Co-lab Shiny Workshop

Hello World!

Normal Probability Density Histogram, Reactivity, ggplot, OPM Overview

October 17, 2019

1 Overview

- Preliminaries
  - What is R?
  - What is Shiny?
  - What can Shiny do for you?
  - What are your expectations of this workshop?
- Examples
  - Example visualizations
  - Example Shiny apps
- Resources
- Access workshop material
  - From RStudio Cloud
  - From github (execute locally)
- First app - NPDHist
  - Libraries required
  - Execute using `runApp()`
  - Examine R and Shiny instructions
  - Execute as ui.r and server.r
  - Reactivity
    - What is reactivity?
    - Using the `reactive()` function
    - Using `isolate()` to disable reactivity
  - Debugging
- Data tables
  - Read source data
  - Construct table
  - Configure table controls (column sorting, filtering, paging)
  - Trigger actions with row click
  - Embed HTML for url href linking
- Generate plot from data table row
  - Subset data using selected row values
  - Use tabs to isolate table from plot

2 Examples

2.1 Visualizations

- ggplot gallery: https://www.r-graph-gallery.com/all-graphs.html
- ggplot extensions: https://www.ggplot2-exts.org/gallery/

2.2 Shiny Apps

- Duke Data+ project, *Big Data for Reproductive Health*, http://bd4rh.rc.duke.edu:3838
- Duke Data+ project, *Water Quality Explorer*, http://WaterQualityExplorer.rc.duke.edu:3838

3 Resources

- R
  - Books
    - Norm Matloff, *The Art of R Programming*, No Starch Press
    - Wickham and Grolemund, *R for Data Science*, O'Reilly
    - Andrews and Wainer, *The Great Migration: A Graphics Novel*, https://rss.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1740-9713.2017.01070.x
    - Friendly, *A Brief History of Data Visualization*, http://datavis.ca/papers/hbook.pdf
  - Reference cards
    - R reference card: https://cran.r-project.org/doc/contrib/Short-refcard.pdf
    - Base R: https://rstudio.com/wp-content/uploads/2016/10/r-cheat-sheet-3.pdf
    - Shiny, ggplot, markdown, dplyr, tidy: https://rstudio.com/resources/cheatsheets/
- Shiny
  - Help
    - `?shiny` from the R command line
    - Click `shiny` in the `Packages` tab of RStudio
    - https://cran.r-project.org/web/packages/shiny/shiny.pdf
  - Shiny gallery: https://shiny.rstudio.com/gallery/
- ggplot
  - Help
    - `?ggplot2` from the R command line
    - Click `ggplot2` in the `Packages` tab of RStudio
    - https://cran.r-project.org/web/packages/ggplot2/ggplot2.pdf
  - R graph (ggplot) gallery: https://www.r-graph-gallery.com/
- Workshop material: https://github.com/tbalmat/Duke-Co-lab/tree/master/Session-1

4 Access Workshop Material

4.1 RStudio Cloud

- What is RStudio Cloud?
  - *We* [RStudio] *created RStudio Cloud to make it easy for professionals, hobbyists, trainers, teachers and students to do, share, teach and learn data science using R.*
- With RStudio Cloud
  - You do not need RStudio installed locally
  - Packages and data are available without installation and transfer
- Access workshop material
  - Create an Account: https://rstudio.cloud
  - Workshop project link: https://rstudio.cloud/project/580472

4.2 Execute Locally (copy workshop material from github repo)

Copy scripts and data from https://github.com/tbalmat/Duke-Co-lab/tree/master/Session-1

5 First App - NPDHist

Structure of a Shiny app (side bar, fluid page, columns, comma separation, "Warning: Error in tag: argument is missing, with no default"
Shell execution
Specify alternate port

6 Debugging

ERROR: argument is missing, with no default (comma remaining after removal of parameter)