SOP 06: Introduction to Rstudio Server and Github

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August 18, 2017

1 Introduction

As students of the environment in this course, our ability to have substantive scienctific discourse rests upon our ability to draw meaningul conclusions from observations or data. In dealing with the problems of data, as in other sciences, we will utilize the language of statistics and mathematics to deal with the complexity of environmental issues. This enables us to rely on powerful statistical and computational tools that have been developed to deal with data - in particular open source software like R, Rstudio and Git.
Once you get the hang of using these programs, you will be equipped to do many kinds of interesting and powerful analyses. However, becoming facile in using these programs can feel a lot like learning how to walk. We need to approach this process in discrete steps. The following pages will explain more about what Rstudio and Github are, as well as guide you through an excercise that connects the functionality of both programs!

1.1 Purpose

This document is intended as a resource and guide to help you understand how to:

- Create projects in Rstudio and connect them with your peers so you can collaborate online using Github repositories.
- Troubleshoot when you run into problems "pushing", "pulling" and "merging" your work with your collaborators.

2 Background

2.1 What is R?

2.2 What is Git and Github?

2.3 Why does it matter? Collaboration

3 Connecting Rstudio and Github: The "Beginner's Luck" Excercise

Now that you know what Rstudio and Github are this excercise will guide you through the processes of connecting the two together. This process will require several steps in which you will have to go back and forth between Rstudio and Github.

Step 1: Sign into your Rstudio Server Account

Since we will be using the server version of Rstudio all you need to do is login to your Rstudio Account:

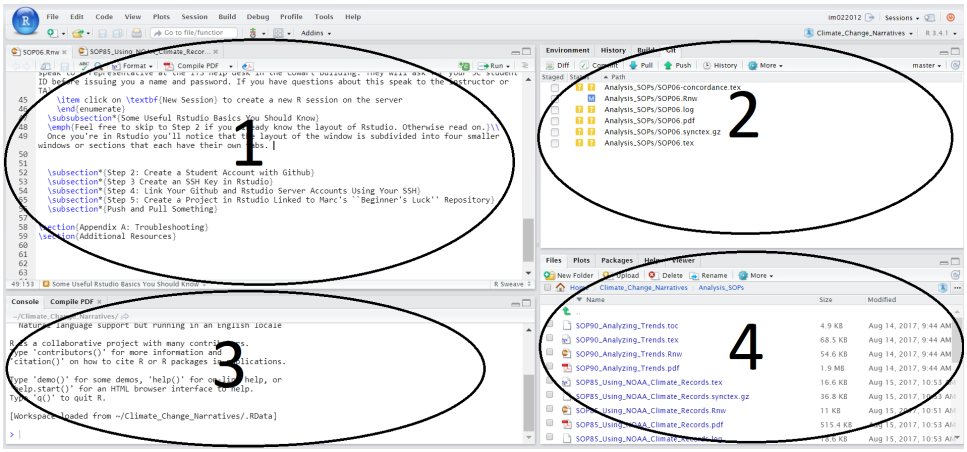
1. Using your computer's web browser go to `https://rstudio2.campus.pomona.edu` to access your Rstudio account
2. Login using your Pomona College user ID and password [1]
3. click on **New Session** to create a new R session on the server

[1] Non-Pomona students must first speak to a representative at the ITS help desk in the Cowart Building. They will ask for your 5C student ID before issuing you a name and password. If you have questions about this speak to the instructor or TA

Some Useful Rstudio Basics You Should Know

Feel free to skip to Step 2 if you already know the layout of Rstudio. Otherwise read on.

Once you're in Rstudio you'll notice that the layout of the window is subdivided into four smaller windows or sections that each have their own tabs.



1. The first window is your **Document** window. Everytime you open or start a new file it will open up here. Rstudio has the capacitity to write many types of files including:

   - R markdown files (.Rmd) which are useful to quickly and easily embed R code into different formats. Once you've written up your R code you can use the KnitR package to easily convert them to a good looking, Microsoft Word, PDF or HTML file.
   - R Sweave (.Rnw) and TeX (.TeX) files to use the typesetting functionalities of the LaTeXlanguage to produce documents with embedded R code and output.
   - Shiny App files to make interactive web applications and data visualization tools

2. The Second Window is where you'll find your **Environment** and **Git** tabs. This window is used to track changes to your R "environment" and your local repository. You will learn to rely on this window once you actually begin loading and working with data in R. For now think of it as a the place which shows you all the data, variables and functions your working with in R.

3. The third window is the **Console** window. This is like the command line in Rstudio for executing R code. Although you can write your code in your document (Window 1), anytime you actually wish to run a line of code or script it must first go into the console.

Additionally this window displays the results of most computations and commands given to R. For example if you type 1 + 2 in the console and hit enter it should display a 3 as output.

4. Window 4 has several tabs including **Files, Plots, Help** to name a few. The Files tab is a graphical user interface (GUI) to help you open, edit and manage the files in your directory. WHile working in Rstudio you will oftentimes find yourself pulling in data, images and information from different files so this tool is very handy for keeping track of where things are saved.
   Any you make a plot, image or graphic of your data means you'll be pulling in many

Step 2: Create a Student Account with Github

Now that you know how to sign into Rstudio, Open a new browser tab or window and follow these steps to get started using Github:

1. Go to `https://github.com/join`
2. Fill in your information in Step 1 to create a new account. Be sure to use your student email address (with a .edu ending) in case you ever want to upgrade your account to a discounted Student account.
3. in step 2 choose the basic/free plan. Should you ever want to create your own private repositories in the future you can upgrade to a discounted student account using the request form here: `https://education.github.com/` For now, the basic plan will suffice for the needs of our class.
4. in step 3 fill out the remaining questions, you can choose research and project managements as as your interests for using github
5. **Verify your email address** by clicking on the link that was automatically sent to your email address

Step 3 Create an SSH Key in Rstudio

Now that you have an active Github account, return