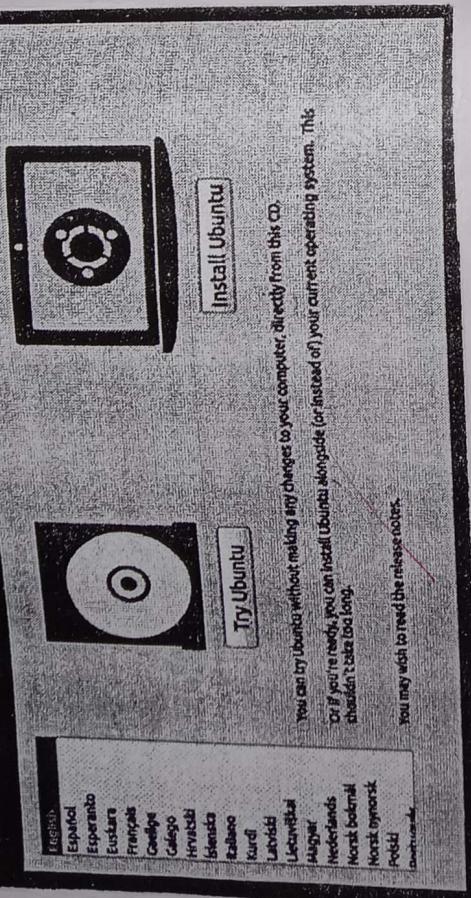


Aim : Installation of Ubuntu & background changing.



STEPS TO INSTALL UBUNTU

USING A USB DRIVE

- Most new computers can boot from USB. You should see a welcome screen prompting you to choose your language & 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.

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 & install third-party software to stay connected to the internet so you can get the latest updates while you install Ubuntu.



Install (as superuser)

Preparing to install Ubuntu

Download updates while installing Ubuntu
This saves time after installation.

Install third-party software for graphics and WiFi hardware, Flash, MP3 and other media
This software is subject to license terms included with its documentation. Some is proprietary.

Please note that installing this software may void your warranty.

Ubuntu MP3 plugin included with EEE-Linux - a audio decoding technology licensed from Fraunhofer IA and Technicolor SA

Back

Continue

Installation type

This computer currently has Microsoft Windows XP Professional on it. What would you like to do?

- Install Ubuntu alongside Microsoft Windows XP Professional

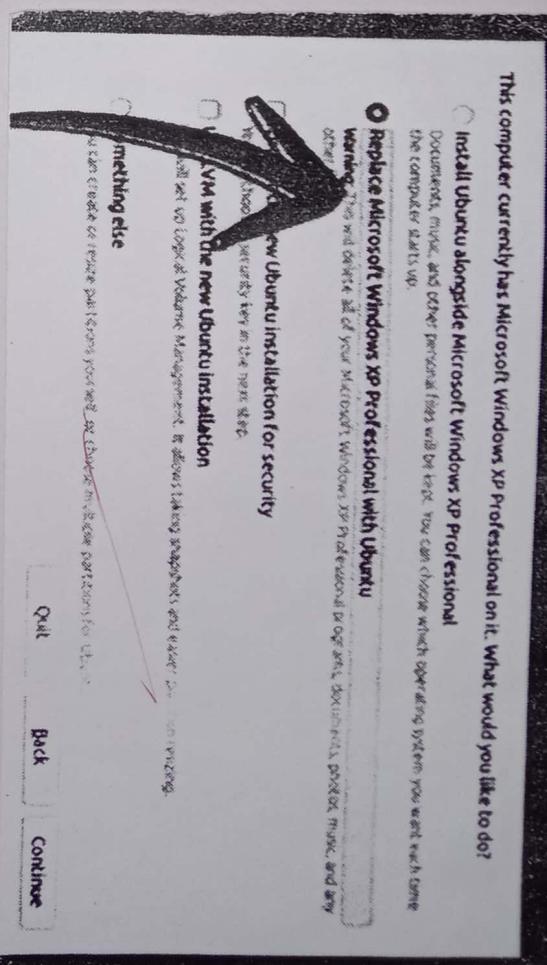
Documents, music, and other personal files will be kept. You can choose which option during setup if you want each item

the computer starts up.

- Install existing operating system. A replace with your existing or 'something else' option.

BEGIN THE INSTALLATION

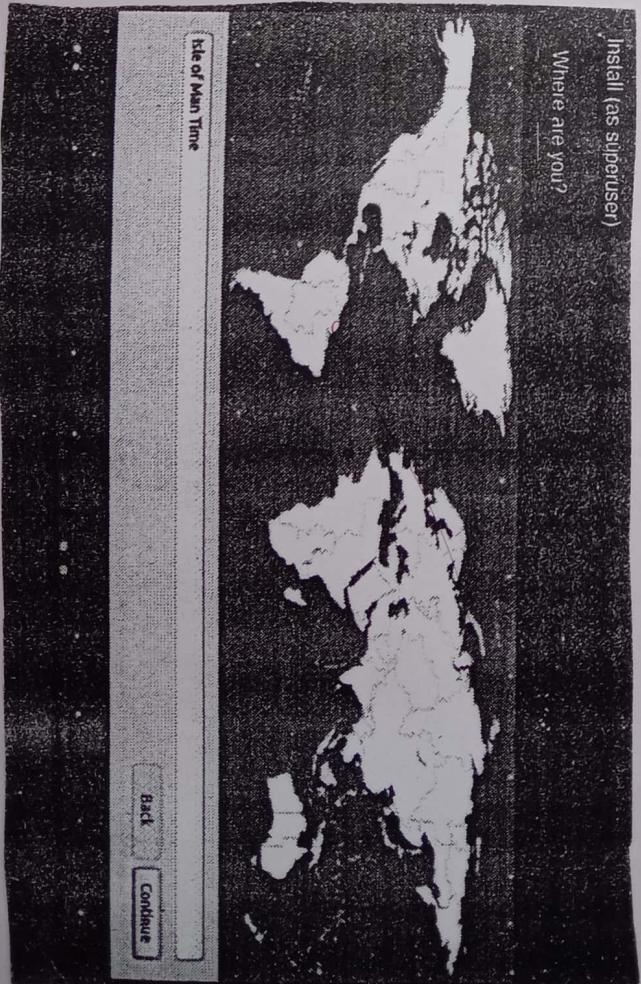
- Depending on your previous selections, you can now verify that you have chosen the way in which you would like to install Ubuntu.



- 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.

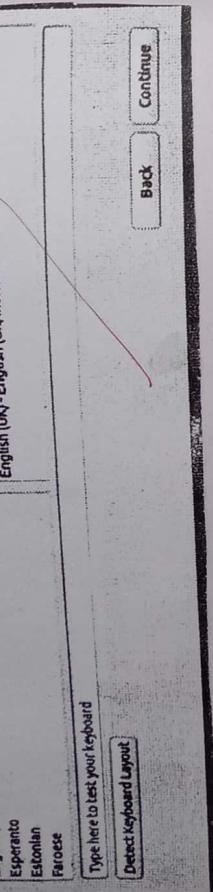
SELECT YOUR LOCATION

- If you are connected to the internet, this should be done automatically. Click 'forward' to continue. If you are unsure of your time zone, type the



name of the keyboard you are in or click on 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're not sure, click the 'Default Keyboard layout' button for help.

6. **GIVE YOUR LOCAL PASSWORD DETAILS** -

7. **Learn more about Ubuntu with the system install..**

8. **THAT'S IT.**
All that's left is to restart with the system & enjoy Ubuntu!

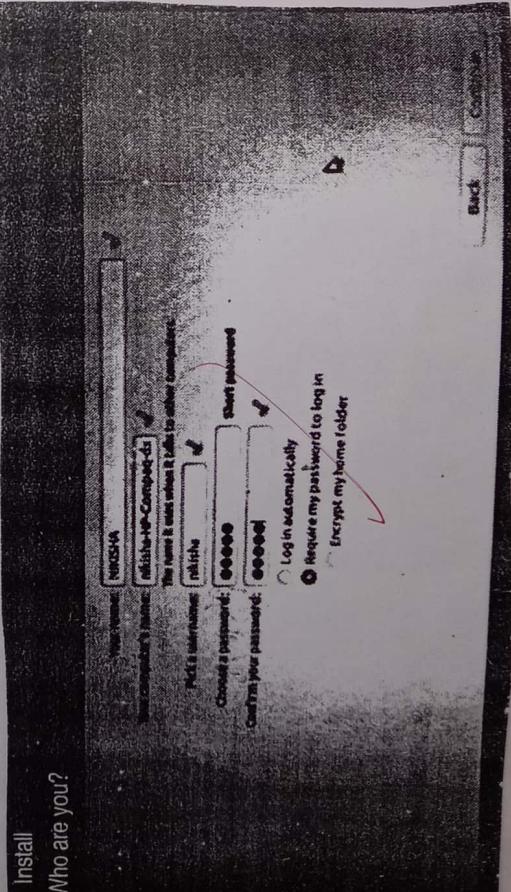
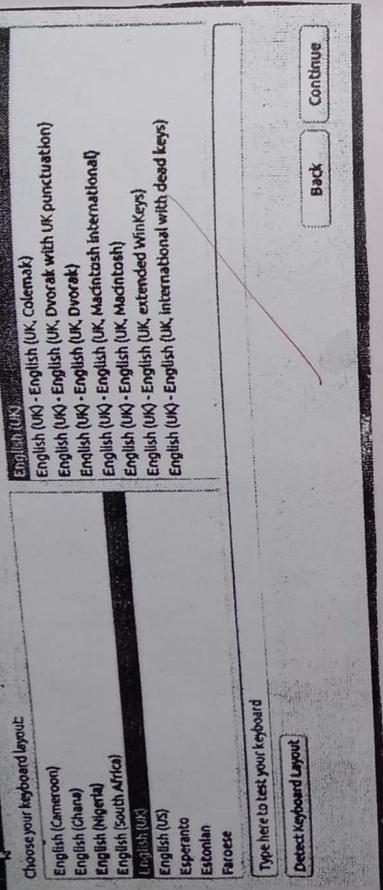
a) **CUSTOMIZE DESKTOP ENVIRONMENT BY CHANGING DIFFERENT DEFAULT OPTIONS** like CHANGING DEFAULT BACKGROUND, THEMES, SCREENSAVERS.

b) **ACCESSING SETTINGS** -

- To access Appearance setting in Ubuntu, lets click on the menu at the top right corner on the top menu bar & select 'System settings'.
- A window will pop-up with All settings divided into personal, hardware & system options now appear on the screen.

Install (as superuser)

Keyboard layout

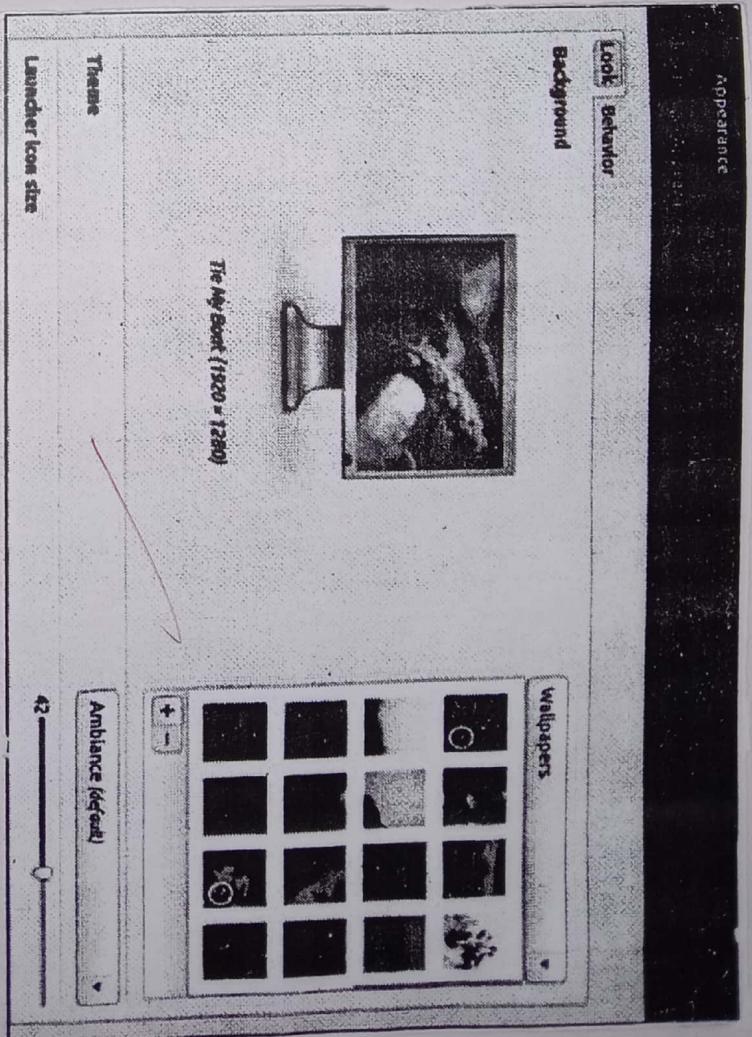
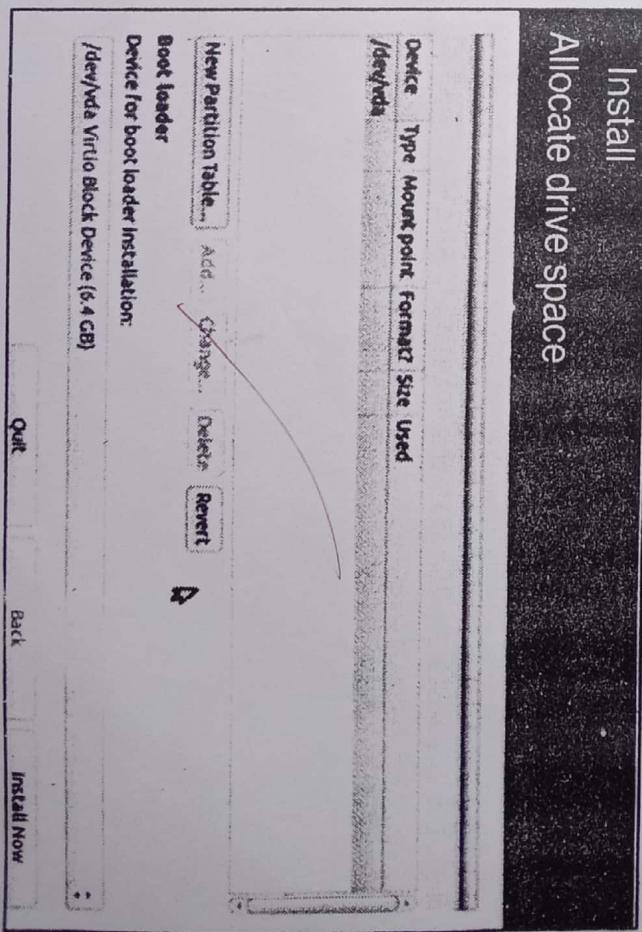


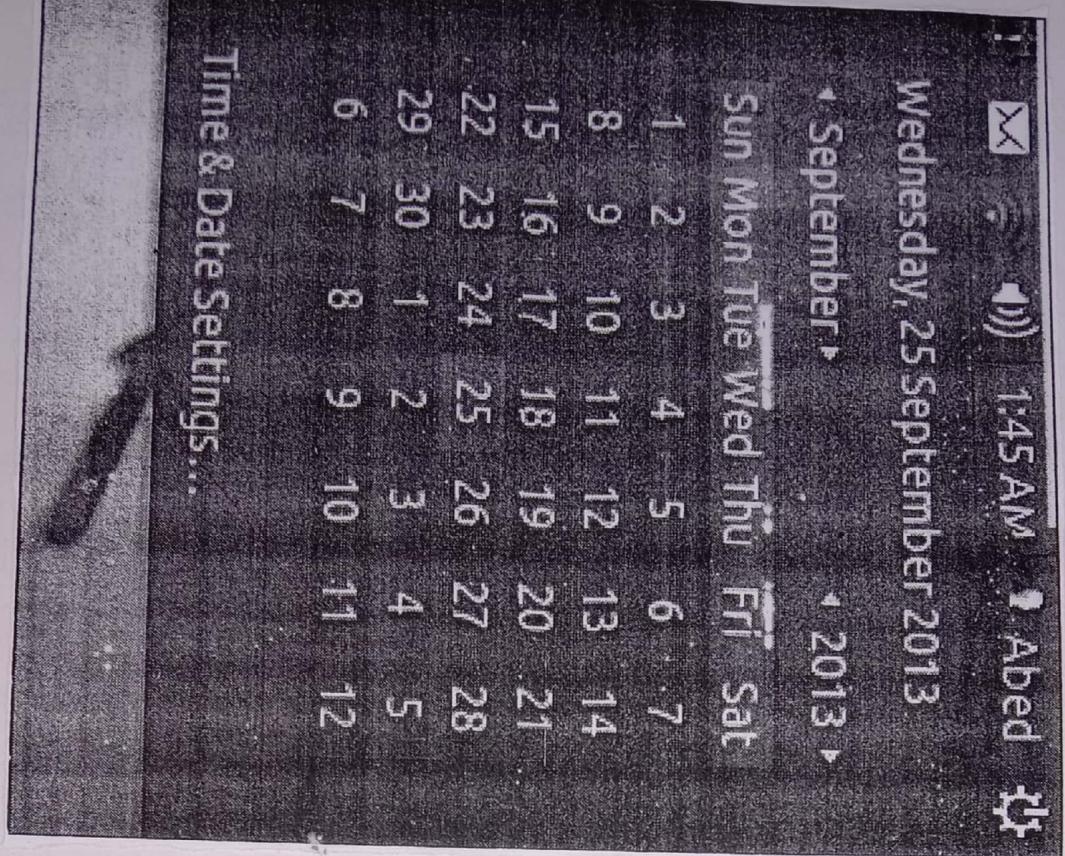


picture

- e) CHANGING WALLPAPER
- 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 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 to select file 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. Then in pop-up window, select the path to our custom folder choose the picture instead of it.

- 3) CHANGING UBUNTU THEME
- Ubuntu also has an option to change the desktop theme. Which in our click will change the entire way your computer looks.
 - To do that, click on the drop-down menu below the wallpaper thumbnails to choose between Ambiance, Radiance or High contrast.
 - Ambiance is the light theme that looks a bit more Mac-like while Radiance is the dark version. Theme used in ubuntu by default.





Time & Date Settings...

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5
6	7	8	9	10	11	12

b) SCREEN RESOLUTION : ASCERTAIN THE CURRENT SCREEN RESOLUTION FOR YOUR DESKTOP

- You can change how big (or how detailed) things appear on the screen by changing the screen resolution.
- You can change which way things appear (for example if you have a rotating display) by changing the rotation.
- Click the icon on the very right of the menu bar to select system settings.

Open screen display.

- If you have multiple displays & they are not mixed you can have different settings on each display. Select a display in the previous and.
- Select your desired resolution & rotation.
- Click apply. The new setting will be applied for 30 seconds before reverting back. That way, if you cannot see anything with no choose automatic.
- TIME SETTINGS CHANGE THE TIME ZONE YOUR SYSTEM TO NEW YORK TIME
 - If you are currently in Indian time, how do the display time change ? After noting the time change, change the time zone back to your local time now.
 - Just click on the clock on the top bar, & choose time & date settings, once the time & date window opens, choose manually, so you can change the time & date otherwise choose your time zone from the map, & choose automatic.

By
10/01

Aim : Installing & removing software

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

Step 1 :

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

Step 2 -

Type 'sudo apt-get install gcc'. After trying 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 languages.

How 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:
ca build /gcc
sudo make uninstall

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

10/10

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 selection

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

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

Open the terminal (Ctrl + Alt + T) and type:
info grep

After typing this command following output will
be displayed 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 command 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 available - that by topic what man pages are complete.

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

d] Finding man pages by section from the command line: Bring up the man page for the print function. Which manual library function found. Page section are

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 & list the std out

There are certain terms that have different pages in different sections (e.g.: '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 - a 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 matching too so you need to use 'term' to limit it.

- c) command-line Help list the available options for the mkder command. How can you do this?

\$ mkder -m a = >w x directory name.

~~8/10/01~~

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 passwd

- (nss / shadow / etc / nss - 1 / drop - 253 / pamd / passwd)

/usr / bin / passwd

- /etc / passwd

- /etc / passwd

d)

Find the directory passwd file under root & on level down.

- # find / - maxdepth 2 - name passwd

- 1) Find the password file under root & 2 levels down.
- # find / - maxdepth 3 - name passwd
 - /nss / bin / passwd
 - /etc / pam.d / passwd
 - /etc / passwd
- Find the password file below sub-directories level 2 & 4
- # find -mandarin 3 - maxdepth 5 - name passwd
 - /nss / bin / passwd
 - /etc / pam.d / passwd
- d) Create a symbolic link to the file you found in last step.
- # ln -s file1 file2
- c) Create an empty file example.txt & move it to tmp directory using mv command.
- # touch example.txt
 - # mv example.txt /tmp

FILE OPERATIONS

f) Please file model no / temp in previous step by absolute method.

rm /tmp/ example.txt
absolute path.

g) find the location of `ls`, `ps`, basic commands.

when is ps

ps : / bin / ps / ws | share | maps : / bin / ps / ws | those | man |
man1 / ps-1.92

error in fork

~~man / man~~ / Rush - 1.92.

Ques. 2. What are the different ways of exploring named file system in linear format.

Ans: $\frac{dy}{dx} = k$

jeba@jeba-VirtualBox:~\$	Filesystem	1K-blocks	Used	Available	Use%	Mounted on
udev		494436	6	494436	0%	/dev
tmpfs		102416	3676	98740	4%	/run
/dev/sda1		7092728	3383372	3326624	51%	/
tmpfs		512076	216	5118752	1%	/dev/shm
tmpfs		5120	4	5116	1%	/run/lock
tmpfs		512076	0	512076	0%	/sys/fs/cgroup
tmpfs		102416	48	1023568	1%	/run/user/1000

3.
→ copying text from file command.
W command in
Windows VIRTUALBOX -> LS
File Music Public
Template

```
jeba@Jeba-VirtualBox:~$ ls
jeba@Jeba-VirtualBox:~$ touch ss.txt
jeba@Jeba-VirtualBox:~$ cp ss.txt gg.txt
jeba@Jeba-VirtualBox:~$ mv gg.txt ss.txt
jeba@Jeba-VirtualBox:~$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@Jeba-VirtualBox:~$ cat >gg.txt
jeba@Jeba-VirtualBox:~$ cat >>gg.txt
jeba@Jeba-VirtualBox:~$ cat >>>gg.txt
jeba@Jeba-VirtualBox:~$ touch dd.txt
jeba@Jeba-VirtualBox:~$ ls
jeba@Jeba-VirtualBox:~$ cp gg.txt dd.txt
jeba@Jeba-VirtualBox:~$ mv dd.txt gg.txt
jeba@Jeba-VirtualBox:~$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@Jeba-VirtualBox:~$ rm gg.txt
jeba@Jeba-VirtualBox:~$ cat dd.txt
cat: dd.txt: No such file or directory
jeba@Jeba-VirtualBox:~$ touch ss.txt
jeba@Jeba-VirtualBox:~$ cp ss.txt gg.txt
jeba@Jeba-VirtualBox:~$ mv gg.txt ss.txt
jeba@Jeba-VirtualBox:~$ cat gg.txt
cat: gg.txt: No such file or directory
```

```
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
```

4. Archiving & backup the work directory using the,

4. Archiving & backing up the work
→
zip zip command,
gzip gzip command.
tar tar command.
tar -xvf filename.

```
laba@laba-VirtualBox:~$ tar -cvf data.tar /nn  
tar: data.tar: cannot open: Permission denied  
tar: Err: ls not recoverable: exiting now  
laba@laba-VirtualBox:~$ sudo tar -cvf data.tar  
/nn/  
laba@laba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~/jeb$ bztp2 ss.txt
```

→ 5. Use ~~diff~~ command to compare two files
~~diff filename / filename~~

```
Jeba@Jeba-VirtualBox:~/jebS ls  
-dR txt.gz ass.txt-bzz  
Jeba@Jeba-VirtualBox:~/jebS cat >aa.txt  
`Hello world  
this is Linux  
Jeba@Jeba-VirtualBox:~/jebS diff aa.txt bb.txt  
1d0  
< hello world  
Jeba@Jeba-VirtualBox:~/jebS cat >bb.txt  
`  
this is Linux  
Jeba@Jeba-VirtualBox:~/jebS diff aa.txt bb.txt  
1c1  
`Hello world  
-  
> this is Linux  
> Jeba@Jeba-VirtualBox:~/jebS gzip aa.txt  
Jeba@Jeba-VirtualBox:~/jebS ddif bb.txt  
Jeba@Jeba-VirtualBox:~/jebS gzip aa.txt.gz bb.txt  
Binary files aa.txt.gz and bb.txt.gz differ
```

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


- Username, up to 8 characters, case-sensitive & usually all lowercase, up to 8 characters, @ are as follows.
- Password, 13 characters encrypted to file in /etc/passwd file.
- The number of days (since January 1, 1970) since the password was last changed.
- The number of days before password may be changed (0 indicates it may be changed at any time)
- The number of days after which the password must be changed (9999 indicates it may be changed for many, many years)
- The number of days the account is of an expiring password (7 for a full week)
- The number of days an account is disabled
- The number of days since January 1, 1970 that an account has been disabled.
- A reserved field for possible future use.

- Each field in a password entry is separated with ":".
- colon characters, @ are as follows:
 - An "x" in the "password" field, forwards an account in the "password" file.
 - A "!" in the "password" file.
 - A "#" in the "password" file.
 - A numeric user id.
 - Numeric user id, plus the following group field, user.
 - Numeric user id, plus this field, plus the following group field, user.
 - Numeric user id, plus this field, plus the following group field, user.
 - Numeric group id, followed by 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 delivery. Normally /home/*username* (eg. phone number). All user's personal files, web pages, mail etc. will be stored here.
 - User's shell account. Often set to "/bin/bash" to provide access to the bash shell (my personal shell).

```
jebao@jeba-VirtualBox:~$ sudo cat /etc/shadow
root:$1$18240$0:99999:7:::
daemon:$1$16911:0:99999:7:::
bin:$1$16911:0:99999:7:::
sys:$1$16911:0:99999:7:::
sync:$1$16911:0:99999:7:::
games:$1$16911:0:99999:7:::
man:$1$16911:0:99999:7:::
lp:$1$16911:0:99999:7:::
mail:$1$16911:0:99999:7:::
news:$1$16911:0:99999:7:::
```

d) explore different ways of getting command history, how to
use previously recorded command with out typing it
→ ! line number

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd^M
root:x:0:0:root:/bin/bash:/usr/sbin/nologin
daemon:x:1:1:daemon:/usr/sbin/nologin
bin:x:2:bin:/bin:/usr/sbin/nologin
sys:x:3:sys:/bin:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/usr/sbin/nologin
games:x:5:60:games:/var/cache/man:/usr/sbin/nologin
man:x:6:12:man:/var/spool/lpd:/usr/sbin/nologin
lp:x:7:7:lp:/var/mail:/usr/sbin/nologin
nntp:x:9:news:/var/spool/uucp:/usr/sbin/nologin
uucp:x:10:10:uucp:/bin:/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
backup-list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
```

c)
Get your working directory
pwd

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

```
jeba@jeba-VirtualBox:~$ history
jeba@jeba-VirtualBox:~$ history
1 whoami
2 who -l
3 whoami
4 clear
5 w -s
6 w -
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:~$ l3
jeba@jeba-VirtualBox:~$ who -l
jeba@jeba-VirtualBox:~$ tty1
jeba@jeba-VirtualBox:~$
```

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

✓

```
jeba@jeba-VirtualBox:~$ alias m="mkdir new"
jeba@jeba-VirtualBox:~$ m
jeba@jeba-VirtualBox:~$ ls
Desktop Downloads Documents Examples Desktop
Music Pictures Templates Videos
jeba@jeba-VirtualBox:~$
```

Linux Editors : vi

a) 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 "Terminal", type o .

iii) Said in a file :
To find a word (forward search) press / followed by the word to search .

iv) Navigate:

Movement in four direction
key J

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

i) Replace

Syntax : % of word to be replaced / s / new word / g

~~key~~ Movement in four direction
key K
j
l
h
Moves cursor up
Moves cursor down
Moves cursor left
Moves cursor right

Word Navigation

Action

key b

Action

key e

Action

key w

Action

key s (arrow)

Action

key \$

Action

key f

Action

key b

Action

key t

Action

key d

Action

key u

Action

key v

Action

key z

Action

key x

Action

key c

Action

key a

Action

key n

Action

key p

Action

key q

Action

key r

Action

key s

Action

key i

Action

key o

Action

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 our Linux example
Welcome
Welldone
This is vi Editor
Thank you

```
:set hisearch
```

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

iii) Show the line numbers
use set nu

```
jeba@jeba-VirtualBox:~$ set nu
1 Hello
2 This is our Linux example
3 Welcome
4 Well done
5 This is vi Editor
6 That is v
7 Thank you
```

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

```
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 user root privileges edit /etc/sudoers file.
In sudoers file new line as highlighted below.

```
# Please consider adding local content in /etc/sudoers.d/ instead of
# directly modifying this file.
#
# See the man page for details on how to write a sudoers file.

Defaults env_reset
Defaults mail_badpass
Defaults secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin/"
Defaults !/sbin:/bin"

# Host alias specification
# User alias specification
# Cmnd alias specification
# User privilege specification
root    ALL=(ALL:ALL) ALL
```

b) Identify operations that require sudo privileges.

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

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

```
jeba@jeba-VirtualBox:~$ sudo chage -l user1
          Minimum number of days before password change
Last password change : Jan 20, 2020
Password expires     : never
Password inactive    : never
Account expires       : never
Maximum 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) Delete newly added user

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

✓ 28/02

```
jeba@jeba-VirtualBox:~$ sudo chage -l 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 [999999]: 200
      Last Password Change (YYYY-MM-DD) [2020-01-20]: 2020-01-21
      Password Expiration Warning [-1]: 5
      Password Inactive [-1]:
      Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31
      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:~$ sudo chage -E 25/01/2020 -m 10 -M 90 -I 30 -W 30 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
```

-*E*: Expiration Date
 -*m*: Minimum number of days before password change
 -*I*: Number of days password is valid

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

Network Management

a) Get IP address of your machine using ifconfig

```
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=97.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=82.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=82.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=84.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=87.1 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=93.5 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=66.9 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=9 ttl=54 time=98.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=10 ttl=54 time=99.9 ms
^C
[1]+  Stopped                  ping www.google.com
jeba@jeba-VirtualBox:~$
```

1) Use diag command

b) get hostname of your machine

```
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 nsec
; SERVER: 127.0.1.1#53(127.0.1.1)
; WHEN: Mon Jan 20 22:40:06 IST 2020
; MSG SIZE rcvd: 39
```

```
jeb@jeb-VirtualBox:~$ ifconfig  
enp0s3      Link encap:Ethernet HWaddr 08:00:27:0e:0b:69  
           inet addr:10.0.2.15 Bcast:10.0.2.255 Mask:255.255.255.0  
           inet6 addr: fe80::c0cd:53ae%enp0s3 brd fe80::ff:fe3d:53ae/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)  
  
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)
```

c) We ping to check the network connectivity to remote machines.

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 68.465 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        0      0    0 enp0s3
10.0.2.0        *            255.255.255.0 U          0      0    0 enp0s3
link-local      *            255.255.0.0   U          0      0    0 enp0s3
jeba@jeba-VirtualBox:~$
```

Use of arp command

```
jeba@jeba-VirtualBox:~$ arp
jeba@jeba-VirtualBox:~$ arp -n
inet     HWAddress             Flags Mask          Iface
10.0.2.2      52:54:00:12:35:02 C      00:00:00:00:00:00 enp0s3
3
```

8/8/20

```
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
```

Use of host command

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

shell scripting

Basics of shell scripting

- To get a shell, you need to start a terminal.
- To run 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 a shell script & it passes the instruction to the program /bin/bash.

echo \$ SHELL

```
tcscc@tcscc-VirtualBox:~$ echo $ SHELL
sh
```

chmod 777 filename.sh
./filename.sh

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

~~Step to write & execute a shell script.~~

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

- Open terminal
- Moved to the place where you want to create script using cd command
- Touch filename.sh
- Vi filename.sh [you can use your 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"
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"
```

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

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

```
a=100
b=25
sum=$((a+b))
echo "Sum is:$sum"
```

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

sed

sed command or stream editor is very powerful utility offered by linux systems. It is mainly used for text substitution, find & replace. 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 file.

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

subjects offered in cs
datastructure
database management

```
linux  
python  
green tech  
softskill  
stats  
calculus  
computer basic
```

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

```
tsc@tsc-VirtualBox:~$ vi lnx2.sh
tsc@tsc-VirtualBox:~$ chmod 777 lnx2.sh
tsc@tsc-VirtualBox:~$ ./lnx2.sh
sum is:125
tsc@tsc-VirtualBox:~$
```

l1n.sh 3 lines, 46 characters

3) Deleting a line

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

1) Displaying partial text of a file.

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

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

- 2) Display all except some lines
- To display all content of a file except for some portion, use option 'd'.

3) Deleting a line

Replacing a string

's' option is for searching a word

tccs@tccs-VirtualBox:~\$ sed 's/cs/computer/' cs.txt

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

- 4) Replace a string on a particular line
- To replace a string on a particular line, use line number with 's' option.

tccs@tccs-VirtualBox:~\$ sed 's/cs/computer system /' cs.txt

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

6) Add a line after / before the matched string.

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

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

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

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

8) Appending lines

To add some content after every line with sed, we can do as follows.

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

1) To change a whole line with matched pattern.

To change a whole line to a new line when a pattern matches, use option 'c'.

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