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Teacher In-Charge

Head of Department

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Examiner

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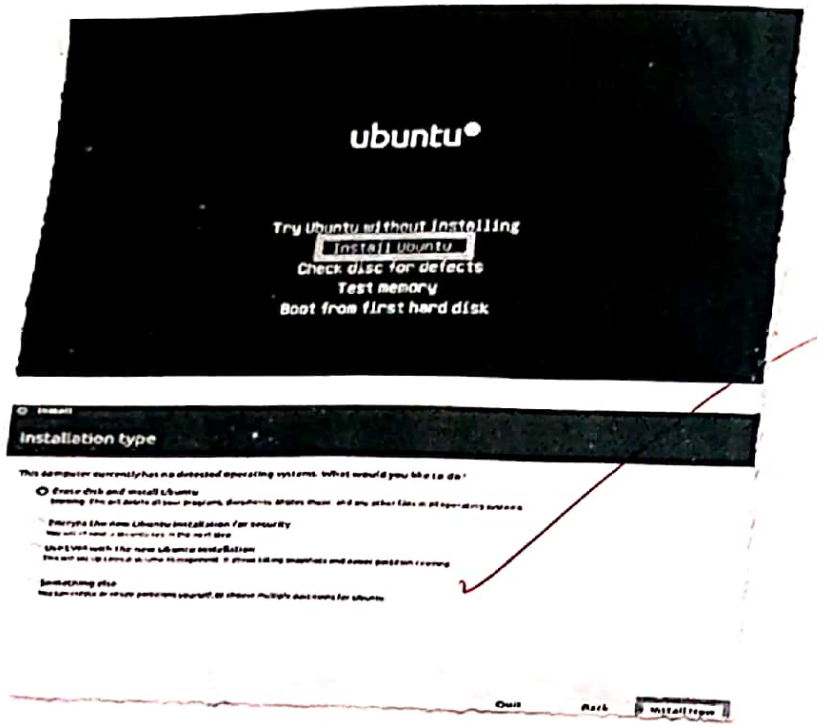


Practical-no. 1.

Aim:-

1. Install your choice of Linux distribution e.g. Ubuntu, Fedora.
2. Customize desktop environment by changing different default option like changing default background, themes, screensavers.
3. Screen Resolution.
4. Time settings

a. Install your choice of linux distribution e.g ubuntu, Fedora: using a USB drive.

→ Most under computers can boot from USB. You should see a welcome screen prompting you to choose your language and giving you the option to install ubuntu or try it from USB. If your computer doesn't automatically do so, you might need to press the F12 key to bring up the boot menu, but be careful not to hold it down that can cause an error message

a. Prepare to install ubuntu.

→ We recomend you plug your computer into power source.

* you should also make sure you have enough space on your computer to install ubuntu
* we advice you to select download updates while installing and install this third-party software now.
* you should also stay connected to the internets so you can get the latest updates while you install ubuntu.
* If you are not connected to the internet you will be asked to select a wireless network if available. we advise you to connect during the installation. so we can ensure your machine is up-to date.

2 Allocate drive space

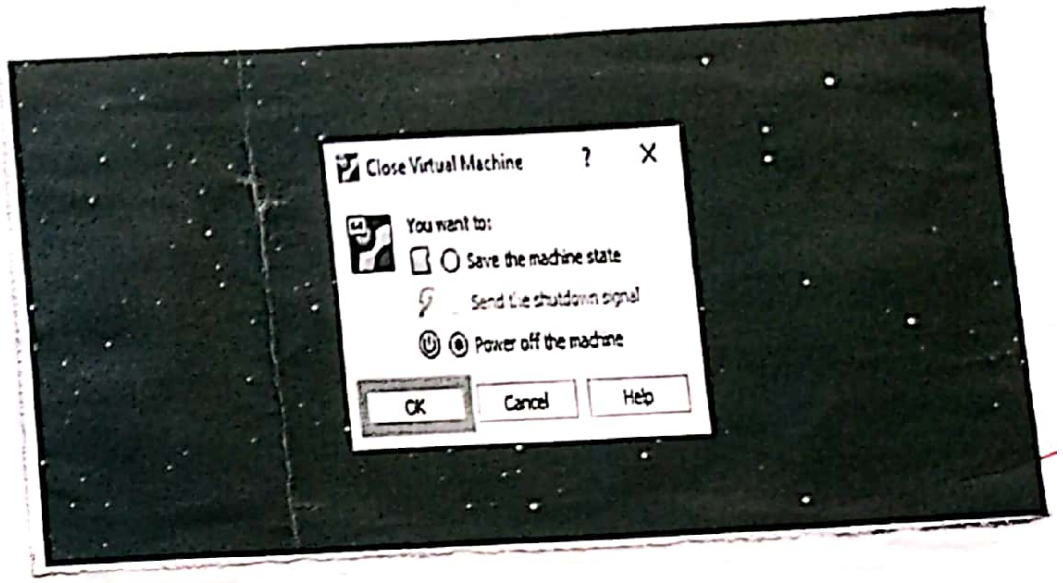
* Use the check force to choose whether you have like install ubuntu alongside another operating system delete you existing O.S and replace it with ubuntu, or if you are on advanced user choose the something else option.

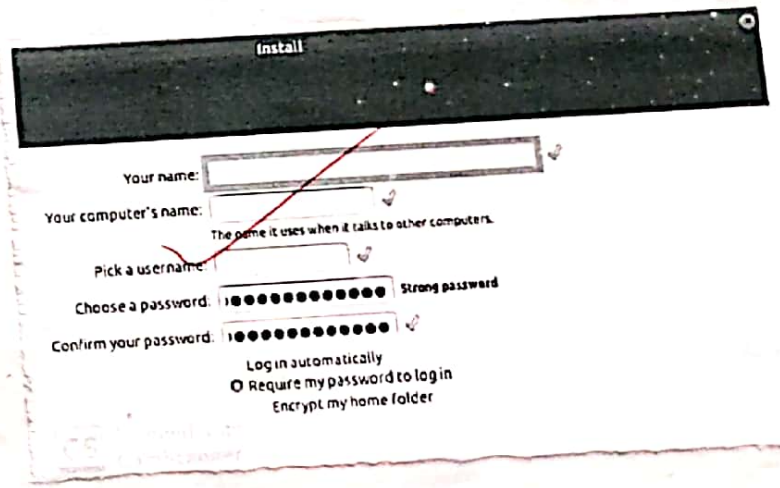
3. Begin the installation.

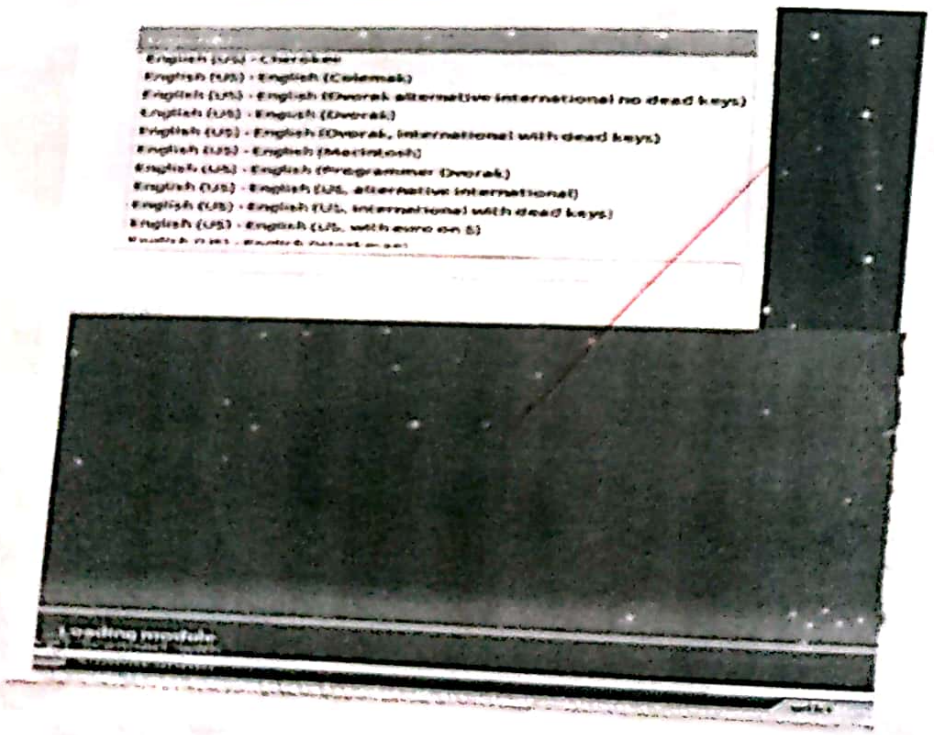
→ Depending on your previous selection, you can very by that you can choosen the way in which you would like to install ubuntu.

→ The installation process will begin when you click the installation now button.

→ Ubuntu needs about 4.5 GB to install so add new feature to allow your files.







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5. Select your preferred keyboard output.
→ Click the language option you need. If you are not sure click the detect keyboard layout button for help.

6. Enter your login and password details.
7. Learn more about Ubuntu while the system install.
8. That it, All that's left is to restart your computer and start enjoying Ubuntu.

9. Customizing the desktop environment by changing different defaults option like changing default background, themes.

→ * Accessing appearance settings

To access appearance setting in Ubuntu let's click on user menu at the top right corner on the t menu bar and select system settings.

* A window will pop-up with all settings divided in personal, Hardware and system option icons. Let's first select the appearance icon.

→ Changing wallpaper picture :—

→ on the left side of the background part, you see your current wallspaper.

→ on the right side is part where we can selec of ubuntu wallpaper clicking any wallpap be changed right away a tooling effect.

180 Practical-2

Aim;- Installing and removing software.

a] Install gcc package, verify that it runs and then remove it.

step 1:-
first type 'gcc-v' to know if you have already installed gcc compiler or not. If the output is blank then it means that you don't have gcc installed.

Step 2:-
Type 'sudo apt-get' installed gcc'. After typing the following command installation will take place.

Step 3:-
Type 'sudo apt-get installed build-essential' This will install all the librarier required for C and C++ programming language.

NOW TO UNINSTALL ACC COMPLETE:-

In GCC 5.1.0, although there is no top tend unistall target, some direction do nave it, in particular gcc, so you can do.

Type:- cod build|gcc
sudo make unistall.

This does not remove everything that was installed, but it remove major executable like gcc, g++, cpp... contained in that directory.

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Practical-3.

Aim:- Utilization of grep, man comman

Documentation:-

a. Finding info documentation from the command line:- bring up the info page for the grep command. Bring up the usage section.

Ans:- To find info about my command ('info' command is used the syntax of info command in " info (comma name).

we are giving to find the info abo the group command:

Open the terminal (ctrl + Alt + T) and type: info group.

After typing this command following output will be displayed onto your screen.

You can also scroll through pages usi ~~output will be displayed out.~~
(Space = up) & (backup = down) keys.

Another more summarized from of showing info is the 'man' comand The command is same as 'info' but required data.

b] finding man pages from the and line: Bring up the man page for the 'ls' commond. Scroll down to the examples section.

Ans:- To use the 'man' command simply type 'man (command name).
Now we are going to find the manual for 'ls' command.
Simply type: 'man ls'.

c] findingman pages by topic 'what man pages are available that document file compression.

Ans:- 'Tar', 'zip' are same man page which are available for document file compresion.
Simply type: map zip
man tar

d] finding man pages by section from the cmd bring up the man page for the printf lib function which manual page section are library function found.

Ans:- The number corresponds to what section of the manual page is from, 1 is user command, while 8 is sysadmin stuff. The man page for man itself explain it and list the std
There are certain terms that have different pages in different section (e.g. 'printf as a command appears in section 1. as 'a stdlib' function appears in section 3.]; in cases like that you can pass the section no. to the man before the page name to choose which on you want or use man -a to show every matching page in a row.

You can tell what section a term falls in with 'man -k' (equivalent to apropos command). It will do something matches too. So you need to use '(term)' to limit.

e) Command-Line Help List the available options for the mkdir command. How can you do this?

$ mkdir -m a=rwx directoryname.

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Practical-1

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Command line operation

a) Install new package on your system
Sudo apt-get install (package name)

b) Remove the package installed
Sudo apt-get remove[package name]

c) Find the password file/zip/using find command
find /-name password.
- /user/share/doc/nss-(day-253)/passwd
- /user/bin/password
- /user/pand/password
- /etc/password.

Find the password file under ~~root~~ root and 2 level down
find /-maxdepth3 -name/passwd.
- /user/bin/passwd.
- /user/share/doc/nss-(day-253)/passwd/passwordb.
- /user/pand/passwordb
- /etc/passwordb.

Find the password file under root and 1 level down
find/-max depth -name/passwd.
- /user/bin/passwd.
- /etc/passwd/passwordb
- /etc/passwordb.

Find the directory password file under root and 1 level down
find /-max depth 2-name nero
- /etc/passwd.

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Find the password file between sub-direction level

find -max depth 3 maxdepth 5 namepass
- /user/bin/passwd
- /etc/pam-cd/passwd.

d) Create a symbolic ~~ln~~ link to the file you found in last step
ln -s file 2

e) Create an empty file example.txt move it to try directory using relative pathname

touch example text
mv example.txt/temp.

f) delete the file name to tmp in previous step try Method
rm/dumm/example.txt

g) find the location of ls, PS, bash commands
where dig.
ls: /bin/ls/user/share/man/man1/ls.1.gz.

whereas PS
PS: /bin/ps/user/share/maps/bin/ps/user/sh
man/es.dog2

whereas bash.
bash: /bin/bash /etc/bash.bashrc /usr/share/man/man1/bash.1.gz.

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Practical - 5

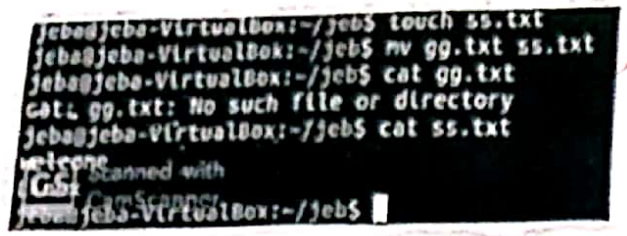
File operation. (40)

1. Expand mounted file system on your computer
Ans: df -k.

```
jeba@jeba-VirtualBox:~$ df -k
Filesystem     1K-blocks     Used Available Use% Mounted on
udev             494436        0    494436   0% /dev
tmpfs            102416     3676     98740   4% /run
/dev/sda1       7092728  3383372   3326024  51% /
tmpfs            512076      216    511860   1% /dev/shm
tmpfs              5120        4      5116   1% /run/lock
tmpfs            512076        0    512076   0% /sys/fs/cgroup
tmpfs            102416       48    102368   1% /run/user/1000
jeba@jeba-VirtualBox:~$
```

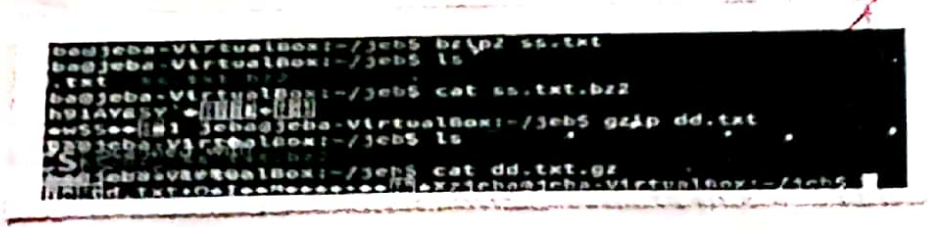
2. What are different ways of exploring mounted file system on Linux?
Ans: mount

3. Copying text from file.
Ans: CP command, mv command.

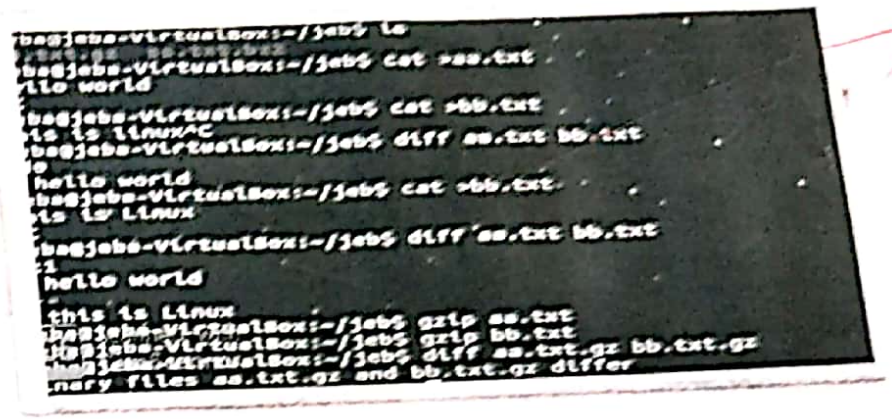


4. Archiving and backup the work directory using tar, gzip and bz2:pz commands.

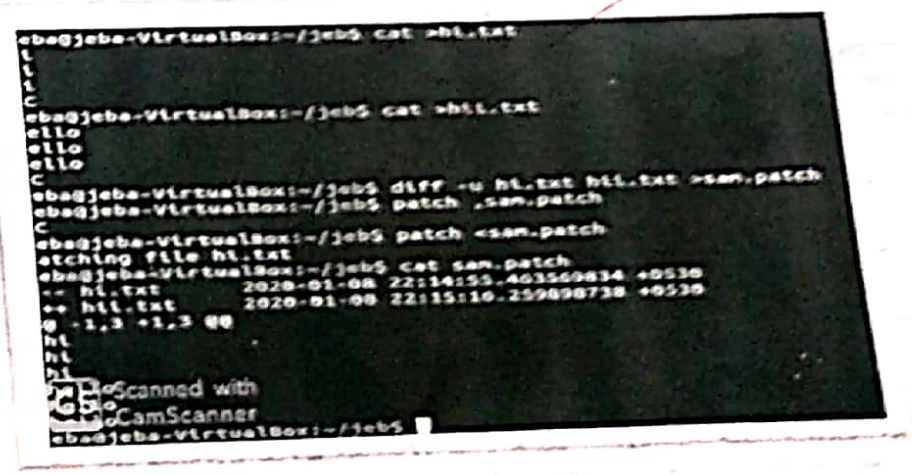
tar- gzip filename.txt
Bzip filename.txt



5. Use different commands to create diff of two files
diff filename1 filename2.



6. Use patch commands to patch a file. And analyze the patch commands again



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Practical No 6

Use Environment

1) Which account you logged in? How do you find out

Ans: who command & whoami

```
jeba@jeba-VirtualBox:~$ who
jeba     tty7         2020-01-15 20:32 (:0)
jeba@jeba-VirtualBox:~$ whoami
jeba
jeba@jeba-VirtualBox:~$ who -l
LOGIN    tty1         2020-01-15 20:30               780 id=tty1
jeba@jeba-VirtualBox:~$ █
```

```
jeba@jeba-VirtualBox:~$ w
 20:35:04 up 4 min,  1 user,  load average: 0.70, 0.79, 0.38
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
jeba     tty7     :0               20:32    4:28   8.19s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -s
 20:35:14 up 4 min,  1 user,  load average: 0.60, 0.77, 0.37
USER     TTY      FROM              IDLE WHAT
jeba     tty7     :0                4:38  /sbin/upstart --user
jeba@jeba-VirtualBox:~$ w -h
jeba     tty7     :0               20:32    4:44   8.67s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -f
 20:36:12 up 5 min,  1 user,  load average: 0.41, 0.69, 0.37
USER     TTY      LOGIN@   IDLE   JCPU   PCPU WHAT
jeba     tty7     20:32    5:36   9.08s  0.33s /sbin/upstart --user
```

b) Display /etc/shadow file using cat command and understood the important of shadow.

Ans: cat /etc/shadow

As with the passwd file, each field in the shadow file is also separated with ":" colons character and are as follows:-

- username, upto 8 characters, case sensitive, usually all lowercase, a direct mark to username in the etc/passwd file
- Password, 13 character encrypted. A blank entry (eg !!) indicates a passwd is not required to log in and a "*" indicate the account has been disabled
- the number of days since passwd was last changed.
- the number of days after which passwd must change
- the number of days before which password changed
- The number of days to warn user of an expiring pass
- The number of days since January, 1970 than account been disabled
- A reserved field for possible future use

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow
[sudo] password for jeba:
root:!:18240:0:99999:7:::
daemon:*:16911:0:99999:7:::
bin:*:16911:0:99999:7:::
sys:*:16911:0:99999:7:::
sync:*:16911:0:99999:7:::
games:*:16911:0:99999:7:::
man:*:16911:0:99999:7:::
lp:*:16911:0:99999:7:::
mail:*:16911:0:99999:7:::
news:*:16911:0:99999:7:::
```

Each field in a passwd is separated with ":" colon character and are as follow.

- username upto 8 character, case sensitive, usually lowercase
- An 'x' in the passwd field. Passwords are stored in '/shadow' file
- * Numeric user id. This is assigned by the 'adduser' Unix uses this field, plus the following group field
- * Numeric group id. RedHat uses group id in a fairly manner for enhanced file security. usually the group
- * Full name of user. I'm not sure what the maximum of this field is but try to keep it reasonable (under
- * user home directory. usually name/username (eg.)

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
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:/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
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologi
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologi
```

c) Get your current working directory.

```
jeba@jeba-VirtualBox:~$ pwd
/home/jeba
jeba@jeba-VirtualBox:~$
```

d) Execute [illegible] command history, how to run previously executed command without typing it from history.

Linux commands:

```
jeba@jeba-VirtualBox:~$ history
    1  who
    2  whoami
    3  who -l
    4  clear
    5  w
    6  w -s
    7  w -h
    8  w -f
    9  clear
   10  cat /etc/shadow
   11  sudo cat /etc/shadow
   12  clear
   13  sudo cat /etc/passwd
   14  pwd
   15  clear
   16  history
jeba@jeba-VirtualBox:~$ !3
who -l
LOGIN    tty1         2020-01-15 20:30               780 id=tty1
jeba@jeba-VirtualBox:~$
```

e) Create alias to most commonly used commands.
Alias commands instructed instruct to shell to replace one thing with another thing executing the command.
Syn - alias label="command".

```
jeba@jeba-VirtualBox:~$ alias m="mkdir new"
jeba@jeba-VirtualBox:~$ m
jeba@jeba-VirtualBox:~$ ls
Desktop    Downloads          [illegible]  Music  Pictures  Templates
Documents  examples.desktop   jj           new    Public    Videos
jeba@jeba-VirtualBox:~$
```


Practical-7

Linux Editor vi

a) Create, modify, search and navigate a file in editor

i) Creating a file

To create a file on the terminal type vi followed by filename.

ii) Modifying the file

To modify a file, on the ~~vedo~~ vi editor, type 'o'.

iii) Search in a file:-

To find a word (forward search) press / followed by the word to search.

iv) Navigate:-

Key	Action
k	Moves cursor up
j	Moves cursor down
h	Moves cursor left
l	Moves cursor right

Movement in four Direction

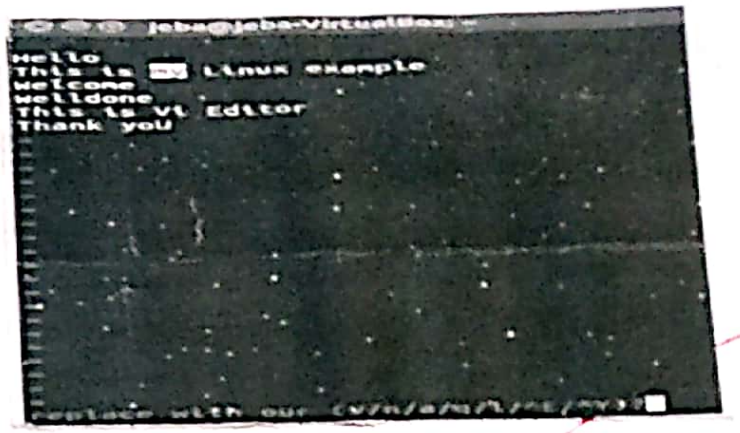
Word Navigation

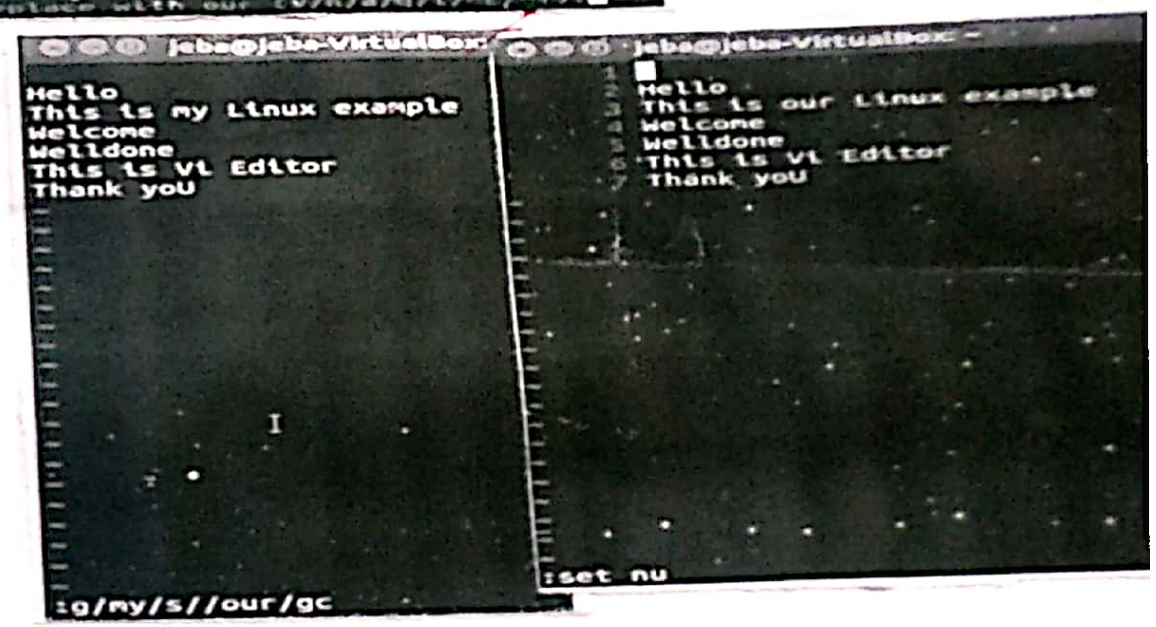
Key	Action
b	Moves back to the begging of the word
e	Moves forward to the end of the word
w	Moves forward to the beginning of the word
0(zero)	Move to first character of a line
$	Move to the end of line

Scrolling.

Key	Action
Ctrl+f	Scrolls forward
Ctrl+b	Scrolls backward
Ctrl+d	Scrolls half page
Ctrl+u	Scrolls half page backward

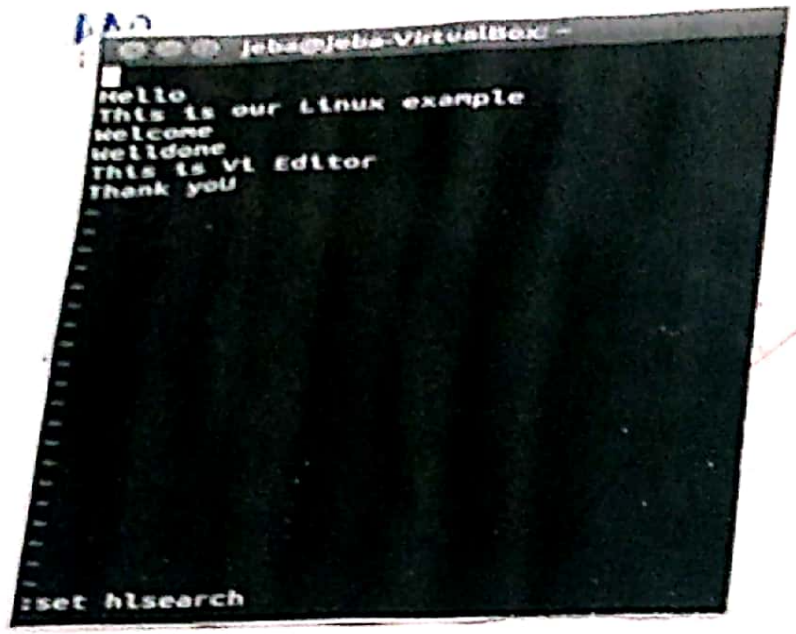
Syntax : [g] word to be replaced [s] new words [g]



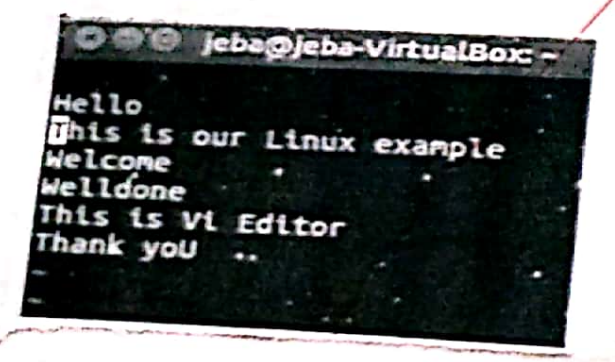


ii) Highlight

Use set hlsearch.



iii. Show the line number.
Use setnu.



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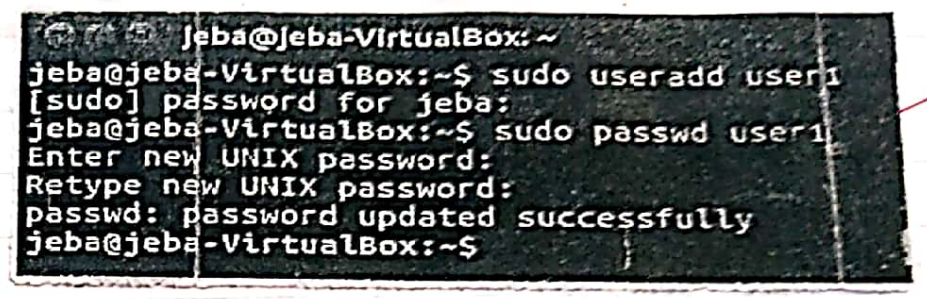
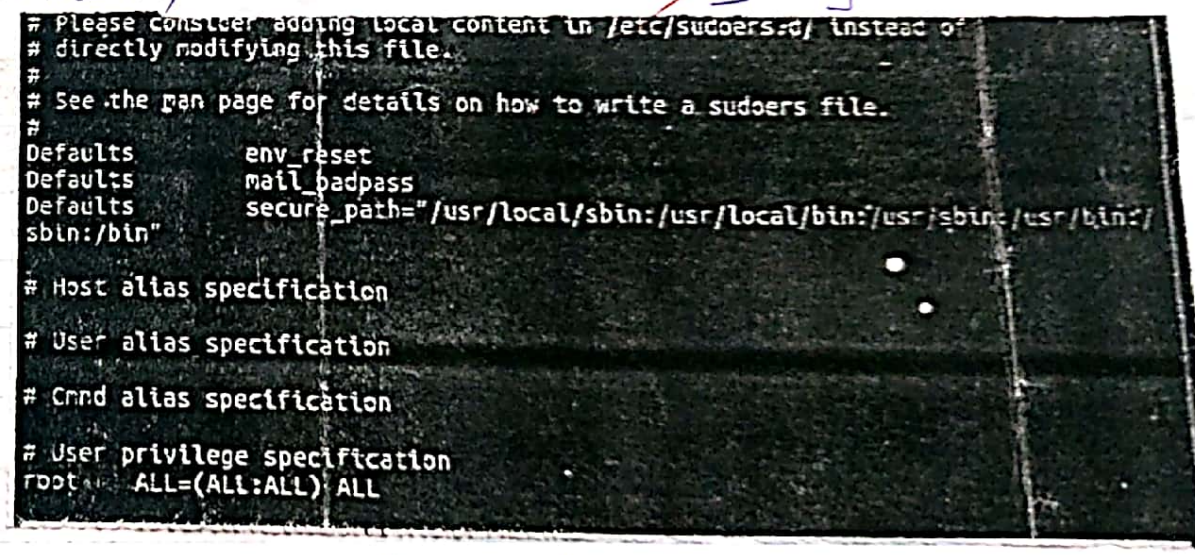
Practical no. 8

Linux security

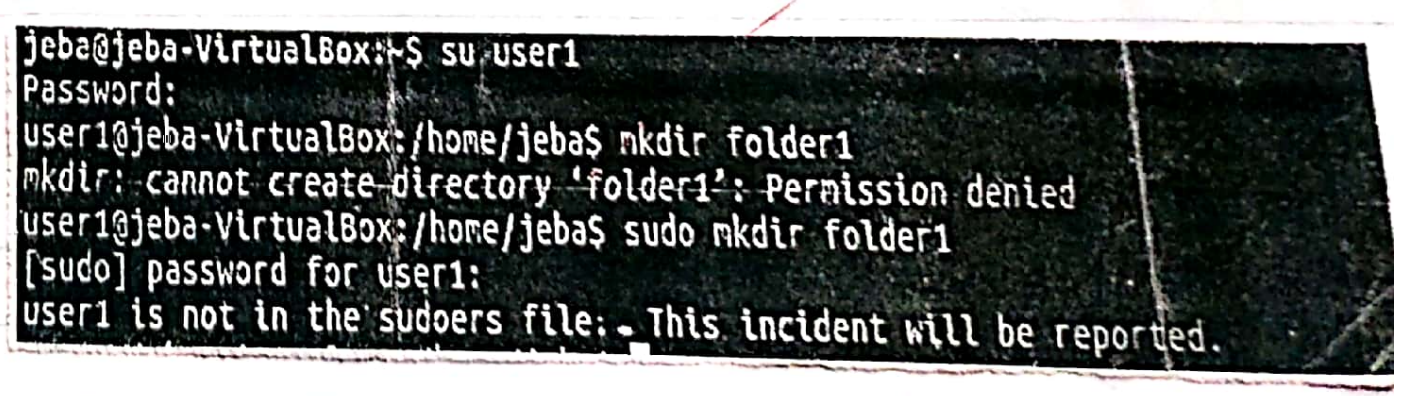
a. Use of sudo to change user privilage to root
Create an user named user1.



To give some users root privileges edit /etc/sudoers using Vi sudo, Enter new line highlighted below.



b. Identify operation that require sudo privileges.



c) Identify expiration done for new using password agen

```
jeba@jeba-VirtualBox:~
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change                                    : Jan 20, 2020
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
```

```
jeba@jeba-VirtualBox:~$ sudo chage user1
Changing the aging information for user1
Enter the new value, or press ENTER for the default

        Minimum Password Age [0]: 100
        Maximum Password Age [99999]: 200
        Last Password Change (YYYY-MM-DD) [2020-01-20]: 2020-01-21
        Password Expiration Warning [7]: 5
        Password Inactive [-1]:
        Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change                                    : Jan 21, 2020
Password expires                                        : Aug 08, 2020
Password inactive                                       : never
Account expires                                         : Jan 31, 2020
Minimum number of days between password change          : 100
Maximum number of days between password change          : 200
Number of days of warning before password expires       : 5
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ sudo chage -E 25/01/2020 -m 10 -M 90 -I 30 -W 30 user1
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change                                    : Jan 21, 2020
Password expires                                        : Apr 20, 2020
Password inactive                                       : May 20, 2020
Account expires                                         : Jan 01, 2022
Minimum number of days between password change          : 10
Maximum number of days between password change          : 90
Number of days of warning before password expires       : 30
jeba@jeba-VirtualBox:~$
```

-E - Expiration Date
-m - minimum number of Days before password change.
-M - number of days password is valid
-I - Account inactive
-W - Number of days of warning before password change is required

d) Delete newly added user

```
jeba@jeba-VirtualBox:~
jeba@jeba-VirtualBox:~$ sudo userdel user1
[sudo] password for jeba:
jeba@jeba-VirtualBox:~$ su user1
No passwd entry for user 'user1'
jeba@jeba-VirtualBox:~$
```

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Practical - 9.

R&D.

Network Management

a) Get IP address of your machine using ifconfig

```
jeba@jeba-VirtualBox:~$ ifconfig
enp0s3    Link encap:Ethernet  HWaddr 08:00:27:0e:6b:69
          inet addr:10.0.2.15  Bcast:10.0.2.255  Mask:255.255.255.0
          inet6 addr: fe80::c0cd:53a0:d5a3:040e/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2 errors:0 dropped:0 overruns:0 frame:0
          TX packets:73 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1180 (1.1 KB)  TX bytes:8518 (8.5 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:53240 errors:0 dropped:0 overruns:0 frame:0
          TX packets:53240 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:4225072 (4.2 MB)  TX bytes:4225072 (4.2 MB)
```

b) Get hostname of your machine

```
jeba@jeba-VirtualBox:~
jeba@jeba-VirtualBox:~$ hostname
jeba-VirtualBox
jeba@jeba-VirtualBox:~$
```


c) Use ping to check the network connectivity to remote machine

```
jeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=
97.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=
82.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=
84.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=
87.1 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=
93.5 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=
80.9 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=
98.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=
90.9 ms
^Z
[1]+  Stopped                 ping www.google.com
jeba@jeba-VirtualBox:~$
```

d) Use all dig commands.

```
jeba@jeba-VirtualBox:~
jeba@jeba-VirtualBox:~$ dig www.google.com

; <<>> DiG 9.10.3-P4-Ubuntu <<>> www.google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52068
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.google.com.                        IN      A

;; ANSWER SECTION:
www.google.com.         91      IN      A       172.217.166.100

;; Query time: 152 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Mon Jan 20 22:40:06 IST 2020
;; MSG SIZE  rcvd: 59

jeba@jeba-VirtualBox:~$
```

e) Trace

```
jeba@jeba-VirtualBox:~
eba@jeba-VirtualBox:~$ traceroute www.google.com
raceroute to www.google.com (172.217.166.100), 30 hops max, 60 byte packets
1  10.0.2.2 (10.0.2.2)  0.190 ms  0.143 ms  0.151 ms
2  * * *
3  10.0.2.2 (10.0.2.2)  68.568 ms  68.486 ms  68.405 ms
eba@jeba-VirtualBox:~$
```

5A0

```
jeba@jeba-VirtualBox:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         10.0.2.2        0.0.0.0         UG    100    0        0 enp0s3
10.0.2.0        *               255.255.255.0   U     100    0        0 enp0s3
link-local      *               255.255.0.0     U     1000   0        0 enp0s3
jeba@jeba-VirtualBox:~$
```

f. use of arp command.

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ arp
Address                  HWtype  HWaddress           Flags Mask            Iface
10.0.2.2                 ether   52:54:00:12:35:02   C                     enp0s3
$
```

g. use of net stat command and N map command

```
jeba@jeba-VirtualBox:~
jeba@jeba-VirtualBox:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
[illegible]              DGRAM                    42319    /run/user/1000/systemd
[illegible]              DGRAM                    9694     /run/systemd/journal/
[illegible]              DGRAM                    9695     /run/systemd/journal/
[illegible]              DGRAM                    9704     /run/systemd/journal/
[illegible]              DGRAM                    9684     /run/systemd/notify
[illegible]              STREAM     CONNECTED     41042    @/tmp/dbus-
[illegible]              STREAM     CONNECTED     42231
[illegible]              STREAM     CONNECTED     42956    @/tmp/dbus-
[illegible]              STREAM     CONNECTED     47699    @/tmp/dbus-
[illegible]              STREAM     CONNECTED     13212    /run/systemd/journal/
[illegible]              STREAM     CONNECTED     43113    /run/systemd/journal/
[illegible]              STREAM     CONNECTED     43013
[illegible]              STREAM     CONNECTED     42935
```

```
jeba@jeba-VirtualBox:~$ nmap www.google.com

Starting Nmap 7.01 ( https://nmap.org ) at 2020-01-20 22:51 IST
Nmap scan report for www.google.com (216.58.196.68)
Host is up (0.044s latency).
Other addresses for www.google.com (not scanned): 2404:6800:4007:811::2004
rDNS record for 216.58.196.68: bom05s11-in-f4.1e100.net
Not shown: 998 filtered ports
PORT    STATE SERVICE
80/tcp  open  http
443/tcp open  https

Nmap done: 1 IP address (1 host up) scanned in 20.32 seconds
jeba@jeba-VirtualBox:~$
```

f) use of host command

```
jeba@jeba-VirtualBox:~$ host -V
host 9.10.3-P4-Ubuntu
jeba@jeba-VirtualBox:~$
```

[signature] 24/01

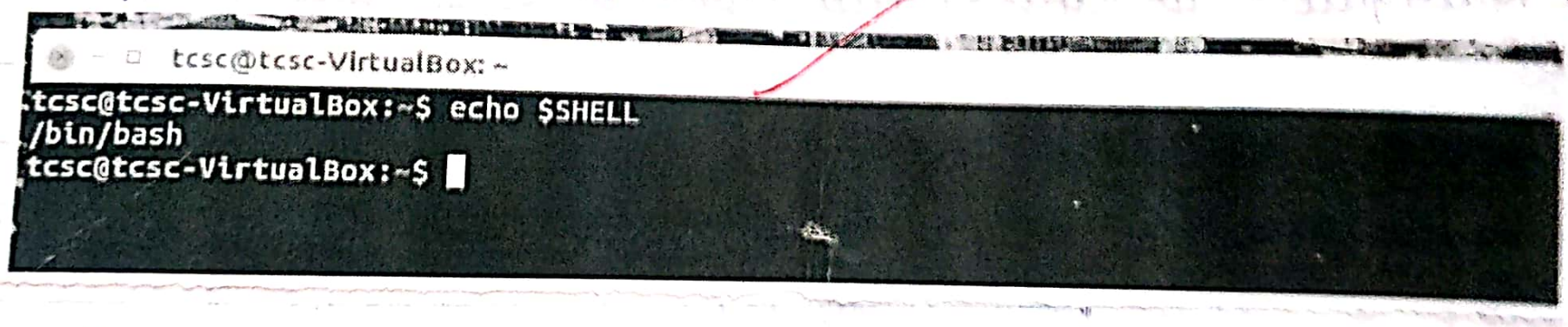
Practical 04

Aim:- Shell scripting

Basics of shell scripting

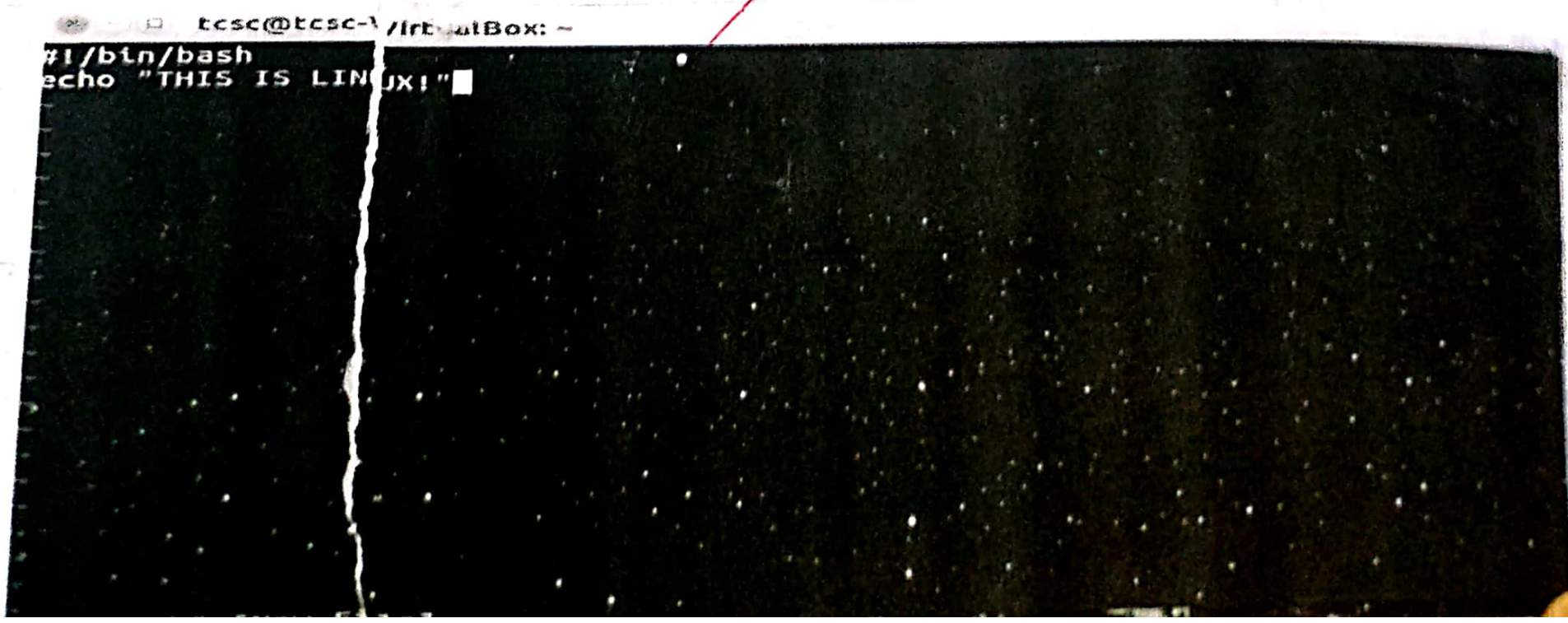
a. To get a shell, you need to start a terminal.
b. To see what shell you have, run: echo $ Shell.
c. In Linux the dollar sign ($) stand for shell variable
d. The echo command just return whatever you type in
e. #!/bin/bash - It is called shebang. It is written at the top of a shell script and it passes the instructions to the program /bin/bash.

Echo $shell.



- vi filename.sh

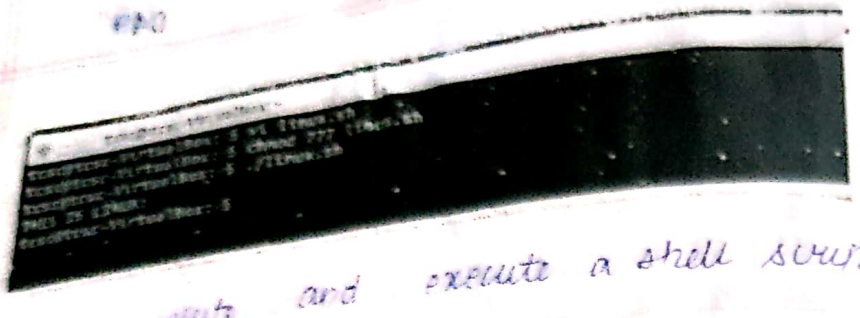
```
#!/bin/bash
echo "This is Linux!"
```



Name :

Div : Roll No :

PAO



Linux to create and execute a shell script

shell script is just a simplest text file with .sh extension, having executable permission

a Open terminal
b Navigate to the place where you want to create script using cd command.
c Touch filename.sh
d vi filename.sh [you can use your favorite editor, to edit the script]
e chmod 777 filename.sh (for making the script executable)
f ./filename.sh or ./filename/sh (for running the script

```
tcsc@tcsc-VirtualBox:~$ touch sh
tcsc@tcsc-VirtualBox:~$ chmod 777 linux2.sh
tcsc@tcsc-VirtualBox:~$ ./linux2.sh
sum is 125
tcsc@tcsc-VirtualBox:~$
```

Program to find the sum of two variable

```
vi filename.sh
#!/bin/bash
a=100
b=25
sum=$(($a+$b))
Echo "sum is : $sum"
```

Program to display your name.

```
#!/bin/bash
Echo "Enter your name"
Read name
Echo "My name is : $name
```

```
#!/bin/bash
a=100
b=25
sum=$((a+b))
echo "sum is: $sum"
```

:wq

```
tcsc@tcsc-VirtualBox:~$ vi linux2.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 linux2.sh
tcsc@tcsc-VirtualBox:~$ ./linux2.sh
sum is: 125
tcsc@tcsc-VirtualBox:~$
```

Program to find the sum of two number (value passed during execution)

```
#!/bin/bash
sum=$(($1+$2))
echo "sum is: $sum"
```

"sum.sh" 3 lines, 46 characters.

```
tcsc@tcsc-VirtualBox:~$ vi sum.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 sum.sh
tcsc@tcsc-VirtualBox:~$ ./sum.sh 50 70
sum is 120
tcsc@tcsc-VirtualBox:~$
```

Sed

Sed command or stream Editor is very powerful utility offered by Linux system. It is mainly used for text substitution, find & replace but it can perform other text manipulation like insertion, deletion, search etc. with sed, we can edit complete files without actually having to open it.

Consider the following text file

1 Displaying the partial text of a file

with sed, we can view part of a file rather than selling whole file.

```
tcsc@tcsc-VirtualBox: ~
tcsc@tcsc-VirtualBox:~$ vi cs.txt
tcsc@tcsc-VirtualBox:~$ sed -n 3,5p cs.txt
database management
linux
python
tcsc@tcsc-VirtualBox:~$
```

2 Display all except some lines.

To display all content of a file except for some portion, use option 'd'.

```
tcsc@tcsc-VirtualBox:~$ sed 3,5d cs.txt
subjects offered in cs
datastructure
green tech
softskill
stats
calclus
computer basic
tcsc@tcsc-VirtualBox:~$
```

3 Deleting a line

To delete a line, use line number followed by

```
tcsc@tcsc-VirtualBox: ~
tcsc@tcsc-VirtualBox:~$ vi linux.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 linux.sh
tcsc@tcsc-VirtualBox:~$ ./linux.sh
THIS IS LINUX!
tcsc@tcsc-VirtualBox:~$
```

4 Search and Replacing a string

's' option is for searching a word.


```
tcsc@tcsc-VirtualBox:~$ sed 's/cs/computer/' cs.txt
subjects offered in computer
datastructure
database management
linux
python
green tech
softskill
stats
calclus
computer basic
```

5 Replacing a string a particular line

To replace a string on a particular line, use the line number with 's' option.

```
tcsc@tcsc-VirtualBox:~$ sed '6 s/cs/computer system /' cs.txt
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calclus
computer basic
```

6 Add a line after/before the matched string.

To add a new line with some content after every pattern match, use option 'a'.

```
tcsc@tcsc-VirtualBox:~$ sed '/cs/a "this is linux"' cs.txt
subjects offered in cs
"this is linux"
datastructure
database management
linux
python
green tech
softskill
stats
calclus
computer basic
tcsc@tcsc-VirtualBox:~$
```

7. To change a whole line with matched pattern.

To changed a whole line to a new line when a seauch pattern matches, use option 'c'

```
tcsc@tcsc-VirtualBox:~$ sed '/linux/c "this is linux"' cs.txt
subjects offered in cs
datastructure
database management
"this is linux"
python
green tech
softskill
stats
calclus
computer basic
```

8.) Appending lines.

To add some content before every line with sed, use * and & as follows.

```
tcsc@tcsc-VirtualBox:~$ sed '/cs/i "this is linux"' cs.txt
"this is linux",
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calclus
computer basic.
tcsc@tcsc-VirtualBox:~$
```