

Ques.

- 1) Install your choice of Linux distribution eg. Ubuntu, Fedora.
- 2) Customize desktop environment by changing different default option like changing default background, themes, screensavers.
- 3) Screen Resolution
- 4) Time Settings.

#### a) Installation

Most newer computers can boot from USB. You should see a welcome screen prompting you to choose your language and giving you the option to install Ubuntu or try it from the USB.

If your computer doesn't automatically do so, you might need to press the F12 key to bring up the boot menu, but be careful not to hold it down that can cause an error message.

#### 1. Prepare to install Ubuntu

- We recommend you plug your computer into a power source.
- You should also make sure you have enough space on your computer to install Ubuntu.
- We advise you to select Download updates while installing an install this third-party software now.

Aim:

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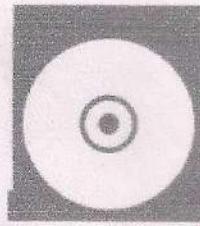
Ubuntu 18.04

## Welcome

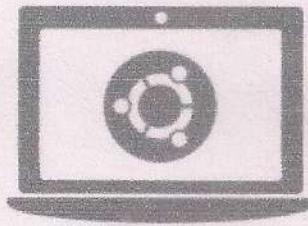
Wed 04:30

Install

- English
- Español
- Esperanto
- Euskara
- Français
- Gaeilge
- Galego
- Hrvatski
- Íslenska
- Italiano
- Kurdi
- Latviski
- Lietuviškai
- Magyar
- Nederlands
- Norsk bokmål
- Norsk nynorsk
- Polski



Try Ubuntu



Install Ubuntu

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.

You may wish to read the [release notes](#).

[www.linuxtech1.com](http://www.linuxtech1.com)

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You should also stay connected to the internet so you can get the latest updates while you install Ubuntu.

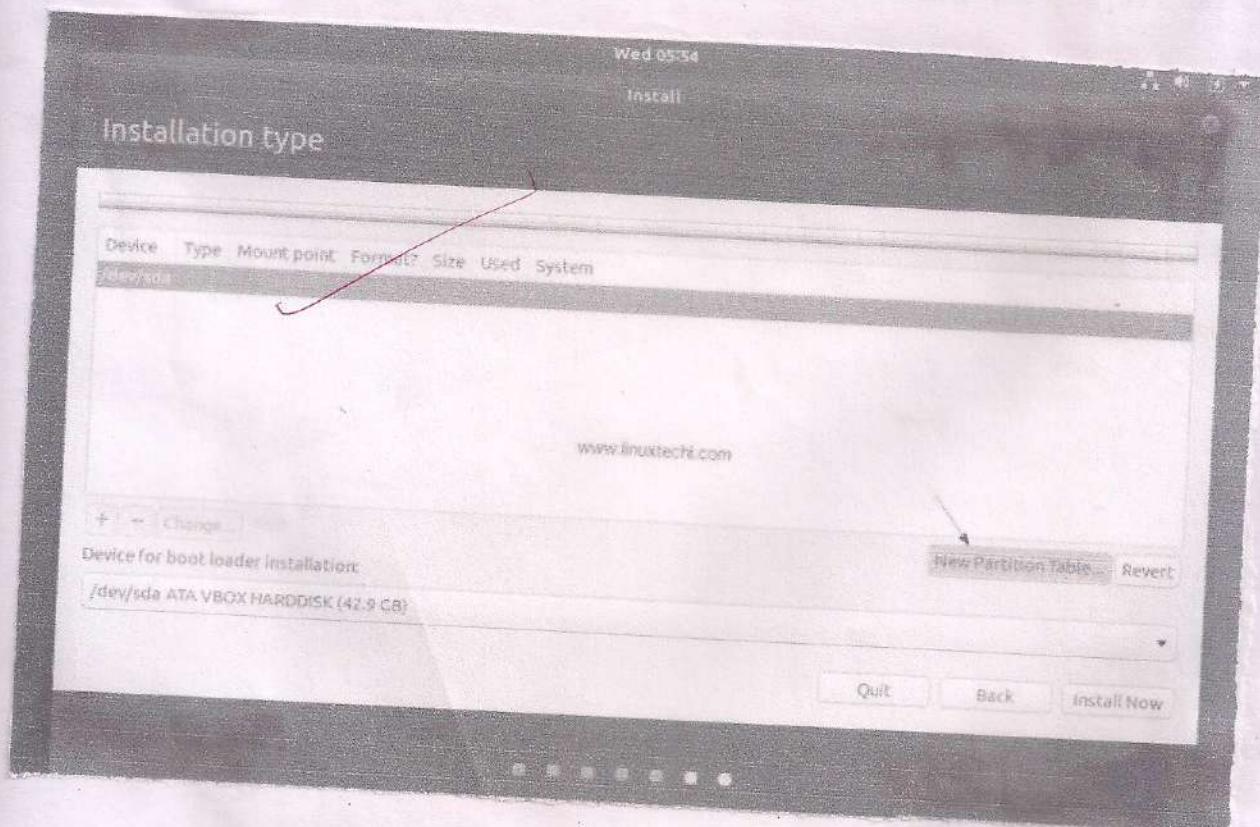
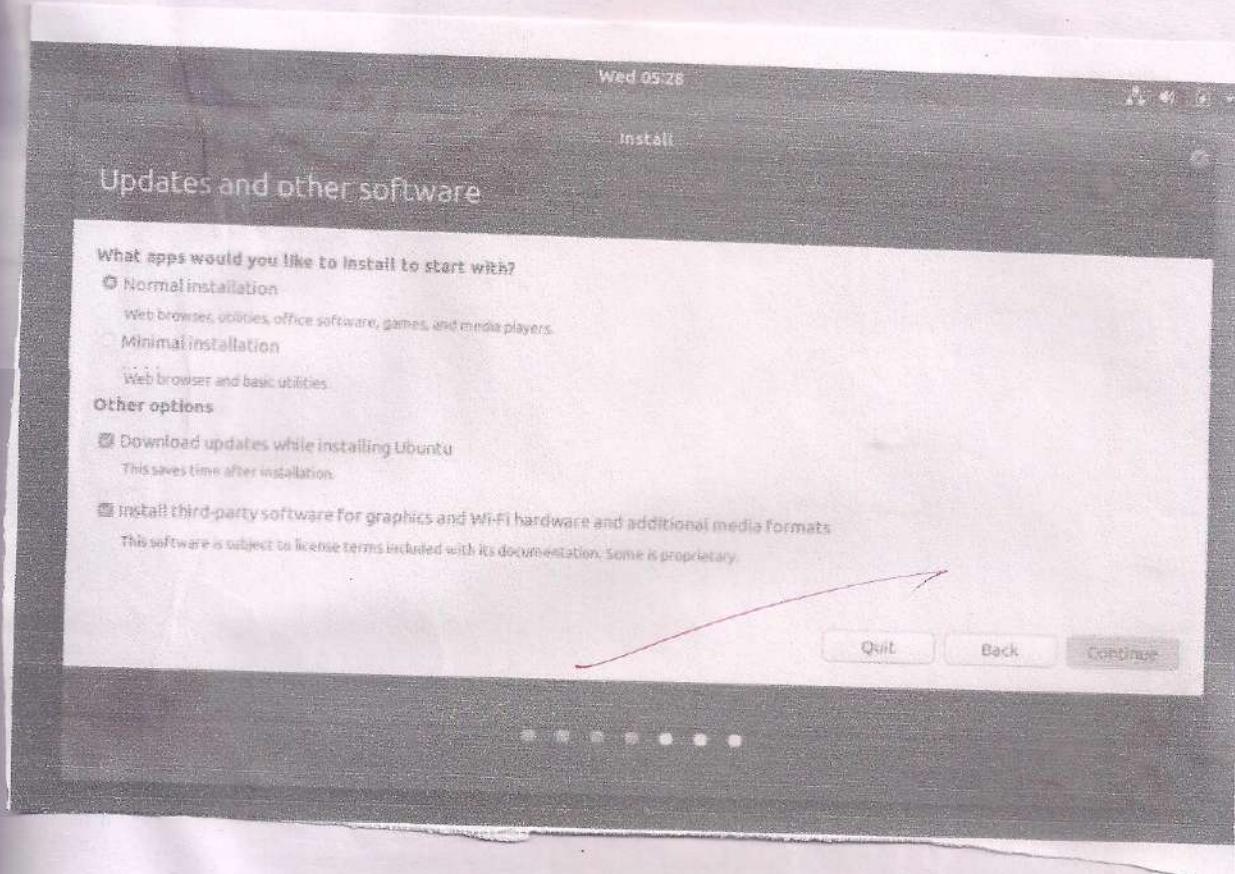
If you are not connected to the internet, you will be asked to select a wireless network, if available. We advise you to connect during the installation so we can ensure your machine is up to date.

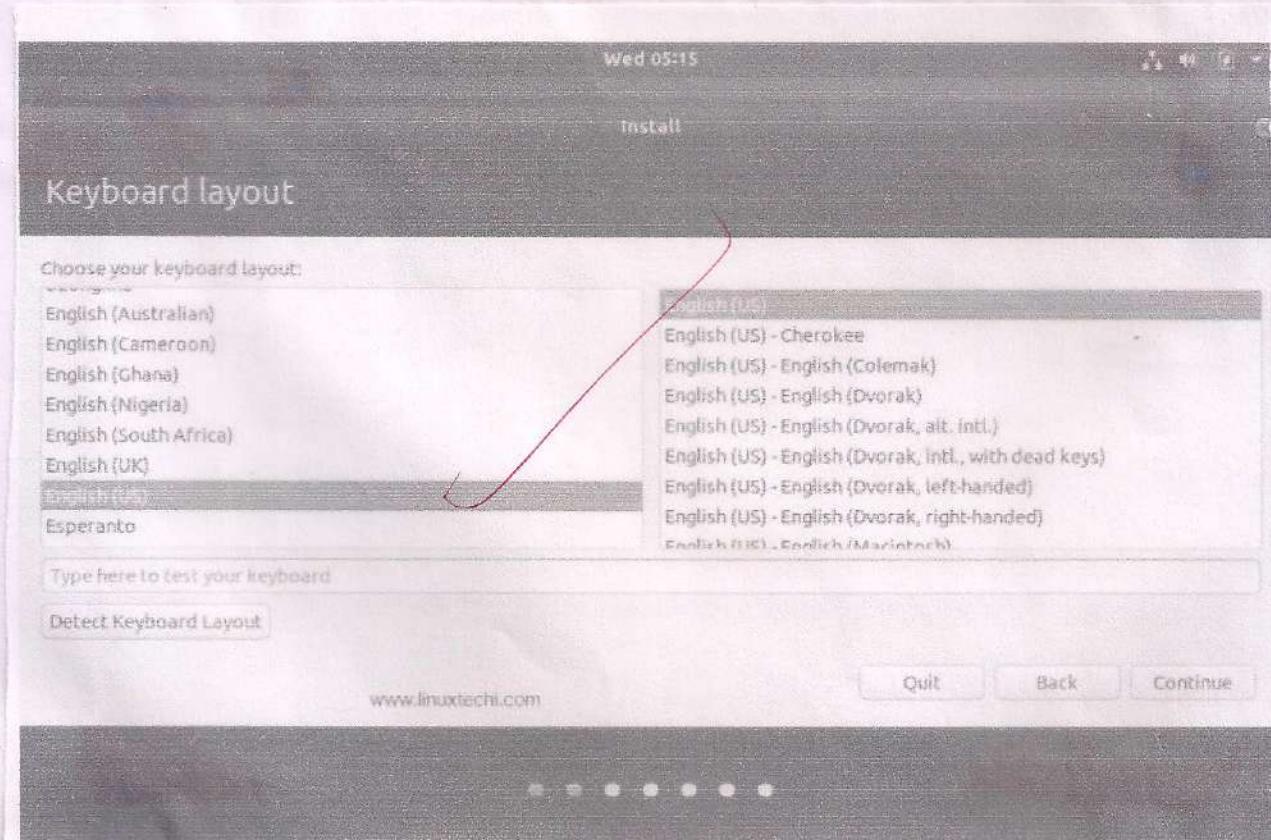
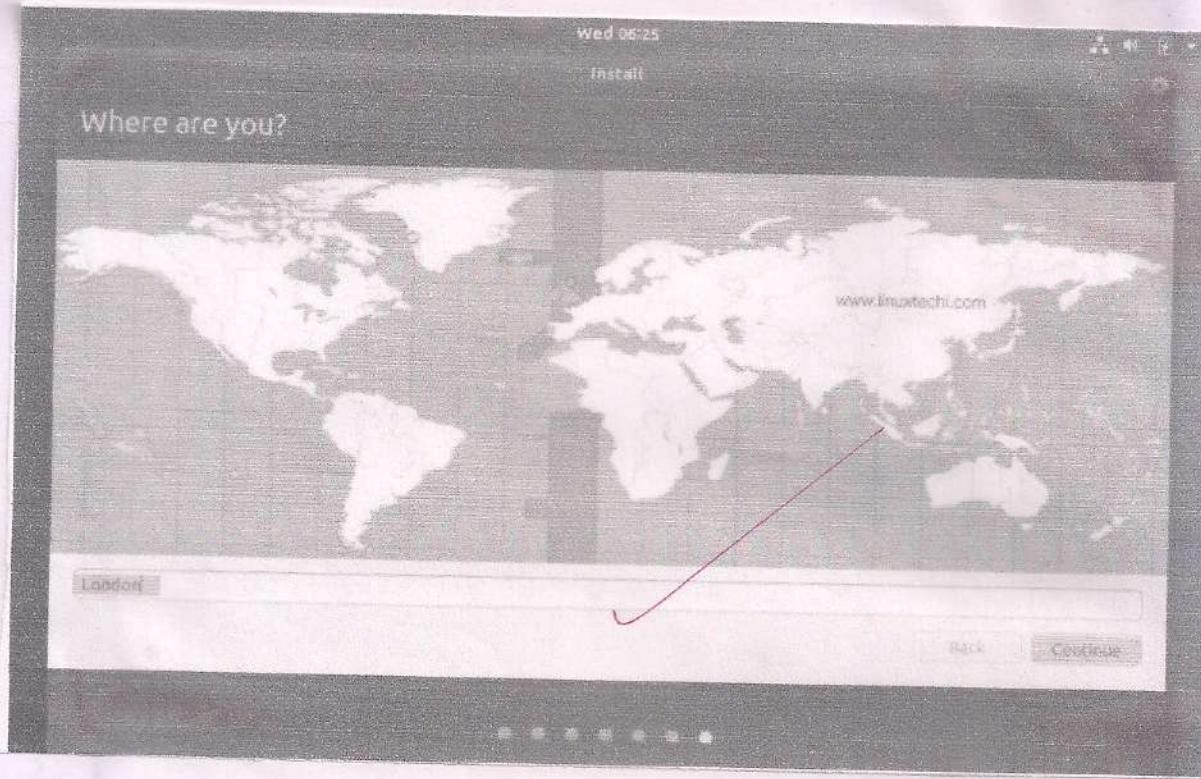
## 2. Allocate ~~drive~~ space

- Use checkboxes to choose whether you would like to install Ubuntu alongside another operating system, delete your existing operating system and replace it with Ubuntu, or if you are an advanced user choose the 'Something else' option

## 3. Begin the installation

- Depending on your previous selections, you can now verify that you have chosen the way in which you would like to install Ubuntu.
- The installation process will begin when you click the Install Now button.
- Ubuntu needs about 4.5 GB to install, so add a few extra GB to allow for your files.





#### 4. Select your location.

- ST - If you are connected to the internet, this should be done automatically. Check your location is correct and click 'Forward' to proceed. If you are unsure of your time zone, type the name of the town you are in or click on the map and we will help you find it.
- TIP: If you are having problems connecting to the Internet, use the menu in the top right-hand corner to select a network

#### 5. Select your preferred keyboard layout

Click on the language option you need. If you're not sure, click the 'Detect Keyboard Layout' button for help

#### 6. Enter your login and password details.

#### 7. Learn more about Ubuntu while the system installs.

#### 8. That's it.

All that's left is to restart your computer and start enjoying Ubuntu

## b) Customize

To access Appearance Settings in 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 divide into Personal, Hardware and System options icons. Let's first select the Appearance icon.

### \* Changing Wall paper picture

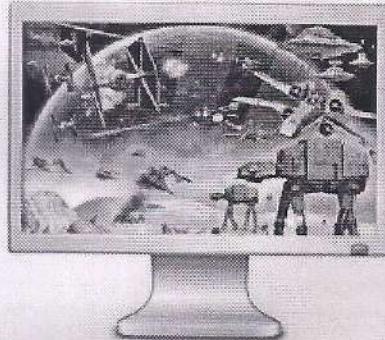
- On the left side of Background part, you can see your current wallpaper.
- On the right side is part where we can select one of Ubuntu wallpapers. Clicking on any thumbnail our wallpaper will be changed right away, with a fading effect.
- If you want to select wallpaper from your Picture folder, click 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 icon below the thumbnails and then in pop-up window, select

## Appearance

All Settings Appearance

Look Behaviour

### Background



star-wars-wallpaper-10.jpg (1920 × 1080)



### Theme

Ambiance (default)

Launcher icon size



Wed 07:28

install

Who are you?

Your name: linuxtechi

Your computer's name: Ubuntu-Rocks

The name it uses when it talks to other computers.

Pick a username: linuxtechi

Choose a password: Strong password

Confirm your password:

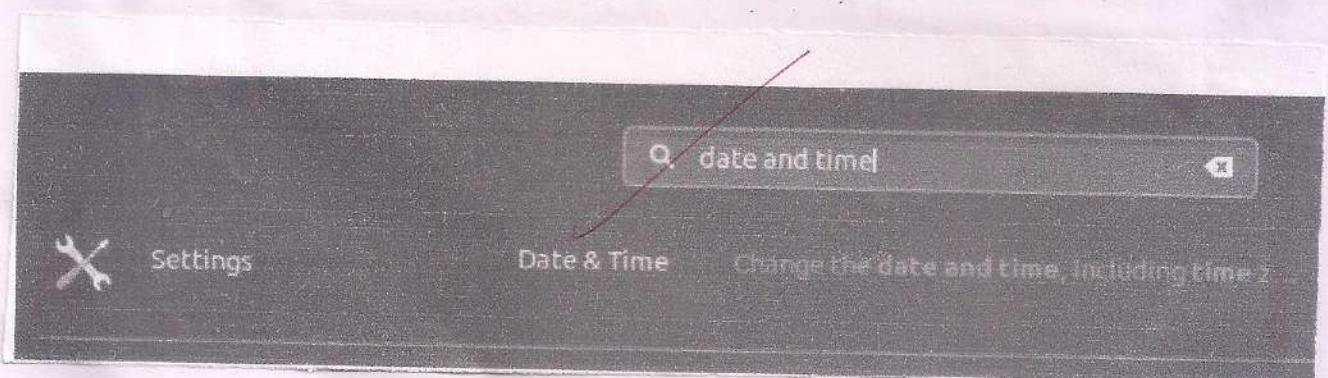
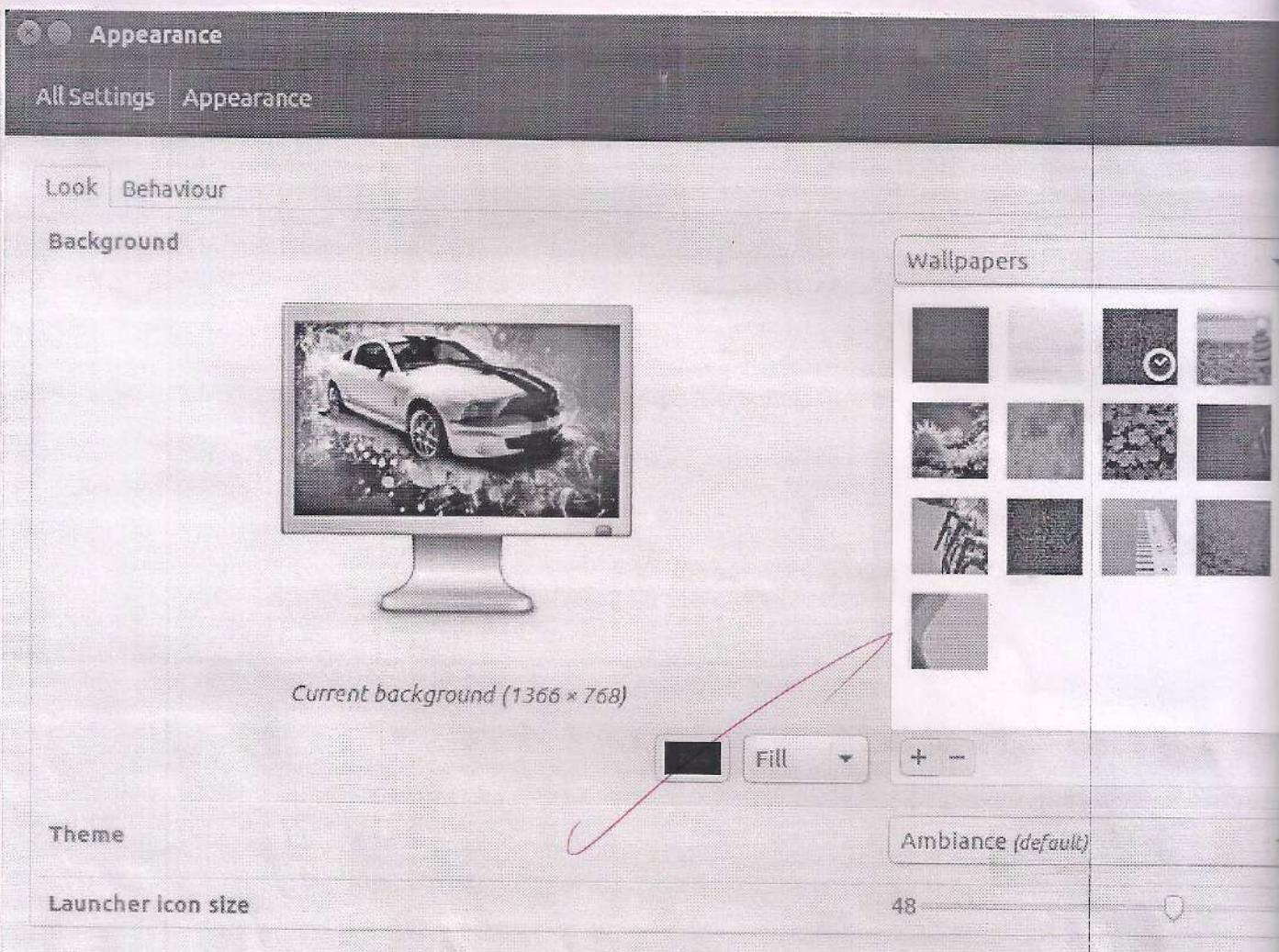
Log in automatically

Require my password to log in

[www.linuxtechi.com](http://www.linuxtechi.com)

Back

Continue



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

#### \* Changing the size or rotation of the screen

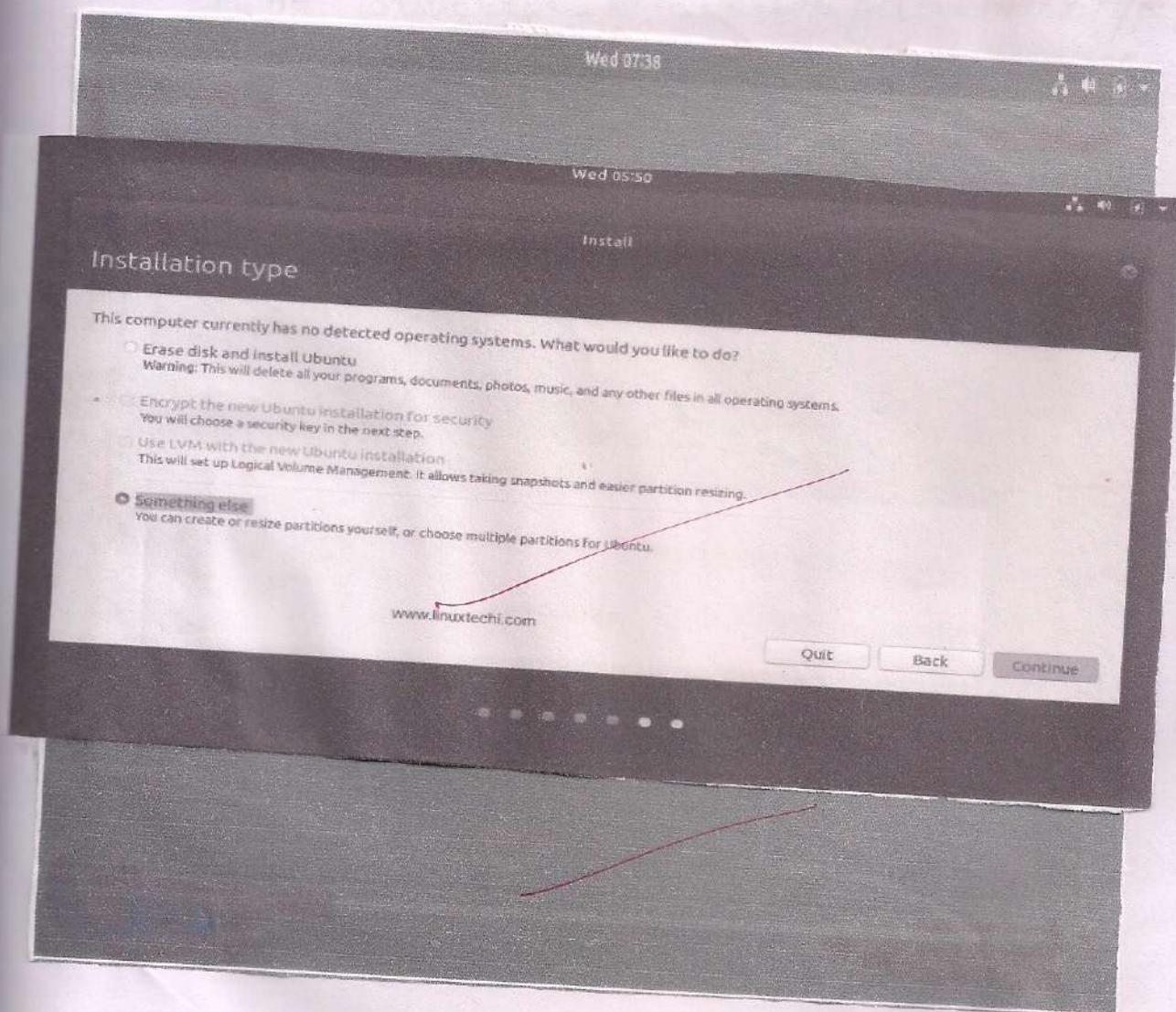
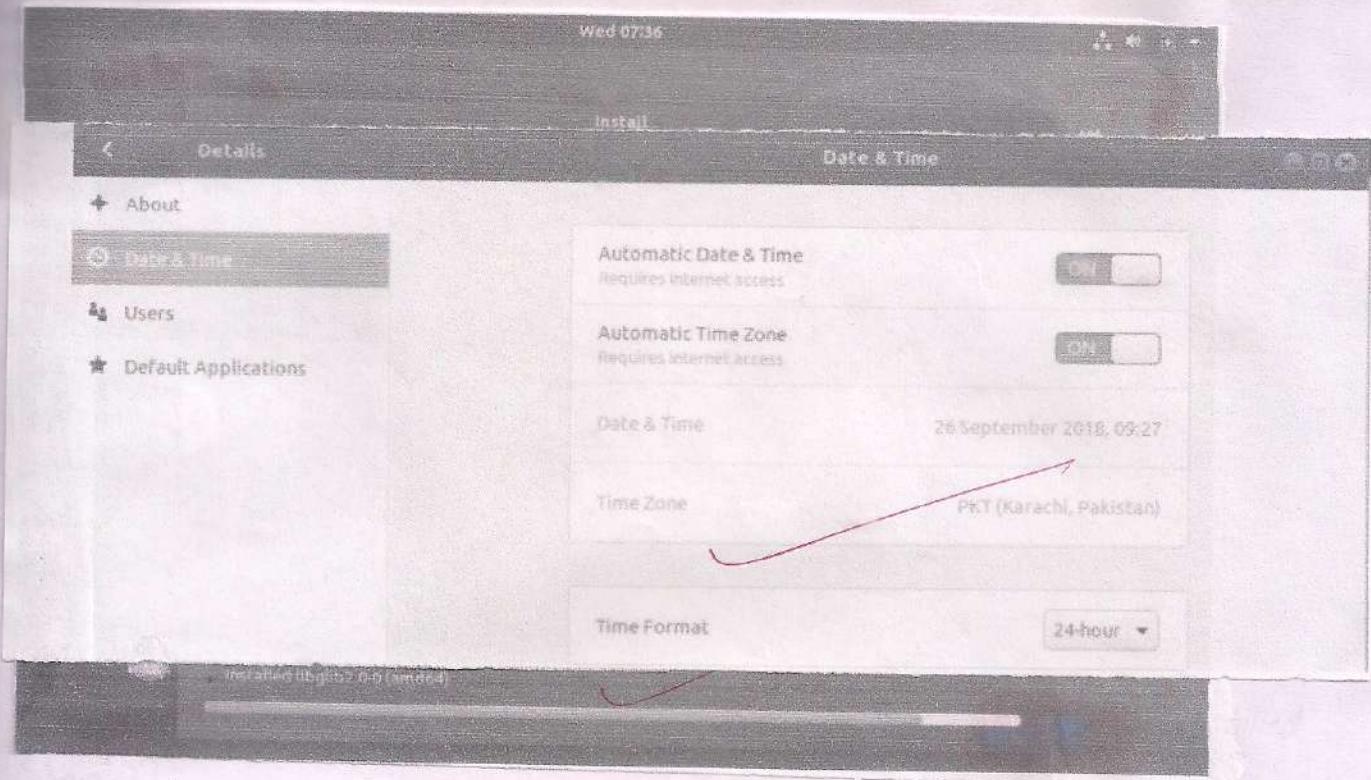
- You can change how big (or how detailed) things appear on the screen by changing the screen resolution.
- You can change which way up things appear (for example if you have a rotating display) by changing the rotation.
  1. Click the icon on the very right of the menu bar and select System Settings
  2. Open Screen Display.

- \* 3. If you have multiple displays and they are not 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

#### 4) Time Settings.

- If you are currently in Indian time. How does the displayed time change?
- After noting the time change, Change the time zone back to your local time zone.
- Just click on the clock on the top bar, and choose Time and Date Settings, once the Time and Date window opens, choose Manually, so you can change the time and date manually; otherwise choose your time zone from the map, and choose Automatic

BB



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.

b] Uninstall gcc compiler.

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

Type: cd build/gcc

Sudo make uninstall

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

10/8/10

## PRACTICAL - 3

Aim

Utilization of grep, man commands Documentation  
 a) finding info documentation from the command line:  
 bring up the info page for the grep command.  
 Bring up the usage section.

Ans: To find info about any command info 'command' is used the syntax of info command is "info (Command name)"

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

Open the terminal ( $\text{ctrl} + \text{Alt} + \text{T}$ ) 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 more summarized form of showing info is the 'man' command. The command is same as 'info', but required data.

b] finding man pages from the cmd line: 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'

c] 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

man tar

d] finding man pages by section from the cmd lines bring up the man page for the printf lib. function. Which manual page section are library function found.

Ans: The number corresponds to what section of the manual page is from, 1 is user command, while 8 is sys admin stuff. The man page for man itself. explain it and list the std only

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 -o to show every matching page in a row.

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

e) Command-line Help list the available options for the mkdir command. How can you do this?

\$ mkdir -m a=rw+ directoryname.

~~BS  
08/01~~

## Practical 4

### Aim - Command line Operations

A] Install new packages 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

/rofs /etc /cron.daily /password

/rofs /etc /pam.d /password

/rofs /etc /password

/rofs /usr /bin /password

/rofs /usr /share /bosh-completion/completions/password

/rofs /usr /share /doc /password

/rofs /usr /share /hintian /overrides /password.

D] Find the directory password file under root & one level down

→ find / -maxdepth 2 -name password

/etc /password.

- E) Find the directory password file under root and two level down
- find -maxdepth 3 -name password  
 /usr/bin/password.  
 /etc/pam.d/password.  
 /etc/password.
- F) Find the password file between Sub-directories level 2 and 4.
- find -maxdepth 3 -maxdepth 5 -name password  
 /etc/cron.daily/password  
 /etc/pam.d/password  
 /etc/password  
 /usr/bin/password  
 /usr/share/bash-completion/completions/password  
 /usr/share/doc/password  
 /usr/share/lintian/overrides/password.

- G) Create a symbolic link to the file you found in last step.
- ln -s filename1.txt filename2.txt  
 ls  
filename2.txt

H) 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

15/01

## File Operation

- 1) Explore mounted file system on your computer  
→ df -k
- 2) What are different ways of exploring mounted file system on Linux?  
→ mount

```
jeba@jeba-VirtualBox:~$ df -k
Filesystem      1K-blocks    Used Available Use% Mounted on
udev              494436       0   494436   0% /dev
tmpfs             102416   3676   98740   4% /run
/dev/sda1        7092728 3383372 3326024 51% /
tmpfs             512076    216   511860   1% /dev/shm
tmpfs              5120       4     5116   1% /run/lock
tmpfs             512076       0   512076   0% /sys/fs/cgroup
tmpfs             102416      48   102368   1% /run/user/1000
jeba@jeba-VirtualBox:~$
```

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

3. Copying text from files

→ Cp command, mv command.

4) Archiving & backup the work directory using  
For gzip & bzip2 commands

→ gzip filename.txt  
Bzip filename.txt

```
jeba@jeba-VirtualBox:~$ ls
Desktop          Downloads          Music           Public
Documents        examples.desktop   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
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$ ■

jeba@jeba-VirtualBox:~/jeb$ touch ss.txt
jeba@jeba-VirtualBox:~/jeb$ mv gg.txt ss.txt
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$ ■
```

```
jeba@jeba-VirtualBox:~/jeb$ bzip2 ss.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt.bz2
BZh91AY&SY'•
•Jew$See•••1 jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz ss.txt.bzz
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
•d.txt+0!eeMeee+ee•Xzjeba@jeba-VirtualBox:~/jeb$
```

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

```
jeba@jeba-VirtualBox:~/jeb$ cat >hi.txt
hi
hi
hi
^C
jeba@jeba-VirtualBox:~/jeb$ cat >hil.txt
hello
hello
hello
^C
jeba@jeba-VirtualBox:~/jeb$ diff -u hi.txt hil.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
+++ hil.txt    2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
-hi
-hi
-hi
+hello
+hello
+hello
jeba@jeba-VirtualBox:~/jeb$ █
```

- 5 Use diff command to create diff of two files  
→ diff filename1 filename2

- i) Use patch command to patch a file. And analyze the patch using patch command again.

Sp  
05/02

## PRACTICAL - 6

### Use Environment

- a) Which account you are logged in? How do you find out?
  - Who command & whoami;
  
- b) Display /etc/shadow file using cat command & understand the important of shadow file. How its different than password file
  - cat /etc/shadow

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

- User name, up to 8 characters Case-Sensitive, usually all lowercase. A direct match to the username in the /etc/passwd file.
- Password, 13 character encrypted • A blank entry (e.g. ::) indicates a password is not required to log in (usually a bad idea), & 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
- The number of days after which password must be changed (99999) indicates user can keep this or her password unchanged for many, many years>

```
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          786 id=tty1
jeba@jeba-VirtualBox:~$ █
```

```
jeba@jeba-VirtualBox:~$ w
20:35:04 up 4 min, 1 user, load average: 0.70, 0.79, 0.38
USER   TTY      FROM           LOGIN@ IDLE   JCPU   PCPU WHAT
jeba   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
```

```
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:::
```

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```
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:Mailing List Manager:/var/list:/usr/sbin/nologin
```

- The number of days to warn user of an expiring password
- The number of days after password expires that account is displayed.
- The number of days since January 1, 1970 than 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.
- An "x" in the password field. Password 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.
- Full name of user. I'm not sure what the maximum length for this field is, but try to keep it reasonable (under 30 characters).
- User's home directory. Usually /home/username (e.g. /home/smith). All user's personal files, web pages, mail forwarding, etc. will be stored here.
- User's "Shell account". Often set to "/bin/bash" to provide access to the bash shell (my personal favorite shell).

- c) Get your current working directory  
→ pwd.
- d) Explore different ways of getting Command history  
how to run previously executed Command without  
typing it.  
→ history  
! line number
- e) Create alias to most commonly use commands.  
Alias Command instructs the shell to replace our  
string with another string while executing the  
commands.  
→ alias label="Command"

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:~\$ 13  
who -l  
LOGIN      tty1      2020-01-15 20:30  
jeba@jeba-VirtualBox:~\$ █

780 id=tty1

*03/02*

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

## PRACTICAL - 7

### Linux Editors: Vi

- i) Create, modify, search & 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 word to search.

#### iv) Navigate.

Movement in four direction

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

#### Word Navigation

Key	Action
b	Moves <del>backward</del> to the beginning of the word
e	Moves forward to the end of the word
w	Moves forward to the beginning of the word
0 (zero)	Moves to first character of a line.

```
jeba@jeba-VirtualBox: ~  
Hello  
This is my Linux example  
Welcome  
Welldone  
This is Vi Editor  
Thank you  
I  
:g/my/s//our/gc
```

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

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

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

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

\$ | 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.

(i) Replace

Syntax : :/g /word to be replaced /s //new word /ge

(ii) Highlight

Use set nlssearch.

(iii) Show the line numbers

Use set nu.

PPR ✓

## PRACTICAL - 8

## Linux Security

- a) Use of Sudo to change user privileges to root.  
Create an user name user1

To give some users root privileges edit /etc/sudoers  
using vi sudo. Enter new lines as highlighted below

- b) Identify Operations that require sudo privileges

- c) ~~Modify expiration date for new user using password again.~~

Q3

```
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:~$
```

```
# Please consider adding local content in /etc/sudoers.d/ instead of
# directly modifying this file.
#
# See the man page for details on how to write a sudoers file.
#
Defaults      env_reset
Defaults      mail_badpass
Defaults      secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/
sbin:/bin"
#
# Host alias specification
#
# User alias specification
#
# Cmnd alias specification
#
# User privilege specification
root    ALL=(ALL:ALL) ALL
user1  ALL=(ALL:ALL) ALL
```

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

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

- 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 working before a password change is required

d) Delete newly added user.

```
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: ~

```
jeba@jeba-VirtualBox:~$ sudo userdel user1
[sudo] password for jeba:
jeba@jeba-VirtualBox:~$ su user1
No passwd entry for user 'user1'
jeba@jeba-VirtualBox:~$
```

10/5/20

## PRACTICAL - 9

## Network Management.

- a) Get IP address of your machine using ifconfig.
- b) Get hostname of your machine.
- c) Use ping to check the network connectivity to remote machines.

```
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:53a3:d5a3:848e/64 Scope:Link  
              UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  
              RX packets:2 errors:0 dropped:0 overruns:0 frame:0  
              TX packets:73 errors:0 dropped:0 overruns:0 carrier:0  
              collisions:0 txqueuelen:1000  
              RX bytes:1180 (1.1 KB) TX bytes:8518 (8.5 KB)  
  
lo          Link encap:Local Loopback  
            inet addr:127.0.0.1 Mask:255.0.0.0  
            inet6 addr: ::1/128 Scope:Host  
              UP LOOPBACK RUNNING MTU:65536 Metric:1  
              RX packets:53240 errors:0 dropped:0 overruns:0 frame:0  
              TX packets:53240 errors:0 dropped:0 overruns:0 carrier:0  
              collisions:0 txqueuelen:1  
              RX bytes:4225072 (4.2 MB) TX bytes:4225072 (4.2 MB)
```

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

```
jeba@jeba-VirtualBox:~$ ping www.google.com  
PING www.google.com (172.217.31.196) 56(84) bytes of data.  
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=97.8 ms  
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=82.0 ms  
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=84.8 ms  
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=87.1 ms  
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=93.5 ms  
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=86.9 ms  
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=98.0 ms  
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=90.9 ms  
^Z  
[1]+ Stopped                  ping www.google.com  
jeba@jeba-VirtualBox:~$
```

- d) Use of dig Command.
- e) Troubleshooting network using tracert, route, route Command.
- f) Use of arp Command.
- g) Use of nslookup Command.

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

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

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

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

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

Active Internet connections (w/o servers)				Foreign Address	State
Proto	Recv-Q	Send-Q	Local Address	I-Node	Path
Proto	Recv-Q	Send-Q	Local Address		
Active UNIX domain sockets (w/o servers)					
Proto	RefCnt	Flags	Type	State	
unix	2	[ ]	DGRAM		42149 /run/user/1000/system
d/notify					
unix	2	[ ]	DGRAM		9694 /run/systemd/journal/
syslog					
unix	16	[ ]	DGRAM		9695 /run/systemd/journal/
dev-log					
unix	7	[ ]	DGRAM		9704 /run/systemd/journal/
socket					
unix	3	[ ]	DGRAM		9684 /run/systemd/notify
unix	3	[ ]	STREAM	CONNECTED	44042 @/tmp/dbus-CymTeI7AQG
unix	3	[ ]	STREAM	CONNECTED	43331 @/tmp/dbus-CymTeI7AQG
unix	3	[ ]	STREAM	CONNECTED	42988 @/tmp/dbus-CMGGc6G7P5
unix	3	[ ]	STREAM	CONNECTED	42690 @/tmp/dbus-CMGGc6G7P5
unix	3	[ ]	STREAM	CONNECTED	13242 /run/systemd/journal/
stdout					
unix	3	[ ]	STREAM	CONNECTED	43113 /run/systemd/journal/
stdout					
unix	3	[ ]	STREAM	CONNECTED	43013
unix	3	[ ]	STREAM	CONNECTED	42935

```
jeba@jeba-VirtualBox:~$ nmap www.google.com
Starting Nmap 7.01 ( https://nmap.org ) at 2020-01-20 22:51 IST
Nmap scan report for www.google.com (216.58.196.68)
Host is up (0.044s latency).
Other addresses for www.google.com (not scanned): 2404:6800:4007:811::2004
rDNS record for 216.58.196.68: bom05s11-in-f4.1e100.net
Not shown: 998 filtered ports
PORT      STATE SERVICE
80/tcp    open  http
443/tcp   open  https

Nmap done: 1 IP address (1 host up) scanned in 20.32 seconds
jeba@jeba-VirtualBox:~$
```

of port 80

~~Q6) Use of netstat command and nmap command.~~

Port 80 is used

for http://www.192.0.1.102:80

for https://www.192.0.1.102:443

192.0.1.102 is not shown; (2) after which port used at (1)

old port

and now port 80 is used by browser also at (b)

at port

21 is provided by 192.0.1.102 at (c)

so port 192.0.1.102 is used to connect

and port 21 is used by 192.0.1.102

and port 21 is used by 192.0.1.102

~~80~~  
~~21~~

is used at

de - server is

used at

port 21 is used at

de - server (HTTP port)

de - server

## Practical 10

### 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 - it is called shebang. it is written at the top of a shell script and it passes the instruction to the program /bin/bash

Echo \$SHELL

- vi filename.sh
- `#!/bin/bash`
- `echo "This is Linux!"`
- ~~chmod 777 filename.sh~~
- ~~./filename -sh~~

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

```
tcsc@tcsc-VirtualBox: ~  
! /bin/bash  
echo "THIS IS LINUX!"
```

linux.sh" [New File]

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

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

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

Steps to write and execute shell script.

Shell Script is just a simple text file with .sh extension.

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

Program to display your name

```
#!/bin/bash
Echo "Enter your name"
Read name
Echo "My name is: $name"
```

Program to find the sum of two 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:~$
```

```
tcsc@tcsc-VirtualBox:~  
#!/bin/bash  
sum=$((S1+S2))  
echo "sum is:$sum"
```

"lin.sh" 3 lines, 46 characters

03

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

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

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

```
:wq
```

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

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

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

Program to 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, find and replace but it can perform other text manipulation like insertion, deletion, search, etc. With sed, we can edit complete files without actually having to open it.

Consider the following text file.

- 1) Displaying partial text of a file.

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

- 2) Display all except some lines

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

- 3) Deleting a line

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

7)

- 4) Search and Replacing a String  
's' option is for searching a word.

- 5) Replace a string on a particular line

To replace a string on a particular line,  
use the number with 's' option.

- 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".

- 7) 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'

- 8) Appending lines

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

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

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

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

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

S3

```
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
```

```
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
```

*S  
H102*