

Lab Cycle: 2
Experiment No.: 1
Date: 10-05-2022

Aim: Familarise with linux commands.

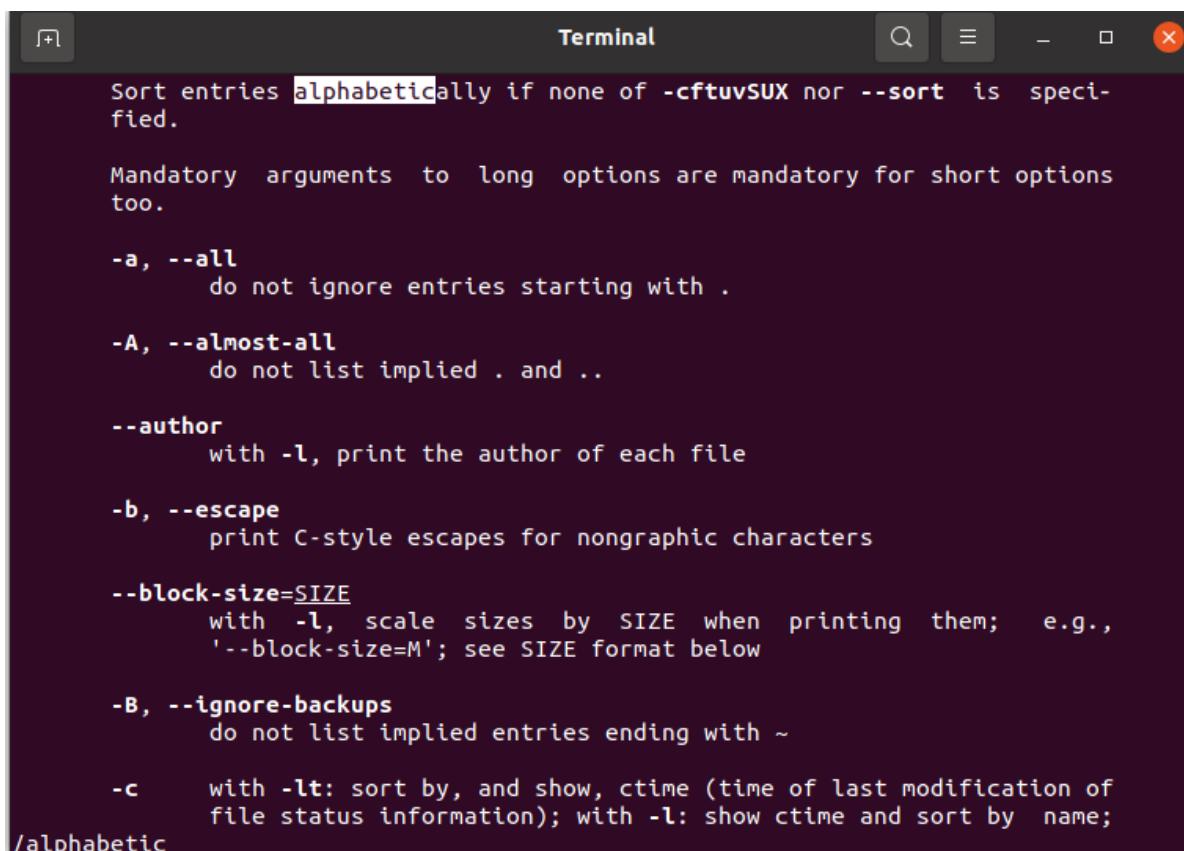
Solution:

1. Command to display the following message as such (Use " and Newline).

"God! Bless us..
We are starting Shell Scripting"

```
lab@lab-Lenovo-IdeaPad-Z400:~$ echo -e "\"God! Bless us..\n We are starting Shel
l Scripting\" "
"God! Bless us..
 We are starting Shell Scripting"
lab@lab-Lenovo-IdeaPad-Z400: ~
```

2. Get the manual page of 'ls' command. Search for the word "alphabetic". Find the next occurrence and then find the previous occurrence.



The screenshot shows a terminal window with the title 'Terminal'. The window displays the man page for the 'ls' command. The text is as follows:

```
Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

Mandatory arguments to long options are mandatory for short options too.

-a, --all
        do not ignore entries starting with .

-A, --almost-all
        do not list implied . and ..

--author
        with -l, print the author of each file

-b, --escape
        print C-style escapes for nongraphic characters

--block-size=SIZE
        with -l, scale sizes by SIZE when printing them; e.g.,
        '--block-size=M'; see SIZE format below

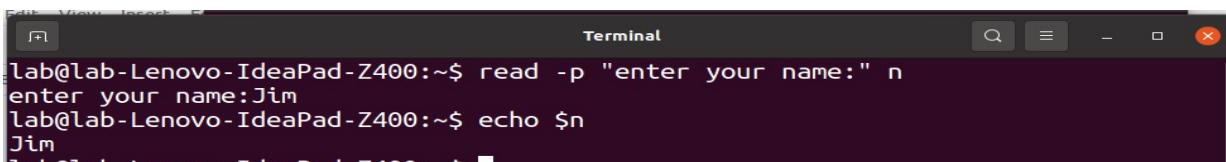
-B, --ignore-backups
        do not list implied entries ending with ~

-c      with -lt: sort by, and show, ctime (time of last modification of
        file status information); with -l: show ctime and sort by name;
/alphabetic
```

- Press n to find the next occurrence of “alphabetic”.
- Press N to find the previous occurrence of “alphabetic”.

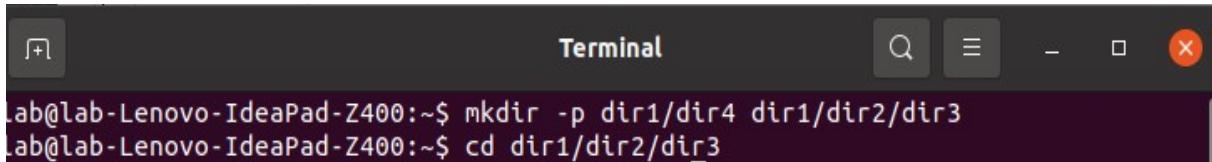
.

3. Read your name from the keyboard and display it.



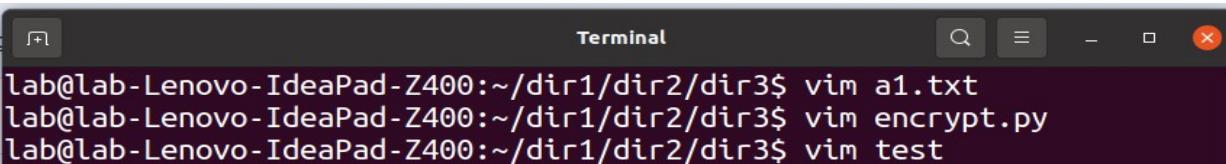
```
lab@lab-Lenovo-IdeaPad-Z400:~$ read -p "enter your name:" n
enter your name:Jim
lab@lab-Lenovo-IdeaPad-Z400:~$ echo $n
Jim
```

4. Create the directory structure dir1/dir4 and dir1/dir2/dir3 with a single command and then change directory to dir3.



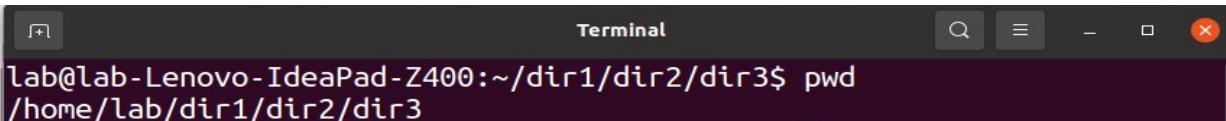
```
lab@lab-Lenovo-IdeaPad-Z400:~$ mkdir -p dir1/dir4 dir1/dir2/dir3
lab@lab-Lenovo-IdeaPad-Z400:~$ cd dir1/dir2/dir3
```

5. Create some files using Vim



```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ vim a1.txt
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ vim encrypt.py
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ vim test
```

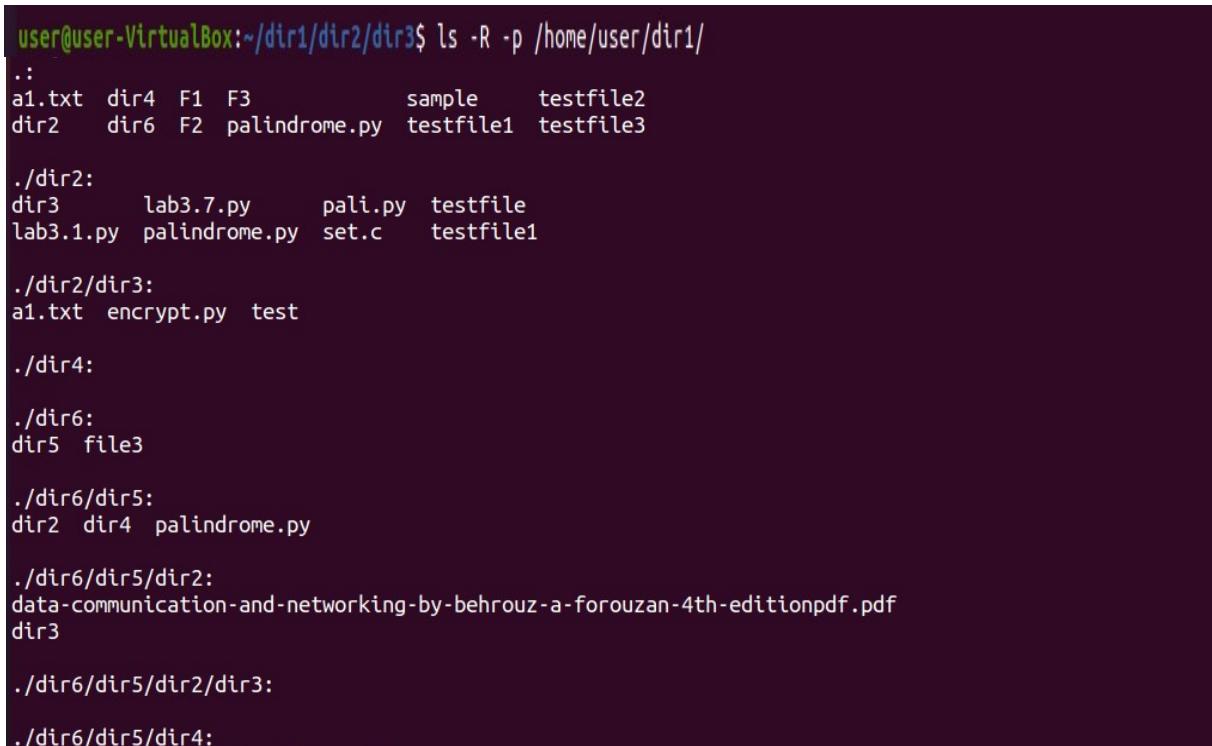
6. Display the current directory



```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ pwd
/home/lab/dir1/dir2/dir3
```

7. Listing Files and folders

a. List the contents of dir1 (Qn. 4) and all its descendants



```
user@user-VirtualBox:~/dir1/dir2/dir3$ ls -R -p /home/user/dir1/
.:
a1.txt  dir4  F1  F3          sample    testfile2
dir2    dir6  F2  palindrome.py  testfile1  testfile3

./dir2:
dir3      lab3.7.py      pali.py  testfile
lab3.1.py  palindrome.py  set.c   testfile1

./dir2/dir3:
a1.txt  encrypt.py  test

./dir4:

./dir6:
dir5  file3

./dir6/dir5:
dir2  dir4  palindrome.py

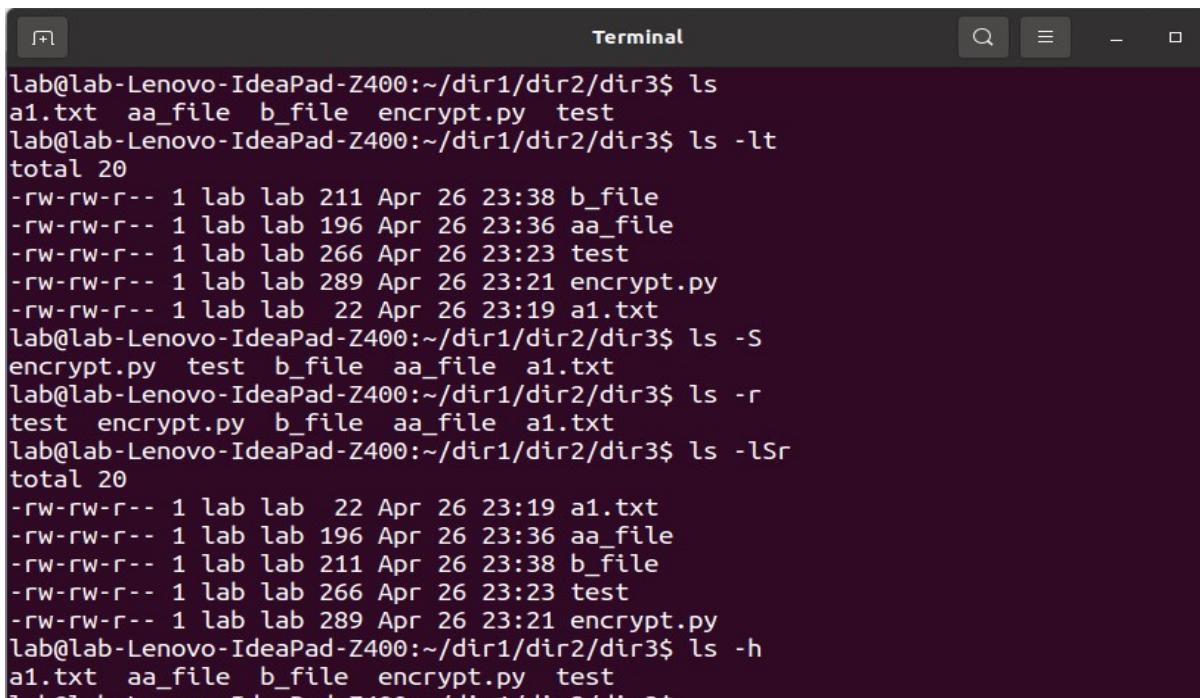
./dir6/dir5/dir2:
data-communication-and-networking-by-behrouz-a-forouzan-4th-editionpdf.pdf
dir3

./dir6/dir5/dir3:

./dir6/dir5/dir4:
```

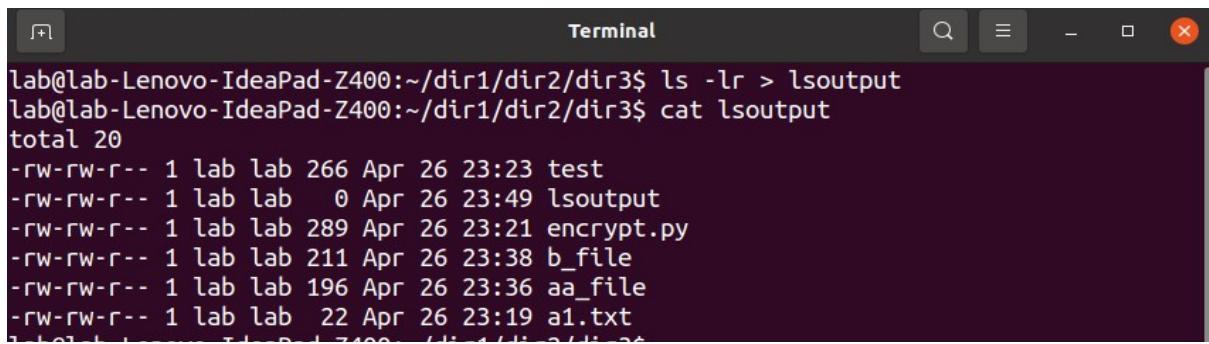
b. List the contents of dir3 (Qn. 4) in

- i. Alphabetical Order
- ii. Sorted on Time of modification, newest first
- iii. Sorted on Size
- iv. Reverse of all above
- v. Long listing of files Sorted on Size with smallest first and size
- vi. displayed in human readable form



```
Terminal
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls
a1.txt aa_file b_file encrypt.py test
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -lt
total 20
-rw-rw-r-- 1 lab lab 211 Apr 26 23:38 b_file
-rw-rw-r-- 1 lab lab 196 Apr 26 23:36 aa_file
-rw-rw-r-- 1 lab lab 266 Apr 26 23:23 test
-rw-rw-r-- 1 lab lab 289 Apr 26 23:21 encrypt.py
-rw-rw-r-- 1 lab lab 22 Apr 26 23:19 a1.txt
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -S
encrypt.py test b_file aa_file a1.txt
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -r
test encrypt.py b_file aa_file a1.txt
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -lSr
total 20
-rw-rw-r-- 1 lab lab 22 Apr 26 23:19 a1.txt
-rw-rw-r-- 1 lab lab 196 Apr 26 23:36 aa_file
-rw-rw-r-- 1 lab lab 211 Apr 26 23:38 b_file
-rw-rw-r-- 1 lab lab 266 Apr 26 23:23 test
-rw-rw-r-- 1 lab lab 289 Apr 26 23:21 encrypt.py
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -h
a1.txt aa_file b_file encrypt.py test
```

8. Execute ls and store the output to a file lsoutput



```
Terminal
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -lr > lsoutput
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat lsoutput
total 20
-rw-rw-r-- 1 lab lab 266 Apr 26 23:23 test
-rw-rw-r-- 1 lab lab 0 Apr 26 23:49 lsoutput
-rw-rw-r-- 1 lab lab 289 Apr 26 23:21 encrypt.py
-rw-rw-r-- 1 lab lab 211 Apr 26 23:38 b_file
-rw-rw-r-- 1 lab lab 196 Apr 26 23:36 aa_file
-rw-rw-r-- 1 lab lab 22 Apr 26 23:19 a1.txt
```

9. Display the file

a. starting with the first 10 lines



```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2$ ls
dir3  out2.txt  result  set.c  testfile  testfile1
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2$ more -10 set.c
#include<stdio.h>
#include<stdlib.h>
int superSet[20],superSetSize=0,
setA[20],setASize=0,
setB[20],setBSize=0,
bitStringA[20],bitStringB[20],bitStringUnion[20],bitStringIntersection[20],bitStringDifference[20];
void generateBitString(int arr[],int size,int bitStringArray[]);
void printSet(int arr[],int size);
int search(int arr[],int arrSize,int elem);
--More--(10%)
```

b. starting with the 10th line with provision for

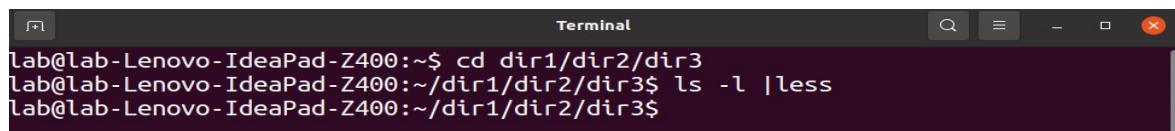
i. Scrolling Up

ii. Scrolling Up and Down

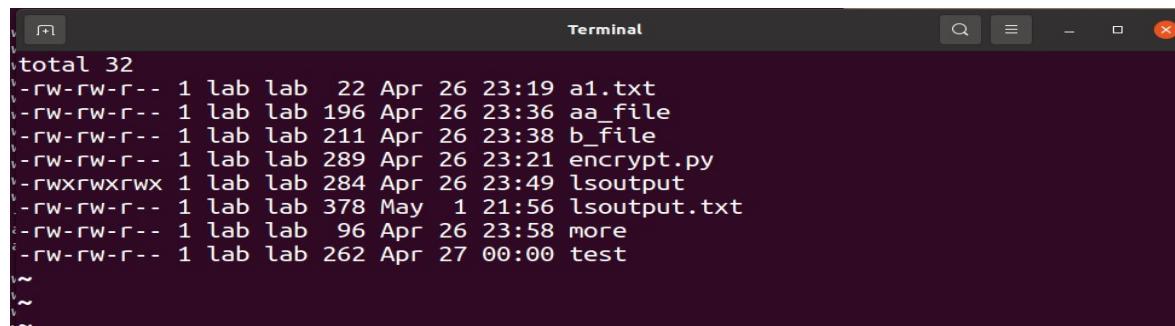
10. Execute ls -l and add the output to lsoutput, at the end.

```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l >> lsoutput
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat lsoutput
total 20
-rw-rw-r-- 1 lab lab 266 Apr 26 23:23 test
-rw-rw-r-- 1 lab lab 0 Apr 26 23:49 lsoutput
-rw-rw-r-- 1 lab lab 289 Apr 26 23:21 encrypt.py
-rw-rw-r-- 1 lab lab 211 Apr 26 23:38 b_file
-rw-rw-r-- 1 lab lab 196 Apr 26 23:36 aa_file
-rw-rw-r-- 1 lab lab 22 Apr 26 23:19 a1.txt
total 56
-rw-rw-r-- 1 lab lab 22 Apr 26 23:19 a1.txt
-rw-rw-r-- 1 lab lab 196 Apr 26 23:36 aa_file
-rw-rw-r-- 1 lab lab 211 Apr 26 23:38 b_file
-rw-rw-r-- 1 lab lab 289 Apr 26 23:21 encrypt.py
-rw-rw-r-- 1 lab lab 27 May 4 21:56 file1
-rwxrwxrwx 1 lab lab 14 May 2 21:27 file2
-rwxrwxrwx 1 lab lab 284 Apr 26 23:49 lsoutput
-rw-rw-r-- 1 lab lab 378 May 1 21:56 lsoutput.txt
-rw-rw-r-- 1 lab lab 96 Apr 26 23:58 more
-rw-rw-r-- 1 lab lab 27 May 4 21:47 newfile
lrwxrwxrwx 1 lab lab 5 May 3 12:47 newfile1 -> file1
-rw-rw-r-- 1 lab lab 13 May 3 22:25 sample
-rw-rw-r-- 1 lab lab 262 Apr 27 00:00 test
-rw-rw-r-- 1 lab lab 52 May 4 22:17 testfile1
-rw-rw-r-- 1 lab lab 27 May 4 22:29 text
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$
```

11. Execute ls -l and feed the result to less command, to scroll through the directory listing.



```
Terminal
lab@lab-Lenovo-IdeaPad-Z400:~$ cd dir1/dir2/dir3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l |less
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$
```



```
Terminal
total 32
-rw-rw-r-- 1 lab lab 22 Apr 26 23:19 a1.txt
-rw-rw-r-- 1 lab lab 196 Apr 26 23:36 aa_file
-rw-rw-r-- 1 lab lab 211 Apr 26 23:38 b_file
-rw-rw-r-- 1 lab lab 289 Apr 26 23:21 encrypt.py
-rwxrwxrwx 1 lab lab 284 Apr 26 23:49 lsoutput
-rw-rw-r-- 1 lab lab 378 May 1 21:56 lsoutput.txt
-rw-rw-r-- 1 lab lab 96 Apr 26 23:58 more
-rw-rw-r-- 1 lab lab 262 Apr 27 00:00 test
~
~
```

12. a. Create a file file1 containing the word "Hello," using cat and output redirection.

b. Create another file file2 containing the word ", Greetings!!"

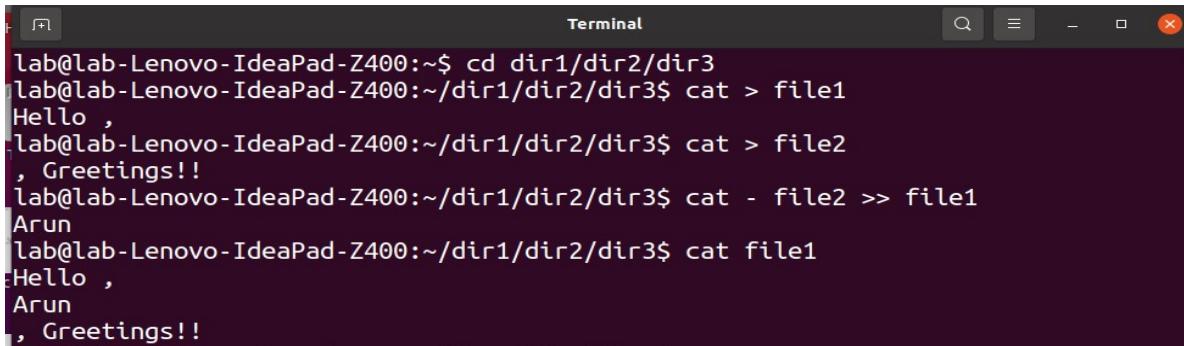
c. Display the sentence,

Hello,

yourname

, Greetings!!

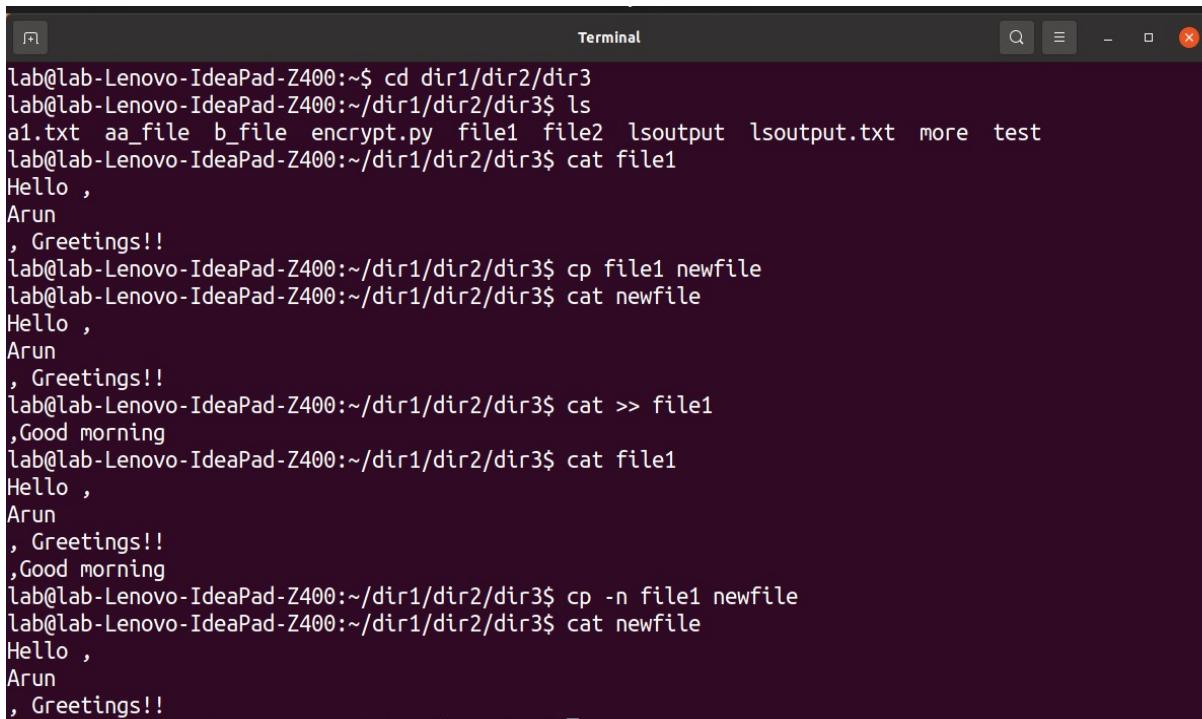
using cat, by concatenating file1, Standard Input and file2. Standard input may receive the contents from an echo or a read.



```
lab@lab-Lenovo-IdeaPad-Z400:~$ cd dir1/dir2/dir3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat > file1
Hello ,
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat > file2
, Greetings!!
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat - file2 >> file1
Arun
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat file1
Hello ,
Arun
, Greetings!!
```

13. Copy the file file1 to newfile.

- a. If newfile already exists, it should be replaced.
- b. If newfile already exists, it should not be replaced.



```
lab@lab-Lenovo-IdeaPad-Z400:~$ cd dir1/dir2/dir3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls
a1.txt aa_file b_file encrypt.py file1 file2 lsoutput lsoutput.txt more test
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat file1
Hello ,
Arun
, Greetings!!
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cp file1 newfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat newfile
Hello ,
Arun
, Greetings!!
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat >> file1
,Good morning
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat file1
Hello ,
Arun
, Greetings!!
,Good morning
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cp -n file1 newfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat newfile
Hello ,
Arun
, Greetings!!
```

- c. If newfile already exists, it should be replaced, but only with the consent of the user.
- d. If newfile already exists, it should be replaced only if its contents is older than that of file1.

```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat file1
Hello ,
arun
, Greetings!!
,Good morning
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cp -i file1 newfile
cp: overwrite 'newfile'? y
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat newfile
Hello ,
arun
, Greetings!!
,Good morning
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat >> file1
to you
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cp -u file1 newfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat newfile
Hello ,
arun
, Greetings!!
,Good morning
to you

```

- e. Even if newfile is read only.
- f. Create a link instead of copying.
- g. Copy the entire directory tree from dir1 of Qn.4 to a new directory dir5

```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ chmod 444 newfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat >> file1
people
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cp -f file1 newfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat newfile
Hello ,
arun
, Greetings!!
,Good morning
to you
people
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cp -s file1 newfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l
total 52
-rw-rw-r-- 1 lab lab 22 Apr 26 23:19 a1.txt
-rw-rw-r-- 1 lab lab 196 Apr 26 23:36 aa_file
-rw-rw-r-- 1 lab lab 211 Apr 26 23:38 b_file
-rw-rw-r-- 1 lab lab 289 Apr 26 23:21 encrypt.py
-rw-rw-r-- 1 lab lab 55 May 6 22:01 file1
-rwxrwxrwx 1 lab lab 14 May 2 21:27 file2
-rwxrwxrwx 1 lab lab 988 May 6 20:20 lsoutput
-rw-rw-r-- 1 lab lab 378 May 1 21:56 lsoutput.txt
-rw-rw-r-- 1 lab lab 96 Apr 26 23:58 more
lrwxrwxrwx 1 lab lab 5 May 6 22:03 newfile -> file1
lrwxrwxrwx 1 lab lab 5 May 3 12:47 newfile1 -> file1
-rw-rw-r-- 1 lab lab 13 May 3 22:25 sample
-rw-rw-r-- 1 lab lab 262 Apr 27 00:00 test
-rw-rw-r-- 1 lab lab 52 May 4 22:17 testfile1
-rw-rw-r-- 1 lab lab 27 May 4 22:29 text
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cd
lab@lab-Lenovo-IdeaPad-Z400:~$ cp -R dir1 dir5
lab@lab-Lenovo-IdeaPad-Z400:~$ ls
a.out    dir5      file1  mydir.tar.gz  rbt.c      snap
btree.c  Documents  file2  Pictures       sample.py  Templates
Desktop   Downloads  LAB    Public        set1.c    Videos
dir1     dsalab    Music   pythonlab    set.c
lab@lab-Lenovo-IdeaPad-Z400:~$
```

14. Create a new directory, dir6 inside dir1

- a.Move all files in dir5 into it.
- b.Rename the file newfile in Qn.13 to oldfile

```
lab@lab-Lenovo-IdeaPad-Z400:~$ mkdir -p dir1/dir6
lab@lab-Lenovo-IdeaPad-Z400:~$ mv dir5 dir1/dir6
lab@lab-Lenovo-IdeaPad-Z400:~$ cd dir1/dir6
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6$ ls
dir5
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6$ cd ..
lab@lab-Lenovo-IdeaPad-Z400:~/dir1$ cd dir2/dir3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ mv newfile oldfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls
a1.txt  b_file  file1  lsoutput  more  oldfile  test  text
aa_file  encrypt.py  file2  lsoutput.txt  newfile1  sample  testfile1
```

- c.Move the file file1 in Qn.12 to dir6 with the name file3
- d.Delete all files where the name starts with a vowel character, upper or lower case.
- e.Delete all files where the name is at least 3 characters long.
- f.Delete all hidden folders, and files.

```
lab@lab-Lenovo-IdeaPad-Z400:~$ mv file1 dir1/dir6/file3
lab@lab-Lenovo-IdeaPad-Z400:~$ cd dir1/dir2/dir3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ rm [a,e,i,o,u,A,E,I,O,U]*
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls
b_file  file2  lsoutput.txt  newfile1  test  text
file1  lsoutput  more  sample  testfile1
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls
f1  lsoutput  more  s  testfile1  v
file2  lsoutput.txt  newfile1  test  text
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ rm ???
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls
f1  s  v
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -a
.  ..  f1  .f3  s  v
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ rm -rf .*
rm: refusing to remove '.' or '..' directory: skipping '.'
rm: refusing to remove '.' or '..' directory: skipping '..'
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -a
.  ..  f1  s  v
```

15. Create a file testfile1 using Vim

>> **vim testfile1**

- a.Set line number
 - 1) Press Esc key
 - 2) Type :set number

The screenshot shows a terminal window with a dark background and light-colored text. In the top left, there is a vertical column of small, blue, tilde-shaped symbols. In the top right corner, the text "All" is visible. At the bottom left, the command ":set number" is entered. At the bottom right, the coordinates "0,0 - 1" are displayed. The main area of the terminal is mostly blank, except for the blue symbols.

b.Type your name and address with district and pincode

Press Esc key then press ‘i’ [To change to insert mode]

The screenshot shows a terminal window with a dark background and light-colored text. In the top left, there is a vertical column of small, blue, tilde-shaped symbols. In the top right corner, the text "All" is visible. At the bottom left, the text "Stephan , xyz , SM street , Erode , Tamilnadu-638001" is entered, preceded by a blue number "1". At the bottom right, the coordinates "1,1" are displayed. At the very bottom left, the text "-- INSERT --" is visible. The main area of the terminal is mostly blank, except for the blue symbols and the inserted text.

c.Copy paste the contents 10 times.

- 1. Place the cursor in the desired location(at beginning) .**
- 2. Press Esc key then press ‘v’ [To change to visual mode] .**
- 3. Press the ‘y’ key followed by movement command ,‘\$’.**

4. Move the cursor to the location where you want to paste the contents.

5. Press ‘10p’ to paste the contents.

d.Replace all occurrence of your district with a neighbouring district.

1. Press Esc key [To change to normal mode].

2. Type “:%s/Erode/Dindigul/gi”

```
1 Stephan , xyz , SM street , Erode , Tamilnadu-638001
2 Stephan , xyz , SM street , Erode , Tamilnadu-638001
3 Stephan , xyz , SM street , Erode , Tamilnadu-638001
4 Stephan , xyz , SM street , Erode , Tamilnadu-638001
5 Stephan , xyz , SM street , Erode , Tamilnadu-638001
6 Stephan , xyz , SM street , Erode , Tamilnadu-638001
7 Stephan , xyz , SM street , Erode , Tamilnadu-638001
8 Stephan , xyz , SM street , Erode , Tamilnadu-638001
9 Stephan , xyz , SM street , Erode , Tamilnadu-638001
10 Stephan , xyz , SM street , Erode , Tamilnadu-638001
11 Stephan , xyz , SM street , Erode , Tamilnadu-638001
~
```

```
:%s/erode/Dindigul/gi■
```

```
1 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
2 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
3 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
4 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
5 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
6 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
7 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
8 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
9 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
10 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
11 Stephan , xyz , SM street , Dindigul , Tamilnadu-638001
~
```

```
11 substitutions on 11 lines
```

```
11,1
```

```
All
```

16. Create 2 files testfile2 and testfile3 using Vim.

a.Modify the permissions of testfile2 using symbolic mode.

- i Add read permission to others
- ii Revoke write from owner
- iii Set only execute to Group
- iv Add write to owner, revoke read from others and set read only to group
- v Set read and write to all

```
-rw-rw-r-- 1 lab lab 13 May 7 17:46 testfile2
-rw-rw-r-- 1 lab lab 6 May 7 17:46 testfile3
-rw-rw-r-- 1 lab lab 211 Apr 26 23:38 v
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ chmod o+r testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ chmod u-w testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile2
-r--rw-r-- 1 lab lab 13 May 7 17:46 testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ chmod g=x testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile2
-r-----xr-- 1 lab lab 13 May 7 17:46 testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ chmod u+w,o-r,g=r testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile2
-rw-r----- 1 lab lab 13 May 7 17:46 testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ chmod a=rw testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile2
-rw-rw-rw- 1 lab lab 13 May 7 17:46 testfile2
```

b.Modify the permissions of testfile3 using numeric mode

- i Set read and write to all
- ii set read,write and execute to owner, read and execute to group and read only to others

```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile3
-rw-rw-r-- 1 lab lab 6 May 7 17:46 testfile3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ chmod 666 testfile3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile3
-rw-rw-rw- 1 lab lab 6 May 7 17:46 testfile3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ chmod 754 testfile3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile3
-rwxr-xr-- 1 lab lab 6 May 7 17:46 testfile3
```

c.Set the permissions of testfile2 the same as that of testfile3

```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile3
-rwxr-xr-- 1 lab lab 6 May 7 17:46 testfile3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile2
-rw-rw-rw- 1 lab lab 13 May 7 17:46 testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ chmod --reference=testfile3 testfile2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l testfile2
-rwxr-xr-- 1 lab lab 13 May 7 17:46 testfile2
```

d. Set the permissions of the tree (the directory, its children, grand children, etc.) rooted at dir1 (Qn. 4) directory to 664 to student

```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6$ ls -l
total 12
drw-rw-rw- 5 lab lab 4096 May  7 23:33 dir1
drwxrwxrwx 5 lab lab 4096 May  7 23:25 dir5
-rw-rw-rwx 1 lab lab     6 Apr 24 22:22 file3
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6$ chmod -R 664 dir1
```

```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6$ ls -l
total 12
drw-rw-r-- 5 lab lab 4096 May  7 23:33 dir1
drwxrwxrwx 5 lab lab 4096 May  7 23:25 dir5
-rw-rw-rwx 1 lab lab     6 Apr 24 22:22 file3
```

17. Using cut filter

a. Display the filenames from ls -l assuming filenames start at column 44

```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2$ ls -l
total 36
drwxrwxr-x 2 lab lab 4096 May  7 18:04 dir3
-rw-rw-r-- 1 lab lab  243 Jan 11 21:53 lab3.1.py
-rw-rw-r-- 1 lab lab  453 Jan 11 21:35 lab3.7.py
-rw-rw-r-- 1 lab lab 3165 May  6 20:02 out2.txt
-rw-rw-r-- 1 lab lab 242 Mar  6 17:32 palindrome.py
-rw-rw-r-- 1 lab lab   74 Mar  6 17:24 pali.py
-rw-rw-r-- 1 lab lab 3521 Mar 12 13:03 set.c
-rw-rw-r-- 1 lab lab   89 Apr 25 23:14 testfile
-rw-rw-r-- 1 lab lab  13 Apr 25 23:02 testfile1
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2$ ls -l|cut -c 40-
dir3
lab3.1.py
lab3.7.py
out2.txt
palindrome.py
pali.py
set.c
testfile
testfile1
```

b. Display user Id and user name of all users from /etc/passwd.(fields 1 and 3)

```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2$ cut -d: -f 1,3 /etc/passwd
root:0
daemon:1
bin:2
sys:3
sync:4
games:5
man:6
lp:7
mail:8
news:9
uucp:10
proxy:13
www-data:33
backup:34
list:38
irc:39
gnats:41
nobody:65534
systemd-network:100
systemd-resolve:101
systemd-timesync:102
messagebus:103
syslog:104
_apt:105
tss:106
uuid:107
tcpdump:108
```

18.Using tr

- Piped with cat, display all that are entered in Uppercase
- Squeeze all space characters in ls -l and cut the size and name of all files.
- Piped with cat, change the output of Qn.12c to Hello, yourname, Greetings!!

```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat > sample
jim hopper
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat sample|tr [:lower:] [:upper:]
JIM HOPPER
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ ls -l|tr -s ' '|cut -d' ' -f 5,9

27 file1
13 s
11 sample
616 tesfile
616 testfile
13 testfile1
13 testfile2
6 testfile3
211 v
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat file1
Hello ,
arun
, Greetings!!
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat file1 | tr -d "\n"
Hello ,arun, Greetings!!lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$
```

19. Create 3 files containing name, age and marks of 5 students respectively and paste them into a single csv (comma separated values) file.

```
Hello ,arun, Greetings!!lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat > name
Arathi
Peter
Rose
Jack
Milli
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat > age
22
21
34
18
19
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat > marks
70
80
75
90
85
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ paste -d ","  name age marks >> csvfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2/dir3$ cat csvfile
Arathi,22,70
Peter,21,80
Rose,34,75
Jack,18,90
Milli,19,85
```

20. Using find

- a.piped with wc, display the number of files in a directory that starts with the letter a
- b.Delete all .py files in the parent directory

```
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind$ ls
a1.txt  age  dir2  rbt.c
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind$ find a*|wc -l
2
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind$ cd dir2
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind/dir2$ ls
palindrome.py  pali.py
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind/dir2$ cd ..
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind$ find -name "*.py" -type f -delete
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind$ cd dir2
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind/dir2$ ls
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind/dir2$
```

- c.Copy all files that starts with “a” to dir2

```
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind$ find . -type f -name "a*" -exec cp {} dir2 \;
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind$ cd dir2
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind/dir2$ ls
a1.txt  age
```

- d.Display files in the current directory that were modified in the last 30 minutes.

```
lab@lab-Lenovo-IdeaPad-Z400:~/dirfind/dir2$ find . -type f -mmin -30
./age
./a1.txt
```

21. Use head and tail piped with cat /etc/passwd to display the details of
- The first 12 users in the system.
 - The last 7 users in the system.

```
lab@lab-Lenovo-IdeaPad-Z400:~$ cat /etc/passwd|head -12
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
lab@lab-Lenovo-IdeaPad-Z400:~$ cat /etc/passwd|tail -7
hplip:x:124:7:HPLIP system user,,,:/run/hplip:/bin/false
gnome-initial-setup:x:125:65534::/run/gnome-initial-setup/:/bin/false
gdm:x:126:131:Gnome Display Manager:/var/lib/gdm3:/bin/false
lab:x:1000:1000:Lab,,,:/home/lab:/bin/bash
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
mysql:x:127:134:MySQL Server,,,:/nonexistent:/bin/false
user2:x:1001:1001:/home/user2:/bin/bash
```

- All but the first 3.

```
lab@lab-Lenovo-IdeaPad-Z400:~$ cat /etc/passwd | tail +4
```

- All but the last 5.

```
lab@lab-Lenovo-IdeaPad-Z400:~$ cat /etc/passwd |head -n -5
```

- Only the 9 th.

```
lab@lab-Lenovo-IdeaPad-Z400:~$ cat /etc/passwd|head -9|tail -1
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
```

22. Use grep to

- Display all lines in a file that contains the string “abc”
- Display all lines in a file that *does not* contain the string “abc”
- List names of all .py files that contains a *print*
- List names of all .py files that does not contain a *print*
- Display the number of *import* statements in each .py file.

```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ cat > txtfile
abc
abc is a string
these are english alphabets
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ grep abc txtfile
abc
abc is a string
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ grep -v abc txtfile
these are english alphabets
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ grep -l "print" *.py
lab3.1.py
lab3.7.py
palindrome.py
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ grep -L "print" *.py
pali.py
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ grep -c "import" *.py
lab3.1.py:0
lab3.7.py:0
palindrome.py:1
pali.py:1
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$
```

f.Display the Line numbers of *print* in a .py file.

g.List names of all files in the directory tree that contain a *print*.

```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ ls
dir3      lab3.7.py  palindrome.py  set.c      testfile1
lab3.1.py  out2.txt  pali.py       testfile  txtfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ cat lab3.7.py
area1=lambda x:x*x
area2=lambda x,y:x*y
area3=lambda x,y:0.5*x*y
a=int(input("Enter the length of the square: "))
print("Area of the square is ",area1(a))
l=int(input("Enter the length of the rectangle: "))
w=int(input("Enter the width of the rectangle: "))
print("Area of the rectangle is ",area2(l,w))
h=int(input("Enter the height of the triangle: "))
b=int(input("Enter the basearea of the triangle: "))
print("Area of the triangle is ",area3(h,b))
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ grep -n "print" lab3.7.py
5:print("Area of the square is ",area1(a))
8:print("Area of the rectangle is ",area2(l,w))
11:print("Area of the triangle is ",area3(h,b))
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ grep -lR "print"
lab3.1.py
palindrome.py
set.c
lab3.7.py
out2.txt
dir3/encrypt.py
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$
```

h.Display the context of every *print* in a .py file. i.e., n lines before and after every *print*.

```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ ls
dir3      lab3.7.py  palindrome.py  set.c      testfile1
lab3.1.py  out2.txt  pali.py       testfile  txtfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ cat palindrome.py
import math
def palindrom(str1):
    flag=0
    length=len(str1)
    for i in range(0,math.ceil(length/2)):
        if(str1[i]!=str1[length-i-1]):
            flag=1
            break
    if(flag==1):
        print(str1+" not a palindrome");
    else
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ grep "print" palindrome.py -A 1
                print(str1+" not a palindrome");
else
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ grep "print" palindrome.py -B 5
    for i in range(0,math.ceil(length/2)):
        if(str1[i]!=str1[length-i-1]):
            flag=1
            break
    if(flag==1):
        print(str1+" not a palindrome");

```

i. ls -l starts with d for directories. Use ls -l piped with grep & cut to display the names of all directories in the current directory.

```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ ls -l
total 40
drwxrwxr-x 2 lab lab 4096 May  7 12:42 dir3
-rw-rw-r-- 1 lab lab  243 May  7 12:42 lab3.1.py
-rw-rw-r-- 1 lab lab  453 May  7 12:42 lab3.7.py
-rw-rw-r-- 1 lab lab 3165 May  7 12:42 out2.txt
-rw-rw-r-- 1 lab lab  206 May  7 22:48 palindrome.py
-rw-rw-r-- 1 lab lab   74 May  7 12:42 pali.py
-rw-rw-r-- 1 lab lab 3521 May  7 12:42 set.c
-rw-rw-r-- 1 lab lab   89 May  7 12:42 testfile
-rw-rw-r-- 1 lab lab   13 May  7 12:42 testfile1
-rw-rw-r-- 1 lab lab   48 May  7 22:13 txtfile
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ ls -l | grep "^d" | cut -d " " -f 10
dir3

```

23.Using expr

- a.Read two integers X and Y. Display the sum, difference, product, quotient and remainder of these variables.
- b.Read a string, S, a position, p and a length l. Display the substring of length l starting at position p from the string S.

```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ read -p "enter two numbers: " x y
enter two numbers: 12 5
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ echo "sum is : `expr $x + $y`"
sum is : 17
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ echo "Difference is : `expr $x - $y`"
Difference is : 7
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ echo "Product is : `expr $x \* $y`"
Product is : 60
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ echo "Quotient is : `expr $x / $y`"
Quotient is : 2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ echo "Reminder is : `expr $x % $y`"
Reminder is : 2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ read -p "enter a string: " s
enter a string: notebook
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ read -p "enter the position: " p
enter the position: 5
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ read -p "enter the length: " l
enter the length: 4
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6/dir5/dir2$ echo "substring: `expr substr \$s \$p \$l`"
Substring: book

```

24.a.Add a normal user, user1. Create (if it does not exist) the folder /user1 and set /user1 as the home directory of user1. Also set /bin/bash as the login shell (*Use a single command*).

b.Modify the user account of user1, to expire it after a specific date .

c.Change the owner and group of the directory tree from dir2 and all its contents to user1

```

lab@lab-Lenovo-IdeaPad-Z400:/home$ sudo useradd -s /bin/bash -m -d /home/u_ser1 u_ser1
lab@lab-Lenovo-IdeaPad-Z400:/home$ sudo chage -l u_ser1
Last password change : May 08, 2022
Password expires : never
Password inactive : never
Account expires : never
Minimum number of days between password change : 0
Maximum number of days between password change : 99999
Number of days of warning before password expires : 7
lab@lab-Lenovo-IdeaPad-Z400:/home$ chage -E 2022-05-10 u_ser1
chage: Permission denied.
lab@lab-Lenovo-IdeaPad-Z400:/home$ sudo chage -E 2022-05-10 u_ser1
lab@lab-Lenovo-IdeaPad-Z400:/home$ sudo chage -l u_ser1
Last password change : May 08, 2022
Password expires : never
Password inactive : never
Account expires : May 10, 2022
Minimum number of days between password change : 0
Maximum number of days between password change : 99999
Number of days of warning before password expires : 7
lab@lab-Lenovo-IdeaPad-Z400:/home$ sudo chown -R u_ser1:u_ser1 dir2
chown: cannot access 'dir2': No such file or directory
lab@lab-Lenovo-IdeaPad-Z400:/home$ sudo chown -R u_ser1:u_ser1 /home/lab/dir1/dir2

```

```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2$ cd ..
lab@lab-Lenovo-IdeaPad-Z400:~/dir1$ ls -l
total 32
-rw-rw-r-- 1 lab    lab      9 Apr 25 21:46 a1.txt
drwxrwxrwx 3 u_ser1 u_ser1 4096 May  7 20:10 dir2
drwxrwxr-x 2 lab    lab     4096 Apr 21 20:25 dir4
drwxrwxr-x 4 lab    lab     4096 May  7 23:41 dir6
-rw-rw-r-- 1 lab    lab     24 Apr 25 21:03 F1
-rw-rw-r-- 1 lab    lab     15 Apr 25 21:04 F2
-rw-rw-r-- 1 lab    lab     15 Apr 25 21:05 F3
-rw-rw-r-- 1 lab    lab    242 Apr 25 22:25 palindrome.py
-rw-rw-r-- 1 lab    lab      0 Apr 25 20:08 sample
lab@lab-Lenovo-IdeaPad-Z400:~/dir1$ cd dir2
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2$ ls -l
total 24
drwxrwxr-x 2 u_ser1 u_ser1 4096 May  7 20:10 dir3
-rw-rw-r-- 1 u_ser1 u_ser1 3165 May  6 20:02 out2.txt
-rw-rw-r-- 1 u_ser1 u_ser1  470 May  7 19:20 result
-rw-rw-r-- 1 u_ser1 u_ser1 3521 Mar 12 13:03 set.c
-rw-rw-r-- 1 u_ser1 u_ser1   89 Apr 25 23:14 testfile
-rw-rw-r-- 1 u_ser1 u_ser1  13 Apr 25 23:02 testfile1

```

d.Delete the user account user1

i.By retaining the home folder

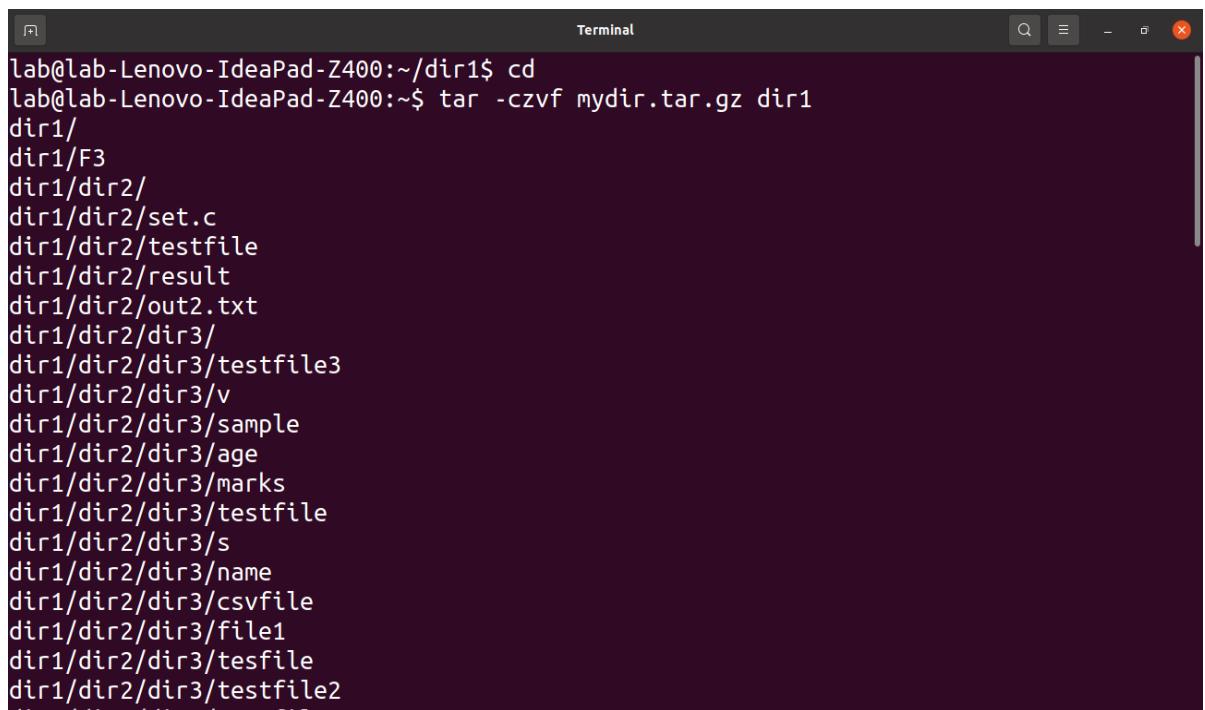
```
lab@lab-Lenovo-IdeaPad-Z400:~$ sudo userdel u_ser1
```

ii.By deleting the home folder

```
lab@lab-Lenovo-IdeaPad-Z400:~$ sudo userdel -r u_ser1
```

25.Miscellaneous

a.Using tar create a tar.gz file of the folder dir1 of Qn.4 with the name *mydir.tar.gz*



```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1$ cd
lab@lab-Lenovo-IdeaPad-Z400:~/dir1$ tar -czvf mydir.tar.gz dir1
dir1/
dir1/F3
dir1/dir2/
dir1/dir2/set.c
dir1/dir2/testfile
dir1/dir2/result
dir1/dir2/out2.txt
dir1/dir2/dir3/
dir1/dir2/dir3/testfile3
dir1/dir2/dir3/v
dir1/dir2/dir3/sample
dir1/dir2/dir3/age
dir1/dir2/dir3/marks
dir1/dir2/dir3/testfile
dir1/dir2/dir3/s
dir1/dir2/dir3/name
dir1/dir2/dir3/csvfile
dir1/dir2/dir3/file1
dir1/dir2/dir3/tesfile
dir1/dir2/dir3/testfile2

```

b.Extract the contents of *mydir.tar.gz* to dir6 of Qn.14

```
lab@lab-Lenovo-IdeaPad-Z400:~$ tar -xvzf mydir.tar.gz -C dir1/dir6
dir1/
dir1/F3
dir1/dir2/
dir1/dir2/set.c
dir1/dir2/testfile
dir1/dir2/result
dir1/dir2/out2.txt
dir1/dir2/dir3/
dir1/dir2/dir3/testfile3
dir1/dir2/dir3/v
dir1/dir2/dir3/sample
dir1/dir2/dir3/age
dir1/dir2/dir3/marks
dir1/dir2/dir3/testfile
dir1/dir2/dir3/s
dir1/dir2/dir3/name
dir1/dir2/dir3/csvfile
dir1/dir2/dir3/file1
dir1/dir2/dir3/tesfile
dir1/dir2/dir3/testfile2
dir1/dir2/dir3/testfile1
dir1/dir2/testfile1
dir1/F1
dir1/F2
dir1/palindrome.py
dir1/sample
dir1/dir4/
dir1/dir6/
dir1/dir6/dir5/
dir1/dir6/dir5/testfile3
```

```
dir1/dir6/dir5/dir2/dir3/b_file
dir1/dir6/dir5/dir2/dir3/file1
dir1/dir6/dir5/dir2/dir3/encrypt.py
dir1/dir6/dir5/dir2/dir3/a1.txt
dir1/dir6/dir5/dir2/dir3/text
dir1/dir6/dir5/dir2/dir3/testfile1
dir1/dir6/dir5/dir2/testfile1
dir1/dir6/dir5/F1
dir1/dir6/dir5/F2
dir1/dir6/dir5/palindrome.py
dir1/dir6/dir5/sample
dir1/dir6/dir5/dir4/
dir1/dir6/dir5/dir6/
dir1/dir6/dir5/a1.txt
dir1/dir6/dir5/testfile2
dir1/dir6/dir5/testfile1
dir1/dir6/file3
dir1/mydir.tar.gz
dir1/a1.txt
lab@lab-Lenovo-IdeaPad-Z400:~$ ls -l mydir.tar.gz
-rw-rw-r-- 1 lab lab 5067 May  7 23:33 mydir.tar.gz
```

```

lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir6$ ls -R
.:
dir1 dir5 file3

./dir1:
a1.txt dir2 dir4 dir6 F1 F2 F3 mydir.tar.gz palindrome.py sample

./dir1/dir2:
dir3 out2.txt result set.c testfile testfile1

./dir1/dir2/dir3:
age csvfile file1 marks name s sample tesfile testfile testfile1 testfile2 testfile3 v

./dir1/dir4:

./dir1/dir6:
dirs file3

./dir1/dir6/dir5:
a1.txt dir2 dir4 dir6 F1 F2 F3 palindrome.py sample testfile1 testfile2 testfile3

./dir1/dir6/dir5/dir2:
dir3 lab3.1.py lab3.7.py out2.txt palindrome.py pali.py set.c testfile testfile1 txtfile

./dir1/dir6/dir5/dir3:
a1.txt b_file file1 lsoutput more newfile1 test text
aa_file encrypt.py file2 lsoutput.txt newfile sample testfile1

./dir1/dir6/dir4:

./dir1/dir6/dir5/dir6:

./dir5:
a1.txt dir2 dir4 dir6 F1 F2 F3 palindrome.py sample testfile1 testfile2 testfile3

./dir5/dir2:
dir3 lab3.1.py lab3.7.py out2.txt palindrome.py pali.py set.c testfile testfile1 txtfile

```

c.Use top to display processes sorted on

i.ProcessId

1. Type top

2. Press N

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
35342	lab	20	0	402144	44192	33592	S	15.6	0.7	0:00.47	gnome-screensho
35333	lab	20	0	21584	4012	3336	R	0.7	0.1	0:00.12	top
35313	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/0:3-cgroup_destroy
35244	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0-events
35241	root	20	0	0	0	0	I	0.0	0.0	0:00.09	kworker/u16:0-events_unbound
35193	lab	20	0	1108.5g	63928	48524	S	0.0	1.1	0:00.04	chrome
35181	lab	20	0	1108.5g	166884	101196	S	2.0	2.8	0:16.81	chrome
35173	lab	20	0	20.3g	42584	31328	S	0.0	0.7	0:00.02	chrome
35131	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/u17:0
35112	root	20	0	0	0	0	I	0.0	0.0	0:00.09	kworker/3:2-events
35101	root	20	0	0	0	0	I	0.3	0.0	0:00.17	kworker/u16:3-phy0
35061	lab	20	0	17228	2556	2284	S	0.0	0.0	0:00.14	pager
35051	lab	20	0	18492	4044	2924	S	0.0	0.1	0:00.01	man
35043	root	20	0	0	0	0	I	0.0	0.0	0:00.18	kworker/0:2-events
35025	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/1:0-events
34983	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/2:0-events
34874	root	20	0	0	0	0	I	0.0	0.0	0:00.38	kworker/u16:2-iwlwifi
34870	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/u17:1-rb_allocator
34836	root	20	0	0	0	0	I	0.0	0.0	0:00.11	kworker/0:1-cgroup_destroy
34808	root	20	0	0	0	0	I	0.3	0.0	0:01.18	kworker/2:1-events
34691	root	20	0	0	0	0	I	0.0	0.0	0:00.78	kworker/u16:1-iwlwifi
34497	root	20	0	0	0	0	I	0.0	0.0	0:00.24	kworker/3:1-events
34257	root	0	-20	0	0	0	I	0.7	0.0	0:02.45	kworker/u17:2-i915_flip
32684	root	20	0	0	0	0	I	0.0	0.0	0:01.28	kworker/1:2-events
32506	root	20	0	395836	29828	25108	S	0.0	0.5	0:00.67	fwupd
31950	lab	20	0	18716	4264	3604	S	0.0	0.1	0:00.11	bash
31576	lab	20	0	18716	4420	3752	S	0.0	0.1	0:00.16	bash
24267	lab	20	0	434172	71360	45500	S	5.0	1.2	1:24.22	gnome-terminal-
17368	lab	20	0	3001548	134608	44836	S	0.0	2.3	0:09.03	gjs
17246	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	irq/28-me1_me
15010	lab	20	0	919828	121340	54424	S	0.0	2.0	1:25.03	nautilus

ii.CPU%

1.Type top

2. Press P

```
top - 00:06:25 up 12:06, 1 user, load average: 0.33, 0.32, 0.34
Tasks: 261 total, 2 running, 259 sleeping, 0 stopped, 0 zombie
%Cpu(s): 13.1 us, 2.0 sy, 0.0 ni, 84.8 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 5797.5 total, 688.6 free, 2354.7 used, 2754.2 buff/cache
MiB Swap: 11443.0 total, 11443.0 free, 0.0 used, 2794.1 avail Mem

      PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM TIME+ COMMAND
 1657 lab      20   0 5584528 306860 129564 S 20.9  5.2 31:54.69 gnome-shell
 35416 lab     20   0 402148 43884 33292 R 17.9  0.7 0:00.54 gnome-screensho
 24267 lab      20   0 434172 71616 45500 S  4.6  1.2 1:25.27 gnome-terminal-
 35181 lab      20   0 1108.5g 164768 101080 S  2.0  2.8 0:18.03 chrome
 1501 lab      20   0 10080  6440  4148 S  0.7  0.1 0:06.55 dbus-daemon
 2170 lab      20   0 1367192 54320 38040 S  0.7  0.9 0:11.99 xdg-desktop-por
 34808 root     20   0      0      0      0 I  0.7  0.0 0:01.30 kworker/2:1-events
 35333 lab     20   0 21584  4012  3336 R  0.7  0.1 0:00.41 top
 13 root     20   0      0      0      0 I  0.3  0.0 0:35.58 rcu_sched
 753 root     20   0 346472 20148 16756 S  0.3  0.3 1:22.36 NetworkManager
 1013 mysql    20   0 2155724 379132 33584 S  0.3  6.4 2:24.49 mysqld
 2974 lab      20   0 16.5g 275208 159996 S  0.3  4.6 15:51.79 chrome
 3019 lab      20   0 16.3g 126916 87036 S  0.3  2.1 6:43.55 chrome
 34257 root    0 -20      0      0      0 I  0.3  0.0 0:02.56 kworker/u17:2-i915_flip
 35043 root    20   0      0      0      0 I  0.3  0.0 0:00.21 kworker/0:2-events
 35101 root    20   0      0      0      0 I  0.3  0.0 0:00.24 kworker/u16:3-iwlwifi
 1 root      20   0 164828 10960 7708 S  0.0  0.2 0:03.15 systemd
 2 root      20   0      0      0      0 S  0.0  0.0 0:00.03 kthreadd
 3 root      0 -20      0      0      0 I  0.0  0.0 0:00.00 rcu_gp
 4 root      0 -20      0      0      0 I  0.0  0.0 0:00.00 rcu_par_gp
 6 root      0 -20      0      0      0 I  0.0  0.0 0:00.00 kworker/0:0H-events_highpri
 9 root      0 -20      0      0      0 I  0.0  0.0 0:00.00 mm_percpu_wq
 10 root     20   0      0      0      0 S  0.0  0.0 0:00.00 rcu_tasks_rude_
 11 root     20   0      0      0      0 S  0.0  0.0 0:00.00 rcu_tasks_trace
 12 root     20   0      0      0      0 S  0.0  0.0 0:00.81 ksoftirqd/0
 14 root     rt  0      0      0      0 S  0.0  0.0 0:00.22 migration/0
 15 root     -51  0      0      0      0 S  0.0  0.0 0:00.00 idle_inject/0
 16 root     20   0      0      0      0 S  0.0  0.0 0:00.00 cpuhp/0
 17 root     20   0      0      0      0 S  0.0  0.0 0:00.00 cpuhp/1
 18 root     -51  0      0      0      0 S  0.0  0.0 0:00.00 idle_inject/1
 19 ?       00:00:00 migration/1
 20 ?       00:00:00 ksoftirqd/1
 22 ?       00:00:00 kworker/1:0H-kblockd
 23 ?       00:00:00 cpuhp/2
 24 ?       00:00:00 idle_inject/2
 25 ?       00:00:00 migration/2
 26 ?       00:00:00 ksoftirqd/2
 28 ?       00:00:00 kworker/2:0H-events_highpri
 29 ?       00:00:00 cpuhp/3
 30 ?       00:00:00 idle_inject/3
 31 ?       00:00:00 migration/3
 32 ?       00:00:00 ksoftirqd/3
 34 ?       00:00:00 kworker/3:0H-events_highpri
 35 ?       00:00:00 kdevtmpfs
 36 ?       00:00:00 netns
 37 ?       00:00:00 inet_frag_wq
 38 ?       00:00:00 kauditd
 39 ?       00:00:00 ksoftirqd/4
```

d.Use ps to display

i.Processes associated with the current terminal

ii.All processes in the system

```
lab@lab-Lenovo-IdeaPad-Z400:~$ ps -T
  PID      SPID TTY      TIME CMD
 31576    31576 pts/0    00:00:00 bash
 35866    35866 pts/0    00:00:00 ps
lab@lab-Lenovo-IdeaPad-Z400:~$ ps -A
  PID TTY      TIME CMD
  1 ?      00:00:03 systemd
  2 ?      00:00:00 kthreadd
  3 ?      00:00:00 rcu_gp
  4 ?      00:00:00 rcu_par_gp
  6 ?      00:00:00 kworker/0:0H-events_highpri
  9 ?      00:00:00 mm_percpu_wq
 10 ?      00:00:00 rcu_tasks_rude_
 11 ?      00:00:00 rcu_tasks_trace
 12 ?      00:00:00 ksoftirqd/0
 13 ?      00:00:36 rcu_sched
 14 ?      00:00:00 migration/0
 15 ?      00:00:00 idle_inject/0
 16 ?      00:00:00 cpuhp/0
 17 ?      00:00:00 cpuhp/1
 18 ?      00:00:00 idle_inject/1
 19 ?      00:00:00 migration/1
 20 ?      00:00:00 ksoftirqd/1
 22 ?      00:00:00 kworker/1:0H-kblockd
 23 ?      00:00:00 cpuhp/2
 24 ?      00:00:00 idle_inject/2
 25 ?      00:00:00 migration/2
 26 ?      00:00:00 ksoftirqd/2
 28 ?      00:00:00 kworker/2:0H-events_highpri
 29 ?      00:00:00 cpuhp/3
 30 ?      00:00:00 idle_inject/3
 31 ?      00:00:00 migration/3
 32 ?      00:00:00 ksoftirqd/3
 34 ?      00:00:00 kworker/3:0H-events_highpri
 35 ?      00:00:00 kdevtmpfs
 36 ?      00:00:00 netns
 37 ?      00:00:00 inet_frag_wq
 38 ?      00:00:00 kauditd
 39 ?      00:00:00 ksoftirqd/4
```

e. Use df to display the storage available in each partition in human readable form.

```
lab@lab-Lenovo-IdeaPad-Z400:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs          580M   1.9M  578M   1% /run
/dev/sda7       281G   19G  248G   8% /
tmpfs          2.9G   93M  2.8G   4% /dev/shm
tmpfs          5.0M   4.0K  5.0M   1% /run/lock
tmpfs          4.0M     0  4.0M   0% /sys/fs/cgroup
tmpfs          580M   1.3M  579M   1% /run/user/1000
```

Lab Cycle: 2
Experiment No.: 2
Date: 17-05-2022

1. Read a number and print whether it is even or odd. (if..then..else..fi).

```
#!/bin/bash
read -p "Enter a number: " num
if test=$((num % 2)) == 0
then
echo "$num is even"
else
echo "$num is odd"
fi
```

Output:

```
lab@lab-Lenovo-IdeaPad-Z400:~/shell_prgms$ bash prgrm1.sh
Enter a number: 48
48 is even
```

2. Read 3 marks of a student and find the average. Display the grade of the student based on the average. (if..then..elif..fi)

S >= 90%
A < 90%, but >= 80%
B < 80%, but >= 60%
P < 60%, but >= 40%
F < 40%

```
#!/bin/bash
read -p "Enter three marks out of 100 each : " m1 m2 m3
s=$((m1+m2+m3))
avg=$(echo "scale=2;$s / 3"|bc)
echo -e "Average: $avg"
if [[ $(echo "if (${avg} >= 90) 1 else 0" | bc) -eq 1 ]]
then
echo "Grade: S"
elif [[ $(echo "if (${avg} < 90) 1 else 0" | bc) -eq 1 ]] &&
[[ $(echo "if (${avg} >= 80) 1 else 0" | bc) -eq 1 ]]
then
echo "Grade: A"
elif [[ $(echo "if (${avg} < 80) 1 else 0" | bc) -eq 1 ]] &&
```

```

[[ $(echo "if (${avg} >= 60) 1 else 0" | bc) -eq 1 ]]
then
echo "Grade: B"
elif [[ $(echo "if (${avg} < 60) 1 else 0" | bc) -eq 1 ]] &&
[[ $(echo "if (${avg} >= 40) 1 else 0" | bc) -eq 1 ]]
then
echo "Grade: P"
else
echo "Grade: F"
fi

```

Output:

```

lab@lab-Lenovo-IdeaPad-Z400:~/shell_prgms$ bash prgrm2.sh
Enter three marks out of 100 each : 63 77 96
Average: 78.66
Grade: B

```

3. Read the name of an Indian state and display the main language according to the table. For other states, the output may be “Unknown”. Use “|” to separate states with same language (case..esac)

State	Main Language
Andhra Pradesh	Telugu
Assam	Assamese
Bihar	Hindi
Himachal Pradesh	Hindi
Karnataka	Kannada
Kerala	Malayalam
Lakshadweep	Malayalam
Tamil Nadu	Tamil

```

#!/bin/bash
read -p "Enter the Indian state: " state
state=$(echo $state | tr '[:upper:]' '[:lower:]')
case $state in
"andhra pradesh")
    echo "Language: Telugu";;
"assam")
    echo "Language: Assamese";;
"bihar"|"himachal pradesh")

```

```

        echo "Language: Hindi";;
    "karnataka")
        echo "Language: Kannada";;
    "kerala"|"lakshadweep")
        echo "Language: Malayalam";;
    "tamil nadu")
        echo "Language: Tamil";;
*)
    echo "Language: Unknown";;
esac

```

Output:

```

Lab@lab-Lenovo-IdeaPad-Z400:~/shell_prgms$ bash prgrm3.sh
Enter the Indian state: Andhra pradesh
Language: Telugu
Lab@lab-Lenovo-IdeaPad-Z400:~/shell_prgms$ bash prgrm3.sh
Enter the Indian state: gujarat
Language: Unknown

```

4. Change the home folder of all users whose name start with stud from /home/username to /usr/username. Also change the password of username to username123 (e.g., /home/stud25 changes to /usr/stud25 and his/her password changes to stud25123) - (Use for .. in)

```

#!/bin/bash
result=$(grep stud* /etc/passwd)
result=$(echo "${result}"| cut -d: -f 1)
echo $result
for f in $result
do
    p="${f}123"
    sudo usermod -p $(echo $p | openssl passwd -1 -stdin) $f
    sudo usermod -m -d /usr $f
done

```

Output:

```

stud:x:1003:1003::/home:/bin/sh
students:x:1006:1006::/home:/bin/sh

user@user-VirtualBox:~/shellpg$ bash usermod.sh
stud students
usermod: directory /usr exists
usermod: directory /usr exists

stud:x:1003:1003::/usr:/bin/sh
students:x:1006:1006::/usr:/bin/sh

```

5. Read a number and display the multiplication table of the number up to 10 lines. (Use for(..))

```
#!/bin/bash
read -p "Enter a number: " num
echo "Multiplication table of $num : "
for (( i=1; i<=10; i++))
do
val=$(( num * i ))
echo "$i * $num = $val"
done
```

Output:

```
lab@lab-Lenovo-IdeaPad-Z400:~/shell_prgrms$ bash prgrm5.sh
Enter a number: 5
Multiplication table of 5 :
1 * 5 = 5
2 * 5 = 10
3 * 5 = 15
4 * 5 = 20
5 * 5 = 25
6 * 5 = 30
7 * 5 = 35
8 * 5 = 40
9 * 5 = 45
10 * 5 = 50
```

6. Read a Decimal number. Convert it to Binary and display the result. -(Use while)

```
#!/bin/bash
read -p "Enter a decimal number: " n
val=0
power=1
while [ $n -ne 0 ]
do
r=`expr $n % 2`
val=`expr $r \* $power + $val`
power=`expr $power \* 10`
n=`expr $n / 2`
done
echo "Binary equivalent : $val"
```

Output:

```
lab@lab-Lenovo-IdeaPad-Z400:~/shell_prgms$ bash prgrm6.sh
Enter a decimal number: 15
Binary equivalent : 1111
```