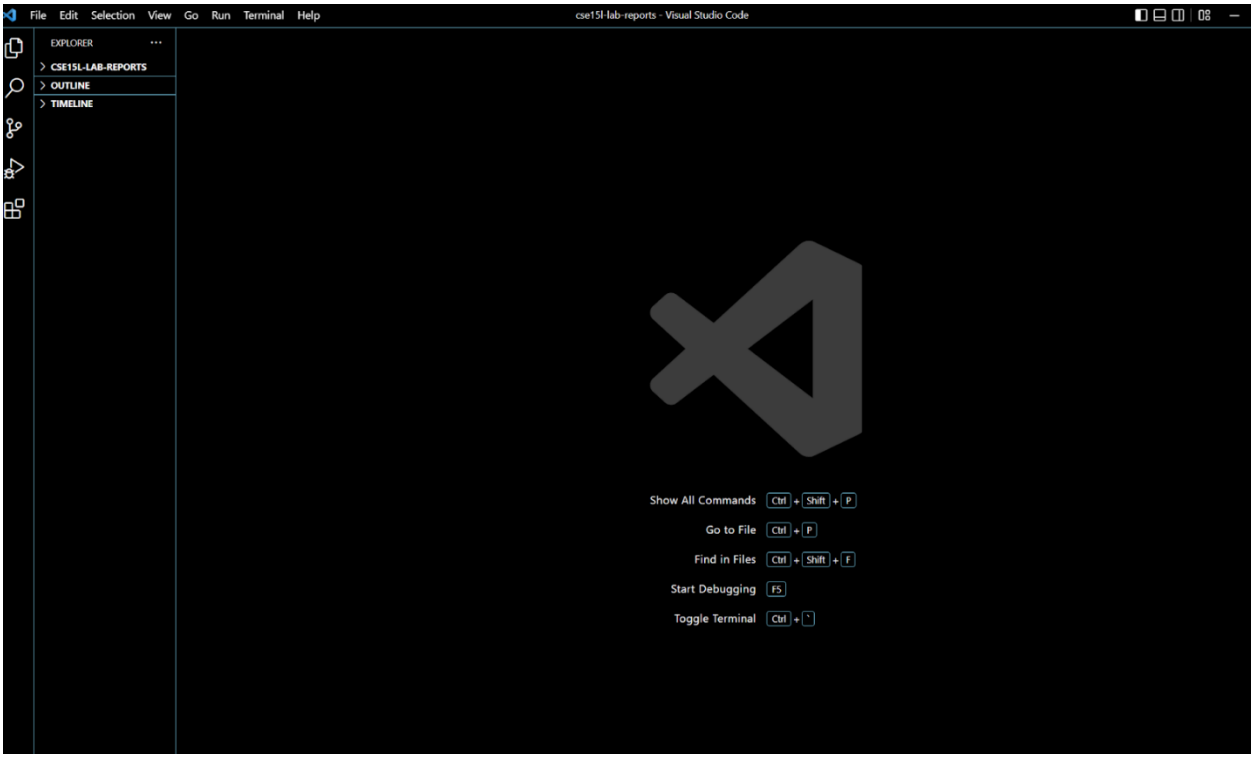
Natasha Dhanrajani

CSE 15L

Remote Access Tutorial

1. Installing VScode

Head to the following url https://code.visualstudio.com/ and use the directions provided on the webpage to download it on your device. Make sure you download the version that supports your device's operating system (Windows, macOS, Linux, etc). You can change the theme or look of your VScode as you wish, but make sure your pages opens up to something like this:



2. Remotely Connecting

Open the terminal by either

- Clicking "Terminal" at the top of the page and selecting "New Terminal"
- Ctrl +

Then, secure-shell into the Linux-operating computer at UCSD using your corresponding user credentials with the following command and hit enter:

ssh cs15lfa22(xx)@ieng6.ucsd.edu (replace "xx" with the letters assigned to your user)

Once the "Password:" prompt comes up, enter the password for the corresponding user. **note that the characters you type while entering the password will not appear in the text, but it is being written!** Hit enter when you are done and the following messages should appear, indicating you have successfully logged into the computer remotely!

```
------------------------------------------------------------------------

*** Problems, Suggestions, or Feedback ***

    For help requests, please create a ticket at:
    https://support.ucsd.edu/its

    You may also report issues, suggestions, or feedback by e-mailing root on any system:
    mail -s "Your subject here" root
    Type your message - Ctrl+D to send

*** Access our Linux ssh terminals or remote desktops via a web browser at: ***
    https://linuxcloud.ucsd.edu

    All accounts must be enrolled in Duo for access. No VPN required.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Hello ndhanrajani, 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   16:50:01   20  0.25,  0.11,  0.07
ieng6-202   16:50:01   15  0.15,  0.13,  0.14
ieng6-203   16:50:01   14  0.14,  0.10,  0.06



To see all available software packages, type "prep -l" at the command prompt,
or "prep -h" for more options.
[ndhanrajani@ieng6-202]:~:1$
```

3. **Trying Some Commands**

   Run some of the following commands and see what happens (run them while logged into the remote computer and your own separately) and compare the outcomes. You can log out by simply typing the exit command or Ctrl-D:

   cd

   cd ~

   ls -lat

   ls -a

   ls <directory>, where <directory> is /home/linux/ieng6/cs15lfa22abc, where “abc” is your username.

Here is an example of what displays in ls -lat and ls a- in the remote computer:

```
[ndhanrajani@ieng6-202]:~:4$ ls -lat
total 96
-rw-r--r--   1 ndhanrajani ieng6_staff  1104 Sep 28 16:51 .modulesbegenv
-rw-r-----   1 ndhanrajani ieng6_staff     0 Sep 28 16:51 .motd
drwxr-s---   6 ndhanrajani ieng6_staff  4096 Sep 28 16:51 .
drwxr-sr-x   2 ndhanrajani ieng6_staff  4096 Sep 28 16:51 perl5
drwxr-sr-x   3 ndhanrajani ieng6_staff  4096 Sep 28 16:51 .local
drwxr-sr-x   3 ndhanrajani ieng6_staff  4096 Sep 28 16:51 .config
drwxr-sr-x   3 ndhanrajani ieng6_staff  4096 Sep 28 16:51 .cache
drwxr-sr-x 288 root        ieng6_staff 24576 May  3 14:08 ..
-rwxr-x---   1 ndhanrajani ieng6_staff   290 May  3 14:08 .zshrc
-rwxr-x---   1 ndhanrajani ieng6_staff   481 May  3 14:08 .zshenv
-rwxr-x---   1 ndhanrajani ieng6_staff  1931 May  3 14:08 .zprofile
-rwxr-x---   1 ndhanrajani ieng6_staff  1961 May  3 14:08 .profile
-rwxr-x---   1 ndhanrajani ieng6_staff   837 May  3 14:08 .procmailrc
-rwxr-x---   1 ndhanrajani ieng6_staff   431 May  3 14:08 .login
-rwxr-x---   1 ndhanrajani ieng6_staff   155 May  3 14:08 .locallogin
-rwxr-x---   1 ndhanrajani ieng6_staff  1692 May  3 14:08 .kshrc
-rwxr-x---   1 ndhanrajani ieng6_staff  1931 May  3 14:08 .cshrc
-rwxr-x---   1 ndhanrajani ieng6_staff  1721 May  3 14:08 .bashrc
-rwxr-x---   1 ndhanrajani ieng6_staff   975 May  3 14:08 .bash_profile
[ndhanrajani@ieng6-202]:~:5$ ls -a
.   .bash_profile  .cache   .cshrc  .local       .login          .motd        .profile   .zshenv
..  .bashrc        .config  .kshrc  .locallogin  .modulesbegenv  .procmailrc  .zprofile  .zshrc
```

4. **Moving Files with scp**

   Now, lets try copying files from your computer and placing a copy into the remote computer! To do so, lets create a java file called WhereAmI.java first with the following lines of code. (Download Oracle Java jdk if you do not already have it from the internet)

```
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"));
  }
}
```

   To do so, open Notepad (Windows) and write the above. Then, save the file with the name “WhereAmI.java” as an “All Files” type.

   Run the following commands in the terminal

   javac WhereAmI.java

   java WhereAmI

   Then, run the following command to copy the file from your computer into the remote one

   scp WhereAmI.java cs15lfa22xx@ieng6.ucsd.edu:~/

You will be prompted to enter your password into the remote computer. Put it in. Then, the file should be copied! Afterwards, Secure-Shell into your remote computer again and us ls to check and see

if the file copied over. Try running the program with javac and java commands again in the remote computer! Here is everything that should have happened below:

```
PS C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports> javac WhereAmI.java
PS C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports> java WhereAmI
perl5
[ndhanrajani@ieng6-202]:~:11$ ls -lat
total 96
-rw-r--r--   1 ndhanrajani ieng6_staff  1104 Sep 28 17:27 .modulesbegenv
-rw-------   1 ndhanrajani ieng6_staff    52 Sep 28 17:04 .bash_history
perl5
[ndhanrajani@ieng6-202]:~:11$ ls -lat
total 96
-rw-r--r--   1 ndhanrajani ieng6_staff  1104 Sep 28 17:27 .modulesbegenv
-rw-------   1 ndhanrajani ieng6_staff    52 Sep 28 17:04 .bash_history
drwxr-s---   6 ndhanrajani ieng6_staff  4096 Sep 28 17:04 .
-rw-r-----   1 ndhanrajani ieng6_staff     0 Sep 28 16:51 .motd
drwxr-sr-x   2 ndhanrajani ieng6_staff  4096 Sep 28 16:51 perl5
drwxr-sr-x   3 ndhanrajani ieng6_staff  4096 Sep 28 16:51 .local
drwxr-sr-x   3 ndhanrajani ieng6_staff  4096 Sep 28 16:51 .config
drwxr-sr-x   3 ndhanrajani ieng6_staff  4096 Sep 28 16:51 .cache
drwxr-sr-x 288 root        ieng6_staff 24576 May  3 14:08 ..
-rwxr-x---   1 ndhanrajani ieng6_staff   290 May  3 14:08 .zshrc
nhdha
C:\Users\nhdha
C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports
PS C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports> scp WhereAmI.java ndhanrajani@ieng6.ucsd.edu
       1 file(s) copied.
PS C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports> scp WHereAmI.java ndhanrajani@ieng6.ucsd.edu:~/

Password:
WHereAmI.java                                         100%  297    11.9KB/s   00:00
PS C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports> ls


-a----         9/28/2022   5:06 PM 297


PS C:\U    \nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports>
PS C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports>
PS C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports>
PS C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports> ssh ndhanrajani@ieng6.ucsd.edu
Password:
Last login: Wed Sep 28 17:27:13 2022 from 100.81.37.47
ls
Hello ndhanrajani, you are currently logged into ieng6-202.ucsd.edu
```

```
To see all available software packages, type "prep -l" at the command prompt,
or "prep -h" for more options.
[ndhanrajani@ieng6-202]:~:14$ ls
WHereAmI.java  perl5
[ndhanrajani@ieng6-202]:~:15$ ls
WHereAmI.java  perl5
[ndhanrajani@ieng6-202]:~:15$
```

5. Setting an SSH Key

Rather than entering your password over and over to access a computer, you can use the ssh key. Essentially, you copy over and public and private key in a particular location in place of your password. To do so, enter the following:

ssh-keygen

When this pops up Enter file in which to save the key (/Users/<the user>/.ssh/id_rsa): , press enter and take note of the file path it gives.

A private key (id_rsa) and public key (id_rsa.pub) are made and stored in the .ssh directory of your computer. Now, copy the public key to the .ssh directory of the user on the remote computer using the following commands:

ssh cs15lfaxx@ieng6.ucsd.edu

password: <enter it here>

mkdir .ssh

scp/users/<the user>/.ssh/id_rsa.pub cs15lfa22@ieng6.ucsd.edu:~/.ssh.authorized_keys

(use the username and same directions above).

Here is how it should be:

```
To see all available software packages, type "prep -l" at the command prompt,
or "prep -h" for more options.
[ndhanrajani@ieng6-202]:~:14$ ls
WHereAmI.java  perl5
[ndhanrajani@ieng6-202]:~:15$ ls
WHereAmI.java  perl5
[ndhanrajani@ieng6-202]:~:15$ exit
logout
| * =..= o...     |
| * =..= o...     |
|  * o=. So+      |
| . *. +o.+ +     |
|  . oo o+ o .    |
|   . oo .o       |
|    o .o         |
+----[SHA256]-----+
PS C:\Users\nhdha\Documents\UCSD Freshman Year 2022-2023\CSE 15L\cse15l-lab-reports> ssh ndhanr
ajani@ieng6.ucsd.edu
Password:
Last login: Wed Sep 28 17:33:09 2022 from 100.81.37.47
Hello ndhanrajani, 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   17:40:01   31  0.11,  0.21,  0.21
ieng6-202   17:40:01   14  0.13,  0.09,  0.09
ieng6-203   17:40:01   24  0.06,  0.09,  0.13



To see all available software packages, type "prep -l" at the command prompt,
or "prep -h" for more options.
```

6. Optimizing Remote Running

Here are some other ways to get what you need to get done much more streamlined in one command rather than multiple! For example, to list the files located in your home directory on the remote computer, use this command:

ssh cs15lfa22@ieng.ucsd.edu “ls”

Also, use semicolons to run multiple commands on the same line, such as this example:

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

Here is what happens in both scenarios: