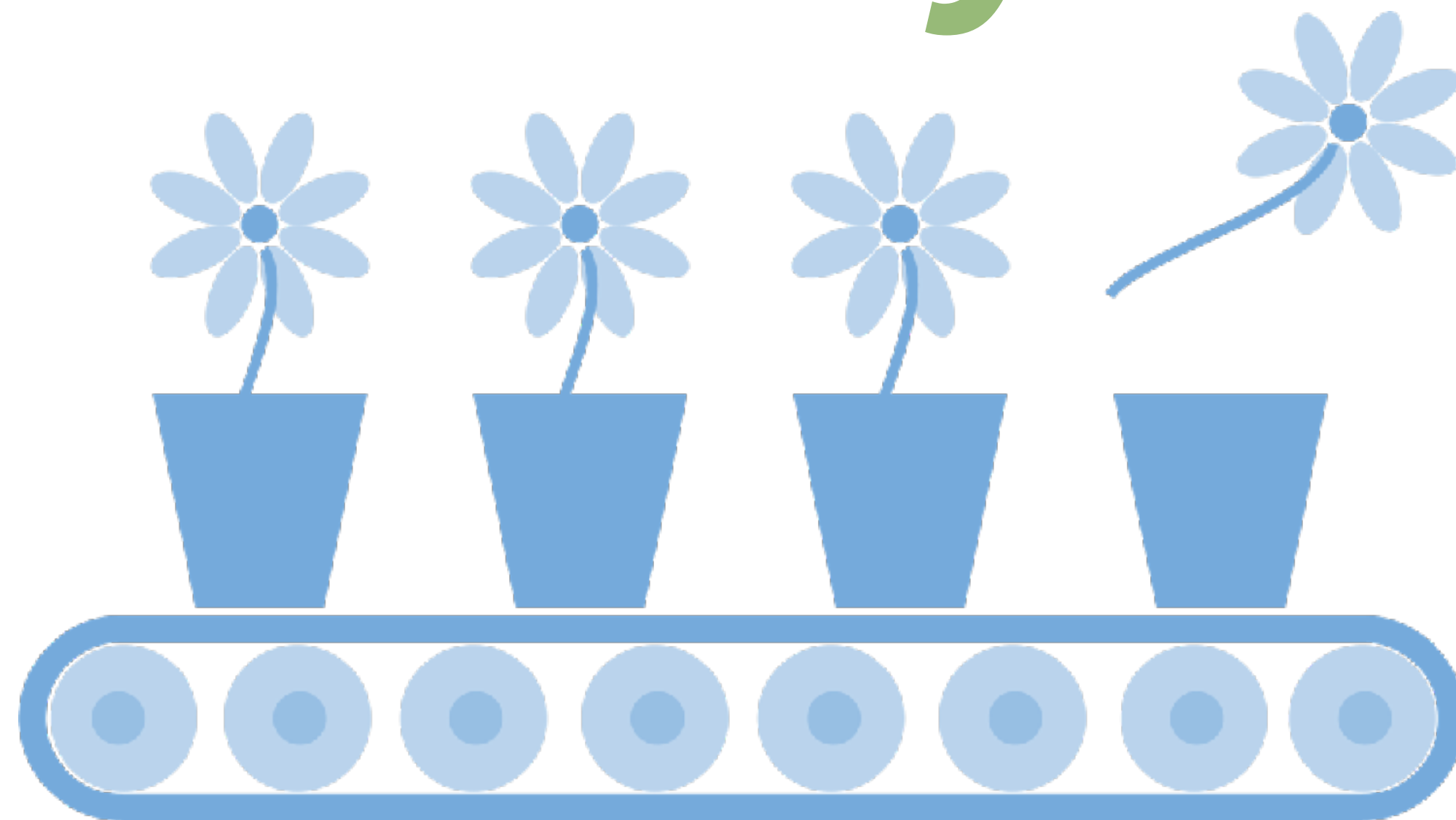


From reproducibility to interactivity



minebocek 

mine-cetinkaya-rundel 

cetinkaya.mine@gmail.com 

61

45

4

94

12

3



```
# set.seed  
set.seed(20190314)
```

```
# generate 8 random numbers between 0 and 99  
runif(8, 0, 99) %>% round()
```

20

44

more than **70** percent

have tried and **failed** to reproduce
another scientist's experiments

more than **50** percent

have tried and **failed** to reproduce
their **own** experiments

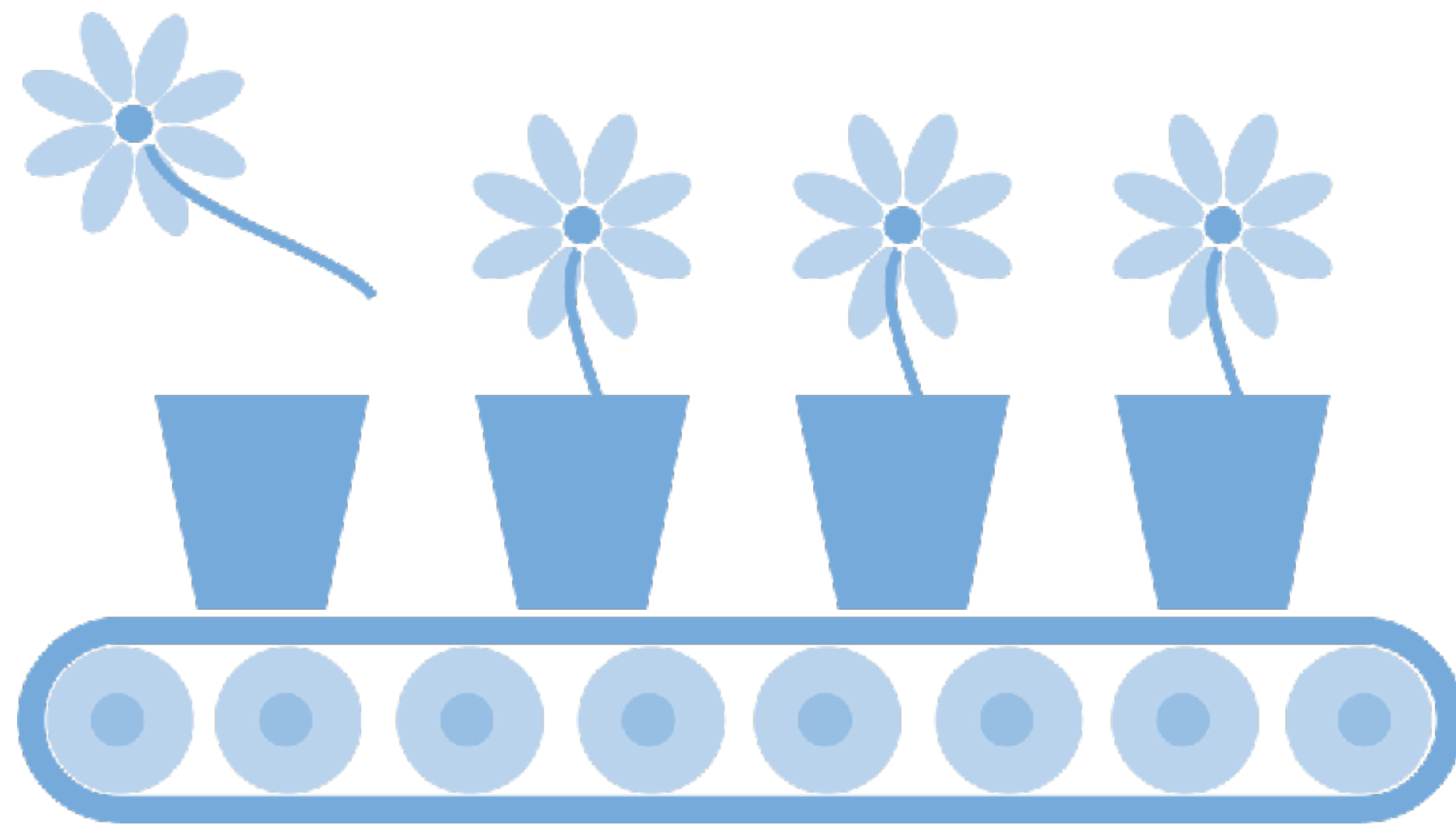
Google Scholar yields

715

results containing the term **reproducibility crisis**
just in **2019**

Computational Documents





Authors

Generate reports
efficiently



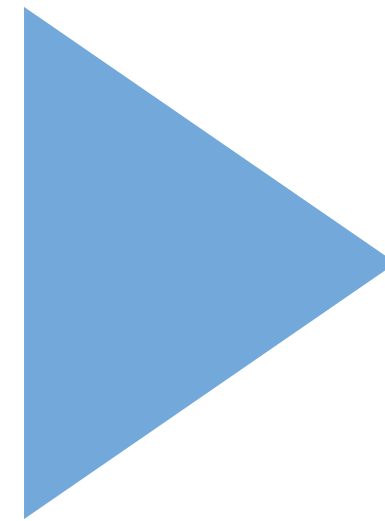
Users

Interact with
content

Outline

1. Computational Documents
2. R Markdown
3. Tips
4. Thinking about Interactivity

R Markdown



02-rmd.Rmd

rmarkdown.rstudio.com/formats

RStudio Formats

R Markdown formats from RStudio (see below for additional formats created by the R community)

Documents

Notebook	Interactive R Notebooks
HTML	HTML document w/ Bootstrap CSS
PDF	PDF document (via LaTeX template)
Word	Microsoft Word document (docx)
ODT	OpenDocument Text document
RTF	Rich Text Format document
Markdown	Markdown document (various flavors)

Presentations

ioslides	HTML presentation with ioslides
reveal.js	HTML presentation with reveal.js
Slidy	HTML presentation with W3C Slidy
Beamer	PDF presentation with LaTeX Beamer
PowerPoint	PowerPoint presentation

Journals

jss_article	Journal of Statistical Software (JSS)
acm_article	Association for Computing Machinery (ACM)
acs_article	American Chemical Society (ACS) Journal
ctex	Documents based on the LaTeX package ctex
elsevier_article	Submissions to Elsevier journals

More

flexdashboard	Interactive dashboards
bookdown	HTML, PDF, ePub, and Kindle books
Websites	Multi-page websites
blogdown	Customizable websites and blogs
pkgdown	Package documentation websites
Tuftes Handout	Handouts in the style of Edward Tufte
Package Vignette	R package vignette (HTML)
Github Document	GitHub Flavored Markdown document.

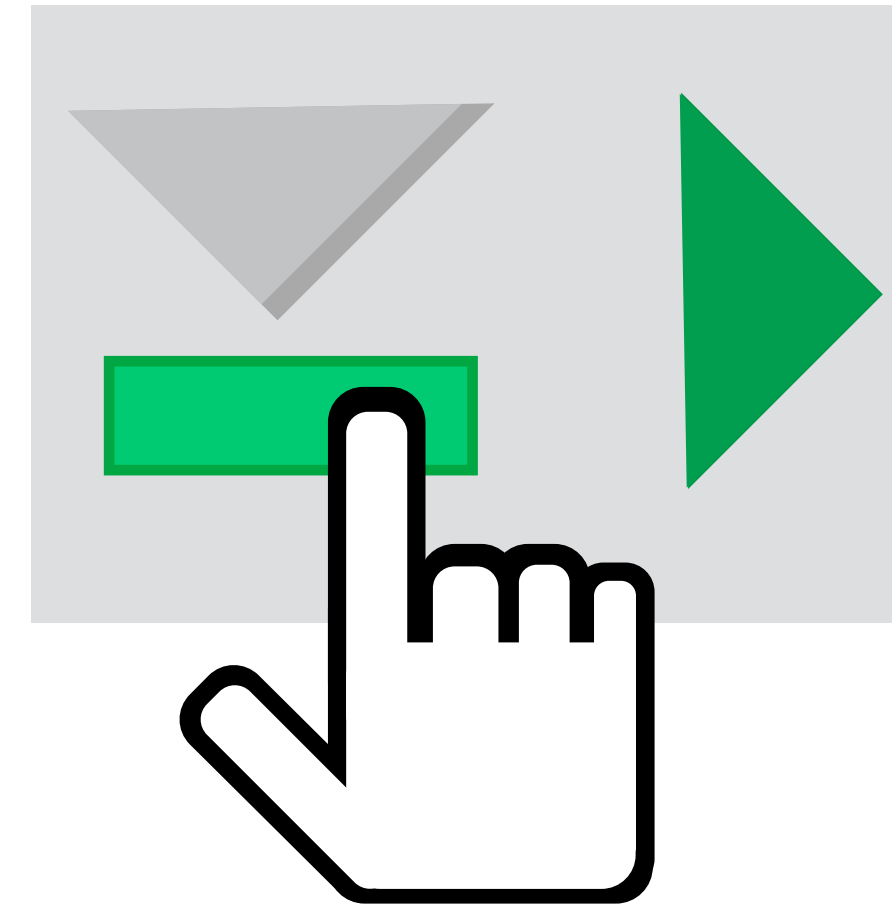
Recap



Plain text
files



Embedded
code



Notebook
interface



Generate
reports

Tips

rmarkdown.rstudio.com/lesson-1.html

Introduction

How It Works

Code Chunks

Inline Code

Code Languages

Parameters

Tables

Markdown Basics

Output Formats

Notebooks

Slide Presentations

Dashboards

Websites

Interactive Documents

Cheatsheets

Introduction

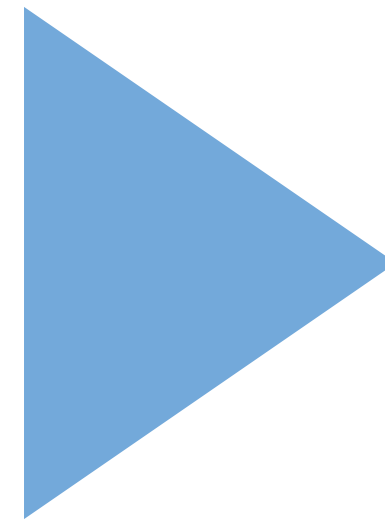
Overview

R Markdown provides an authoring framework for data science. You can use a single R Markdown file to both

- save and execute code
- generate high quality reports that can be shared with an audience

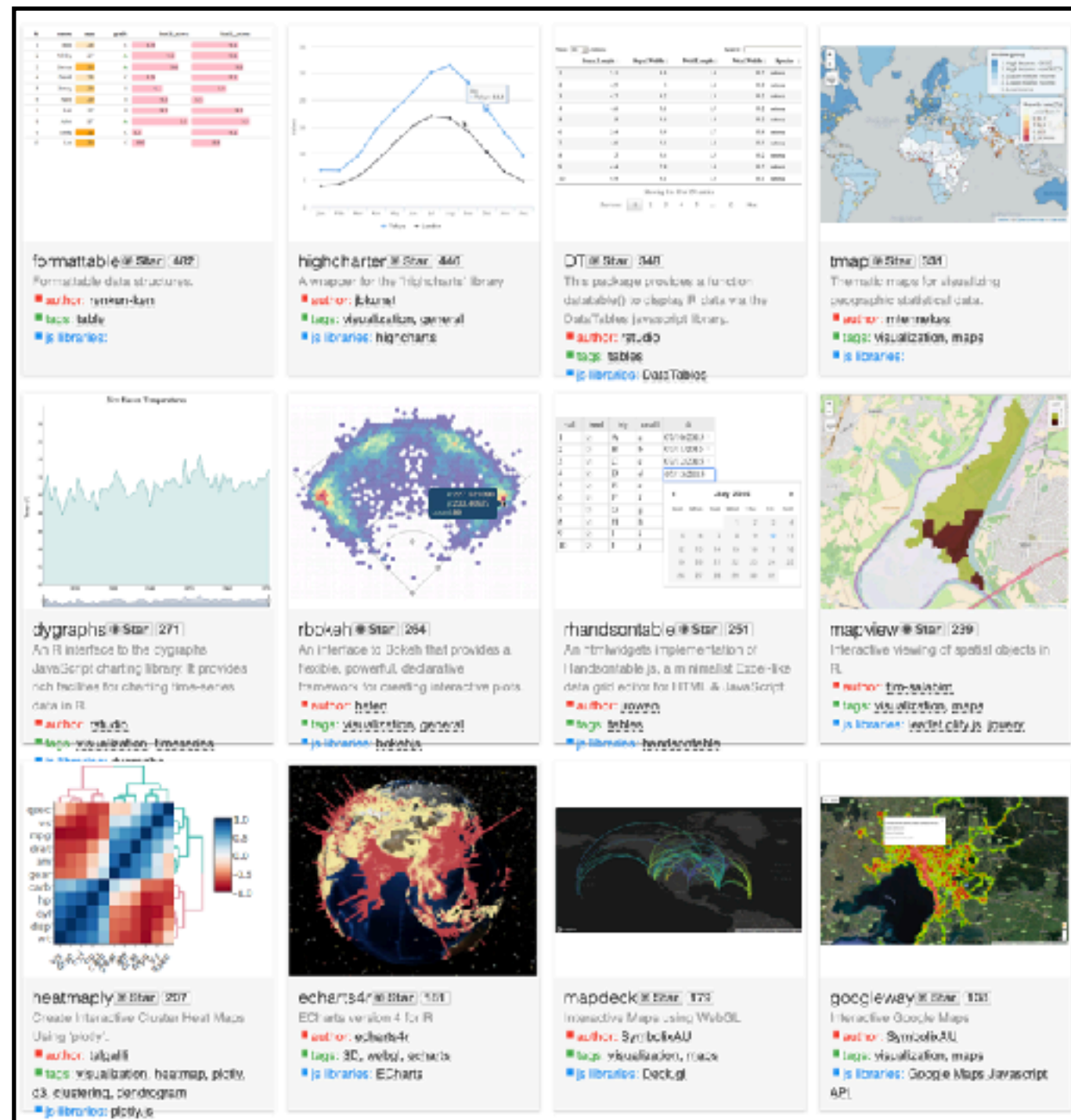
R Markdown documents are fully reproducible and support dozens of static and dynamic output formats. This 1-minute video provides a quick tour of what's possible with R Markdown:





02-rmd.Rmd

03-rmd-with-parameters.Rmd



htmlwidgets

Self-contained
interactive widgets



Shiny

Interactive GUI
to a live R session

www.htmlwidgets.org

htmlwidgets for R

Home

Showcase

Develop ▾

Flexdashboard

Crosstalk

Gallery

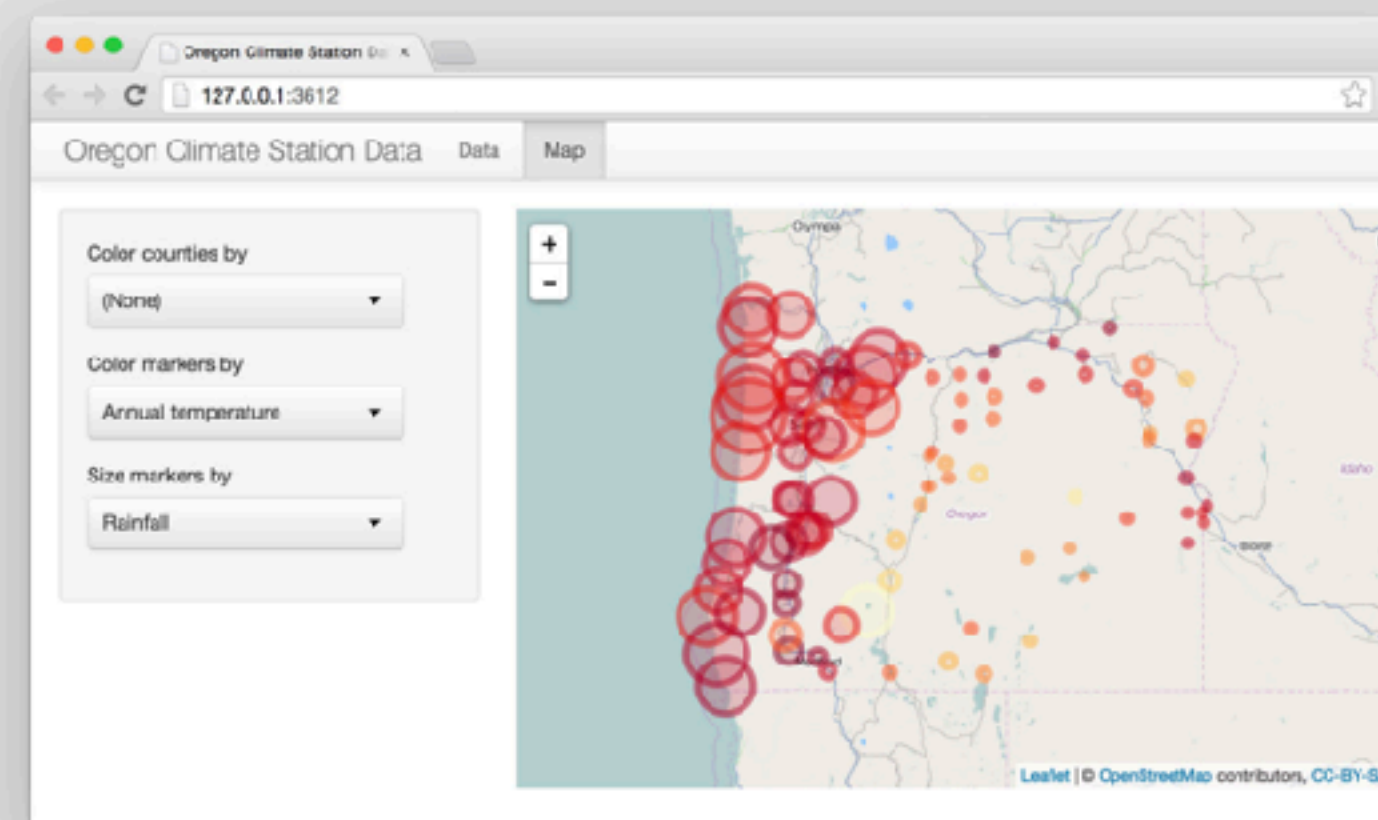
GitHub

Bring the best of JavaScript data visualization to R

Use JavaScript visualization libraries at the R console, just like plots

Embed widgets in R Markdown documents and Shiny web applications

Develop new widgets using a framework that seamlessly bridges R and JavaScript

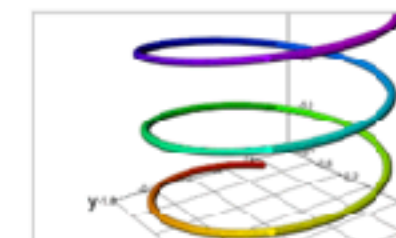
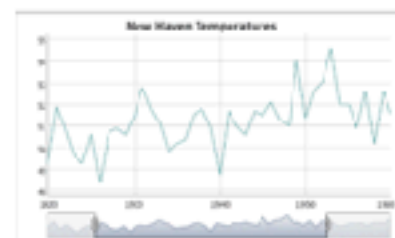


At the R console

In R Markdown docs

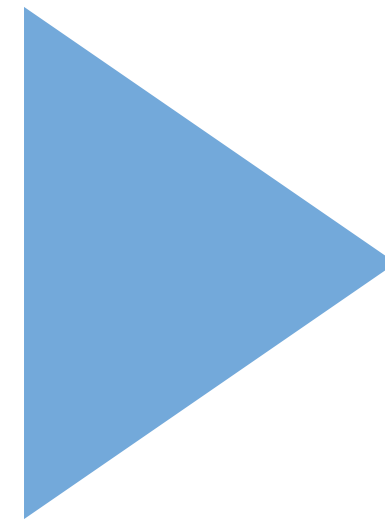
In Shiny apps

Widgets in action



Just a line or two of R code can be used to create interactive visualizations. See the featured widgets in the [showcase](#) and browse over 50 available widgets in the [gallery](#).


[See the showcase »](#)




`04-rmd-with-htmlwidget.Rmd`

shiny.rstudio.com

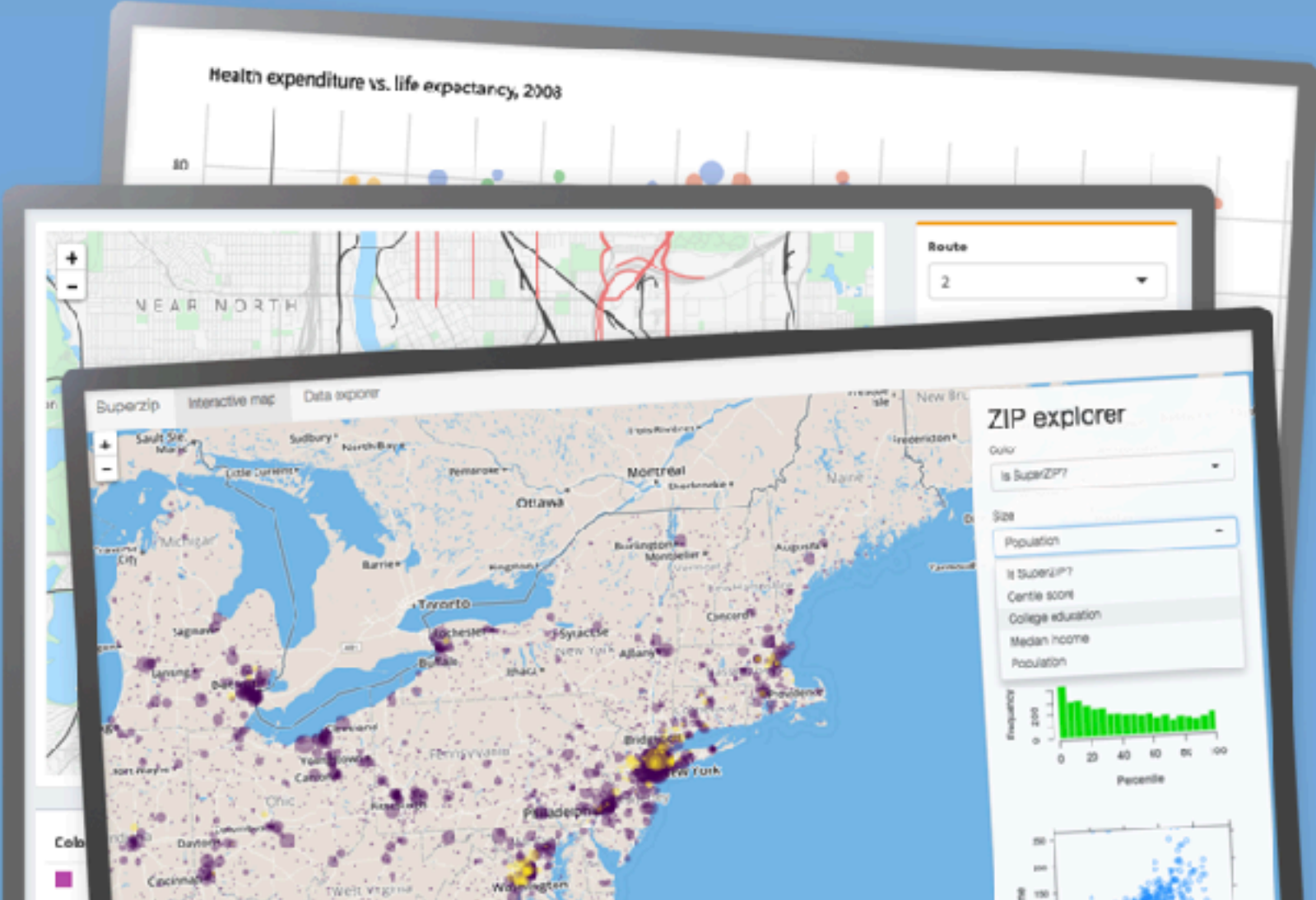
Shiny

from  Studio

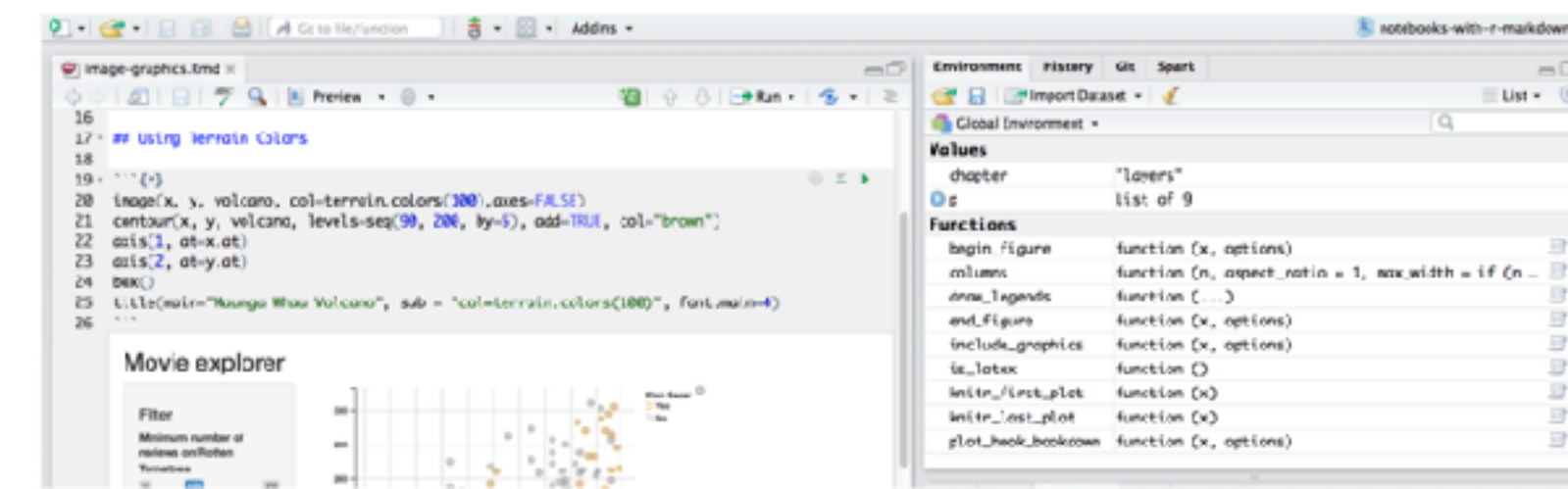
[Get Started](#) [Gallery](#) [Articles](#) [Reference](#) [Deploy](#) [Help](#) [Contribute](#) 

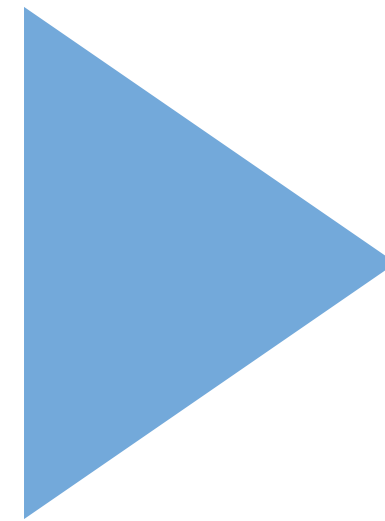
Interact. Analyze. Communicate.

Take a fresh, interactive approach to telling your data story with Shiny. Let users interact with your data and your analysis. And do it all with R.



Shiny is an R package that makes it easy to build interactive web apps straight from R. You can host standalone apps on a webpage





`05-rmd-with-shiny.Rmd`

`06-rmd-dashboard-with-shiny.Rmd`

Recap

Inline code

multi-language support

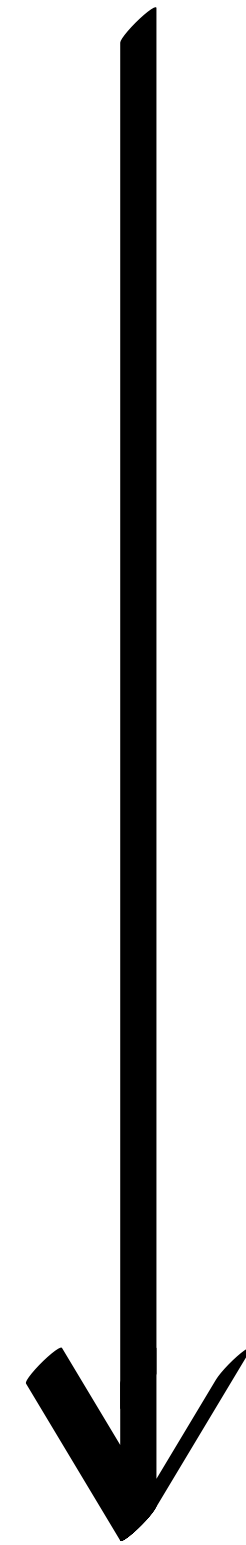
echo = FALSE

.Rmd with parameters

.Rmd with htmlwidgets

.Rmd with Shiny components

More
interactive



.Rmd

.Rmd with parameters

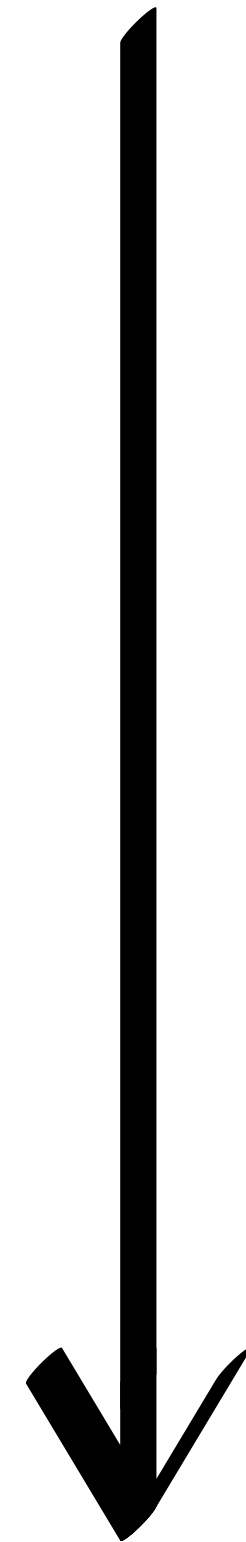
.Rmd with htmlwidgets

.Rmd with Shiny components

Shiny app

Thinking about Interactivity

More
Complicated



.Rmd

.Rmd with parameters

.Rmd with htmlwidgets

.Rmd with Shiny components

Shiny app

.Rmd

.Rmd with parameters

.Rmd with htmlwidgets

.Rmd with Shiny components

Shiny app

Change the data
more than once per
session?

.Rmd

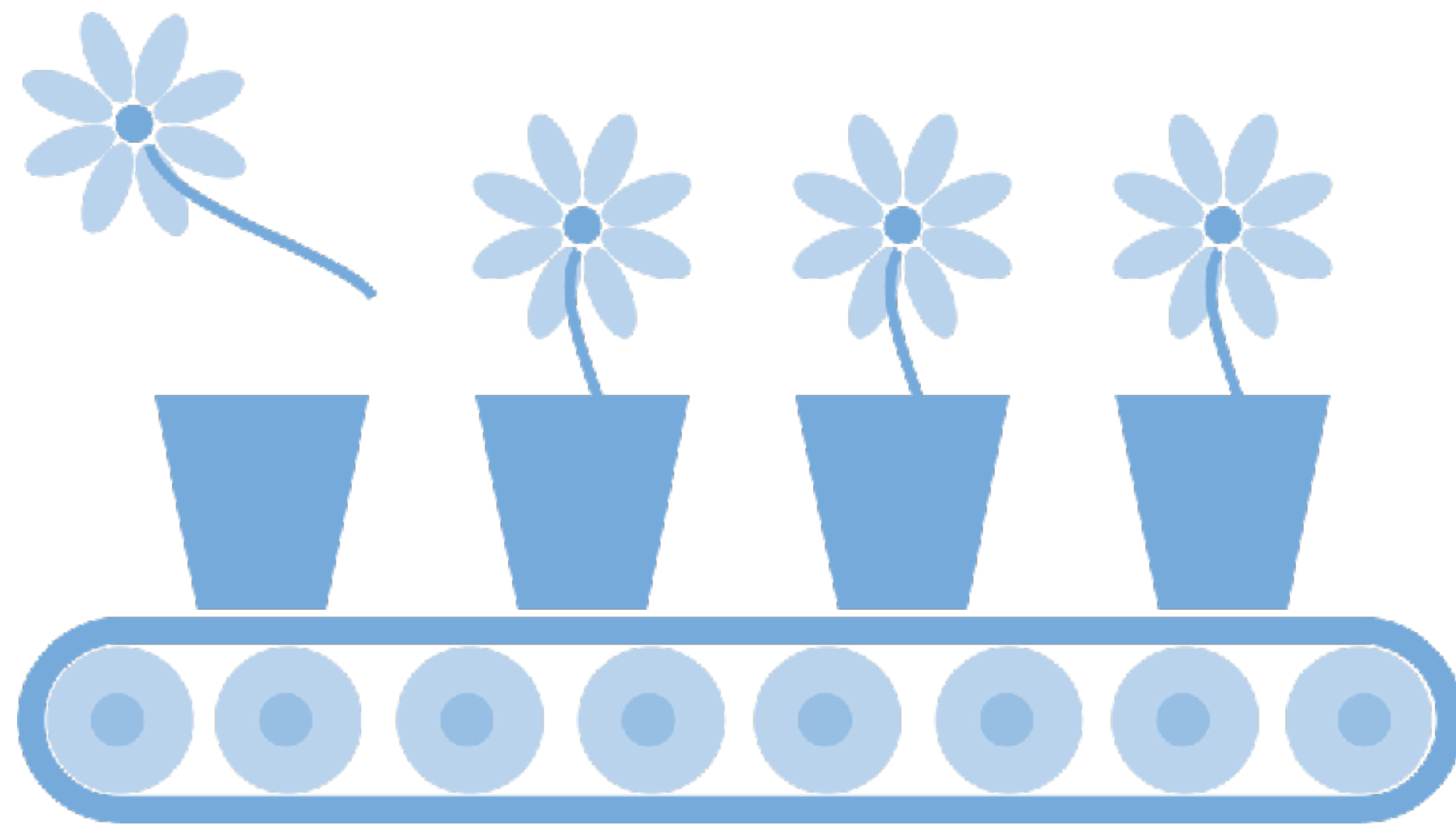
.Rmd with parameters

.Rmd with htmlwidgets

.Rmd with Shiny components

Shiny app

Need More than
a document or
dashboard?



Authors

Generate reports
efficiently



Users

Interact with
content

From reproducibility to interactivity

 rstudio.io/repro-to-interact



CC-BY-4.0

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