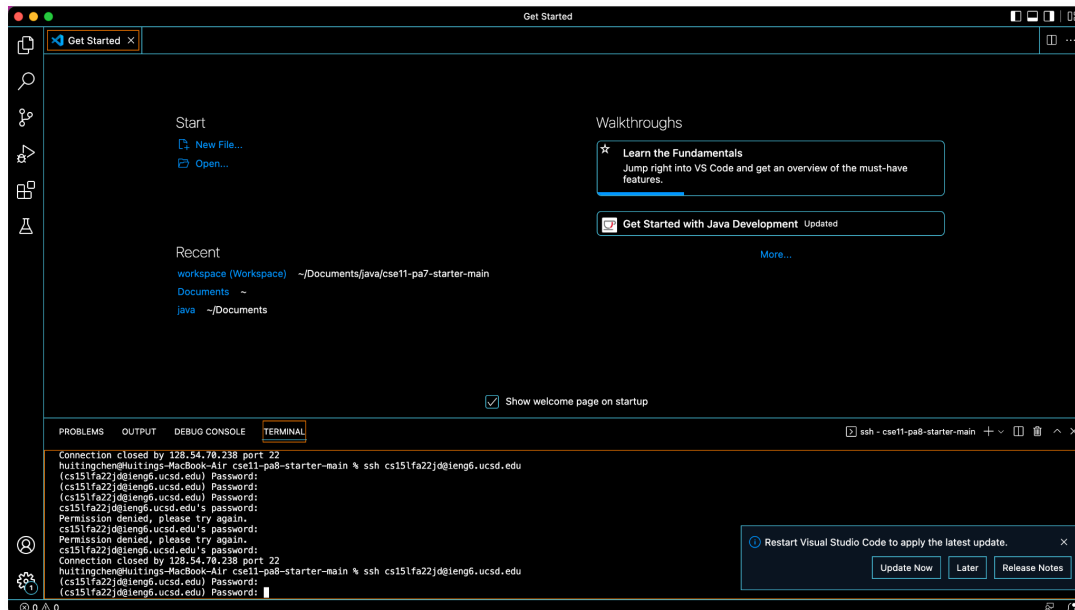# Week1 Lab Report

Install VScode

I have already installed my VScode in my previous CSE class. This is a screenshot of my VScode.

Remotely Connecting

I failed to log in to my own account, so I use another one. I successfully connected to a remote computer by typing "ssh cs15lfa22ta10@ieng6.ucsd.edu" in the terminal.

Trying Some Comments

```
Thu Sep 29, 2022 11:00am - Prepping cs15lfa22
[cs15lfa22ta10@ieng6-203]:~:37$ cd
[cs15lfa22ta10@ieng6-203]:~:38$ cd
[cs15lfa22ta10@ieng6-203]:~:38$ pwd
/home/linux/ieng6/cs15lfa22/cs15lfa22ta10
[cs15lfa22ta10@ieng6-203]:~:39$ ls
hello.txt  newDir  perl5
[cs15lfa22ta10@ieng6-203]:~:40$ cd /home/linux/ieng6/cs15lfa22/cs15la22ta10
-bash: cd: /home/linux/ieng6/cs15lfa22/cs15la22ta10: No such file or directory
[cs15lfa22ta10@ieng6-203]:~:41$ cat hello.txt
Hi! Welcome to CSE15L Fall 22
[cs15lfa22ta10@ieng6-203]:~:42$ cp
cp: missing file operand
Try 'cp --help' for more information.
[cs15lfa22ta10@ieng6-203]:~:43$ cp hello.txt
cp: missing destination file operand after 'hello.txt'
Try 'cp --help' for more information.
[cs15lfa22ta10@ieng6-203]:~:44$ mkdir
mkdir: missing operand
Try 'mkdir --help' for more information.
[cs15lfa22ta10@ieng6-203]:~:45$ mkdir -
[cs15lfa22ta10@ieng6-203]:~:46$
```

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL                                    ssh - cse11-pa8-starter-main

[cs15lfa22ta10@ieng6-203]:~:46$ cd /home
[cs15lfa22ta10@ieng6-203]:home:47$ ls
linux
[cs15lfa22ta10@ieng6-203]:home:48$ cd /home/linux/ieng6/cs15lfa22/cs15la22ta10
-bash: cd: /home/linux/ieng6/cs15lfa22/cs15la22ta10: No such file or directory
[cs15lfa22ta10@ieng6-203]:home:49$ ls
linux
[cs15lfa22ta10@ieng6-203]:home:50$ cd linux
[cs15lfa22ta10@ieng6-203]:linux:51$ ls
bioinf  ieng6  staff
[cs15lfa22ta10@ieng6-203]:linux:52$ cd ieng6
[cs15lfa22ta10@ieng6-203]:ieng6:53$ ls
```

```
[cs15lfa22ta10@ieng6-203]:ieng6:54$ cd cs15lfa22
[cs15lfa22ta10@ieng6-203]:cs15lfa22:55$ ls
```

```
[cs15lfa22ta10@ieng6-203]:cs15lfa22:56$ cd cs15lfa22ta10
[cs15lfa22ta10@ieng6-203]:~:57$ ls
-  hello.txt  newDir  perl5
[cs15lfa22ta10@ieng6-203]:~:58$ cd ~
[cs15lfa22ta10@ieng6-203]:~:59$ ls -lat
total 128
-rw-r--r--   1 cs15lfa22ta10 ieng6_cs15lfa22   311 Sep 29 11:19 WhereAmI.java
drwx-s---   9 cs15lfa22ta10 ieng6_cs15lfa22  4096 Sep 29 11:19 .
-rw-------   1 cs15lfa22ta10 ieng6_cs15lfa22   810 Sep 29 11:18 .bash_history
-rw-r--r--   1 cs15lfa22ta10 ieng6_cs15lfa22    30 Sep 29 11:15 hello.txt
drwxr-x---   2 cs15lfa22ta10 ieng6_cs15lfa22  4096 Sep 29 11:13 -
-rw-r--r--   1 cs15lfa22ta10 ieng6_cs15lfa22  1349 Sep 29 11:12 .modulesbegenv
drwxr-sr-x 463 cs15lfa22    ieng6_cs15lfa22 36864 Sep 29 08:06 ..
drwx--S---   2 cs15lfa22ta10 ieng6_cs15lfa22  4096 Sep 28 15:52 .ssh
drwx-s---   2 cs15lfa22ta10 ieng6_cs15lfa22  4096 Sep 28 15:46 newDir
drwxr-sr-x   3 cs15lfa22ta10 ieng6_cs15lfa22  4096 Sep 28 15:45 perl5
-rw-r-----   1 cs15lfa22ta10 ieng6_cs15lfa22     0 Sep 28 15:29 .motd
drwxr-sr-x   3 cs15lfa22ta10 ieng6_cs15lfa22  4096 Sep 28 15:29 .local
drwxr-sr-x   3 cs15lfa22ta10 ieng6_cs15lfa22  4096 Sep 28 15:29 .config
drwxr-sr-x   3 cs15lfa22ta10 ieng6_cs15lfa22  4096 Sep 28 15:29 .cache
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22   290 Sep 21 14:47 .zshrc
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22   481 Sep 21 14:47 .zshenv
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22  1931 Sep 21 14:47 .zprofile
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22  1961 Sep 21 14:47 .profile
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22   837 Sep 21 14:47 .procmailrc
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22   431 Sep 21 14:47 .login
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22   155 Sep 21 14:47 .locallogin
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22  1692 Sep 21 14:47 .kshrc
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22  1931 Sep 21 14:47 .cshrc
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22  1721 Sep 21 14:47 .bashrc
-rwxr-x---   1 cs15lfa22ta10 ieng6_cs15lfa22   975 Sep 21 14:47 .bash_profile
[cs15lfa22ta10@ieng6-203]:~:60$ ls -a
.                .bash_profile   .cache    .cshrc    .local     .login       .motd    .profile   .zprofile  .zshrc    hello.txt  perl5
..   .bash_history   .bashrc         .config   .kshrc    .locallogin   .modulesbegenv   .procmailrc   .ssh     .zshenv   WhereAmI.java  newDir
[cs15lfa22ta10@ieng6-203]:~:61$ cd ../cs15lfa22
```

```
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % pwd
/Users/huitingchen/Documents/java/cse11-pa8-starter-main
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ls
CompareLists.java      HelloWorld.java       RandomWord.java        lib            run
HelloGoodbye.java      Percolation.java      algs4.jar             person.java     run.bat
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % cd
huitingchen@Huitings-MacBook-Air ~ % ls
Applications    Desktop       Documents      Downloads     Library      Movies       Music        Pictures      Public
huitingchen@Huitings-MacBook-Air ~ % pwd
/Users/huitingchen
huitingchen@Huitings-MacBook-Air ~ % mkdir
usage: mkdir [-pv] [-m mode] directory ...
huitingchen@Huitings-MacBook-Air ~ % cp
usage: cp [-R [-H | -L | -P]] [-fi | -n] [-apvXc] source_file target_file
       cp [-R [-H | -L | -P]] [-fi | -n] [-apvXc] source_file ... target_directory
huitingchen@Huitings-MacBook-Air ~ % cd User
cd: no such file or directory: User
huitingchen@Huitings-MacBook-Air ~ % cd Documents
huitingchen@Huitings-MacBook-Air Documents % cd java/cse11-pa8-starter-main
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % cp
usage: cp [-R [-H | -L | -P]] [-fi | -n] [-apvXc] source_file target_file
       cp [-R [-H | -L | -P]] [-fi | -n] [-apvXc] source_file ... target_directory
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % mkdir
usage: mkdir [-pv] [-m mode] directory ...
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % █
```

I used the pwd command to check the current directory in the remote computer and the ls command to see all the files exist. Then I used the cd command to get the home directory and see what files each directory contains. I also tried these commands on my own computer and found that the command ran in the remote computer shows the files in the remote computer while the command ran in my computer shows the files in my computer.

Moving Files With SCP

```
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % scp WhereAmI.java cs15lfa22ta10@ieng6.ucsd.edu:~/
(cs15lfa22ta10@ieng6.ucsd.edu) Password:
WhereAmI.java
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ssh cs15lfa22ta10@ieng6.ucsd.edu
(cs15lfa22ta10@ieng6.ucsd.edu) Password:
Last login: Thu Sep 29 11:41:13 2022 from 69.196.40.172
Hello cs15lfa22ta10, you are currently logged into ieng6-203.ucsd.edu

You are using 0% CPU on this system

Cluster Status
Hostname    Time     #Users  Load  Averages
ieng6-201   11:45:01  14    0.00,  0.04,  0.10
ieng6-202   11:45:01   7    0.06,  0.06,  0.07
ieng6-203   11:45:01  18    0.02,  0.07,  0.12


Thu Sep 29, 2022 11:48am - Prepping cs15lfa22
[cs15lfa22ta10@ieng6-203]:~:131$ ls
-  WhereAmI.class  WhereAmI.java  cs15lfa22ta10  hello.txt  newDir  perl5  ssh
[cs15lfa22ta10@ieng6-203]:~:132$ javac WhereAmI.java
[cs15lfa22ta10@ieng6-203]:~:133$ java WhereAmI
Linux
cs15lfa22ta10
/home/linux/ieng6/cs15lfa22/cs15lfa22ta10
/home/linux/ieng6/cs15lfa22/cs15lfa22ta10
[cs15lfa22ta10@ieng6-203]:~:134$ █
```

When I tried to move WhereAmI.java to the remote computer, there was not a row under "Password:" showing the file's information. But when I connect to the remote computer by ssh, I find that WhereAmI.java exists in the remote computer. I am not sure if this is correct.

Setting an SHH key

```
connection to iengo.ucsu.euu ctoseu.
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/Users/huitingchen/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /Users/huitingchen/.ssh/id_rsa
Your public key has been saved in /Users/huitingchen/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:FVzZA4Xc3uTe6/viLJjYUM+wg/Fjj/lhGKMyyxLz9Bc huitingchen@Huitings-MacBook-Air.local
The key's randomart image is:
+---[RSA 3072]----+
|         ..ooB.  |
|          ..+ + .|
|           .  . =|
|        ..o    . o|
|         S=o=   ..|
|     o . o.E+o   o|
|      =o..=.Xo   .|
|     ...+o B.oo.. |
|      .o  . ..o+++|
+-----[SHA256]-----+
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ssh cs15lfa22jd@ieng6.ucsd.edu
(cs15lfa22jd@ieng6.ucsd.edu) Password:
Last login: Fri Sep 30 20:17:00 2022 from 128.54.162.41
Hello cs15lfa22jd, 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   20:20:01   11  0.16,  0.06,  0.06
ieng6-202   20:20:01   11  0.01,  0.03,  0.05
ieng6-203   20:20:01   18  0.02,  0.04,  0.05


Fri Sep 30, 2022  8:20pm - Prepping cs15lfa22
[cs15lfa22jd@ieng6-202]:~:2$ mkdir .ssh
[cs15lfa22jd@ieng6-202]:~:3$ exit
logout
Connection to ieng6.ucsd.edu closed.
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % █
```

```
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % scp /Users/huitingchen/.ssh/id_rsa.pub cs15lfa22jd@ieng6.ucsd.edu:~/.ssh/authorized_keys
(cs15lfa22jd@ieng6.ucsd.edu) Password:
id_rsa.pub
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ssh cs15lfa22jd@ieng6.ucsd.edu
Last login: Fri Sep 30 20:24:44 2022 from 128.54.162.41
Hello cs15lfa22jd, 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   20:25:01   11  0.00,  0.02,  0.05
ieng6-202   20:25:01   11  0.02,  0.06,  0.05
ieng6-203   20:25:01   19  0.03,  0.04,  0.05


Fri Sep 30, 2022  8:28pm - Prepping cs15lfa22
[cs15lfa22jd@ieng6-202]:~:4$ █
```

The process of creating a public key and private key goes well. In the second part, I failed at first because I tried to store my public key in cs15lfa22. Then as I find that I don't know the password of cs15lfa22, I realize that I should store the key in cs15lfa22jd.

Optimizing Remote Running

```
/Users/huitingchen/Documents/java/cse11-pa8-starter-main
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ssh cs15lfa22jd@ieng6.ucsd.edu "cat WhereAmI.java"
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"));
    }
}
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % scp WhereAmI.java cs15lfa22jd@ieng6.ucsd.edu:~/
WhereAmI.java
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ssh cs15lfa22jd@ieng6.ucsd.edu "cat WhereAmI.java"
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"));
        System.out.println("Make a Change");
    }
}
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ssh cs15lfa22jd@ieng6.ucsd.edu "javac WhereAmI"
error: Class names, 'WhereAmI', are only accepted if annotation processing is explicitly requested
1 error
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ssh cs15lfa22jd@ieng6.ucsd.edu "javac WhereAmI.java"
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main % ssh cs15lfa22jd@ieng6.ucsd.edu "java WhereAmI"
Linux
cs15lfa22jd
/home/linux/ieng6/cs15lfa22/cs15lfa22jd
/home/linux/ieng6/cs15lfa22/cs15lfa22jd
Make a Change
huitingchen@Huitings-MacBook-Air cse11-pa8-starter-main %
```

After I change the file in my computer, I use scp to move it to the remote computer and then use ssh to run it on the remote computer. It prints out its location in the remote computer and the change I made.