

Data Products and Interactivity with R

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2019-11-04

If statistics programs/languages were cars...



Outline

Computational Documents/ Reproducibility
R Markdown
Demo of Parameterized Rmd
html widgets in R
flexdashboard

What happens once analysis is done?

Computational documents

- documents with executable code inside of them

Authors generate reports

End users interact with reports

Considerations for end users

- can they interpret output?
- do they know how to code?
- do they have R/RStudio installed?

Considerations for developers

- where is the data coming from?
- do you need a live R session?
- how often will this need to be changed?

Goal

allow end users to interact with data products
without involvement of the developer

R Markdown (Rmd)

Computational Documents in Rmd

Rmd

Rmd with parameters

Rmd report with html widgets

Rmd with Shiny elements

Shiny app

Computational Documents in Rmd

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DEMO

Example data

Today you will use example data from NUFORC to analyze UFO sightings and product a data product.

There are 80,000 + sightings over the past 70 years within this dataset.

Example data

<https://github.com/rfordatascience/tidytuesday/tree/master/data/2019/2019-06-25>

```
ufo_sightings <- readr::read_csv(paste0("https://raw.githubusercontent.com/rfordatascience/tidytuesday/master/data/2019/2019-06-25/ufo_sightings.csv"))
```

In-course task #1

1. read in the data
2. create a *new* dataframe with only observations in the United States
3. convert `date_time` and `date_documented` variables to the correct class
4. generate a parameterized Rmd using the `ufo_shape` variable

Computational Documents in Rmd

Rmd

Rmd with parameters

Rmd report with html widgets

Rmd with Shiny elements

Shiny app

Interactive elements

html widgets

- self-contained, interactive

Shiny

- GUI with live R session
- do you need a live R session?
- are you changing data more than once per session?

html widgets

JavaScript libraries for R
embed them in Rmd/Shiny

- plotly
- leaflet
- DataTable

where to find html widgets

<https://www.htmlwidgets.org/>

In-course task #2

1. install plotly, leaflet, DT
2. create an interactive bar chart of UFO shape counts (choose 3)
3. create a leaflet map of `encounter_length`
4. create an interactive data table

flexdashboard

- group of visualizations
- versatile components (static, plotly, leaflet)

install flexdashboard

```
install.packages("flexdashboard")
```

Structure of a dashboard

<https://rmarkdown.rstudio.com/flexdashboard/layouts.h>

Making data products meaningful

- color (viridis)
- information
- size
- text (scales)
- highlighting

In-course task #3

1. Use the UFO data already in your environment to recreate the following dashboard
2. If you finish, alter the dashboard by rearranging plots, filtering to new data, etc.

Helpful links for in-course task

<https://rmarkdown.rstudio.com/flexdashboard/>

<https://www.htmlwidgets.org/index.html>

[https://cran.r-](https://cran.r-project.org/web/packages/viridis/vignettes/intro-to-viridis.html)

[project.org/web/packages/viridis/vignettes/intro-to-viridis.html](https://cran.r-project.org/web/packages/viridis/vignettes/intro-to-viridis.html)

<https://rviews.rstudio.com/2019/09/19/intro-to-ggforce/>

<https://rstudio.com/resources/cheatsheets/>

Final thoughts- create a portfolio!

RStudio has made a variety of tools for you to showcase your skills using Rmd!

- blogdown
- bookdown
- Rmd resume/CV