Interactive web apps with Shiny

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The Shiny package for R provides a way to transform your R code into interactive applications accessible through a web browser. This lesson provides a hands-on example of how you can use Shiny to create intuitive graphical user interfaces.

Learning objectives

1. Explain the different responsibilities of the user interface and the server function
2. Manipulate user interface options in side panels
3. Apply defensive programming techniques to reduce errors
4. Diagnose problems with Shiny built-in debugging features
5. Share the application through shinyapps.io

Description

While the R programming language is immensely popular, not everyone has the time or resources to learn how to use it (a shame, I know). How then, can you share your awesome data visualization tools that you wrote in R? The Shiny package provides the architecture to build beautiful web applications without writing a single HTML tag. This workshop will introduce some of the functionality of the package as well as platforms you can use to share your work.

Getting started

To start with, we will need to install the shiny package for R. For this lesson, we also be using the ggplot2 package for data visualization and the palmerpenguins package for our data source.

```
install.packages("shiny")
install.packages("ggplot2")
install.packages("palmerpenguins")
```

Note, I misspell "palmerpenguins" more frequently that I would like to admit, so if you encounter installation problems with that package, double-check to make sure it is spelled correctly.

We are now ready to start our Shiny Application!

- From the File menu, select New Project…
- Choose "New Directory" in the first dialog
- In the Project Type dialog, select "Shiny Web Application", which is probably the third option in the list. If you do not see this as an option, try shutting down RStudio and starting it up again.

Name your project "shiny-lesson" and be sure you save it somewhere you can remember (I usually save these lessons to the Desktop or My Documents).
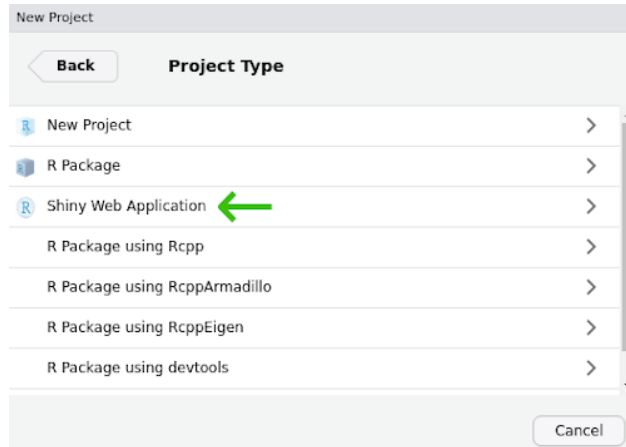

Figure 1: The new Shiny web application dialog

[TOPIC ONE]

Look at two parts of file (`ui` and `server` (and `shinyApp` at the very end of the file))

[TOPIC TWO]

Adding the interactivity

Do panel manipulation with Species first as a text field, then change this to a drop-down menu (defensive programming)

`textInput`

PEBKAC

We've all been there. Here's the point for defensive programming (changing the text input field to a dropdown dialog)

Maybe also add an option checkbox to color by sex

[TOPIC THREE]

Add some bells & whistles, like the regression model output to the screen with `tableOutput` or `textOutput` functions.

Introduce some error here, so it doesn't show up. Use `runApp(display.mode = "showcase")`

Fix the problem

Sharing is caring

Share the app via shinyapps.io. Acknowledge other sharing resources are in the Additional resources section.

Additional resources

- resource one
- The invaluable Shiny cheat sheet
- A PDF version of this lesson

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Questions? e-mail me at jcoliver@email.arizona.edu.