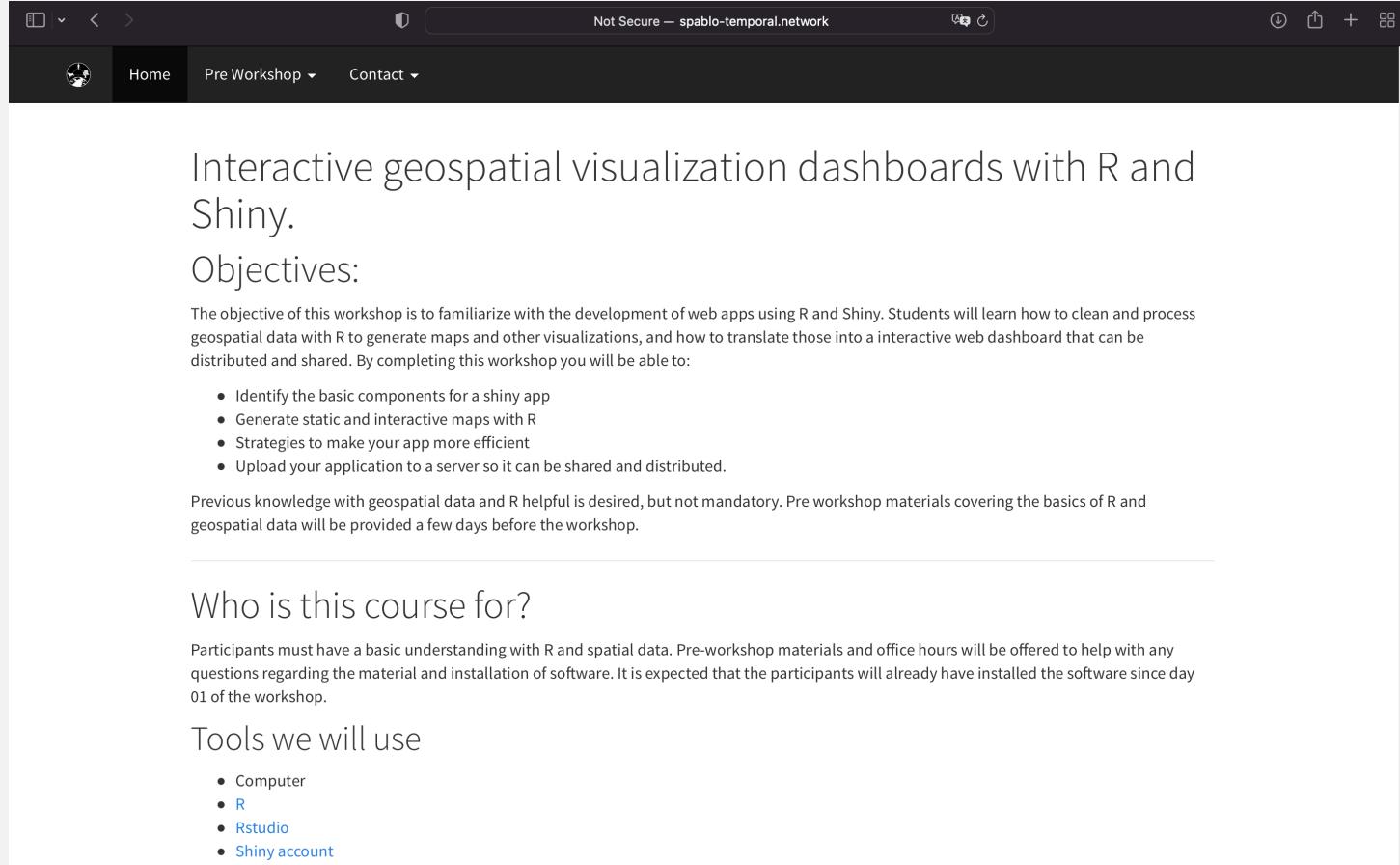


# INTRODUCTION

# WORKSHOP FORMAT



The screenshot shows a web browser window with a dark theme. The address bar says "Not Secure — spablo-temporal.network". The main content area displays the following text:

Interactive geospatial visualization dashboards with R and Shiny.

**Objectives:**

The objective of this workshop is to familiarize with the development of web apps using R and Shiny. Students will learn how to clean and process geospatial data with R to generate maps and other visualizations, and how to translate those into a interactive web dashboard that can be distributed and shared. By completing this workshop you will be able to:

- Identify the basic components for a shiny app
- Generate static and interactive maps with R
- Strategies to make your app more efficient
- Upload your application to a server so it can be shared and distributed.

Previous knowledge with geospatial data and R helpful is desired, but not mandatory. Pre workshop materials covering the basics of R and geospatial data will be provided a few days before the workshop.

---

**Who is this course for?**

Participants must have a basic understanding with R and spatial data. Pre-workshop materials and office hours will be offered to help with any questions regarding the material and installation of software. It is expected that the participants will already have installed the software since day 01 of the workshop.

**Tools we will use**

- Computer
- [R](#)
- [Rstudio](#)
- [Shiny account](#)

# WORKSHOP FORMAT

## Short Lectures

Ia: Basic components of a Shiny App

INTRODUCTION

WORKSHOP FORMAT

A screenshot of a presentation slide. The main title is 'INTRODUCTION'. Below it is a section titled 'WORKSHOP FORMAT'. At the bottom of the slide, there is a preview of another slide with the title 'Interactive geospatial visualization dashboards with R and Shiny' and 'Objectives'.

## Labs

Your first App

In this exercise we will create our first shiny app.

Objectives:

- Familiarize with Rstudio and Shiny
- identify basic components of a shiny app
- How to run our app from R

1 Creating your first app

There are multiple ways to create your first app, in general the shiny apps consist of 4 parts:

- Loading the libraries, data and functions.
- User interface (UI).
- Server.
- Integrating the components `shinyApp()`

First we will make sure we have the shiny library installed.

```
# Install shiny  
install.packages("shiny")
```

Once we have the library installed, we can start. To create your first web app, lets use the user interface of Rstudio. For this we the menu for creating a new files, and select `Shiny Web App...` from the list

A screenshot of the RStudio interface showing the 'File' menu open with the 'New File' option highlighted by a red arrow. The 'Shiny Web App...' option is visible in the dropdown menu.

# WORKSHOP FORMAT: LABS

The screenshot shows a web browser window with the URL "Not Secure — spablo-temporal.network". The page title is "Your first App". A sidebar on the left has two items: "1 Creating your first app" (selected) and "2 Examining the components". The main content area starts with the heading "1 Creating your first app". It says: "In this exercise we will create our first shiny app." Under "Objectives:" there is a bulleted list: "• Familiarize with Rstudio and Shiny", "• identify basic components of a shiny app", and "• How to run our app from R". Below this is another heading "1 Creating your first app". It states: "There are multiple ways to create your first app, in general the shiny apps consist of 4 parts:". A bulleted list follows: "• Loading the libraries, data and functions.", "• User interface (UI).", "• Server.", and "• Integrating the components `shinyApp()`". The next section is titled "First we will make sure we have the shiny library installed." It contains a code snippet:

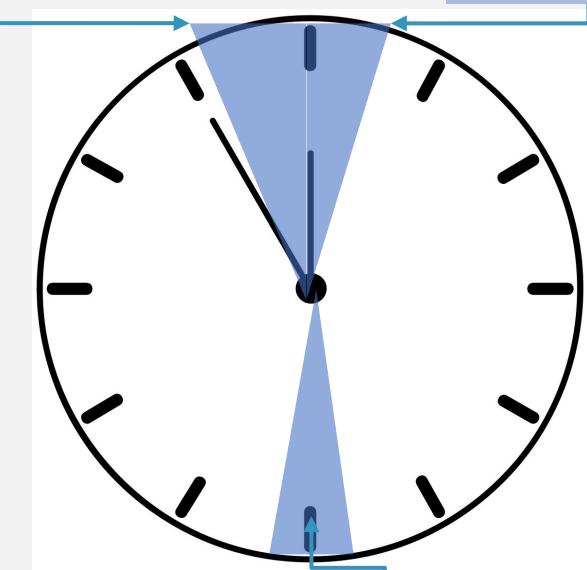
```
# Install shiny
install.packages("shiny")
```

Once we have the library installed, we can start. To create your first web app, lets use the user interface of Rstudio. For this we need to open Rstudio. In the menu for creating a new files, and select *Shiny Web App...* from the list

The RStudio interface is shown at the bottom. The "File" menu is open, and the "New File" option is highlighted with a red box and a red arrow pointing to it. The menu also includes "R Script", "R Notebook", and "R Markdown...".

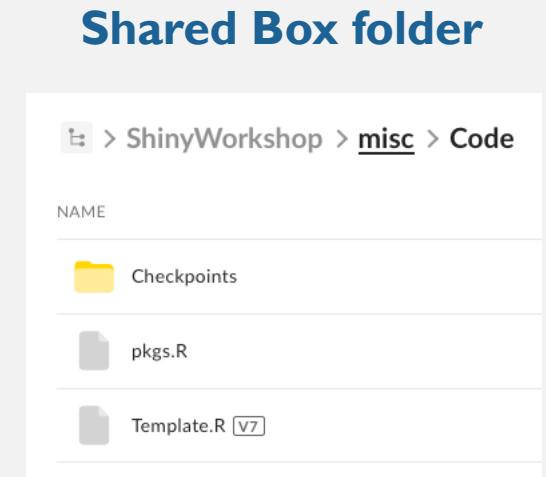
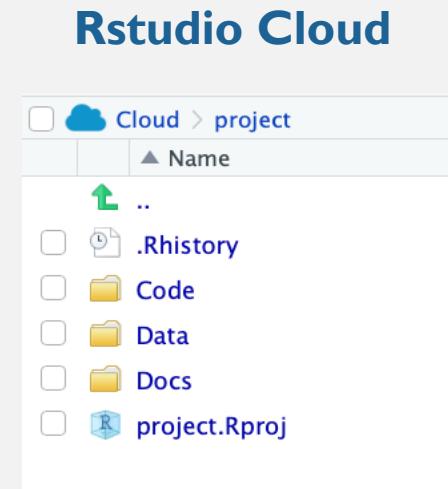
Conclusion

Introduction



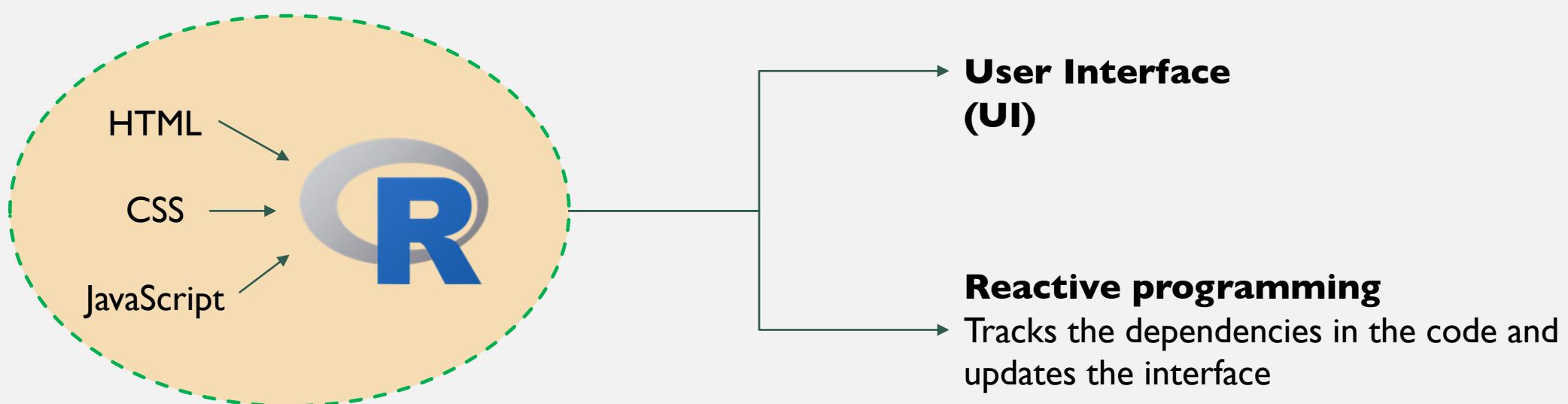
Check progress

# CHECKPOINTS



# WHAT IS A SHINY APP?

Shiny is an R library that allows to interface with HTML and JavaScript to create interactive applications that can be run locally or on a web server



# SOME EXAMPLES



Tracking Home

Data Visualizations ▾

Global Map

U.S. Map

Data in Motion

Tracking FAQ

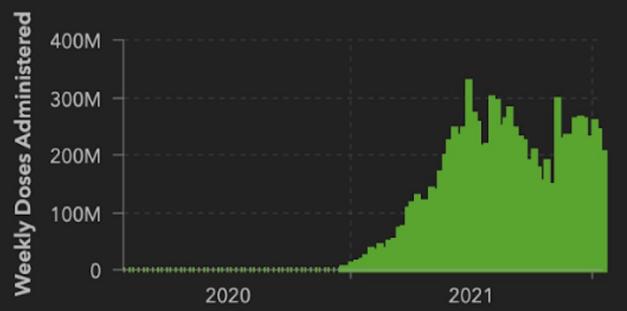
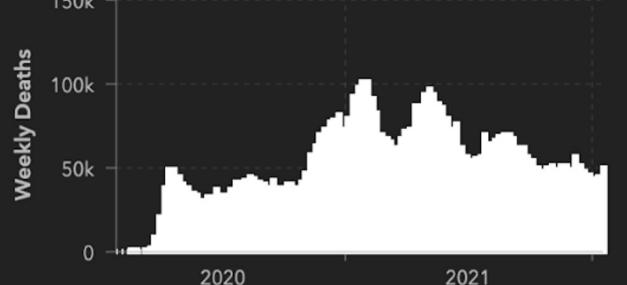


## COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU)

<https://coronavirus.jhu.edu/map.html>Last Updated at (M/D/YYYY)  
**21/1/2022 12:21**Total Cases  
**344.002.803**Total Deaths  
**5.578.967**Total Vaccine Doses Administered  
**9.759.350.036**Cases | Deaths by  
Country/Region/Sovereignty**US**  
28-Day: **17.479.329** |  
**42.845**  
Totals: **69.591.919** | **861.392****France**  
28-Day: **6.721.223** | **5.825**  
Totals: **15.715.702** | **129.105****Italy**  
28-Day: **3.901.202** | **6.345**  
Totals: **9.603.856** | **142.963****United Kingdom**  
28-Day: **3.881.284** | **5.523**  
Totals: **15.814.135** | **153.998****India**  
28-Day: **3.793.401** | **9.263**  
Totals: **38.566.027** | **488.396****Spain**  
28-Day: **3.116.356** | **2.580**  
Totals: **8.834.363** | **91.599**28-Day Cases  
**64.312.808**28-Day Deaths  
**186.109**28-Day Vaccine Doses Administered  
**809.080.419**

Esri, FAO, NOAA

Powered by Esri



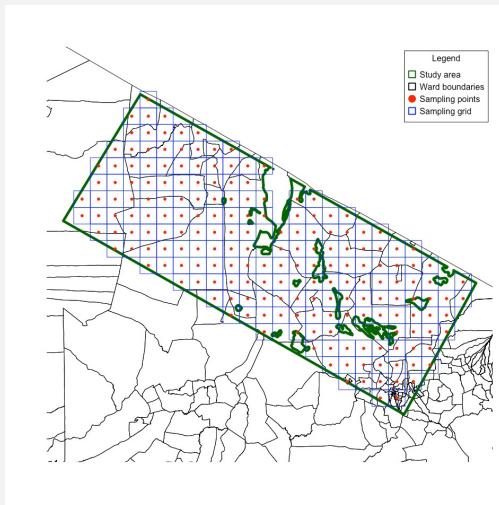
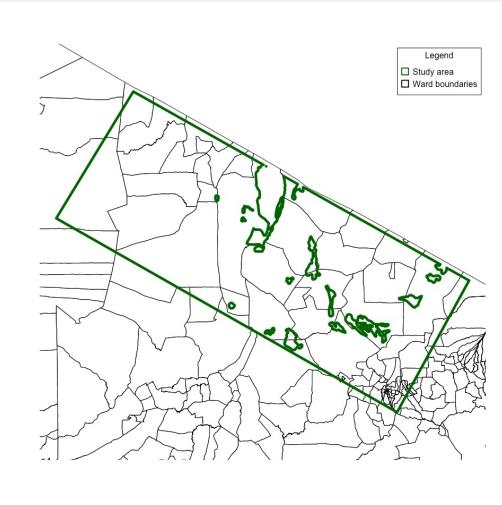
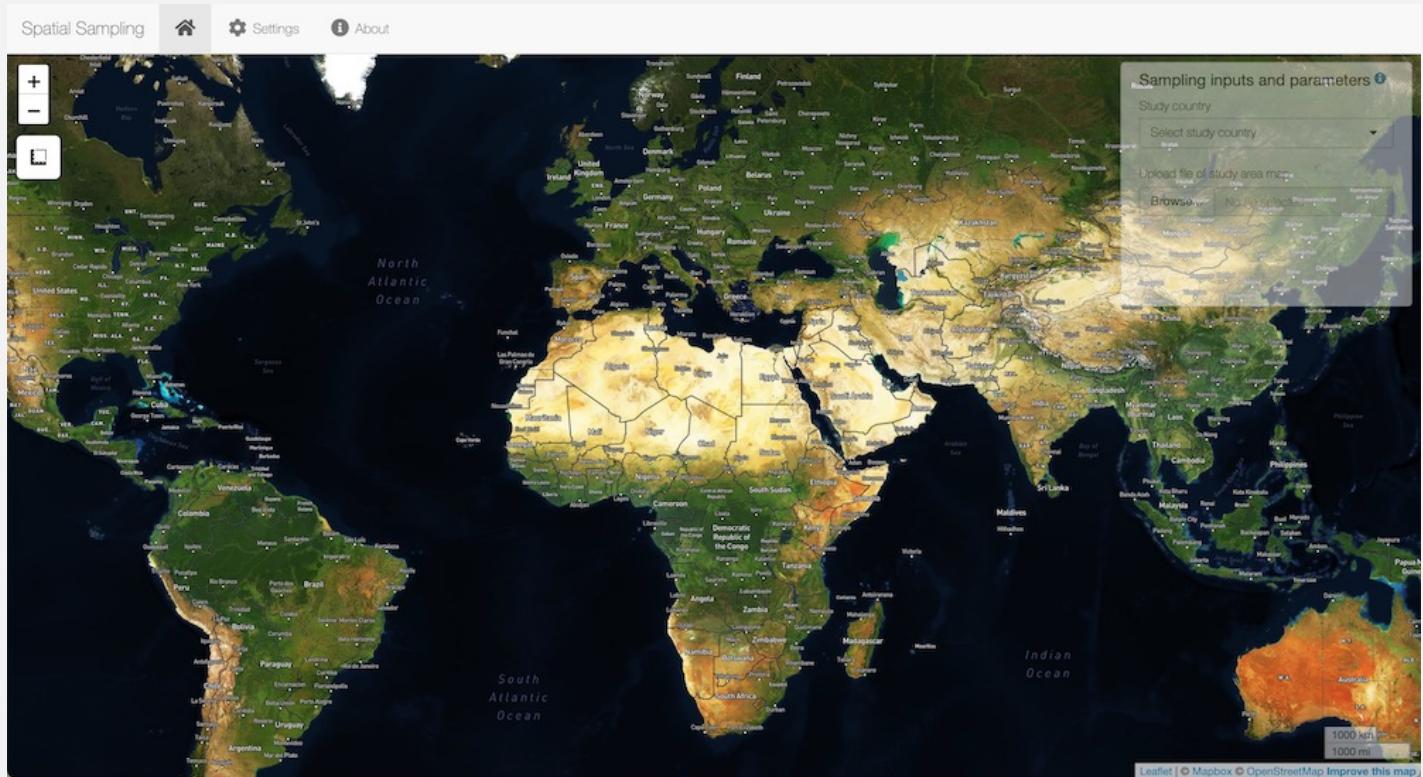
Admin0

Admin0

28-Day

28-Day

Weekly



<https://github.com/ecohealthalliance/spatialsampling>

# 1-way Analysis Of Variance (ANOVA)



<https://saskiacotto.de/shiny/>

Mean of population 1,  $\mu_1$ :

10 13 40

Mean of population 2,  $\mu_2$ :

10 23 40

Mean of population 3,  $\mu_3$ :

10 26 40

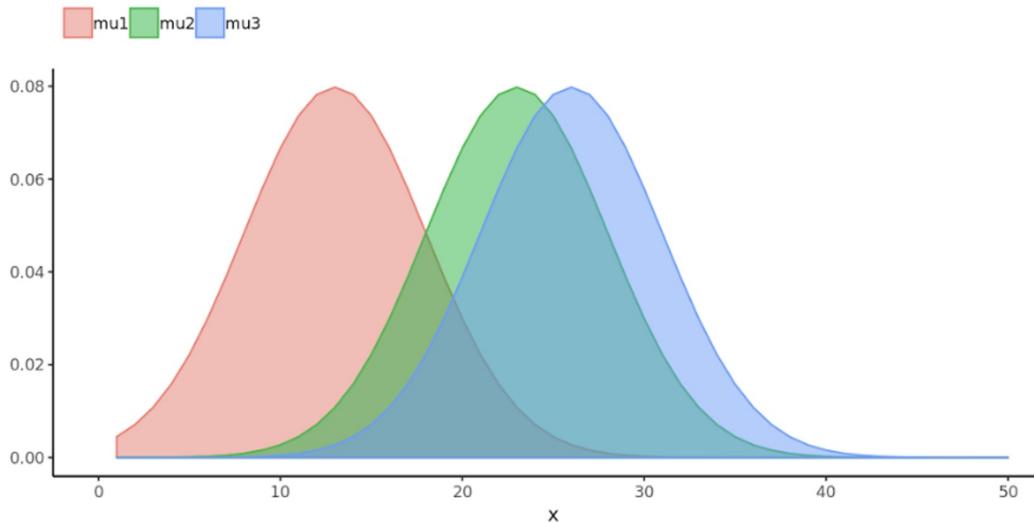
Population standard deviation,  $\sigma$ :

1 5 20

Sample size

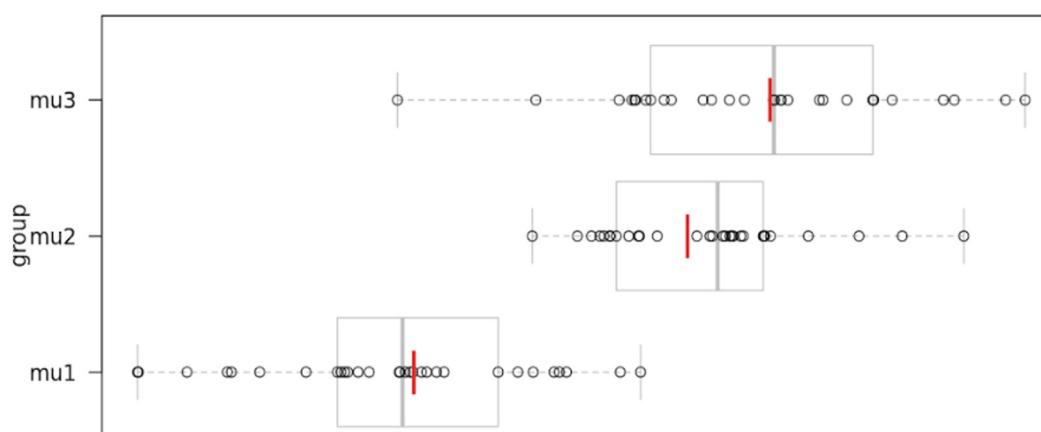
2 30 100

## Population distributions



## Observed sample data

The red bars denote group means.



General

Scenarios

Sensitivity Analysis

## Scenario A

## Transmission

Low

Med

High

## Introduction Region

Norte Litoral Centro Sur

## Interventions

## Culling Rate

0

0.1

0.12

## Movement Restrictions

 Yes No

## Average days to detection and removal of infected

7

10

14

## Vaccination Coverage

2019 2020 Reported

## Scenario B

## Transmission

Low

Med

High

## Introduction Region

Norte Litoral Centro Sur

## Interventions

## Culling Rate

0

0.1

0.12

## Movement Restrictions

 Yes No

## Average days to detection and removal of infected

7

10

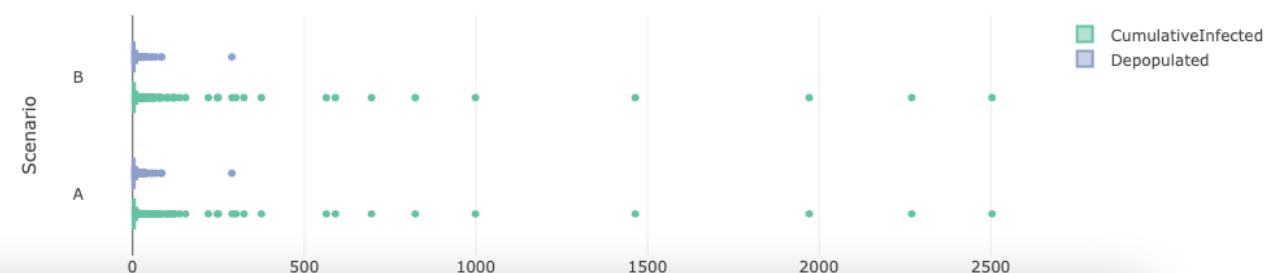
14

## Vaccination Coverage

2019 2020 Reported

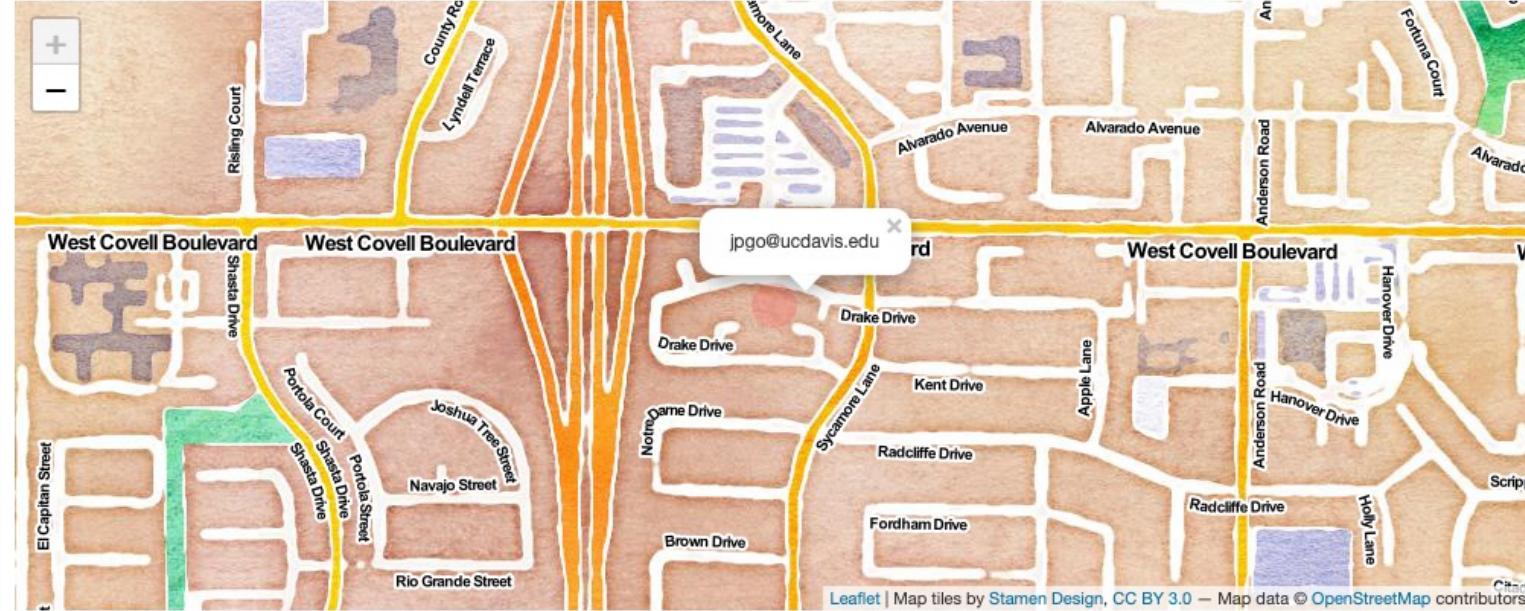
Filter

## A vs B



[Submit an entry](#)[Data](#)[About](#)[Night Market](#)[Cart locations](#)

Carts Map



## Submit a location

-

## Address

## Contact Name

## Contact (i.e phone, email)

## Remove Location

+

[Submit](#)

-  Presentación
-  Dashboard principal
-  Registro de solicitudes
-  Seguimiento a solicitudes <
-  En proceso de autorizar
-  Pendiente por correcciones
-  Compartimentos autorizados
-  Información de compartimentos

## Registro de solicitudes

### 1. Datos del propietario

**1.1. Folio de la upp:****1.2. Fecha de solicitud****1.3. Folio asignado por la Representación Estatal del SENASICA****1.4. Nombre de la granja:****1.5. Fin zootécnico:****1.6. Fin general**

### 2. Domicilio de la granja

**2.1. Estado:****2.4. Colonia:****2.2. Municipio:****2.5. C.P.:****2.3. Localidad:****2.6. Calle:**

Transformar coordenadas grados, minutos, segundos a grados decimales



```

Console Terminal × Render × Jobs ×
R 4.1.3 · ~/Library/CloudStorage/Box-Box/Methodology/QuantRRA
> QuantRRA::runQuantRRA()

```

**QuantRRA**

- Model
- Documentation
- Examples

# QuantRRA: Quantitative rapid risk assessment

This application is still under development, documentation will be shortly added, for any questions please contact the developer: [Jose Pablo Gomez](#)

Due to higher traffic than expected, we are experiencing some problems with the server. You can also download the R package and run the app locally using the `QuantRRA::runQuantRRA()` function, for more information visit: [Project repository](#)

The following application was developed for the implementation of rapid risk assesment. A model tree file can be uploaded or specified in the app, and the risk is estimated using a stochastic probabilistic model.

Example model files can be found in the library of exmaples tab in this application

**Model table**

To start, you need to specify the model. Models can be constructed directly from the app using the network tools in the following section, or can be uploaded from a model file previously created.

**Upload a model file**

No file selected

Show 10 entries Search:

id	label	type	level	distribution	formula
1	P0	Prevalence	In	1	Pert(0.01, 0.1, 0.15)
2	P1	Vaccine Efficacy	In	1	Pert(0.7, 0.8, 0.9)
3	P2	Detection	In	1	Pert(0.6, 0.7, 0.8)
4	P	Introduction	Out	2	P0*P1

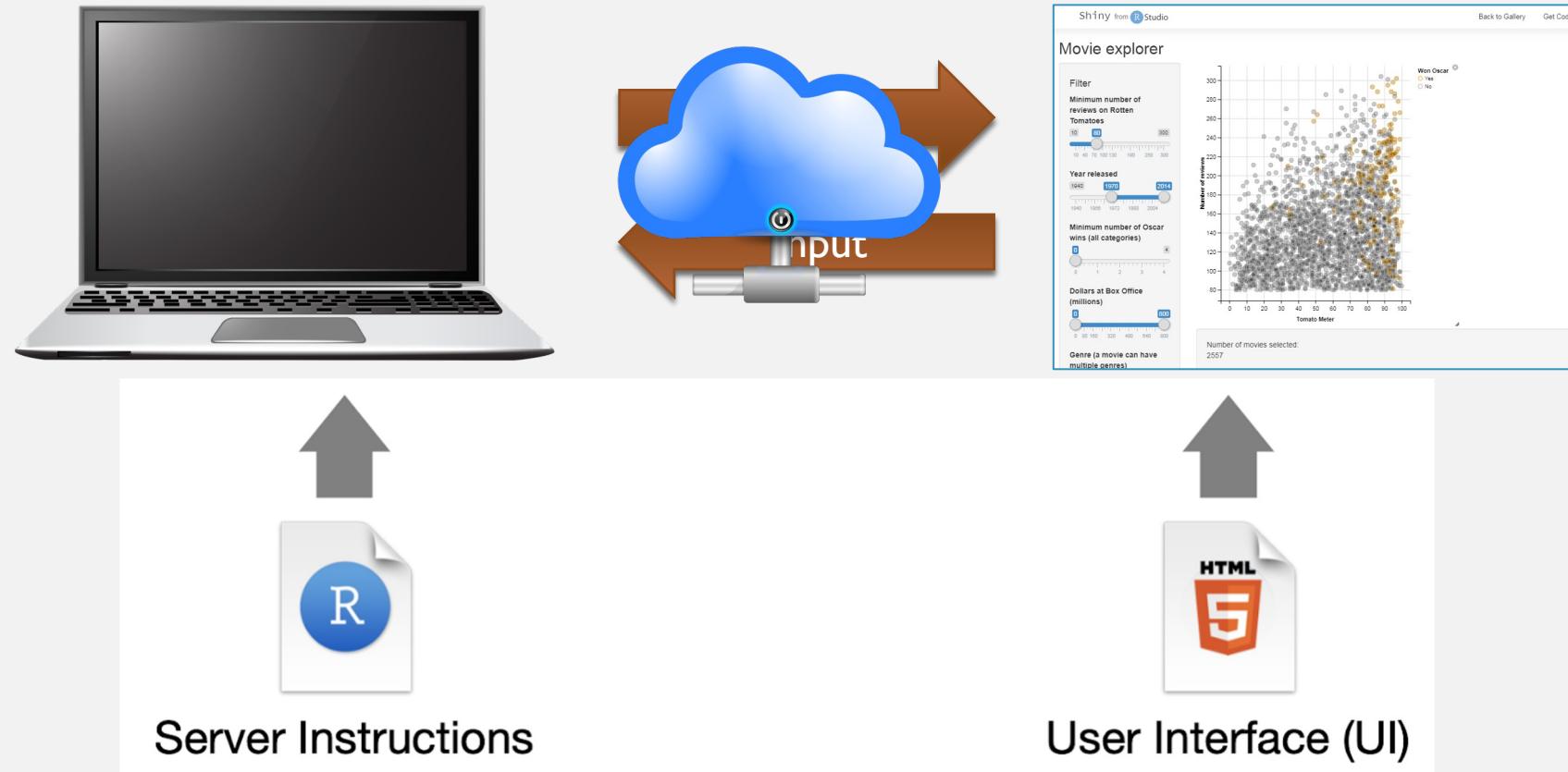
Showing 1 to 4 of 4 entries Previous 1 Next

If you want to save your model to continue working on it later or to share it, you can download the file here:

# HOW TO BUILD AN APP

# STRUCTURE OF A SHINY APP

A shiny app use a website connected to a computer with an active R session



## BASIC COMPONENTS

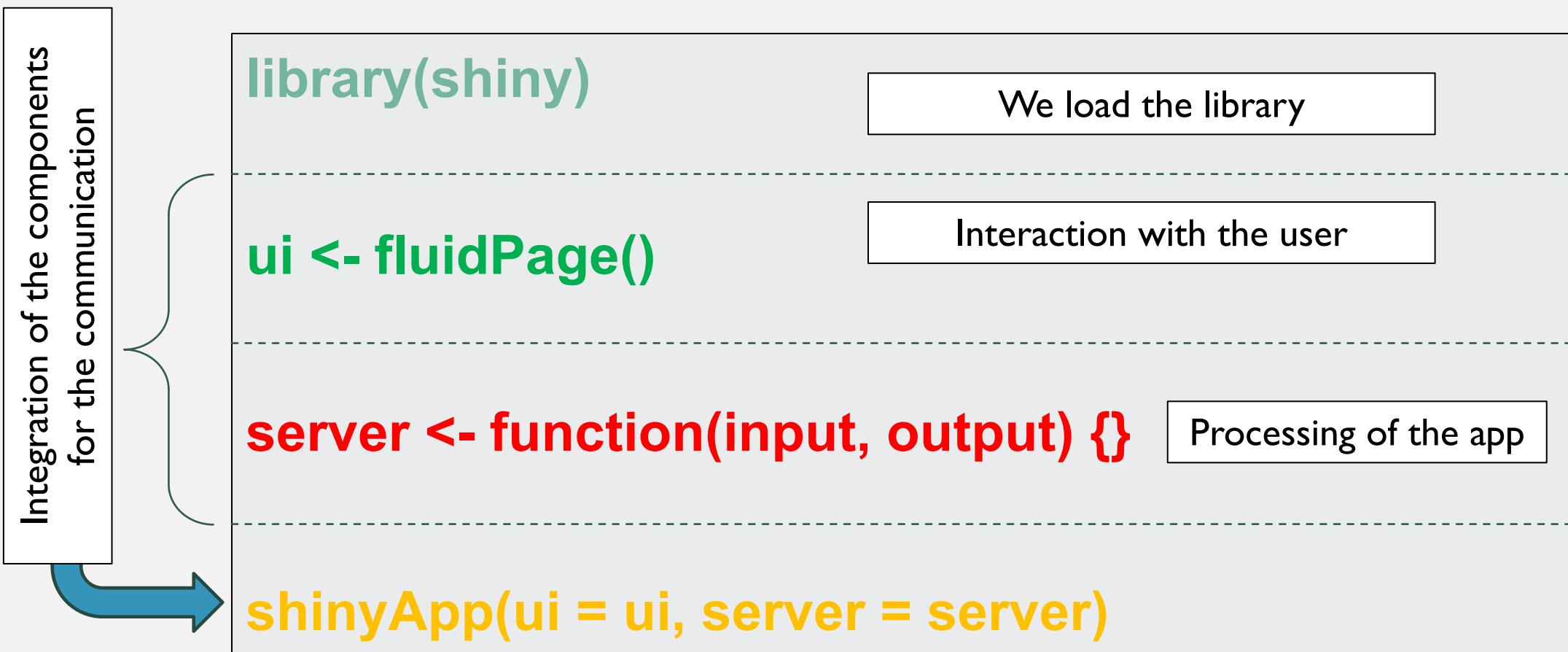
```
library(shiny)

ui <- fluidPage()

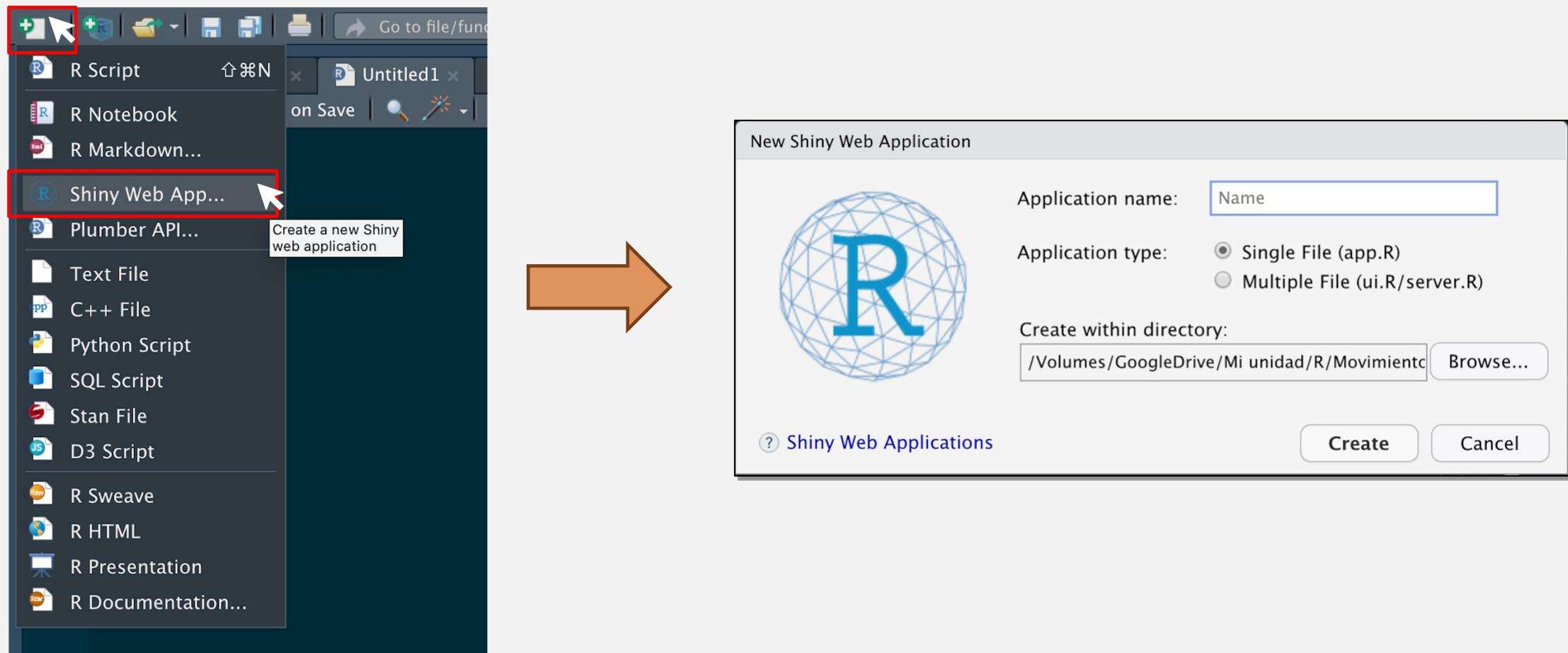
server <- function(input, output) {}

shinyApp(ui = ui, server = server)
```

# BASIC COMPONENTS

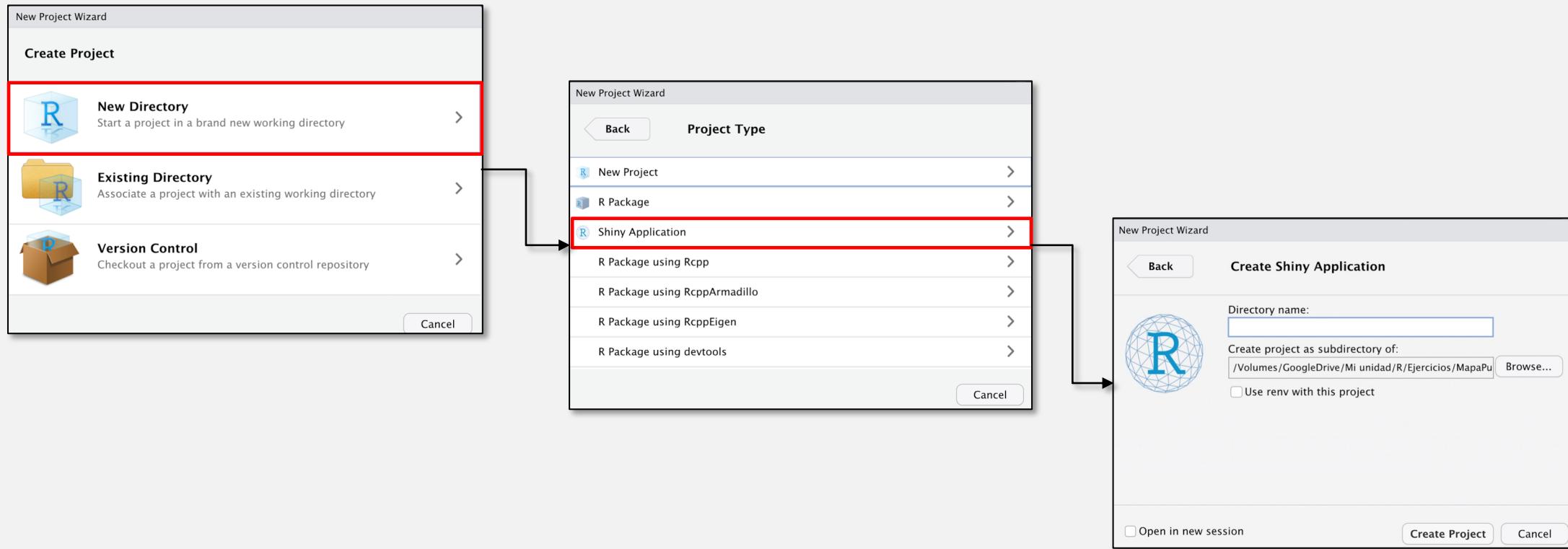


# EXERCISE I: CREATING YOUR FIRST APP IN R STUDIO



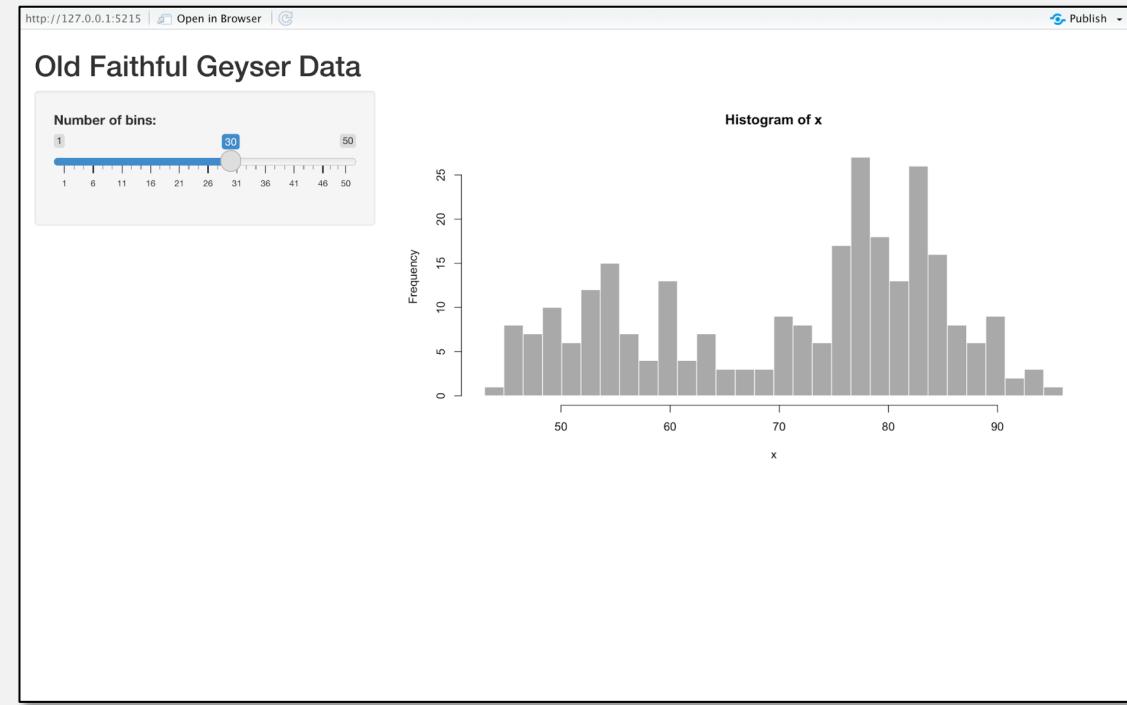
# EJERCICIO I: CREAR UN PROYECTO DE SHINY EN RSTUDIO

**File > New Project > New Directory > Shiny Application > Create Shiny Application**

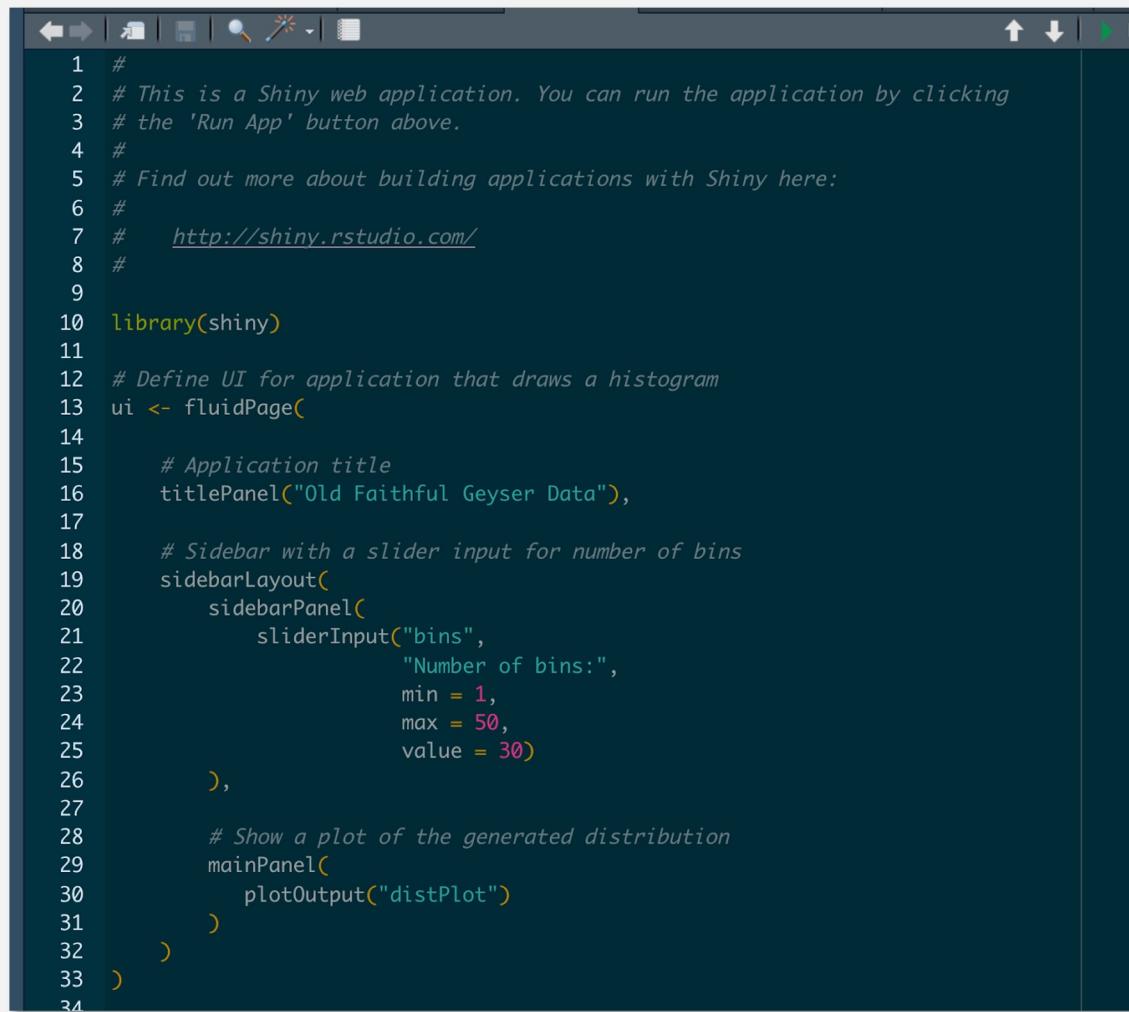


# EXERCISE I: CREATE YOUR FIRST APP

```
1 #  
2 # This is a Shiny web application. You can run the application by clicking  
3 # the 'Run App' button above.  
4 #  
5 # Find out more about building applications with Shiny here:  
6 #  
7 #     http://shiny.rstudio.com/  
8 #  
9 #  
10 library(shiny)  
11 # Define UI for application that draws a histogram  
12 ui <- fluidPage(  
13     # Application title  
14     titlePanel("Old Faithful Geyser Data"),  
15     # Sidebar with a slider input for number of bins  
16     sidebarLayout(  
17         sidebarPanel(  
18             sliderInput("bins",  
19                         "Number of bins:",  
20                         min = 1,  
21                         max = 50,  
22                         value = 30)  
23         ),  
24         # Show a plot of the generated distribution  
25         mainPanel(  
26             plotOutput("distPlot")  
27         )  
28     )  
29 )  
30 )  
31 )  
32 )  
33 )  
34 )
```



# EXERCISE I: CREATE YOUR FIRST APP



The image shows a screenshot of the RStudio IDE. The top bar includes standard icons for file operations, search, and help, along with a 'Run App' button. The main area displays R code for a Shiny application. The code defines a UI with a title panel and a sidebar containing a slider input for the number of bins. It also defines a main panel with a plot output. The code is annotated with sections: 'librerias', 'User interface', 'Server', and 'Run'.

```
1 #  
2 # This is a Shiny web application. You can run the application by clicking  
3 # the 'Run App' button above.  
4 #  
5 # Find out more about building applications with Shiny here:  
6 #  
7 #   http://shiny.rstudio.com/  
8 #  
9  
10 library(shiny)  
11  
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 )
```

**Identify the sections in the app**

##### librerias #####

library(shiny)

##### User interface #####

ui <- fluidPage()

##### Server #####

server <- function(input, output) {

##### Run #####

shinyApp(ui = ui, server = server)