

## VirtualBox

Install or upgrade my

**Download 6.0**  
VirtualBox



Steps for installation of Ubuntu on Virtual Box.

- Install your choice of Linux distribution eg Ubuntu, Fedora, Debian.
- Customize desktop environment by changing different default options like changing default background, themes, screensaver.
- Screen Resolution.
- Time Settings

### Install Virtual Box

Open Virtual Box : Double click the Virtual Box app icon.

Click now , its a blue badge in the upper left corner the Virtual Box windows . doing so opens a pop up menu.

Enter a name for your virtual name . Type whatever you want to name your VM (eg ubuntu) into the "Name" text field.

That's near the top of the pop up menu .

Select Linux as the "Type" value . Click the "Type" drop down box , then click Linux in the resulting drop down

menu .

Select Ubuntu as the "Version" value ; Ubuntu should be selected by default after you set the "Type" value to Linux but if isn't , click the "Version" drop down box & click Ubuntu (64-bit) before proceeding .

Click next ; This at the bottom of the menu .

Select an amount of RAM to use ; Click drag the slider left or right to decrease or increase the amount of RAM . The ideal amount of RAM will automatically be selected

when you get to this page .

Make sure not to increase the RAM into the hard section of slides.

9. Click Next. It's at the bottom of the menu.

10. Create your own virtual machine Virtual hard disk drives The virtual hard drives in the section of your computer's hard drives space which will use to store Virtual machine's file & program.

- Click Create

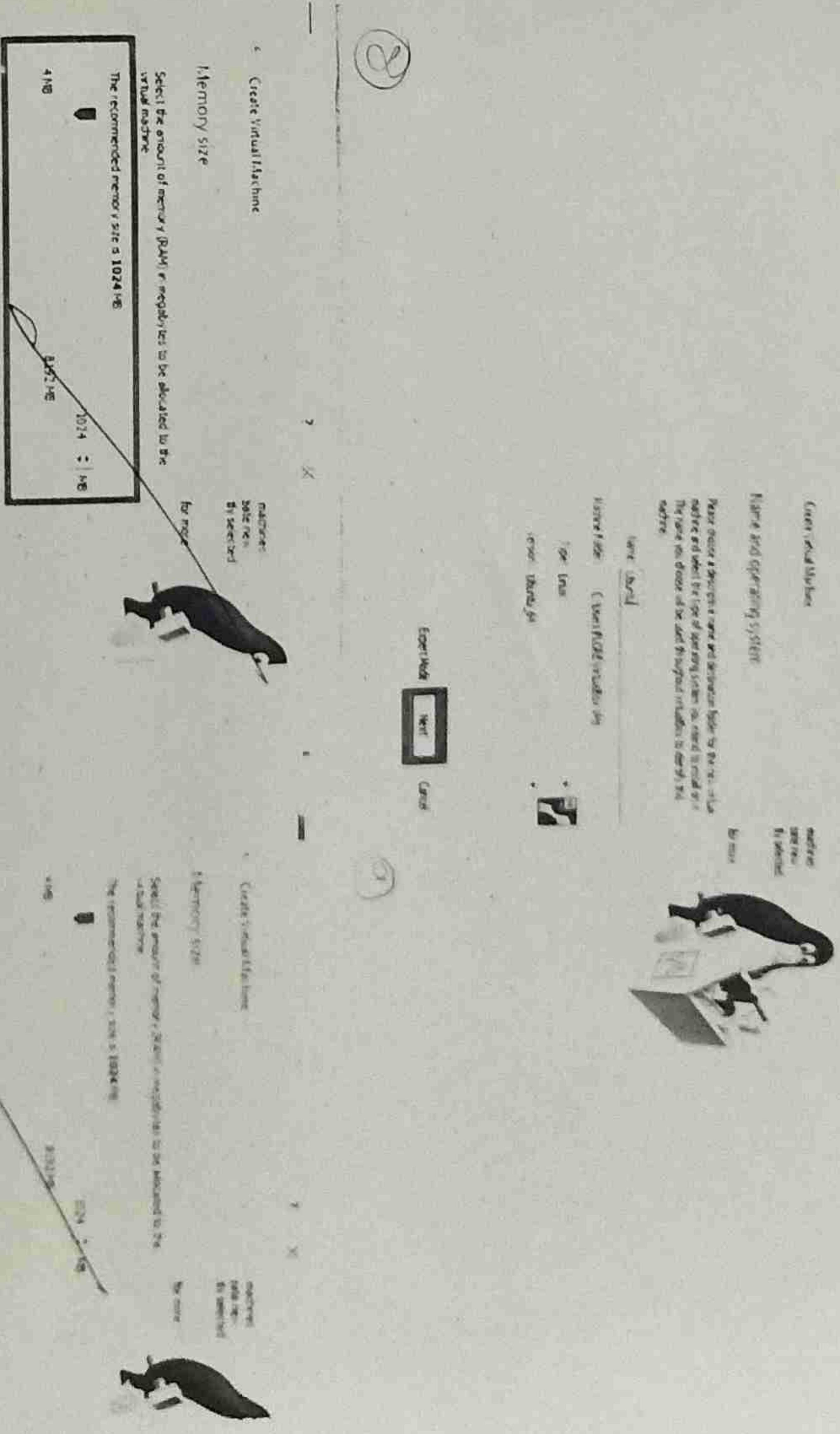
- Click Next

- Click Next

- Select an amount of space to use.

- Click Create

11. Make sure that your Ubuntu file is done downloading Once the Ubuntu is finished downloading you can proceed with installing it to Virtual Box.



## 2. Accessing Appearance settings.

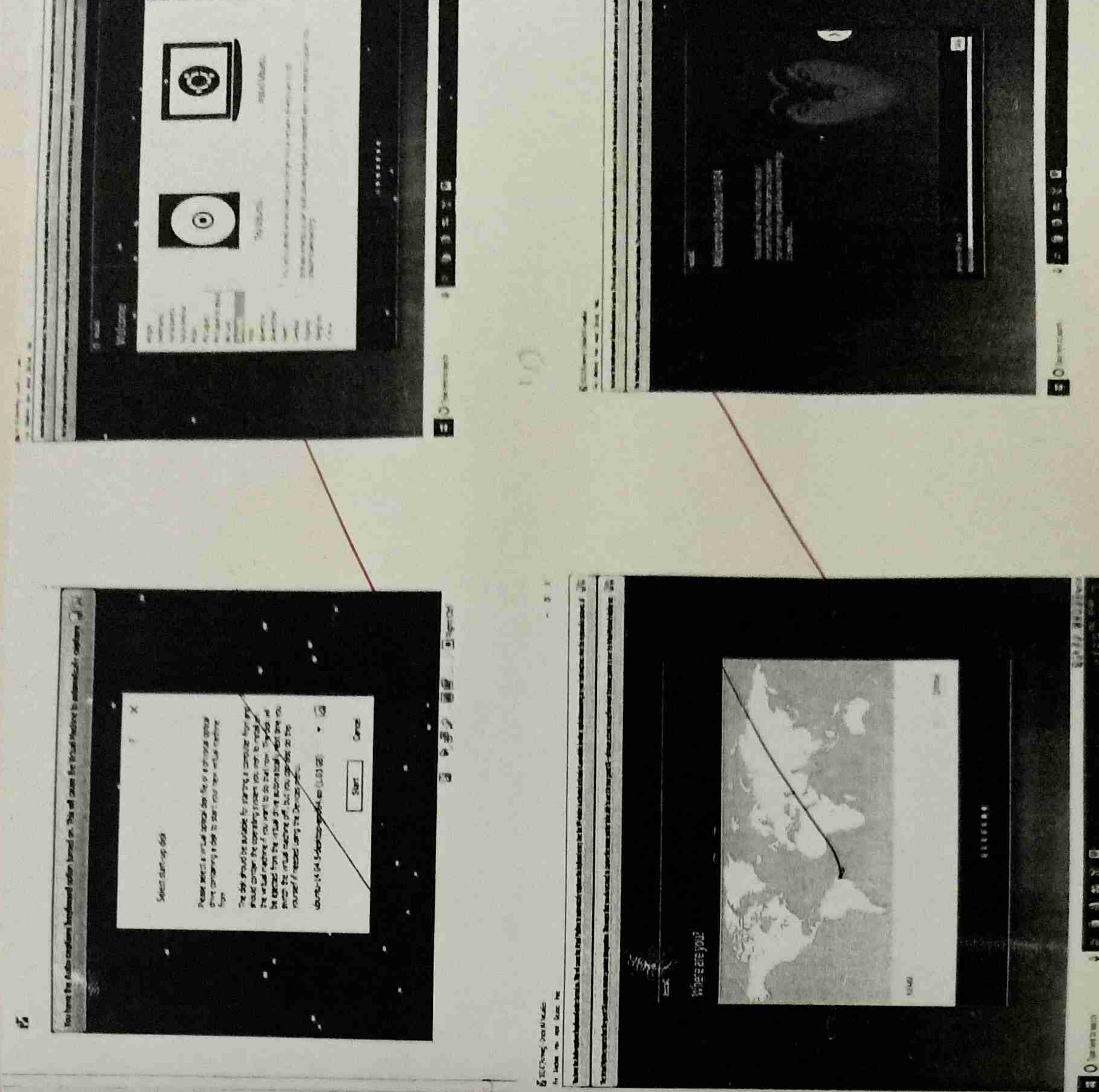
- To access Appearance settings in Ubuntu, lets click on user menu at the top right corner. On top menu bar & select system settings ...

Hardware & system options icons. Lets first select the Appearance icon.

- Changing Wall paper Picture.
- On the left side of background panel, you can see your current wall paper.
- On the right side is part where we can select one Ubuntu wall papers. Clicking on any thumbnail, wallpaper will be changed right away, with a



- 4 Time Settings  
 . If you are currently in Indian time , How does the displayed time changed?  
 After nothing the time changed , change the home zone back to your local time zone .
- Just click on the clock on the top bar , a choose time & date settings , Once the time & date windows opens choose time & date settings , the time & date choose manually , otherwise choose your time zone from the menu , & choose automatic .



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## PRACTICAL -2

AIM: Installing and removing software.

2] Install Gee package Newly that is done & then remove it.

Step 1:

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

Step 2:

Type 'sudo apt - get install gee'; After typing the following command installation will take place.

Step 3:

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

## NOW TO UNINSTALL gce COMPILER:

In gce 5.1.0, although there is no specific uninstall target, some directories do have it, in particular gce, so you can do:

Type: cd build/gce.

Sudo make uninstall

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

## PRACTICAL - 3

AIM : the Utilization of group man commands

Documentation:

- a) finding 'info' documentation from the command line; bring up into page 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 ) &  
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 one summarized form of showing info. is the 'man' command . The command is same as 'info' but required data .

- 5) finding man pages from the command line : Bringing the man page for the 'ls' command scroll down to the example section .

Ans: To use the 'man' command simply type 'man [command name]'.

'Now we are going to find the manual for 'ls' command  
simply type : 'man ls'

c) Finding man pages by topic: What man pages are available for document 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 sections from the codline bring up the man page for the printf function which manual page section are library function found?

Ans: The number corresponds to what section of the manual page is form. 1 is user command while 8 is sys. admin stuff. The man page for man itself explains it better.

There are certain terms that have different pages in different sections (eg: 'printf' as a command appears in section 1 as a 'Stab' function appears in section 3)

3) in cases like that you can pass the section no. to the man before the page name to choose which page you want or use man -a the show every matching page in a new.

You can tell what section a term falls in the 'man.k' (equivalent to appends command) It will do globbing matches too show you need to use "Term" to limit it

- c) Command line help list the available option for the mkdir command. How can you do this?

\$ mkdir m.a -<sup>directory</sup> directory name.

## PRACTICAL - 4

Command line operations :-

a) Install new package on your system

Sudo apt-get install [package name]

b) Remove the package installed.

Sudo apt-get remove [package name].

c) find the passwd file in / using find command.

# find / -name passwd

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

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

# find / -maxdepth 2 -name passwd

- /etc/passwd

find the passwd file under root and 2 level down.

# find / -maxdepth 3 -name passwd

- ls -l bin | grep passwd
- lsh | grep d | grep passwd
- lsh | grep passwd

Find the password file like /etc /etc - directories, /etc /etc.

- # find - max depth 3 - maxdepth 5 - name passwd
- ls -l bin | grep passwd
- lsh | grep d | grep passwd

a) ~~Find the create a symbolic link to the file you found in this step~~

# ln -s file1 file2

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

# touch example.txt

# mv example.txt /tmp

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

# rm /tmp/example.txt

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

# where is ls

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

# where is ps

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

# where is bash

bash : /bin/bash /etc/bash.bashrc /usr/share/man/man1/bash.1.gz.



- 4) Archiving and backup the work directory using tar, gzip and bzip2 commands.
- gzip filename.txt  
Bzip2 filename.txt

```
jebajeba@VirtualBox:~$ ls
jebajeba@VirtualBox:~/Jobs$ bzip2 ss.txt
jebajeba@VirtualBox:~/Jobs$ ls
dd.txt ss.txt.gz
jebajeba@VirtualBox:~/Jobs$ cat ss.txt.gz
jebajeba@VirtualBox:~/Jobs$ gzip dd.txt
jebajeba@VirtualBox:~/Jobs$ ls
dd.txt.gz ss.txt.gz
jebajeba@VirtualBox:~/Jobs$ cat dd.txt.gz
jebajeba@VirtualBox:~/Jobs$ gunzip dd.txt.gz
jebajeba@VirtualBox:~/Jobs$ cat dd.txt
jebajeba@VirtualBox:~/Jobs$ exit
jebajeba@VirtualBox:~/Jobs$
```

- 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 .

```
jebajeba@VirtualBox:~/Jobs$ ls
dd.txt.gz ss.txt.gz
jebajeba@VirtualBox:~/Jobs$ cat >aa.txt
hello world
^C
jebajeba@VirtualBox:~/Jobs$ cat >bb.txt
this is Linux^C
jebajeba@VirtualBox:~/Jobs$ diff aa.txt bb.txt
< hello world
this is Linux
^C
jebajeba@VirtualBox:~/Jobs$ cat >bb.txt
ici hello world
^C
> this is Linux
jebajeba@VirtualBox:~/Jobs$ diff -u bb.txt ici.txt
jebajeba@VirtualBox:~/Jobs$ patch -saaa.patch
jebajeba@VirtualBox:~/Jobs$ cat saaa.patch
Binary files aa.txt.gz and bb.txt.gz differ
```

*8*

```
jebajeba@VirtualBox:~/Jobs$ cat ->hi.txt
hi
^C
jebajeba@VirtualBox:~/Jobs$ cat ->hi.txt
hello
^C
jebajeba@VirtualBox:~/Jobs$ diff -u hi.txt saaa.patch
jebajeba@VirtualBox:~/Jobs$ patch -saaa.patch
patching file hi.txt
jebajeba@VirtualBox:~/Jobs$ cat saaa.patch
jebajeba@VirtualBox:~/Jobs$ cat saaa.patch
2020-01-08 22:14:55.403500000 +0530
hi.txt 2020-01-08 22:12:16.259800000 +0530
00-1,3 +1,3 00
hi
hi
hello
^C
jebajeba@VirtualBox:~/Jobs$
```

### Practical 1.6.

Use Environment

```
jebal@jeba-VirtualBox ~
jebal@jeba-VirtualBox:~$ who
jebal    ttys7          2020-01-15 20:32 (:0)
jebal@jeba-VirtualBox:~$ who -l
jebal    ttys2          2020-01-15 20:30
jebal@jeba-VirtualBox:~$ 780 id=tty1
```

```
jebal@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
jebal  ttys7  :0              20:32  4:28  8.19s 0.33s /sbin/upstart -
jebal@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
jebal  ttys7  :0              4:38  /sbin/upstart --user
jebal@jeba-VirtualBox:~$ w -n
20:32  4:44  8.67s 0.33s /sbin/upstart -
jebal@jeba-VirtualBox:~$ w -f
20:36:12 up 5 min, 1 user, load average: 0.41, 0.69, 0.37
USER   TTY      LOGIN  IDLE  JCPU PCPU WHAT
jebal  ttys7  20:32  5:36  9.00s 0.33s /sbin/upstart --user
```

```
jebal@jeba-VirtualBox:~$ sudo cat /etc/shadow
[sudo] password for jebal:
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:::
```

```
jebal@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/bin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:4:sync:/bin:/bin/sync
games:x:5:5:games:/usr/games:/usr/sbin/nologin
man:x:6:6: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:46:46:backup:/var/backups:/usr/sbin/nologin
www-data:x:38:38:www-data:/var/www:/usr/sbin/nologin
```

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

→ who command & whoami command

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

→ cat /etc/shadow

As with 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

→ 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 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 (to indicate it may be changed at any time)

→ The number of days to warn user of a expiring password.

→ The number of days after password expires that account is disabled.

→ The number of days since January 1, 1970 that an account has been disabled.

- A password field has possible white use.
- A password field in a passed entry is separated with ":" colon character  
Each field in a passed entry is separated with ":" colon character  
and are as follows:
- Username up to 8 characters (one underline, usually lowercase).
  - "Pw" in the password field. Passwords are stored in 'hashed'.
  - "Grp" in the password field. Passwords are stored in 'hashed'.
  - Numeric group id. Set user group id's in a fairly unique manner for shared file security.
  - Full name of user. I'm not sure what the maximum length for this field is but try to keep it reasonable (about 30 characters).
  - User home directory. Usually /home/username . All owned, personal files, work files etc will be stored here.
  - User "shell account". Often set to "/bin/bash" to provide access to the bash shell - one my personal favorite shells.
- ④) get your current working directory by changing your prompt.
- put `PS1=$PWD` in the file `.bashrc`
- ⑤) explore the help command
- ⑥) history command
- ⑦) employ different ways of getting command history, how to run previously executed command without typing its line number.
- history command look to previous history lines to find and copy them to current line to execute them.
- ⑧) create alias to most commonly used commands.
- alias label = "command".

```
jens@jens-VirtualBox:~$ alias m=ls|du -h
jens@jens-VirtualBox:~$ alias j=ls|cat > /etc/passwd
jens@jens-VirtualBox:~$ ls
Desktop  Downloads  Pictures  Templates
Documents examples desktop
jens@jens-VirtualBox:~$
```

Practical : 7  
Linux Editors : Vi

```
jeba@jeba-VirtualBox: ~
Hello is my Linux example
This is our welcome
Welldone
This is VI Editor
Thank you
```

```
:q/mvls//ourfac
```

- a) Create , modify , search and navigate a file in editor.
- b) Creating a file .
- c) To create a file . On the terminal type vi followed by filename .

- i) Modifying the file :
- To modify a file , on the vi editor type "o"

ii) Search in a file :-

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

- (4) Navigate  
Movement in four directions .

Key	Action
K	Moves cursor up
J	Moves cursor down
H	Moves cursor left
L	Moves cursor right

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

## 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.
W	Moves to the first character of a line.
0	Moves to the end of line.
\$	Moves to the end of line.

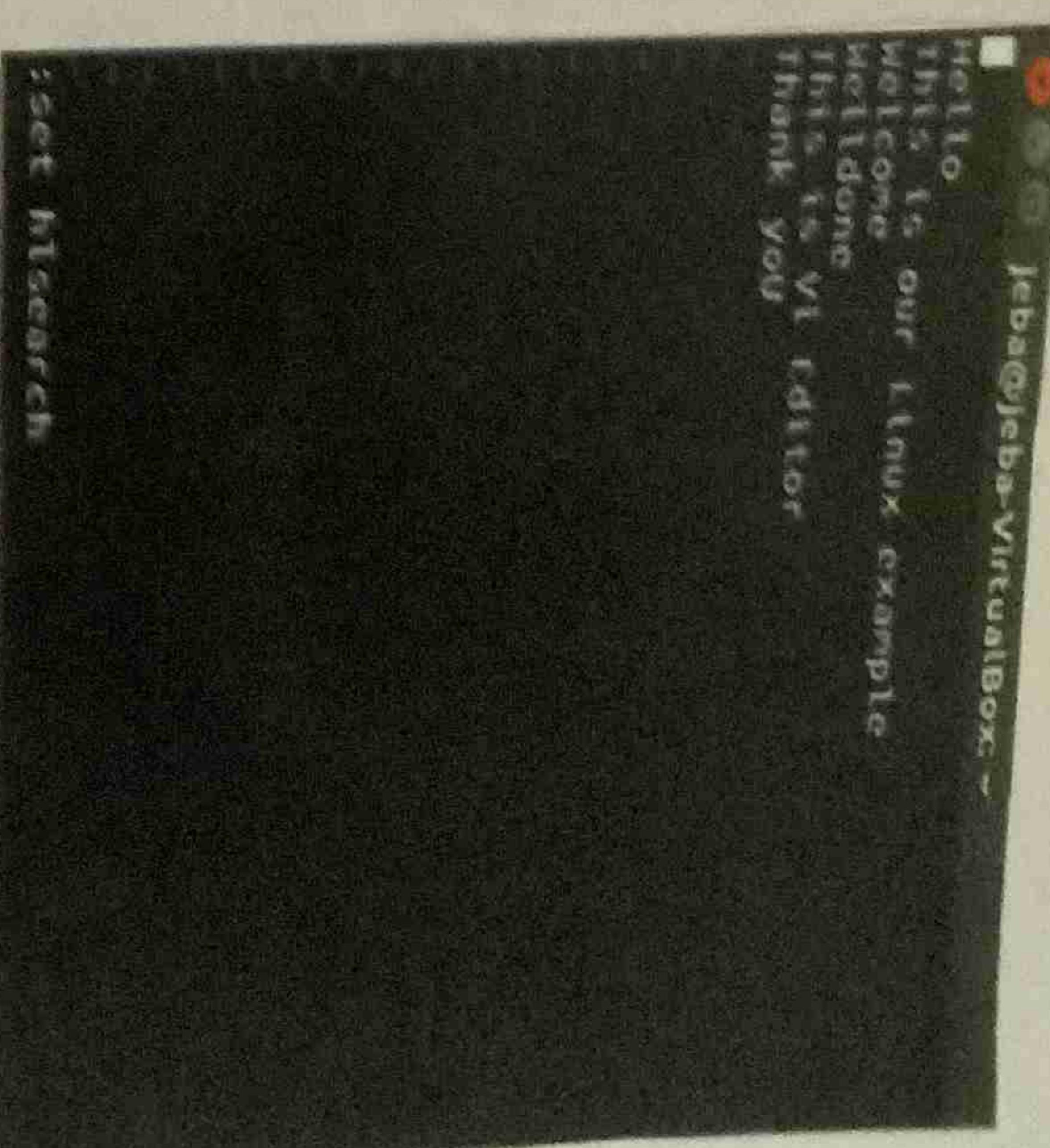
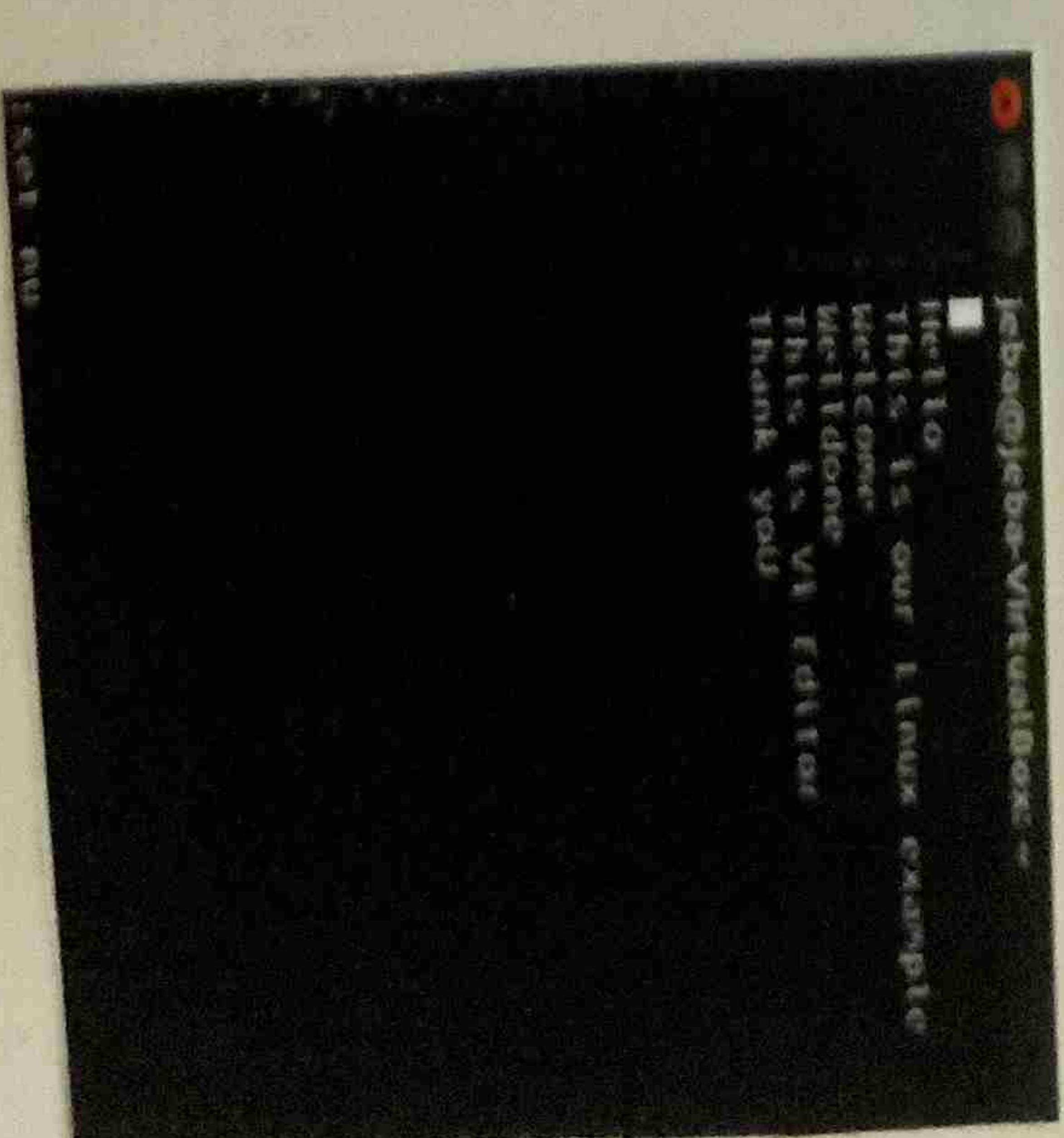
## Scrolling

Key	Action
Ctrl + f	scrolls forward
Ctrl + b	scrolls backward
Ctrl + d	scrolls half page
Ctrl + g	scrolls half page backward

- Learn all essentials commands like search / replace, highlight, show line numbers.

Replace.  
Highlight  
Use ctrl W search

- Show the line numbers  
→ Use set nu.



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

To give some users 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
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
```

- b) Identify operations that require sudo privileges.

g) Modify expiration date for new user using password aging.

```
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.
```

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

Minimum number of days between password change	: Jan 20, 2020
Maximum number of days between password change	: never
Number of days of warning before password expires	: 0
Account expires	: 99999
never	: 7

- E - Expiration date
- m - Minimum number of days before password change.
- M - Number of days password is valid after creation.
- I - Account inactive.
- W - Number of days of warning before a password change is required.

```
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
Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31
Last password change : Jan 21, 2020
Password expires : Aug 08, 2020
never
Account inactive : Jan 31, 2020
Maximum number of days between password change : 100
Number of days of warning before password expires : 200
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
Account inactive : May 20, 2020
Maximum number of days between password change : Jan 01, 2022
Number of days of warning before password expires : 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:~$
```

Riot  
Protested  
Notus &  
Monsieur

```
ifconfig  
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  
            inet  addr: fe80::c0c9:53a0%enp0s3  Bcast:  fe80::ff:ffff%enp0s3  Scope: Link  
            UP BROADCAST RUNNING MULTICAST MTU: 1500 Metric: 1  
            RX packets: 2 errors: 0 dropped: 0 overrun: 0 frame: 0  
            TX packets: 73 errors: 0 dropped: 0 overrun: 0 carrier: 0  
            collisions: 0 txqueuelen: 1000  
            RX bytes: 8518 (8.5 KB)  TX bytes: 1180 (1.1 KB)
```

```
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)
```

ebay@ebay-VirtualBox:~\$ hostname  
ebay-VirtualBox  
ebay@ebay-VirtualBox:~\$

- Practical : a  
Network Management

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

d) Use of dig command.

e) Troubleshooting network using traceroute, route command.

f) Use of arp command.

g) Use of host command.

h) Use of netstat command and Nmap 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.
: 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:~$ 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:~$ 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
10.0.2.0        *              255.255.0.0   U     1000  0    0 enp0s3
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ arp
Address          Hwtype  Hwaddress          Flags Mask
10.0.2.2        ether   52:54:00:12:35:02  C
3
```

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

		Foreign Address	State
Proto	Local Address	I-Node	Path
active RECV-Q Send-Q	sockets (w/o servers)	42149	/run/user/1000/system
proto UNIX	domain flags	9694	/run/systemd/journal/
proto RefCnt [ ]		9695	/run/systemd/journal/
unix 2 d/notify [ ]		9704	/run/systemd/journal/
unix 10 syslog [ ]		9684	/run/systemd/notify
unix 7 dev-log [ ]		44042	@/tmp/dbus-CymTeiTzA0c
socket 3 DGRAM [ ]		43331	@/tmp/dbus-CMGG6C7P5
unix 3 STREAM [ ]	CONNECTED	42988	@/run/systemd/journal/
unix 3 STREAM [ ]	CONNECTED	42690	/run/systemd/journal/
unix 3 STREAM [ ]	CONNECTED	13242	/run/systemd/journal/
unix 3 STREAM [ ]	CONNECTED	43013	/run/systemd/journal/
unix 3 STREAM [ ]	CONNECTED	42935	/run/systemd/journal/
unix 3 STDOUT [ ]			
unix 3 STDOUT [ ]			
unix 3 STDOUT [ ]			

jeba@jeba-VirtualBox:~\$ netstat -an | grep 'w/o servers'

```

jeba@jeba-VirtualBox:~$ netstat -an | grep 'w/o servers'
Active connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
proto  Active  UNIX  domain  sockets  (w/o servers)  Type      State
proto  Active  UNIX  domain  flags
proto  2      unix  2      d/notify
unix  2      unix  10   syslog
unix  7      unix  7   dev-log
socket 3      socket 3   DGRAM
unix 3      unix 3   STREAM [ ]  CONNECTED

```

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: b0m05s11-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:~\$

1/1/02

## Basics of shell scripting

- a) To get a shell, you need to start a terminal.
- b) To see what shell you have, run: echo \$SHELL
- c) In Linux, the dollar sign (\$) stands for shell variable.
- d) The echo command just returns whatever you type in.
- e) #!/bin/bash - It is called Shebang. It is written at the top of a shell script and it passes the instruction to the program /bin/bash.

```
vi filename.sh
#!/bin/bash
```

```
echo "This is Linux!"
```

```
chmod 777 filename.sh ~ . /filename.sh.
```

Step to write and execute a shell script.

- a) Open terminal
- b) Navigate to the place where you want to create using cd command.
- c) Touch filename.sh.
- d) Vi filename.sh
- e) chmod 777 filename.sh (for making the script executable)
- f) sh filename.sh or ./filename.sh.

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

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

Program to display your name

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

Program to find the sum of two variables  
vi filename.sh

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

```
tcsc@tcsc-VirtualBox:~$ vi linux2.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 linux2.sh
tcsc@tcsc-VirtualBox:~$ ./linux2.sh
tcsc@tcsc-VirtualBox:~$
```

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

Sed  
Sed command or Stream Editor is very powerful utility offered by Linux systems. It is mainly used for text substitution, and to replace both can perform other text manipulations like insertion, deletion, Search, etc. With sed, we can edit complete files without actually having to open it.

Consider the following text file:

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

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

```
tcsc@tcsc-VirtualBox:~$ lln.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 lln.sh
tcsc@tcsc-VirtualBox:~$ ./lln.sh 50 70
sum ls:120
tcsc@tcsc-VirtualBox:~$
```

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

```
tcsc@tcsc-VirtualBox:~$ sed 3,5d cs.txt
tcsc@tcsc-VirtualBox:~$ subjects offered in cs
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:~$
```

Displaying Partial Text of a file  
 With sed , we can view only part of a file like  
 from starting whole file .

- i) Display all except some lines  
 To display all content of a file except for some  
 position , use option 'd' .

ii) Deleting a line  
 To delete a line , use line number followed by 'd'

iii) Search & 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
calculus
computer basic
```

- 5) Replace a 'string' on a particular line  
 To replace a string on a particular line, use line number with 's' option.

```
tscs@tscs-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'.

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

```
tscs@tscs-VirtualBox:~$ sed '/cs/a "this is linux"' cs.txt
"this is linux"
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
tscs@tscs-VirtualBox:~$
```

```
tscs@tscs-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
tscs@tscs-VirtualBox:~$
```

```
tcsc@tcsc-VirtualBox:~$ sed '/linux/c "this is linux"' cs.txt
```

objects offered in cs  
datastructure management  
"this is linux"  
python  
green tech  
softskill  
stats  
calculus  
computer basic

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

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

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'.

Appendix lines  
To add some content before every line with sed  
use ~~or~~ add ~~b~~ as follows.

~~11/07~~