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VM 1: 172.16.50.28

VM 2: 172.16.50.19

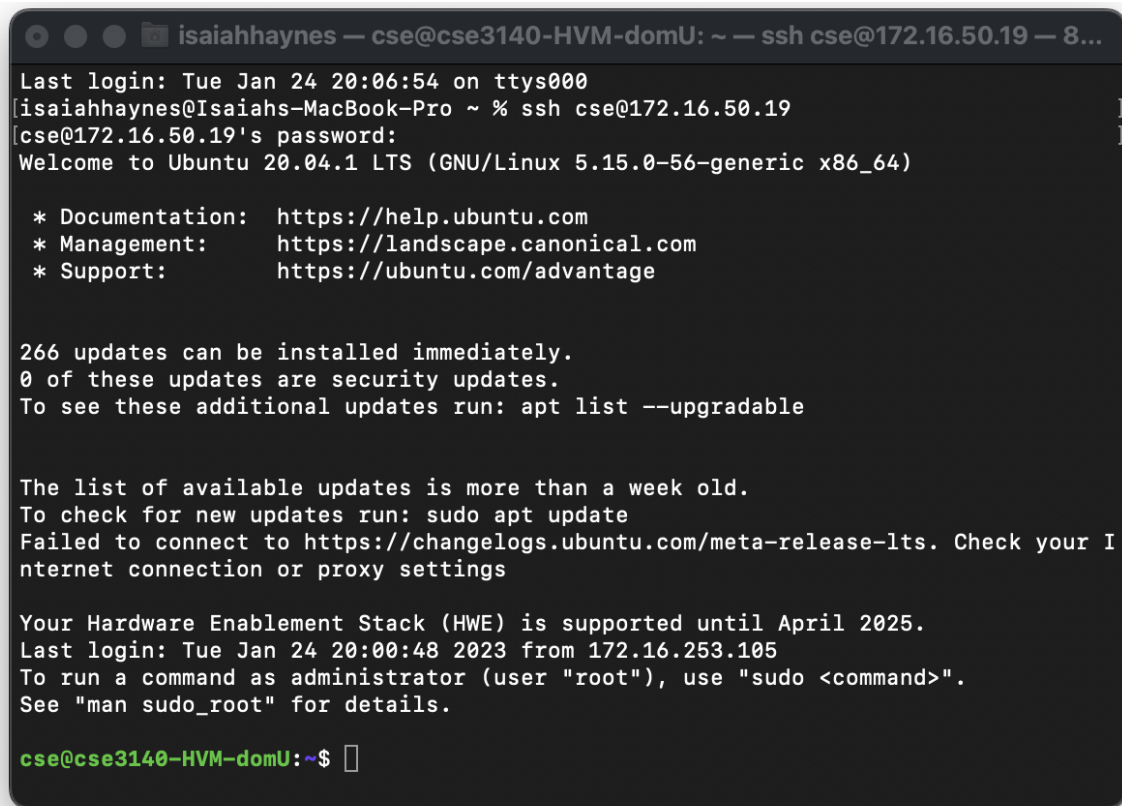
Lab Section 001

SSH Login Challenge

Lab 0 involved learning the proper use of various commands in a virtual machine's (VM) terminal. The first step involved connecting to the VM which can be accomplished by typing "ssh cse@iPaddress" in the terminal. The next commands used were *pwd* to show the current directory, *ls* to list the files in the directory, and *cd* to go to a specific directory. Screenshots of and explanations of the various other commands are included in the results section of this report.

Results:

The below picture shows how ssh can be used to login to a remote virtual machine (VM).



```
isaiahhaynes — cse@cse3140-HVM-domU: ~ — ssh cse@172.16.50.19 — 8...
Last login: Tue Jan 24 20:06:54 on ttys000
[isaiahhaynes@Isaiahs-MacBook-Pro ~ % ssh cse@172.16.50.19
[cse@172.16.50.19's password:
Welcome to Ubuntu 20.04.1 LTS (GNU/Linux 5.15.0-56-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

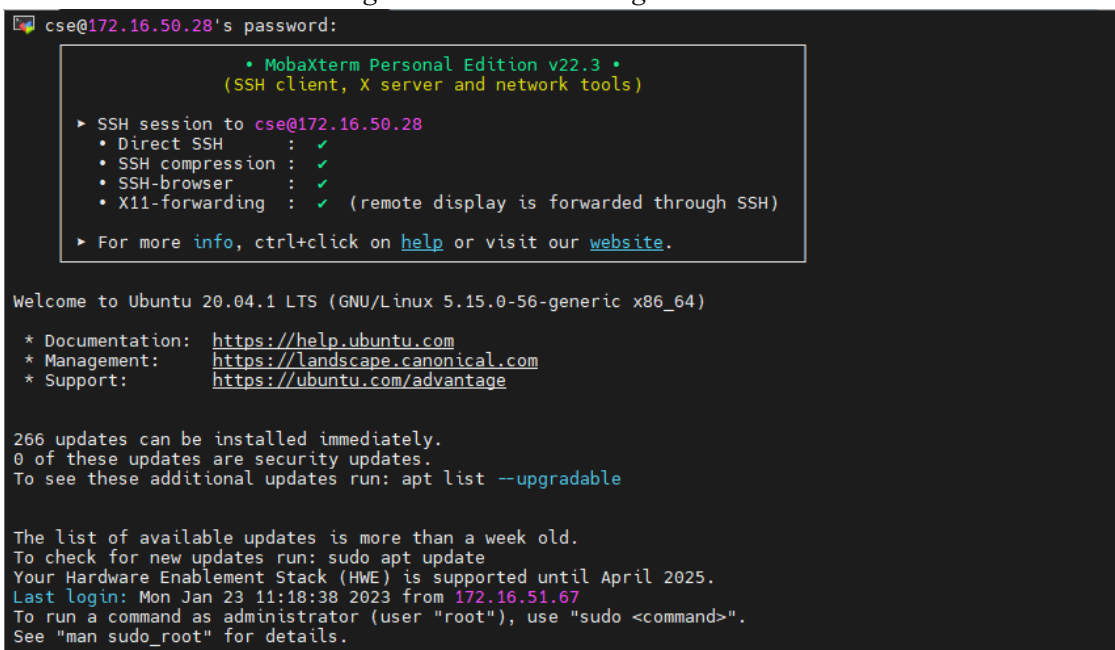
266 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

The list of available updates is more than a week old.
To check for new updates run: sudo apt update
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your I
nternet connection or proxy settings

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Tue Jan 24 20:00:48 2023 from 172.16.253.105
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

cse@cse3140-HVM-domU:~$
```

Image 1.1: how to ssh using 172.16.50.19



```
cse@172.16.50.28's password:
• MobaXterm Personal Edition v22.3 •
  (SSH client, X server and network tools)

► SSH session to cse@172.16.50.28
• Direct SSH : ✓
• SSH compression : ✓
• SSH-browser : ✓
• X11-forwarding : ✓ (remote display is forwarded through SSH)

► For more info, ctrl+click on help or visit our website.

Welcome to Ubuntu 20.04.1 LTS (GNU/Linux 5.15.0-56-generic x86_64)

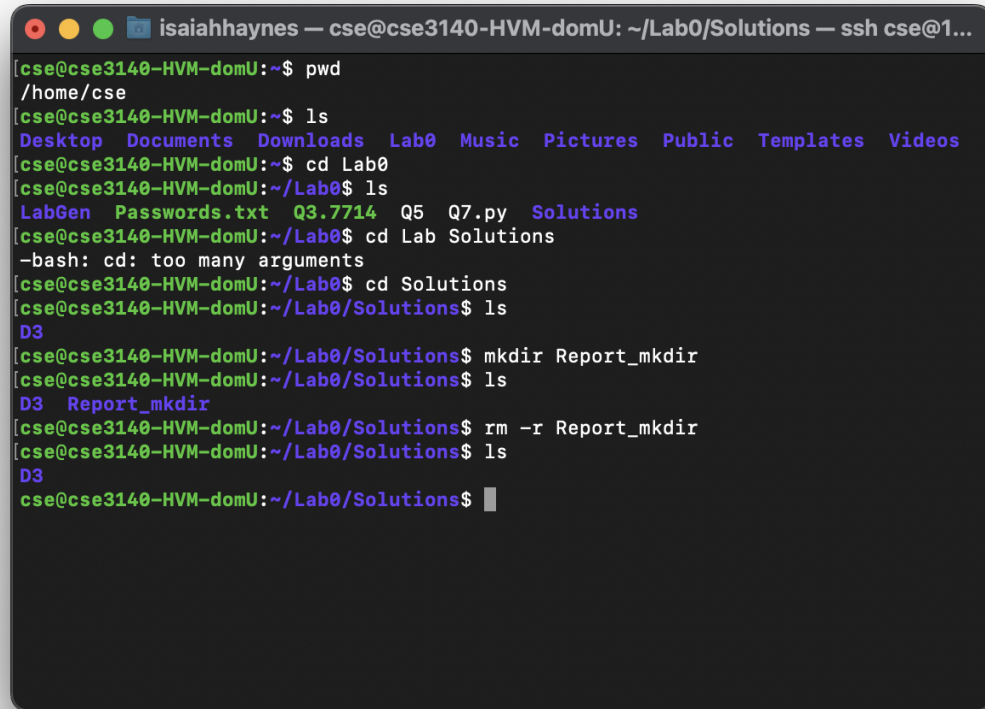
 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

266 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

The list of available updates is more than a week old.
To check for new updates run: sudo apt update
Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Mon Jan 23 11:18:38 2023 from 172.16.51.67
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
```

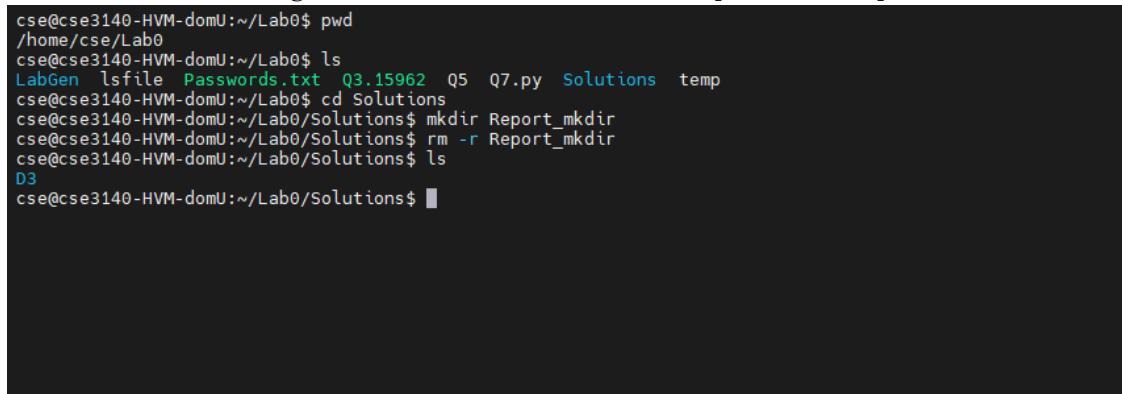
Image 1.2: how to ssh using 172.16.50.28

This next screenshot shows (from top to bottom) the uses of *pwd*, *ls*, *cd*, *mkdir*, and *rm*. “*pwd*” is used to show the directory that the VM is currently in, *ls* shows the files in the current directory, *cd Lab0* is used to go to the Lab0 directory, *mkdir Report* *mkdir* makes a directory titled “Report_mkdir”, and *rm* removes a file. In the screenshot shown, the option *-r* is included to remove the directory “Report_mkdir”.



```
isaiahhaynes — cse@cse3140-HVM-domU: ~/Lab0/Solutions — ssh cse@1...
[cse@cse3140-HVM-domU:~$ pwd
/home/cse
[cse@cse3140-HVM-domU:~$ ls
Desktop  Documents  Downloads  Lab0  Music  Pictures  Public  Templates  Videos
[cse@cse3140-HVM-domU:~$ cd Lab0
[cse@cse3140-HVM-domU:~/Lab0$ ls
LabGen  Passwords.txt  Q3.7714  Q5  Q7.py  Solutions
[cse@cse3140-HVM-domU:~/Lab0$ cd Lab Solutions
-bash: cd: too many arguments
[cse@cse3140-HVM-domU:~/Lab0$ cd Solutions
[cse@cse3140-HVM-domU:~/Lab0/Solutions$ ls
D3
[cse@cse3140-HVM-domU:~/Lab0/Solutions$ mkdir Report_mkdir
[cse@cse3140-HVM-domU:~/Lab0/Solutions$ ls
D3  Report_mkdir
[cse@cse3140-HVM-domU:~/Lab0/Solutions$ rm -r Report_mkdir
[cse@cse3140-HVM-domU:~/Lab0/Solutions$ ls
D3
cse@cse3140-HVM-domU:~/Lab0/Solutions$
```

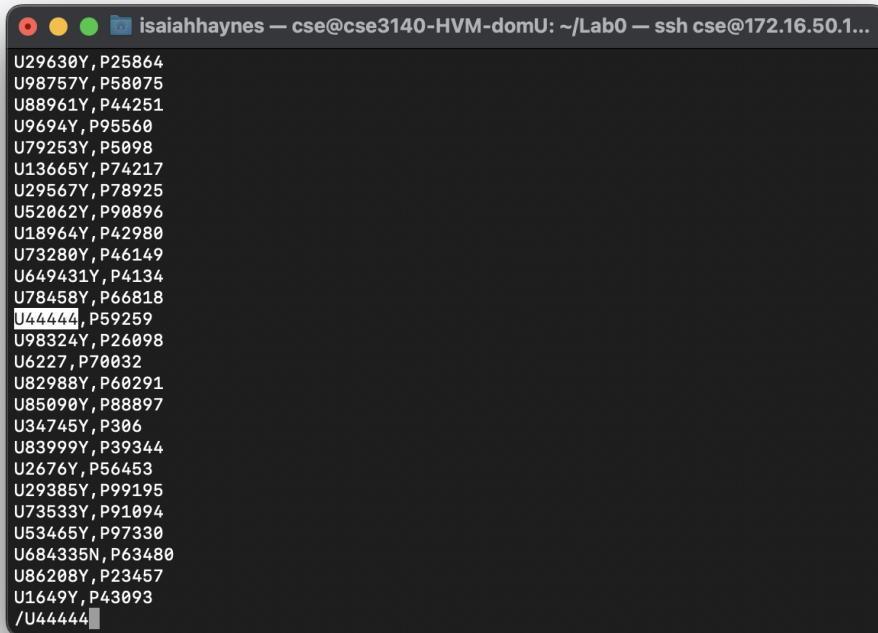
Image 2.1: various terminal commands [172.16.50.19]



```
cse@cse3140-HVM-domU:~/Lab0$ pwd
/home/cse/Lab0
cse@cse3140-HVM-domU:~/Lab0$ ls
LabGen  lsfile  Passwords.txt  Q3.15962  Q5  Q7.py  Solutions  temp
cse@cse3140-HVM-domU:~/Lab0$ cd Solutions
cse@cse3140-HVM-domU:~/Lab0/Solutions$ mkdir Report_mkdir
cse@cse3140-HVM-domU:~/Lab0/Solutions$ rm -r Report_mkdir
cse@cse3140-HVM-domU:~/Lab0/Solutions$ ls
D3
cse@cse3140-HVM-domU:~/Lab0/Solutions$
```

Image 2.2: various terminal commands [172.16.50.28]

The next screenshot shows how to find a specific string using the search function in the vim text editor.



A terminal window with a dark background. The title bar shows 'isaiahhaynes — cse@cse3140-HVM-domU: ~/Lab0 — ssh cse@172.16.50.1...'. The terminal displays a list of strings, each on a new line. The strings are: U29630Y, P25864; U98757Y, P58075; U88961Y, P44251; U9694Y, P95560; U79253Y, P5098; U13665Y, P74217; U29567Y, P78925; U52062Y, P90896; U18964Y, P42980; U73280Y, P46149; U649431Y, P4134; U78458Y, P66818; U44444, P59259; U98324Y, P26098; U6227, P70032; U82988Y, P60291; U85090Y, P88897; U34745Y, P306; U83999Y, P39344; U2676Y, P56453; U29385Y, P99195; U73533Y, P91094; U53465Y, P97330; U684335N, P63480; U86208Y, P23457; U1649Y, P43093; and /U44444. The cursor is at the end of the last line.

```
U29630Y, P25864
U98757Y, P58075
U88961Y, P44251
U9694Y, P95560
U79253Y, P5098
U13665Y, P74217
U29567Y, P78925
U52062Y, P90896
U18964Y, P42980
U73280Y, P46149
U649431Y, P4134
U78458Y, P66818
U44444, P59259
U98324Y, P26098
U6227, P70032
U82988Y, P60291
U85090Y, P88897
U34745Y, P306
U83999Y, P39344
U2676Y, P56453
U29385Y, P99195
U73533Y, P91094
U53465Y, P97330
U684335N, P63480
U86208Y, P23457
U1649Y, P43093
/U44444
```

Image 3.1: search using vim [172.16.50.19]

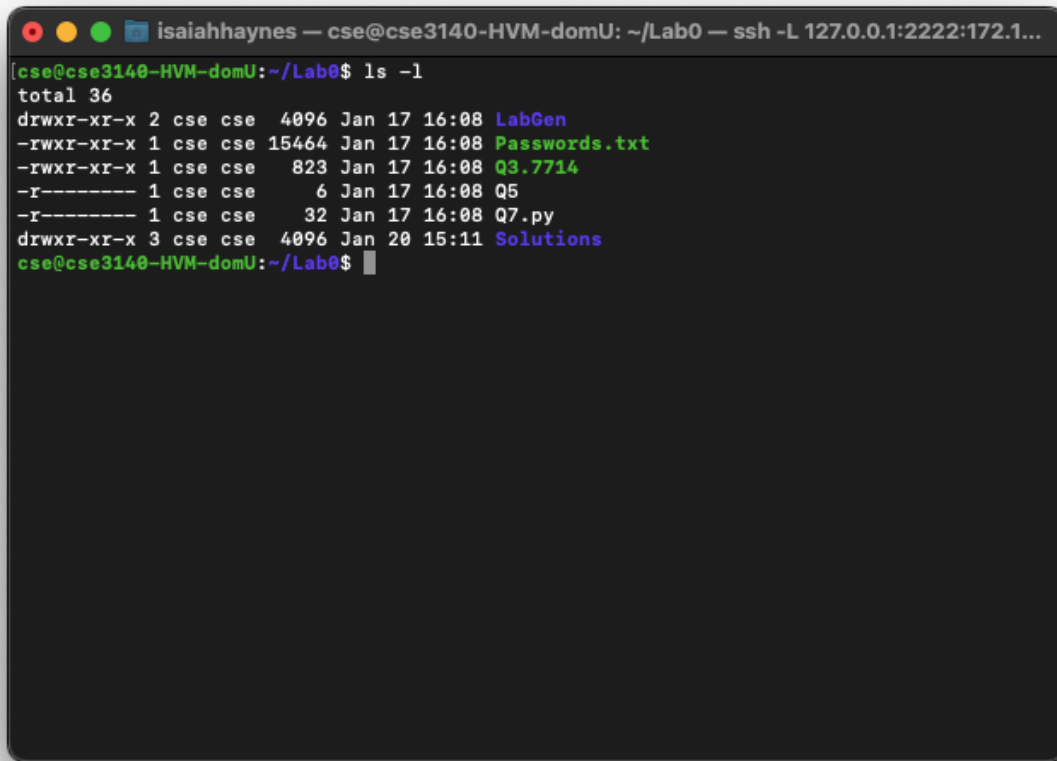


A terminal window with a dark background. The terminal displays a list of strings, each on a new line. The strings are: U36521Y, P90187; U86026Y, P22703; U20350Y, P76235; U85444Y, P65722; U49929Y, P43322; U9287Y, P21720; U87463Y, P88304; U50109Y, P55721; U30897Y, P40681; U32084Y, P70116; U14180Y, P86938; U65789, P50100; U38827Y, P86907; U58399Y, P25533; U30363Y, P50650; U31895Y, P5073; U21070Y, P16912; U26376Y, P39375; U44444, P79633; U98459Y, P42486; U64683, P20894; U37419Y, P79494; U21442Y, P72117; U22027Y, P48258; U97218Y, P20387; U33479Y, P14380; U98167Y, P31096; U20432Y, P70011; U84927Y, P18325; U8452Y, P19931; U31143Y, P63961; U282Y, P10662; U19204Y, P46502; U23295Y, P3738; U43703Y, P36257; U58586Y, P56937; U17444Y, P1881; and /U44444. The cursor is at the end of the last line.

```
U36521Y, P90187
U86026Y, P22703
U20350Y, P76235
U85444Y, P65722
U49929Y, P43322
U9287Y, P21720
U87463Y, P88304
U50109Y, P55721
U30897Y, P40681
U32084Y, P70116
U14180Y, P86938
U65789, P50100
U38827Y, P86907
U58399Y, P25533
U30363Y, P50650
U31895Y, P5073
U21070Y, P16912
U26376Y, P39375
U44444, P79633
U98459Y, P42486
U64683, P20894
U37419Y, P79494
U21442Y, P72117
U22027Y, P48258
U97218Y, P20387
U33479Y, P14380
U98167Y, P31096
U20432Y, P70011
U84927Y, P18325
U8452Y, P19931
U31143Y, P63961
U282Y, P10662
U19204Y, P46502
U23295Y, P3738
U43703Y, P36257
U58586Y, P56937
U17444Y, P1881
/U44444
```

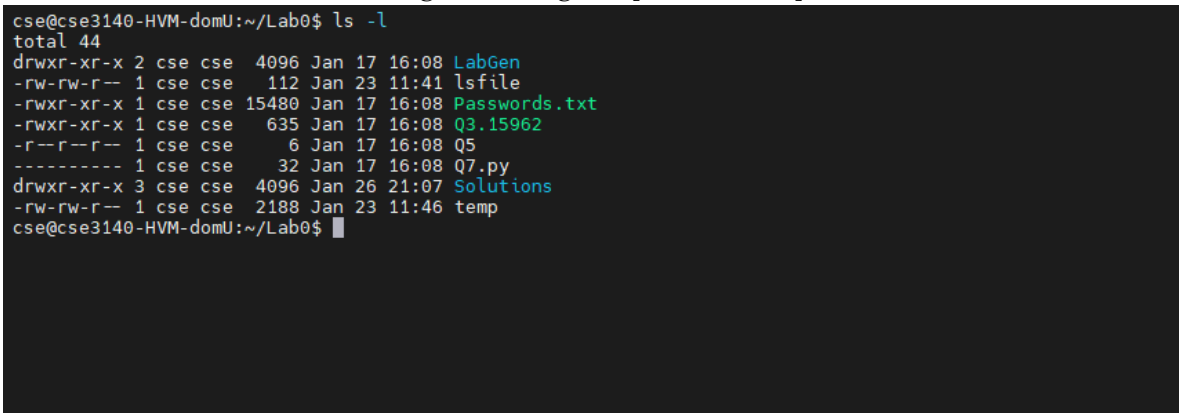
Image 3.2: search using vim [172.16.50.28]

Image 4 shows how different options can change the use of a command. In this case adding `-l` to the `ls` command lists the permissions and attributes of each file or directory.



```
cse@cse3140-HVM-domU:~/Lab0$ ls -l
total 36
drwxr-xr-x 2 cse cse 4096 Jan 17 16:08 LabGen
-rwxr-xr-x 1 cse cse 15464 Jan 17 16:08 Passwords.txt
-rwxr-xr-x 1 cse cse 823 Jan 17 16:08 Q3.7714
-r----- 1 cse cse 6 Jan 17 16:08 Q5
-r----- 1 cse cse 32 Jan 17 16:08 Q7.py
drwxr-xr-x 3 cse cse 4096 Jan 20 15:11 Solutions
cse@cse3140-HVM-domU:~/Lab0$
```

Image 4.1: using `ls -l` [172.16.50.19]



```
cse@cse3140-HVM-domU:~/Lab0$ ls -l
total 44
drwxr-xr-x 2 cse cse 4096 Jan 17 16:08 LabGen
-rw-rw-r-- 1 cse cse 112 Jan 23 11:41 lsfile
-rwxr-xr-x 1 cse cse 15480 Jan 17 16:08 Passwords.txt
-rwxr-xr-x 1 cse cse 635 Jan 17 16:08 Q3.15962
-r--r--r-- 1 cse cse 6 Jan 17 16:08 Q5
----- 1 cse cse 32 Jan 17 16:08 Q7.py
drwxr-xr-x 3 cse cse 4096 Jan 26 21:07 Solutions
-rw-rw-r-- 1 cse cse 2188 Jan 23 11:46 temp
cse@cse3140-HVM-domU:~/Lab0$
```

Image 4.2: using `ls -l` [172.16.50.28]

The following image shows how the *chmod* command can be used to change the permissions of a file. Notice how when “cat Q5” is used, there is a “permission denied” error; however, after “*chmod u+r Q5*” is used, the output of Q5 is printed to stdout.

```

isaiahhaynes — cse@cse3140-HVM-domU: ~/Lab0 — ssh cse@172.16.50.1...
[cse@cse3140-HVM-domU:~/Lab0$ ls -l
total 36
drwxr-xr-x 2 cse cse 4096 Jan 23 14:33 LabGen
-rwxr-xr-x 1 cse cse 15464 Jan 17 16:08 Passwords.txt
-rwxr-xr-x 1 cse cse 823 Jan 17 16:08 Q3.7714
----- 1 cse cse 6 Jan 17 16:08 Q5
-r----- 1 cse cse 32 Jan 17 16:08 Q7.py
drwxr-xr-x 3 cse cse 4096 Jan 24 20:58 Solutions
[cse@cse3140-HVM-domU:~/Lab0$ cat Q5
cat: Q5: Permission denied
[cse@cse3140-HVM-domU:~/Lab0$ chmod u+r Q5
[cse@cse3140-HVM-domU:~/Lab0$ ls -l
total 36
drwxr-xr-x 2 cse cse 4096 Jan 23 14:33 LabGen
-rwxr-xr-x 1 cse cse 15464 Jan 17 16:08 Passwords.txt
-rwxr-xr-x 1 cse cse 823 Jan 17 16:08 Q3.7714
-r----- 1 cse cse 6 Jan 17 16:08 Q5
-r----- 1 cse cse 32 Jan 17 16:08 Q7.py
drwxr-xr-x 3 cse cse 4096 Jan 24 20:58 Solutions
[cse@cse3140-HVM-domU:~/Lab0$ cat Q5
V38435cse@cse3140-HVM-domU:~/Lab0$

```

Image 5.1: using *chmod* [172.16.50.19]

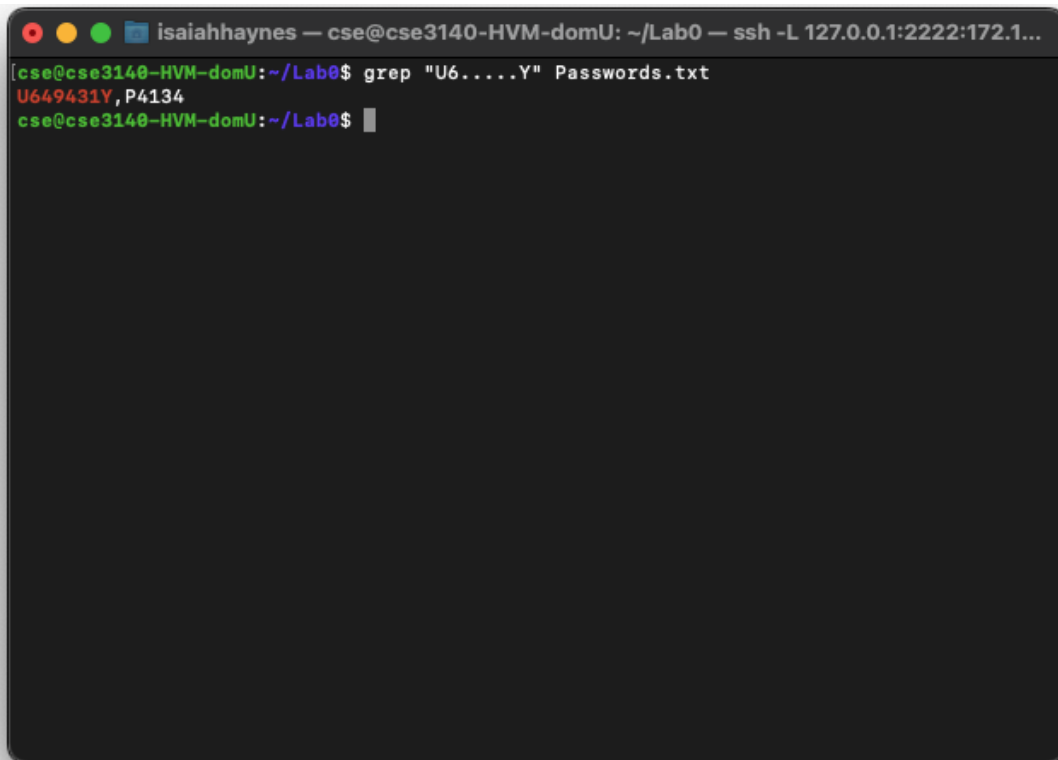
```

cse@cse3140-HVM-domU:~/Lab0$ ls -l
total 44
drwxr-xr-x 2 cse cse 4096 Jan 17 16:08 LabGen
-rw-rw-r-- 1 cse cse 112 Jan 23 11:41 lsfile
-rwxr-xr-x 1 cse cse 15480 Jan 17 16:08 Passwords.txt
-rwxr-xr-x 1 cse cse 635 Jan 17 16:08 Q3.15962
-r--r--r-- 1 cse cse 6 Jan 17 16:08 Q5
----- 1 cse cse 32 Jan 17 16:08 Q7.py
drwxr-xr-x 3 cse cse 4096 Jan 26 21:07 Solutions
-rw-rw-r-- 1 cse cse 2188 Jan 23 11:46 temp
cse@cse3140-HVM-domU:~/Lab0$ chmod u+r Q5
cse@cse3140-HVM-domU:~/Lab0$ ls -l
total 44
drwxr-xr-x 2 cse cse 4096 Jan 17 16:08 LabGen
-rw-rw-r-- 1 cse cse 112 Jan 23 11:41 lsfile
-rwxr-xr-x 1 cse cse 15480 Jan 17 16:08 Passwords.txt
-rwxr-xr-x 1 cse cse 635 Jan 17 16:08 Q3.15962
-r--r--r-- 1 cse cse 6 Jan 17 16:08 Q5
----- 1 cse cse 32 Jan 17 16:08 Q7.py
drwxr-xr-x 3 cse cse 4096 Jan 26 21:07 Solutions
-rw-rw-r-- 1 cse cse 2188 Jan 23 11:46 temp
cse@cse3140-HVM-domU:~/Lab0$

```

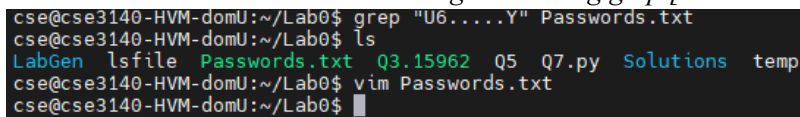
Image 5.2: using *chmod* [172.16.50.28]

The next image shows how the *grep* command can be used to search a large file for a specific sequence of characters.

A terminal window with a dark background. The title bar shows 'isaiahhaynes — cse@cse3140-HVM-domU: ~/Lab0 — ssh -L 127.0.0.1:2222:172.1...'. The prompt is '[cse@cse3140-HVM-domU:~/Lab0\$]'. The command 'grep "U6....Y" Passwords.txt' has been entered. The output is 'U649431Y,P4134'. The prompt is now 'cse@cse3140-HVM-domU:~/Lab0\$' with a cursor.

```
isaiahhaynes — cse@cse3140-HVM-domU: ~/Lab0 — ssh -L 127.0.0.1:2222:172.1...
[cse@cse3140-HVM-domU:~/Lab0$] grep "U6....Y" Passwords.txt
U649431Y,P4134
cse@cse3140-HVM-domU:~/Lab0$
```

Image 6.1: using grep [172.16.50.19]

A terminal window with a dark background. The prompt is 'cse@cse3140-HVM-domU:~/Lab0\$'. The command 'grep "U6....Y" Passwords.txt' has been entered. The prompt is now 'cse@cse3140-HVM-domU:~/Lab0\$'. Below this, the command 'ls' has been entered, showing the output 'LabGen lsfile Passwords.txt Q3.15962 Q5 Q7.py Solutions temp'. The prompt is now 'cse@cse3140-HVM-domU:~/Lab0\$'. Below this, the command 'vim Passwords.txt' has been entered. The prompt is now 'cse@cse3140-HVM-domU:~/Lab0\$' with a cursor.

```
cse@cse3140-HVM-domU:~/Lab0$ grep "U6....Y" Passwords.txt
cse@cse3140-HVM-domU:~/Lab0$ ls
LabGen lsfile Passwords.txt Q3.15962 Q5 Q7.py Solutions temp
cse@cse3140-HVM-domU:~/Lab0$ vim Passwords.txt
cse@cse3140-HVM-domU:~/Lab0$
```

Image 6.2: The grep command in this file didn't work as intended due to an accidental alteration to the file leading to the deletion of the required "username". It was looked for using both vim and grep and resulted in no found results. [172.16.50.28]

This final image below shows how to run a python program in the terminal.

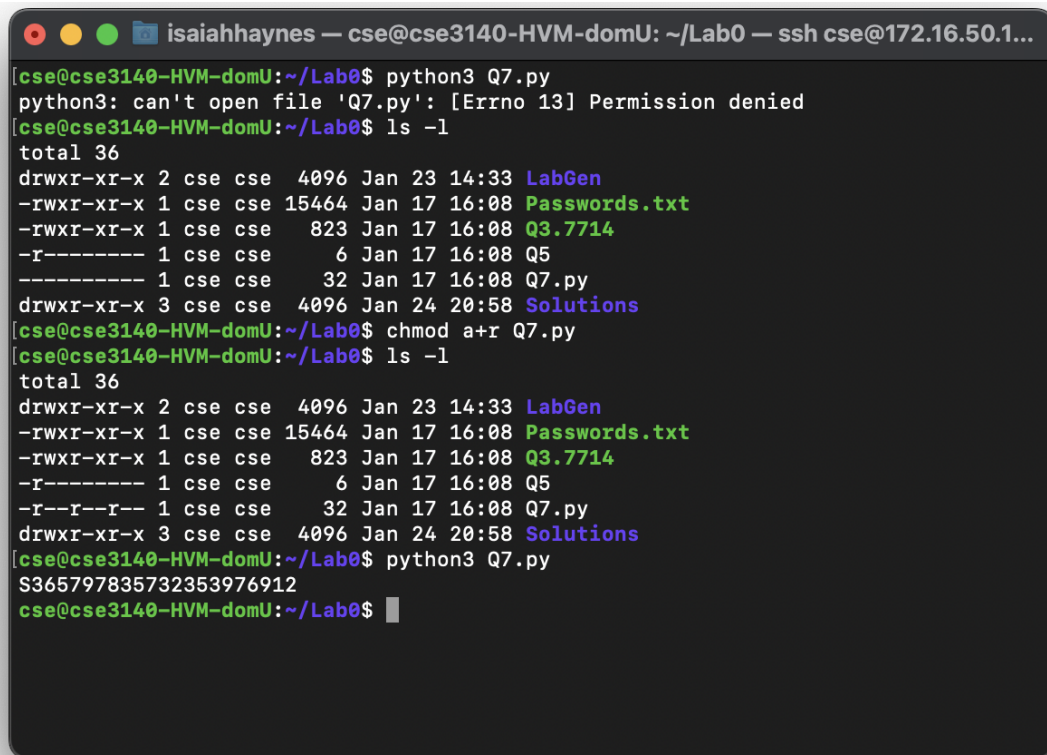
A terminal window with a dark background and light text. The title bar shows 'isaiahhaynes — cse@cse3140-HVM-domU: ~/Lab0 — ssh cse@172.16.50.1...'. The terminal shows the user attempting to run 'python3 Q7.py', receiving a 'Permission denied' error. They then run 'ls -l' to view file permissions. The output shows several files, including 'LabGen', 'Passwords.txt', 'Q3.7714', 'Q5', 'Q7.py', and 'Solutions'. The permissions for 'Q7.py' are shown as '-r-----'. The user then runs 'chmod a+r Q7.py' to change permissions. A second 'ls -l' command shows the permissions for 'Q7.py' updated to '-r--r--r--'. Finally, the user runs 'python3 Q7.py' again, which outputs a long alphanumeric string 'S365797835732353976912'.

Image 7.1: running a python program [172.16.50.19]

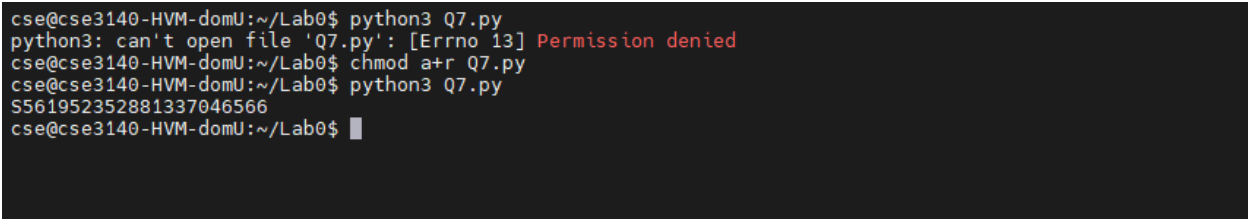
A terminal window with a dark background and light text. The terminal shows the user running 'python3 Q7.py', receiving a 'Permission denied' error. They then run 'chmod a+r Q7.py' to change permissions. Finally, they run 'python3 Q7.py' again, which outputs a long alphanumeric string 'S561952352881337046566'.

Image 7.2: running a python program [172.16.50.28]