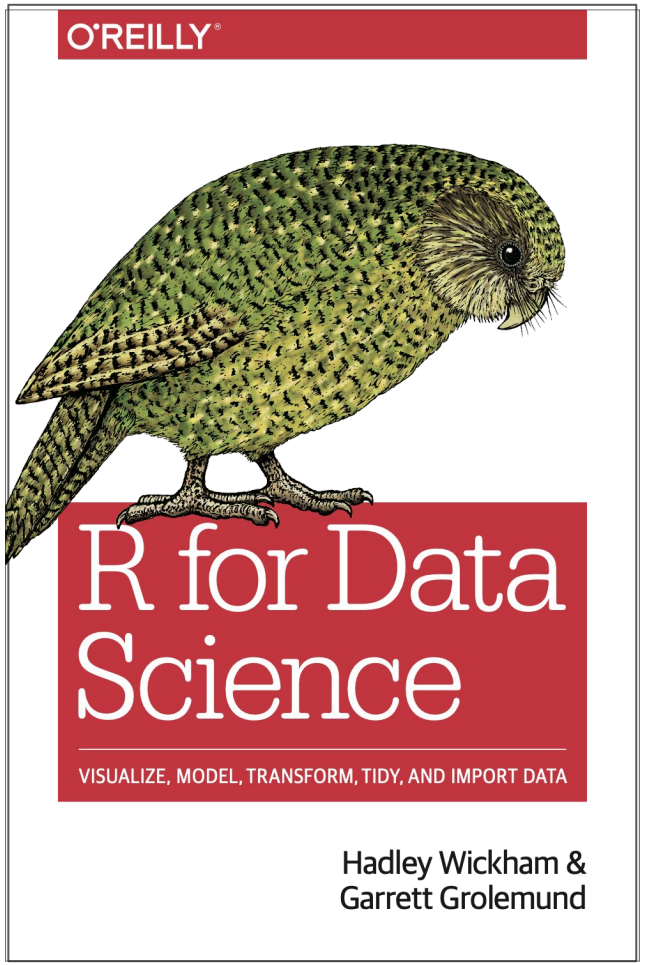
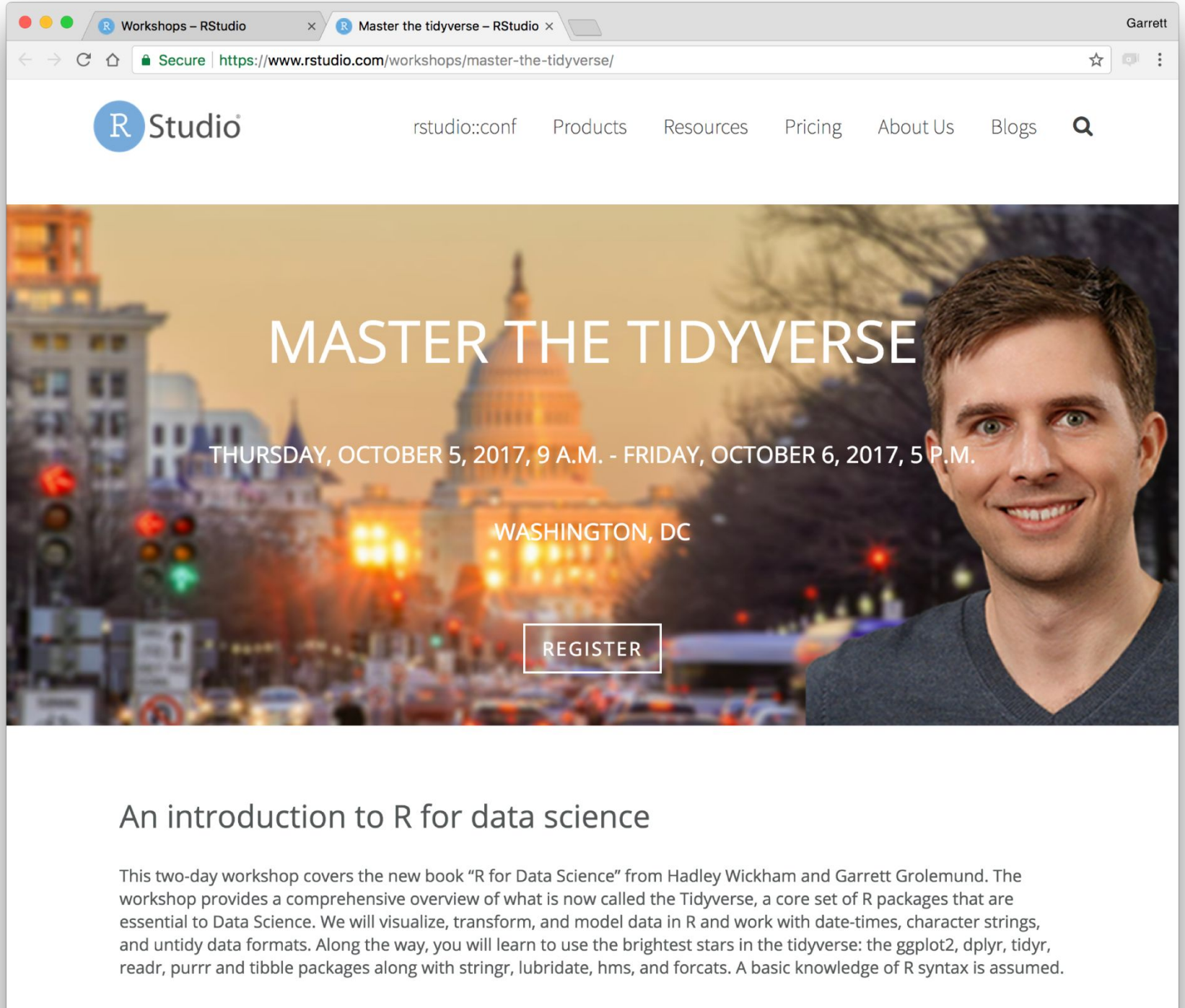
Analyze Clinical Trial Data with Posit Academy

Garrett Grolemund / February 7, 2023


O'REILLY
R for Data Science
VISUALIZE, MODEL, TRANSFORM, TIDY, AND IMPORT DATA
Hadley Wickham &
Garrett Grolemund


Workshops – RStudio
Master the tidyverse – RStudio
Garrett
Secure https://www.rstudio.com/workshops/master-the-tidyverse/
RStudio
rstudio::conf
Products
Resources
Pricing
About Us
Blogs
MASTER THE TIDYVERSE
THURSDAY, OCTOBER 5, 2017, 9 A.M. - FRIDAY, OCTOBER 6, 2017, 5 P.M.
WASHINGTON, DC
REGISTER
An introduction to R for data science
This two-day workshop covers the new book "R for Data Science" from Hadley Wickham and Garrett Grolemund. The workshop provides a comprehensive overview of what is now called the Tidyverse, a core set of R packages that are essential to Data Science. We will visualize, transform, and model data in R and work with date-times, character strings, and untidy data formats. Along the way, you will learn to use the brightest stars in the tidyverse: the ggplot2, dplyr, tidyr, readr, purrr and tibble packages along with stringr, lubridate, hms, and forcats. A basic knowledge of R syntax is assumed.

Workshop

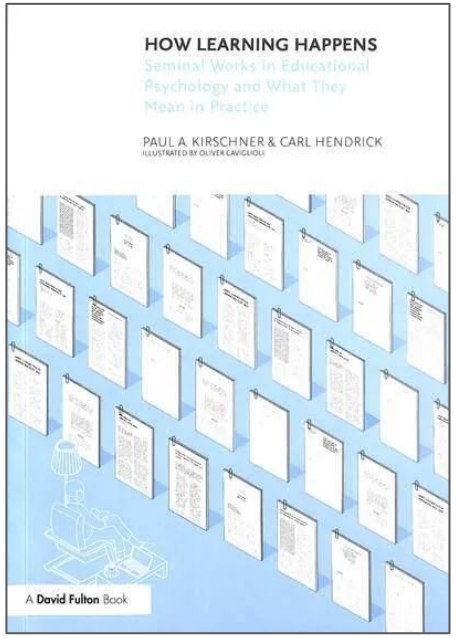
~~Workshop~~

~~Online Course~~

posit™

How to train a data scientist

Cognitive Load Theory
Multimedia learning Theory
Dual Coding Theory
Mastery Learning
Direct Instruction
Deep Processing
Active Learning



How Learning Happens by Paul Kirshner and Carl Hendrick

...your course once again deserved the honor of the Excellence-in-CE Award. Congratulations! It's very impressive for a course to win the award this many times. It's actually unprecedented.

As part of the award you are invited back to present the...

posit

>

But...

<

56%

Students only remember 56% of content **immediately after the lecture**, with drop off expected as time goes on.

Risko, E. F., Anderson, N., Sarwal, A., Engelhardt, M., & Kingstone, A. (2012). Everyday attention: variation in mind wandering and memory in a lecture. Applied Cognitive Psychology, 26(2), 234-242.

60% 40% 30%

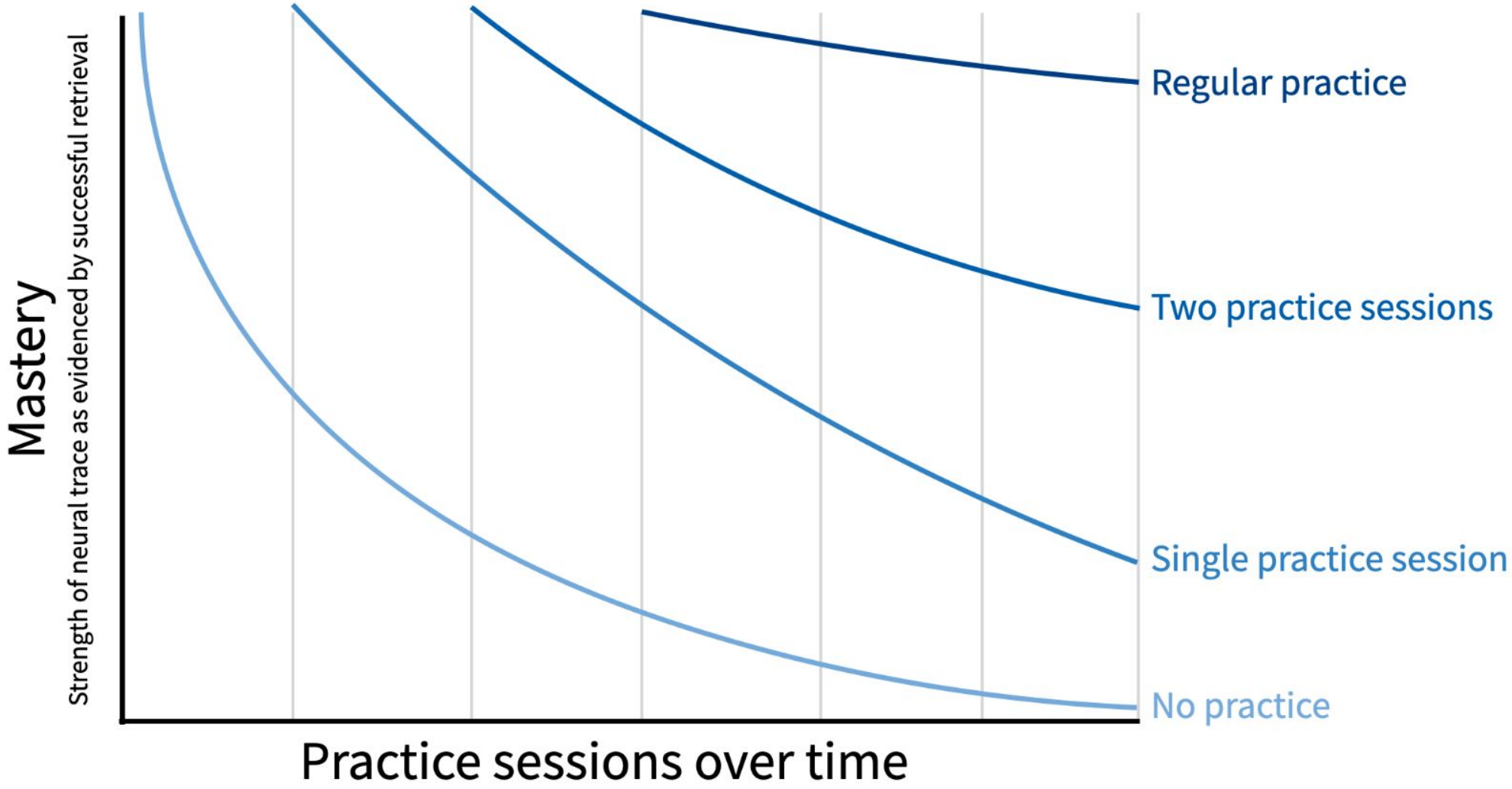
60% can apply content immediately after the training

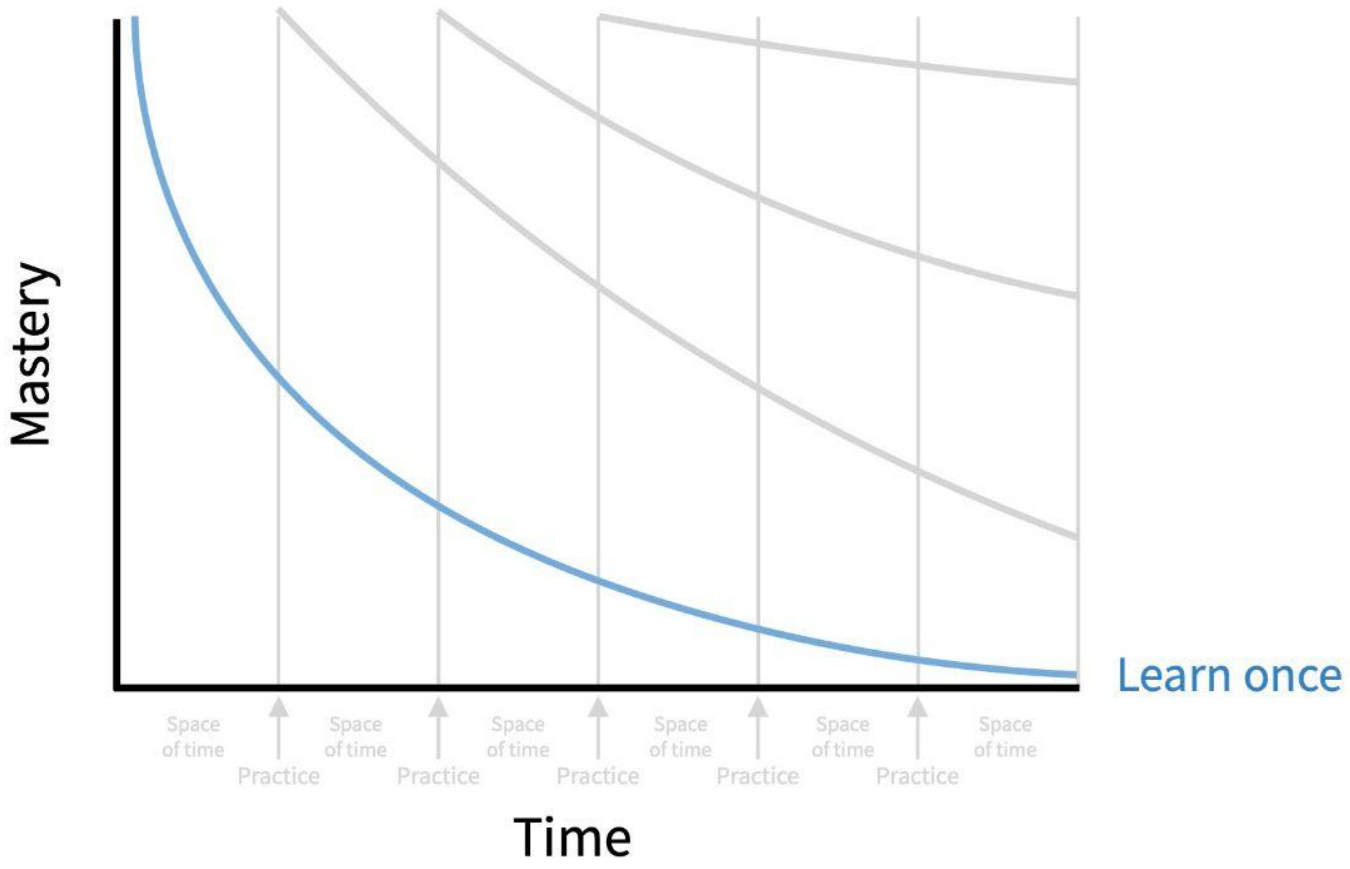
40% six months later

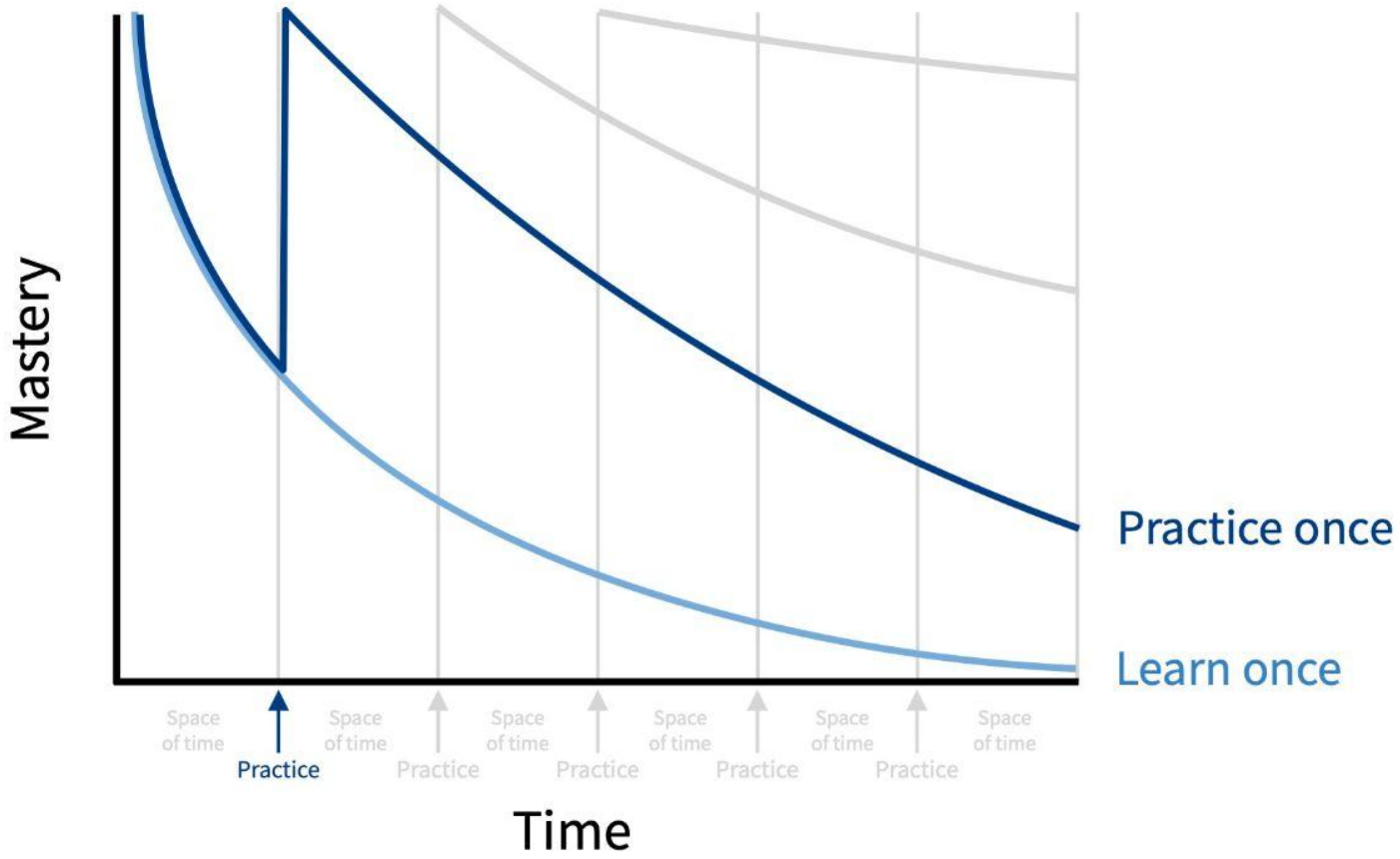
30% one year after

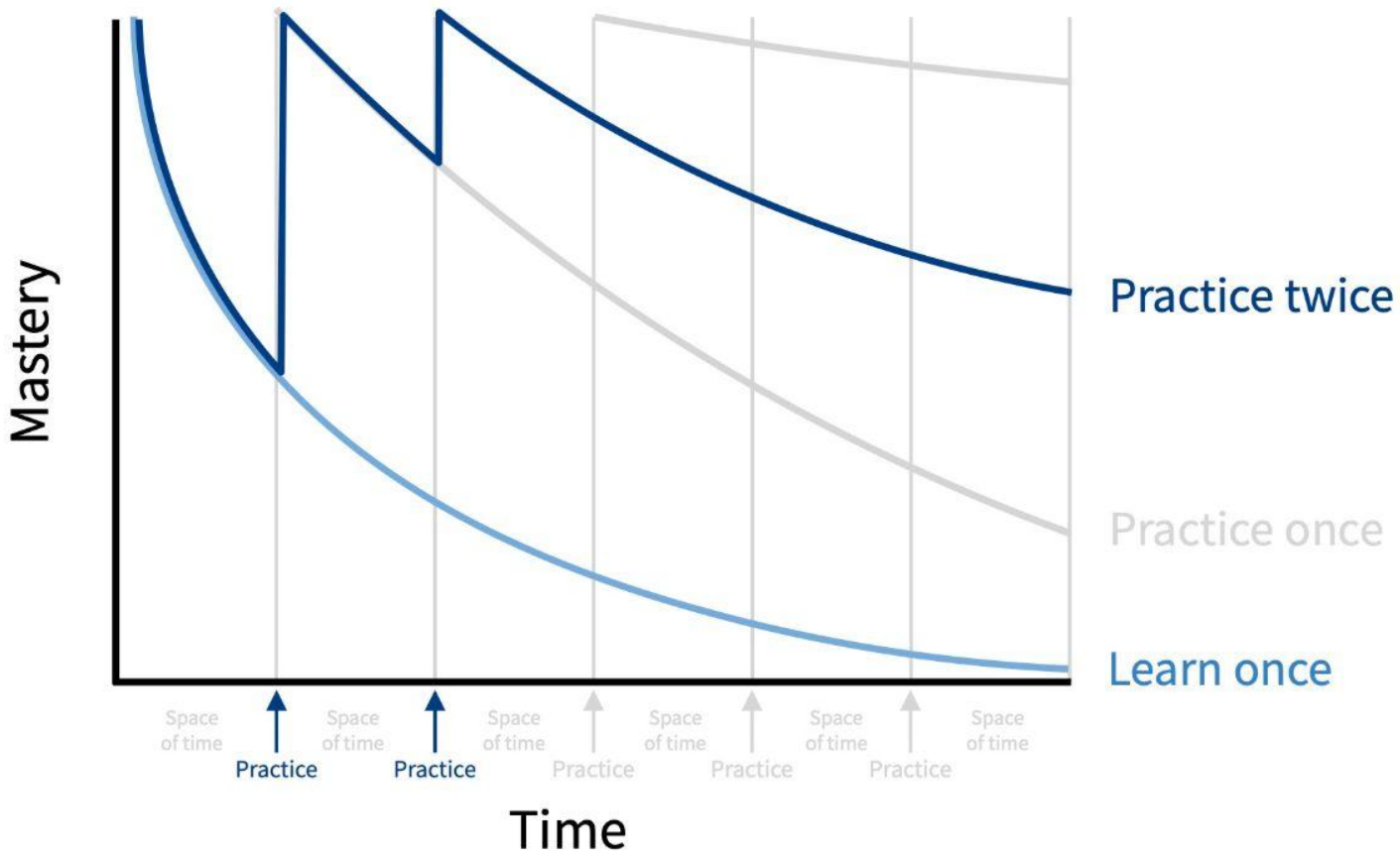
Saks, A. M. (2002). So what is a good transfer of training estimate? A reply to Fitzpatrick. The Industrial-Organizational Psychologist, 39(3), 29-30.

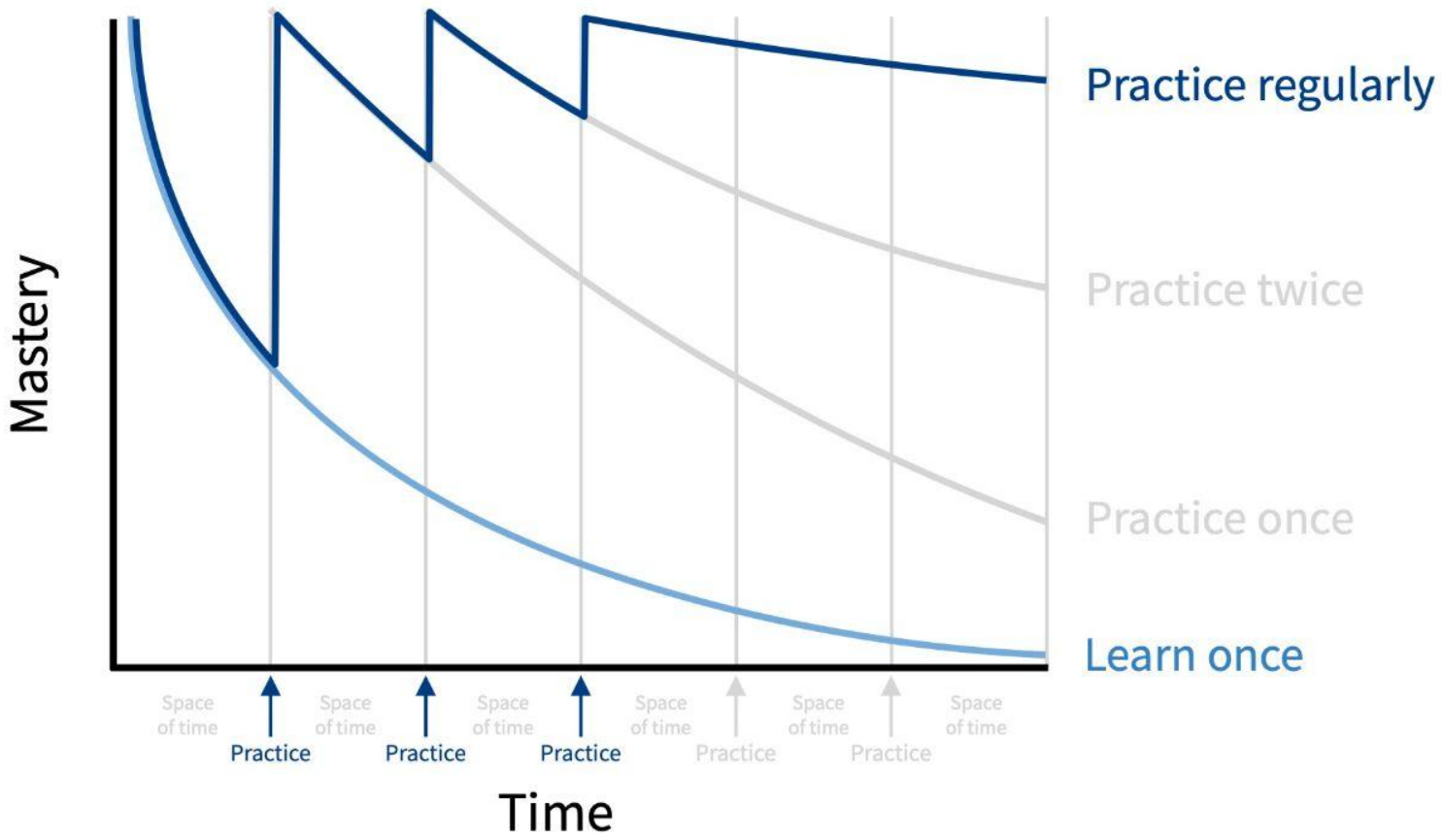
Forgetting Curves



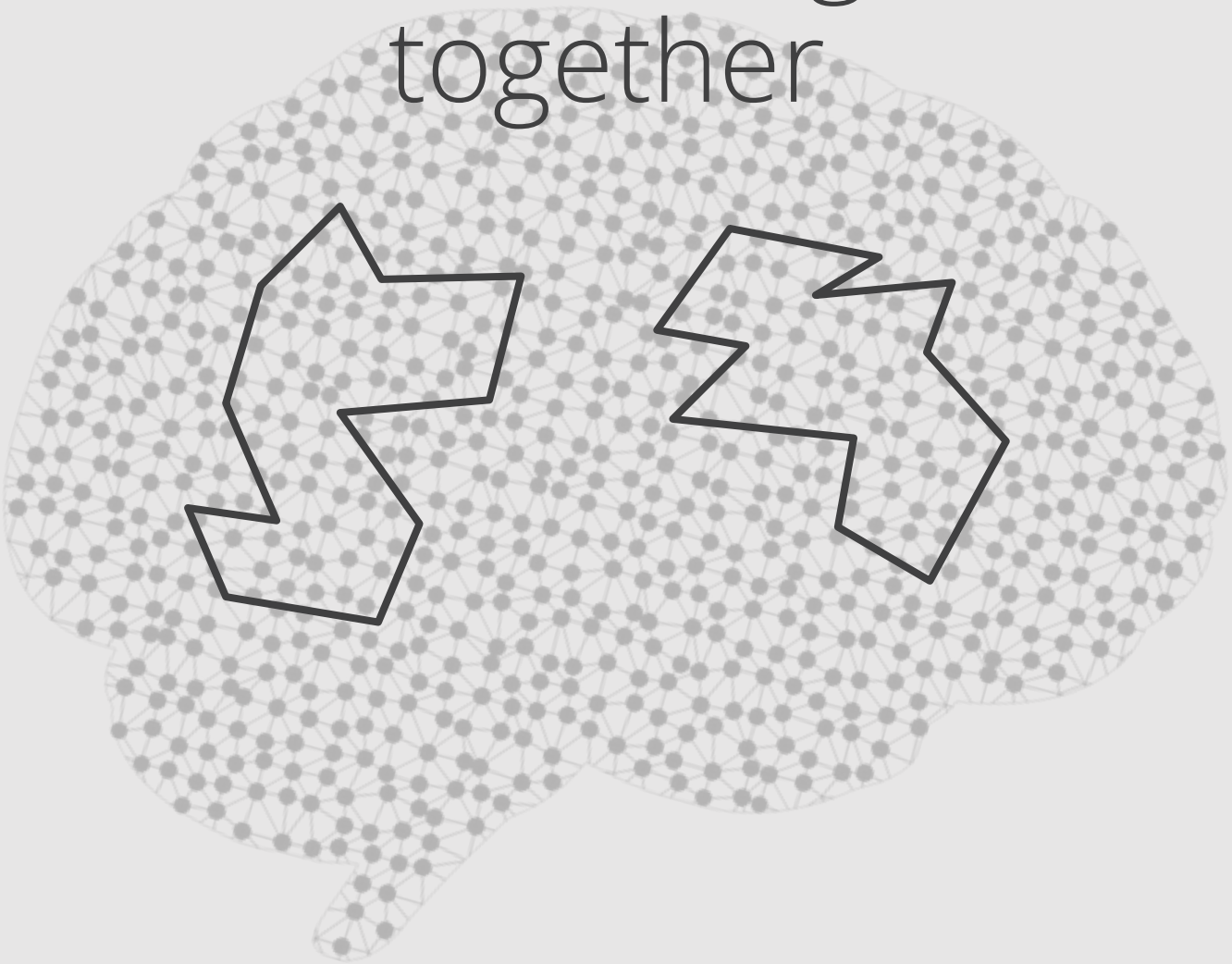

Mastery
Learn once
Space of time
Practice
Space of time
Practice
Space of time
Practice
Space of time
Practice
Space of time
Practice
Space of time
Time


Mastery
Practice once
Learn once
Space of time
Space of time
Space of time
Space of time
Space of time
Space of time
Practice
Practice
Practice
Practice
Practice
Time

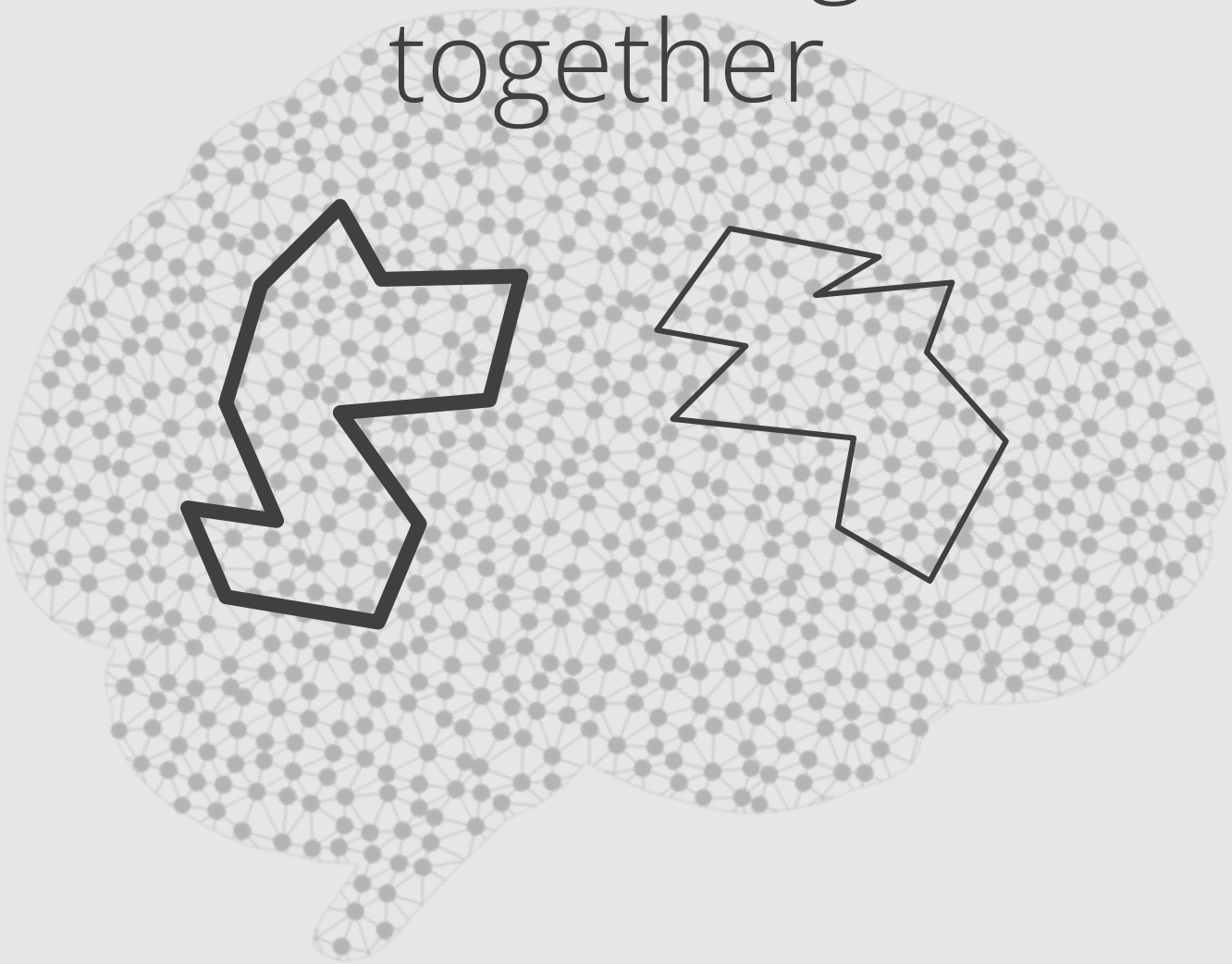

Mastery
Practice twice
Practice once
Learn once
Space of time
Space of time
Space of time
Space of time
Space of time
Space of time
Practice
Practice
Practice
Practice
Practice
Time


Practice regularly
Practice twice
Practice once
Learn once
Mastery
Time
Space of time
Practice
Space of time
Practice
Space of time
Practice
Space of time
Practice
Space of time
Practice
Space of time

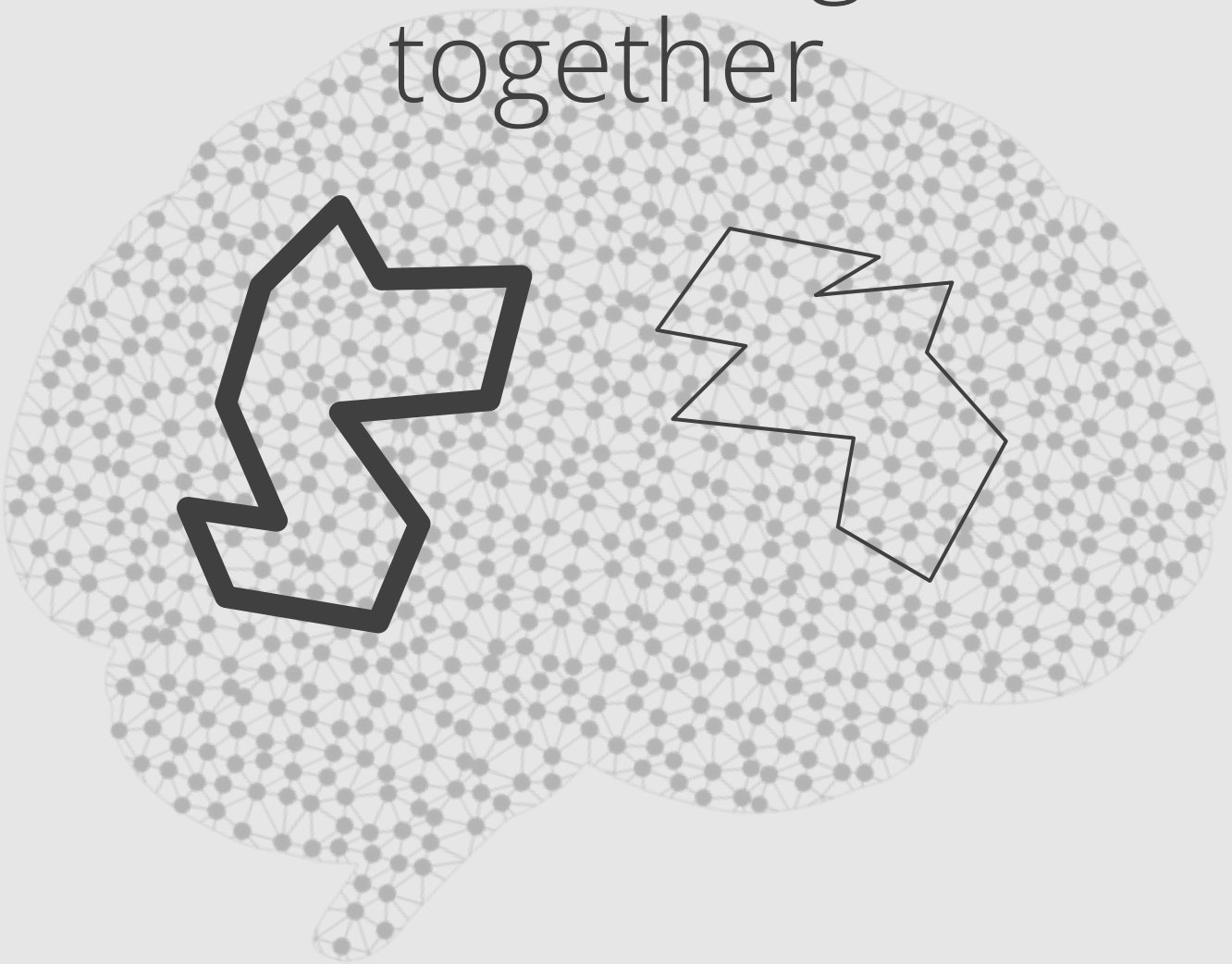
Neurons that fire together, wire together



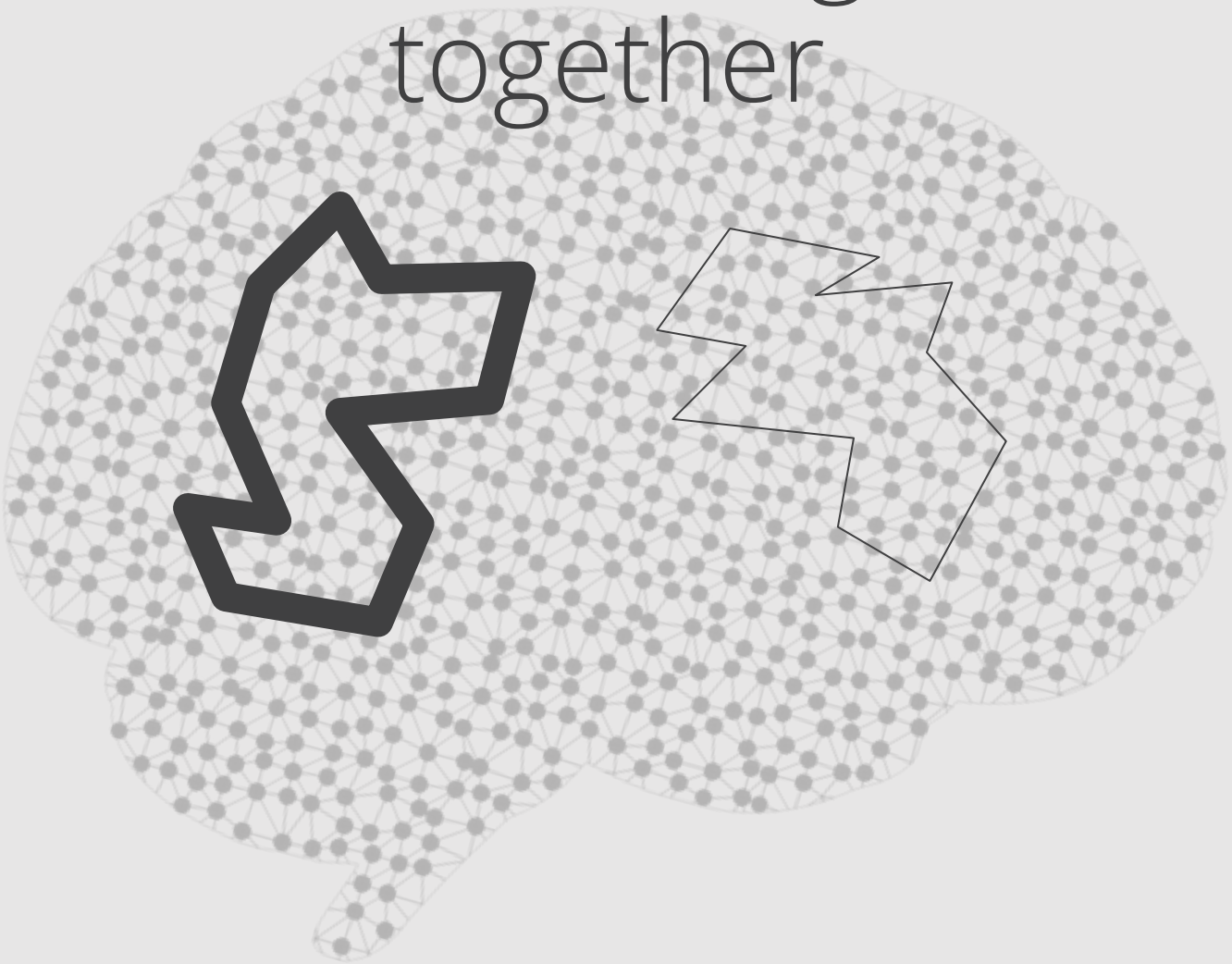
Neurons that fire together, wire together



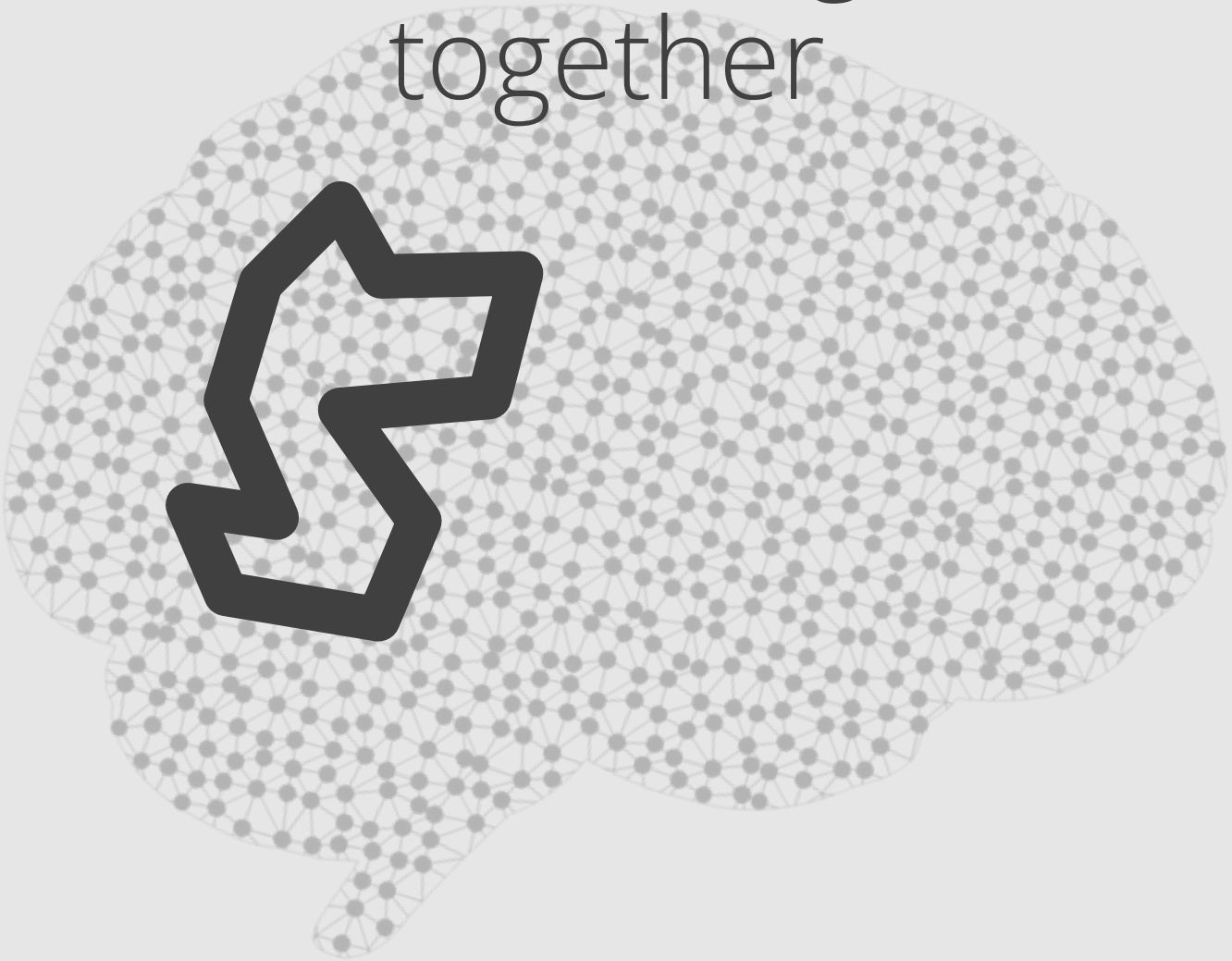
Neurons that fire together, wire together

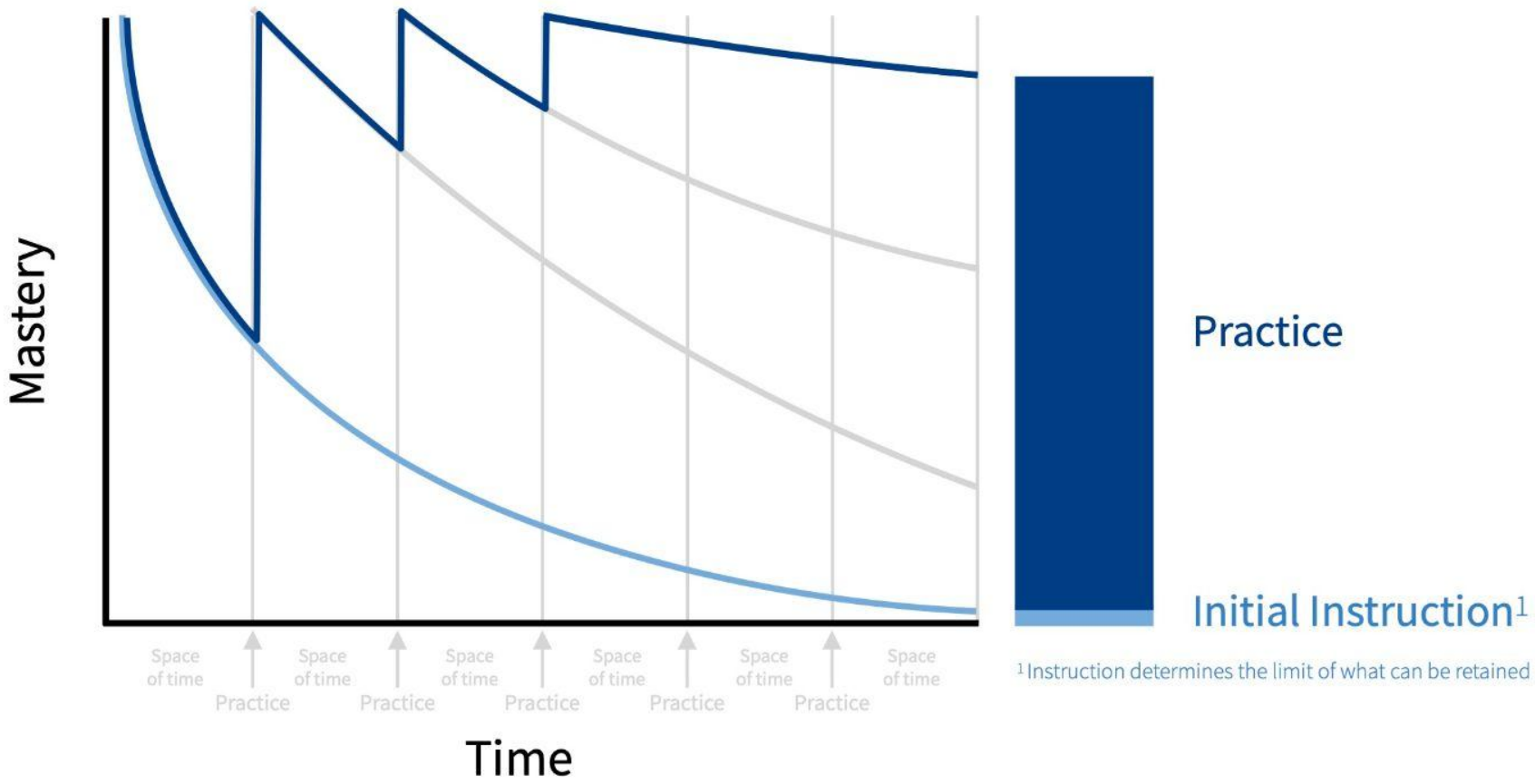


Neurons that fire together, wire together

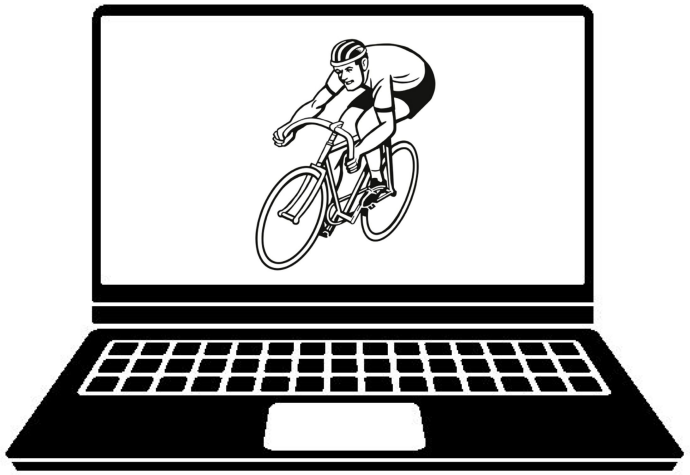


Neurons that fire together, wire together




Mastery
Space of time
Practice
Space of time
Practice
Space of time
Practice
Space of time
Practice
Space of time
Practice
Space of time
Time
Practice
Initial Instruction[1]
[1] Instruction determines the limit of what can be retained

What neural networks does each build?



A

B

Data Science is a Skill

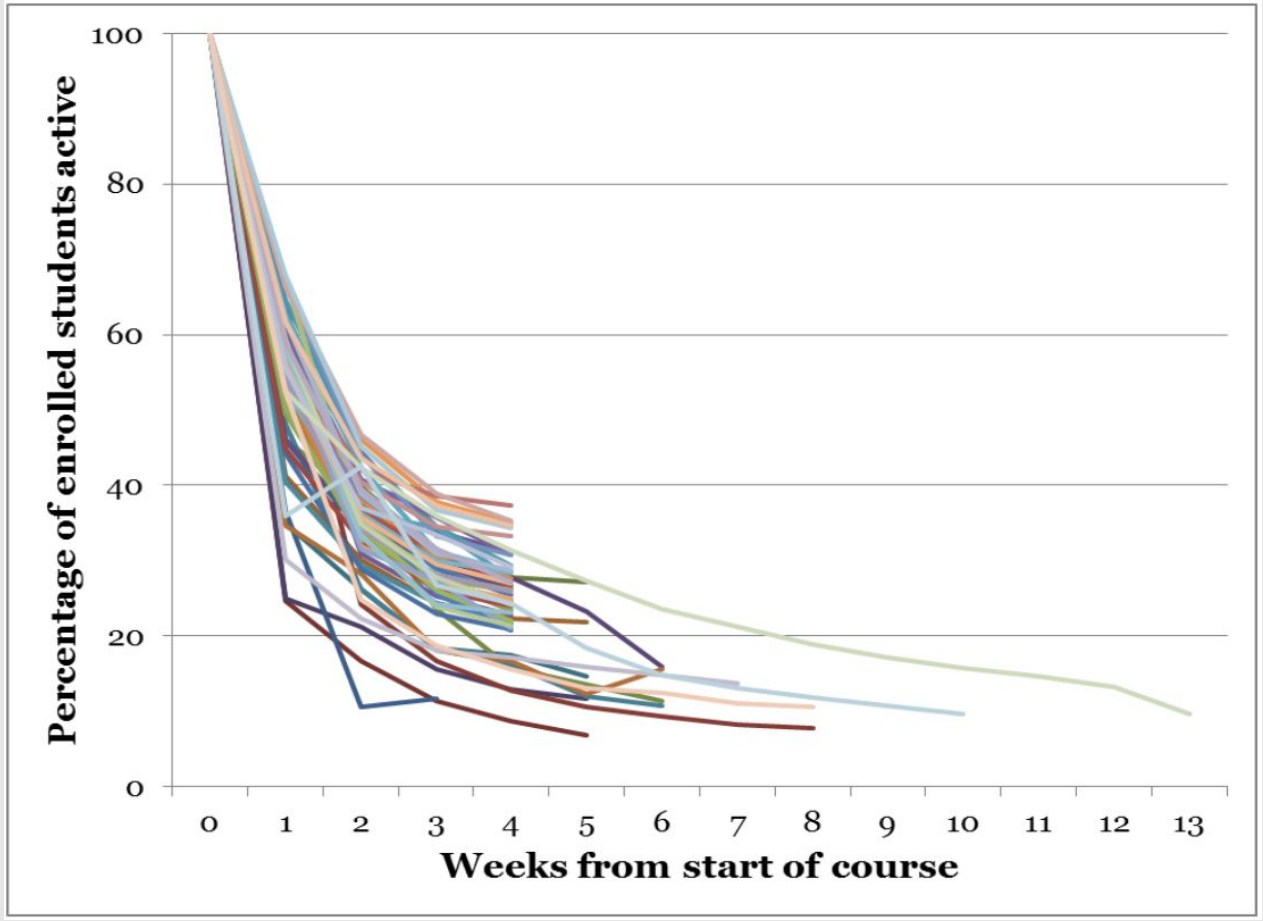
- Practice
- Over time

>

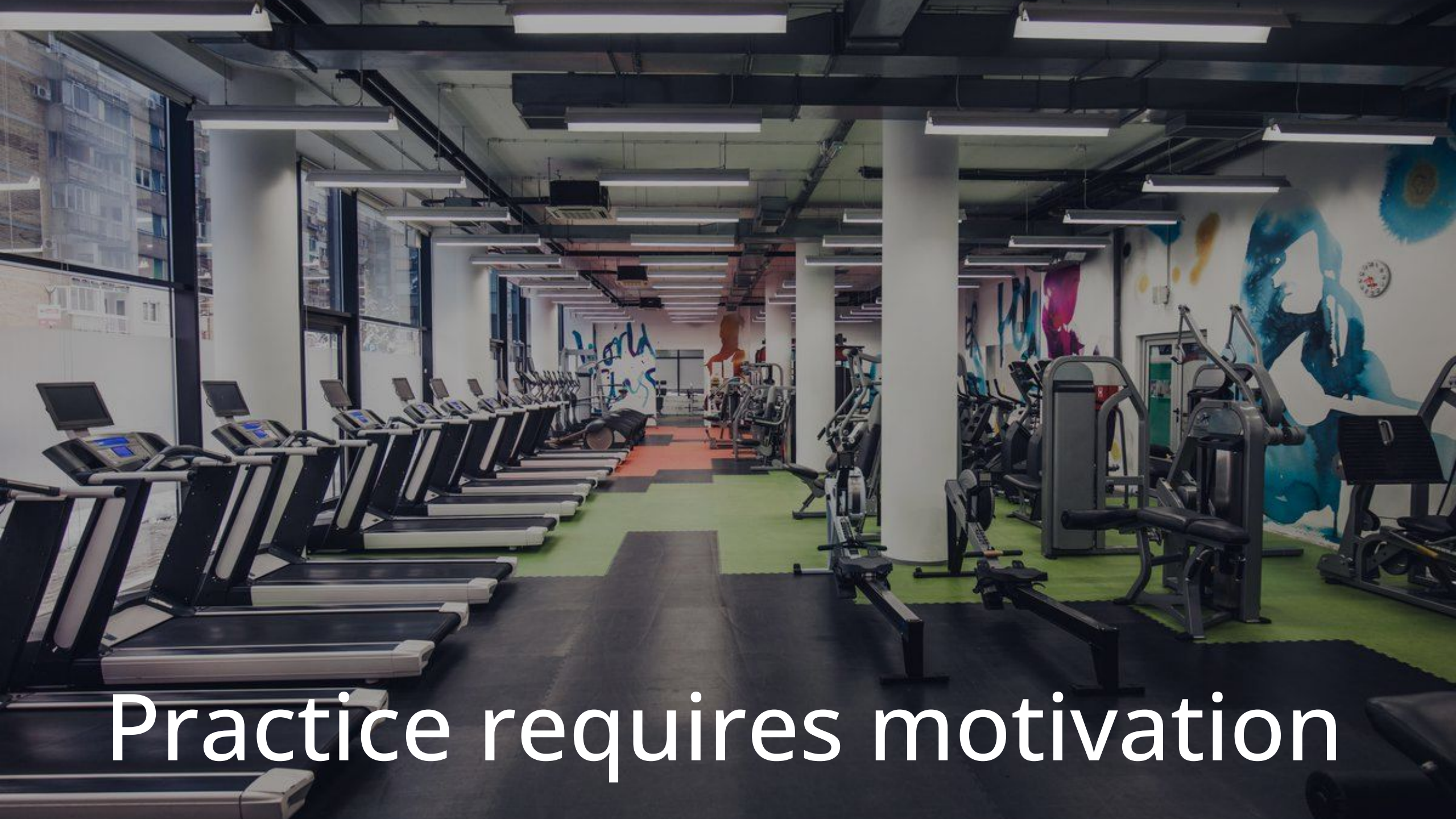
What about online courses?

<

12.6% of students complete MOOCs

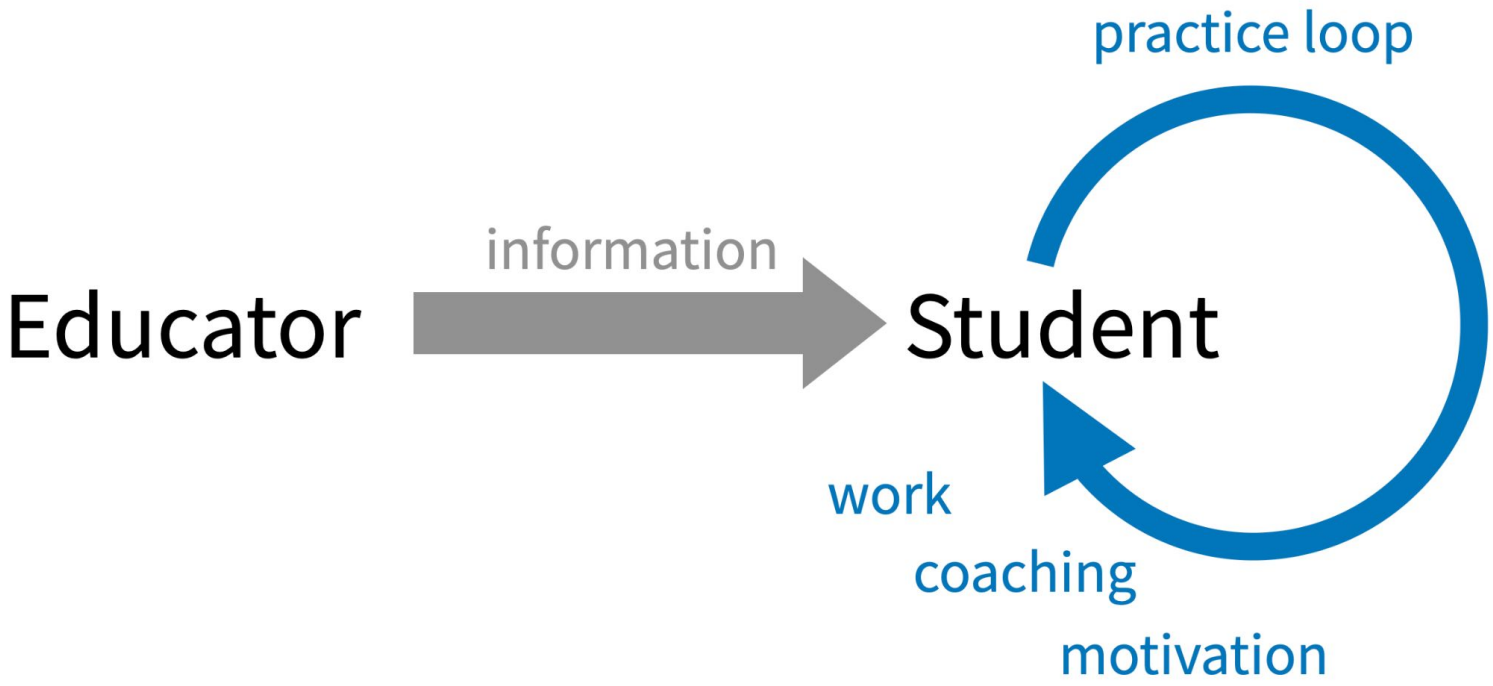


- Jordan, K. (2015) Massive Open Online Course Completion Rates Revisited: Assessment, Length and Attrition. International Review of Research in Open and Distributed Learning, 16(3), 341-358.



Practice requires motivation

information
Educator
Student


practice loop
information
Educator
Student
work
coaching
motivation

>

So how do humans learn skills?

<

Apprenticeships
Internships
Residencies
Coaching

posit

>

How should your analysts learn data science / code / R / python?

<

Your Academy mentor

Brendan Cullen
Data Science Mentor

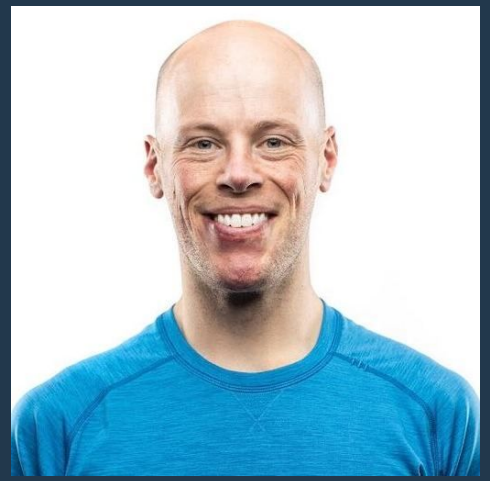
Your Academy groupmates

Jordan Creed
Clinical Trials

Grace Lawley
Clinical Trials

Aaron Coyner
Pharmacokinetics

Kristin Bott
Scientist



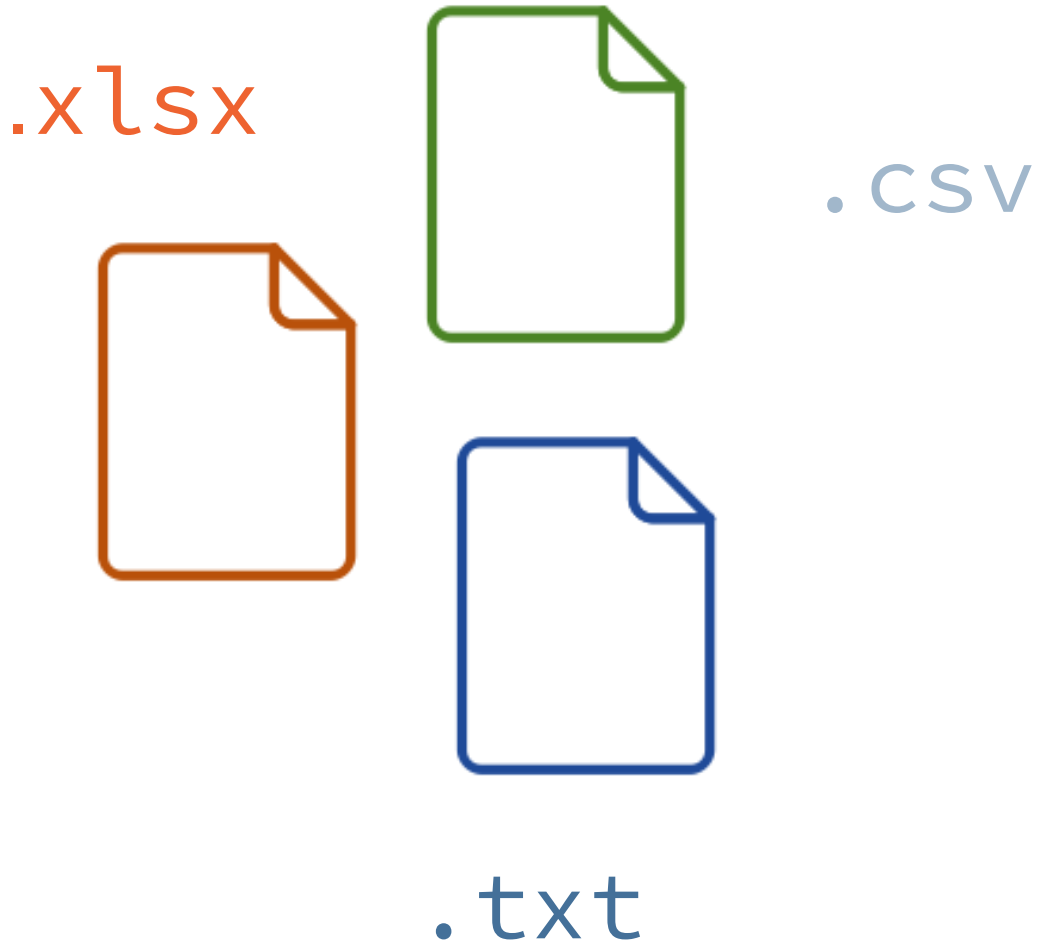
Ryan Johnson
Trials Coordinator

Your Academy project

Comparing Asthma Treatments

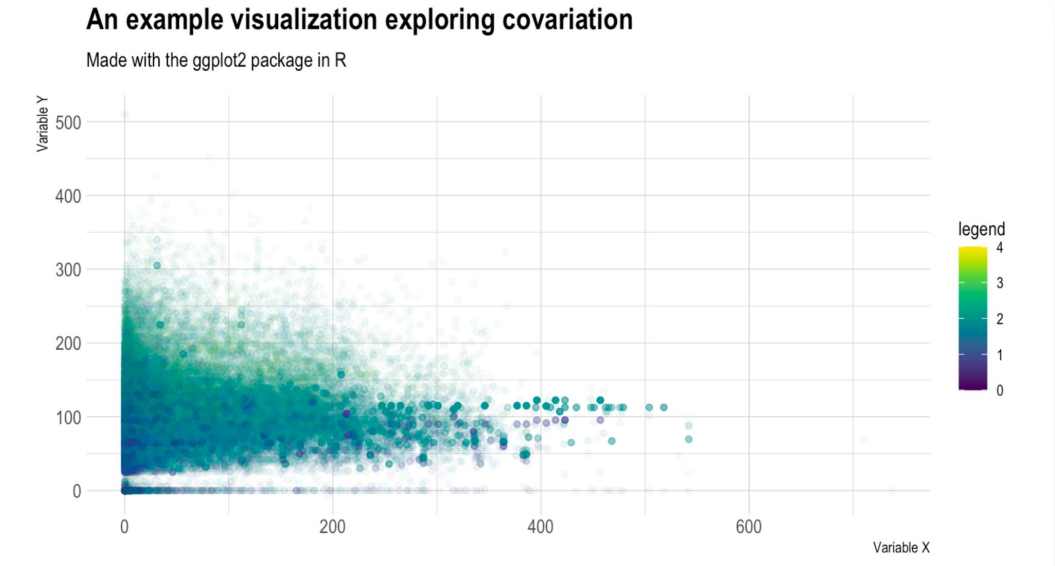
Analyzing data from a randomized clinical trial

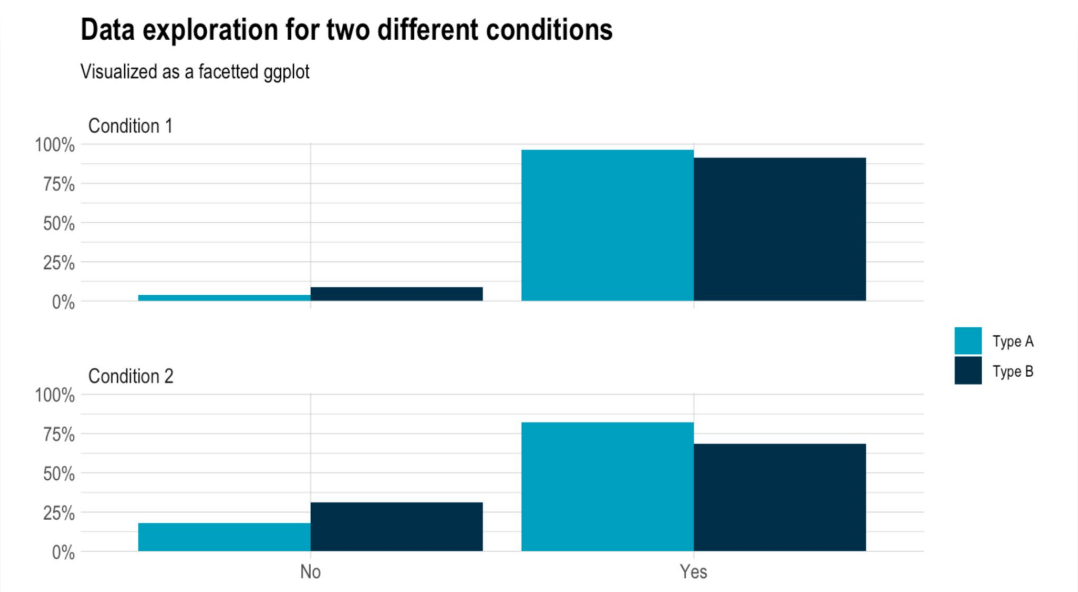
Import familiar data types



PROJECT COMPONENTS

Explore the data





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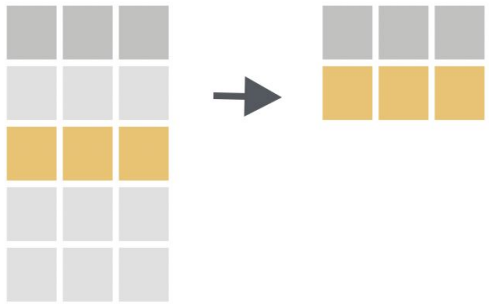
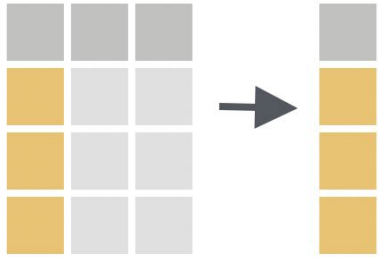
PROJECT COMPONENTS

Wrangle & analyze

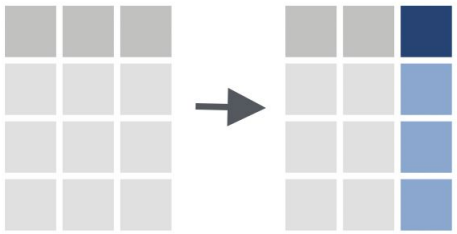
Extract specific observations



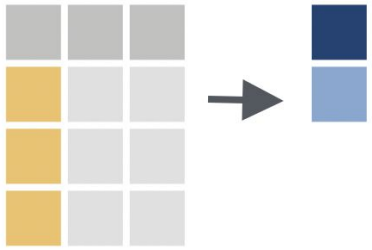
Remove distracting columns



Compute new variables

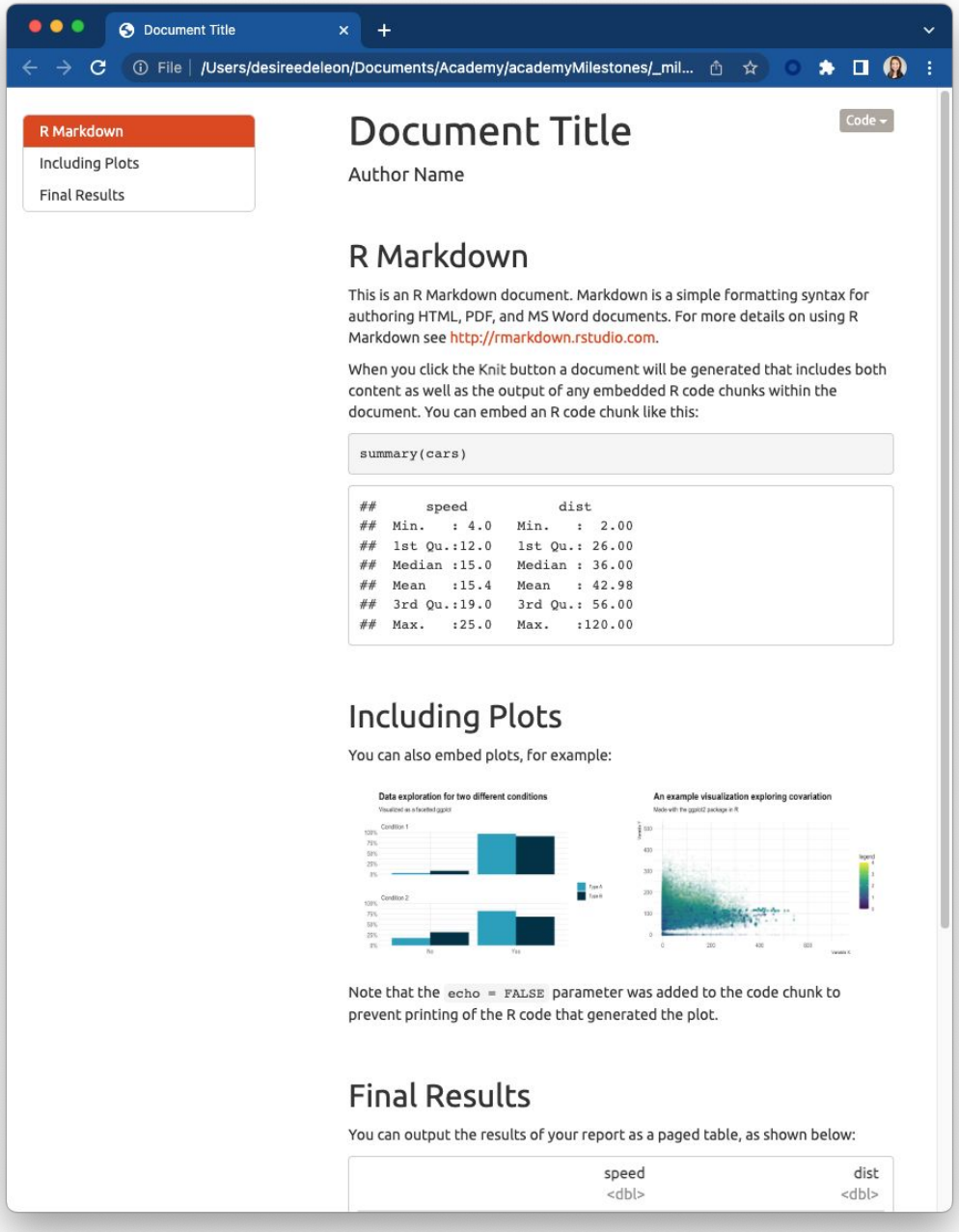


Summarize cases



PROJECT COMPONENTS

Summarize & communicate



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How will you accomplish the project? 🛠

10 progressive milestones

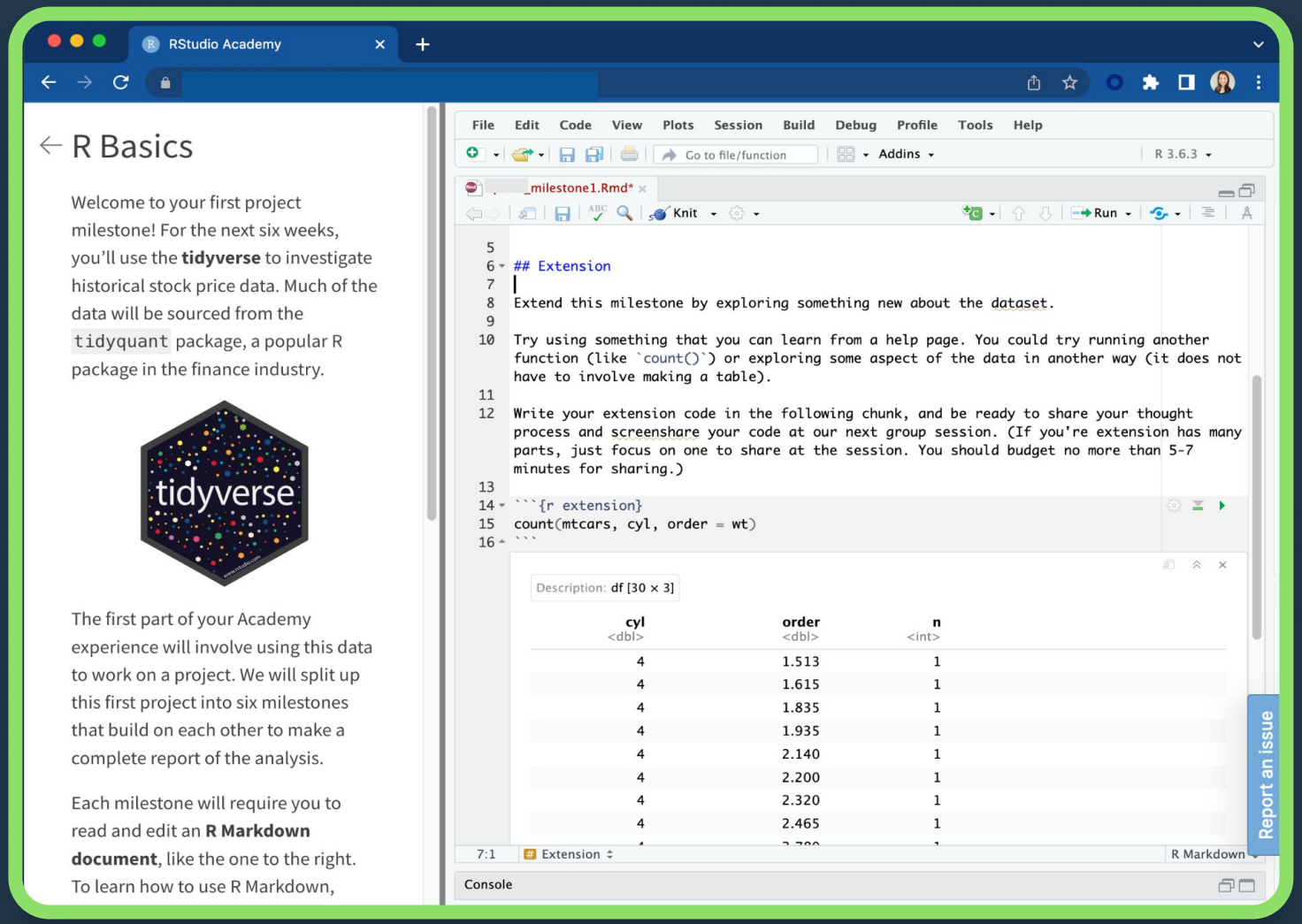
Your Academy project

Import | Explore | Wrangle | Model | Report

Your Academy project

Your Academy project

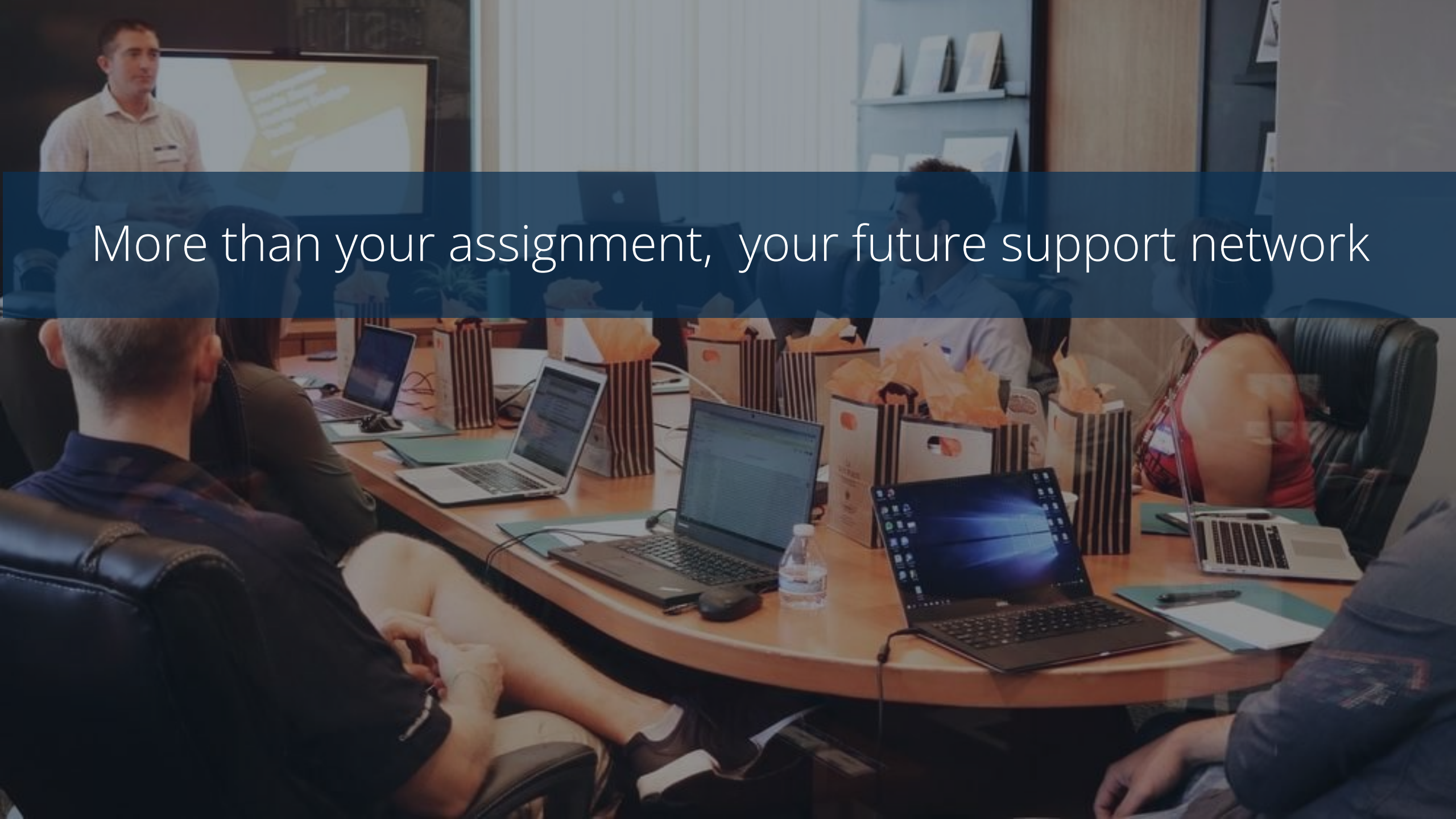
Group Sessions


RStudio Academy
R Basics
Welcome to your first project milestone! For the next six weeks, you'll use the **tidyverse** to investigate historical stock price data. Much of the data will be sourced from the `tidyquant` package, a popular R package in the finance industry.
tidyverse
The first part of your Academy experience will involve using this data to work on a project. We will split up this first project into six milestones that build on each other to make a complete report of the analysis.
Each milestone will require you to read and edit an **R Markdown document**, like the one to the right. To learn how to use R Markdown,
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
R 3.6.3
_milestone1.Rmd*
Knit
Run
Extension
Extend this milestone by exploring something new about the dataset.
Try using something that you can learn from a help page. You could try running another function (like `count()`) or exploring some aspect of the data in another way (it does not have to involve making a table).
Write your extension code in the following chunk, and be ready to share your thought process and screenshare your code at our next group session. (If you're extension has many parts, just focus on one to share at the session. You should budget no more than 5-7 minutes for sharing.)
```{r extension}
count(mtcars, cyl, order = wt)
```
Description: df [30 × 3]
cyl <dbl> | order <dbl> | n <int>
4 | 1.513 | 1
4 | 1.615 | 1
4 | 1.835 | 1
4 | 1.935 | 1
4 | 2.140 | 1
4 | 2.200 | 1
4 | 2.320 | 1
4 | 2.465 | 1
Report an issue
7:1
Extension
R Markdown
Console

Meryl Streep

Dwayne Johnson

Justin T



More than your assignment, your future support network

Your Academy project

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1. Do tutorials

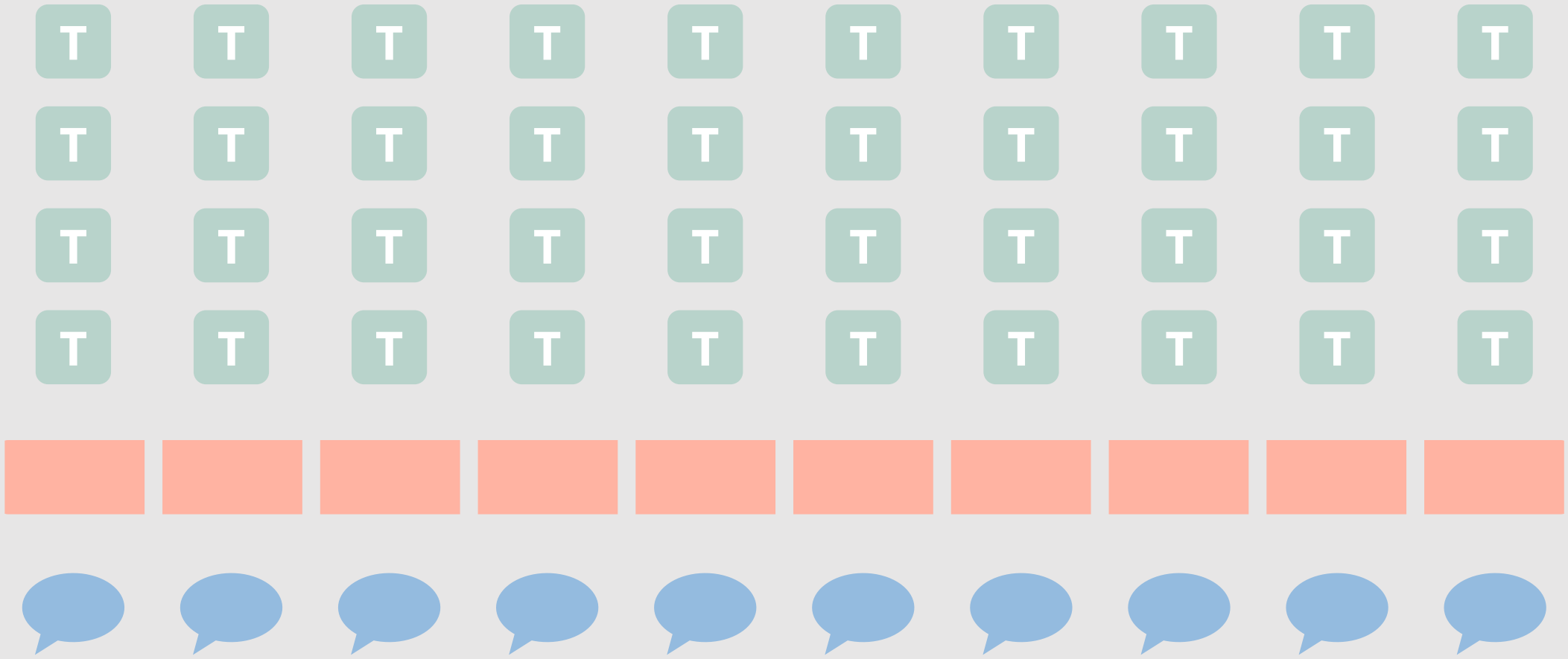
   Coworking

   Slack

2. Complete and personalize milestone

3. Present to group

Your Academy project



>

Does it work?

<

Yes.

~ 600 students so far

~ 95% Completion rate

Keith Wikle · 2nd

Senior Business Analyst Enterprise Analytics at Kellogg Company

Kalamazoo, Michigan, United States · Contact info

500+ connections

Kellogg Company

Michigan State University

Keith Wikle • 2nd

Senior Business Analyst Enterprise Analytics at...

1w •

+ Follow •••

Over the last 9-10 Weeks. **Kellogg Company** created the opportunity for two classes of our Analytics Team to participate in **Posit PBC** Academy. There were a few absolute newbies in the courses like myself. It was an absolute privilege to take part. It was a huge challenge as I hadn't done any scripted programming since about 2003. But with the help of several amazing colleagues, and the Posit team it made for a very rewarding experience.

https://lnkd.in/gy_sJDA6

"Surveying them **6 months** after they left Academy, we found that **16 out of 17** of survey respondents were still writing code at least once per month, or more frequently."

JAMES WADE

DOW®

RSTUDIO ENTERPRISE MEETUP

RStudio

posit™

Thank you.