

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

Aim: Familarise with linux commands.

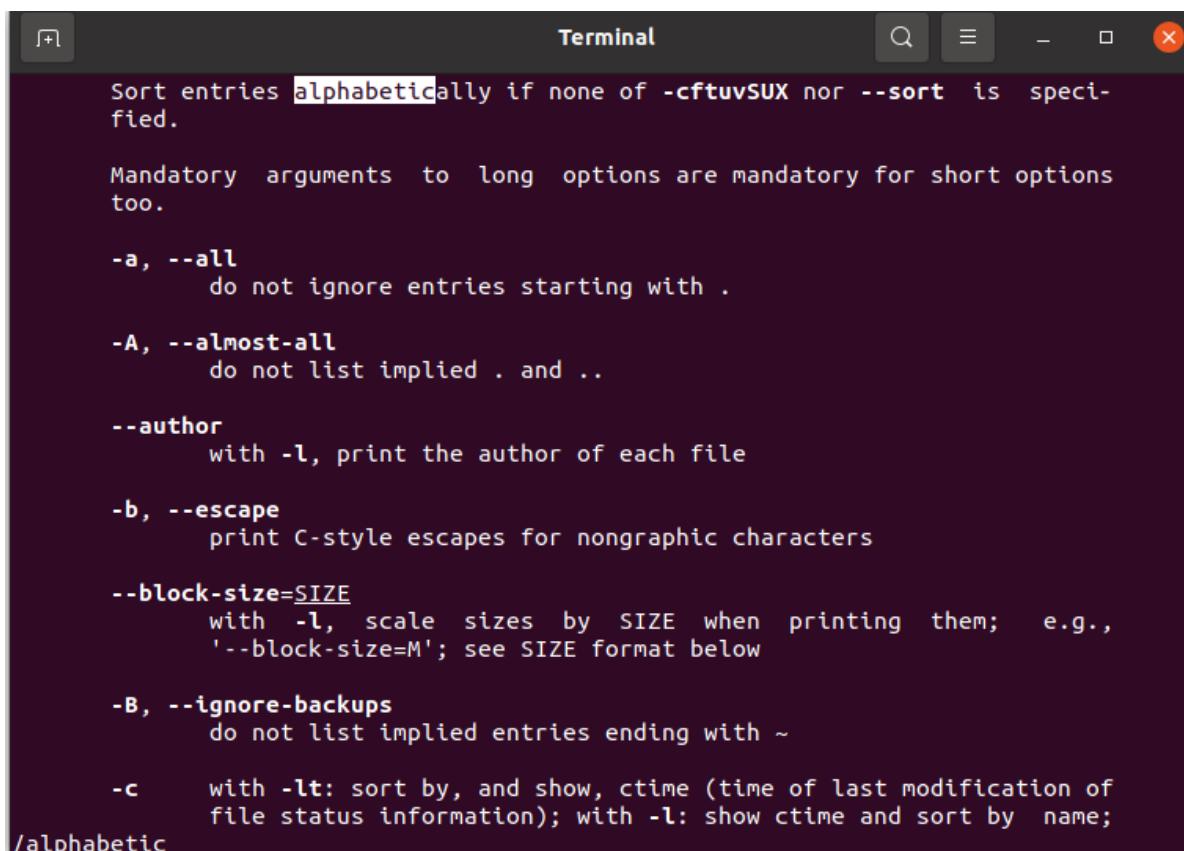
Solution:

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

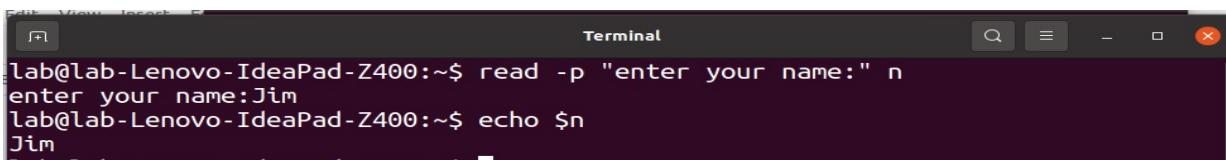
-B, --ignore-backups
        do not list implied entries ending with ~

-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”.

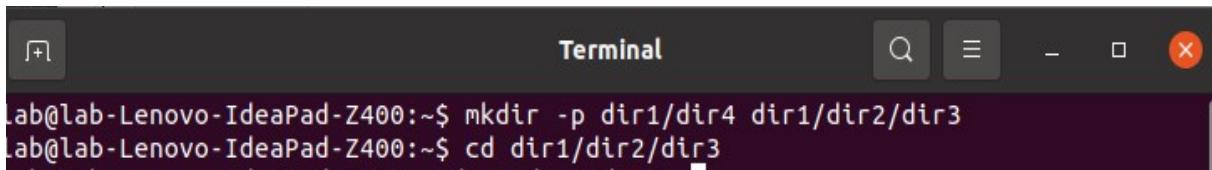
.

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



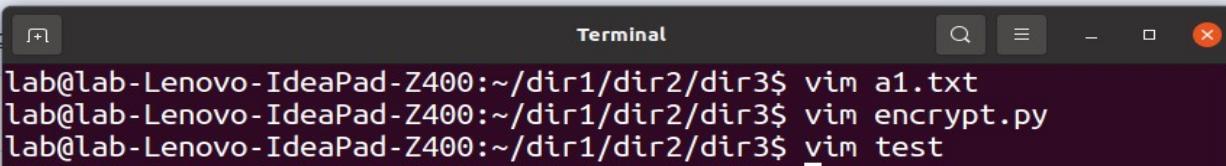
```
lab@lab-Lenovo-IdeaPad-Z400:~$ read -p "enter your name:" n
enter your name:Jim
lab@lab-Lenovo-IdeaPad-Z400:~$ echo $n
Jim
```

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



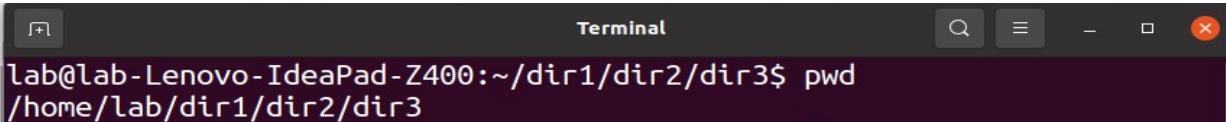
```
lab@lab-Lenovo-IdeaPad-Z400:~$ mkdir -p dir1/dir4 dir1/dir2/dir3
lab@lab-Lenovo-IdeaPad-Z400:~$ cd dir1/dir2/dir3
```

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
```

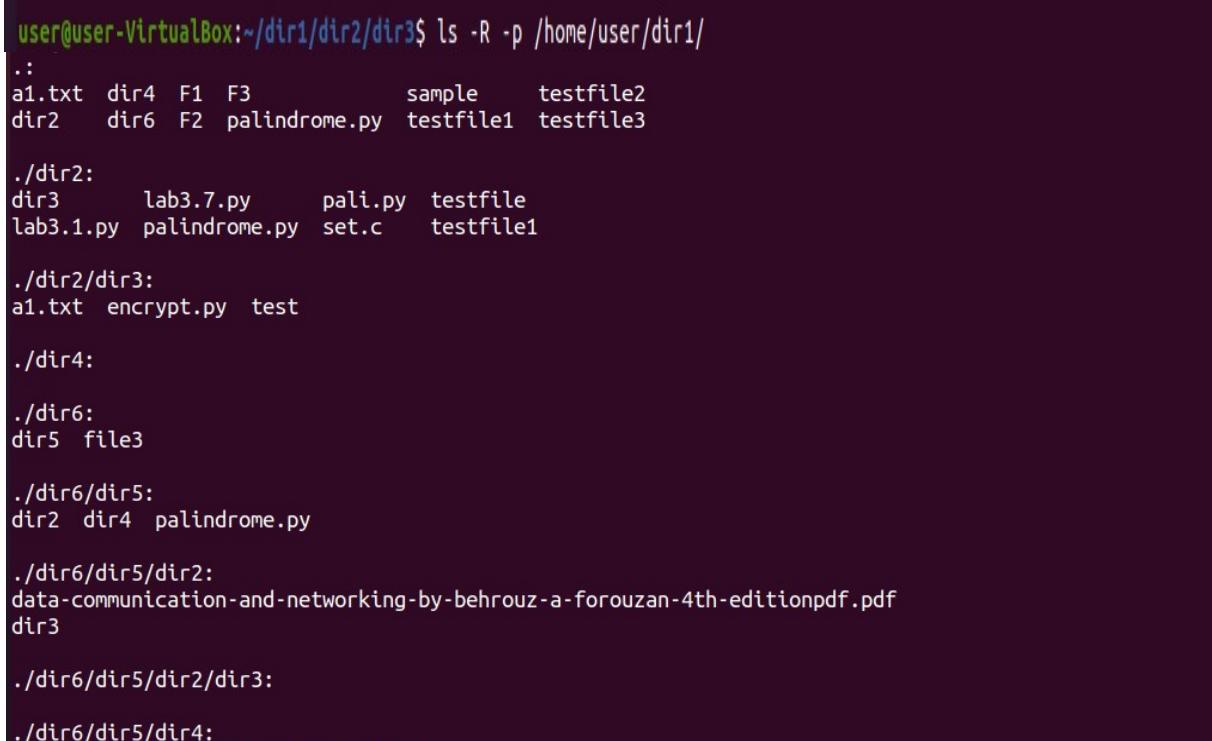
6. Display the current directory



```
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

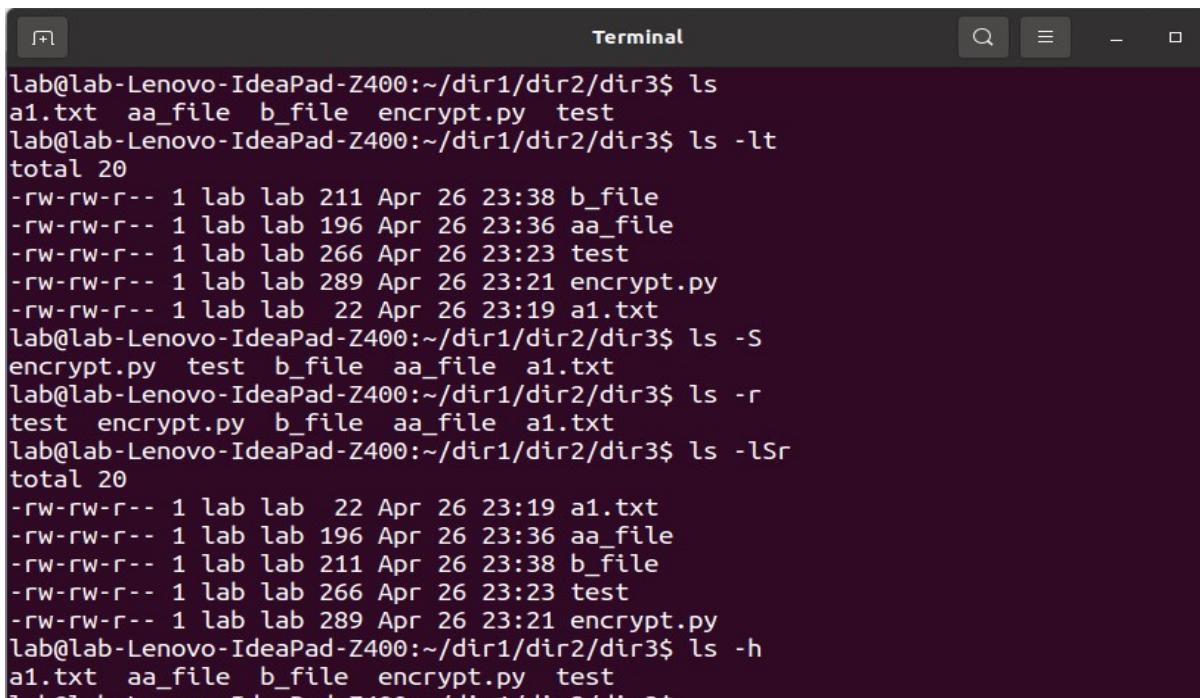
./dir6/dir5/dir2:
data-communication-and-networking-by-behrouz-a-forouzan-4th-editionpdf.pdf
dir3

./dir6/dir5/dir3:

./dir6/dir5/dir4:
```

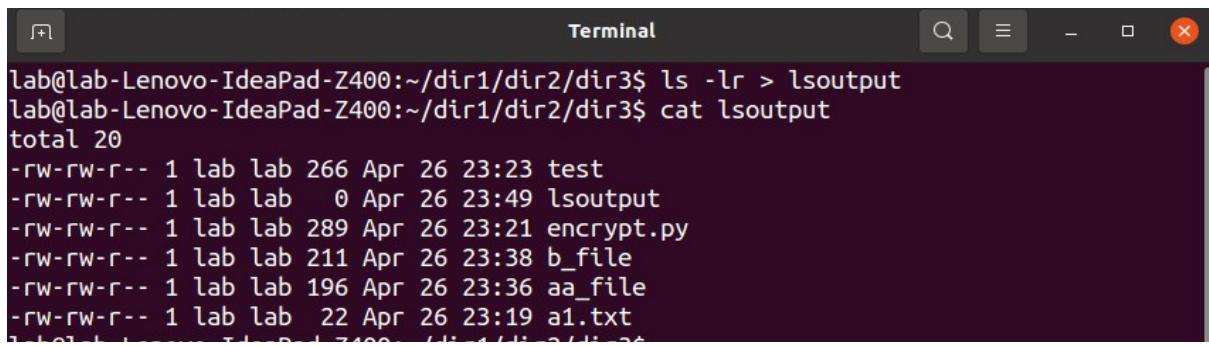
b. List the contents of dir3 (Qn. 4) in

- 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

```
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
```

```
void setUnion(int arr1[],int arr2[]){
    int i;
    for(i=0;i<superSetSize;i++){
        bitStringUnion[i]=arr1[i]|arr2[i];
    }
}
void setIntersection(int arr1[],int arr2[]){
    int i;
    for(i=0;i<superSetSize;i++){
        bitStringIntersection[i]=arr1[i]&arr2[i];
    }
}
void setDifference(int arr1[],int arr2[]){
    int i;
    for(i=0;i<superSetSize;i++){
        bitStringDifference[i]=arr1[i]&(!arr2[i]);
    }
}
int getSet(int arr[],int size){
    int i,j,k;
    printf("\nEnter set\n");
--More--(24%)
```

ii. Scrolling Up and Down

```
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2$ ls
dir3  out2.txt  result  set.c  testfile  testfile1
lab@lab-Lenovo-IdeaPad-Z400:~/dir1/dir2$ less +10 set.c
```

```

void setUnion(int arr1[],int arr2[]){
    int i;
    for(i=0;i<superSetSize;i++){
        bitStringUnion[i]=arr1[i]|arr2[i];
    }
}
void setIntersection(int arr1[],int arr2[]){
    int i;
    for(i=0;i<superSetSize;i++){
        bitStringIntersection[i]=arr1[i]&arr2[i];
    }
}
void setDifference(int arr1[],int arr2[]){
    int i;
    for(i=0;i<superSetSize;i++){
        bitStringDifference[i]=arr1[i]&(!arr2[i]);
    }
}

int getSet(int arr[],int size){
set.c

```

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

b. Type your name and address with district and pincode

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

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

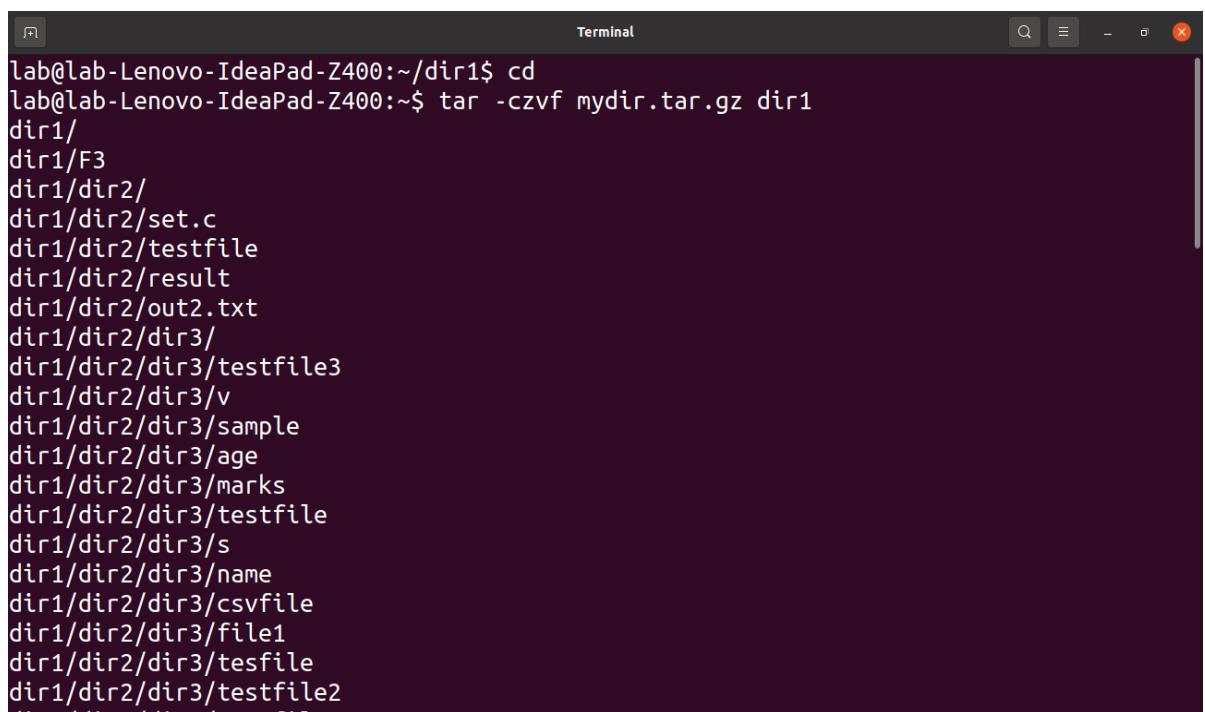
```
lab@lab-Lenovo-IdeaPad-Z400:~$ sudo userdel u_ser1
```

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:

./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
```