

BISC/ES 307, Lab 1: Ecoclimate & Public Health

Pre-Lab 1A

INTRODUCTION

This lab will introduce you to the R programming language. Like any language, R is a very powerful and sophisticated tool but it does come with a learning curve and requires patience and practice to learn. Just as if we were learning the a spoken/written language in this class, there are two language learning methods that we'll use to develop our R skills:

- 1) Learning the bottom-up syntax and structure of R (similar to learning vocabulary words and grammar)
- 2) Top-down language immersion by using existing R code (similar to learning by studying abroad in the country that speaks the language)

Throughout this course, the lab exercises are designed to draw on both techniques to build R skills.

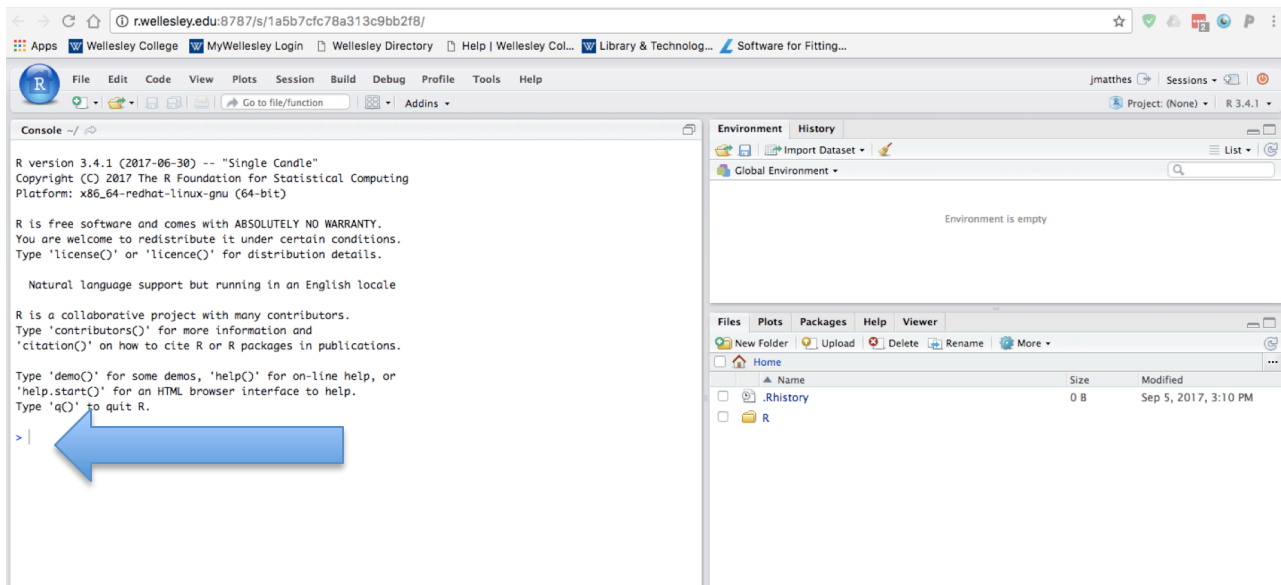
This first lab will address research questions related to the climates of Phoenix and Boston by visualizing real, dense data within R. You'll work through exercises in the R for Data Science book as your Pre-Lab assignment to gain some initial familiarity with visualization in R. It's okay if things are unclear after reading through the R for Data Science book, in fact this is part of the point of the Pre-Lab! In lab, we'll work with these concepts and you'll have plenty of opportunities to ask questions, but the Pre-Lab is designed to give you some context for what we'll be working on in lab and to give you an additional resource to draw on when you run into questions.

PRE-LAB ASSIGNMENTS

1. If you need a laptop for this course, you can get one through the LTS front circulation desk in the Clapp library. If there is any trouble,

please give them my name and email (jmatthes) and have them contact me so that we can get any issues resolved! You should bring your laptop to each lab session.

2. Read through Chapter 1 (the Introduction) of the R for Data Science Book: <http://r4ds.had.co.nz/introduction.html> and skim Chapter 4: <http://r4ds.had.co.nz/workflow-basics.html>
3. RECOMMENDED VERSION: In this course, we'll use a "server version" of R that you can access at this website: <http://r.wellesley.edu:8787> with your user name and password that I sent you in an individual email. Using this R server website will allow you to use R for the whole semester without having to download the software (also I'm happy to show you how to download everything before the semester ends so that you can continue post-Wellesley!). Before lab, you should make sure that your login and password for the server work. You'll know that it worked if you see this after you log in:



To do the Pre-Lab exercises from the R4DS book, you can type the code from R4DS (stuff in the grey boxes) into the console window at the blue ">" indicated by the blue arrow on the above screenshot. This R server

website will work if you are on a campus WiFi network, but if you try to access it off-campus you'll need to log-in by VPN (same process as if you're trying to access a journal article from off-campus):

<http://www.wellesley.edu/lts/techsupport/sslvpn>

4. ALTERNATIVE TO STEP 3: Download and install the following programs for the correct operating system of your laptop:
 - i. R (you MUST install R before installing Rstudio): <https://cran.r-project.org/>
 - ii. Rstudio Desktop (free open source license): <https://www.rstudio.com/products/rstudio/download/>
 - iii. If you prefer to work with R downloaded on your laptop, you'll need to install individual R packages as we go along, starting with the "tidyverse" as described in the R4DS book, Chapter 3 – occasionally there are conflicts with package versions and operating systems, which is part of the motivation for using the website server version of R, which already has the packages for this course installed.
5. Read and work through sections 3.1-3.6 in the R for Data Science Book: <http://r4ds.had.co.nz/data-visualisation.html>

ASSIGNMENT: For your Pre-Lab 1A assignment (2 points, credit/non) you should submit answers/attempts at answers to at least three of the end-of-section questions via Sakai before Monday, September 11 at 10pm. You only need to attempt to answer three questions total, not all the questions for three total sections! You can pick any questions that you'd like. You should submit a document with your answers as a .PDF titled:

BISC307_PreLab1A_YOURLASTNAME.pdf Your Pre-Lab Assignment will not be graded, but is designed as an opportunity for you to become familiar with some concepts that will come up in lab before we start.