

Practical No. 1

Linux Installation

41

Install your choice of Linux distribution using a USB drive

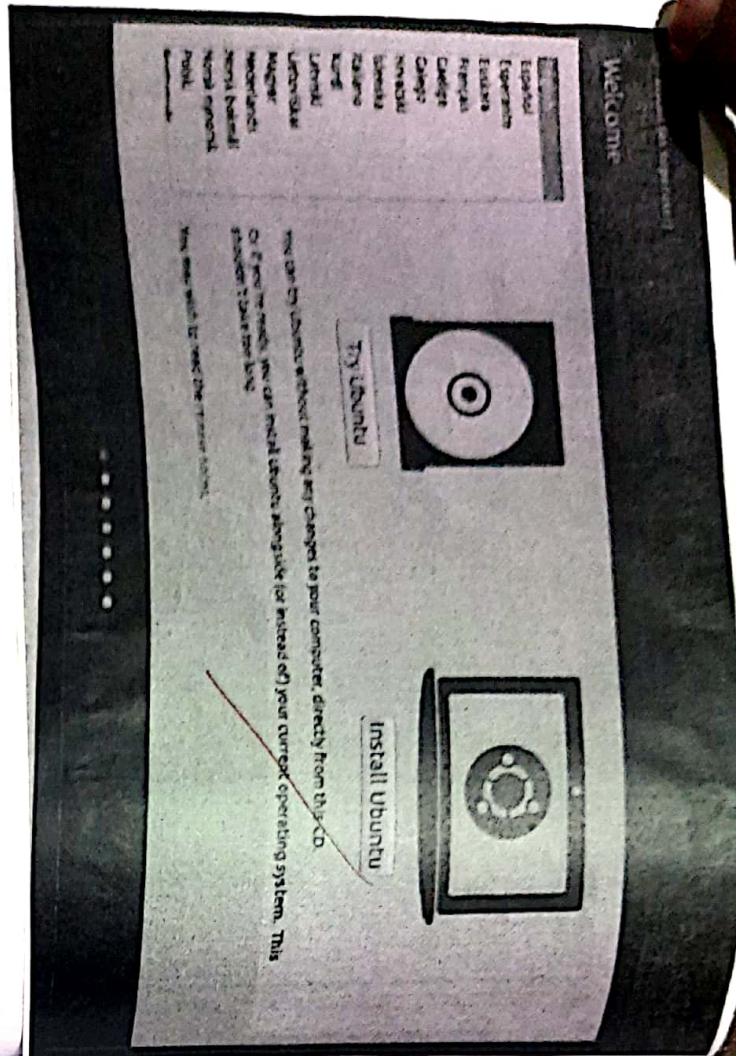
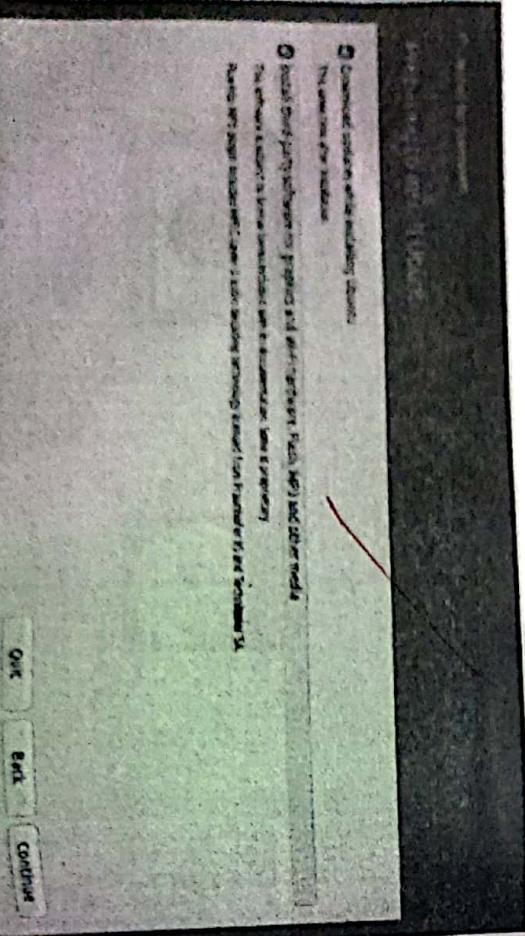
Most newer computers can boot from USB. You should see a welcome screen prompting you to choose your language and giving you option to install Ubuntu on the USB.

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.

Prepare to Install Ubuntu.

We recommend you plug your computer into a power source. You should always make sure you have enough space on your computer to install Ubuntu. We advise you to select Download updates while installing and Install this third-party software now.

You should also stay connected to the internet 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 checkboxes to choose whether you had like to install Ubuntu alongside another operating system, delete your existing operating system and replace it with Ubuntu or if you have an advanced user choose the 'something else' option.

3. Begin the Installation:

- Depending on your previous selection, you can now verify that you have chosen the way in which you would like to install Ubuntu. The installation process will begin when you click the 'Install Now' button. Ubuntu needs about 4.5GB to install so add a few extra GB to allow for your files.

Install (xserver-xorg)
Where are you?

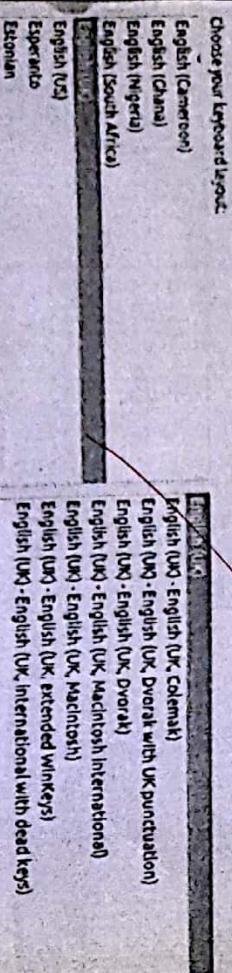


4. Select your location.

If you are connected to Internet be sure automatically to Internet correct and click 'Forward' to proceed. If you are unsure of your location click on the map and you are in our find it. TIP : If you are having problems connecting to the internet, use the menu in the top right hand corner to select a network.

5. Select your preferred keyboard layout.

~~Click on the language option you need. If you're not sure, click the 'Select Keyboard Layout' button for help.~~



Type here to test your keyboard
Detect Keyboard Layout

Back Continue

53

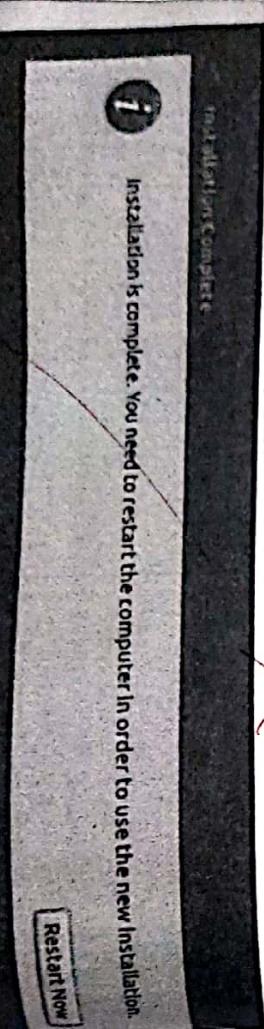
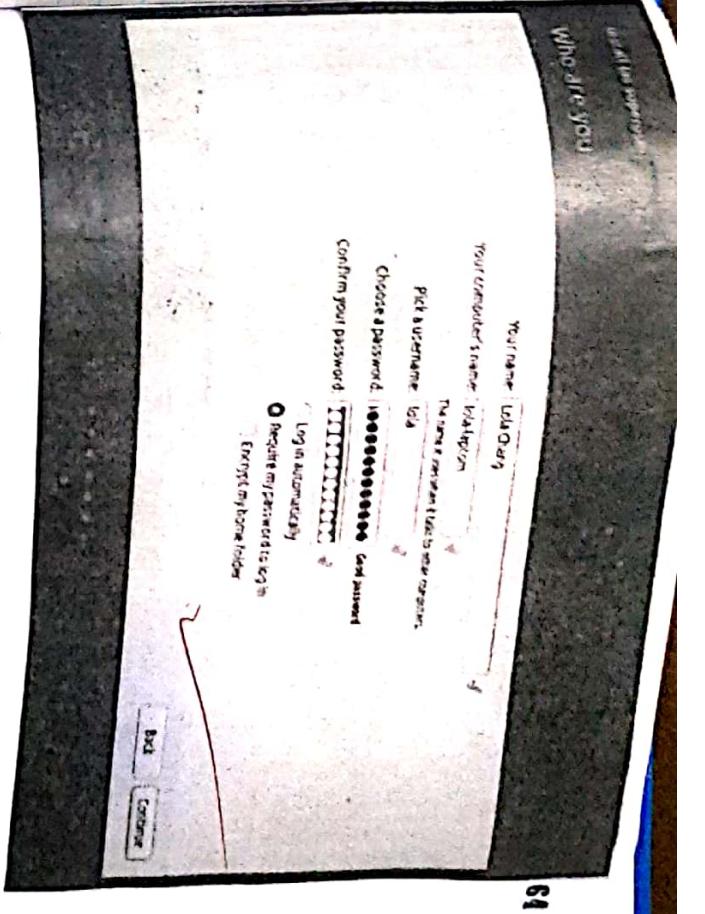
6. Enter your login password details:

Who are you?

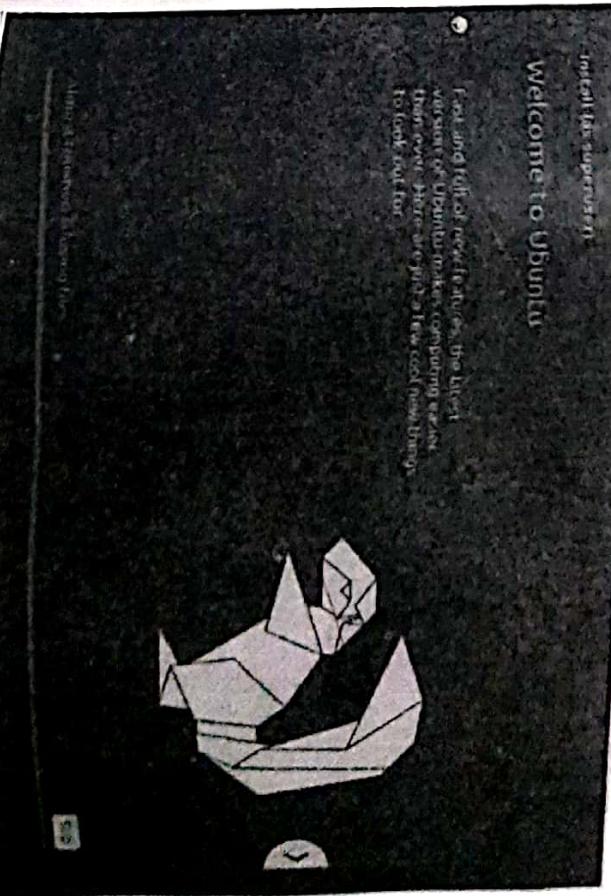
7. Scan issue about ubuntu while the system install
8. That's it.

10/10/27

54



After installation is finished, do the following for



Practical NO. 2.

Aim: Install gcc package and removing

- a. Install gcc package 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 installed

step 2: Type 'sudo apt-get install gcc'. After the following command installation will take place.

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

NOW TO UNINSTALL GCC COMPILER

In GCC 5.1.0, although there is no top-level uninstall target, some directories do have it, in particular gcc so you can do:

Type: cd build / gcc
sudo make uninstall

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

99
10/02

Practical NO. 3.

Aim: Utilization of grep, man commands

Documentation:

a. finding info documentation from the command line.

bring up the page from the grep command
Bring up the usage section.

Any To find info about any command 'info' is used then syntax of 'info' command is:
`info (command name)`

We are 'grep' to find the info about the 'grep' command

- Open the terminal (`ctrl + A + T`) and type `info grep`.
- After typing command following output will be displayed onto your screen.
- You can also scroll through pages using (`space = up`) & (`Backspace = down`) keys.

Another more summarised form of showing info is the 'man' command. The command is same as 'info', but requires data.

b. finding man pages from the end line:
Bring up the main page for 'ls'
command scroll down the example
section.

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. finding man pages by topic: what man
pages are available for document

d. finding man pages by section
line: bring up the man page for the
print lib function, which manual page section
are library function.

Simply type: 'man zip'
man ls

The number corresponds to what section of
manual page it is from; 1 is user command
while 8 is system stuff. The man page for
man itself explain it and list the standard
output.

→ Shows all certain items that have different pages in different sections (eg print) as command open in section 3; in case like that you can pass the section no. to the man before the page name to whose which on you need to use 'man -a' to show every matching page in a show.

Practical No. 4.

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 in / using find command.

- ✓ # find / -name password
- / user / share / doc / misc - ldap - 253 | grep password
- / etc / pam.d / password
- / etc / passwd

find the directory password file under root and one level down.

find / -maxdepth 2 -name password
• /etc / passwd

find the password file under root and 2 level down
✓ # find / -maxdepth 3 -name passwd

→ You can tell what section or term falls in with 'man -k' (equivalent to proper command) It will do substituting matches too, so you even need to use 'term' to limit it.

99

8.

• /usr / bin / password
• /etc / pam.d / password
• /etc / password

find the password file between sub-directories
find / level 2 & u

find - maxdepth 3 -maxdepth 5 -name password
• /usr / bin / password
• /etc / pam.d / password

d. Create a symbolic link to the file y on
found in ~~want~~ step .

ln -s file1 file2

e. Create an empty file example .txt & move
it to /tmp ~~absolutely~~ using relative pathname

touch example.txt
mv example.txt /tmp

f. delete the file moved to /tmp in previous
~~step~~ by absolute method.

rm /tmp /example.txt

g. find the location of ls , ps , bash commands
which ls
ls : /bin / ls | www | share | man | man1 | ls.1 .gz

whereis ps
ps : /bin / ps | www | share | man | man1 | ps.1 .gz

whereis bash
bash : /bin / bash | etc | bash. bashrc | www | share | man | man1 | ps.1 .gz

~~man / man1 / bash.1 .gz~~

~~10/10~~

Practical

۱۵

File Options

1. Explore mounted file systems on your computer.

Fs	Filesystem	1K-blocks	Used	Available	Use%	Mounted on
udev		494436	0	494436	0%	/dev
tmpfs		102416	3676	98740	4%	/run
tmpfs	/dev/sda1	7892728	3383372	3326024	51%	/dev/shm
tmpfs	512076	512076	216	511860	1%	/run/lock
tmpfs	5120	5120	4	5116	1%	/run/cgroup
tmpfs	512076	512076	0	512076	0%	/sys/fs/cgroup

2

What are the different ways of exploring mount file system on Linux?

3.
Copying text from files.
cp command, mv command.

4. Archiving and backup ~~the~~ work directory using tar, gzip and bzip2 commands.
gzip file name .tar
bzip2 file name .tar

```
jebas@jeba-VirtualBox:~/jeb$ ls -l
total 3
drwxr-xr-x 3 jebas users 96 Jun 10 14:08 Desktop
drwxr-xr-x 2 jebas users 64 Jun 10 14:08 Documents
drwxr-xr-x 2 jebas users 64 Jun 10 14:08 Downloads
drwxr-xr-x 2 jebas users 64 Jun 10 14:08 Pictures
drwxr-xr-x 2 jebas users 64 Jun 10 14:08 Public
drwxr-xr-x 2 jebas users 64 Jun 10 14:08 Templates
drwxr-xr-x 2 jebas users 64 Jun 10 14:08 Videos
jebas@jeba-VirtualBox:~/jeb$ cd jeb
jebas@jeba-jeb:~/jeb$ touch ss.txt
jebas@jeba-jeb:~/jeb$ mv gg.txt ss.txt
jebas@jeba-jeb:~/jeb$ cat gg.txt ss.txt
jebas@jeba-VirtualBox:~/jeb$ cat ss.txt
Linux
jebas@jeba-VirtualBox:~/jeb$ cat dd.txt
Welcome to my desktop
jebas@jeba-VirtualBox:~/jeb$ cat dd.txt
```

```

jeba@jeba-VirtualBox:~/jebS ls
aa.txt.gz  bb.txt.gz
jeba@jeba-VirtualBox:~/jebS cat >aa.txt
hello world
^C
jeba@jeba-VirtualBox:~/jebS cat >bb.txt
this is linux
^C
jeba@jeba-VirtualBox:~/jebS diff aa.txt bb.txt
jeba@jeba-VirtualBox:~/jebS cat >bb.txt
this is Linux
^C
jeba@jeba-VirtualBox:~/jebS diff aa.txt bb.txt
jeba@jeba-VirtualBox:~/jebS diff aa.txt bb.txt
jeba@jeba-VirtualBox:~/jebS diff aa.txt bb.txt
< hello world
> this is Linux
jeba@jeba-VirtualBox:~/jebS gzip aa.txt
jeba@jeba-VirtualBox:~/jebS gzip bb.txt
jeba@jeba-VirtualBox:~/jebS diff aa.txt.gz bb.txt.gz
Binary files aa.txt.gz and bb.txt.gz differ

```

5. Use ~~diff~~ command to compare ~~diff~~ of two files.

6. Use patch command to patch a file again.

10/07

```

jeba@jeba-VirtualBox:~/jebS cat >hi.txt
hi
hi
^C
jeba@jeba-VirtualBox:~/jebS cat >hi1.txt
hello
hello
^C
jeba@jeba-VirtualBox:~/jebS diff -u hi.txt hi1.txt >sam.patch
^C
jeba@jeba-VirtualBox:~/jebS patch <sam.patch
patching file hi1.txt
jeba@jeba-VirtualBox:~/jebS cat sam.patch
--- hi1.txt    +22:14:55.463569834 +0530
+++ hi1.txt    @@ -1,3 +1,3 @@
hi
^C
hello
^C
jeba@jeba-VirtualBox:~/jebS

```

Practical No. 6.

Use Environment.

a. Which account you are logged in? How do you find out? & whoami

```
jeba@jeba-VirtualBox:~$ w
20:35:01 up 1 min, 1 user, load average: 0.70, 0.79, 0.38
USER      TTY      FROM             :0
jeba@jeba-VirtualBox:~$ w -s
20:35:14 up 1 min, 1 user, load average: 0.60, 0.77, 0.37
USER      TTY      FROM             :0
jeba@jeba-VirtualBox:~$ w -h
4:38 /sbin/upstart --user
jeba@jeba-VirtualBox:~$ whoami
jeba@jeba-VirtualBox:~$ w -f
20:36:12 up 1 min, 1 user, load average: 0.41, 0.69, 0.37
USER      TTY      LOGIN@    IDLE   JCPU   PCPU
jeba@jeba-VirtualBox:~$ w -t
20:32 5:36 9.08s 0.33s /sbin/upstart --user
```

```
jeba@jeba-VirtualBox:~$ whoami
jeba@jeba-VirtualBox:~$ who
jeba@jeba-VirtualBox:~$ whoami
jeba@jeba-VirtualBox:~$ who -l
jeba@jeba-VirtualBox:~$ who -1
jeba@jeba-VirtualBox:~$ who -t
jeba@jeba-VirtualBox:~$ who -v
jeba@jeba-VirtualBox:~$ who -u
jeba@jeba-VirtualBox:~$ who -w
```

b. Display /etc/shadow file using cat command and understand the importance of shadow file. How it's different than passwd file.

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

```
jeba@jeba-virtualBox:~$ sudo cat /etc/shadow
[jeba]:password:0:99999:7:::
[root]:18240:0:99999:7:::
[daemon]:*:16911:0:99999:7:::
[bin]:*:16911:0:99999:7:::
[sys]:*: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:::
```

- Username : up to 8 characters usually all lowercase. Case-sensitive the username in the /etc/passwd file.
- pass word , 13 character entry (eg. ::) indicates a direct match to required to log in (usually a password is not and a "*" entry (eg. ::+) indicates the account has been disabled.
- The number of days (since Jan 1, 1970) since the password was last changed.
- The number of days before password may be changed (0 indicates it may be changed at any time).
- The number of days after which password must be changed (99999 indicates user can keep his or her password unchanged for many years.)
- The number of days to warn user of an expiring password (7 for a full week)
- The number of days after pass word expires that account is disabled.
- The number of days since Jan 1, 1970 than an account has been disabled.
- A reserved field for possible future use.

Each field in a password entry is separated with colon ":" colon characters, and are as follow:

- Username , up to 8 characters . case-sensitive usually all lowercase.
- An "x" in the password field . password are stored in the " /etc/shadow " file.
- Numeric user Id . This is assigned by " adduser " script . Unix uses the field plus the following group field , to identify which files belong to the user.
- User's home directory . Usually "/home/username" . An user's personal files , web pages , mail forwarding , etc will be stored here.
- User's shell account . Often to "/bin/bash" to provide access to the bash-shell

- c. get your current working directory
- Ans

```
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:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin:/usr/sbin/nologin
```

- d. Explore different ways of getting command history, how to run previously executed command without typing it.

the history
! line number.

```
jeba@jeba-VirtualBox:~$ history
jeba@jeba-VirtualBox:~$ history
1 who
2 whoami
3 who -l
4 clear
5 x -s
6 x -h
7 x -f
8 x -r
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:~$ !13
who -l
jeba@jeba-VirtualBox:~$
```

o.

Practical No. 7

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

- Creating file.
To create a file, on the terminal type vi followed by filename.
- Modifying the file:
To modify a file, on the vi editor, type 'o'
- Navigate.

Movement in four directions.

Key ↗ ↘ ↙ ↖

Action.

Move cursor up
Move cursor down
Move cursor left
Move cursor right

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

Legend navigation.

key

Action:

b Moves back to the beginning of the word.

e Moves forward to the end of the word.

w Moves forward to the beginning of the word.

o (zero) Move to first character of line.

s Move to the end of line.

scrolling:

Action:

Ctrl + b scrolls forward.

Ctrl + e scrolls backward.

Ctrl + d scrolls half page.

Ctrl + u scrolls half page backward.

b. Learn all vi commands
replace, highlighted commands like search
(i) Replace syntax:

```
jeb@jeba-VirtualBox ~
Hello
This is my Linux example
Welcome
Welldone
This is VI Editor
Thank you
```

```
:g/my/s/!our/9c
jeb@jeba-VirtualBox ~
Hello
This is my Linux example
Wellcome
THLLlone VI Editor
Thank you
```

```
jeb@jeba-VirtualBox ~
Hello
This is our Linux example
Welcome
Welldone
This is VI Editor
Thank you
```

(iii) highlight
use set hlsearch

```
jeba@jeba-VirtualBox: ~  
Hello  
This is our Linux example  
Welcome  
Welldone  
This is Vi Editor  
Thank you  
:  
:set hlsearch
```

(iii) show the line number.
use set nu.

```
jeba@jeba-VirtualBox: ~  
1 Hello  
2 This is our Linux example  
3 Welcome  
4 Welldone  
5 This is Vi Editor  
6 Thank you  
:  
:set nu
```

Practical No. 8.

a. Use of sudo to change user privileges to root.

Create an user named user 1

To give some user root privileges edit /etc/sudoers
and using visudo. Enter new lines as highlighted
below.

```
jeba@jeba-VirtualBox:~  
[sudo] password for jeba:  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
jeba@jeba-VirtualBox:~$
```

```
# Please consider adding local content in /etc/sudoers.d/ instead of  
# directly modifying this file.  
# See the man page for details on how to write a sudoers file.  
Defaults env_reset  
Defaults mail_badpass  
Defaults secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/  
# Host alias specification  
# User alias specification  
# Cmnd alias specification  
# User privilege specification  
root    ALL=(ALL:ALL) ALL  
user1  ALL=(ALL:ALL) ALL
```

b. Identify operations that require sudo privileges.

```
jeba@jeba-VirtualBox:~$ su user1  
Password:  
user1@jeba-VirtualBox:~/home/jeba$ mkdir folder1  
mkdir: cannot create directory 'folder1': Permission denied.  
user1@jeba-VirtualBox:~/home/jeba$ sudo mkdir folder1  
[sudo] password for user1:  
user1 is not in the sudoers file. This incident will be reported.
```

c. Modify expiration date for new user using
password aging.

```
jeba@jeba-VirtualBox:~$ sudo chage -i 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:~$ ifconfig
enp0s3      Link encap:Ethernet HWaddr 08:00:27:0e:6b:69
            inet addr:10.0.2.15 Brdcast:10.0.2.255 Mask:255.255.255.0
              Inet6 addr: fe80::c0c0:53a0%enp0s3 Brdcast:fe80::ff:fe:6b:69/64 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 frame:0
                collisions:0 txqueuelen:1000
                RX bytes:1160 (1.1 kB) TX bytes:8514 (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:4225872 (4.2 MB) TX bytes:4225872 (4.2 MB)
```

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

a.

Get IP address of your machine using ifconfig.

83

Practical no. 9.

b. get hostname of your machine.

c.

Using ping to check the network connectivity to remote machines.

d.

Use of dig command.

```
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=84.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=84.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=87.1 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=93.5 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=86.9 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=98.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=90.9 ms
[1]+  Stopped                  ping www.google.com
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: ; QUESTION SECTION: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
; www.google.com.

; 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
```

18.

e. Trouble shooting network using tracert, route command.

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

```
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:~$ arp
jeba@jeba-VirtualBox:~$ arp
Address          HWtype  HWaddress           Flags Mask          Iface
10.0.2.2        ether   52:54:00:12:35:02  C            enp0s
```

g. Use of host command.

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

2. Use of netstat command and Nmap command.

```
jeba@jeba-VirtualBox:~$ netstat -an | grep 'Active UNIX' | grep 'DGRAM'  
Proto Recv-Q Local Address           Foreign Address     State  
Active UNIX domain sockets (w/o servers)  
Proto RefCnt Flags       Type      State          I-Node Path  
dgram    [ ]        DGRAM  
unix    :3      [ ]        DGRAM  
syslog  [ ]        DGRAM  
unix    :16     [ ]        DGRAM  
dev.log [ ]        DGRAM  
unix    :3      [ ]        DGRAM  
socket  [ ]        DGRAM  
unix    :3      [ ]        DGRAM  
unix    :3      [ ]        STREAM  CONNECTED  9684  /run/systemd/journal/  
unix    :3      [ ]        STREAM  CONNECTED  44042 /run/systemd/journal/  
unix    :3      [ ]        STREAM  CONNECTED  43113 /run/systemd/journal/  
unix    :3      [ ]        STREAM  CONNECTED  42988 @/tmp/dbus-Cyntei7AOG  
unix    :3      [ ]        STREAM  CONNECTED  42696 @/tmp/dbus-CMGG6G7P5  
stdout  [ ]        STREAM  CONNECTED  13242 /run/systemd/journal/  
stdout  [ ]        STREAM  CONNECTED  43113 /run/systemd/journal/  
unix    :3      [ ]        STREAM  CONNECTED  43013 /run/systemd/journal/  
unix    :3      [ ]        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  
FQDN 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:~$
```

```
tcsc@tcsc-VirtualBox: ~
tcsc@tcsc-VirtualBox: ~$ echo $SHELL
/bin/bash
tcsc@tcsc-VirtualBox: ~
```



```
tcsc@tcsc-VirtualBox: ~
#!/bin/bash
echo "THIS IS LINUX!"
```

linux.sh [New File]

Practical NO.10.

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 Unix, the dollar sign stands for ~~shell~~ variable.
- d. The echo command just returns 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 instruction to the program /bin/bash.

~~Echo \$ SHELL~~

```
vi filename.sh
#!/bin/bash
echo "This is Linux!"
```

chmod 777 filename.sh

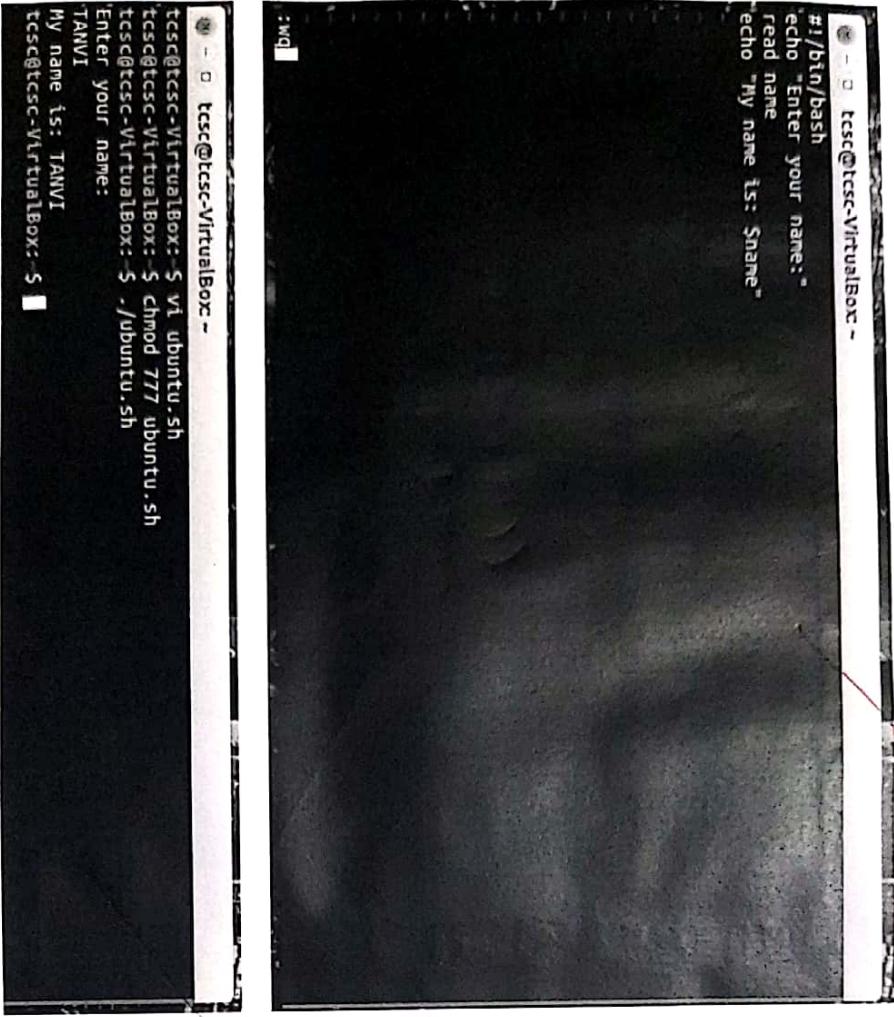
./filename.sh

steps to write and execute a shell script.

Shell script is just a simple text 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. Go filename.sh.
- e. chmod 777 filename.sh
- f. sh filename.sh or ./filename.sh.

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



```
tcscc@tcscc-VirtualBox:~$ ./ubuntu.sh
#!/bin/bash
echo "Enter your name:"
read name
echo "My name is: $name"
tcscc@tcscc-VirtualBox:~$ ./ubuntu.sh
Enter your name:
TANVI
My name is: TANVI
tcscc@tcscc-VirtualBox:~$
```

Program to display your name.

```
#!/bin/bash
echo "Enter your name"
read name
echo "My name is : $name"
```

Program to find the sum of two variables.

vi filename.sh
#!/bin/bash

a=100
b=25

sum=\$((a+b))
echo "Sum is:\$sum"

```
tcscc@tcscc-VirtualBox:~$ vi llinux2.sh
tcscc@tcscc-VirtualBox:~$ chmod 777 llinux2.sh
tcscc@tcscc-VirtualBox:~$ ./llinux2.sh
Sum is:125
tcscc@tcscc-VirtualBox:~$
```

~~Program
numbers
values
sum
passed during
execution.~~

91

"lin.sh" 3 lines, 46 characters

```
[1] /bin/bash
sum=$((S1+S2))
echo "sum is:$sum"
```

90

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

```
#!/bin/bash
sum=$((S1+S2))
echo "sum is:$sum"
```

Sed

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

1. Displaying partial text of a file.

With sed, we can view only part of a file than seeing whole file.

2. To display all except some lines.

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

```
tcsc@tcsc-VirtualBox:~$ subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
```

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

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

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

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

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

3. To delete a line.

Use line numbers followed by d.

5. Search and replacing a string on a particular line.
's' option is for searching a word.

Replacing a string on a particular line.
Use line number with 's' option.

~~To do my best option "C"~~

~~To do my best option "C"~~

The following is a brief introduction to some of the Linux® subsystems different in its architecture management, file system, partition, green "tech" software stack.

```
tscs@tscs-virtualbox:~$ sed "N;N" /tmp/testfile | less
```

8 Appending lines

To add some line with sed follows.

use * before every line and & in

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