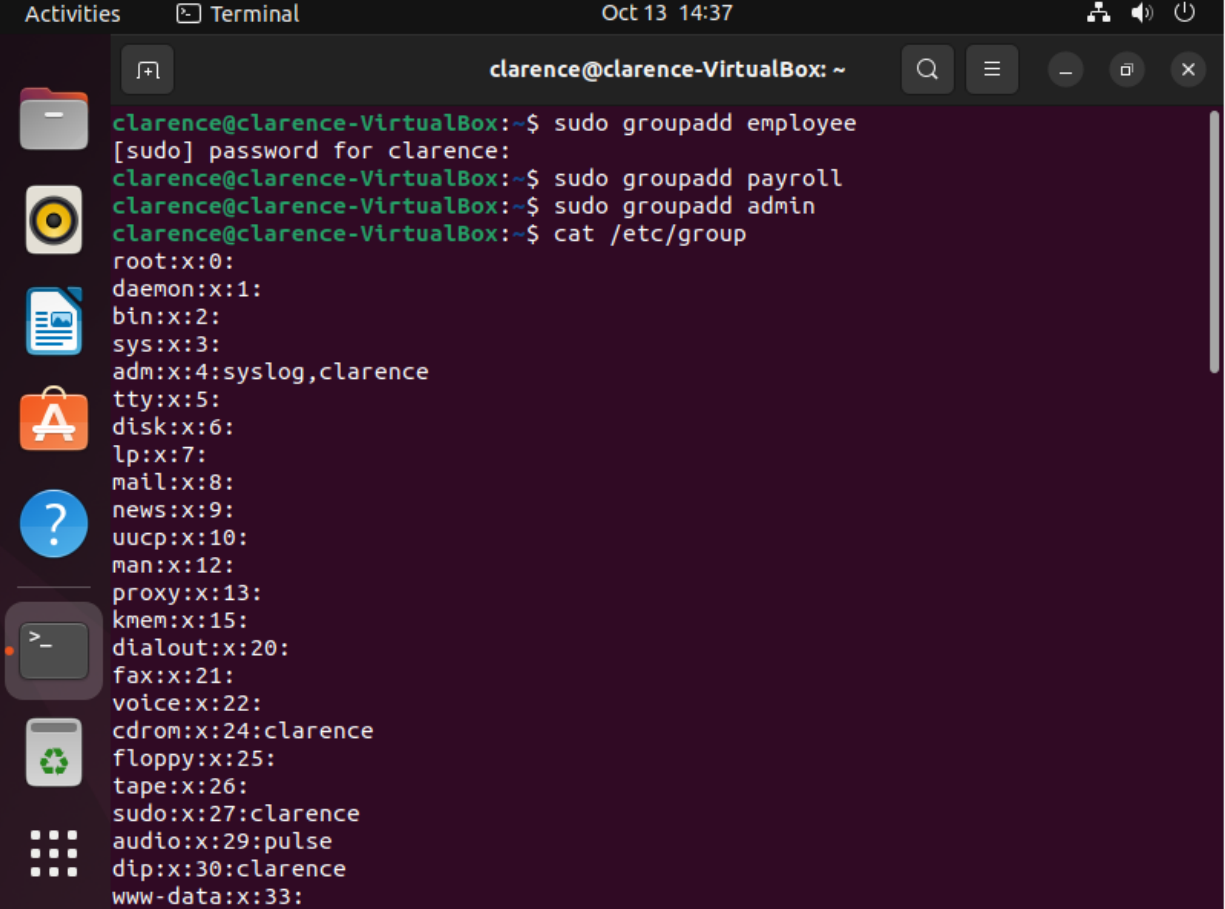
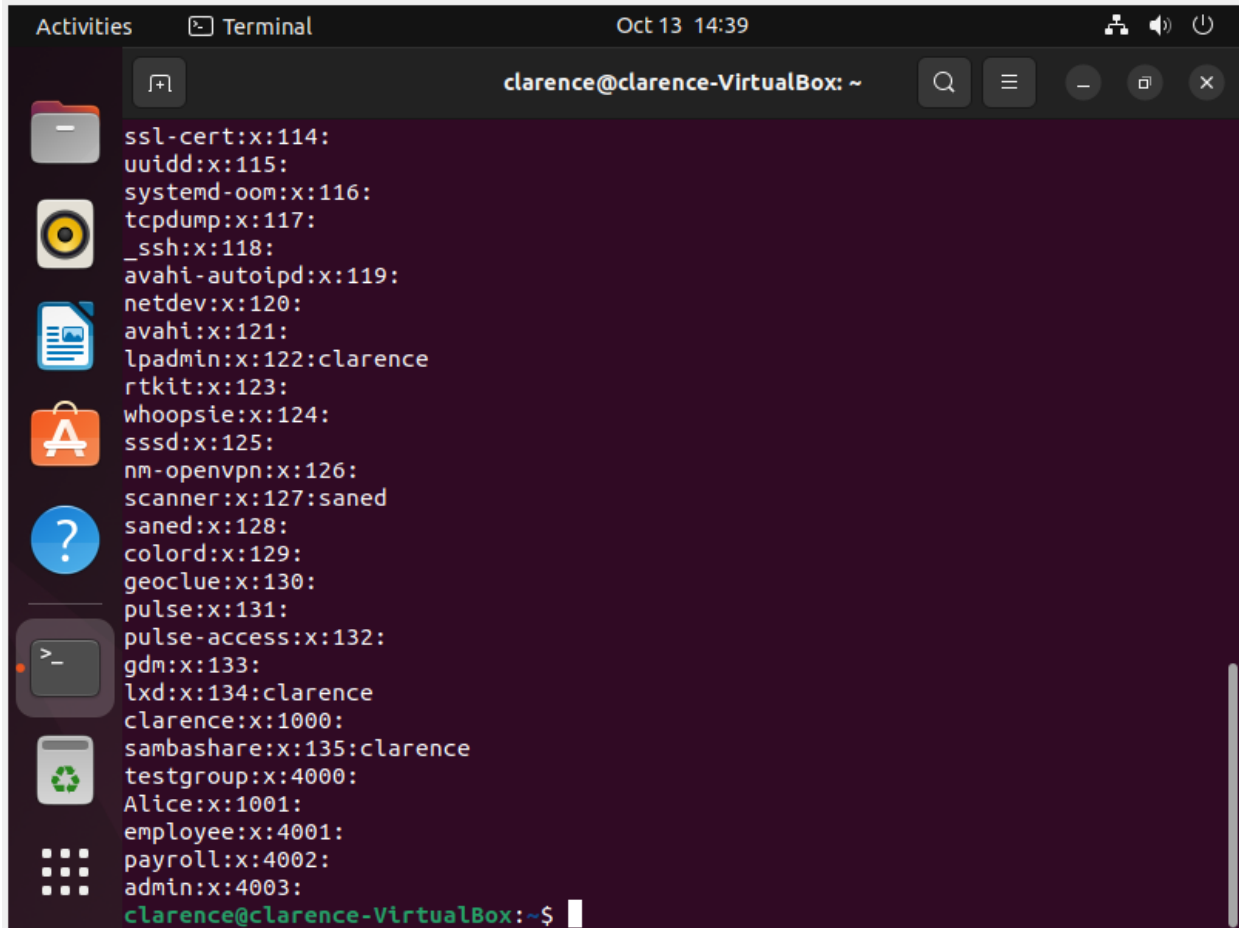


A terminal window titled "clarence@clarence-VirtualBox: ~" with a search icon, menu icon, and window control buttons. The terminal shows the execution of several commands: "sudo groupadd employee", "sudo groupadd payroll", and "sudo groupadd admin". After the last command, the user runs "cat /etc/group", which displays a list of system groups and users. The groups listed are root, daemon, bin, sys, adm, tty, disk, lp, mail, news, uucp, man, proxy, knem, dialout, fax, voice, cdrom, floppy, tape, sudo, audio, dip, and www-data. The user "clarence" is listed as a member of the "adm" and "sudo" groups.

```
clarence@clarence-VirtualBox:~$ sudo groupadd employee
[sudo] password for clarence:
clarence@clarence-VirtualBox:~$ sudo groupadd payroll
clarence@clarence-VirtualBox:~$ sudo groupadd admin
clarence@clarence-VirtualBox:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,clarence
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
knem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:clarence
floppy:x:25:
tape:x:26:
sudo:x:27:clarence
audio:x:29:pulse
dip:x:30:clarence
www-data:x:33:
```

A terminal window titled "clarence@clarence-VirtualBox: ~" with a search icon, menu icon, and window control buttons. The terminal displays a list of system users and their IDs, with the "clarence" user highlighted in green. The list includes: ssl-cert (114), uidd (115), systemd-oom (116), tcpdump (117), _ssh (118), avahi-autoipd (119), netdev (120), avahi (121), lpadmin (122), rtkit (123), whoopsie (124), sssd (125), nm-openvpn (126), scanner (127), saned (128), colord (129), geoclue (130), pulse (131), pulse-access (132), gdm (133), lxd (134), clarence (1000), sambashare (135), testgroup (4000), Alice (1001), employee (4001), payroll (4002), and admin (4003). The prompt "clarence@clarence-VirtualBox:~\$" is at the bottom.

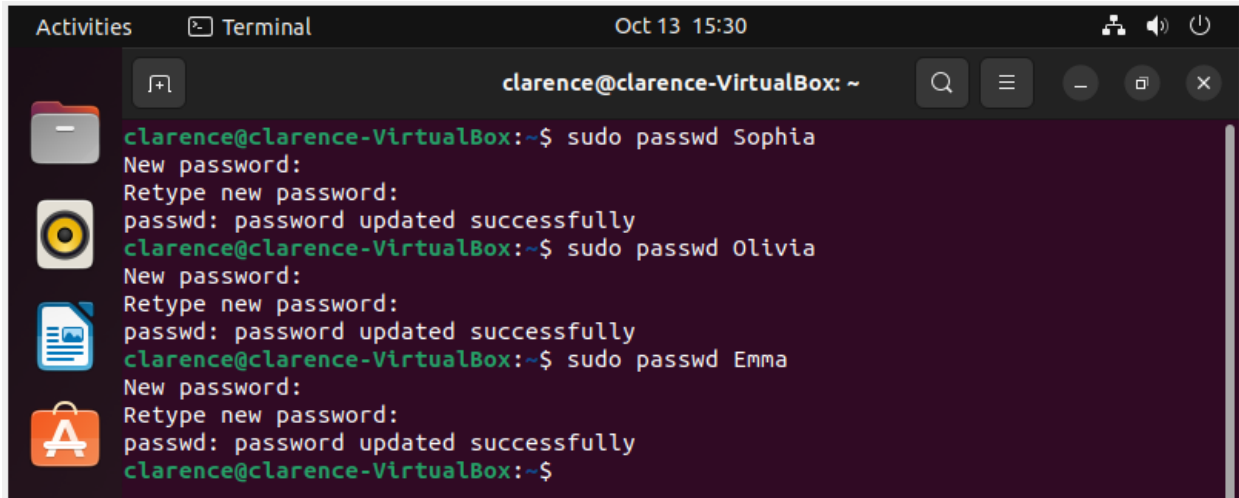
```
ssl-cert:x:114:
uidd:x:115:
systemd-oom:x:116:
tcpdump:x:117:
_ssh:x:118:
avahi-autoipd:x:119:
netdev:x:120:
avahi:x:121:
lpadmin:x:122:clarence
rtkit:x:123:
whoopsie:x:124:
sssd:x:125:
nm-openvpn:x:126:
scanner:x:127:saned
saned:x:128:
colord:x:129:
geoclue:x:130:
pulse:x:131:
pulse-access:x:132:
gdm:x:133:
lxd:x:134:clarence
clarence:x:1000:
sambashare:x:135:clarence
testgroup:x:4000:
Alice:x:1001:
employee:x:4001:
payroll:x:4002:
admin:x:4003:
clarence@clarence-VirtualBox:~$
```

```
Activities Terminal Oct 13 15:00
clarence@clarence-VirtualBox: ~
clarence@clarence-VirtualBox:~$ sudo useradd -m Sophia
useradd: user 'Sophia' already exists
clarence@clarence-VirtualBox:~$ sudo useradd -m Olivia
clarence@clarence-VirtualBox:~$ sudo useradd -m Emma
clarence@clarence-VirtualBox:~$ sudo tail -6 /etc/shadow >> clarence
clarence@clarence-VirtualBox:~$ cat clarence
gdm*:19213:0:99999:7:::
clarence:$y$j9T$5FeZoFrQnmj/733JG0iU2/$dunQtquB06ER/xI/w2ZeEAb5NllfU9Ib9DyNj0BT
wQ.:19255:0:99999:7:::
Alice!:19264:0:99999:7:::
Sophia!:19278:0:99999:7:::
Olivia!:19278:0:99999:7:::
Emma!:19278:0:99999:7:::
clarence@clarence-VirtualBox:~$
```

```
Emma!:19278:0:99999:7:::
clarence@clarence-VirtualBox:~$ sudo usermod -G employee -a Sophia
clarence@clarence-VirtualBox:~$ sudo usermod -G payroll -a Olivia
clarence@clarence-VirtualBox:~$ sudo usermod -G admin -a Emma
clarence@clarence-VirtualBox:~$
```

```
Emma!:19278:0:99999:7:::
clarence@clarence-VirtualBox:~$ sudo usermod -G employee -a Sophia
clarence@clarence-VirtualBox:~$ sudo usermod -G payroll -a Olivia
clarence@clarence-VirtualBox:~$ sudo usermod -G admin -a Emma
clarence@clarence-VirtualBox:~$ sudo usermod -s /bin/bash Sophia
clarence@clarence-VirtualBox:~$ sudo usermod -s /bin/bash Olivia
clarence@clarence-VirtualBox:~$ sudo usermod -s /bin/bash Emma
clarence@clarence-VirtualBox:~$ tail /etc/passwd
geoclue:x:123:130::/var/lib/geoclue:/usr/sbin/nologin
pulse:x:124:131:PulseAudio daemon,,:/run/pulse:/usr/sbin/nologin
gnome-initial-setup:x:125:65534:./run/gnome-initial-setup:/bin/false
hplip:x:126:7:HPLIP system user,,:/run/hplip:/bin/false
gdm:x:127:133:Gnome Display Manager:/var/lib/gdm3:/bin/false
clarence:x:1000:1000:clarence,,:/home/clarence:/bin/bash
Alice:x:1001:1001:./home/Alice:/bin/bash
Sophia:x:1002:4001:./users/employee:/bin/bash
Olivia:x:1003:4002:./home/Olivia:/bin/bash
Emma:x:1004:4003:./home/Emma:/bin/bash
clarence@clarence-VirtualBox:~$
```

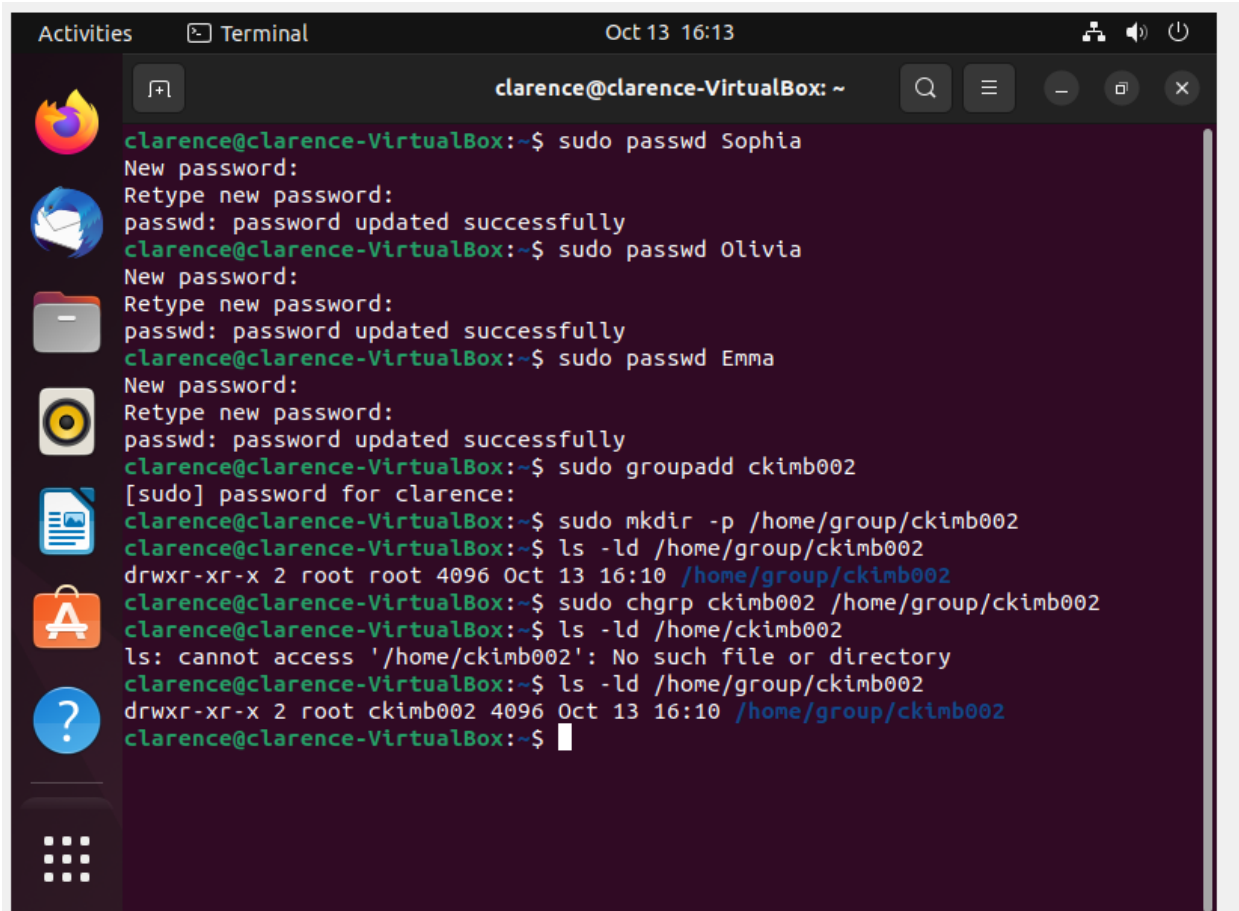
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A terminal window titled "clarence@clarence-VirtualBox: ~" with a search bar and window controls. The terminal shows three successful password updates using the 'passwd' command with 'sudo' for users Sophia, Olivia, and Emma. The prompt is 'clarence@clarence-VirtualBox:~\$'.

```
clarence@clarence-VirtualBox:~$ sudo passwd Sophia
New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo passwd Olivia
New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo passwd Emma
New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$
```

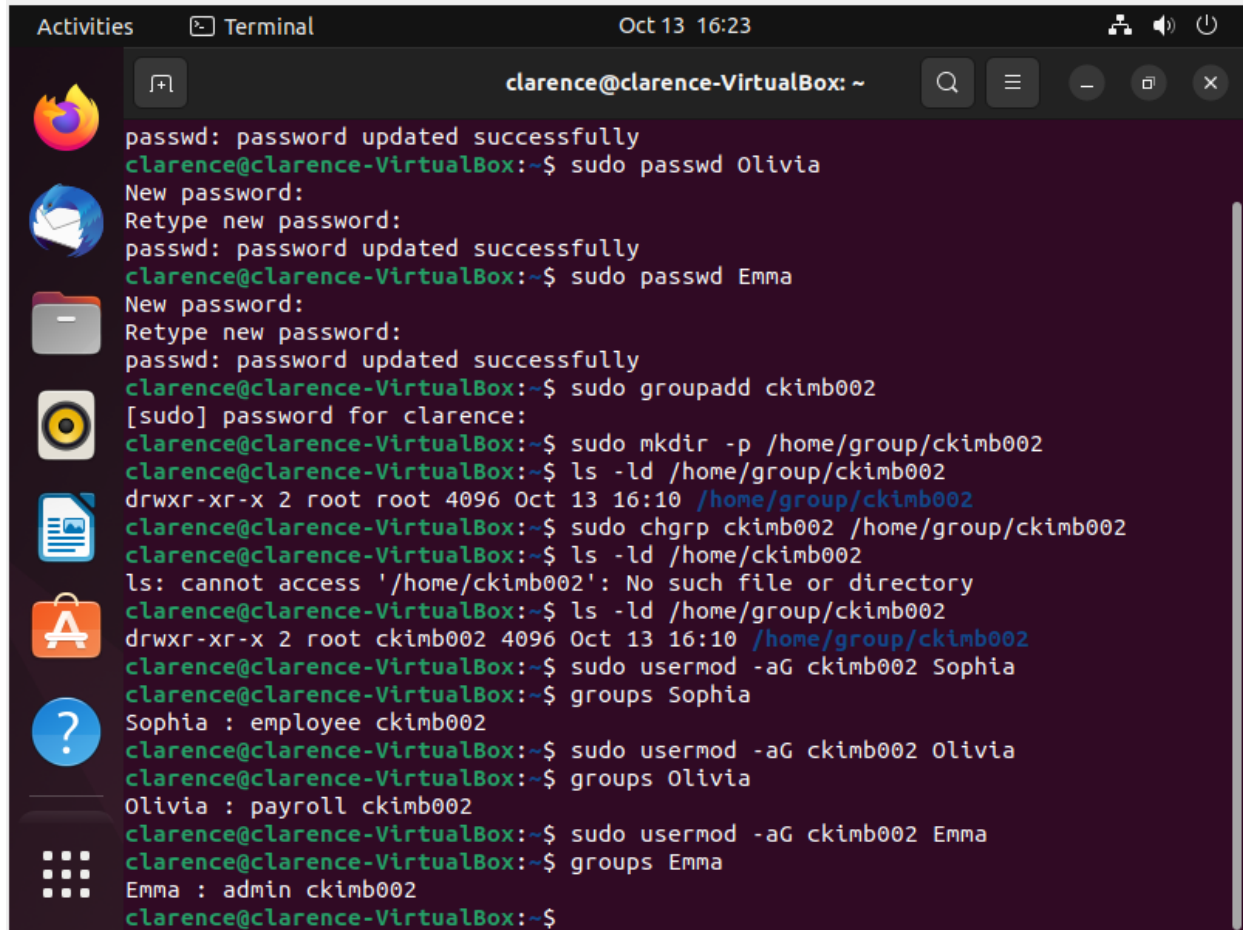
3.



A terminal window titled "clarence@clarence-VirtualBox: ~" with a search bar and window controls. The terminal shows the creation of a group 'ckimb002', a directory '/home/group/ckimb002', and the assignment of permissions and ownership. The prompt is 'clarence@clarence-VirtualBox:~\$'.

```
clarence@clarence-VirtualBox:~$ sudo passwd Sophia
New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo passwd Olivia
New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo passwd Emma
New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo groupadd ckimb002
[sudo] password for clarence:
clarence@clarence-VirtualBox:~$ sudo mkdir -p /home/group/ckimb002
clarence@clarence-VirtualBox:~$ ls -ld /home/group/ckimb002
drwxr-xr-x 2 root root 4096 Oct 13 16:10 /home/group/ckimb002
clarence@clarence-VirtualBox:~$ sudo chgrp ckimb002 /home/group/ckimb002
clarence@clarence-VirtualBox:~$ ls -ld /home/ckimb002
ls: cannot access '/home/ckimb002': No such file or directory
clarence@clarence-VirtualBox:~$ ls -ld /home/group/ckimb002
drwxr-xr-x 2 root ckimb002 4096 Oct 13 16:10 /home/group/ckimb002
clarence@clarence-VirtualBox:~$
```

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A terminal window titled "clarence@clarence-VirtualBox: ~" with a search bar and window controls. The terminal shows a series of commands and their outputs for setting up a group and users. The background is dark purple with green and white text. On the left side of the terminal, there is a vertical sidebar with icons for various applications: Firefox, Mail, Files, Music, Documents, and a question mark icon.

```
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo passwd Olivia
New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo passwd Emma
New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo groupadd ckimb002
[sudo] password for clarence:
clarence@clarence-VirtualBox:~$ sudo mkdir -p /home/group/ckimb002
clarence@clarence-VirtualBox:~$ ls -ld /home/group/ckimb002
drwxr-xr-x 2 root root 4096 Oct 13 16:10 /home/group/ckimb002
clarence@clarence-VirtualBox:~$ sudo chgrp ckimb002 /home/group/ckimb002
clarence@clarence-VirtualBox:~$ ls -ld /home/ckimb002
ls: cannot access '/home/ckimb002': No such file or directory
clarence@clarence-VirtualBox:~$ ls -ld /home/group/ckimb002
drwxr-xr-x 2 root ckimb002 4096 Oct 13 16:10 /home/group/ckimb002
clarence@clarence-VirtualBox:~$ sudo usermod -aG ckimb002 Sophia
clarence@clarence-VirtualBox:~$ groups Sophia
Sophia : employee ckimb002
clarence@clarence-VirtualBox:~$ sudo usermod -aG ckimb002 Olivia
clarence@clarence-VirtualBox:~$ groups Olivia
Olivia : payroll ckimb002
clarence@clarence-VirtualBox:~$ sudo usermod -aG ckimb002 Emma
clarence@clarence-VirtualBox:~$ groups Emma
Emma : admin ckimb002
clarence@clarence-VirtualBox:~$
```

```
Activities Terminal Oct 13 17:08
clarence@clarence-VirtualBox: ~

New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo passwd Emma
New password:
Retype new password:
passwd: password updated successfully
clarence@clarence-VirtualBox:~$ sudo groupadd ckimb002
[sudo] password for clarence:
clarence@clarence-VirtualBox:~$ sudo mkdir -p /home/group/ckimb002
clarence@clarence-VirtualBox:~$ ls -ld /home/group/ckimb002
drwxr-xr-x 2 root root 4096 Oct 13 16:10 /home/group/ckimb002
clarence@clarence-VirtualBox:~$ sudo chgrp ckimb002 /home/group/ckimb002
clarence@clarence-VirtualBox:~$ ls -ld /home/ckimb002
ls: cannot access '/home/ckimb002': No such file or directory
clarence@clarence-VirtualBox:~$ ls -ld /home/group/ckimb002
drwxr-xr-x 2 root ckimb002 4096 Oct 13 16:10 /home/group/ckimb002
clarence@clarence-VirtualBox:~$ sudo usermod -aG ckimb002 Sophia
clarence@clarence-VirtualBox:~$ groups Sophia
Sophia : employee ckimb002
clarence@clarence-VirtualBox:~$ sudo usermod -aG ckimb002 Olivia
clarence@clarence-VirtualBox:~$ groups Olivia
Olivia : payroll ckimb002
clarence@clarence-VirtualBox:~$ sudo usermod -aG ckimb002 Emma
clarence@clarence-VirtualBox:~$ groups Emma
Emma : admin ckimb002
clarence@clarence-VirtualBox:~$ sudo chmod 770 /home/group/ckimb002
[sudo] password for clarence:
clarence@clarence-VirtualBox:~$
```

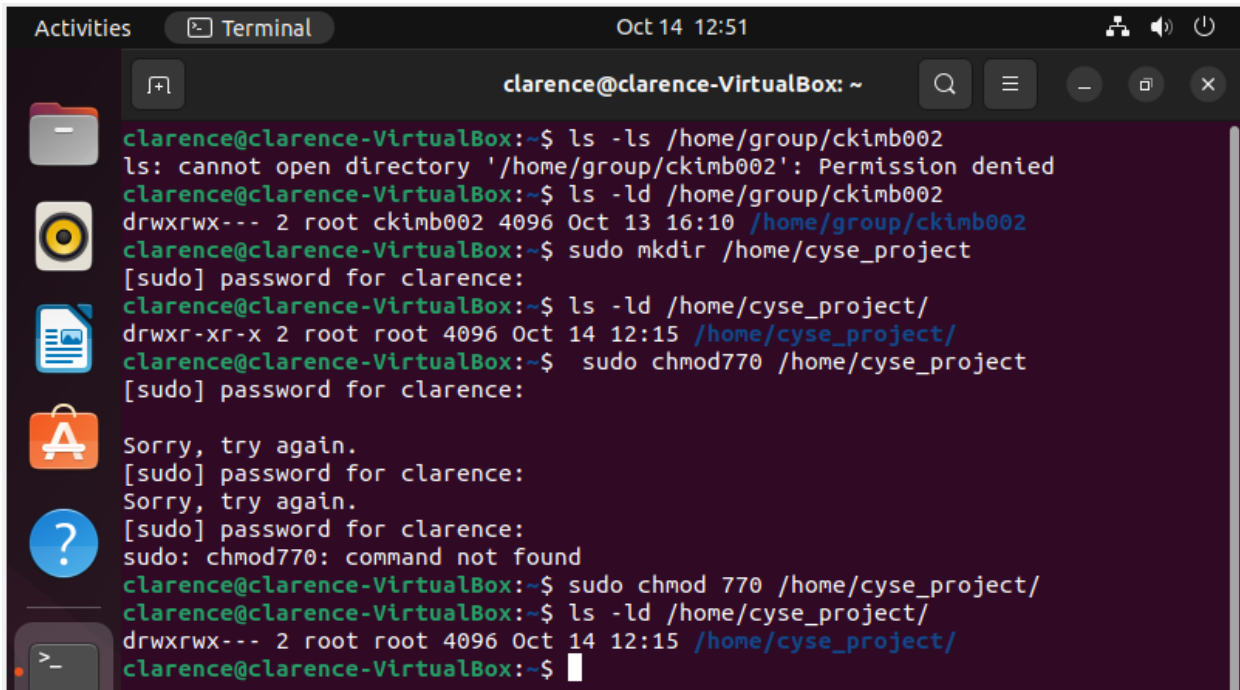
```
Activities Terminal Oct 14 12:29
clarence@clarence-VirtualBox: ~

clarence@clarence-VirtualBox:~$ ls -ls /home/group/ckimb002
ls: cannot open directory '/home/group/ckimb002': Permission denied
clarence@clarence-VirtualBox:~$ ls -ld /home/group/ckimb002
drwxrwx--- 2 root ckimb002 4096 Oct 13 16:10 /home/group/ckimb002
clarence@clarence-VirtualBox:~$ sudo mkdir /home/cyse_project
[sudo] password for clarence:
clarence@clarence-VirtualBox:~$
```

```
Activities Terminal Oct 14 13:37
clarence@clarence-VirtualBox: ~

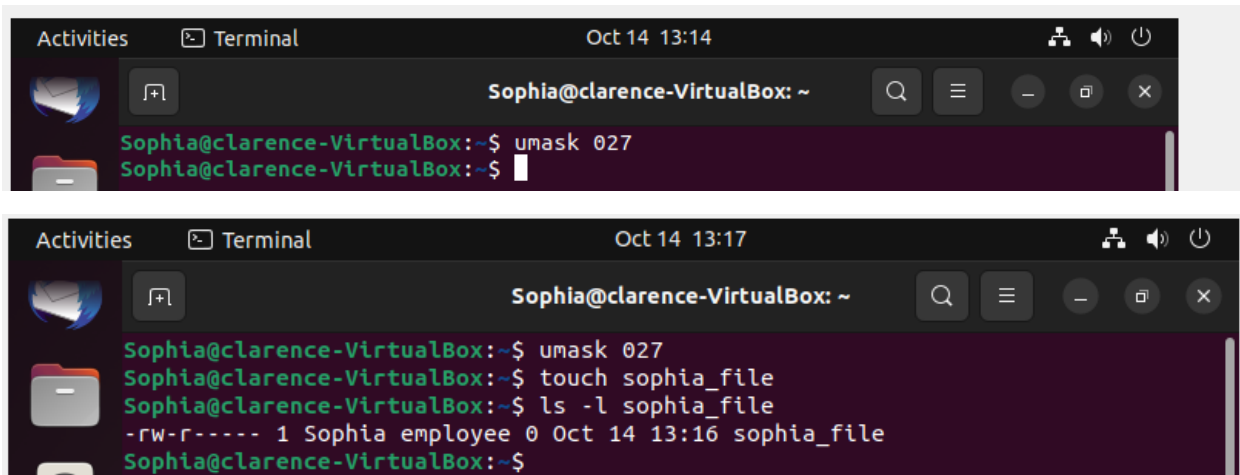
clarence@clarence-VirtualBox:~$ sudo chgrp ckimb002 /home/cyse_project
[sudo] password for clarence:
clarence@clarence-VirtualBox:~$ ls -ld /home/cyse_project
drwxrwx--- 2 root ckimb002 4096 Oct 14 12:15 /home/cyse_project
clarence@clarence-VirtualBox:~$
```

5.



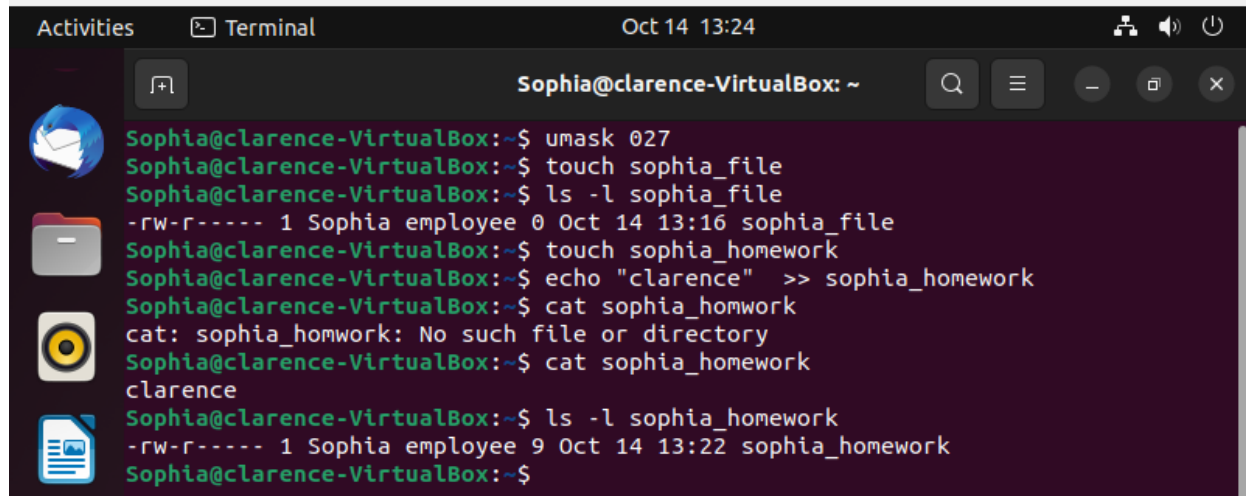
```
clarence@clarence-VirtualBox: ~  
clarence@clarence-VirtualBox:~$ ls -ls /home/group/ckimb002  
ls: cannot open directory '/home/group/ckimb002': Permission denied  
clarence@clarence-VirtualBox:~$ ls -ld /home/group/ckimb002  
drwxrwx--- 2 root ckimb002 4096 Oct 13 16:10 /home/group/ckimb002  
clarence@clarence-VirtualBox:~$ sudo mkdir /home/cyse_project  
[sudo] password for clarence:  
clarence@clarence-VirtualBox:~$ ls -ld /home/cyse_project/  
drwxr-xr-x 2 root root 4096 Oct 14 12:15 /home/cyse_project/  
clarence@clarence-VirtualBox:~$ sudo chmod770 /home/cyse_project  
[sudo] password for clarence:  
Sorry, try again.  
[sudo] password for clarence:  
Sorry, try again.  
[sudo] password for clarence:  
sudo: chmod770: command not found  
clarence@clarence-VirtualBox:~$ sudo chmod 770 /home/cyse_project/  
clarence@clarence-VirtualBox:~$ ls -ld /home/cyse_project/  
drwxrwx--- 2 root root 4096 Oct 14 12:15 /home/cyse_project/  
clarence@clarence-VirtualBox:~$
```

6.



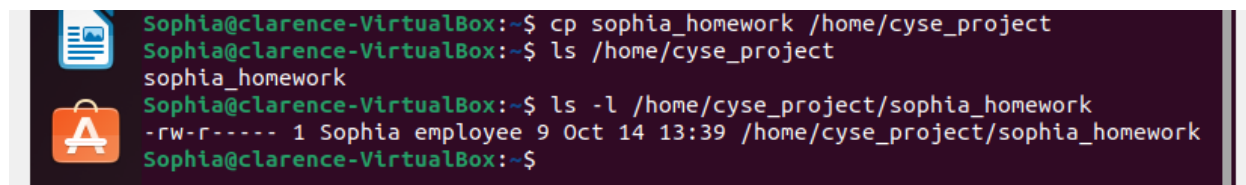
```
Sophia@clarence-VirtualBox: ~  
Sophia@clarence-VirtualBox:~$ umask 027  
Sophia@clarence-VirtualBox:~$  
  
Sophia@clarence-VirtualBox:~$ umask 027  
Sophia@clarence-VirtualBox:~$ touch sophia_file  
Sophia@clarence-VirtualBox:~$ ls -l sophia_file  
-rw-r----- 1 Sophia employee 0 Oct 14 13:16 sophia_file  
Sophia@clarence-VirtualBox:~$
```

7.



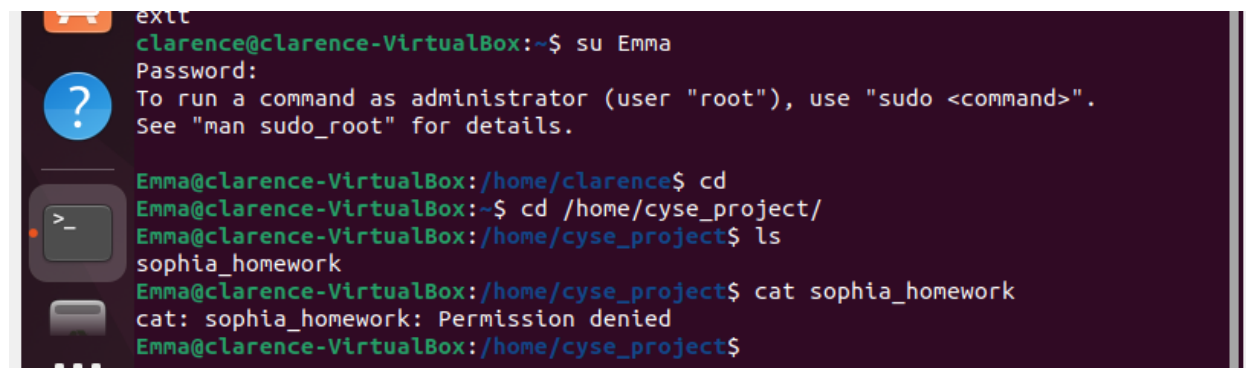
```
Sophia@clarence-VirtualBox: ~  
Sophia@clarence-VirtualBox:~$ umask 027  
Sophia@clarence-VirtualBox:~$ touch sophia_file  
Sophia@clarence-VirtualBox:~$ ls -l sophia_file  
-rw-r----- 1 Sophia employee 0 Oct 14 13:16 sophia_file  
Sophia@clarence-VirtualBox:~$ touch sophia_homework  
Sophia@clarence-VirtualBox:~$ echo "clarence" >> sophia_homework  
Sophia@clarence-VirtualBox:~$ cat sophia_homework  
cat: sophia_homework: No such file or directory  
Sophia@clarence-VirtualBox:~$ cat sophia_homework  
clarence  
Sophia@clarence-VirtualBox:~$ ls -l sophia_homework  
-rw-r----- 1 Sophia employee 9 Oct 14 13:22 sophia_homework  
Sophia@clarence-VirtualBox:~$
```

8.



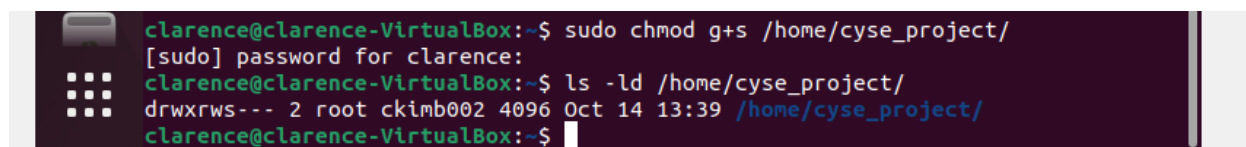
```
Sophia@clarence-VirtualBox:~$ cp sophia_homework /home/cyse_project  
Sophia@clarence-VirtualBox:~$ ls /home/cyse_project  
sophia_homework  
Sophia@clarence-VirtualBox:~$ ls -l /home/cyse_project/sophia_homework  
-rw-r----- 1 Sophia employee 9 Oct 14 13:39 /home/cyse_project/sophia_homework  
Sophia@clarence-VirtualBox:~$
```

9.



```
exit  
clarence@clarence-VirtualBox:~$ su Emma  
Password:  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
Emma@clarence-VirtualBox:/home/clarence$ cd  
Emma@clarence-VirtualBox:~$ cd /home/cyse_project/  
Emma@clarence-VirtualBox:/home/cyse_project$ ls  
sophia_homework  
Emma@clarence-VirtualBox:/home/cyse_project$ cat sophia_homework  
cat: sophia_homework: Permission denied  
Emma@clarence-VirtualBox:/home/cyse_project$
```

Task B Step 1



```
clarence@clarence-VirtualBox:~$ sudo chmod g+s /home/cyse_project/  
[sudo] password for clarence:  
clarence@clarence-VirtualBox:~$ ls -ld /home/cyse_project/  
drwxrws--- 2 root ckimb002 4096 Oct 14 13:39 /home/cyse_project/  
clarence@clarence-VirtualBox:~$
```

Step 2

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```
clarence@clarence-VirtualBox:~$ su Sophia
Password:
Sophia@clarence-VirtualBox:/home/clarence$ cd
Sophia@clarence-VirtualBox:~$ touch sophia_homework2
Sophia@clarence-VirtualBox:~$ ls -l sophia_homework2
-rw-r--r-- 1 Sophia employee 0 Oct 14 14:24 sophia_homework2
Sophia@clarence-VirtualBox:~$ cp homework2 /home/cyse_project/
cp: cannot stat 'homework2': No such file or directory
Sophia@clarence-VirtualBox:~$ cp sophia_homework2 /home/cyse_project/
Sophia@clarence-VirtualBox:~$ echo "new homework with permissions" >> sophia_ho
mework2
Sophia@clarence-VirtualBox:~$ cat sophia_homework2
new homework with permissions
Sophia@clarence-VirtualBox:~$
```

Step 3

```
Activities Terminal Oct 14 15:12
Emma@clarence-VirtualBox: /home/cyse_project

clarence@clarence-VirtualBox:~$ su Emma
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

Emma@clarence-VirtualBox:/home/clarence$ cd
Emma@clarence-VirtualBox:~$ cd /home/cyse_project/
Emma@clarence-VirtualBox:/home/cyse_project$ ls -l
total 4
-rw-r----- 1 Sophia employee 9 Oct 14 13:39 sophia_homework
-rw-r--r-- 1 Sophia ckimb002 0 Oct 14 14:28 sophia_homework2
Emma@clarence-VirtualBox:/home/cyse_project$ cat sophia_homework2
Emma@clarence-VirtualBox:/home/cyse_project$ cat sophia_homework
cat: sophia_homework: Permission denied
Emma@clarence-VirtualBox:/home/cyse_project$
```

Task C Step 1

```
Emma@clarence-VirtualBox:/home/cyse_project$ exit
exit
clarence@clarence-VirtualBox:~$ sudo chmod g-s /home/cyse_project/
[sudo] password for clarence:
clarence@clarence-VirtualBox:~$ ls -ld /home/cyse_project/
drwxrwx--- 2 root ckimb002 4096 Oct 14 14:28 /home/cyse_project/
clarence@clarence-VirtualBox:~$
```

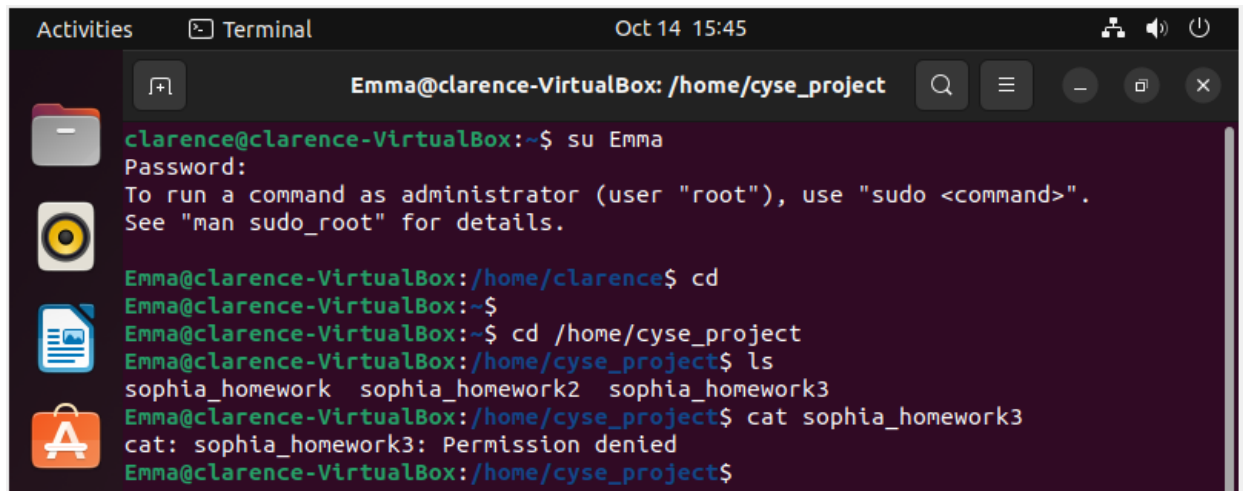
Step 2

```
clarence@clarence-VirtualBox:~$ su Sophia
Password:
Sophia@clarence-VirtualBox:/home/clarence$ cd
Sophia@clarence-VirtualBox:~$ cd /home/cyse_project/
Sophia@clarence-VirtualBox:/home/cyse_project$ cp sophia_homework sophia_homewo
rk3
Sophia@clarence-VirtualBox:/home/cyse_project$ ls
sophia_homework sophia_homework2 sophia_homework3
Sophia@clarence-VirtualBox:/home/cyse_project$
```

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Step 3



The image shows a terminal window titled "Emma@clarence-VirtualBox: /home/cyse_project". The window has a dark background with light-colored text. On the left side, there is a vertical sidebar with icons for a file manager, a terminal, a document, and an application store. The terminal content shows the following sequence of commands and output:

```
clarence@clarence-VirtualBox:~$ su Emma
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

Emma@clarence-VirtualBox:/home/clarence$ cd
Emma@clarence-VirtualBox:~$
Emma@clarence-VirtualBox:~$ cd /home/cyse_project
Emma@clarence-VirtualBox:/home/cyse_project$ ls
sophia_homework sophia_homework2 sophia_homework3
Emma@clarence-VirtualBox:/home/cyse_project$ cat sophia_homework3
cat: sophia_homework3: Permission denied
Emma@clarence-VirtualBox:/home/cyse_project$
```