

Install your choice of linux distribution e.g Ubuntu, fedora, Debian.

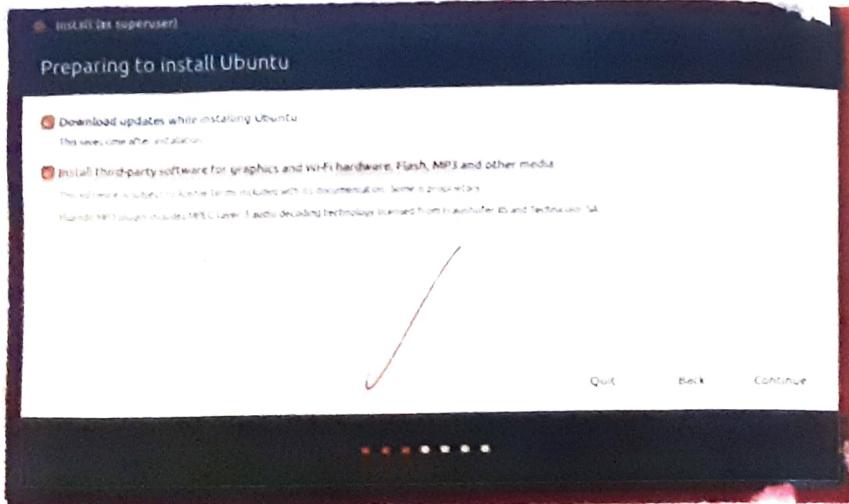
Using a USB drive

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 an error message.

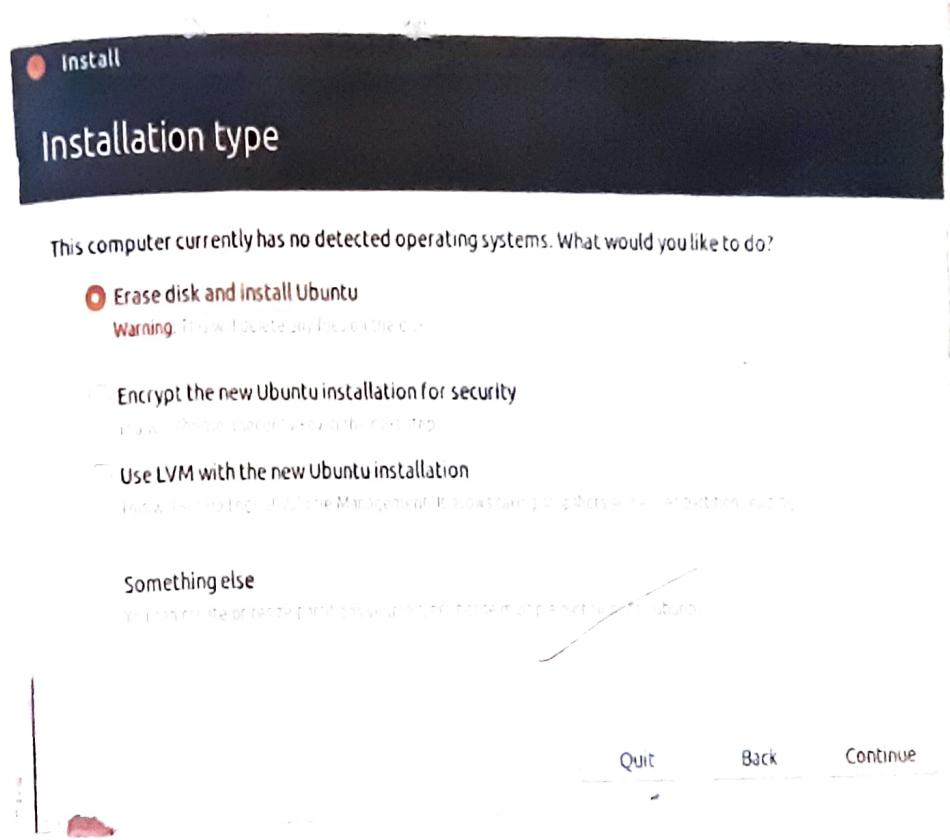
I Prepare to install Ubuntu

- 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 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 to ensure that the machine is up to date.



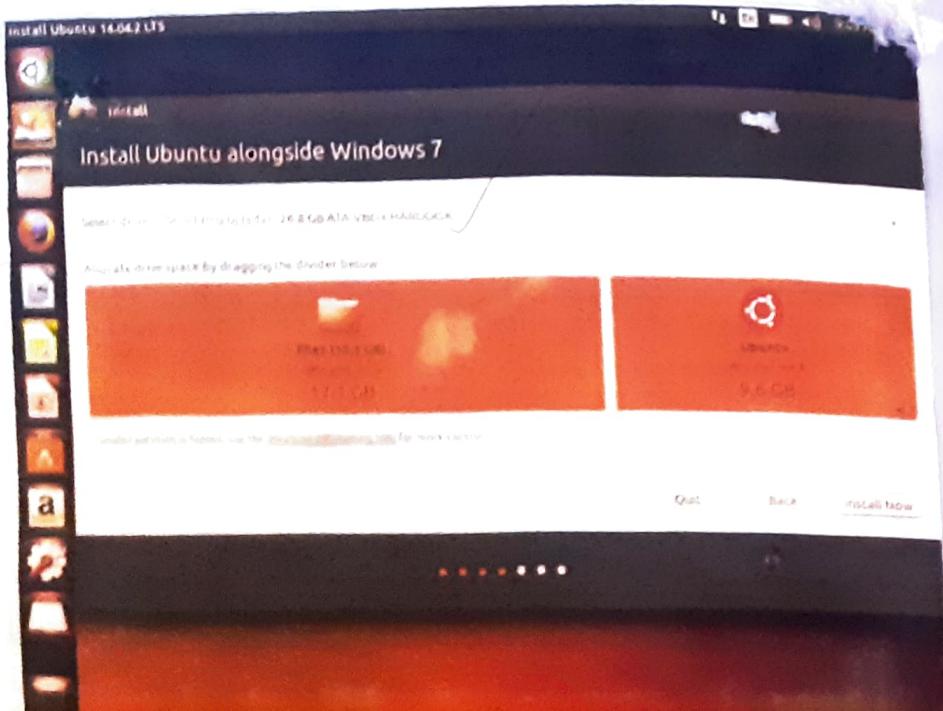
Allocate drive space

Use the 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

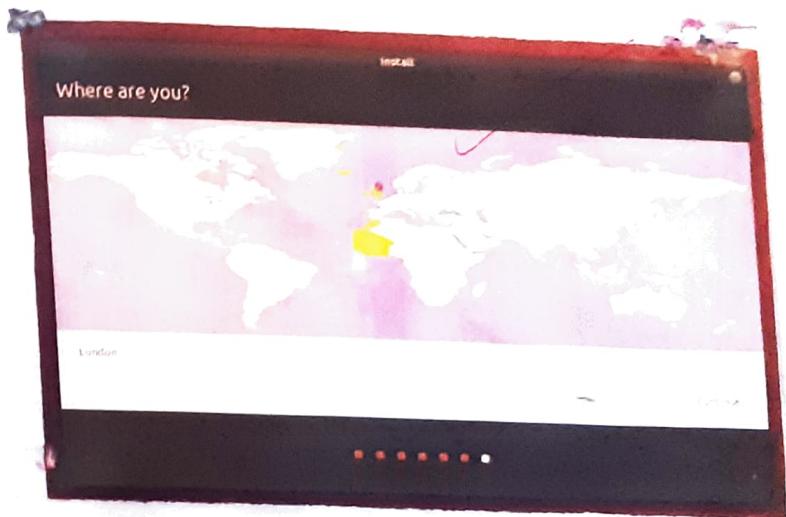
- Depending on your previous selections, you can now verify that you have chosen the way in which you would like to install Ubuntu.
 - The installation process will begin when you click the Install now button.
 - Ubuntu needs about 4.5 GB to install, so add a few extra GB to allow for your files
- to 9.6



Select Your Location

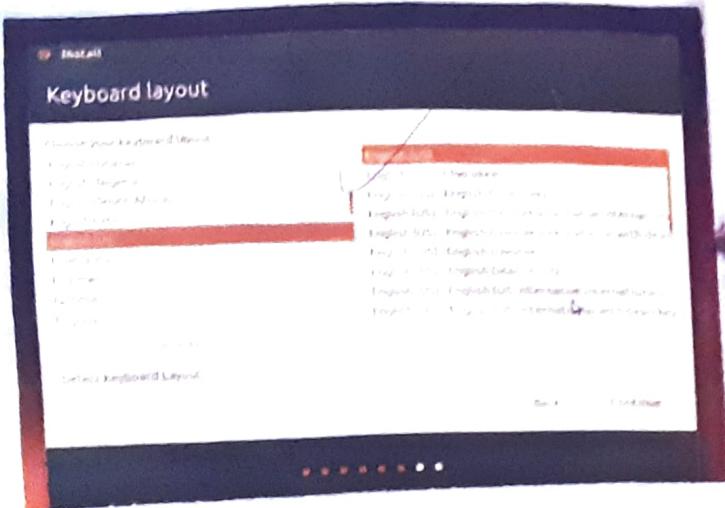
If you are connected to the internet, this should be done automatically. Check your location is correct and click forward to proceed. If you are unsure of your timezone, type the name of the town you are in or click the map we will help you find it.

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.

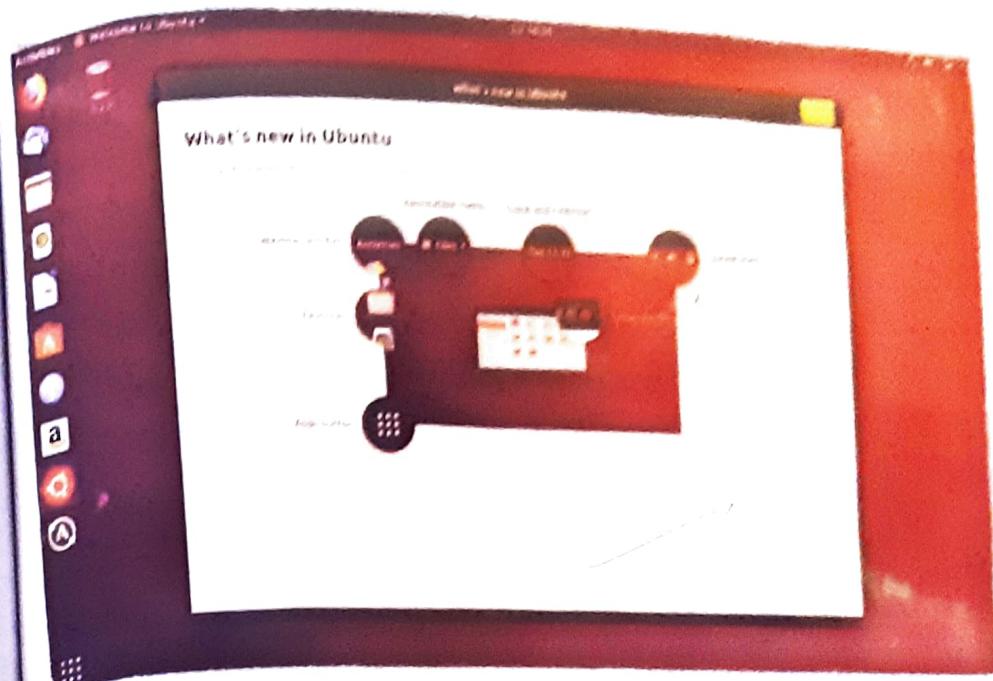
Click on the language option you need. If you are not sure click the 'Detect Keyboard Layout' button for help.



6. Enter Your login And Password Details

- Your Name :
- Your Computer's Name :
- Pick a Username
- Choose a Password
- Confirm your Password

7. Learn More About Ubuntu While The System Installs (What's New in Ubuntu)



8. That's It

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



installation is complete. You need to restart Computer In order to use the new installation.

82 * Changing Wallpaper picture

- On the left side of Background part, you can see your current wallpaper.
- On the right side is the part where we can select one of Ubuntu's wallpaper. 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.

* 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.

PRACTICAL 2 - Linux

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Aim: Installing and Removing Software

- 1] Install gcc package, Verify it runs and then later on remove it.

Step 1:

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

Step 2:

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

Step 3:

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

Now to Uninstall 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 executables like gcc, g++, cpp... contained in that directory.

H/2

Ques 1 Continuation

- Change the size of rotation of the screen 60
 - You can change how big (or detailed) things appear on the screen by changing the screen resolution.
 - You can change which way up things appear by changing the rotation
- 1] Click on the icon on the very right of the menu bar and select system settings.
 - 2] Open Screen Display
 - 3] Select your desired resolution and rotation
 - 4] Click apply the new setting will be applied for 30 seconds before reverting back. That way, if you cannot see anything with the new.

Aim : Utilization of grep command file
bring up the info page for the grep command
bring up the usage selection from the command line

To find info about any command 'info' command is used. The syntax of info command is info (command name). We are going to find the info about the grep command. Open the terminal (ctrl + alt + t) and type info group.

After typing this command following output will be displayed onto your screen you can also scroll through your pages using (space-up) and (backspace + down) keys More summarized form of showing info in the main command line.

- This is the info menu. A few useful info commands:
 - 'q' quits
 - 'h' starts the info tutorial
 - 'g' lists all the info commands

- Finding main page from the end line - Print up the main page for the ls command

To use the main command simply type man (Command name)

Now we are going to find the manual for 'ls' command.

Simply type 'main ls'

- Finding main page by topic: What man pages are available that document file compression

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

Simply type : man zip
man tar

Name → zip - package and compress (archive) files

Synopsis → ziplock (see separate man page)

zipnote (" " " ")

zipsplit (" " " ")

Use → ① add → Update existing entries and add
② update (-u) → Update existing entries if newer
file system and add new files.

→ flashen fd) → update existing entries and archive if newer in the system. Does not add new files to archive

Output → Name → ls - list directory contents
Synopsis → ls [OPTION] [FILE]
Description .

- a, -all

do not ignore entries starting with

-A, -almost-all

do not list implied and

-b, --escape

print(-style) escapes for nonimplied characters

-C list entries by columns

-d, --directory

list directories themselves, not their contents

→ Delete (-d) → Select entries in an existing archive and delete them

→ Copy (-u) → Select entries in an existing archive and copy them to a new archive

(g) finding man page by section from the end line
 bring up the man page by section for the
 printf library; which manual page section
 are library function for the number correspond
 to what section of the manual page is
 From: l is user command, which is sysadmin
 stuff. The man page for man itself explains
 it and like the standard output.

Manual Sections:

The standard section of the manual in user
 commands.

- (1) System calls
- (2) Library functions
- (3) devices and ^{special} Files
- (4) file formats and conventions
- (5) Games at .at
- (6) miscellaneus
- (7) system administration tools.

Distributions customize the manual section to which
 often include additional sections. There are certain
 terms that have different sections. (eg. printf) as
 a command section. as a 'std lib' function appears
 in sections: in cases like that you can pass the
 section no. to man before the page. name to choose
 which one you want or use man -a to show every
 matching page in a row.

```
$ man 1 printf
$ man 3 printf
$ man -n printf
$ man -k '^ printf'
```

printf(1) - format and print data
 printf(4p) - write formatted output
 printf(3) - formatted output with version
 printf(3p) - Print formatted output
 printf [builtin] n) - bash built-in command see bache(1)

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 'form'
 to limit.

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

~~\$ mkdir -m a = rw directoryname~~

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Practical No. 4

Command line Operations

- a) Install new package on your system.
`sudo apt-get install [package name]`

- b) Remove the package installed
`sudo apt-get remove [package name]`

- c) Find the passwd file in / using find command

✓ # `find / -name passwd`.

- `/usr/share/nss-ldap-253/pam.d/passwd`

- `/usr/bin/passwd`

- `/etc/pam.d/passwd`

- `/etc/passwd`.

- Find the directory password 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`.

. /etc/pam.d/passwd
. /etc/passwd

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

`find -maxdepth 3 -maxdepth 5 -name passwd`
. /usr/bin/passwd

. /etc/pam.d/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 and move it to /tmp directory using relative pathname.

`touch example.txt`.

`mv example.txt /tmp`

- f) delete the file moved to /tmp in previous step by absolute method

~~`rm /tmp/example.txt`~~

j. find the location of ls, ps, bash commands

whereis ls

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

whereis ps

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

whereis bash

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

SP
17/01

PRACTICAL No. 5

BT

FILE OPERATIONS

Explore mounted file systems on your computer

Ans: df -k

| Fs | Total | Used | Available | Use% | Mounted on |
|----------------|---------|---------|-----------|------|----------------|
| /dev | 494436 | 0 | 494436 | 0% | /dev |
| /dev/loop0 | 102416 | 3676 | 98740 | 4% | /run |
| /dev/sda1 | 7092728 | 3383372 | 3324824 | 51% | / |
| /dev/shm | 512876 | 216 | 512660 | 1% | /dev/shm |
| /run/lock | 5120 | 4 | 5116 | 1% | /run/lock |
| /sys/fs/cgroup | 512876 | 0 | 512876 | 0% | /sys/fs/cgroup |
| /run/user/1000 | 102416 | 48 | 102368 | 1% | /run/user/1000 |

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

Ans: Mount

```
ac on /proc type proc (rw,nosuid,nodev,noexec,relatime)
ev on /dev type devtmpfs (rw,nosuid,relatime,size=494436k,nr_inodes=123609,nodev=755)
vpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000)
pts on /run type tmpfs (rw,nosuid,noexec,relatime,size=102416k,mode=755)
/sda1 on / type ext4 (rw,relatime,errors=remount-ro,data=ordered)
curltyfs 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,nsroot=/)
agent=/lib/systemd/systemd-cgroups-agent,name=systemd,nsroot=/)
tore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
croup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset,nsroot=/)
croup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,nsroot=/,net_prio,nsroot=/)
croup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids,nsroot=/)
croup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,nsroot=/)
croup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpuacct,nsroot=/)
croup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsroot=/)
croup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,nsroot=/)
croup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio,nsroot=/)
croup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event,nsroot=/)
croup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsroot=/)
stemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=32,pgrp=1,timeout=8,nsroot=5,maxproto=5,direct)
getlbfs on /dev/hugepages type hugetlbfs (rw,relatime)
```

ing text from files.

: Cp command, mv command

```
jeba@jeba-VirtualBox:~/jeb$ cd jeb          Pictures  Templates  Videos
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$ ■
```

4. Archiving & backup work directory using tar, gzip and bzip2 commands
Ans: gzip filename.txt
Bzip2 filename.txt

- a) Use ~~hi~~ command to create diff of 2 files
 Ans: diff filename1 filename2

```
jeba@jeba-VirtualBox:~$ ls
jeba@jeba-VirtualBox:~$ jeba$ cat aa.txt
hello world
^C
jeba@jeba-VirtualBox:~$ jeba$ cat bb.txt
this is Linux
jeba@jeba-VirtualBox:~$ jeba$ diff aa.txt bb.txt
1:0
< hello world
jeba@jeba-VirtualBox:~$ jeba$ cat >bb.txt
this is Linux
^C
jeba@jeba-VirtualBox:~$ jeba$ diff aa.txt bb.txt
1:1
< hello world
> this is Linux
jeba@jeba-VirtualBox:~$ jeba$ gzip aa.txt
jeba@jeba-VirtualBox:~$ jeba$ gzip bb.txt
jeba@jeba-VirtualBox:~$ jeba$ diff aa.txt.gz bb.txt.gz
binary files aa.txt.gz and bb.txt.gz differ
```

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

```
jeba@jeba-VirtualBox:~$ jeba$ cat ht1.txt
h1
h1
h1
^C
jeba@jeba-VirtualBox:~$ jeba$ cat ht11.txt
hello
hello
hello
^C
jeba@jeba-VirtualBox:~$ jeba$ diff -u ht1.txt ht11.txt >sam.patch
jeba@jeba-VirtualBox:~$ jeba$ patch ,sam.patch
^C
jeba@jeba-VirtualBox:~$ jeba$ patch <sam.patch
patching file ht1.txt
jeba@jeba-VirtualBox:~$ jeba$ cat sam.patch
ht1.txt    2020-01-08 22:14:55.463509834 +0530
ht11.txt   2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
ht1
ht1
hello
hello
hello
jeba@jeba-VirtualBox:~$ jeba$
```

YK/20

PRACTICAL No. 6

Use Environment

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

Ans: who command and whoami

```
jeba@jeba-VirtualBox:~$ who
jeba  pts/7      2020-01-15 20:32 (:0)
jeba@jeba-VirtualBox:~$ whoami
jeba
jeba@jeba-VirtualBox:~$ who -t
LOGIN  pts/1      2020-01-15 20:30
jeba@jeba-VirtualBox:~$ who -s
zsh: id: tty1

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   pts/7      :0              20:32   4:28   0.19s  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   pts/7      :0              4:38   /sbin/upstart --user
jeba@jeba-VirtualBox:~$ w -h
jeba   pts/7      :0              20:32   4:44   0.67s  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   pts/7      20:32   5:36   0.00s  0.33s /sbin/upstart --user
```

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

Ans: 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 character encrypted. A blank entry (eg ::) indicates a password is not required to log in. and a “*” entry (eg : *) indicates account has been disabled.
- The number of days (since January 1, 1970) since 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 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.

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0:root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin/nologin
bin:x:2:2: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
```

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 password filed. Password stored in the "/etc/shadow" file.
- Numeric user id. Assigned by the "adduser" script. Unix uses this field, plus the following group field, to identify which file belongs to user.
- Full name of user. Try to keep it reasonable (under 30 characters).
- User's home directory. Usually /home/username. All user's personal file web pages, etc will be stored here.
- User's "shell account". Often set to "/bin/bash" to provide access to the bash shell.

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0:root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin/nologin
bin:x:2:2: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
```

c. Get your current working directory.

Ans. `pwd`

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox: $ pwd
/home/jeba
jeba@jeba-VirtualBox: $
```

d. Explore different ways of getting command history.

Ans. `history`

`!line number`

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox: $ history
1 who
2 whoami
3 who -l
4 clear
5 w
6 w -s
7 w -b
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
0G18  ttys2  2020-01-15 20:10  780 1d-tty1
jeba@jeba-VirtualBox: $
```

e. Create alias to most commonly used commands.

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

Ans. Alias label = "command"

```
jeba@jeba-VirtualBox: ~ alias m='mkdir new'
jeba@jeba-VirtualBox: ~ m
jeba@jeba-VirtualBox: ~ ls
music Pictures Templates
Desktop Downloads new Public videos
Documents examples.desktop j1
jeba@jeba-VirtualBox: ~
```

B/0

Linux Editors - VI

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

Creating a file.

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

Modifying the file:

To modify a file, on the vi editor, type "o"

Search in a file:

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

Navigate:

Movement in four directions

Key Action

k - Moves cursor up

j - Moves cursor down

h - Moves cursor left

l - Moves cursor right

Word Navigation : Key Action

b - Moves back to the beginning of word

e - Moves forward to the end of word

w - Moves forward to beginning of the word.

o(zero) - Moves to first char of line

f \$ - Moves to end of line.

Scrolling :

| key | Action |
|--------|----------------------------|
| Ctrl+f | scrolls forward |
| Ctrl+b | scrolls backward |
| Ctrl+d | scrolls half word |
| 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/gc

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

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

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

ii. Highlight

Use set hlsearch

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

:set hlsearch

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

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

```
# Please consider adding local content to /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"  
  
# Host alias specification  
  
# User alias specification  
  
# Cmnd alias specification  
  
# User privilege specification  
root    ALL=(ALL:ALL) ALL  
  
user1  ALL=(ALL:ALL) ALL
```

Ans

Identify operations that require sudo privileges

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

Modify expiration date for new user using password ageing.

```
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
```

d) Use of dig command

```
jeba@jeba-VirtualBox:~$ dig www.google.com
; <> SIG 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: ad; udp: 4096
; QUESTION SECTION:
; www.google.com.
;
; ANSWER SECTION:
www.google.com. 92 IN A 172.217.166.100
;
; Query time: 152 msec
; SERVER: 127.0.1.1#53(127.0.1.1)
; WHEN: Mon Jan 20 22:40:06 IST 2020
; MSG SIZE rcvd: 59
jeba@jeba-VirtualBox:~$
```

e) Troubleshooting network using traceroute, route command

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

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

f) Use of arp command

g) Use of netstat command and Nmap command

```
jeba@jeba-VirtualBox:~$ netstat
Active Internet connections (w/o servers)
proto proto-to-foreign Address          Foreign Address      State
proto-UNIX domain sockets (w/o servers)
proto-netlink logs
unix: 1      [ ]          DGRAM
unix: 2      [ ]          DGRAM
unix: 16     [ ]          DGRAM
unix: log    [ ]          DGRAM
unix: socket  [ ]          DGRAM
unix: 3      [ ]          STREAM CONNECTED
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ nmap www.google.com
```

```
Starting Nmap 7.01 ( https://nmap.org ) at 2020-01-26 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): 2484:6800:4007:811::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
```

Aim: Shell scripting

Basics of shell scripting.

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

Echo \$ SHELL

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

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

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

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

to write and execute a shell script.

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

- Open Terminal
- Navigate to the place where you want to create script using cd command
- Touch filename.sh
- Vi filename.sh [You can use favorite editor to edit the script]
- chmod 777 filename.sh (for making the script executable)
- sh filename.sh or ./filename.sh (for running the script)

program to display your name

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

```
tcsc@tcsc-VirtualBox: ~  
echo -n "Enter your name:"  
read name  
echo "My name is: $name"
```

```
tcsc@tcsc-VirtualBox: ~  
tcsc@tcsc-VirtualBox: ~$ vi ubuntu.sh  
tcsc@tcsc-VirtualBox: ~$ chmod 777 ubuntu.sh  
tcsc@tcsc-VirtualBox: ~$ ./ubuntu.sh  
Enter your name:  
TANVI  
My name is: TANVI  
tcsc@tcsc-VirtualBox: ~$
```

Program to find the sum of 2 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"
```

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

program two find the sum of 2 numbers (values passed during execution)

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

file
/attes
nl.

Sed

Sed command or Stream editor is very powerful utility offered by linux systems. Mainly used for text substitution, find and replace but it can perform other text manipulations like insertion, deletion, search, etc. With sed, we can edit complete files without having to open it.

Consider the following text file.

```
tcsc@tcsc-VirtualBox: ~
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
```

1. Displaying partial text of a file.

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

Display all except some lines

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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
calculus
computer basic
tcsc@tcsc-VirtualBox: $
```

etc.

Deleting a line

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

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

File

Search and Replacing a string
's' option is for searching a word.

characters

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

h.

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5) Replace a string on a particular line

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

```
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
```

```
tsc@tsc-VirtualBox: $ sed '6 s/cs/computer system /' cs.txt  
this is linux  
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
```

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

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'.

```
tsc@tsc-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
```

Appending lines

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

```
tsc@tsc-VirtualBox: $ sed '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
```

10/02