

Assignment No 1:

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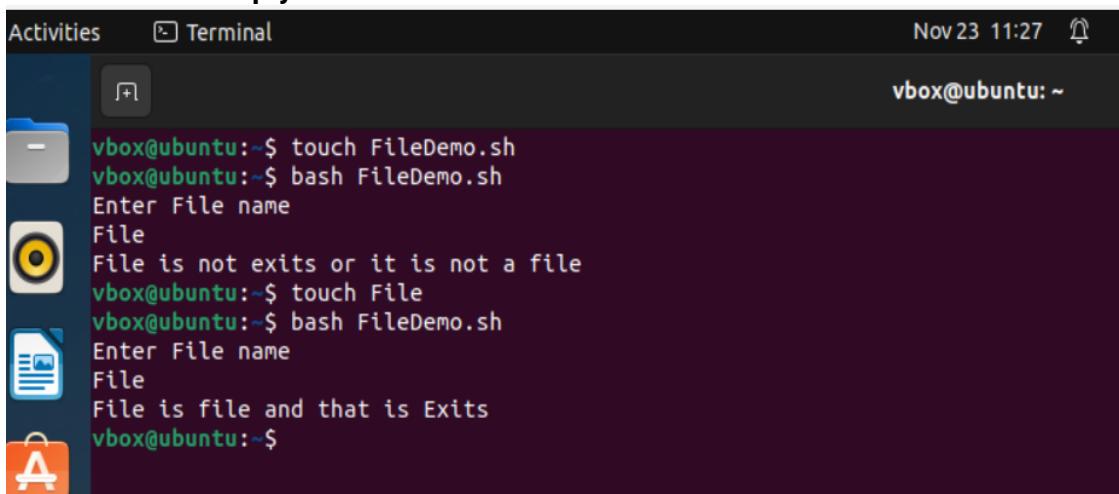
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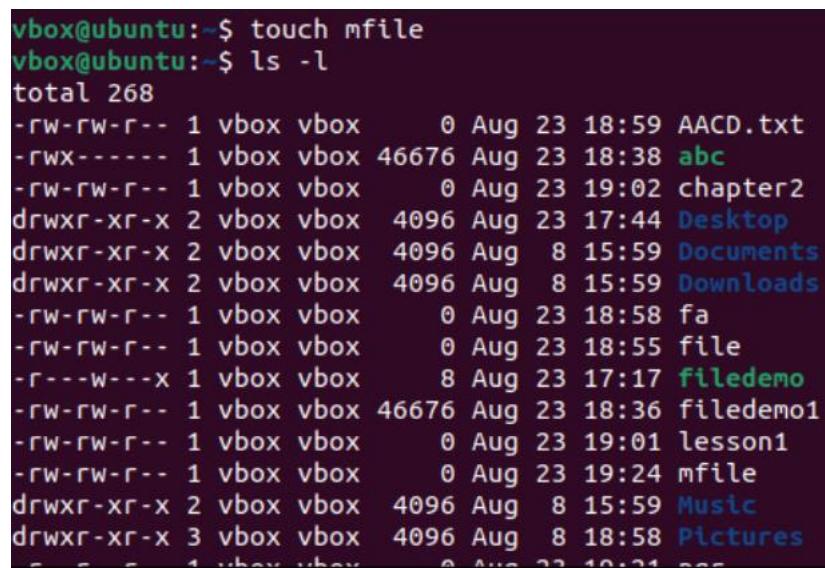
Sub: Operating System Lab

Q] 1 Execution of Basic & Advanced Linux Commands

Touch – Creates empty file

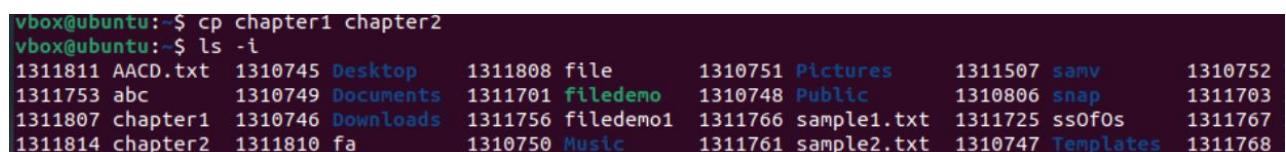


```
vbox@ubuntu:~$ touch FileDemo.sh
vbox@ubuntu:~$ bash FileDemo.sh
Enter File name
File
File is not exists or it is not a file
vbox@ubuntu:~$ touch File
vbox@ubuntu:~$ bash FileDemo.sh
Enter File name
File
File is file and that is Exits
vbox@ubuntu:~$
```



```
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 23 15:59 Documents
drwxr-xr-x 2 vbox vbox   4096 Aug 23 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-----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 23 15:59 Music
drwxr-xr-x 3 vbox vbox   4096 Aug 23 18:58 Pictures
- - - - 4 .....
```

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



```
vbox@ubuntu:~$ cp chapter1 chapter2
vbox@ubuntu:~$ ls -i
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 ss0fOs    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
-rw-rw-r-- 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
-rw-rw-r-- 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
```

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.

Date: 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 ta          1310748 Public      1310752 Videos       1311815 xz
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.

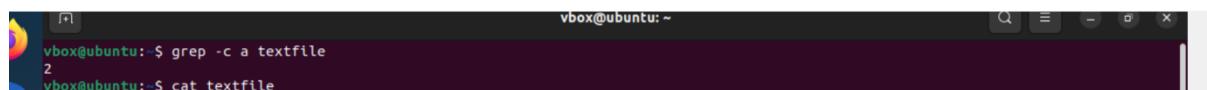
```
> vbox@ubuntu:~$ ps -f
> UID          PID  PPID  C STIME TTY          TIME CMD
> vbox        3474  3456  0 17:49 pts/0    00:00:00 bash
> vbox        3485  3474  0 17:49 pts/0    00:00:00 ps -f
> vbox@ubuntu:~$ -e
> -e: command not found
> vbox@ubuntu:~$ ps -e
>   PID TTY          TIME CMD
>     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 myfile
2
vbox@ubuntu:~$ cat myfile
```

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 ss0f0s      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 ss0f0s   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 -i
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 ss0f0s     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 -i
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 ss0f0s     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
-rw-rw-r-- 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
-rw-rw-r-- 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
-rw-rw-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
-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
```

Q]2 Write shell script covering following concepts-

1. Basic arithmetic

Checks no is even or odd.

The screenshot shows a terminal window titled "shelldemo1.sh" with the file path "~/". The window has "Open" and "+" buttons at the top left. The script content is as follows:

```
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

The screenshot shows a terminal window titled "shelldemo1.sh" with the file path "~/". The window has "Open" and "+" buttons at the top left. The script content is as follows:

```
1
2 for a in 10 20 30 40
3 do
4 echo "$a"
5 done|
```

Display Strings values with for loop

The screenshot shows a terminal window titled "shelldemo1.sh" with the file path "~/". The window has "Open" and "+" buttons at the top left. The script content is as follows:

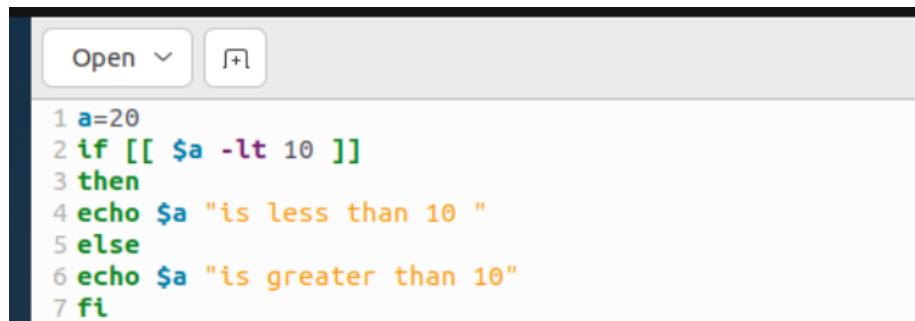
```
1 for a in mon tue web thu fri sat sun
2 do
3 echo "$((i++)):$a"
4 done|
```

Loop to fetch files from the system.

The screenshot shows a terminal window titled "shelldemo1.sh" with the file path "~/". The window has "Open" and "+" buttons at the top left. The script content is as follows:

```
1 for file in *
2 do if [ -x $file ]
3 then
4 echo "$file"
5 fi
6 done|
```

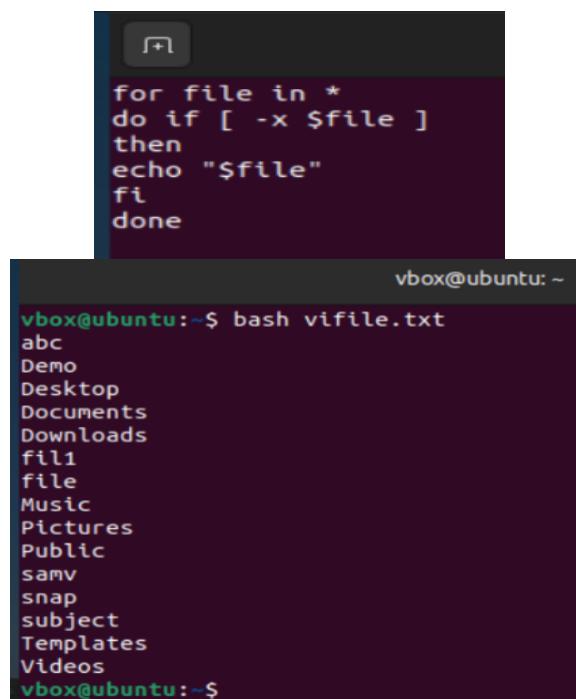
If, if-else and control structure to show greater no



```
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.

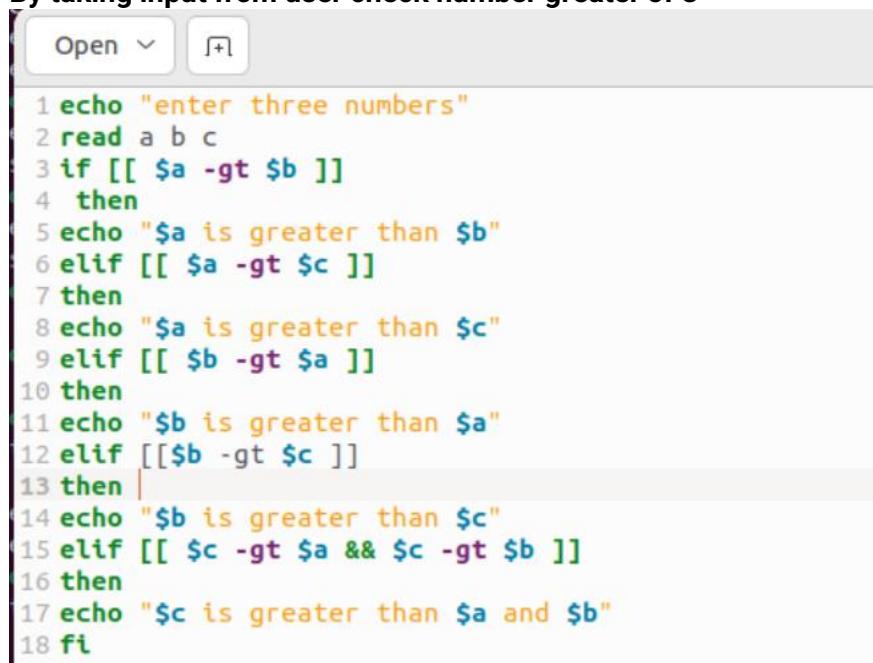


```
for file in *
do if [ -x $file ]
then
echo "$file"
fi
done
```

vbox@ubuntu:~\$ 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



```
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 .



The screenshot shows a terminal window titled "shelldemo1.sh" with the file path "~/" at the top right. In the top left corner, there are "Open" and "+" buttons. The code in the terminal is:

```
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



The screenshot shows a terminal window titled "shelldemo1.sh" with the file path "~/" at the top right. In the top left corner, there are "Open" and "+" buttons. The code in the terminal is:

```
1 array=10,20,30
2 echo "array elements are :"
3 for a in $array
4 do
5 echo "$a"
6 done |
```