Introduction to Shiny

Spring 2023

May 08 2023

Shiny: Overview

- *Shiny is an R package that provides a fairly high-level framework for creating interactive graphics*
- *Shiny web app allows us to build interactive dashboard that we will let Rstudio host for us with their servers*
- *Rstudio makes it easy to create and even upload these graphs to the web*
- *You can publish Shiny documents to the ShinyApps (https://shinyapps.io) hosted service*

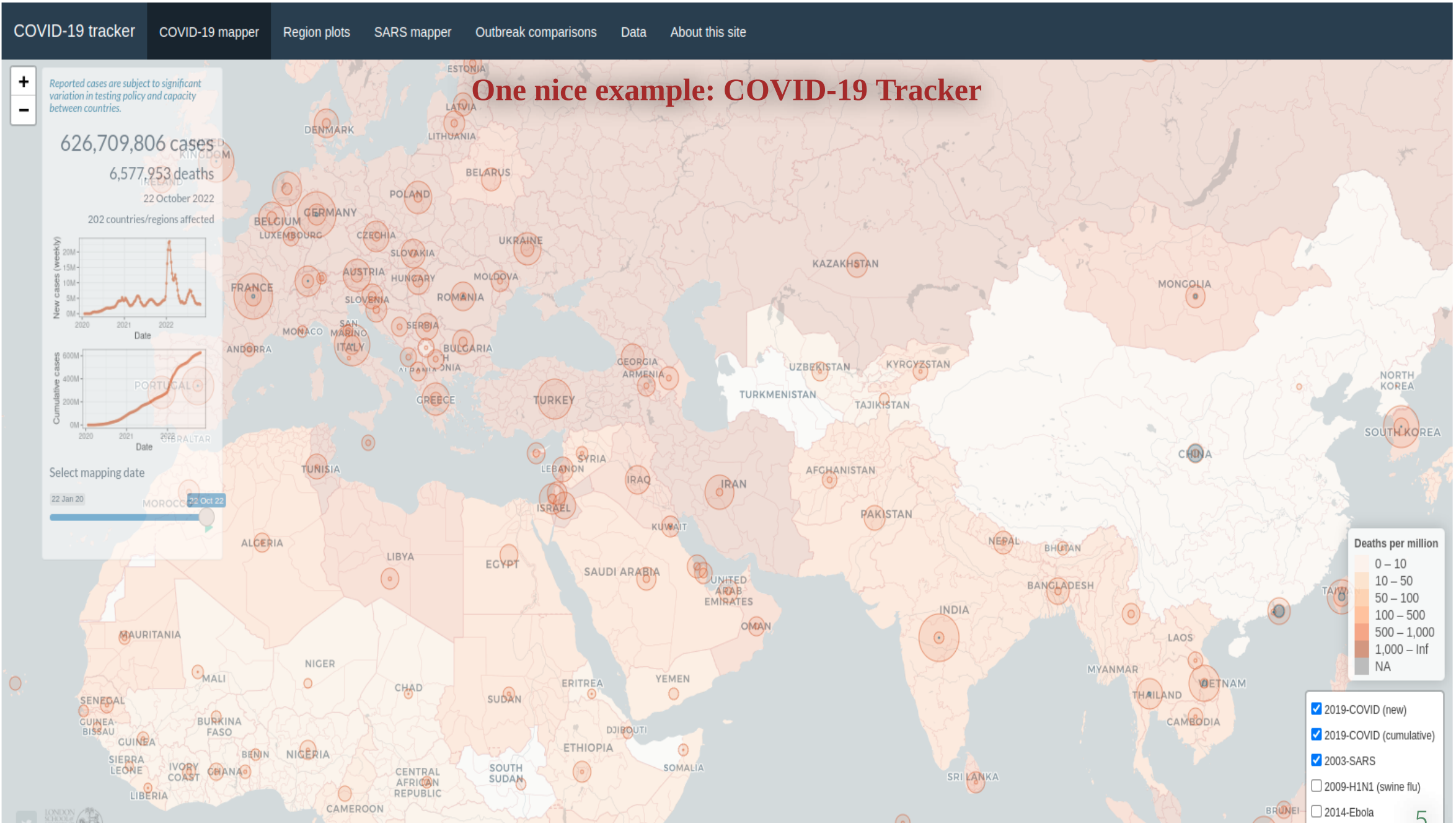
Interactive plots

- Shiny uses reactive programming to automatically update outputs when inputs change
- Shiny applications have two components:
  - a **user interface (UI)** object
  - a **server** function
- These are passed as arguments to the `shinyApp` function that creates a Shiny app object from this UI/server pair

The YAML header of this R Markdown document has the line `runtime: shiny` so that RStudio understands this is a Shiny document.

Useful Resources

- Shiny RStudio Documentation
- Shiny Documents for further reading
- Learn Shiny with videos and written tutorials.
- Shiny Gallery with example demonstrations
- Mastering Shiny by Hadley Wickham.
- Shiny Cheatsheet


COVID-19 tracker
COVID-19 mapper
Region plots
SARS mapper
Outbreak comparisons
Data
About this site
One nice example: COVID-19 Tracker
Reported cases are subject to significant variation in testing policy and capacity between countries.
626,709,806 cases
6,577,953 deaths
22 October 2022
202 countries/regions affected
New cases (weekly)
Cumulative cases
Date
Select mapping date
22 Jan 20
22 Oct 22
Deaths per million
0 – 10
10 – 50
50 – 100
100 – 500
500 – 1,000
1,000 – Inf
NA
2019-COVID (new)
2019-COVID (cumulative)
2003-SARS
2009-H1N1 (swine flu)
2014-Ebola

Shiny : : CHEAT SHEET

Building an App

A **Shiny** app is a web page (**ui**) connected to a computer running a live R session (**server**).

Users can manipulate the UI, which will cause the server to update the UI's displays (by running R code).

Save your template as **app.R**. Keep your app in a directory along with optional extra files.

To generate the template, type **shinyapp** and press **Tab** in the RStudio IDE or go to **File > New Project > New Directory > Shiny Web Application**

In **ui** nest R functions to build an HTML interface

Customize the UI with **Layout Functions**

Add Inputs with ***Input()** functions

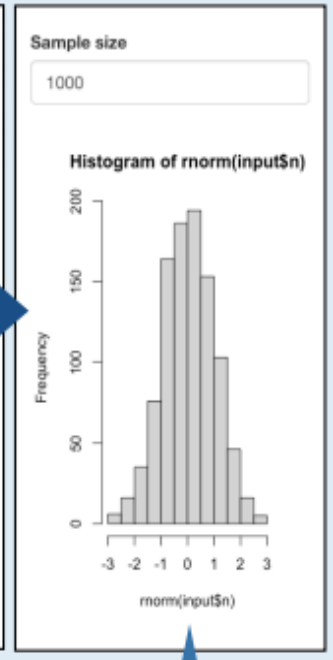
Add Outputs with ***Output()** functions

Tell the **server** how to render outputs and respond to inputs with R

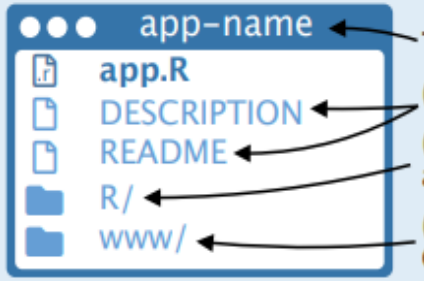
Wrap code in **render*()** functions before saving to output

Refer to UI inputs with **input$<id>** and outputs with **output$<id>**

```
# app.R
library(shiny)

ui <- fluidPage(
  numericInput(inputId = "n",
    "Sample size", value = 25),
  plotOutput(outputId = "hist")
)


server <- function(input, output, session) {
  output$hist <- renderPlot({
    hist(rnorm(input$n))
  })
}

shinyApp(ui = ui, server = server)
```



Call **shinyApp()** to combine **ui** and **server** into an interactive app!



The directory name is the app name

(optional) used in showcase mode

(optional) directory of supplemental .R files that are sourced automatically, must be named "**R**"

(optional) directory of files to share with web browsers (images, CSS, .js, etc.), must be named "**www**"

Launch apps stored in a directory with **runApp(**<path to directory>**)**.

See annotated examples of Shiny apps by running **runExample(**<example name>**)**. Run **runExample()** with no arguments for a list of example names.

shinyapps.io ☰ Help Account: deepbas

- Dashboard
- Applications
- Account
  - Profile
  - Tokens
  - Domains
  - Settings
  - Usage
  - Billing
  - Members

GETTING STARTED ×

http://shinyapps.io/

Hi! You must be new here...

Thanks for trying out shinyapps.io! You'll need to install the `rsconnect` R package or `rsconnect-python` Python package to get started. These packages enable you to deploy and manage your Shiny applications directly from your local environment. To get started, fire up your favorite IDE, and follow the directions below.

Start with R | Start with Python

STEP 1 – INSTALL RSCONNECT

The `rsconnect` package can be installed directly from CRAN. To make sure you have the latest version run following code in your R console:

```
install.packages('rsconnect')
```

STEP 2 – AUTHORIZE ACCOUNT

The `rsconnect` package must be authorized to your account using a token and secret. To do this, click the copy button below and we'll copy the whole command you need to your clipboard. Paste it into your R console to authorize your account. Once you've entered the command successfully in R, that computer is now authorized to deploy Shiny for R applications to your shinyapps.io account.

```
rsconnect::setAccountInfo(name='deepbas',
                          token='DF6C0142297452E0313D02AF1674AB03',
                          secret='<SECRET>')
```

Show secret

Copy to clipboard

In the future, you can manage your tokens from the Tokens page the settings menu.

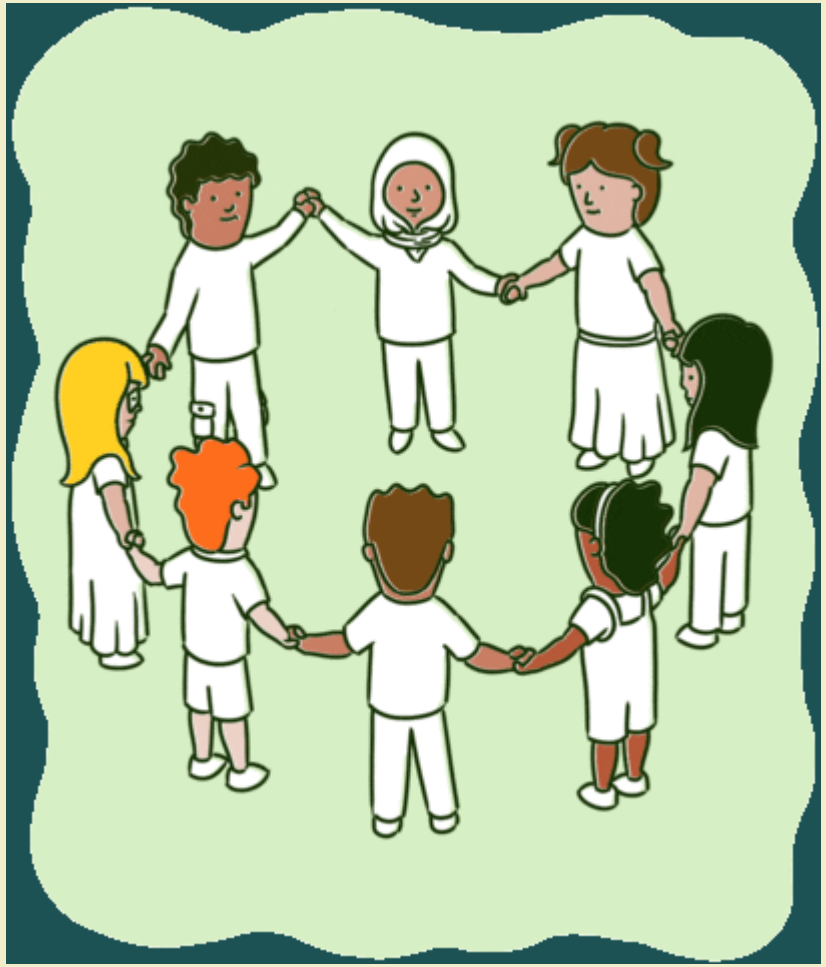
STEP 3 – DEPLOY

Once the `rsconnect` package has been configured, you're ready to deploy your first application. If you haven't written any applications yet, you can also checkout the Getting Started Guide for instructions on how to deploy our demo application. Run the following code in your R console.

```
library(rsconnect)
    rsconnect::deployApp('path/to/your/app')
```

GROUP ACTIVITY 1

05:00



- *Let's go over to maize server/ local Rstudio and our class moodle*
- *Get the class activity 18.Rmd file*
- *Work on activity 1*
- *Ask me questions*

Tracking Covid in Minnesota

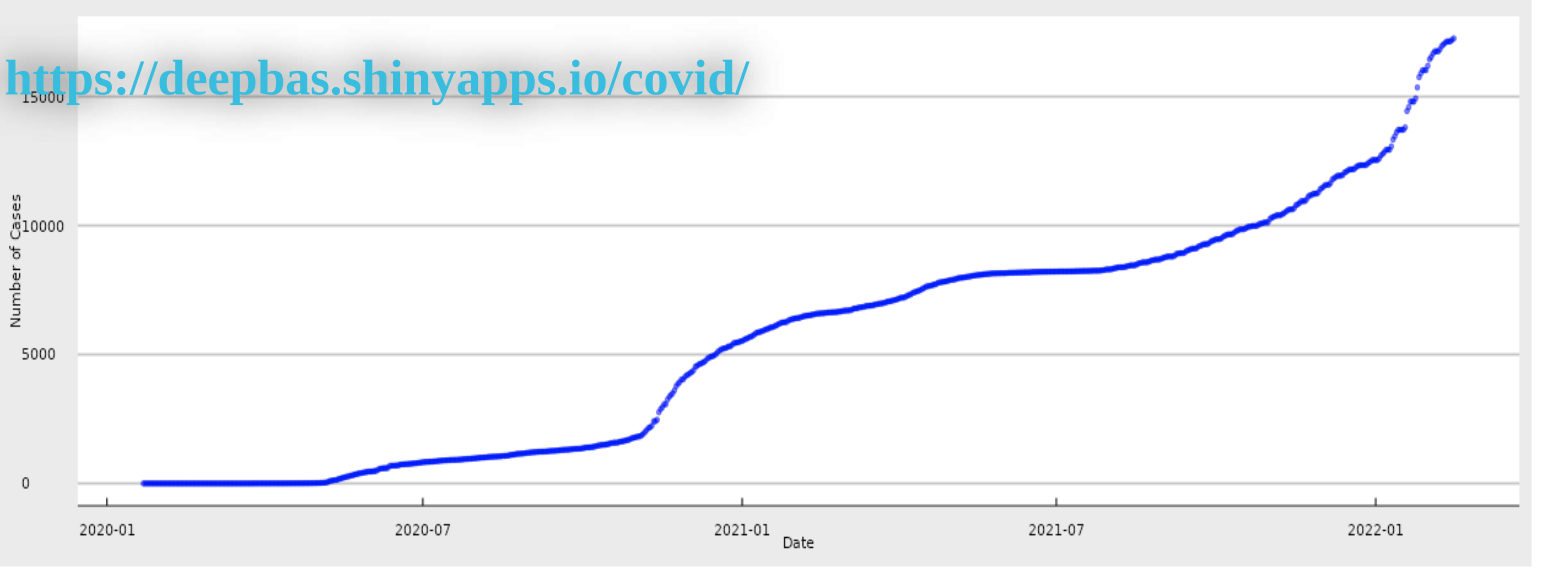
Pick a County

County

Rice

Date range

2020-01-22 to 2022-02-15



Show 10 entries

Search:

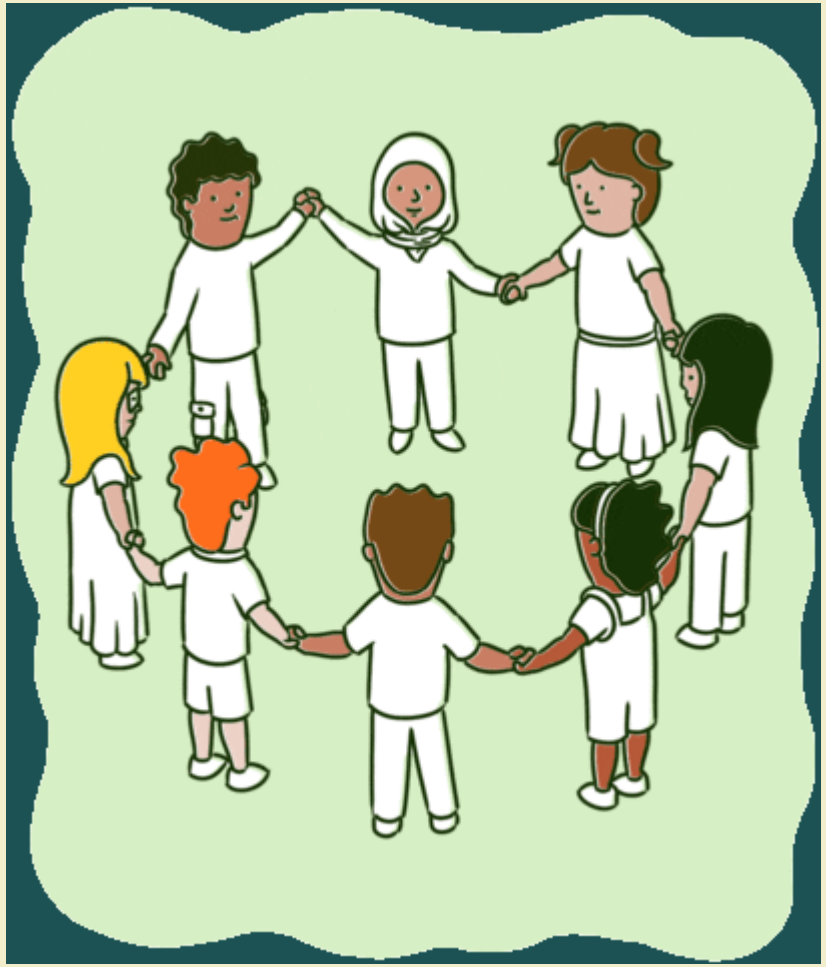
	Counties	dates	cases	month	year
1	Rice	2020-01-22	0	1	2020
2	Rice	2020-01-23	0	1	2020
3	Rice	2020-01-24	0	1	2020
4	Rice	2020-01-25	0	1	2020
5	Rice	2020-01-26	0	1	2020
6	Rice	2020-01-27	0	1	2020
7	Rice	2020-01-28	0	1	2020
8	Rice	2020-01-29	0	1	2020
9	Rice	2020-01-30	0	1	2020
10	Rice	2020-01-31	0	1	2020

Showing 1 to 10 of 756 entries

Previous 1 2 3 4 5 ... 76 Next

GROUP ACTIVITY 2

10:00



- Let's go over to class activity 18 .Rmd file on class moodle and practice building a shiny app together
- Ask me questions