CS100: Studio 0

Welcome!

September 4, 2019

Instructions:

Welcome to your first CS100 studio! During this studio, you will take care of various administrative necessities, to get you ready for an exciting and productive semester. For example, you will begin by signing the course Collaboration Policy. You will also get started with Markdown, a tool for creating documents that can be converted into web pages, pdfs, etc...

You will complete most studios in a computer lab in the CIT, with your fellow classmates. For this studio only, you can/should do most of your work independently, and then visit the CS100 TAs during office hours to introduce yourselves to them, and get credit for completing this studio. They can also help you with the various studio tasks, as necessary.

To find out when TA hours are held each week, you can check the TA hours here. This week (only), the TAs will be holding extra hours on Monday, so you will have plenty of opportunities to stop by.

Objectives

By the end of this studio, you will have:
- Read and signed a copy of the course Collaboration Policy
- Joined the course on Piazza
- Learned about pair programming
- Learned some Markdown
- Had fun searching for data
- Installed R and RStudio

**Collaboration Policy**

Read and sign the course collaboration policy.

You must submit this form to receive credit for this studio.

**Piazza**

Please sign up for our course on Piazza. Throughout the semester, you can post any questions you have about the course on Piazza, and a TA will reply. Feel free to give it a try now: If you have a favorite data visualization (or can find a cool one quickly), post it as a note and tag it 

studio0

**Pair programming**

During future studio sessions, we will be “pair programming,” meaning that two students will be working together to complete the tasks. To get a better understanding of what to expect, please read this pair programming guide. Note that Amy compiled this guide over a decade ago, when she starting teaching CS 17 / 18.
Once you have finished, please answer these True or False questions. You can jot your answers down on a piece of paper, or type them into a text file. Before you leave studio today, you will need to have them checked off by a TA.

1. One student should be in charge of typing for the entire duration of a studio session.
2. Pair programming is a divide-and-conquer strategy, in which each student works on a different part of the assignment.
3. Pair programming helps students learn more and write better code.
4. It is important to communicate respectfully while pair programming.

**Markdown Tutorials**

All CS100 documents, including this one, are written in Markdown, a simple language for easily generating web pages, pdfs, etc. In a few weeks, we will require that your handins be generated from Markdown, specifically R Markdown. To prepare, you should complete lessons 1-7 of this [Markdown tutorial](#).

**Fun finding data!**

At some point soon, you will find yourself searching for data, so we’re going to practice now.

Electronic data are stored in various formats, including **CSV**, meaning
comma-separated values, and TSV, meaning tab-separated values.

Google can help you search for CSV (or TSV) files. You simply append the file type of interest to the end of your query, as follows:

+filetype:csv

For example, searching for South Africa +filetype:csv produces CSV files mentioning South Africa:

Google: South Africa +filetype:csv

Find a CSV or TSV file on a topic you are interested in. Once you’ve found something, post it on Piazza and comment on why you find the data interesting. (As above, tag your post studio0.) We are always on the hunt for interesting data, so you never know … your file might reappear later on as course material!
Software Installations on a Laptop

All of the necessary software for the course can be accessed on computers in the CIT. (In addition to the rooms where we will be holding studio—CIT 201 and CIT 167, a.k.a. the MS Lab—you may also use the computers in the Sunlab, which is the large room full of computers on the first floor of the CIT.) You may also choose to work on your assignments using a personal laptop. To install the necessary software on a laptop, please follow the instructions below.

At the start of the course, we’ll be using Google Sheets. Sheets comes with your Brown Google account, so you should be able to access it directly from your Google Drive. Visit drive.google.com, and click on **New**, and select **Google Sheets**.

A few weeks into the course, we will add two further tools to our toolkit: R, a programming language tailored to statistics and visualizations, and RStudio, a development environment for R programs. To install this software, follow these instructions:

**Setting up R:**

1. To download R, visit [this link](https://cran.r-project.org/).
2. If you are using a Windows computer download R for Windows, if you are using a Mac download R for (Mac) OS X.

**R for Windows**

Subdirectories:

- **base**: Binaries for base distribution (managed by Duncan Murdoch). This is what you want to **install R for the first time**.
- **contrib**: Binaries of contributed CRAN packages (for R >= 2.11.x; managed by Uwe Ligges). There is also information on third party software available for CRAN Windows services and corresponding environment and make variables.
- **old contrib**: Binaries of contributed CRAN packages for outdated versions of R (for R < 2.11.x; managed by Uwe Ligges).
- **Rtools**: Tools to build R and R packages (managed by Duncan Murdoch). This is what you want to build your own packages on Windows, or to build R itself.

Please do not submit binaries to CRAN. Package developers might want to contact Duncan Murdoch or Uwe Ligges directly in case of questions / suggestions related to Windows binaries.

You may also want to read the R FAQ and R for Windows FAQ.

Note: CRAN does some checks on these binaries for viruses, but cannot give guarantees. Use the normal precautions with downloaded executables.

**Windows:**

Click on **install R for the first time**, and then follow the download instructions:

**Files:**

- **R-3.4.1.pkg**
  - Size: 61 MB
  - MD5 hash: [link]
  - Platform: OS X 10.11 (El Capitan) and higher
  - Contains: R 3.4.1 framework, R app GUI 1.70 in 64-bit for Intel Macs, Tcl/Tk 8.6.6 X11 libraries and Texinfo 5.2
  - Note: the use of X11 (including tcltk) requires XQuartz to be installed since it is no longer part of OS X. Always re-install XQuartz when upgrading your OS X to a new major version.

- **R-3.3.3.pkg**
  - Size: 71 MB
  - MD5 hash: [link]
  - Platform: OS X 10.9 (Mavericks) and higher
  - Contains: R 3.3.3 framework, R app GUI 1.69 in 64-bit for Intel Macs, Tcl/Tk 8.6.6 X11 libraries and Texinfo 5.2
  - Note: the use of X11 (including tcltk) requires XQuartz to be installed since it is no longer part of OS X. Always re-install XQuartz when upgrading your OS X to a new major version.

- **R-3.2.1-osx-leopard.pkg**
  - Size: 65 MB
  - MD5 hash: [link]
  - Platform: OS X 10.6 (Snow Leopard) + 10.8 (Mountain Lion), signed package
  - Contains: R 3.2.1 framework, R app GUI 1.66 in 64-bit for Intel Mac
  - This package contains the R framework, 64-bit GUI (R app), Tcl/Tk 8.6.6 X11 libraries and Texinfo 5.2.
  - Note: the binary support for OS X before Mavericks is being phased out, we do not expect further releases.

**Mac:**

There are multiple R packages for Macs, depending on your installation...
Once you have downloaded R, you can move on to installing RStudio.

**Setting up RStudio:**

In CS100, we use RStudio to write R programs—also called *scripts*—and to view their output (often, data visualizations). RStudio is an IDE for R. IDE stands for “integrated development environment,” which is an application that facilitates writing and executing of code.

Go to the RStudio website. Scroll down as necessary until you can click
on “Download RStudio Desktop”. This link will take you to a table of different products. You should download the first RStudio Desktop product, because it is free!

Once you click on the download link, the .exe file for RStudio should begin downloading. Click the downloaded .exe file and follow the directions on the RStudio setup guide.

Click next to continue when the install wizard opens.
Click next to accept the default install location.
Last step! Click **Install** to accept the default start menu folder and install RStudio!

Click **Finish** to close the wizard.

Once RStudio is installed, open it up to make sure it was correctly installed. You should see a few panels on your screen. The one on the bottom left is called the **console**. If you type R code into the console, and then hit enter, RStudio will run your code, and display the results. As a simple test, enter this line of code into the console, and see what happens:
print("Welcome to the world of data!")

End of Studio

Congratulations! You’ve completed your first CS100 studio. You are now in good shape to complete future, more interesting, assignments.

Please go to TA hours so that a TA can check your work. You must get checked off to get credit for completing this studio.