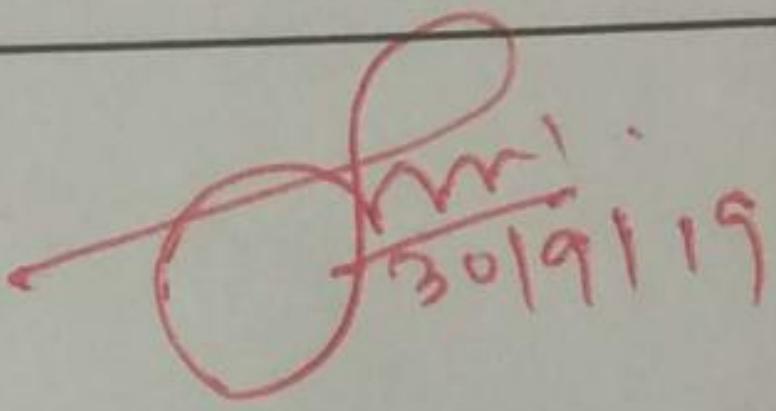
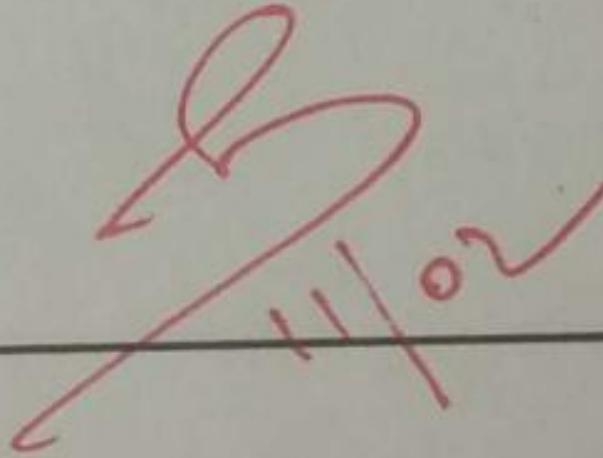
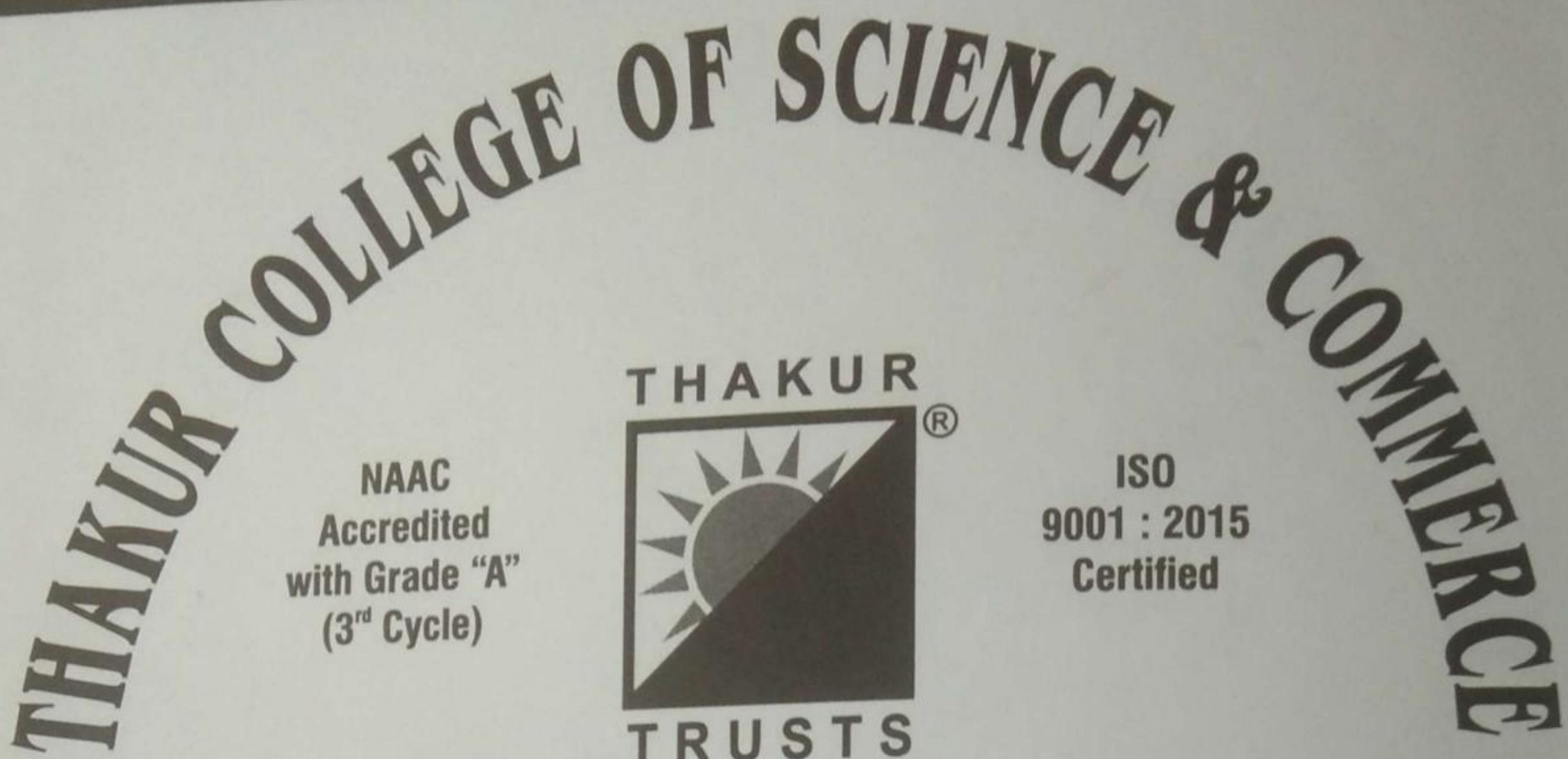


PERFORMANCE

Term	Remarks	Staff Member's Signature
I	Completed	 30/11/19
II	Completed	 11/12

Exam Seat No. _____



Degree College
Computer Journal
CERTIFICATE

SEMESTER II UID No. _____

Class FyBSC-CS Roll No. 1757 Year 2019-20

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

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

Teacher In-Charge

11/0

Head of Department

Date : _____

Examiner

INDEX

No.	Title	Page No.	Date	Staff Member's Signature
1.	Install your choice of Linux distribution. e.g:- Ubuntu, Fedora.	41-46	28/11/19	
2.	Installing and removing software.	46-48	5/12/19	
3.	Utilization of grep, man commands Documentation.	48-52	19/02/19	
4.	Command line operations	52-54	02/01/20	87%
5.	File operations	55-56	02/01/20	87%
6.	Use Environment	56-60	2/01/20	
7.	Linux Editors Vi	60-63	9/1/20	
8.	Linux Security	63-65	16/1/20	87% 23/01
9.	Network Management	65-67	23/1/20	
10.	Shell Scripting	67-71	06/02/20	87% 11/02

(a) AIM: Install your choice of Linux distribution. e.g:- Ubuntu, Fedora, Debian.

Step1: Download the ISO file from the official website of UBUNTU.

Step2: Download Universal USB installer to make a bootable USB stick.

Step3: Select one distribution from dropbox select the ISO file. Select the drive letter of USB to install UBUNTU and Press create.

Step4: Click yes to start installation.

Step5: Once the download is complete open setup file and follow the steps.

1. UNOME replaces unity as desktop.

2. Display server will be wayland.

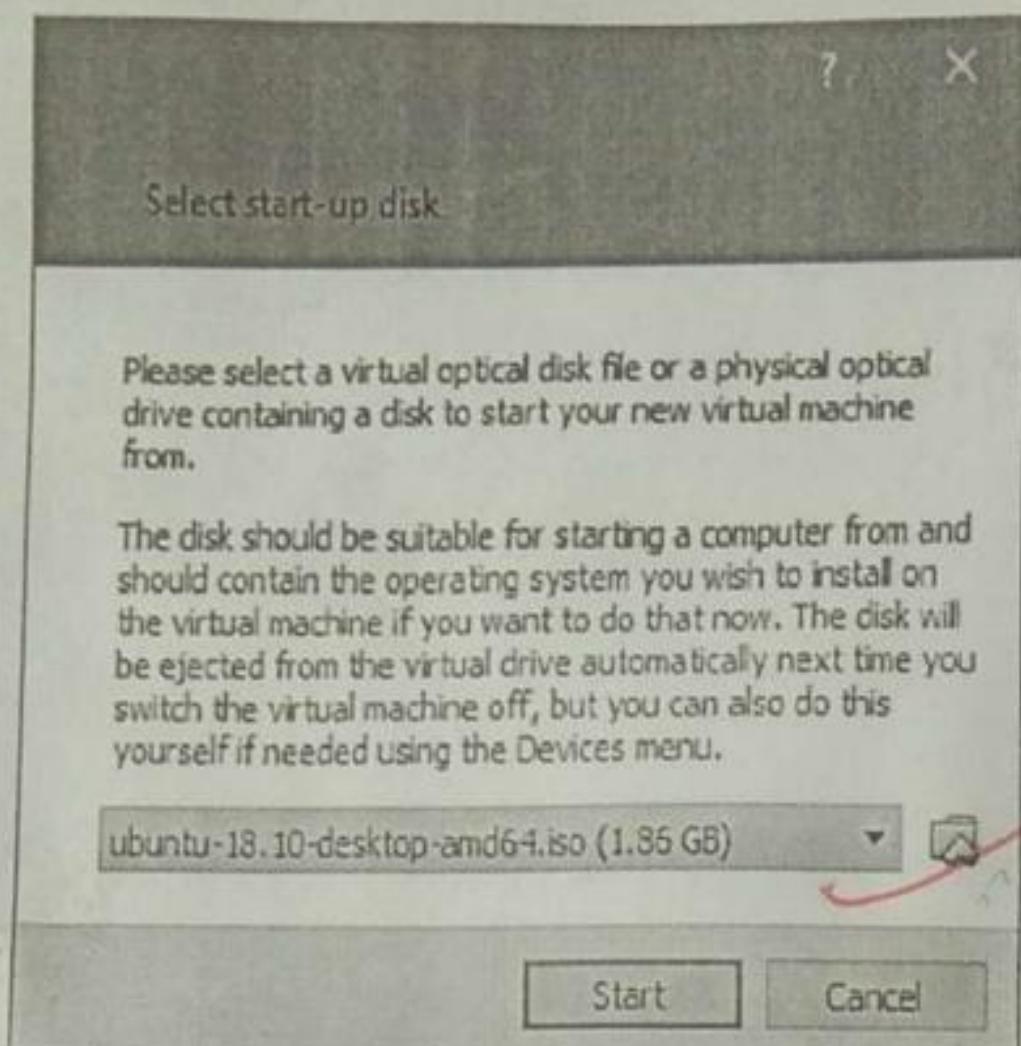
3. Window buttons go back to the right.

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

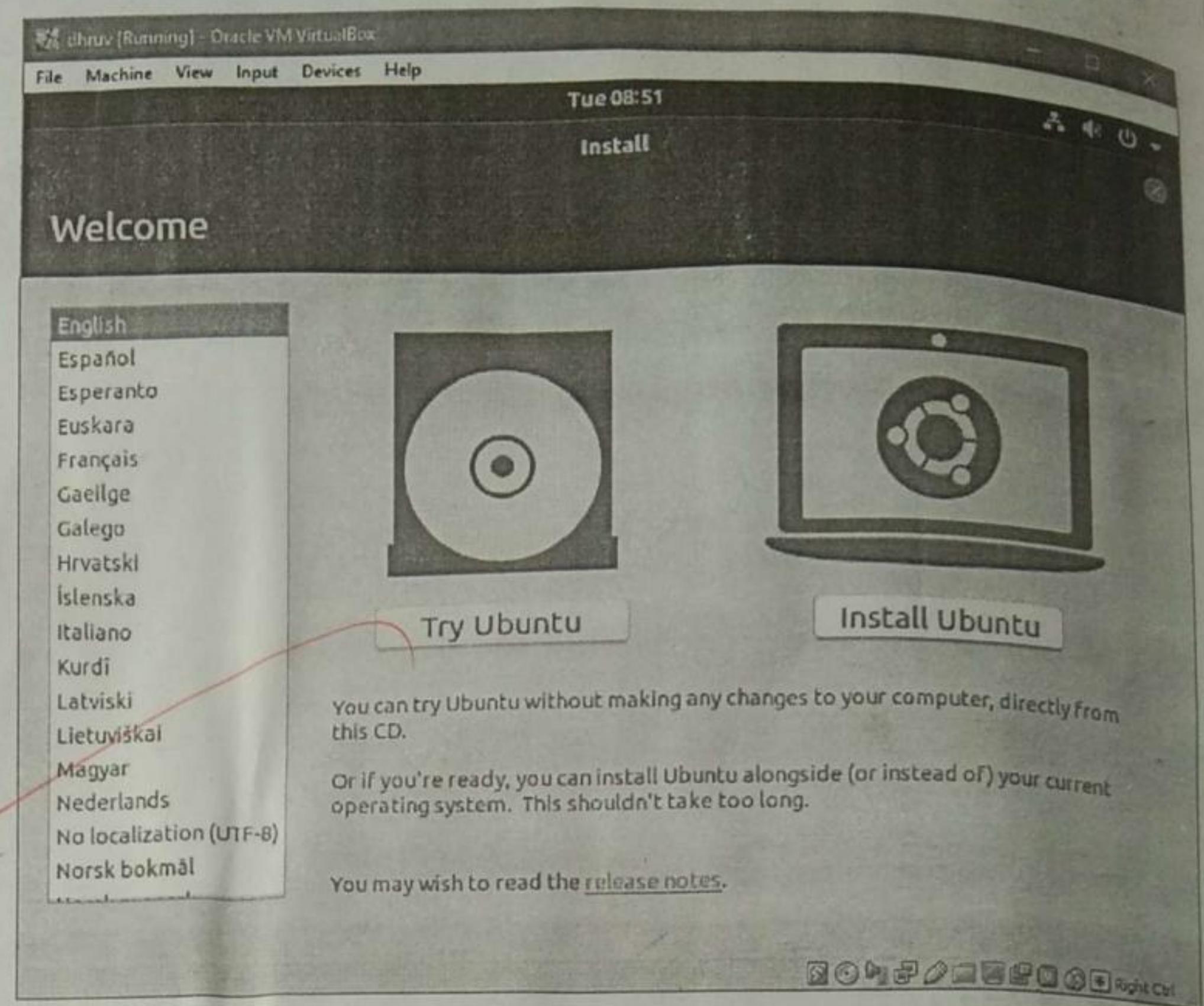
Accessing Appearance settings:

To access Appearance settings in

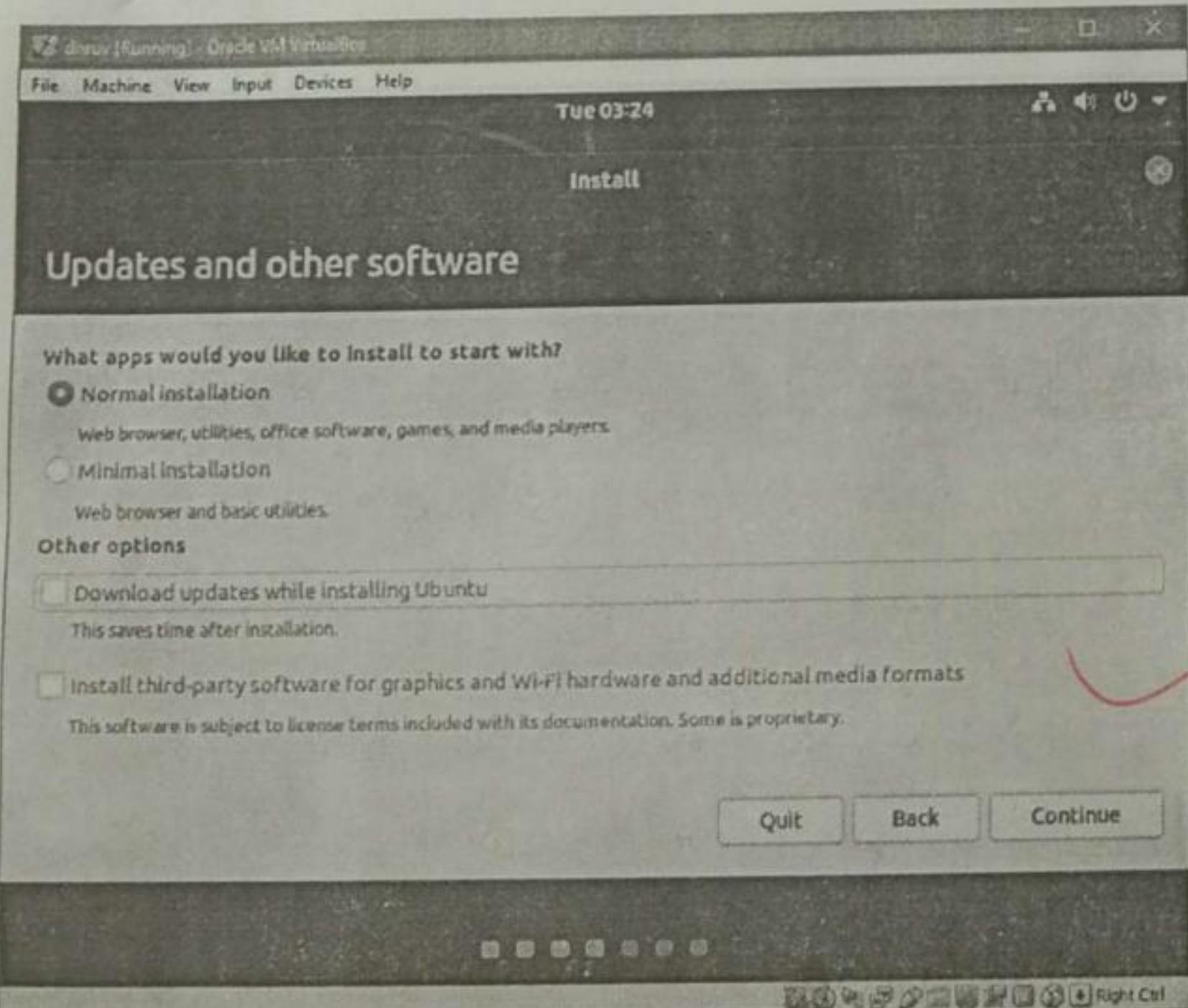
Step1



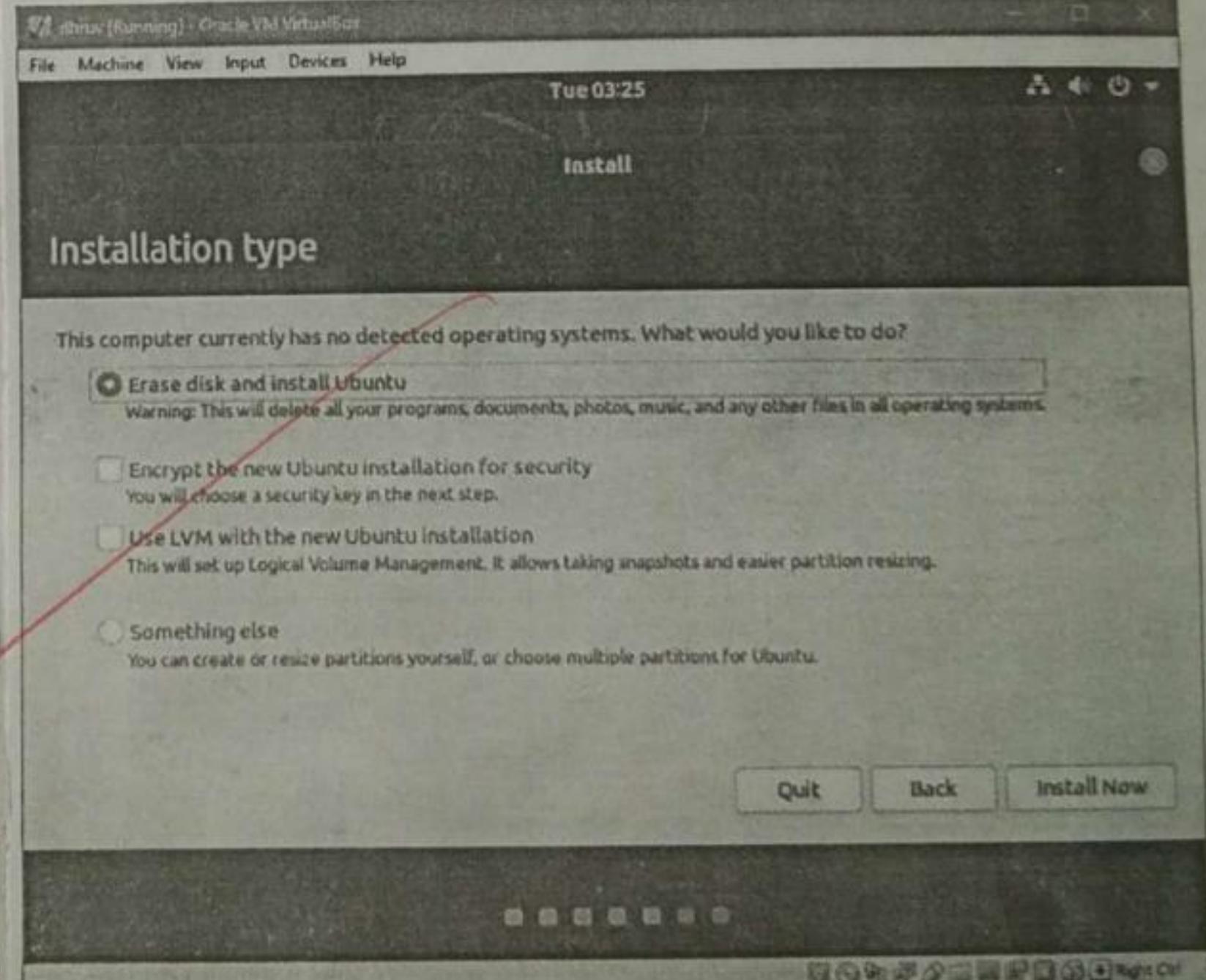
Step 2



Step3



step 4



Ubuntu, let's click on user menu at the top right corner, on the top menu bar and select system settings.

- A window will pop-up with all settings divided into Personal, Hardware and system options icons. Let's first select the Appearance icon.

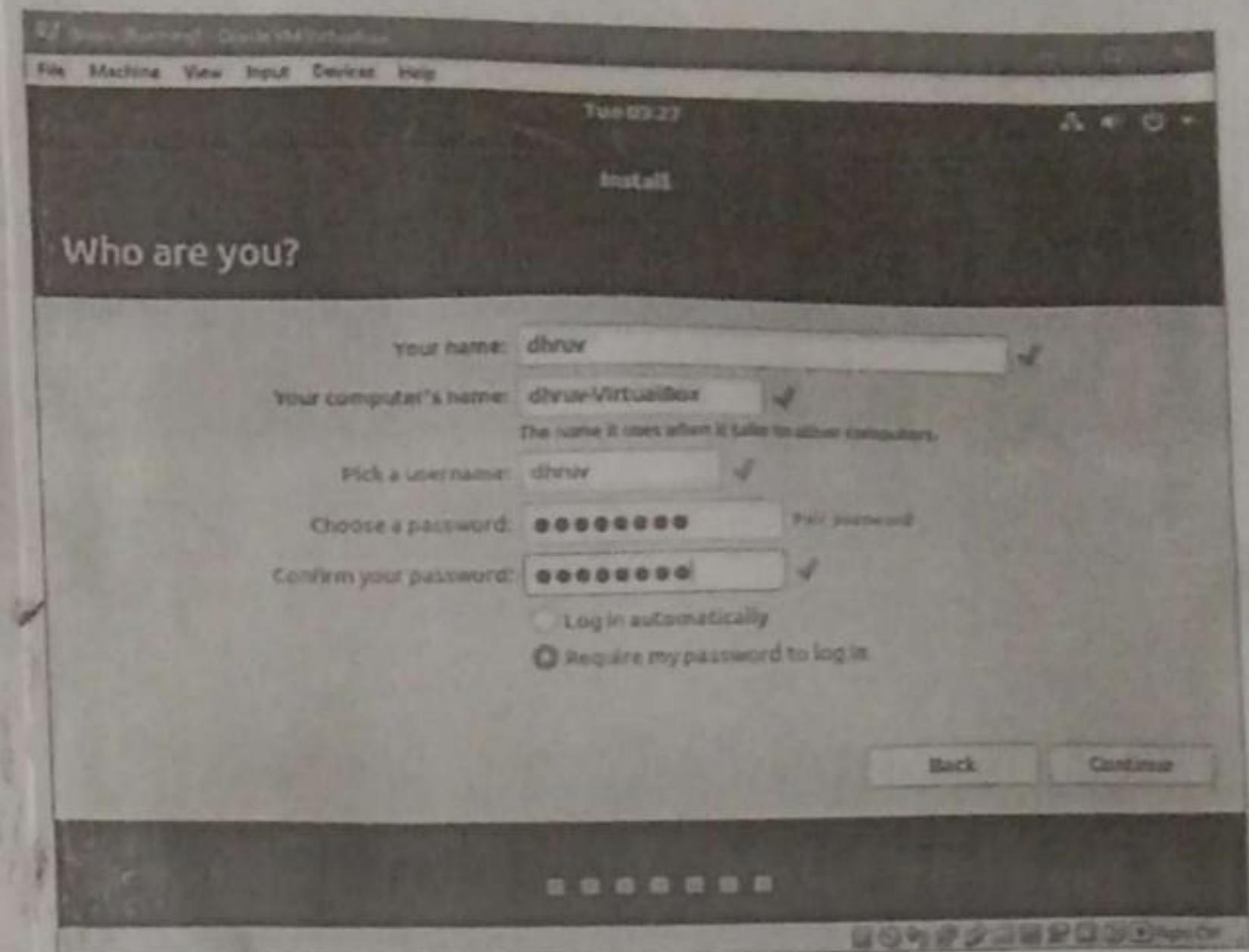
Changing Wallpaper Picture:

- On the left side of Background part, you can see your current wallpaper.
- On the right side is part where we can select one of Ubuntu wallpapers. Clicking on any thumbnail our wallpaper will be changed right away, with a fading effect.
- If you want to select wallpaper from your picture folder, click the drop down menu above thumbnails and select the 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 the Plus

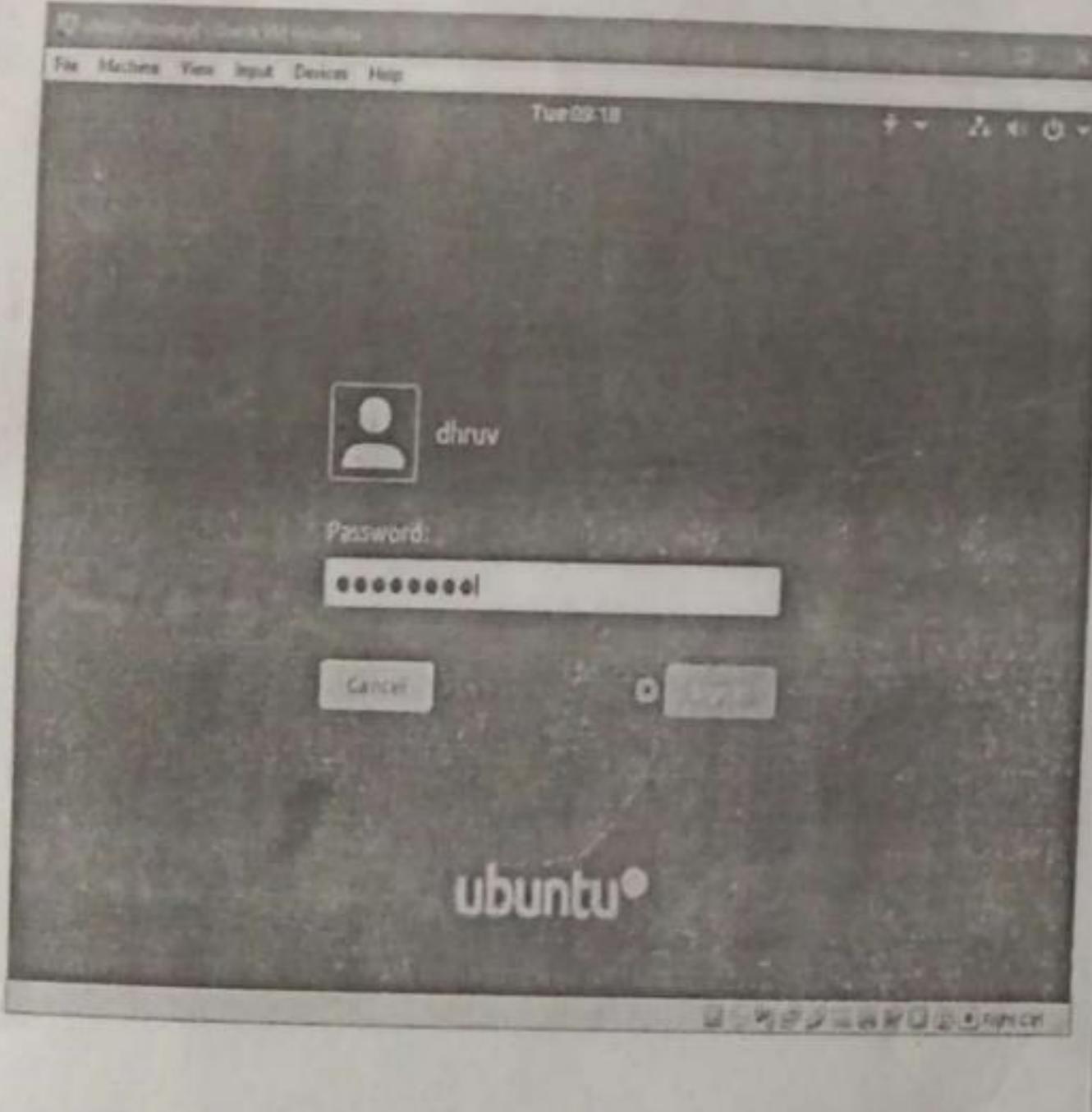
Step5



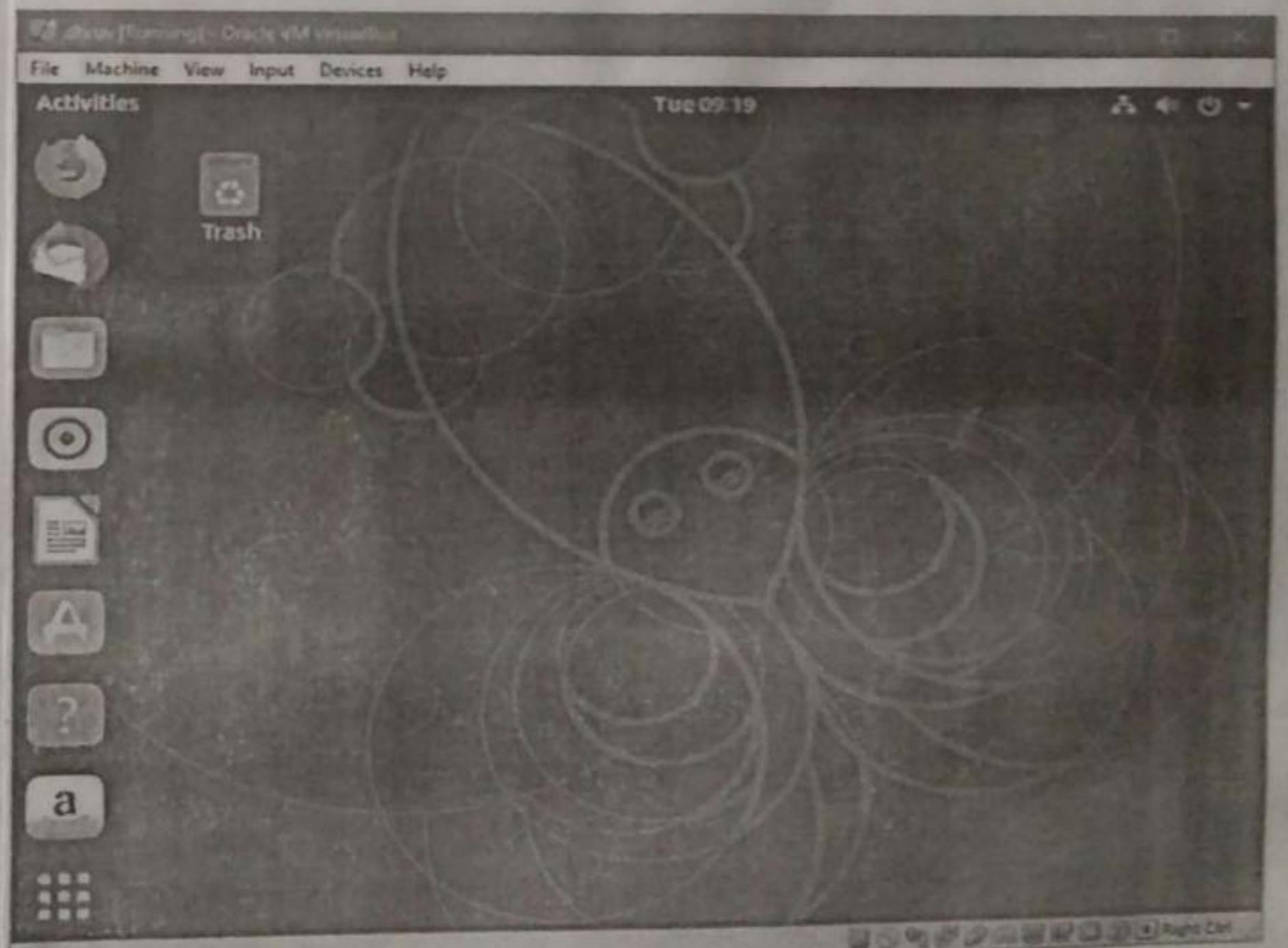
step6



Step7



step 8



icon below the thumbnails and then in Pop-up window, select the path to our custom folder and choose the picture inside of it.

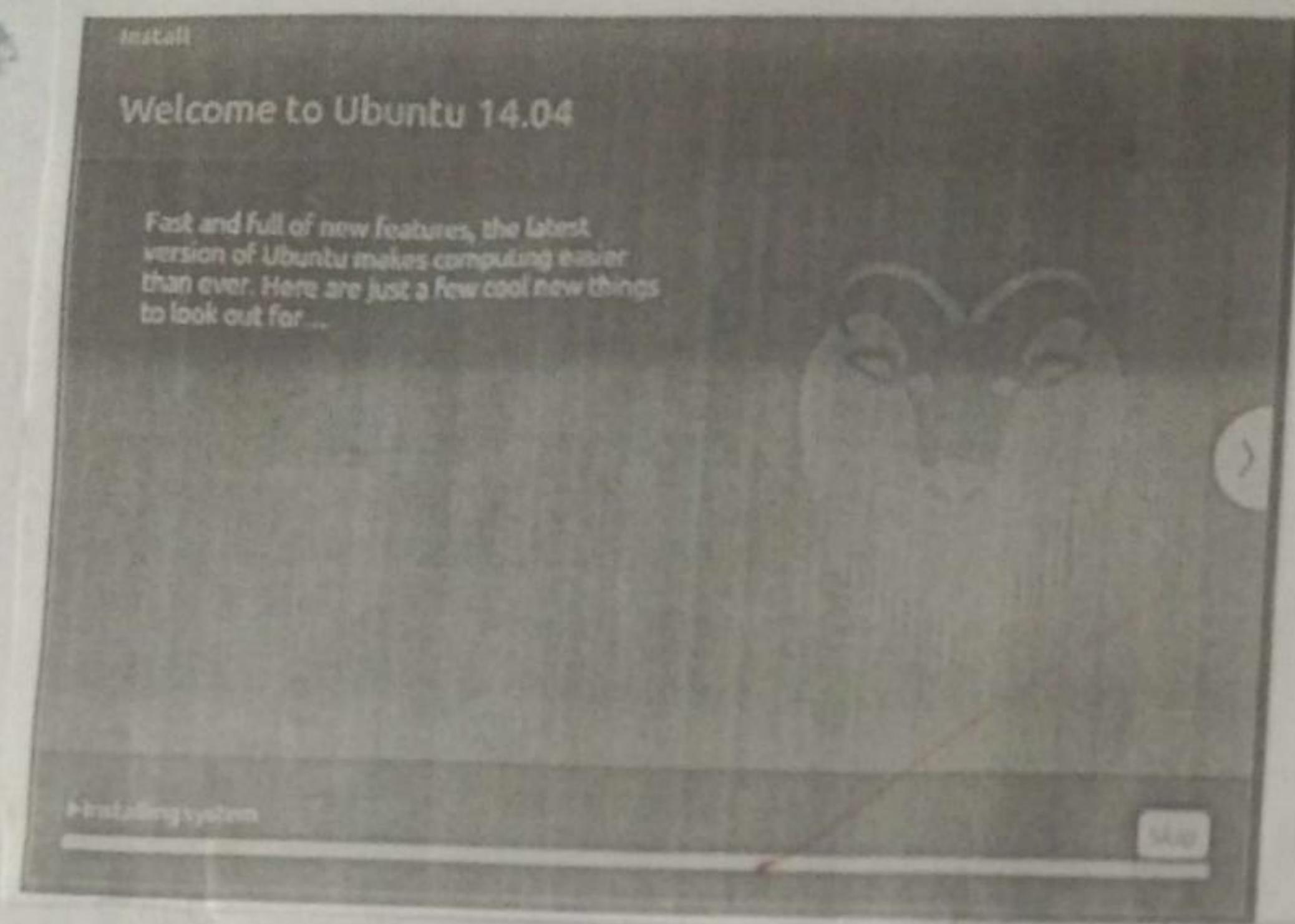
Changing Ubuntu theme:

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

(c) Screen Resolution: Ascertain the current screen resolution for your desktop:

Change the or rotation of the screen

- you can change how big (or how detailed) things appear on the screen by changing the screen resolution.

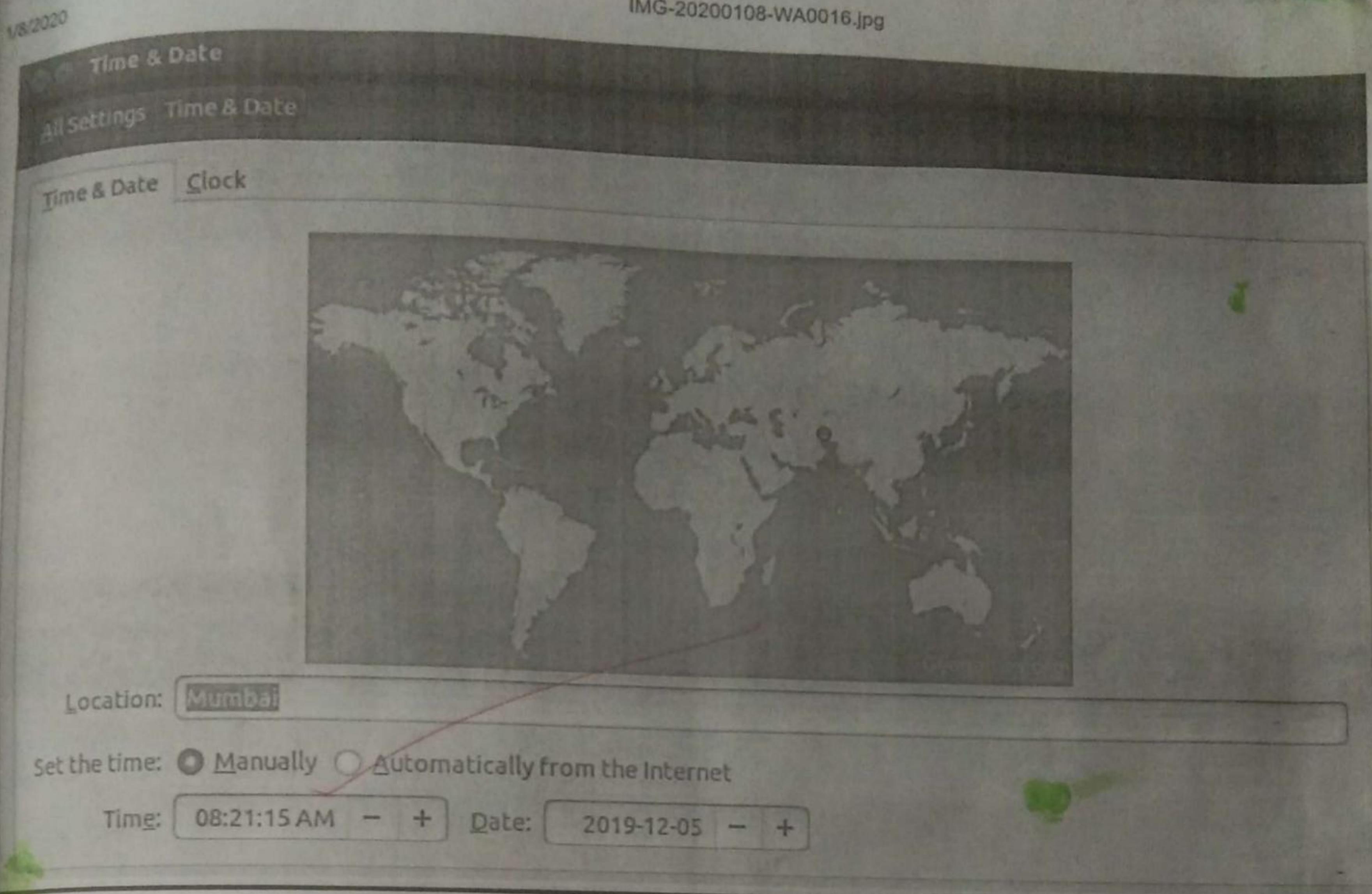


- you can change which way up things appear (for example, if you have a rotating display) by changing the rotation.
1. click the icon on the very right of the menu bar and select System Settings.
 2. open Screen Display
 3. If you have multiple displays and they are mirrored, you can have different settings on each display. Select a display in the preview area.
 4. select your desired resolution and rotation.
 5. click Apply. The new settings will be applied for 30 seconds before reverting back. That way, if you cannot see anything with the new.

(d) Time settings change the time zone of your system to (or New York Time). -

- If you are currently in Indian time. How does the displayed time change.

IMG-20200108-WA0016.jpg



After nothing 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 you can change the time and date manually; otherwise choose your time zone from the map, and choose Automatic.

80
16/01

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 don't have gcc installed.

Step 2: Type 'sudo apt-get install gcc'. After Typing the following command installation will take place.

Step 3:

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

Now TO UNINSTALL UCC compiler:

In UCC 5.1.0, although there is no top-level uninstall target, some directories do have it, in particular gcc, so you can do:

Type: cd build/gcc
sudo make uninstall

This does not remove everything that was installed, but it removes major executables like gcc, g++, CPP..... contained in that directory.

By
16/01

PRACTICAL NO: 3

AIM : Utilization of grep, man Commands
Documentation:

- a) finding info documentation from the commands line:-

Bring up the info page for the group command Bring up the wage section.

- To find info about any command 'info' command is used the syntax of info command "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 on to your screen.

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

Another more summarized form of showing info the 'man' command. The command

is same as 'info', but required data.

- ⑥ Finding man Pages from the commandline:
 Bring up the man Page for the 'ls' command scroll down to the examples 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' o/p 1

- ⑦ Finding man Pages by topic: What man Pages are available that document file compression.

Ans:-

'tar', 'zip' are some man pages which are available for document file compression.

Simply type : man zip
o/p 1
 man tar o/p 1

- ⑧ Finding man Pages by section from the command lines bring up the man Page for the printflib 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 sysadmin stuff. The man page for man itself. explain if and list the stdoubt.

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

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

⑥ Command available line help list the Options for the mkdir command. How can you do this?

\$ mkdir -ma=rwx directoryname

Practical No: 4

Aim :- Command line operations :

- a) Install new package on your system.

sudo apt-get install [Package name]

- b) Remove the Package installed.

sudo apt-get remove [Package name]

- c) Find the Password file in / using find command.

find / -name Password

• /usr/share/doc/nss-1dap-253/
Pam.d/ Password

• /usr/bin/ Password

• /etc/ Password

Find the directory Password file
Under root and one level down.

find / max depth 2 -name Password

• /etc/ Password

Find the Password file under root
and 2 level.

find / -maxdepth 3 -name Password
 • /usr/bin/Password
 • /etc/pam.d>Password
 • /etc/Password

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

Find - maxdepth 3 - maxdepth 5 -name Password.
 • /usr/bin/Password
 • /etc/pam.d>Password

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

ln -sfile1 file2 .

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

touch example.txt
 # mv example.txt /tmp

f) delete the file moved to /tmp in previous absolute method.

rm /tmp/example.txt

1.3

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

whereis ls

ls: /bin /ls/usr/share/man/manL:
ls.gz

whereis ps

ps: /bin/ps /usr/share/meps: /bin
/ps/usr/share/man/manL/ps.gz

whereis bash

bash: /bin/bash /etc/bash.bashrc /usr/
share/man/manL/bash.gz

80
16/0

Practical V - 05

Aim:- File operations

55

1. Explore mounted file systems on your computer.

Ans 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	51116	1%	/run/lock
tmpfs	512076	0	512076	0%	/sys/fs/cgroup
tmpfs	102416	48	102368	1%	/run/user/1000

2. What are the different ways of exploring mounted file systems on Linux?

Ans mount

```
jeba@jeba-VirtualBox:~$ mount
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
udev on /dev type devtmpfs (rw,nosuid,relatime,size=494436k,nr_inodes=123609,mode=755)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,size=102416k,mode=755)
/dev/sda1 on / type ext4 (rw,relatime,errors=remount-ro,data=ordered)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev)
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime,size=5120k)
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,mode=755)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,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)
```

3. Copying text from files.

Ans CP Command , mv Command

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

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

Ans gzip filename.txt
 Bzip2 filename.txt

```
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/00007550000000000000000000000013605376557010365  Sustar  rootrootmnn/hd/0000755000000
000000000000000013605376557010760  Sustar  rootrootjeba@jeba-VirtualBox:/ $ ■
```

```
jeba@jeba-VirtualBox:~/jeb$ bzip2 ss.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt.bz2
BZh91AY&SY`*0000000000000000000000000000000013605376557010365
JewSSo0001 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
*00000d.txt+0*Ie*Me***+0000000000000000000000000000000013605376557010760
jeba@jeba-VirtualBox:~/jeb$ ■
```

5. use diff command to create diff of two files.

~~AWS~~ diff filename1 filename2

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

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

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

-80
Tblo!

Practical : 6

- Aim: User Environment
- a) Which account you are logged in?
How do you find out?

Ans Who command & whoami

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

Ans cat/etc/shadow

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

- Username, upto 8 characters. Case-sensitive usually all lowercase. A direct match to the username in the /etc/passwd file.
- Password, 13 characters encrypted. A blank entry (eg. ::) indicates a password is not required to log in (usually indicates the account has been disabled).
- The number of days (since January 1, 1970) since the password was last changed.

57

```
jeba@jeba-VirtualBox ~
jeba@jeba-VirtualBox:~$ who
jeba    tty7          2020-01-15 20:32 (:0)
jeba@jeba-VirtualBox:~$ whoami
jeba
jeba@jeba-VirtualBox:~$ who -l
LOGIN   tty1          2020-01-15 20:30
jeba@jeba-VirtualBox:~$ █
jeba@jeba-VirtualBox:~$ w
20:35:04 up 4 min, 1 user, load average: 0.78, 0.79, 0.38
USER   TTY      FROM           LOGIN@  IDLE   JCPU   PCPU WHAT
jeba   tty7      :0            20:32   4:28   8.19s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -s
20:35:14 up 4 min, 1 user, load average: 0.60, 0.77, 0.37
USER   TTY      FROM           IDLE WHAT
jeba   tty7      :0            4:38   /sbin/upstart --user
jeba@jeba-VirtualBox:~$ w -h
jeba   tty7      :0            20:32   4:44   8.67s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -f
20:36:12 up 5 min, 1 user, load average: 0.41, 0.69, 0.37
USER   TTY      LOGIN@  IDLE   JCPU   PCPU WHAT
jeba   tty7      20:32   5:36   9.00s  0.33s /sbin/upstart --user
```

780 id=tty1

```
jeba@jeba-VirtualBox:~$ w
20:35:04 up 4 min, 1 user, load average: 0.78, 0.79, 0.38
USER   TTY      FROM           LOGIN@  IDLE   JCPU   PCPU WHAT
jeba   tty7      :0            20:32   4:28   8.19s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -s
20:35:14 up 4 min, 1 user, load average: 0.60, 0.77, 0.37
USER   TTY      FROM           IDLE WHAT
jeba   tty7      :0            4:38   /sbin/upstart --user
jeba@jeba-VirtualBox:~$ w -h
jeba   tty7      :0            20:32   4:44   8.67s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -f
20:36:12 up 5 min, 1 user, load average: 0.41, 0.69, 0.37
USER   TTY      LOGIN@  IDLE   JCPU   PCPU WHAT
jeba   tty7      20:32   5:36   9.00s  0.33s /sbin/upstart --user
```

- The number of days before password may be changed (0 indicates it may be changed at any time).
- The number of days after which password must be changed (99999 indicates user can keep his or her password unchanged for many, many years).
- The number of days to warn user of an expiring password (7 for a full week).
- The number of days after password expires that account is disabled.
- The number of days since January 1, 1990 that an account has been disabled.
- A ~~reserved~~ field for possible future use.

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

- Username, up to 8 characters. case-sensitive, usually all lowercase.

```
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:::
```

- An "x" in the password field. Passwords are stored in the "/etc/shadow" file.
- Numeric userid. This is assigned by the "adduser" script. Unix uses this field plus the following group field, to identify which files belong to the user.
- Numeric groupid. Red Hat uses group id's in a fairly unique manner for enhanced file security. Usually the group id will match the userid.
- 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/smithj). 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 the bash shell (my personal favorite shell).

jeba@jeba-VirtualBox:~\$ sudo cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/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:Mail list Manager:/var/list:/usr/sbin/nologin

- (c) List your current working directory.
 Ans ~~pwd~~
- (d) Explore different ways of getting command history, how to run previously executed command without typing it.
~~one~~
 history
 ! line number
- (e) Create alias to most commonly used commands.

Alias command instructs the shell to replace one string with another string while executing the commands.

Ans alias label = "command"

SD
23/01

```
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  
Documents examples.desktop  jj  new  Pictures  Templates  
jeba@jeba-VirtualBox:~$ █
```

Practical: 7

13

Aim: Linux Editors : Vi

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

i) Creating a file:

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

ii) Modifying the 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:

Movement in four direction.

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

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)	Move to first character of a line
\$	Move to the end of line

Scrolling

Key	Action
Ctrl+f	Scrolls forward
Ctrl+b	Scrolls backward
Ctrl+d	Scrolls half page
Ctrl+u	Scrolls half page backward

- b) Learn all essential commands like search/ replace , highlight , show line numbers .

1) Replace

Syntax: /g /word to replaced/s //new word/gc

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

I

:g/mv/s//our/gc
```

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

P

replace with our (y/n/a/q/l/^E/^W)P■
jeba@jeba-VirtualBox: ~

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

ii) Highlight

use set hlsearch

iii) Show the line numbers

Use set nu

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

80
23p1

Practical - 08

AIM: Linux security

- ③ Use of sudo to change user Privileges
do root.
→ Create an user named user1.

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

To 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.

```
jeba@jeba-VirtualBox:~$ su user1
Password:
user1@jeba-VirtualBox:/home/jeba$ mkdir folder1
mkdir: cannot create directory 'folder1': Permission denied
user1@jeba-VirtualBox:/home/jeba$ sudo mkdir folder1
[sudo] password for user1:
user1 is not in the sudoers file. This incident will be reported.
```

c) Modify expiration date of new user using password aging.

...g.

```
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change : Jan 20, 2020
Password expires       : never
Password inactive      : never
Account expires        : never
Minimum number of days between password change : 0
Maximum number of days between password change : 99999
Number of days of warning before password expires : 7
```

```
jeba@jeba-VirtualBox:~$ sudo chage user1
Changing the aging information for user1
Enter the new value, or press ENTER for the default
      Minimum Password Age [0]: 100
      Maximum Password Age [99999]: 200
      Last Password Change (YYYY-MM-DD) [2020-01-20]: 2020-01-21
      Password Expiration Warning [7]: 5
      Password Inactive [-1]:
      Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change : Jan 21, 2020
Password expires     : Aug 08, 2020
Password inactive    : never
Account expires       : Jan 31, 2020
Minimum number of days between password change : 100
Maximum number of days between password change : 200
Number of days of warning before password expires : 5
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ sudo chage -E 25/01/2020 -m 10 -M 90 -I 30 -W 30 user1
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change : Jan 21, 2020
Password expires     : Apr 20, 2020
Password inactive    : May 20, 2020
Account expires       : Jan 01, 2022
Minimum number of days between password change : 10
Maximum number of days between password change : 90
Number of days of warning before password expires : 30
jeba@jeba-VirtualBox:~$
```

-E : Expiration Date

-m : Minimum number of days before
Password change

-M : Number of days Password is valid

-I : Account inactive

-W : Number of days of warning
before a password change is
required.

④ Delete newly added user

65

```
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:~$
```

PP
23/10

Practical :- 9

Aim : Network Management

(a) Cret IP address of your machine using ifconfig.

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox: ~$ ifconfig
enp0s3      Link encap:Ethernet HWaddr 08:00:27:0e:6b:69
             inet addr: 10.0.2.15 Bcast:10.0.2.255 Mask:255.255.255.0
                     inet6 addr: fe80::c0cd:53a0:d5a3:848e/64 Scope:Link
                         UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
                         RX packets:2 errors:0 dropped:0 overruns:0 frame:0
                         TX packets:73 errors:0 dropped:0 overruns:0 carrier:0
                         collisions:0 txqueuelen:1000
                         RX bytes:1180 (1.1 KB) TX bytes:8518 (8.5 KB)

lo          Link encap:Local Loopback
             inet addr: 127.0.0.1 Mask:255.0.0.0
                     inet6 addr: ::1/128 Scope:Host
                         UP LOOPBACK RUNNING MTU:65536 Metric:1
                         RX packets:53240 errors:0 dropped:0 overruns:0 frame:0
                         TX packets:53240 errors:0 dropped:0 overruns:0 carrier:0
                         collisions:0 txqueuelen:1
                         RX bytes:4225072 (4.2 MB) TX bytes:4225072 (4.2 MB)
```

(b) Cret hostname of your machine

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

① Using Ping to check the network connectivity to remote machines -

machines

```
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:~$
```

② Use of dig command

```
jeba@jeba-VirtualBox:~$ dig www.google.com
; <>> DiG 9.10.3-P4-Ubuntu <>> www.google.com
; global options: +cmd
; Got answer:
; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52068
; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
;
; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; QUESTION SECTION:
www.google.com.           IN      A
;
; ANSWER SECTION:
www.google.com.         91      IN      A      172.217.166.100
;
; Query time: 152 msec
; SERVER: 127.0.1.1#53(127.0.1.1)
; WHEN: Mon Jan 20 22:40:06 IST 2020
; MSG SIZE  rcvd: 59
jeba@jeba-VirtualBox:~$
```

(e) Troubleshooting network Using traceroute , route command.

```
jeba@jeba-VirtualBox:~  
jeba@jeba-VirtualBox:~$ traceroute www.google.com  
traceroute to www.google.com (172.217.166.100), 30 hops max, 60 byte packets  
 1  10.0.2.2 (10.0.2.2)  0.190 ms  0.143 ms  0.151 ms  
 2  * * *  
 3  10.0.2.2 (10.0.2.2)  68.568 ms  68.486 ms  68.405 ms  
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ route  
Kernel IP routing table  
Destination     Gateway         Genmask        Flags Metric Ref    Use Iface  
default         10.0.2.2      0.0.0.0       UG    100    0        0 enp0s3  
10.0.2.0        *             255.255.255.0  U     100    0        0 enp0s3  
link-local      *             255.255.0.0   U     1000   0        0 enp0s3  
jeba@jeba-VirtualBox:~$
```

(f) Use of ~~arp~~ command

```
jeba@jeba-VirtualBox:~  
jeba@jeba-VirtualBox:~$ arp  
Address          Hwtype  Hwaddress          Flags Mask           Iface  
10.0.2.2        ether   52:54:00:12:35:02  C               enp0s
```

(g) Use of host command

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

b) use of netstat command and Nmap command

67

jeba@jeba-VirtualBox:~\$ netstat		
Active Internet connections (w/o servers)		
Proto	Recv-Q	Send-Q
Active UNIX domain sockets (w/o servers)		
Proto	RefCnt	Flags
unix	2	[]
d/notify	2	[]
unix	2	[]
syslog	16	[]
unix	7	[]
dev-log		
unix	7	[]
socket		
unix	3	[]
stdout	3	[]
unix	3	[]
stdout	3	[]
unix	3	[]
unix	3	[]

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:~\$ █

PD
23/01

Practical-10

Aim: SHELL SCRIPTING

Basics of shell scripting

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

Echo \$SHELL

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

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

tcsc@tcsc-VirtualBox: ~

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

"linux.sh" [New File]

- chmod 777 filename.sh
- ./filename.sh

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

- Step to write and execute a shell script.
 Shell script is just a simple text file with .sh extension , having executable permission.

- ④ open terminal
- ⑤ 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"
```

```
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: ~
```

- 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: ~
```

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

:wq

```
tcsc@tcsc-VirtualBox: ~  
tcsc@tcsc-VirtualBox: $ vi linux2.sh  
tcsc@tcsc-VirtualBox: $ chmod 777 linux2.sh  
tcsc@tcsc-VirtualBox: $ ./linux2.sh ...  
Sum is:125  
tcsc@tcsc-VirtualBox: ~
```

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

```
tcsc@tcsc-VirtualBox ~  
~/bin/bash  
sum=$((S1+S2))  
echo "sum is:$sum"  
  
"lin.sh" 3 lines, 46 characters
```

```
tcsc@tcsc-VirtualBox:~$ vi lin.sh  
tcsc@tcsc-VirtualBox:~$ chmod 777 lin.sh  
tcsc@tcsc-VirtualBox:~$ ./lin.sh 50 70  
sum is:120  
tcsc@tcsc-VirtualBox:~$
```

Sed: Sed command or Stream Editor is very powerful utility offered by Linux systems. It is mainly used for text substitution, find & replace but it can performs 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  
  
:wq!
```

① Displaying partial text of a file

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

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

② Display all except some lines

To display all content of a file except for some portion, use `sed`

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

- ③ Deleting a line
To delete a line, use line number
followed by ~~d~~.

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

- ④ Search and Replacing a String

's' option is for searching a word

tcsc@tcsc-VirtualBox:~\$ sed 's/cs/computer/' cs.txt
subjects offered in computer
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic

⑤ Replace a string on a particular line
To replace a string on a particular line, use line numbers with 's' option. 71

```
tcsc@tcsc-VirtualBox: $ sed '6 s/cs/computer system /' cs.txt
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
```

⑥ Add a line after/before the matched string.
To add a new line with some content after every pattern match, use option 'a'.

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

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

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

- 7) To change a whole line with matched patterns.
- To change a whole line to a new line which a search pattern matches use option 'c'.

```
tcsc@tcsc-VirtualBox:~$ sed '/linux/c "this is linux"' cs.txt
subjects offered in cs
datastructure
database management
>this is linux<
python
green tech
softskill
stats
calculus
computer basic
```

8) Appending lines

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

```
tcsc@tcsc-VirtualBox:~$ sed -e 's/.*/Thanks &/' cs.txt
Thanks subjects offered in cs
Thanks datastructure
Thanks database management
Thanks linux
Thanks python
Thanks green tech
Thanks softskill
Thanks stats
Thanks calculus
Thanks computer basic
```