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Aim:- Install your choice of Linux Distributions,
e.g. Ubuntu, Fedora, Debian.

Ubuntu & Ubuntu is a free and open source software based on debian. Ubuntu is officially released into 3 editions - desktop, server, union.

All the edition can be runned on the computer alone or a virtual box machine.

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

Steps for installing ubuntu in a virtual machine:

Step 1:- Select a virtual optical file on a physical drive to start ubuntu in your virtual machine. Space given to it is 1.86 GB.

Step 2:- Select the language of your choice and click on 'Install ubuntu'.

You can also 'try ubuntu' can free on computer device from this link.

Step 3:- In 'Updates and add software' click on the normal installation.

Step 4:- While configuring installing type we need to click 'Erase disk and install ubuntu'. This step would delete all type of document.

photos, etc in all operating system.

Step 5 In this you only need to choose the location for the clock to work on ubuntu 32

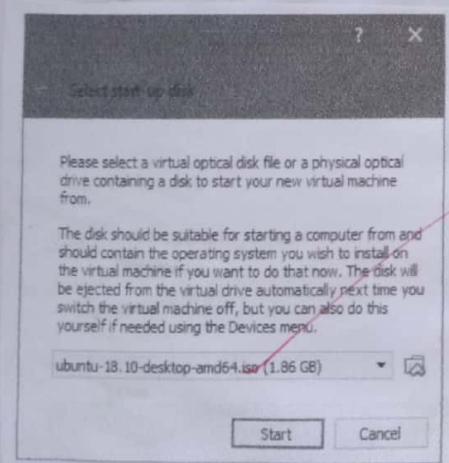
Step 6 In this step you need to choose username and password for the login in ubuntu and then click on continue

Step 7:- Here you simply need to type password again and it is done.

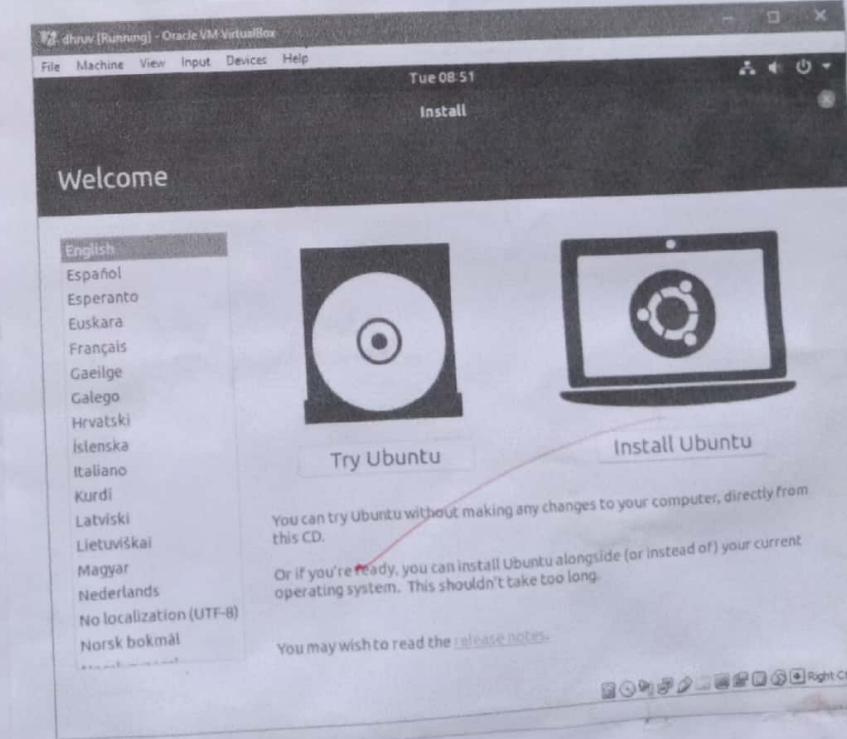
Step 8:- Type name of virtual disk and recommended size to be given is 2048 GB or 27B.

Therefore, now virtual box is ready to use

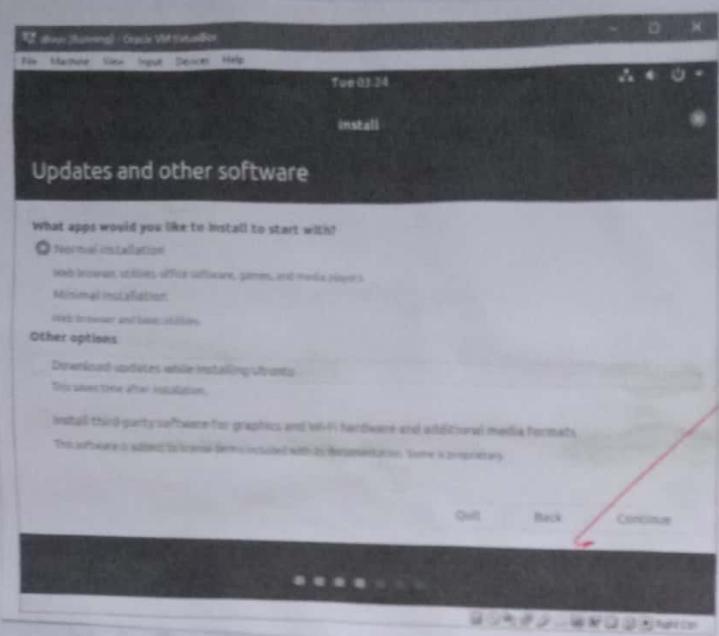
Step 1



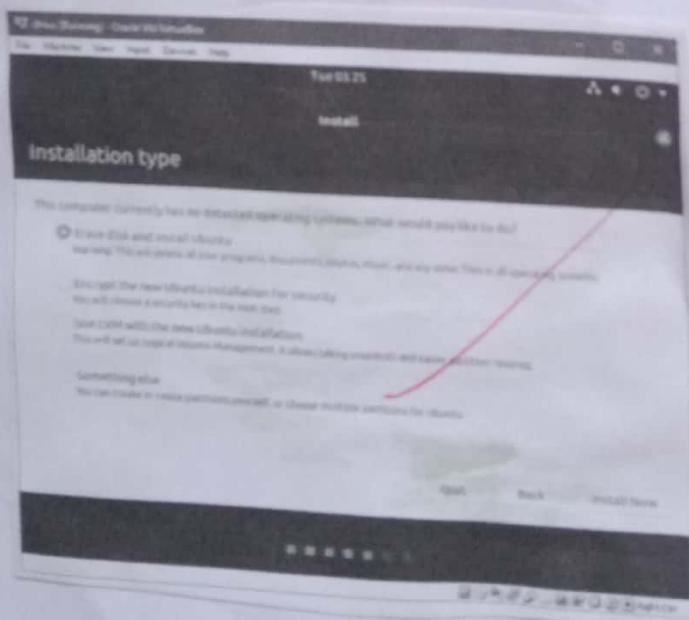
Step 2



Step3



step 4



b) Customize desktop environment by changing different default option like changing default background, themes, screen savers.

Accessing Appearance Setting:-

- 1) To access Appearance Setting in ubuntu, lets click on user menu at the top right corner, on the top menu bar and select System Settings.
- 2) A window will pop-up with all setting divided into personal, Hardwares and System options icons. Let's first select the experience icon.

Changing wall paper picture.

- 1) On the left side of Background part, you can see your correct wall paper.
- 2) On the right side is part where we can select one of Ubuntu wall papers. Clicking on any thumbnail our wall paper will be changed right away, with a feeling effort.
- 3) If you want select wall paper from your picture folder. Click the drop down menu above thumbnail and select the picture folder.

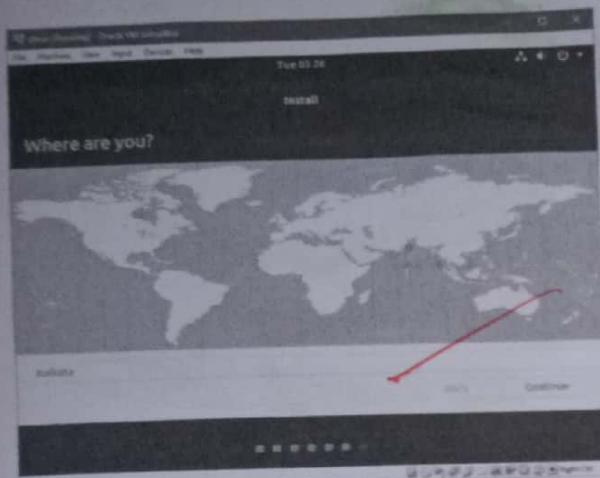
8) You will see all the pictures in your picture folder as thumbnails, where you can select them as your wallpaper.

To add wallpaper that is in another folder just click the plus icon below the thumbnails and then in pop-up window, Select the path to our custom folder and choose the picture inside of it.

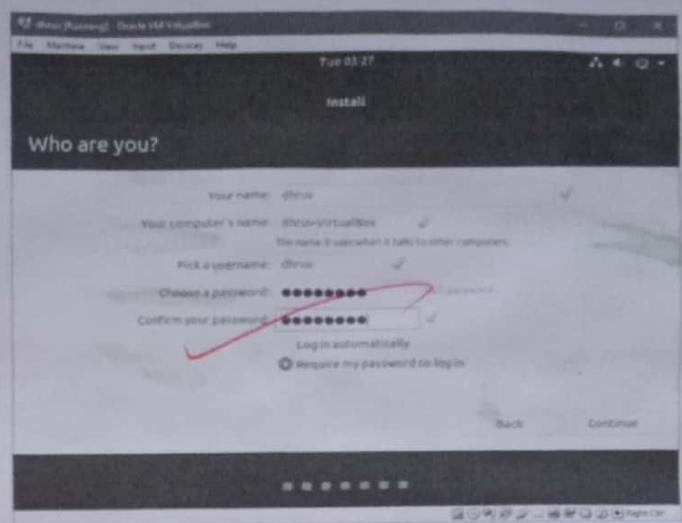
Changing Ubuntu Theme

- 1) Ubuntu also has an option to change the desktop theme in one click which will change the entire way your computer looks.
- 2) To do that, click on the drop-down menu below the wallpaper, thumbnails, and choose between Ambiance, Radiance or High contrast.
- 3) Ambiance is a light theme that looks a bit more mac-like, while Radiance is the darker brown theme used in ubuntu by default.

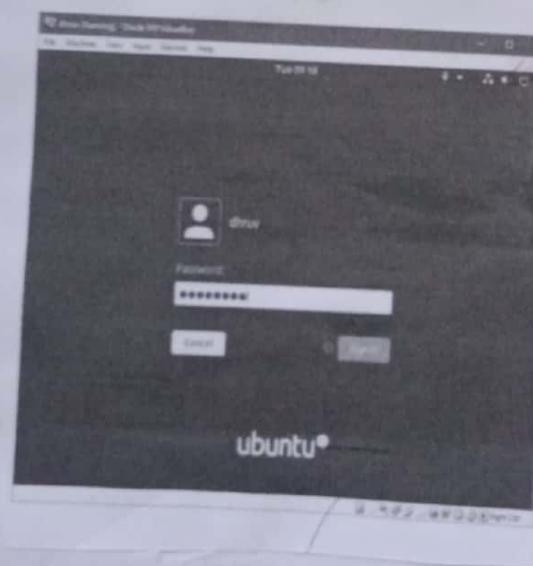
Step5



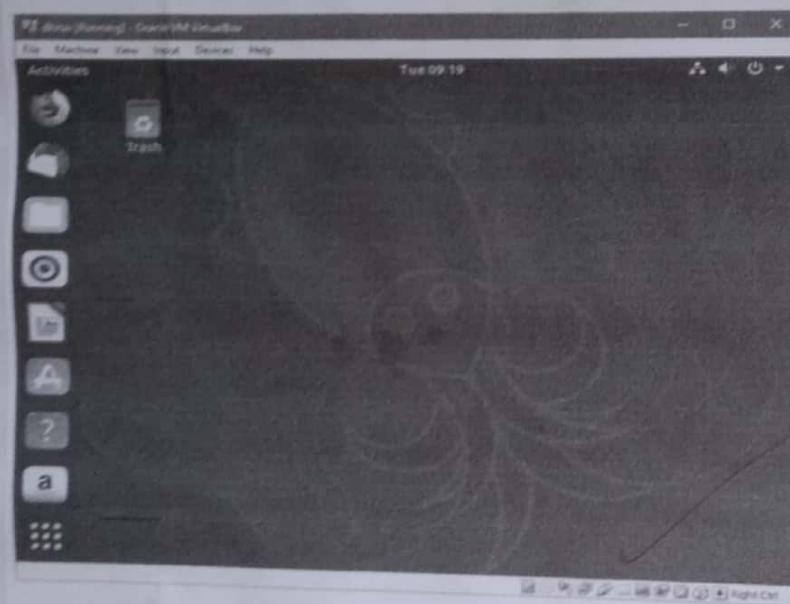
step6



Step7



step 8

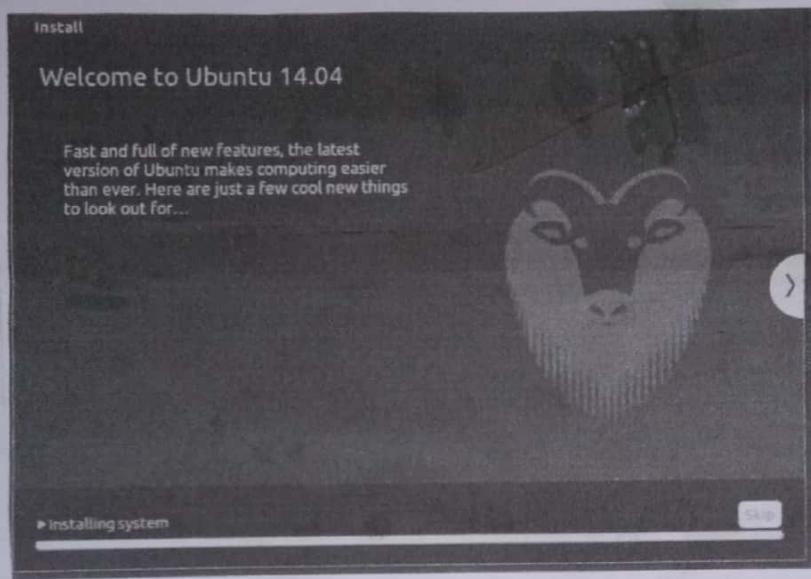


c) Screen Resolution :- Assertion the current screen resolution for your desktop.

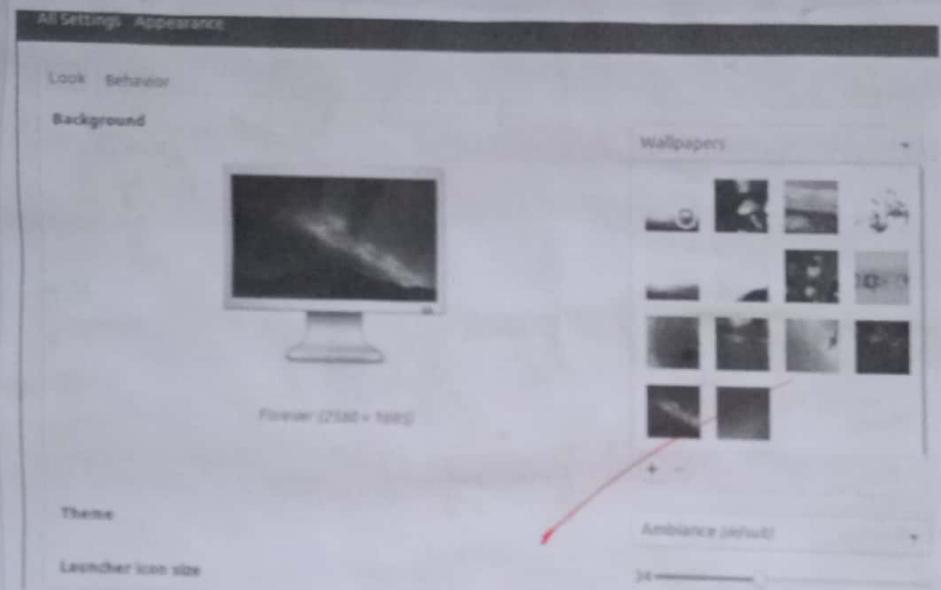
change the size or rotation of the screen.

- 1) You can change how big (or how detailed) things appear on the screen by changing the screen resolution.
- 2) You can change which way up things appear (for example, if you have a rotation display) by changing the rotation.
- 3) Click the icon on the very right of the menu bar and select System settings.
- 4) Open screen display.
- 5) If you have multiple display and they are not mirrored, you can have different setting on each display. Select a display in the previous area.
- 6) Select your desired resolution and rotation.
- 7) Click Apply. The new setting will be applied for 30 second reverting back. That way, if you cannot see anything with new.

- d) Time setting change the time zone of your system to East New York Time.
- 1) If you are currently in Indian Time. How does the displayed time change.
 - 2) After doing the time change, change the time zone back to your local time zone.
 - 3) Just click on the clock on the top bar, and choose time and Date setting, once the time and date window opens, choose manually, so you can change the time and date manually; otherwise choose your time zone from the map, and choose automatic.



18/01



AIM :- Installing and removing Software.

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

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

Step 2 :- Type "Sudo apt-get install gcc". After typing the following command installation will take place.

Step 3 :- 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 files like gcc, g++, c++, ... contained in that directory.

PRACTICAL-04.

Command line operators :-

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/nss-1dap-253/pam/d1$ass
• /user/bin/password
• /etc/pam.d/password
• /etc/password
```

Find the directory password file under root one level down

```
# find / -max_depth 2 -name password
• /etc/password
```

Find the password file under root and 2 level down.

```
# find / -maxdepth 3 -name password
• /etc/bin/password
• /etc/pam.d/password
• /etc/password
```

Find the password file b/w sub-directories level 2 & 4-

find -maxdepth 3 -maxdepth -name password
/user/bfn/password
/etc/password & pam/d/password

38.

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

ln -s file file2

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

touch example.txt

mv example.txt /temp.

f) delete the file moved to /temp in previous step by absolute method

rm /temp/example.txt

g) find the location of ls, ps, bash commands.

whereis ls

ls: /bin/ls /usr/share/man/man1/ls.1.g2

whereis ps

ps: /bin/ps /usr/share/man/man1/bin/ps.1.g2
man/man1/ps.1.g2

whereis bash

bash: /bin/bash /etc/bash.bashrc /user/share/
man/man1/bash.1.g2

1801

PRACTICAL

Ques 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' command :-

Open the terminal (ctrl+ALT+T) and type %info grep

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

You can also scroll through pages using (space=up) & (backspace=down) keys.

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

- b] Finding man page from the cmd line. Bring up the man page for the 'ls' command. scroll down to the examples section.

Ans :- To use the 'command simply' type '`man (command name)`'.

Now we are going to find the manual for 'ls' command.

Simply type or '`man ls`'.

c) Finding man pages by topic. What man pages are available that document file compression.

Ans :- 'tar', 'zip' are some pages which are available for document file compression.

Simply type `man tar` `man zip`.

d) Finding man pages by section from the cmdline bring up the man page for the printf library function. Which manual page section the library function found.

Ans:- The number corresponding to what section of the manual page is from; 1 is user command while 8 is Sys admin stuff. The man page for man itself explain it and list the std.

MANUAL SECTION: The standard sections of the manual include:

1) User commands

2) System function calls.

- 3) C library function
 - 4) Devices and Special files
 - 5) Files formats and conventions
 - 6) Games et. al.
 - 7) Miscellanea
 - 8) System Administration tools and Parameters
- Distribution customize manuel section to their specifics, which often include addition section.

There are certain terms that have different pages in different section (e.g. 'printf' as a command appears in section 1, etc a 'stalib' function appears in section 3); in cases like that you can pass name to choose which one you want or use `man -a` to show every matching page in a row.

\$ man 1 printf

\$ man 3 printf

\$ man -a printf

\$ man -k '^printf'

~~printf - (1) — Format print data~~

~~printf - (1p) — Write formatted output~~

~~printf - (3) — Formatted output conversion~~

~~printf - (3p) — Print formatted output~~

~~printf [builtins] - (1) — bash built-in command, see builtins~~

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

e) Command-line Help the available option for
the MKDIR command. How you can you do this?
~~\$MKDIR -m a=rwx directory name~~

89

zip & package and compress (archive) file
symp. 801

zip: [-aABCDEFghiklmTvwxyz/\$J] (-log option)
[-n m fixes t+date) [-zip] [-t] [-r] [-e]
zipcloak (see separate man page)
zipnote (see separate man page)
zipsplit (see separate manpage)

Note: command line processing in zip has been changed
to support long option and handle all option
and argument more consistently

89
1801

Q8

```
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)
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,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)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime)
```

Practical No:- 5.

Aim :- File Operation.

(1) Explore mounted file system on your computer.

⇒ df - h.

(2) What are the different ways of exploring mounted file system on linux.

⇒ Mount.

(3) Copying text from files

⇒ cp command, mv command.

4) Archiving and backup the work directory using tar, gzip, and bzip2 command.

⇒ gzip filename.txt
bzip2 filename.txt

```
jeba@jeba-VirtualBox:~$ ls
Desktop  Downloads  Music  Public  Videos
Documents examples.desktop  jj  Pictures  Templates
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$ ■
```

```
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 5ustar rootrootmnn/hd/0000755000000
0000000000000000000000000000000013605376557010760 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`♦♦♦♦♦♦♦
'Jew$5♦♦♦1 jeba@jeba-VirtualBox:~/jeb$ 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!e♦M♦♦♦+♦♦♦XZjeba@jeba-VirtualBox:~/jeb$ ■
```

```
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 difference between two files.

⇒ diff filename1 filename2

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

8/02

Aims Use Environment

(1) Which account you are logged in & how do you find out?

⇒ who command & whereas

(2) Display /etc/shadow file using cat command & understand the importance of shadow file. How it's different than passwd file?

⇒ cat /etc/shadow

- Username up to 8 characters. Case-sensitive, usually all lowercase. A direct match to the username in the etc/passwd file
- Password is character encrypted. A blank entry (eg: :) indicated a password is not required to log in (usually a bad idea), a "*" entry (eg: ! *:) indicate the account has been disabled
- The number of days (since January 1, 1970) since the password was last changed
- The number of day 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 indicate user can keep his or her password unchanged for many years)

```
[root@jekya-VirtualBox ~]  
[root@jekya-VirtualBox ~]# who  
root 0247 2020-01-25 20:32 (:0)  
[root@jekya-VirtualBox ~]# whoami  
root  
[root@jekya-VirtualBox ~]# who -l  
root 0247 2020-01-25 20:30  
[root@jekya-VirtualBox ~]# █
```

788 id=tty1

```
[root@jekya-VirtualBox ~]# w  
20:35:28 up 4 min, 1 user, load averages: 0.79, 0.79, 0.38  
USER     TTY      FROM          LOGIN@   IDLE    CPU  WHAT  
jekya    ttys7    :0            20:32    4:29   0.19s  0.33s /sbin/upstart -  
[root@jekya-VirtualBox ~]# w -s  
20:35:28 up 4 min, 1 user, load averages: 0.68, 0.77, 0.37  
USER     TTY      FROM          IDLE    WHAT  
jekya    ttys7    :0            4:38   /sbin/upstart --user  
[root@jekya-VirtualBox ~]# w -h  
20:35:28 up 4 min, 1 user, load averages: 0.67, 0.67, 0.37  
USER     TTY      LOGIN@   IDLE    CPU  WHAT  
jekya    ttys7    20:32    5:36   0.00s  0.33s /sbin/upstart --user  
[root@jekya-VirtualBox ~]# w -f  
20:35:12 up 5 min, 1 user, load averages: 0.41, 0.69, 0.37  
USER     TTY      LOGIN@   IDLE    CPU  WHAT  
jekya    ttys7    20:32    5:36   0.00s  0.33s /sbin/upstart --user
```

```
jabber@jabber-VirtualBox:~$ sudo 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
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
```

- The number of days to warn user of an existing expiring password (7 for a full week).
- The number of days after password expired that account is disabled.
- The number of days since January 1, 1970 that an account has been disabled.
- A reserved field for possible future use.

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

- Username, up to 8 characters. Case-sensitive, usually all lower case.
- An 'x' in the password field. Passwords are stored in the "/etc/shadow" file.
- Numeric user id. This is assigned by the "adduser" script. Unix this field plus the following group field, to identify which files belong 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 (under 30 characters).
- User's home directory. Usually /home/username (e.g. /home/smith). All user's personal files, web pages, mail forwarding, etc. will be stored here.

- user's shell account". Often set to "/bin/bash" provide access to the bash shell (any person at favorite shell).

(3) Get your current working directory.

⇒ pwd

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

⇒ history

! line number

(5) 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".

```
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:::
```

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

```
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:~$ █
```

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

Jebas
Notebook

```
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  
~  
~  
~  
~  
~  
~  
~  
~  
~  
replace with our (y/n/a/q/l/^E/^Y)? █  
x - o jeba@jeba-VirtualBox: ~  
Hello  
This is our Linux example  
Welcome  
Welldone  
This is Vi Editor  
Thank yoU  
~  
~
```

Practical : 07

AIM :- Unix Editor : vi

(i) Create, modify, search and navigate a file in editor.

1) Creating a file.

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

2) Modifying the file.

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

3) Search in a file.

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

4) Navigate.

⇒ Movement in four direction.

Key

k

j

h

l

Action

moves cursor up

moves cursor down

moves cursor left

moves cursor right

5A

ii) highlight?

\Rightarrow use the ms search

iii) show me the numbers

\Rightarrow use set nu

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

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

J P
Postov

```
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.
```

Practical 1

AIM : Linux Security

A] use of sudo to change privilege to root

1) Create an user-named user

2) To make same user root privilege edit /etc/sudoers using visudo. Ensure new line is highlighted.

B] Identify operation that require sudo privileges.

Q

EP

C) modify expiration date for now user
using password aging

⇒ E: Expiration Date

⇒ m: minimum number of days before
password changes

⇒ N: Number of days password is
valid.

⇒ T: Account inactive

⇒ w: Number of day of warning
before password change is required.

D) Delete newly added user.

```
jeba@jeba-VirtualBox:~  
jeba@jeba-VirtualBox:~$ sudo chage -l user1  
Last password change : never  
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:~$ 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:~  
jeba@jeba-VirtualBox:~$ sudo userdel user1  
[sudo] password for jeba:  
jeba@jeba-VirtualBox:~$ su user1  
No passwd entry for user 'user1'  
jeba@jeba-VirtualBox:~$
```

Dhruv

```
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)
```

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

```
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:~$
```

AIM :- Network Management

- A] Get IP address of your machine using ifconfig.
- B] Get hostname of your machine.
- C] Use ping to check the network connectivity to remote machine.

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D] use of dig or command

E]

E] Troubleshooting networks using
trace route root command.

F] use of arp 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:~$
```

```
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:~$
```

```
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
```

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```
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	I-Node	Path
Active UNIX domain sockets (w/o servers)					
Proto	RefCnt	Flags	Type	State	
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 @/tmp/dbus-CymTeI7AQG
unix	3	[]	STREAM	CONNECTED	42988 @/tmp/dbus-CMGGc6G7P5
unix	3	[]	STREAM	CONNECTED	42690 /run/systemd/journal/
unix	3	[]	STREAM	CONNECTED	13242 /run/systemd/journal/
stdout					
unix	3	[]	STREAM	CONNECTED	43113 /run/systemd/journal/
stdout					
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
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:~$
```

G1] use of host command

H1] use of netstat command and

Mmap command

and how they interact with each other

Q1] explain what will happen if

OS or OS or

OS or OS or

Q2] what is

Q3] what is

Q4] what is

Q5] what is

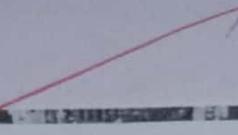
Aim :- Shell Scripting.

Basic 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 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!"



```
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]
```

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

```
tcsc@tcsc-VirtualBox:~$  
#!/bin/bash  
echo "Enter your name:"  
read name  
"echo "My name is: $name"  
tcsc@tcsc-VirtualBox:~$
```

```
tcsc@tcsc-VirtualBox:~$ vi ubuntu.sh  
tcsc@tcsc-VirtualBox:~$ chmod 777 ubuntu.sh  
tcsc@tcsc-VirtualBox:~$ ./ubuntu.sh  
Enter your name:  
TANVI  
My name is: TANVI  
tcsc@tcsc-VirtualBox:~$
```

- Chmod 777 filename.sh
- ./filename.sh

Step to write and execute a Shell Script.

→ Shell script is just a simple text file .sh extension, having executable permission.

(a) Open terminal.

(b) Navigate to the place where you want to create script using cd command.

(c) Touch filename.sh.

(d) Vi filename.sh [You can use your favorite editor, to edit the script].

(e) Chmod 777 filename.sh [For making the script executable]

(f) Sh 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"

Program to find the sum of two variable.

vi filename.sh

#!/bin/bash

a=100

b=200

sum=\$((a+b))

Echo "sum is : \$sum"

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

```
tcsc@tcsc-VirtualBox:~
```

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

```
:wq
```

```
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:~$
```

```
tcsc@tcsc-VirtualBox:~
```

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

```
"lin.sh" 3 lines, 46 characters
```

```
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:~$
```

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

```
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:~$
```

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

Sed:

Sed command on 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 manipulation like insertion, deletion, search, etc. With Sed, we can edit complete files without actually having to open it.

Consider the following text file.

1) Displaying partial text of a file:

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

2) Display all except some lines

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

(3) Deleting a line:
To delete a line, use line number followed by 'd'

(4) Search and Replacing a String:
's' option is for searching a word

(5) Replacing a String on a particular line:

To replace a string on a particular line,
use line number with the '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
```

```
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
```

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

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```
csc@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
```

```
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:~$
```

```
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:~$
```

6) Add a line after/before the matched string.

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

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

7) To change a whole line with matched pattern

To change a whole line to a new line when a search pattern matches, let use option 'C'.

(B) Appending lines:

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

```
tcsc@tcst-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
```

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11/02