

# Shiny

R for Data Science workshop

2019-05-01 (updated: 2019-07-14)

# Shiny

Note: Shiny is not covered in *R for Data Science*.

## Outline

- Overview
- Shiny app structure
- Reactivity
- File structure
- Deployment

# Data science workflow



Image source: [R for Data Science](#) by Hadley Wickham & Garrett Golemund.

# Data science workflow

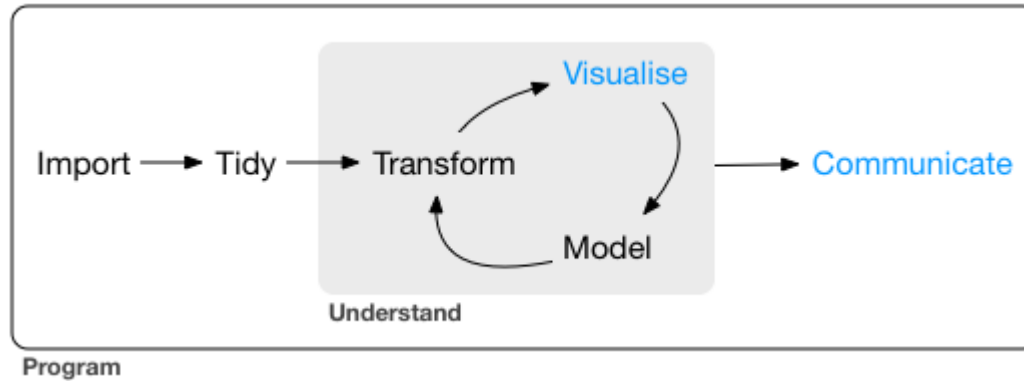


Image source: [R for Data Science](#) by Hadley Wickham & Garrett Golemund.

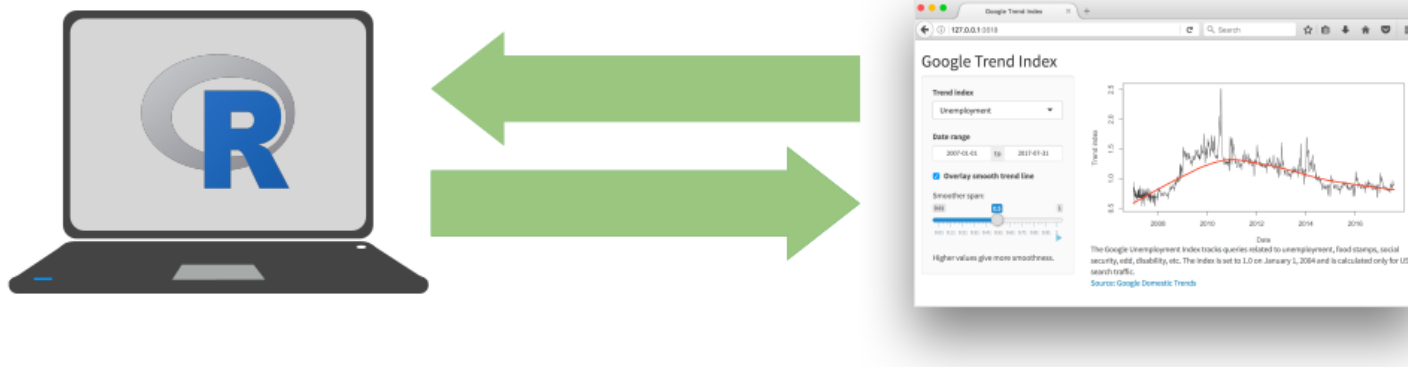
# Shiny

## Overview

- Web apps written completely in R
- Shiny generates a web UI consisting of HTML, CSS, & JavaScript
- The web server executes R code
- The UI interacts with the R server using websockets
- You only have to write R code

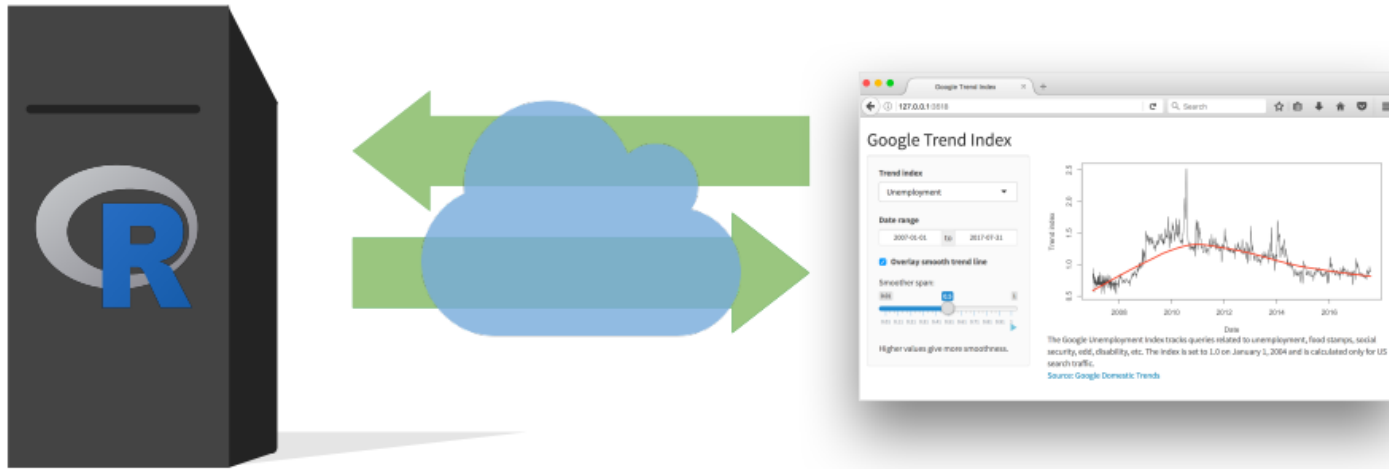


A Shiny app consists of a web page served by an R program.



During development and when running locally, the R program is running on your computer.

Image credit: Mine Çetinkaya-Rundel / RStudio



When the Shiny app is deployed in production, a web server runs the R program that serves the app.

The R program processes data and generates the UI (HTML, CSS, JavaScript).

The UI (HTML, CSS, JavaScript) runs in the user's web browser.



# Shiny

## Shiny app structure

```
library(shiny)

ui <- fluidPage(
  ...
)

server <- function(input, output) {
  ...
}

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

# Demo

# Shiny

## Reactivity

Shiny has three kinds of objects for reactive programming.

Reactive source



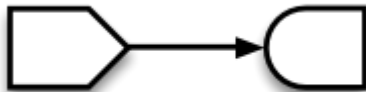
Reactive conductor



Reactive endpoint



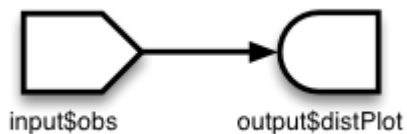
The simplest structure of a reactive program involves just a source and an endpoint:



# Shiny

## Reactivity example

```
server <- function(input, output) {  
  output$distPlot <- renderPlot({  
    hist(rnorm(input$obs))  
  })  
}
```



See it in action: [https://gallery.shinyapps.io/01\\_hello/](https://gallery.shinyapps.io/01_hello/)

# Shiny

## Household Income example

Our "eat cake first" demo turned into a Shiny app!

Demo

# Shiny

## Deploying your app

- **Shinyapps.io** - hosting service from RStudio (\$, includes a free tier)
- **Shiny server** - open source, deploy to your own server or Docker container
- **RStudio Connect** - RStudio publishing platform for Shiny apps, RMarkdown reports, Plumber API's, dashboards, and more (\$\$\$)

# Your turn

## Shiny

**Create a shiny web app!**