Creating Interactive Visualizations in

...

GW Libraries Workshop
Dan Kerchner ~ November 12, 2021

go.gwu.edu/rshinyworkshop

Logistics

- Just speak up OR use the Zoom chat
- Plan for 1 brief  break

Shiny is a web application framework for R

Goals

Today's Goal

- Create 2 Shiny apps:
  - Old Faithful
  - Framingham study data
- Publish a Shiny app in shinyapps.io

Today's Data Set: Old Faithful

Azzalini, A. and Bowman, A.W., 1990. A look at some data on the Old Faithful geyser. Journal of the Royal Statistical Society: Series C (Applied Statistics), 39(3), pp.357-365. doi.org/10.2307/2347385

- Waiting times between eruptions of the Old Faithful Geyser, Yellowstone National Park, WY

Today's Data Set: Framingham Heart Study

- framinghamheartstudy.org
- Long-term prospective study of the etiology of cardiovascular disease among a population of subjects in Framingham, MA
- Began in 1948 with 5,209 subjects
- Is the source of the term "risk factor"
- Over 3,000 peer-reviewed papers published based on this study
- Participants were each followed for a total of 24 years for cardiovascular events (heart attack, stroke, death, etc.)

Structure of an R Shiny app

```
library(shiny)
ui <- fluidPage(
  # Comma-separated list of components
  # collecting input from the user
  # using output in rendering
)

server <- function(input, output, session) {
  # server logic
  # using parts of input
  # and setting parts of output
}

# Run the app - ties together ui and server
shinyApp(ui, server)
```

← FORM

shiny.rstudio.com/articles/layout-guide.html

← FUNCTION

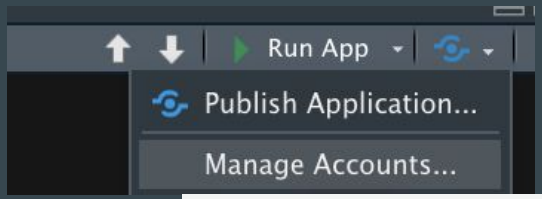
Connecting inputs and outputs

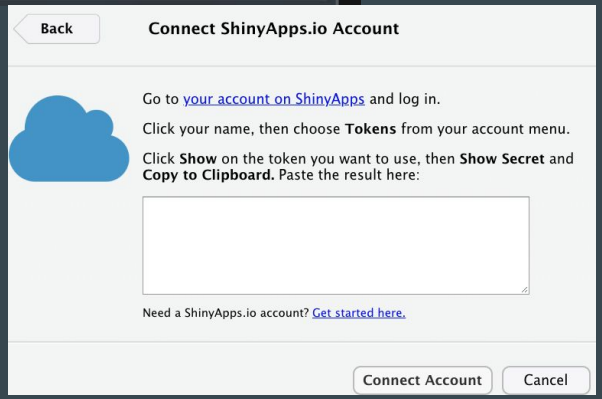
```
ui <- fluidPage(
  # ...
  sidebarLayout(
    sidebarPanel(
      sliderInput("bins",
                  "Number of bins:",
                  min = 1,
                  max = 50,
                  value = 30)
    ),
    mainPanel(
      plotOutput("distPlot")
    )
  )
)
```

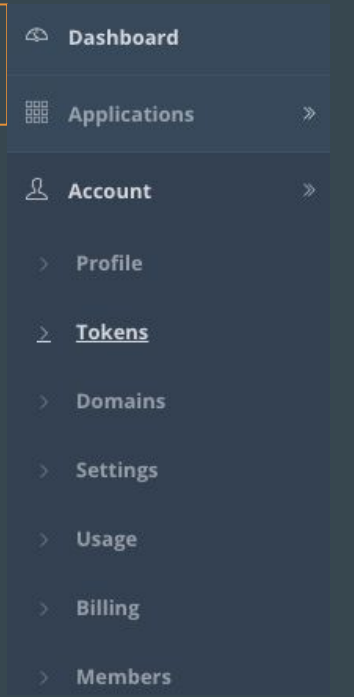
```
server <- function(input, output) {
  output$distPlot <- renderPlot({
    x    <- faithful[, 2]
    bins <- seq(min(x), max(x),
                length.out = input$bins + 1)

    hist(x, breaks = bins, col = 'darkgray',
         border = 'white')
  })
}
```

Publishing your app to shinyapps.io

- Create account
- Create a token
- Copy the token (***with secret***) into RStudio "Connect Account"
- Publish your application
- View at: *youraccount.shinyapps.io/yourapp*

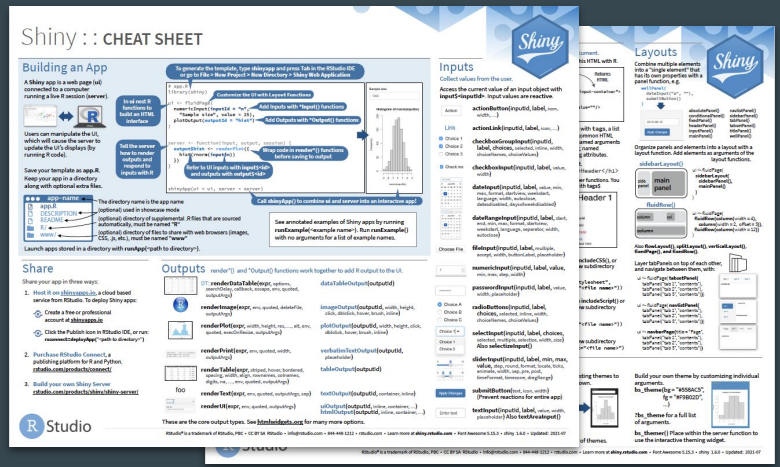






Shiny Resources

- Tutorial : shiny.rstudio.com/tutorial/
- Online book: mastering-shiny.org
- Gallery : shiny.rstudio.com/gallery/
- Cheat sheet : shiny.rstudio.com/articles/cheatsheet.html
- LinkedIn Learning
- Library Resources



Data Visualization - aside from Shiny

- In R:
  - htmlwidgets.org
  - www.r-graph-gallery.com/interactive-charts.html
  - rstudio.com/resources/cheatsheets
  - ggplot2-book.org
  - rkabacoff.github.io/datavis
  - worldbank.github.io/r-econ-visual-library
- Other than R:
  - Tableau
  - Power BI
  - Python

Statistics+R help @ GW

R-Statistics Appointments:
academiccommons.gwu.edu/statistical-consulting

Also...

Appointments with me:
calendly.com/kerchner

Coding consultations (Python, R, git, etc.):
calendly.com/gwul-coding/

Thanks!

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