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DEPARTMENT OF
STATISTICS

Introduction to RShiny

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What do we want to be able to do?

Data Science!

- Read in raw data and manipulate it
- Combine data sources
- Summarize data to glean insights
- Apply common analysis methods
- Communicate Effectively

Important considerations for data analysis workflow:

- **Reproducibility**
- **Version control**
- **Collaboration**

What is R Shiny?

- R Shiny Package
  - Developed by RStudio
  - Allows for creation of apps and dashboards
- Usually a .R file (or two) with special code to create an app
  - `ui.R` (User Interface)
  - `server.R` (R functions that run/respond to UI)
  - `app.R` (both UI and server combined)

Example App

Example App

```r
library(...)
ui <- fluidPage(
  # Application title
  titlePanel("Investigation of Mammal Sleep Data"),
  # Sidebar with options for the data set
  sidebarLayout(
    sidebarPanel(
      h3("Select the mammal's biological order:"),
      selectizeInput("vore",
                     "Vore",
                     selected = "omni",
                     choices = levels(as.factor(msleep$vore))
                     ),
     ...
    # Show outputs
    mainPanel(
      plotOutput("sleepPlot"),
      textOutput("info"),
      tableOutput("table")
      )
  )
)
```

Example App

Example App

```r
server <- function(input, output, session) {
  #get data for only order specified
  getData <- reactive({
    vores <- input$vore
    msleep %>% filter(vore == vores)
  })
  #create plot
  output$sleepPlot <- renderPlot({
    #get data
    sleepData <- getData()
    #base plotting object
    g <- ggplot(sleepData, aes(x = bodywt, y = sleep_total))
    if (input$conservation) {
      g + geom_point(size = input$size, aes(col = conservation))
    } else {
      g + geom_point(size = input$size)
    }
  })
  ...
```

Example App

Example App

- This code goes below the `ui` and `server` objects

```r
# Run the application
shinyApp(ui = ui, server = server)
```

- Save file as `app.R` and RStudio knows it is a shiny app!
- Let's create this app!

How to Learn about Shiny?

- Learn about user interface (UI) elements
    - UI layout
    - Input widgets (sliders, numeric inputs, etc.)
    - Formatting of text/HTML elements
    - Outputs from server
- Understand how the server (R) back-end works with the UI elements
    - Reactivity concepts
    - Accessing UI inputs
    - Creating outputs

Create your first apps!

- Read through the following pages of the Posit tutorial (**complete the `Your Turn` sections within these lessons** - no need to turn anything in, this is just to help you learn!)
  - Welcome to Shiny
  - Build a user interface
    - Note: You will need to install (and load in your script) the `bslib` library. They use `page_sidebar()`, `cards()`, and `value_box()` from this package to build their UI
  - Add Control Widgets