LABORATORY MANUAL

INTRODUCTION TO COMPUTER SCIENCE

CSIS-110

**Computer Science Department**

**Siena College**

**Loudonville, NY 12211**

## 1. Introduction

### Purpose of the Labs:

We believe that people learn some things best by doing them. The labs for CSIS-110 provide time to *do* computer science under the direction of an instructor who will be serving as a facilitator during the lab session. This means that the instructor will not solve your problems or show you how to complete the activities. The instructor may provide helpful hints, ask additional questions, ask you to explain a solution, ask how you obtained a solution, or facilitate discussions about observations, experiments, results, discoveries, and other topics that arise.

Some lab activities will ask you to develop solutions to problems, program solutions in a programming language such as Python, Perl, or Alice, and test the programs. Other activities will involve using programs we give you to illustrate important concepts in Computer Science. You will be required to make observations, form and test hypotheses, and use the results of your testing to change aspects of your programs.

The lab session format will provide opportunities for discussing your observations, experiments, discoveries, and solutions to problems. Discussions may take place with your lab partner, your instructor, or other lab groups. The lab materials you hand in to your instructor will provide the opportunity to communicate in writing about the computer science being done.

### Goals we will make progress towards:

* Understanding that computer science is a way of thinking or asking questions rather than just a set of facts about technology.
* Formulating, analyzing, and solving problems using the concept of an algorithm. This includes the ability to solve problems with a sense of imagination and creativity.
* Communicating effectively in both oral and written form.
* Understanding what computer science is, what its connections are to other subjects, and what are some of its important questions.

#### Having fun !!!

### Student responsibilities:

You are responsible for preparing for the labs (reading the materials in the first portion of each lab), attending the lab sessions, completing the lab assignments (which may require time outside of the lab sessions), and handing in required materials on time. In particular:

1. Lab reports consist of **one** Lab Worksheet for each team of students. All information and answers requested during the lab will be filled in on the Worksheet; additional responses and program printouts must be attached to the back of the lab, **in the order requested.** All lab team members are responsible for the lab, and the grade earned by the lab will be assigned to all team members.
2. Lab reports are due at the *beginning* of the next lab. **Labs handed in during lab time will lose 20 points (out of 100)**, so have your lab ready for submission in advance and **don’t be late for lab**. **Labs handed in within 24 hours after lab begins will lose 50 points.** Labs handed in more than a day late will earn no credit. Exceptions to this policy may be announced during the semester.
3. You will work with one or two partners in each lab. You will have two partners only if an odd number of people are in the lab, and then only one group will have three people. If you do not finish the lab during lab period, you and your partner(s) can make whatever arrangements you like in order to get together and complete the lab.
4. In general, you will not receive credit for a lab you do not attend, unless you make other arrangements in advance with the instructor.
5. Please be punctual for lab. If you arrive late, you may end up working alone, putting you at a serious disadvantage. Arriving late will also result in points off from the lab, at the instructor’s discretion.

## 2. Lab Preparation

You should bring to every lab: **both textbooks.**

The remainder of this lab manual contains some helpful information on the software and hardware systems you will be using this semester. This lab manual should be available whenever you are logged in and doing work for this course, either in a lab or for a homework assignment or for any other reason.

The next section contains information on how to do your CSIS-110 work on a PC that is located in a computer science lab (RB306, RB304, RB330, or RB350 (“The Open Lab”, where you can work anytime)). These PCs are all part of the Siena network, called SienaServices.

There are two kinds of activities you will be doing in labs: one involves some software that exists only on the PCs in the computer science labs (RB304, RB306, RB330, and RB350). You cannot do that work anywhere else. These activities will usually be completed during lab time, so there should be no need to worry about them outside of the CS Lab.

The other kind of activity can be done from anywhere on the Internet; so what you don’t finish during the two hours of lab, can be finished later. One place to finish it is the Computer Science open lab, RB350, which is always open and has all the software that you use in RB304, RB306 and RB330. RB304, RB306, and RB330 are also available when labs are not scheduled. The other option is from somewhere else, either on-campus or off (see Section 4).

## Working in the CS Lab Rooms (RB304, RB306, RB330, RB350)

**Logging in/logging out**

IMPORTANT: When we ask you to “click” the mouse, we mean click the LEFT mouse button unless otherwise specified. When we ask you to type something, we often put it in quotes. You should not type these quotes.

**Logging in:**

1. If the computer or monitor (another name for the screen) is turned off, then turn it on. If you get a screen asking you to choose between Linux and Windows, select the Windows option and press <enter> (or just wait, and it will start automatically).
2. When the computer is running normally, it will present you with a screen that says “Press **ctrl+alt+delete** to log on”. That means you hold down the “ctrl” and “alt” keys while pressing the “delete” key. Then you release all three keys. To login to the computer, you need to fill in two blank spots at this point: The top line should contain your **login name**, which is the same login name you use elsewhere on campus.
3. In the bottom blank, type your password. This is your SienaServices password.
4. Once the two boxes contain the right information, simply click the “OK” button on the screen (using the mouse) or press the “Enter” key on the keyboard.
5. At this point you are logged in to the computer in front of you, which is an IBM PC-compatible. To use this computer, you communicate with it using a program called Windows, the computer’s operating system.

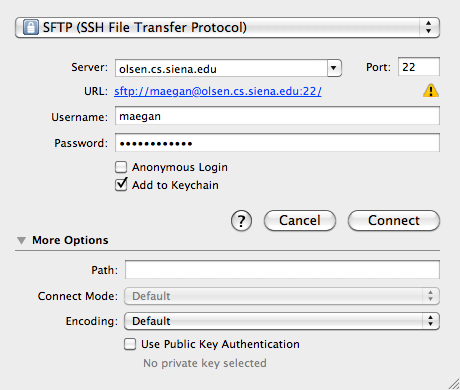
**Logging out**:

First, make sure you have properly exited any programs you were using. Then, click on the Windows icon in the lower left corner of the screen, then click on your name, then select the “Sign out” option. Do **not** turn the computer or the monitor off.

## 4. Working Outside of the CS Lab Rooms

Note that the RB350 lab is always open (except sometimes over breaks), so you don’t really need to have any other place to work. But if you like, much of your work can be done from anywhere on the Internet, unless it involves special software that we only have in the CS labs. For things like Alice or Python programming, or writing answers to lab or homework questions that you want to save online, you can access your information from anywhere if you have the right software. Here are instructions on how to do all this from outside the 3rd floor of Roger Bacon Hall:

1. **Logging in**: This of course depends on where you are. We assume that you’ve got this covered. You could be in your room, or in the library, or at an Internet café in Tasmania. Just get logged in somehow.
2. **Remote Access to your files**: This is the main difference: when you log in from your own computer or from off-campus, you may not have your network data folder available like you do on the 3rd floor of Roger Bacon Hall and elsewhere on campus. To make it available, you need to install some software to make this work. Through the wonders of WinSCP, a file transfer program, you can download your files from one network to another, or to a local machine. There is a link to the WinSCP site at the following link, with instructions on the settings to use: <http://www.cs.siena.edu/Help_Pages/Accessing_Files_Remotely.php>



WinSCP only works on Windows-based machines; for Mac users, there is the program Cyberduck that allows you to copy your files back and forth between your local computer and the network drive.

After installing it on your local machine, select Open Connection and complete the form as shown, but ensuring that you enter your SienaServices username/password.

All your files for this course should go inside the “csis110” folder that is inside your main network data folder.

Note that if you set this up properly you will have remote access to your “Z:” drive from anywhere, but you may not have access to the “common” portion of your “csis110” folder if you are off-campus. Thus, if you need anything from there and plan to work off-campus, copy it to another portion of your “csis110” folder first.

1. **Software:** You will be using Python as your primary programming language.

**Python for Multimedia** can be downloaded at <http://code.google.com/p/mediacomp-jes/downloads/list> (make sure you download the latest version, and if you’re not sure whether you have the right version of Java already installed, use the one with Java included in it).

**Python for Music** sections can download Python from <http://jythonmusic.org> .

Some of the software (circuits, VonNeumann architecture, etc.) is only accessible in Roger Bacon 304, 306, 330, and 350.

1. **Printing**: This also is dependent on where you are and how you print from there. Just be aware that the printers in our labs are not available to you unless you are using one of our computers in that lab, and when you print things, they will be sent to whatever printer(s) are available to the specific computer you are logged into.
2. **Logging out**: This procedure is also specific to where you are.

**5. General Operations**

**Accessing your files**:

When you log in, one of the things available to you will be a “folder” in which you can store information for this course. This folder will be available to you no matter which PC you use or which room you are in. To see what you have in this folder, click on the Windows icon in the lower-left corner of the screen, then click on “Computer”, and your folder will be listed in the “Network Locations” section on the bottom right, with the same name as your login. Your files are actually stored on our file server.

All your files for this course should go inside the “csis110” folder that is inside your main network folder.

**Printing**:

When you issue a print command, the output will come to the printer in that room.

**Capturing Screen Output:**

You can use “Alt-PrintScreen” to capture screen images. After using “Alt-PrintScreen”, your screenshots are saved to the clipboard. Open a document or Paint and paste your image into the file. You may then print or save the screen capture. You can easily crop the screen capture using Paint.

**Sharing files using WinSCP:**

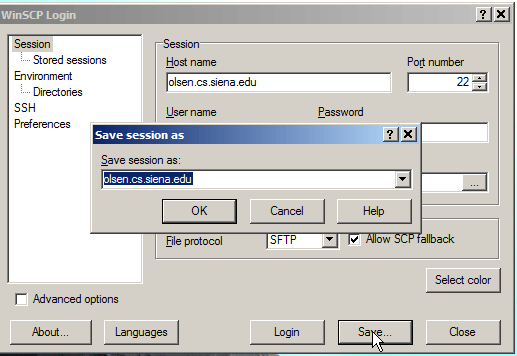
A simple tool for giving "the other" team member a copy of lab work is named WinSCP, and is on all the SOS lab computers. The name stands for Windows Secure Copy. At the end of each lab your team should share the files you created, either via email or by completing the following steps:

ScreenHunter_01 Jan. 12 09.21.gif

**Open** **WinSCP** by double clicking the icon on your desktop.

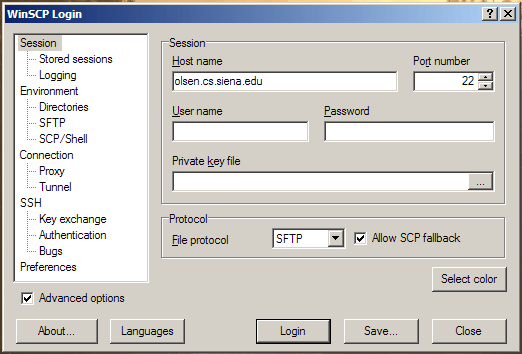
On WinSCP Login Dialog Box:

1. Enter Host name: ***olsen.cs.siena.edu***



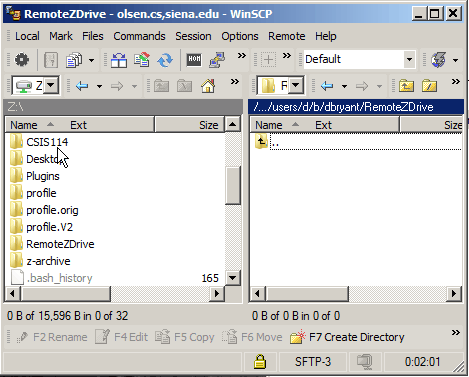
1. Click **OK**, Accepting the Session name
2. Click Save

This section applies to the team member who is ***NOT Logged on*** to the Lab Workstation.

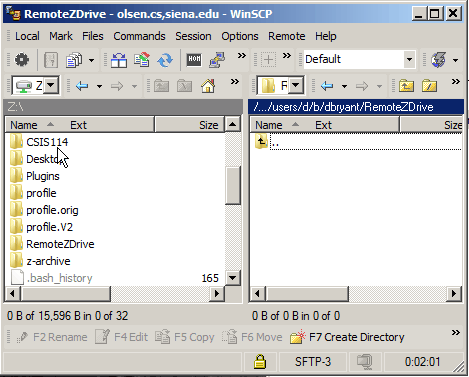
 >>Login to your (the one who needs the files) Z drive by entering your username and password:

**Login**

On the Main WinSCP window note the left (Local) and right (Remote) panels.



*FYI - Local (left) is the storage for the Workstation i.e. for the logged in team member  
 Remote (right) is the Z storage for the team member logged into WinSCP*

>**Navigate** using the tools above the ***left (Local)*** panel to the Z drive until you see the CSIS110 folder

>**Navigate** using the tools above the **right (Remote)** panel to the Z drive until you see the second team member's CSIS110 folder

>**Drag** the desired files from the CSIS110 folder from the left panel to the right panel to create a copy of the desired files for the second team member.

**6. Directory Structure and Drives**

After you log on, you will have access to your local drive (C: drive), as well as to your own space on the Siena network drive. This drive is named Z: , and it is accessible throughout the Siena network. This drive is important, since it contains your lab instructions, sample files for labs and homeworks, and areas in which you will turn in your projects.

The Z: drive has been set up for you with a folder, **csis110.** This folder will contain all files for this course.

Within the csis110 folder is the **common** folder. This is a link to all of the files and documents that exist in our sharable course space, and includes the lab instructions and sample files. You do not have permission to edit any of these files. You will copy them into others parts of your csis110 folder, which you will create (in the diagram below, **MyLabs**). The common folder is divided into areas depending upon which theme your course is using.

Within the csis110 folder you will also find the **hw** folder. This directory contains subfolders for each of the homeworks, and is the location to which you will copy your project work. Do not delete any of the folders we provide for you there.

Read Only

To begin your first lab, you will have to copy the **lab1** folder from **common** into your **csis110** folder. Open the **lab1** folder. There will be a document titled **lab1.docx**, which contains the instructions for completing the lab. Your instructor will hand out the worksheets on which you will record your answers, and to which you will attach your printouts.

Don’t copy all of the directories right away! Sometimes we like to alter or clarify the instructions, so copy the current lab only.