

ITW ASSIGNMENT – 1

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BRANCH : COMPUTER SCIENCE AND ENGINEERING

Q1. Count the total number of files in the directory `/usr/lib` starting with 'lib' and print output in a `count.txt` file.

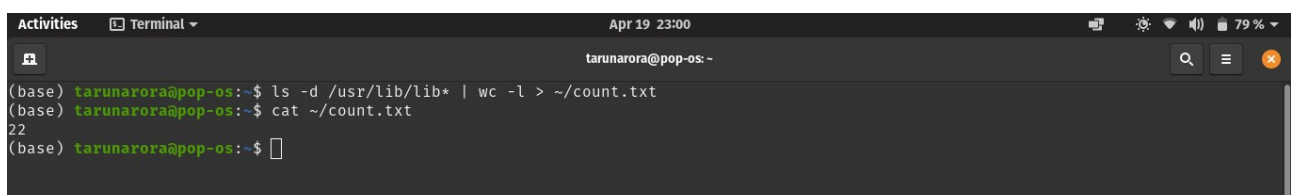
Solution:-

Current `/usr/lib` directory → `ls -l /usr/lib`

```
tarun@linux:~$ ls -l /usr/lib
libcryptfs.so.1 -> libcryptfs.so.1.0.0
libcryptfs.so.1.0 -> libcryptfs.so.1.0.0
libcryptfs.so.1.0.0
libfirmware_manager.so
libfirmware_manager.so.0 -> libfirmware_manager.so
libhardsid-builder.so.0 -> libhardsid-builder.so.0.0.1
libhardsid-builder.so.0.0.1
libpop_theme_switcher.so
libpop_theme_switcher.so.0 -> libpop_theme_switcher.so
libpop_upgrade_gtk.so
libpop_upgrade_gtk.so.0 -> libpop_upgrade_gtk.so
libreoffice
libresid-builder.so.0 -> libresid-builder.so.0.0.1
libresid-builder.so.0.0.1
libs76_hidpi_widget.so
libs76_hidpi_widget.so.0 -> libs76_hidpi_widget.so
libsidplay2.so.1 -> libsidplay2.so.1.0.1
libsidplay2.so.1.0.1
libzopfli.so.1 -> libzopfli.so.1.0.3
libzopfli.so.1.0.3
libzopfli.so.1.0.3
libzopfli.so.1.0.3
```

CODE:

```
ls -d /usr/lib/lib* | wc -l > ~/count.txt
```



```
Activities Terminal Apr 19 23:00 tarunarora@pop-os-~
(base) tarunarora@pop-os:~$ ls -d /usr/lib/lib* | wc -l > ~/count.txt
(base) tarunarora@pop-os:~$ cat ~/count.txt
22
(base) tarunarora@pop-os:~$
```

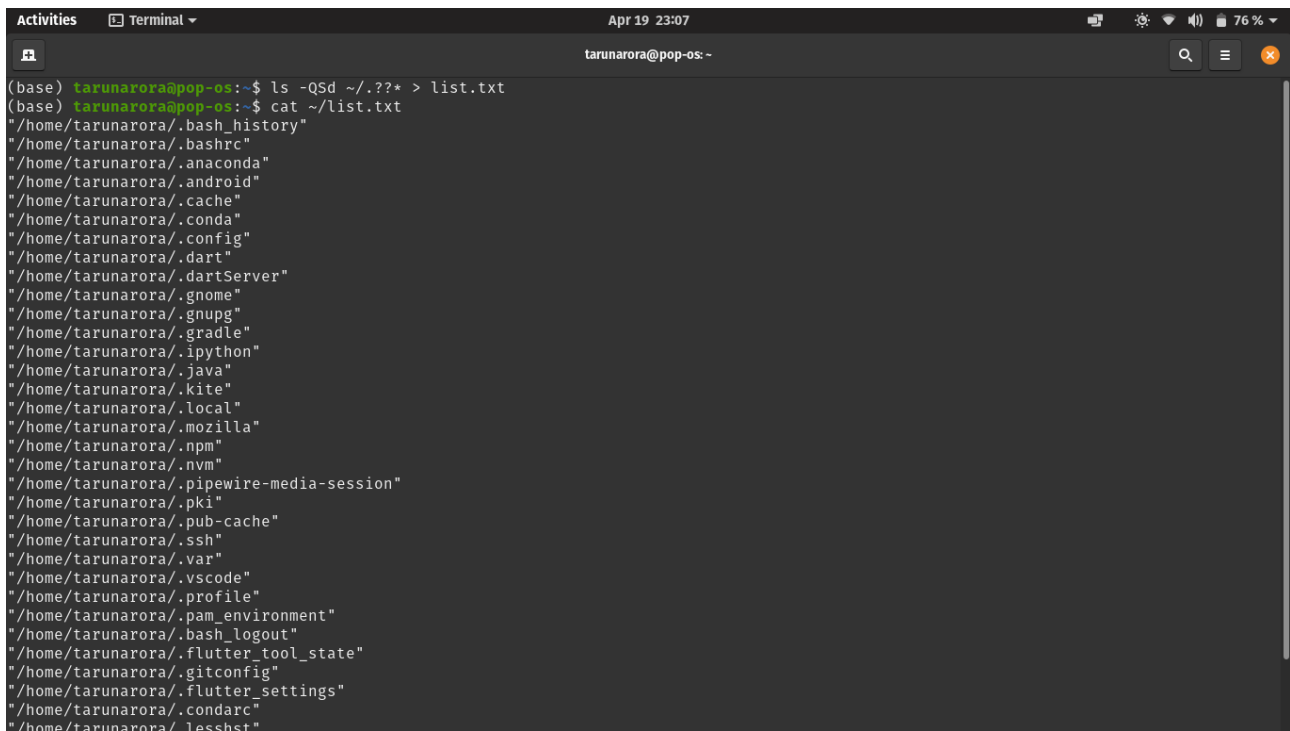
Q2. List all hidden files in your home directory and save it in a list.txt file in decreasing order of their word count.

Solution:-

Code:-

```
ls -Qsd ~/.??* > list.txt
```

```
cat ~/list.txt
```



```
Activities Terminal Apr 19 23:07 tarunarora@pop-os: -
(base) tarunarora@pop-os:~$ ls -Qsd ~/.??* > list.txt
(base) tarunarora@pop-os:~$ cat ~/list.txt
"/home/tarunarora/.bash_history"
"/home/tarunarora/.bashrc"
"/home/tarunarora/.anaconda"
"/home/tarunarora/.android"
"/home/tarunarora/.cache"
"/home/tarunarora/.conda"
"/home/tarunarora/.config"
"/home/tarunarora/.dart"
"/home/tarunarora/.dartServer"
"/home/tarunarora/.gnome"
"/home/tarunarora/.gnupg"
"/home/tarunarora/.gradle"
"/home/tarunarora/.ipython"
"/home/tarunarora/.java"
"/home/tarunarora/.kite"
"/home/tarunarora/.local"
"/home/tarunarora/.mozilla"
"/home/tarunarora/.npm"
"/home/tarunarora/.nvm"
"/home/tarunarora/.pipewire-media-session"
"/home/tarunarora/.pki"
"/home/tarunarora/.pub-cache"
"/home/tarunarora/.ssh"
"/home/tarunarora/.var"
"/home/tarunarora/.vscode"
"/home/tarunarora/.profile"
"/home/tarunarora/.pam_environment"
"/home/tarunarora/.bash_logout"
"/home/tarunarora/.flutter_tool_state"
"/home/tarunarora/.gitconfig"
"/home/tarunarora/.flutter_settings"
"/home/tarunarora/.condarc"
"/home/tarunarora/.lessht"
```

Q3. List all hidden files in your home directory and save it in a list.txt file in decreasing order of their word count.

Solution:-

Code:-

```
ps -U root u > processes.txt
```

```
cat ~/processes.txt
```

```
Activities Terminal Apr 19 23:12 tarunarora@pop-os: -
(base) tarunarora@pop-os:~$ ps -U root u>processes.txt
(base) tarunarora@pop-os:~$ cat ~/processes.txt
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.1  0.1 168564 11980 ?        Ss   22:42   0:01 /sbin/init splash
root         2  0.0  0.0      0     0 ?        S    22:42   0:00 [kthreadd]
root         3  0.0  0.0      0     0 ?        I<   22:42   0:00 [rcu_gp]
root         4  0.0  0.0      0     0 ?        I<   22:42   0:00 [rcu_par_gp]
root         6  0.0  0.0      0     0 ?        I<   22:42   0:00 [kworker/0:0H-kblockd]
root         9  0.0  0.0      0     0 ?        I<   22:42   0:00 [mm_percpu_wq]
root        10  0.0  0.0      0     0 ?        S    22:42   0:00 [rcu_tasks_rude_]
root        11  0.0  0.0      0     0 ?        S    22:42   0:00 [rcu_tasks_trace]
root        12  0.0  0.0      0     0 ?        S    22:42   0:00 [ksoftirqd/0]
root        13  0.0  0.0      0     0 ?        I    22:42   0:01 [rcu_sched]
root        14  0.0  0.0      0     0 ?        S    22:42   0:00 [migration/0]
root        15  0.0  0.0      0     0 ?        S    22:42   0:00 [idle_inject/0]
root        16  0.0  0.0      0     0 ?        S    22:42   0:00 [cpuhp/0]
root        17  0.0  0.0      0     0 ?        S    22:42   0:00 [cpuhp/1]
root        18  0.0  0.0      0     0 ?        S    22:42   0:00 [idle_inject/1]
root        19  0.0  0.0      0     0 ?        S    22:42   0:00 [migration/1]
root        20  0.0  0.0      0     0 ?        S    22:42   0:00 [ksoftirqd/1]
root        22  0.0  0.0      0     0 ?        I<   22:42   0:00 [kworker/1:0H-events_highpri]
root        23  0.0  0.0      0     0 ?        S    22:42   0:00 [cpuhp/2]
root        24  0.0  0.0      0     0 ?        S    22:42   0:00 [idle_inject/2]
root        25  0.0  0.0      0     0 ?        S    22:42   0:00 [migration/2]
root        26  0.0  0.0      0     0 ?        S    22:42   0:00 [ksoftirqd/2]
root        28  0.0  0.0      0     0 ?        I<   22:42   0:00 [kworker/2:0H-events_highpri]
root        29  0.0  0.0      0     0 ?        S    22:42   0:00 [cpuhp/3]
root        30  0.0  0.0      0     0 ?        S    22:42   0:00 [idle_inject/3]
root        31  0.0  0.0      0     0 ?        S    22:42   0:00 [migration/3]
root        32  0.0  0.0      0     0 ?        S    22:42   0:00 [ksoftirqd/3]
root        34  0.0  0.0      0     0 ?        I<   22:42   0:00 [kworker/3:0H-events_highpri]
root        35  0.0  0.0      0     0 ?        S    22:42   0:00 [cpuhp/4]
root        36  0.0  0.0      0     0 ?        S    22:42   0:00 [idle_inject/4]
root        37  0.0  0.0      0     0 ?        S    22:42   0:00 [migration/4]
root        38  0.0  0.0      0     0 ?        S    22:42   0:00 [ksoftirqd/4]
```

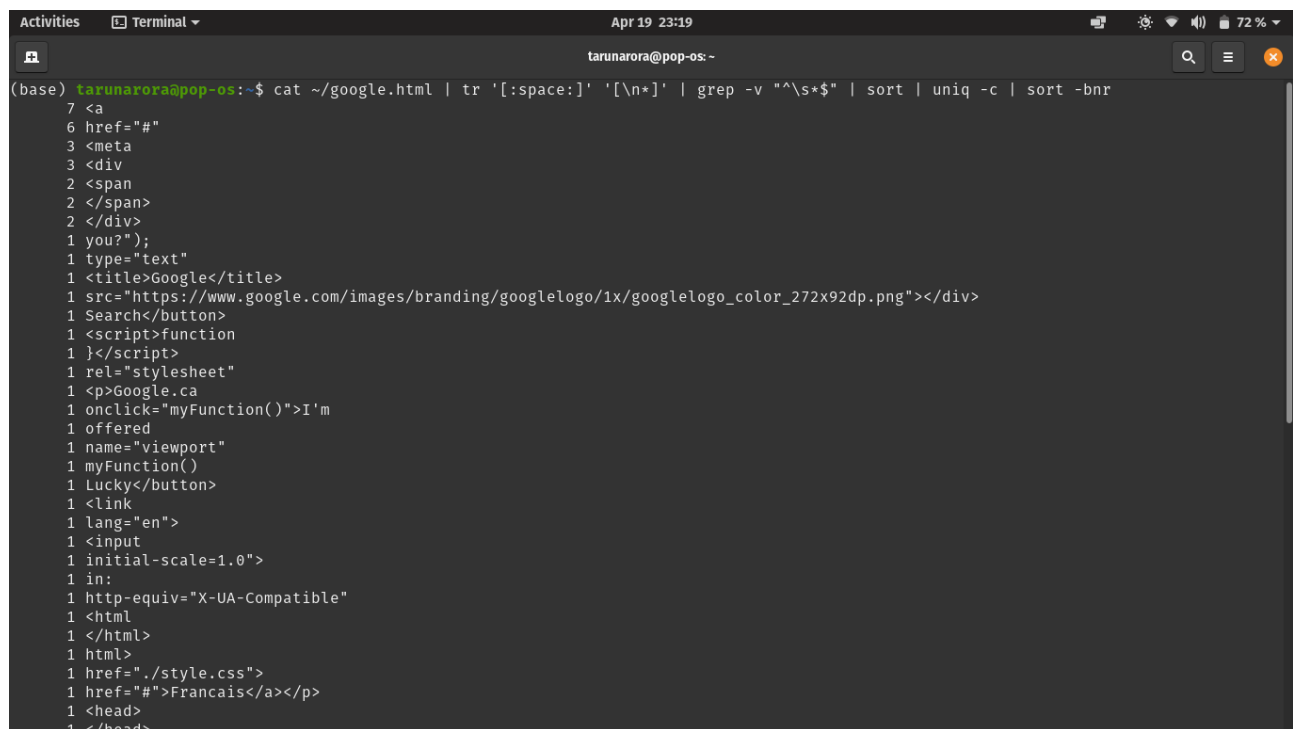
Q4. Given an input file, write a command sequence to find the count of each word.

Solution:-

Code:-

```
cat ~/google.html | tr '[:space:]' '[\n*]' | grep -v "^\  
s*$" | sort | uniq -c | sort -bnr
```

NOTE: REPLACE google.html WITH OTHER FILE LOCATION

A terminal window titled 'tarunarora@pop-os: ~' showing the execution of the command: `cat ~/google.html | tr '[:space:]' '[\n*]' | grep -v "^\
s*$" | sort | uniq -c | sort -bnr`. The output lists various HTML tags and attributes, each preceded by a count. The output is as follows:

```
(base) tarunarora@pop-os:~$ cat ~/google.html | tr '[:space:]' '[\n*]' | grep -v "^\  
s*$" | sort | uniq -c | sort -bnr
7 <a
6 href="#"
3 <meta
3 <div
2 <span
2 </span>
2 </div>
1 you?");
1 type="text"
1 <title>Google</title>
1 src="https://www.google.com/images/branding/googlelogo/1x/googlelogo_color_272x92dp.png"></div>
1 Search</button>
1 <script>function
1 </script>
1 rel="stylesheet"
1 <p>Google.ca
1 onclick="myFunction()">I'm
1 offered
1 name="viewport"
1 myFunction()
1 Lucky</button>
1 <link
1 lang="en">
1 <input
1 initial-scale=1.0">
1 in:
1 http-equiv="X-UA-Compatible"
1 <html
1 </html>
1 html>
1 href="/style.css">
1 href="#">Francais</a></p>
1 <head>
1 </head>
```

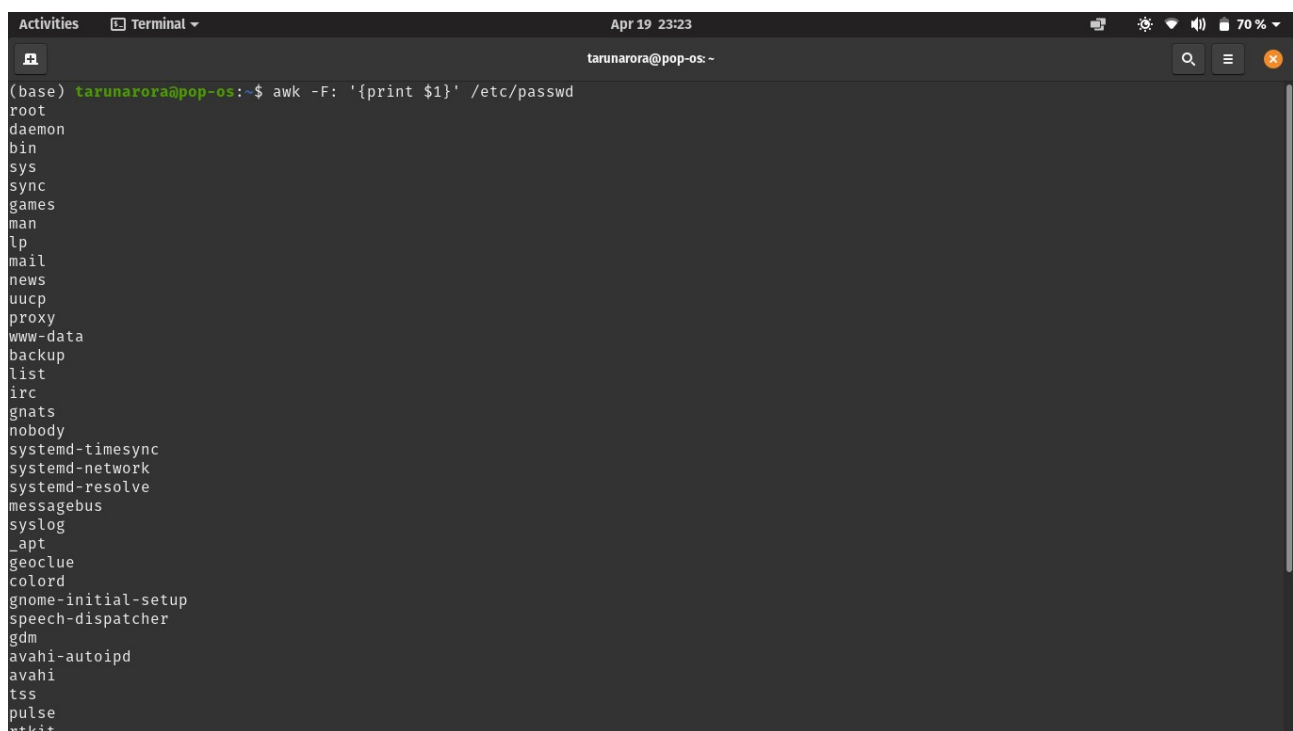
Q5. How will you print the login names of all users on a system?

Solution:-

Code:-

```
awk -F: '{print $1}' /etc/passwd
```

NOTE: This prints all users on system whether they are logged in or not.



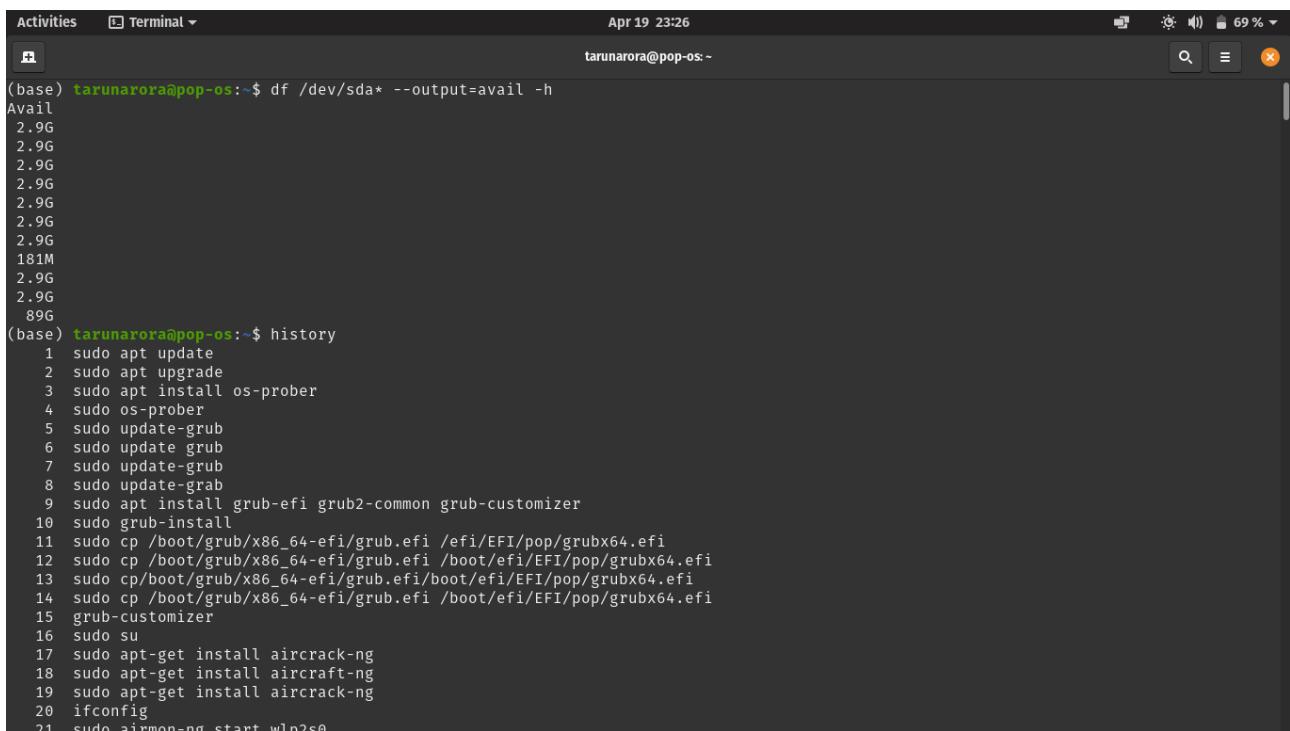
```
Activities Terminal Apr 19 23:23 tarunarora@pop-os: -
(base) tarunarora@pop-os:~$ awk -F: '{print $1}' /etc/passwd
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
nobody
systemd-timesync
systemd-network
systemd-resolve
messagebus
syslog
_apt
geoclue
colord
gnome-initial-setup
speech-dispatcher
gdm
avahi-autoipd
avahi
tss
pulse
rtkit
```

Q6. What is the command to find remaining disk space in unix server? Also find the method to see command line history ?

Solution:-

Code:-

1. `df /dev/sda* --output=avail -h`
2. `history`



```
Activities Terminal Apr 19 23:26 tarunarora@pop-os: ~  
(base) tarunarora@pop-os:~$ df /dev/sda* --output=avail -h  
Avail  
2.9G  
2.9G  
2.9G  
2.9G  
2.9G  
2.9G  
2.9G  
2.9G  
181M  
2.9G  
2.9G  
89G  
(base) tarunarora@pop-os:~$ history  
1 sudo apt update  
2 sudo apt upgrade  
3 sudo apt install os-prober  
4 sudo os-prober  
5 sudo update-grub  
6 sudo update grub  
7 sudo update-grub  
8 sudo update-grub  
9 sudo apt install grub-efi grub2-common grub-customizer  
10 sudo grub-install  
11 sudo cp /boot/grub/x86_64-efi/grub.efi /efi/EFI/pop/grubx64.efi  
12 sudo cp /boot/grub/x86_64-efi/grub.efi /boot/efi/EFI/pop/grubx64.efi  
13 sudo cp /boot/grub/x86_64-efi/grub.efi /boot/efi/EFI/pop/grubx64.efi  
14 sudo cp /boot/grub/x86_64-efi/grub.efi /boot/efi/EFI/pop/grubx64.efi  
15 grub-customizer  
16 sudo su  
17 sudo apt-get install aircrack-ng  
18 sudo apt-get install aircraft-ng  
19 sudo apt-get install aircrack-ng  
20 ifconfig  
21 sudo airmon-ng start wlan2s0
```

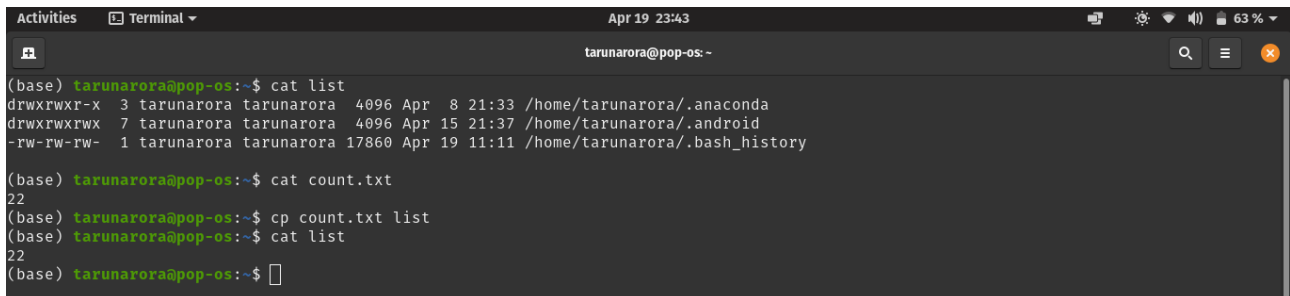
Q7. Write a command to copy one file into another ? Also find, how to concatenate the files.

Solution:-

Code:-

1. Command to copy file to other (overwriting)

```
cp file1.txt file2.txt
```



A terminal window titled 'tarunarora@pop-os: ~' showing the following commands and output:

```
(base) tarunarora@pop-os:~$ cat list
drwxrwxr-x 3 tarunarora tarunarora 4096 Apr  8 21:33 /home/tarunarora/.anaconda
drwxrwxrwx 7 tarunarora tarunarora 4096 Apr 15 21:37 /home/tarunarora/.android
-rw-rw-rw- 1 tarunarora tarunarora 17860 Apr 19 11:11 /home/tarunarora/.bash_history

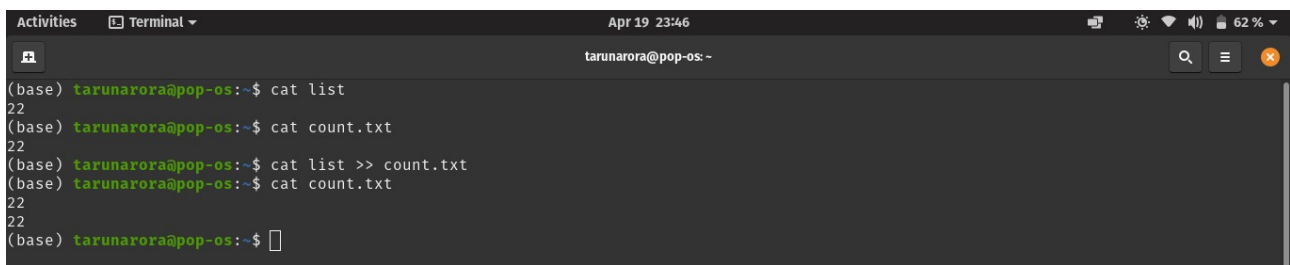
(base) tarunarora@pop-os:~$ cat count.txt
22

(base) tarunarora@pop-os:~$ cp count.txt list
(base) tarunarora@pop-os:~$ cat list
22

(base) tarunarora@pop-os:~$
```

2. Command to copy file to other (appending)

```
cat file1.txt >> file2.txt
```



A terminal window titled 'tarunarora@pop-os: ~' showing the following commands and output:

```
(base) tarunarora@pop-os:~$ cat list
22

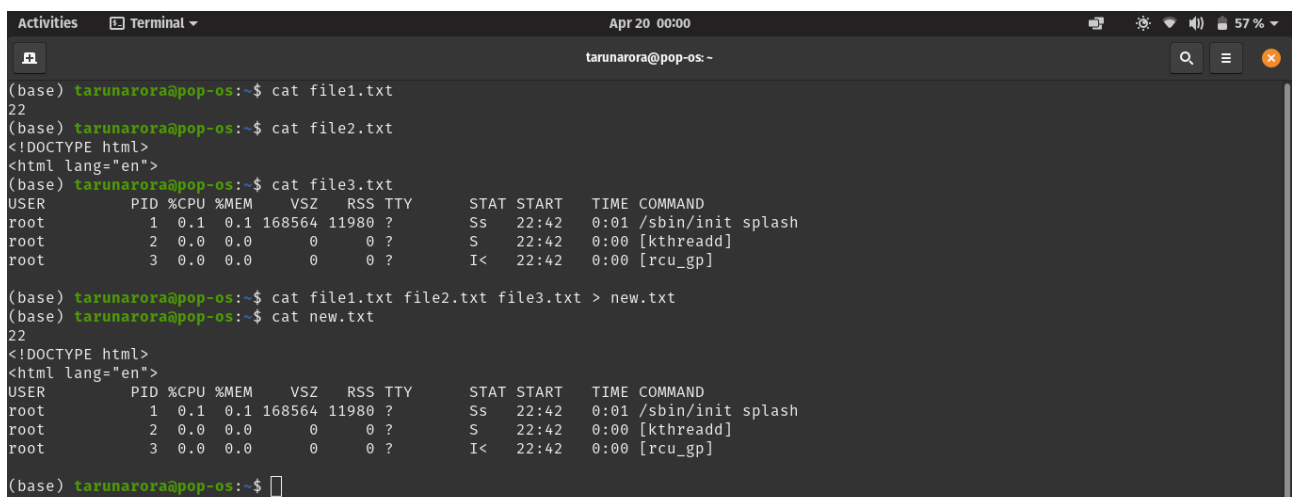
(base) tarunarora@pop-os:~$ cat count.txt
22

(base) tarunarora@pop-os:~$ cat list >> count.txt
(base) tarunarora@pop-os:~$ cat count.txt
22
22

(base) tarunarora@pop-os:~$
```

3. Command to concatenate files together

```
cat file1.txt file2.txt file3.txt > new.txt
```



A terminal window titled 'tarunarora@pop-os: ~' showing the following commands and output:

```
(base) tarunarora@pop-os:~$ cat file1.txt
22

(base) tarunarora@pop-os:~$ cat file2.txt
<!DOCTYPE html>
<html lang="en">

(base) tarunarora@pop-os:~$ cat file3.txt
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.1  0.1 168564 11980 ?        Ss   22:42   0:01 /sbin/init splash
root         2  0.0  0.0      0     0 ?        S    22:42   0:00 [kthreadd]
root         3  0.0  0.0      0     0 ?        I<   22:42   0:00 [rcu_gp]

(base) tarunarora@pop-os:~$ cat file1.txt file2.txt file3.txt > new.txt
(base) tarunarora@pop-os:~$ cat new.txt
22
<!DOCTYPE html>
<html lang="en">
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.1  0.1 168564 11980 ?        Ss   22:42   0:01 /sbin/init splash
root         2  0.0  0.0      0     0 ?        S    22:42   0:00 [kthreadd]
root         3  0.0  0.0      0     0 ?        I<   22:42   0:00 [rcu_gp]

(base) tarunarora@pop-os:~$
```

Q8. Write a command to copy one file into another ? Also find, how to concatenate the files.

Solution:-

a. File system commands :

- cat
- cd
- cp
- ls
- mkdir
- mv
- popd
- pushd

b. Process control command :

- bg - put suspended process into background
- fg - bring process into foreground
- jobs - list processes

c. Utility commands :

- pwd
- chmod
- emacs
- less

Q9. Count the number of words in the file which contain all the letters a, e, i, o, u. These letters may occur more than once & other letters are also permitted.

Solution:-

Code:-

```
cat ~/count.txt | tr '[:space:]' '[\n*]' | grep a | grep e | grep i  
| grep u | grep o | wc -l > list.txt
```



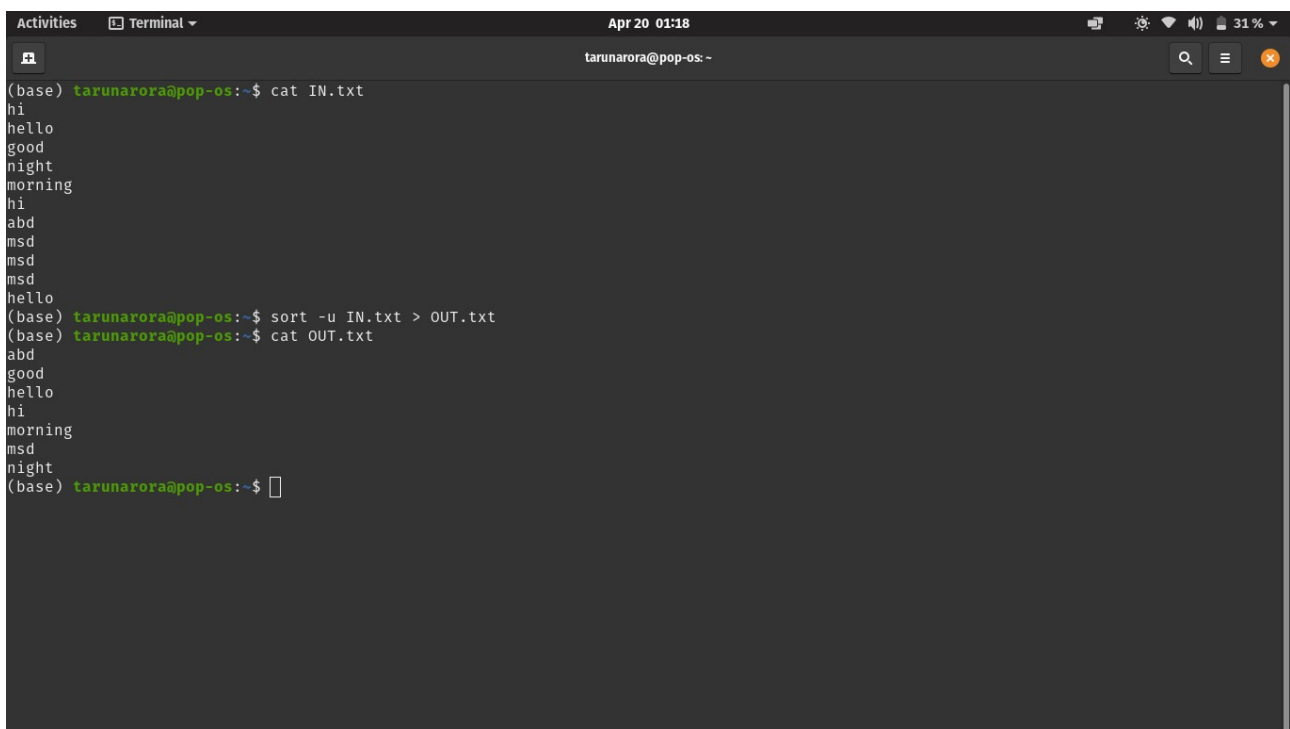
```
Activities Terminal Apr 20 01:08 tarunarora@pop-os: ~  
(base) tarunarora@pop-os:~$ cat count.txt  
abcdefgh  
abedgflo  
aeipoulo  
oeiualop  
lakoiehu  
abeukoei  
aeiou aeiou  
(base) tarunarora@pop-os:~$ cat ~/count.txt | tr '[:space:]' '[\n*]' | grep a | grep e | grep i | grep u | grep o | wc -l > list.txt  
(base) tarunarora@pop-os:~$ cat list.txt  
6  
(base) tarunarora@pop-os:~$
```

Q10. Write a command that will output the sorted contents of a file named IN.txt and place the output in another file named OUT.txt while at the same time excluding duplicate entries

Solution:-

Code:

```
sort -u IN.txt > OUT.txt
```

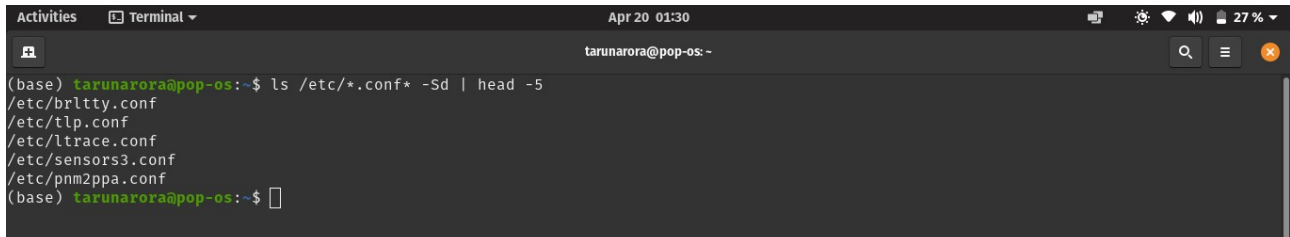
A terminal window titled 'Terminal' with a timestamp of 'Apr 20 01:18' and a battery level of '31%'. The user 'tarunarora@pop-os' is logged in. The terminal shows the following sequence of commands and output:
(base) tarunarora@pop-os:~\$ cat IN.txt
hi
hello
good
night
morning
hi
abd
msd
msd
msd
hello
(base) tarunarora@pop-os:~\$ sort -u IN.txt > OUT.txt
(base) tarunarora@pop-os:~\$ cat OUT.txt
abd
good
hello
hi
morning
msd
night
(base) tarunarora@pop-os:~\$

Q11. List 5 largest files in the /etc directory which contain the string '.conf', sorted by decreasing file size.

Solution:-

Code:

```
ls /etc/*.conf* -Sd | head -5
```



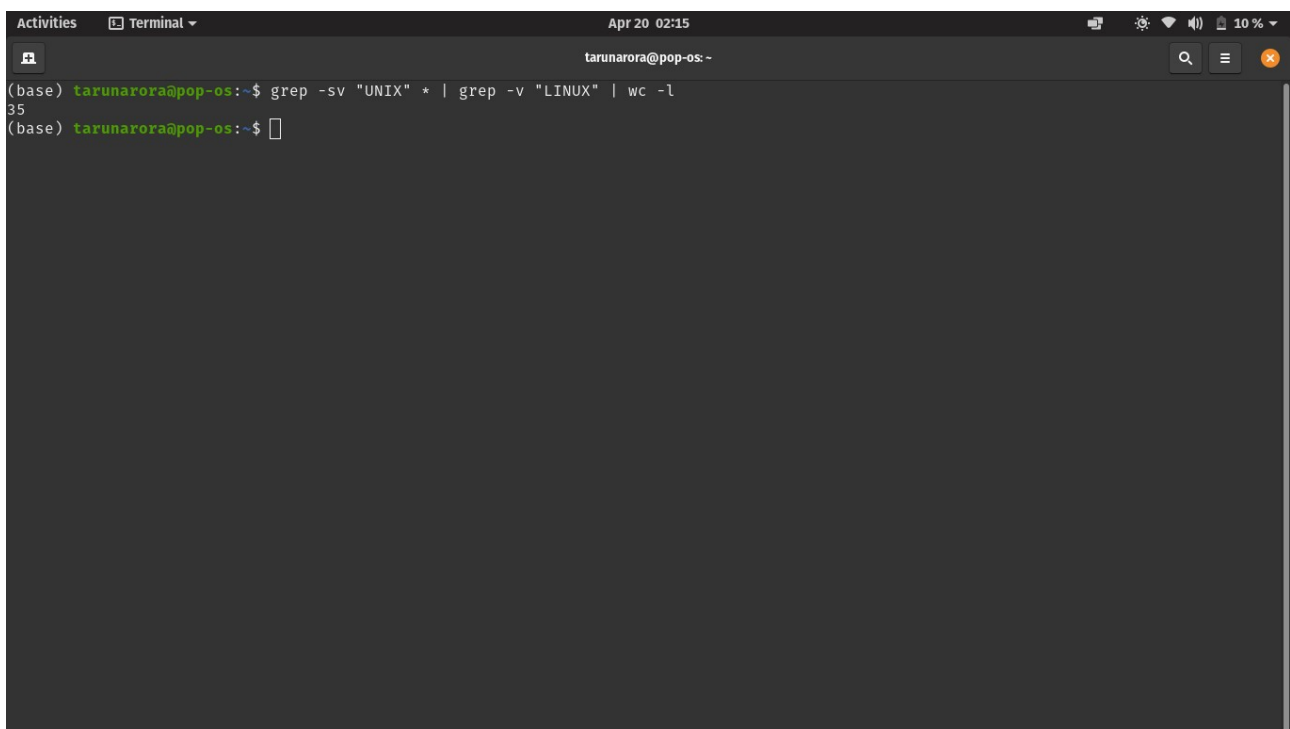
```
Activities Terminal Apr 20 01:30 tarunarora@pop-os: -
(base) tarunarora@pop-os:~$ ls /etc/*.conf* -Sd | head -5
/etc/brltty.conf
/etc/tlp.conf
/etc/ltrace.conf
/etc/sensors3.conf
/etc/pnm2ppa.conf
(base) tarunarora@pop-os:~$
```

Q12. Write a command to search contents of all files in current directory and display the total number of lines that contain the string 'LINUX' but not 'UNIX'.

Solution:-

Code:

```
grep -sv "UNIX" * | grep -v "LINUX" | wc -l
```

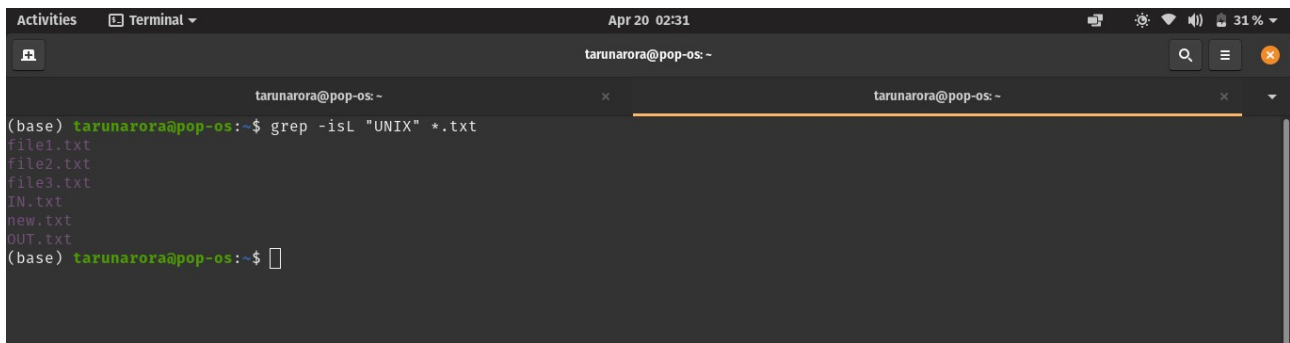
A screenshot of a Linux terminal window. The title bar shows 'Activities', 'Terminal', and the date 'Apr 20 02:15'. The terminal content shows a user prompt '(base) tarunarora@pop-os:~\$' followed by the command 'grep -sv "UNIX" * | grep -v "LINUX" | wc -l'. The output '35' is displayed on the next line. The prompt is then shown again with a cursor: '(base) tarunarora@pop-os:~\$'.

Q13. Write a command that will find all text files in a directory such that it does not contain the word "unix" in any form (that is, it must include the words Unix, UNIX, or uNix).

Solution:-

Code:

```
grep -isL "UNIX" *.txt
```

A screenshot of a Linux terminal window. The window title is "Activities" and "Terminal". The top bar shows the date "Apr 20 02:31" and system icons. The terminal shows a prompt "(base) tarunarora@pop-os: ~" and the command "grep -isL 'UNIX' *.txt" being executed. The output lists several text files: "file1.txt", "file2.txt", "file3.txt", "IN.txt", "new.txt", and "OUT.txt". The prompt then returns to "(base) tarunarora@pop-os: ~\$".

```
(base) tarunarora@pop-os: ~$ grep -isL "UNIX" *.txt
file1.txt
file2.txt
file3.txt
IN.txt
new.txt
OUT.txt
(base) tarunarora@pop-os: ~$
```

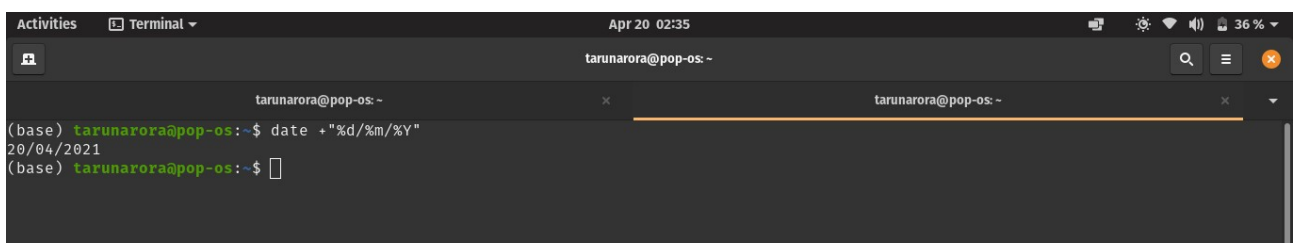
Q14. How will you display Today's date in the format of dd/mm/yyyy ? In a file word UNIX is appearing many times. How you count the number ?

Solution:-

Code:

1. Displaying today's Date.

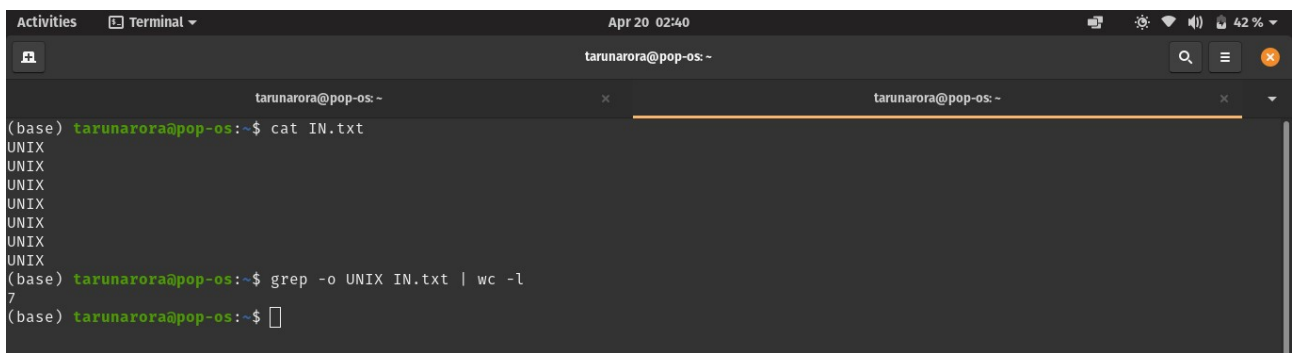
```
date +"%d/%m/%Y"
```



A terminal window titled 'Terminal' with a dark background. The prompt is '(base) tarunarora@pop-os: ~'. The command 'date +"%d/%m/%Y"' has been entered and executed, resulting in the output '20/04/2021'.

2. Counting number of times UNIX occurs

```
grep -o UNIX IN.txt | wc -l
```



A terminal window titled 'Terminal' with a dark background. The prompt is '(base) tarunarora@pop-os: ~'. The command 'cat IN.txt' has been entered and executed, showing the contents of the file: 'UNIX', 'UNIX', 'UNIX', 'UNIX', 'UNIX', 'UNIX', 'UNIX', 'UNIX'. Then, the command 'grep -o UNIX IN.txt | wc -l' has been entered and executed, resulting in the output '7'.