Advanced R

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Adapted from *Tidy Tools* by Hadley Wickham

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Welcome to the **Advanced R** Workshop!

1. Get connected to the wifi:

2. Get the course materials:
   `usethis::use_course("bit.ly/advr-jul18")`
3. Follow the instructions in **setup.R**
4. Stuck? Please ask for help!

Use this link, **not** one in handout!

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Preliminaries

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Your turn

This course is very hands on, and while we're here to help you, the best resource is often the person sitting next to you.

Introduce yourself to your neighbours. Who are you and what are you using R for?

This means that you have to work!

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Goal

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Go from code like this...

```
# Fix missing values
df$a <- df$a[df$a == -99] <- NA
df$b <- df$b[df$b == -99] <- NA
df$c <- df$c[df$c == -99] <- NA
df$d <- df$d[df$d == -99] <- NA
df$e <- df$e[df$e == -99] <- NA
df$f <- df$f[df$f == -99] <- NA
df$g <- df$g[df$g == -98] <- NA
df$h <- df$h[df$h == -99] <- NA
df$i <- df$i[df$i == -99] <- NA
df$j <- df$i[df$j == -99] <- NA
```

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To code like this...

```
fix_missing <- function(x) {
  x[x == -99] <- NA
  x
}
df <- modify(df, fix_missing)
```

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Overall goal:

Code that expresses what you did, not the details of how you did it.

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Learning Objectives

By the end of the day you'll be able to ...

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Functions

Reduce repetitive code by extracting a common action into a function

1. Identify when to write a function, and use a strategy for how to write a function
2. Apply good design principles to make your functions easy for you and others to use.

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Functional Programming

Reduce repetitive code by having functions write for loops for you

1. Describe what it means that functions in R are first class citizens
2. Solve iteration problems using purrr::map() and friends
3. Avoid a single error stopping iteration with purrr::safely()

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Tidy Evaluation

Write functions that wrap tidyverse functions

1. Identify arguments in functions that are automatically quoted
2. Refer to a saved variable in the quoted arguments of a tidyverse function
3. Wrap a tidyverse function inside your own function by combining quo() and !!

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Schedule

10:15-10:30	Morning break
12:30-14:00	Lunch
15:15-15:30	Afternoon break

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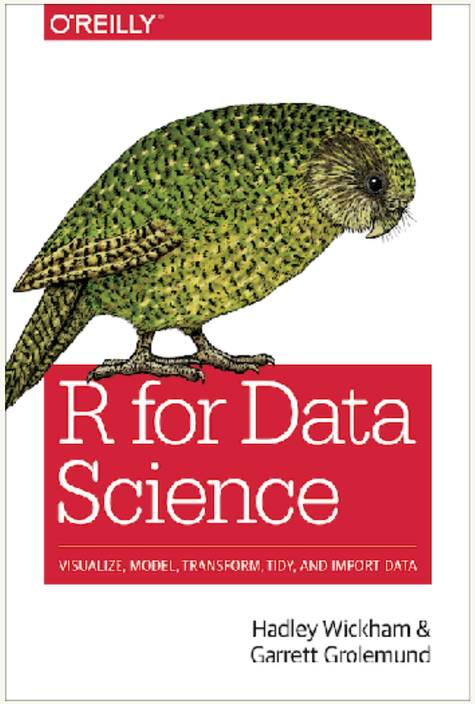
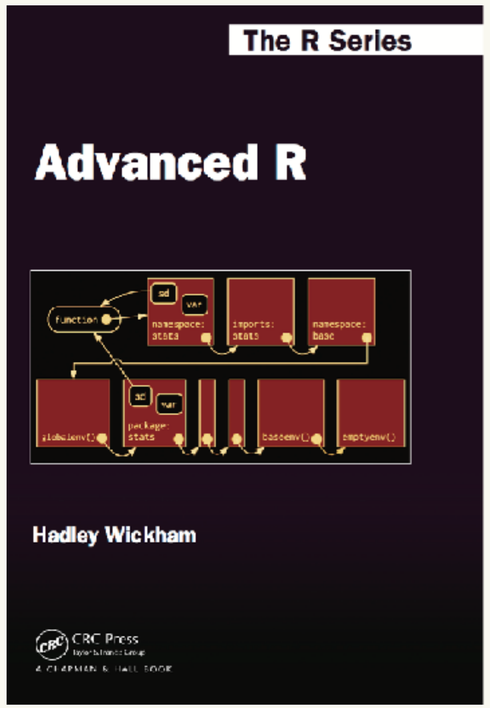
Much of the course is drawn from existing books



http://r4ds.had.co.nz



http://adv-r.had.co.nz/

2nd Ed. WIP:
https://adv-r.hadley.nz

Get materials: `usethis::use_course("bit.ly/advr-jul18")`

Warmups

Don’t expect to know all the answers!

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Your turn

What are the four common types of atomic vectors?
(Bonus points for the two uncommon types)

What are the three primary properties of a vector?

Four common types: logical, integer, double, character

```
typeof(TRUE)
typeof(1L)
typeof(1.5)
typeof("a")
```

Every vector has three properties:

```
x <- 1:5

# 1. Type:
typeof(x)

# 2. Length
length(x)

# 3. Attributes
attributes(x)
```

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Missing values

What does NA == NA return? Why?

What should you use instead?

There isn't a single unknown value

```
age_john <- NA
age_mary <- NA
age_john == age_mary

is.na(x)
```

```
sum(is.na(x))
mean(is.na(x))
```

Your turn

What are the six types of thing that you can put inside []?

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Number (be specific), Integer (be more specific)

1. positive integer (get those elements)
2. negative integer (exclude)
3. zero
4. logical
5. character
6. nothing

blank	include all
integer	**+ve**: include **0**: drop all **-ve**: exclude
logical	keep TRUEs
character	lookup by name

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Use character subsetting for simple look ups

```
x <- c("m", "f", "u", "f", "f", "m", "m")

lookup <- c(m = "Male", f = "Female", u = NA)
lookup[x]

unname(lookup[x])
```

RStudio

You don't have to use RStudio,
but if you do, try to master it!

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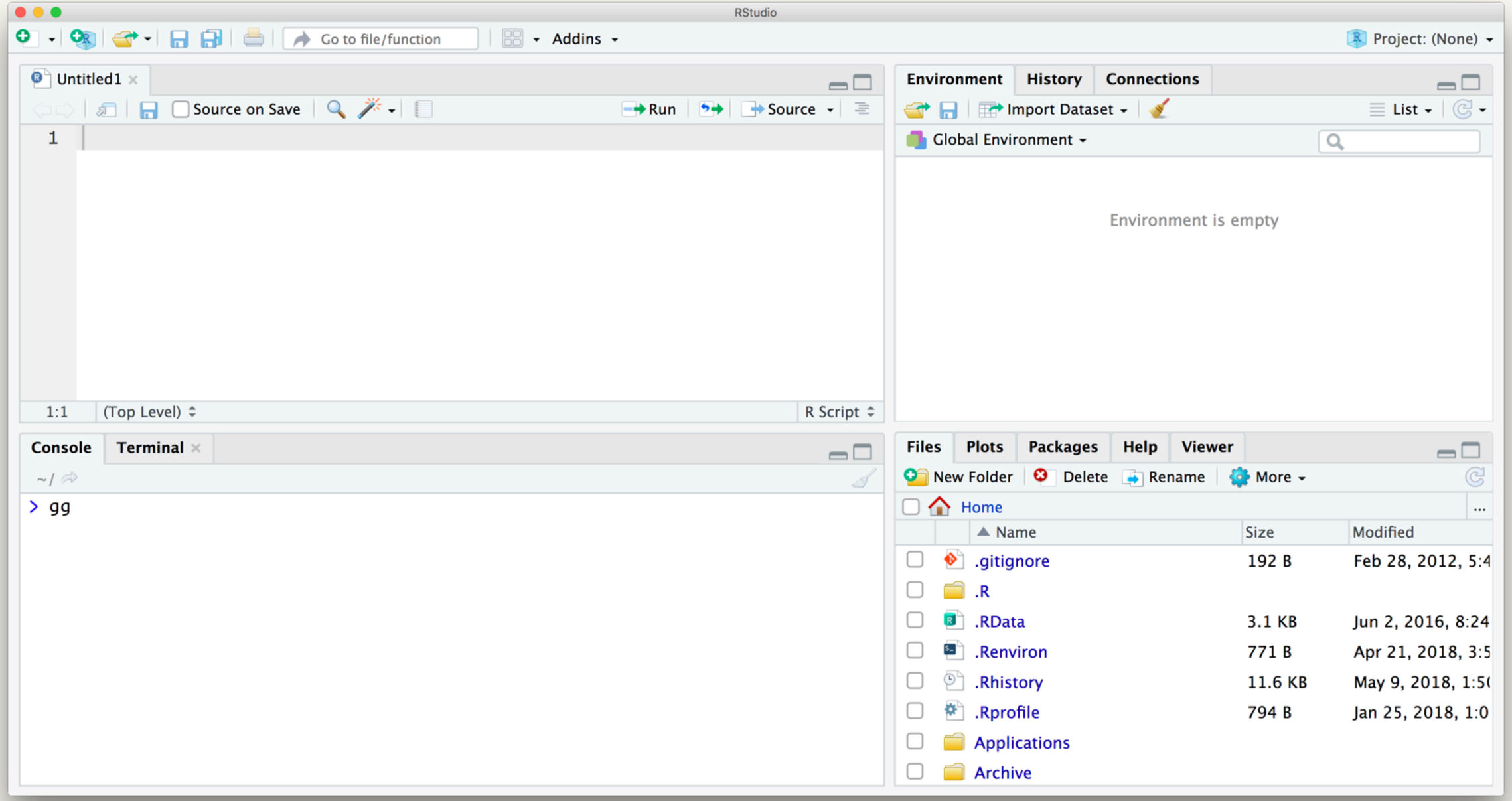

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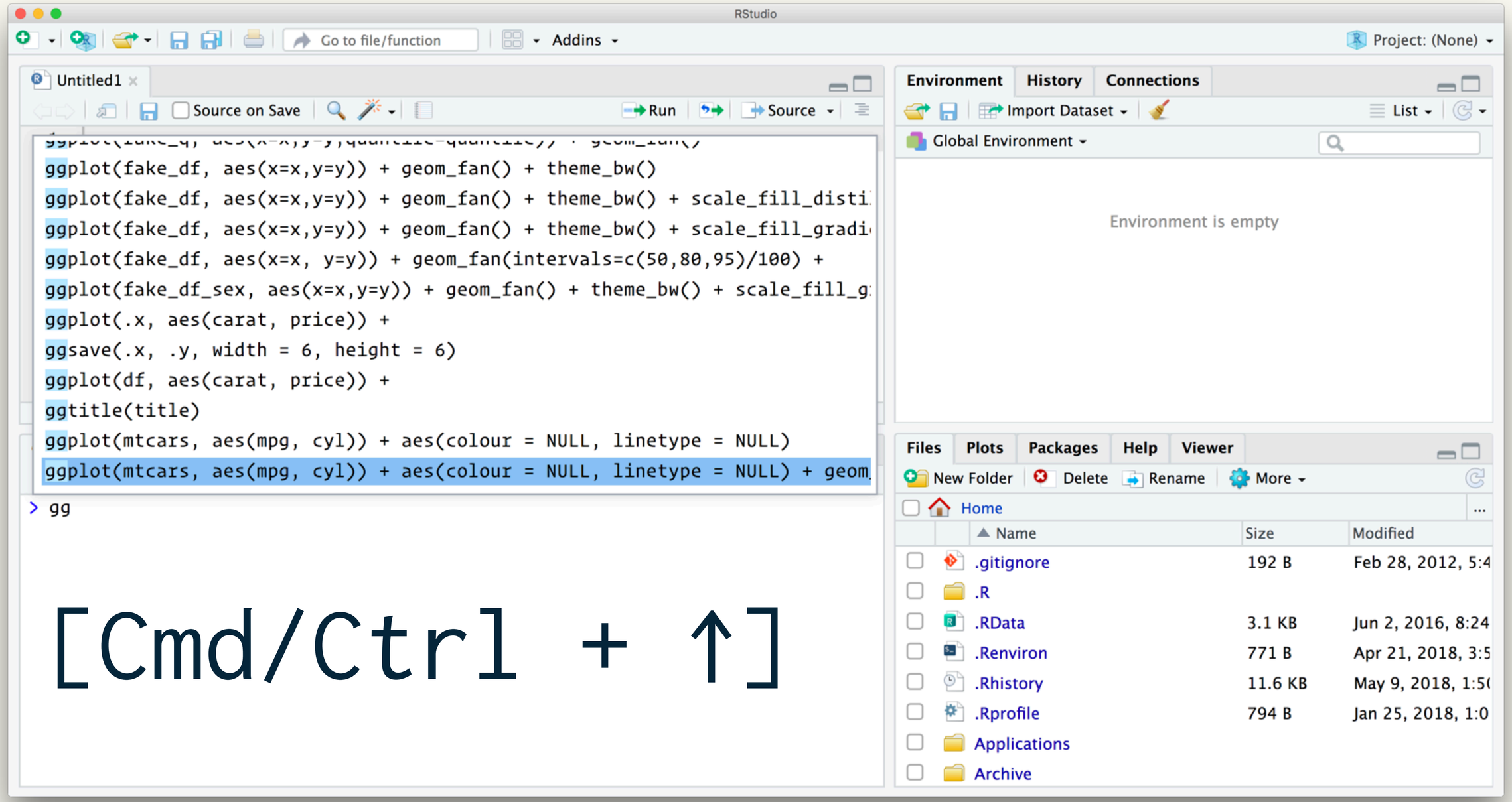

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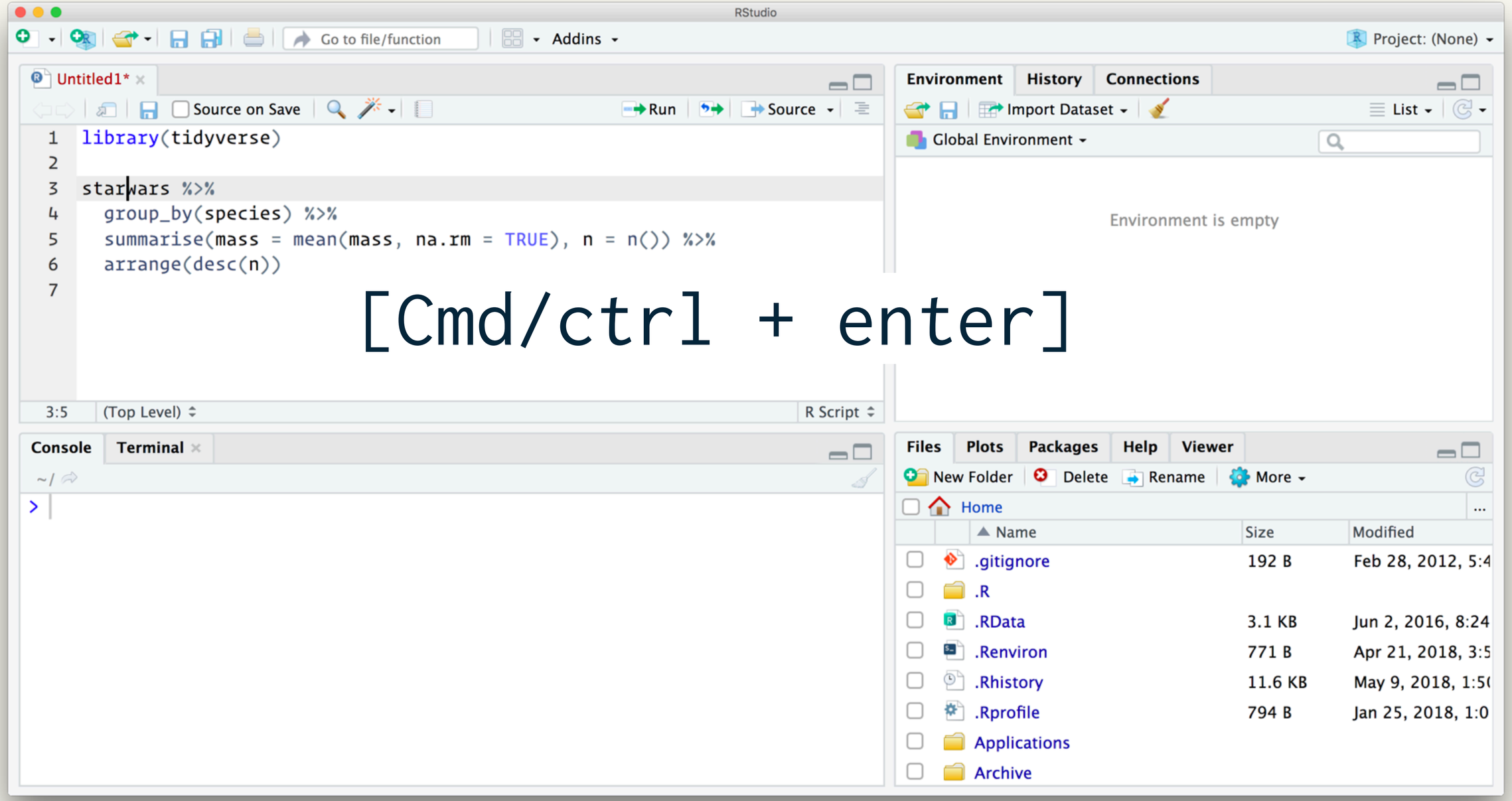

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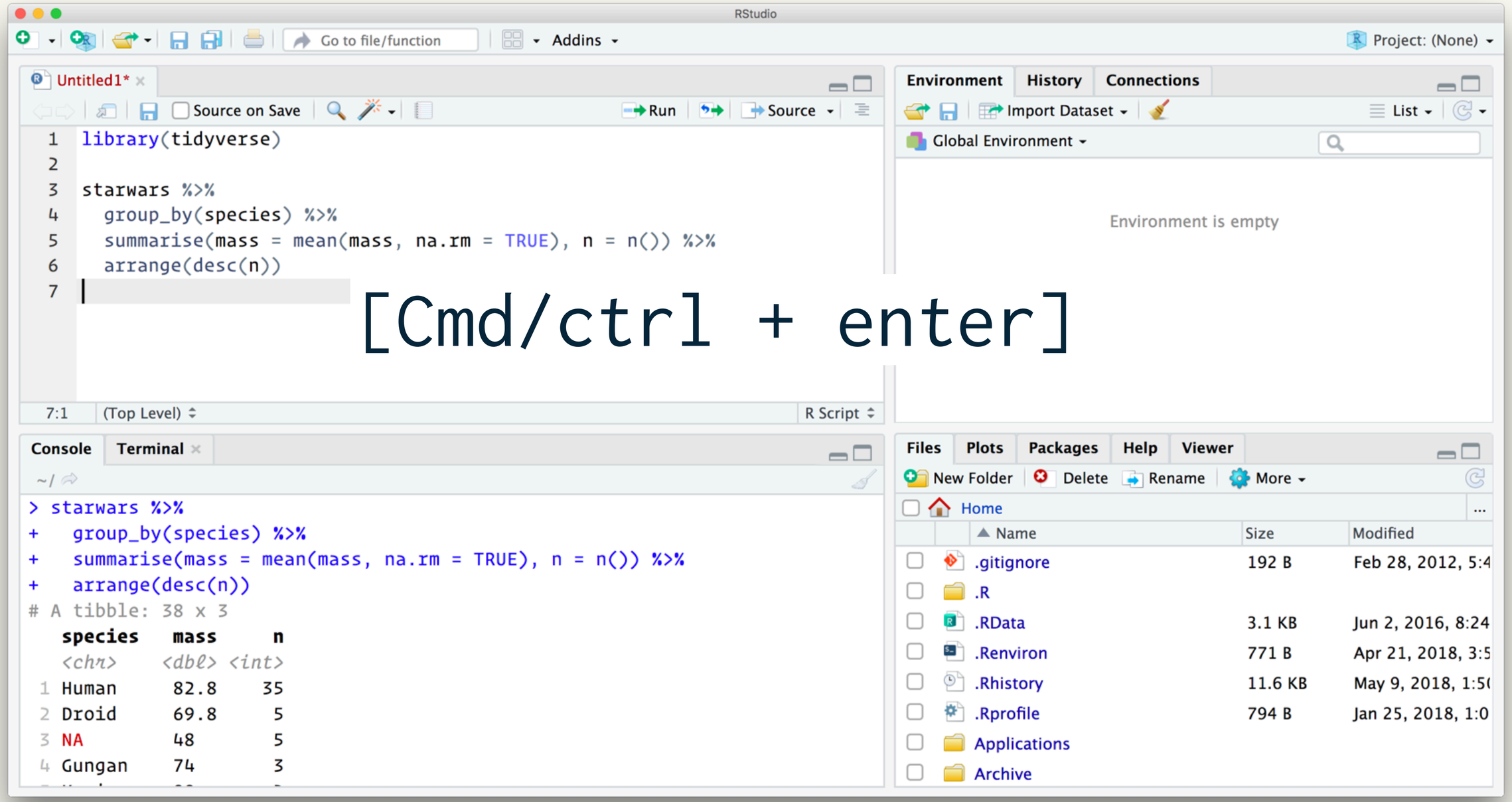

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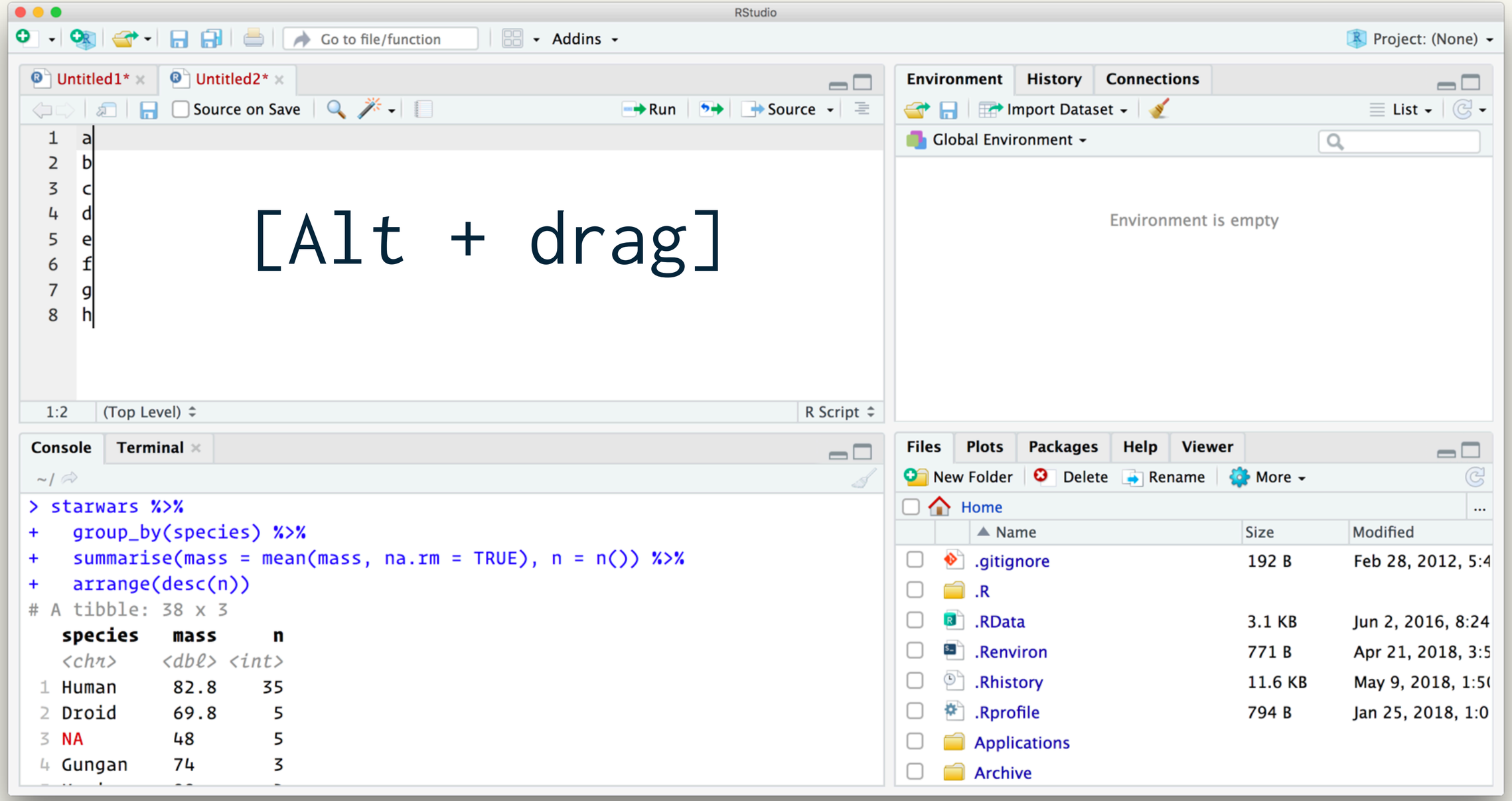

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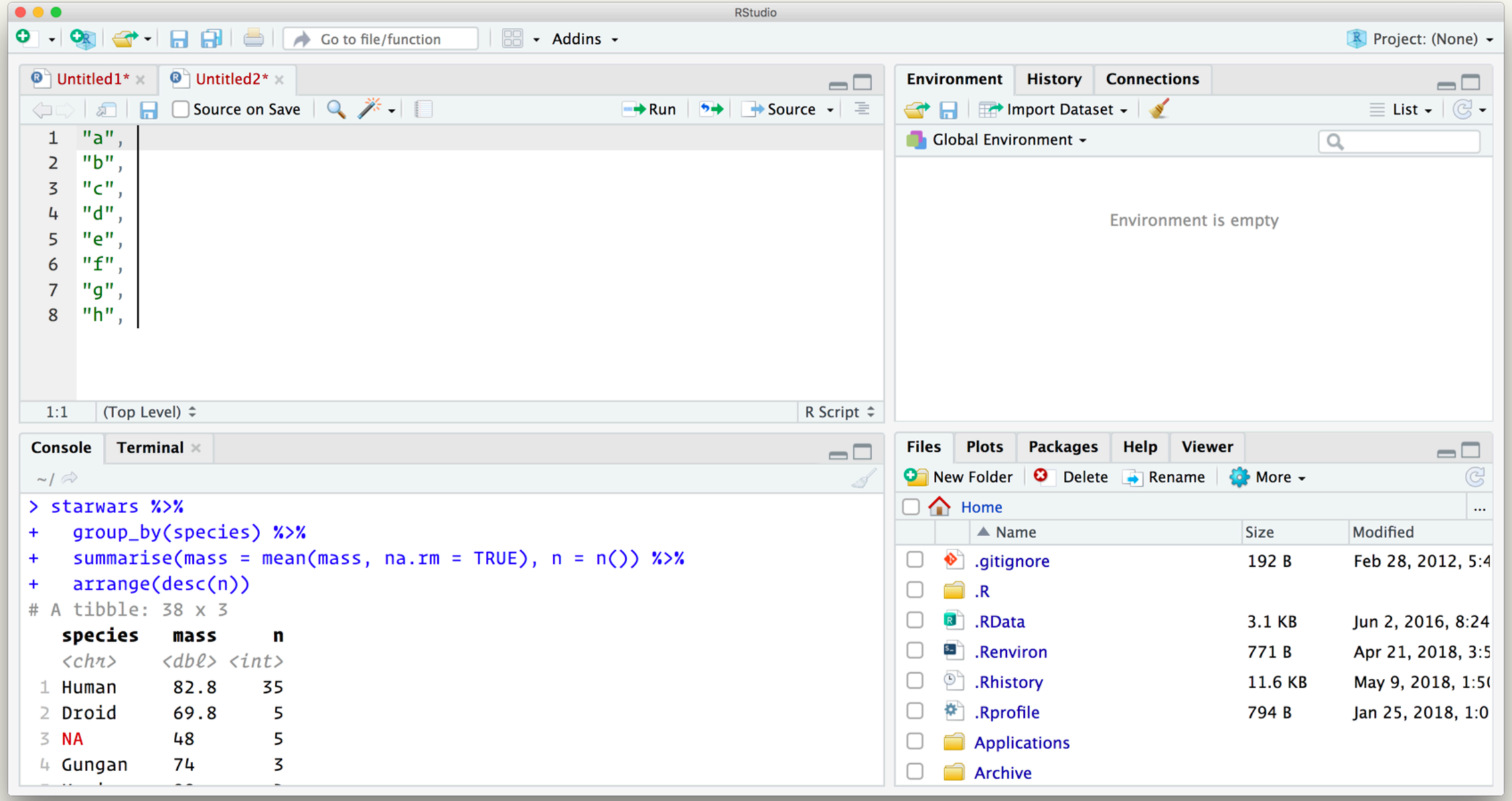

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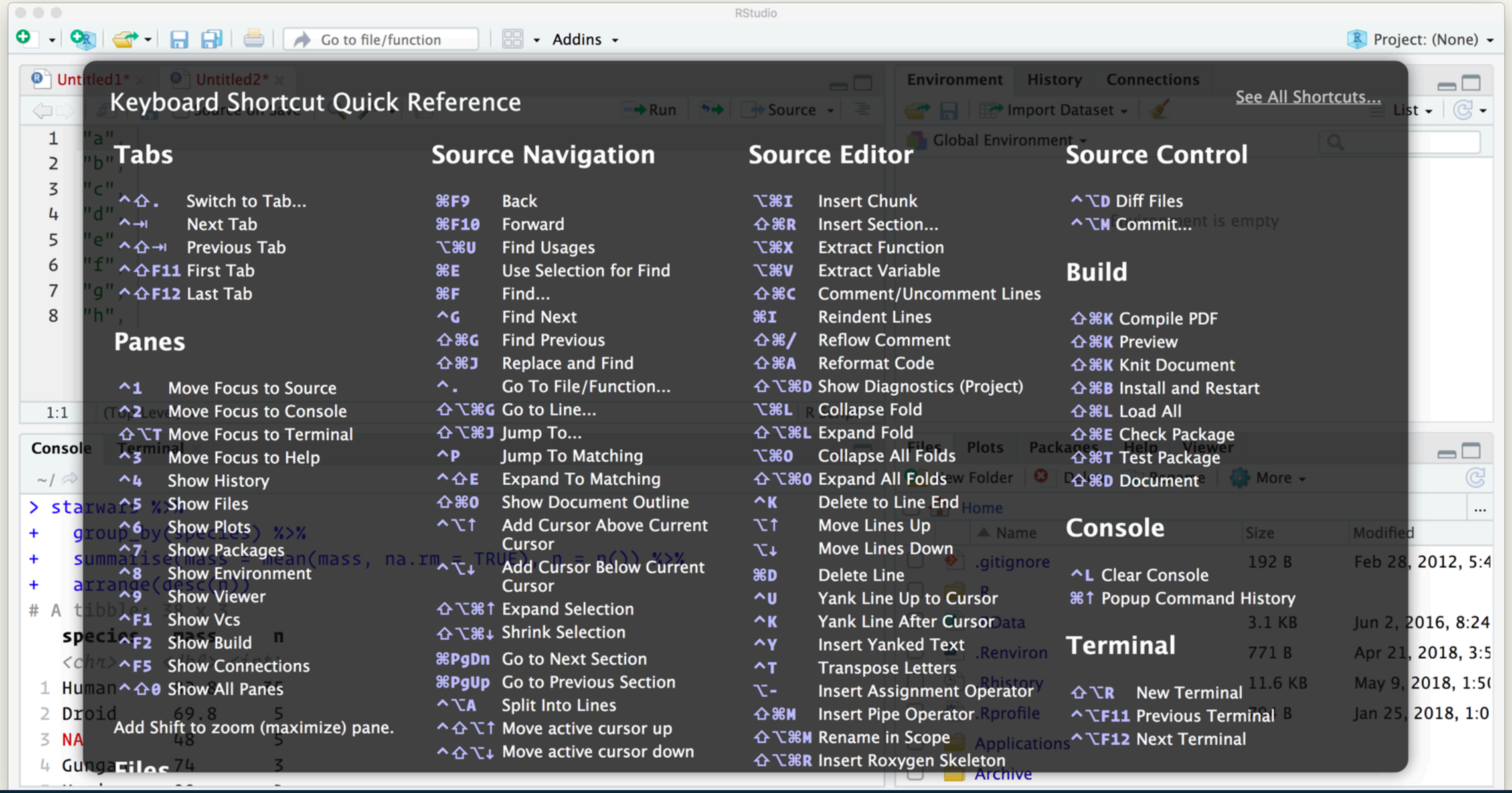

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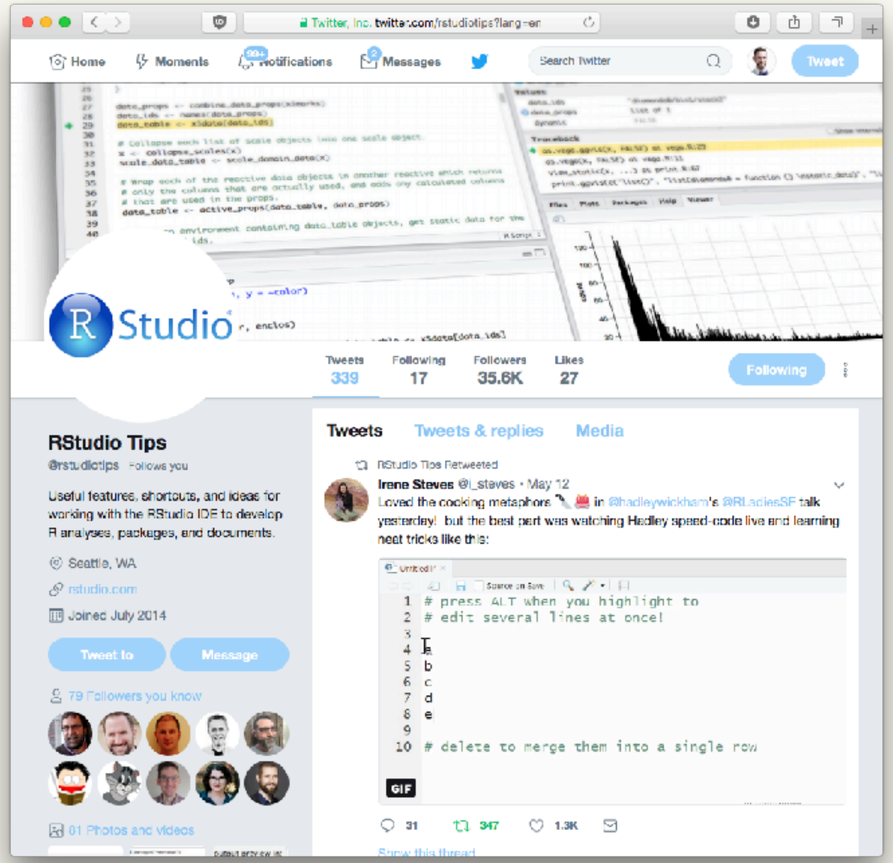
Your turn

What's the shortcut for <- (assignment)?

What about %>% (pipe)?

How can you quickly comment a block of lines?



@rstudiotips

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