

(A) Aim :- To install your choice of Linux distribution.  
eg:- Ubuntu.

Theory :-

Ubuntu is a free and open source software based on Debian. • Ubuntu is officially released under three editions Desktop, Server,

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

Step for installing Ubuntu in a virtual machine;

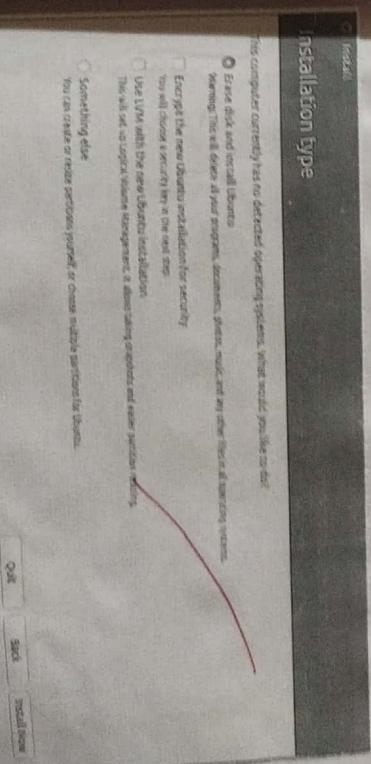
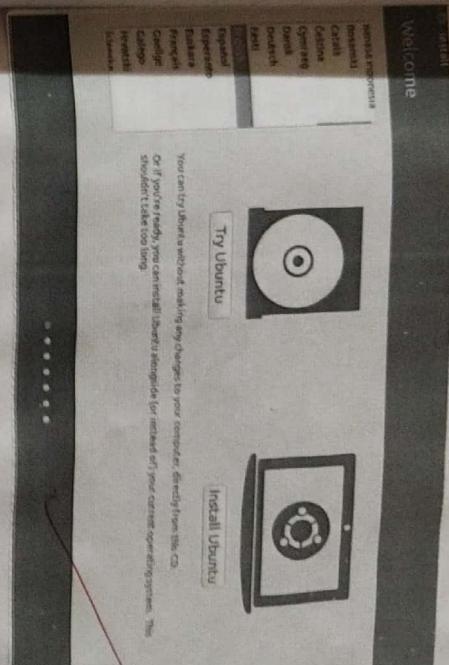
Step 1: Select a virtual optical disk file or a physical drive to start Ubuntu in your virtual machine

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

Step 3: In 'Updates and add software' click on 'Normal installation'

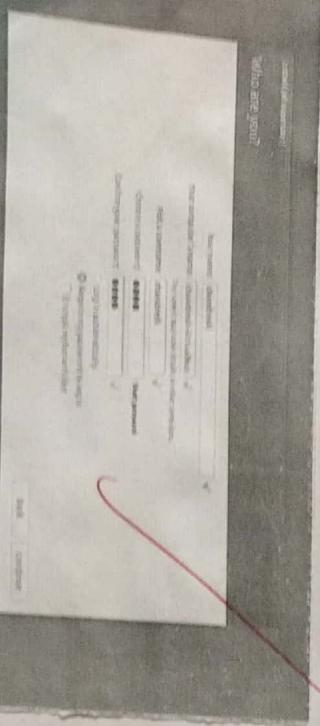
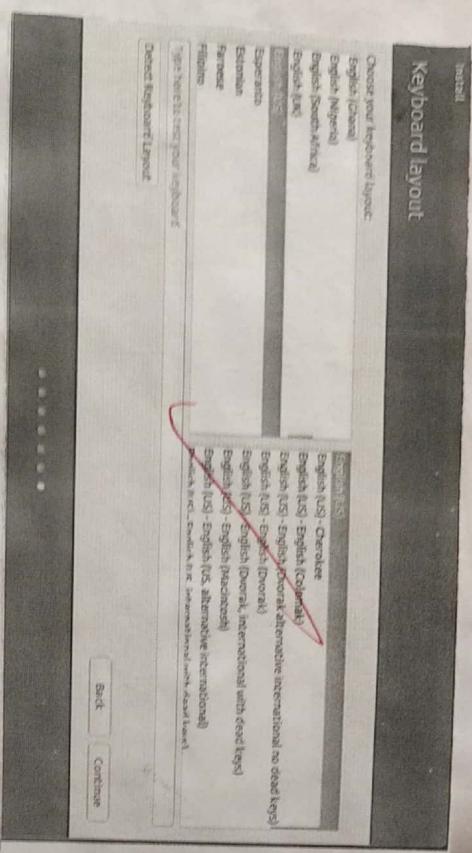
Step 4: While configuring installation type, we need to click 'Erase disk' and install ubuntu

Step 5: In this you only need to choose location for the dock to work on Ubuntu



Step :- In this step you need to choose username or password for login in ubuntu.

~~Step :- Here you simply need to type password as and it is done.~~



- (B) Aim :- To customize desktop environment by changing different default options like changing default background, theme.

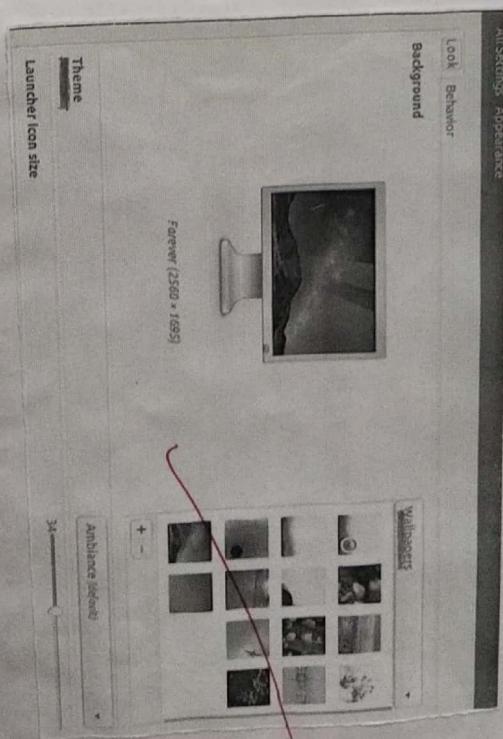
Theory :-

#### Changing wallpaper Pictures:

- On left side of background part, you can see your current wallpaper.
- On right side is part where you can select one of Ubuntu wallpapers. Clicking on any thumbnail our wallpaper will be changed with a fading effect.
- If you want to select wallpaper from your Picture folder, do the drop-down menu and select Pictures Folder.
- You will see all the pictures in your Pictures folder as thumbnails where you can select them as your wallpaper.
- To add wallpaper that is in another folder, just click plus icon below thumbnails and then in pop-up window, select the path to our custom folder.

#### Changing Ubuntu theme:

- Ubuntu also has an option to change Desktop theme, which in our list will change entire way your computer looks.
- To do that, click on drop down menu below wallpaper thumbnail and choose between Ambiance, Radiance or High Contrast.
- Ambiance is a light theme that looks a bit more Mac-like, while Radiance is darker brown theme used in Ubuntu as default.



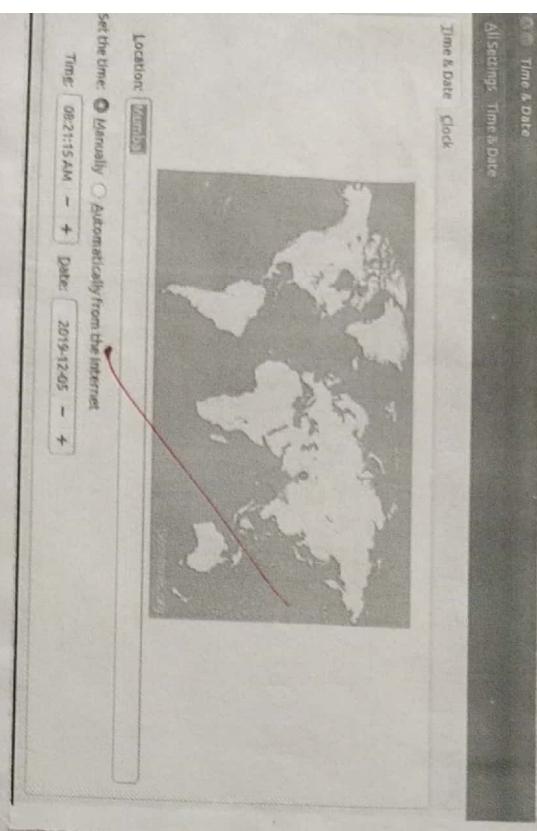
Time Setting: Change the timezone of your system

How does the displayed time change?

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

Just click on the clock on the top bar and choose Time and Date Settings.

Once the Time and Date window opens, choose Manually so that you can change the date and time manually; otherwise, change the time zone from the map, and choose Automatic.



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## PRACTICAL - 02

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 do not 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 install build-essential'. This will install all the libraries required for C and C++ programming language.

To Uninstall GCC Compiler:

In GCC 5.1.0, although there is no top-level ~~uninstall~~ ~~tar~~ file 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 - 03

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im :: Utilization of grep , man commands

mentation :

Finding info documentation from the command line:

Bring up the info page for the grep command . Bring up the usage section-

To find info about any command 'info' command is used .  
The syntax of info command is : info (command name)

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

Open the terminal (ctrl+Alt+t) and type: info grep

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

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

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

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

Ans Ans : To use the 'man' command simply type : man ls

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

Simply type : man ls

c] Finding man pages by topic . What man pages are available for document file compression

Ans : 'Tar' , 'zip' are some man pages which are available for document file compression.

Simply type : man zip  
man tar

d] Finding man pages by section . From the cmd line . Bringing up the man page for the printf lib function which manual page section are library function found .

Ans : The number corresponds to what section of the man page is from ; ! is user command while 8 is stuff . The man page for man itself explain it and list std one

There are certain terms that have different pages in different sections (eg: 'printf' as a command appears in section 1 and as a 'stdlib' function appears in section 3); in cases like that you can pass the section no. to man before the page name to choose which you want or use man-a to show every matching page in a row.

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

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## PRACTICAL - 04

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

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

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### 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 file command

```
# find / -name passwd
# rm /tmp/example.txt/tmp
```

d) Delete the file moved to /tmp in previous step by absolute no

```
# find / -name passwd
./usr/share/doc/nss-1dep-253/pam.d/passwd
```

- /usr/bin/passwd
- /etc/pam.d/passwd
- /etc/passwd

Find directory password file under root and one level down

```
# find / -maxdepth 2 -name passwd
./etc/passwd
```

Find the password file under root and 2 level down

```
# find / -maxdepth 3 -name passwd
./usr/bin/passwd
./etc/pam.d/passwd
./etc/passwd
```

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PRACTICAL - 05

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Explore a mounted file system on your computer.

Ans: df - k

what are different ways of exploring mounted file systems on

Ans: mount

(3) copying text from files.

Ans: cp command, mv command

	Music	Pictures	Public	Videos
jeba@jeba-VirtualBox:~/jebS	cd ..	cd ..	cd ..	cd ..
jeba@jeba-VirtualBox:~/jebS	ls	ls	ls	ls
jeba@jeba-VirtualBox:~/jebS	-d -xat	-d -xat	-d -xat	-d -xat
jeba@jeba-VirtualBox:~/jebS	cat 99.txt	cat 99.txt	cat 99.txt	cat 99.txt
jeba@jeba-VirtualBox:~/jebS	touch dd.txt	touch dd.txt	touch dd.txt	touch dd.txt
jeba@jeba-VirtualBox:~/jebS	cat dd.txt	cat dd.txt	cat dd.txt	cat dd.txt
jeba@jeba-VirtualBox:~/jebS	rm 99.txt	rm 99.txt	rm 99.txt	rm 99.txt
jeba@jeba-VirtualBox:~/jebS	ls	ls	ls	ls
jeba@jeba-VirtualBox:~/jebS	-d -xat	-d -xat	-d -xat	-d -xat
jeba@jeba-VirtualBox:~/jebS	cat ss.txt	cat ss.txt	cat ss.txt	cat ss.txt
jeba@jeba-VirtualBox:~/jebS	rm ss.txt	rm ss.txt	rm ss.txt	rm ss.txt
jeba@jeba-VirtualBox:~/jebS	ls	ls	ls	ls
jeba@jeba-VirtualBox:~/jebS	-d -xat	-d -xat	-d -xat	-d -xat
jeba@jeba-VirtualBox:~/jebS	cat gg.txt	cat gg.txt	cat gg.txt	cat gg.txt
jeba@jeba-VirtualBox:~/jebS	No such file or directory			

(a) Retrieving and backup the work directory using tar, gzip and bzip<sup>2</sup> commands.

Ans: gzip filename.txt  
gzip -d filename.txt

(5) use diff command to create diff of two files

~~Ans. diff filename1 filename2~~

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

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```
jeba@jeba-VirtualBox:~/jeba ls  
dd.txt.gz ss.txt  
jeba@jeba-VirtualBox:~/jeba cat >aa.txt  
AC  
hello world  
jeba@jeba-VirtualBox:~/jeba cat >bb.txt  
this is LinuxAC  
jeba@jeba-VirtualBox:~/jeba diff aa.txt bb.txt  
ido  
hello world  
jeba@jeba-VirtualBox:~/jeba cat >bb.txt  
this is Linux  
AC  
jeba@jeba-VirtualBox:~/jeba diff aa.txt bb.txt  
ici  
< hello world  
> this is Linux  
> jeba@jeba-VirtualBox:~/jeba gzip ss.txt  
jeba@jeba-VirtualBox:~/jeba gzip bb.txt  
jeba@jeba-VirtualBox:~/jeba diff aa.txt.gz bb.txt.gz  
Binary files aa.txt.gz and bb.txt.gz differ
```

```
jebaa0@jeba-VirtualBox:~/jobs bztp ss.txt  
jebaa0@jeba-VirtualBox:~/jobs ls  
jebaa0@jeba-Virtuabox:~/jobs cat ss.txt  
jebaa0@jeba-Virtuabox:~/jobs gztbp dd.txt  
jebaa0@jeba-Virtuabox:~/jobs ls  
jebaa0@jeba-Virtuabox:~/jobs cat dd.txt bz  
jebaa0@jeba-Virtuabox:~/jobs cat dd.txt bz  
jebaa0@jeba-Virtuabox:~/jobs gztbp dd.txt  
jebaa0@jeba-Virtuabox:~/jobs ls  
jebaa0@jeba-Virtuabox:~/jobs cat dd.txt bz  
jebaa0@jeba-Virtuabox:~/jobs gztbp dd.txt  
jebaa0@jeba-Virtuabox:~/jobs ls
```

```
[root@jeb01 ~]# tar -xvf data.tar /min  
tar: data.tar: Cannot open: Permission denied  
tar: Error is not recoverable: exiting now  
[root@jeb01 ~]# sudo tar -xvf data.tar /min  
tar: Removing leading '/' from member names  
[minv]  
[minv]/id  
[jeb01:jeb01]# ls  
bin   dev   etc   lib   min  opt   run  svr  usr  
boot dd   home  letterfound minc  proc  sbin  sys  var  
cdrom dev   initrd  log  minc  root  snap  svr  vmlinuz  
jeb01:jeb01 VirtualBox's cat data.tar  
minv/000000000000000000000000000000001300537053701035 Sustar root@jeb01:jeb01-VirtualBox:~
```

## PRACTICAL - 06

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```
jebajeba@jeba-VirtualBox:~$ who
jeba          ttv7
jeba@jeba-VirtualBox:~$ whoami
jeba
jeba@jeba-VirtualBox:~$ who -l
2010-01-15 20:30
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      ttv7     :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      ttv7     :0                4:38   /sbin/upstart --user
jeba@jeba-VirtualBox:~$ w -h
jeba      ttv7     :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      ttv7     :0                20:32   5:36   9.00s 0.33s /sbin/upstart --user
```

- Ans: cat /etc/shadow
- Q) Which account you are logged in? How do you find out?
- Ans: who command of whoami
- Q) Display /etc/shadow file using cat command and understand the importance of shadow file. How its different than password file.

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

- Username, up to 8 characters. Case sensitive, usually all lowercase. A direct match to username in /etc/passwd file.
- Password, 13 characters encrypted. A blank entry (eg. ::) indicates a password is not required to log in (usually a bad idea), and a "\*" entry (eg. \*:) indicates account has been disabled.
- The number of days 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 password unchanged for years)
- 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
- The number of days since the account has been disabled
- A reserved file for possible future use.

- Q1**
- Each field in a password is separated with ":" characters, and contains up to 8 characters. Case-sensitive. Usually longer than "x".
  - "x" in password file. Passwords are stored in "etc/shadow".
  - Numeric user id is assigned by "adduser" script. Unix uses group field, plus following group field, to identify which file belongs to user.
  - Numeric id group. Red Hat uses group id's in fairly unique manner for enhanced file security. Usually the group id will match user id.

- Full name of user. I'm not sure what maximum length for this field is, but try to keep it reasonable.
- User's home directory. Usually /home/username. All user's personal files, web pages, mail forwarding etc will be stored here.
- User's "shell account", often set to "/bin/bash" to provide access to bash shell.

**(c) Get your current working directory**

Ans: pwd

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

Ans: history + line number

- (e) Create alias to most commonly used command**

Ans: Alias command instructs shell to replace one string with another

alias label = "command"

**(f)**

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0::root:/root/Bash
daemon:x:1:1::daemon:/root/sbin/nologin
bin:x:2:1::bin:/root/sbin/nologin
sync:x:3:2::sync:/root/sbin/nologin
games:x:4:65534::sync:/bin:/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
proxy:x:10:10::proxy:/var/spool/varspool:/usr/sbin/nologin
kern:x:13:13::kern:/bin:/usr/sbin/nologin
backup:x:33:33::www:/var/www:/usr/sbin/nologin
list:x:38:38::listing List Manager:/var/list:/usr/sbin/nologin
jeba@jeba-VirtualBox:~$
```

**(g)**

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

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0::root:/root/Bash
daemon:x:1:1::daemon:/root/sbin/nologin
bin:x:2:1::bin:/root/sbin/nologin
sync:x:3:2::sync:/root/sbin/nologin
games:x:4:65534::sync:/bin:/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
proxy:x:10:10::proxy:/var/spool/varspool:/usr/sbin/nologin
kern:x:13:13::kern:/bin:/usr/sbin/nologin
backup:x:33:33::www:/var/www:/usr/sbin/nologin
list:x:38:38::listing List Manager:/var/list:/usr/sbin/nologin
jeba@jeba-VirtualBox:~$
```

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## PRACTICAL - 07

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Create, modify, search and navigate a file in editor

### i) Creating a file :

To create a file, on terminal type 'vi' followed by filename

### ii) Modifying a file :

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

### iii) Search in a file :

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

### iv) Navigate :

#### (1) Movement in four direction :

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

#### (2) Word navigation :

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

(3) Suckling

Key	Action
Ctrl+f	Scroll forward
Ctrl+b	Scroll backward
Ctrl+d	Scroll half page
Ctrl+v	Scroll half page backward

i) Replace ~~ls~~ all essential commands like search/replacing, highlight, show line numbers.

Replace

Syntax: ~~1~~ / word to be replaced / ~~1~~ / new word / ~~get~~

### i) Highlight:

jebs@jebs-VirtualBox: ~

```
Hello
This is our Linux example
Not done.
Well done.
This is vi Editor
Thank you
```

A screenshot of a terminal window titled "jeba@jeba-VirtualBox: ~". The window displays a script with several lines of text. The text includes "Hello", "This is our Linux example", "Welcome", "Welldone", "This is Vt Editor", and "Thank you". There are also some graphical elements like icons and a progress bar.

```
leba@leba-virtualbox: ~
Hello
This is my Linux example
Welcome
Welldone
This is VI Editor
Thank you
```

## Practical - 08

a)

- a) use of sudo change user privileges to root  
Create an user named user1

To give some user root privileges edit /etc/sudoers using visudo. Enter new line 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  
.nail/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
```

- b) Identify operations that require sudo privileges

b)

```
jeba@jeba-VirtualBox:~$ su user1  
jeba@jeba-VirtualBox:~$ 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

using

```
jeba@jeba-VirtualBox:~$ su user1  
jeba@jeba-VirtualBox:~$ sudo chage -l user1  
Last password change: Jan 28, 2015  
Password expires: never  
Password inactive: never  
Account expires: never  
Minimum number of days between password change: 99999  
Maximum number of days between password change: 7  
Number of days of warning before password expires: 7
```

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```
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:~$
```

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

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```
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]: -1
Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31
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:~$
```

E → Expiration Date  
m → Minimum no. of days before password changes.  
n → Number of days password is valid.  
I → Account inactive  
w → Number of days of warning before a password  
change is required.

```
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, 2022
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:~$
```

d) Delete a newly added user

```
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 - 09

a) Get IP address of your machine using ifconfig

```
jeba@jeba-VirtualBox:~$ ifconfig
enp0s3      Link encap:Ethernet HWaddr 08:00:27:0e:6b:69
            inet addr:10.0.2.15 Brdcast:10.0.2.255 Mask:255.255.255.0
            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:1186 (1.1 KB) TX bytes:8518 (8.5 KB)
```

b) Get hostname of your machine

b)

```
jeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from naab33s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=97.8 ms
64 bytes from naab33s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=82.0 ms
64 bytes from naab33s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=84.8 ms
64 bytes from naab33s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=87.1 ms
64 bytes from naab33s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=93.5 ms
64 bytes from naab33s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=86.9 ms
64 bytes from naab33s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=98.0 ms
64 bytes from naab33s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=98.9 ms
^Z
```

```
[1]+ Stopped                  ping www.google.com
jeba@jeba-VirtualBox:~$
```

c) Use ping to check network connectivity to remote machines

b)

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

```
jeba@jeba-VirtualBox:~$ ifconfig
eth0      Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          UP LOOPBACK RUNNING MTU:1536 Metric:1
          RX packets:3240 errors:0 dropped:0 overruns:0 frame:0
          collisions:0 txqueuelen:1
          RX bytes:1186 (1.1 KB) TX bytes:8518 (8.5 KB)
```

d) Use of dig command

```
(c)
@ @ @ jeba@jeba-VirtualBox:~$ dig www.google.com
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.
; ANSWER SECTION:
www.google.com. 91 IN A 172.217.166.100
IN A
; QUERY TIME: 152 msec
; SERVER: 127.0.1.1#53(127.0.1.1)
; WHEN: Mon Jan 28 22:46:55 IST 2020
; MSG SIZE rcvd: 59
```

(c)

```
(d)
@ @ @ jeba@jeba-VirtualBox:~$ traceroute www.google.com
traceroute to www.google.com (172.217.166.100), 30 hops max, 60 byte packets
 1 * *
 2 * *
 3 192.2.2 (192.2.2) 68.568 ms 68.486 ms 68.405 ms
```

(d)

jeba@jeba-VirtualBox:~\$ route

Kernel IP routing table	Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
	192.2.2	*	0.0.0.0	UG	100	0	0	enp0s3
	*	*	255.255.0.0	U	100	0	0	enp0s3
	*	*	255.255.255.0	U	1000	0	0	enp0s3
	*	*	255.255.255.255	U	10000	0	0	enp0s3

```
(e)
@ @ @ jeba@jeba-VirtualBox:~$ host -V
jeba@jeba-VirtualBox:~$ host -V
jeba@jeba-VirtualBox:~$ host -V
```

f) Use of arp command

```
(f)
@ @ @ jeba@jeba-VirtualBox:~$ arp -n
jeba@jeba-VirtualBox:~$ arp -n
jeba@jeba-VirtualBox:~$ arp -n
jeba@jeba-VirtualBox:~$ arp -n
```

g) Use of host command

Use of netstat command and Nmap command

			Foreign Address	State
unix	2	socket	[ ]	I-Node 42149 Path /run/user/1000/system
unix	2	socket	[ ]	9694 /run/systemd/journal/
unix	2	socket	[ ]	9784 /run/systemd/journal/
unix	3	DGRAM	[ ]	9684 /run/systemd/journal/
unix	3	DGRAM	[ ]	44042 @/tmp/dbus-notify
unix	3	STREAM	[ ]	44042 @/tmp/dbus-notify
unix	3	STREAM	[ ]	43313 @/tmp/dbus-Cmtr7t9G
unix	3	STREAM	[ ]	42690 @/tmp/dbus-chrigedg75
stdout	3	STREAM	[ ]	13242 /run/systemd/journal/
stderr	3	STREAM	[ ]	42913 /run/systemd/journal/
unix	3	STREAM	[ ]	42913 /run/systemd/journal/
unix	3	STREAM	[ ]	42913 /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): 24046800:4067:811:2004  
DNS record for 216.58.196.68: b005511-in-f4.1e100.net  
Not shown: 998 filtered ports  
PORT STATE SERVICE  
80/tcp open http  
443/tcp open https

1/23/01

Nmap done: 1 IP address (1 host up) scanned in 29.32 seconds

Aim : Shell scripting

### Basics of shell scripting :

- To get a shell, you need to start a terminal
- To see what shell you have, run : echo \$SHELL
- In Linux, dollar sign stands for shell variable
- #!/bin/bash is called shebang. It is written at top of a shell script and it passes instruction to program /bin/bash.

i) Echo \$SHELL

```
ii) • vi filename.sh
#!/bin/bash
echo "THIS IS LINUX"
```

```
iii) chmod 777 filename.sh
```

Steps to write and execute a shell script :

- Open terminal
- Navigate to place where you want to create script using cd command
- Touch filename.sh
- vi filename.sh
- chmod 777 filename.sh
- sh filename.sh or ./filename.sh

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

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

"linux.sh" [New File]

```
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:~$
```

• Program to Display your name:

```
#!/bin/bash
# Enter your name:
echo "Enter your name:"
```

```
read name
```

```
echo "My name is : $name"
```

• Program to find sum of two variables:

```
vi filename.sh
```

```
#!/bin/bash
```

```
a=100
```

```
b=25
```

```
Sum=$((a+b))
```

```
echo "Sum is : $Sum"
```

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

```
#!/bin/bash
```

```
a=100
```

```
b=25
```

```
Sum=$((a+b))
```

```
echo "Sum is:$Sum"
```

```
:wq
```

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

```
vi ubuntu.sh
```

```
chmod 777 ubuntu.sh
```

```
./ubuntu.sh
```

```
Enter your name:
```

```
TANVI
```

```
My name is: TANVI
```

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

```
:wq
```

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

```
vi linux2.sh
```

```
chmod 777 linux2.sh
```

```
./linux2.sh
```

```
Sum is:125
```

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

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

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

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

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 manipulations like insert or deletion, search etc.

Consider the following text file.

```
linux
python
green tech
softskill
stats
calculus
computer basic
```

1) Displaying partial text on a file

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

a) Display all except some lines

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

3) Deleting a line

To delete a line, use line number followed by 'd'

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

4) Search and replace 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
```

tcsc@tcsc-VirtualBox:~\$ ls

subjects offered in cs  
datastructure  
database management  
Linux  
Python  
green tech  
softskill  
stats  
calculus  
computer basic

computer basic

tcsc@tcsc-VirtualBox:~\$ sed '/cs/a -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:~\$

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:~\$

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

7) To change a whole line with matched pattern

To change a whole line to a new line when a search matches, use option 'c'

6) Add a line after / before matched string

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

6) Replace a string on particular line .

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