LECTURE VIII. INTRODUCTION TO SHINY

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LECTURE VIII. INTRODUCTION TO SHINY

WHAT IS SHINY

WEB APP EXAMPLES WITH SHINY

INITIAL ACTIVITIES

WHAT IS SHINY?

Shiny from RStudio

- *Shiny is an R package that allows you to build interactive web applications from R scripts.*
- *Shiny allows you to export your time worked with R and expose it on a web page so that everyone can see it.*
- *Shiny makes you look "fantastic", it's easy to produce polished web applications with a minimal amount of pain.*

Instal·lació

```
1  install.packages("shiny")
2  library("shiny")
```

Shiny makes it much easier for the R programmer to create web applications:

- It provides a carefully selected set of UI functions (UI for short) that generate the HTML, CSS, and JavaScript needed for common tasks. This means that you don't need to know the ins and outs of HTML/CSS/JavaScript until you want to go beyond the basics that Shiny has to offer.
- Introducing a new programming style called reactive scheduling that automatically tracks dependencies on code snippets. This means that whenever you change an entry, Shiny can automatically figure out how to do the least amount of work to update all related outputs.

Shiny from RStudio

WHAT IS SHINY?

Shiny from RStudio

Users use Shiny to:

- *Create dashboards that track important high-level performance indicators, while making it easier to explore the metrics that need further investigation.*
- *Replace hundreds of PDF pages with interactive applications that allow the user to jump to the exact portion of the results that matter to them.*
- *ComuProvide complex models to a non-technical audience with informative visualizations and interactive sensitivity analysis.*
- *Provide self-service data analytics for common workflows, replacing email requests with a Shiny app that allows people to upload their own data and perform standard analytics.You can make sophisticated R analytics available to users with no programming knowledge.*
- *Create interactive demonstrations to teach statistical and data science concepts that allow students to adjust inputs and observe the subsequent effects of these changes on an analysis.*

WHAT IS SHINY?

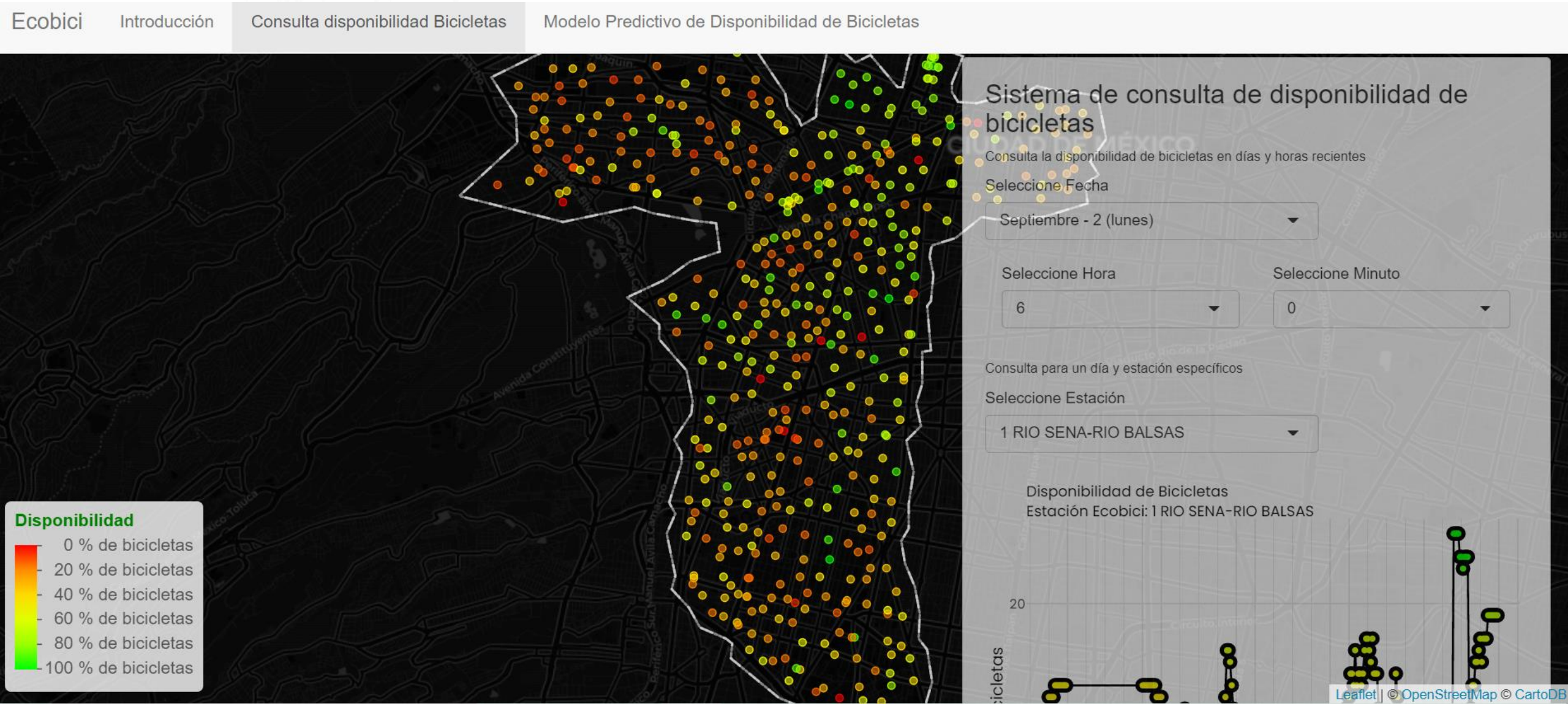
Shiny from RStudio

Shiny gives you the ability to pass on some of your R superpowers to anyone who might use the web.

WEB APP EXAMPLES DEVELOPED WITH SHINY

Shiny from RStudio

WEB APP EXAMPLES DEVELOPED WITH SHINY



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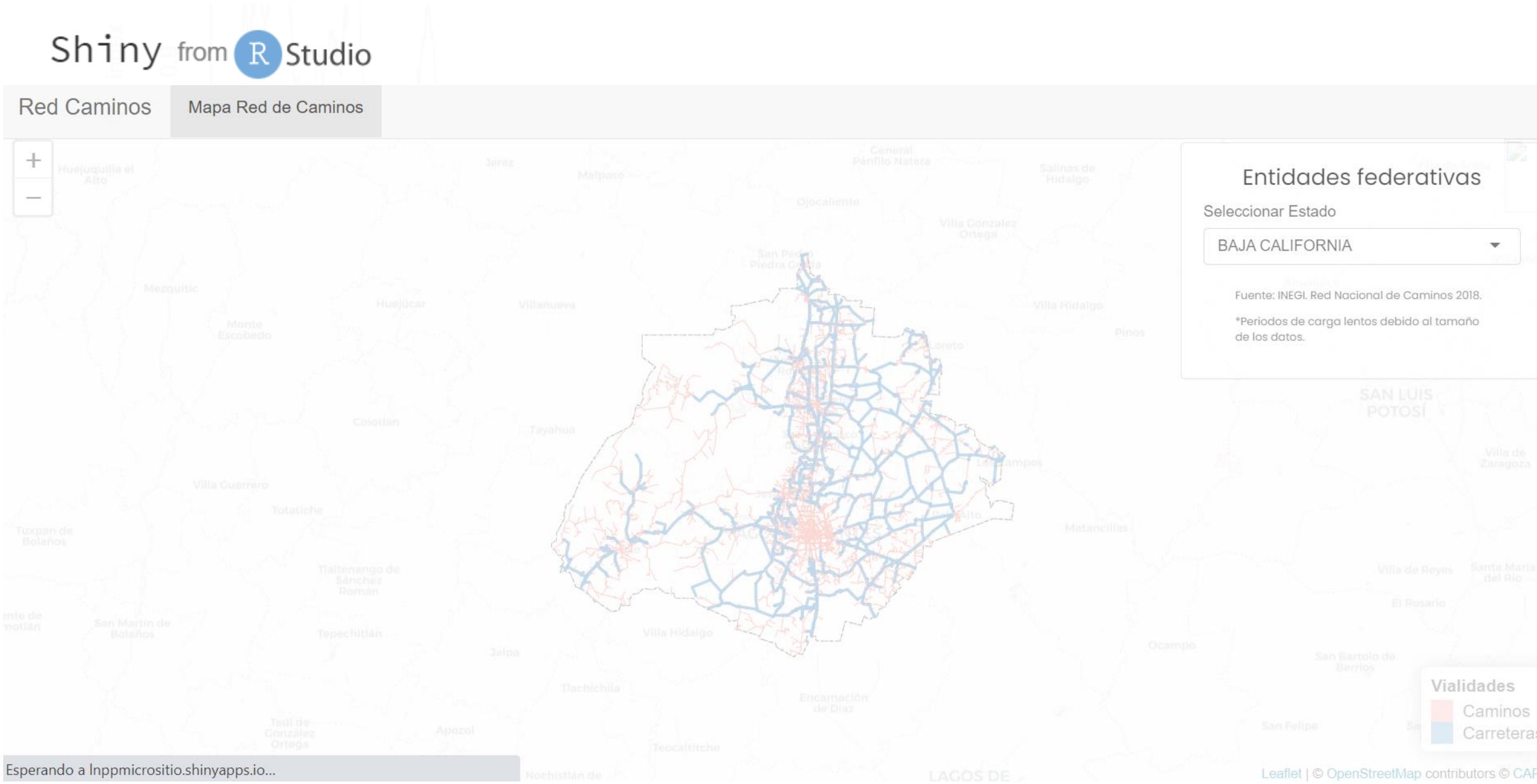
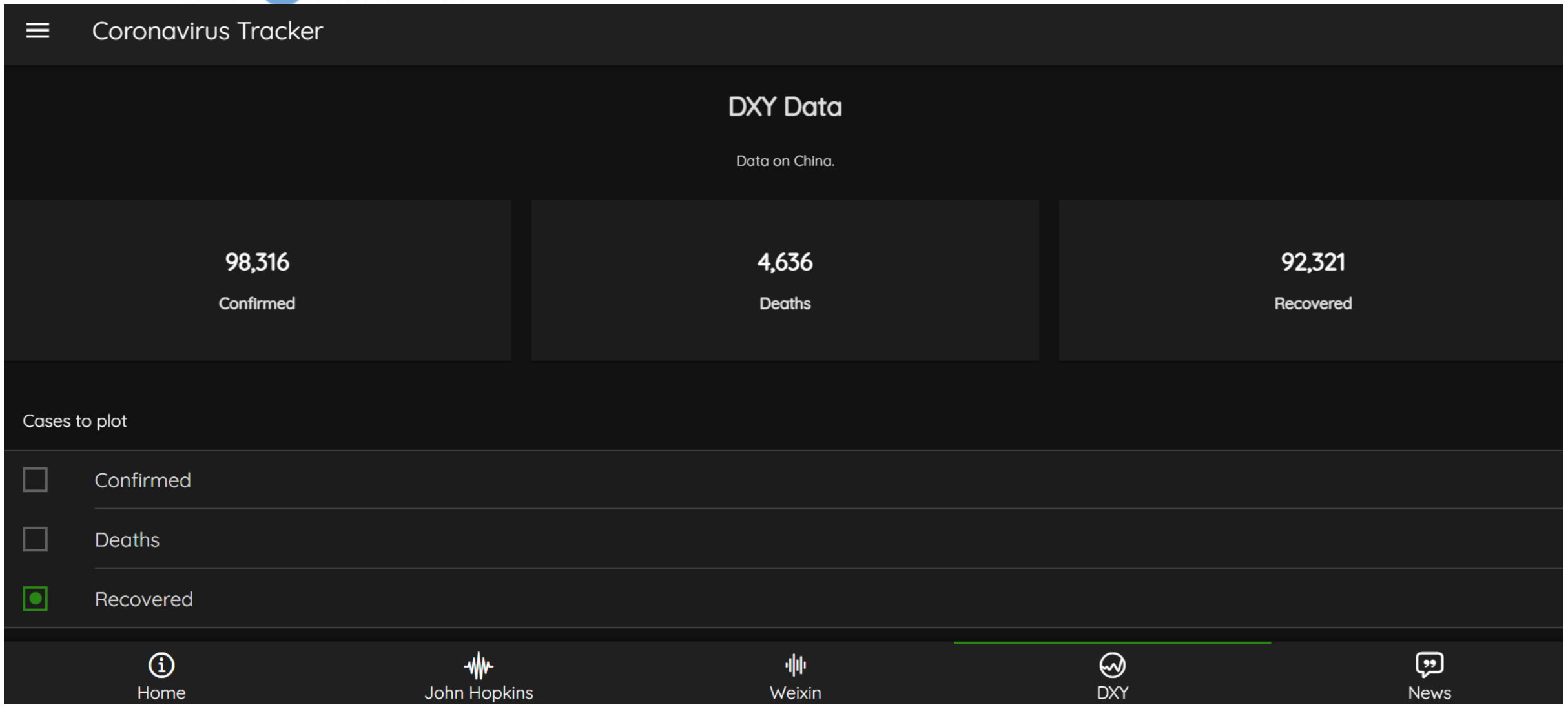


WEB APP EXAMPLES DEVELOPED WITH SHINY

Shiny from RStudio



Shiny from RStudio

European Climate Assessment & Dataset (ECA&D) stations data browser

Browse the available stations in the Blended ECA Dataset. Click on each marker to see the time-series and the metadata.

Data from the European Climate Assessment & Dataset project. Processed data retrieved from KNMI Climate Explorer Data description & policy

Developed by Matteo De Felice (the author is not involved in the ECA&D project). The code is available on Github Thanks to Geert Jan van Oldenburgh and the KNMI (Koninklijk Nederlands Meteorologisch Instituut) for the data access

Click on a marker to show daily time-series data.

The horizontal lines are the 5th and 95th percentiles for the entire time-series. Change the number in the bottom left to apply a rolling average (default one day, i.e. no average)

Filter

Minimum number of years

0 10 80

0 10 20 30 40 50 60 70 80

Filter all the stations with

any all

INTERACTIVE APPLICATIONS DESIGNED WITH SHINY- PRACTICAL INTRODUCTION

RSTUDIO PREPARATION WITH SHINY

DEFAULT EXAMPLE WITH SHINY

DEFAULT EXAMPLE WITH SHINY- CODE BODY

INITIAL ACTIVITIES

Shiny from RStudio

Instal·lació

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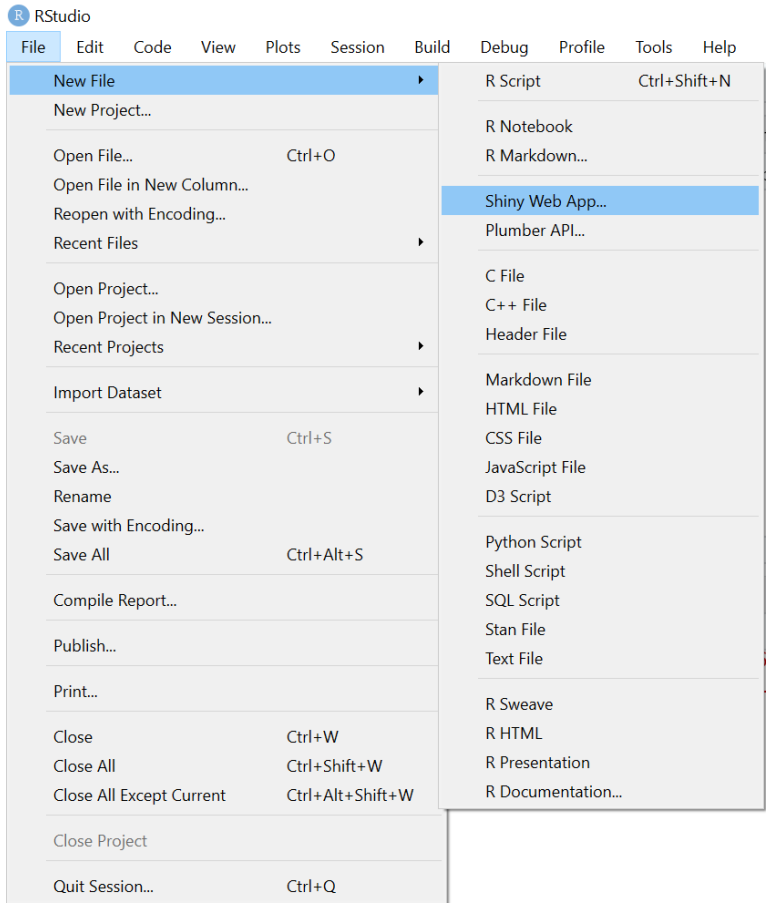
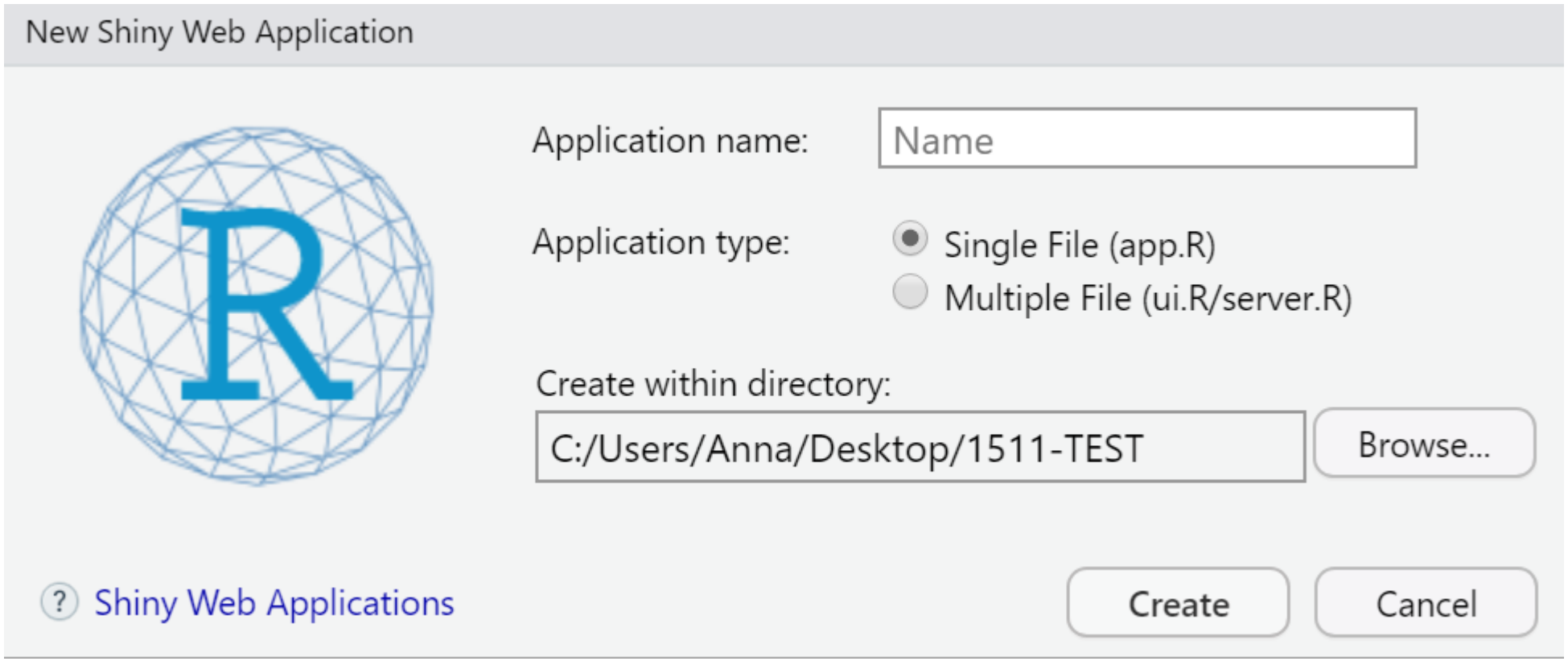
Possible options for working with Shiny

- *Create a file with R and save it in a folder called app (option 1)*
- *File-> new file-> new shiny web app (opció 2)*

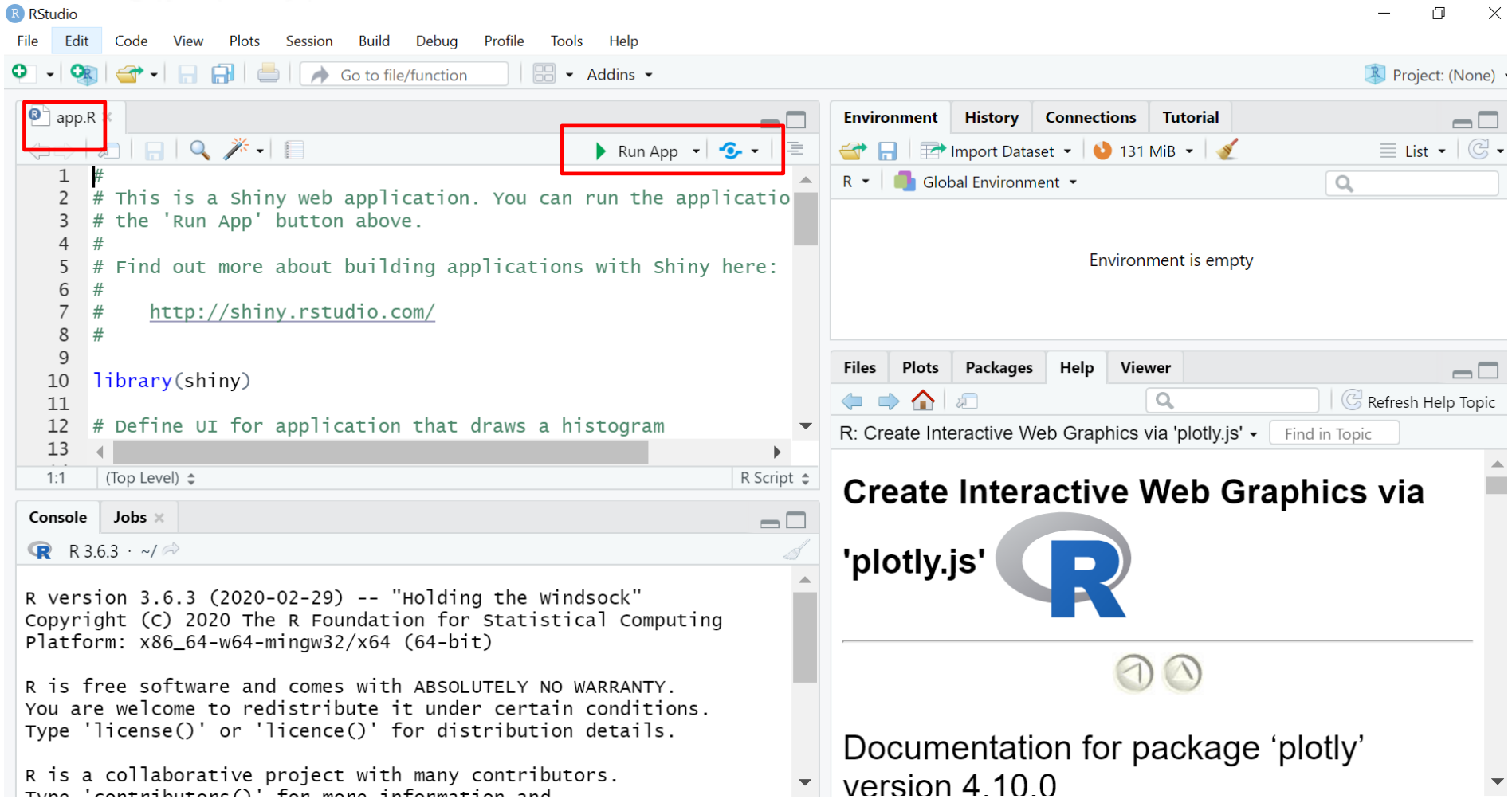


Shiny from RStudio



FIRST STEPS WITH SHINY. DEFAULT EXAMPLE WITH SHINY

Shiny from RStudio



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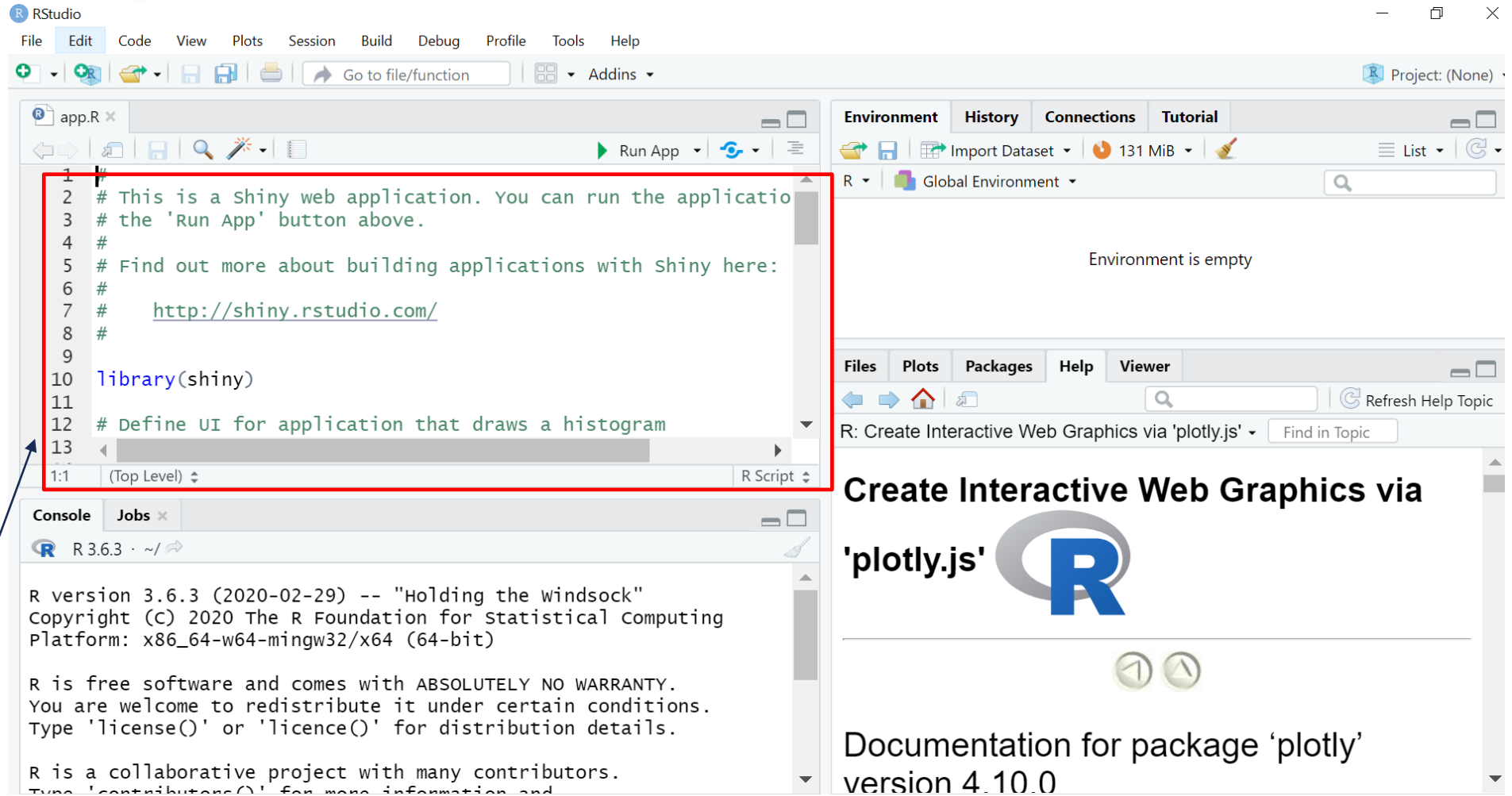
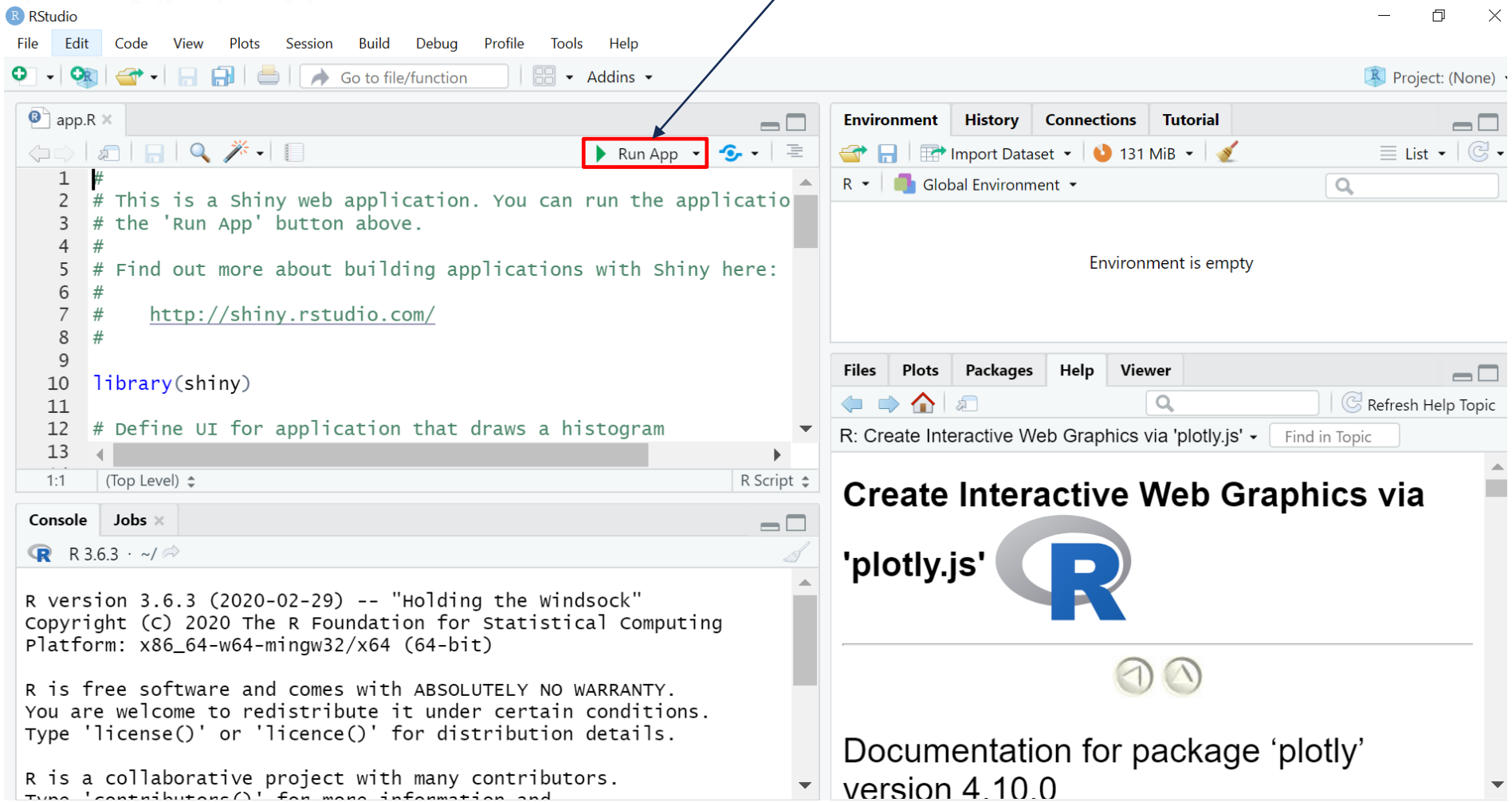


The code of the web app is complex and has a generic base structure

FIRST STEPS WITH SHINY. DEFAULT EXAMPLE WITH SHINY

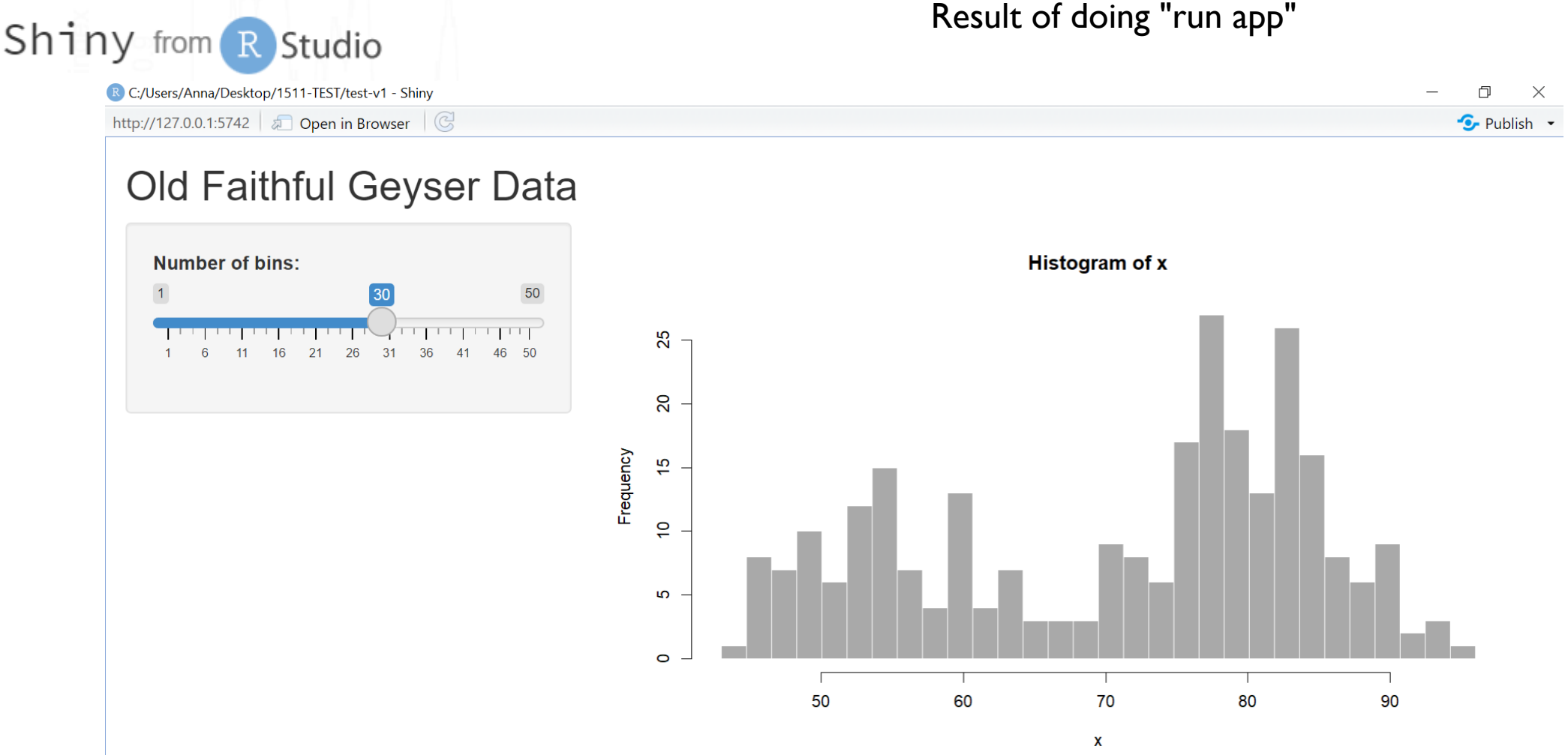
Shiny from RStudio

To run all the app code



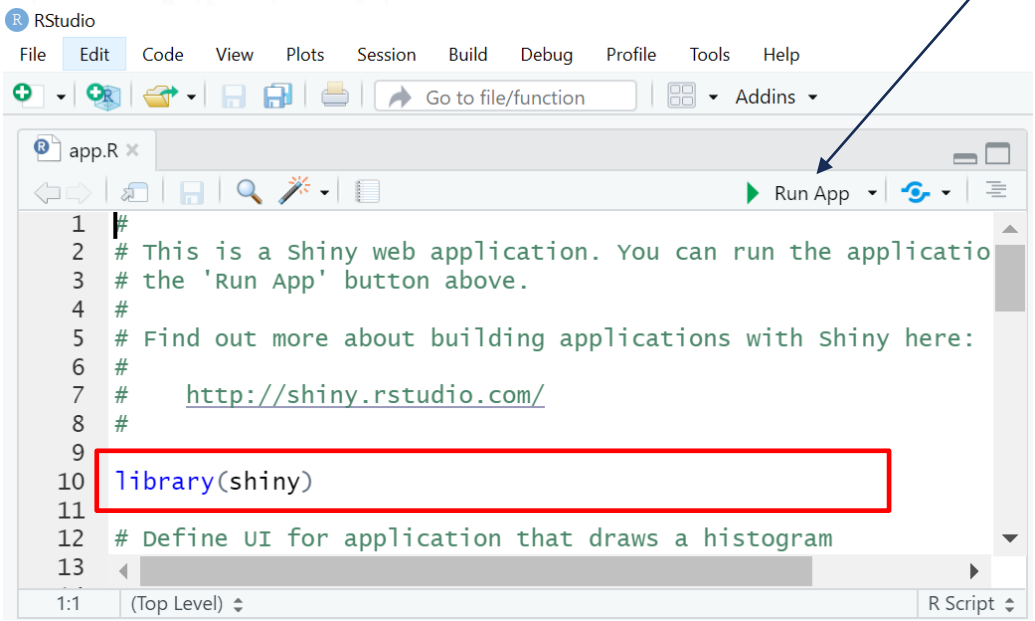
FIRST STEPS WITH SHINY. DEFAULT EXAMPLE WITH SHINY

Result of doing "run app"



FIRST STEPS WITH SHINY. DEFAULT EXAMPLE WITH SHINY- CODE BODY

Shiny from RStudio



But... What's inside all the code?

- Required Packages
- Definition of the UI (User Interface)
- Server Definition
- The code to "run" in the application

FIRST STEPS WITH SHINY. DEFAULT EXAMPLE WITH SHINY- CODE BODY

Shiny from RStudio

Reload App

```
12  # Define UI for application that draws a histogram
13  ui <- fluidPage(
14
15      # Application title
16      titlePanel("Old Faithful Geyser Data"),
17
18      # Sidebar with a slider input for number of bins
19      sidebarLayout(
20          sidebarPanel(
21              sliderInput("bins",
22                          "Number of bins:",
23                          min = 1,
24                          max = 50,
25                          value = 30)
26          ),
27
28          # Show a plot of the generated distribution
29          mainPanel(
30             plotOutput("distPlot")
31          )
32      )
33  )
34
35
```

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FIRST STEPS WITH SHINY. DEFAULT EXAMPLE WITH SHINY- CODE BODY

Shiny from RStudio

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```
35  # Define server logic required to draw a histogram
36  server <- function(input, output) {
37
38      output$distPlot <- renderPlot({
39          # generate bins based on input$bins from ui.R
40          x    <- faithful[, 2]
41          bins <- seq(min(x), max(x), length.out = input$bins + 1)
42
43          # draw the histogram with the specified number of bins
44          hist(x, breaks = bins, col = 'darkgray', border = 'white')
45      })
46  }
```

FIRST STEPS WITH SHINY. DEFAULT EXAMPLE WITH SHINY- CODE BODY

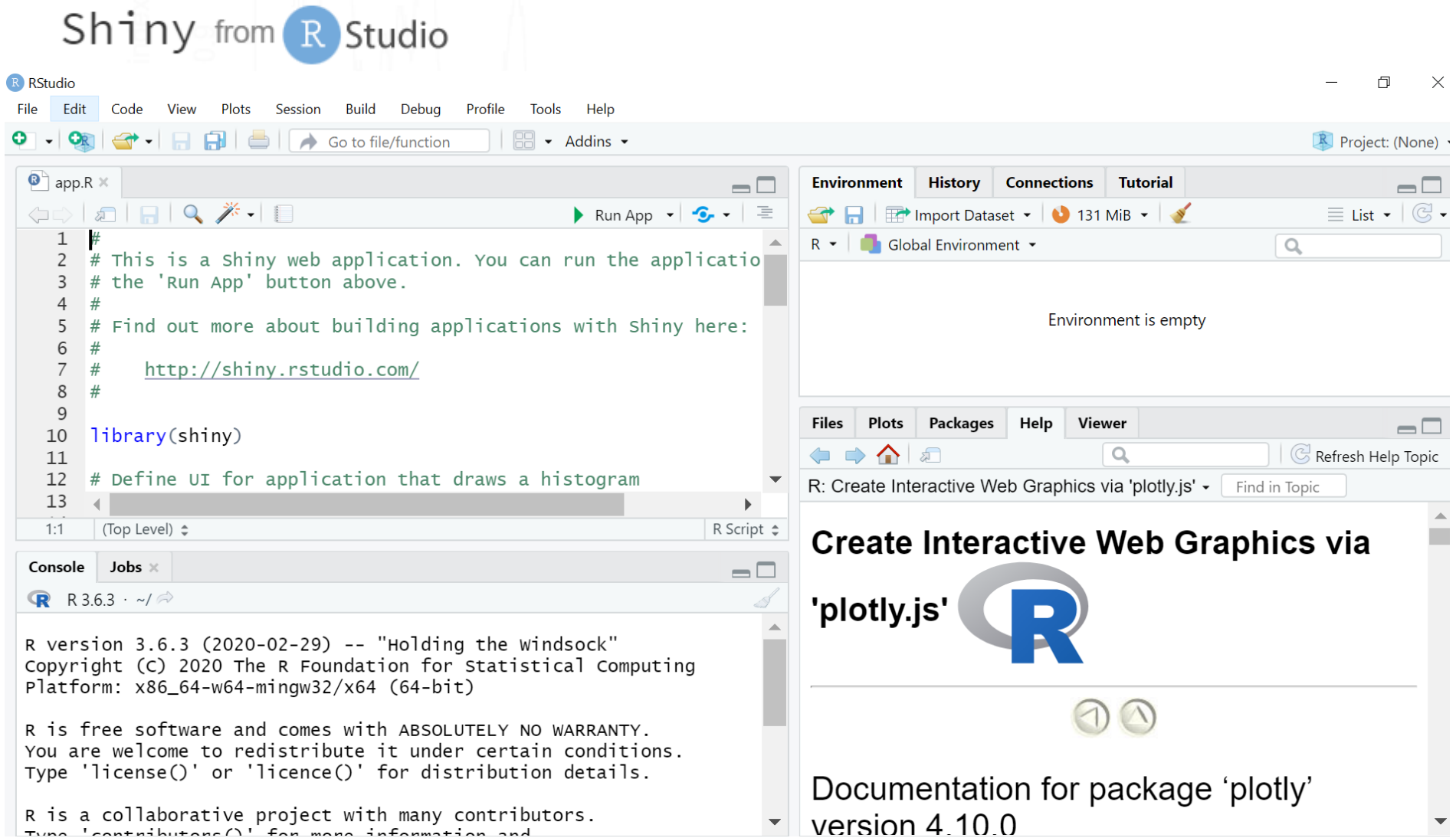
Shiny from RStudio

But... What's inside all the code?

```
48  # Run the application
49  shinyApp(ui = ui, server = server)
50
```

- Required Packages
- Definition of the UI (User Interface)
- Server Definition
- The code to "run" in the application

FIRST STEPS WITH SHINY. INITIAL ACTIVITIES



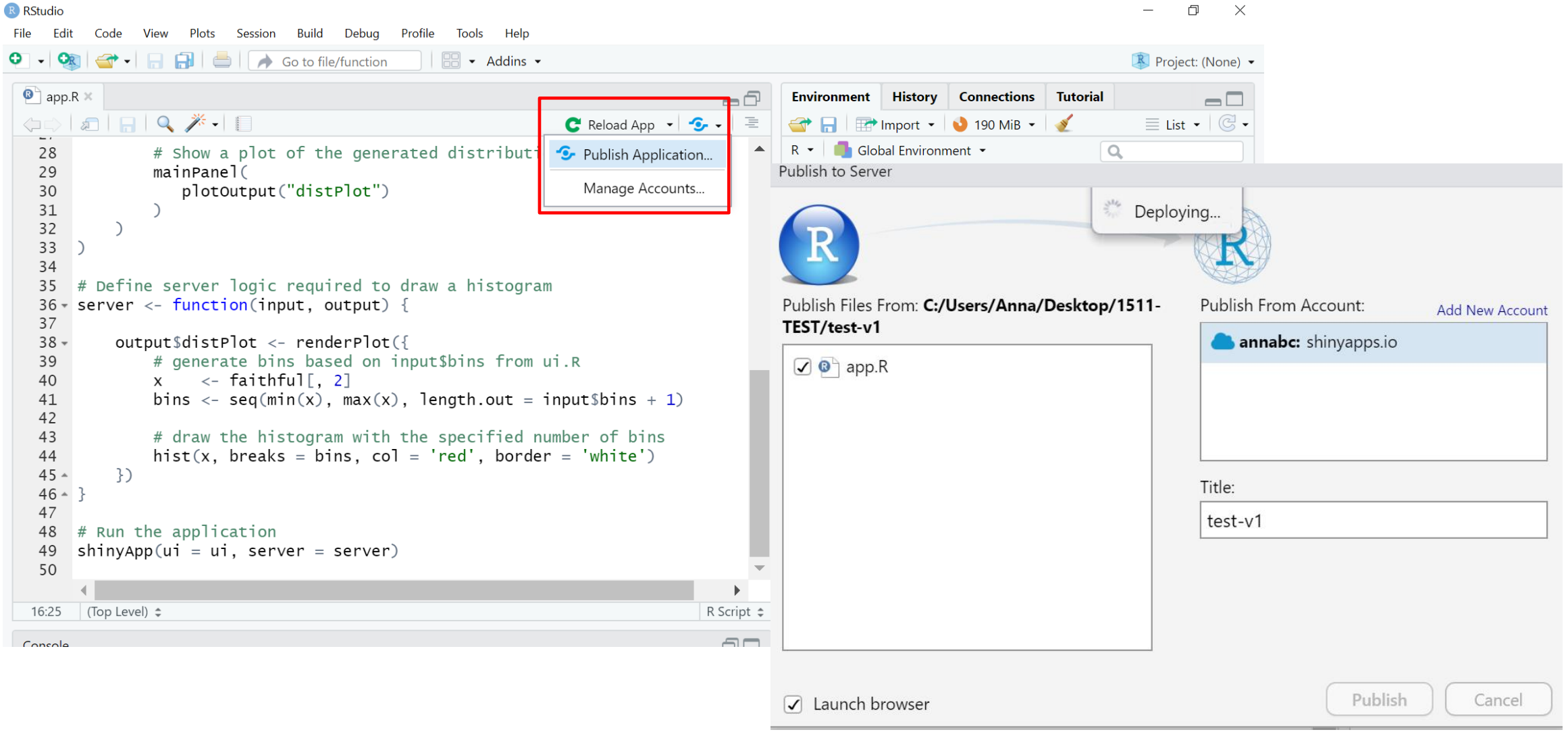
- Change the title
- Change the color of the chart bars
- Change the title of the slider

Shiny from RStudio

Shiny gives you the ability to pass on some of your R superpowers to anyone who might use the web.

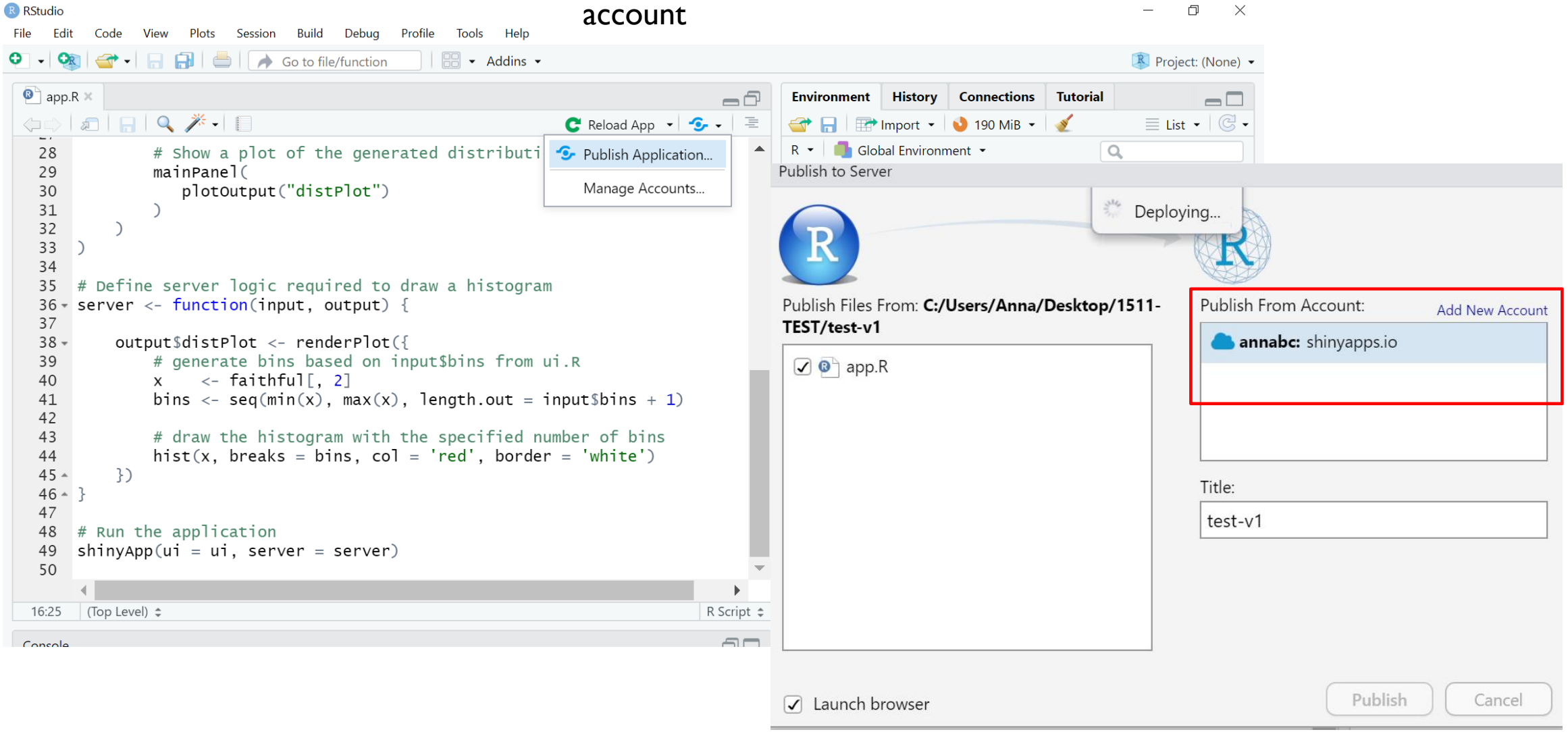
HOW DO WE DO IT???!!

Let's learn how to publish the web-app



Let's learn how to publish the web-app - You need to create a new account

https://www.shinyapps.io/



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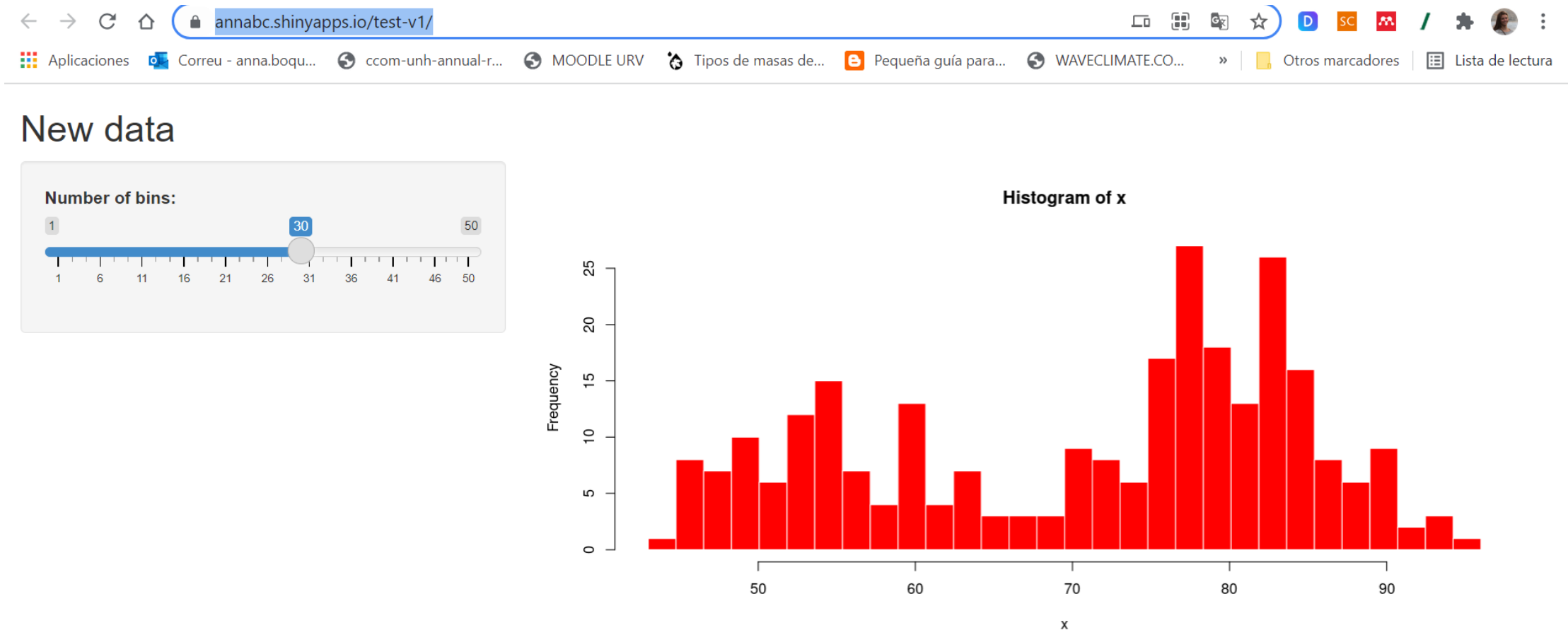

FIRST STEPS WITH SHINY. INITIAL ACTIVITIES

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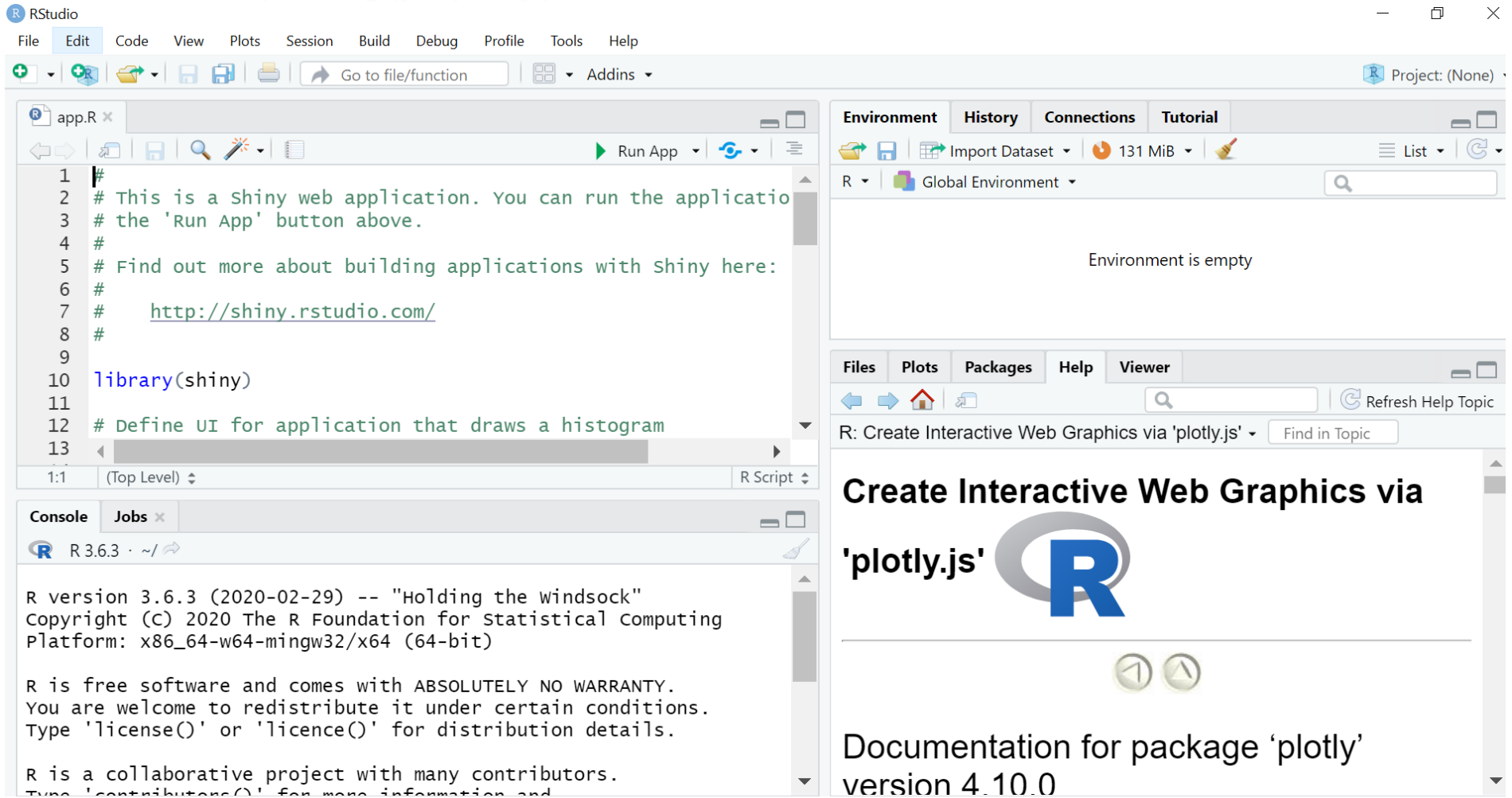

- Change the title
- Change the color of the chart bars
- Change the title of the slider
- **Publish your first web app**