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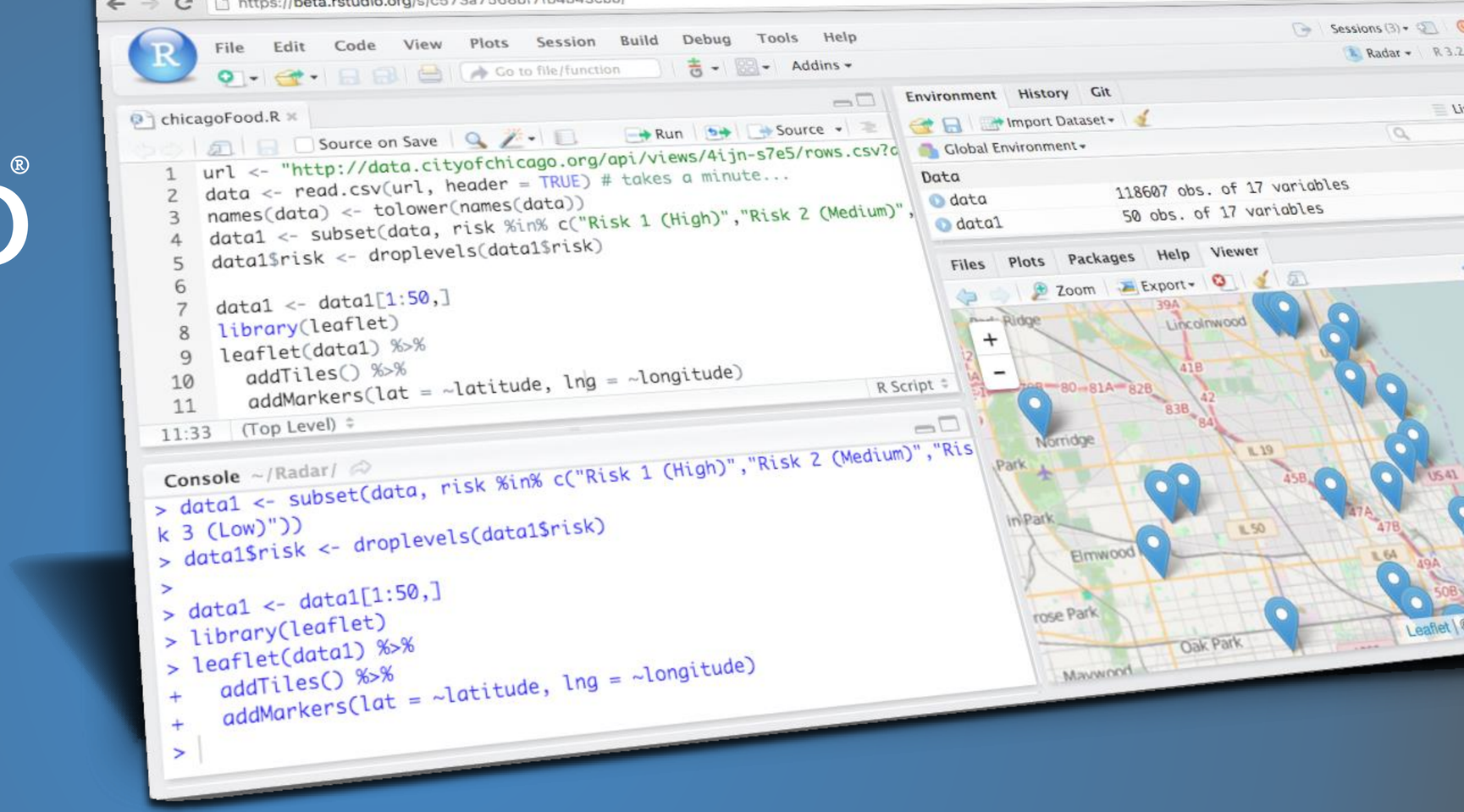

RStudio Overview

RStudio
250 Northern Ave, Boston, MA 02210
Phone: 844-448-1212
Email: info@rstudio.com
Web: http://www.rstudio.com

All Training materials are provided "as is" and without warranty and RStudio disclaims any and all express and implied warranties including without limitation the implied warranties of title, fitness for a particular purpose, merchantability and noninfringement.

Safe Harbor

This presentation is confidential and intended for existing and prospective customers of RStudio. It may not be distributed to others without permission.

Any future plans are best guesses and may change at any time due to market conditions. Nothing in this presentation should be construed as a commitment.

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Fannie Mae ML Workshop

RStudio & Setup	1:30 - 1:40
Afternoon Break	2min
Transforming Data & Data Visualization	1:42 - 1:55
Afternoon Break	5min
Intro to Landscape for ML in R	2:00 - 2:50
Afternoon break	5min
Shiny & RMD	2:55 - 3:20
Afternoon break & Q/Z	10min

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Course Info

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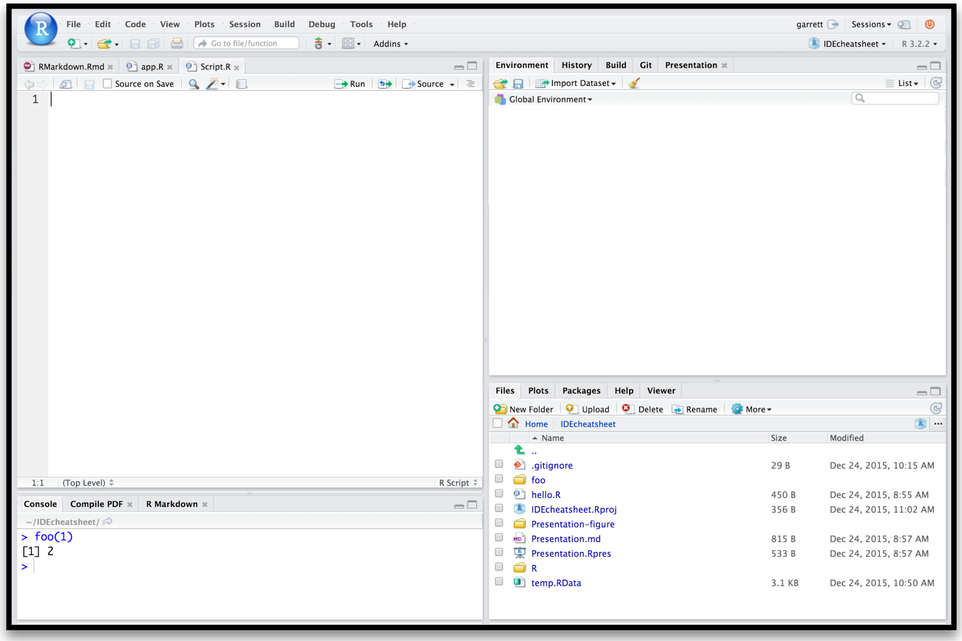

Course Info

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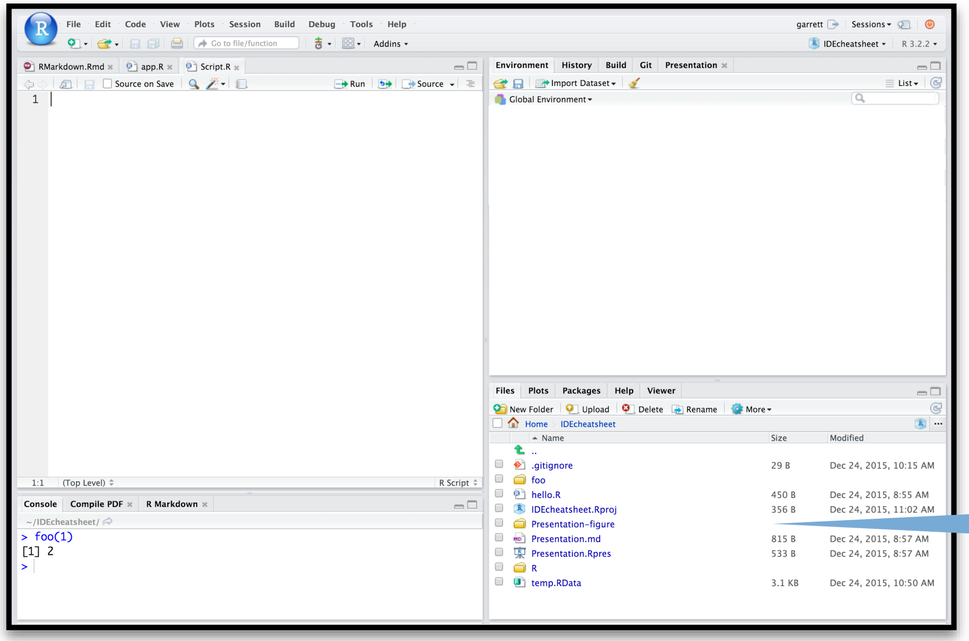
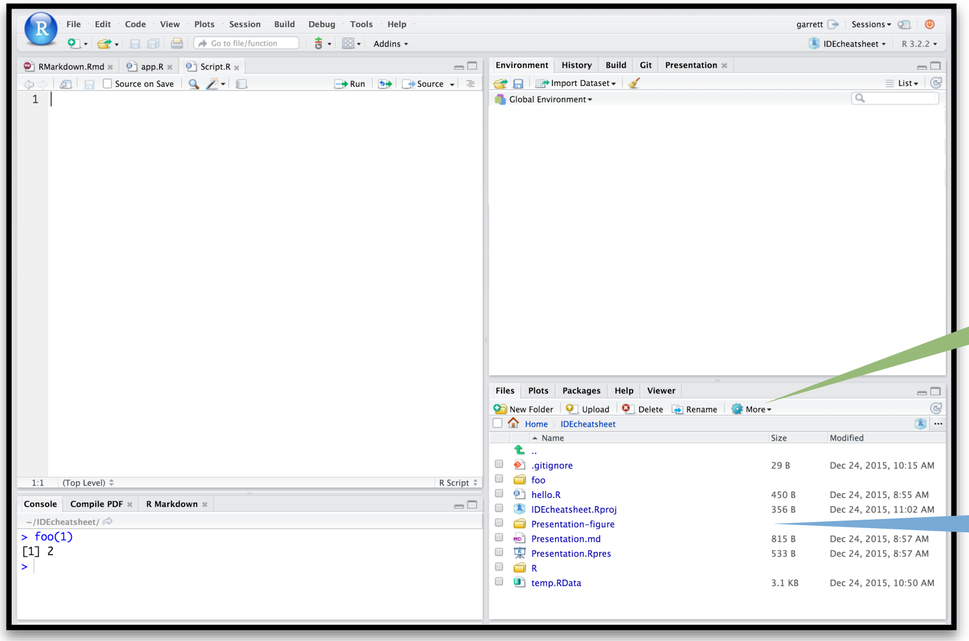


File Browser
manage scripts

Course Info

Collect a login card. Then login to the class server.



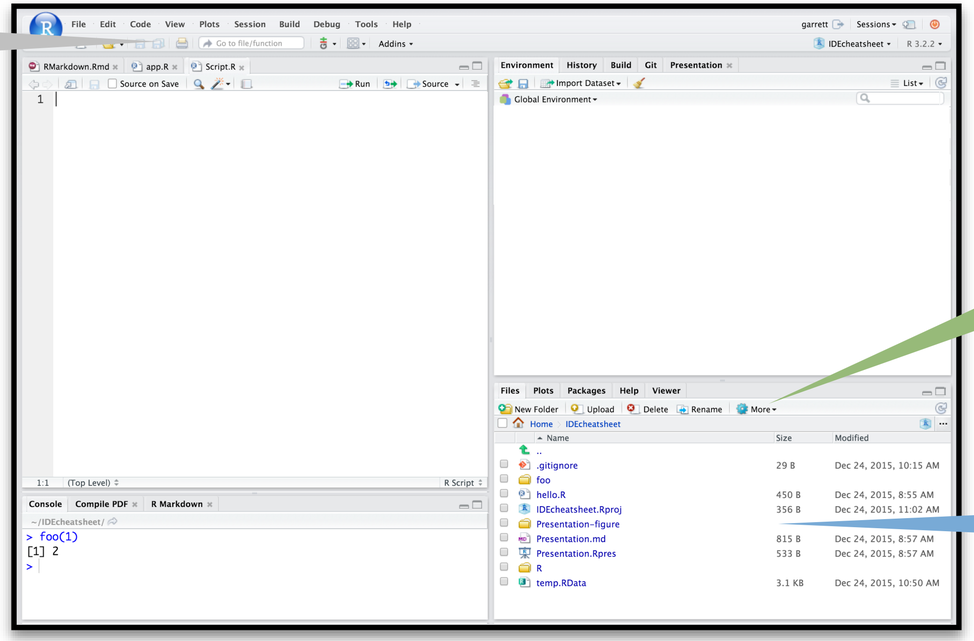
Download class files with **More > Export**

File Browser to manage scripts

Course Info

Collect a login card. Then login to the class server.

Scripts Pane to compose R code. Open with File > New.



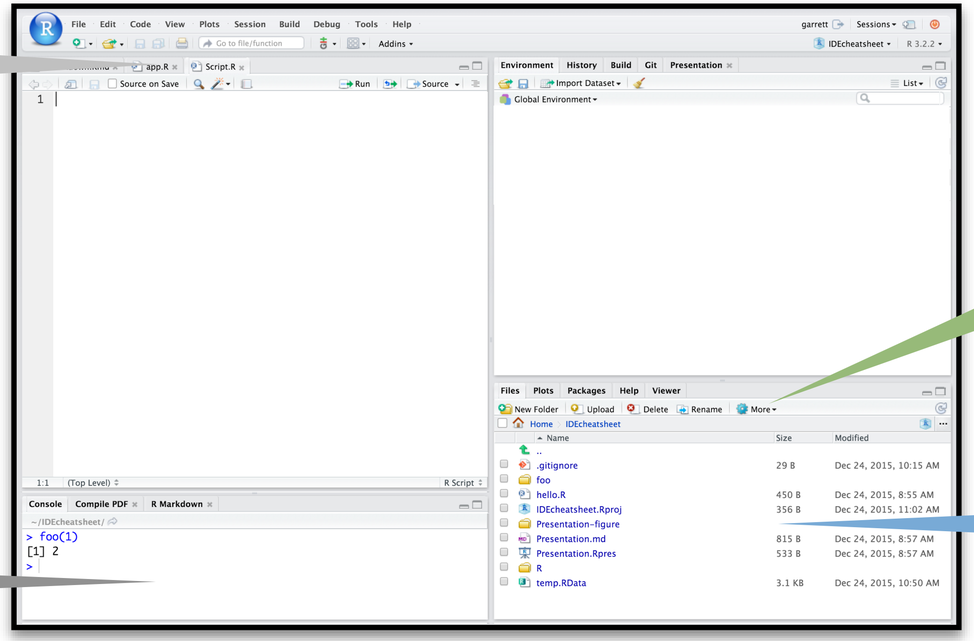
Download class files with **More > Export**

File Browser to manage scripts

Course Info

Collect a login card. Then login to the class server.

Scripts Pane to compose R code. Open with File > New.



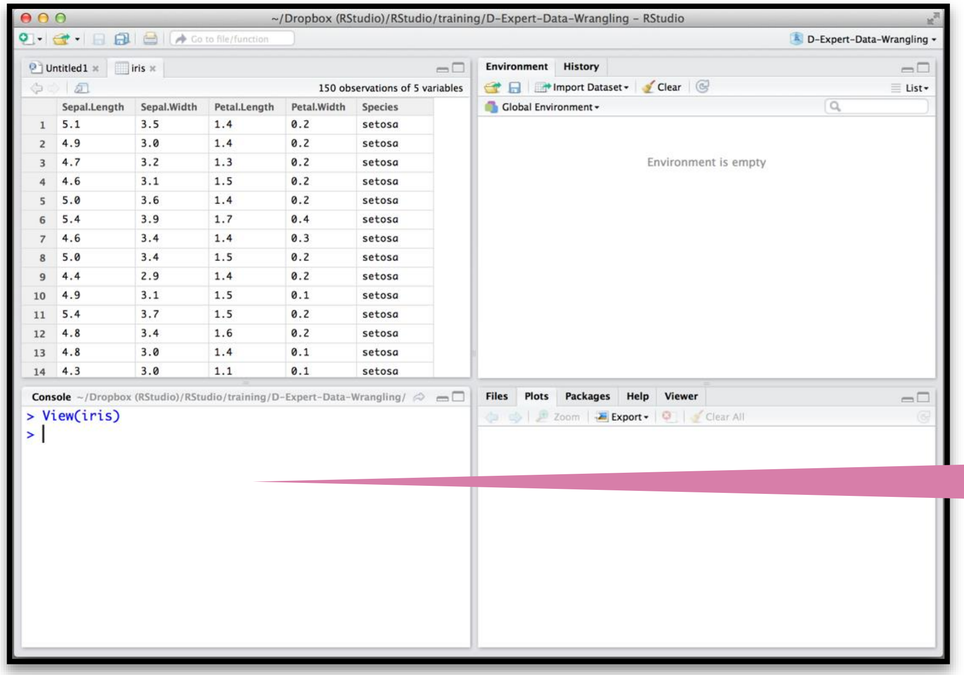
Download class files with **More > Export**

Command line to run R code

File Browser to manage scripts

Course Info

Collect a login card. Then login to the class server.



? to open help page, e.g. ?iris

Enabling the human desire to understand and improve the world through data analysis

WHAT WE DO

- Build and promote software that supports **reproducible** data analysis
  - Primary focus is **usability** in our interfaces and APIs
  - Open-source products have become the **de facto standards** for R statistical programming
- Our tools are not for everyone, but they are **available to everyone** (Like R itself)
  - 70% of our engineering effort is towards open source: RStudio, Shiny, R Markdown, dplyr, etc.
  - The essential parts of our stack must be **open source**
- Achieve a sustainable business model, primarily from commercially-licensed versions of our servers
  - Helpful features in our Pro products for: Security, Scalability, Manageability, Auditing, Deployment, Collaboration, etc
  - **If you've licensed our Pro products, thank you for supporting us!**

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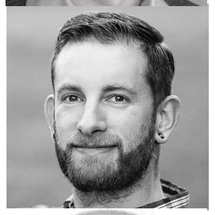
WHO WE ARE

J.J Allaire
Founder & CEO

Tareef Kawaf
President



Hadley Wickham
Chief Scientist

Joe Cheng
Chief Technology Officer

- Founded in 2008 with the aim of making a distinctive and durable contribution to software for data analysis
- Initial open-source products became the de facto standards for R statistical programming
- Commercial products introduced in 2013 allow adoption at scale on the web or within organizations

ebay™ Lilly AstraZeneca agios Google Boehringer Ingelheim
Allianz zapier waze OUTSMARTING TRAFFIC, TOGETHER DTCC STITCH FIX™ EDF
Medtronic NASA Erie Insurance® AMGEN Roche RStudio®

What is R?

- Open source software environment for statistical computing and graphics
- Created over 20 years ago by two statistics professors in New Zealand
- Based on S, a similar environment originally developed at AT&T Bell Labs

Why R?

- It's free, open source, and available on every major platform. As a result, if you do your analysis in R, anyone can easily replicate it.
- A massive set of packages for statistical modelling, machine learning, visualization, and importing and manipulating data.
- Cutting edge tools - a powerful and flexible toolkit which allows you to write concise yet descriptive code.
- A fantastic community.
- Powerful tools for communicating your results…*Data Products*

Free & Open Source R Packages

- RStudio employees contribute extensively to the R community
- This includes the most widely used and newest open-source libraries for data manipulation (plyr and dplyr), data visualization (ggplot2 and ggvis), and publishing (knitr, R Markdown...)
- RStudio packages provide powerful productivity tools for R (packrat, devtools, roxygen2, testthat)
- Next generation of interactive web enabled graphics for R

RStudio

How we think about Data Science

Import

Tidy

Transform

Visualise

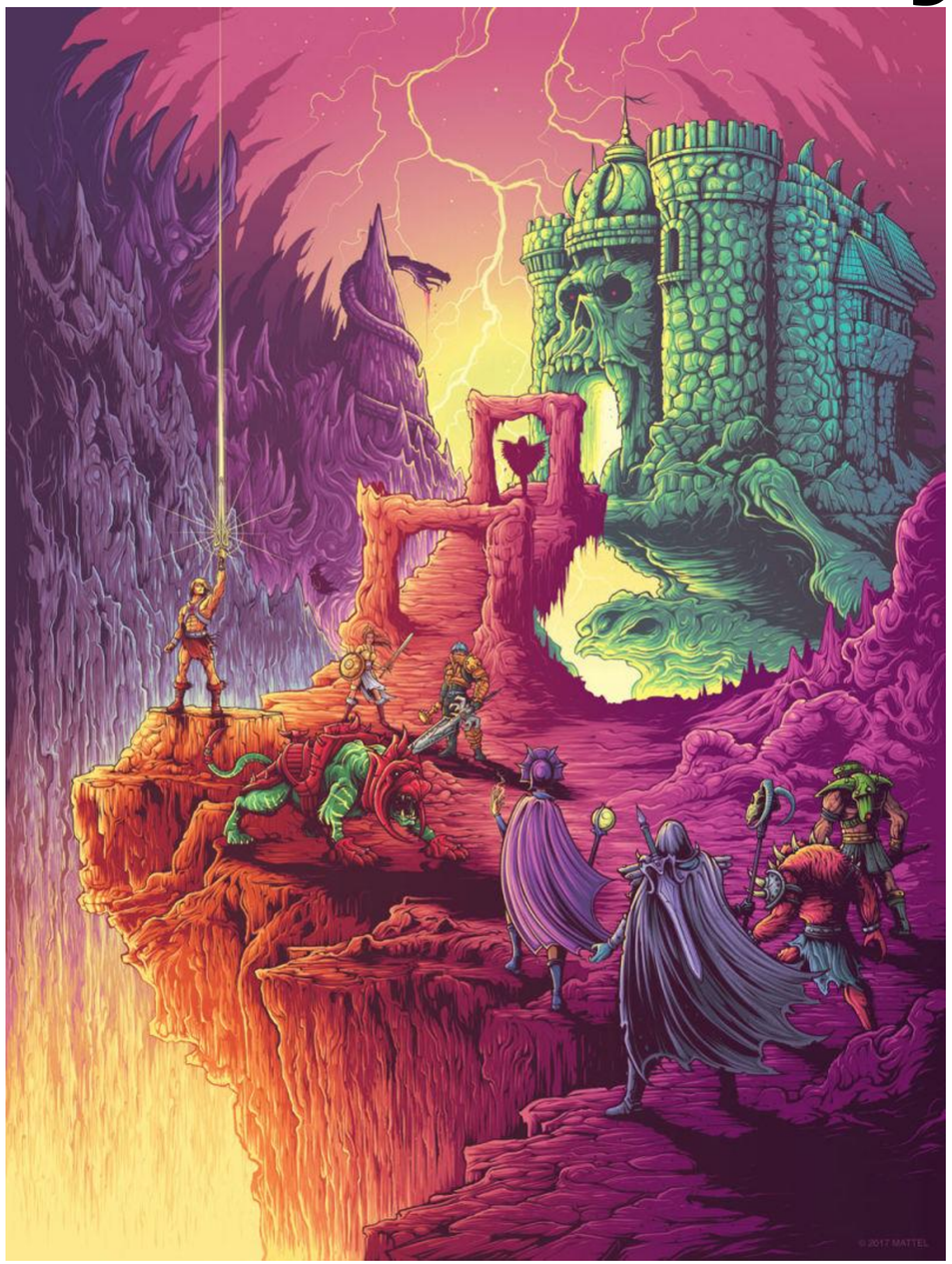
Model

Communicate

Understand

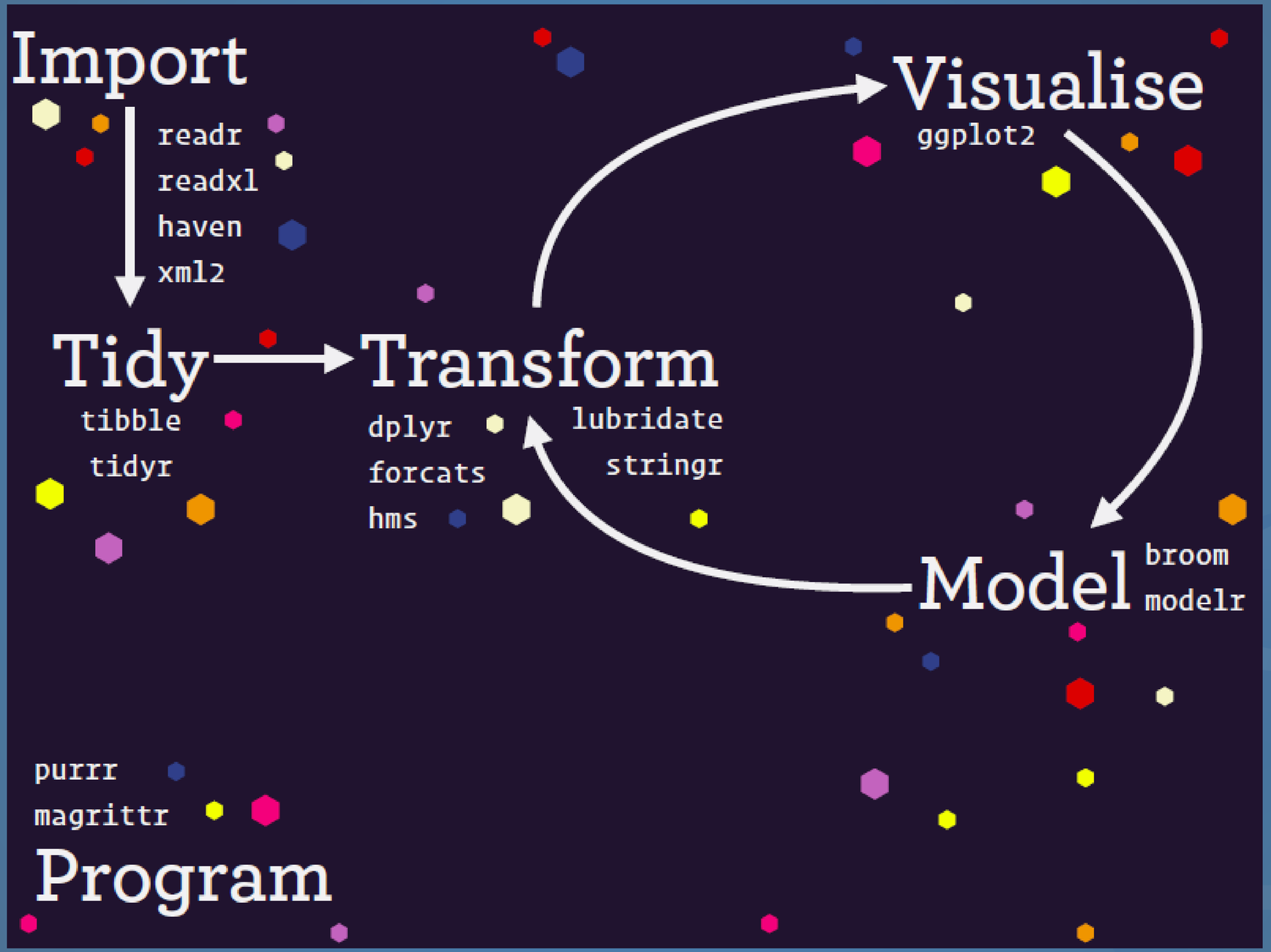
R for Data Science, Grolemund & Wickham

Masters of the Tidyverse



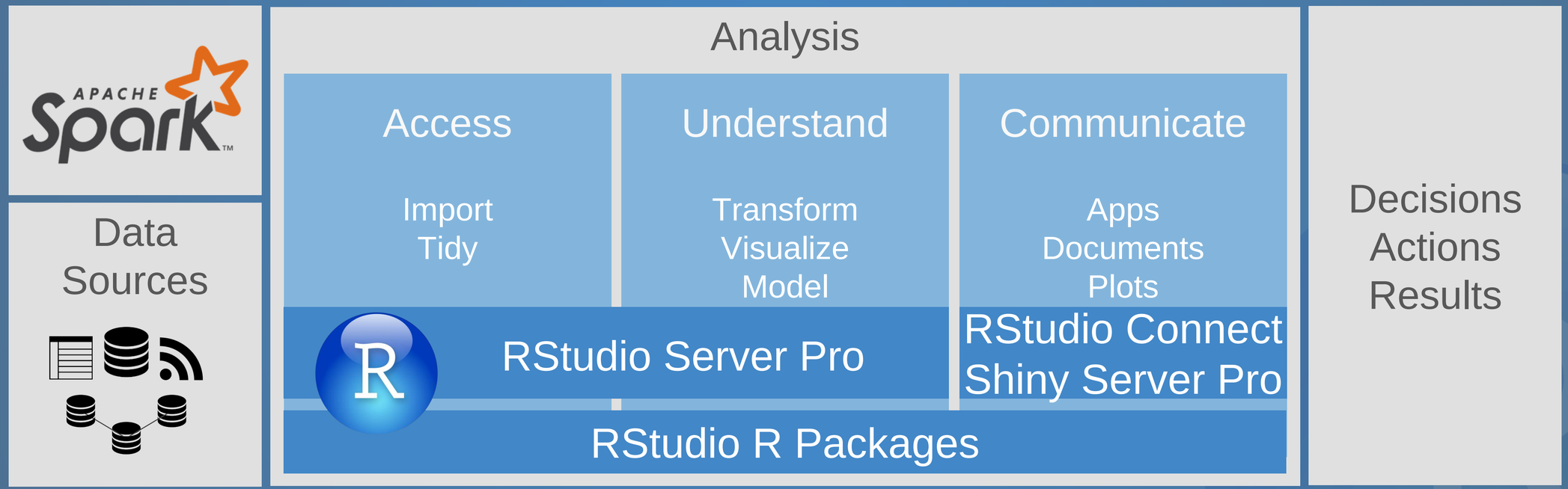
Art by Dan Mumford


tidyverse
www.rstudio.com


Import
readr
readxl
haven
xml2
Visualise
ggplot2
Tidy
tibble
tidyr
Transform
dplyr
forcats
hms
lubridate
stringr
Model
broom
modelr
purrr
magrittr
Program

Our Toolchain

FAST, EASY, REPRODUCIBLE…



RSTUDIO PRODUCTS

RStudio and RStudio Server

- Open source IDE to improve the usability of R and the productivity of R users (like Eclipse or Visual Studio but for R). Runs on Windows, OSX, and Linux or over the Web as a server

RStudio Commercial Desktop and RStudio Server Pro

- Commercial IDEs to enable wider adoption of R in the enterprise

Shiny Server

- Open source web application server to share interactive data visualizations created with R

Shiny Server Pro

- Commercial web application server to enable enterprise scale deployment of interactive data visualizations, web applications and reproducible reports created with R

shinyapps.io

- Hosted service for deploying interactive reports and web applications created with R

RStudio Connect

- A new publishing platform for the work your teams create in R. Share Shiny applications, R Markdown reports, dashboards, plots, and more in one convenient place. Push-button publishing from the RStudio IDE, scheduled execution of reports, and flexible security policies to bring the power of data science to your entire enterprise.

R Packages

- Open source libraries for data manipulation (plyr and dplyr), data visualization (shiny, ggplot2, ggvis, htmlwidgets), and publishing (e.g., knitr, R Markdown...) and powerful productivity tools for R (packrat, devtools, roxygen2, testthat, tidyr, fastread)

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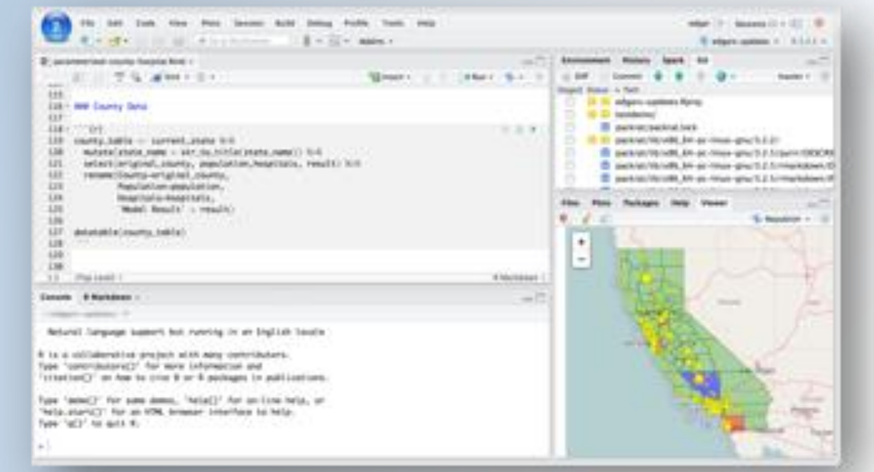
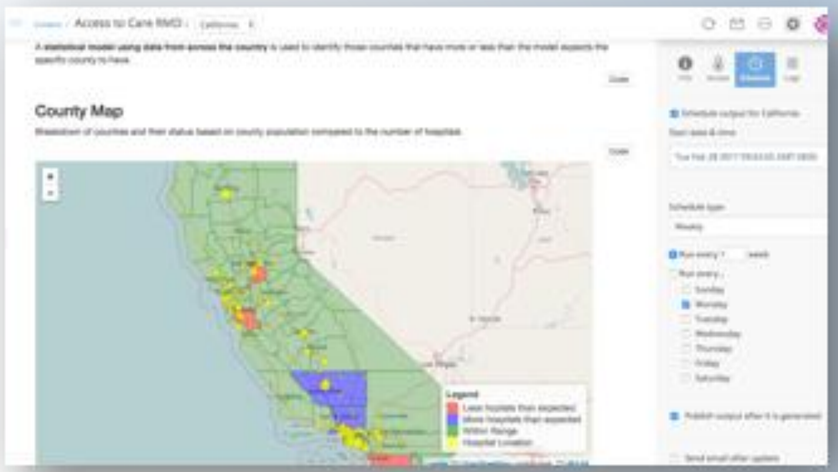
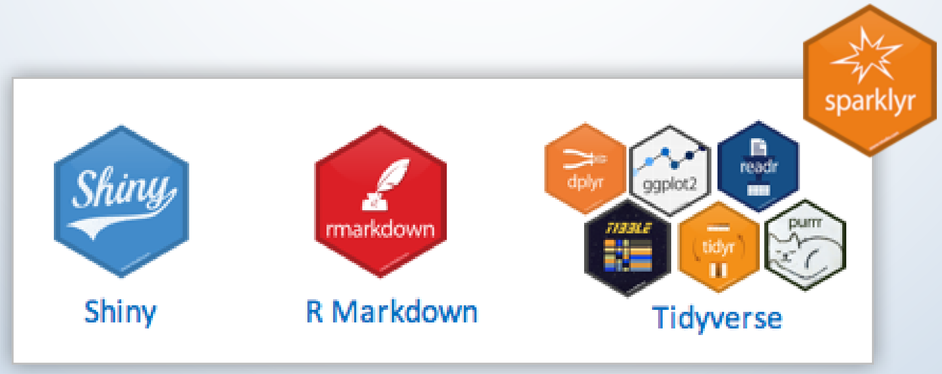
RStudio Products and Packages



RStudio Server Pro



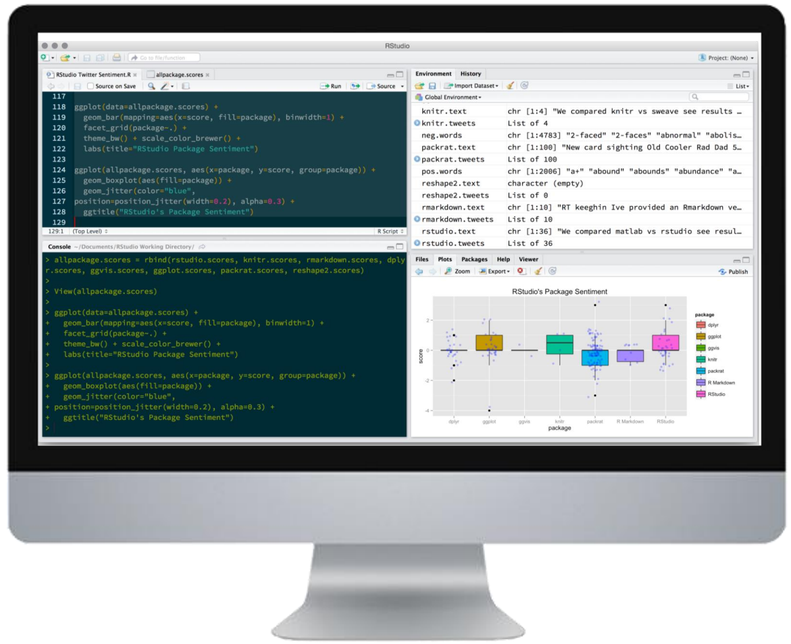
RStudio Connect
Shiny Server Pro



R Packages

RSTUDIO IDE

- Integrated Development Environment for R (i.e. like Eclipse or Visual Studio but for R)
- Runs on the Desktop (Windows, OSX, Linux) or over the Web as a server to enable shared resources and collaboration
- Released in 2012 and now the most popular front-end for R users with thousands of downloads per day
- Download the desktop IDE here: http://www.rstudio.com/products/RStudio/#Desk



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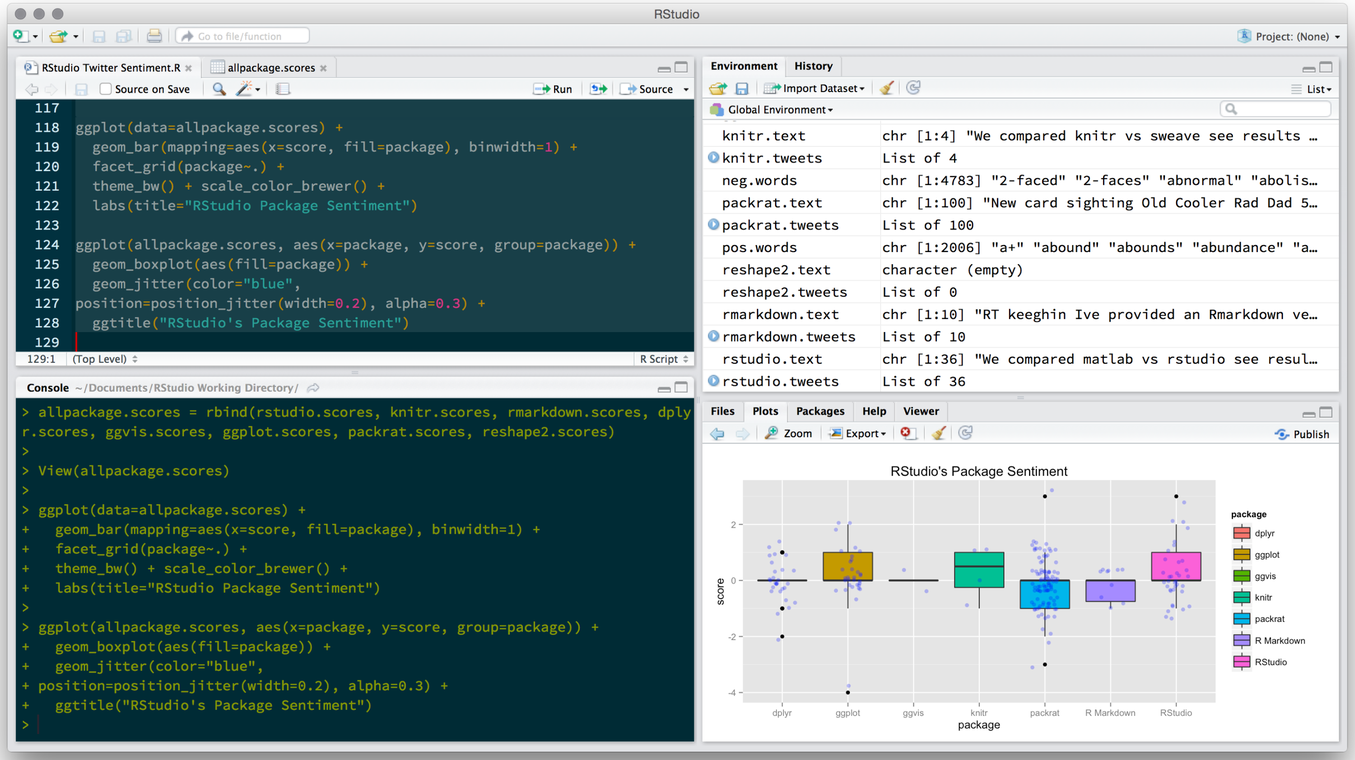
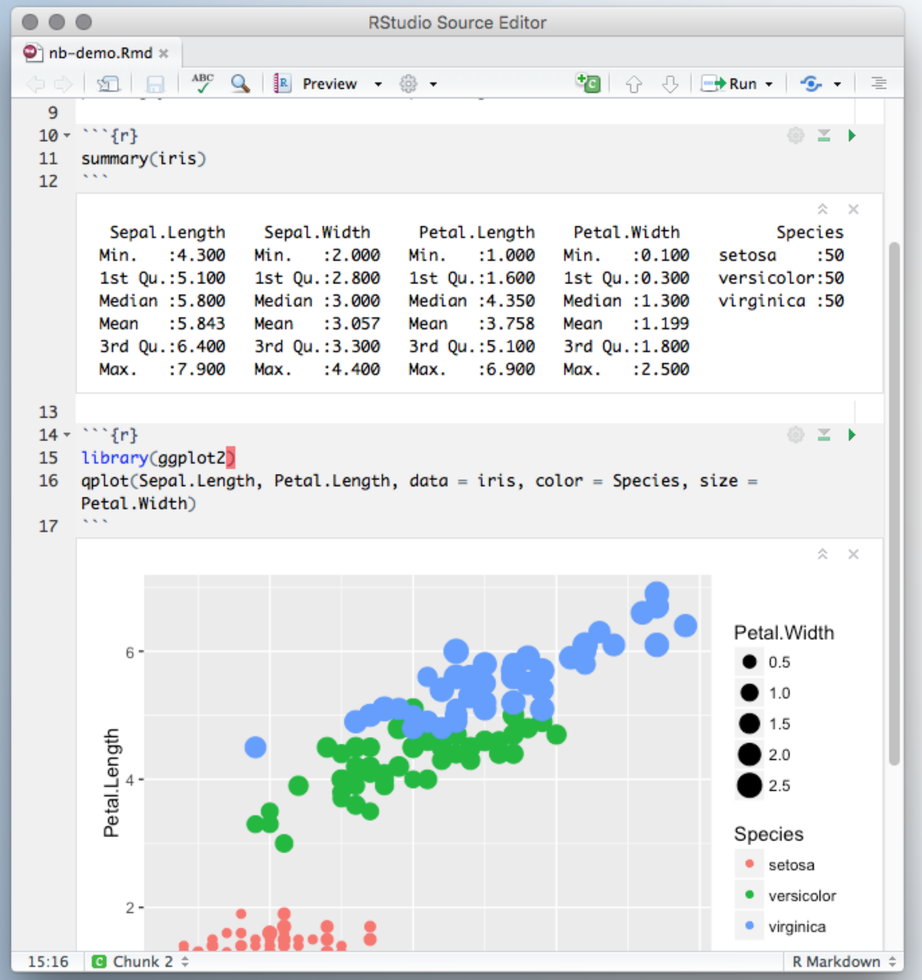
RSTUDIO IDE

- Data viewer -- support large datasets, filtering, searching, sorting
- Code completion
- Code diagnostics
- Customizable code snippets
- Improved tools for Rcpp
- Multiple cursors
- Tab re-ordering
- New themes
- Enhanced Vim mode
- Notebooks
- Add-ins
- Session Management
- Project Sharing
- Collaborative Editing



And much more!

RStudio Server Pro



- Notebooks
- Bookdown
- R Markdown websites
- Data import
- Flex dashboards
- RStudio Add-ins
- Profvis
- Crosstalk

SHINY

- Open source R package that facilitates the rapid creation and deployment of interactive web apps
- Targets data scientists/analysts with R expertise who want to share their analyses
- Uses spreadsheet-like programming semantics to make creating web applications with R very straightforward
- Allows analysts to put interactive analysis tools into the hands of decision makers immediately
- Building applications requires no HTML, CSS or JavaScript knowledge and eliminates the need for proprietary BI clients
- To learn more visit: http://shiny.rstudio.com/

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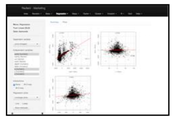
What can a Shiny App do?



Make R analysis accessible to **non-programmers**

Highly **customizable**, highly **shareable** HTML front end

Read and write to **databases**

Monitor **streaming data**

Require and use **authentication**

Ideal for Exploratory Data Analysis

Ideal Data Portal / Results Explorer / Simulation API / Dashboard

Share your app

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Shiny Server Open Source And Pro

Shiny Server

- A web application framework for R (i.e. the bridge enabling the power of R for the web)
- Reactive - Uses spreadsheet like programming semantics to make creating web applications with R
- Start and Stop a Shiny Process
- Translate non-Websocket traffic into Websockets
- Map URL's to particular applications

Shiny Server Pro

Everything that's available in Shiny Server plus enterprise features:

- Administrative Tools - View and manage users, applications & resources
- Authentication - Secure access to applications
- Scalability - Enable multiple R instances per application
- No Centralized Storage - Only "Stateful" information for active sessions; all authentication information is stored in an encrypted cookie

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What is the difference between Shiny and Shiny Server?

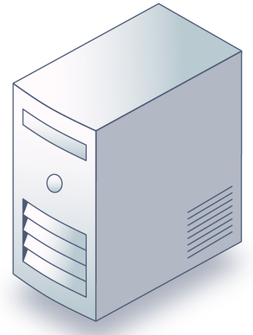
Shiny

Free and open source R Package

Makes it incredibly easy to
build interactive web applications with R

Automatic reactive binding between inputs and outputs and extensive pre-built widgets make it possible to build beautiful, responsive, and powerful applications.

Shiny Server



Software you install on your server

Enable users to
host and managing Shiny applications

Scale a Shiny application to support many users
Protect and secure your applications
Manage the user experience

RSTUDIO CONNECT

A new publishing platform for the work your teams create in R.

Share Shiny applications, R Markdown reports, dashboards, plots, and more in one convenient place.

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RStudio Connect

A publishing platform for all the work your team creates in R

Content Creators

Publish

Push button

RStudio Connect

Create variants
Schedule jobs
Distribute reports

Self-service

Content Consumers

Make decisions
Take actions
See results

Connect is Built for Data Scientists and IT

	Features	Solutions
Analyst	Push Button Deployment	Rapid Iteration
	Web UI for Managing Content	Self Service
	Email Integration	Content Sharing
	Job Scheduler	Automatic Updates
IT	User Roles	Access Control
	Authentication: AD / PAM / LDAP	Secure & Integrated
	Metrics and Logging	Scalable & Reliable

R Markdown

Can’t we do better than?

Ctrl + C (Copy)

Ctrl + V (Paste)

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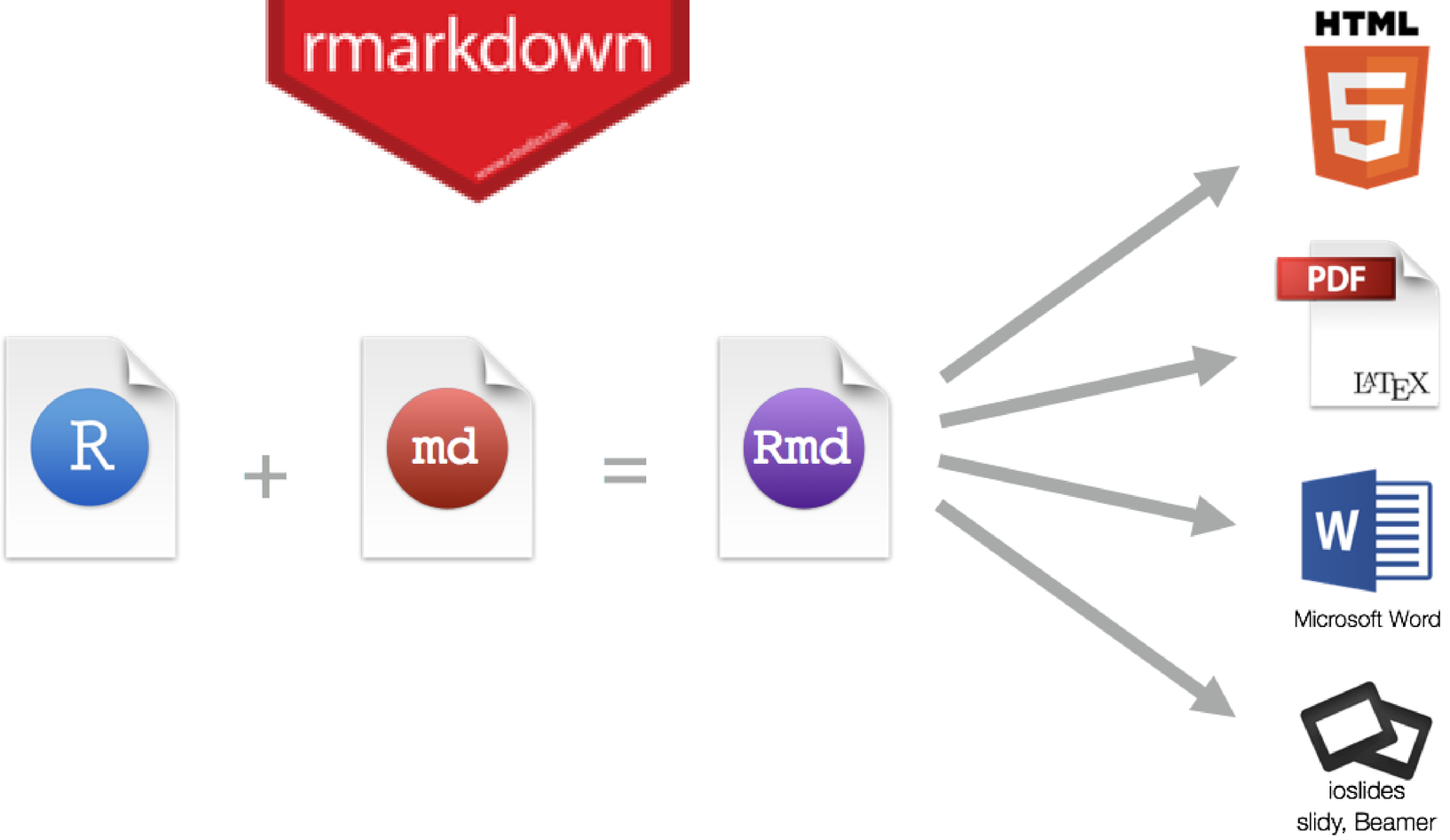
R Markdown



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htmlwidgets

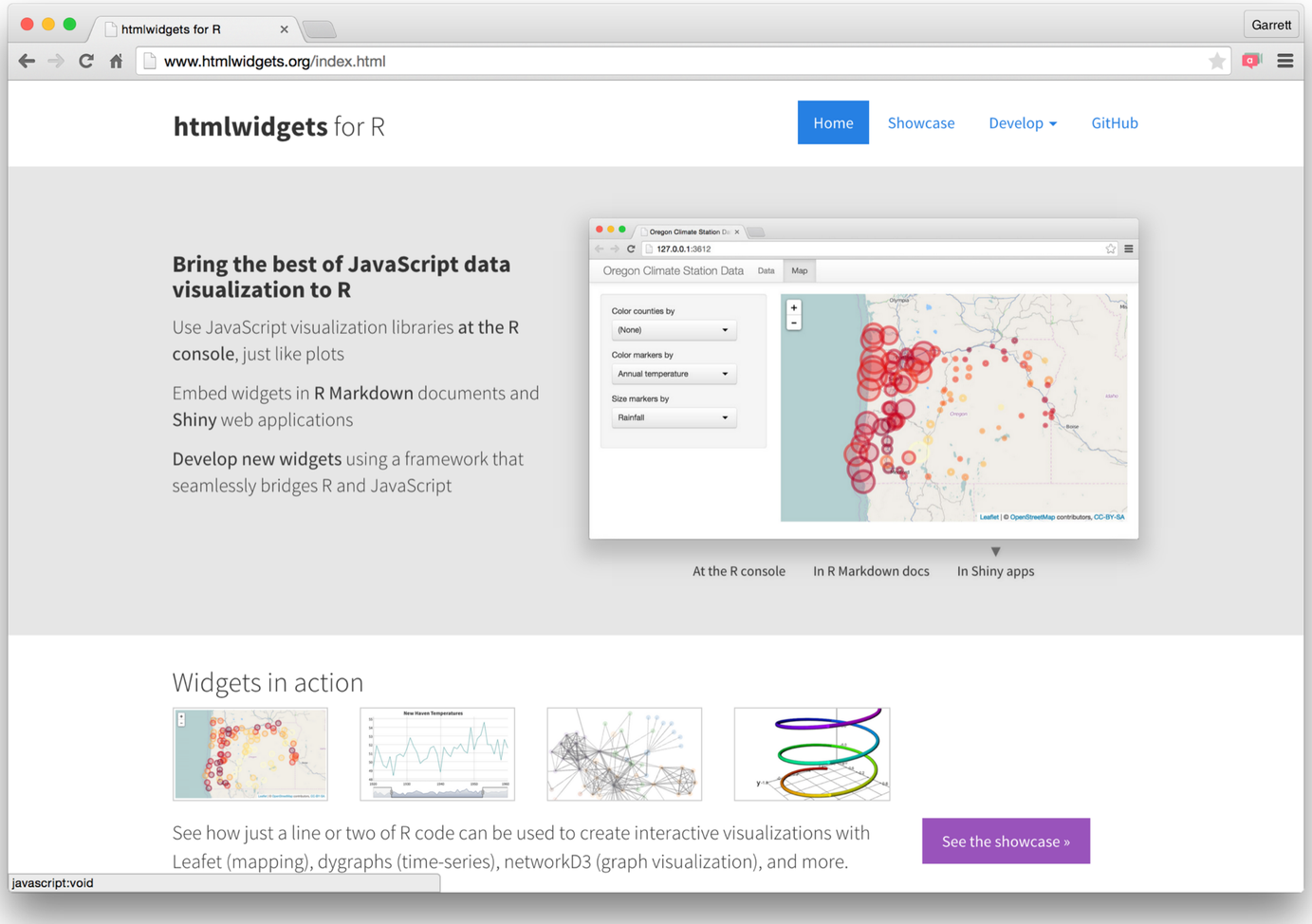
htmlwidgets for R:

- R bindings to JavaScript libraries
- Used to create interactive visualizations
- A line or two of R code is all it takes to produce an example

Use htmlwidgets in:

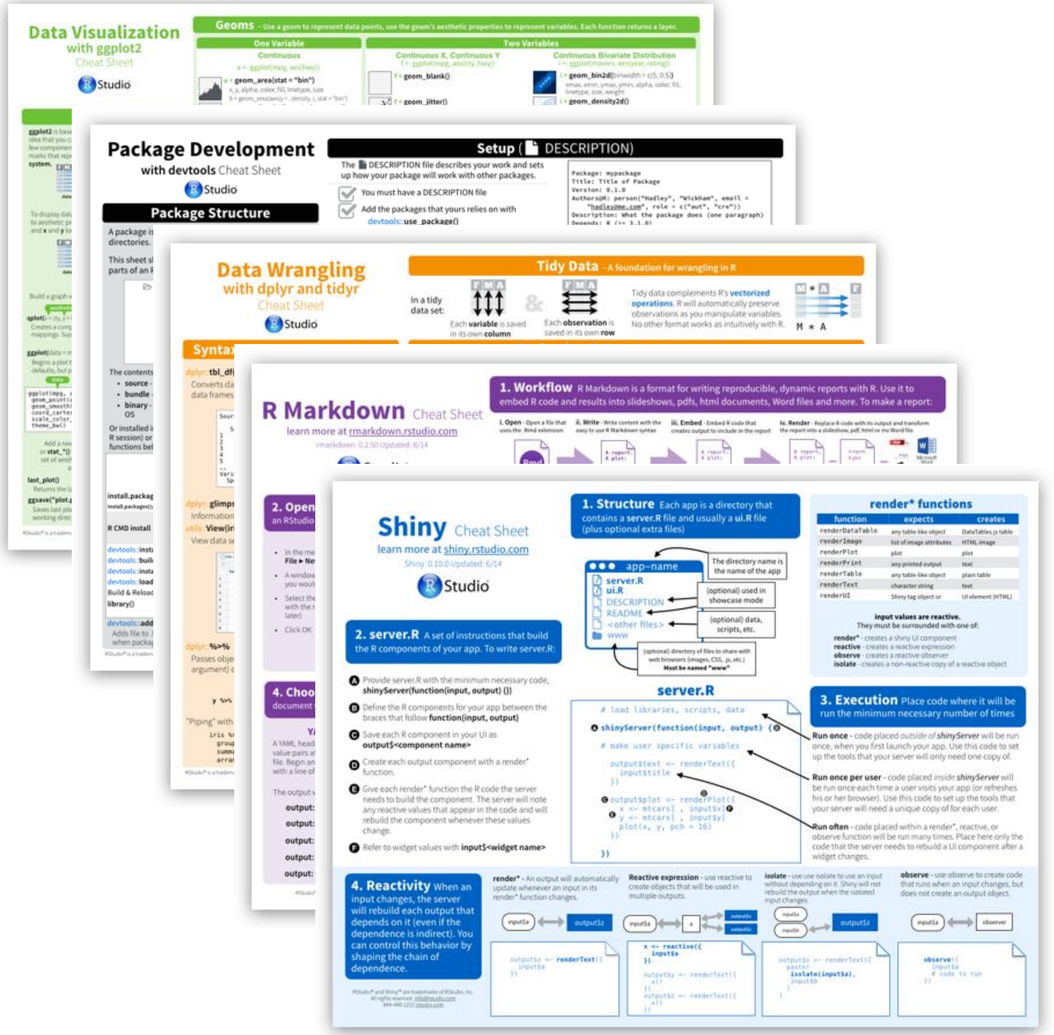
- RStudio viewer pane
- R Markdown files
- Shiny Apps

www.htmlwidgets.org



Other Goodies

- Cheatsheets
- Webinars & Recordings



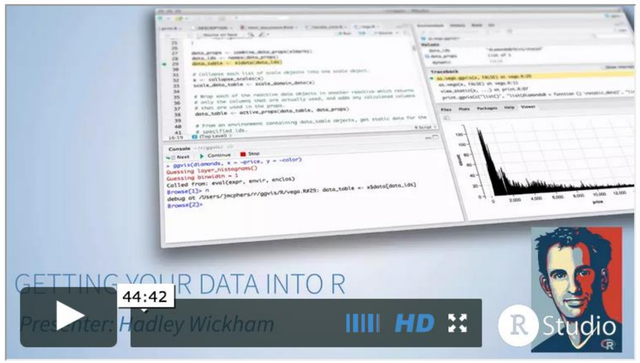
Latest Webinars

Getting your data into R

You can't use R for data analysis unless you can get your data into R. Getting your data into R can be a major hassle, so in the last few months Hadley Wickham has been working hard to make it easier.

In this webinar Hadley will discuss the places you most often find data (databases, excel, text files, other statistical packages, web apis, and web pages) and the packages (DBI, xml2, jsonlite, haven, readr, exel) that make it easy to get your data into R.

GitHub Webinar Repository
Materials for this specific webinar



How to start with Shiny – Part 3

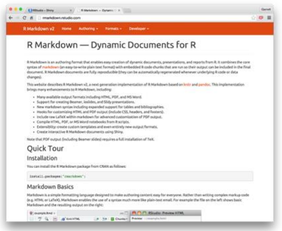
In this talk (Part 3 of 3), Garrett Grolemund will show you how to customize the appearance of your app. You will learn how to arrange the components of your app into an attractive layout, as well as how to change the appearance of text, images, and other HTML elements in your app.

GitHub Webinar Repository
Materials for this specific webinar
Alternate Link: bit.ly/shiny-quickstart-3

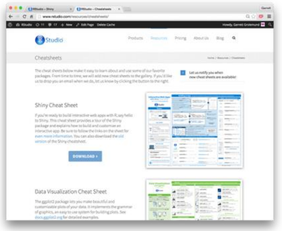
RStudio

Useful Websites

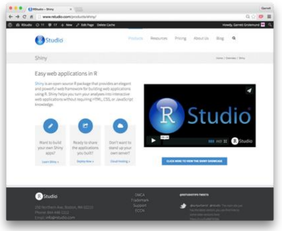
The Shiny development center:
shiny.rstudio.com



The R Markdown development center:
rmarkdown.rstudio.com



Shiny and R Markdown cheat sheets:
www.rstudio.com/resources/cheatsheets



RStudio products:
www.rstudio.com/products/shiny

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Open Source & Free

Desktop: http://www.rstudio.com/products/rstudio/download/

RStudio Server: http://www.rstudio.com/products/rstudio/download-server/

Shiny Server: http://www.rstudio.com/products/shiny/download-server/

shinyapps.io beta: https://www.shinyapps.io/admin/#/signup

45 Day Evaluation of Pro Products

RStudio Server Pro: http://www.rstudio.com/products/rstudio-server-pro/evaluation/

Shiny Server Pro: http://www.rstudio.com/products/shiny-server-pro/evaluation/

PLEASE STAY IN TOUCH

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Twitter - @rstudio #rstats http://twitter.com/rstudio/

GitHub - https://github.com/rstudio/

LinkedIn - https://linkedin.com/company/rstudio-inc

Facebook - https://www.facebook.com/pages/RStudio-inc

Google+ - https://plus.google.com/110704473211154995841/posts

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Community Activities

R Consortium

Supports the R foundation

RStudio

Community

rstudio::conf

Annual conference

2016 - Palo Alto
2017 - Orlando Florida
2018 - San Diego

R Views

Community blog