

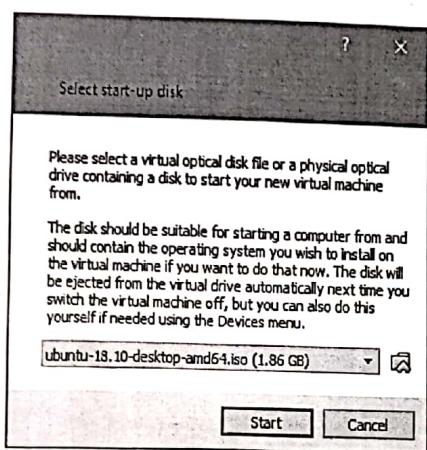
Aim: Installing your choice of Linux Distribution
ubuntu.

Ubuntu is a free and open source software based on Linux Kernel, released under 2 conditions Desktop and Server LTS or long term release and a standard release. It's a popular software among coders cloud compute with support for openstack.

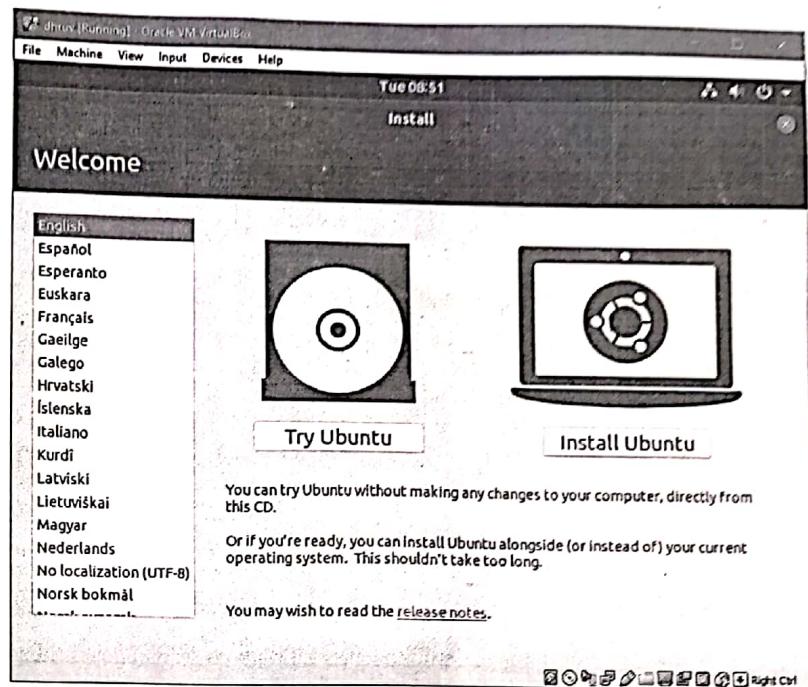
Steps to install Ubuntu Virtual box:

- ① Open virtual box, click on New, and set up to create the virtual machine by adding saving location, memory size and virtual hardisk.
- ② Click on start, add location of Ubuntu Disk image and start, later as Ubuntu is initialized Click on 'Install Ubuntu (safe graphics)'
- ③ Click next and go through all the default options coming to install now. Let the system install ubuntu.
- ④ Finally add your desired username and password. Let the system set up your Ubuntu installation.

Step1

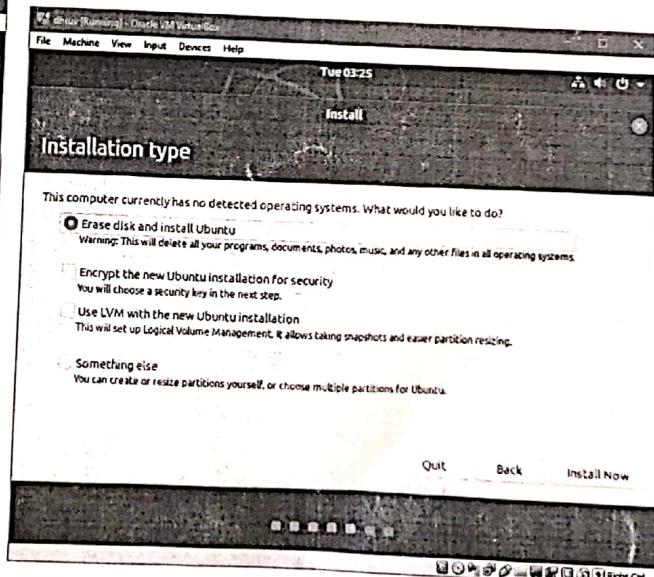
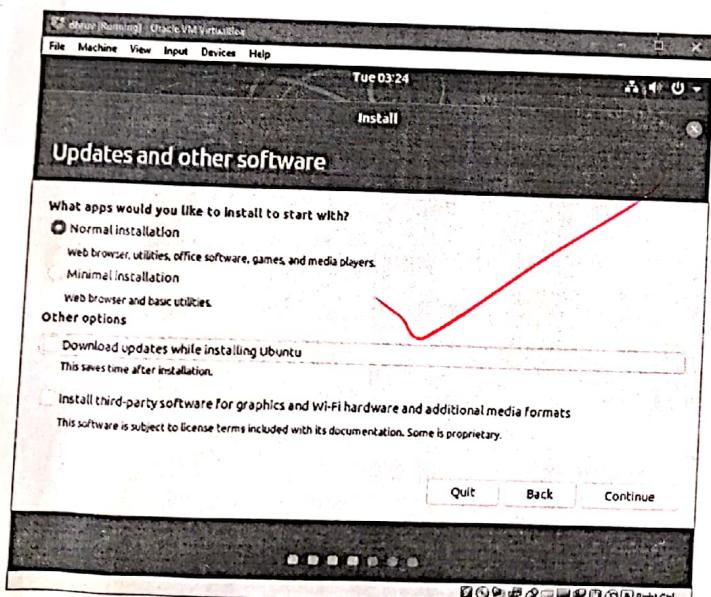


Step 2

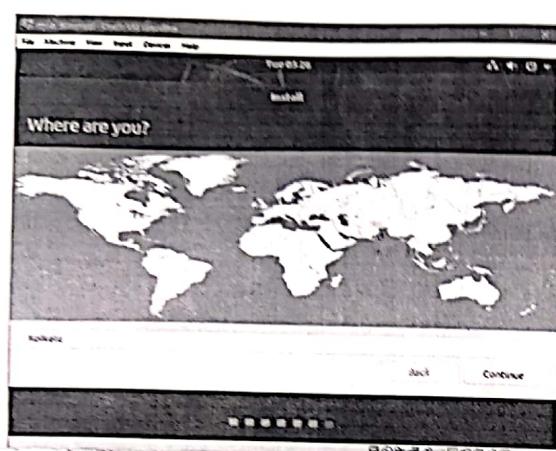


Step3

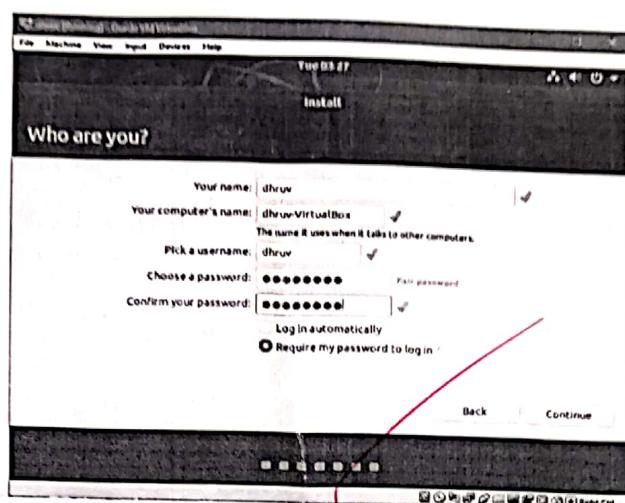
step 4



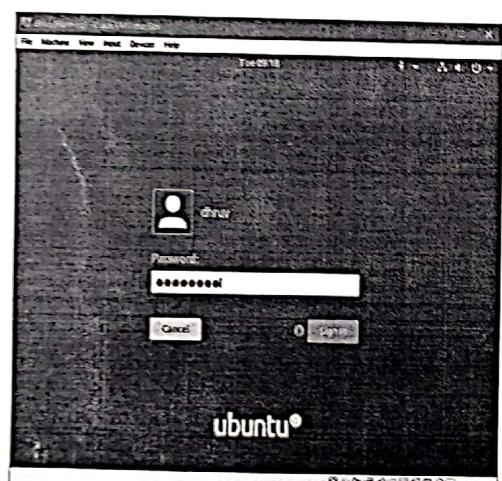
Step5



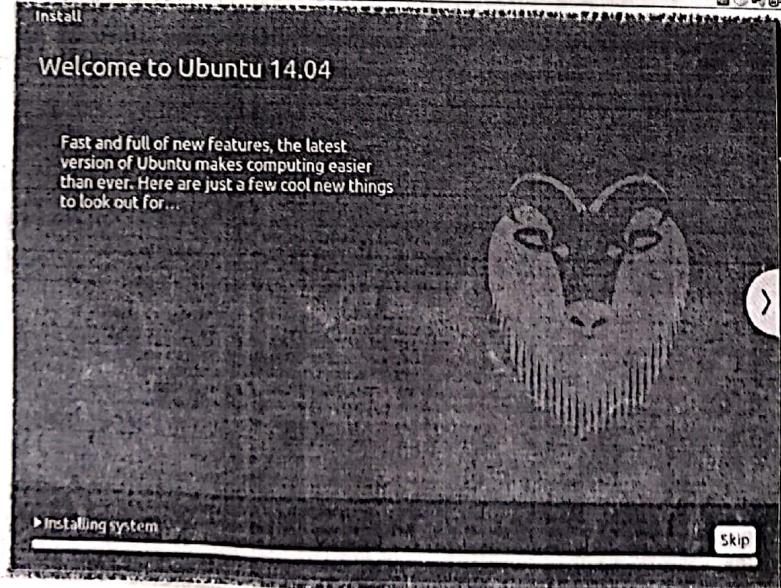
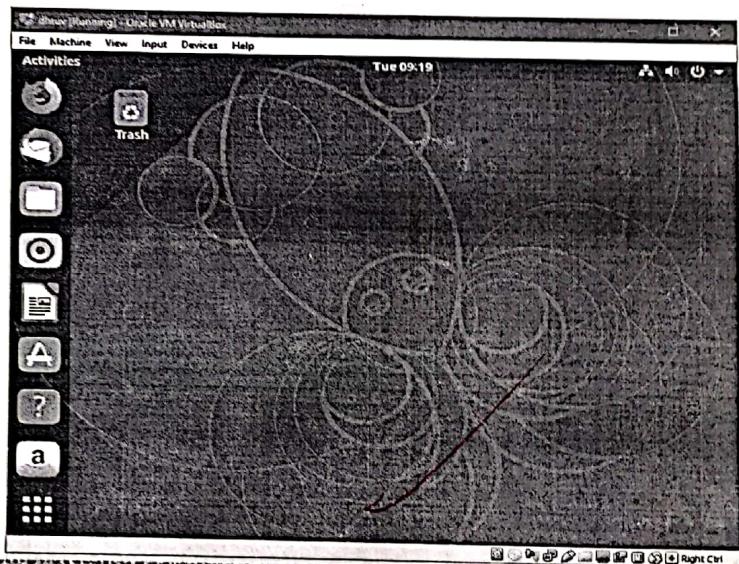
step6



Step7



step 8



- ⑤ Ubuntu distribution is installed on your virtual machine, let's restart.
 - ⑥ Customize desktop environment by changing different default options like changing default background themes, screensavers.
 - ⑦ Click on the Show application select settings, click on background. Select your desired wallpaper and choose whether you want to set as clock-screen or background.
 - ⑧ If you would like to change the resolution in setting click on display. change to your desired resolution.
- * Screen Resolution:
- 1) Click on the icon on the very right of the menu bar and select system settings.
 - 2) Open Screen Display
 - 3) If you have multiple displays and they are not mirrored you can have different settings on each display. select a display in the preview area.
 - a) Select your desired resolution and rotation.
 - 5) Click apply. The new settings will be applied for 30 seconds before reverting back.

PRATICAL - 2

Aim :- Installing and removing software and using some terminal commands.

- ①) Installing 'gcc' package, verify that it runs and then remove it.

Step 1: Type 'gcc -v' to know if you have already installed gcc compiler or not. If the output is blank then gcc isn't installed.

Step 2: Type 'Sudo apt-get install gcc'. This command is used to install gcc compiler.

Step 3:

Type 'Sudo - apt-get install build-essential'. This command will install all the libraries required for C and C++ programming language.

* How to install Gcc compiler

In Gcc 5.1.0 although there is no uninstall target, some directories do have it.

→ 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.

↳
↳ or

Aim :- utilization of grep, man commands.

Documentation:-

1) man ls

ls - list directory contents.

Synopsis: ls [OPTION]... [FILE]...

Description:-

List information about the files (The current directory by default) sort entries alphabets if none of -v -u -x -n -r - sort.

-a, --all

do not ignore entries starting with

-A, --almost-all:

do not list implied

2) man tar

tar - the GNU ignore version of the tar archiving the function letters:-

-A, --catenate, --concatenate

append tar files to an archive.

-C, --Create

Create a new archive.

③ man mk dir

→ Create the directory if they do not exist.

mandatory arguments to long options are mandatory for short options too.

-m, -- mode= MODE - set file mode

-P, -- parents

no errors if existing, make parent directories as needed.

-v, -- verbose

print a message for each created directory.

④ man3 printf

The functions printf() and vprintf() write output to `stdout`, the standard output stream;

fprintf() write output to the given output stream

⑤ info ✓

This is the Info main menu(aka directory node).
A few useful info commands:-

'q' quit;

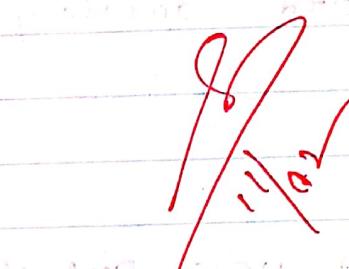
'?' lists all info commands;

'h' starts the info tutorial;

'm Textinfo RET' visits the Texinfo manual, etc.

⑤ Zip - package and compress archiving files

→ Zip is a compression and file packaging utility for UNIX, MS DOS, OS/2; It is analogous to a combination of the Unix commands tar and compress
add - update existing entries and new files
update - update existing entries if newer on the file system
delete - select entries in an existing archive and delete them.



Aim: Command Line operations.

① find | -name passwd.

/etc/cron.daily/passwd.

/etc/pam.d/passwd.

/etc/passwd.

/user/share/doc/passwd.

/user/etc/cron.daily/passwd

② find | -maxdepth 2 -name passwd.

/etc/passwd.

③ find | -maxdepth 2 -maxdepth 3 -name passwd

/etc/cron.daily/passwd.

/etc/pam.d/passwd.

/etc/passwd.

/user/bin/passwd.

/root/etc/passwd.

④ find - maxdepth 3 - maxdepth 5 - name passwd.

/user/bin/passwd.

/user/share/bash-completion/passwd

/user/share/doc/passwd.

6)

where is ls.

ls: /bin/ls /usr/share/man/man1 (ls.l,g.2)

7) where is ps

ps: /bin/ps /usr/share/man/man1 (ps.l,g.2)

8) where is bash.

bash: /bin/bash /etc/bash.bashrc /usr/share/man/man1 (bash.l,g.2)

8) ln -s filename1.txt filename2

```
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:~$
```

```
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)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release_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,nsroot=/)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpuacct,nsroot=/)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsroot=/)
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_event,nsroot=/)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsroot=/)
systemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=32,pgrp=1,timeout=0,minproto=5,maxproto=5,direct)
hugetlbfss on /dev/hugepages type hugetlbfss (rw,relatime)
```

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- 1) Explore mounted file systems on your computer
→ df - K

- 2) What are different ways of exploring nested file system on Linux
→ mount

3] copying text from file

→ cp command , mv command

4] Archiving and Backup the work directory using tar,

→ gzip and bzip2 commands

gzip filename.txt

bzip2 filename.txt

```
jeba@jeba-VirtualBox:~$ ls
Desktop  Downloads
Documents examples.desktop  Music  Pictures  Public  Templates  Videos
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
dd.txt  gg.txt
jeba@jeba-VirtualBox:~/Jeb$ ls
jeba@jeba-VirtualBox:~/Jeb$ cp gg.txt dd.txt
welcome
Linux
jeba@jeba-VirtualBox:~/Jeb$ cat dd.txt
Linux
jeba@jeba-VirtualBox:~/Jeb$ ■
```

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```
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$ ■
```

```
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/0000755000000000000000000000000013605376557010365 Sustar  rootrootmnn/hd/0000755000000
0000000000000000000000000000000013605376557010760 Sustar  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`♦[■]♦[■]
'Jew$♦[■]♦[■] jeba@jeba-VirtualBox:~/Jeb$ 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♦e♦e♦e♦e♦e♦Xzjeba@jeba-VirtualBox:~/Jeb$ ■
```

3A

```
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
```

```
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
^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$ █
```

- 5) Use diff command to create diff of two files.
~~diff filename1 filename2~~

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

a) which account you are logged in? How do you find out?

→ who command & whom whoami.

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

Ans) cat /etc/shadow

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

- username, up to 8 characters. (case-sensitive, usually all lowercase. A direct match to the username in the /etc/passwd file.)
- password, 13 character encrypted. A blank entry (eg:;) indicates a password is not required to log in (usually a bad idea), and a "*" entry (eg :*:*) indicates the account has been disabled.
- The number of days (since January 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, many years.)
- The number of days to warn user of an expiring password (7 for a full week.)

```
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
jeba@jeba-VirtualBox:~$ █
```

780 id=tty1

```
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      LOGIN@     IDLE     JCPU     PCPU 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      FROM      LOGIN@     IDLE     JCPU     PCPU WHAT
jeba   tty7     20:32     5:36    9.00s  0.33s /sbin/upstart --user
```

```
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:::
```

```
[root@redhat1 ~]# su -c "cat /etc/passwd"
```

```
root:x:0:0:root:/bin/bash
daemon:x:1:1:daemon:/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
gdm: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
```

- The number of days after ~~password~~ password expires that account has been disabled
- A reserved field for possible future use

Each field in a passwd entry is separated with ":" colon characters, and are as follows.

- Username, up to 8 characters. Case-sensitive, usually all lowercase
- An "x" is the password field. password are stored in the "/etc/shadow" file.
- Numeric user id: This is assigned by the "adduser" script.
- Unix uses this field, plus the following group field, to identify which file belongs to the user.
- Numeric group id: Red Hat uses 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 the maximum length for this field is, but try to keep it reasonable.
- User's home directory. Usually /home/ [username]. All users' personal files, web pages, mail forwarding, etc. will be stored here.
- User's "shell account". Often said to "/bin/bash" to provide access to the bash shell (my p.)

Q.1

- c) Get your current working directory.
- Ans → `pwd`.
- d) Explore different ways of getting command history, how to run previously executed command without typing history
line number.
- e) Create alias to most commonly used commands
→ Alias command instructs the shell to replace one string with another string while executing the command
`alias label = "command"`.

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c)

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

d)

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

e)

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

b) Learn all essential commands like search | replace , highlight
Show line numbers.

i) Replace .
syntax : /q/ word to be replaced | s || new word | g .

```
jeba@jeba-VirtualBox: ~
Hello
This is my Linux 'example'
Welcome
Welldone
This is Vi Editor
Thank you
~
I

:g/my/s//our/gc
```

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

Hello
This is my Linux example
Welcome
Welldone
This is Vi Editor
Thank you

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

replace with our (y/n/a/q/l/^E/^Y)?

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

Hello
This is our Linux example
Welcome
Welldone
This is Vi Editor
Thank you

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 file name.

ii) modifying the file:

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

iii) search in a file:

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

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

iv) Navigate:

Movement in four direction

key

k

j

h

l

Action

moves cursor up

moves cursor down.

moves cursor left

moves cursor right.

Word Navigation

Key	Action
b	moves back to the beginning of word
e	moves forward to the end of the word
w	moves forward to the beginning of word
0(zero)	moves forward to first character of word
\$	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

(ii) Highlight
use set hlsearch.

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```
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
7
:set nu
```

```
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:~$
```

```
# 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
```

```
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.
```

11/02

- a) Use of sudo to change user privileges to root
- (i) Create an user named user 1.
 - (ii) To give some users root privileges edit /etc/sudoers using visudo. Enter new line as highlighted below.
- b) Identify operations that require sudo privileges.

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c) modify expiration date for new user using password ageing

- 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 a password change is required

d) Delete newly added user.

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) [2020-01-26]: 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

54

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 -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:~\$ sudo userdel user1
[sudo] password for jeba:
jeba@jeba-VirtualBox:~\$ su user1
No passwd entry for user 'user1'
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:5a0: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)
```

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

Ran

```
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:~$
```

- a) Get IP address of your machine using ifconfig.
- b) Get host name of your machine.
- c) Use ping to check the network connectivity to remote machines.

Q2

- d) use of dig command.
- e) Troubleshooting network using traceout, route command.
- f) use of arp command.
- g) use of host command.

```
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:~\$

```
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
* * *
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:~$
```

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

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

Active Internet connections (w/o servers)				Foreign Address	State
Proto	Recv-Q	Send-Q	Local Address		
Active UNIX domain sockets (w/o servers)					
Proto	RefCnt	Flags	Type	State	
unix	2	[]	DGRAM		I-Node Path
/notify			DGRAM		42149 /run/user/1000/system
unix	2	[]	DGRAM		9694 /run/systemd/journal/
syslog			DGRAM		9695 /run/systemd/journal/
unix	16	[]	DGRAM		9704 /run/systemd/journal/
dev-log			DGRAM		
unix	7	[]	DGRAM		
socket			DGRAM		
unix	3	[]	STREAM	CONNECTED	9684 /run/systemd/notify
unix	3	[]	STREAM	CONNECTED	44042 @/tmp/dbus-CymTeI7AQG
unix	3	[]	STREAM	CONNECTED	43331 @/tmp/dbus-CymTeI7AQG
unix	3	[]	STREAM	CONNECTED	42988 @/tmp/dbus-CHGCc6G7PS
unix	3	[]	STREAM	CONNECTED	42690 @/tmp/dbus-CHGCc6G7PS
unix	3	[]	STREAM	CONNECTED	13242 /run/systemd/journal/
stdout			STREAM	CONNECTED	43113 /run/systemd/journal/
unix	3	[]	STREAM	CONNECTED	43013 /run/systemd/journal/
stdout			STREAM	CONNECTED	
unix	3	[]	STREAM	CONNECTED	42935 /run/systemd/journal/

```
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: bom05\$11-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:~$
```

h) use of netstat command and nmap command

~~for
10.2~~

PRATICAL - 10

APM: SHELL SCRIPTING

Basic of shell scripting

- a) To get a shell, you need to start
- 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 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

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

```
!/bin/bash  
echo "THIS IS LINUX!"
```

"linux.sh" [New File]

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

The image shows a terminal window titled "Ubuntu VirtualBox". The terminal is running a bash script. The script content is as follows:

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

The terminal window has a dark background with white text. The bottom left corner of the window frame contains the text "twq".

steps to write and execute a Shell Script

Shell Script is just a simple text file with .sh extension, having executable program

- 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 or ./filename.sh for running the script

Program to display your name

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

82

Program to find the sum of two variables.

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

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

60

: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:~$
```

08

Program to find the sum of two numbers (values passed during execution)

```
tcsc@tcsc-VirtualBox:~$ vi lin.sh
tcsc@tcsc-VirtualBox:~$ echo "sum=$(( $1+$2 ))"
echo "sum=$sum"
tcsc@tcsc-VirtualBox:~$ chmod 777 lin.sh
tcsc@tcsc-VirtualBox:~$ ./lin.sh 50 70
sum is:120
tcsc@tcsc-VirtualBox:~$
```

```
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:~$
```

program to find sum of two numbers
(values passed during execution)

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

Sed:-

Sed command or stream Editor is very powerful utility offered by UNIX systems. It is mainly used for text substitution, find and replace but it can perform other text manipulations like insertion, deletion, search, etc. With Sed user can edit complete files without actually ~~to~~ having to open it.

Consider the text file on the blank page.

i) Displaying partial text of a file.

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

→ sed -n 3, 5p ls.txt

```
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
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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
```

2) Display all except some lines

To display all content of a file except for some function use option "d"

3) Deleting a line

To delete a line, use line numbers followed by "d"

→ sed 3, 5d cs.txt

4) search and replacing a string

's' option is for searching a word

sed 's/Computer/Apple/g' cs.txt

3) Replace a string on a particular line

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

→ `sed 'f s /cs/computer system/ ' cs.txt`

4) Add a line after/before the matched

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

→ `sed ' /cs/a "this is Linux" ' cs.txt`

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

→ `sed ' /cs/i "this is Linux" ' cs.txt`

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  
calculus  
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  
calculus  
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  
calculus  
computer basic  
tcsc@tcsc-VirtualBox:~$
```

7) 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  
calculus  
computer basic
```

8) Appending lines

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

```
tcsc@tcsc-VirtualBox:~$ sed -e 's/.*/& Thanks &/' cs.txt
```

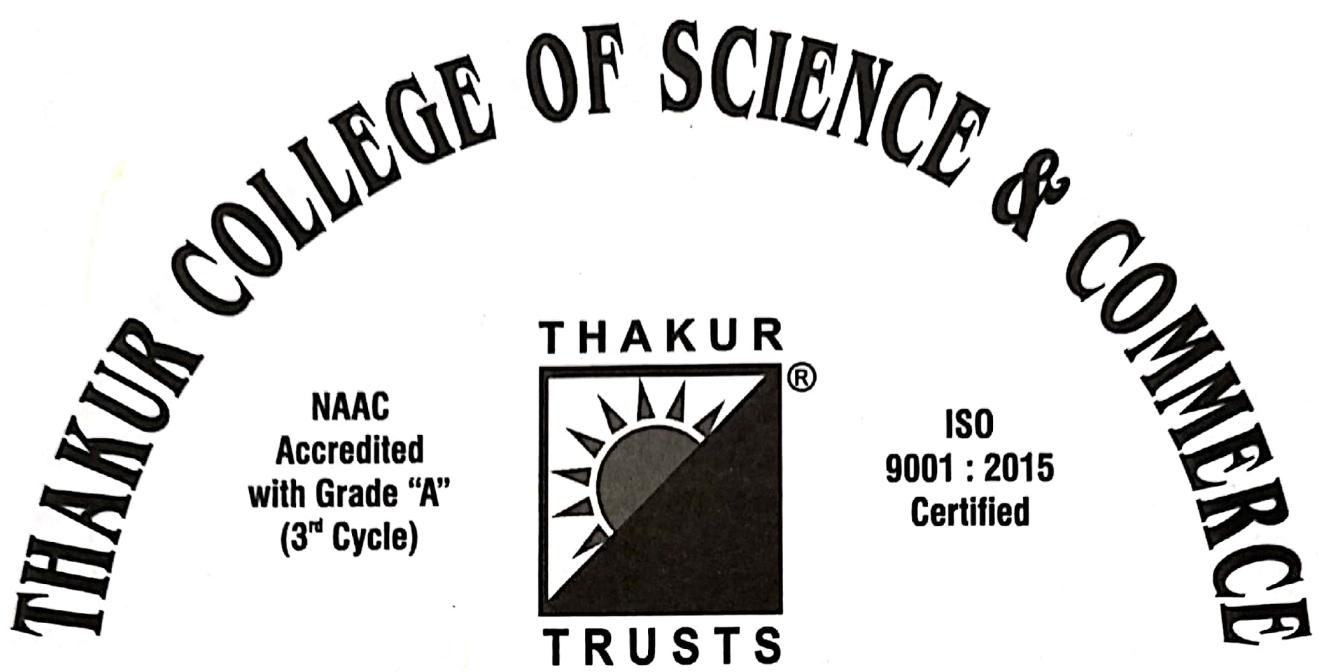
```
Thanks subjects offered in cs  
Thanks datastructure  
Thanks database management  
Thanks Linux  
Thanks python  
Thanks green tech  
Thanks softskill  
Thanks stats  
Thanks calculus  
Thanks computer basic
```

- 7) To change a whole line with matched pattern.
- To change a whole line to a new line a search pattern matches, use option '!' (!).
- 8) Appending lines
- To add some content before every line with sed, use `#` and `q` as mentioned alongside.

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11/02

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Degree College

Computer Journal

CERTIFICATE

SEMESTER II UID No. _____

Class Fybsc-CS Roll No. 1734 Year II 2019-2020

This is to certify that the work entered in this journal
is the work of Mst. / Ms. Sachit Parday

who has worked for the year 2019-2020 in the Computer
Laboratory.

Teacher In Charge

Head of Department

Date : _____

Examiner

PERFORMANCE

Term	Remarks	Staff Member's Signature
I	L.S. completed	 19/10/19
II	Completed	