ARPIT SAGAR

Assignment 1 – File System Management

1) List out 5 files in your system which consuming most of the disk space

2) Create one common folder in such a way that anyone can create files inside that independently and should not be able to delete other users files from that common folder.

3) Create user name "shubham" and add that user in the group "adm"
a) Create folder /data , change owner and group as "root:adm
b) Change /data permission such a way that user can able to write data in this folder and ownership of files or folder which you creates in this folder should be same as parent folder i.e /data folder permission (root:adm)

Sol.1

```
ubuntu@ip-172-31-32-198:~$ du -ah | sort -rh | head -6
92K     .
16K     ./folder2
12K     ./.local
12K     ./.bash_history
8.0K    ./.ssh
8.0K    ./.local/share
ubuntu@ip-172-31-32-198:~$
```

Here I'm using head -6 and then getting first 5 lines of expected output, but it includes first line of output as 92K because because du -ah includes the total size of the current directory(92K).

Sol.2

```
Last login: Mon Mar 31 12:59:44 2025 from 45.119.28.184
ubuntu@ip-172-31-32-198:~$ sudo mkdir common_folder
ubuntu@ip-172-31-32-198:~$ sudo chmod 1777 common_folder
ubuntu@ip-172-31-32-198:~$ ls -ld common_folder
drwxrwxrwt 2 root root 4096 Mar 31 15:35 common_folder
ubuntu@ip-172-31-32-198:~$ sudo useradd -m user1
ubuntu@ip-172-31-32-198:~$ sudo useradd -m user2
ubuntu@ip-172-31-32-198:~$ sudo useradd -m user3
ubuntu@ip-172-31-32-198:~$ sudo passwd user1
New password:
Retype new password:
passwd: password updated successfully
ubuntu@ip-172-31-32-198:~$ sudo passwd user2
New password:
Retype new password:
passwd: password updated successfully
ubuntu@ip-172-31-32-198:~$ sudo passwd user3
New password:
Retype new password:
passwd: password updated successfully
ubuntu@ip-172-31-32-198:~$ su - user1
Password:
```

```
ubuntu@ip-172-31-32-198:~$ sudo mv ~/common_folder /common_folder
ubuntu@ip-172-31-32-198:~$ ls -ld /common_folder/
drwxrwxrwt 2 root root 4096 Mar 31 15:35 /common_folder/
ubuntu@ip-172-31-32-198:~$ su - user1
Password:
$ touch /common_folder/f1
$ ^C
$
ubuntu@ip-172-31-32-198:~$ su - user2
Password:
$ rm /common_folder/f1
rm: remove write-protected regular empty file '/common_folder/f1'? ^C
$ rm /common_folder/f1
rm: remove write-protected regular empty file '/common_folder/f1'? y
rm: cannot remove '/common_folder/f1': Operation not permitted
$
ubuntu@ip-172-31-32-198:~$ su - user2
Password:
su: Authentication failure
ubuntu@ip-172-31-32-198:~$ su - user1
Password:
$ rm /common_folder/f1
$
```

I created a common_folder in my home directory and set its permissions to 1777 (world-writable with a sticky bit). Then, I moved the folder to the root directory (/common_folder). I created 3 users, Users can add files to it, but only the file owner can delete them.
Shown in the above pictures that user1 has created a file, f1 and using user 2 tried to delete f1 but unable to delete it, due to sticky bit.
But user1 can delete the files made by himself.

Sol3.

```
ubuntu@ip-172-31-32-198:~$ sudo useradd -G adm shubham
ubuntu@ip-172-31-32-198:~$ mkdir /data
mkdir: cannot create directory ‘/data’: Permission denied
ubuntu@ip-172-31-32-198:~$ sudo mkdir /data
ubuntu@ip-172-31-32-198:~$ sudo chown root:adm /data
ubuntu@ip-172-31-32-198:~$ sudo chmod 2775 /data
ubuntu@ip-172-31-32-198:~$ ls -ld /data
drwxrwsr-x 2 root adm 4096 Mar 31 16:40 /data
ubuntu@ip-172-31-32-198:~$ sudo -u shubham
ubuntu@ip-172-31-32-198:~$ sudo -su shubham
shubham@ip-172-31-32-198:/home/ubuntu$ touch /data/f1
shubham@ip-172-31-32-198:/home/ubuntu$ ls -l /data/f1
-rw-rw-r-- 1 shubham adm 0 Mar 31 16:49 /data/f1
shubham@ip-172-31-32-198:/home/ubuntu$ touch /data/f2
shubham@ip-172-31-32-198:/home/ubuntu$ ls -l/data/f2
ls: invalid option -- '/'
Try 'ls --help' for more information.
shubham@ip-172-31-32-198:/home/ubuntu$ ls -l /data/f2
-rw-rw-r-- 1 shubham adm 0 Mar 31 16:50 /data/f2
```

I created a user named shubham and added them to the adm group. Then I’ve created a directory /data, changed its ownership to root:adm, and set 2775 permissions so that files inside inherit the adm group. After switching to shubham, created files in /data and checked their permissions to confirm they inherited the correct group and write access. Verified everything using ls -ld /data, ls -l /data, and shubham.