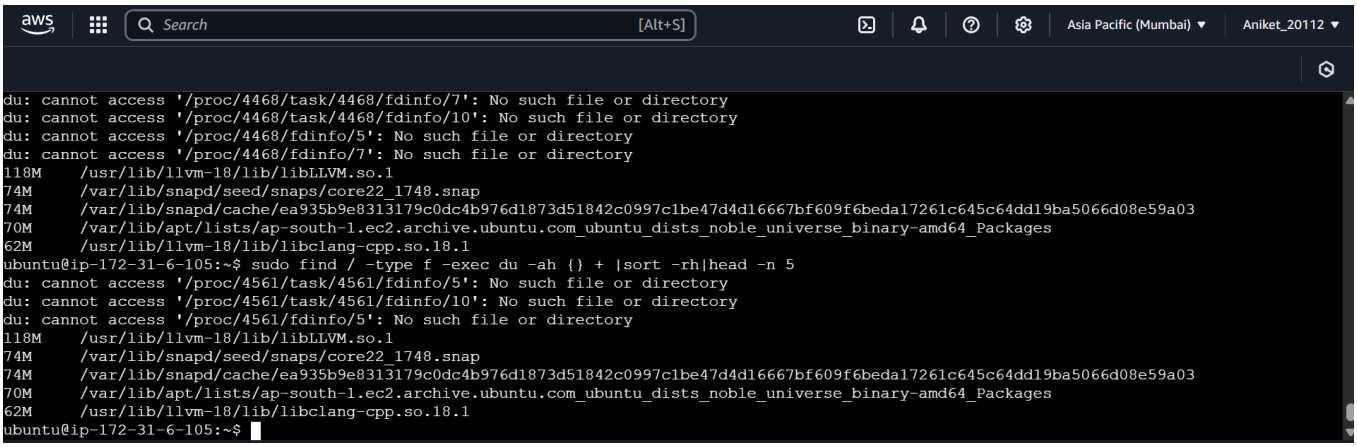
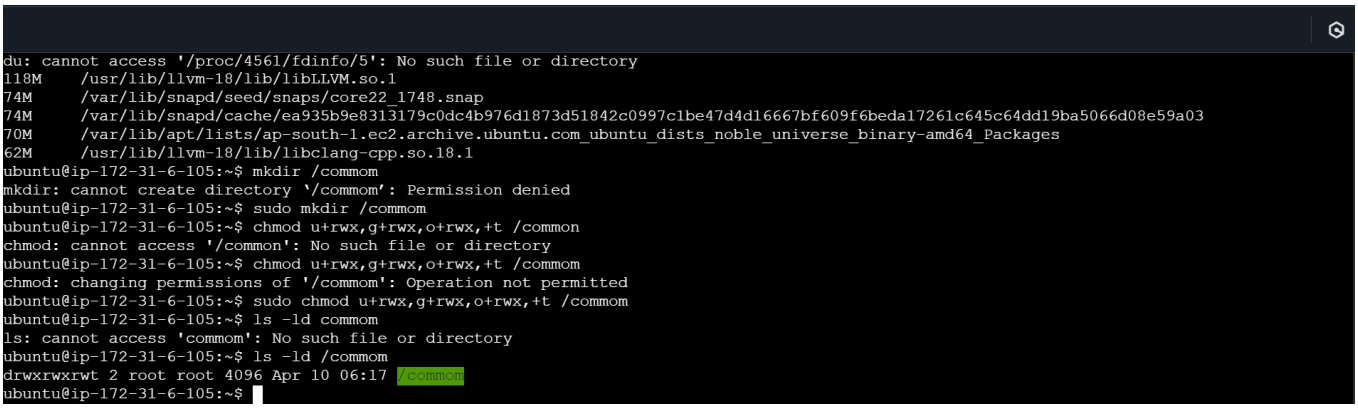
Assignment 1 – File System Management

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





- /usr/lib/llvm-18/lib/libLLVM.so.1 - 118M

This is a shared object library file for LLVM (Low-Level Virtual Machine) used in compiler tools and development environments. It's the largest file found during the scan, likely due to the large amount of functionality and debug info it includes.

- /var/lib/snapd/seed/snaps/core22_1748.snap - 74M

This is a Snap package file for the Core22 base, which is part of the Snap ecosystem in Ubuntu. Used to run snap applications, it's essential for snap-based application support.

- /var/lib/snapd/cache/ea935b9e8313179c0dc4b976d1873d51842c0997c1b... - 74M

A cached Snap file, stored temporarily for installations or updates. It consumes notable space due to redundancy but is needed for smoother snap operations.

- /var/lib/apt/lists/ap-south-1.ec2.archive.ubuntu.com_ubuntu_... - 70M

These are APT package lists, which store metadata for package management. It can become large over time especially after frequent updates and package operations.

- /usr/lib/llvm-18/lib/libclang-cpp.so.18.1 - 62M

This shared library is part of the Clang front end (C-family language compiler) bundled with LLVM. It's required for development tools and IDEs like VSCode or CLion that rely on Clang for IntelliSense.

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.

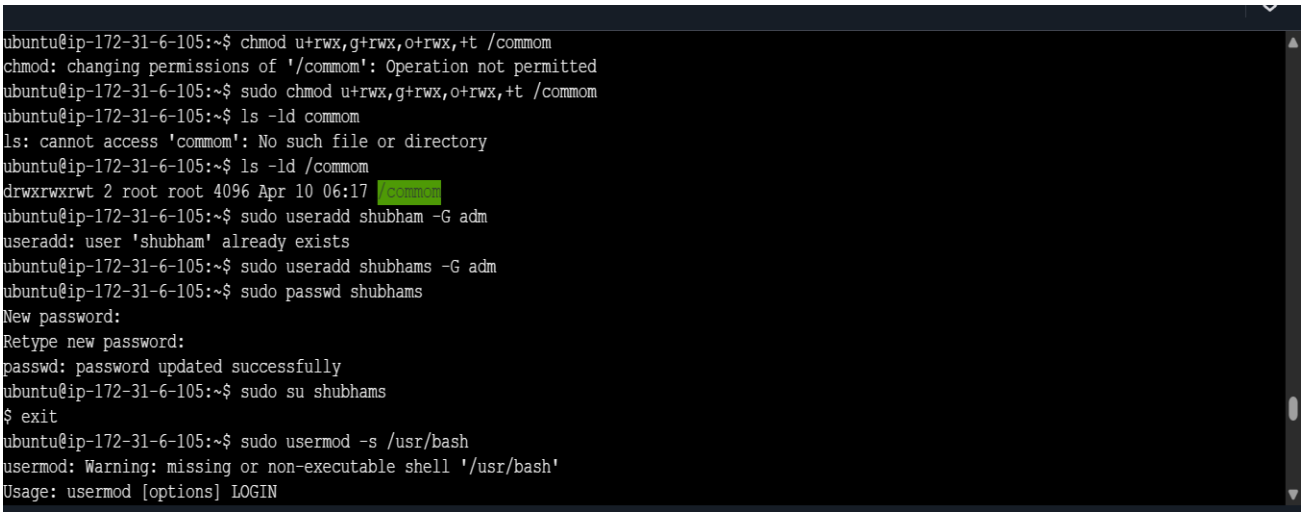
```
exit
ubuntu@ip-172-31-6-105:~$ sudo su- shubhams
sudo: su-: command not found
ubuntu@ip-172-31-6-105:~$ sudo su -shubhams
su: failed to execute hubhams: No such file or directory
ubuntu@ip-172-31-6-105:~$ sudo su shubhams
shubhams@ip-172-31-6-105:/home/ubuntu$ sudo mkdir /Data
[sudo] password for shubhams:
shubhams is not in the sudoers file.
shubhams@ip-172-31-6-105:/home/ubuntu$ exit
exit
ubuntu@ip-172-31-6-105:~$ sudo mkdir /Data
ubuntu@ip-172-31-6-105:~$ sudo chown -r root:adm /Data
chown: invalid option -- 'r'
Try 'chown --help' for more information.
ubuntu@ip-172-31-6-105:~$ sudo chown -R root:adm /Data
ubuntu@ip-172-31-6-105:~$ ls -ld /Data
drwxr-xr-x 2 root adm 4096 Apr 10 06:57 /Data
ubuntu@ip-172-31-6-105:~$
```

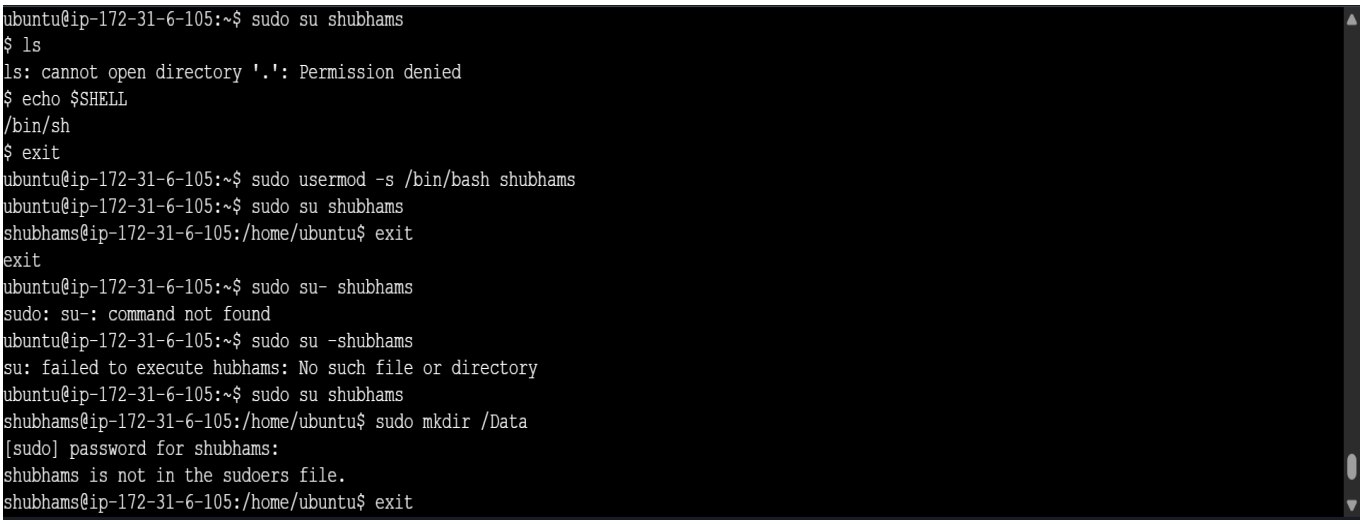
```
ubuntu@ip-172-31-6-105:~$ chmod u+rwx,g+rwx,o+rwx,+t /commom
chmod: changing permissions of '/commom': Operation not permitted
ubuntu@ip-172-31-6-105:~$ sudo chmod u+rwx,g+rwx,o+rwx,+t /commom
ubuntu@ip-172-31-6-105:~$ ls -ld commom
ls: cannot access 'commom': No such file or directory
ubuntu@ip-172-31-6-105:~$ ls -ld /commom
drwxrwxrwt 2 root root 4096 Apr 10 06:17 /commom
ubuntu@ip-172-31-6-105:~$ sudo useradd shubham -G adm
useradd: user 'shubham' already exists
ubuntu@ip-172-31-6-105:~$ sudo useradd shubhams -G adm
ubuntu@ip-172-31-6-105:~$ sudo passwd shubhams
New password:
Retype new password:
passwd: password updated successfully
ubuntu@ip-172-31-6-105:~$ sudo su shubhams
$ exit
ubuntu@ip-172-31-6-105:~$ sudo usermod -s /usr/bash
usermod: Warning: missing or non-executable shell '/usr/bash'
Usage: usermod [options] LOGIN
```

- A directory named /common was created using the mkdir command with sudo privileges.
- Permissions were set on the folder using the chmod command.
- The permission used was u+rwx,g+rwx,o+rwx,+t which gives read, write, and execute access to all users.
- The +t option sets the sticky bit, which prevents users from deleting or renaming files owned by other users.

- As a result, all users can create and manage their own files in the /common folder but cannot delete or alter files created by others.

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)





```
ubuntu@ip-172-31-6-105:~$ sudo mkdir /Data
ubuntu@ip-172-31-6-105:~$ sudo chown -r root:adm /Data
chown: invalid option -- 'r'
Try 'chown --help' for more information.
ubuntu@ip-172-31-6-105:~$ sudo chown -R root:adm /Data
ubuntu@ip-172-31-6-105:~$ ls -ld /Data
drwxr-xr-x 2 root adm 4096 Apr 10 06:57 /Data
ubuntu@ip-172-31-6-105:~$ sudo chmod g+rwx /Data
ubuntu@ip-172-31-6-105:~$ sudo chmod u+rwx /Data
ubuntu@ip-172-31-6-105:~$ sudo chmod o+r /Data
ubuntu@ip-172-31-6-105:~$ sudo chmod g+s /Data
ubuntu@ip-172-31-6-105:~$ ls -ld /Data
drwxrwsr-x 2 root adm 4096 Apr 10 06:57 /Data
ubuntu@ip-172-31-6-105:~$ sudo chmod u+s /Data
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drwxrwsr-x 2 root adm 4096 Apr 10 06:57 /Data
```

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 in such a way that the user can write data in this folder and the ownership of files or folders created inside it should remain the same as the parent folder (/data)

Steps:

1. Created a user named shubham using the useradd command and added to the adm group.
2. Created the /data folder using mkdir with sudo privileges.
3. Changed the ownership of the /data folder to root:adm using chown command.
4. Granted write and execute permissions to the group using chmod g+rwX on /data so users in adm group can create and access files.
5. Set the group ID on the /data folder using chmod g+s so that all new files and folders inside inherit the group ownership of the /data folder.
6. This ensures any file created inside /data has root:adm as its owner:group, just like the parent folder.