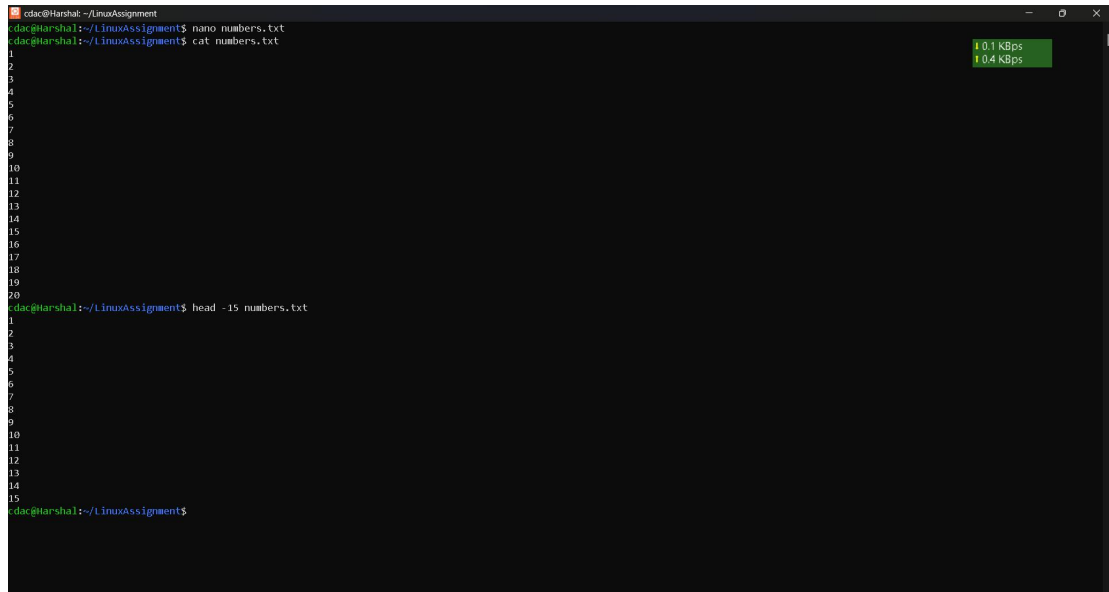
- Suppose you have a file named "data.txt" containing important information. Display the first 10 lines of this file to quickly glance at its contents using a command.

```
cdac@Harshal: ~/LinuxAssignment
cdac@Harshal:~/LinuxAssignment$ nano file1.txt
cdac@Harshal:~/LinuxAssignment$ cat file1.txt
cat: file1.txt: No such file or directory
cdac@Harshal:~/LinuxAssignment$ cat file1.txt
Inside
file1.txt
Helo World
hi
java
python
c
cpp
c#
javascript
MySQL
Html
css
cdac@Harshal:~/LinuxAssignment$ head -10 file1.txt
Inside
file1.txt
Helo World
hi
java
python
c
cpp
c#
javascript
cdac@Harshal:~/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@Harshal: ~/LinuxAssignment
cdac@Harshal:~/LinuxAssignment$ nano file1.txt
cdac@Harshal:~/LinuxAssignment$ cat file1.txt
Inside
file1.txt
Helo World
hi
java
python
c
cpp
c#
javascript
MySQL
Html
css
Spring boot
spring
hibernate
cdac@Harshal:~/LinuxAssignment$ tail -5 file1.txt
Html
css
Spring boot
spring
hibernate
cdac@Harshal:~/LinuxAssignment$ _
```

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.

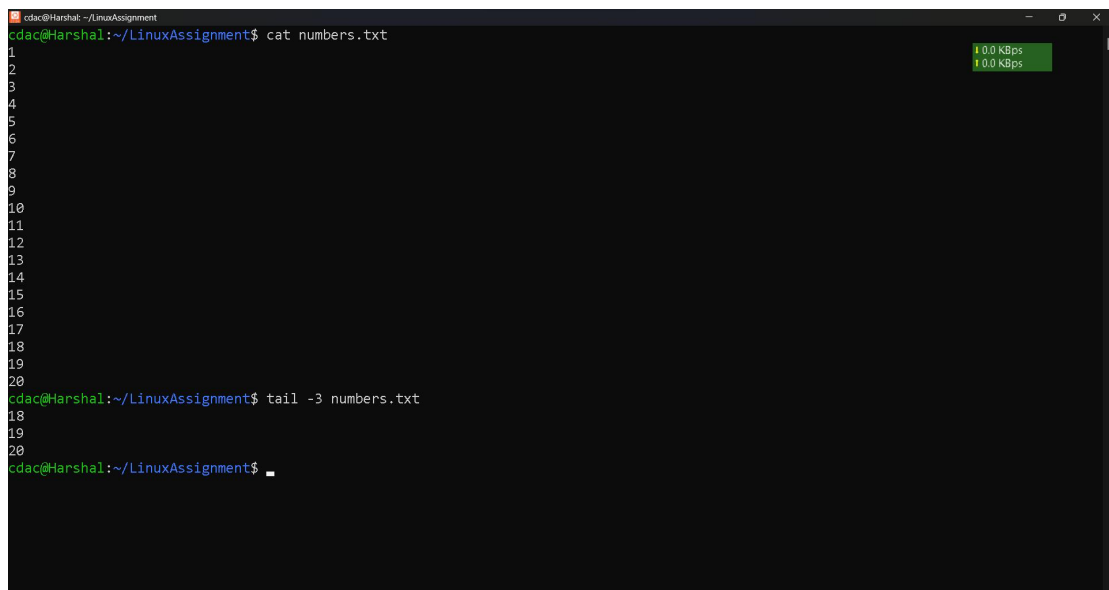
A terminal window titled 'cdac@Harshal: ~/LinuxAssignment' shows the following commands and output:

```
cdac@Harshal:~/LinuxAssignment$ nano numbers.txt
cdac@Harshal:~/LinuxAssignment$ cat numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
cdac@Harshal:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@Harshal:~/LinuxAssignment$
```

A green status bar in the top right corner displays '0.1 KBps' and '0.4 KBps'.

```
cdac@Harshal:~/LinuxAssignment$ nano numbers.txt
cdac@Harshal:~/LinuxAssignment$ cat numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
cdac@Harshal:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@Harshal:~/LinuxAssignment$
```

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

A terminal window titled 'cdac@Harshal: ~/LinuxAssignment' shows the following commands and output:

```
cdac@Harshal:~/LinuxAssignment$ cat numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
cdac@Harshal:~/LinuxAssignment$ tail -3 numbers.txt
18
19
20
cdac@Harshal:~/LinuxAssignment$
```

A green status bar in the top right corner displays '0.0 KBps' and '0.0 KBps'.

```
cdac@Harshal:~/LinuxAssignment$ cat numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
cdac@Harshal:~/LinuxAssignment$ tail -3 numbers.txt
18
19
20
cdac@Harshal:~/LinuxAssignment$
```



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@Harshal:~/LinuxAssignment$ nano input.txt
cdac@Harshal:~/LinuxAssignment$ cat input.txt
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@Harshal:~/LinuxAssignment$ man lowercase
No manual entry for lowercase
cdac@Harshal:~/LinuxAssignment$ tr [:lower] [:upper] input.txt > output.txt
tr: extra operand 'input.txt'
Try 'tr --help' for more information.
cdac@Harshal:~/LinuxAssignment$ tr '[:lower:]' '[:upper:]' input.txt > output.txt
tr: extra operand 'input.txt'
Try 'tr --help' for more information.
cdac@Harshal:~/LinuxAssignment$ tr '[:lower:]' '[:upper:]' <input.txt > output.txt
cdac@Harshal:~/LinuxAssignment$ cat output.txt
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@Harshal:~/LinuxAssignment$ batcat output.txt
```

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@Harshal:~/LinuxAssignment$ nano duplicate.txt
cdac@Harshal:~/LinuxAssignment$ cat duplicate.txt
Harshal
Harshal
Harshal
Atharv
Atharv
Atharv
cdac@Harshal:~/LinuxAssignment$ cat duplicate.txt | uniq
Harshal
Atharv
cdac@Harshal:~/LinuxAssignment$
```

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@Harshal:~/LinuxAssignment$ nano duplicate.txt
cdac@Harshal:~/LinuxAssignment$ cat duplicate.txt
Harshal
Harshal
Harshal
Atharv
Atharv
Atharv
cdac@Harshal:~/LinuxAssignment$ cat duplicate.txt | uniq
Harshal
Atharv
cdac@Harshal:~/LinuxAssignment$ nano fruits.txt
cdac@Harshal:~/LinuxAssignment$ cat fruits.txt
Mango
Apple
Grappes
Mango
Watermelon
Apple
Apple
cdac@Harshal:~/LinuxAssignment$ cat fruits.txt | uniq
Mango
Apple
Grappes
Mango
Watermelon
Apple
cdac@Harshal:~/LinuxAssignment$ cat fruits.txt | sort | uniq
Apple
Grappes
Mango
Watermelon
cdac@Harshal:~/LinuxAssignment$
```