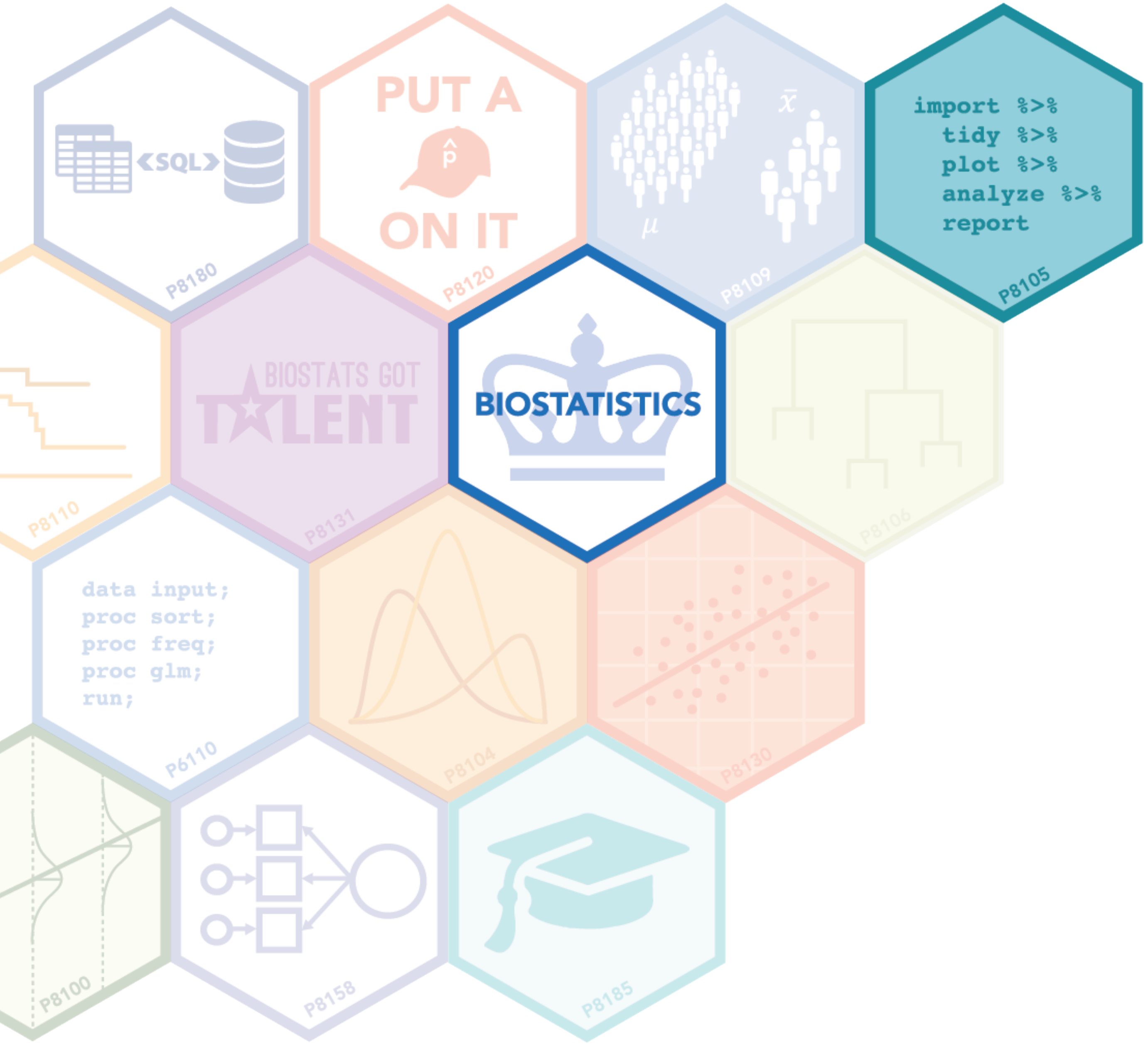

SHINY

Jeff Goldsmith, PhD
Department of Biostatistics

What is Shiny?

- Framework for building interactive plots and web applications in R

- Shiny allows you to create a graphical user interface (GUI)
  – Users can interact with your code without knowing R!
  – Communicate visualizations, models, algorithms to collaborators

- Uses HTML, CSS, and JavaScript framework
  – You don't need to know these to use Shiny
  – The syntax can be tricky at first, though
  – Knowing more can help you get fancy

- Brought to you by R Studio in 2012

What is Shiny?

- Package for creating web-apps
- Don’t need to learn how to code apps directly; you write R code and shiny creates then app
  - Analogous to creating HTML files by writing R Markdown and knitting

- Adds interactivity – your app can take user input and update outputs accordingly

- For a quick example, run `shiny::runExample("01_hello")` in your R console

What is Shiny?

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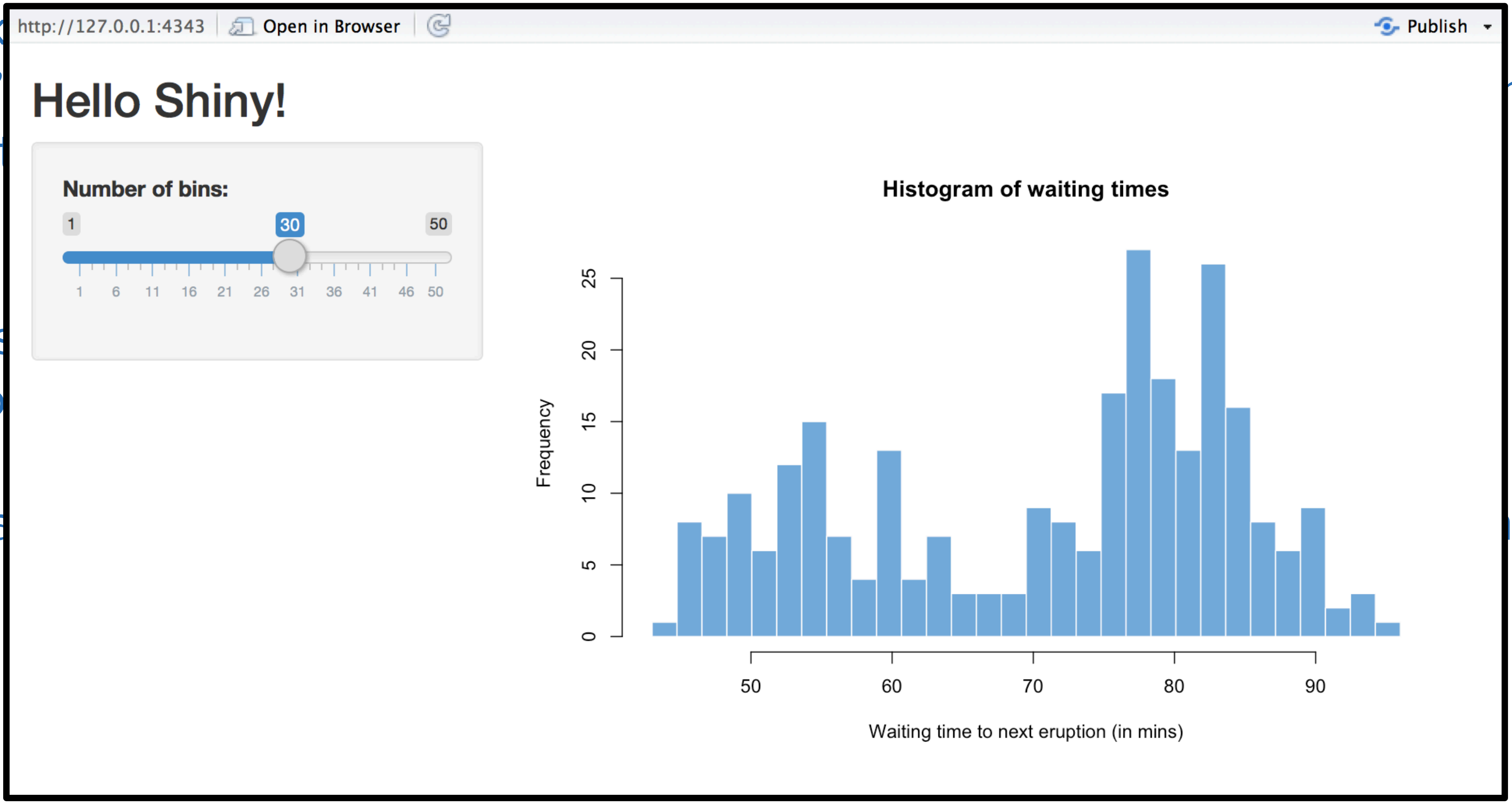


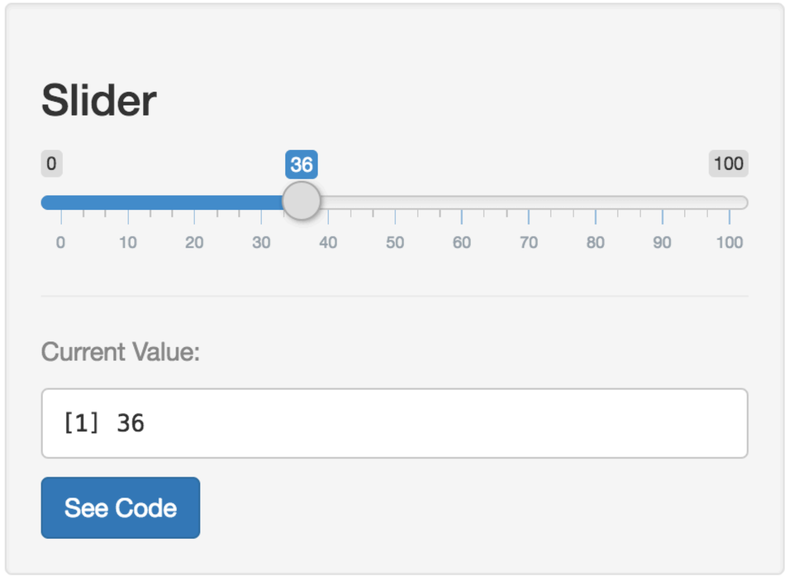
How does Shiny work?

- Shiny applications have two components:
  - A user interface to obtain inputs
  - Code that reacts to inputs and produces outputs

- R code executes in the background
- Because you need R to use Shiny, sharing Shiny-based products requires some thought
  - Not as “easy” as sending / hosting HTML files produced only by R Markdown

Getting inputs

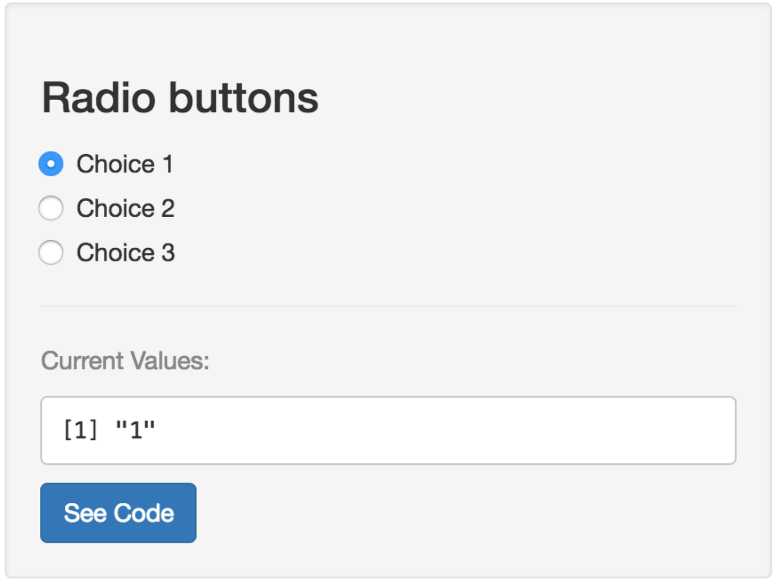
- Widgets are text elements that users can interact with
  - Examples include scroll bars, buttons, text, ect
  - Take in user input



Slider

Current Value:

```
[1] 36
```

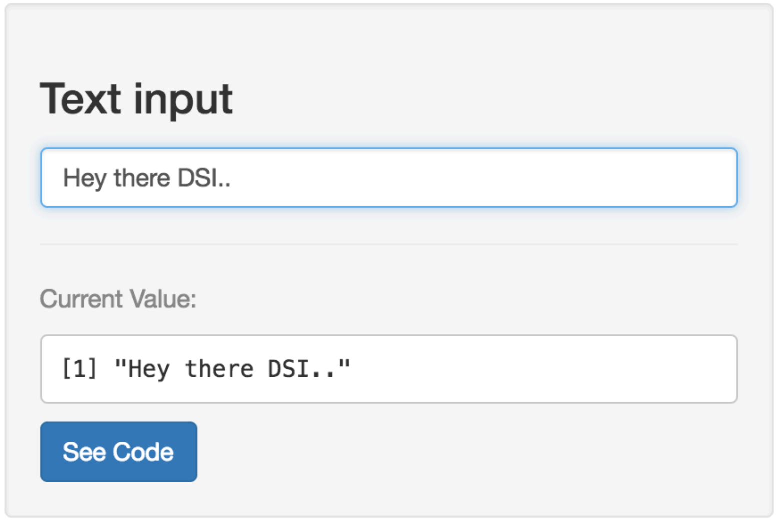


Radio buttons

● Choice 1
○ Choice 2
○ Choice 3

Current Values:

```
[1] "1"
```



Text input

Hey there DSI..

Current Value:

```
[1] "Hey there DSI.."
```

Producing outputs

- These are functions that react to user input from widgets
  - `renderPrint()` -- prints output of a function
  - `renderText()` -- outputs text
  - `renderTable()` -- for making tables
  - `renderPlot()` -- outputs plot made using ggplot2 (and base R, …)
  - `renderPlotly()` -- outputs plot made with plotly library

Flexdashboard + Shiny

- R-Markdown-based **Shiny document**
- Relatively easy to use (given an understanding of dashboards / markdown)

- Adds dynamic elements to a flexdashboard
  - Input / output elements are added directly to the R Markdown file

Shiny applications

- Standalone web-app framework

- Not built within an R Markdown document
  - Separate .R files control UI and “server” computations for input / output
  - Alternatively, UI and server objects included in a single app file

- Potentially more flexible than piggybacking on R Markdown / flexdashboard

Shiny applications

- ui
  - Controls layout and appearance
  - Where you add widgets
  - ui.R

- server
  - Instructions your computer needs to build the app
  - R code for plots, etc
  - server.R

Sharing shiny products

- Not always easy – Shiny requires R to run in the background

- Providing files
  - Send “raw” files (.rmd, .R, data, etc), maybe as an R project
  - Recipient knits the file / runs the app through Rstudio

- Hosting online
  - Needs a server that runs R in the background, and github doesn’t
  - shinyapps.io is pretty common way to permanently host document / app