

# Assignment 01

**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.

Ans:-

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~$ cd
kaustubh@kaustubh-joshi:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
kaustubh@kaustubh-joshi:~$ mkdir LinuxAssignment
kaustubh@kaustubh-joshi:~$ ls
Desktop  Downloads  Music  Public  Videos
Documents LinuxAssignment Pictures Templates
kaustubh@kaustubh-joshi:~$ cd LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

b) File Management:

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

Ans:-

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ touch file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls
file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat file1.txt
Kaustubh Joshi
CDAC Mumbai-Kharghar
Feb25
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

c) Directory Management:

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

Ans:-

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment/docs
kaustubh@kaustubh-joshi:~/LinuxAssignment$ mkdir docs
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls
docs  file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cd docs
kaustubh@kaustubh-joshi:~/LinuxAssignment/docs$
```

d) Copy and Move Files:

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

Ans:-

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment/docs
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls
docs  file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cp file1.txt docs
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cd docs/
kaustubh@kaustubh-joshi:~/LinuxAssignment/docs$ ls
file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment/docs$ mv file1.txt file2.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment/docs$ ls
file2.txt
kaustubh@kaustubh-joshi:~/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.

Ans:-

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment/docs
kaustubh@kaustubh-joshi:~/LinuxAssignment/docs$ chmod 744 file2.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 kaustubh kaustubh 42 Mar  1 01:33 file2.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment/docs$ chown $(whoami) file2.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 kaustubh kaustubh 42 Mar  1 01:33 file2.txt
kaustubh@kaustubh-joshi:~/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.

Ans:-

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment/docs$ cd ..
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls -l ~/LinuxAssignment
total 8
drwxrwxr-x 2 kaustubh kaustubh 4096 Mar  1 01:34 docs
-rw-rw-r-- 1 kaustubh kaustubh  42 Mar  1 01:20 file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls -l /
ls: invalid option -- '/'
Try 'ls --help' for more information.
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls -l /
total 2744400
lrwxrwxrwx  1 root root          7 Dec 13  2022 bin -> usr/bin
drwxr-xr-x  4 root root    4096 Mar  8  2023 boot
drwxrwxr-x  2 root root    4096 Dec 13  2022 cdrom
drwxr-xr-x 19 root root   4300 Feb 28 23:57 dev
drwxr-xr-x 130 root root  12288 Feb 24 18:27 etc
drwxr-xr-x  3 root root    4096 Dec 13  2022 home
lrwxrwxrwx  1 root root          7 Dec 13  2022 lib -> usr/lib
lrwxrwxrwx  1 root root          9 Dec 13  2022 lib32 -> usr/lib32
lrwxrwxrwx  1 root root          9 Dec 13  2022 lib64 -> usr/lib64
lrwxrwxrwx  1 root root         10 Dec 13  2022 libx32 -> usr/libx32
drwx-----  2 root root   16384 Dec 13  2022 lost+found
drwxr-xr-x  3 root root    4096 Dec 13  2022 media
drwxr-xr-x  2 root root    4096 Aug  9  2022 mnt
drwxr-xr-x  3 root root    4096 Dec 13  2022 opt
dr-xr-xr-x 282 root root        0 Feb 28 23:56 proc
drwx-----  4 root root    4096 Dec 15  2022 root
drwxr-xr-x 35 root root     940 Feb 28 23:57 run
lrwxrwxrwx  1 root root          8 Dec 13  2022/sbin -> usr/sbin
drwxr-xr-x 15 root root    4096 Feb 24 17:43 snap
drwxr-xr-x  2 root root    4096 Aug  9  2022 srv
-rw-----  1 root root 2810183680 Dec 13  2022 swapfile
dr-xr-xr-x 13 root root        0 Feb 28 23:56 sys
drwxrwxrwt 19 root root    4096 Mar  1 01:58 tmp
drwxr-xr-x 14 root root    4096 Aug  9  2022 usr
drwxr-xr-x 14 root root    4096 Aug  9  2022 var
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

g) File Searching:

a. Search for all files with the extension ".txt" in the current directory and its subdirectories. Ans:-

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ find . -type f -name "*.txt"
./file1.txt
./docs/file2.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

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

Ans:-

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ find . -type f -name "*.txt"
./file1.txt
./docs/file2.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ touch Cricket.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls
Cricket.txt  docs  file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano Cricket.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat Cricket.txt
Cricket is not just a sport, cricket is a way of life for many. People gather t
o watch cricket matches, cheer for their favorite cricket teams, and discuss cr
icket strategies endlessly. From cricket being played in the streets to profess
ional cricket tournaments, the spirit of cricket unites communities. The love f
or cricket knows no bounds, and the joy of cricket brings people together in ex
traordinary ways. Truly, cricket is a celebration of passion, skill, and camara
derie.
kaustubh@kaustubh-joshi:~/LinuxAssignment$ grep "cricket" Cricket.txt
Cricket is not just a sport, cricket is a way of life for many. People gather t
o watch cricket matches, cheer for their favorite cricket teams, and discuss cr
icket strategies endlessly. From cricket being played in the streets to profess
ional cricket tournaments, the spirit of cricket unites communities. The love f
or cricket knows no bounds, and the joy of cricket brings people together in ex
traordinary ways. Truly, cricket is a celebration of passion, skill, and camara
derie.
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

h) System Information:

a. Display the current system date and time.

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ date
Saturday 01 March 2025 03:16:16 AM IST
kaustubh@kaustubh-joshi:~/LinuxAssignment$ date +"%Y-%m-%d"
2025-03-01
kaustubh@kaustubh-joshi:~/LinuxAssignment$ date +"%H:%M:%S"
03:17:58
kaustubh@kaustubh-joshi:~/LinuxAssignment$ date +"%A, %B %d, %Y %I:%M %p"
Saturday, March 01, 2025 03:18 AM
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

i) Networking:

a. Display the IP address of the system

```
kaustubh@kaustubh-joshi: ~  
kaustubh@kaustubh-joshi:~$ ifconfig  
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255  
    inet6 fe80::bc0d:4ffc:f682:1a77 prefixlen 64 scopeid 0x20<link>  
    ether 08:00:27:bc:a6:e5 txqueuelen 1000 (Ethernet)  
    RX packets 80374 bytes 100858238 (100.8 MB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 19591 bytes 4852242 (4.8 MB)  
    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 3126 bytes 353616 (353.6 KB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 3126 bytes 353616 (353.6 KB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

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

```
kaustubh@kaustubh-joshi:~$ ping 8.8.8.8  
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=115 time=8.53 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=115 time=9.20 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=115 time=12.6 ms  
64 bytes from 8.8.8.8: icmp_seq=4 ttl=115 time=6.59 ms  
64 bytes from 8.8.8.8: icmp_seq=5 ttl=115 time=8.49 ms  
^C  
--- 8.8.8.8 ping statistics ---  
5 packets transmitted, 5 received, 0% packet loss, time 4018ms  
rtt min/avg/max/mdev = 6.586/9.084/12.612/1.967 ms
```

j) File Compression:

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

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment  
kaustubh@kaustubh-joshi:~$ cd LinuxAssignment  
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls  
Cricket.txt docs file1.txt  
kaustubh@kaustubh-joshi:~/LinuxAssignment$ zip -r docs.zip docs  
  adding: docs/ (stored 0%)  
  adding: docs/file2.txt (stored 0%)  
kaustubh@kaustubh-joshi:~/LinuxAssignment$ unzip docs.zip -d extracted_docs  
Archive:  docs.zip  
  creating: extracted_docs/docs/  
  extracting: extracted_docs/docs/file2.txt  
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```



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

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~$ cd LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls
Cricket.txt  docs  file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
kaustubh@kaustubh-joshi:~/LinuxAssignment$ unzip docs.zip -d extracted_docs
Archive:  docs.zip
  creating: extracted_docs/docs/
  extracting: extracted_docs/docs/file2.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

k) File Editing:

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

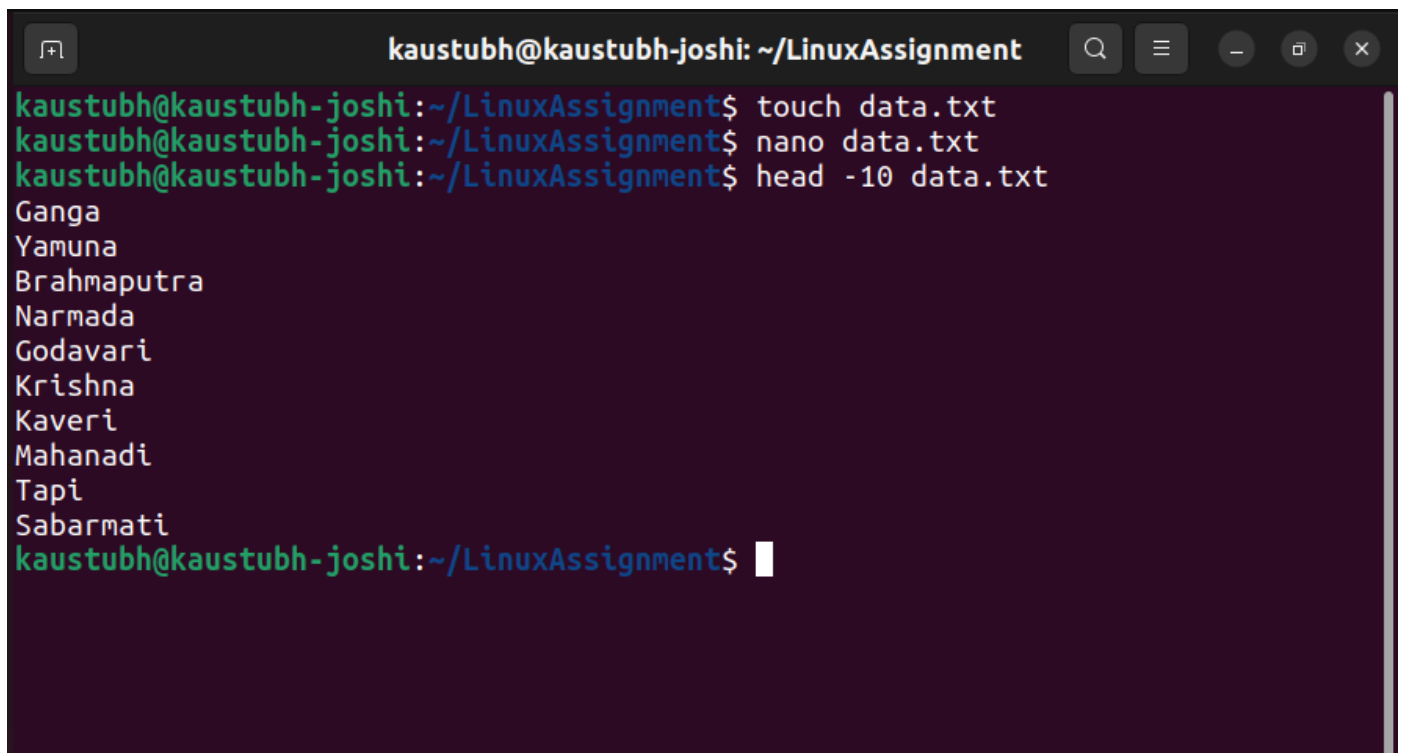
```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~$ ls
Desktop  Downloads  Music  Public  Videos
Documents LinuxAssignment Pictures Templates
kaustubh@kaustubh-joshi:~$ cd LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls
Cricket.txt  docs  docs.zip  extracted_docs  file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat file1.txt
Kaustubh Joshi
CDAC Mumbai-Kharghar
Feb25
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat file1.txt
Kaustubh Joshi
CDAC Mumbai-Kharghar
Feb25
Cricket is not just a sport; cricket is a way of life for many. People gather to
watch cricket matches, cheer for their favorite cricket teams, and discuss cr
icket strategies endlessly. From cricket being played in the streets to profess
ional cricket tournaments, the spirit of cricket unites communities. The love f
or cricket knows no bounds, and the joy of cricket brings people together in ex
traordinary ways. Truly, cricket is a celebration of passion, skill, and camara
derie.
kaustubh@kaustubh-joshi:~/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).

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
Desktop Downloads Music Public Videos
Documents LinuxAssignment Pictures Templates
kaustubh@kaustubh-joshi:~$ cd LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls
Cricket.txt docs docs.zip extracted_docs file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat file1.txt
Kaustubh Joshi
CDAC Mumbai-Kharghar
Feb25
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat file1.txt
Kaustubh Joshi
CDAC Mumbai-Kharghar
Feb25
Cricket is not just a sport; cricket is a way of life for many. People gather t
o watch cricket matches, cheer for their favorite cricket teams, and discuss cr
icket strategies endlessly. From cricket being played in the streets to profess
ional cricket tournaments, the spirit of cricket unites communities. The love f
or cricket knows no bounds, and the joy of cricket brings people together in ex
traordinary ways. Truly, cricket is a celebration of passion, skill, and camara
derie.
kaustubh@kaustubh-joshi:~/LinuxAssignment$ sed -i 's/cricket/football/g' file1.
txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ ls
Cricket.txt docs docs.zip extracted_docs file1.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat file1.txt
Kaustubh Joshi
CDAC Mumbai-Kharghar
Feb25
Cricket is not just a sport; football is a way of life for many. People gather
to watch football matches, cheer for their favorite football teams, and discuss
football strategies endlessly. From football being played in the streets to pr
ofessional football tournaments, the spirit of football unites communities. The
love for football knows no bounds, and the joy of football brings people toget
her in extraordinary ways. Truly, football is a celebration of passion, skill,
and camaraderie.
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

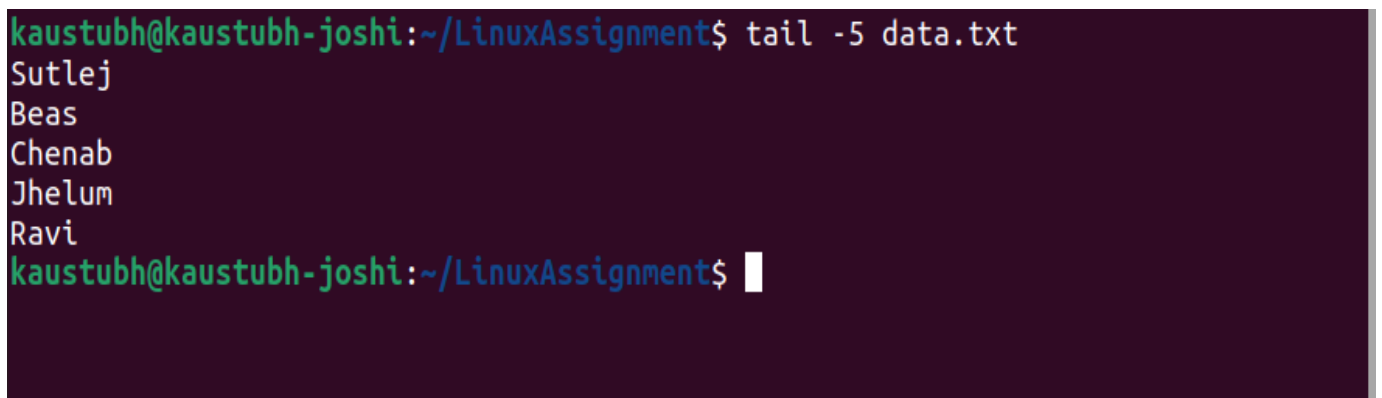
## Problem 2: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

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.

A terminal window with a dark purple background. The title bar shows 'kaustubh@kaustubh-joshi: ~/LinuxAssignment'. The prompt is 'kaustubh@kaustubh-joshi:~/LinuxAssignment\$'. The user enters 'touch data.txt', then 'nano data.txt', and finally 'head -10 data.txt'. The output of the head command lists ten river names: Ganga, Yamuna, Brahmaputra, Narmada, Godavari, Krishna, Kaveri, Mahanadi, Tapi, and Sabarmati. The prompt returns after the last command.

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ touch data.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano data.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ head -10 data.txt
Ganga
Yamuna
Brahmaputra
Narmada
Godavari
Krishna
Kaveri
Mahanadi
Tapi
Sabarmati
kaustubh@kaustubh-joshi:~/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.

A terminal window with a dark purple background. The title bar shows 'kaustubh@kaustubh-joshi: ~/LinuxAssignment'. The prompt is 'kaustubh@kaustubh-joshi:~/LinuxAssignment\$'. The user enters 'tail -5 data.txt'. The output shows the last five lines of the file: Sutlej, Beas, Chenab, Jhelum, and Ravi. The prompt returns after the command.

```
kaustubh@kaustubh-joshi:~/LinuxAssignment$ tail -5 data.txt
Sutlej
Beas
Chenab
Jhelum
Ravi
kaustubh@kaustubh-joshi:~/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.

```
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano numbers.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

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."

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano input.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat input.txt
kaustubh joshi
a b.tech engineer
at cdac mumbai kharghar
to get a job

kaustubh@kaustubh-joshi:~/LinuxAssignment$ tr '[:lower:]' '[:upper:]' < input.t
xt> output.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat input.txt
kaustubh joshi
a b.tech engineer
at cdac mumbai kharghar
to get a job

kaustubh@kaustubh-joshi:~/LinuxAssignment$
kaustubh@kaustubh-joshi:~/LinuxAssignment$
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat output.txt
KAUSTUBH JOSHI
A B.TECH ENGINEER
AT CDAC MUMBAI KHARGHAR
TO GET A JOB

kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

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."

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano fruit.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat fruit.txt
Grapes
Apple
Papaya
Watermelon
Grapes
Watermelon
Pear
Kiwi
Dragon Fruit
Papaya
Apple
Pomogramate
Banana
Guava
Strawberry
Pear
kaustubh@kaustubh-joshi:~/LinuxAssignment$ sort fruits.txt | uniq -c
sort: cannot read: fruits.txt: No such file or directory
kaustubh@kaustubh-joshi:~/LinuxAssignment$ sort fruit.txt | uniq -c
  2 Apple
  1 Banana
  1 Dragon Fruit
  2 Grapes
  1 Guava
  1 Kiwi
  2 Papaya
  2 Pear
  1 Pomogramate
  1 Strawberry
  2 Watermelon
kaustubh@kaustubh-joshi:~/LinuxAssignment$
kaustubh@kaustubh-joshi:~/LinuxAssignment$
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```

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."

```
kaustubh@kaustubh-joshi: ~/LinuxAssignment
kaustubh@kaustubh-joshi:~/LinuxAssignment$ nano fruit.txt
kaustubh@kaustubh-joshi:~/LinuxAssignment$ cat fruit.txt
Grapes
Apple
Papaya
Watermelon
Grapes
Watermelon
Pear
Kiwi
Dragon Fruit
Papaya
Apple
Pomogramate
Banana
Guava
Strawberry
Pear
kaustubh@kaustubh-joshi:~/LinuxAssignment$ sort fruits.txt | uniq -c
sort: cannot read: fruits.txt: No such file or directory
kaustubh@kaustubh-joshi:~/LinuxAssignment$ sort fruit.txt | uniq -c
      2 Apple
      1 Banana
      1 Dragon Fruit
      2 Grapes
      1 Guava
      1 Kiwi
      2 Papaya
      2 Pear
      1 Pomogramate
      1 Strawberry
      2 Watermelon
kaustubh@kaustubh-joshi:~/LinuxAssignment$
kaustubh@kaustubh-joshi:~/LinuxAssignment$
kaustubh@kaustubh-joshi:~/LinuxAssignment$
```