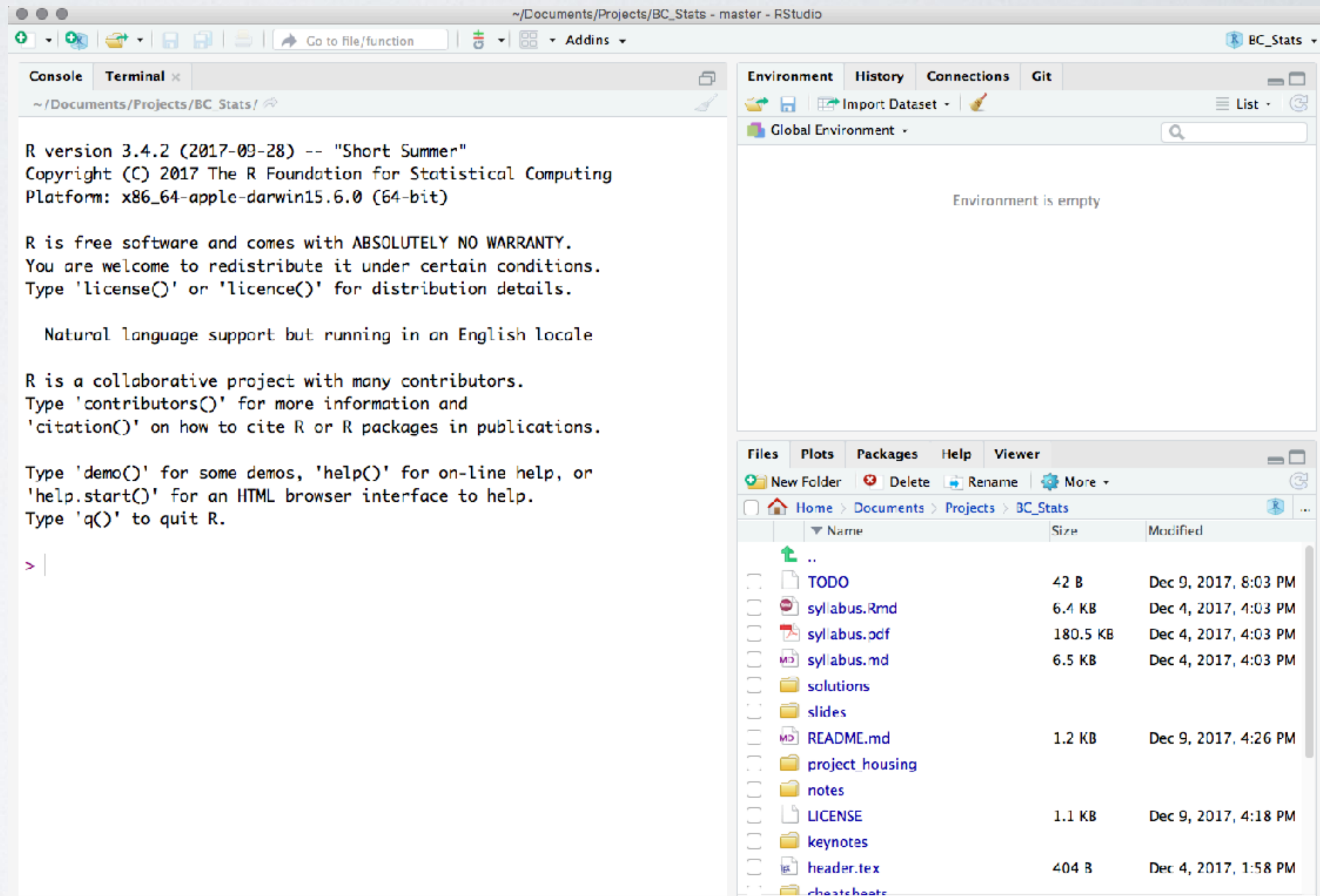


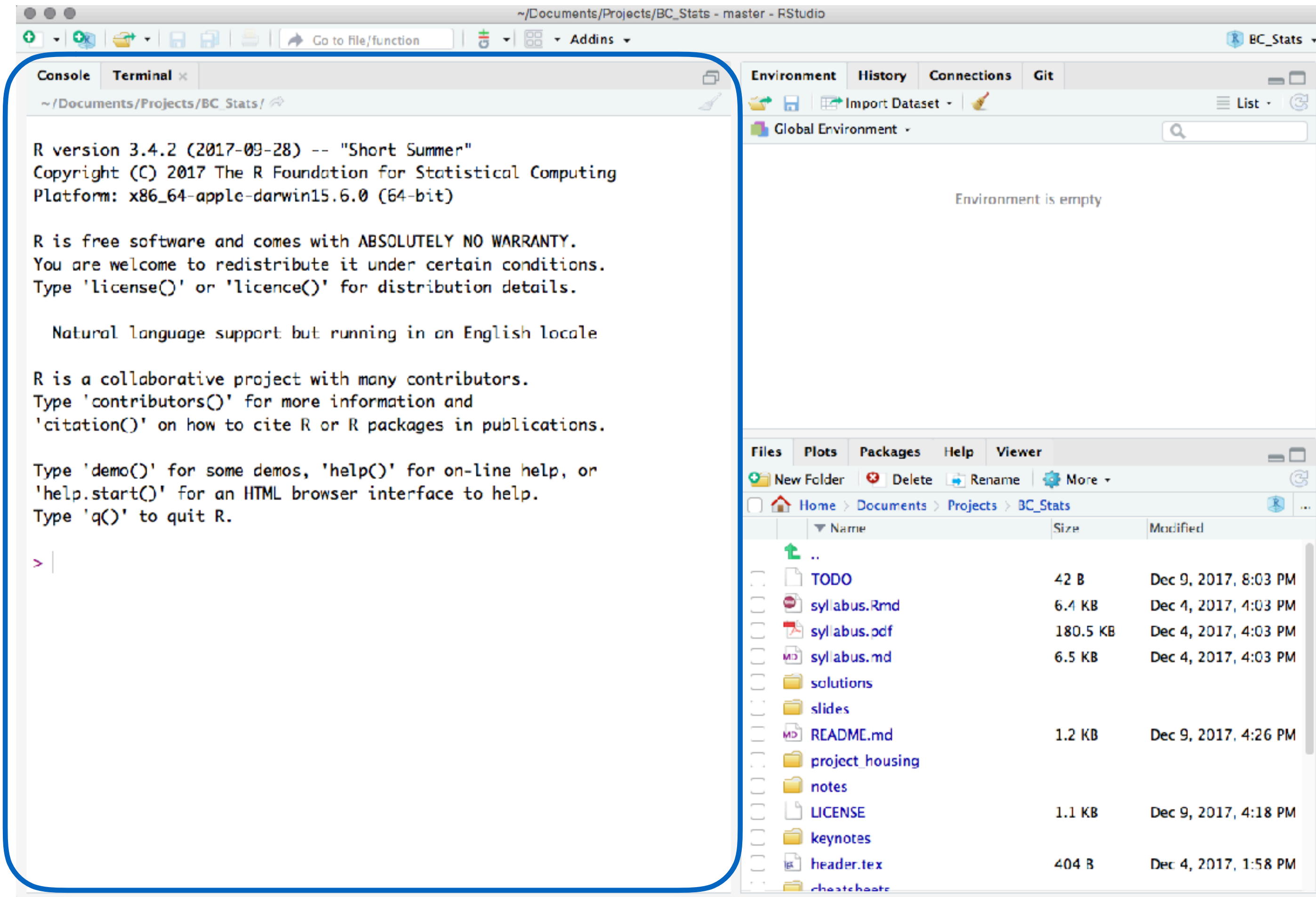
Getting Started with R and RStudio

Your Turn

If you haven't already,
open up the
r_intro_bc_stats.Rproj
file.

This should open up
RStudio.





Console

R is awaiting your instructions

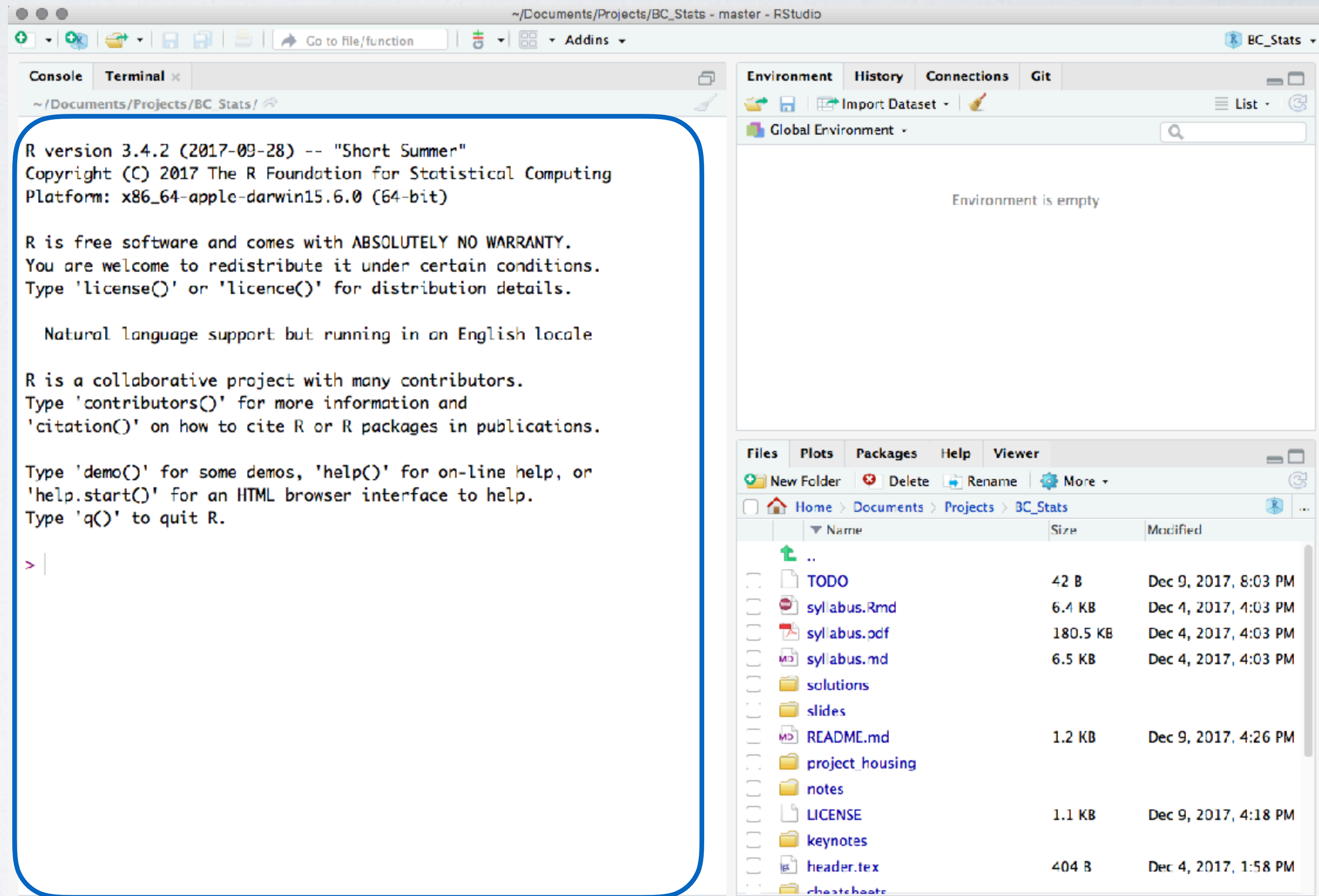
You can type code here, hit Enter, and R will evaluate it

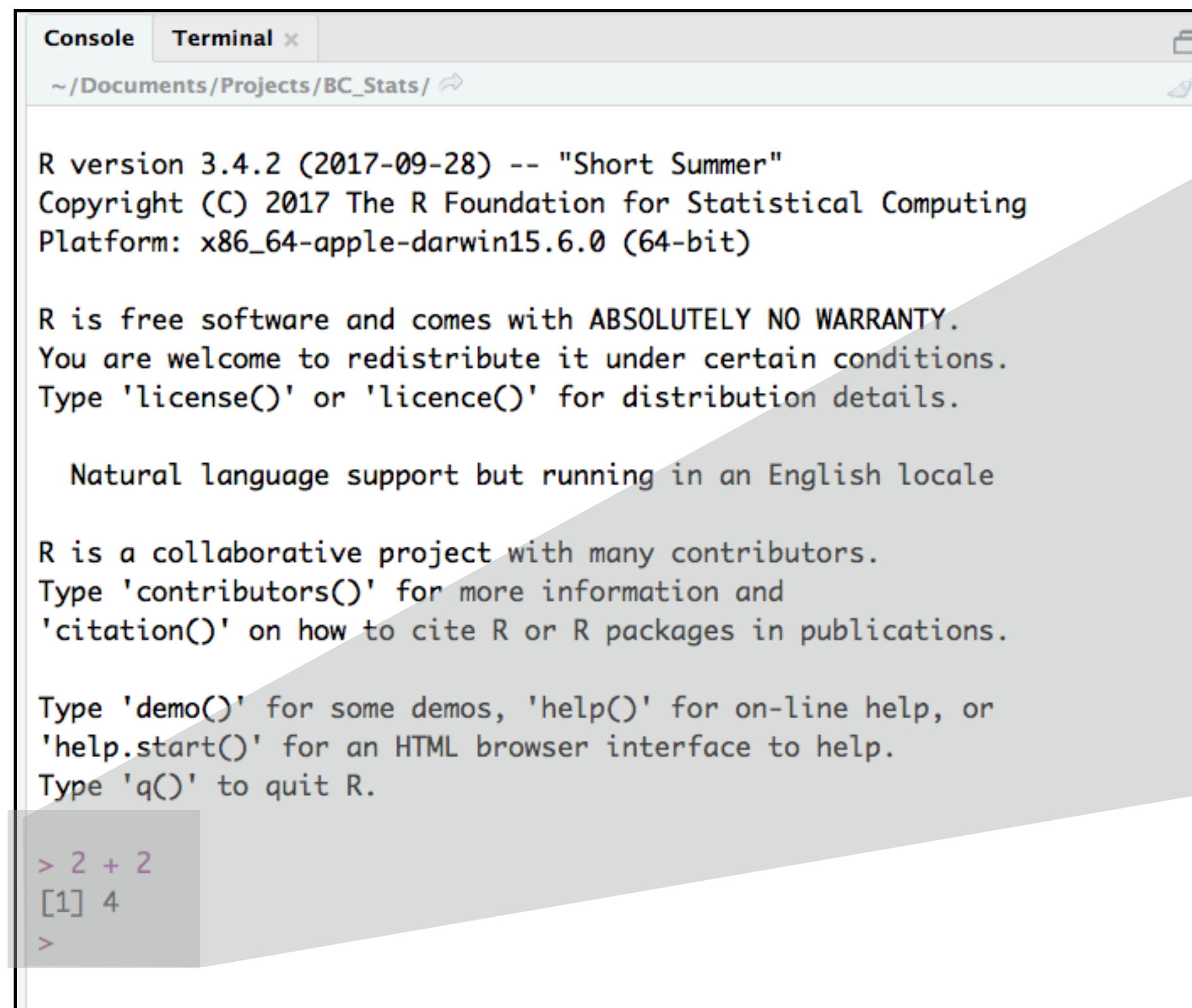
Your Turn

Into the console, type:

$2 + 2$

Then hit Enter





Console Terminal x

~/Documents/Projects/BC_Stats/

R version 3.4.2 (2017-09-28) -- "Short Summer"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin15.6.0 (64-bit)

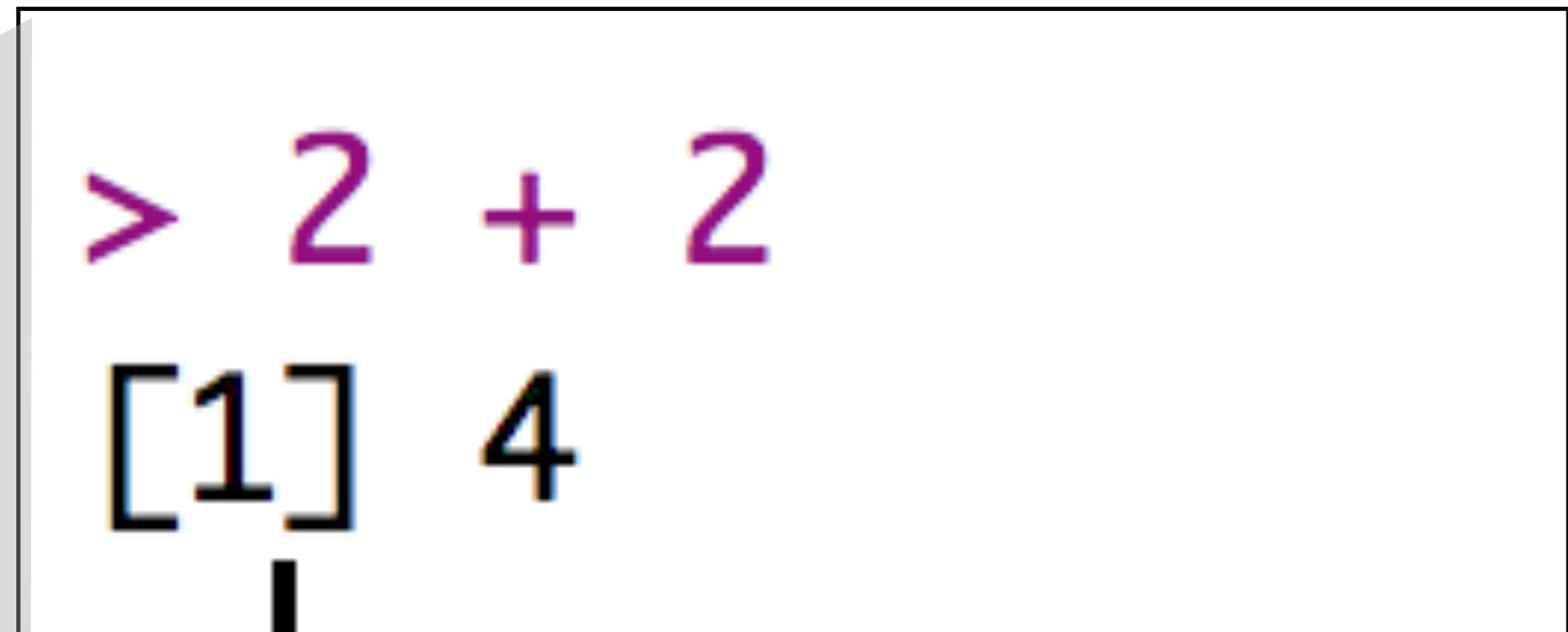
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

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.

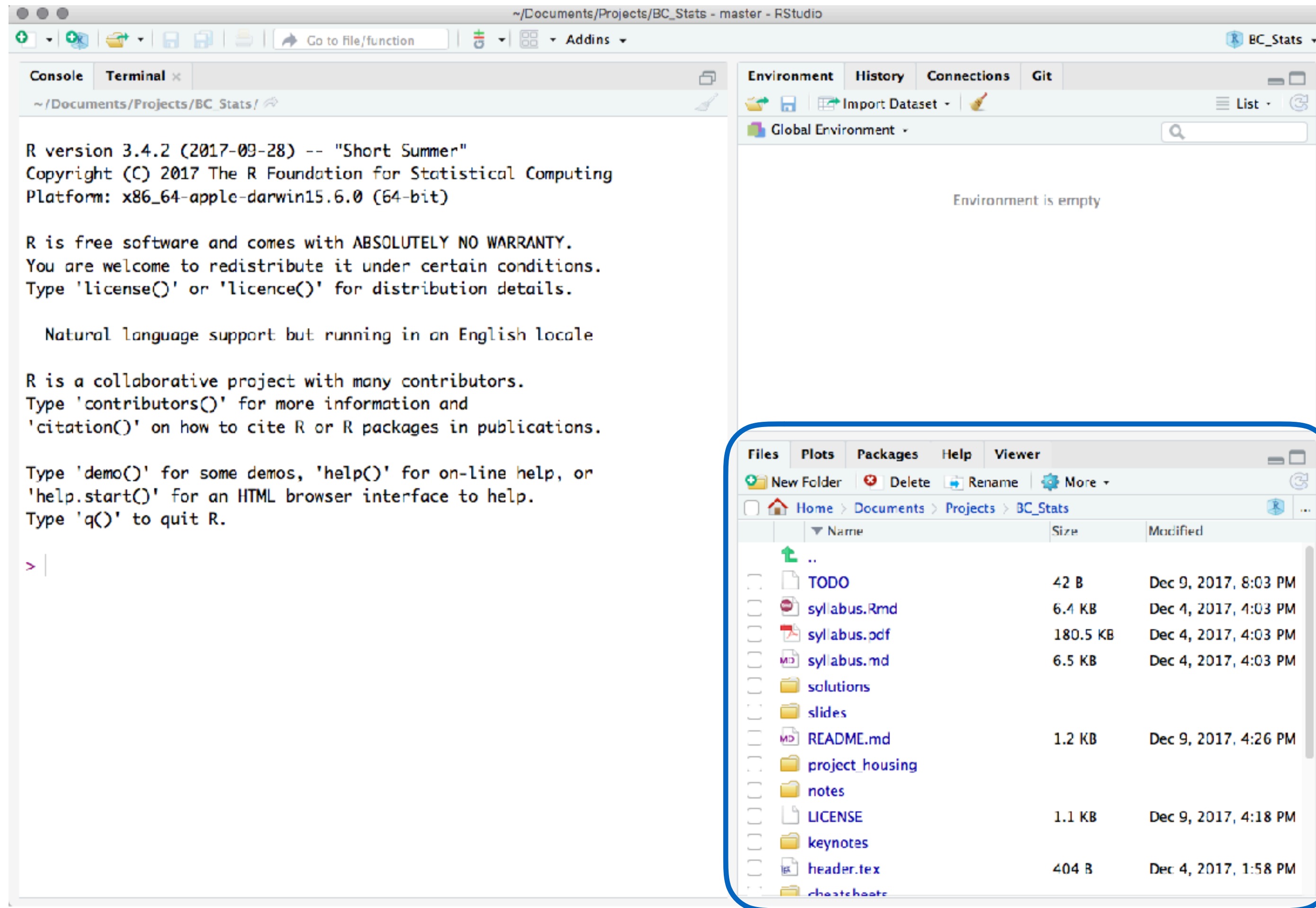
```
> 2 + 2  
[1] 4  
>
```



```
> 2 + 2  
[1] 4  
|
```

You asked, and R answered,
but this is ephemeral.

In practice you'll keep your R code in a
document.

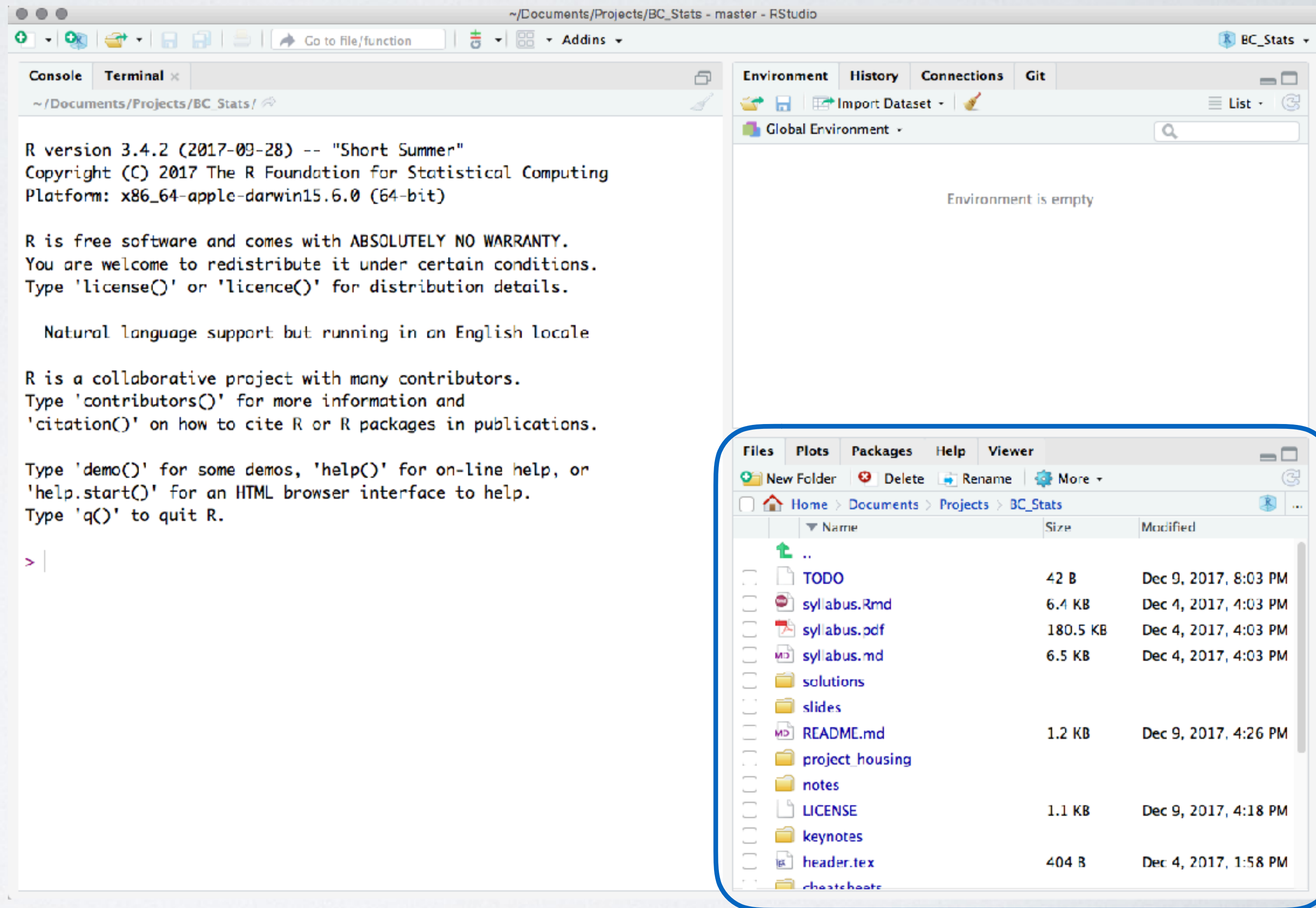


Files Pane

Files in your current working directory.

Your Turn

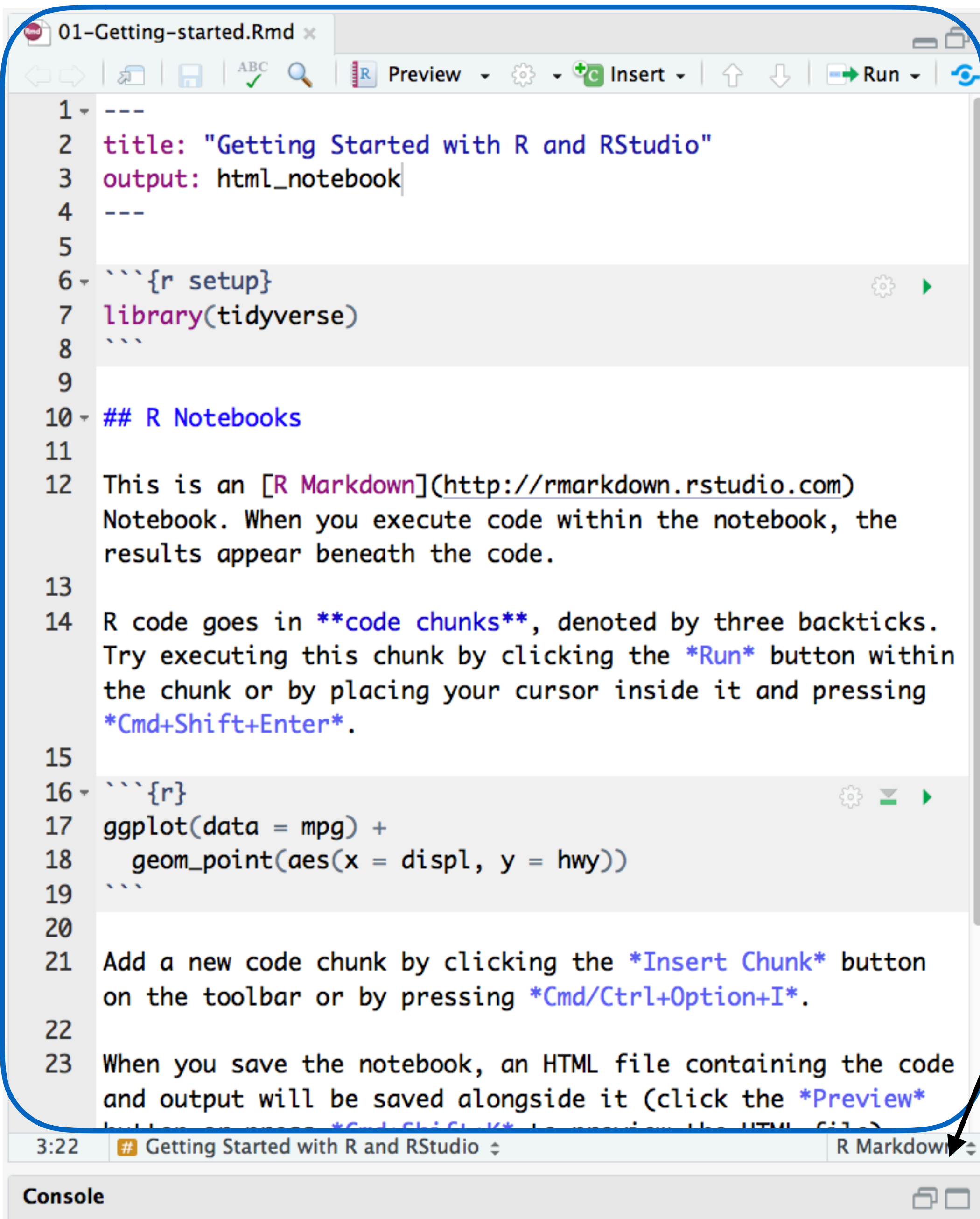
In the Files Pane,
Find 01-Getting-
started.Rmd
Click on it's name to
open the file.



Source Pane

Documents open up here.

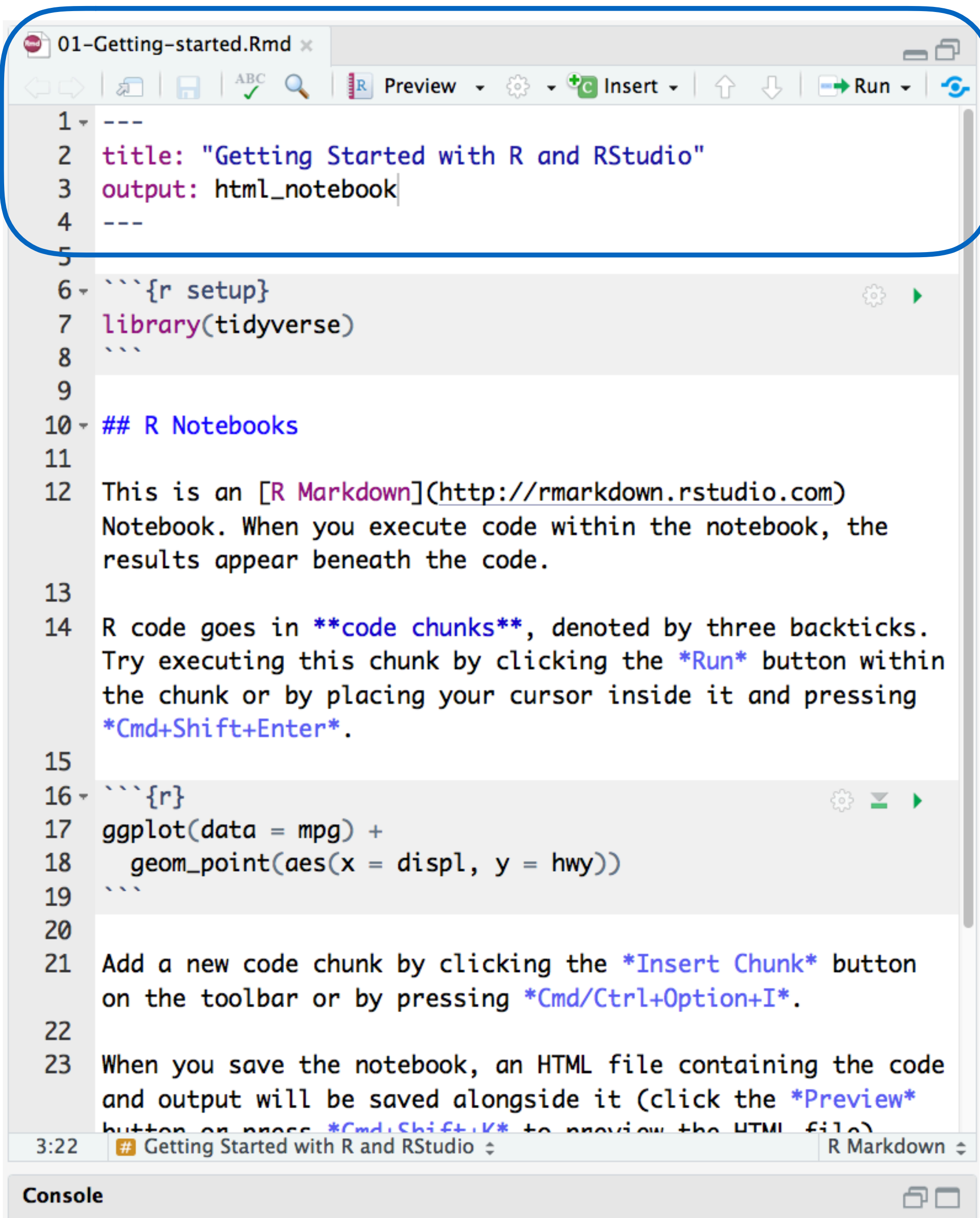
The console is still here but it's been minimized



R notebooks

An authoring format for
Data Science

01-Getting-started.Rmd is
an R notebook



```
1 ---
2 title: "Getting Started with R and RStudio"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ## R Notebooks
11
12 This is an [R Markdown](http://rmarkdown.rstudio.com)
13 Notebook. When you execute code within the notebook, the
14 results appear beneath the code.
15
16 R code goes in code chunks, denoted by three backticks.
17 Try executing this chunk by clicking the Run button within
18 the chunk or by placing your cursor inside it and pressing
19 Cmd+Shift+Enter.
20
21 ```{r}
22 ggplot(data = mpg) +
23   geom_point(aes(x = displ, y = hwy))
24 ```
25
26 Add a new code chunk by clicking the Insert Chunk button
27 on the toolbar or by pressing Cmd/Ctrl+Option+I.
28
29 When you save the notebook, an HTML file containing the code
30 and output will be saved alongside it (click the Preview
31 button on the toolbar or press Cmd+Shift+K to preview the HTML file).
```

3:22 # Getting Started with R and RStudio R Markdown

The screenshot shows an R Markdown notebook titled "01-Getting-started.Rmd". The editor has a toolbar with buttons for navigation, saving, previewing, and running code. The notebook content includes a YAML header, two code chunks, and several paragraphs of text explaining R Markdown syntax and usage. Two code chunks are highlighted with blue rounded rectangles: the first contains R setup code for the tidyverse, and the second contains a ggplot2 command to create a scatter plot. The status bar at the bottom shows the time as 3:22 and the current mode as "R Markdown".

```
1 ---
2 title: "Getting Started with R and RStudio"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ## R Notebooks
11
12 This is an [R Markdown](http://rmarkdown.rstudio.com)
13 Notebook. When you execute code within the notebook, the
14 results appear beneath the code.
15
16 R code goes in code chunks, denoted by three backticks.
17 Try executing this chunk by clicking the Run button within
18 the chunk or by placing your cursor inside it and pressing
19 Cmd+Shift+Enter.
20
21 ```{r}
22 ggplot(data = mpg) +
23   geom_point(aes(x = displ, y = hwy))
24 ```
25
26 Add a new code chunk by clicking the Insert Chunk button
27 on the toolbar or by pressing Cmd/Ctrl+Option+I.
28
29 When you save the notebook, an HTML file containing the code
30 and output will be saved alongside it (click the Preview
31 button or press Cmd+Shift+K to preview the HTML file).
```

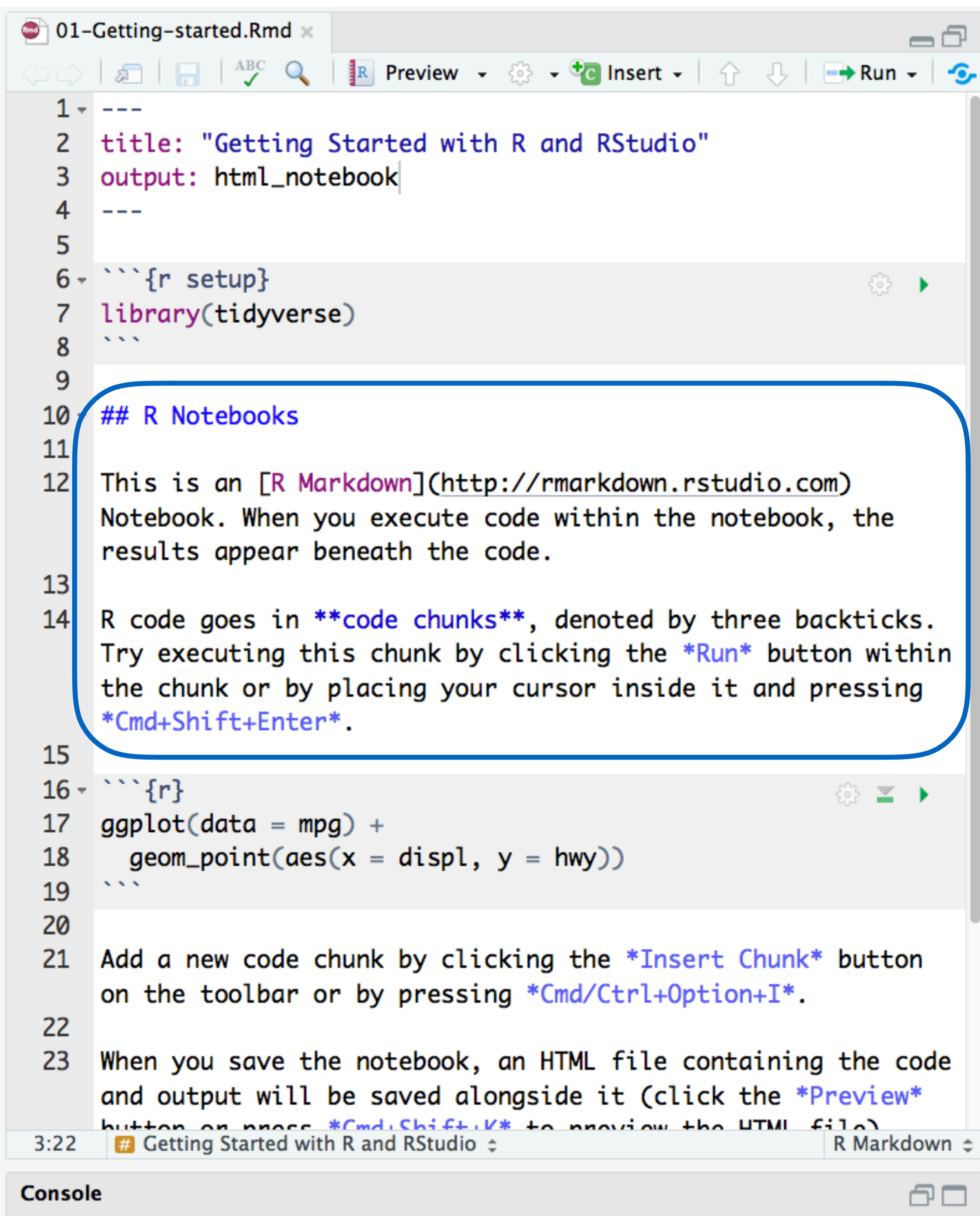
R notebooks

An authoring format for
Data Science

01-Getting-started.Rmd is
an R notebook

Integrates:

- Code



The screenshot shows an R Markdown notebook titled "01-Getting-started.Rmd". The editor has a toolbar with buttons for navigation, saving, previewing, and running code. The notebook content is as follows:

```
1 ---
2 title: "Getting Started with R and RStudio"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ## R Notebooks
11
12 This is an [R Markdown](http://rmarkdown.rstudio.com)
13 Notebook. When you execute code within the notebook, the
14 results appear beneath the code.
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16 R code goes in code chunks, denoted by three backticks.
17 Try executing this chunk by clicking the Run button within
18 the chunk or by placing your cursor inside it and pressing
19 Cmd+Shift+Enter.
20
21 ```{r}
22 ggplot(data = mpg) +
23   geom_point(aes(x = displ, y = hwy))
24 ```
25
26 Add a new code chunk by clicking the Insert Chunk button
27 on the toolbar or by pressing Cmd/Ctrl+Option+I.
28
29 When you save the notebook, an HTML file containing the code
30 and output will be saved alongside it (click the Preview
31 button on the toolbar or press Cmd+Shift+K to preview the HTML file).
```

The status bar at the bottom shows the time "3:22", the file name "# Getting Started with R and RStudio", and the current mode "R Markdown". A "Console" panel is visible at the very bottom.

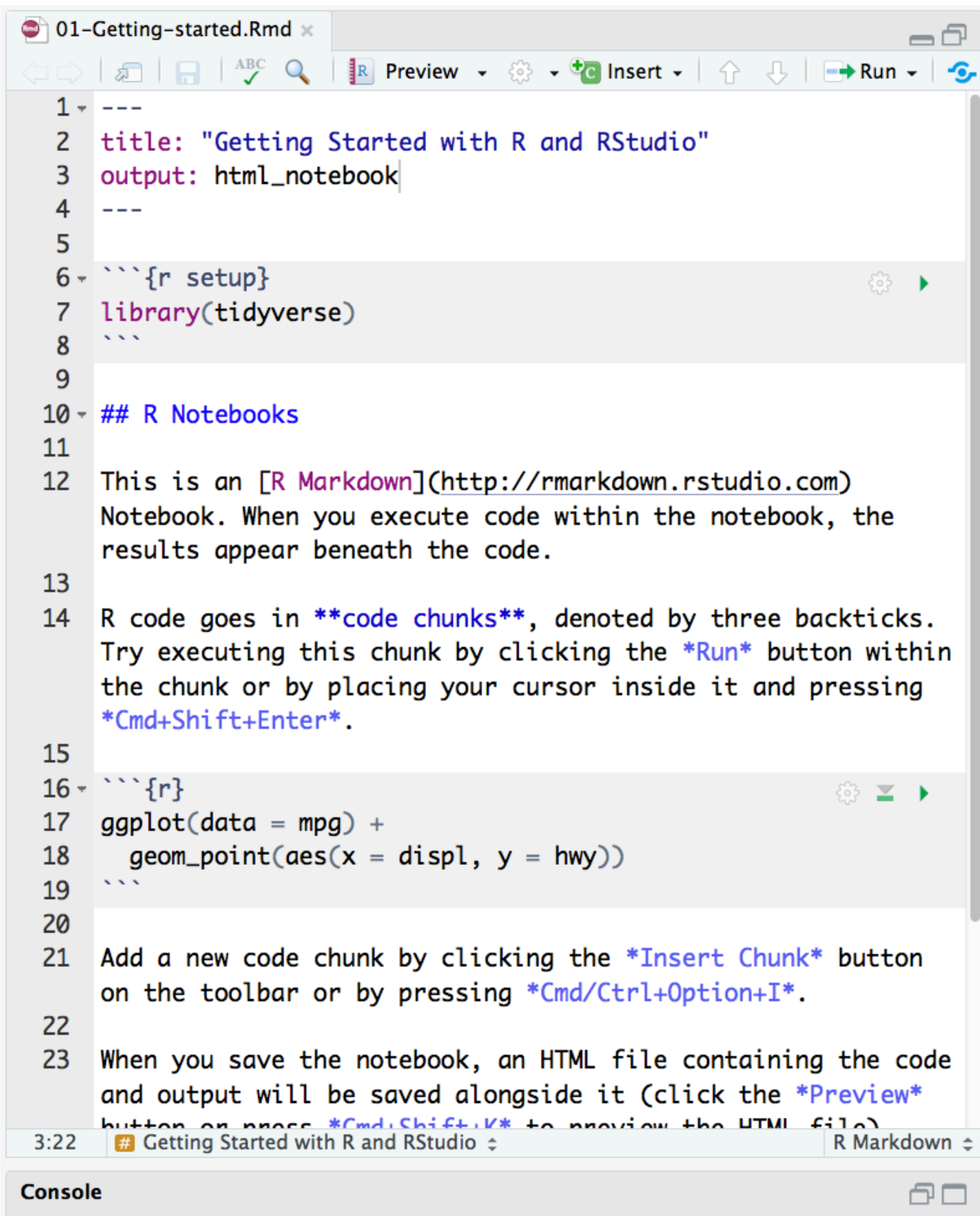
R notebooks

An authoring format for
Data Science

01-Getting-started.Rmd is
an R notebook

Integrates:

- Code
- Text



The screenshot shows an R Markdown notebook titled "01-Getting-started.Rmd". The editor has a toolbar with buttons for navigation, saving, previewing, inserting chunks, and running code. The notebook content includes a title, output format, a code chunk for setting up the tidyverse, a section header "## R Notebooks", and explanatory text about R Markdown and code chunks. A second code chunk contains a ggplot2 command. The status bar at the bottom shows the time 3:22, the file name, and the current mode (R Markdown).

```
1 ---
2 title: "Getting Started with R and RStudio"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ## R Notebooks
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18 the chunk or by placing your cursor inside it and pressing
19 Cmd+Shift+Enter.
20
21 ```{r}
22 ggplot(data = mpg) +
23   geom_point(aes(x = displ, y = hwy))
24 ```
25
26 Add a new code chunk by clicking the Insert Chunk button
27 on the toolbar or by pressing Cmd/Ctrl+Option+I.
28
29 When you save the notebook, an HTML file containing the code
30 and output will be saved alongside it (click the Preview
31 button or press Cmd+Shift+K to preview the HTML file).
```

R notebooks

An authoring format for
Data Science

01-Getting-started.Rmd is
an R notebook

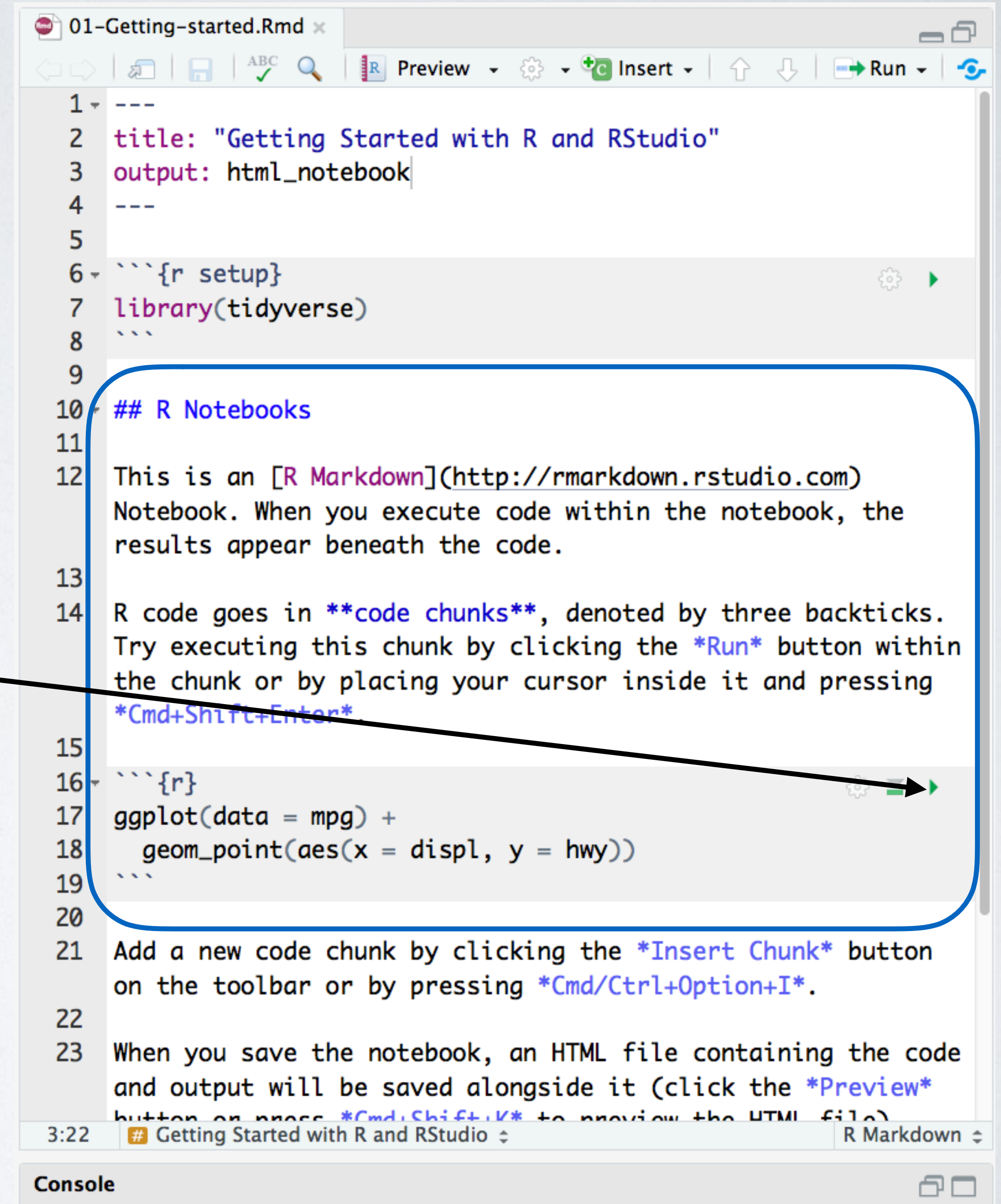
Integrates:

- Code
- Text
- Output

Your Turn

Read the instructions.

Run the code by hitting
the play button,
or using the keyboard
shortcut.



```
01-Getting-started.Rmd x
1 ---
2 title: "Getting Started with R and RStudio"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ## R Notebooks
11
12 This is an [R Markdown](http://rmarkdown.rstudio.com)
13 Notebook. When you execute code within the notebook, the
14 results appear beneath the code.
15
16 R code goes in code chunks, denoted by three backticks.
17 Try executing this chunk by clicking the Run button within
18 the chunk or by placing your cursor inside it and pressing
19 Cmd+Shift+Enter.
20
21 ```{r}
22 ggplot(data = mpg) +
23   geom_point(aes(x = displ, y = hwy))
24 ```
25
26 Add a new code chunk by clicking the Insert Chunk button
27 on the toolbar or by pressing Cmd/Ctrl+Option+I.
28
29 When you save the notebook, an HTML file containing the code
30 and output will be saved alongside it (click the Preview
31 button on the toolbar or press Cmd+Shift+K to preview the HTML file).
```

3:22 # Getting Started with R and RStudio R Markdown

Console

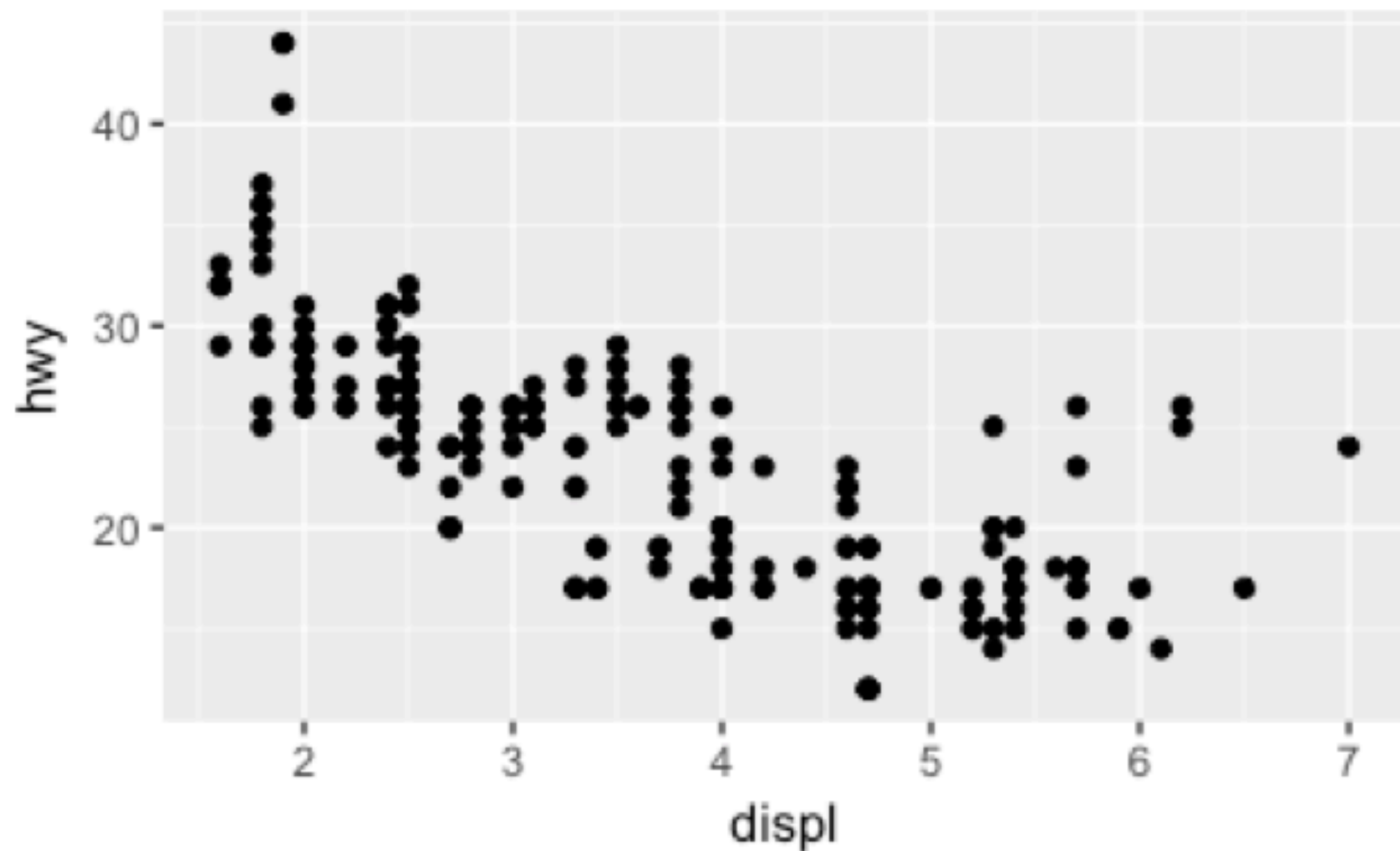
```
```{r}  
ggplot(data = mpg) +
 geom_point(aes(x = displ, y = hwy))
```
```



Click to run code
in chunk

Click to run all
code chunks
above

Code result



Your Turn

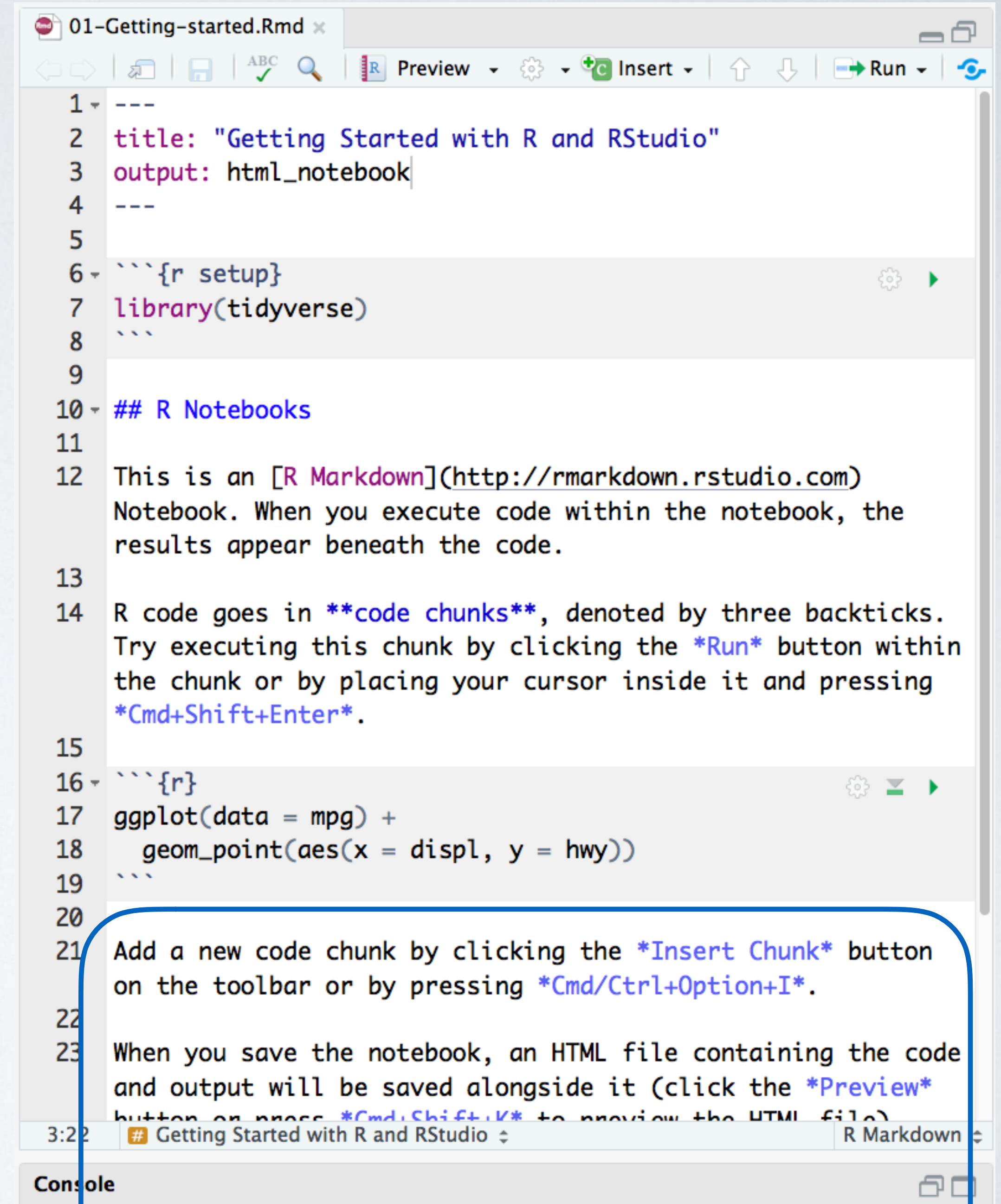
Keep going!

Add a new code chunk.

Put:

$2 + 2$

in your new chunk and run it.

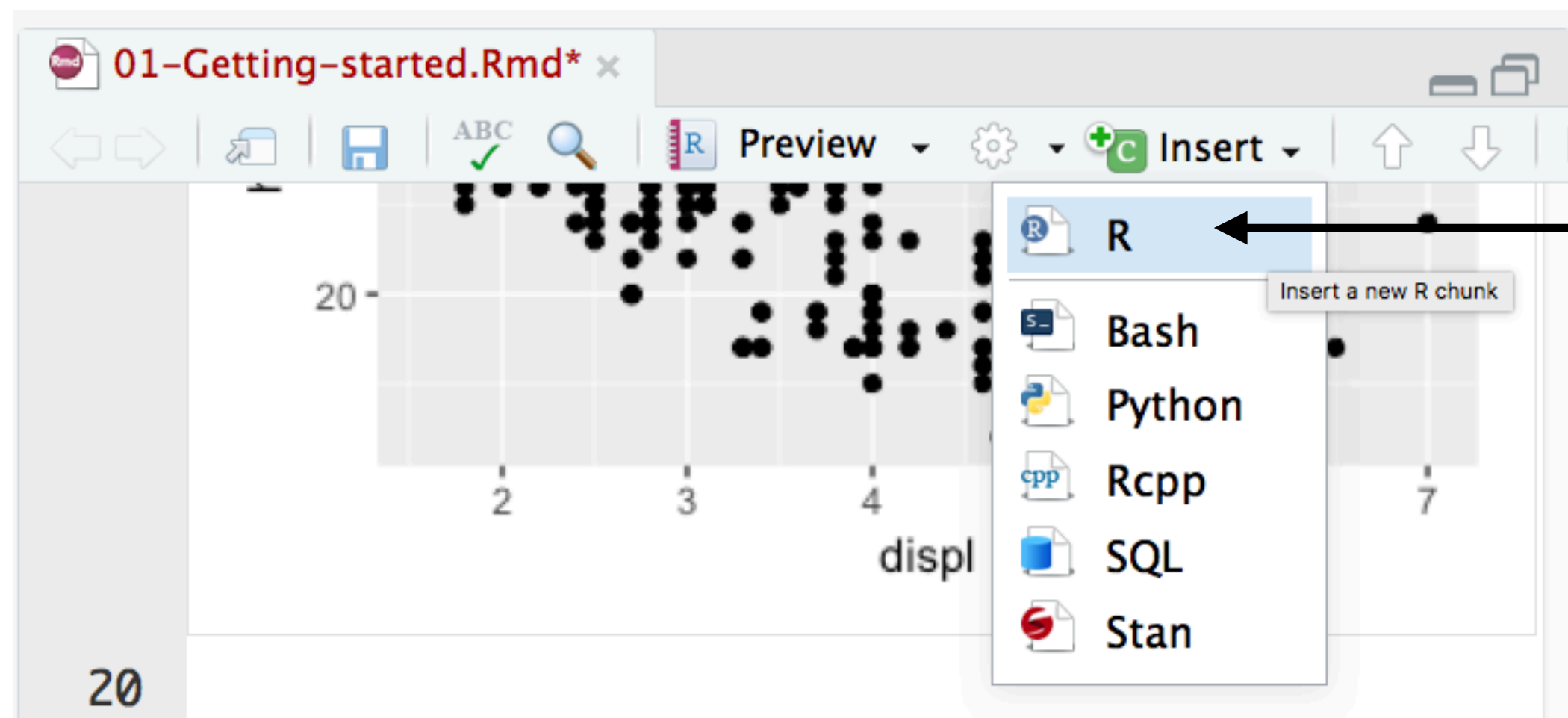


The screenshot shows an R Markdown notebook titled "01-Getting-started.Rmd". The editor has a toolbar with buttons for navigation, saving, previewing, and running. The code is organized into numbered lines (1-23) and code chunks (6-8, 16-19). The first chunk contains R code to set up the tidyverse library. The second chunk contains a title, a description of R Markdown notebooks, and instructions on how to execute code chunks. The third chunk contains R code to create a scatter plot using ggplot2. A blue callout box highlights the "Insert Chunk" button in the toolbar and the "Cmd/Ctrl+Option+I" keyboard shortcut. The console at the bottom shows the output of the code.

```
1 ---
2 title: "Getting Started with R and RStudio"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ## R Notebooks
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18 the chunk or by placing your cursor inside it and pressing
19 Cmd+Shift+Enter.
20
21 ```{r}
22 ggplot(data = mpg) +
23   geom_point(aes(x = displ, y = hwy))
24 ```
25
26 Add a new code chunk by clicking the Insert Chunk button
27 on the toolbar or by pressing Cmd/Ctrl+Option+I.
28
29 When you save the notebook, an HTML file containing the code
30 and output will be saved alongside it (click the Preview
31 button or press Cmd+Shift+K to preview the HTML file).
```

3:22 # Getting Started with R and RStudio R Markdown

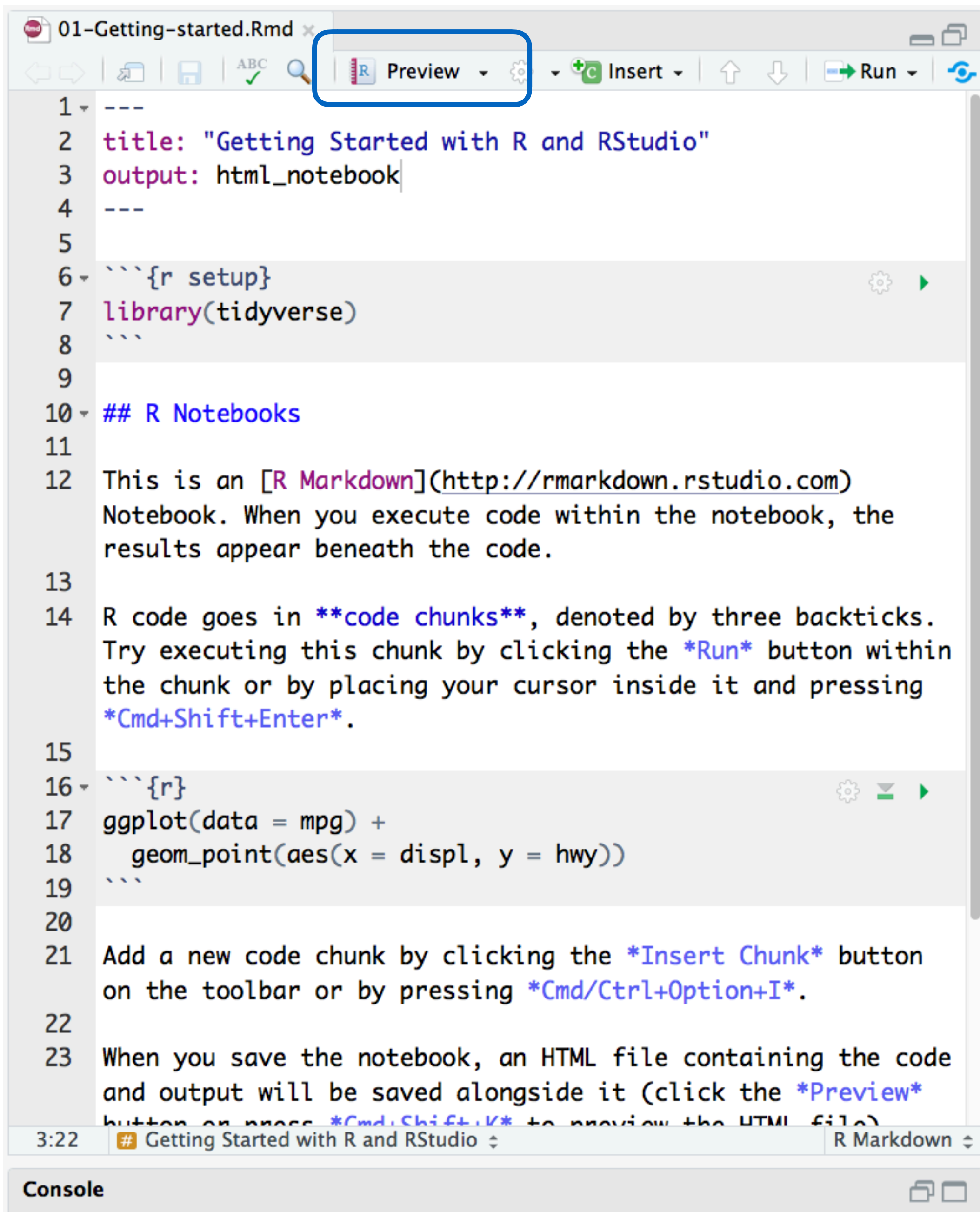
Console



Insert new code chunk

```
22
23 ```{r}
24 2 + 2
25 ```
```

[1] 4

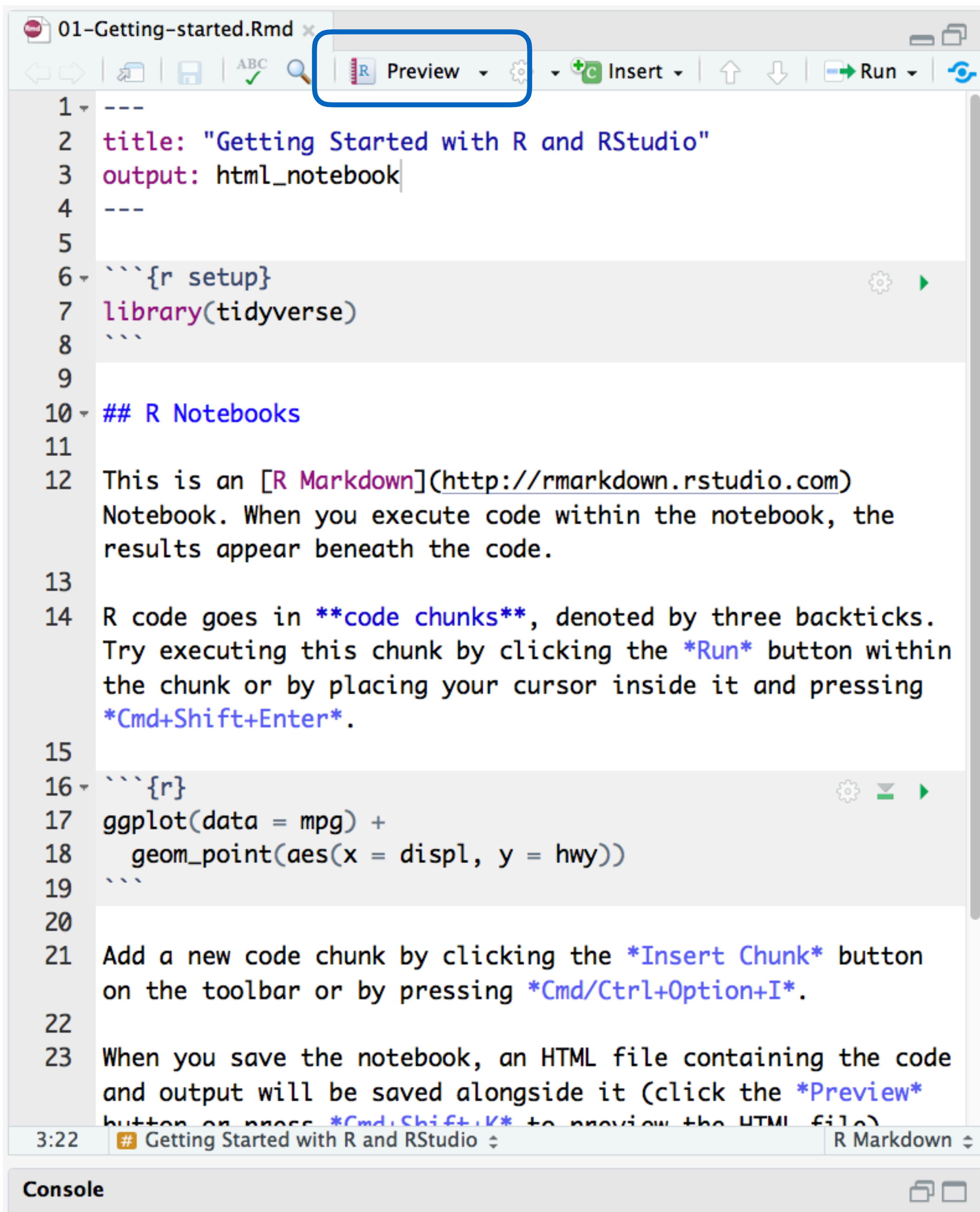


```
1 ---
2 title: "Getting Started with R and RStudio"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ## R Notebooks
11
12 This is an [R Markdown](http://rmarkdown.rstudio.com)
13 Notebook. When you execute code within the notebook, the
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17 Try executing this chunk by clicking the Run button within
18 the chunk or by placing your cursor inside it and pressing
19 Cmd+Shift+Enter.
20
21 ```{r}
22 ggplot(data = mpg) +
23   geom_point(aes(x = displ, y = hwy))
24 ```
25
26 Add a new code chunk by clicking the Insert Chunk button
27 on the toolbar or by pressing Cmd/Ctrl+Option+I.
28
29 When you save the notebook, an HTML file containing the code
30 and output will be saved alongside it (click the Preview
31 button on the toolbar or press Cmd+Shift+K to preview the HTML file).
```

3:22 # Getting Started with R and RStudio R Markdown

R notebooks

Keep a record of things you have run, you can see an HTML version, by hitting preview.



```
1 ---
2 title: "Getting Started with R and RStudio"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ## R Notebooks
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12 This is an [R Markdown](http://rmarkdown.rstudio.com)
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16 R code goes in code chunks, denoted by three backticks.
17 Try executing this chunk by clicking the Run button within
18 the chunk or by placing your cursor inside it and pressing
19 Cmd+Shift+Enter.
20
21 ```{r}
22 ggplot(data = mpg) +
23   geom_point(aes(x = displ, y = hwy))
24 ```
25
26 Add a new code chunk by clicking the Insert Chunk button
27 on the toolbar or by pressing Cmd/Ctrl+Option+I.
28
29 When you save the notebook, an HTML file containing the code
30 and output will be saved alongside it (click the Preview
31 button or press Cmd+Shift+K to preview the HTML file).
```

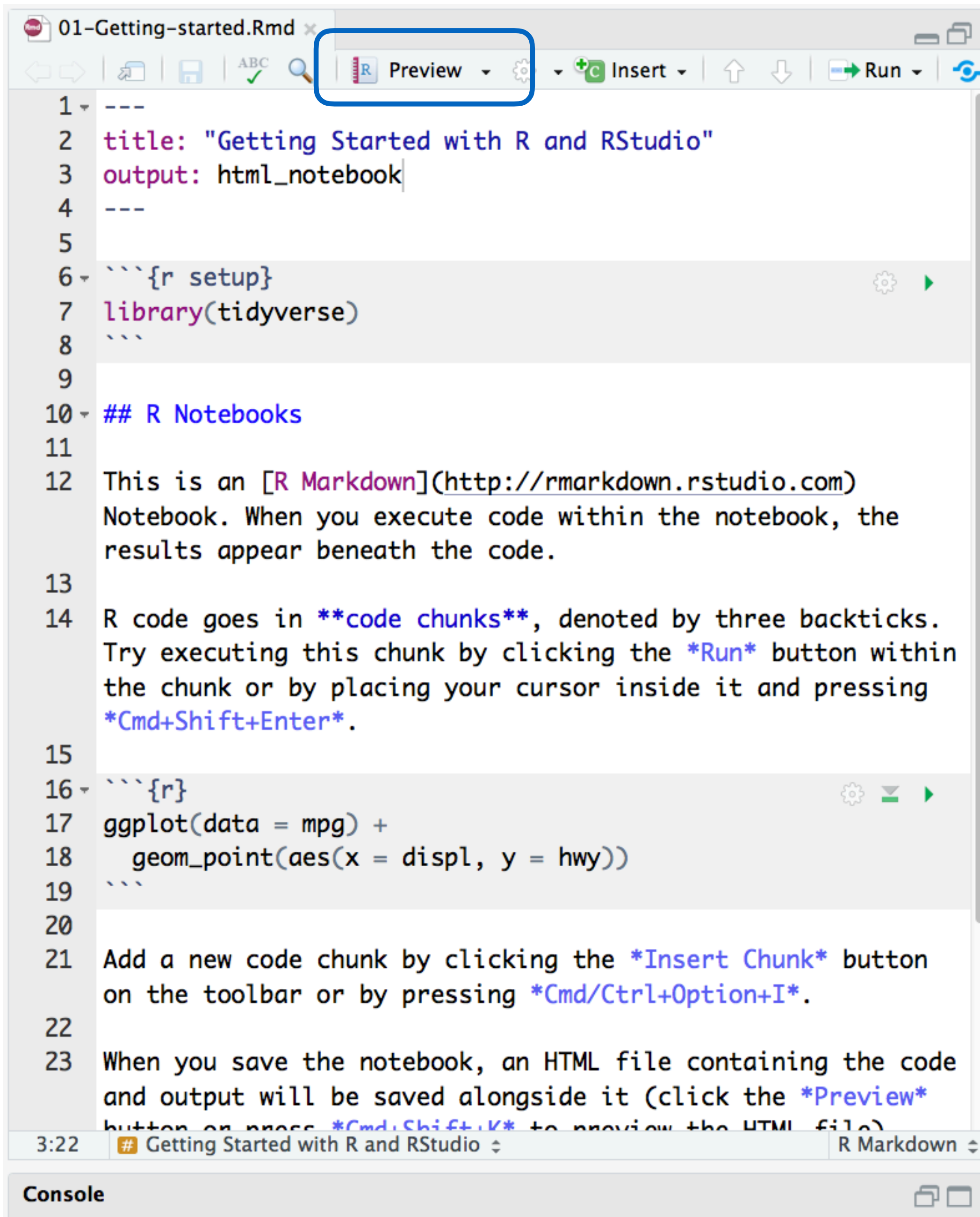
3:22 # Getting Started with R and RStudio R Markdown

R notebooks

Keep a record of things you have run, you can see an HTML version, by hitting preview.

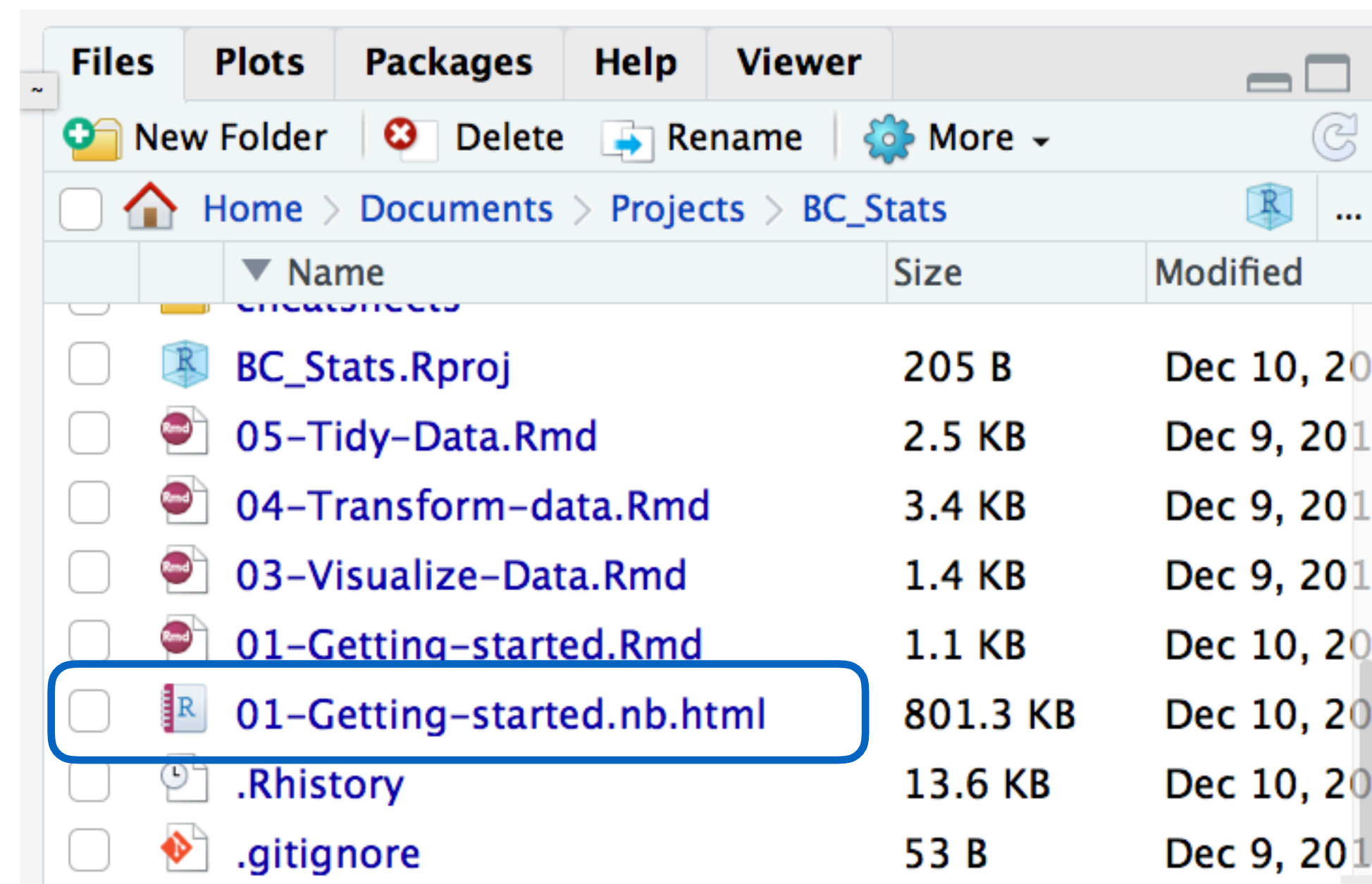
R notebooks

The result is stand-alone,
you can email it to your
friends.



```
1 ---
2 title: "Getting Started with R and RStudio"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ## R Notebooks
11
12 This is an [R Markdown](http://rmarkdown.rstudio.com)
13 Notebook. When you execute code within the notebook, the
14 results appear beneath the code.
15
16 R code goes in code chunks, denoted by three backticks.
17 Try executing this chunk by clicking the Run button within
18 the chunk or by placing your cursor inside it and pressing
19 Cmd+Shift+Enter.
20
21 ```{r}
22 ggplot(data = mpg) +
23   geom_point(aes(x = displ, y = hwy))
24 ```
25
26 Add a new code chunk by clicking the Insert Chunk button
27 on the toolbar or by pressing Cmd/Ctrl+Option+I.
28
29 When you save the notebook, an HTML file containing the code
30 and output will be saved alongside it (click the Preview
31 button or press Cmd+Shift+K to preview the HTML file).
```

3:22 # Getting Started with R and RStudio R Markdown



| Files | | | |
|--|--|----------|------------|
| Plots | | | |
| Packages | | | |
| Help | | | |
| Viewer | | | |
| New Folder Delete Rename More | | | |
| Home > Documents > Projects > BC_Stats | | | |
| Name | | Size | Modified |
| cheatsheets | | | |
| BC_Stats.Rproj | | 205 B | Dec 10, 20 |
| 05-Tidy-Data.Rmd | | 2.5 KB | Dec 9, 201 |
| 04-Transform-data.Rmd | | 3.4 KB | Dec 9, 201 |
| 03-Visualize-Data.Rmd | | 1.4 KB | Dec 9, 201 |
| 01-Getting-started.Rmd | | 1.1 KB | Dec 10, 20 |
| 01-Getting-started.nb.html | | 801.3 KB | Dec 10, 20 |
| .Rhistory | | 13.6 KB | Dec 10, 20 |
| .gitignore | | 53 B | Dec 9, 201 |

R Notebooks

An easy way to combine R code and narrative

Useful for us:

- I'll provide starter code
- You can complete "Your Turns"
- At the end, a useful record for you

Your Turn

1. Spot the difference

```
filter(mtcars, cyl == 4)
```

```
four_cyls <- filter(mtcars, cyl == 4)
```

2. Find the chunks in the notebook and run them, what's different about what happens?

```
30
31 ▾ ## Assigning variables
32
33 What's the difference between the code in this
   chunk:
34 ▾ ```{r}
35 filter(mtcars, cyl == 4)
36 ```
37
38 And the code in this chunk?
39 ▾ ```{r}
40 four_cyls <- filter(mtcars, cyl == 4)
41 ```
42
```

```
filter(mtcars, cyl == 4)
```

Does something (?) and output is displayed

```
four_cyls <- filter(mtcars, cyl == 4)
```

Does the exact same thing but
output is stored in variable
four_cyls

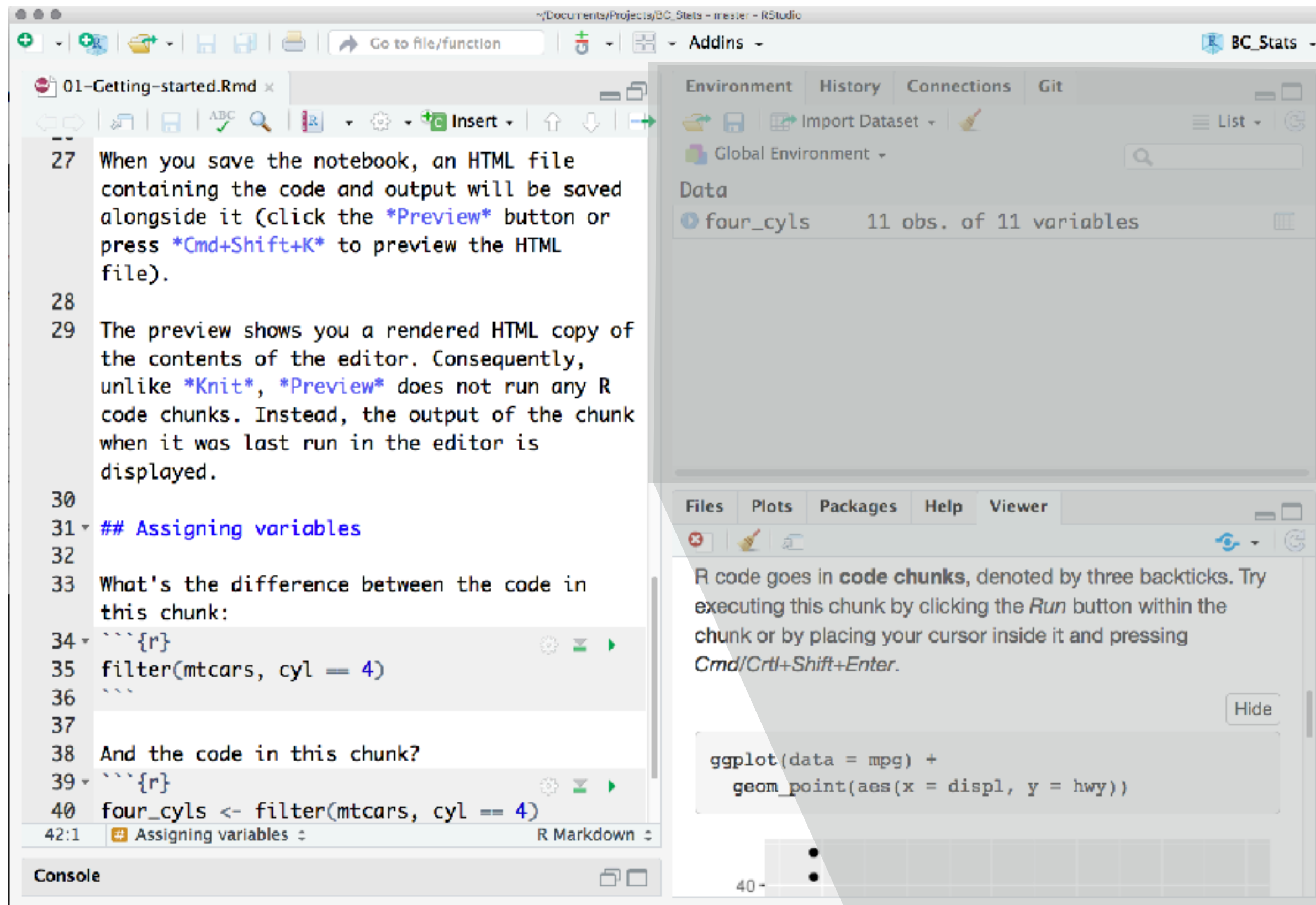
Assignment

```
four_cyls <- filter(mtcars, cyl == 4)
```

**Assign the output from the right
hand side,
to a variable with the name on the left
hand side**

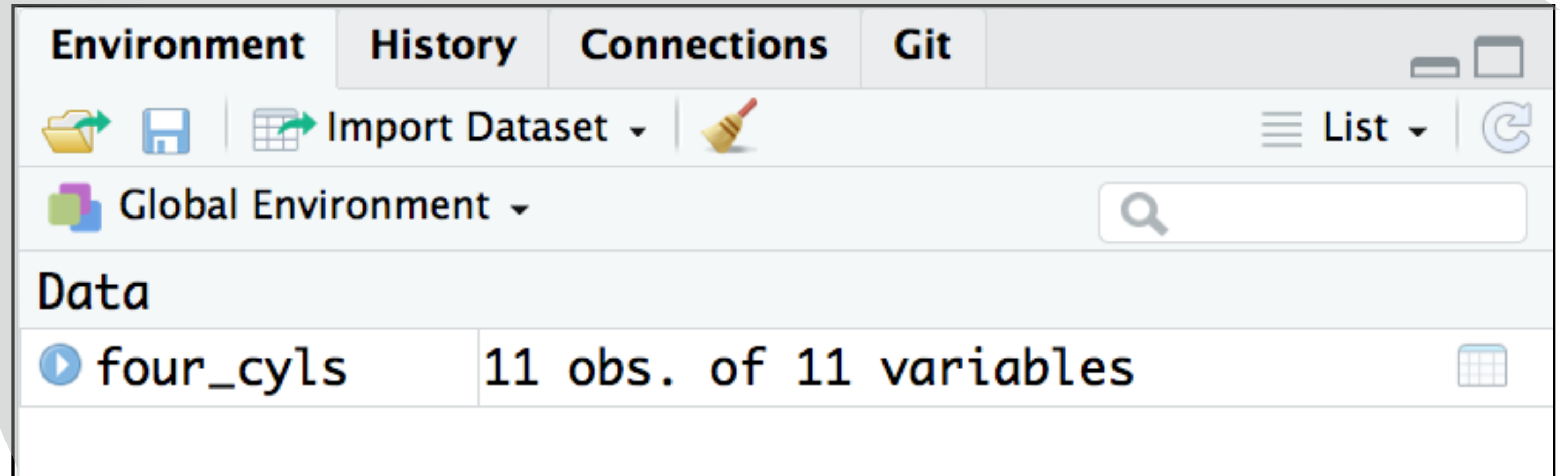
<-

The assignment operator, 'less than symbol' 'dash'



Environment

All the variables you have stored

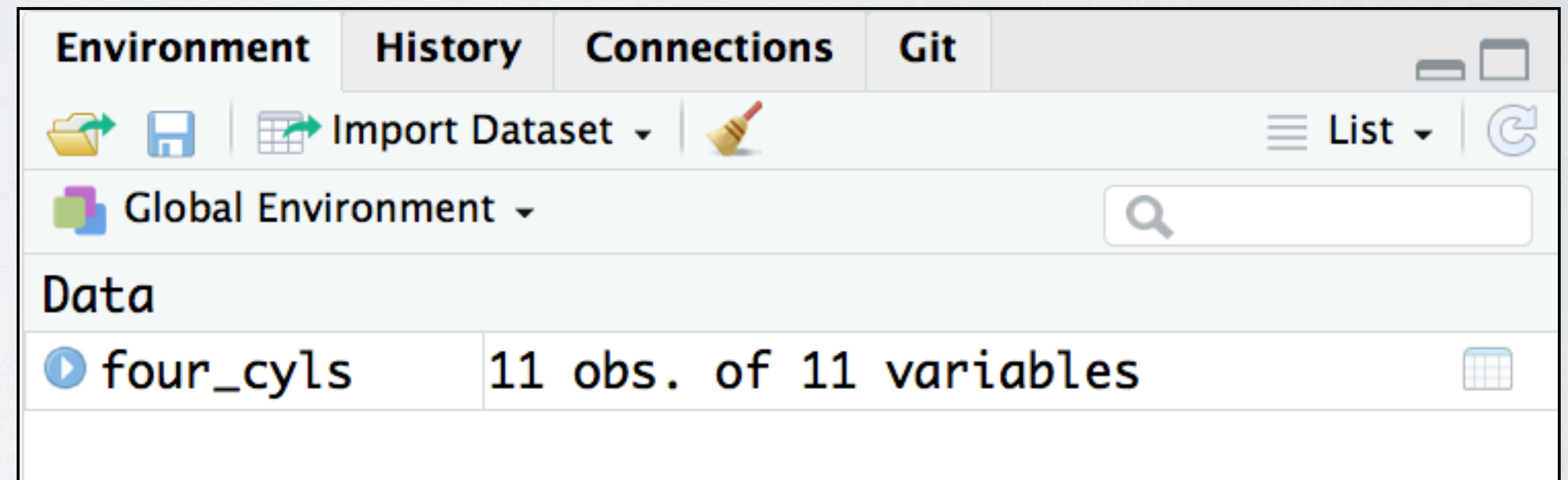


Your Turn

Find `four_cyls` in the environment pane.

Double-click on the name `four_cyls`.

What happens? What is this object?



Double-clicking on an object in the Environment will open an interactive Viewer

The screenshot shows the RStudio interface. The Environment pane on the right lists the 'four_cyls' object as having 11 observations and 11 variables. The Console pane on the left shows the following R code being executed:

```
> 2 + 2
[1] 4
> filter(mtcars, cyl == 4)
> four_cyls <- filter(mtcars, cyl == 4)
> filter(mtcars, cyl == 4)
> four_cyls <- filter(mtcars, cyl == 4)
> View(four_cyls)
> View(four_cyls)
>
```

The screenshot shows the RStudio Viewer pane displaying the 'four_cyls' data frame. The data is presented as a table with 11 rows and 11 columns. The columns are labeled mpg, cyl, disp, hp, drat, wt, qsec, and vs. The rows are numbered 1 through 11. The data is as follows:

| | mpg | cyl | disp | hp | drat | wt | qsec | vs |
|----|------|-----|-------|----|------|-------|-------|----|
| 1 | 22.8 | 4 | 108.0 | 93 | 3.85 | 2.320 | 18.61 | 1 |
| 2 | 24.4 | 4 | 146.7 | 62 | 3.69 | 3.190 | 20.00 | 1 |
| 3 | 22.8 | 4 | 140.8 | 95 | 3.92 | 3.150 | 22.90 | 1 |
| 4 | 32.4 | 4 | 78.7 | 66 | 4.08 | 2.200 | 19.47 | 1 |
| 5 | 30.4 | 4 | 75.7 | 52 | 4.93 | 1.615 | 18.52 | 1 |
| 6 | 33.9 | 4 | 71.1 | 65 | 4.22 | 1.835 | 19.90 | 1 |
| 7 | 21.5 | 4 | 120.1 | 97 | 3.70 | 2.465 | 20.01 | 1 |
| 8 | 27.3 | 4 | 79.0 | 66 | 4.08 | 1.935 | 18.90 | 1 |
| 9 | 26.0 | 4 | 120.3 | 91 | 4.43 | 2.140 | 16.70 | 0 |
| 10 | 30.4 | 4 | 75.7 | 52 | 4.93 | 1.615 | 18.52 | 1 |
| 11 | 33.9 | 4 | 71.1 | 65 | 4.22 | 1.835 | 19.90 | 1 |

Basic Syntax

```
four_cyls <- filter(mtcars, cyl == 4)
```

A function

Functions **do** things in R

Functions take arguments, and output results

If you want to keep the output, you assign it to a variable

Basic Syntax

```
four_cyls <- filter(mtcars, cyl == 4)
```

To *call* a function, you need to know its **name**, and the **arguments** it is expecting.

Arguments are comma separated and go inside the parenthesis following the function name.

?

for help on functions

To get help on a function in R, on the **Console**,
type

?function_name

Your Turn

Try

?filter

The screenshot shows the RStudio interface. In the console, the command `?filter` has been entered. The help viewer on the right displays the results of this search. It shows that help for the `filter` function was found in the `dplyr` package. The viewer lists two topics: "Return rows with matching conditions" (in package `dplyr`) and "Linear Filtering on a Time Series" (in package `stats`). A large black arrow points from the help viewer to the R Documentation page below.

| | mpg | cyl | disp | hp | drat | wt | qsec | vs |
|---|------|-----|-------|----|------|-------|-------|----|
| 1 | 22.8 | 4 | 108.0 | 93 | 3.85 | 2.320 | 18.61 | 1 |
| 2 | 24.4 | 4 | 146.7 | 62 | 3.69 | 3.190 | 20.00 | 1 |
| 3 | 22.8 | 4 | 140.8 | 95 | 3.92 | 3.150 | 22.90 | 1 |
| 4 | 32.4 | 4 | 78.7 | 66 | 4.08 | 2.200 | 19.47 | 1 |
| 5 | 30.4 | 4 | 75.7 | 52 | 4.93 | 1.615 | 18.52 | 1 |
| 6 | 33.9 | 4 | 71.1 | 65 | 4.22 | 1.835 | 19.90 | 1 |
| 7 | 21.5 | 4 | 120.1 | 97 | 3.70 | 2.465 | 20.01 | 1 |
| 8 | 27.3 | 4 | 79.0 | 66 | 4.08 | 1.935 | 18.90 | 1 |
| 9 | 26.0 | 4 | 120.3 | 91 | 4.43 | 2.140 | 16.70 | 0 |

Showing 1 to 10 of 11 entries

Help on topic 'filter' was found in the following packages:

- [Return rows with matching conditions](#)
(in package `dplyr` in library /Users/wickhamc/R)
- [Linear Filtering on a Time Series](#)
(in package `stats` in library /Library/Frameworks/R.framework/Versions/3.4/Resources)

filter {dplyr}

R Documentation

Return rows with matching conditions

Description

Use `filter()` find rows/cases where conditions are true. Unlike base subsetting, rows where the condition evaluates to `NA` are dropped.

Usage

```
filter(.data, ...)
```

Arguments

Return rows with matching conditions

Description

Use `filter()` find rows/cases where conditions are true. Unlike base subsetting, rows where the condition evaluates to `NA` are dropped.

Usage

```
filter(.data, ...)
```

Arguments

Arguments

A named argument `.data`

... Some other
unnamed arguments

filter {dplyr}

R Documentation

Return rows with matching conditions

Description

Use `filter()` find rows/cases where conditions are true. Unlike base subsetting, rows where the condition evaluates to NA are dropped.

Usage

```
filter(.data, ...)
```

Arguments

- `.data` A tbl. All main verbs are S3 generics and provide methods for [tbl_df\(\)](#), [dtplyr::tbl_dt\(\)](#) and [dbplyr::tbl_dbi\(\)](#).
- ... Logical predicates defined in terms of the variables in `.data`. Multiple conditions are combined with `&`. Only rows where the condition evaluates to TRUE are kept.

These arguments are automatically [quoted](#) and [evaluated](#) in the context of the data frame. They support [unquoting](#) and splicing. See `vignette("programming")` for an introduction to these concepts.

Details

Note that dplyr is not yet smart enough to optimise filtering optimisation on grouped datasets that don't need grouped calculations. For this reason, filtering is often considerably faster on [ungroup\(\)](#)ed data.

Naming arguments is optional,
unnamed arguments are used in the order they are given

```
four_cyls <- filter(mtcars, cyl == 4)
```

the first argument should take
the value `mtcars`

```
four_cyls <- filter(.data = mtcars, cyl == 4)
```

the `.data` argument should
take the value `mtcars`

Your Turn

Take a look at the next chunk.

1. What functions are being called?

2. What arguments do they take?

3. What values are being passed as which arguments?

```
46  
47 ```{r}  
48 heights <- pull(.data = starwars, var = height)  
49 mean(heights, na.rm = TRUE)  
50 ```  
51
```



```
heights <- pull(.data = starwars, var = height)
```

pull() is being called with the **.data** argument being **starwars**, and the **var** argument being **height**

```
mean(heights, na.rm = TRUE)
```

mean() is being called with the **x** argument being **heights**, and the **na.rm** argument being **TRUE**

Common Syntax problem #1

Missing closing parenthesis or quotes

```
mean(heights
```

```
"Oops I'm stuck in a string
```

Common Syntax problem #2

Surrounding something in quotes, when R expected something else (or vice versa), e.g.

```
> mean("heights")
```

```
[1] NA
```

Warning message:

In mean.default("heights") :

argument is not numeric or logical: returning NA

Your Turn

There are three chunks under "Syntax gone wrong".

Run each, read the error message, and try to fix the syntax.

```
sd(pull(.data = starwars, var = weight))
```

```
my_name <- "Charlotte"
```

```
pull(.data = starwars, var = height)
```



Getting Started with R and RStudio

Summary

Use R Notebooks to keep together code, output and text.

If you need to use output, assign it to a variable <-

Get help on a function with ?

Watch your (, "

RStudio IDE :: CHEAT SHEET



Documents and Apps

Open Shiny, R Markdown, knitr, Sweave, LaTeX, .Rd files and more in Source Pane

Check spelling, Render output, Choose output format, Choose output location, Insert code chunk

Jump to previous chunk, Jump to next chunk, Run selected lines, Publish to server, Show file outline

Access markdown guide at **Help > Markdown Quick Reference**

Jump to chunk, Set knitr chunk options, Run this and all previous code chunks, Run this code chunk

RStudio recognizes that files named **app.R**, **server.R**, **ui.R**, and **global.R** belong to a shiny app

Run app, Choose location to view app, Publish to shinyapps.io or server, Manage publish accounts

Write Code

Navigate tabs, Open in new window, Save, Find and replace, Compile as notebook, Run selected code

Import data with wizard, History of past commands to run/copy, Display .RPres slideshows **File > New File > R Presentation**

Load workspace, Save workspace, Delete all saved objects, Search inside environment

Choose environment to display from list of parent environments, Display objects as list or grid

Displays saved objects by type with short description, View in data viewer, View function source code

Create folder, Upload file, Delete file, Rename file, Set As Working Directory, Go To Working Directory, Change directory

Path to displayed directory, A File browser keyed to your working directory. Click on file or directory name to open.

Multiple cursors/column selection with **Alt + mouse drag**, Code diagnostics that appear in the margin. Hover over diagnostic symbols for details, Syntax highlighting based on your file's extension, Tab completion to finish function names, file paths, arguments, and more, Multi-language code snippets to quickly use common blocks of code, Change file type

Jump to function in file, Working Directory, Maximize, minimize panes, Press **↑** to see command history, Drag pane boundaries

R Support

Pro Features

Share Project with Collaborators, Active shared collaborators, Start new R Session in current project, Close R Session in project, Select R Version

PROJECT SYSTEM
File > New Project
RStudio saves the call history, workspace, and working directory associated with a project. It reloads each when you re-open a project.

Debug Mode

Open with **debug()**, **browse()**, or a breakpoint. RStudio will open the debugger mode when it encounters a breakpoint while executing code.

Click next to line number to add/remove a breakpoint.

Highlighted line shows where execution has paused

Run commands in environment where execution has paused, Examine variables in executing environment, Select function in traceback to debug

Launch debugger mode from origin of error, Open traceback to examine the functions that R called before the error occurred

Step through code one line at a time, Step into and out of functions to run, Resume execution mode, Quit debug

Version Control with Git or SVN

Turn on at **Tools > Project Options > Git/SVN**

Stage files, Show file diff, Commit staged files, Push/Pull to remote, View History

Added, Deleted, Modified, Renamed, Untracked

Open shell to type commands, current branch

Package Writing

File > New Project > New Directory > R Package

Turn project into package, Enable roxygen documentation with **Tools > Project Options > Build Tools**

Roxygen guide at **Help > Roxygen Quick Reference**

RStudio opens plots in a dedicated Plots pane

Navigate recent plots, Open in window, Export plot, Delete plot, Delete all plots

GUI Package manager lists every installed package

Install Packages, Update Packages, Create reproducible package library for your project

Click to load package with **library()**. Unclick to detach package with **detach()**

Package version installed, Delete from library

RStudio opens documentation in a dedicated Help pane

Home page of helpful links, Search within help file, Search for help file

Viewer Pane displays HTML content, such as Shiny apps, RMarkdown reports, and interactive visualizations

Stop Shiny app, Publish to shinyapps.io, rpubs, RSConnect, ..., Refresh

View(<data>) opens spreadsheet like view of data set

Filter rows by value or value range, Sort by values, Search for value



1 LAYOUT

Move focus to Source Editor
Move focus to Console
Move focus to Help
Show History
Show Files
Show Plots
Show Packages
Show Environment
Show Git/SVN
Show Build

Windows/Linux Mac

Ctrl+1
Ctrl+2
Ctrl+3
Ctrl+4
Ctrl+5
Ctrl+6
Ctrl+7
Ctrl+8
Ctrl+9
Ctrl+0

2 RUN CODE

Search command history

Navigate command history
Move cursor to start of line
Move cursor to end of line
Change working directory

Interrupt current command

Clear console

Quit Session (desktop only)

Restart R Session

Run current line/selection

Run current (retain cursor)
Run from current to end
Run the current function
Source a file

Source the current file

Source with echo

Windows/Linux Mac

Ctrl+↑
↑/↓
Home
End
Ctrl+Shift+H
Esc
Ctrl+L
Ctrl+O
Ctrl+Shift+F10
Ctrl+Enter
Alt+Enter
Ctrl+Alt+E
Ctrl+Alt+F
Ctrl+Alt+G
Ctrl+Shift+S
Ctrl+Shift+Enter

Mac

Cmd+↑
↑/↓
Cmd+←
Cmd+→
Esc
Ctrl+L
Cmd+O
Cmd+Shift+F10
Cmd+Enter
Option+Enter
Cmd+Option+E
Cmd+Option+F
Cmd+Option+G
Cmd+Shift+S
Cmd+Shift+Enter

3 NAVIGATE CODE

Goto File/Function

Fold Selected
Unfold Selected
Fold All
Unfold All
Go to line
Jump to
Switch to tab
Previous tab
Next tab
First tab
Last tab
Navigate back
Navigate forward
Jump to Brace
Select within Braces
Use Selection for Find
Find in Files
Find Next
Find Previous
Jump to Word
Jump to Start/End
Toggle Outline

Windows /Linux Mac

Ctrl+.
Alt+L
Shift+Alt+L
Alt+O
Shift+Alt+O
Shift+Alt+G
Shift+Alt+J
Ctrl+Shift+.
Ctrl+F11
Ctrl+F12
Ctrl+Shift+F11
Ctrl+Shift+F12
Ctrl+F9
Ctrl+F10
Ctrl+P
Ctrl+Shift+Alt+E
Ctrl+F3
Ctrl+Shift+F
Win: F3, Linux: Ctrl+G
W: Shift+F3, L:
Ctrl+↔
Ctrl+↑/↓
Ctrl+Shift+O

Mac

Ctrl+.
Cmd+Option+L
Cmd+Shift+Option+L
Cmd+Option+O
Cmd+Shift+Option+O
Cmd+Shift+Option+G
Cmd+Shift+Option+J
Ctrl+Shift+.
Ctrl+F11
Ctrl+F12
Ctrl+Shift+F11
Ctrl+Shift+F12
Cmd+F9
Cmd+F10
Cmd+P
Ctrl+Shift+Option+E
Cmd+E
Cmd+Shift+F
Cmd+G
Cmd+Shift+G
Option+↔
Cmd+↑/↓
Cmd+Shift+O

4 WRITE CODE

Attempt completion

Navigate candidates
Accept candidate
Dismiss candidates
Undo
Redo
Cut
Copy
Paste
Select All
Delete Line
Select
Select Word
Select to Line Start
Select to Line End
Select Page Up/Down
Select to Start/End
Delete Word Left
Delete Word Right
Delete to Line End
Delete to Line Start
Indent
Outdent
Yank line up to cursor
Yank line after cursor
Insert yanked text

Insert <-

Insert %>%

Show help for function
Show source code
New document
New document (Chrome)
Open document
Save document
Close document
Close document (Chrome)
Close all documents
Extract function
Extract variable
Reindent lines

(Un)Comment lines

Reflow Comment
Reformat Selection
Select within braces
Show Diagnostics
Transpose Letters
Move Lines Up/Down
Copy Lines Up/Down
Add New Cursor Above
Add New Cursor Below
Move Active Cursor Up
Move Active Cursor Down
Find and Replace
Use Selection for Find
Replace and Find

Windows /Linux

Tab or Ctrl+Space
↑/↓
Enter, Tab, or →
Esc
Ctrl+Z
Ctrl+Shift+Z
Ctrl+X
Ctrl+C
Ctrl+V
Ctrl+A
Ctrl+D
Shift+[Arrow]
Ctrl+Shift+↔
Alt+Shift+←
Alt+Shift+→
Shift+PageUp/Down
Shift+Alt+↑/↓
Ctrl+Backspace
Tab (at start of line)
Shift+Tab
Ctrl+U
Ctrl+K
Ctrl+Y
Alt+
Ctrl+Shift+M
F1
F2
Ctrl+Shift+N
Ctrl+Alt+Shift+N
Ctrl+O
Ctrl+S
Ctrl+W
Ctrl+Alt+W
Ctrl+Shift+W
Ctrl+Alt+X
Ctrl+Alt+V
Ctrl+I
Ctrl+Shift+C
Ctrl+Shift+/

Mac

Tab or Cmd+Space
↑/↓
Enter, Tab, or →
Esc
Cmd+Z
Cmd+Shift+Z
Cmd+X
Cmd+C
Cmd+V
Cmd+A
Cmd+D
Shift+[Arrow]
Option+Shift+↔
Cmd+Shift+←
Cmd+Shift+→
Shift+PageUp/Down
Cmd+Shift+↑/↓
Ctrl+Opt+Backspace
Option+Delete
Ctrl+K
Option+Backspace
Tab (at start of line)
Shift+Tab
Ctrl+U
Ctrl+K
Ctrl+Y
Option+
Cmd+Shift+M
F1
F2
Cmd+Shift+N
Cmd+Shift+Opt+N
Cmd+O
Cmd+S
Cmd+W
Cmd+Option+W
Cmd+Shift+W
Cmd+Option+X
Cmd+Option+V
Cmd+I
Cmd+Shift+C
Cmd+Shift+/

WHY RSTUDIO SERVER PRO?

RSP extends the the open source server with a commercial license, support, and more:

- open and run multiple R sessions at once
- tune your resources to improve performance
- edit the same project at the same time as others
- see what you and others are doing on your server
- switch easily from one version of R to a different version
- integrate with your authentication, authorization, and audit practices

Download a free 45 day evaluation at

www.rstudio.com/products/rstudio-server-pro/



5 DEBUG CODE

Toggle Breakpoint
Execute Next Line
Step Into Function
Finish Function/Loop
Continue
Stop Debugging

Windows/Linux Mac

Shift+F9
F10
Shift+F4
Shift+F6
Shift+F5
Shift+F8

6 VERSION CONTROL

Show diff
Commit changes
Scroll diff view
Stage/Unstage (Git)
Stage/Unstage and move to next

Windows/Linux Mac

Ctrl+Alt+D
Ctrl+Alt+M
Ctrl+↑/↓
Spacebar
Enter

7 MAKE PACKAGES

Build and Reload

Load All (devtools)

Test Package (Desktop)

Test Package (Web)

Check Package

Document Package

Windows/Linux Mac

Ctrl+Shift+B
Cmd+Shift+B
Ctrl+Shift+L
Cmd+Shift+L
Ctrl+Shift+T
Cmd+Shift+T
Ctrl+Alt+F7
Cmd+Opt+F7
Ctrl+Shift+E
Cmd+Shift+E
Ctrl+Shift+D
Cmd+Shift+D

8 DOCUMENTS AND APPS

Preview HTML (Markdown, etc.)

Knit Document (knitr)

Compile Notebook

Compile PDF (TeX and Sweave)

Insert chunk (Sweave and Knitr)

Insert code section

Re-run previous region

Run current document

Run from start to current line

Run the current code section

Run previous Sweave/Rmd code

Run the current chunk

Run the next chunk

Sync Editor & PDF Preview

Previous plot

Next plot

Show Keyboard Shortcuts

Windows/Linux Mac

Ctrl+Shift+K
Cmd+Shift+K
Ctrl+Shift+K
Cmd+Shift+K
Ctrl+Shift+K
Cmd+Shift+K
Ctrl+Alt+I
Cmd+Option+I
Ctrl+Shift+R
Cmd+Shift+R
Ctrl+Shift+P
Cmd+Shift+P
Ctrl+Alt+R
Cmd+Option+R
Ctrl+Alt+B
Cmd+Option+B
Ctrl+Alt+T
Cmd+Option+T
Ctrl+Alt+P
Cmd+Option+P
Ctrl+Alt+C
Cmd+Option+C
Ctrl+Alt+N
Cmd+Option+N
Ctrl+F8
Cmd+F8
Ctrl+Alt+F11
Cmd+Option+F11
Ctrl+Alt+F12
Cmd+Option+F12
Alt+Shift+K
Option+Shift+K



Your Turn

Open 02-Data-basics.Rmd