# Software Setup

## Day 1 PM

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# Agenda

- Installing R and RStudio IDE
- Starting a script in RStudio
- Getting syntax figured out

# Installing and Familiarizing Yourself with R and RStudio

# R

R is downloadable via the CRAN (Comprehensive R Archive Network).

You will need to choose the R distribution download suitable for your operating system (i.e. macOS, Windows, or Linux).

Go ahead and follow the instructions at the download link, ensure that the program downloads properly, and stored in a familiar location on your computer.

# RStudio

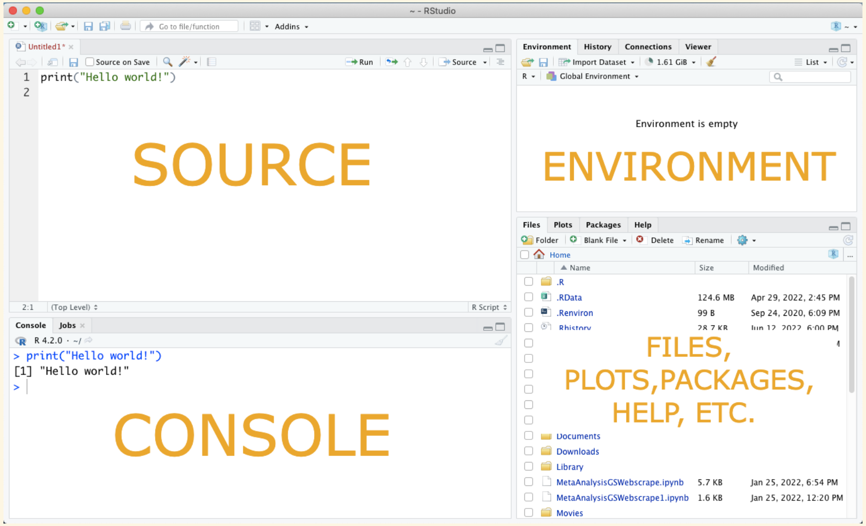
Next, visit the RStudio site.

RStudio is an environment that makes working in R and other programs a little more manageable.

You can choose between the Cloud or Desktop version. If you choose the Desktop version, follow the download guidelines given your operating system and ensure again that the program stores in a familiar location on your computer.

# Navigating RStudio

Upon completing download of both R and RStudio, you may open up RStudio and browse around. You will see that the RStudio interface has 4 primary panes.



```
print("Hello world!")
```

```
> print("Hello world!")
[1] "Hello world!"
>
```

| Name | Size | Modified |
|---|---|---|
| .R | | |
| .RData | 124.6 MB | Apr 29, 2022, 2:45 PM |
| .Renviron | 99 B | Sep 24, 2020, 6:09 PM |
| .Rhistory | 28.7 KB | Jun 12, 2022, 6:00 PM |
| Documents | | |
| Downloads | | |
| Library | | |
| MetaAnalysisGSWebscrape.ipynb | 5.7 KB | Jan 25, 2022, 6:54 PM |
| MetaAnalysisGSWebscrape1.ipynb | 1.6 KB | Jan 25, 2022, 12:20 PM |
| Movies | | |

Basic RStudio Pane Layout

1. In the SOURCE pane, write editable and savable scripts of code. All R source code has the file format ".r".

- To run a line of code, you can either click the Run button at the top of the script pane, or press `Cmd/Ctrl + Enter` on your keyboard.
- To run chunks of your script, you can highlight the relevant code and then perform this same operation while the code text is highlighted. To run the full script you can simply press `Cmd/Ctrl + Shift + Enter`.
- Commenting on your code is one of the most important practices to develop early on in programming. To do so in R, simply begin a line of code with `#`. This will prevent the program from running whatever is written at that line in the script. Note that for every line of comments you will need to input a new `#`.

```
# Imagine here is where I am going to put information about this variab
wars_1920

# And here is where I will explain why I ran this test.
t.test(wars_1920~industrial)
```

1. The CONSOLE is the default location to display code output as well as previously run code. You can also run code in the console itself, however this is not advisable as earlier codes cannot be edited, and you cannot save an editable script as is possible in the source pane.

Running code sometimes also takes a long time or is prone to bugs, while you run code a STOP sign will appear in the upper right hand corner of the console. Should you need to force stop code, pressing this stop button should discontinue the operation.

1. The R ENVIRONMENT contains the names and details of all objects that have been programmed into R's local memory. The R environment panel also has a few other tabs for history, connections, Git, and object viewing. These tabs are not immediately relevant and we will address them later in the text, as necessary.

1. The FILES, PLOTS, PACKAGES, HELP is another multi-use pane, with tabs that will likely all be relevant to you.

   > - The *Files* tab will allow to open and interact with files that are available in your directories accessible from your local, git, or cloud workspace. The *Plots* tab displays all the image or graph outputs from the source code.
   >
   > - The *Packages* tab lists all the installed packages, with checkboxes that indicate whether or not the package has been loaded for use.
   >
   > - Finally, the *Help* tab allows access to all R package help files avaible on the CRAN. You can query a specific package's help file in the search bar on the Help tab, or you can call for a specific help file in the source code or console. More on these topics will be addressed in the chapters to come.

To begin writing and editing code in R, you will click the blank page icon in the top left hand corner. When a drop down menu gives you a number of options to choose from, choose R Script. There are other options of new sheets that you can open and edit in R, but for now we will focus on the most basic script. From now and through the rest of this course, you should assume that R usage and coding activities will be moderated via RStudio, as opposed to the base R program.

# Why R?

Oftentimes, students ask *why* they will learn R rather than other potential statistical analysis programs, such as STATA.

> - The easy and clearest answer is that R and it's cognate applications are all open source. This means that R and any additional packages in R are free to use. In addition to being free, open source coding also means that the back-end development codes are open and free to reproduce and modify.
>
> - R's package diversity, data visualization capabilities, and relative age to other programs are also reasons that we might argue for the emphasis on R. Other languages are not yet as popular, it may take some time before languages such as Python become as accessible and necessary for training in quantitative social science.