Today's Agenda

Installing and configuring R and RStudio

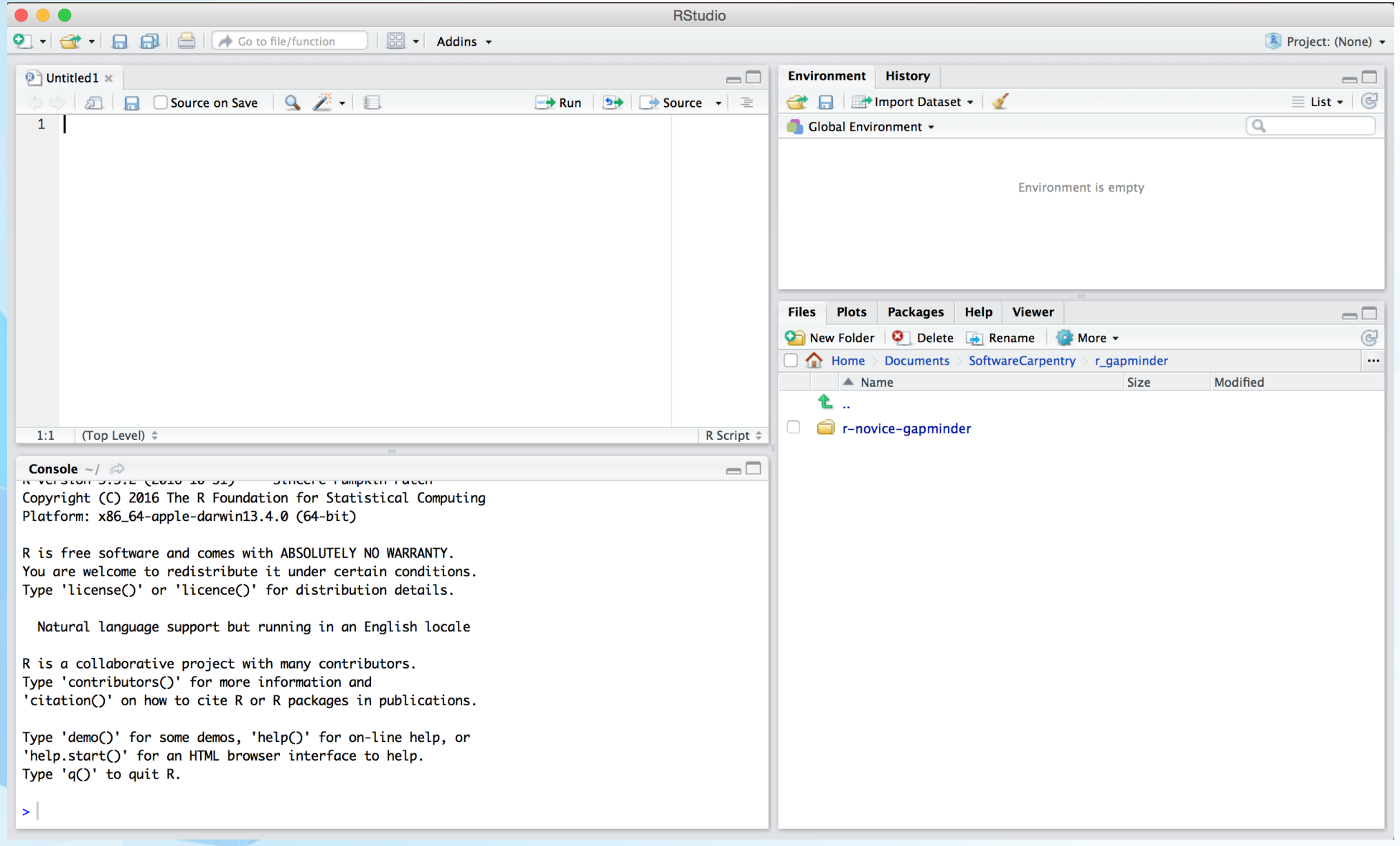
Justin Leinaweaver (Spring 2024)

R

RStudio

R: Engine	RStudio: Dashboard
	

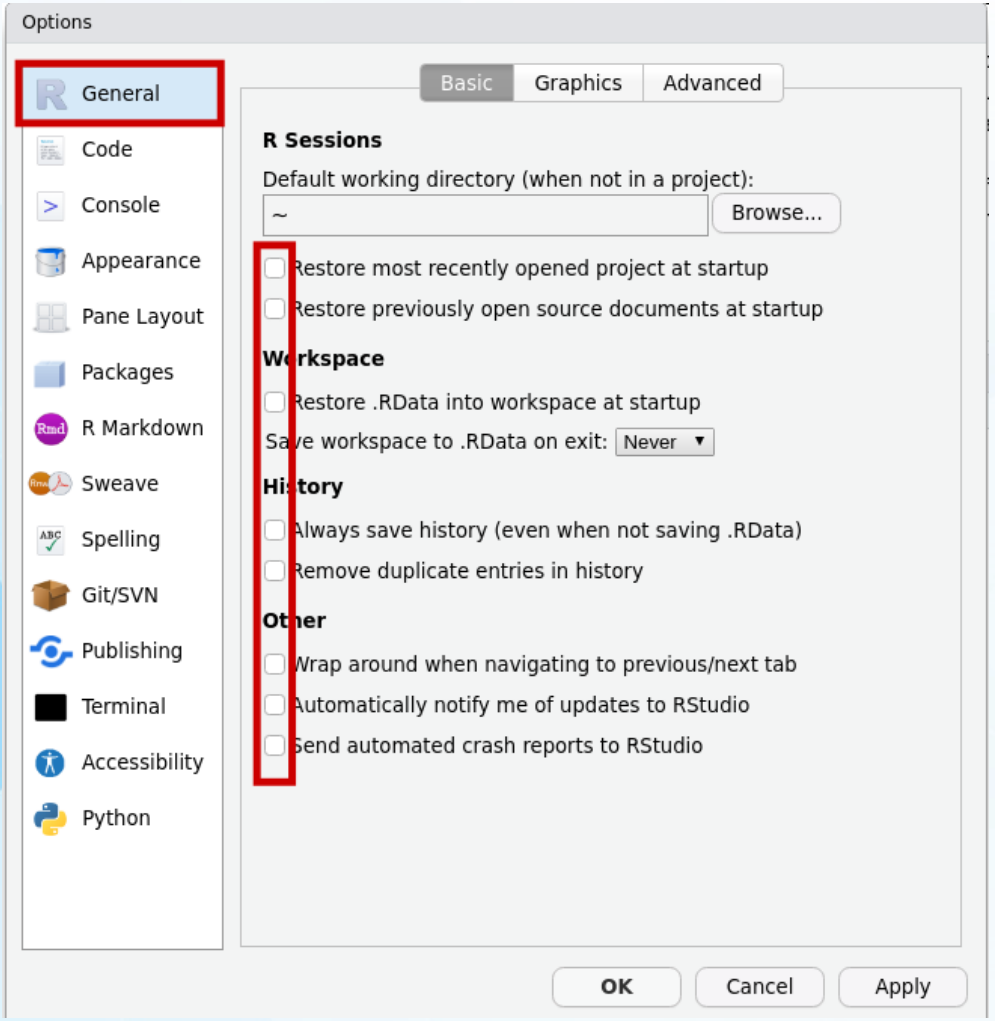
FIGURE 1.1: Analogy of difference between R and RStudio.


RStudio
Go to file/function
Addins
Project: (None)
Untitled1
Source on Save
Run
Source
1
1:1
(Top Level)
R Script
Environment
History
Import Dataset
List
Global Environment
Environment is empty
Files
Plots
Packages
Help
Viewer
New Folder
Delete
Rename
More
Home
Documents
SoftwareCarpentry
r_gapminder
Name
Size
Modified
..
r-novice-gapminder
Console ~/
Copyright (C) 2016 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin13.4.0 (64-bit)
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
Natural language support but running in an English locale
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
>

1. Open RStudio

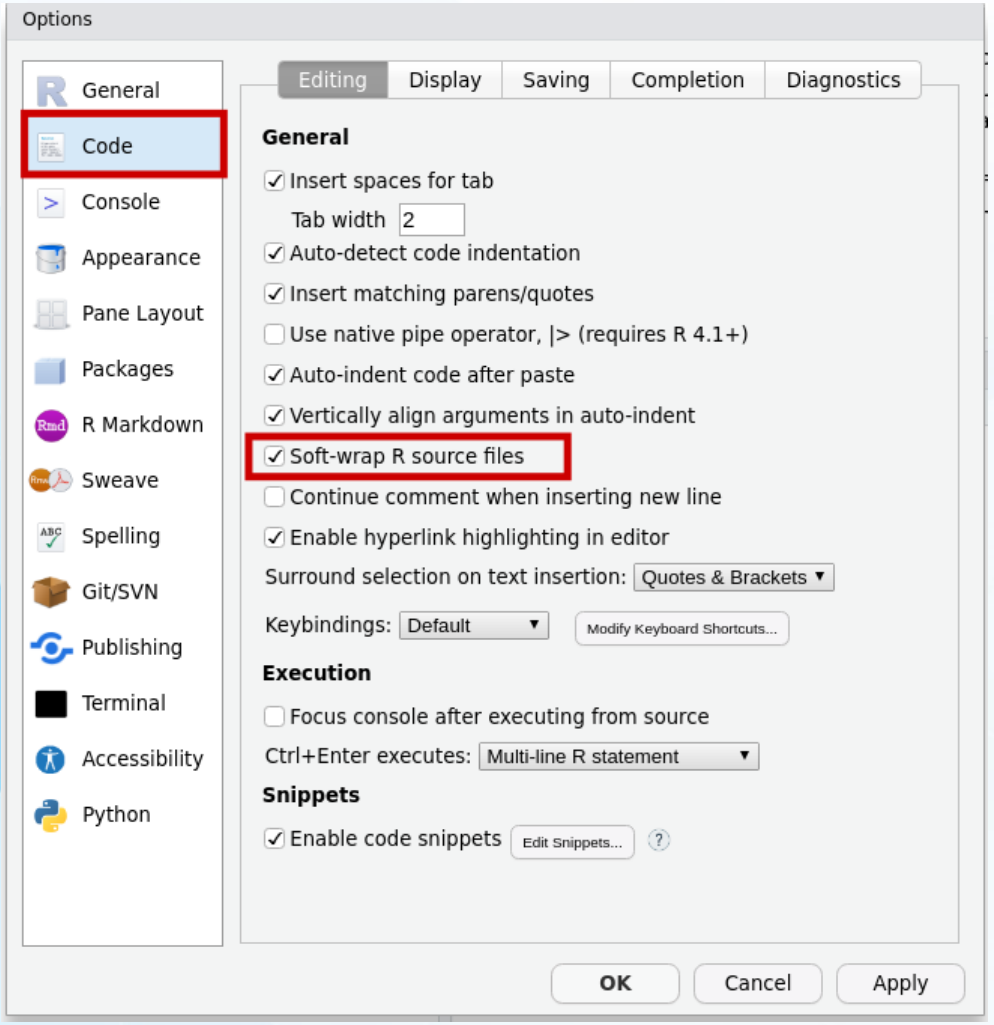
2. "Tools" → "Global Options"

3. Uncheck all boxes in "General"



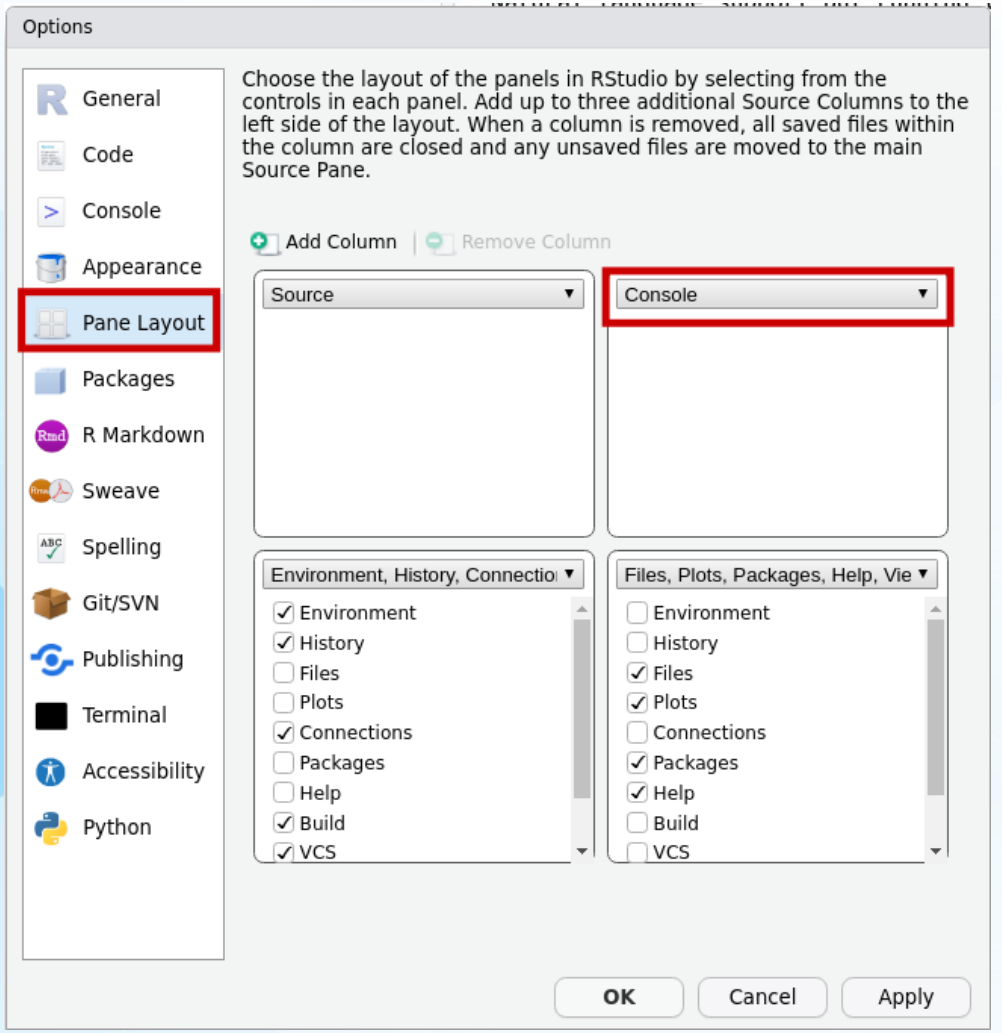
1. "Code" page

2. ✔ soft-wrap R source files



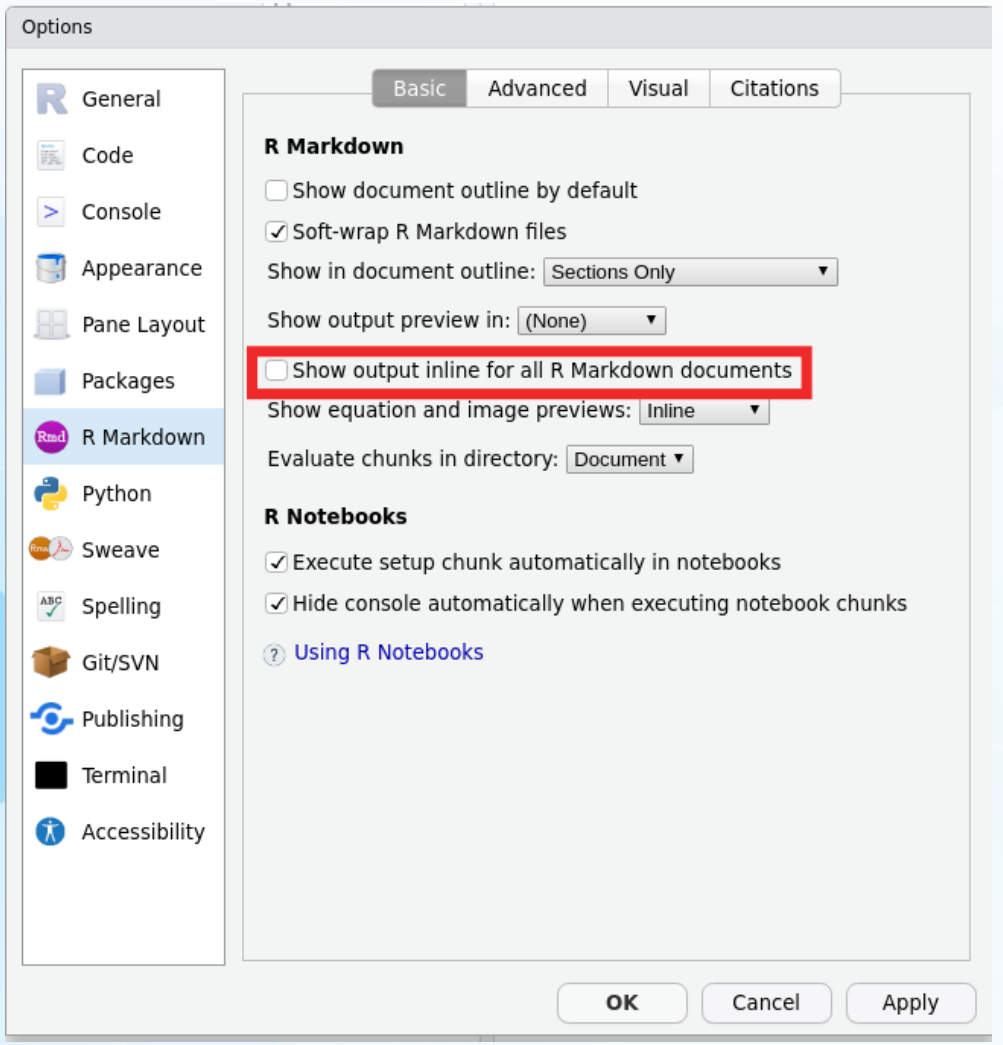
1. "Pane Layout" page

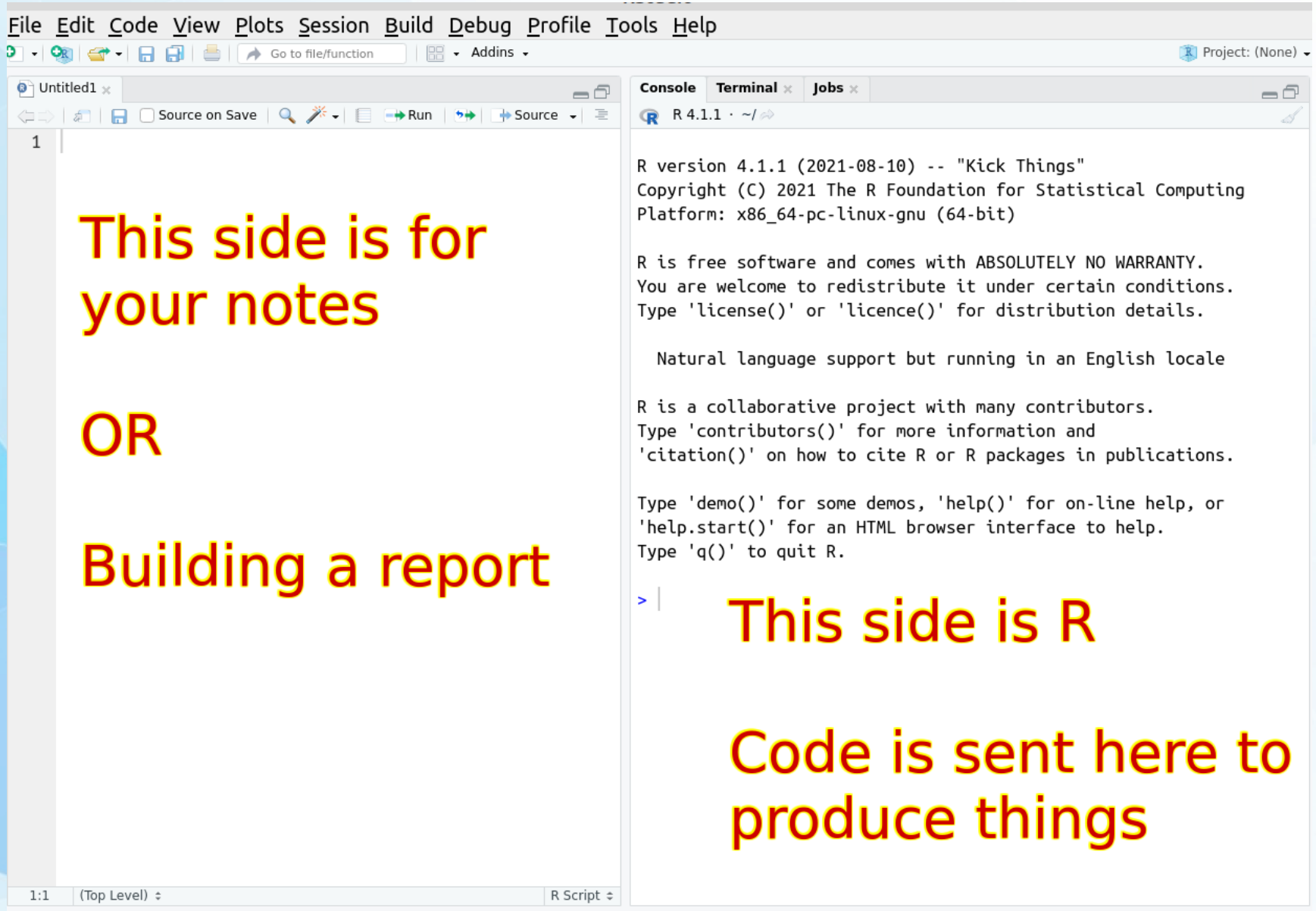
2. Move the "Console" to the top-right box



1. "Rmarkdown" page

2. Uncheck "Show output inline..."

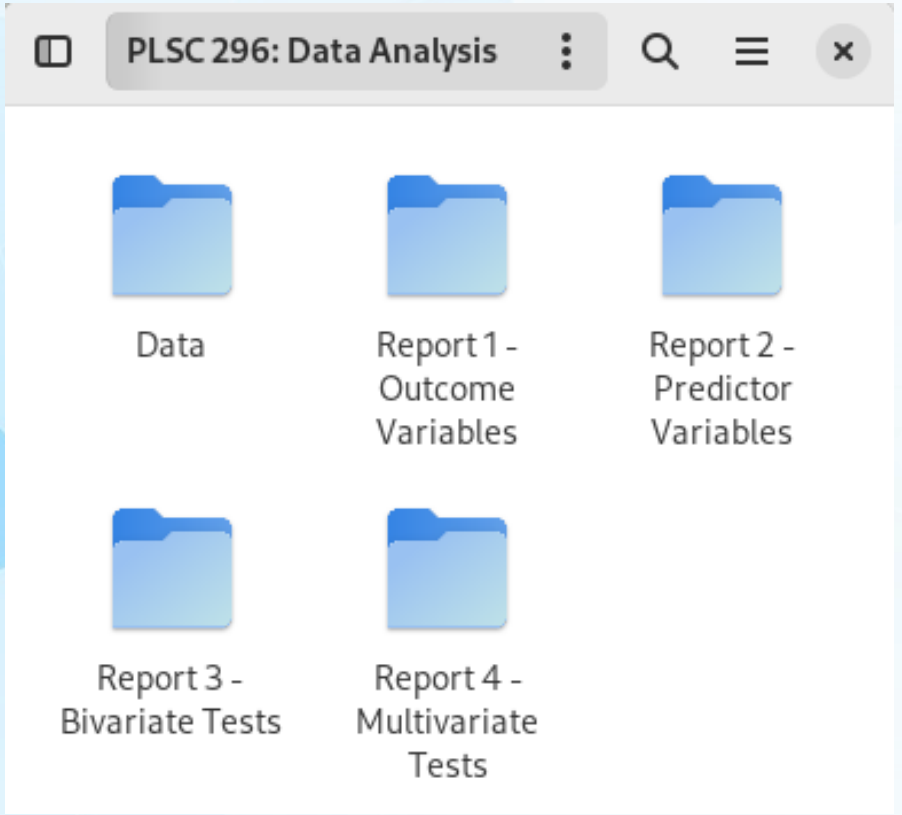



File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Untitled1
Source on Save
Run
Source
1
This side is for your notes
OR
Building a report
1:1
(Top Level)
R Script
Console
Terminal
Jobs
R 4.1.1 · ~/
R version 4.1.1 (2021-08-10) -- "Kick Things"
Copyright (C) 2021 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (64-bit)
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
Natural language support but running in an English locale
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
>
This side is R
Code is sent here to produce things

Organize your Semester: Data and Notes

Include:

- A top-level folder for the class,
- A folder for the data, and
- A folder for each report



Create a script file: Getting_Started.R

Option 1

"File"

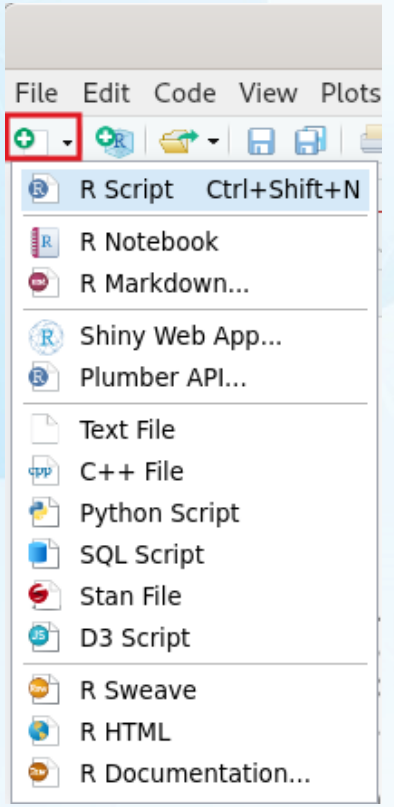
↓

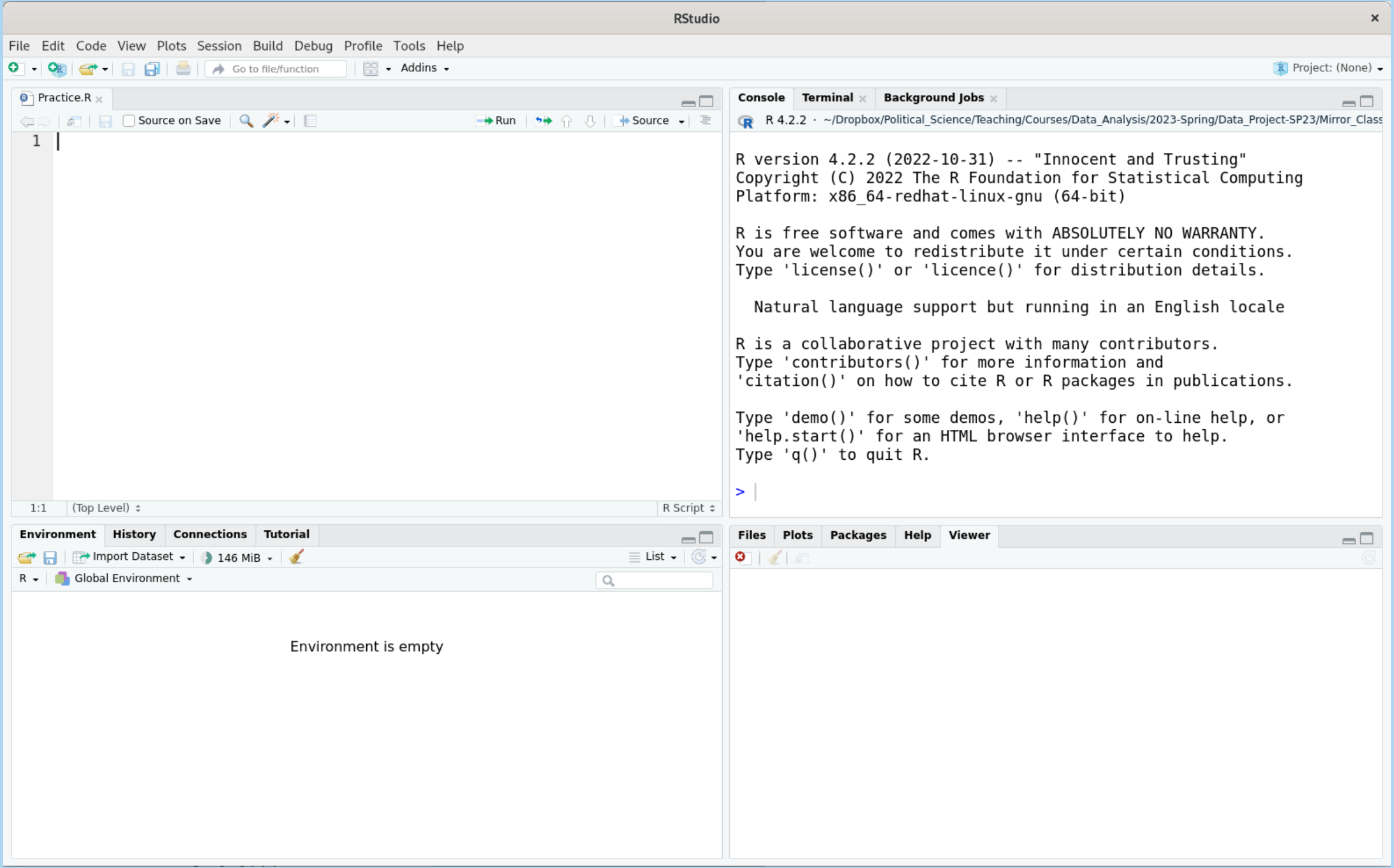
"New File"

↓

"R Script"

Option 2




RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Practice.R
Source on Save
Run
Source
1
1:1
(Top Level)
R Script
Console
Terminal
Background Jobs
R 4.2.2 · ~/Dropbox/Political_Science/Teaching/Courses/Data_Analysis/2023-Spring/Data_Project-SP23/Mirror_Class
R version 4.2.2 (2022-10-31) -- "Innocent and Trusting"
Copyright (C) 2022 The R Foundation for Statistical Computing
Platform: x86_64-redhat-linux-gnu (64-bit)
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
Natural language support but running in an English locale
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
>
Environment
History
Connections
Tutorial
Import Dataset
146 MiB
List
R
Global Environment
Environment is empty
Files
Plots
Packages
Help
Viewer

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins | Project: (None)

Practice.R*

Source on Save | Run | Source

```
1
2
3  # Write notes preceded by a '#'
4
5  # This tells R and RStudio these lines are not code to be evaluated
6
7  # So, take lots of notes as you work BUT don't forget the '#'
```

7:62 (Top Level) R Script

Console Terminal Background Jobs

R 4.2.2 · ~/Dropbox/Political_Science/Teaching/Courses/Data_Analysis/2023-Spring/Data_Project-SP23/Mirror_Class

```
R version 4.2.2 (2022-10-31) -- "Innocent and Trusting"
Copyright (C) 2022 The R Foundation for Statistical Computing
Platform: x86_64-redhat-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

  Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

>
```

Environment History Connections Tutorial

Import Dataset | 259 MiB | List

R | Global Environment

Environment is empty

Files Plots Packages Help Viewer

Using R as a Calculator

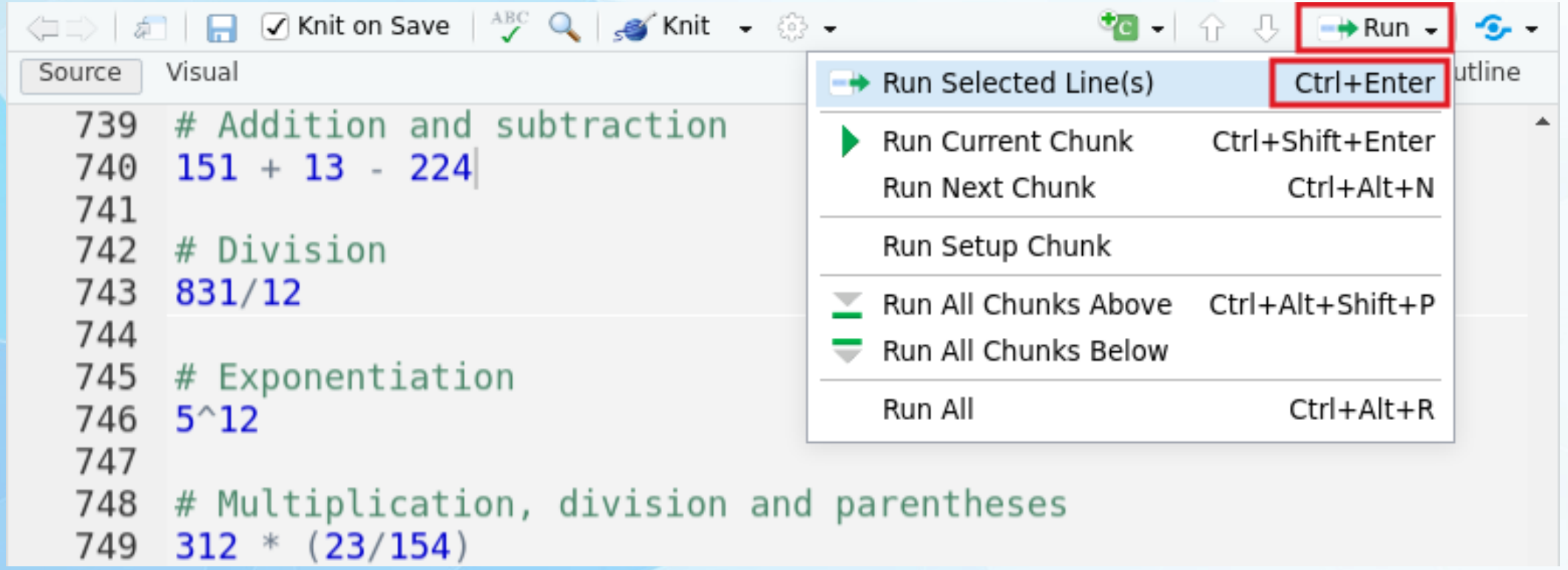
Function	Description
x + y	Addition
x - y	Subtraction
x * y	Multiplication
x / y	Division
x ^ y	Exponentiation

```
# Addition & subtraction
151 + 13 - 224

# Division
831/12

# Exponentiation
5^12

# Multiplication,
# division and parentheses
312 * (23/154)
```


Knit on Save
Knit
Run
Source
Visual
Run Selected Line(s) Ctrl+Enter
Run Current Chunk Ctrl+Shift+Enter
Run Next Chunk Ctrl+Alt+N
Run Setup Chunk
Run All Chunks Above Ctrl+Alt+Shift+P
Run All Chunks Below
Run All Ctrl+Alt+R
739 # Addition and subtraction
740 151 + 13 - 224
741
742 # Division
743 831/12
744
745 # Exponentiation
746 5^12
747
748 # Multiplication, division and parentheses
749 312 * (23/154)

Using R for simple relationships

Function	Description
x < y	Less than
x <= y	Less or equal to
x > y	Greater than
x >= y	Greater or equal to
x == y	Equal to
x != y	Not equal to

```
# Less than
22 < 234

# Greater than
67 > 5366

# Equal to
7 == 32

# Not equal to
7 != 32
```

Using R for Vectors of Data

```r
# Save a list of numbers as the object 'x1'
x1 <- c(64, 57, 52, 58, 67)

# Print the numbers in the object
x1

# Do math on the vector
x1 + 10
x1 * 3

# Check relationships on the vector
x1 > 56
```

Installing Extra Packages

```
# Install packages with extra tools

# Readxl let's you input Excel files into R
install.packages("readxl")

# Tidyverse makes tons of statistics work easier
install.packages("tidyverse")
```

Let's Install R!

1. http://www.r-project.org/

2. Click on “CRAN.”

3. Select a site near you or “0-Cloud,”

Windows

- "Download R for Windows"
- "Download and Install R"
- Select "base"
- Download the .exe and run it

macOS

- "Download R for (Mac) OS X"
- Click .pkg under "Latest release"
- Run the .pkg file

Let's Install RStudio!

https://posit.co/download/rstudio-desktop/

1) Scroll down to "All Installers"

2) Download and run the file for your OS