

# Assignment No 1:

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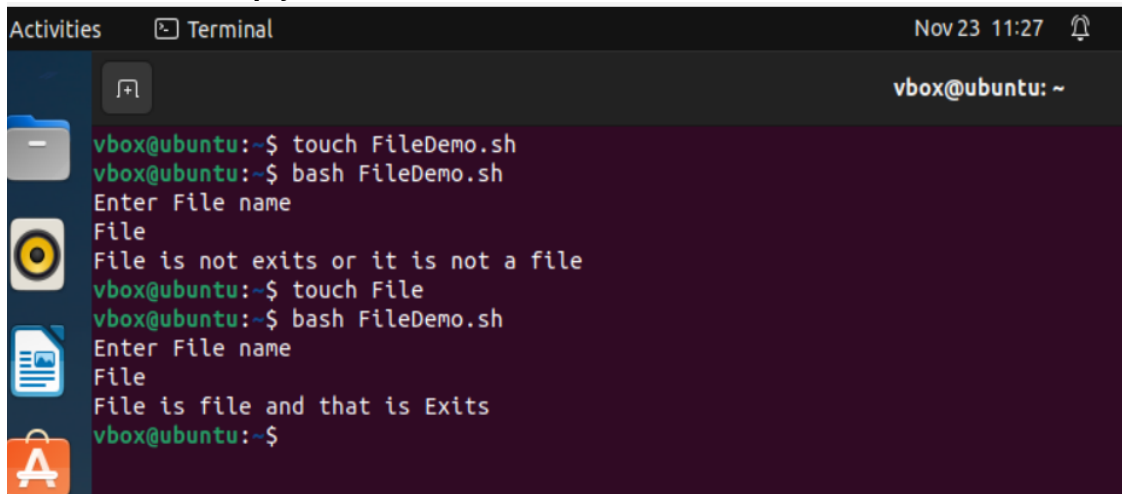
Prn: 12420020

Roll no: 2

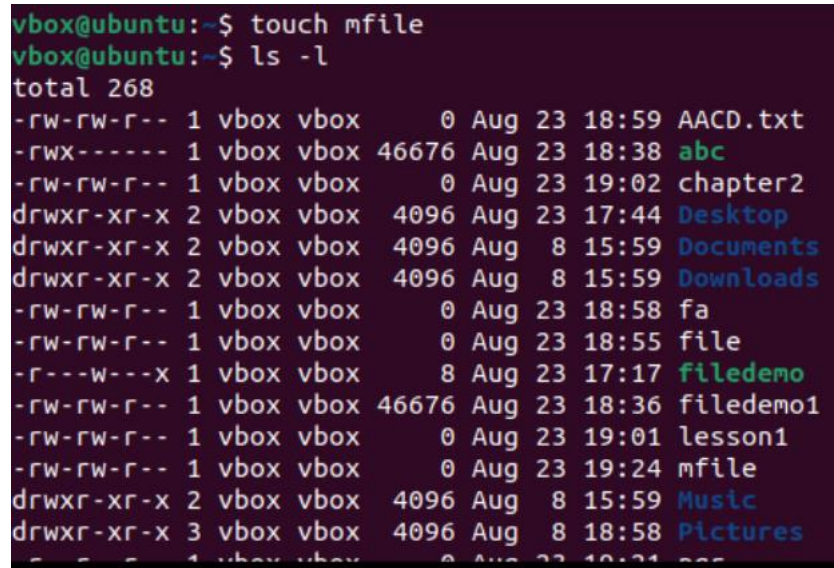
Sub: Operating System Lab

Q] 1 Execution of Basic & Advanced Linux Commands

Touch – Creates empty file

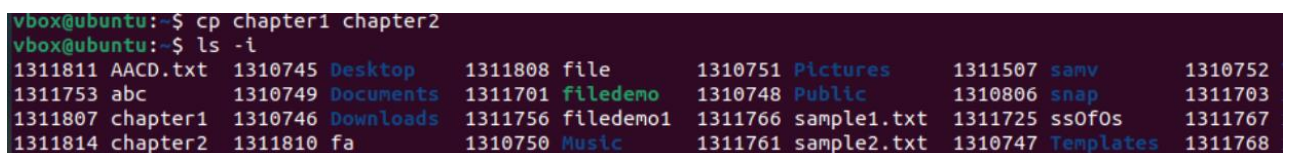


```
Activities Terminal Nov 23 11:27
vbox@ubuntu: ~
vbox@ubuntu:~$ touch FileDemo.sh
vbox@ubuntu:~$ bash FileDemo.sh
Enter File name
File
File is not exists or it is not a file
vbox@ubuntu:~$ touch File
vbox@ubuntu:~$ bash FileDemo.sh
Enter File name
File
File is file and that is Exits
vbox@ubuntu:~$
```



```
vbox@ubuntu:~$ touch mfile
vbox@ubuntu:~$ ls -l
total 268
-rw-rw-r-- 1 vbox vbox 0 Aug 23 18:59 AACD.txt
-rwx----- 1 vbox vbox 46676 Aug 23 18:38 abc
-rw-rw-r-- 1 vbox vbox 0 Aug 23 19:02 chapter2
drwxr-xr-x 2 vbox vbox 4096 Aug 23 17:44 Desktop
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Documents
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Downloads
-rw-rw-r-- 1 vbox vbox 0 Aug 23 18:58 fa
-rw-rw-r-- 1 vbox vbox 0 Aug 23 18:55 file
-r--w---x 1 vbox vbox 8 Aug 23 17:17 filedemo
-rw-rw-r-- 1 vbox vbox 46676 Aug 23 18:36 filedemo1
-rw-rw-r-- 1 vbox vbox 0 Aug 23 19:01 lesson1
-rw-rw-r-- 1 vbox vbox 0 Aug 23 19:24 mfile
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Music
drwxr-xr-x 3 vbox vbox 4096 Aug 8 18:58 Pictures
```

Cp: copies content of file1 to file2 just as copy and paste



```
vbox@ubuntu:~$ cp chapter1 chapter2
vbox@ubuntu:~$ ls -l
1311811 AACD.txt 1310745 Desktop 1311808 file 1310751 Pictures 1311507 samv 1310752
1311753 abc 1310749 Documents 1311701 filedemo 1310748 Public 1310806 snap 1311703
1311807 chapter1 1310746 Downloads 1311756 filedemo1 1311766 sample1.txt 1311725 ssOf0s 1311767
1311814 chapter2 1311810 fa 1310750 Music 1311761 sample2.txt 1310747 Templates 1311768
```

Mv: copies content of file1 to file2 just as cut and paste

```
vbox@ubuntu:~$ mv chapter1 lesson1
vbox@ubuntu:~$ ls -l
total 216
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:59 AACD.txt
-rw-rw-r-- 1 vbox vbox 46676 Aug 23 18:38 abc
-rw-rw-r-- 1 vbox vbox    0 Aug 23 19:02 chapter2
drwxr-xr-x 2 vbox vbox  4096 Aug 23 17:44 Desktop
```

Tr – text Replace in file

```
vbox@ubuntu:~$ tr -s " " data.txt
vbox@ubuntu:~$ vi vifile.txt
vbox@ubuntu:~$ cat vifile.txt

i

D
ghj
ghj

ghj
vbox@ubuntu:~$
```

```
vbox@ubuntu:~$ tr "[a-f]" "[0-5]"< employee
s0mru33hi 123 95%
xyz 3829 90%
012 282 89%
wq
qw
q
vbox@ubuntu:~$
```

Cat – to read and write context into the file.

```
vbox@ubuntu:~$ cat employee
cat: employee: No such file or directory
vbox@ubuntu:~$ cat employee
cat: employee: No such file or directory
vbox@ubuntu:~$ cat >employee
samruddhi 123 95%
xyz 3829 90%
abc 282 89%
^[:wq
^[:qw
q
```

```
ls: cannot access 'a*n': No such file or directory
vbox@ubuntu:~$ ls s?
ls: cannot access 's?': No such file or directory
vbox@ubuntu:~$ cat abc >> xz
vbox@ubuntu:~$ ls -l
total 264
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:59 AACD.txt
-rw-rw-r-- 1 vbox vbox 46676 Aug 23 18:38 abc
-rw-rw-r-- 1 vbox vbox    0 Aug 23 19:02 chapter2
drwxr-xr-x 2 vbox vbox  4096 Aug 23 17:44 Desktop
drwxr-xr-x 2 vbox vbox  4096 Aug  8 15:59 Documents
drwxr-xr-x 2 vbox vbox  4096 Aug  8 15:59 Downloads
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:58 fa
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:55 file
-r---w---x 1 vbox vbox    8 Aug 23 17:17 filedemo
-rw-rw-r-- 1 vbox vbox 46676 Aug 23 18:36 filedemo1
-rw-rw-r-- 1 vbox vbox    0 Aug 23 19:01 lesson1
```

```
vbox@ubuntu:~$ cat > file1
name id
abc 1
xyz 2
pqw 3
lmn 4
ghi 5
vbox@ubuntu:~$ cat >file2
city habits
junnar adopter
peace  dance
awsari songs singing
pune  happier
vbox@ubuntu:~$ paste file1 file2
name id city habits
abc 1  junnar adopter
xyz 2  peace  dance
pqw 3  awsari songs singing
lmn 4  pune   happier
ghi 5
vbox@ubuntu:~$
```

Wc – Word count of no of char, word and lines into the file

```
vbox@ubuntu:~$ wc textfile
  2  202 1101 textfile
```

```
vbox@ubuntu:~$ wc data.txt
  3  345 1876 data.txt
```

Ls : ls -l list of files with all authorities , creation date, time and by which user.

```
vbox@ubuntu:~$ ls -l
total 268
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:59 AACD.txt
-rwx----- 1 vbox vbox 46676 Aug 23 18:38 abc
-rw-rw-r-- 1 vbox vbox    0 Aug 23 19:02 chapter2
drwxr-xr-x 2 vbox vbox  4096 Aug 23 17:44 Desktop
drwxr-xr-x 2 vbox vbox  4096 Aug  8 15:59 Documents
drwxr-xr-x 2 vbox vbox  4096 Aug  8 15:59 Downloads
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:58 fa
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:55 file
-r---w---x 1 vbox vbox    8 Aug 23 17:17 filedemo
-rw-rw-r-- 1 vbox vbox 46676 Aug 23 18:36 filedemo1
-rw-rw-r-- 1 vbox vbox    0 Aug 23 19:01 lesson1
-rw--w---x 1 vbox vbox    0 Aug 23 19:24 mfile
```

Sort : sorting of file data with numeric or alphabetic order.

```
vbox@ubuntu:~$ sort file1
abc 1
ghi 5
lmn 4
name id
pqw 3
xyz 2
vbox@ubuntu:~$ sort -n file1
abc 1
ghi 5
lmn 4
name id
pqw 3
xyz 2
vbox@ubuntu:~$
```

Echo: displays the text on output terminal.

```
vbox@ubuntu:~$ echo $$
5555
vbox@ubuntu:~$
```

Sleep: suspend execution in ms.

Data: show current date and time in PM IST format

```
vbox@ubuntu:~$ sleep 30; date
Wednesday 23 August 2023 07:50:39 PM IST
vbox@ubuntu:~$
```

Diff: uncommon things from two files.

```
1311810 fa      1310748 Public      1310752 videos      1311815 x2
vbox@ubuntu:~$ diff filedemo filedemo1
1c1,626
< inkkkk
---
```

Ps : work with process 1. [-f] to get basic processes with details 2. [-e] for all system running process.

```
> vbox@ubuntu:~$ ps -f
>  UID      PID      PPID  C  STIME TTY          TIME CMD
>  vbox      3474      3456  0  17:49 pts/0        00:00:00 bash
>  vbox      3485      3474  0  17:49 pts/0        00:00:00 ps -f
>  vbox@ubuntu:~$ -e
>  -e: command not found
>  vbox@ubuntu:~$ ps -e
>      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
>      5 ?            00:00:00 slub_flushwq
>      6 ?            00:00:00 netns
```



Comm: works on sorted data's file give comm values data from it.

```
vbox@ubuntu:~$ comm filedemo filedemo1
inkkkk
comm: file 1 is not in sorted order

vbox@ubuntu:~$ ps -f
comm: file 2 is not in sorted order
  UID          PID    PPID  C STIME TTY          TIME CMD
  vbox        3474    3456  0 17:49 pts/0      00:00:00 bash
  vbox        3485    3474  0 17:49 pts/0      00:00:00 ps -f
vbox@ubuntu:~$ -e
-e: command not found
vbox@ubuntu:~$ ps -e
  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
   5 ?           00:00:00 slub_flushwq
```

Grep: works as regular expression to search, replace or find any particular string into the file.

```
vbox@ubuntu:~$ grep -c a textfile
2
vbox@ubuntu:~$ cat textfile
```

Dir: get list of directories.

Mkdir: to make new directory

Rmdir: to remove directory from the system.

```
vbox@ubuntu:~$ dir
AACD.txt chapter2 Documents fa filedemo lesson1 Pictures sample1.txt samv ssOf0s Videos xab xad XXX.txt
abc Desktop Downloads file filedemo1 Music Public sample2.txt snap Templates xaa xac xae xz
vbox@ubuntu:~$ mkdir
mkdir: missing operand
Try 'mkdir --help' for more information.
vbox@ubuntu:~$ mkdir folder
vbox@ubuntu:~$ dir
AACD.txt Desktop fa filedemo1 Music sample1.txt snap Videos xac XXX.txt
abc Documents file folder Pictures sample2.txt ssOf0s xaa xad xz
chapter2 Downloads filedemo lesson1 Public samv Templates xab xae
vbox@ubuntu:~$ cd folder
vbox@ubuntu:~/folder$ cd.
```

```
vbox@ubuntu:~$ mkdir folder
vbox@ubuntu:~$ ls -l
1311811 AACD.txt 1311701 filedemo 1311761 sample2.txt 1311768 xac
1311753 abc 1311756 filedemo1 1311507 samv 1311769 xad
1311814 chapter2 1311762 folder 1310806 snap 1311770 xae
1310745 Desktop 1311807 lesson1 1311725 ssOf0s 1311812 XXX.txt
1310749 Documents 1310750 Music 1310747 Templates 1311815 xz
1310746 Downloads 1310751 Pictures 1310752 Videos
1311810 fa 1310748 Public 1311703 xaa
1311808 file 1311766 sample1.txt 1311767 xab
vbox@ubuntu:~$ rmdir folder
vbox@ubuntu:~$ ls -l
1311811 AACD.txt 1311808 file 1311766 sample1.txt 1311703 xaa
1311753 abc 1311701 filedemo 1311761 sample2.txt 1311767 xab
1311814 chapter2 1311756 filedemo1 1311507 samv 1311768 xac
1310745 Desktop 1311807 lesson1 1310806 snap 1311769 xad
1310749 Documents 1310750 Music 1311725 ssOf0s 1311770 xae
1310746 Downloads 1310751 Pictures 1310747 Templates 1311812 XXX.txt
1311810 fa 1310748 Public 1310752 Videos 1311815 xz
vbox@ubuntu:~$
```

Join: appending one file data to another one on sorted data

Split: separates/extracts file data as per constraint.

```

vbox@ubuntu:~$ join -t ":" sample1.txt sample2.txt
join: sample1.txt:3: is not sorted:
join: sample2.txt:2: is not sorted: aam 96.8
join: input is not in sorted order
vbox@ubuntu:~$ join -t ":" sample1.txt sample2.txt
join: sample1.txt:3: is not sorted:
join: sample2.txt:3: is not sorted:
join: input is not in sorted order
vbox@ubuntu:~$ split -10 sample1.txt
vbox@ubuntu:~$ ls -l
total 216
-rw-rw-r-- 1 vbox vbox 46676 Aug 23 18:38 abc
drwxr-xr-x 2 vbox vbox 4096 Aug 23 17:44 Desktop
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Documents
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Downloads
-r--w---x 1 vbox vbox 8 Aug 23 17:17 filedemo
-rw-rw-r-- 1 vbox vbox 46676 Aug 23 18:36 filedemo1
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Music
drwxr-xr-x 3 vbox vbox 4096 Aug 8 18:58 Pictures
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Public
-rw-rw-r-- 1 vbox vbox 54 Aug 23 18:47 sample1.txt
-rw-rw-r-- 1 vbox vbox 19 Aug 23 18:48 sample2.txt
drwxrwxr-x 2 vbox vbox 4096 Aug 8 18:32 samv
drwx----- 5 vbox vbox 4096 Aug 8 18:09 snap
-rw-rw-r-- 1 vbox vbox 46676 Aug 23 18:07 ss0f0s
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Templates
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Videos

```

Pwd: returns in which directory we are currently present.

Cd: to change the directory.

rm: removes any file from the system

```

vbox@ubuntu:~$ pwd
/home/vbox
vbox@ubuntu:~$ mkdir subject
vbox@ubuntu:~$ cd subject
vbox@ubuntu:~/subject$ touch sample
vbox@ubuntu:~/subject$ ls
sample
vbox@ubuntu:~/subject$ ls -;
ls: cannot access '-': No such file or directory
vbox@ubuntu:~/subject$ ls -l
total 0
-rw-rw-r-- 1 vbox vbox 0 Aug 23 19:11 sample
vbox@ubuntu:~/subject$ u-r sample
u-r: command not found
vbox@ubuntu:~/subject$ chmod u-2 sample
chmod: invalid mode: 'u-2'
Try 'chmod --help' for more information.
vbox@ubuntu:~/subject$ chmod u-w sample
vbox@ubuntu:~/subject$ ls -l
total 0
-r--rw-r-- 1 vbox vbox 0 Aug 23 19:11 sample

```

Chmod: updation of the authorities given for the files

```

vbox@ubuntu:~$ chmod 700 abc
vbox@ubuntu:~$ ls -l
total 268
-rw-rw-r-- 1 vbox vbox 0 Aug 23 18:59 AACD.txt
-rwx----- 1 vbox vbox 46676 Aug 23 18:38 abc
-rw-rw-r-- 1 vbox vbox 0 Aug 23 19:02 chapter2
drwxr-xr-x 2 vbox vbox 4096 Aug 23 17:44 Desktop
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Documents
drwxr-xr-x 2 vbox vbox 4096 Aug 8 15:59 Downloads
-rw-rw-r-- 1 vbox vbox 0 Aug 23 18:58 fa
-rw-rw-r-- 1 vbox vbox 0 Aug 23 18:55 file

```



```
vbox@ubuntu:~$ chmod ugo+r pqr1
vbox@ubuntu:~$ ls -l
total 268
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:59 AACD.txt
-rwx----- 1 vbox vbox 46676 Aug 23 18:38 abc
-rw-rw-r-- 1 vbox vbox    0 Aug 23 19:02 chapter2
drwxr-xr-x 2 vbox vbox  4096 Aug 23 17:44 Desktop
drwxr-xr-x 2 vbox vbox  4096 Aug  8 15:59 Documents
drwxr-xr-x 2 vbox vbox  4096 Aug  8 15:59 Downloads
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:58 fa
-rw-rw-r-- 1 vbox vbox    0 Aug 23 18:55 file
-r--w---x 1 vbox vbox    8 Aug 23 17:17 filedemo
-rw-rw-r-- 1 vbox vbox 46676 Aug 23 18:36 filedemo1
-rw-rw-r-- 1 vbox vbox    0 Aug 23 19:01 lesson1
drwxr-xr-x 2 vbox vbox  4096 Aug  8 15:59 Music
drwxr-xr-x 3 vbox vbox  4096 Aug  8 18:58 Pictures
-r--r--r-- 1 vbox vbox    0 Aug 23 19:21 pqr
-rw-rw-r-- 1 vbox vbox    0 Aug 23 19:21 pqr1
drwxr-xr-x 2 vbox vbox  4096 Aug  8 15:59 Public
```

Vi: virtual editor from ubuntu system

```
vbox@ubuntu:~$ vi filedemo
vbox@ubuntu:~$ ls
Desktop Documents Downloads filedemo Music Pictures Public
vbox@ubuntu:~$ ls -l
total 44
drwxr-xr-x 5 vbox vbox 4096 Aug 23 17:03 Desktop
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Documents
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Downloads
-rw-rw-r-- 1 vbox vbox    8 Aug 23 17:17 filedemo
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Music
drwxr-xr-x 3 vbox vbox 4096 Aug  8 18:58 Pictures
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Public
drwxrwxr-x 2 vbox vbox 4096 Aug  8 18:32 samv
drwx----- 5 vbox vbox 4096 Aug  8 18:09 snap
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Templates
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Videos
```

```
vbox@ubuntu:~$ chmod 763 templates
chmod: cannot access 'templates': No such file or directory
vbox@ubuntu:~$ chmod 763 filedemo
vbox@ubuntu:~$ ls -l
total 44
drwxr-xr-x 5 vbox vbox 4096 Aug 23 17:03 Desktop
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Documents
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Downloads
-rwxrw--wx 1 vbox vbox    8 Aug 23 17:17 filedemo
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Music
drwxr-xr-x 3 vbox vbox 4096 Aug  8 18:58 Pictures
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Public
drwxrwxr-x 2 vbox vbox 4096 Aug  8 18:32 samv
drwx----- 5 vbox vbox 4096 Aug  8 18:09 snap
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Templates
drwxr-xr-x 2 vbox vbox 4096 Aug  8 15:59 Videos
vbox@ubuntu:~$
```

## Q]2 Write shell script covering following concepts–

### 1. Basic arithmetic

Checks no is even or odd.

```
Open  [icon] shelldemo1.sh ~/
1 echo "enter any number"
2 read num
3 re=$((num % 2))
4 if [[ $re -eq 0 ]]
5 then
6 echo "$num is even"
7 else
8 echo "$num is odd"
9 fi
```

### 2. Control structures and loops

For in loop to print numeric values

```
Open  [icon] shelldemo1.sh ~/
1
2 for a in 10 20 30 40
3 do
4 echo "$a"
5 done
```

Display Strings values with for loop

```
Open  [icon] shelldemo1.sh ~/
1 for a in mon tue web thu fri sat sun
2 do
3 echo "$((i++)): $a"
4 done
```

Loop to fetch files from the system.

```
Open  [icon] shelldemo1.sh ~/
1 for file in *
2 do if [ -x $file ]
3 then
4 echo "$file"
5 fi
6 done
```



If, if-else and control structure to show greater no

```
Open ▾ [🔍]
1 a=20
2 if [[ $a -lt 10 ]]
3 then
4 echo $a "is less than 10 "
5 else
6 echo $a "is greater than 10"
7 fi
```

### 3. Execution of Linux command in shell

Checks -x (execute) permission of the sys files.

```
[🔍]
for file in *
do if [ -x $file ]
then
echo "$file"
fi
done

vbox@ubuntu: ~
vbox@ubuntu:~$ bash vifile.txt
abc
Demo
Desktop
Documents
Downloads
fil1
file
Music
Pictures
Public
samv
snap
subject
Templates
Videos
vbox@ubuntu:~$
```

### 4. Command line arguments

By taking input from user check number greater of 3

```
Open ▾ [🔍]
1 echo "enter three numbers"
2 read a b c
3 if [[ $a -gt $b ]]
4 then
5 echo "$a is greater than $b"
6 elif [[ $a -gt $c ]]
7 then
8 echo "$a is greater than $c"
9 elif [[ $b -gt $a ]]
10 then
11 echo "$b is greater than $a"
12 elif [[ $b -gt $c ]]
13 then
14 echo "$b is greater than $c"
15 elif [[ $c -gt $a && $c -gt $b ]]
16 then
17 echo "$c is greater than $a and $b"
18 fi
```

## 5. Functions and Arrays.

Use of array to print integers with user of for loop .

```
Open  [icon] shelldemo1.sh ~/
1 array=10,20,30
2 echo "array elements are :"
3 for (( i=0;i<3;i++))
4 do
5 echo "$i"
6 done
7
```

Array with use of for in loop

```
Open  [icon] shelldemo1.sh ~/
1 array=10,20,30
2 echo "array elements are :"
3 for a in $array
4 do
5 echo "$a"
6 done |
```