

# Frictionless onboarding to data science with



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Mine Çetinkaya-Rundel  
Duke University + RStudio

## don't start like this

- Install R
- Install RStudio
- Install the following packages
  - rmarkdown
  - tidyverse
  - shiny
- Load these packages
- install git

## start like this

- Go to [rstudio.cloud](https://rstudio.cloud)
  - Log in
- > hello R!

*tidy*

# what are R and RStudio?



statistical  
programming  
language

**R: Engine**



**Studio**<sup>®</sup> integrated  
development  
environment for R

**RStudio: Dashboard**

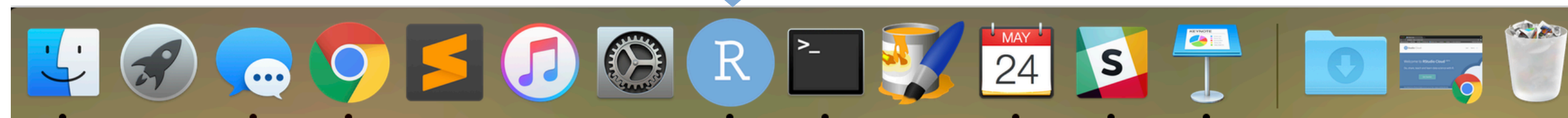
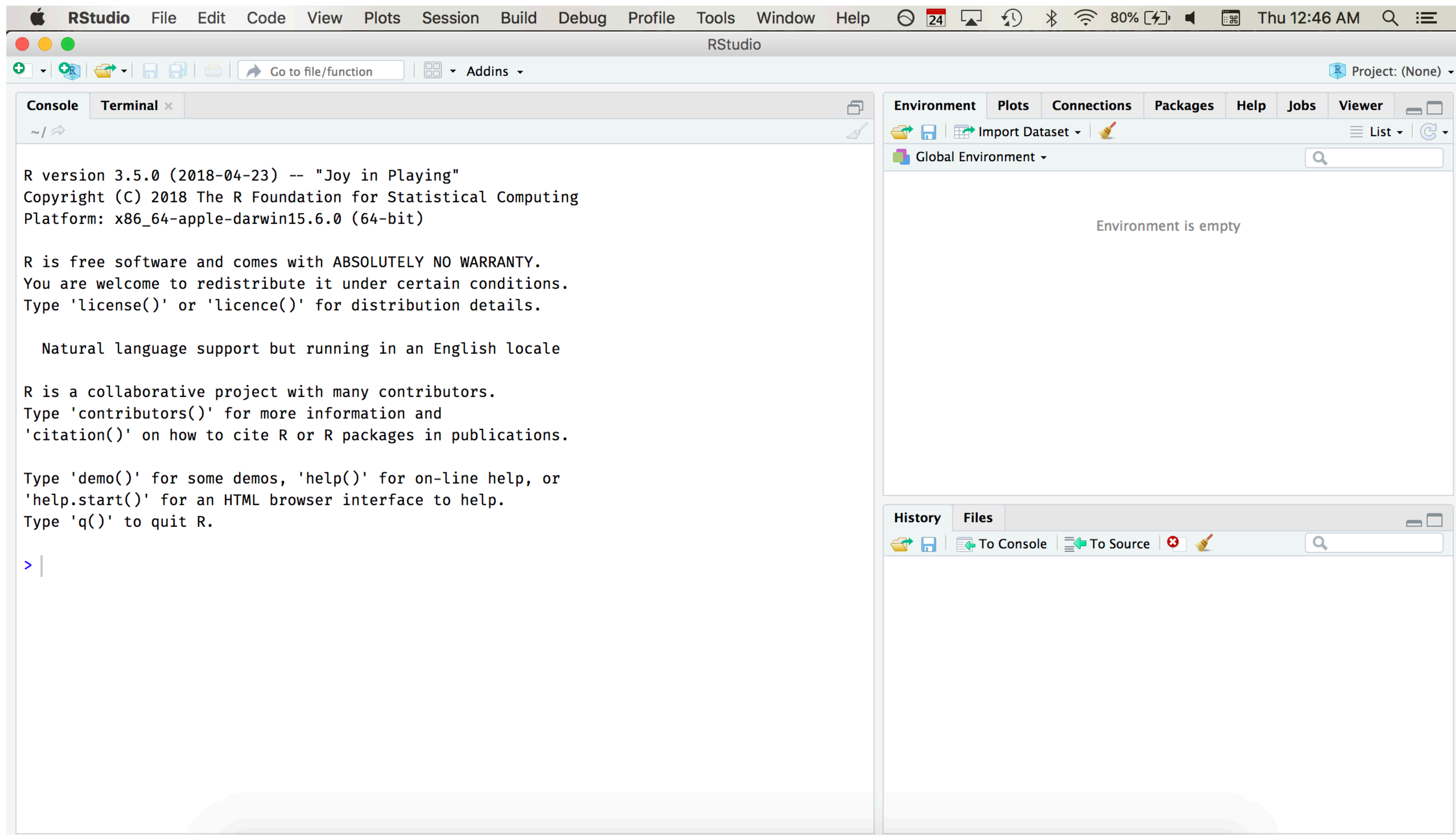


# what is RStudio Cloud?



makes it easy for professionals, hobbyists, trainers, teachers, and students to do, share, teach, and learn data science using R





Chrome File Edit View History Bookmarks People Window Help

Secure | <https://rstudio.cloud/project/38096>

Your Workspace / Untitled Project Click to name your project

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins R 3.4.4

Console Terminal x

/cloud/project/

R version 3.4.4 (2018-03-15) -- "Someone to Lean On"  
Copyright (C) 2018 The R Foundation for Statistical Computing  
Platform: x86\_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.

>

Environment History Connections

Import Dataset

Global Environment

Environment is empty

Files Plots Packages Help Viewer

New Folder Upload Delete Rename More

/ > cloud > project

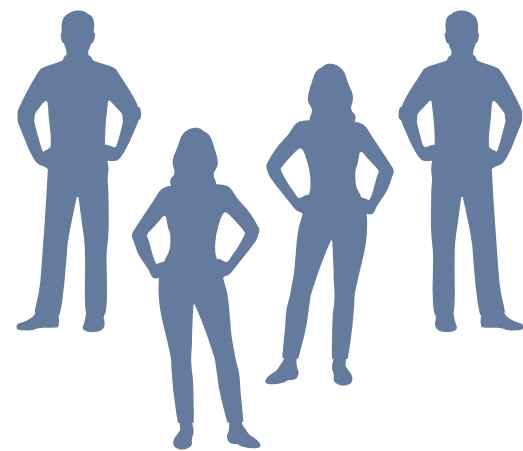
	Name	Size	Modified
↑	..		
📄	.Rhistory	0 B	May 24, 2018, 12:40 AM
📁	project.Rproj	205 B	May 24, 2018, 12:40 AM



# context



intro data science

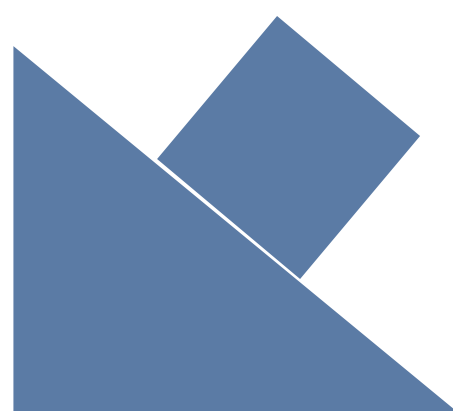


students with little to no background in stats,  
data science, programming



R as a data science (not programming) language

# why RStudio in the cloud?



reduce friction at first exposure to R



avoid local installation



install R and RStudio on a server and provide access to students:

- Centralized RStudio server
- Dockerized RStudio server
- RStudio Cloud

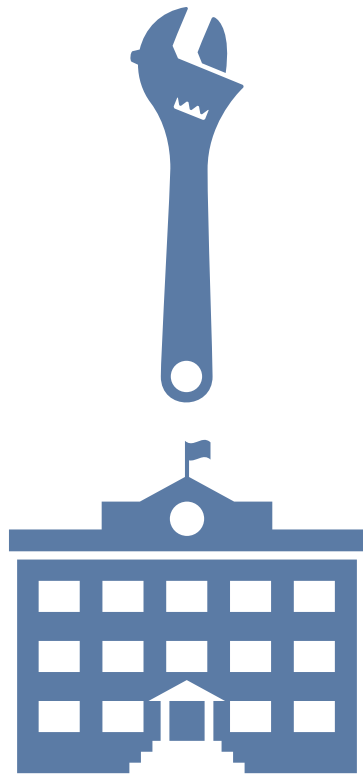
Çetinkaya-Rundel, Mine, and Rundel, Colin. "Infrastructure and tools for teaching computing throughout the statistical curriculum." The American Statistician (2018). Part of the Practical Data Science for Stats collection.

this talk 😊





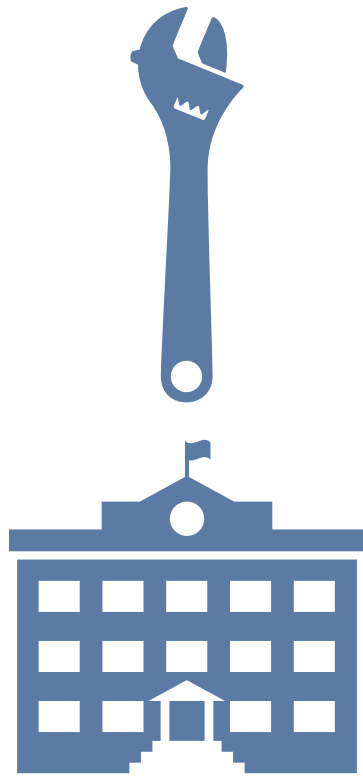
# why RStudio Cloud?



does not require IT support

features designed for instructors:

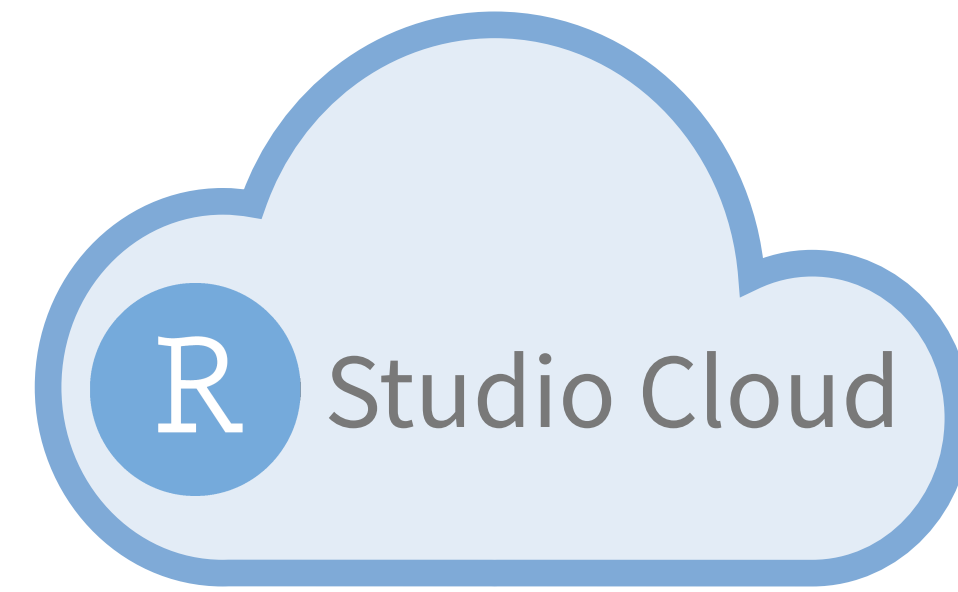
# why RStudio Cloud?



does not require IT support

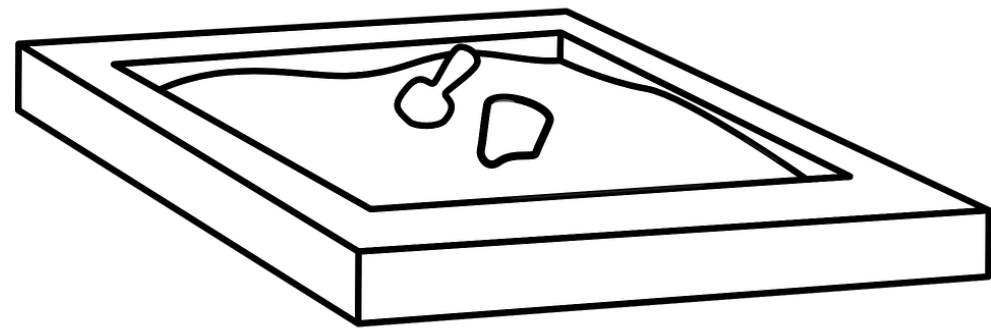
features designed for instructors:

- classes can be organized in workspaces
- members can be assigned different roles: instructor, TA, student
- projects can be public or private
- students can make copies of projects created by instructor
- instructor can peek into student projects
- a base project template can ensure same packages in each new project created in the workspace
- git integration
- interactive learning with built-in **learnr** primers

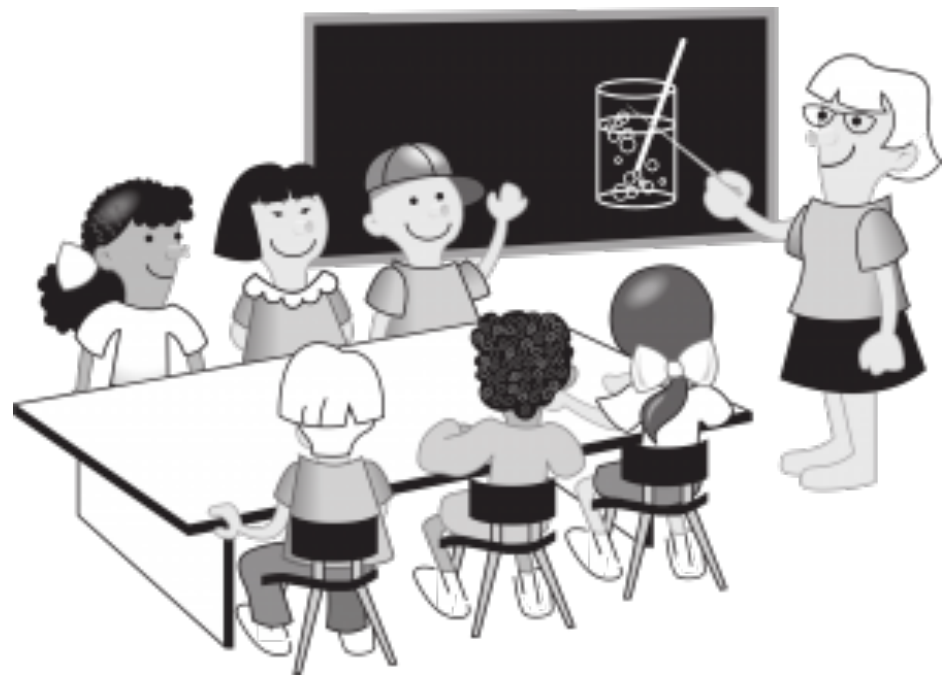


**[bit.ly/ecots2018-cloud](https://bit.ly/ecots2018-cloud)**

# workspaces



when you create an account on RStudio Cloud you get a workspace of your own - projects you create here are public



you can add a new workspace and control its permissions - projects you create here can be public or private



# permissions

**admin** manage users, view, edit and manage all projects **instructor**

**moderator** view, edit and manage all projects **TA**

**contributor** create, edit and manage their own projects **student**

**viewer** view projects shared with everyone **auditor**


# getting students into class workspace


## Access

☐ Invitation required  
Add specific members to the space by sending invitations.

☒ Shared  
Anyone with the sharing link can access the space.

Initial Role (i)

**Contributor** 

 Copy Sharing Link

after drop/add switch over to this access level, use invitations for visitors added mid-semester

make workspace shared for a short period of time, share link with students, enroll them as contributors

## Permissions

- ☒ Contributors can see the Members list
- ☐ Viewers can see the Members list

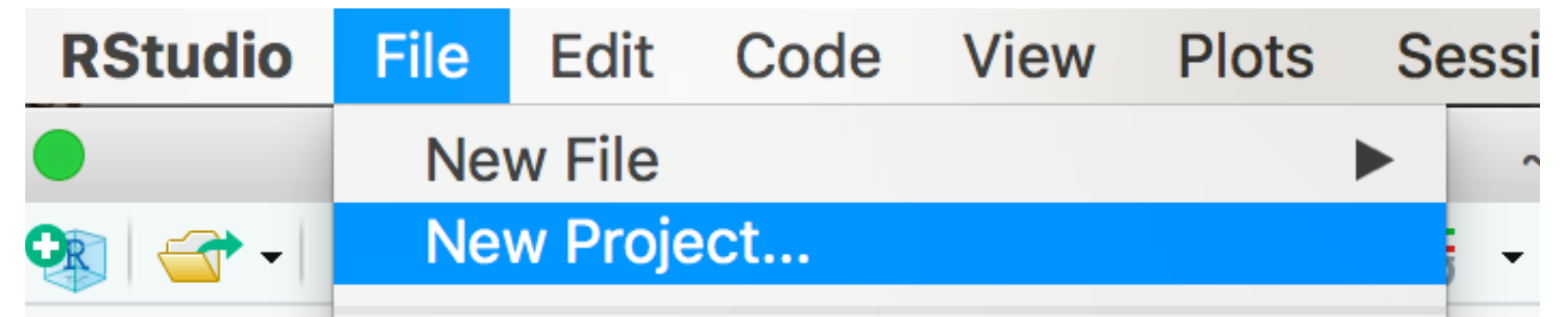
if you're ok with students seeing other students' names on the list but don't want your visitors seeing your roster

# projects

a new project in RStudio Cloud

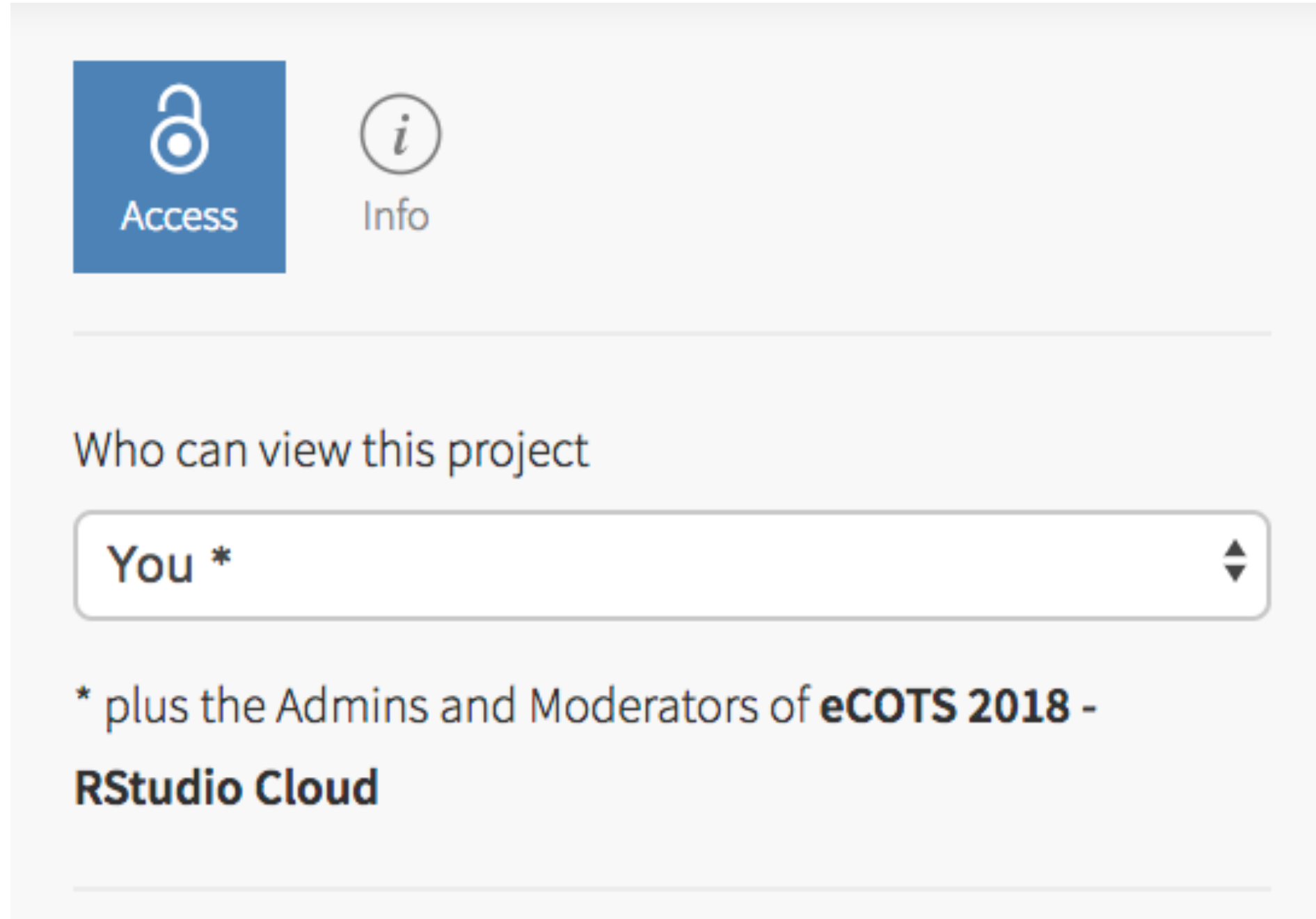


is a new project in RStudio



If you use RStudio, use projects! Trust me, you won't regret it. Find out more at [r4ds.had.co.nz/workflow-projects.html](https://r4ds.had.co.nz/workflow-projects.html).

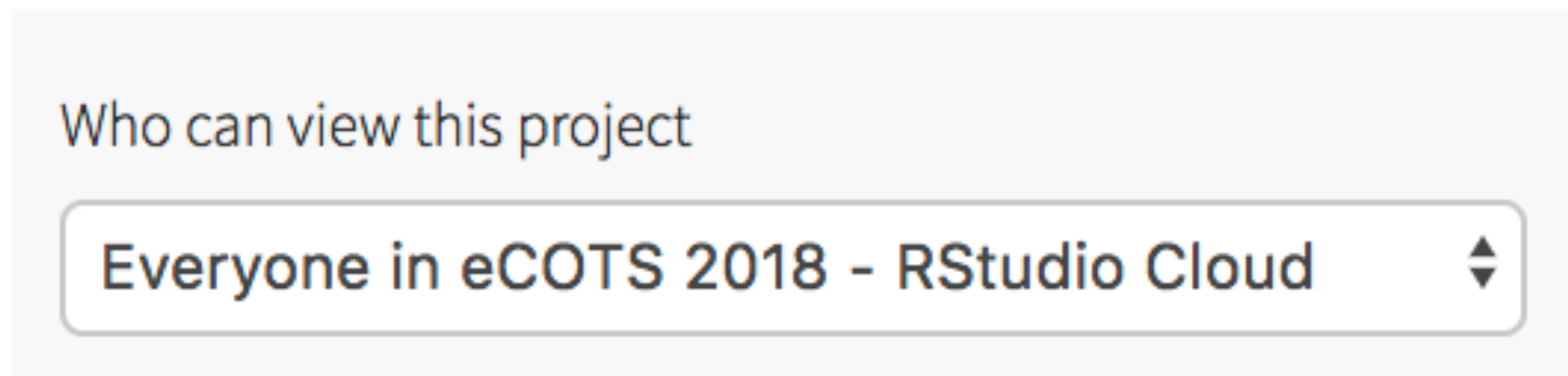
# sharing projects



The screenshot shows the 'Access' tab of a project in RStudio Cloud. At the top, there are two icons: a blue square with a white padlock icon labeled 'Access' and a circle with an 'i' icon labeled 'Info'. Below these, the text 'Who can view this project' is followed by a dropdown menu currently showing 'You \*'. A footnote below the dropdown states: '\* plus the Admins and Moderators of **eCOTS 2018 - RStudio Cloud**'.

by default, projects in a workspace are visible to you (+ admins and moderators only)

+ students can't see each others' projects



This screenshot shows the same 'Access' tab interface, but the dropdown menu now displays 'Everyone in eCOTS 2018 - RStudio Cloud'.

change permissions to make your projects visible to students



# copying a project

≡ ECOTS 2018 - RStudio Cloud / hello cloud

**TEMPORARY**



Save a Permanent Copy



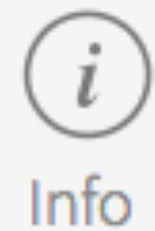
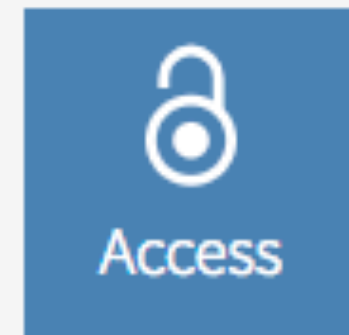
Student Mine

when a student clicks on your shared project, they are notified that this is a temporary copy, and are given the option to make their own copy, including all starter documents and code + installed packages



make a second account for yourself and add as contributor (student) to see what your students see

# viewing student projects



Who can view this project

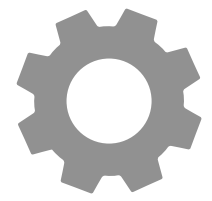
You \*

\* plus the Admins and Moderators of **eCOTS 2018 - RStudio Cloud**

soon students won't be able to make their projects visible to other students

instructor and TAs can view student projects

# base project template



## Space Settings

Name

eCOTS 2018 - RStudio Cloud

Base project template



none



Save

## Set Base Project Template



Select the project to use

none

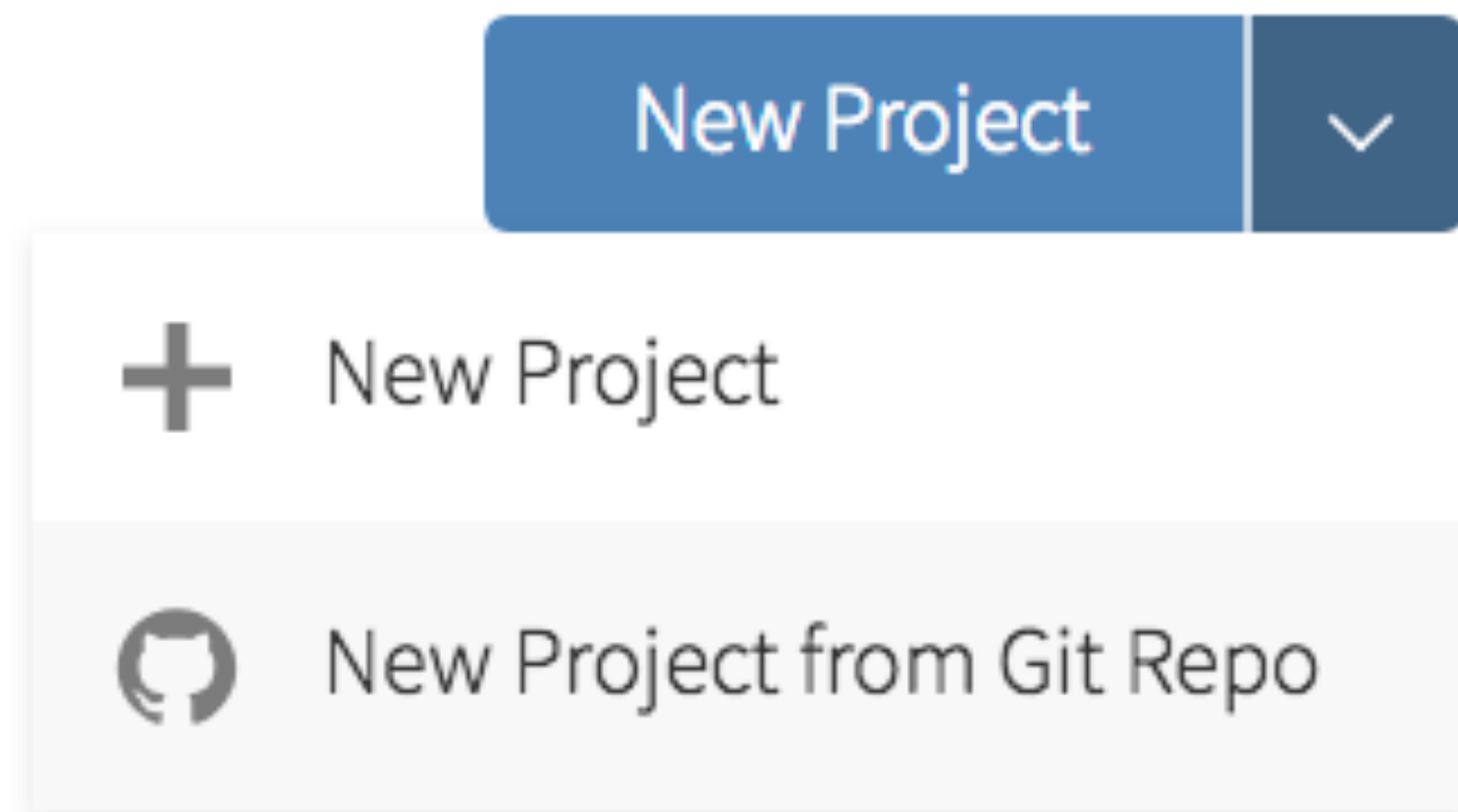
hello cloud

If you don't see the project you're looking for listed above, make sure that you have set its access to 'Everyone in eCOTS 2018 - RStudio Cloud'.

OK

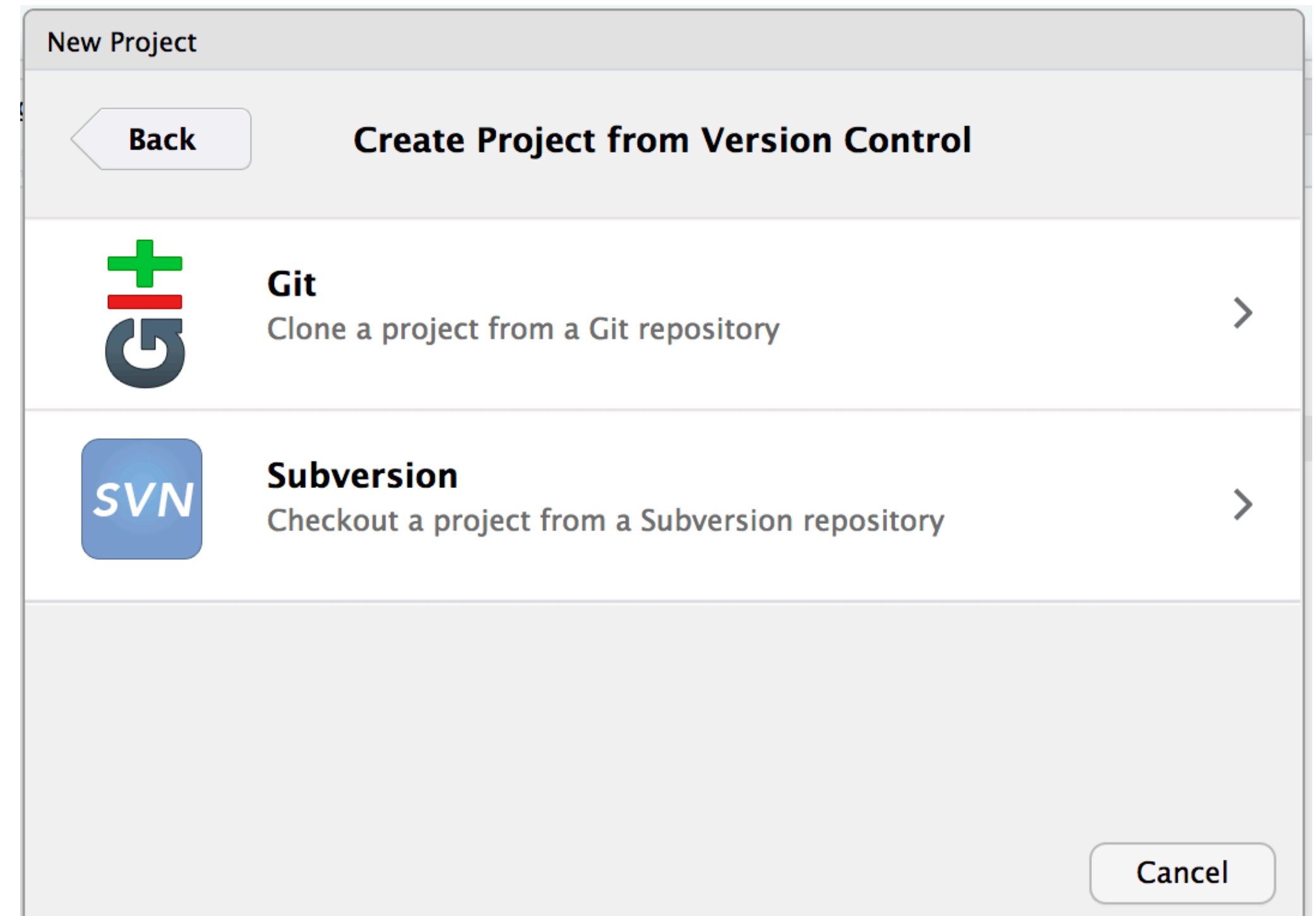
# git integration

a new project from Git Repo  
in RStudio Cloud



+ base project template is used, so new project from git also has the right packages installed!

is creating (cloning) a project  
from a Git repository RStudio





# built-in `learnr` primers

☰ Your Workspace

📁 DataCamp Projects

📖 Info

Learn



Mine Çetinkaya-Rundel

## Studio Primers

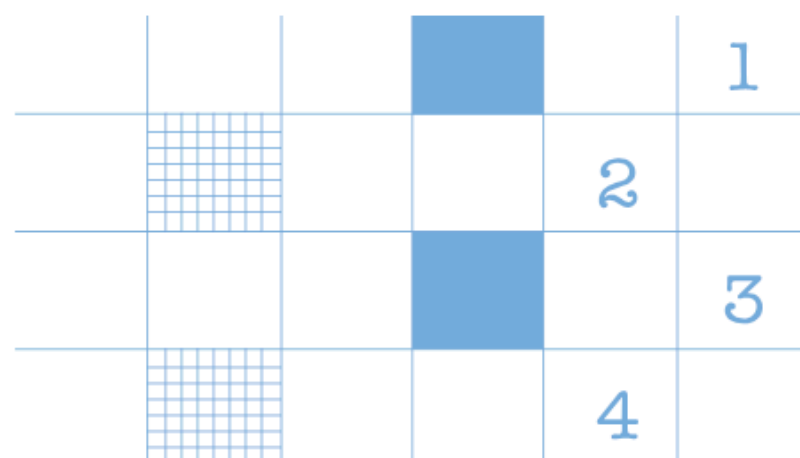
Learn data science basics with the interactive tutorials below.

### The Basics



Start here to learn the skills that you will rely on in every analysis (and every primer that follows): how to inspect, visualize, subset, and transform your data, as well as how to run code.

### Work with Data



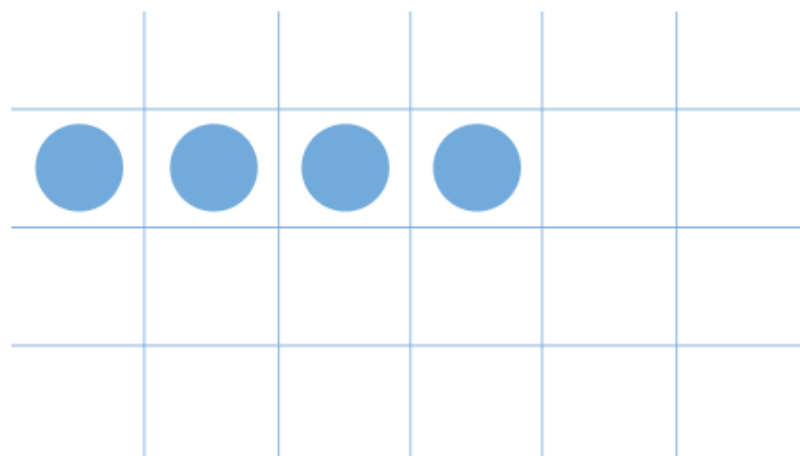
Learn the most important data handling skills in R: how to extract values from a table, subset tables, calculate summary statistics, and derive new variables.

### Visualize Data



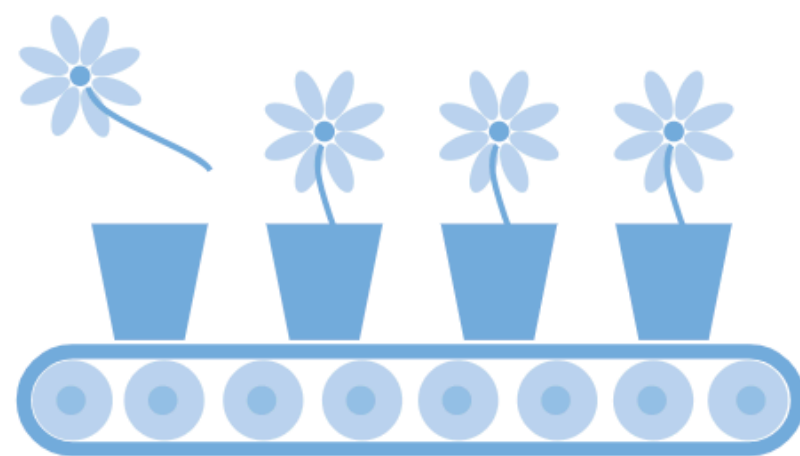
Learn how to use `ggplot2` to make any type of plot with your data. Then learn the best ways to visualize patterns within values and relationships between variables.

### Tidy Your Data



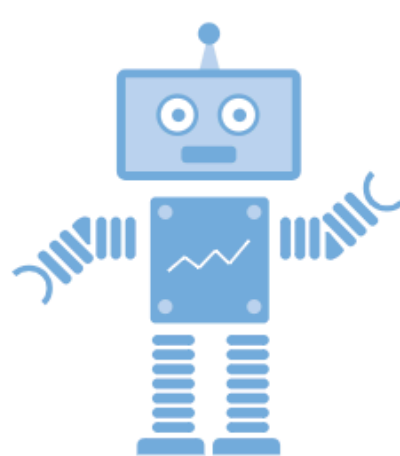
Unlock the tidyverse by learning how to make and use tidy data, the data format designed for R.

### Iterate



Master a core programming paradigm with the `purrr` package: for each \_\_\_\_ do \_\_\_\_.

### Automate Tasks



COMING  
SOON

Functions are the key to programming in R. This primer will teach you how to write and use them.

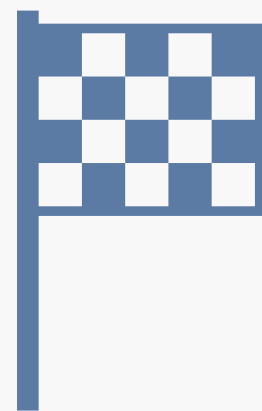
# limits



each project is allocated 1GB of RAM



test things out before assignments  
involving large datasets



each account is allocated one private space,  
with up to 3 members and 5 projects



you can submit a request to the RStudio  
Cloud team for more capacity

# parting remark

A large, bold, orange alpha symbol (α) is positioned on the left side of the slide, serving as a visual indicator for the 'WORK IN PROGRESS' section.

## WORK IN PROGRESS

We're in alpha and still adding important features and improving performance, reliability and availability. Please reach out with any questions or feedback at <https://community.rstudio.com/c/rstudio-cloud>.

Thank  
you!



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[bit.ly/frictionless-onboard](https://bit.ly/frictionless-onboard)

