Introduction to Shiny

Jason Bryer, Ph.D.

Open Data Day

March 3, 2018

github.com/jbryer/ShinyApps

“Shiny is an R package that makes it easy to build interactive web apps straight from R. You can host standalone apps on a webpage or embed them in R Markdown documents or build dashboards. You can also extend your Shiny apps with CSS themes, htmlwidgets, and JavaScript actions.”

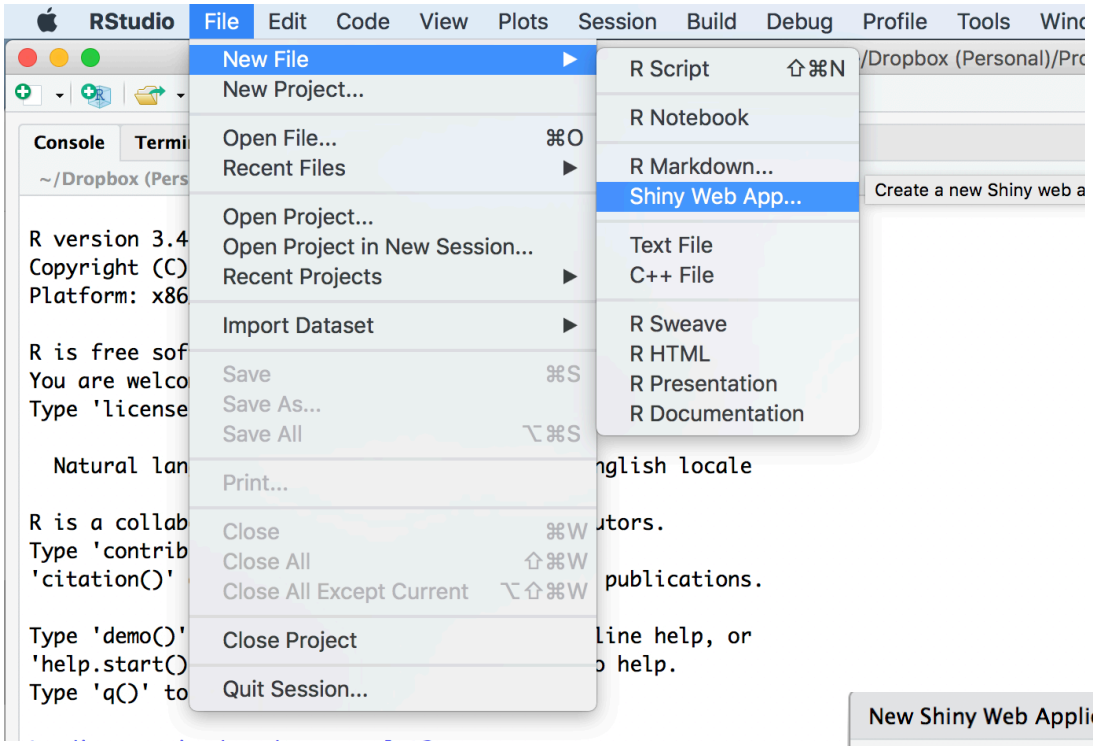
-RStudio (http://shiny.rstudio.com/)

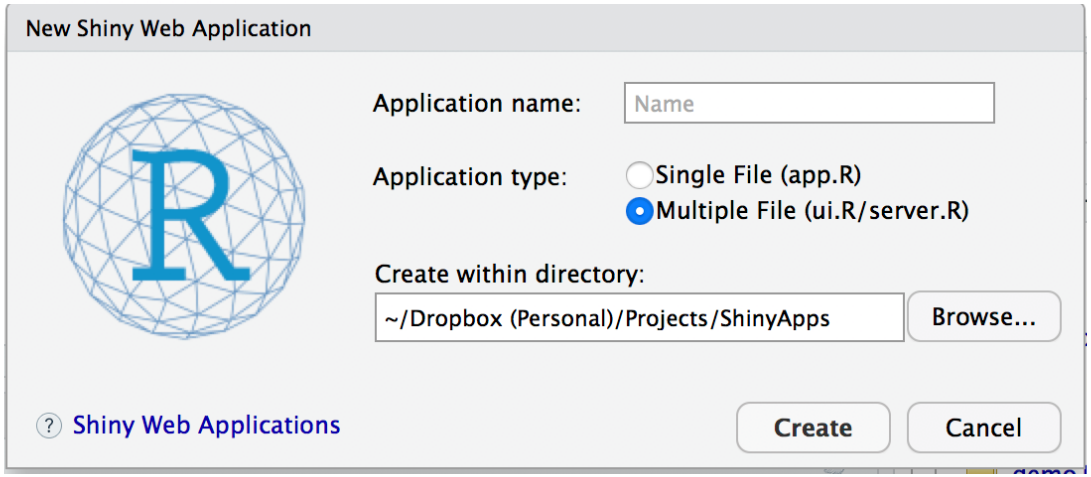
Examples

- PBIS: www.pbisny.org
- Factor Analysis: http://shiny.daacs.net/shiny/PrePilot
- DAACS Dashboard: http://shiny.daacs.net/shiny/dashboard/

```
shiny::runGitHub('NYSchools','jbryer', subdir='NYSEnrollment')
shiny::runGitHub('NYSchools','jbryer', subdir='NYSReportCard')

library(IRRsim)
IRRsim_demo()

library(DATA606)
shiny_demo() # Lists shiny apps in the DATA606 package
shiny_demo('BayesBilliards')
shiny_demo('gambler')
shiny_demo('lottery')
```

Getting Started





Web App in 3 R Scripts !

- `ui.R` - Defines the user interface
- `server.R` - Defines the logic to create plots, analysis, table output, etc.
- `global.R` - (optional) - This script is run as the application starts up. This is a great place to load data, make database connections, and define other global parameters.

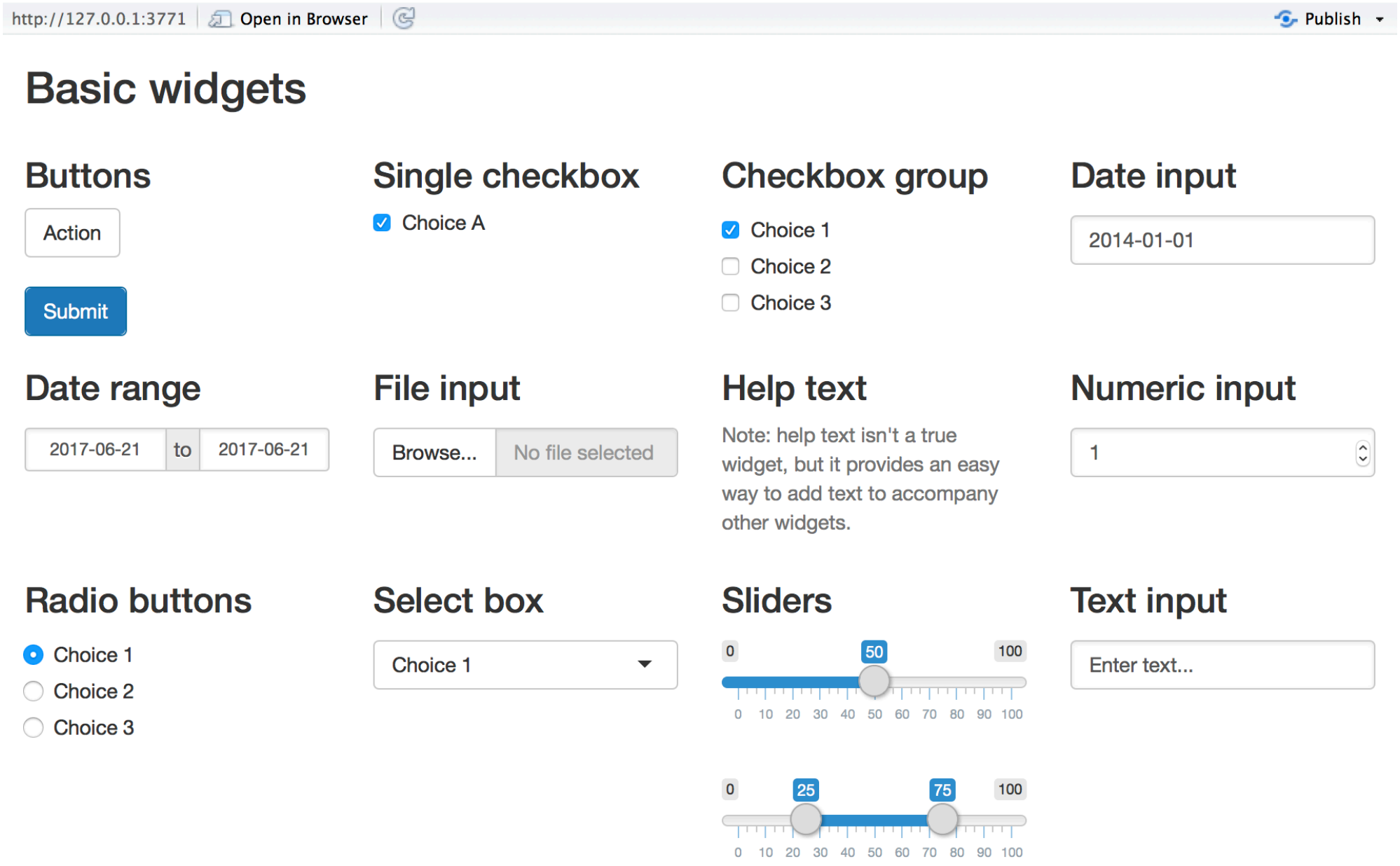
```
library(shiny)

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,
                   max = 50,
                   value = 30)
    ),

    # Show a plot of the generated distribution
    mainPanel(
       plotOutput("distPlot")
    )
  )
))
```

File: ui.R

```
library(shiny)

shinyServer(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')

  })

})
```

File: server.R

Input Types


http://127.0.0.1:3771
Open in Browser
Publish
Basic widgets
Buttons
Action
Submit
Single checkbox
Choice A
Checkbox group
Choice 1
Choice 2
Choice 3
Date input
2014-01-01
Date range
2017-06-21
to
2017-06-21
File input
Browse...
No file selected
Help text
Note: help text isn't a true widget, but it provides an easy way to add text to accompany other widgets.
Numeric input
1
Radio buttons
Choice 1
Choice 2
Choice 3
Select box
Choice 1
Sliders
0
50
100
0 10 20 30 40 50 60 70 80 90 100
0
25
75
100
0 10 20 30 40 50 60 70 80 90 100
Text input
Enter text...

Input Types

- `actionButton` - Action Button
- `checkboxGroupInput` - A group of check boxes
- `checkboxInput` - A single check box
- `dateInput` - A calendar to aid date selection
- `dateRangeInput` - A pair of calendars for selecting a date range
- `fileInput` - A file upload control wizard
- `helpText` - Help text that can be added to an input form
- `numericInput` - A field to enter numbers
- `radioButtons` - A set of radio buttons
- `selectInput` - A box with choices to select from
- `sliderInput` - A slider bar
- `submitButton` - A submit button
- `textInput` - A field to enter text

https://shiny.rstudio.com/tutorial/written-tutorial/lesson3/

Goal

- Create a Shiny app that allows the user to interact with high school graduations rates from NYS.
- Data source: https://data.nysed.gov/downloads.php
- Download App Here: https://github.com/jbryer/ShinyApps

Additional Resources

Learning Shiny

- Cheatsheet: http://shiny.rstudio.com/images/shiny-cheatsheet.pdf
- RStudio Tutorials: https://shiny.rstudio.com/tutorial/
- RStudio Articles: http://shiny.rstudio.com/articles/

Deployment:

- https://www.shinyapps.io/
- RStudio and Shiny Server: https://deanattali.com/2015/05/09/setup-rstudio-shiny-server-digital-ocean/
- Ubuntu: https://www.digitalocean.com/community/tutorials/how-to-set-up-shiny-server-on-ubuntu-16-04

Thank You!

Email: jason.bryer@gmail.com
Web: www.bryer.org
Github: github.com/jbryer
Twitter: @jbryer

Albany R Users Group:
https://www.meetup.com/Albany-R-Users-Group/

Intro Statistics and Probability for Data Analytics
(Course taught at CUNY's Master of Science in Data Science): www.data606.net