CSE 310 Recitation 0

Objectives:

1. Download, set up and use WinSCP or Putty
2. Logon to general.asu.edu to compile and test & run a simple C++ program on linked list.

Note: for this recitation, you need NOT submit it on Canvas. It is designed for preparation purposes only.

Step #0: Which C/C++ IDE you should/can use for this course?

You can use any IDEs which you already have or feel comfortable with, but make sure you test our sample code provided and your final source code on general.asu.edu before submitting them on Gradescope. Below are some recommendations and are for your reference only.

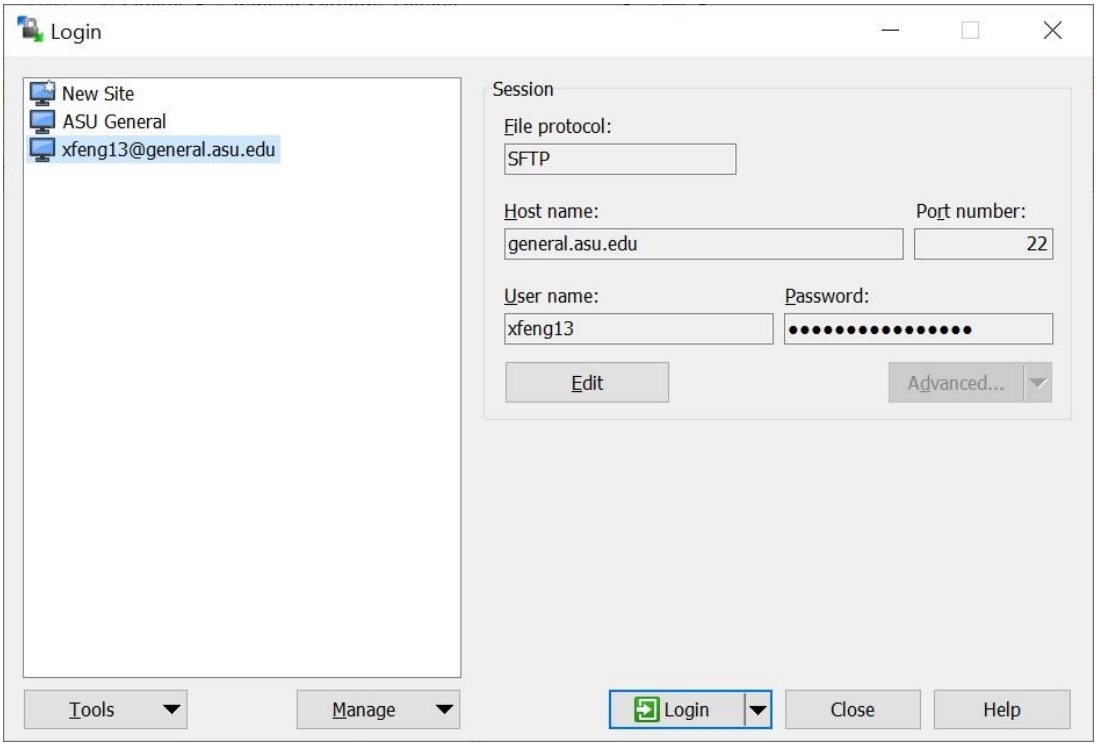
OS	Command Line	File Transfer	IDEs
Windows	PuTTY	WinSCP	Visual Studio /CodeBlock / Sublime Text
Mac OS	Terminal / iTerm	Cyberduck	Visual Studio Code /CodeBlock / Sublime Text
Linux	Terminal	scp	vi / emacs

- Visual Studio is a comprehensive IDE for .NET and C++ developers, highly recommended for Windows PC.
- Visual Studio Code is a standalone, lightweight, source code editor that runs on Windows, macOS, and Linux. Recommended for macOS or Linux only.
- Both are developed by Microsoft, check here for their differences.

Step #1 – Set up the connection to general.asu.edu

For Windows Operating System Only – WinSCP instruction

- Click here to install WinSCP.
- WinSCP is a free and open-source SFTP (Secured File Transfer Protocol) client for Microsoft Windows. Its main function is for secure file transfer between a local and a remote computer.
- For all CSE310 programming assignments, before submitting, you will run and test it on ASU Linux server – ***general.asu.edu***, to make sure it compiles and generates the correct output. (***i.e.*** **later no nagging on "my program compiles and runs perfectly on my own PC, but it shows a segmentation fault on submission server, etc**)
- Once successfully installed WinSCP, click on the desktop to open it (see the following window)



Note: if *general.asu.edu* does not work, then try *general1.asu.edu* or *general2.asu.edu* instead. Make sure you enter the following information correct:

Host Name: **general.asu.edu**
Username: **your_ASURite_ID**
Password: **your ASU login password**
Port Number: **22**

For Mac Operating System – SSH

- Mac OS X has a built-in SSH client called **Terminal** which can be used to connect to remote servers. By default, Terminal.app is in Applications > Utilities folder. Double-click on the icon to start the client.

- At the prompt type:

```
ssh your_ASURite_ID@general.asu.edu
```

For example, if I want to connect to general.asu.edu, I will type:

```
ssh xfeng13@general.asu.edu
```

If general.asu.edu does not work, then try *general1.asu.edu* or *general2.asu.edu* instead.

- To save a remote connection (so that you don't have to type in the command every time):

  1) Select Shell then New Remote Connection... from the top menu

2) Under the Server column, click on the + icon to add a new connection.

3) Enter the hostname when prompted by the dialog.

4) Enter your username (such as xfeng13) in the User field and click Connect.

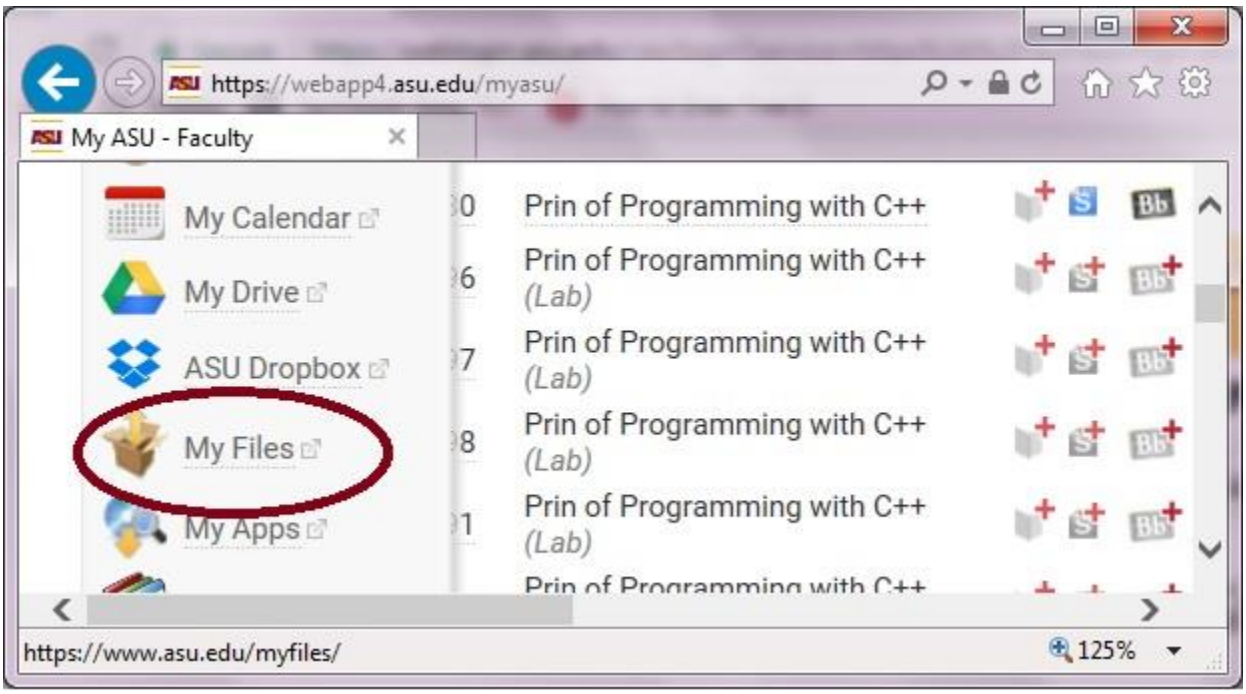
For Windows & Mac Operating System – PuTTY

- PuTTY is a free open-source terminal emulator which lets you initiate interactive command-line sessions to Unix/Linus servers.
- Download the executable putty.exe from here.
- Run the executable. In the UI enter the host name as *general.asu.edu*
- Enter your ASU login and password to access the general server.

Note: If you use PuTTY,

- To transfer files between your machine and the general server, you can use

1) "My Files" under "My ASU" (see below)



or for a Mac OS user,

2) use **scp** (secure shell file transfer) command, such as

```
scp ~/Document/file1.txt xfeng13@general2.asu.edu:~/cse310
```

will copy a local file *file1.txt* to the general.asu.edu server directory called *cse310* and

```
scp xfeng13@general2.asu.edu:~/cse310/file1.txt ~/Desktop
```

will copy a remote file named *file1.txt* from general.asu.edu server to your local desktop.

Mac users, in case you need a free graphical file transfer client, please check the following:

- CyberDuck
- FileZilla
- Transmit (might need to pay)

Step #2 – Create, compile and run a C++ program on general.asu.edu

- Create a folder called *cse310* in general.asu.edu where you will store your CSE310 C++ code.
- Navigate to that folder in *general.asu.edu* by typing

```
$ cd cse310
```

- Write a simple C++ program (I recommend that you write one with a *while* loop or pointers) or download **ListExample.cpp** we posted on Canvas. suppose the source code is called *ListExample.cpp*. The command you need to enter in Linux terminal to compile is

```
$ g++ -o prog ListExample.cpp
```

Here *prog* is the executable file name (it can be any other names as you like) which is created if *ListExample.cpp* compiles successfully.

- To run and test your code, type in the command "./prog" to see output or enter any inputs relevant to your code

```
$ ./prog
```

- To run and test your program by using the input file, for example sample*Input.txt* and save the output inside a file called *myout.txt*, *i.e.* output won't show on screen, you can do:

```
$ ./prog <sampleInput.txt >myout.txt
```

Debugging a C/C++ program

Debugging is the process of finding logic errors in your program. A logic error is an error that the compiler will not find. Debugging is a very important procedure in C/C++ coding, and may take you a huge amount of time, so always give yourself enough time to debug and be patient. There are several ways to debug a C++ program:

1. Check the program logic by hand
2. Insert `cout` statements in the program
3. Use a debugger

Below we will only talk about above item #3 – use a debugger.

- Use an online gdb to debug your code: https://www.onlinegdb.com/

- For simple guidance on compile, build and debugging a C++ project using **Visual Studio or Visual Studio code**, watch the following YouTube video (debugging starts from 8:28m)

  https://www.youtube.com/watch?v=2VokW_Jt0oM

  For more detailed info. debugging under Visual Studio or Visual Studio code, check the following website:

  https://code.visualstudio.com/docs/editor/debugging

- For simple guidance on debugging under CodeBlock, watch the following YouTube video:

  https://www.youtube.com/watch?v=ISV2wLkQ8_s

Mice.:

1. Click here for a simple Unix/Linus command tutorial for beginner.

2. Click here for a good Vim editor tutorial from Purdue University.