CYSE 270: Linux System for Cybersecurity

Lab 6 – File Permission

CYSE 270: Linux System for Cybersecurity

You need to configure the system to allow three users to perform the shared folder actions. Please

submit the screenshot for all the steps in a word or pdf file

Task A: Get accounts and groups ready (70 points)

Step 1. Create three groups- employee, payroll, and admin. (You may refer to the slides under Module
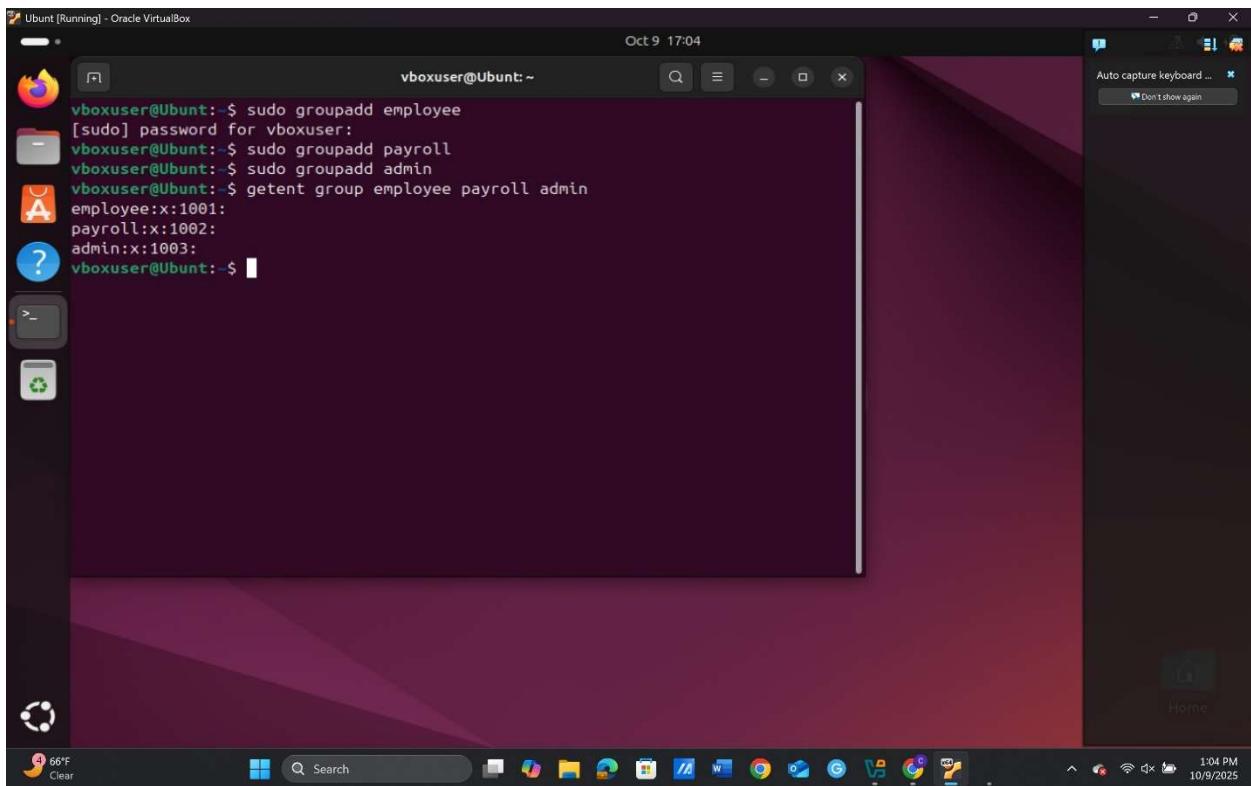
2 – Group Management)

Step 2. Create three user accounts with a specified home directory for Sophia, Olivia, and Emma. Set the primary group for Sophia, Olivia, and Emma to "employee", "payroll", and "admin", respectively. And change their login shell to /bin/bash. Don't forget to set their passwords.
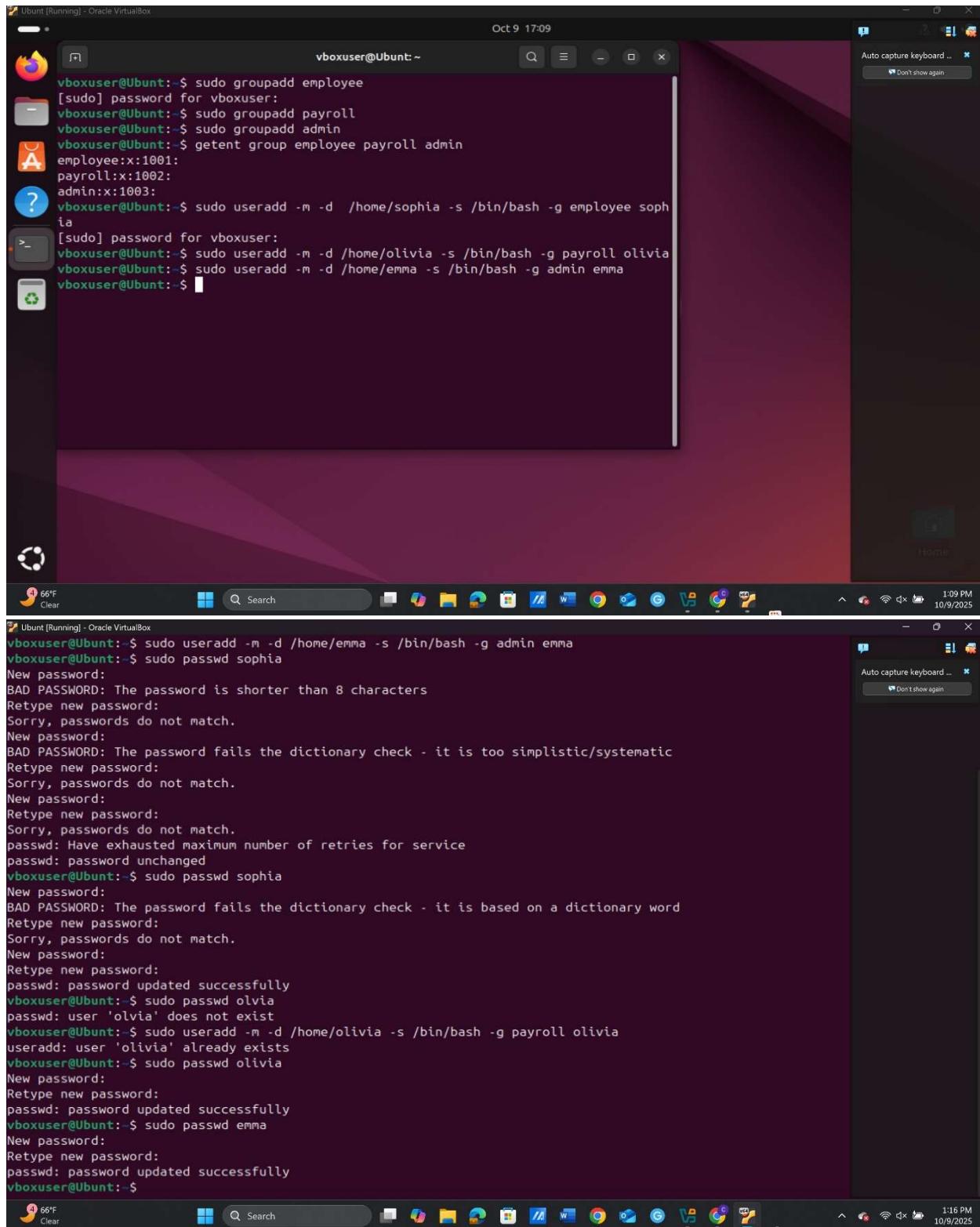
```
vboxuser@Ubunt:~$ sudo groupadd employee
[sudo] password for vboxuser:
vboxuser@Ubunt:~$ sudo groupadd payroll
vboxuser@Ubunt:~$ sudo groupadd admin
vboxuser@Ubunt:~$ getent group employee payroll admin
employee:x:1001:
payroll:x:1002:
admin:x:1003:
vboxuser@Ubunt:~$ sudo useradd -m -d  /home/sophia -s /bin/bash -g employee soph
ia
[sudo] password for vboxuser:
vboxuser@Ubunt:~$ sudo useradd -m -d /home/olivia -s /bin/bash -g payroll olivia
vboxuser@Ubunt:~$ sudo useradd -m -d /home/emma -s /bin/bash -g admin emma
vboxuser@Ubunt:~$
```



```
vboxuser@Ubunt:~$ sudo useradd -m -d /home/emma -s /bin/bash -g admin emma
vboxuser@Ubunt:~$ sudo passwd sophia
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
Sorry, passwords do not match.
New password:
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic
Retype new password:
Sorry, passwords do not match.
New password:
Retype new password:
Sorry, passwords do not match.
passwd: Have exhausted maximum number of retries for service
passwd: password unchanged
vboxuser@Ubunt:~$ sudo passwd sophia
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
Sorry, passwords do not match.
New password:
Retype new password:
passwd: password updated successfully
vboxuser@Ubunt:~$ sudo passwd olvia
passwd: user 'olvia' does not exist
vboxuser@Ubunt:~$ sudo useradd -m -d /home/olivia -s /bin/bash -g payroll olivia
useradd: user 'olivia' already exists
vboxuser@Ubunt:~$ sudo passwd olivia
New password:
Retype new password:
passwd: password updated successfully
vboxuser@Ubunt:~$ sudo passwd emma
New password:
Retype new password:
passwd: password updated successfully
vboxuser@Ubunt:~$
```

Step 3. Create a shared group called "your_midas" (replace it with your MIDAS name) and set this shared group as the above accounts' secondary group. After this step, remember to check each user's group profile.

Step 4. Create a directory named /home/cyse_project, which is to be owned by the "your_midas" group which is a shared group). After this step, remember to check the permission of this shared directory.

Step 5. Change the permissions of the /home/cyse_project directory to "rwxrwx---" using the octal method so that only the project group members have access to this directory. After this step, remember to check the permission of this shared directory.

Step 6. Switch to Sophia's account. Change the default permissions using octal method with umask command, to "rw-r-----" for Sophia when she creates a file or directory. Check the value of umask, and permission of a new file after this step.

Step 7. Create a new file called "Sophia_homework" in the home directory of Sophia and put your name in the file as content. After this step, remember to check the content and the permission of the new file. (ls -l Sophia_homework)
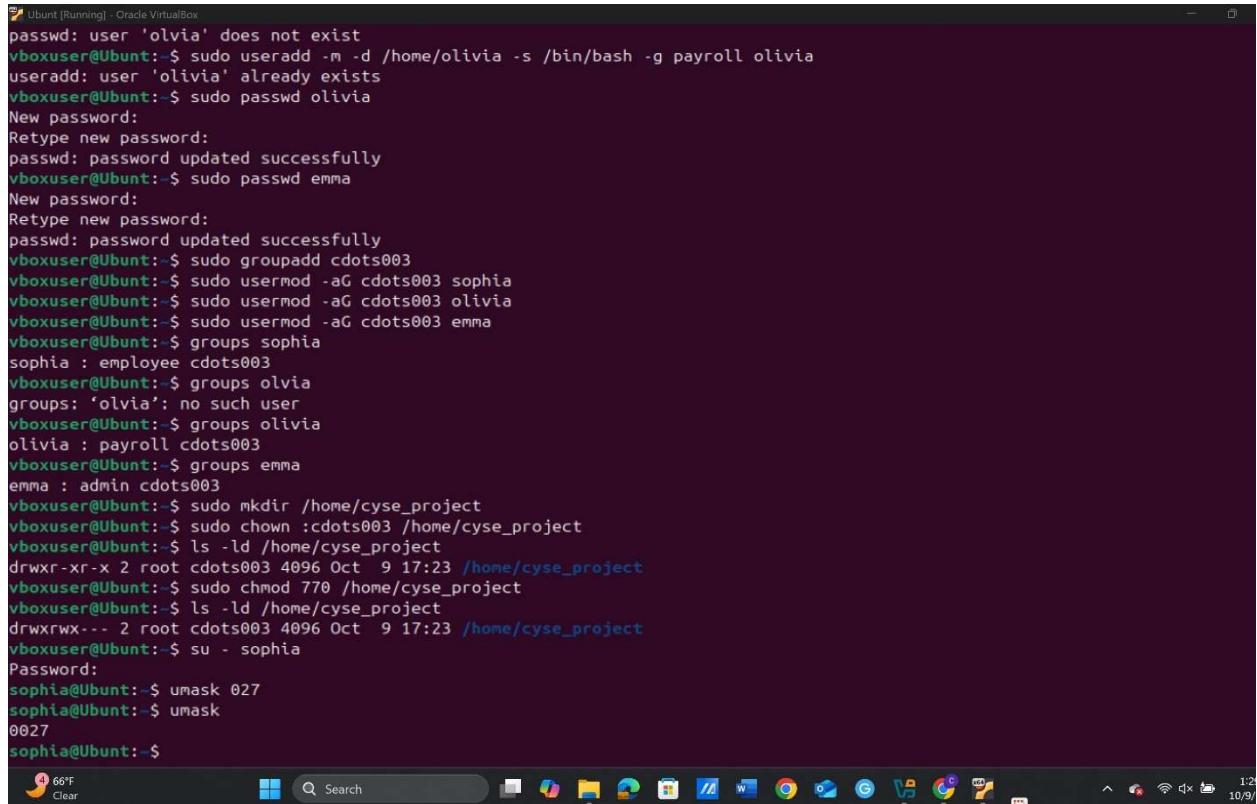

```
Ubunt [Running] - Oracle VirtualBox
passwd: user 'olvia' does not exist
vboxuser@Ubunt:~$ sudo useradd -m -d /home/olivia -s /bin/bash -g payroll olivia
useradd: user 'olivia' already exists
vboxuser@Ubunt:~$ sudo passwd olivia
New password:
Retype new password:
passwd: password updated successfully
vboxuser@Ubunt:~$ sudo passwd emma
New password:
Retype new password:
passwd: password updated successfully
vboxuser@Ubunt:~$ sudo groupadd cdots003
vboxuser@Ubunt:~$ sudo usermod -aG cdots003 sophia
vboxuser@Ubunt:~$ sudo usermod -aG cdots003 olivia
vboxuser@Ubunt:~$ sudo usermod -aG cdots003 emma
vboxuser@Ubunt:~$ groups sophia
sophia : employee cdots003
vboxuser@Ubunt:~$ groups olvia
groups: 'olvia': no such user
vboxuser@Ubunt:~$ groups olivia
olivia : payroll cdots003
vboxuser@Ubunt:~$ groups emma
emma : admin cdots003
vboxuser@Ubunt:~$ sudo mkdir /home/cyse_project
vboxuser@Ubunt:~$ sudo chown :cdots003 /home/cyse_project
vboxuser@Ubunt:~$ ls -ld /home/cyse_project
drwxr-xr-x 2 root cdots003 4096 Oct  9 17:23 /home/cyse_project
vboxuser@Ubunt:~$ sudo chmod 770 /home/cyse_project
vboxuser@Ubunt:~$ ls -ld /home/cyse_project
drwxrwx--- 2 root cdots003 4096 Oct  9 17:23 /home/cyse_project
vboxuser@Ubunt:~$ su - sophia
Password:
sophia@Ubunt:~$ umask 027
sophia@Ubunt:~$ umask
0027
sophia@Ubunt:~$
```

Step 8. Copy "Sophia_homework" to the /home/cyse_project directory. After this step, remember to check the permission of the file in the shared directory.

Step 9. Switch to Emma's account. Try to read "Sophia_homework" in the /home/cyse_project Directory.

Step 10. Exit out of Emma's account and Sophia's account.

Task B: Set SGID permission (15 points)

Step 1. Switch to root or the regular user's account. To allow group members to access the

files shared in the shared directory, you need to fix the sharing issue by setting the correct SGID group values to /home/cyse_project directory.
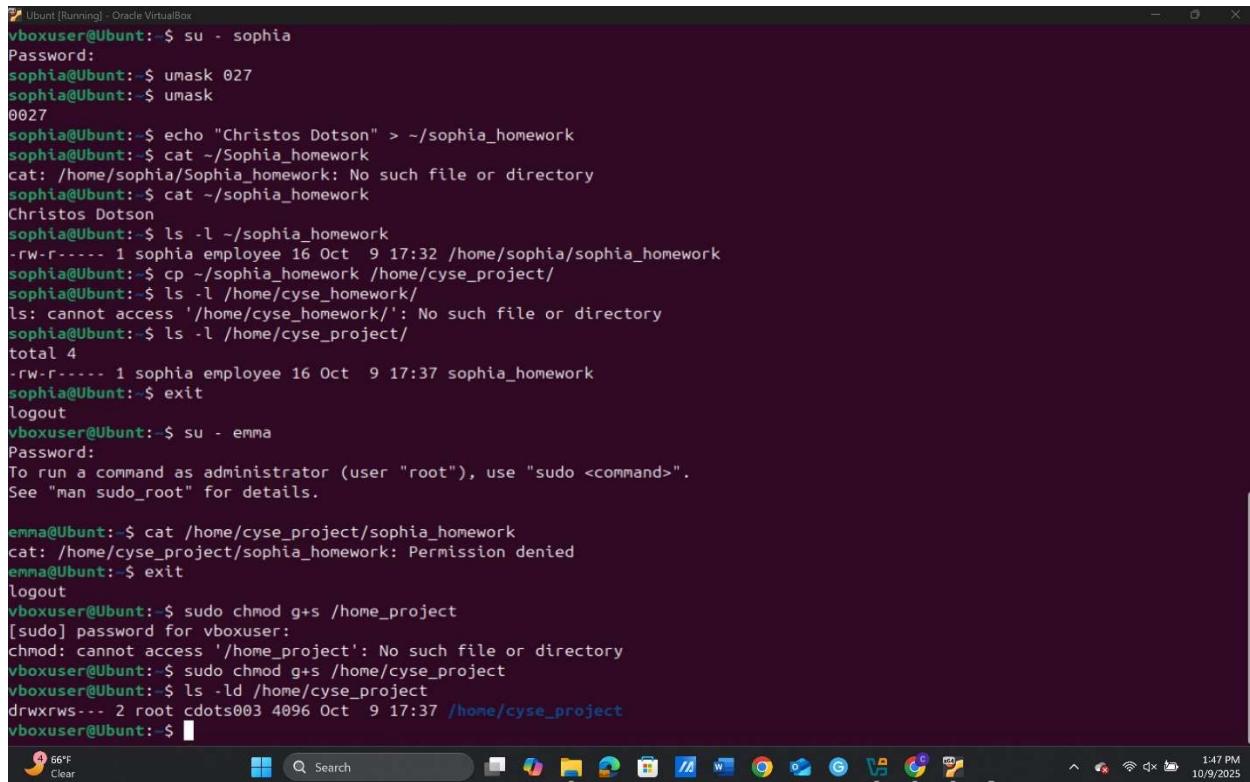

```
vboxuser@Ubunt:~$ su - sophia
Password:
sophia@Ubunt:~$ umask 027
sophia@Ubunt:~$ umask
0027
sophia@Ubunt:~$ echo "Christos Dotson" > ~/sophia_homework
sophia@Ubunt:~$ cat ~/Sophia_homework
cat: /home/sophia/Sophia_homework: No such file or directory
sophia@Ubunt:~$ cat ~/sophia_homework
Christos Dotson
sophia@Ubunt:~$ ls -l ~/sophia_homework
-rw-r----- 1 sophia employee 16 Oct  9 17:32 /home/sophia/sophia_homework
sophia@Ubunt:~$ cp ~/sophia_homework /home/cyse_project/
sophia@Ubunt:~$ ls -l /home/cyse_homework/
ls: cannot access '/home/cyse_homework/': No such file or directory
sophia@Ubunt:~$ ls -l /home/cyse_project/
total 4
-rw-r----- 1 sophia employee 16 Oct  9 17:37 sophia_homework
sophia@Ubunt:~$ exit
logout
vboxuser@Ubunt:~$ su - emma
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

emma@Ubunt:~$ cat /home/cyse_project/sophia_homework
cat: /home/cyse_project/sophia_homework: Permission denied
emma@Ubunt:~$ exit
logout
vboxuser@Ubunt:~$ sudo chmod g+s /home_project
[sudo] password for vboxuser:
chmod: cannot access '/home_project': No such file or directory
vboxuser@Ubunt:~$ sudo chmod g+s /home/cyse_project
vboxuser@Ubunt:~$ ls -ld /home/cyse_project
drwxrws--- 2 root cdots003 4096 Oct  9 17:37 /home/cyse_project
vboxuser@Ubunt:~$
```

Step 2. Switch to Sophia's account. Copy "Sophia_homework" to the /home/cyse_project directory as"Sophia_homework2".

Step 3. Switch to Emma's account. Try to read "Sophia_ homework2" in the /home/cyse_project directory.

Task C: Unset SGID permissions (15 points)

Step 1. Switch to root the regular user's account. To disallow group members to access the files in the shared folder, you need to fix the sharing issue by setting the correct SGID group values to /home/cyse_project directory to remove the group user read permission.

Step 2. Switch to Sophia's account. Copy "Sophia_homework" to the /home/cyse_project directory as "Sophia_homework3".

Step 3. Switch to Olivia's account. Try to read "Sophia_home3" in the /home/cyse_project directory.

Extra credit: Sticky Bit (10 points)

CYSE 270: Linux System for Cybersecurity

Step 1. Switch to Olivia' account. Delete "Sophia_ homework" in the /home/cyse_project directory.
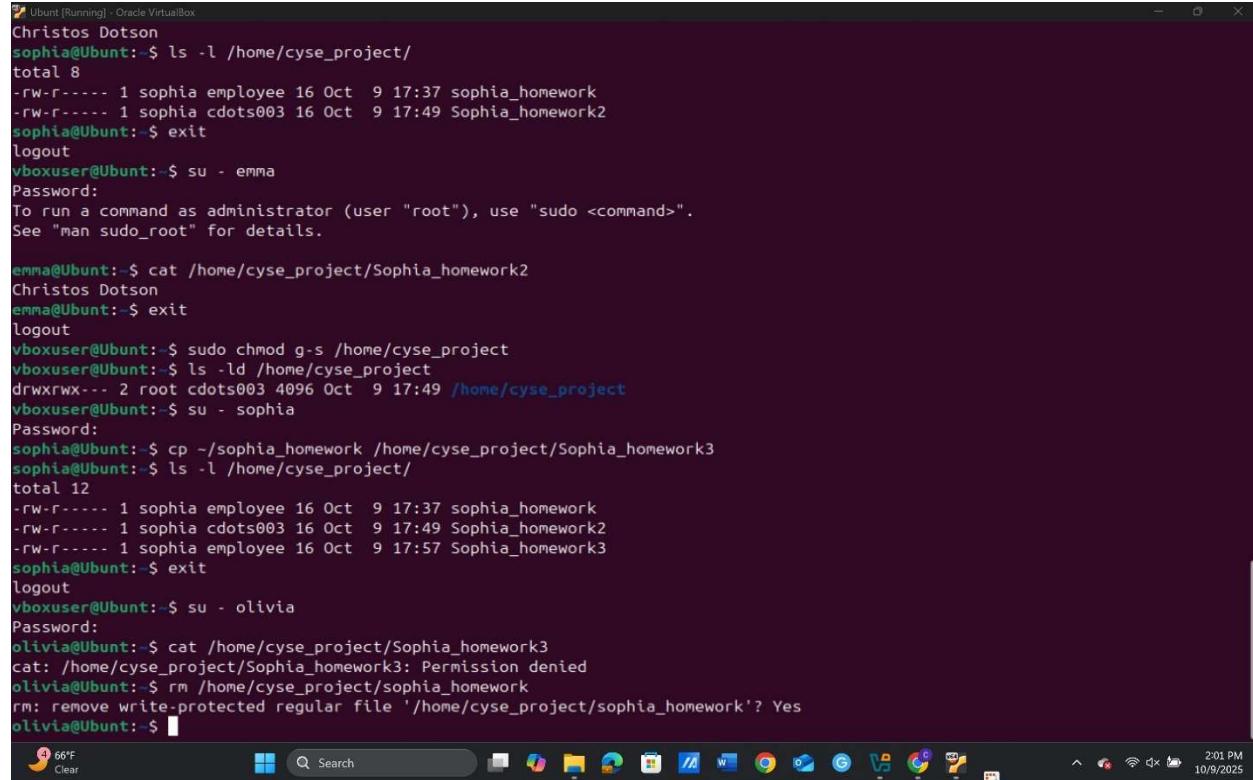

```
Ubunt [Running] - Oracle VirtualBox
Christos Dotson
sophia@Ubunt:~$ ls -l /home/cyse_project/
total 8
-rw-r----- 1 sophia employee 16 Oct  9 17:37 sophia_homework
-rw-r----- 1 sophia cdots003 16 Oct  9 17:49 Sophia_homework2
sophia@Ubunt:~$ exit
logout
vboxuser@Ubunt:~$ su - emma
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

emma@Ubunt:~$ cat /home/cyse_project/Sophia_homework2
Christos Dotson
emma@Ubunt:~$ exit
logout
vboxuser@Ubunt:~$ sudo chmod g-s /home/cyse_project
vboxuser@Ubunt:~$ ls -ld /home/cyse_project
drwxrwx--- 2 root cdots003 4096 Oct  9 17:49 /home/cyse_project
vboxuser@Ubunt:~$ su - sophia
Password:
sophia@Ubunt:~$ cp ~/sophia_homework /home/cyse_project/Sophia_homework3
sophia@Ubunt:~$ ls -l /home/cyse_project/
total 12
-rw-r----- 1 sophia employee 16 Oct  9 17:37 sophia_homework
-rw-r----- 1 sophia cdots003 16 Oct  9 17:49 Sophia_homework2
-rw-r----- 1 sophia employee 16 Oct  9 17:57 Sophia_homework3
sophia@Ubunt:~$ exit
logout
vboxuser@Ubunt:~$ su - olivia
Password:
olivia@Ubunt:~$ cat /home/cyse_project/Sophia_homework3
cat: /home/cyse_project/Sophia_homework3: Permission denied
olivia@Ubunt:~$ rm /home/cyse_project/sophia_homework
rm: remove write-protected regular file '/home/cyse_project/sophia_homework'? Yes
olivia@Ubunt:~$
```

Step 2. Switch to root account. Set the sticky bit permission, to make files can only be removed by the owner of the file.
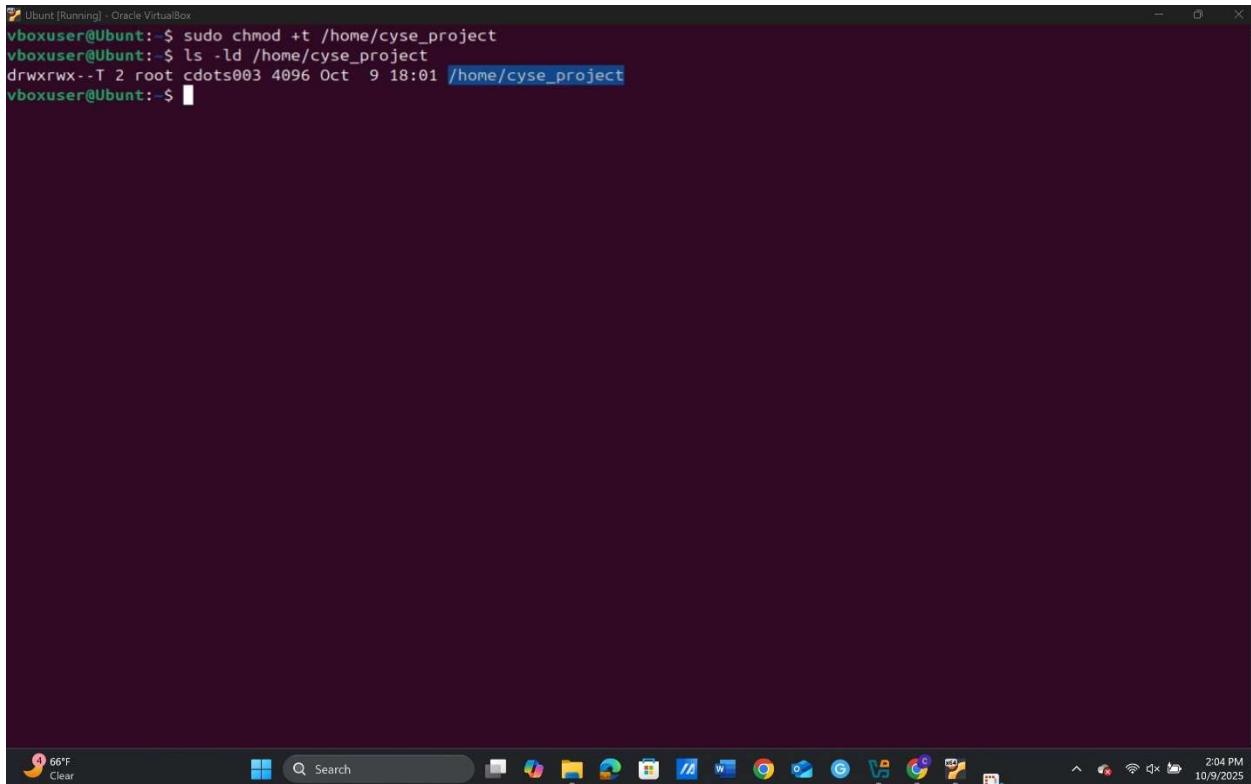
```
Ubunt [Running] - Oracle VirtualBox
vboxuser@Ubunt:~$ sudo chmod +t /home/cyse_project
vboxuser@Ubunt:~$ ls -ld /home/cyse_project
drwxrwx--T 2 root cdots003 4096 Oct  9 18:01 /home/cyse_project
vboxuser@Ubunt:~$
```

Step 3. Switch to Olivia' account. Try to delete "Sophia_ homework3" in the /home/cyse_project directory. Can you delete it this time? Why?
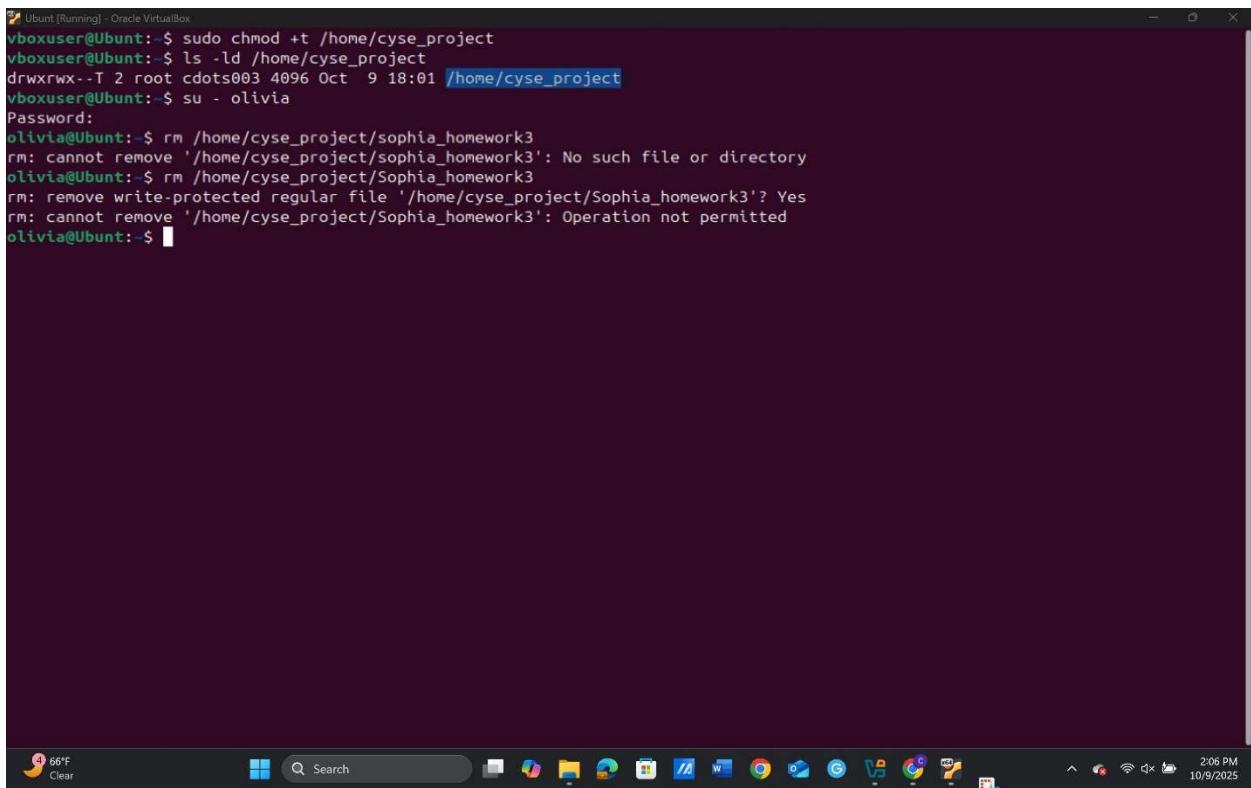

```
Ubunt [Running] - Oracle VirtualBox
vboxuser@Ubunt:~$ sudo chmod +t /home/cyse_project
vboxuser@Ubunt:~$ ls -ld /home/cyse_project
drwxrwx--T 2 root cdots003 4096 Oct  9 18:01 /home/cyse_project
vboxuser@Ubunt:~$ su - olivia
Password:
olivia@Ubunt:~$ rm /home/cyse_project/sophia_homework3
rm: cannot remove '/home/cyse_project/sophia_homework3': No such file or directory
olivia@Ubunt:~$ rm /home/cyse_project/Sophia_homework3
rm: remove write-protected regular file '/home/cyse_project/Sophia_homework3'? Yes
rm: cannot remove '/home/cyse_project/Sophia_homework3': Operation not permitted
olivia@Ubunt:~$
```