Shiny is good for you !

Christophe Bontemps
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@Xtophe_Bontemps

About me & my Job

- Econometrician @ *Toulouse School of Economics*

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- R useR ! (among others)

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- Co-organiser of the Toulouse Dataviz Meetup

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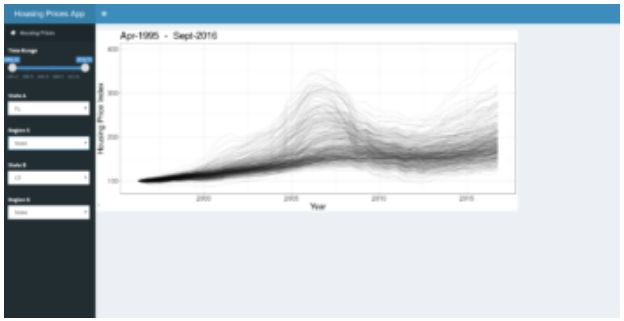
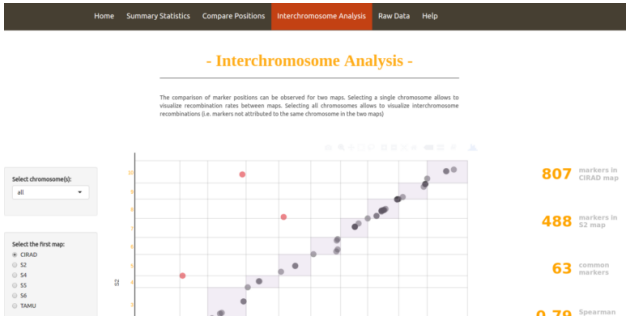
- Some examples in a minute
- `shiny` is **easy**

Examples

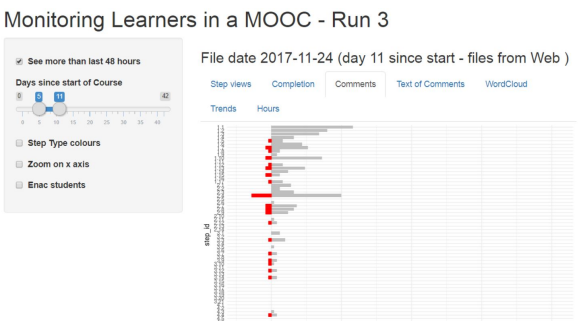


Housing prices by Eric Ray Anderson

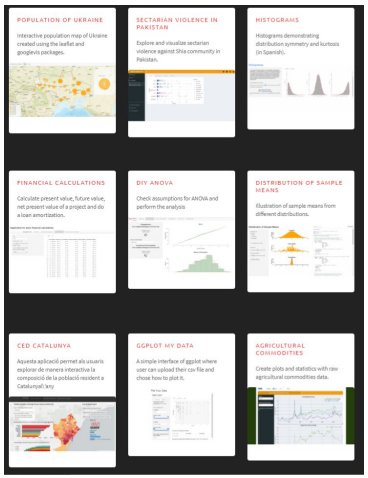


The Genetic Map Comparator by Yan Holtz, Jacques David, Vincent Ranwez

Other examples



A MOOC monitor (C. Bontemps, DEE 2017)



Show me shiny (Fully reusable applications)

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  - Time varying animations
  - Adding interaction between graphs (panels, tabs)

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- Everything you do in R can be integrated in shiny !
- Huge community, lots of developments
- Lots of re-usable examples

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- Other things I don't want to talk now !

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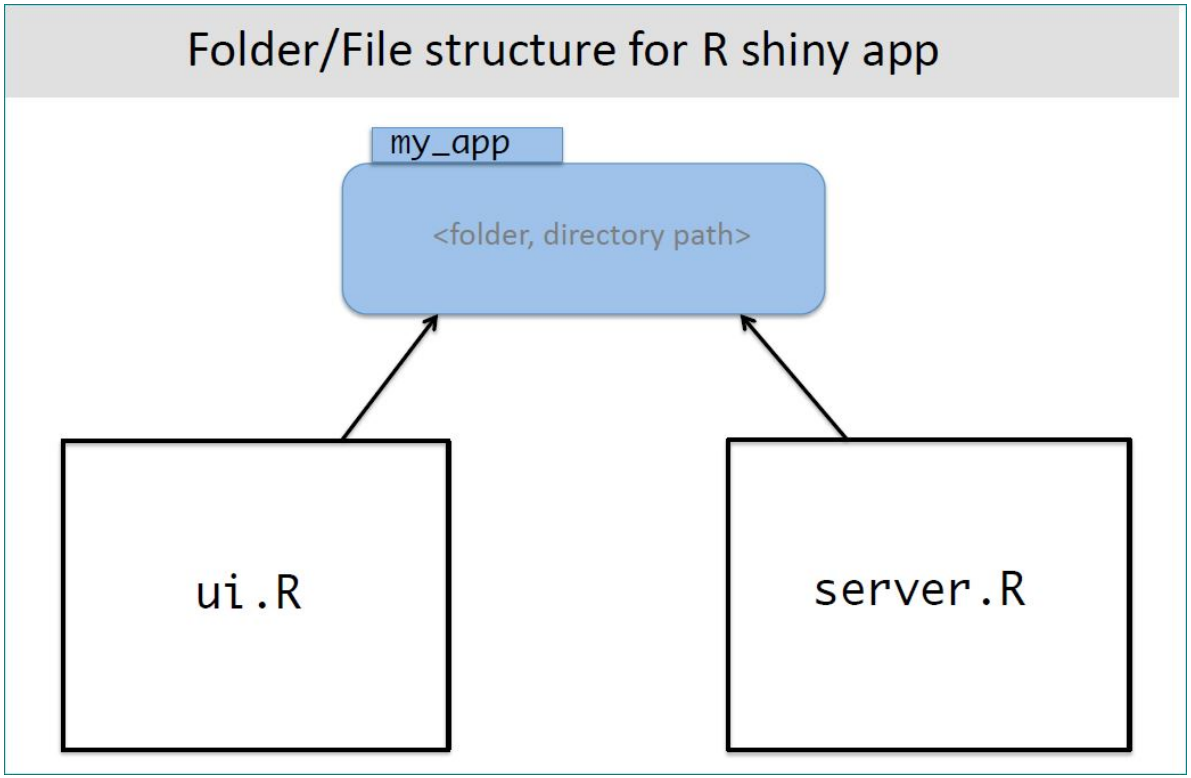
  The two files are very different
- Code in the `ui.R` file is shiny code (+ html)
- Code in the `server.R` is R code

STRUCTURE OF A SHINY APP

The basic structure is simple `ui.R` & `server.R` should be in the same directory



From Iowa State university

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Let's built our first `shiny` application with RStudio

WHAT IS UI.R DOING ?

ui.R is collecting actions (inputs) and displaying elements (outputs)

```
library(shiny)

# Define UI for application that draws a histogram
shinyUI(fluidPage(

  # Application title
  titlePanel("Old Faithful Geyser Data"),

  # Sidebar with a slider input for number of bins
  sidebarLayout(
    sidebarPanel(
       sliderInput("bins",
                   "Number of bins:",
                   min = 1,
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    ),

    # Show a plot of the generated distribution
    mainPanel(
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WHAT IS SERVER.R DOING ?

`server.R` is receiving actions (inputs) and computing elements (outputs) to be displayed by `ui.R`

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library(shiny)

# Define server logic required to draw a histogram
shinyServer(function(input, output) {

  output$distPlot <- renderPlot({

    # generate bins based on input$bins from ui.R
    x    <- faithful[, 2]
    bins <- seq(min(x), max(x), length.out = input$bins + 1)

    # draw the histogram with the specified number of bins
    hist(x, breaks = bins, col = 'darkgray', border = 'white')

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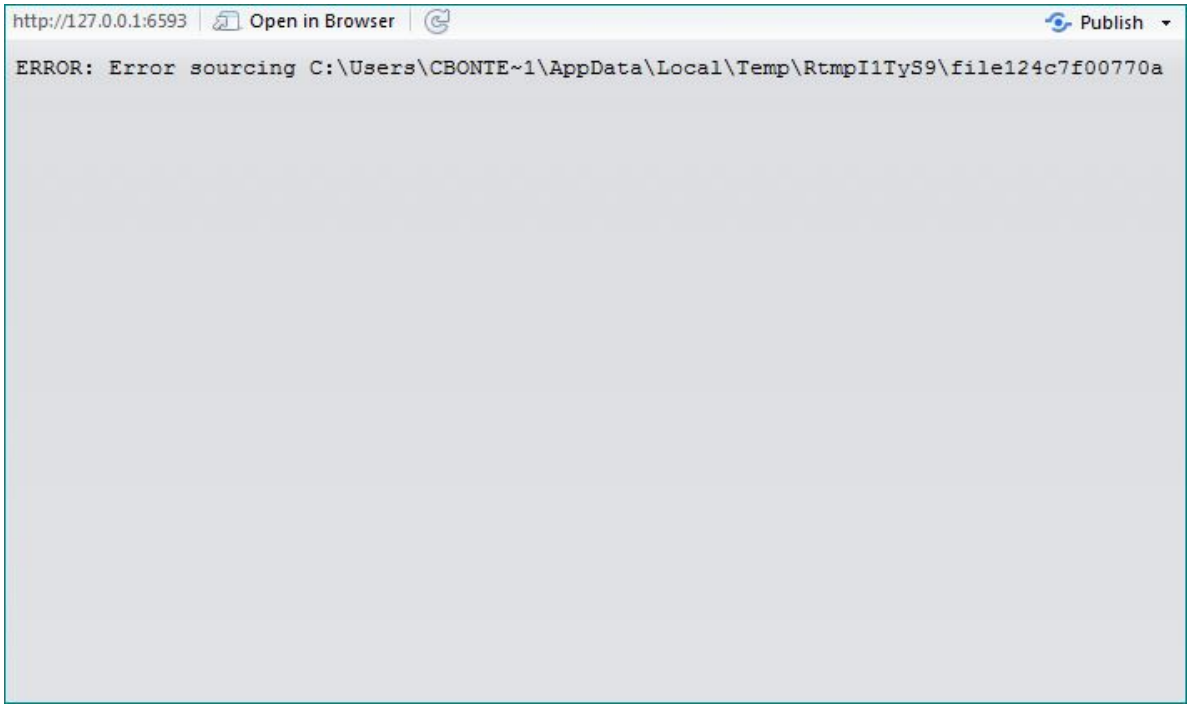
Live demo - prepared with E. Maigné (INRA)

Let us modify `ui.R` and `server.R`



A NOTE ON SCOPE

What is done once *vs* what is done every time the function is called ?

server

```
library(shiny)
Some R code # Will load once, when Shiny starts, and will be available to each session
server <- function(input, output) {
      Some R code # Objects here are defined in each session
      output$xxx<- renderPlot({
              # Objects here are defined each time this function is called
              some R code using input$zzz
      })
}
```

See scoping in `shiny`

WHATEVER YOU DO IN R, CAN BE DONE IN SHINY !

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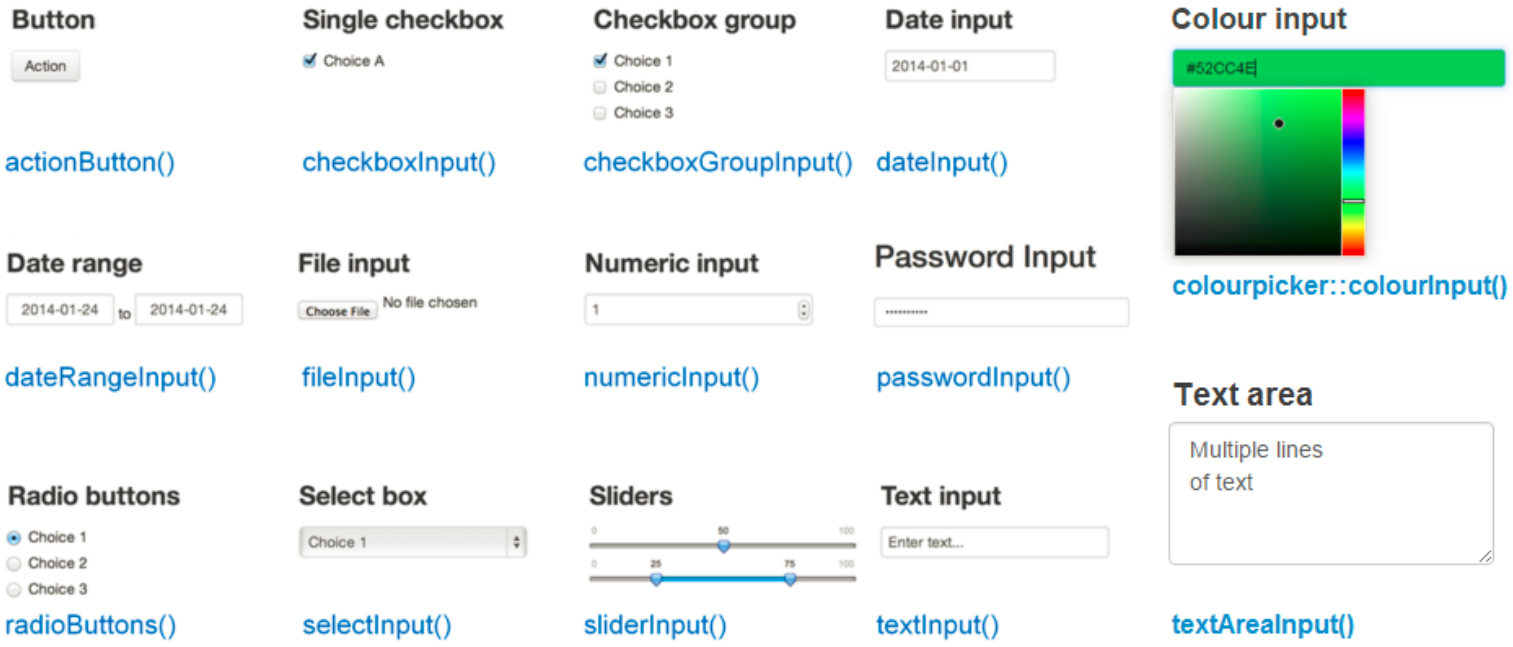
- Text (summaries, estimation results, raw numbers, ..)
- Plot (Statistical, images, interactive plots ? ...)
- Table (Standard, table widget, customized, ...)

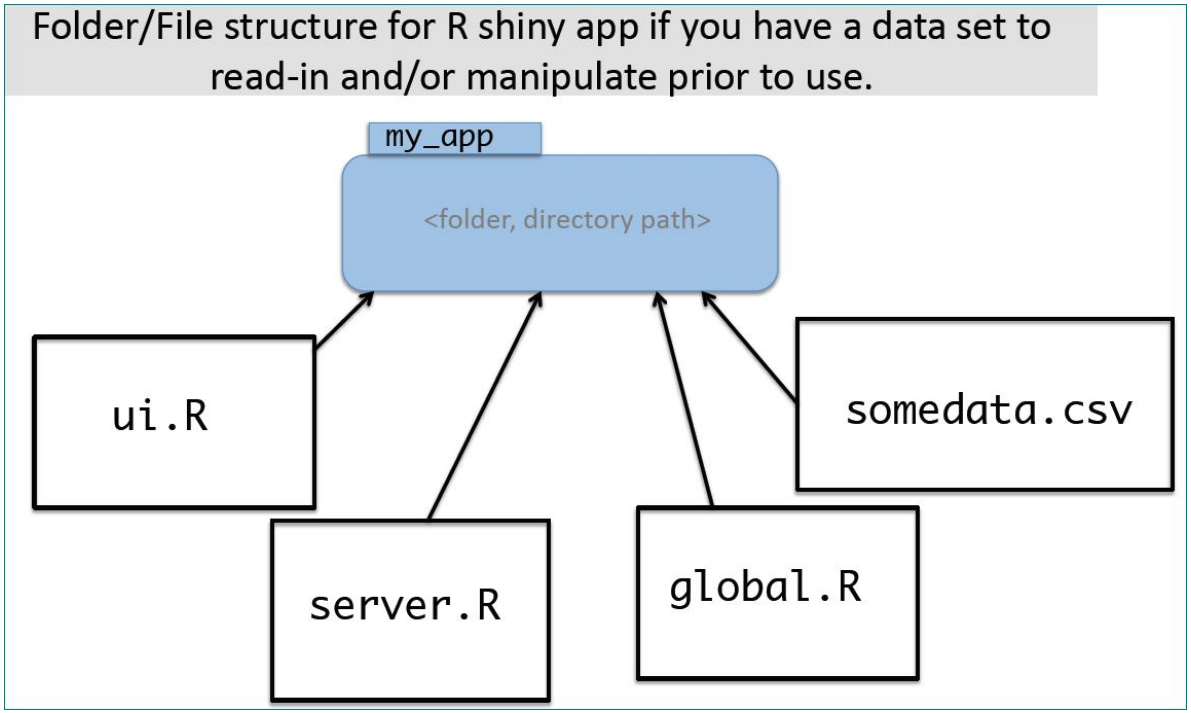
Many options for the interface : Highly customable !

`ui.R` has a huge (and increasing) collection of Inputs :



Structure of a more complex shiny app

For more complex structures `global.R` can complement `ui.R` & `server.R` (in the same directory)



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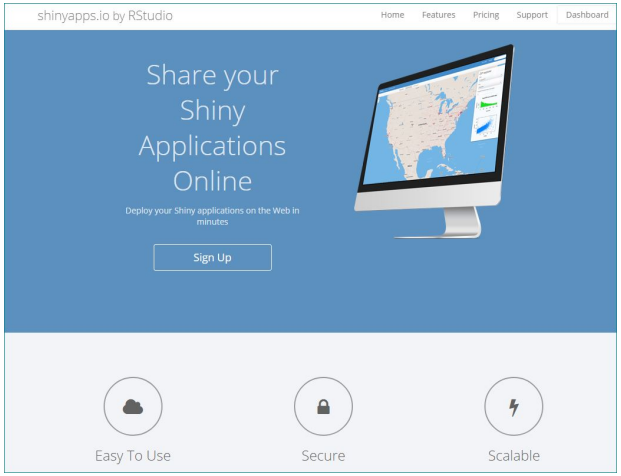

see ShinyApps.io

References I

Unwin, A., Theus, M., and Hofmann, H. (2006). *Graphics of large datasets : visualizing a million*. Springer Science & Business Media.