

Lab Report 1

Here is how to connect to a course-specific account on ieng6! (Mac only)

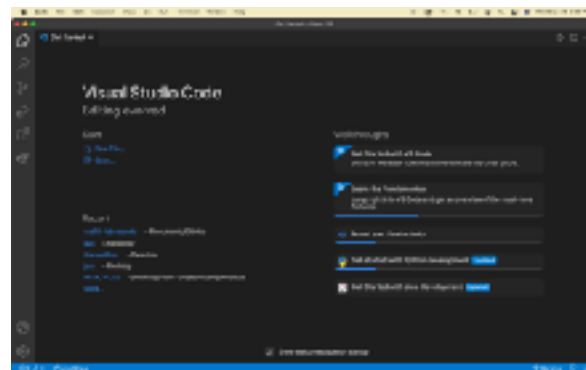
Step 1: Install VSCode

Go to the this link: <https://code.visualstudio.com/>

Press Download

Unzip and Open

It should look like this:



Step 2: Remotely Connecting

In VSCode, open a new terminal by pressing terminal > new terminal

Enter this command with your specific ID:

```
ssh cs15lfa22zz@ieng6.ucsd.edu
```

Enter your password and you should see this.

```
hello cs15lfa22ai, you are currently logged into ieng6-202.ucsd.edu
You are using 0% CPU on this system

Cluster Status
Hostname    Time    #Users  Load Averages
ieng6-201   14:35:01  14  0.62, 0.12, 0.17
ieng6-202   14:35:01  14  0.15, 0.15, 0.11
ieng6-203   14:35:01  13  0.13, 0.00, 0.12

Wed Sep 28, 2022  2:37pm - Prepping cs15lfa22
cs15lfa22@ieng6-202:~$
```

You are now connected!!

Step 3: Trying some commands

Now you can try some commands and see what happens.

Try:

```
ls
cd
ls -lat
ls -a
cp /home/linux/ieng6/cs151fa22/public/hello.txt ~/
And others
```

And see what they do.

```
[cs151fa22a@ieng6-202] ~:R1$ cat /home/linux/ieng6/cs151fa22/public/hello.txt
Hi! Welcome to CSE151 Fall 22
```

Step 4: Moving Files with scp

Now let's move a file from our computer to the remote computer.

First use exit to log out.

Now, create a new java file called WhereAmI.java and copy this code:

```
class WhereAmI {
    public static void main(String[] args) {
        System.out.println(System.getProperty("os.name"));
        System.out.println(System.getProperty("user.name"));
        System.out.println(System.getProperty("user.home"));
        System.out.println(System.getProperty("user.dir"));
    }
}
```

In the terminal run

```
javac WhereAmI.java
Java WhereAmI
```

Take note of the output, it should look like this:

```
MacBook-Pro-83:Class CSE lukegentry$ java WhereAmI
Mac OS X
lukegentry
MacBook-Pro-83:Class CSE lukegentry$ scp WhereAmI.java cs151fa22a@ieng6.ucsd.edu:~/
Password:
WhereAmI.java                               100% 383    84.7KB/s   00:00
MacBook-Pro-83:Class CSE lukegentry$ ssh cs151fa22a@ieng6.ucsd.edu
Password:
Last login: Wed Sep 28 14:36:59 2022 from 69.196.44.132
```

Now let's copy that file to the remote computer.

Copy this command into the terminal:

```
scp WhereAmI.java cs15lfa22zz@ieng6.ucsd.edu: ~/
```

Make sure to change the zz to your id

Enter your password.

If it worked you will see this:

```
MacBook-Pro-83:Class CSE lukegentry$ scp WhereAmI.java cs15lfa22ai@ieng6.ucsd.edu:~/
Password:
WhereAmI.java                                100% 303   84.7KB/s   00:00
MacBook-Pro-83:Class CSE lukegentry$ ssh cs15lfa22ai@ieng6.ucsd.edu
Password:
Last login: Wed Sep 28 14:36:59 2022 from 69.196.44.132
```

Now reconnect to the computer with

```
ssh cs15lfa22zz@ieng6.ucsd.edu
```

Type the command ls.

You should notice that the file WhereAmI.java is now there.

```
Wed Sep 28, 2022 5:55pm - Prepping cs15lfa22
[cs15lfa22ai@ieng6-202]:~:83$ ls
WhereAmI.class WhereAmI.java hello.txt perl5
[cs15lfa22ai@ieng6-202]:~:84$
```

WhereAmI.class will be there too if you compile it.

Next run that file with

```
javac WhereAmI.java
```

```
Java WhereAmI
```

The output should look like this:

```
[cs15lfa22ai@ieng6-202]:~:85$ java WhereAmI
Linux
cs15lfa22ai
/home/linux/ieng6/cs15lfa22/cs15lfa22ai
/home/linux/ieng6/cs15lfa22/cs15lfa22ai
[cs15lfa22ai@ieng6-202]:~:86$
```

Step 5:

Now let's set an SSH Key so we don't have to type in that password every time!

Make sure you exit and then use the command

`ssh-keygen`

It will ask for a you to enter a file to save the key, just press enter if the line ends with `is_rsa`

Enter a "passphrase" (a shorter password)

```
MacBook-Pro-83:Class CSE lukeentry$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/Users/lukeentry/.ssh/id_rsa):
/Users/lukeentry/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /Users/lukeentry/.ssh/id_rsa.
Your public key has been saved in /Users/lukeentry/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:cctj1lQhyUWz25TaXW8TExsdPchfSpLqsp6C0T52jc lukeentry@MacBook-Pro-83.lan
The key's randomart image is:
[SHA256]
+-----+
|          |
|          |
|          |
|          |
|          |
|          |
|          |
|          |
|          |
|          |
+-----+
MacBook-Pro-83:Class CSE lukeentry$
```

It should output a picture like this:

Next, reconnect to the server using

`ssh cs15lfa22zz@ieng6.ucsd.edu`

And your password

Run the command: `mkdir .ssh`

If it says that the file exists, don't worry about it and move on.

Exit the remote computer

Run this command to copy the key to the remote computer:

```
scp /Users/<your_username>/.ssh/id_rsa.pub
cs15lfa22zz@ieng6.ucsd.edu: ~/.ssh/authorized_keys
```

Make sure to add your username on your Mac and your id.

```
MacBook-Pro-83:Class CSE lukeentry$ scp /Users/lukeentry/.ssh/id_rsa.pub cs15lfa22a@ieng6.ucsd.edu:~/.ssh/authorized_keys
Password:
id_rsa.pub 100% 583 21.7KB/s 00:00
MacBook-Pro-83:Class CSE lukeentry$
```

If it works it will look like this.

Now try to connect again with

`ssh cs15lfa22zz@ieng6.ucsd.edu`

It should now look like this:

```
MacBook-Pro-83:Class CSE lukeentry$ ssh cs15lfa22a@ieng6.ucsd.edu
Enter passphrase for key '/Users/lukeentry/.ssh/id_rsa':
```

Enter your passphrase and it should connect!

Step 6: Optimizing Remote Running!

You can also write extra command lines at the end of an ssh connection line to run it immediately on the server. For example:

```
ssh cs15lfa22zz@ieng6.ucsd.edu ls
```

It should look like this.

```
MacBook-Pro-B3:Class CSE lukegentry$ ssh cs15lfa22ai@ieng6.ucsd.edu ls
Enter passphrase for key '/Users/lukegentry/.ssh/id_rsa':
hello.txt
perl5
WhereAmI.class
WhereAmI.java
MacBook-Pro-B3:Class CSE lukegentry$
```

You can also run multiple commands with semicolons. For example:

```
cp WhereAmI.java OtherMain.java; javac OtherMain.java; java WhereAmI
```

Done!