GEOG 5680
Introduction to R
14: Web applications with R and **Shiny**

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What is Shiny?

- Open source web application for R (from RStudio)
- Turn analysis into interactive web app
- No real knowledge of HTML, CSS or javascript needed
- Examples: https://shiny.rstudio.com/gallery/

Shiny applications

Can use single script (app.R), but for more complex applications, easier to work with two scripts

- *ui*: user interface
- Controls user interface
- Layout, appearance
- Widgets for input that changes behavior of app
- Displays output from *server*

- *server*: server
- Imports parameters from *ui*
- Uses these to run analysis and produces output
- Defines two objects (`input` and `output`) which are used to transfer parameters between UI and server

Shiny applications

Simple example of *ui.R*:

```
library(shiny)
shinyUI(fluidPage(
  titlePanel("Hello Shiny!"),
  sidebarLayout(
    sidebarPanel(
      sliderInput("bins",
                  "Number of bins:",
                  min = 1,
                  max = 50,
                  value = 30)
    ),
    mainPanel(
      plotOutput("distPlot")
    )
  )
))
```

Shiny applications

Simple example of *server.R*:

```
library(shiny)
shinyServer(function(input, output) {
  output$distPlot <- renderPlot({
    x    <- faithful[, 2]  # Old Faithful Geyser data
    bins <- seq(min(x), max(x), length.out = input$bins + 1)
    hist(x, breaks = bins, col = 'darkgray', border = 'white')
  })
})
```

Shiny applications

Example output

Shiny applications

- Easy way to make simple web applications for analysis
- Integrates with RMarkdown
- Can use all standard R add-ons, including **ggplot2**, etc
- Can be deployed using personal Shiny server or through RStudio's site