

PRACTICAL- 01

- AIM :- Install your choice of linux distribution
eg: Ubuntu
 - ✓ Customize desktop environment by changing different default by options like changing default background, themes, screenshots
 - ✓ Screen Resolution
 - ✓ Time settings

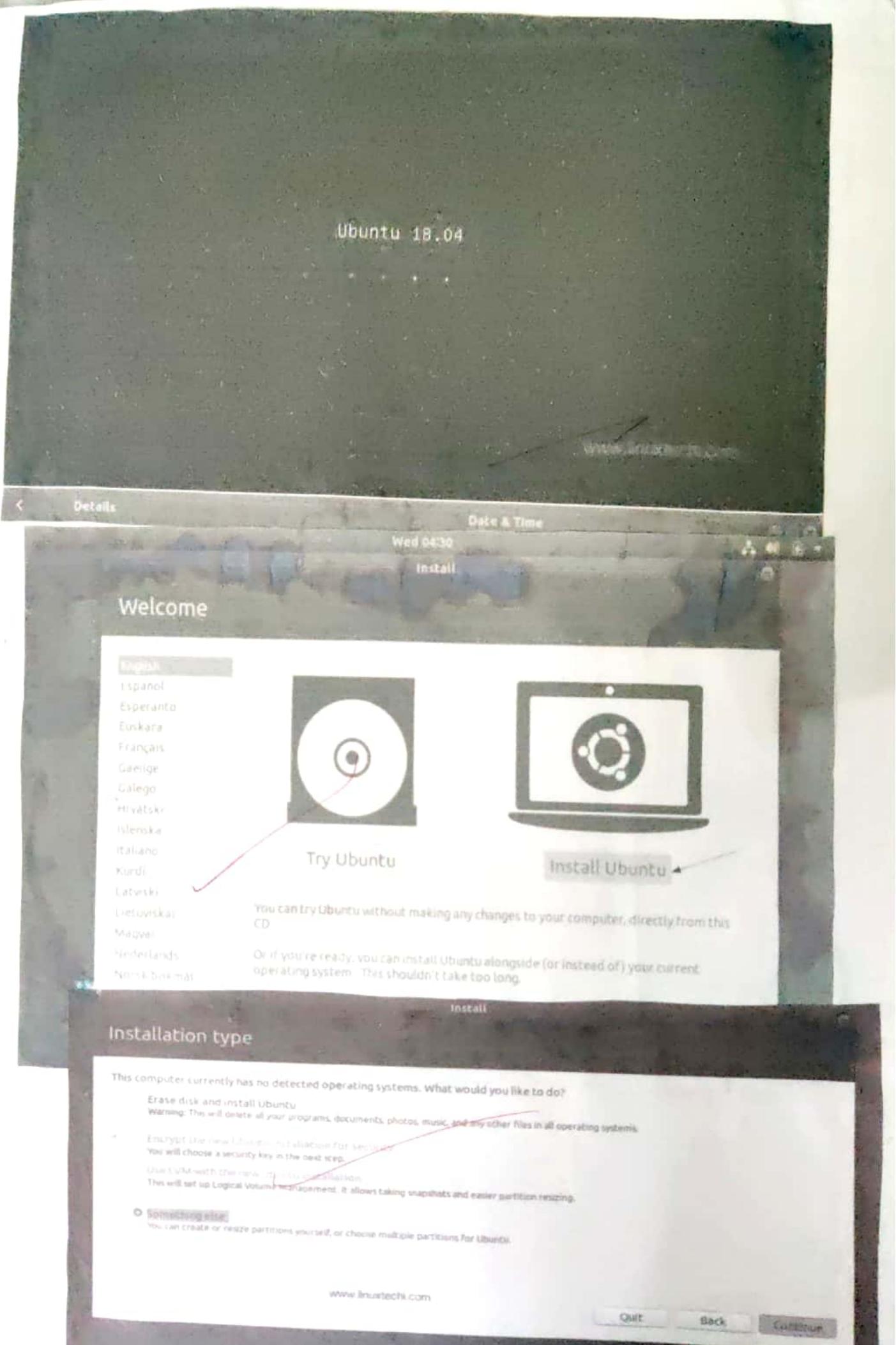
a) Installation of Linux- Ubuntu

Using a USB drive:

- 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 error message.

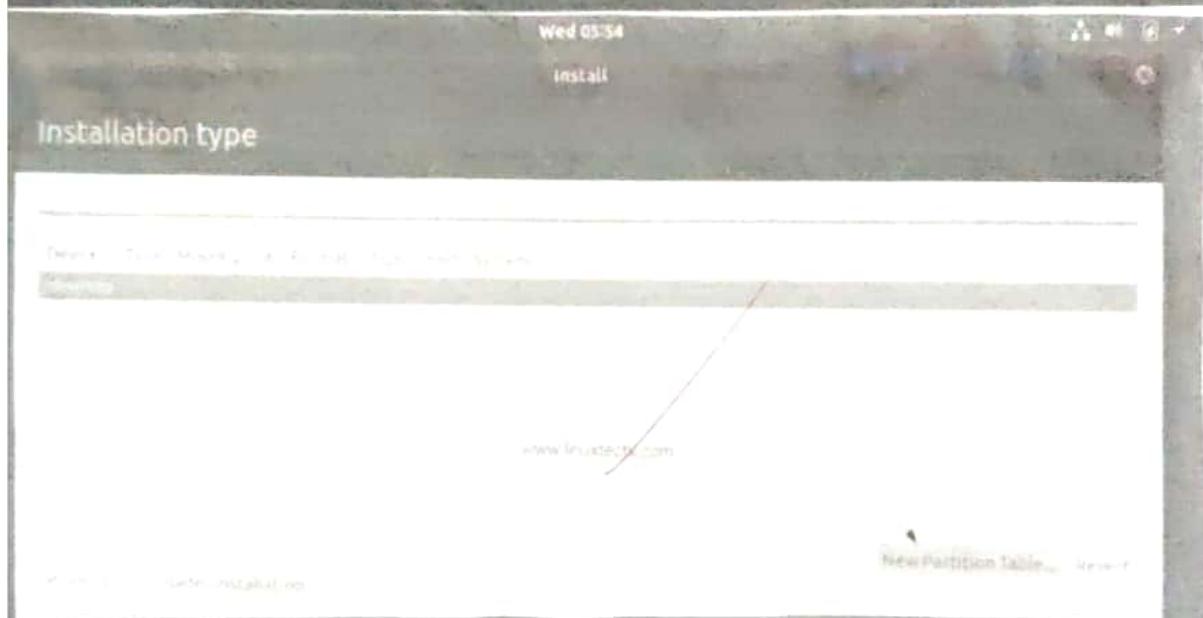
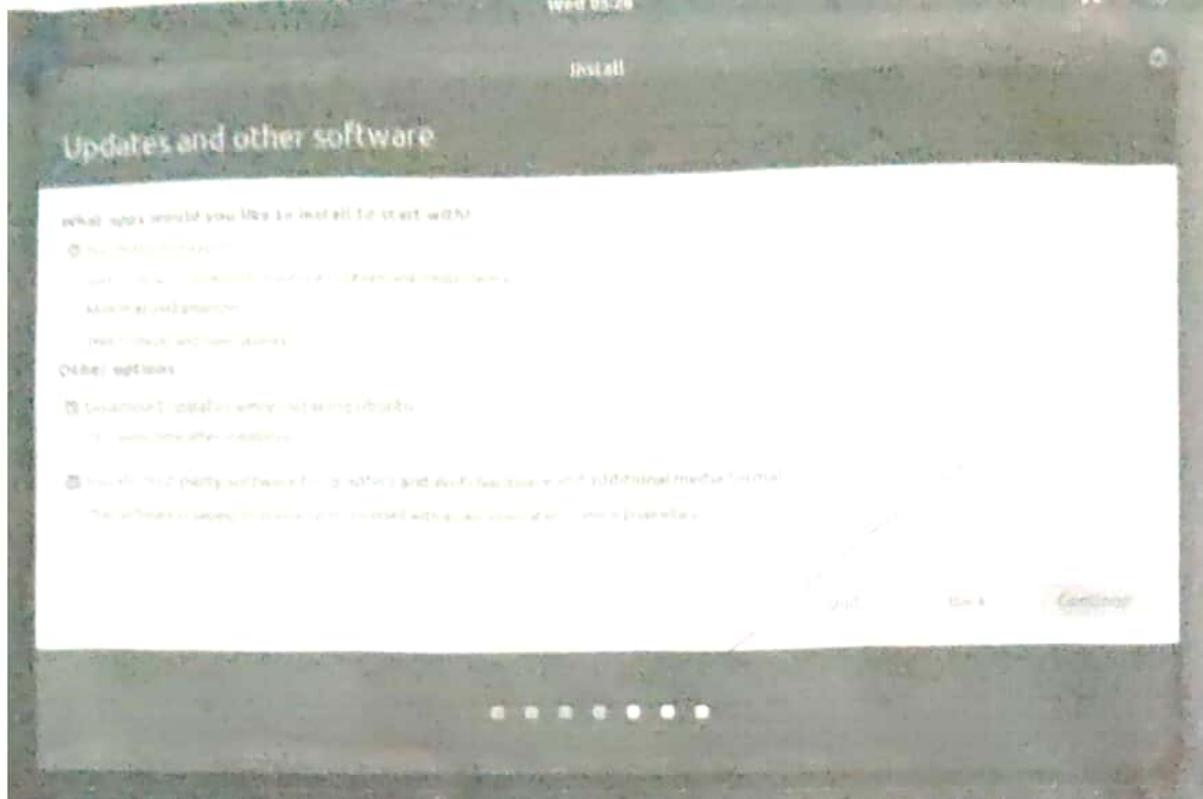
1) Prepare to install Ubuntu.

- 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



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installing and install this third party software now.

- 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 installation so we ensure your machine up to date.

2. Allocate drive space

- Use the checkboxes to choose whether you'd like to install Ubuntu alongside another operating system delete your existing operating system and replace it with Ubuntu

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

- If you are connected to the internet, this should be done automatically

- Forwarded 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 top-right hand corner to select a network

5. Select your preferred keyboard layout

Click on the language option you needed 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

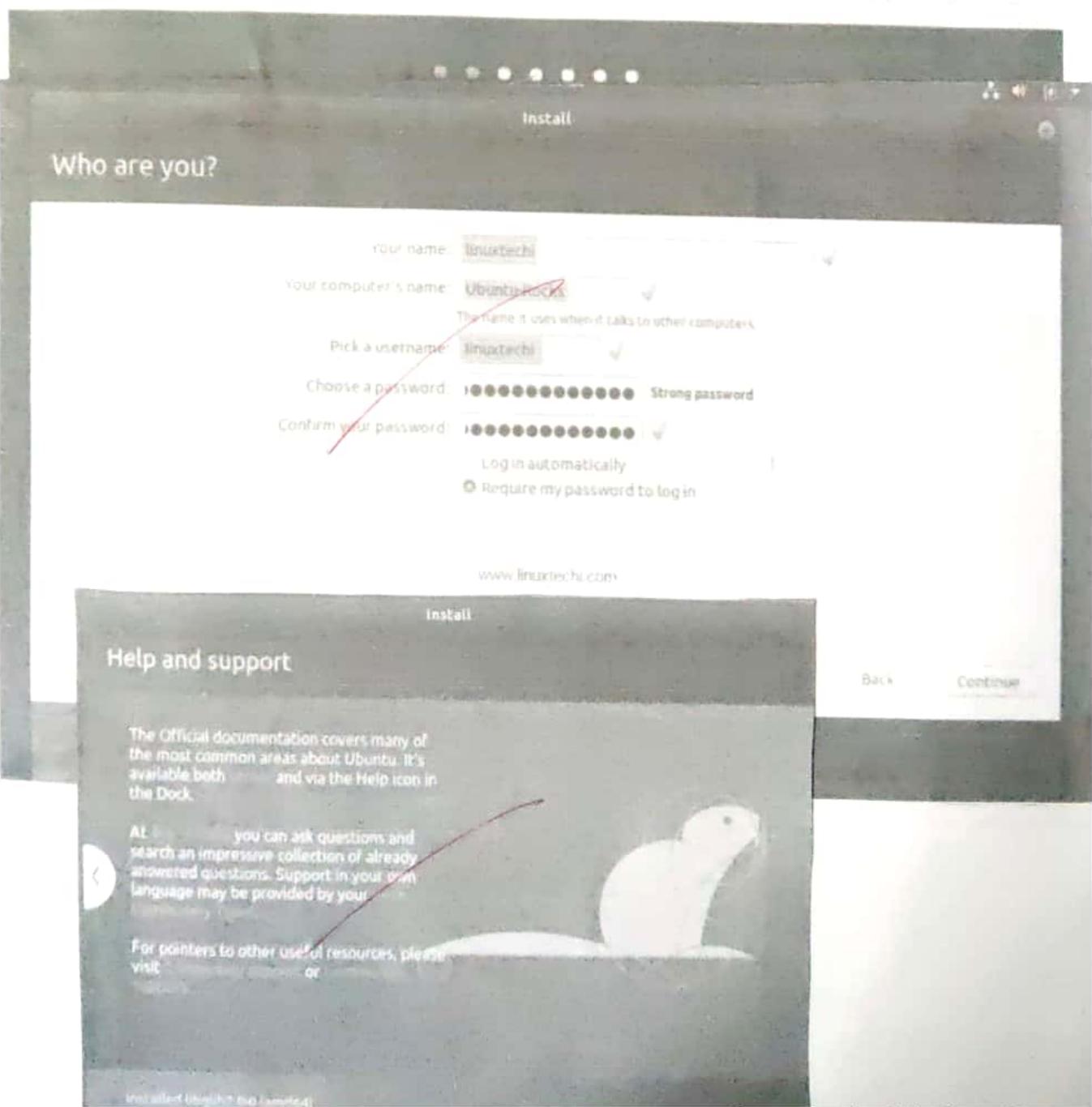
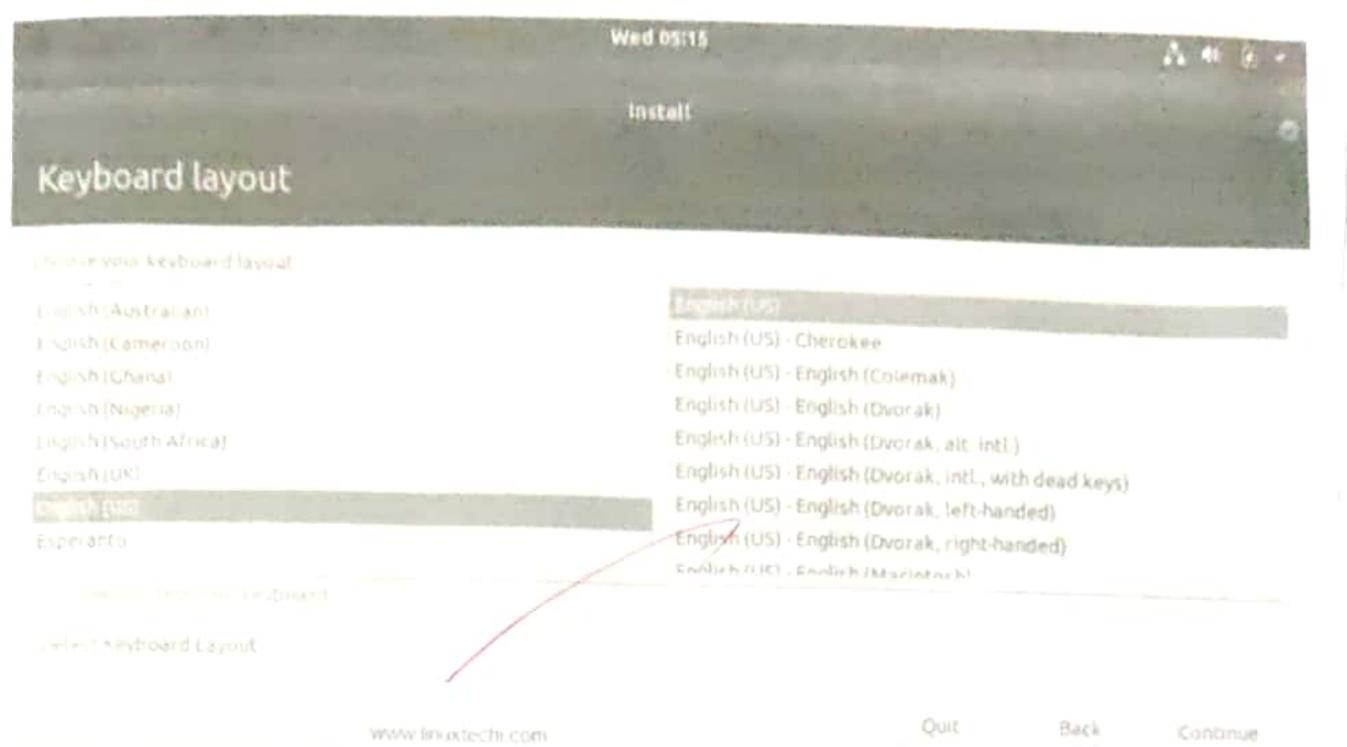
8. That's it

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

(B) Customization of desktop

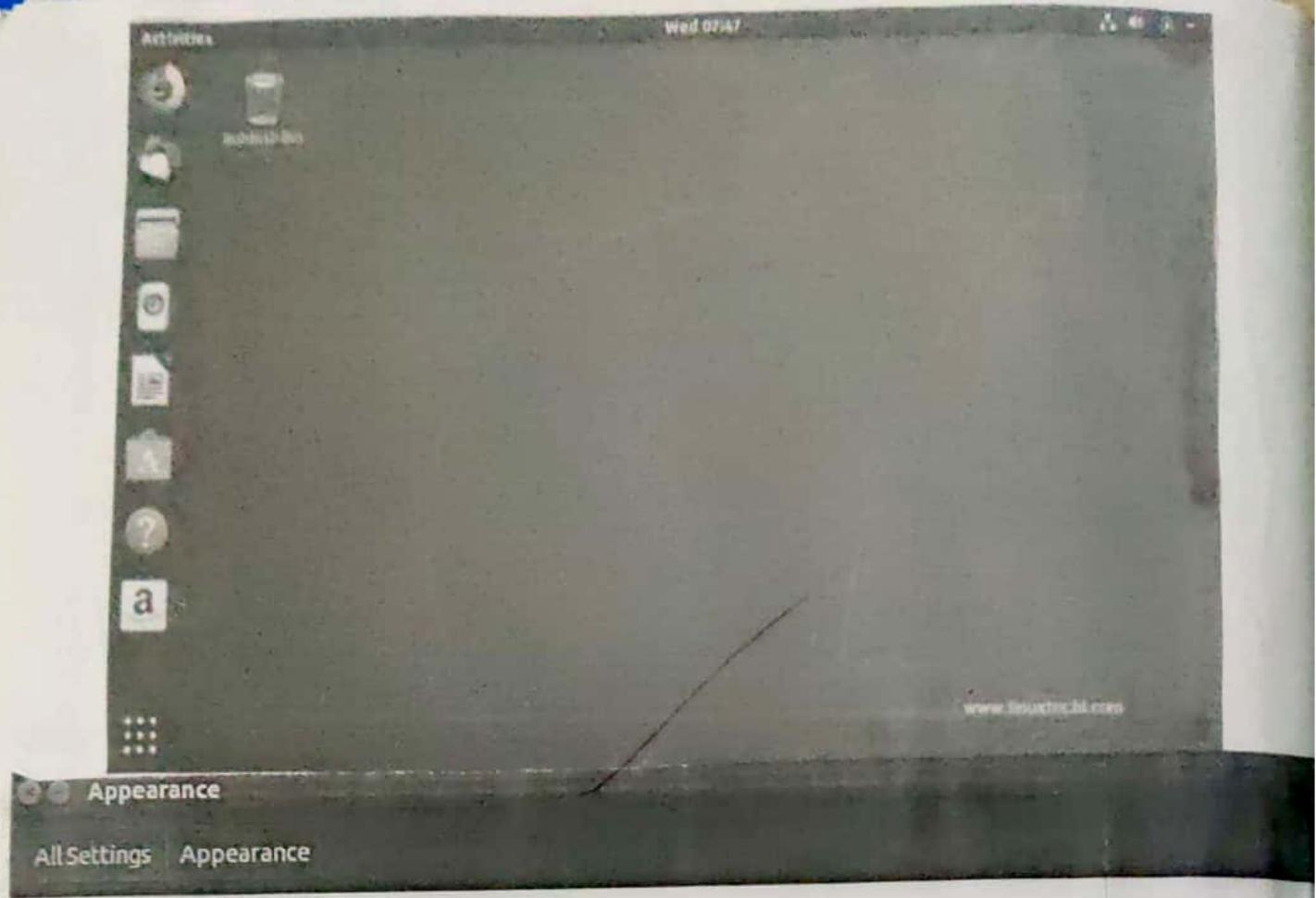
Accessing appearance settings

- 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



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Look Behaviour

Background

Wallpapers



Current background (1366 x 768)



Fill

+ -

Ambiance (default)

Theme

Launcher icon size

48

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

f changing Wallapaper picture

- On the left side of background part, you can see your current wallapaper.
- On the right side is port where we can select one of ubuntu wallapaper will be changed.
- If you want to select wallapaper from your picture folder. click the dropdown menu above thumbnails and select the picture folder.
- To add wallapaper this is an another folder as thumbnails, where you can select them as your wallapaper. 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.

f changing Ubuntu theme

- Ubuntu also has an option to change desktop theme which is one click will change the entire way your computer looks.
- To do that, click on the drop-down menu below the wallpaper thumbnail and choose between Ambiance, Radiance or high Contrast.

(c) Screen Resolution :

Change the size or rotation of the screen.

- You can change how big (or) things appears on the screen by changing the screen resolution
 - You can change which way up things appear 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.
 4. Select your desired resolution and rotation
 5. Click apply. The new settings will be applied for 30 seconds.

d) Time settings changes the time zone of your system

- If you are currently in Indian time. How does the display time change, change the time zone back to your local time zone.
- Just click on the clock on 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 window manually; otherwise choose your time zone from the map, & choose automatic.

PP
%

Appearance

All Settings Appearance

Look Behaviour

Background



Pictures Folder



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



Zoom ▾



Theme

Ambiance (default)

Launcher icon size

48

>About

Date & Time

Automatic Date & Time

On

Users

Automatic Time Zone

On

Default Applications

Default Time

29 September 2018, 09:27

Time Zone

Karachi, Pakistan

Time Format:

24-hour ▾



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PRACTICAL- 02

AIM: Installing and removing software.

- a] Install gcc package, verify that it runs & 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

880

Now to 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

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

This does not remove everything that was installed, but it removes major execution like `gcc`, `g++`, `gpp` -- contained in that directory

10/20/2017

ANSWER

Output :

This is the info main menu (directory mode)
A few useful info commands :
'q' quits ;
'l' list all info Commands ;
'h' state the info tutorial ;
'm' text info RET visits the textinfo manual , etc.

PRACTICAL - 03

AIM: Utilization of grep, man Commands.

a] Documentation :

- Finding info documentation from the command line: bring up the info page for the grep command. Bring up the usage section.

Solution : To find info about any command 'info' command is used.

The syntax of info command is
n\$ info (command name)

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

Open the terminal and type
n\$ info grep

After typing this command following output will be displayed onto your screen! Another more summarized form of showing info is the 'man' command.

~~The Command is same as 'info' but required data.~~

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

- Finding man pages from command line : Bring up the man page for the 'ls' command scroll down to the example section

Answer : 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'

- Finding man pages by topic . What man pages are available for document file compression.
Simply type : Man zip
Man tar
- Finding man pages by section from the command like bringing up the man page for the printf lib function which manual page section are library function found.

output: Name

036

ls - list directory contents

Synopsis

ls [options] ... [file] ..

Description:

list information about the FILES sort entries
alphabetically if none of -etmsux,

-nos -- sort n specified

--q, --all

do not ignore entries starting with

-A, -- almost all

do not list implied and

--author

: n§ man tar

output: Name: The (TNU version of the tar
archiving utility)

Synopsis:

tar [-] A -- concatenate e/c -- create

I d - diff -- compare / -- delete / z -- append /
t - nlist / -- test - lable / U -- update > -- extract

380

Description

tar stores and extract file from a tar or disk archive

Function letters

- A,-- Catenate, -- Concatenate
append tar files to an archive
- C,-- Create
Create a new archive.

Name: printf, sprintf, fprintf, dprintf, snprintf
vprintf, vfprintf, vsprintf, for matted
output version

Description

The function in the printf () family
produce output accordingly its a format as
described below.

ANSWER! The number corresponds to what section of the manual page is from; 1 is user command while 8 is system admin stuff. The man page for man itself explains it and lists the std one. There are certain terms that have different page in different sections; 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 a row.

You can tell which section a term falls in with 'man -k'. It will do substring matches too so you need to use "term" to limit it.

Simply type : Man 3 printf

- Command line help list the available options for the mkdir command

Answer: n\$ mkdir = ma = rwx
tycs 3

: n\$ ls

8/5/-

PRACTICAL - 04

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-1/dep-253/pam/d/passwd
 - /usr/bin/passwd
 - /etc/pam.d/passwd
 - /etc/passwd

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

find / -maxdepth 2 -name passwd

- /etc/passwd

~~find the passwd file under root and 2 level down~~

find / -maxdepth 3 -name passwd

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

- 8) Find the password file between sub-directories level 2 and 4
 → find - maxdepth 3 - maxdepth 5 - name password
 /etc/iron.daily/password
 /etc/pam.d/password
 /etc/password
 /usr/bin/password
 /usr/share/bash-completion/completions/password
 /usr/share/doc/password
 /usr/share/figcaption/overrides/password.

- 9) Create a symbolic link to the file you found in last step.
 ln -s filename.txt filename2.txt

ls
 | filename 2.txt

- 10) Find the location of ls, ps, bash command

→ 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

PRACTICAL - 05
operations

1. Explore mounted file systems on your computer
⇒ `df -k`
2. What are the different ways of exploring mounted file systems on Linux?
⇒ `mount`
3. Copying text from files.
⇒ `cp` Command, `mv` Command
4. Archiving and backup the work directory using tar, gzip & bzip 2 commands.
⇒
`gzip filename.txt`
`Bzip 2 filename.txt`
5. Use diff command to create diff of two files
⇒ `diff filename1 filename2`
6. Use patch command to patch a file and analyze the patch using patch command again

```
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,node=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,node=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,node=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=/)
pstree on /sys/fs/pstree type pstree (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/blktio 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,intr=0,maxproto=5,maxproto=5,direct)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime)
```

```
Desktop  Downloads  Music  Public  Videos
Documents  examples.desktop  Pictures  Templates
jeba@jeba-VirtualBox:~ cd jeb
jeba@jeba-VirtualBox:~/jeb$ cat .gg.txt
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
ac
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$ ■
```

```
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   mnt  root  snap  [redacted]  vmlinuz
jeba@jeba-VirtualBox:/$ cat data.tar
mnn/0000755000000000000000000000000013605376557010365 Sustar  rootrootmnn/hd/000075500000
0000000000000000000013605376557010760 Sustar  rootrootjeba@jeba-VirtualBox:/$ ■
```

```
jeba@jeba-VirtualBox:~/jeb$ bzip2 ss.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  ss.txt.b22
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt.b22
BZh91AY&SY [redacted]
jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
[redacted].txt+0eI+4Me...+**]+Xrjeba@jeba-VirtualBox:~/jeb$ ■
```

```
jeba@jeba-VirtualBox:~/jeb$ cat >hi.txt
hi
hi
hi
^C
jeba@jeba-VirtualBox:~/jeb$ cat >hi1.txt
hello
hello
hello
^C
jeba@jeba-VirtualBox:~/jeb$ diff -u hi.txt hi1.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
+++ hi1.txt    2020-01-08 22:15:16.2598948738 +0530
@@ -1,3 +1,3 @@
-hi
-hi
-hi
+hello
+hello
+hello
jeba@jeba-VirtualBox:~/jeb$
```

```
jeba@jeba-VirtualBox:~/jeb$ ls
aa.txt.gz  bb.txt.gz
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
```

09/02

```
jeba@jeba-VirtualBox:~  
jeba@jeba-VirtualBox:~$ who  
jeba    ttys                2020-01-15 20:32 (:0)  
jeba@jeba-VirtualBox:~$ whoami  
jeba  
jeba@jeba-VirtualBox:~$ who -l  
LOGIN   ttys                2020-01-15 20:30  
jeba@jeba-VirtualBox:~$ █  
  
jeba@jeba-VirtualBox:~$ w  
20:35:04 up 4 min, 1 user, load average: 0.70, 0.79, 0.38  
USER     TTY      FROM          LOGIN@        IDLE      JCPU      PCPU WHAT  
jeba     ttys                :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: 0.68, 0.77, 0.37  
USER     TTY      FROM          LOGIN@        IDLE      JCPU      PCPU WHAT  
jeba     ttys                :0           4:38      /sbin/upstart --user  
jeba@jeba-VirtualBox:~$ w -h  
jeba     ttys                :0           20:32      4:44      8.67s  0.33s /sbin/upstart -  
jeba@jeba-VirtualBox:~$ w -f  
20:36:12 up 5 min, 1 user, load average: 0.41, 0.69, 0.37  
USER     TTY      FROM          LOGIN@        IDLE      JCPU      PCPU WHAT  
jeba     ttys                :0           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::::
```

```
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:/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
```

PRACTICAL- 06

User Environment

- ⇒ which account you are logged in ? How do you find out ?
- ⇒ who Command & whoami
- ⇒ Display /etc/shadow file using cat command & understand the importance of shadow file. How its different than passwd file.
- ⇒ Cat /etc/shadow

As with the passwd file , each file 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 . Case sensitive , usually all lower case . ~~A direct match to the~~ encrypted . A blank entry (eg. ::)
- The number of days after which password must be changed (9999 indicates user can keep his or her

password unchanged for many, many years)

- The number of days to warn user for an expiring password (7 for a full week)
- The number of days after password expires the account is disabled.
- The number of days since January 1, 1970 when an account has been disabled
- A reserved field for possible future use.

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

- Username upto 8 characters. Case sensitive, usually all lowercase.
- Numeric group id. This is assigned by the "adduser" script. Unix uses this field.
- User's home directory. Usually home/username (eg. /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 favourite shell).

```
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      ttys1          2020-01-15 20:38          780  fd=tty1  
jeba@jeba-VirtualBox:~$
```

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```
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:~$ █
```

- i) get your current working directory
⇒ pwd.
- j) explore different ways of getting command history,
how to run previously executed Command
⇒ history
! line number.
- k) Create alias to most commonly used Commands
⇒ alias ~~label~~ = "Command"

~~OS or~~

PRACTICAL - 07

linux editors : vi

g) Create, modify, search and navigate a file in editor

i) Creating a file

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

ii) Modifying the file :

To modify a file, on 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 directions .

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

Word navigate

```
jeba@jeba-VirtualBox: ~  
Hello  
This is my Linux example  
Welcome  
Welldone  
This is Vi Editor  
Thank you  
  
: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/d/t/l/f)~? n
```

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

PRACTICAL - 08

Linux Security

a] Use of sudo to change user privileges to root.

Create an user named user1.

To give some users root privileges edit /etc/group using visudo. Enter new line as highlighted -

b] Identify operations that requires sudo privileges

```
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:~$ 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:~$
```

- c) ~~Modify expiration date for new user using password ageing.~~
- d) ~~Delete newly added user.~~

By
Osman

PRACTICAL - 09

Network Management.

- a) Get IP address of your machine using ifConfig.
- b) Get host name of your machine.

```
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)
```

```
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:~$
```

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

c]

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

d)

jeba@jeba-VirtualBox:~\$ arp
Address HWtype HWaddress Flags Mask Iface
10.0.2.2 ether 52:54:00:12:35:02 C enp0s3
3

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

c] Use ping to check the network connectivity to remote machines.

d] use dig command

e) Troubleshooting network using traceroute, now
Command

f) Use of arp command

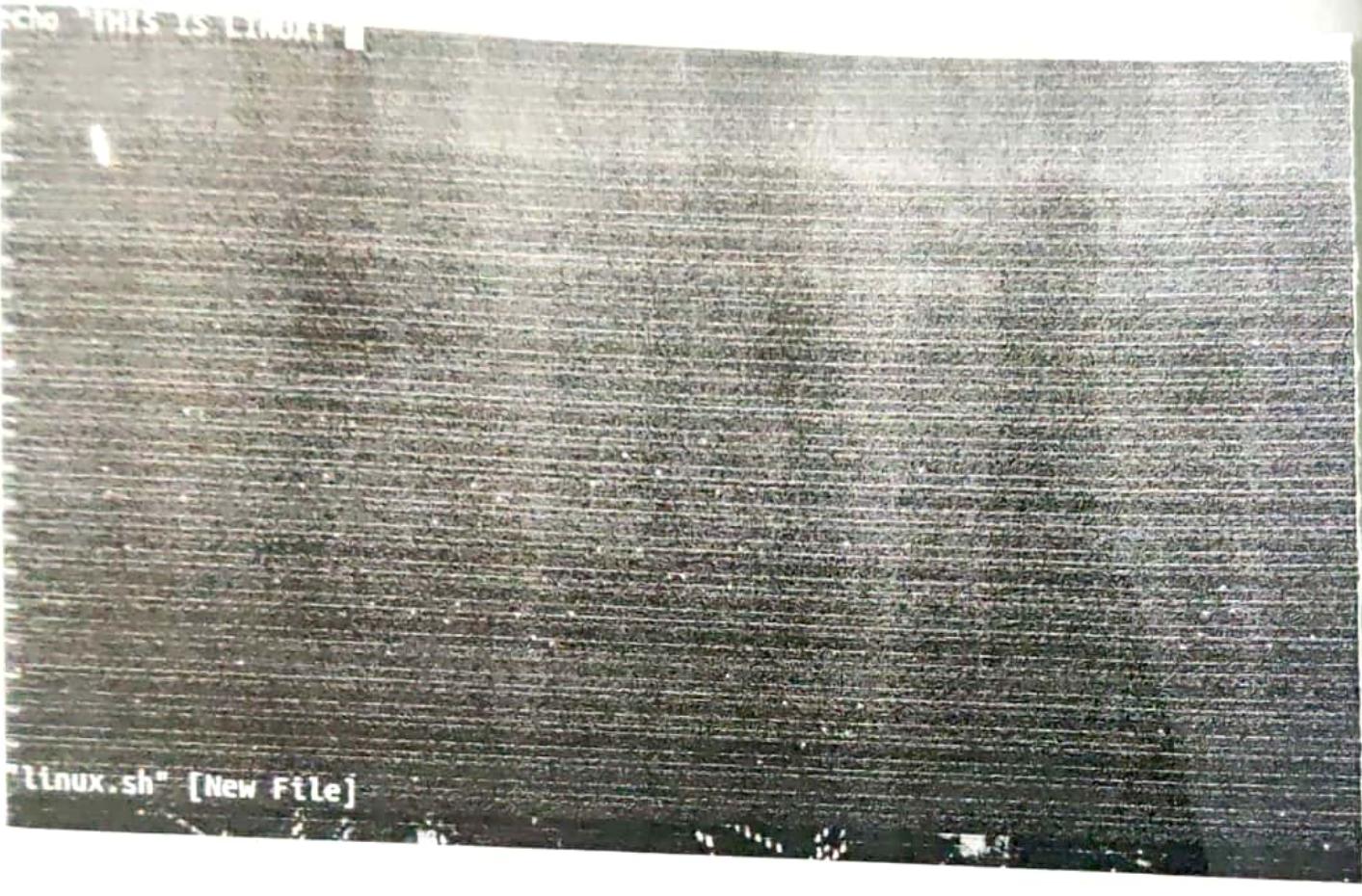
g) Use of host command

h) Use of netstat command and Nmap command

| jeba@jeba-VirtualBox:~\$ netstat | | | | | |
|---|--------|--------|---------------|-----------------|-----------------------|
| Active Internet connections (w/o servers) | | | | | |
| Proto | Recv-Q | Send-Q | Local Address | Foreign Address | State |
| unix | 2 | [] | DGRAM | I-Node 42149 | /run/user/1000/system |
| d/notify | | | | | |
| unix | 3 | [] | 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 | 44842 | @/tmp/dbus-CymTe17AQG |
| unix | 3 | [] | STREAM | 43331 | |
| unix | 3 | [] | STREAM | 42988 | @/tmp/dbus-CymTe17AQG |
| unix | 3 | [] | STREAM | 42698 | @/tmp/dbus-CMGGcoG7PS |
| stdout | | | | 13242 | /run/systemd/journal/ |
| unix | 3 | [] | STREAM | 43113 | /run/systemd/journal/ |
| stdout | | | | | |
| unix | 3 | [] | STREAM | 43013 | /run/systemd/journal/ |
| unix | 3 | [] | STREAM | 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:~$
```



"linux.sh" [New File]

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

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
#!/bin/bash
echo "This is Linux!"
./filename.sh

```

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 favourite 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 "
```

* Program to find the sum
 (Values passed during execution of two numbers)

sed Command or stream Editor is very powerful utility offered by Linux systems. It is mainly used for text substitution, find & replace but it can perform other text manipulations like insertion, deletion, search etc. With sed, we can edit complete files without actually having to open it.

Consider the following text files:

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

3) Deleting a line

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

4) Search and Replacing a string

's' option is for searching a word.

3) Replace a string on a particular line

To replace a string on a particular line, use line 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.

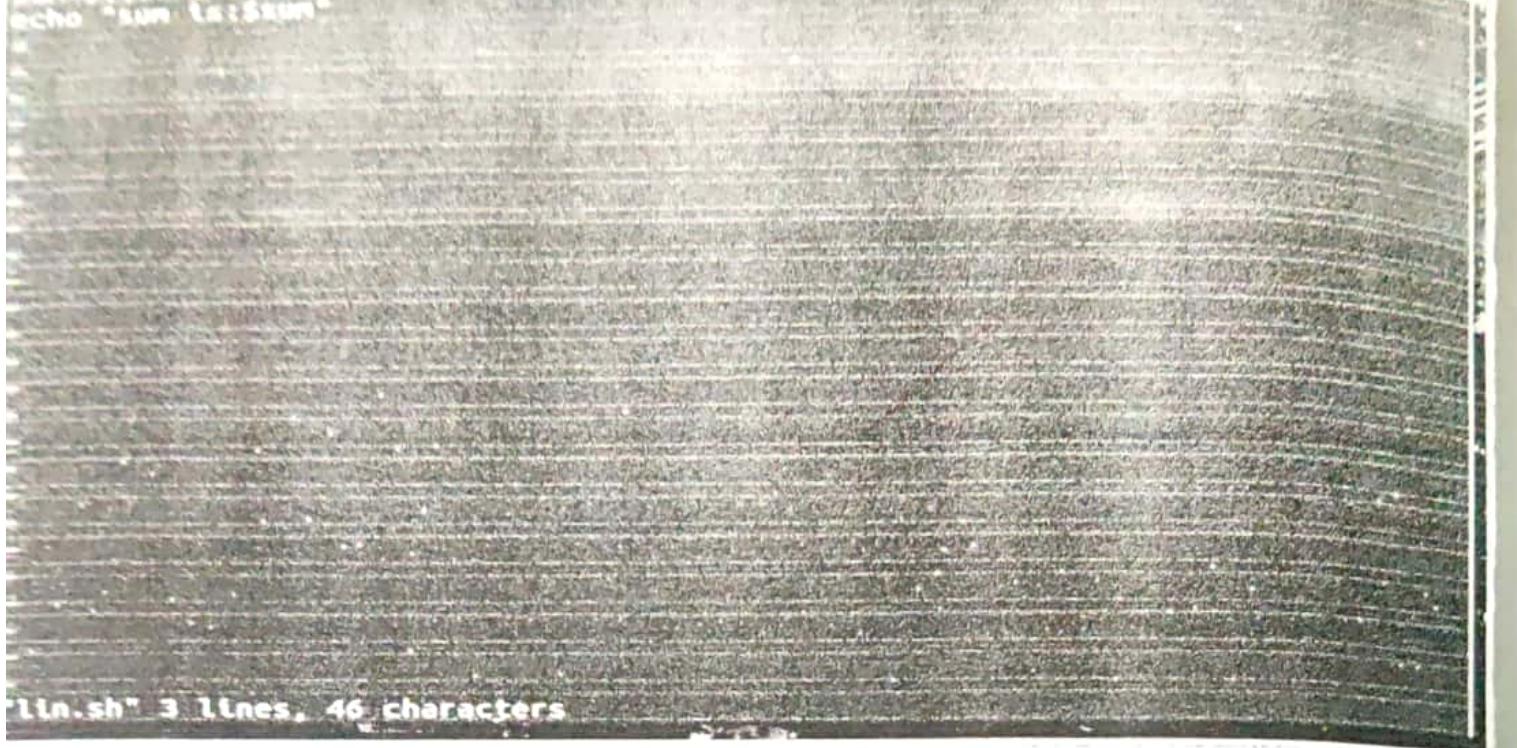
To change a whole line to a new line which a search pattern matches, use option 'c'

8) Appending lines

To add some content before every line with sed, use t & & as follows.

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

```
* tcsc@tcsc-VirtualBox: ~
tcsc@tcsc-VirtualBox:~$ vi ubuntu.sh
```



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

```
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:~$
```

```
datastructure  
green tech  
softskill  
stats  
calclus  
computer basic  
tcsc@tcsc-VirtualBox:~$
```

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

datastructure
database management
linux
python
green tech
softskill
stats
calculus
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
calculus
computer basic
tcsc@tcsc-VirtualBox:~$
```

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

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
calclus
computer basic
```

```
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 calclus
Thanks computer basic
```

PP
26/02