

# Welcome!

## Intro to R and RStudio



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# Our goal for today

## Overview of the R ecosystem:

- **What is possible with R?**
- **RStudio the company**
- **R the programming language**
- **RStudio the IDE (Workbench)**
  - Importing your data
  - Visualization
  - Reporting

Photo Credit: Jeremy Allen

# What is possible with R?

T-Mobile

◀ Back To Blogs

## Enterprise Web Services with Neural Networks Using R and TensorFlow

By: Jacqueline Nolis and Heather Nolis

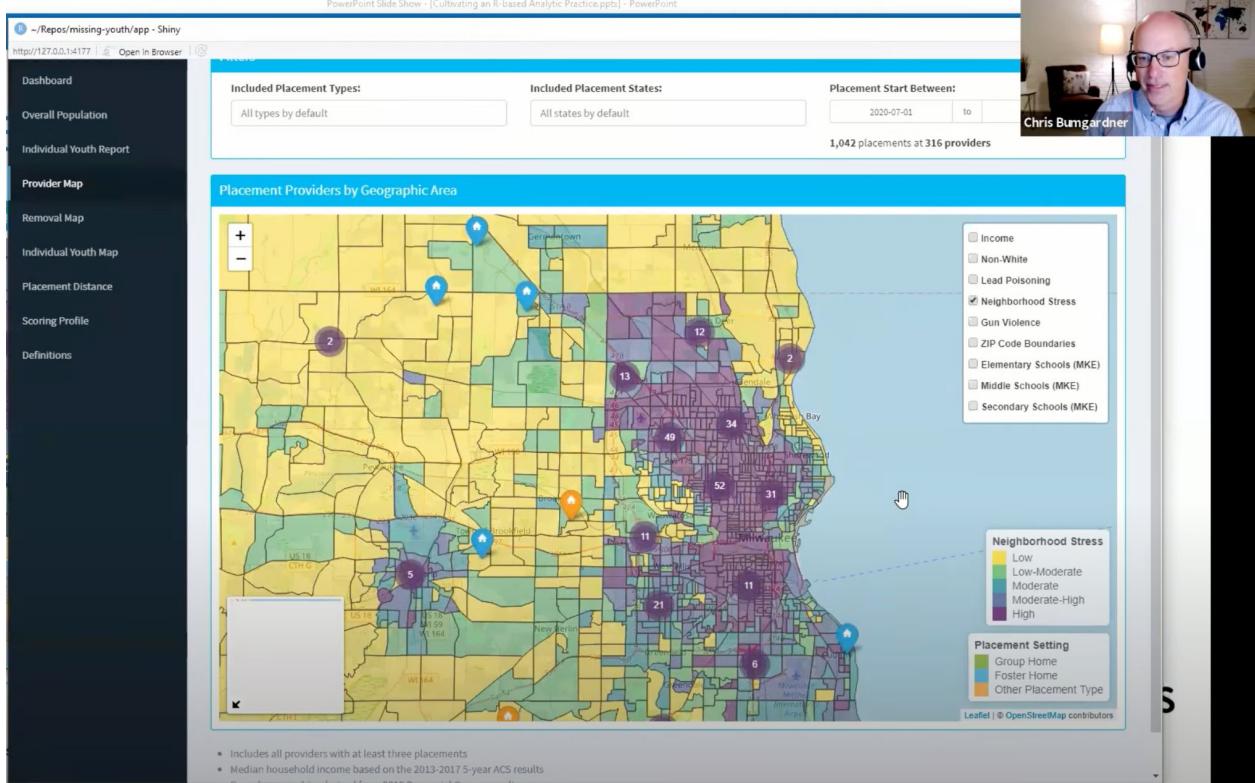
2018-11-02

“

We explore in R and immediately deploy in R. Our APIs are neural network models using R and TensorFlow in docker containers that are small and maintainable enough to make our DevOps team happy!

[Presented at rstudioconf::2019](#)

# What is possible with R?

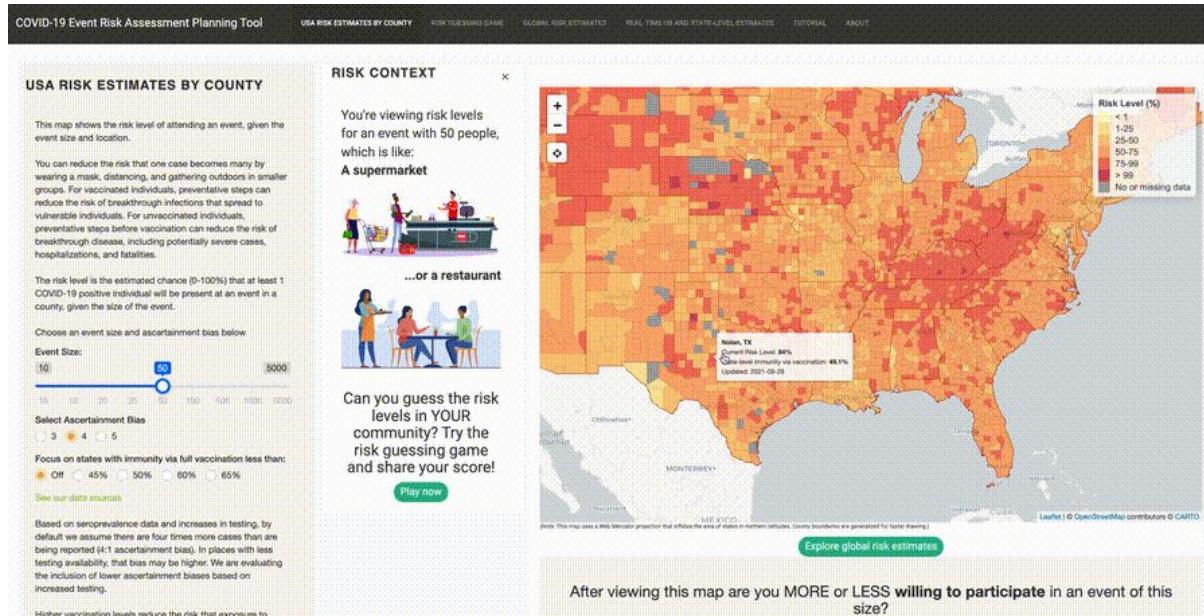


“

At Children's  
Wisconsin...Example  
R-based Projects: Missing  
Youth, System-wide:  
COVID-19 Response,  
Operational: Patient  
Placement Planning and  
Optimization

Presented at our  
community meetup

# What is possible with R?



“ Georgia Tech’s COVID-19 Event Risk Assessment Planning Tool...adding up to ultimately over 8 million unique users around the world

[on YouTube](#)  
[on RStudio's blog](#)

# What is possible with R?



“ Making 170+ beautiful reports to inform policymakers and others in the state of Connecticut. All the way from data import to final report in R – David Keyes & Thomas Vroylandt

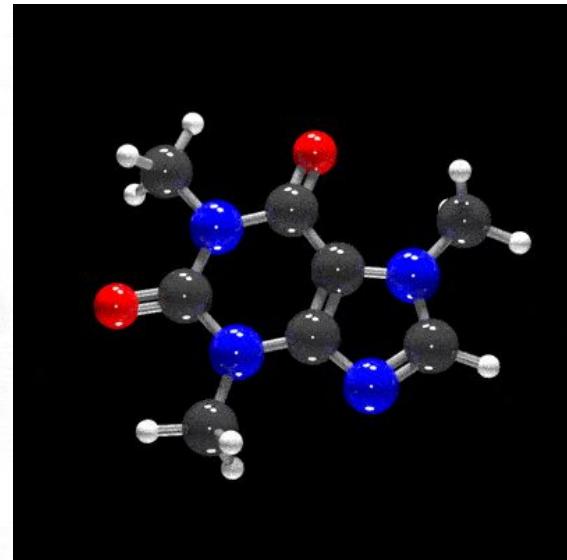
on R for the Rest of US

the products

# What is possible with R?

“

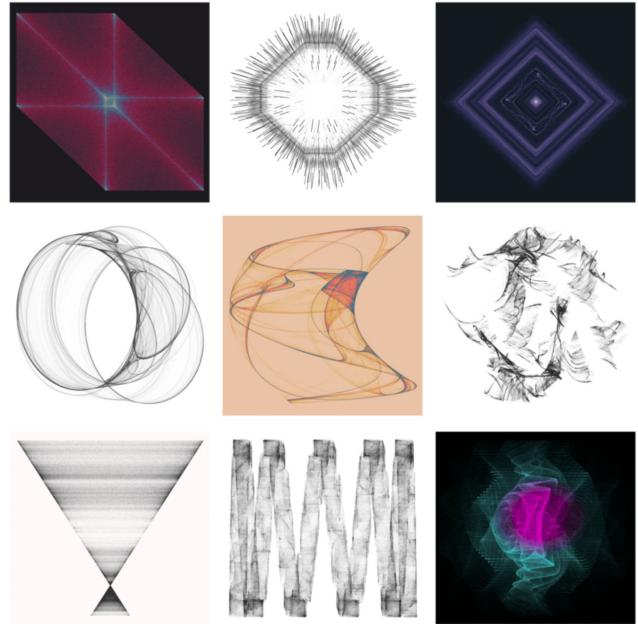
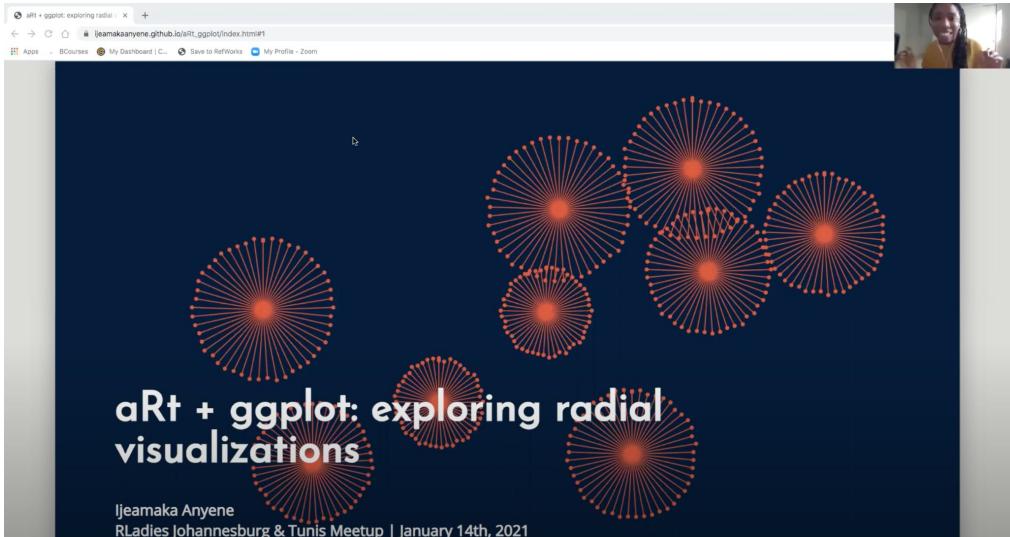
`raymolecule` is an R package to parse and render molecules in 3D. Rendering is powered by two packages: `rayrender` package, a pathtracer for R, and `rayvertex`, a rasterizer for R



[More 3D rendering by  
Tyler Mogan-Wall](#)

# What is possible with R?

Art!



[Will Chase](#)

[Ijeamaka Anyene](#)  
(ee-jee-maka)

# What is possible with R?

Books!

All of these books  
were written in R with  
the bookdown  
package!

[bookdown.org](https://bookdown.org)

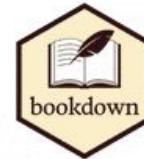
## BOOKDOWN

Write HTML, PDF, ePub, and Kindle books with R Markdown

The `bookdown` package is an [open-source R package](#) that facilitates writing books and long-form articles/reports with R Markdown. Features include:

- Generate printer-ready books and ebooks from R Markdown documents.
- A markup language easier to learn than LaTeX, and to write elements such as section headers, lists, quotes, figures, tables, and citations.
- Multiple choices of output formats: PDF, LaTeX, HTML, EPUB, and Word.
- Possibility of including dynamic graphics and interactive applications (HTML widgets and Shiny apps).
- Support a wide range of languages: R, C/C++, Python, Fortran, Julia, Shell scripts, and SQL, etc.
- LaTeX equations, theorems, and proofs work for all output formats.
- Can be published to GitHub, bookdown.org, and any web servers.
- Integrated with the RStudio IDE.
- One-click publishing to <https://bookdown.org>.

Below is a list of featured books. For a full list, please see the [archive](#) page. For the full documentation of the `bookdown` package, please see the free [online book](#) `bookdown: Authoring Books and Technical Documents with R Markdown`.



### Geocomputation with R

by Robin Lovelace, Jakub Nowosad, Jannes Muenchow

2021-09-22



Welcome to Geocomputation with R for people who want to analyze, visualize and model geographic data with open source software. It is based on R, a statistical programming language that has powerful data processing, visualization, and geospatial capabilities. The book equips you with the knowledge and skills to tackle a wide range of issues manifested in geographic data, including those with scientific, societal, and environmental implications. This book will interest people from many backgrounds, especially Geographic Information Systems (GIS) users interested in applying their domain-specific knowledge in a powerful open source language for data science, and R users interested in extending their skills to handle spatial data. [Read more →](#)

### R Graphics Cookbook, 2nd edition

by Winston Chang

2021-09-22



This cookbook contains more than 150 recipes to help scientists, engineers, programmers, and data analysts generate high-quality graphs quickly—without having to comb through all the details of R's graphing systems. Each recipe tackles a specific problem with a solution you can apply to your own project and includes a discussion of how and why the recipe works. [...] Welcome to the R Graphics Cookbook, a practical guide that provides more than 150 recipes to help you generate high-quality graphs quickly, without having to comb through all the details of R's graphing systems. Each recipe ... [Read more →](#)

2

### blogdown: Creating Websites with R Markdown

by Yihui Xie, Amber Thomas, Alison Presmanes Hill

2021-09-17



A guide to creating websites with R Markdown and the R package blogdown. [...] A note from the authors: Some of the information and instructions in this book are now out of date.

### Statistical Inference via Data Science

by Chester Ismay and Albert Y. Kim

2021-09-16



An open-source and fully-reproducible electronic textbook for teaching statistical inference using tidyverse data science tools. [...] This is the website for Statistical Inference via Data Science: A ModernDive into R and the

1

The R Series

# What is possible with R?

Websites, too!

[blogdown, also at bookdown.org](https://bookdown.org)

**blogdown**

Creating Websites  
with R Markdown



**Yihui Xie**  
**Amber Thomas**  
**Alison Presmanes Hill**

 CRC Press  
Taylor & Francis Group  
A CHAPMAN & HALL BOOK

# What is possible with R?

And, research within the world's leading life sciences, healthcare, finance, manufacturing, and tech companies, as well as universities, governments, and non-profits.





## Public Benefit Corporation

Open source mission codified into our charter

Corporate decisions must balance the best interests of  
community, customers, employees, and shareholders

J.J. Allaire CEO, RStudio [rstudio.com/pbc-keynote](https://rstudio.com/pbc-keynote)

Details of Certified B Corporation assessment at <https://bcorporation.net/directory/rstudio>





A language



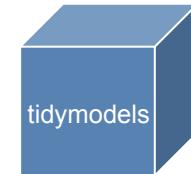
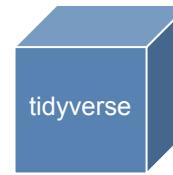
Software for writing R and  
Python code, analyzing data

# First look at R...



<https://www.r-project.org/about.html>

An open source  
programming language



With packages of code  
for related tasks

Download: <https://cran.r-project.org/>



## Available Packages

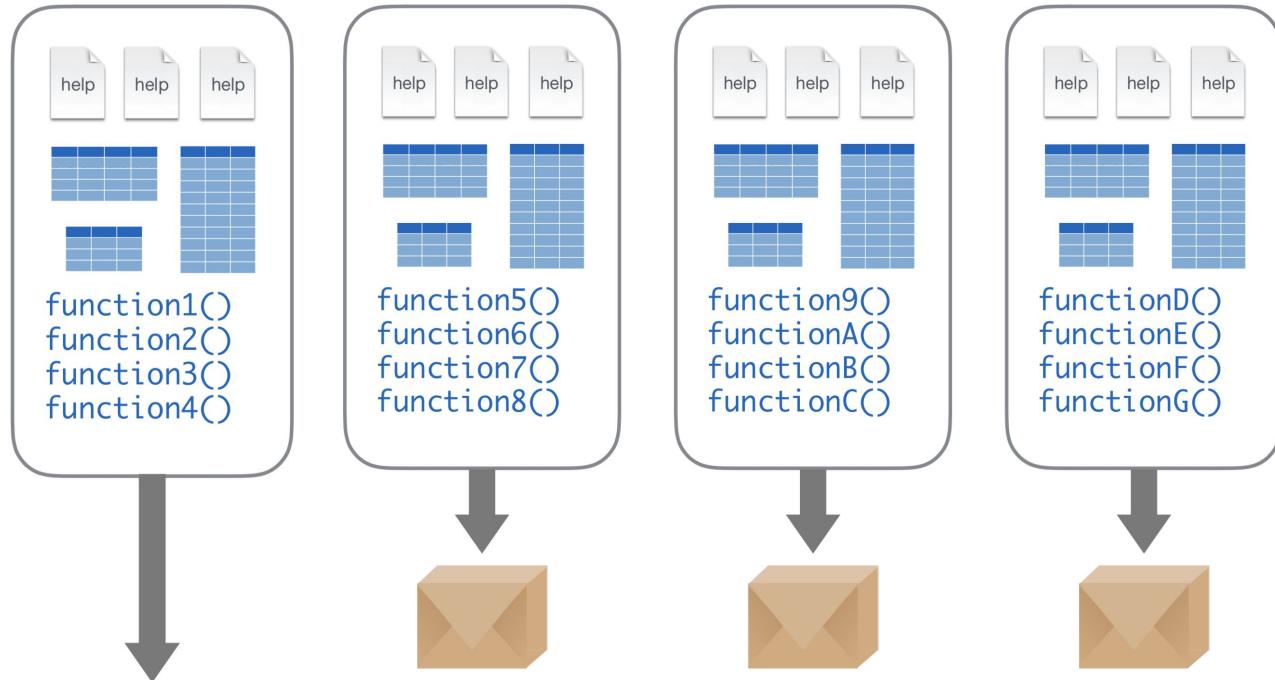
Currently, the CRAN package repository features 18042 available packages.

September, 2021



Today...we  
don't want to  
lose the forest  
for the trees

Photo Credit: Jeremy Allen

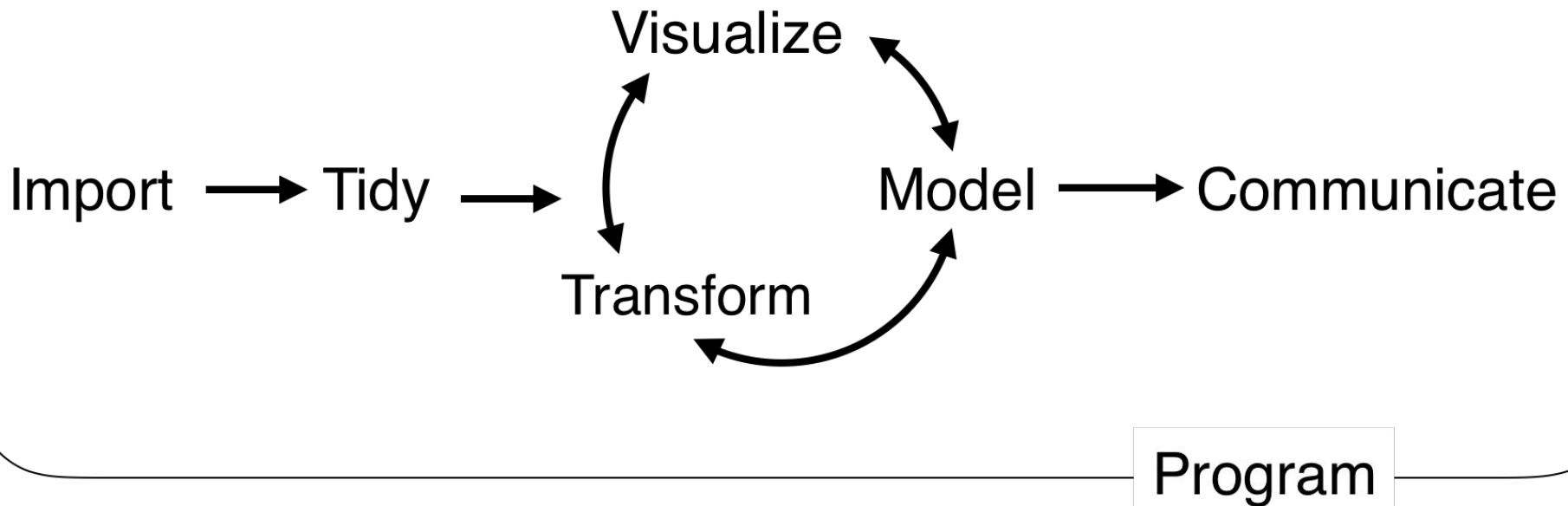


Base R

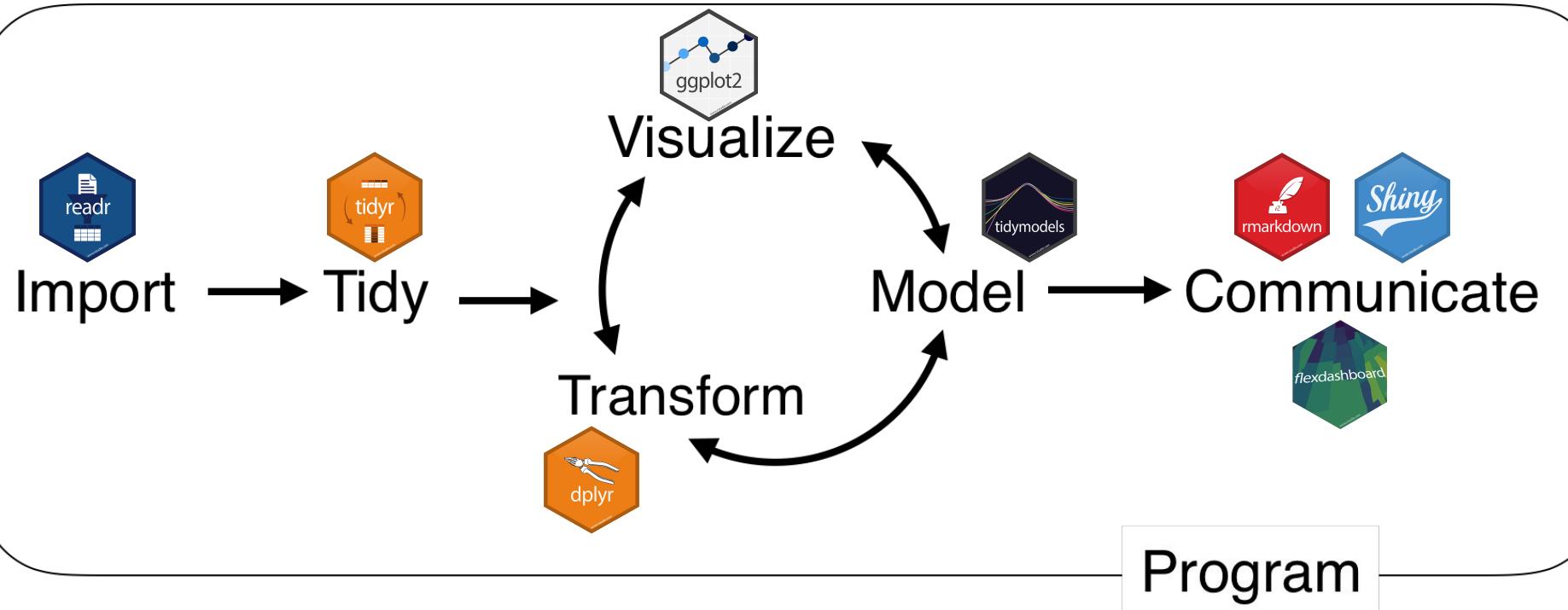
R Packages



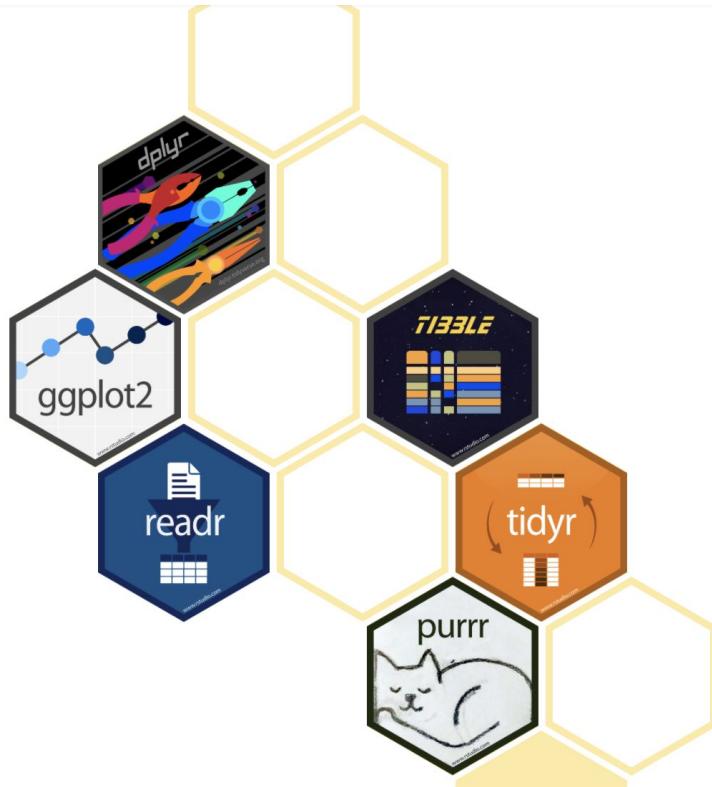
# How we think about data science...



# How we think about data science...



# Tidyverse



R packages for data science

The tidyverse is an opinionated **collection of R packages** designed for data science. All packages share an underlying design philosophy, grammar, and data structures.

Install the complete tidyverse with:

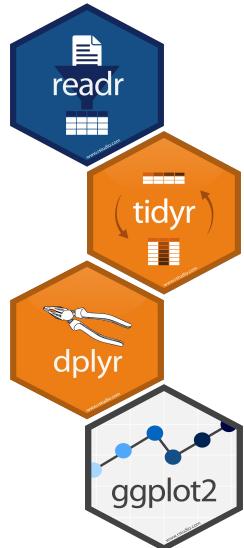
```
install.packages("tidyverse")
```

# Let's go code!

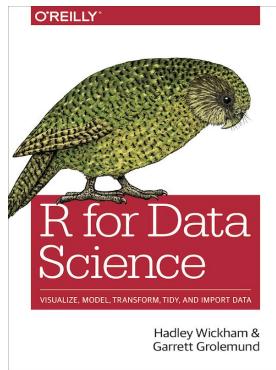
R script  
R Markdown  
ggplot2  
plotly  
publish to Connect



# Learn more!



## R for Data Science Book



Also see our RStudio Education site



Get Started with R markdown



Learn Tidymodels



Shiny Tutorials



Using Flexdashboard



Code and slides: <https://github.com/jeremy-allen/intro-to-r>



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Thank you