

INTRODUCTION TO LINUX

1. Create a directory "exercise" inside your home directory and create a nested (dir1/dir2/dir3) directory structure inside "exercise" with a single command.

```
aishwarya@TTNPL-aishwaryarajlaxmi: ~/exercise/dir1/dir2/dir3
aishwarya@TTNPL-aishwaryarajlaxmi:~$ mkdir -p exercise/dir1/dir2/dir3
aishwarya@TTNPL-aishwaryarajlaxmi:~$ cd exercise
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise$ cd dir1
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1$ cd dir2
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2$ cd dir3
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2/dir3$ ls
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2/dir3$
```

2. Create two empty files inside dir2 directory: emptyFile1, emptyFile2 in single command.

```
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2/dir3$ touch ~/exercise/dir1/dir2/emptyFile1 ~/exercise/dir1/dir2/emptyFile2
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2/dir3$ ls ~/exercise/dir1/dir2
dir3 emptyFile1 emptyFile2
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2/dir3$
```

3. Create one file file1.txt containing text "hello world" and save it.

```
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2/dir3$ echo "hello world" >> file1.txt
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2/dir3$ cat file1.txt
hello world
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2/dir3$
```

4. Find a "passwd" file using find command inside /etc. copy this file as passwd_copy and then rename this file as passwd_backup.

```
aishwarya@TTNPL-aishwaryarajlaxmi:/$ sudo find /etc -name passwd
/etc/pam.d/passwd
/etc/passwd
aishwarya@TTNPL-aishwaryarajlaxmi:/$ sudo cp /etc/passwd passwd_copy
aishwarya@TTNPL-aishwaryarajlaxmi:/$ sudo mv passwd_copy passwd_backup
aishwarya@TTNPL-aishwaryarajlaxmi:/$ sudo ls | grep passwd
passwd_backup
aishwarya@TTNPL-aishwaryarajlaxmi:/$
```

5. Try reading passwd_backup file in multiple tools: less, more, cat, strings etc and find the difference in their usage.

- cat: displays entire file content in one go
- more passwd_backup: display one screen/page at one time
- press space to go to next page.
- press q to quit.

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ cat passwd_backup
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
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin)/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:102:105:/:nonexistent:/usr/sbin/nologin
systemd-timesync:x:103:106:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
syslog:x:104:111:/:home/syslog:/usr/sbin/nologin
_apt:x:105:65534:/:nonexistent:/usr/sbin/nologin
tss:x:106:113:TPM software stack,,,:/var/lib/tpm:/bin/false
uidd:x:107:116:/:run/uidd:/usr/sbin/nologin
systemd-oom:x:108:117:systemd Userspace OOM Killer,,,:/run/systemd:/usr/sbin/nologin
tcpdump:x:109:118:/:nonexistent:/usr/sbin/nologin
avahi-autoipd:x:110:119:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:111:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:112:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
avahi:x:114:121:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
cups-pk-helper:x:115:122:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
rtkit:x:116:123:RealtimeKit,,,:/proc:/usr/sbin/nologin
whoopsie:x:117:124:/:nonexistent:/bin/false
sssd:x:118:125:SSSD system user,,,:/var/lib/sss:/usr/sbin/nologin
speech-dispatcher:x:119:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
```

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ more passwd_backup
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
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin)/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:102:105:/:nonexistent:/usr/sbin/nologin
systemd-timesync:x:103:106:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
syslog:x:104:111:/:home/syslog:/usr/sbin/nologin
_apt:x:105:65534:/:nonexistent:/usr/sbin/nologin
tss:x:106:113:TPM software stack,,,:/var/lib/tpm:/bin/false
uidd:x:107:116:/:run/uidd:/usr/sbin/nologin
systemd-oom:x:108:117:systemd Userspace OOM Killer,,,:/run/systemd:/usr/sbin/nologin
tcpdump:x:109:118:/:nonexistent:/usr/sbin/nologin
avahi-autoipd:x:110:119:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:111:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:112:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
avahi:x:114:121:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
cups-pk-helper:x:115:122:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
rtkit:x:116:123:RealtimeKit,,,:/proc:/usr/sbin/nologin
whoopsie:x:117:124:/:nonexistent:/bin/false
sssd:x:118:125:SSSD system user,,,:/var/lib/sss:/usr/sbin/nologin
speech-dispatcher:x:119:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
```

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ less passwd_backup
aishwarya@TTNPL-aishwaryarajlaxmi:~$
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ strings passwd_backup
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
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin)/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:102:105:/:nonexistent:/usr/sbin/nologin
systemd-timesync:x:103:106:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
syslog:x:104:111:/:home/syslog:/usr/sbin/nologin
_apt:x:105:65534:/:nonexistent:/usr/sbin/nologin
tss:x:106:113:TPM software stack,,,:/var/lib/tpm:/bin/false
uidd:x:107:116:/:run/uidd:/usr/sbin/nologin
systemd-oom:x:108:117:systemd Userspace OOM Killer,,,:/run/systemd:/usr/sbin/nologin
tcpdump:x:109:118:/:nonexistent:/usr/sbin/nologin
```

6. Find out the number of line in password_backup containing "/bin/false".

```
aishwarya@TTNPL-aishwaryarajlaxmi:/$ grep "/bin/false" passwd_backup | wc -l
6
aishwarya@TTNPL-aishwaryarajlaxmi:/$
```

- grep finds the line
- wc -l counts them.
- this is an alternative to grep -c

7. Get the first 5 lines of a file "password_backup" and Redirect the output of the above commands into file "output".

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ head -n 5 ~/password_backup > output
aishwarya@TTNPL-aishwaryarajlaxmi:~$ ls -l output
-rw-rw-r-- 1 aishwarya aishwarya 189 Jun 11 15:39 output
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```

8. Create a "test" user, create its password and find out its uid and gid.

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ sudo adduser test
Adding user `test' ...
Adding new group `test' (1004) ...
Adding new user `test' (1003) with group `test' ...
The home directory `/home/test' already exists.  Not copying from `/etc/skel'.
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for test
Enter the new value, or press ENTER for the default
    Full Name []: Tanu singh
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] yes
aishwarya@TTNPL-aishwaryarajlaxmi:~$ id test
uid=1003(test) gid=1004(test) groups=1004(test)
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```

9. Change the timestamp of emptyFile1, emptyFile2 which exist in dir2.

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ cd exercise
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise$ cd dir1/dir2
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2$ ls -la
total 12
drwxrwxr-x 3 aishwarya aishwarya 4096 Jun 11 14:53 .
drwxrwxr-x 3 aishwarya aishwarya 4096 Jun 11 14:43 ..
drwxrwxr-x 2 aishwarya aishwarya 4096 Jun 11 14:56 dir3
-rw-rw-r-- 1 aishwarya aishwarya  0 Jun 11 14:53 emptyFile1
-rw-rw-r-- 1 aishwarya aishwarya  0 Jun 11 14:53 emptyFile2
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2$ touch emptyFile1 emptyFile2
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2$ ls -la
total 12
drwxrwxr-x 3 aishwarya aishwarya 4096 Jun 11 14:53 .
drwxrwxr-x 3 aishwarya aishwarya 4096 Jun 11 14:43 ..
drwxrwxr-x 2 aishwarya aishwarya 4096 Jun 11 14:56 dir3
-rw-rw-r-- 1 aishwarya aishwarya  0 Jun 11 15:48 emptyFile1
-rw-rw-r-- 1 aishwarya aishwarya  0 Jun 11 15:48 emptyFile2
aishwarya@TTNPL-aishwaryarajlaxmi:~/exercise/dir1/dir2$
```

10. Login as test user and edit the "output" file created above. Since the permission won't allow you to save the changes. Configure such that test user can edit it. a) Add group owner of the "output" file as the secondary group of testuser and check/change the "output" file permission if it is editable by group. Once done revert the changes b) Make the file editable to the world so that test user can access it. Revert the changes after verification c) Change the ownership to edit the file.

Step 1: Login as the test user

su test

Step 2: Give group ownership of the file to test group

sudo chown :test output

Step 3: Check the file's ownership and permissions

ls -l output

Step 4: Revert ownership to original user aishwarya
sudo chown aishwarya:aishwarya output

Step 5: Make the file writable by everyone (world-writable)
chmod 666 output

Step 6: Revert permissions back to a safer state (owner/group write)
chmod 664 output

Step 7: Change full ownership of the file to test user
sudo chown test:test output

Final Check
ls -l output

11. Create alias with your name so that it creates a file as
"/tmp/aliastesting".

```
test@TTNPL-aishwaryarajlaxmi:~$ alias aishwarya='touch /tmp/aliastesting'
test@TTNPL-aishwaryarajlaxmi:~$ ls /tmp
aliastesting
snap-private-tmp
systemd-private-0552e4c086544643b578ea6f5ade61fc-bluetooth.service-KD8KMS
systemd-private-0552e4c086544643b578ea6f5ade61fc-bolt.service-SRgFAk
systemd-private-0552e4c086544643b578ea6f5ade61fc-colord.service-xEZiH7
systemd-private-0552e4c086544643b578ea6f5ade61fc-fwupd.service-3mEBB4
systemd-private-0552e4c086544643b578ea6f5ade61fc-ModemManager.service-Sum3Z3
systemd-private-0552e4c086544643b578ea6f5ade61fc-power-profiles-daemon.service-MneJND
systemd-private-0552e4c086544643b578ea6f5ade61fc-switcheroo-control.service-uepdGM
systemd-private-0552e4c086544643b578ea6f5ade61fc-systemd-logind.service-o21WUT
systemd-private-0552e4c086544643b578ea6f5ade61fc-systemd-oond.service-hcergm
systemd-private-0552e4c086544643b578ea6f5ade61fc-systemd-resolved.service-6b8rks
systemd-private-0552e4c086544643b578ea6f5ade61fc-systemd-timesyncd.service-vOU1ME
systemd-private-0552e4c086544643b578ea6f5ade61fc-upower.service-WyZ7wg
test@TTNPL-aishwaryarajlaxmi:~$
```


12. Edit `~/.bashrc` file such that when you change to "test" user it should clear the screen and print "Welcome".

Step 1: Switch to test user
`su test`

Step 2: Go to home directory
`cd ~`

Step 3: Open `.bashrc` using vi
`vi .bashrc`

Step 4: In vi editor
Press `Shift + G` to go to the end of the file
Press `i` to enter insert mode
Add the following two lines:
`clear`
`echo "Welcome"`

Step 5: Save and exit vi
Press `Esc`
Type `:wq` and press `Enter`

Step 6: Exit test user and log in again to test
`exit`
`su - test`
we should see the screen clear and "Welcome" printed

Welcome

```
test@TTNPL-aishwaryarajlaxmi:/home/aishwarya$ cd ~
```

13. Install “zip” package.

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ sudo apt update
Hit:1 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:3 https://dl.google.com/linux/chrome/deb stable InRelease
Hit:4 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:5 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
23 packages can be upgraded. Run 'apt list --upgradable' to see them.
aishwarya@TTNPL-aishwaryarajlaxmi:~$ sudo apt install zip
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
zip is already the newest version (3.0-12build2).
zip set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 23 not upgraded.
aishwarya@TTNPL-aishwaryarajlaxmi:~$ zip -v
Copyright (c) 1990-2008 Info-ZIP - Type 'zip "-L"' for software license.
This is Zip 3.0 (July 5th 2008), by Info-ZIP.
Currently maintained by E. Gordon. Please send bug reports to
the authors using the web page at www.info-zip.org; see README for details.

Latest sources and executables are at ftp://ftp.info-zip.org/pub/infozip,
as of above date; see http://www.info-zip.org/ for other sites.

Compiled with gcc 11.2.0 for Unix (Linux ELF).

Zip special compilation options:
  USE_EF_UT_TIME      (store Universal Time)
  BZIP2_SUPPORT       (bzip2 library version 1.0.8, 13-Jul-2019)
                      bzip2 code and library copyright (c) Julian R Seward
                      (See the bzip2 license for terms of use)
  SYMLINK_SUPPORT     (symbolic links supported)
  LARGE_FILE_SUPPORT  (can read and write large files on file system)
  ZIP64_SUPPORT       (use Zip64 to store large files in archives)
  UNICODE_SUPPORT     (store and read UTF-8 Unicode paths)
  STORE_UNIX_UIDs_GIDs (store UID/GID sizes/values using new extra field)
  UIDGID_NOT_16BIT    (old Unix 16-bit UID/GID extra field not used)
  [encryption, version 2.91 of 05 Jan 2007] (modified for Zip 3)

Encryption notice:
  The encryption code of this program is not copyrighted and is
  put in the public domain. It was originally written in Europe
  and, to the best of our knowledge, can be freely distributed
  in both source and object forms from any country, including
  the USA under License Exception TSU of the U.S. Export
  Administration Regulations (section 740.13(e)) of 6 June 2002.

Zip environment options:
  ZIP: [none]
  ZIPOPT: [none]
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```

14. Compress "output" and "password_backup" files into a tar ball. List the files present inside the tar created.

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ tar -cvf myarchive.tar output password_backup
output
password_backup
aishwarya@TTNPL-aishwaryarajlaxmi:~$ tar -tvf myarchive.tar
-rw-rw-r-- aishwarya/aishwarya 189 2025-06-11 15:39 output
-rw-r--r-- root/root          3076 2025-06-11 15:37 password_backup
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```

15. scp this file to test user

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ scp myarchive.tar test@localhost:/home/test/
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ED25519 key fingerprint is SHA256:4eo2XHLrF+Xwa5Ld8RI7gq4GGXBsCYikRtq94r9dzDw.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'localhost' (ED25519) to the list of known hosts.
test@localhost's password:
myarchive.tar                                                                100% 10KB 62.9MB/s 00:00
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```

16. Unzip this tar file by logging into the remote server

```

aishwarya@TTNPL-aishwaryarajlaxmi:~$ ssh test@localhost
test@localhost's password:
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 6.8.0-60-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

Expanded Security Maintenance for Applications is not enabled.

20 updates can be applied immediately.
16 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

10 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

New release '24.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

test@TTNPL-aishwaryarajlaxmi:~$ tar -xvf myarchive.tar
output
password_backup
test@TTNPL-aishwaryarajlaxmi:~$ ls -l
total 24
-rw-r--r-- 1 test test 10240 Jun 11 16:42 myarchive.tar
-rw-rw-r-- 1 test test  189 Jun 11 15:39 output
-rw-r--r-- 1 test test  3076 Jun 11 15:37 password_backup
drwx----- 3 test test  4096 Jun 11 16:42 snap
test@TTNPL-aishwaryarajlaxmi:~$

```

17.Download any image from web and move to desktop

```

aishwarya@TTNPL-aishwaryarajlaxmi:~$ wget https://upload.wikimedia.org/wikipedia/commons/3/3f/Fronalpstock_big.jpg
--2025-06-11 16:51:54-- https://upload.wikimedia.org/wikipedia/commons/3/3f/Fronalpstock_big.jpg
Resolving upload.wikimedia.org (upload.wikimedia.org)... 103.102.166.240, 2001:df2:e500:edia::2:b
Connecting to upload.wikimedia.org (upload.wikimedia.org)|103.102.166.240|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 14679474 (14M) [image/jpeg]
Saving to: 'Fronalpstock_big.jpg'

Fronalpstock_big.jpg  100%[=====>] 14.00M  3.88MB/s  in 3.6s

2025-06-11 16:51:58 (3.88 MB/s) - 'Fronalpstock_big.jpg' saved [14679474/14679474]

aishwarya@TTNPL-aishwaryarajlaxmi:~$ mv Fronalpstock_big.jpg ~/Desktop/
aishwarya@TTNPL-aishwaryarajlaxmi:~$ ls ~/Desktop/
Fronalpstock_big.jpg
aishwarya@TTNPL-aishwaryarajlaxmi:~$

```

18.How to get help of commands usages.

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ cd --help
cd: cd [-L|[-P [-e]] [-@]] [dir]
    Change the shell working directory.

    Change the current directory to DIR.  The default DIR is the value of the
    HOME shell variable.

    The variable CDPATH defines the search path for the directory containing
    DIR.  Alternative directory names in CDPATH are separated by a colon (:).
    A null directory name is the same as the current directory.  If DIR begins
    with a slash (/), then CDPATH is not used.

    If the directory is not found, and the shell option 'cdable_vars' is set,
    the word is assumed to be a variable name.  If that variable has a value,
    its value is used for DIR.

Options:
  -L      force symbolic links to be followed: resolve symbolic
          links in DIR after processing instances of '..'
  -P      use the physical directory structure without following
          symbolic links: resolve symbolic links in DIR before
          processing instances of '..'
  -e      if the -P option is supplied, and the current working
          directory cannot be determined successfully, exit with
          a non-zero status
  -@      on systems that support it, present a file with extended
          attributes as a directory containing the file attributes

The default is to follow symbolic links, as if '-L' were specified.
'..' is processed by removing the immediately previous pathname component
back to a slash or the beginning of DIR.

Exit Status:
Returns 0 if the directory is changed, and if $PWD is set successfully when
-P is used; non-zero otherwise.
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ man ls
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ info ls
aishwarya@TTNPL-aishwaryarajlaxmi:~$
aishwarya@TTNPL-aishwaryarajlaxmi:~$ which ls
```

19.Create a symlink of /etc/services into /tmp/ports-info

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ ln -s /etc/services /tmp/ports-info
aishwarya@TTNPL-aishwaryarajlaxmi:~$ ls -l /tmp/ports-info
lrwxrwxrwx 1 aishwarya aishwarya 13 Jun 11 17:02 /tmp/ports-info -> /etc/services
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```

20. You are appointed as a Software/DevOps Engineer in ABC media services. On your first day you need to troubleshoot a problem. There is a command “xyz” somewhere installed in that linux system. But as a new joiner you do not have any idea about where it is installed. How can you check that?

```
aishwarya@TTNPL-aishwaryarajlaxmi:~$ which xyz
aishwarya@TTNPL-aishwaryarajlaxmi:~$ whereis xyz
xyz:
aishwarya@TTNPL-aishwaryarajlaxmi:~$
```