

Ques:- Ans:- You have choice of Linux distribution e.g. Ubuntu, Fedora, Debian, etc.

Ubuntu : Ubuntu is a free and open source software based on Debian. Ubuntu is officially developed under 3 editions to keep server, desktop and mobile. All three editions can be runned on the computer alone or a virtual box machine. It is a popular open source software for cloud computing with support of openstack.

Steps for installing Ubuntu in virtual machine.

Step 1 : Select a virtual optical file or a physical drive to start Ubuntu in your virtual machine. Space given 1.06 GB.

Step 2 : Select language of your choice and click on install Ubuntu.

You can also try Ubuntu for free on computer drive from this CD.

Step 3 : In update and add software click on the normal installation.

Step 4 : While configuring Installation type we need to click Erase and Alloc and install Ubuntu. This step would type of document photo etc in all operating system.

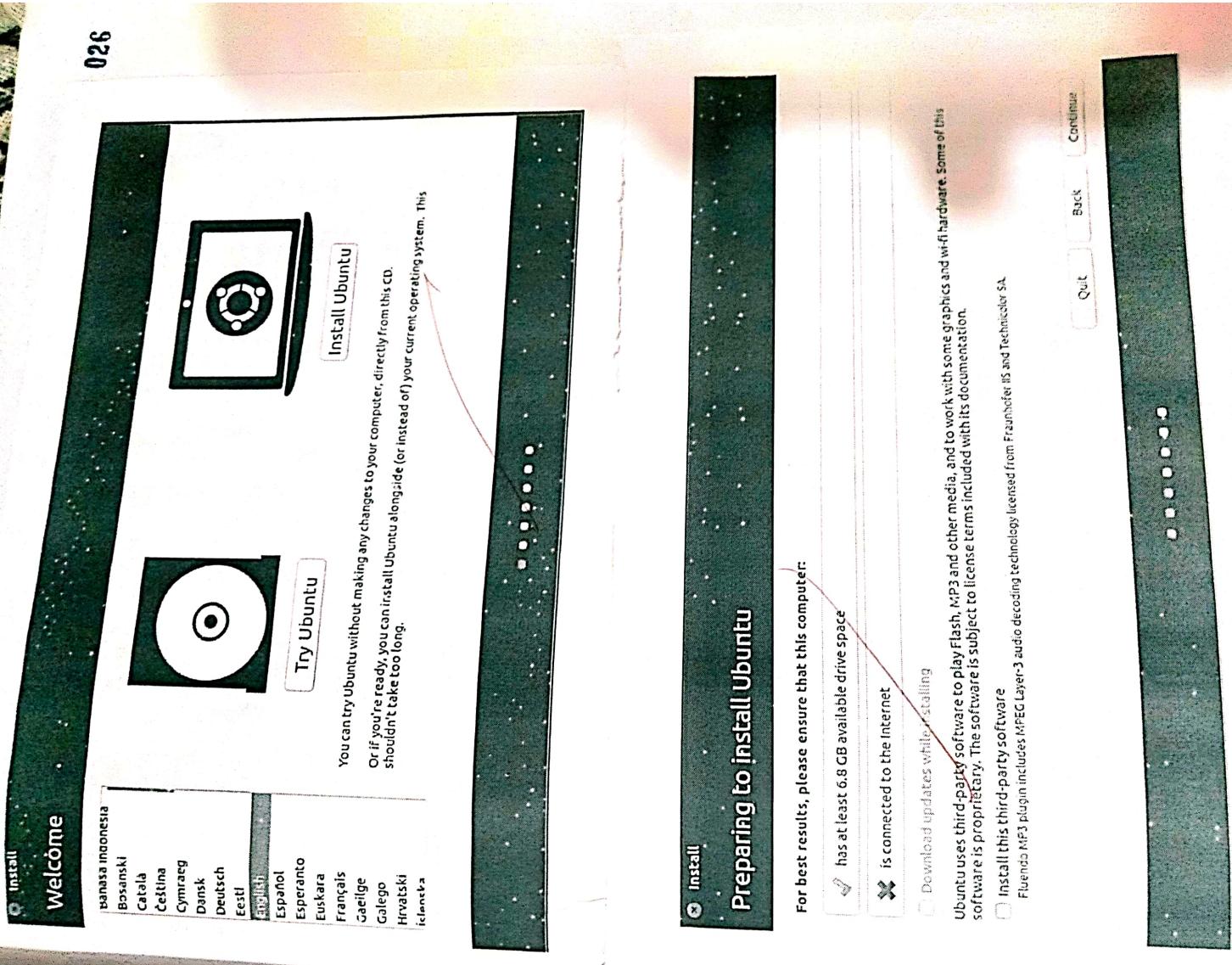
**Step 5 =** In this you only need to choose the location for the clock to work. On Ubuntu,

**Step 6:** In this type you need to choose your username and password for the login. In my account I chose "Step 6" as my login and "password" as my password and then click on continue.

**Step 8:** Type name of virtual click and recommend size to be given as  
2048 GB or 2780 therefore now the virtual box is ready for use.

**Welcome**

Install



The image shows the Ubuntu 12.04 LTS desktop environment. On the left, there's a vertical menu bar with language options: Bahasa Indonesia, Bosanski, Català, Čeština, Cymraeg, Dansk, Deutsch, Eesti, English, Español, Esperanto, Euskara, Français, Gaeilge, Galego, Hrvatski, and Italiana. Below this is a large 'Welcome' banner with a green gradient background. It features a central icon of a computer monitor with a circular logo on it, a CD icon, and two 'Try Ubuntu' and 'Install Ubuntu' buttons. To the right of the banner, there's a text block: 'You can try Ubuntu without making any changes to your computer, directly from this CD. Or if you're ready, you can install Ubuntu alongside (or instead of) your current operating system. This shouldn't take too long.' A red arrow points from the text towards the 'Install Ubuntu' button.

**Preparing to Install Ubuntu**

For best results, please ensure that this computer:

- has at least 6.8 GB available drive space
- is connected to the Internet
- Download updates while installing

Ubuntu uses third-party software to play Flash, MP3 and other media, and to work with some graphics and wi-fi hardware. Some of this software is proprietary. The software is subject to license terms included with its documentation.

Install this third-party software  
Fluendo MP3 plugin includes MP3 Layer-3 audio decoding technology licensed from Fraunhofer IIS and Technicolor SA.

Install Back Continue



Instapal

Where are you?

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

### Accessing Appearance settings.

- 1) To access Appearance settings in Ubuntu lets click on user menu in the top right corner. On the top menu bar and select system settings.
- 2) A window will pop-up will all settings divided into personal, hardware and systems options icons lets first select the appearance icons.

Changing wallpaper picture.  
On the left side of Background part you can see your current wallpaper. On the right side is that where we can select one of existing wallpaper clicking on any thumbnail.

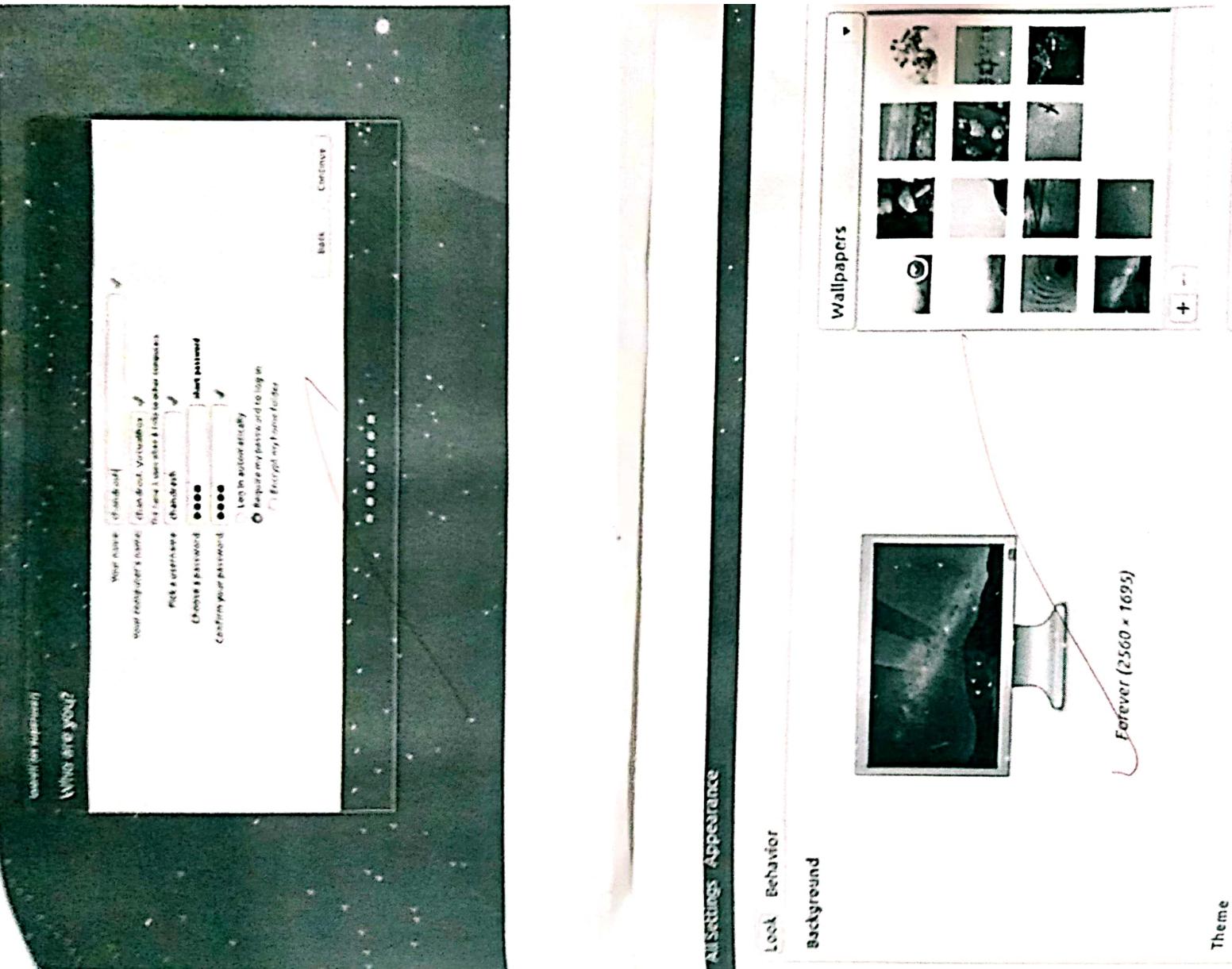
If you want to select wallpaper from your pictures folder, click the drop-down menu above thumbnails and select the pictures folder.

- 4) You will see all the picture in your picture folder as thumbnails where you can select as your wallpaper.
- 5) To add wallpaper that is in another folder just click the plus icon below the thumbnails and then in pop-up window select the path to our custom folder and choose the picture inside of it.

### Changing Ubuntu theme

- 1) Ubuntu also has an option to change the desktop theme which in one click will change the entire way your computer looks.
- 2) To do that click on the drop-down menu below the wallpaper thumbnails and choose between Ambiance, Radiance or High contrast.

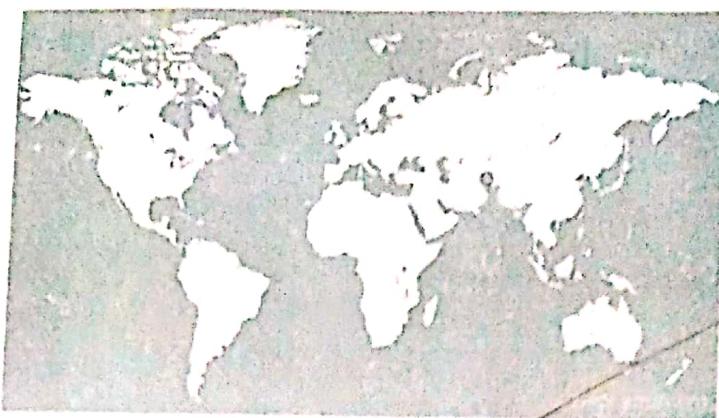
Ambiance is a light them that looks a bit more mac-like while Radiance is the darker brown them used in Ubuntu by default.



Time & Date

All Settings Time & Date

Time & Date Clock



Location: Mumbai

Set the time:  Manually  Automatically from the Internet

Time: 08:21:15 AM - + Date: 2019-12-05 - +

**Screen Resolution:** Ascertain the current screen resolution for your desktop.

Change the size or rotation of the screen. You can change how big (or how distorted) 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.

Click the icon on the very right of the menu bar and select System settings.

Open: screen display and they are not mirrored. If you have different settings on each display and rotate them. Select your desired resolution and rotate click apply. The new settings will be applied for 30 seconds before reverting back. That way if you cannot see anything with both the monitors.

- d) Time setting change the time zone of your system do now, your time  
1) If you are currently in Andam  
time (my) now choose the displayed time changes.
- 2) After setting the time change change the time zone back to your local time zone.
- 3) Just click on the clock on the top bar, and choose AM/PM and date setting once the time and date window open, choose manually so you can change the AM/PM & date manually otherwise choose year them zone the setup, and choose Automate.

9/6/0

## Activity: Installing and removing software

031

- ② Install gcc package, verify that it runs

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 trying the following command will take place.

Step 3:

Type `sudo apt-get install build-essential` This will install all libraries required for C and C++ programming language

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

Type : `cd build/gcc`  
`sudo make uninstall`.

This does not remove everything that was installed but it removes any ~~or~~ executables like `gcc`, `g++`, `cpp` contained in that directory.

### Practical no. 3

033

Aim: Utilization of grep, man commands

Documentation:

- a) finding info documentation commands  
Commands line: bring up the info page for the grep command. Bring up the usage section.

Ans:- To find info about any command its well if info command is well known name.

Use are given to find the info about the grep command:

Open the terminal ( $ctrl + alt + T$ ) and type: info grep.

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

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

Another one is summarized from of scrolling info is the man command. The command of info is same as 'info' but required data.

b] finding man pages from the command line  
 Bring up the man page for the ls command, down to the example section.

Ans: To use the 'man' command simply type 'man ls' (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 that document files 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 cmdlines:  
 bring up the man page for the printlib function which manual page section are library function found-

Ans: The number corresponds to what section of the manual page is from; 1 as user command, while & is sysadmin stuff. The man page for man itself explain it and list the std.

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

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

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-ldap-2.53/pam.d/password
- /usr/bin/password
- /etc/pam.d/password
- /etc/password

find the password file b/w sub-directories

and 2+4

✓ # find -maxdepth 3 -name pas  
✓ /usr /bin /passwd /etc /passwd

d) Create a symbolic link to the file you found

In last step.

## ln -s file1 file2

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

# touch example.txt

# mv example.txt /tmp

deletion the file moved to /tmp in previous step by absolute method.

# rm /tmp/examp.txt

~~rm -r /tmp~~

Q)

find the location of ls, ps, bash

036

# where is ls

ls: /bin/ls | less | share/man/man1/s.1.92

# where is ps

ps: /bin/ps | less | share/man/man1/ps.1.92

# where is bash.

bash: /bin/bash | less | share/man/man1/bash.1.92

~~PS  
09/01~~

```
jeb03jeb0-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=494430k,nr_inodes=123009,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-cg-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=)
```

Practical no - 5  
file operation

- 037
- 1 explore mounted file system on your computer.
  - Ans :- `df -k`
  - 2 what are the different ways of exploring mounted file system on Linux?
  - Ans :- `mount`
  - 3 copying text from files.
  - Ans :- `cp command, mv command`

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

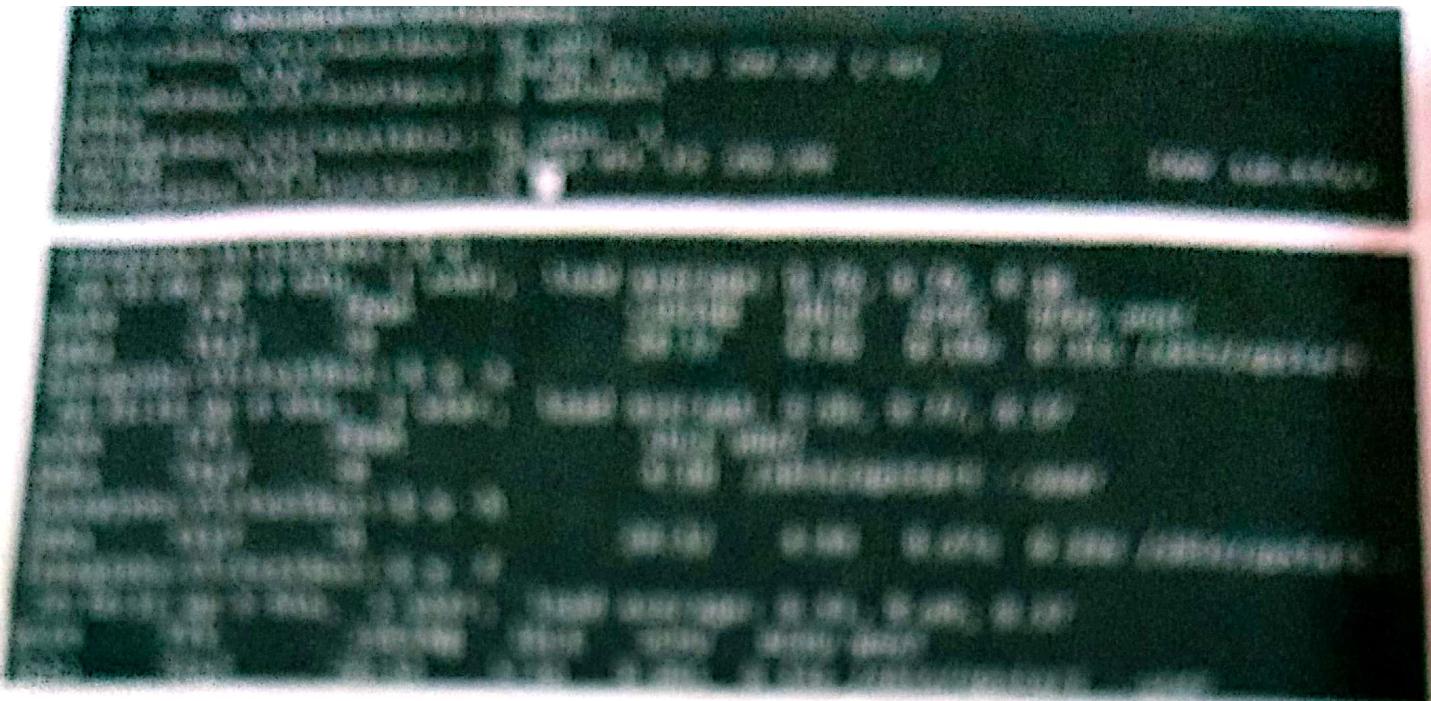
Ans:-  
tar -czvf2 filename.tar  
tar -xvf2 filename.tar

5 Use diff command to create diff two files :- diff filename1 filename2

6 Use patch command to patch a file, command analyze the patch using patch -v option.

✓/✓/✓/✓/✓

```
ls -l /jeps
total 12
drwxr-xr-x 2 jeps jeps 4096 Dec 15 14:45 .
drwxr-xr-x 2 jeps jeps 4096 Dec 15 14:45 ..
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 aa.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 bb.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 cc.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 dd.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ee.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ff.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 gg.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 hh.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ii.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 jj.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 kk.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ll.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 mm.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 nn.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 oo.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 pp.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 qq.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 rr.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ss.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 tt.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 uu.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 vv.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ww.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 xx.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 yy.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 zz.txt
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 aa.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 bb.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 cc.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 dd.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ee.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ff.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 gg.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 hh.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ii.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 jj.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 kk.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ll.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 mm.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 nn.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 oo.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 pp.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 qq.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 rr.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ss.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 tt.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 uu.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 vv.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 ww.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 xx.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 yy.gz
-rw-r--r-- 1 jeps jeps 12 Dec 15 14:45 zz.gz
```



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

An who command & whoami

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

An cat /etc/shadow

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

- Username, up to 8 characters. case-sensitive, usually all lowercase. A direct match to the username in the /etc/passwd file.
- password, 13 characters encrypted. A blank entry (e.g. "") indicates a password is not required to log in (usually a bad idea), and a "\*" entry (e.g. "\*") indicates the account has been disabled.
- The number of days (since January 1, 1970) since the password was last changed.
- The number of days before password may be changed (0 indicates it may be changed at any time).
- The number of days after which password must be changed (9999 indicates user can keep his or her password for many, many years).

- The ~~number~~ 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, 1970 that an account has been disabled.
- A reserved field for possible future use.

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

- Username up to 8 characters case-sensitive usually all lowercase.
- As "x" in the password field. passwords are stored in the "/etc/shadow" file.
- Numeric user id. This is assigned by the "adduser" script. Unix uses this field, plus the following group field to identify which files belong to the user.
- Numeric group id. Red Hat users group id's in a fairly unique manner for security, usually the group id group id will match the user id.
- Full name of user. I'm not sure what maximum length for this field is, but try User's home directory (usually /home/username (eg. /home/smith)). All user's personal files, web pages, mail, etc.

```
jebaa[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:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
```

```
④④④ 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:~$ 13  
who -l  
LOGIN      tty1          2020-01-15 20:30          780 id=tty1  
jeba@jeba-VirtualBox:~$ █
```

User's Shell account". Often set to "/bin/bash" to provide access to the bash shell (my personal favorite shell).

c) Get your current working directory.

d) Explore different ways of getting command history, how to run previously executed command with typing it.

Ans history (alias history) shows a list of line numbers before edit got terminated

e) Create alias to most commonly used commands. Alias command instructs the shell to replace one string with another while executing the command.

Any alias label = "command"

PP  
23/01

- Q) Linux Editors: vi  
a) Create, modifying, search and manipulate  
a file. In editor.  
b) Creating a file.  
To create a file, on the terminal type:  
vi followed by filename.

- iii) ~~Modifying the file:~~  
To modify a file on the vi editor,  
type 'o'.
- iv) Navigation:  
To move forward in a file,  
press the right arrow key.  
To move backward in a file,  
press the left arrow key.

三

Waterfall 6,663 ft. 30° N. 30° E. 30° S. 30° W.

5

Key	Action
I	Move cursor up
K	Move cursor down
J	Move cursor left
L	Move cursor right

Hello to  
This is my Linux example  
Welcome  
Well done  
This is vi Editor  
Thank you

jeba@jeba-VirtualBox ~

Hello  
This is our Linux example  
Welcome  
Well done  
This is vi Editor  
Thank you

## word Navigating action

043

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
o (zero)	Moves to first character of a line
\$	Moves to the end of lines

## scrolling

Key	Action
Ctrl + F	scroll forward
Ctrl + P	scroll backward
Ctrl + D	scroll half page
Ctrl + U	scroll half page backward

Learn all essential command like search / replace, highlight, show line number.

Replace.

840

(ii) highlight  
use set hlssearch

(iii) show the line number  
use set nu

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

:set hlsearch

Show the line number

Use set nu

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

:set nu

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
- Cmd alias specification
- User privilege specification
- root ALL=(ALL:ALL) ALL

```
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:~$ █
```

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

```
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%eth0/64 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  
      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)
```

Get hostname of your machine

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

Use ping to check the network connectivity to remote 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:~$ 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: 0
; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; QUESTION SECTION:
www.google.com. IN A
; ANSWER SECTION:
www.google.com. 91 IN A 172.217.166.166
; 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
link-local      *              255.255.0.0   U        1000  0        0 enp0s3
```

```
jeba@jeba-VirtualBox:~$ arp
jeba@jeba-VirtualBox:~$ arp
Hwtype Hwaddress Flags Mask Iface
ether 52:54:00:12:35:02 C enp0s3
```

```
Scanned with CamScanner
```

Use of arp command

x -o jeba@jeba-VirtualBox:~\$ route
jeba@jeba-VirtualBox:~\$ traceroute www.google.com
jeba@jeba-VirtualBox:~\$ arp
Address Hwtype Hwaddress Flags Mask Iface
10.0.2.2 ether 52:54:00:12:35:02 C enp0s3

Scanned with CamScanner

```
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
DNS 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:~$ █
```

- 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

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

### Step to write and execute a shell script.

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

- a) Open terminal.
- b) Navigate to the place where you want to create script using cd command
- c) Touch filename.sh
- d) Vi filename.sh [You can use your favorite editor, to edit the script]
- e) Chmod 777 filename.sh (for making the script executable)
- f) sh filename.sh or ./filename.sh (for running the script)

Program to display your name

#! bin bash

Echo "Enter your name:"

Read name

Echo "My name is:\$name"

```
tccs@tccs-VirtualBox:~  
$ !/bin/bash  
echo "Enter your name:"  
read name  
echo "My name is: $name"  
read name:  
TANVI  
$ name is: TANVI  
tccs@tccs-VirtualBox:~$ █
```

/bin/bash

#=100

#=25

```
sun=$(( $(cat $b) ))
echo "sun ls:$sun"
```

ing

\* - e csc@tcsctc-VirtualBox: ~

```
tcsctc-VirtualBox:~$ vi lLinux2.sh
tcsctc-VirtualBox:~$ chmod 777 lLinux2.sh
tcsctc-VirtualBox:~$ ./lLinux2.sh
[... ls:125
tcsctc-VirtualBox:~$
```

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

-lin.sh" 3 llnes, 46 characters

## 2) Display all except some lines

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

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

## 3) Deleting a line

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

```
tsc@tsc-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'.

```
tsc@tsc-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  
tsc@tsc-VirtualBox:~$
```

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

```
tsc@tsc-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  
tsc@tsc-VirtualBox:~$
```