Don’t reinvent the wheel: making use of shiny extension packages

Münster R User Group

Hi!

I’m Suthira Owlarn :)

- Biologist/postdoc at the Max Planck Institute
- R newbie (~1.5 years)
- Shiny enthusiast!

 @s_owla

 sowla

 2019-MS-RUG-shiny-extensions

Shiny

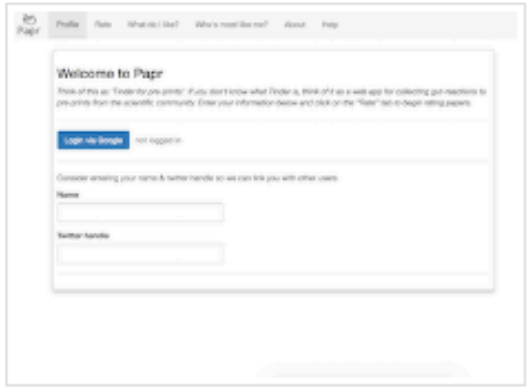
Using the Right tools Saves A Lot of pain

Shiny

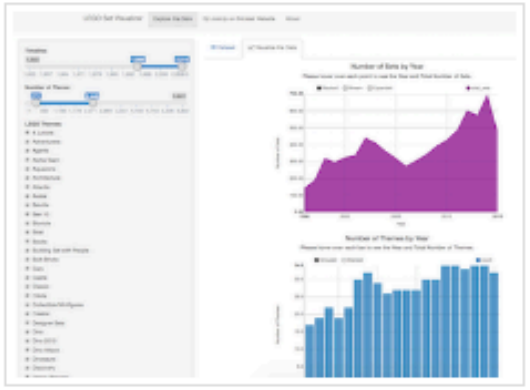
Shiny User Showcase

The Shiny User Showcase contains an inspiring set of sophisticated apps developed and contributed by Shiny users.


Genome browser



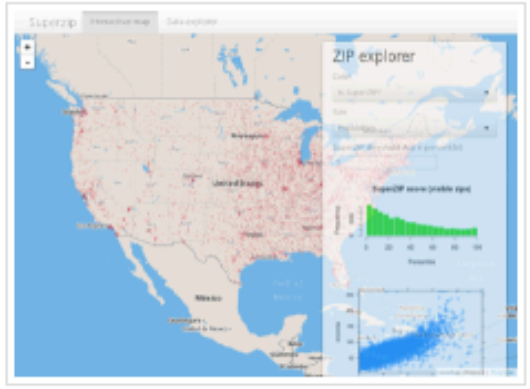
Papr


Lego Set Database Explorer

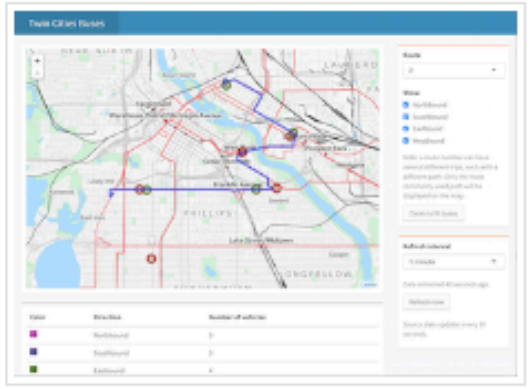

See more

Interactive visualizations

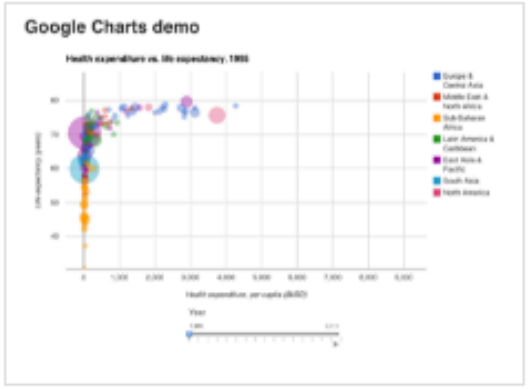
Shiny is designed for fully interactive visualization, using JavaScript libraries like d3, Leaflet, and Google Charts.



SuperZip example

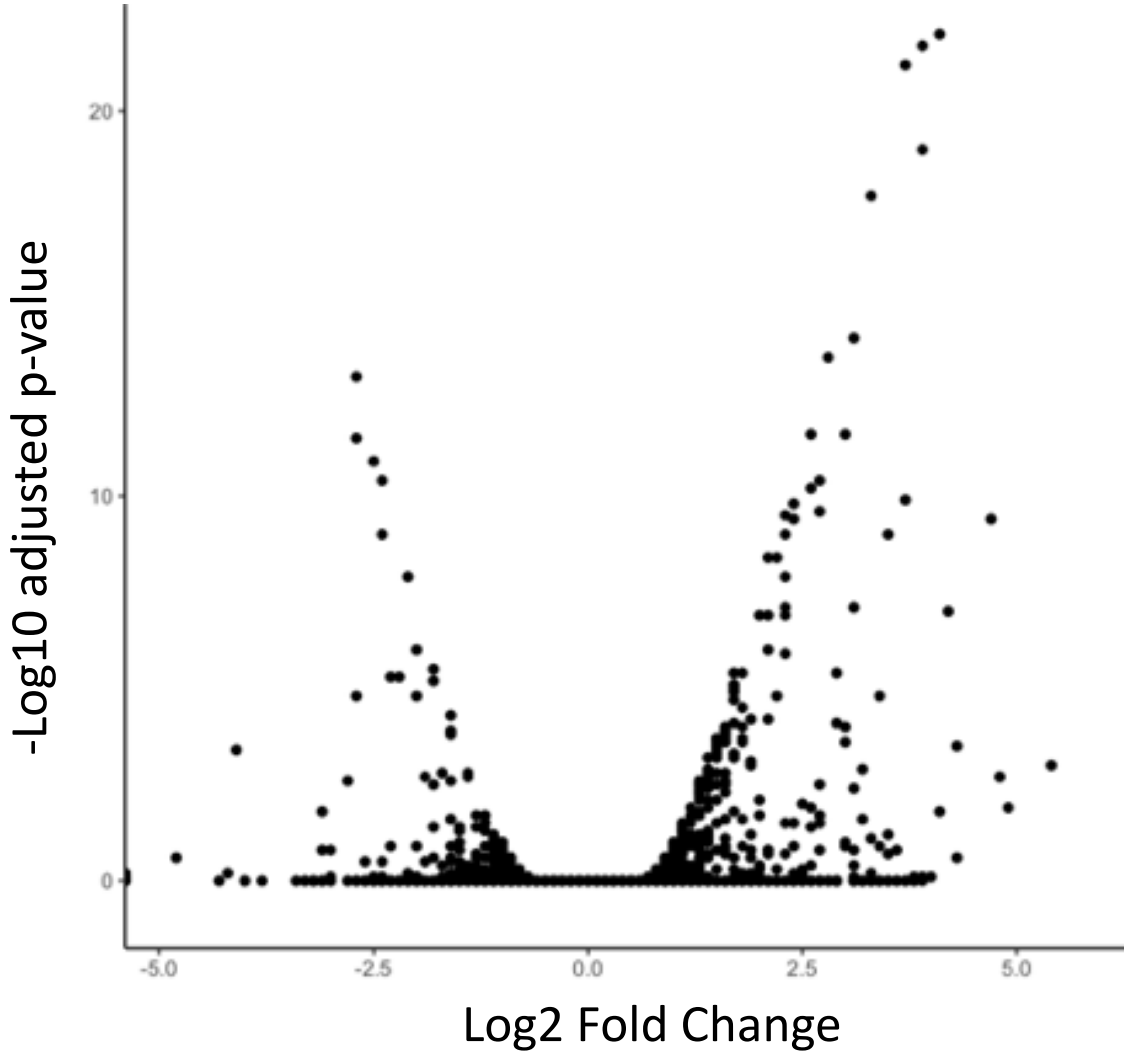

Bus dashboard

Movie explorer



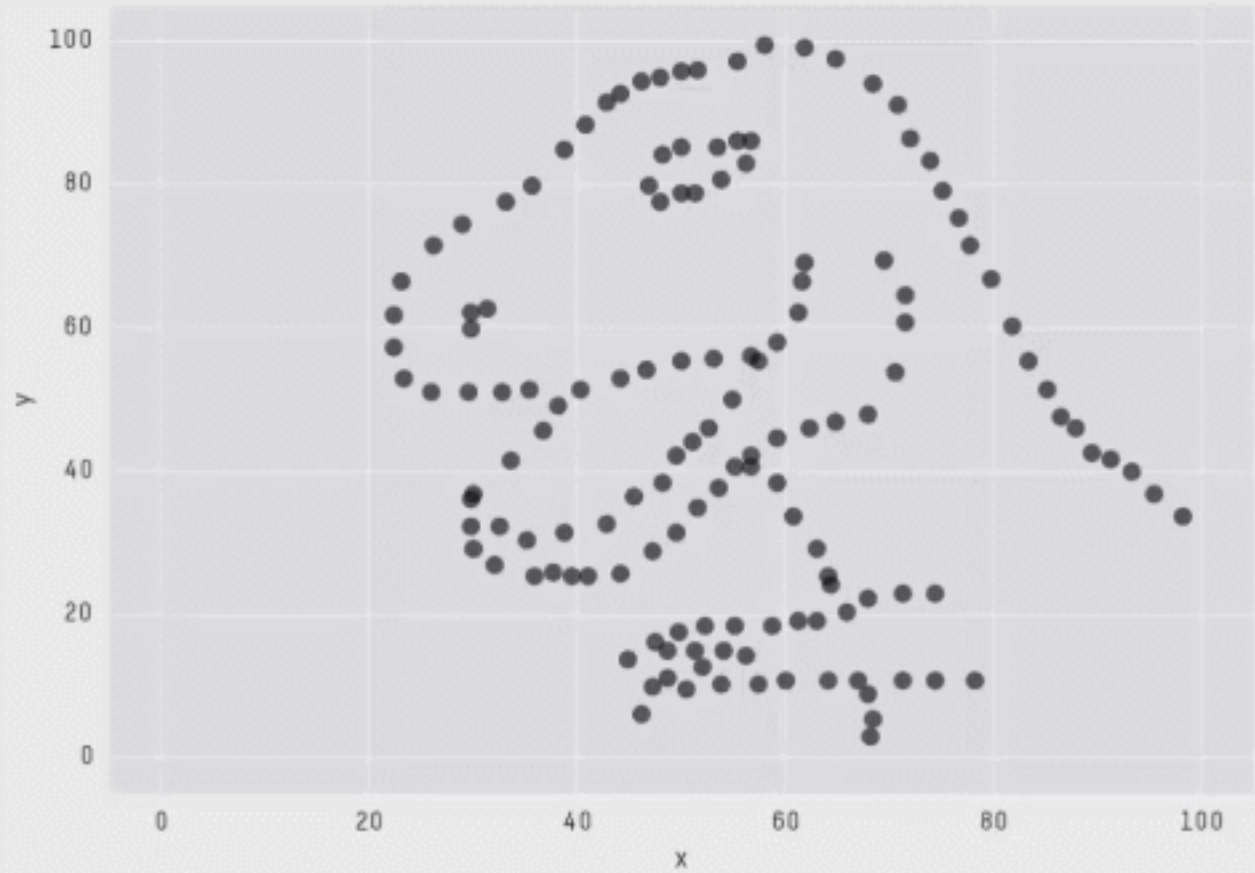
Google Charts

Why did I start using shiny?



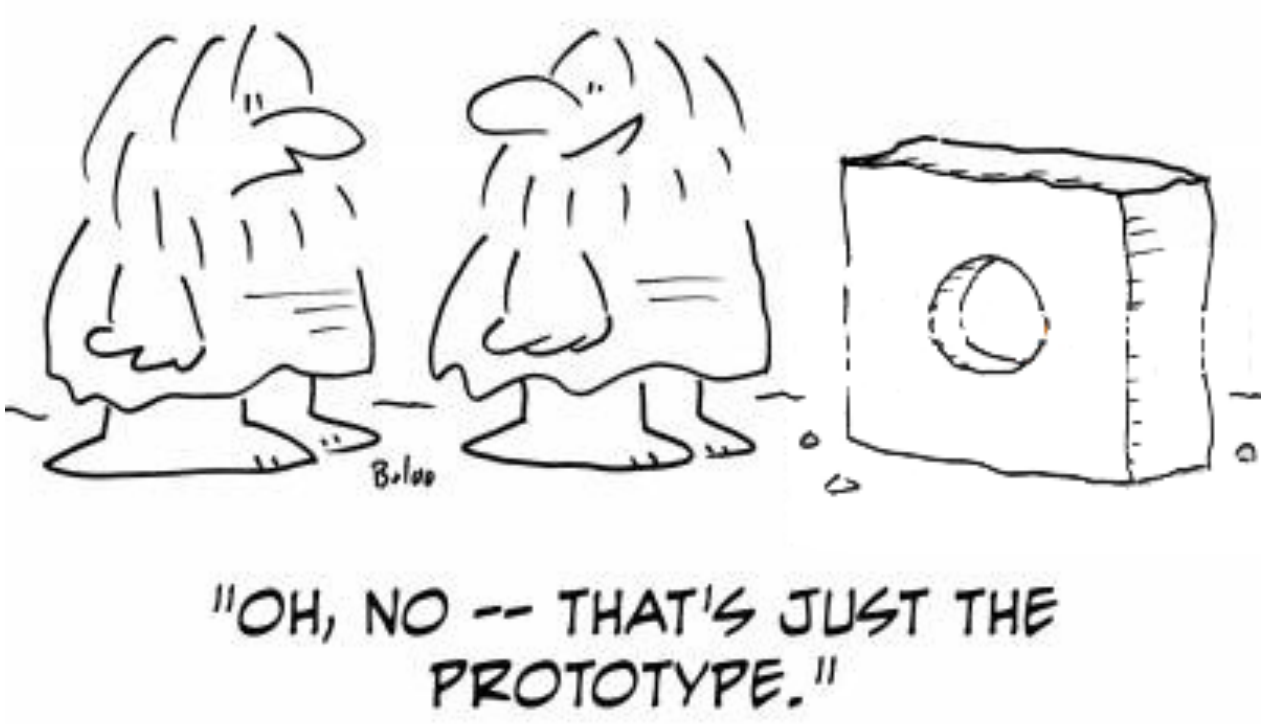
	A	B	C	D
1	Id	baseMean	log2Foldchange	padj
2	dd_Smed_v6_102_0_1	796.510123	-1.227211103	0.01294388
3	dd_Smed_v6_10302_0_1	369.428622	0.987704116	6.72E-08
4	dd_Smed_v6_1033_0_1	1855.65034	0.989061916	0.00671085
5	dd_Smed_v6_1054_0_1	5001.65104	-0.828711614	0.0009754
6	dd_Smed_v6_10849_0_1	202.860402	-0.500429771	0.04398802
7	dd_Smed_v6_1114_0_1	3545.29634	0.653791911	0.01336137
8	dd_Smed_v6_11501_0_1	63.8936551	-1.289230411	1.04E-06
9	dd_Smed_v6_1224_0_1	941.936102	0.622942178	0.01667194
10	dd_Smed_v6_12355_0_1	277.217068	-1.022192875	0.0162604
11	dd_Smed_v6_13291_0_1	56.5819099	-0.978517859	0.00789344
12	dd_Smed_v6_1350_0_1	117.100205	-1.160414409	0.01550004
13	dd_Smed_v6_14068_0_1	82.338354	-1.097416225	0.01971501
14	dd_Smed_v6_1509_0_1	1042.41145	-0.553030165	0.00980481
15	dd_Smed_v6_1519_0_1	955.358024	0.753083458	0.02762951
16	dd_Smed_v6_1531_0_1	652.722592	-1.148139028	1.39E-07
17	dd_Smed_v6_158_0_1	377.730819	-3.076838854	4.73E-20
18	dd_Smed_v6_1580_0_1	2953.09382	1.802740685	1.87E-13
19	dd_Smed_v6_1581_0_1	1773.91345	-0.524144223	0.00198497
20	dd_Smed_v6_1596_0_1	505.382348	-0.602958258	0.00268586
21	dd_Smed_v6_1753_0_1	66.3417388	1.73775701	0.0042826
22	dd_Smed_v6_1772_0_1	3602.39903	0.638196287	0.01017817
23	dd_Smed_v6_1774_0_1	366.528291	1.348691806	0.00078916

Why did I start using shiny?



X Mean: 54.2659224
Y Mean: 47.8313999
X SD : 16.7649829
Y SD : 26.9342120
Corr. : -0.0642526

Demo



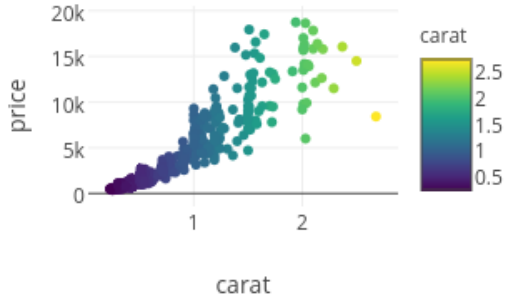
Let’s chat! :)

- Do you actually need shiny?
- Straight out of the shiny box
- Judging a book by its cover
- More ways to add to add to the UI/UX
- Tools to help your shiny workflow

Do you actually need shiny?

- Crosstalk
  - HTML report demoed
  - Linked data sets
  - Filter/selection
  - Some interactivity without needing shiny
- Some compatible widgets ->
- Make your own using htmlwidgets or reactR

plotly



summary widget

You have selected **4** cars with an average mpg of **24.0** . The **2** cars with automatic transmission have an average mpg of **22.1** .

Cylinders

☑ 4 ☐ 6 ☐ 8

Horsepower

94 335

52 110 168 226 284

	mpg	cyl
Merc 230	22.8	4
Toyota Corona	21.5	4
Lotus Europa	30.4	4
Volvo 142E	21.4	4

leaflet

DT

Show 10 entries Search:

	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
1	5.1	3.5	1.4	0.2	setosa
2	4.9	3	1.4	0.2	setosa
3	4.7	3.2	1.3	0.2	setosa
4	4.6	3.1	1.5	0.2	setosa
5	5	3.6	1.4	0.2	setosa
6	5.4	3.9	1.7	0.4	setosa
7	4.6	3.4	1.4	0.3	setosa
8	5	3.4	1.5	0.2	setosa
9	4.4	2.9	1.4	0.2	setosa
10	4.9	3.1	1.5	0.1	setosa

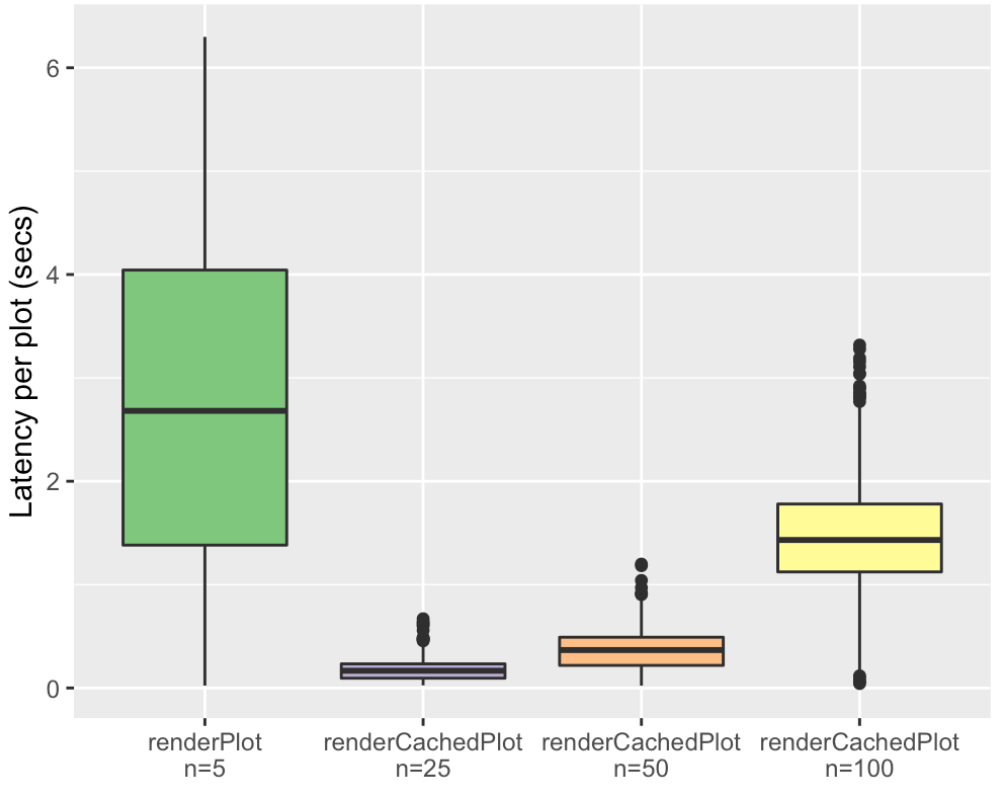
Showing 1 to 10 of 150 entries

Previous 1 2 3 4 5 … 15 Next

Straight out of the shiny box

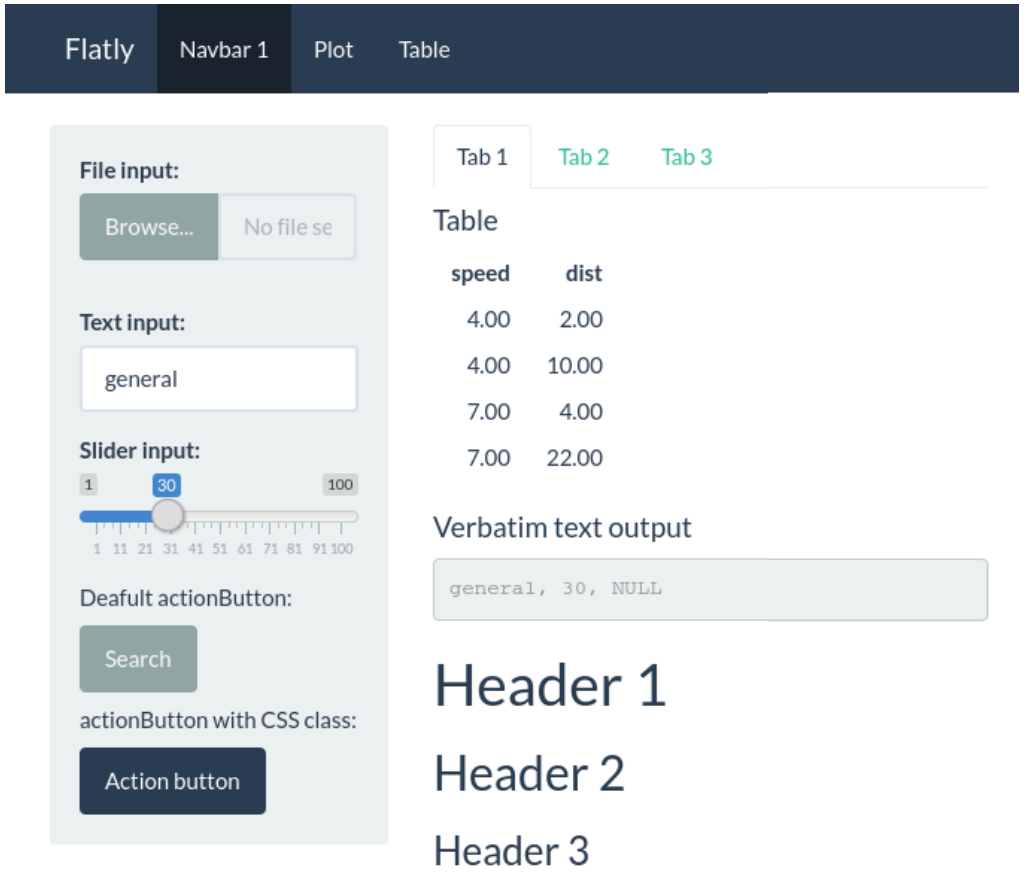
- Easy to make boostrap-based web apps
  - Multiple inputs/outputs
  - Fine-tuned reactivity
  - Dynamic UI
  - Modules
  - Bookmarking

- Shiny 1.2.0 (Nov 2018):
  - Plot caching

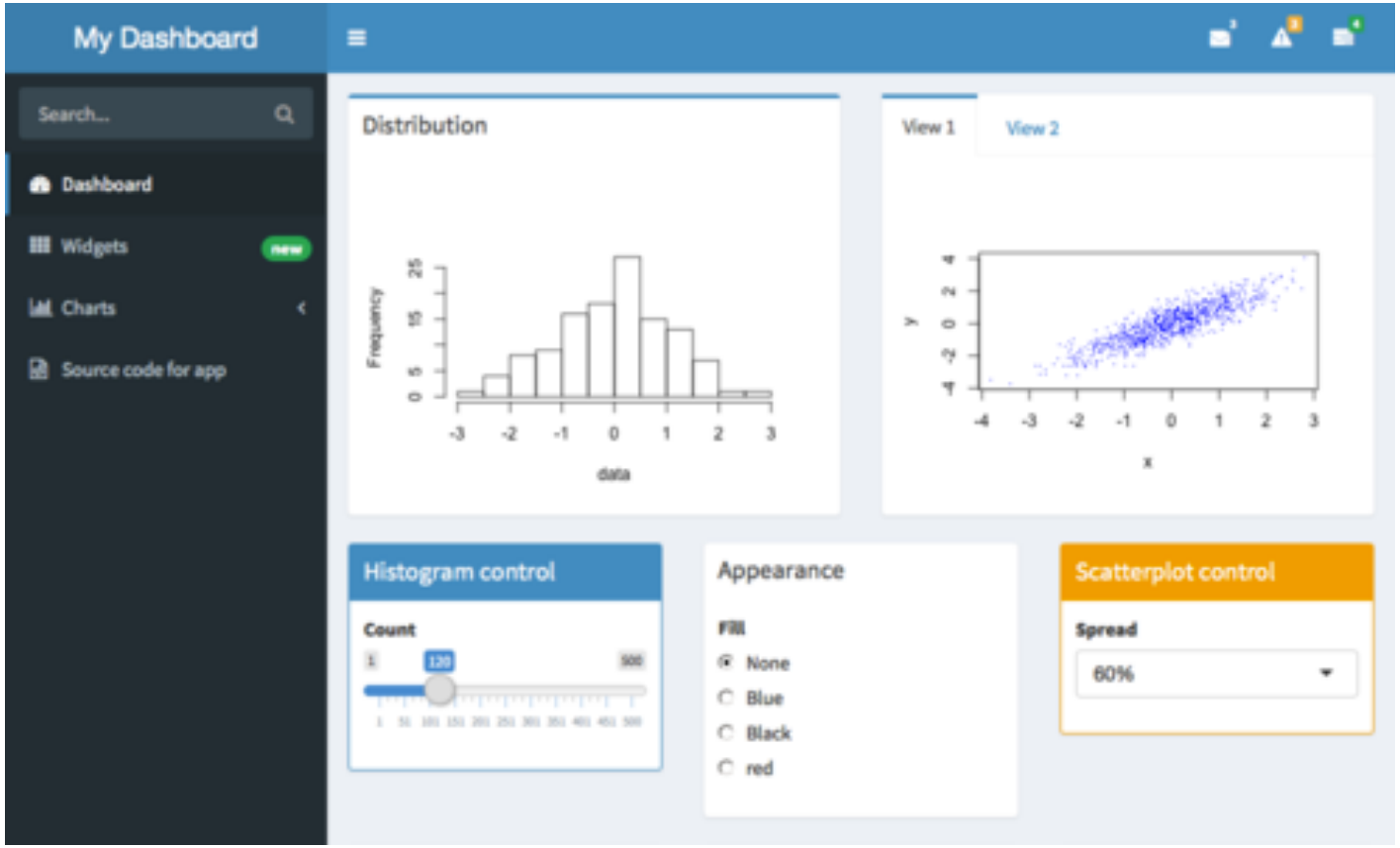


Judging a book by its cover

16 shinythemes



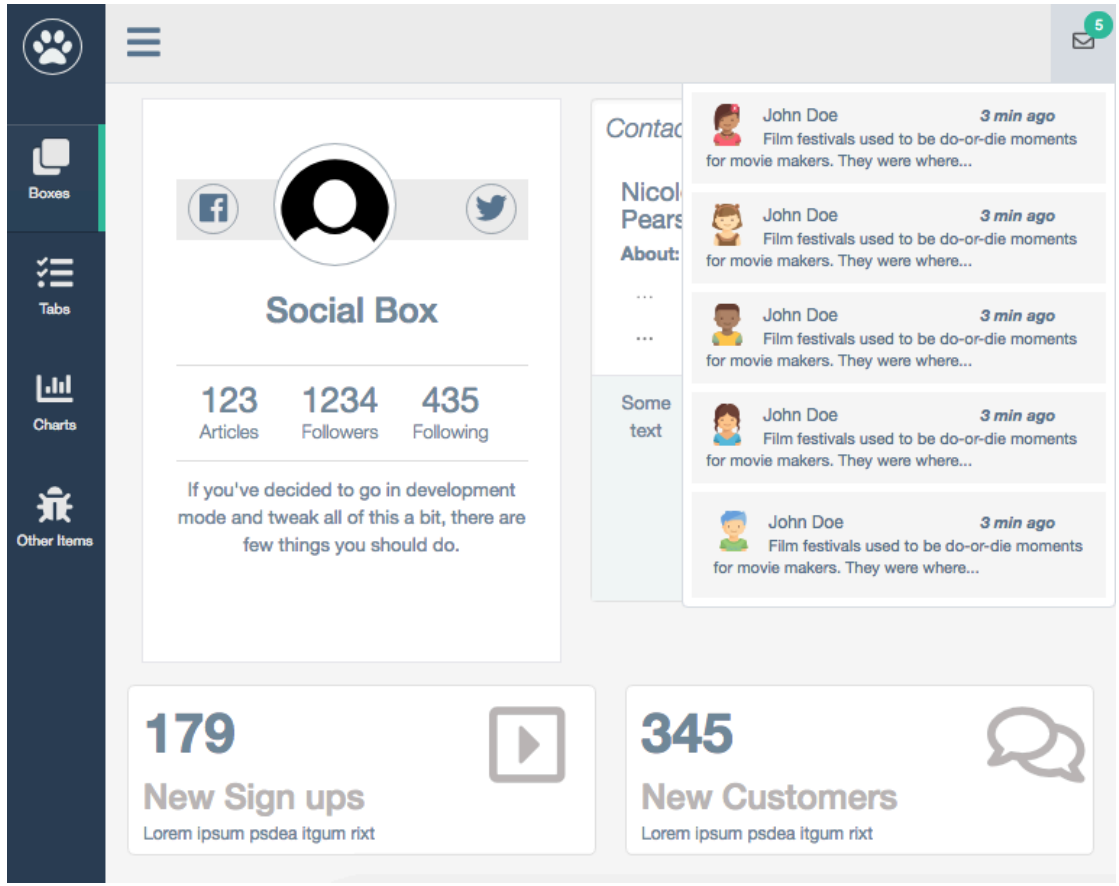
shinydashboard

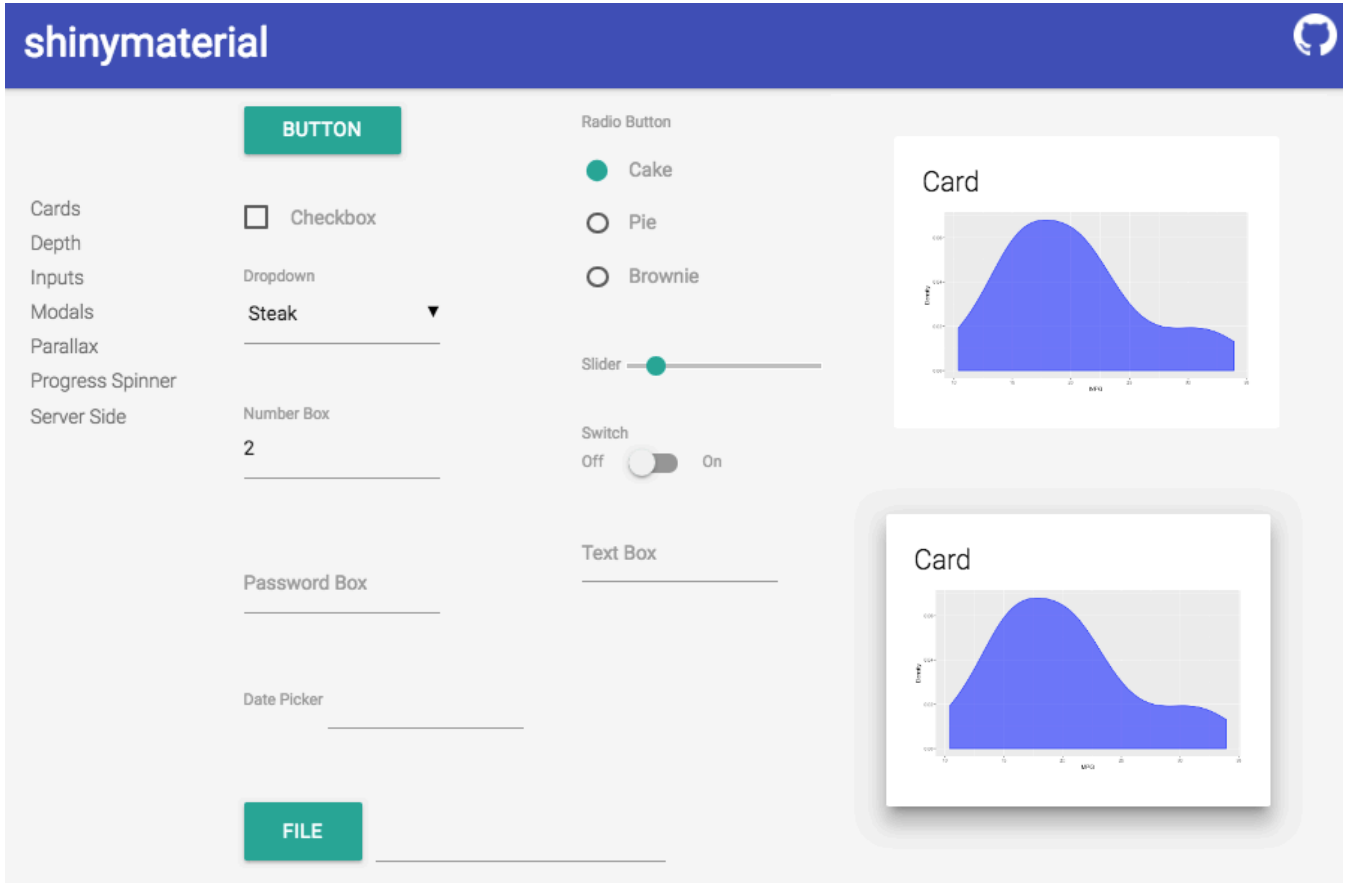


Judging a book by its cover

gentelellaShiny

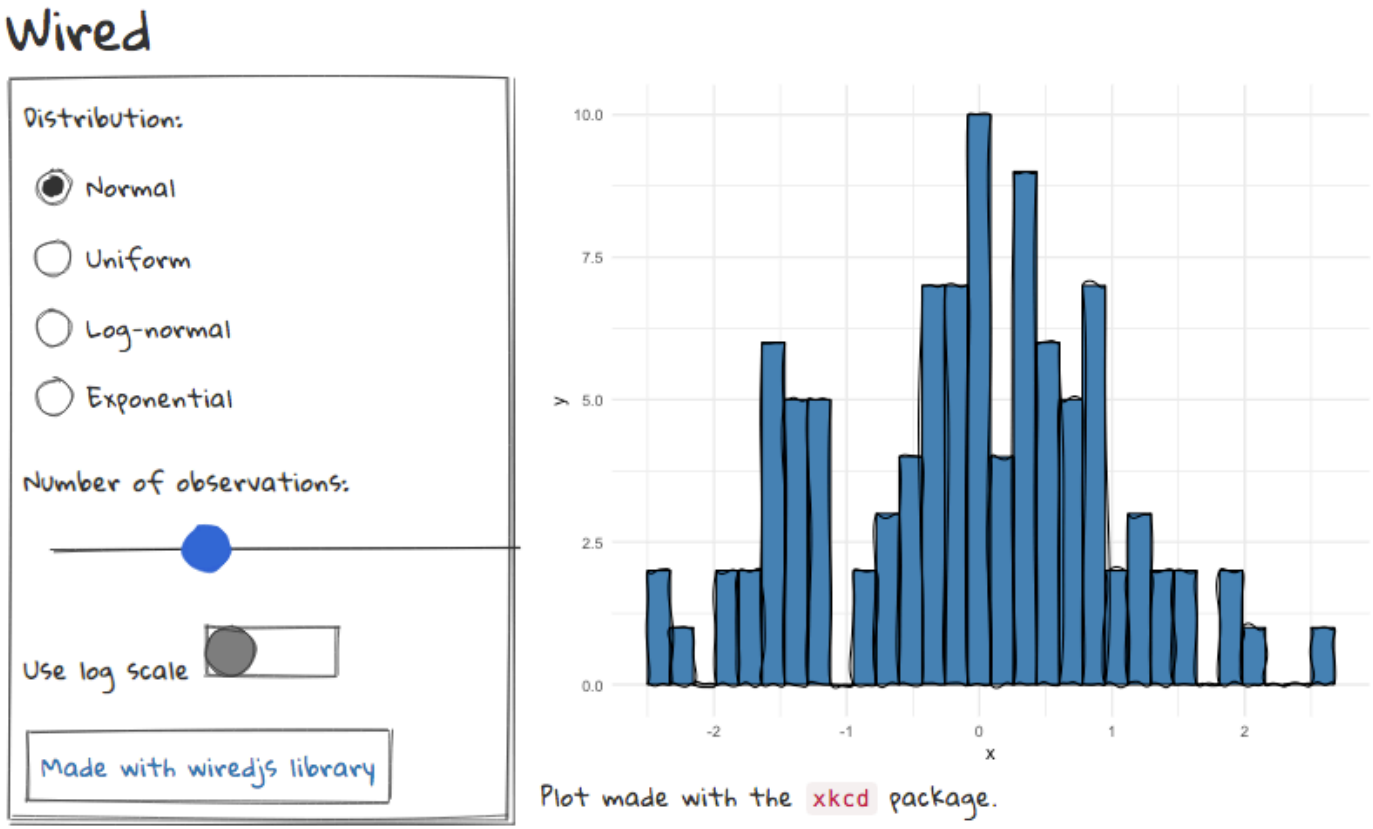
shinymaterial



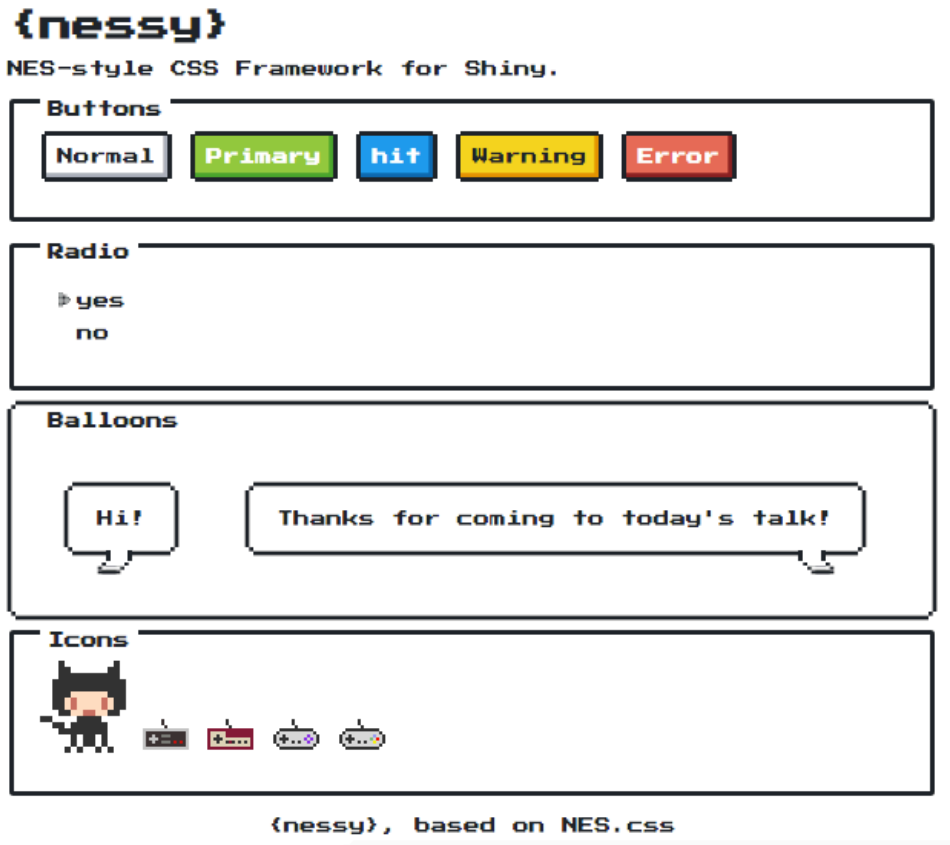


Judging a book by its cover

wired (+ xkcd)

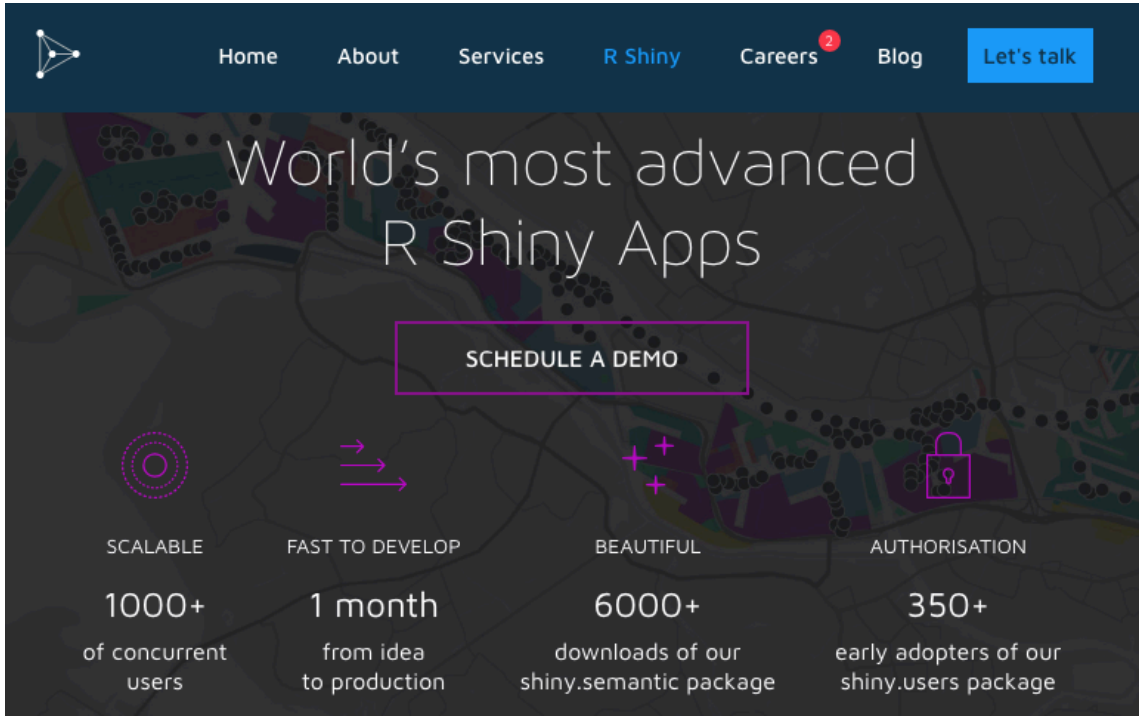


nessy



Judging a book by its cover

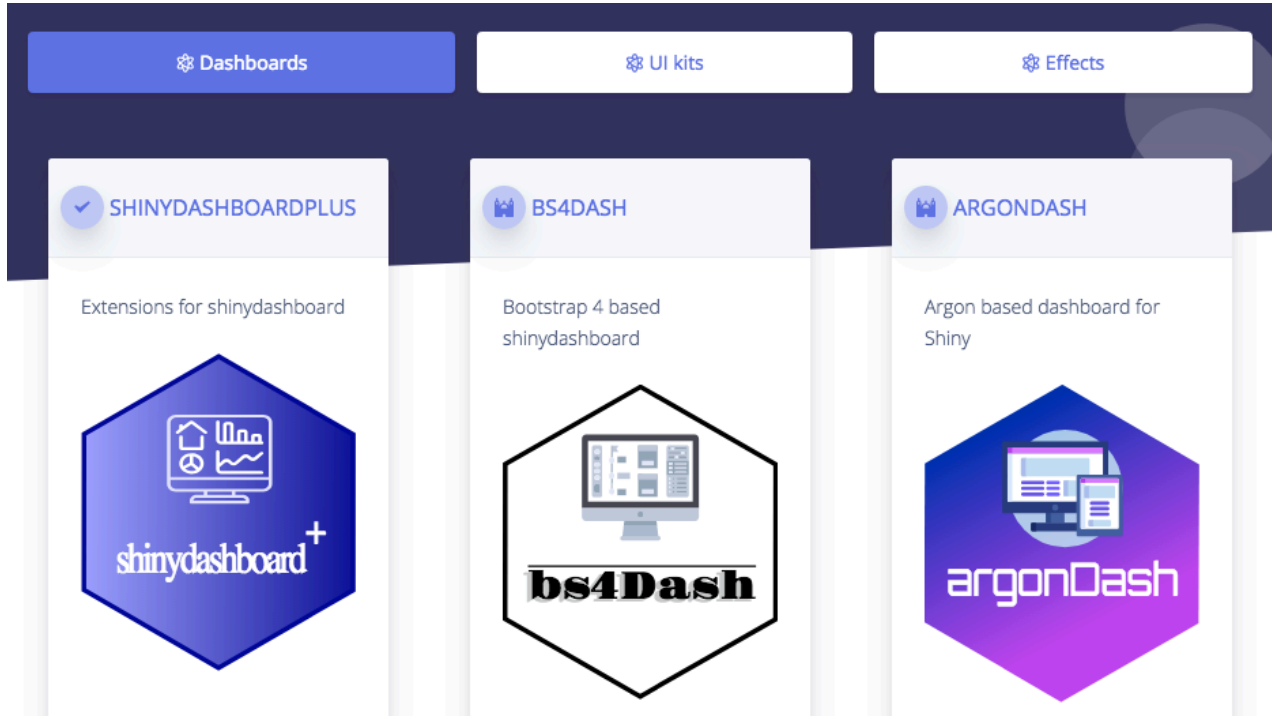
appsilon



shiny.semantic + semantic.dashboard

Also: shiny supports HTML templates

rinterface



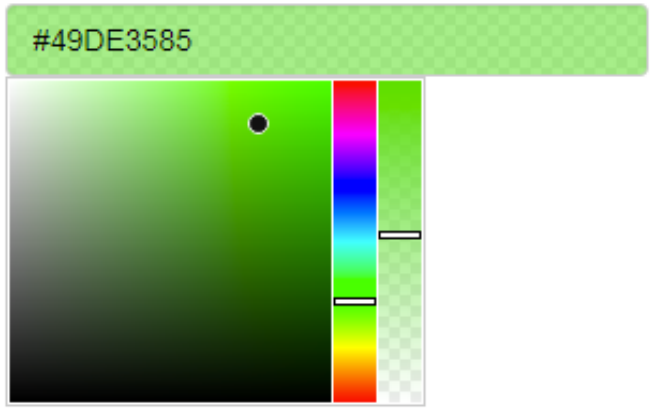
shinydashboardPlus, bs4Dash, argonDash + argonR, shinybulma

More ways to add to the UI/UX

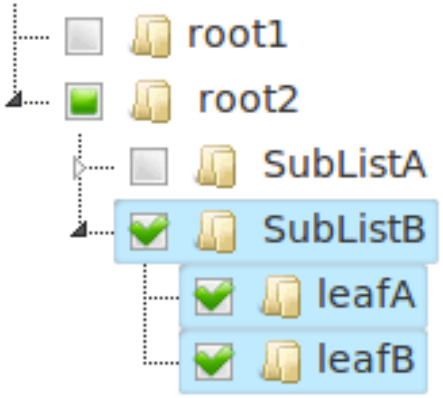
[shinyAce]

```
library(shiny)
library(shinyAce)

modes <- dir(system.file('www/ace', package='shinyAce'), "^mode-.*.js$"
modes <- sub("^mode-(.*).js$", "\\1", modes)

themes <- dir(system.file('www/ace', package='shinyAce'), "^theme-.*.js
themes <- sub("^theme-(.*).js$", "\\1", themes)

#' Define UI for application that demonstrates a simple Ace editor
#' @author Jeff Allen \email{jeff@trestletech.com}
shinyUI(
  pageWithSidebar(
  # Application title
  headerPanel("Simple Shiny Ace!"),

  sidebarPanel(
    selectInput("mode", "Mode: ", choices=modes, selected="plain_text"),
    selectInput("theme", "Theme: ", choices=themes, selected="textmate"
    actionButton("reset", "Reset Text"),
    HTML("<hr />"),
    helpText(HTML("A simple Shiny Ace editor.
                  <p>Created using <a href = \"http://github.com/trestle
  ),

  # Show the simple table
```

[colourpicker]



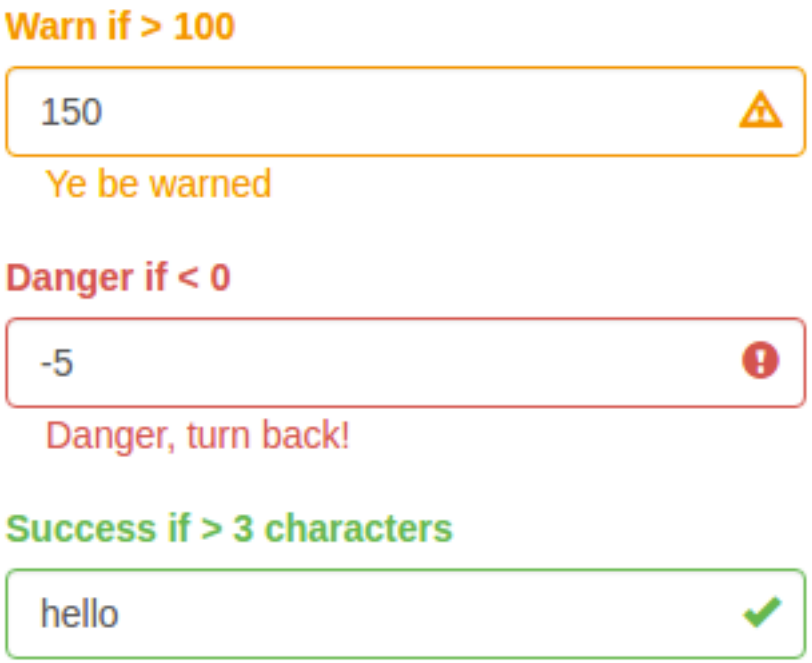
[shinyTree]



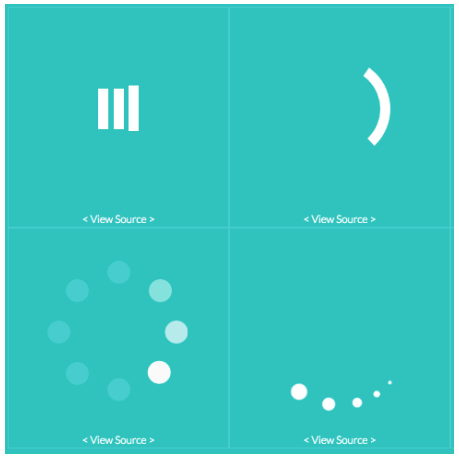
more UI elements:
[shinyWidgets], [shinyBS], [bsplus], [TileMaker]

More ways to add to the UI/UX

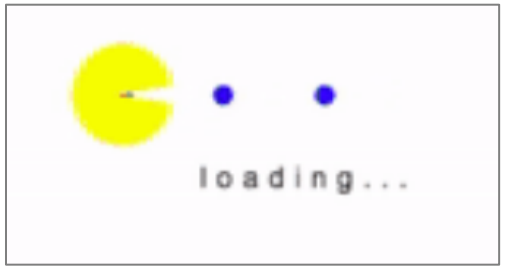
shinyFeedback



shinycssloaders



shinycustomloader



rintrojs

step-by-step introductions, clickable hints (from intro.js)

shinyjs

Easy ways to eg.

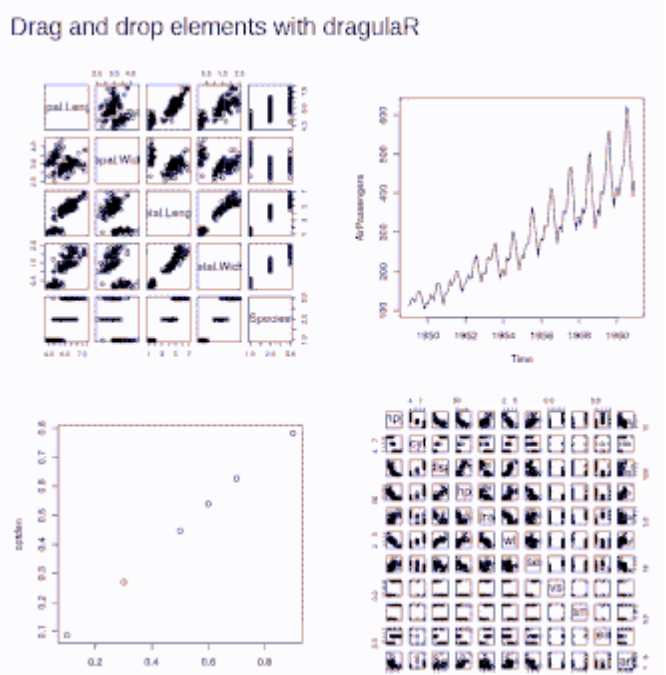
- Show/hide
- Enable/disable

shinyEffects

CSS effects

More ways to add to the UI/UX

Interact with/edit elements



shinyjqui, dragulaR, shinydnd

shinysense – "help shiny sense the world around it"

- shinyswipr - cards that can be swiped left/right
- shinydrawr, shinyearr, shinyviewr, shinymovr

shiny.router – helps create paged URLs

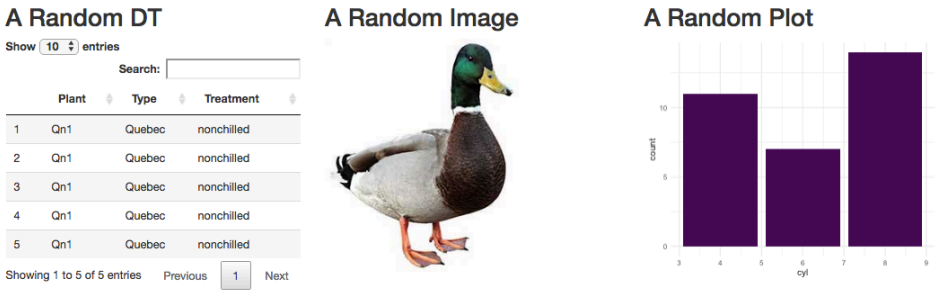
shiny.i18n – helps with internationalisation

shiny.collections – "Google Docs-like live collaboration in Shiny"

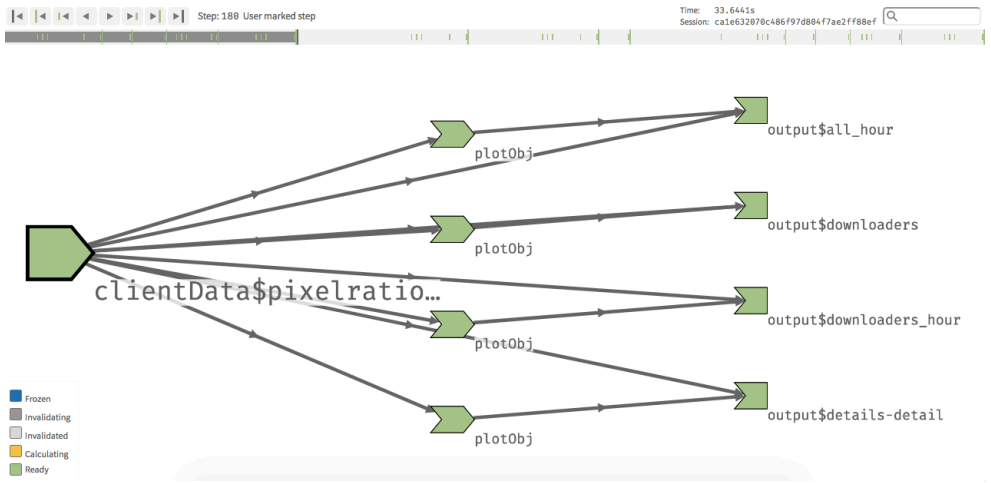
fullPage – fullscreen scrolling websites

Tools to help your shiny workflow

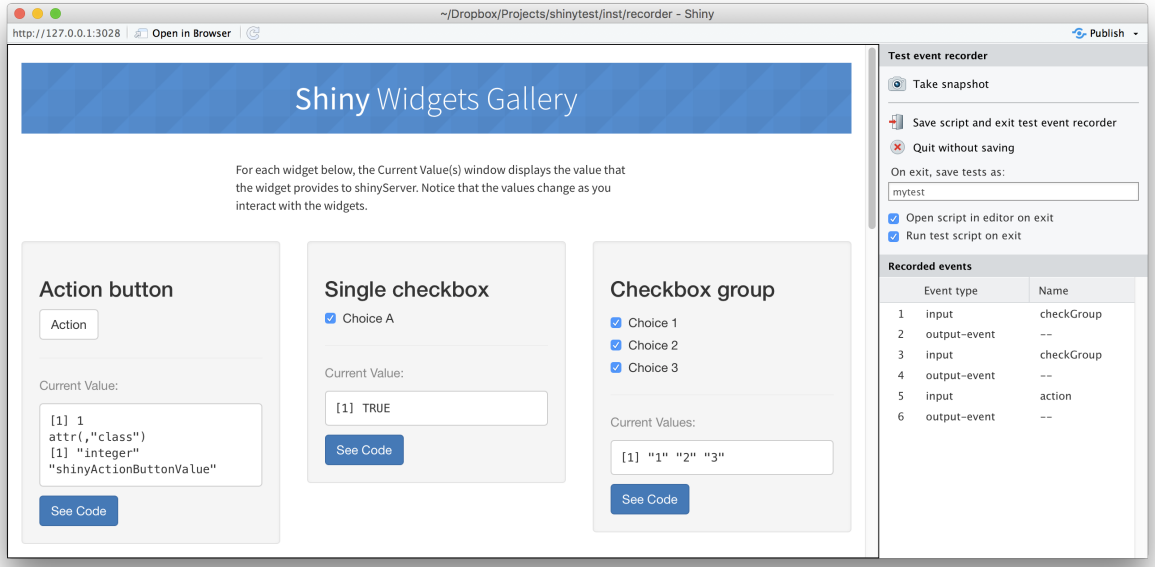
shinipsum (for prototyping)



reactlog (talk, demo)



shinytest (test overall function)



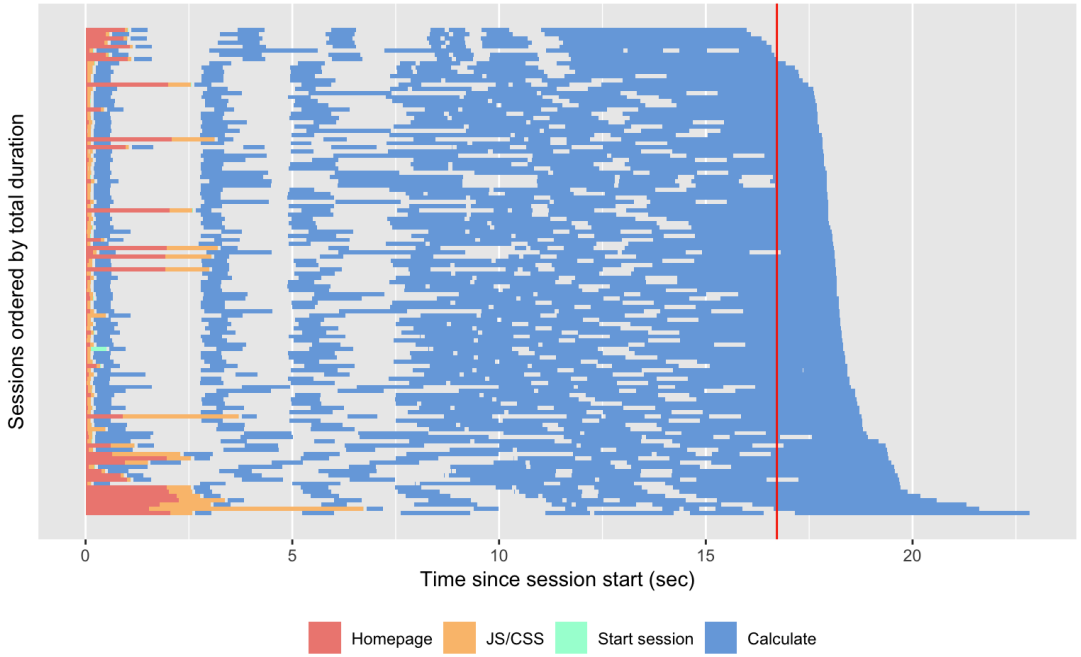
- alternatively, RSelenium
- unit test underlying functions, eg. testthat
- frankenstein to “resurrect” your app
- shinysnippets to save you some typing

Tools to help your shiny workflow

Performance workflow

1. Use **shinyloadtest** to see if it's fast enough
2. If not, use **profvis** to see what's making it slow
3. Optimize
    1. Move work out of Shiny (very often)
    2. Make code faster (very often)
    3. Use caching (sometimes)
    4. Use async (occasionally)
4. Repeat!

shinyloadtest
profvis (+ eg. microbenchmark)



Joe Cheng, rstudio::conf 2019 keynote

Tools to help your shiny workflow

Performance workflow

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    2. Make code faster (very often)
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4. Repeat!

- Asynchronous programming
    - future, promises
    - ipc
    - furrr

Joe Cheng, rstudio::conf 2019 keynote

Tools to help your shiny workflow

- Shiny + Electron
  - Alternative to shinyapps.io/Shiny Server/RStudio Connect
  - Katie Sasso's UseR 2018 talk
    (Shiny meets Electron: Turn your Shiny app into a **standalone desktop app** in no time)
  - Columbus Collaboratory's electron-quick-start github repo

- More materials:
  - Shiny in production: Joe Cheng's keynote and Kelly O'Briant's (WIP) book
  - Building Big Shiny Apps - A Workflow blog post
  - shinytemplate "an RStudio project template for building prod-ready shiny apps"

A few sources for shiny updates/advice

- @_ColinFay/@Thinkr_FR
  - eg. various advice on working with shiny, especially shiny in production
- @_pvictorr/@dreamRs_fr
  - eg. esquisse: a package and RStudio add-in for ggplot2 GUI
- @nic_crane
  - eg. a javascript snippet to get confirmation when clicking back/forward buttons
  - inspired by her, I added a bit of code for the refresh button as well
- Rstudio also has shiny tutorials, videos and a cheatsheet
- Joe Cheng is writing a “Mastering Shiny” book

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 @s_owla

 sowla

 2019-MS-RUG-shiny-extensions