

1. List all the files and directories in your user directory

```
[siddharrth@siddharrth ~]$ ls
CEO      Documents  fileinfo  Music    newtry    permissions  Public  touch  Videos
Desktop  Downloads  linux     'new locate'  permission folder  Pictures  Templates  try
```

2. Observe the permission for each file and directories.

```
[siddharrth@siddharrth ~]$ ls -l
total 16
drwxr-xr-x. 6 siddharrth siddharrth 79 Oct 1 19:27 CEO
drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Desktop
drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Documents
drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Downloads
-rw-r--r--. 1 siddharrth siddharrth 1126 Oct 2 17:12 fileinfo
drwxrwxr-x. 4 siddharrth siddharrth 101 Oct 2 15:57 linux
drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Music
-rw-r--r--. 1 siddharrth siddharrth 23 Oct 3 12:46 'new locate'
drwxr-xr-x. 2 siddharrth siddharrth 4096 Oct 2 16:52 Pictures
drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Public
drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Templates
drwxr-xr-x. 2 siddharrth siddharrth 6 Oct 2 16:32 touch
-rw-r--r--. 2 siddharrth siddharrth 18 Oct 2 11:20 try
drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Videos
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz4-abc
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz6-abc
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz7-abc
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz8-abc
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz9-abc
[siddharrth@siddharrth ~]$
```

3. For Directory give the following permission using **chmod** cmd

a. VP Sales

- i User – rwx
- ii Group – r-x
- iii Others – r- -

```
[siddharrth@siddharrth CEO]$ chmod o-x VP_Sales/
[siddharrth@siddharrth CEO]$ ls -l
total 4
-rw-r--r--. 1 siddharrth siddharrth 18 Oct 3 16:35 try
drwxr-xr-x. 4 siddharrth siddharrth 41 Oct 1 19:34 VP_Engineering
drwxr-xr-x. 3 siddharrth siddharrth 21 Oct 1 19:32 VP_People
drwxr-xr-x. 4 siddharrth siddharrth 48 Oct 1 19:29 VP_Product
drwxr-xr--. 3 siddharrth siddharrth 24 Oct 1 19:31 VP_Sales
[siddharrth@siddharrth CEO]$
```

b. People

- i User – r - -
- ii Group – r - -
- iii Others – r - -

```
[siddharrth@siddharrth HR_Lead]$ chmod u-w people
[siddharrth@siddharrth HR_Lead]$ ls -l
total 4
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 address
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 contact
-r--r--r--. 1 siddharrth siddharrth 32 Oct 2 17:03 people
[siddharrth@siddharrth HR_Lead]$
```

c. Sales Rep

- i User – r - -
- ii Group – - - -
- iii Others – r - -

```
[siddharrth@siddharrth Sale_lead1]$ chmod u-wx,g-rwx,o-x Sales_Rep/
[siddharrth@siddharrth Sale_lead1]$ ls -l
total 0
dr-----r--. 2 siddharrth siddharrth 6 Oct 1 19:31 Sales_Rep
drwxr-xr-x. 3 siddharrth siddharrth 23 Oct 1 19:31 Senior_Rep
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:47 Xyz3-abc
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:47 Xyz4-abc
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:47 Xyz6-abc
[siddharrth@siddharrth Sale_lead1]$
```

4. For Directory give the following permission using **chmod** cmd using Numeric values

a. Product Lead

- i User – -w-
- ii Group – rwx
- iii Others – rwx

```
[siddharrth@siddharrth VP_Product]$ chmod 277 Product_lead1
[siddharrth@siddharrth VP_Product]$ ls -l
total 0
d-w-rwxrwx. 2 siddharrth siddharrth 6 Oct  1 19:29 Product_lead1
drwxr-xr-x. 2 siddharrth siddharrth 6 Oct  1 19:29 Product_lead2
[siddharrth@siddharrth VP_Product]$
```

b. Senior Developer

- i User – rwx
- ii Group – rw-
- iii Others – --x

```
[siddharrth@siddharrth Tech_Lead]$ chmod 761 Senior_developer/
[siddharrth@siddharrth Tech_Lead]$ ls -l
total 0
drwxrw---x. 3 siddharrth siddharrth 29 Oct  1 19:33 Senior_developer
[siddharrth@siddharrth Tech_Lead]$
```

c. Tech Lead

- i User – r – x
- ii Group – r- x
- iii Others – rwx

```
[siddharrth@siddharrth VP_Engineering]$ chmod 557 Tech_Lead
[siddharrth@siddharrth VP_Engineering]$ ls -l
total 0
dr-xr-xrwx. 3 siddharrth siddharrth 30 Oct  1 19:33 Tech_Lead
drwxr-xr-x. 2 siddharrth siddharrth  6 Oct  1 19:34 Tech_Lead1
[siddharrth@siddharrth VP_Engineering]$
```

5. For the following files change permissions using **chmod** cmd

a. abc1-xyz

- i. User – r – x
- ii. Group – r- x
- iii. Others – r-x

```
[siddharrth@siddharrth ~]$ chmod a=r-x abc1-xyz
[siddharrth@siddharrth ~]$ ls -l
total 24
-r-xr-xr-x. 1 siddharrth siddharrth  0 Oct  8 15:06 abc1-xyz
-rw-r--r--. 1 siddharrth siddharrth  0 Oct  8 15:06 abc2-xyz
-rw-r--r--. 1 siddharrth siddharrth  0 Oct  8 15:06 abc3-xyz
-rw-r--r--. 1 siddharrth siddharrth  0 Oct  8 15:06 abc4-xyz
```

b. abc2-xyz

- i. User – rwx
- ii. Group – rwx
- iii. Others – rwx

```
[siddharrth@siddharrth ~]$ chmod a=rwx abc2-xyz
[siddharrth@siddharrth ~]$ ls -l
total 24
-r-xr-xr-x. 1 siddharrth siddharrth 0 Oct 8 15:06 abc1-xyz
-rwxrwxrwx. 1 siddharrth siddharrth 0 Oct 8 15:06 abc2-xyz
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 8 15:06 abc3-xyz
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 8 15:06 abc4-xyz
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 8 15:06 abc5-xyz
```

c. abc3-xyz

- i. User – - - -
- ii. Group – - -x
- iii. Others – r--

```
[siddharrth@siddharrth ~]$ chmod u=,g=x,o=r abc3-xyz
[siddharrth@siddharrth ~]$ ls -l
total 24
-r-xr-xr-x. 1 siddharrth siddharrth 0 Oct 8 15:06 abc1-xyz
-rwxrwxrwx. 1 siddharrth siddharrth 0 Oct 8 15:06 abc2-xyz
-----xr--. 1 siddharrth siddharrth 0 Oct 8 15:06 abc3-xyz
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 8 15:06 abc4-xyz
-rw-r--r--. 1 siddharrth siddharrth 0 Oct 8 15:06 abc5-xyz
```

6. For the following files change permissions using **chmod** cmd
(Numeric values)

a. abc4-xyz

- i. User – r – x
- ii. Group – ---
- iii. Others – --x

```
[siddharrth@siddharrth ~]$ chmod 501 abc4-xyz
```

```
[siddharrth@siddharrth ~]$ ls -l abc4-xyz
-r-x-----x. 1 siddharrth siddharrth 0 Oct  8 15:06 abc4-xyz
```

b. abc5-xyz

- i. User – r – x
- ii. Group – r- x
- iii. Others – r-x

```
[siddharrth@siddharrth ~]$ chmod 555 abc5-xyz
```

```
[siddharrth@siddharrth ~]$ ls -l abc5-xyz
-r-xr-xr-x. 1 siddharrth siddharrth 0 Oct  8 15:06 abc5-xyz
```

c. abc6-xyz

- i. User – r – x
- ii. Group – r- x
- iii. Others – r-x

```
[siddharrth@siddharrth ~]$ chmod 555 abc6-xyz
```

```
[siddharrth@siddharrth ~]$ ls -l abc6-xyz
-r-xr-xr-x. 1 siddharrth siddharrth 0 Oct  8 15:06 abc6-xyz
```

7. Create a file – **SoftLinkTest** under your user directory, input some text and **cat** it to display its contents.

```
[siddharrth@siddharrth ~]$ echo "This is Softlink" > SoftLinkTest
[siddharrth@siddharrth ~]$ cat SoftLinkTest
This is Softlink
[siddharrth@siddharrth ~]$
```

8. Repeat the same for file – **HardLinkTest**.

```
[siddharrth@siddharrth ~]$ echo "This is Hard link" > HardLinkTest
[siddharrth@siddharrth ~]$ cat HardLinkTest
This is Hard link
[siddharrth@siddharrth ~]$
```

9. Create softlink for file SoftLinkTest under /tmp directory using **ln-s** cmd

```
[siddharrth@siddharrth ~]$ ln -s SoftLinkTest /usr/tmp
[siddharrth@siddharrth ~]$ cat SoftLinkTest /usr/tmp
This is Softlink
cat: /usr/tmp: Is a directory
[siddharrth@siddharrth ~]$
```

10. Create hardlink for file **HardLinkTest** under /tmp directory using **ln** cmd

```
[siddharrth@siddharrth ~]$ ln HardLinkTest /usr/tmp
[siddharrth@siddharrth ~]$ cat HardLinkTest /usr/tmp
This is Hard link
cat: /usr/tmp: Is a directory
[siddharrth@siddharrth ~]$
```

11. Check the **inodes** for each file and its link

```
521979 -rw-r--r--. 1 siddharrth siddharrth 17 Oct 3 15:39 SoftLinkTest 522216 -rw-r--r--. 2 siddharrth siddharrth 18 Oct 3 15:41 HardLinkTest
522216 -rw-r--r--. 2 siddharrth siddharrth 18 Oct 3 15:41 HardLinkTest 34740022 lrwxrwxrwx. 1 siddharrth siddharrth 12 Oct 3 15:57 SoftLinkTest -> So
```

12. **Update** the file **contents** and observe the changes

```
[siddharrth@siddharrth ~]$ cat HardLinkTest
This is Hard link
appending into hardlink
[siddharrth@siddharrth ~]$

[siddharrth@siddharrth tmp]$ cat HardLinkTe
This is Hard link
appending into hardlink
[siddharrth@siddharrth tmp]$

[siddharrth@siddharrth ~]$ echo "appending into softlink" >> SoftLinkTest
[siddharrth@siddharrth ~]$ cat SoftLinkTest
This is Softlink
appending into softlink
[siddharrth@siddharrth ~]$
```

13. **Delete** the **files** and observe the changes


```

[siddharrth@siddharrth ~]$ rm SoftLinkTest
[siddharrth@siddharrth ~]$ ls -ltr
total 20
34252113 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Videos
19100451 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Templates
34252112 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Public
330124 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Music
330123 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Downloads
51526153 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Documents
51526152 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Desktop
34739572 drwxr-xr-x. 6 siddharrth siddharrth 79 Oct 1 19:27 CEO
34739800 -rw-r--r--. 2 siddharrth siddharrth 18 Oct 2 11:20 try
1280848 drwxrwxr-x. 4 siddharrth siddharrth 101 Oct 2 15:57 linux
34740095 drwxr-xr-x. 2 siddharrth siddharrth 6 Oct 2 16:32 touch
522286 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz9-abc
522285 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz8-abc
522284 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz7-abc
522283 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz6-abc
522281 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz4-abc
522288 -rw-r--r--. 1 siddharrth siddharrth 1126 Oct 2 17:12 fileinfo
216121 -rw-r--r--. 1 siddharrth siddharrth 23 Oct 3 12:46 'new locate'
19100452 drwxr-xr-x. 2 siddharrth siddharrth 4096 Oct 3 15:31 Pictures
522216 -rw-r--r--. 2 siddharrth siddharrth 42 Oct 3 16:08 HardLinkTest
[siddharrth@siddharrth ~]$ 
[siddharrth@siddharrth ~]$ rm HardLinkTest
[siddharrth@siddharrth ~]$ ls -ltr
total 16
34252113 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Videos
19100451 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Templates
34252112 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Public
330124 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Music
330123 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Downloads
51526153 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Documents
51526152 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Desktop
34739572 drwxr-xr-x. 6 siddharrth siddharrth 79 Oct 1 19:27 CEO
34739800 -rw-r--r--. 2 siddharrth siddharrth 18 Oct 2 11:20 try
1280848 drwxrwxr-x. 4 siddharrth siddharrth 101 Oct 2 15:57 linux
34740095 drwxr-xr-x. 2 siddharrth siddharrth 6 Oct 2 16:32 touch
522286 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz9-abc
522285 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz8-abc
522284 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz7-abc
522283 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz6-abc
522281 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz4-abc
522288 -rw-r--r--. 1 siddharrth siddharrth 1126 Oct 2 17:12 fileinfo
216121 -rw-r--r--. 1 siddharrth siddharrth 23 Oct 3 12:46 'new locate'
19100452 drwxr-xr-x. 2 siddharrth siddharrth 4096 Oct 3 15:31 Pictures
[siddharrth@siddharrth ~]$ 

65f8a3fd3a79d9b-irqbalance.service-0bW160
85286 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-power-profiles-daemon.service-b5GFNY
85287 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-rtkit-daemon.service-d6uLRO
33781263 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-switcheroo-control.service-FLICIT
33781265 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-systemd-logind.service-LmolnY
33781303 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-upower.service-tGDYK8
33804372 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-ModemManager.service-FVK2yF
51404059 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-kdump.service-bJHFMP
441945 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-geoclue.service-Xg7l1F
521917 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-colord.service-pAuscu
17356118 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-fwupd.service-210IjH
34740022 lrwxrwxrwx. 1 siddharrth siddharrth 12 Oct 3 15:57 SoftLinkTest -> SoftLink
522216 -rw-r--r--. 2 siddharrth siddharrth 42 Oct 3 16:08 HardLinkTest
[siddharrth@siddharrth tmp]$ 
[siddharrth@siddharrth tmp]$ 
85286 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-power-profiles-daemon.service-b5GFNY
85287 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-rtkit-daemon.service-d6uLRO
33781263 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-switcheroo-control.service-FLICIT
33781265 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-systemd-logind.service-LmolnY
33781303 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-upower.service-tGDYK8
33804372 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-ModemManager.service-FVK2yF
51404059 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-kdump.service-bJHFMP
441945 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-geoclue.service-Xg7l1F
521917 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-colord.service-pAuscu
17356118 drwx-----, 3 root root 17 Oct 3 10:08 systemd-private-0e6f6dc
65f8a3fd3a79d9b-fwupd.service-210IjH
34740022 lrwxrwxrwx. 1 siddharrth siddharrth 12 Oct 3 15:57 SoftLinkTest -> SoftLink
522216 -rw-r--r--. 1 siddharrth siddharrth 42 Oct 3 16:08 HardLinkTest
[siddharrth@siddharrth tmp]$ 

```

14. Create a **hard** and **soft link** for a directory of your choice and record the results.

```
[siddharrth@siddharrth ~]$ ln -s /home/siddharrth/linux/try/newtry
[siddharrth@siddharrth ~]$ ls -ltri
total 16
34252113 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Videos
19100451 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Templates
34252112 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Public
330124 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Music
330123 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Downloads
51526153 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Documents
51526152 drwxr-xr-x. 2 siddharrth siddharrth 6 Sep 30 16:12 Desktop
34739572 drwxr-xr-x. 6 siddharrth siddharrth 79 Oct 1 19:27 CEO
34739800 -rw-r--r--. 2 siddharrth siddharrth 18 Oct 2 11:20 try
1280848 drwxrwxr-x. 4 siddharrth siddharrth 101 Oct 2 15:57 linux
34740095 drwxr-xr-x. 2 siddharrth siddharrth 6 Oct 2 16:32 touch
522286 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz9-abc
522285 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz8-abc
522284 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz7-abc
522283 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz6-abc
522281 -rw-r--r--. 1 siddharrth siddharrth 0 Oct 2 16:32 Xyz4-abc
522288 -rw-r--r--. 1 siddharrth siddharrth 1126 Oct 2 17:12 fileinfo
216121 -rw-r--r--. 1 siddharrth siddharrth 23 Oct 3 12:46 'new locate'
19100452 drwxr-xr-x. 2 siddharrth siddharrth 4096 Oct 3 15:31 Pictures
521979 lrwxrwxrwx. 1 siddharrth siddharrth 33 Oct 3 16:26 newtry -> /home/siddharrth/linux/try/newtry
[siddharrth@siddharrth ~]$
```

```
[siddharrth@siddharrth ~]$ ln /home/siddharrth/linux/try
ln: /home/siddharrth/linux/try: hard link not allowed for directory
```

15. Use cp cmd to copy a directory of your choice into CEO directory. Try with **empty** as well as with **sub directories**.

```
[siddharrth@siddharrth ~]$ cp try CEO/
[siddharrth@siddharrth ~]$ cd CEO/
[siddharrth@siddharrth CEO]$ ls
try VP_Engineering VP_People VP_Product VP_Sales
[siddharrth@siddharrth CEO]$
```

16. Go to /var/log, display the contents of file messages using **more** and **less**, **head** and **tail** cmd


```

total 2084
drwxr-xr-x. 2 root root 4096 Sep 30 12:55 anaconda
drwx----- 2 root root 23 Aug 1 18:12 audit
-rw----- 1 root root 2537 Oct 3 10:08 boot.log
-rw----- 1 root root 113630 Oct 2 10:04 boot.log-20241002
-rw----- 1 root root 16920 Oct 3 10:08 boot.log-20241003
-rw-rw---- 1 root utmp 2304 Oct 1 19:42 bttmp
drwxr-x--- 2 chrony chrony 6 Sep 10 18:06 chrony
-rw----- 1 root root 7563 Oct 3 16:01 cron
drwxr-xr-x. 2 lp sys 57 Aug 15 18:46 cups
-rw-r--r-- 1 root root 6542 Oct 3 15:40 dnf.librepo.log
-rw-r--r-- 1 root root 15606 Oct 3 15:40 dnf.log
-rw-r--r-- 1 root root 522 Oct 3 15:40 dnf.rpm.log
-rw-r----- 1 root root 0 Sep 30 16:10 firewalld
drwx--x--x. 2 root gdm 6 Jul 27 00:06 gdm
-rw-r--r-- 1 root root 300 Oct 3 15:40 hawkey.log
-rw-r--r-- 1 root root 1902 Oct 1 11:29 kdump.log
-rw-rw-r-- 1 root utmp 294628 Oct 3 15:17 lastlog
-rw----- 1 root root 0 Sep 30 12:51 maillog
-rw----- 1 root root 1776712 Oct 3 16:33 messages
drwx----- 2 root root 6 Sep 30 12:50 private
drwxr-xr-x. 2 root root 6 Sep 2 20:21 qemu-ga
lrwxrwxrwx. 1 root root 39 Sep 30 12:50 README -> ../../usr/share/doc/systemd/README.logs
drwx----- 3 root root 17 Aug 1 20:54 samba
-rw----- 1 root root 29295 Oct 3 16:32 secure
drwx----- 2 root root 6 Aug 10 2021 speech-dispatcher
-rw----- 1 root root 0 Sep 30 12:51 spooler
drwxr-x--- 2 sssd sssd 26 Jul 22 15:27 sssd
-rw----- 1 root root 0 Sep 30 12:50 tallylog
drwxr-xr-x. 2 root root 6 Aug 8 03:06 tuned
-rw----- 1 root root 215 Oct 2 10:04 vmware-network.1.log
-rw----- 1 root root 211 Oct 1 19:39 vmware-network.2.log
-rw----- 1 root root 211 Oct 1 17:33 vmware-network.3.log
-rw-r--r-- 1 root root 211 Oct 1 11:29 vmware-network.4.log
-rw-r--r-- 1 root root 213 Sep 30 16:14 vmware-network.5.log
-rw-r--r-- 1 root root 213 Sep 30 16:10 vmware-network.6.log
--More--

```

```
total 2084
drwxr-xr-x. 2 root root      4096 Sep 30 12:55 anaconda
drwx-----, 2 root root        23 Aug  1 18:12 audit
-rw-----, 1 root root      2537 Oct  3 10:08 boot.log
-rw-----, 1 root root    113630 Oct  2 10:04 boot.log-20241002
-rw-----, 1 root root    16920 Oct  3 10:08 boot.log-20241003
-rw-rw----, 1 root utmp      2304 Oct  1 19:42 btmp
drwxr-x---, 2 chrony chrony    6 Sep 10 18:06 chrony
-rw-----, 1 root root      7563 Oct  3 16:01 cron
drwxr-xr-x. 2 lp sys          57 Aug 15 18:46 cups
-rw-r--r--, 1 root root      6542 Oct  3 15:40 dnf.librepo.log
-rw-r--r--, 1 root root    15606 Oct  3 15:40 dnf.log
-rw-r--r--, 1 root root      522 Oct  3 15:40 dnf.rpm.log
-rw-r-----, 1 root root        0 Sep 30 16:10 firewalld
drwx--x--x, 2 root gdm        6 Jul 27 00:06 gdm
-rw-r--r--, 1 root root      300 Oct  3 15:40 hawkey.log
-rw-r--r--, 1 root root     1902 Oct  1 11:29 kdump.log
-rw-rw-r--, 1 root utmp    294628 Oct  3 15:17 lastlog
-rw-----, 1 root root        0 Sep 30 12:51 maillog
-rw-----, 1 root root    1776712 Oct  3 16:33 messages
drwx-----, 2 root root        6 Sep 30 12:50 private
drwxr-xr-x. 2 root root        6 Sep  2 20:21 qemu-ga
lrwxrwxrwx. 1 root root        39 Sep 30 12:50 README -> ../../usr/share/doc/systemd/README.logs
drwx-----, 3 root root        17 Aug  1 20:54 samba
-rw-----, 1 root root    29295 Oct  3 16:32 secure
drwx-----, 2 root root        6 Aug 10 2021 speech-dispatcher
-rw-----, 1 root root        0 Sep 30 12:51 spooler
drwxr-x---, 2 sssd sssd      26 Jul 22 15:27 sssd
-rw-----, 1 root root        0 Sep 30 12:50 tallylog
drwxr-xr-x. 2 root root        6 Aug  8 03:06 tuned
-rw-----, 1 root root     215 Oct  2 10:04 vmware-network.1.log
-rw-----, 1 root root     211 Oct  1 19:39 vmware-network.2.log
-rw-----, 1 root root     211 Oct  1 17:33 vmware-network.3.log
-rw-r--r--, 1 root root     211 Oct  1 11:29 vmware-network.4.log
-rw-r--r--, 1 root root     213 Sep 30 16:14 vmware-network.5.log
-rw-r--r--, 1 root root     213 Sep 30 16:10 vmware-network.6.log
:
```

```
[siddharrth@siddharrth log]$ ls -l | head
total 2084
drwxr-xr-x. 2 root root      4096 Sep 30 12:55 anaconda
drwx-----, 2 root root        23 Aug  1 18:12 audit
-rw-----, 1 root root      2537 Oct  3 10:08 boot.log
-rw-----, 1 root root    113630 Oct  2 10:04 boot.log-20241002
-rw-----, 1 root root    16920 Oct  3 10:08 boot.log-20241003
-rw-rw----, 1 root utmp      2304 Oct  1 19:42 btmp
drwxr-x---, 2 chrony chrony    6 Sep 10 18:06 chrony
-rw-----, 1 root root      7563 Oct  3 16:01 cron
drwxr-xr-x. 2 lp sys          57 Aug 15 18:46 cups
[siddharrth@siddharrth log]$ ls -l | tail
-rw-r--r--, 1 root root     213 Sep 30 16:14 vmware-network.5.log
-rw-r--r--, 1 root root     213 Sep 30 16:10 vmware-network.6.log
-rw-----, 1 root root     213 Oct  3 10:08 vmware-network.log
-rw-----, 1 root root    11287 Oct  3 10:08 vmware-vgauthsvc.log.0
-rw-----, 1 root root    21921 Oct  3 15:03 vmware-vmcvc-root.log
-rw-----, 1 root root     4354 Oct  3 10:08 vmware-vmtoolsd-root.log
-rw-----, 1 root siddharrth 2364 Oct  3 10:08 vmware-vmtoolsd-siddharrth.log
-rw-----, 1 root root     1647 Sep 30 16:16 vmware-vmusr-root.log
-rw-----, 1 root siddharrth 5791 Oct  3 10:08 vmware-vmusr-siddharrth.log
-rw-rw-r--, 1 root utmp    12288 Oct  3 10:08 wtmp
[siddharrth@siddharrth log]$
```

17. Go to /bin, run cmd `ls -l | more`

```
total 222660
-rwxr-xr-x. 1 root root      53032 Aug 16 18:40 [
-rwxr-xr-x. 1 root root      33416 Nov  1 2021 ac
-rwxr-xr-x. 1 root root      24000 Jul  4 13:41 aconnect
-rwxr-xr-x. 1 root root      28584 Aug 15 13:39 addr2line
-rwxr-xr-x. 1 root root     293272 Jan  2 2024 adwaita-1-demo
-rwxr-xr-x. 1 root root     154416 Aug 10 2021 aircan-discover
-rwxr-xr-x. 1 root root         33 Feb 15 2024 alias
-rwxr-xr-x. 1 root root      86912 Jul  4 13:41 alsaloop
-rwxr-xr-x. 1 root root      84104 Jul  4 13:41 alsamixer
-rwxr-xr-x. 1 root root        127 Jul  4 13:40 alsanmute
-rwxr-xr-x. 1 root root      32152 Jul  4 13:41 amidi
-rwxr-xr-x. 1 root root      61272 Jul  4 13:41 amixer
-rwxr-xr-x. 1 root root      81720 Jul  4 13:41 aplay
-rwxr-xr-x. 1 root root      28096 Jul  4 13:41 aplaymidi
-rwxr-xr-x. 1 root root     155880 Apr 25 2023 appstreamcli
-rwxr-xr-x. 1 root root      32216 Apr 26 15:17 appstream-compose
-rwxr-xr-x. 1 root root     119368 Apr 26 15:17 appstream-util
lrwxrwxrwx. 1 root root         25 Sep 30 12:51 apropos -> /etc/alternatives/apropos
lrwxrwxrwx. 1 root root         6 Sep 20 2022 apropos.man-db -> whatis
-rwxr-xr-x. 1 root root      57504 Aug 15 13:39 ar
-rwxr-xr-x. 1 root root      32408 Aug 16 18:40 arch
lrwxrwxrwx. 1 root root         5 Jul  4 13:41 arecord -> aplay
-rwxr-xr-x. 1 root root      32240 Jul  4 13:41 arecordmidi
-rwxr-xr-x. 1 root root      15648 Sep  5 19:42 arpaname
-rwxr-xr-x. 1 root root      28072 Sep  6 18:08 arping
-rwxr-xr-x. 1 root root     727536 Aug 15 13:39 as
-rwxr-xr-x. 1 root root      28104 Jul  4 13:41 aseqdump
-rwxr-xr-x. 1 root root      28128 Jul  4 13:41 aseqnet
-rwxr-xr-x. 1 root root      23968 Jul  4 13:41 aseqsend
-rwxr-xr-x. 1 root root      40592 Jun 17 18:24 aserver
-rwsr-xr-x. 1 root root      57928 Apr  4 2022 at
lrwxrwxrwx. 1 root root         2 Apr  4 2022 atq -> at
lrwxrwxrwx. 1 root root         2 Apr  4 2022 atrm -> at
-rwxr-xr-x. 1 root root      16080 Aug 10 2021 attr
-rwxr-xr-x. 1 root root      15064 Feb 20 2024 audit2allow
--More--
```

18. Go to /bin, run cmd `ls -l | less`

```
total 222660
-rwxr-xr-x. 1 root root      53032 Aug 16 18:40 [
-rwxr-xr-x. 1 root root      33416 Nov  1 2021 ac
-rwxr-xr-x. 1 root root      24000 Jul  4 13:41 aconnect
-rwxr-xr-x. 1 root root      28584 Aug 15 13:39 addr2line
-rwxr-xr-x. 1 root root     293272 Jan  2 2024 adwaita-1-demo
-rwxr-xr-x. 1 root root     154416 Aug 10 2021 aircan-discover
-rwxr-xr-x. 1 root root         33 Feb 15 2024 alias
-rwxr-xr-x. 1 root root      86912 Jul  4 13:41 alsaloop
-rwxr-xr-x. 1 root root      84104 Jul  4 13:41 alsamixer
-rwxr-xr-x. 1 root root        127 Jul  4 13:40 alsanmute
-rwxr-xr-x. 1 root root      32152 Jul  4 13:41 amidi
-rwxr-xr-x. 1 root root      61272 Jul  4 13:41 amixer
-rwxr-xr-x. 1 root root      81720 Jul  4 13:41 aplay
-rwxr-xr-x. 1 root root      28096 Jul  4 13:41 aplaymidi
-rwxr-xr-x. 1 root root     155880 Apr 25 2023 appstreamcli
-rwxr-xr-x. 1 root root      32216 Apr 26 15:17 appstream-compose
-rwxr-xr-x. 1 root root     119368 Apr 26 15:17 appstream-util
lrwxrwxrwx. 1 root root         25 Sep 30 12:51 apropos -> /etc/alternatives/apropos
lrwxrwxrwx. 1 root root         6 Sep 20 2022 apropos.man-db -> whatis
-rwxr-xr-x. 1 root root      57504 Aug 15 13:39 ar
-rwxr-xr-x. 1 root root      32408 Aug 16 18:40 arch
lrwxrwxrwx. 1 root root         5 Jul  4 13:41 arecord -> aplay
-rwxr-xr-x. 1 root root      32240 Jul  4 13:41 arecordmidi
-rwxr-xr-x. 1 root root      15648 Sep  5 19:42 arpaname
-rwxr-xr-x. 1 root root      28072 Sep  6 18:08 arping
-rwxr-xr-x. 1 root root     727536 Aug 15 13:39 as
-rwxr-xr-x. 1 root root      28104 Jul  4 13:41 aseqdump
-rwxr-xr-x. 1 root root      28128 Jul  4 13:41 aseqnet
-rwxr-xr-x. 1 root root      23968 Jul  4 13:41 aseqsend
-rwxr-xr-x. 1 root root      40592 Jun 17 18:24 aserver
-rwsr-xr-x. 1 root root      57928 Apr  4 2022 at
lrwxrwxrwx. 1 root root         2 Apr  4 2022 atq -> at
lrwxrwxrwx. 1 root root         2 Apr  4 2022 atrm -> at
-rwxr-xr-x. 1 root root      16080 Aug 10 2021 attr
-rwxr-xr-x. 1 root root      15064 Feb 20 2024 audit2allow
:
```

19. Go to /bin, run cmd `ls -l | head`


```
[siddharrth@siddharrth bin]$ ls -l | head
total 222660
-rwxr-xr-x. 1 root root      53032 Aug 16 18:40 [
-rwxr-xr-x. 1 root root      33416 Nov  1  2021 ac
-rwxr-xr-x. 1 root root      24000 Jul  4 13:41 aconnect
-rwxr-xr-x. 1 root root      28584 Aug 15 13:39 addr2line
-rwxr-xr-x. 1 root root    293272 Jan  2  2024 adwaita-1-demo
-rwxr-xr-x. 1 root root    154416 Aug 10  2021 airscan-discover
-rwxr-xr-x. 1 root root         33 Feb 15  2024 alias
-rwxr-xr-x. 1 root root     86912 Jul  4 13:41 alsaloop
-rwxr-xr-x. 1 root root     84104 Jul  4 13:41 alsamixer
```

20. Go to /bin, run cmd **ls -l | tail**

```
[siddharrth@siddharrth bin]$ ls -l | head
total 222660
-rwxr-xr-x. 1 root root      53032 Aug 16 18:40 [
-rwxr-xr-x. 1 root root      33416 Nov  1  2021 ac
-rwxr-xr-x. 1 root root      24000 Jul  4 13:41 aconnect
-rwxr-xr-x. 1 root root      28584 Aug 15 13:39 addr2line
-rwxr-xr-x. 1 root root    293272 Jan  2  2024 adwaita-1-demo
-rwxr-xr-x. 1 root root    154416 Aug 10  2021 airscan-discover
-rwxr-xr-x. 1 root root         33 Feb 15  2024 alias
-rwxr-xr-x. 1 root root     86912 Jul  4 13:41 alsaloop
-rwxr-xr-x. 1 root root     84104 Jul  4 13:41 alsamixer
[siddharrth@siddharrth bin]$ ls -l | tail
-rwxr-xr-x. 1 root root     65104 Feb 15  2023 zipsplit
-rwxr-xr-x. 1 root root      2210 Apr 22  2022 zless
-rwxr-xr-x. 1 root root      1846 Apr 22  2022 zmore
-rwxr-xr-x. 1 root root      4581 Apr 22  2022 znew
lrwxrwxrwx. 1 root root         6 Oct 11  2021 zsoelim -> soelim
-rwxr-xr-x. 1 root root    1014632 Feb  8  2022 zstd
lrwxrwxrwx. 1 root root         4 Feb  8  2022 zstdcat -> zstd
-rwxr-xr-x. 1 root root      3873 Dec 21  2021 zstdgrep
-rwxr-xr-x. 1 root root        34 Dec 21  2021 zstdless
lrwxrwxrwx. 1 root root         4 Feb  8  2022 zstdmt -> zstd
[siddharrth@siddharrth bin]$
```

21. Run **head** and **tail** cmd to get specified number of lines displayed eg. head -5, tail -3 etc.

```
[siddharrth@siddharrth bin]$ ls -l | tail -4
lrwxrwxrwx. 1 root root          4 Feb  8  2022 zstdcat -> zstd
-rwxr-xr-x. 1 root root      3873 Dec 21  2021 zstdgrep
-rwxr-xr-x. 1 root root        34 Dec 21  2021 zstdless
lrwxrwxrwx. 1 root root          4 Feb  8  2022 zstdmt -> zstd
[siddharrth@siddharrth bin]$ ls -l | head -4
total 222660
-rwxr-xr-x. 1 root root      53032 Aug 16 18:40 [
-rwxr-xr-x. 1 root root      33416 Nov  1  2021 ac
-rwxr-xr-x. 1 root root      24000 Jul  4 13:41 aconnect
```

22. Understand the use of Pipe |.

```
[siddharrth@siddharrth bin]$ ls -l | tail -4
```

```
[siddharrth@siddharrth bin]$ ls -l | head -4
```

```
[siddharrth@siddharrth bin]$ ls -l | head -6
total 222660
-rwxr-xr-x. 1 root root      53032 Aug 16 18:40 [
-rwxr-xr-x. 1 root root      33416 Nov  1  2021 ac
-rwxr-xr-x. 1 root root      24000 Jul  4 13:41 aconnect
-rwxr-xr-x. 1 root root      28584 Aug 15 13:39 addr2line
-rwxr-xr-x. 1 root root     293272 Jan  2  2024 adwaita-1-demo
[siddharrth@siddharrth bin]$
```