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who has worked for the year 2019 - 20 in the Computer Laboratory.

Teacher In-Charge

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PERFORMANCE

Term	Remarks	Staff Member's Signature
I	Completed	01/10/19
II	Completed	11/02

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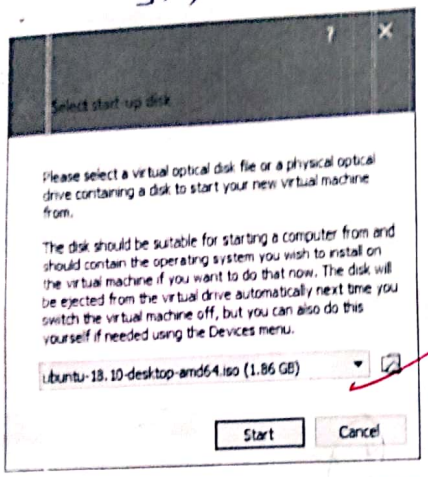
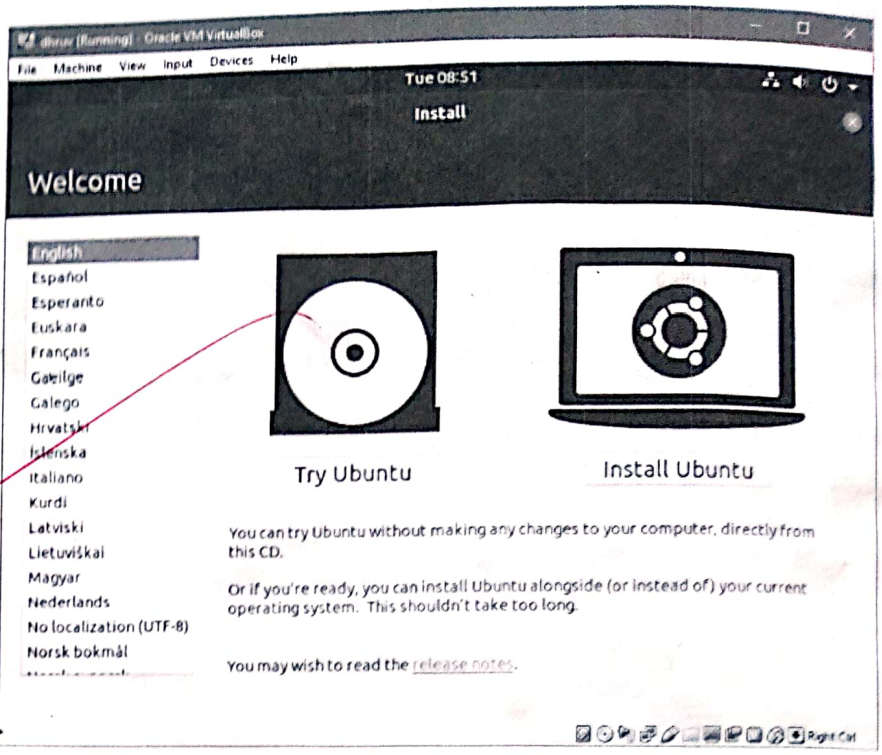
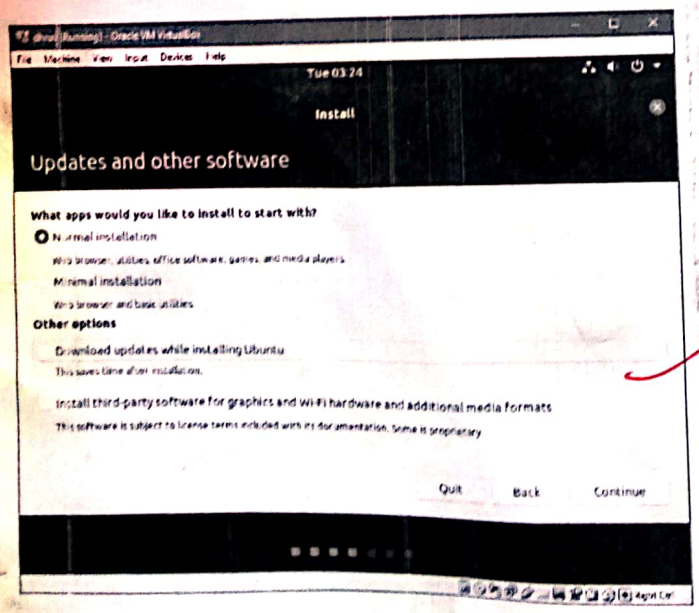
step 1

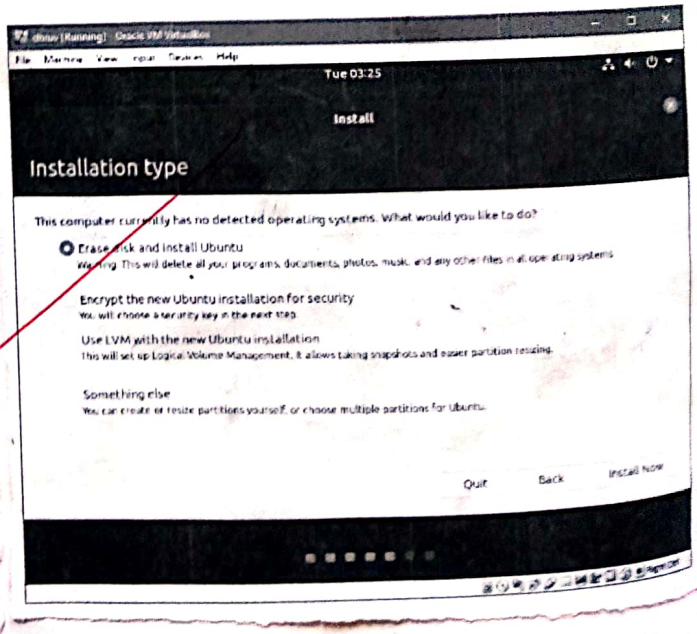




Step3



step 4



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Practical - 1

Aim - Install your choice of linux distribution
eg. - Ubuntu, fedora, debian.

* Ubuntu : Ubuntu is a free and open source software based on ~~b~~ debair, Ubuntu is officially released under 3 edition desktops, server, union.

All the editions can be runned on the computer ~~alon~~ alone or a virtual box machine.

It is a popular open source software for cloud computing with support of open stack.

Steps for installing ubuntu in a virtual machines.

S_1 : Select a virtual optical file or a physical drive to start ubuntu in your virtual machine. Space given to it is 1.86 GB.

S_2 : Select the language of your choice and click on 'Install Ubuntu'. You can also 'try ubuntu' for free on computer device from this w.

S_3 : In updates and add software click on the normal installation

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S_4: While configuring installation type we need to click 'Erase disk and install ubuntu'. This step would delete all types of documents photos, etc in all operating system.

S_5: In this you only need to choose the location for the clock to work on ubuntu.

S_6: In this type you need to choose usemame and password for the login in ubuntu and then click on continue.

S_7: Here you simply need to type password again and it is done.

S_8: Type name of virtual disk and recommand size to be given is 2048 GB or 27 GB.

Therefore, now the virtualization is ready to use.

b) Customize desktop environment by changing different default options like changing default background, themes, screensavers.

Accessing Apperence setting :-

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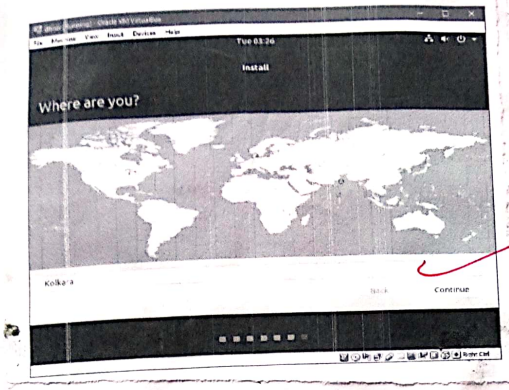
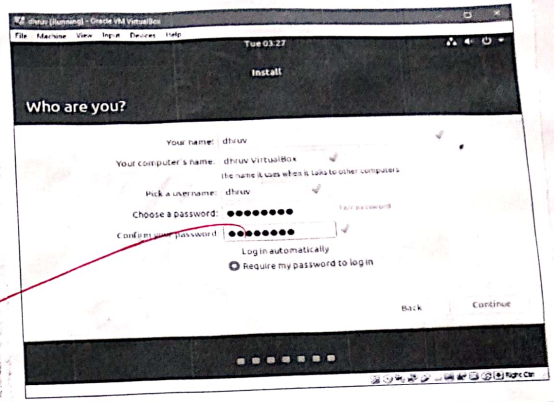
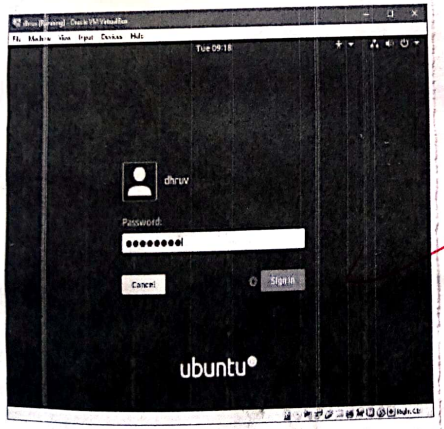
Step5



step6



Step7



step 8

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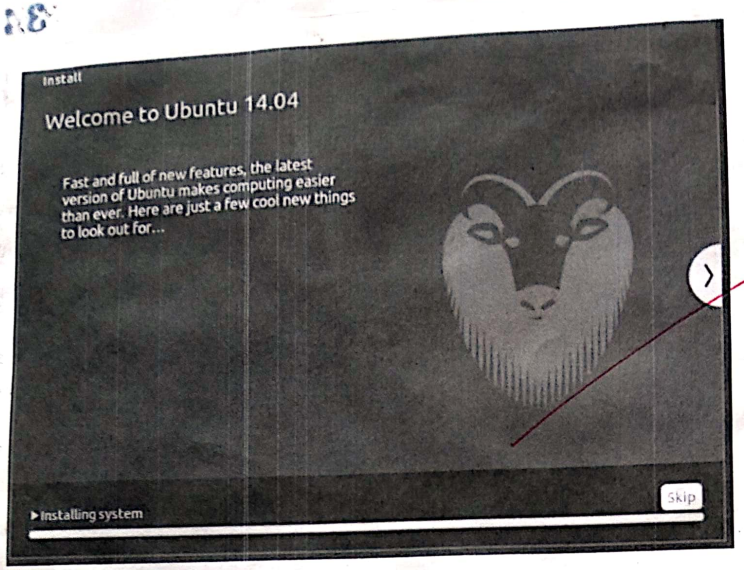

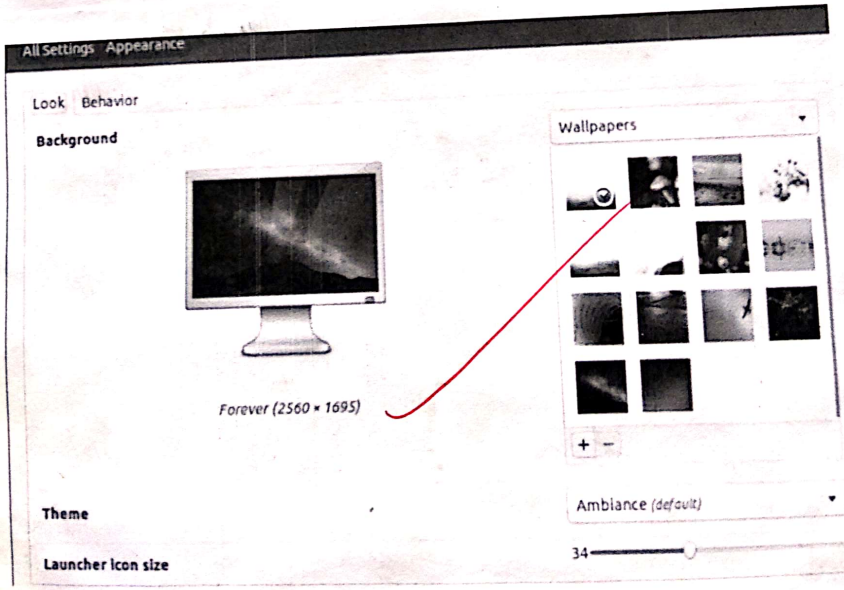

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1) To access appearence setting in ubuntu, lets click on user menu at the top right corner, on the top menu bar and select system setting

2) A window will pop-up will All setting divided into personal, hardware, system setting.

* Changing wallpaper pictures :

1) On the left side of background part, you can see your current wallpaper.

2) On the right side is part where, we can select one of ubuntu wallpaper. Clicking on any thombnaid our wallpaper will be changed.

3) If you want to select wallpaper from your pictures folder, click the drop-down menu above thumbnails select the pictures and folders.

4) You will see all the pictures in your picture folder as thumbnail, where you can select then as your wallpaper

b) Changing Ubuntu Theme :

1) Ubuntu also has an option to change the desktop theme, which in one click will change the entire way your computer looks.

2) To do that, click on the drop-down menu below the wallpaper thumbnail & choose between ambiance, radiame or high contrast.

c) Screen resolution : Ascertion the current screen resolution for your desktop.

d) Changes the size or rotation of screen :

1) You can change how big (or how detailed) things apper on the screen.

2) You can change which way up things apper

3) Click the icon on the very right of the menu bar & select system st setting.

4) Open screen display.

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5) If you have multiple display and they are not mirrored, you can have different setting on each display.

6) Select your desired resolution & rotation.

7) Click apply: The new settings will be applied for 30 sec before reverting back.

d) Time setting change the time zone of your system to (or new you york time).

1) If you are currently in Indian Time. How does the displayed time change?

2) After noting the time change, change the time zone back to your local time zone.

3) Just click on the click on the top bar, and choose time and date setting.

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Practical No. 2

* Aim : Installing & removing software.

a) Instal' 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' install gcc. After typing the following command installation will take place.

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

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Now To uninstall all 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 executables like gcc, g++, cpp... contained in that directory.

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Practical No. 3.

★ Aim - Utilization of grep, man commands

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 any command info command is used the syntax of info command is" info (command name).

We are going to find the info about the 'grep'.

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

You can also scroll through page using (shave = up) & (backspace = down) keys.

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

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b) Finding man pages from the cmd line: Bring up the man page for the 'ls' command scroll down to the examples 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 main pages by topic what man pages are available that document file compression.

→ 'Tar', 'Zip' are some man pages which are available for document file compression.

simply type : man zip
man tar.

TAR (1)

tar - an archiving utility

synopsis:

traditional usage

tar {A|c|d|r|t|u|x} [gnskuwomp...]

UNIX-style usage

tar - A [options] Archive ARCHIVE

tar - c [-f ARCHIVE] [OPTIONS] [FILE...]

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zip clock (see separate man page)
zipnote (see separate man page)
zipnote (see separate man page)

Descriptions :

large archives & zip64, bzip automatically uses the zip 64 extensions.

4) Finding man pages by section from the cmd lines bring up the man pages for the print lib function which manual page section are library function founded.

) The number correspond to what section of the mannual page is from ; is user command, while 8 is sysadmin stuff. The man page for man itself explain it and list the std.

MANUAL SECTIONS

The standard sections of the manual include

1) User commands
2) system calls
3) C library functions

There are certain terms that have different pages in different sections (eg. 'print f' as a command 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 show everything matching page in a row.

$ man 1 print f
$ man 3 print f
$ man - a print f
$ man - k 'print f'

print f	(1) - format & print data
print f	(1p) - write formatted output
print f	(3) - formatted output convers
print f	(3p) - print formated output
print f [building]	(1) - bash built in-commands.

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

c) command-line help list the available options for the mkdir command. How can yo do this?

$mkdir -ma=rwx directoryname.

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PRACTICAL 4

Command line operations :

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 passwword.
- /usr/share/doc/nss-ldap-253/pam d/password
- /usr/bin/password
- /etc/~~bin~~ pam-d/password
- /etc/passwd

d) find the directory password file under root and one level down.
✓ # find / -man depth 2-name passwd
- /etc/passwd

e) find the passwd file under root and 2 level down.
✓ # find / -man depth 3-name passwd
- /usr/bin/passwd
- /etc/pam-d/passwd
- /etc/passwd.

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f) find the passwd file b/w sub-directory level 2 & 4.

✓ # find -mandepth 3 -mandepth 25 -name-passwd

- /usr/bin/passwd
- /etc/pamd/passwd

g) Create a symbolic link to the file you found in last step.

ln -s file file2

h) Create an empty file example.txt & move it to \tmp directory using relative path name.

✓ # touch example.txt

✓ # mv example.txt /tmp

i) delete the file moved to /tmp in previous step by absolute method.

rm/ tmp/example.txt.

j) find the location of ls, ps, bash commands

whereis ls

ls : /bin/ls /usr/share/man/man1/ls/gz

where is ps

ps : /bin/ps /usr/share/maps: /bin/ps /usr/share/man/man1/ps/.gz

where is bash

bash : /bin/bash /etc/bash /.bashx /usr/share/
man/man/bash.1.gz

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Practical No. 5

Topic : file Operation

1) Explore mounted file systems 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 the ways of exploring mounted file system on linux?

Ans : mount

```
jeba@jeba-VirtualBox:~$ mount
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
udev on /dev type devtmpfs (rw,nosuid,relatime,size=494436k,nr_inodes=123609,mode=755)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,size=102416k,mode=755)
/dev/sda1 on / type ext4 (rw,relatime,errors=remount-ro,data=ordered)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev)
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime,size=5120k)
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,mode=755)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,releas
e_agent=/lib/systemd/systemd-cgroups-agent,name=systemd,nsroot=/)
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset,nsroot
=/)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net
_cls,net_prio,nsroot=/)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids,nsroot=/)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,nsro
ot=/)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpua
cct,nsroot=/)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsro
ot=/)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,nsroot
=/)
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio,nsroot=/
)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_even
t,nsroot=/)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsro
ot=/)
systemd 1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=32,pgrp=1,timeout=0,minp
roto=5,maxproto=5,direct)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime)
```

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38) Copying text from files

Ans : Cp command, MV command

```
jeba@jeba-VirtualBox:~$ ls
Desktop   Downloads   examples.desktop   jj   Music   Pictures   Public   Templates   Videos
Documents
jeba@jeba-VirtualBox:~$ cd jeb
jeba@jeba-VirtualBox:~/jeb$ cat .gg.txt
cat: .gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat >gg.txt
welcome
Linux
^C
jeba@jeba-VirtualBox:~/jeb$ touch dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  gg.txt
jeba@jeba-VirtualBox:~/jeb$ cp gg.txt dd.txt
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$
```

```
jeba@jeba-VirtualBox:~/jeb$ touch ss.txt
jeba@jeba-VirtualBox:~/jeb$ mv gg.txt ss.txt
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$
```

9) Archiving & backup the work directory using tar, gzip & zipz commands

Ans gzip filename.txt
Bzipz filename.txt

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```
jeba@jeba-VirtualBox:/$ tar -cvf data.tar /mnn
tar: data.tar: Cannot open: Permission denied
tar: Error is not recoverable: exiting now
jeba@jeba-VirtualBox:/$ sudo tar -cvf data.tar /mnn
tar: Removing leading `/' from member names
/mnn/
/mnn/hd/
jeba@jeba-VirtualBox:/$ ls
bin   data.tar  etc        lib        mnn   opt   run   srv  usr
boot  dd        home       lost+found mnt   proc  sbin  sys  var
cdrom dev       initrd.img media      mnt1  root  snap  tmp  vmlinuz
jeba@jeba-VirtualBox:/$ cat data.tar
mnn/0000755000000000000000000000000000001360537655701036 5ustar  rootrootmnn/hd/0000755000000
000000000000000000001360537655701076 0 5ustar  rootrootjeba@jeba-VirtualBox:/$
```

```
jeba@jeba-VirtualBox:~/jeb$ bzip2 ss.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt.bz2
BZh91AY&SY`◆▯▯▯▯◆▯▯▯
'J◆w$S◆◆▯▯1 jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
◆▯▯▯ ▯▯d.txt+O◆I◆◆M◆◆◆◆+◆◆▯▯◆Xzjeba@jeba-VirtualBox:~/jeb$
```

5) Use diff command to create diff of two files

Ans : diff filename1 filename2

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```
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz   ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat >aa.txt
hello world
^C
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt
this is linux^C
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt
1d0
< hello world
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt
this is Linux
^C
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt
1c1
< hello world
---
> this is Linux
jeba@jeba-VirtualBox:~/jeb$ gzip aa.txt
jeba@jeba-VirtualBox:~/jeb$ gzip bb.txt
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt.gz bb.txt.gz
Binary files aa.txt.gz and bb.txt.gz differ
```

6) Use patch Command to patch a file. And analyze the patch using patch command again.

```
jeba@jeba-VirtualBox:~/jeb$ cat >hi.txt
hi
hi
hi
^C
jeba@jeba-VirtualBox:~/jeb$ cat >hii.txt
hello
hello
hello
^C
jeba@jeba-VirtualBox:~/jeb$ diff -u hi.txt hii.txt >sam.patch
jeba@jeba-VirtualBox:~/jeb$ patch ,sam.patch
^C
jeba@jeba-VirtualBox:~/jeb$ patch <sam.patch
patching file hi.txt
jeba@jeba-VirtualBox:~/jeb$ cat sam.patch
--- hi.txt      2020-01-08 22:14:55.463569834 +0530
+++ hii.txt     2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
-hi
-hi
-hi
+hello
+hello
+hello
jeba@jeba-VirtualBox:~/jeb$
```

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Practical 6.

Topic : Use Environment.

a) Which account you are logged in? How do you find out?
Ans : Who command & whoami

```
jeba@jeba-VirtualBox: ~
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   9.00s  0.33s /sbin/upstart --user
```

b) Display /etc/shadow file using cat command & understand the importance of shadow file. How it is different than passwd file.

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Ans: cat /etc/shadow

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

- Username; up to 8 character. Case-sensitive, usually all lowercase. A direct match to the username in the /etc/passwd file.

- password. 13 character encrypted. A blank ~~emt~~ entry indicates a password is not required to log in, and a "*" entry indicates the account has been disabled.

- The number of days (since January 1, 1970) since the passwd 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 many years)

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- The number of days to warn user of an expiring password (7 for a full week)
- The number of days after password expires that account is 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 entry is separated with ":" colon character, and are as followed.

- Username up to 8 character. case-sensitive, usually all lowercase
- An "x" in the passwd field, passwords are stored in the "etc/shadow" files.
- Numeric group id. Red Hat use group id's in a fairly unique manner for enhanced file security. Usually the group id will match the user id.
- full name of user. I'm not sure what that maximum length for this field is, but try keep it resonable
- User's name directory. usually /home/username. All user's personal files. web pages, mail forwarding, e

• User. "shell account" often set to "/bin/bash" to provide access to the bash shell (my personal favourite shell).

```
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/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
```

c) Get your current working directly

→ Ans: pwd

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

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

: history

line number

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

Create alias as most commonly used commands
Alias commands instructs the shell to replace one string with another string while executing the commands.

Ans :- alias label = " command "

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

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Practical 7

Topic : Linux Editors

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

i) Create a file

To create file, on the terminal type vi follow by filename

ii) Modifying the file

To modify a file, on vi editor, type 'o'

iii) Search in a file

To ~~fi~~find word press / followed by the word to search

iv) Navigate

Movement in four direction

key	Action
k	Moves Cursor up
j	Moves Cursor down
h	Moves Cursor left
l	Moves Cursor right

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Word Navigation

key	Action
b	Moves back to beggning (beginning) of word
e	Moves forward to the end of word
w	Moves forward to beginning of word
0 (zero)	Moves to first character of line
$	Moves to end of line

Scrolling

Key	Action
ctrl + f	scroll forward
ctrl + b	scroll backward
ctrl + d	scroll half page
ctrl + v	scroll half page backward

b) Learn all essential command like/replace, highlight, show line number

i) Replace

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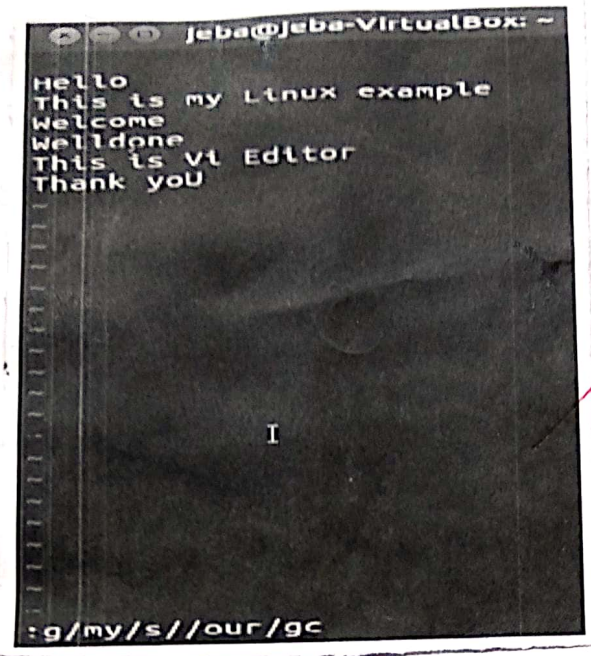
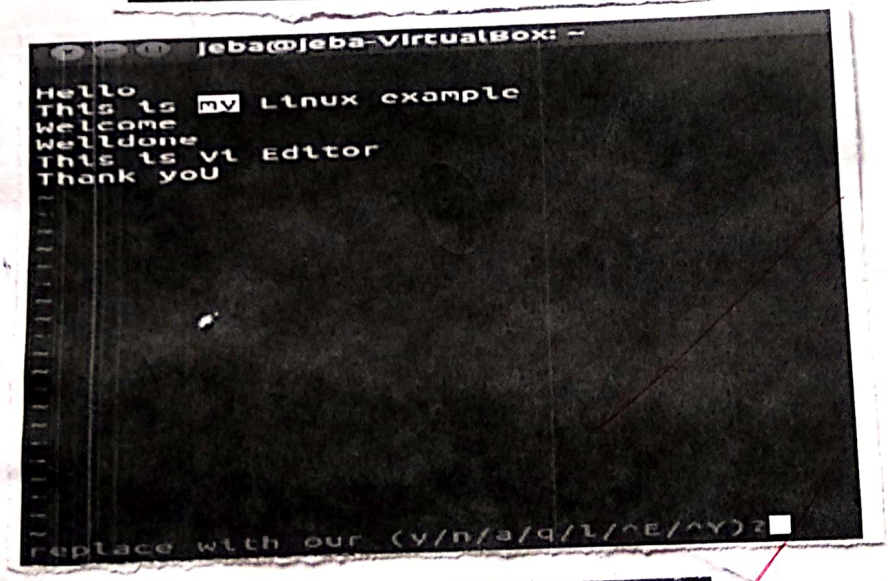
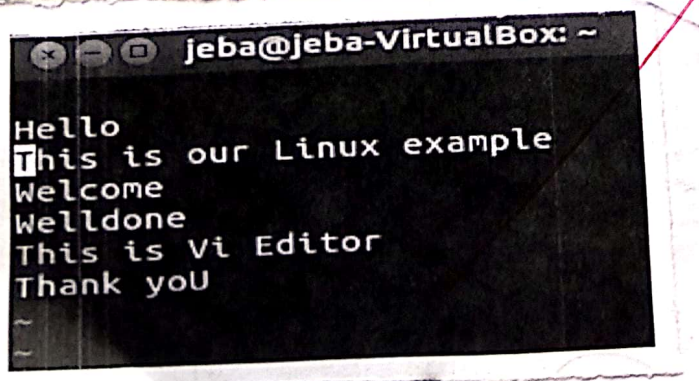
syntax : :g/word to be replaced/s//new word/gc







iii)

Highlight

Use set h/search

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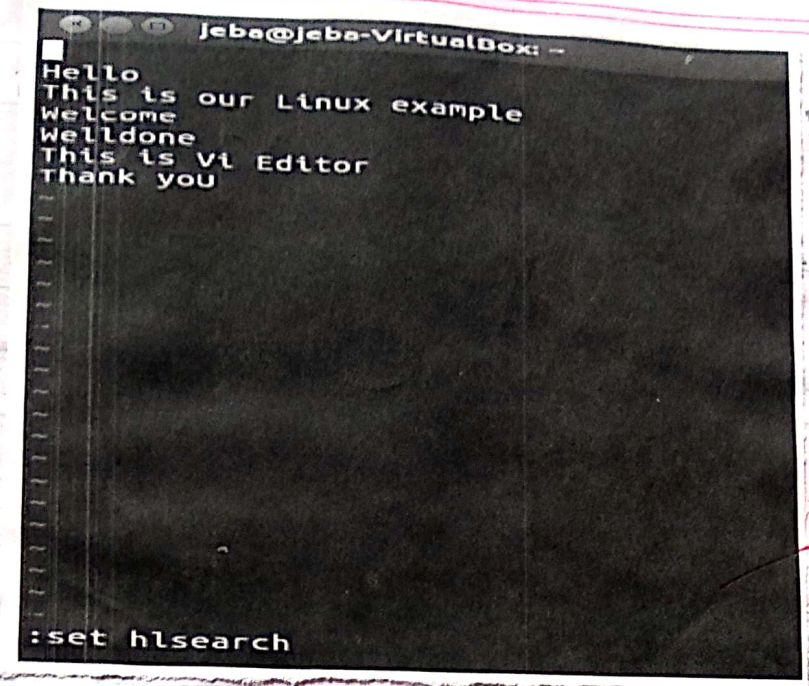
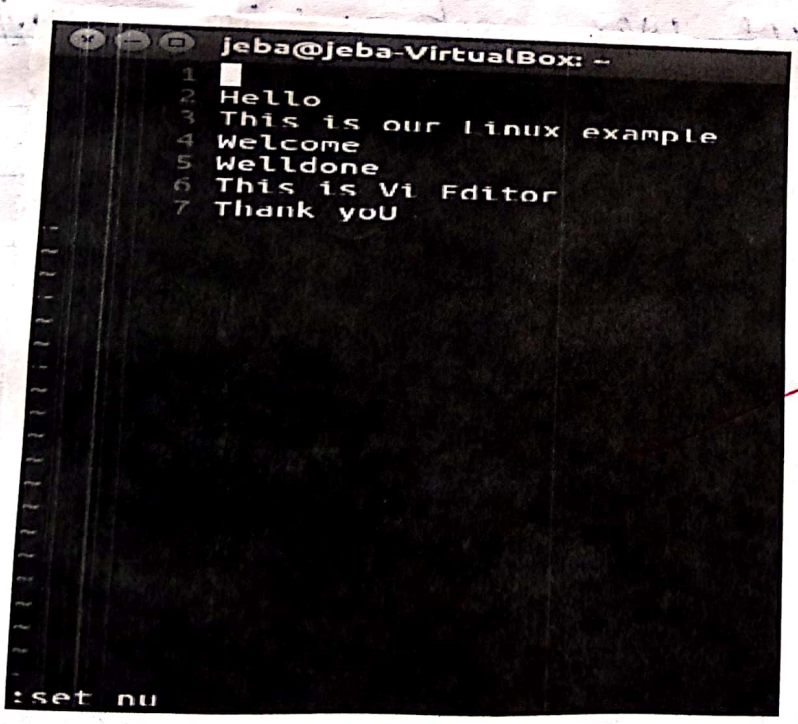


iii) show the line number

Use set nu



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Practical 8.

Linux security

a) Use of sudo to change user privileges to root

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ sudo useradd user1
[sudo] password for jeba:
jeba@jeba-VirtualBox:~$ sudo passwd user1
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
jeba@jeba-VirtualBox:~$
```

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

```
# 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:/
sbin:/bin"

# Host alias specification

# User alias specification

# Cmnd alias specification

# User privilege specification
root    ALL=(ALL:ALL) ALL

user1   ALL=(ALL:ALL) ALL
```

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b) Identify operation that required 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 passwd aging.

```
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:~$
```

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```
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 befor passwd change
- M : Number of days passwd is valid
- I : Account inactives
- w : Number of days of warning before a 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

Network Management

a) Get IP address of your machine using ifconfig

```
jeba@jeba-VirtualBox: ~
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:d5a3:848e/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:~$
```

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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=
86.9 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 of dig command.

```
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:~$
```

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6) Troubleshooting networking using traceroute, route command

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

7) 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                     enp0s
3
```

8) Use of host command.

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

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h) Use of netstat Command & Nmap 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
unix  2      [ ]         DGRAM                    42149    /run/user/1000/system
d/notify
unix  2      [ ]         DGRAM                    9694     /run/systemd/journal/
syslog
unix  16     [ ]         DGRAM                    9695     /run/systemd/journal/
dev-log
unix  7      [ ]         DGRAM                    9704     /run/systemd/journal/
socket
unix  3      [ ]         DGRAM                    9684     /run/systemd/notify
unix  3      [ ]         STREAM     CONNECTED     44042    @/tmp/dbus-CymTeI7AQG
unix  3      [ ]         STREAM     CONNECTED     43331
unix  3      [ ]         STREAM     CONNECTED     42988    @/tmp/dbus-CymTeI7AQG
unix  3      [ ]         STREAM     CONNECTED     42690    @/tmp/dbus-CMGGc6G7P5
unix  3      [ ]         STREAM     CONNECTED     13242    /run/systemd/journal/
stdout
unix  3      [ ]         STREAM     CONNECTED     43113    /run/systemd/journal/
stdout
unix  3      [ ]         STREAM     CONNECTED     43013
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
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:~$
```

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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 linux, 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 & it passes the instruction to the program /bin/bash

Echo $SHELL

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

- vi filename.sh
  #!/bin/bash
  echo"THIS IS LINUX!"

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

"linux.sh" [New File]
```

- Chmod 777 filename.sh
  ./ filename.sh

```
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:~$
```

=) steps to write & execute a shell script.
shell script is just a simple text file with .sh extension, having executable permission.

a) Open terminal
b) Navigate
c) Touch filename.sh
d) Vi filename.sh
e) Chmod 777 filename.sh
f) sh filename.sh or ./filename.sh

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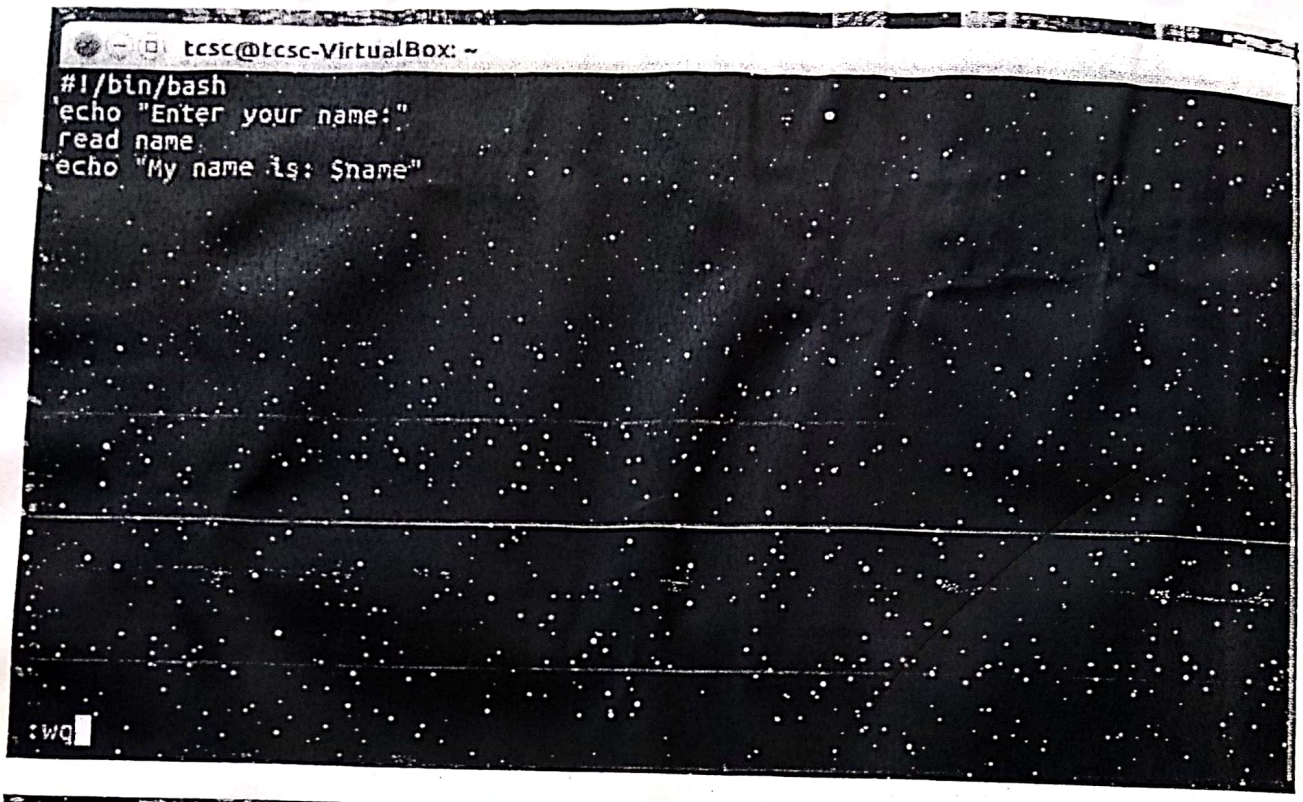
Program to display your name

```
#!/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=45
sum=$((a+b))
echo "sum is: $sum"
```

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```
tcsc@tcsc-VirtualBox: ~
#!/bin/bash
a=100
b=25
sum=$(($a+$b))
echo "Sum is:$sum"
:wq
```

```
tcsc@tcsc-VirtualBox: ~
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 numbers (values passed during execution)

```
tcsc@tcsc-VirtualBox: ~
#!/bin/bash
sum=$(($1+$2))
echo "sum is:$sum"
"lin.sh" 3 lines, 46 characters
```

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```
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:~$
```

Sed : Sed command or Stream Editor is very powerful utility offered by Linux systems. 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 completely files without actually having to open it.

Consider the following text file.

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

1) Displaying partial text of a 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 'd'

```
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
```

Scanned with CamScanner

5) Replace a string on a particular line

To replace a string on a particular line, use 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:~$
```

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

```
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:~$
```

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To change a whole line with matched pattern

To change a whole line to a new line when a search 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
```

Appending lines

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

```
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 calclus
Thanks computer basic
```

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