

The Sage Lab for Math-141: An Introduction

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Welcome

Welcome to the computer laboratories and classrooms in the Department of Mathematics at the University of South Carolina. If you are reading this as you are waiting for your lab session to begin, introduce yourself to another student in the lab and wait for your TA to begin the lab.

Instructions

The purpose of this week's lab is for you to become familiar with the network and Sage. You will learn how to login and logout of the network and how to access Sage and the Internet. You will also learn how to install Sage on your personal computer, if you would like. Once this is complete, you will begin to learn about Sage by working through an interactive Sage worksheet.

A. Login and Logout

- When you are seated at a computer on the network, begin the login process by pressing **Ctrl-Alt-Delete**. This will open a window in which you will be asked to enter your username and password. You should log on using your USC network username and password. (This is the same username/password that you use to access your university email.)
- If you have trouble logging onto the network, you will need to look on with someone else for this lab. Before next week's lab, please visit LC 415 for assistance.
- Once you are logged in, take a look at your Windows desktop. You should see several icons, including ones for Google Chrome and Sage 9.2 - Notebook.
- To logout, click **Start** button or press **Ctrl-Alt-Delete**. Click on **Log Off** ... confirm that you want to logout by pressing the button labeled **Log Off**. **Do not turn off the computer.**

B. Installing and Accessing Sage

There are multiple ways to access Sage for this class.

1. You can access Sage on the lab computer by clicking on **SageMath 9.2 - Notebook** on the desktop. Note that using this method will save all Sage workbooks onto the lab computer and not directly into your **Z:** drive. If you want to keep your Sage files, make sure to save a copy on your **Z:** drive before you log out.
2. If you prefer to use Sage on your own computer, then you can download it from the Sage website for free.

Windows: You can only download Sage on Windows if you have a 64-bit operation system and are running Windows 7 or newer. Go to <https://www.sagemath.org/download-windows.html>. Then choose the download server closest to your location. Next, click on the latest version of Sage to begin the download process. Once the download is complete, run the file and follow the instructions to complete the installation. The installation comes with three programs, but we will be using SageMath 9.2 - Notebook, so make sure to add this shortcut to the desktop. For more information about installation, see <https://wiki.sagemath.org/SageWindows>.

Mac: Go to <https://www.sagemath.org/download-mac.html>. Then choose the download server closest to your location. Next, you need to choose either Intel or PowerPC, depending on your CPU. If you are unsure what CPU you have, click on the Apple in the top left of your computer and choose About This Mac. The Processor section will tell you whether you have an Intel or PowerPC CPU. After choosing either Intel or PowerPC, choose the file **sage-8.9-OSX_10.14.6-x86_64.app.dmg**. Once the download is complete, run the file and follow the instructions to complete the installation.

An installation guide for operating systems other than Windows and Mac can be found at <https://doc.sagemath.org/html/en/installation/>.

3. The last option for accessing Sage is to create an account on the website <https://cocalc.com/>. This will allow you to use Sage without having to install anything to your computer. Also, it will save all of your files on the cloud, so you can access them from anywhere. Using Sage via CoCalc is free, but the free account comes with slower speeds than a paid account. However, it does come with a toolbar that has shortcuts to many of the calculus functions we will be using.

C. Notes on Installing Sage

Following the methods described above will install Sage like a normal program for Windows and Mac. However, Sage is designed to be installed via the Command Prompt or Terminal, so the “easy” method may not work. If that is the case and you still wish to download Sage, first try to download a different version and see if that works instead. Otherwise, you may need to install Sage the intended way by using the Command Prompt or Terminal. Some guidance using this method can be found at <https://doc.sagemath.org/html/en/installation/source.html>.

D. Accessing the Internet and Lab Materials

- Internet Explorer is the standard browser provided in our computer labs. An icon for Internet Explorer should be on your desktop. Double click this icon to launch the browser.
- Open the Lab homepage (<http://people.math.sc.edu/calclab/141L-F18>). Add this page to your list of favorite websites.
- The lab homepage contains links to all lab materials such as the Lab Syllabus and additional resources
- From the Lab homepage, click on the **Suggested Lab Schedule/Assignments**. This page contains the weekly lab assignments. For **Lab 1**, you will see links to this handout, the **New User's Tour**, this week's assignment, and related sections from textbooks. The page will be updated weekly.

New User's Tour

- From the Lab Schedule/Assignments page, double click on the **New User's Tour**. Your TA will walk you through this interactive introduction to Sage.
- Note that cells that begin with **In[]** are for executable Sage commands. To execute the cell, Place the cursor anywhere on the cell and press **Shift + Enter**. The result will appear immediately below the command. Other lines are for normal text such as instructions and comments.
- If you want to be able to return to anything you have worked on in Sage, you must save your work as a Sage Notebook. This is done by selecting **Download As...** from the **File** menu, and then choosing **Notebook (.ipynb)**. It is best to save your work to the **Z:** drive so make sure copy the file from the **Downloads** folder on the computer and move it to your **Z:** drive.
- When you have finished (or the lab session ends), please exit your Sage session and logout of the network. Do not forget to save useful work to the **Z:** drive before exiting.

Assignment

Complete the **New User's Tour** if you did not finish in the Lab and your lab instructor may give other assignment for each section.