

R

Studio Cloud in the classroom



rstd.io/cloud-classroom



@minebocek



mine-cetinkaya-rundel



mine@rstudio.com

Mine Çetinkaya-Rundel

don't start like this

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

start like this

- Go to rstudio.cloud
 - Log in
- > hello R!

rstudio.cloud

what is RStudio Cloud?



We created **RStudio Cloud** to make it easy for professionals, hobbyists, trainers, teachers, and students to do, share, teach, and learn data science using R.

RStudio

Project: (None)

Console Terminal x

R version 3.6.0 (2019-04-26) -- "Planting of a Tree"
Copyright (C) 2019 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin15.6.0 (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.

Natural language support but running in an English locale

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



R Studio Cloud

https://rstudio.cloud/project/374294

Your Workspace / Untitled Project Click to name your project

File Edit Code View Plots Session Build Debug Profile Tools Help

Console Terminal x Jobs x

/cloud/project/ ↵

```
R version 3.6.0 (2019-04-26) -- "Planting of a Tree"
Copyright (C) 2019 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (64-bit)

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'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
```

> |

Environment History Connections

Import Dataset

Global Environment

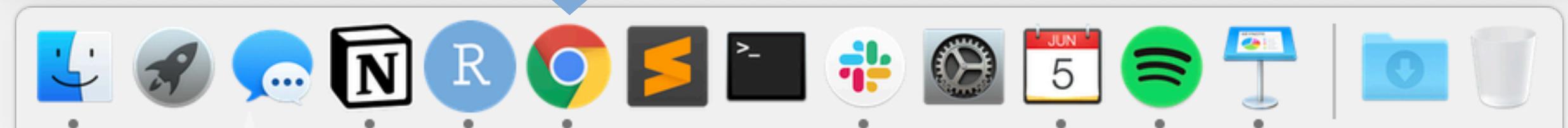
Environment is empty

Files Plots Packages Help Viewer

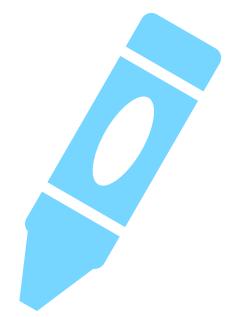
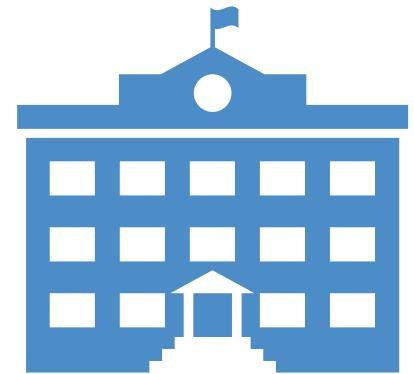
New Folder Upload Delete Rename More

Cloud > project

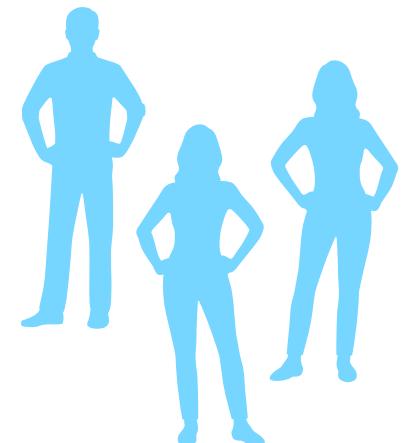
	Name	Size	Modified
..			
	.Rhistory	0 B	Jun 5, 2019, 8:32 AM
	project.Rproj	205 B	Jun 5, 2019, 8:32 AM



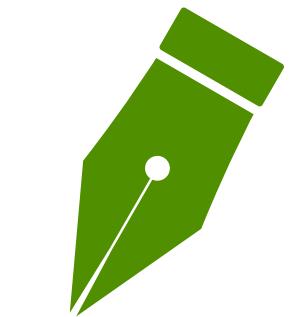
contexts



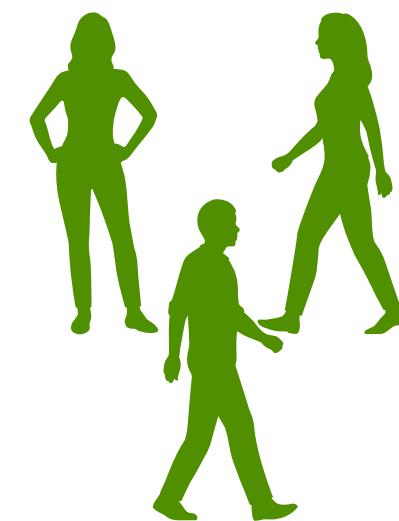
intro stat /
data science



little to no background in
stats, data science,
programming

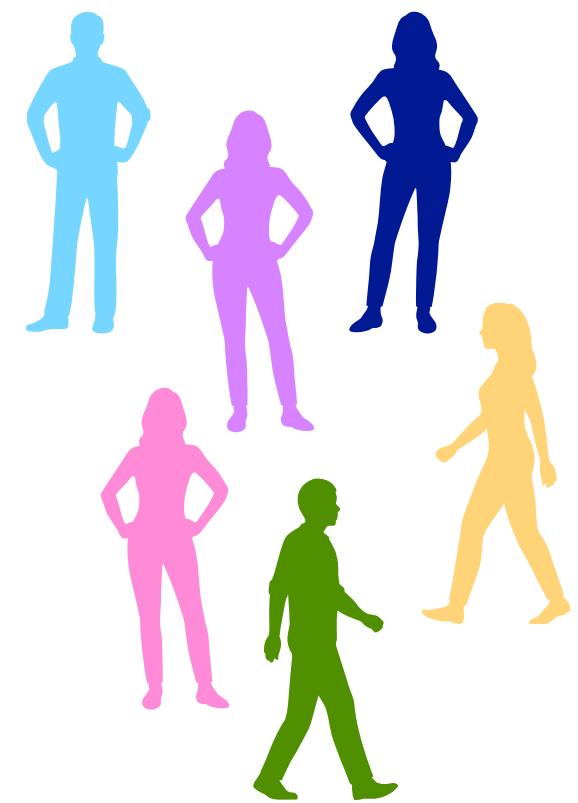


upper level stats / data
science / programming

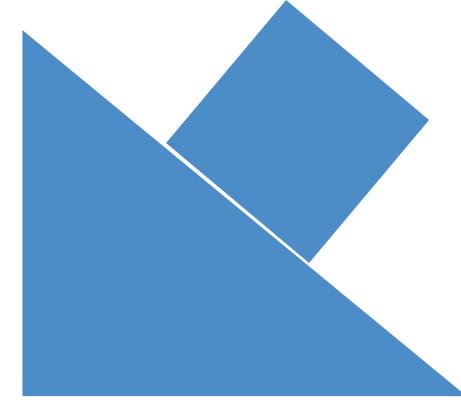


varied computing
background and different
computer setups

workshops



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:

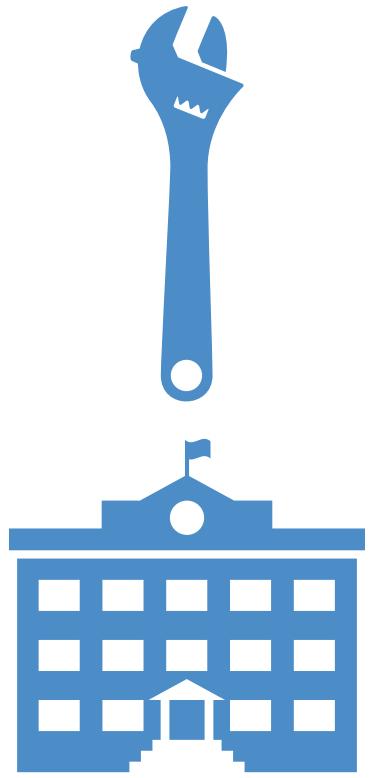
- Centralized RStudio server
- Dockerized RStudio server
- RStudio Cloud

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 webinar 😊



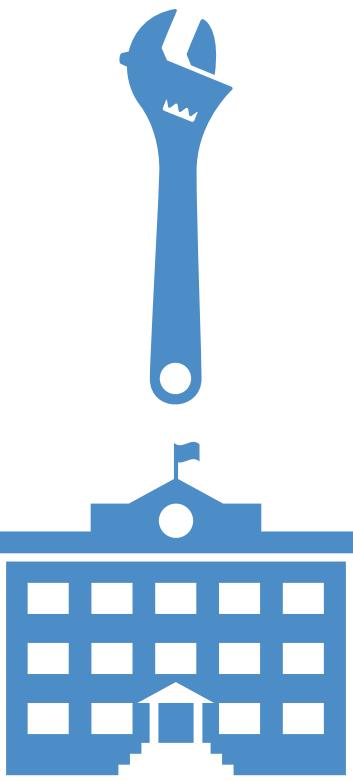
why RStudio Cloud?



does not require IT support

features designed for instructors:

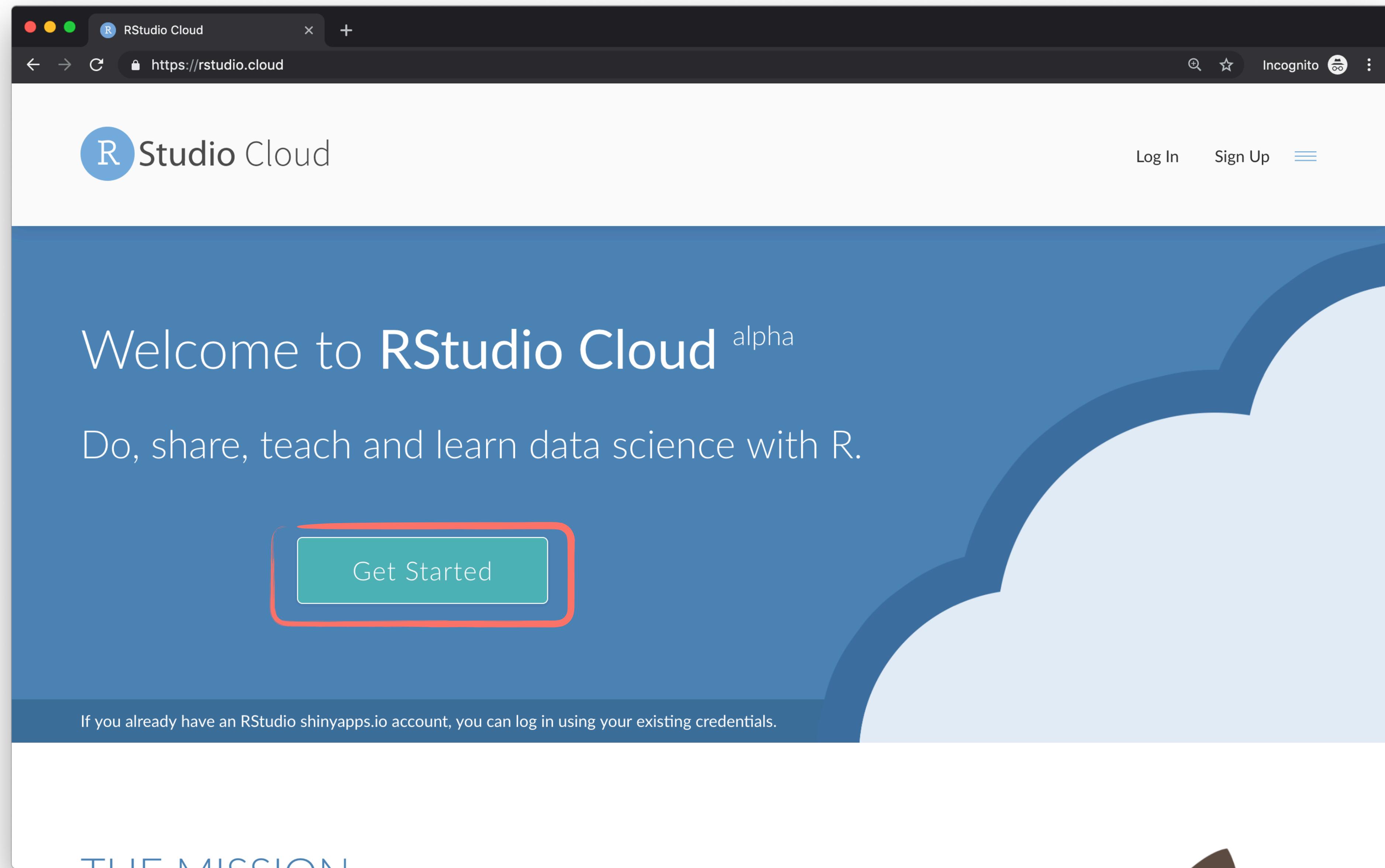
why RStudio Cloud?

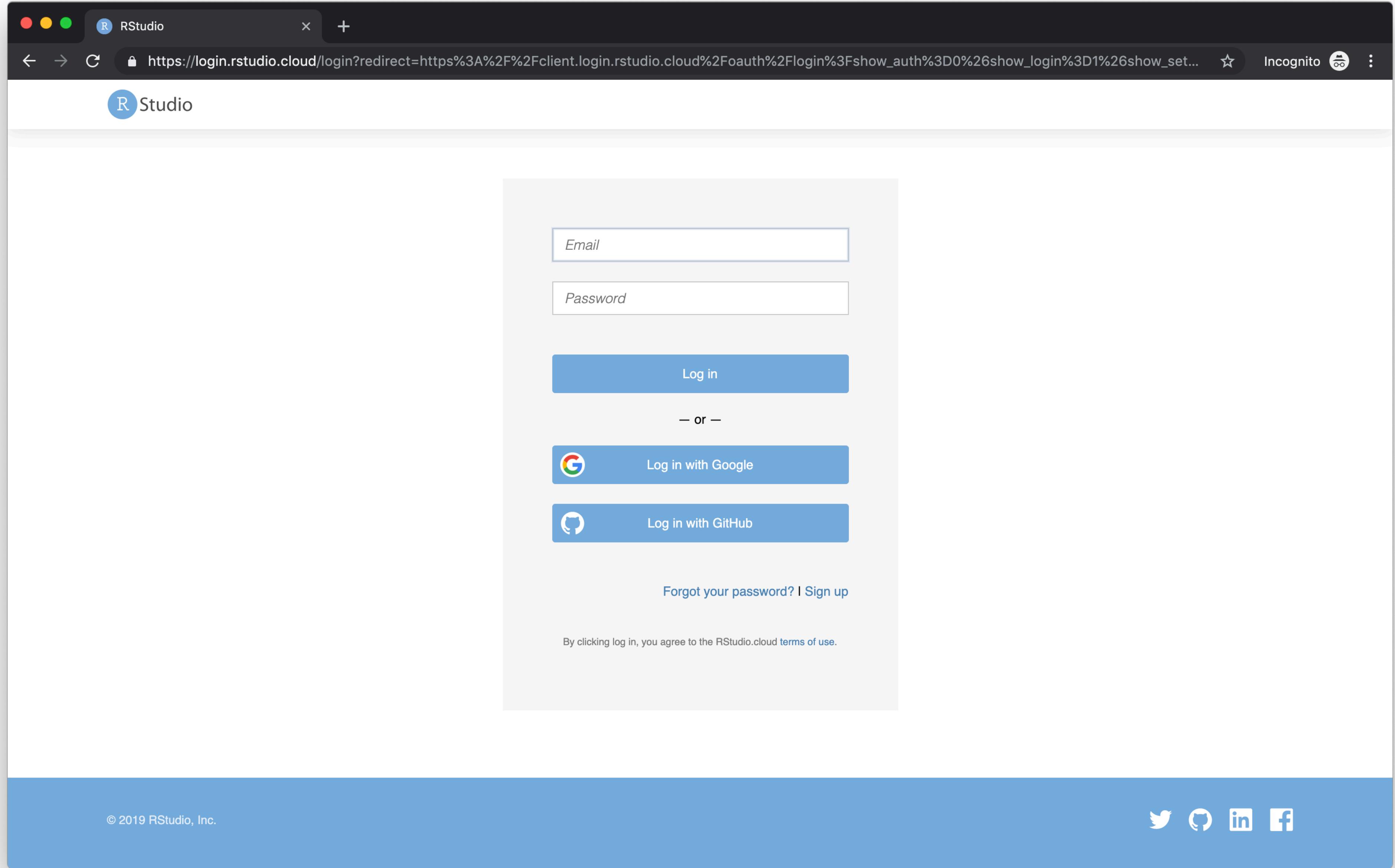


does not require IT support

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
- projects can be made into assignments
- 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 works out of the box





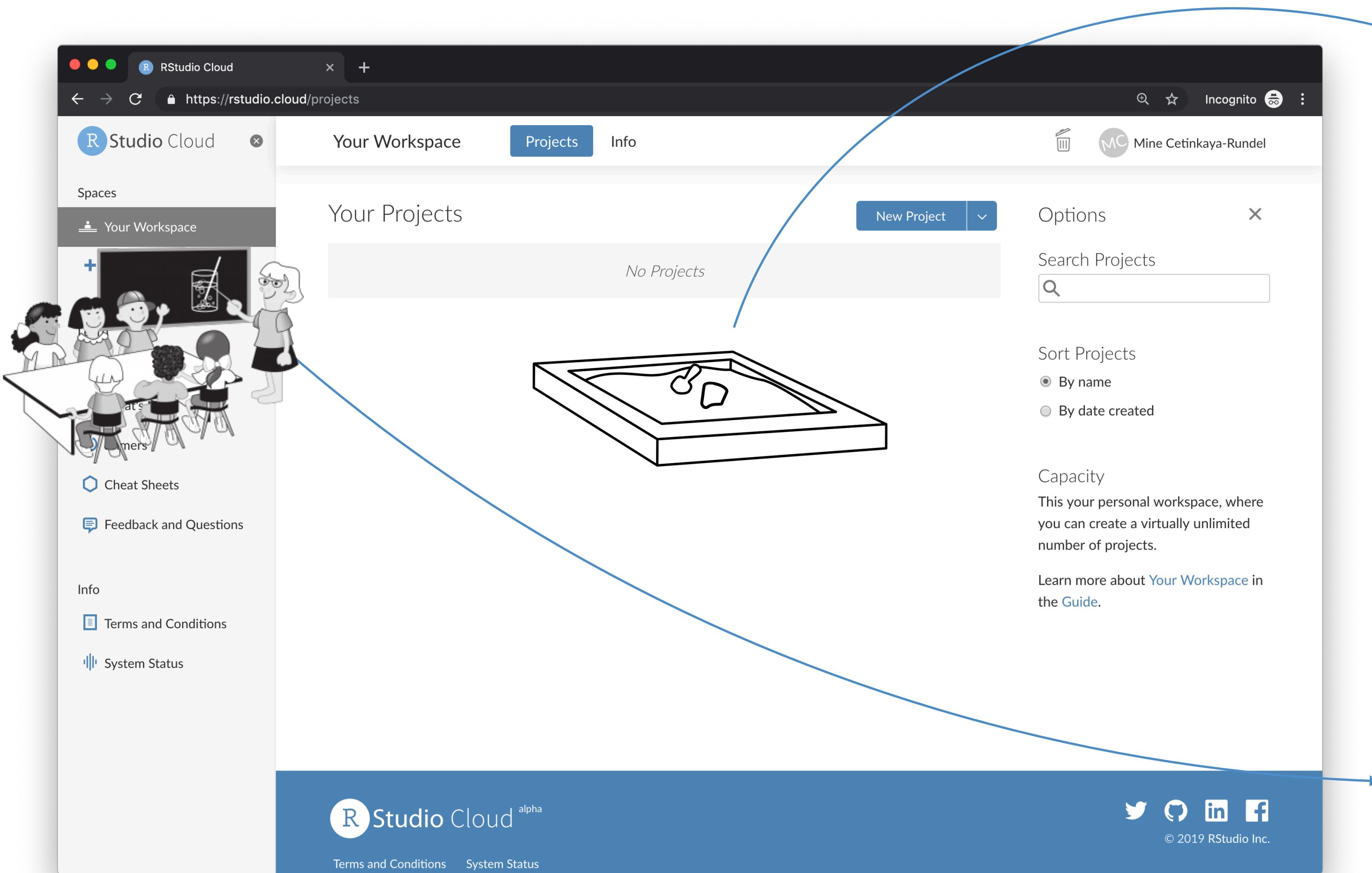
log in with Google,
GitHub, or
shinyapps.io

or create a new
account

© 2019 RStudio, Inc.



workspaces



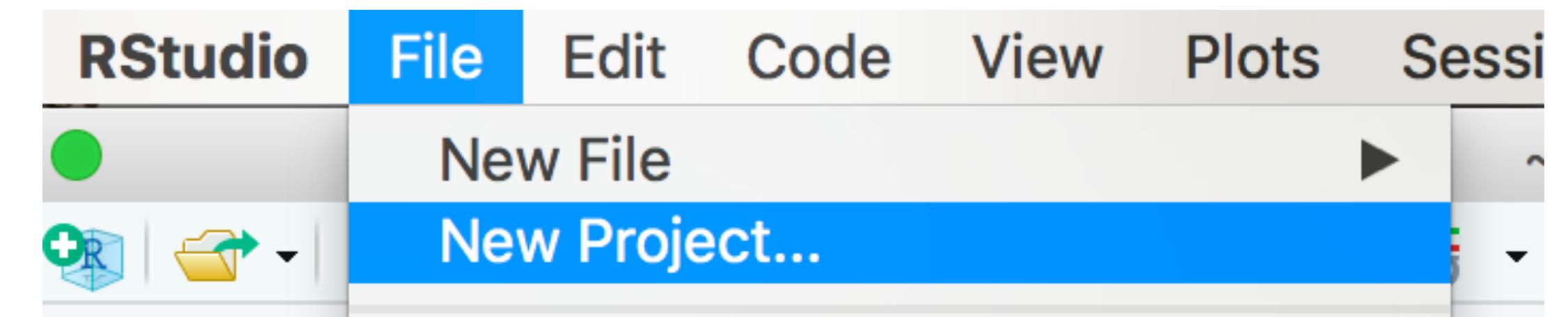
when you create an account on RStudio Cloud you get a workspace of your own - projects you create here are can be public or private

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

projects

a new project in RStudio Cloud

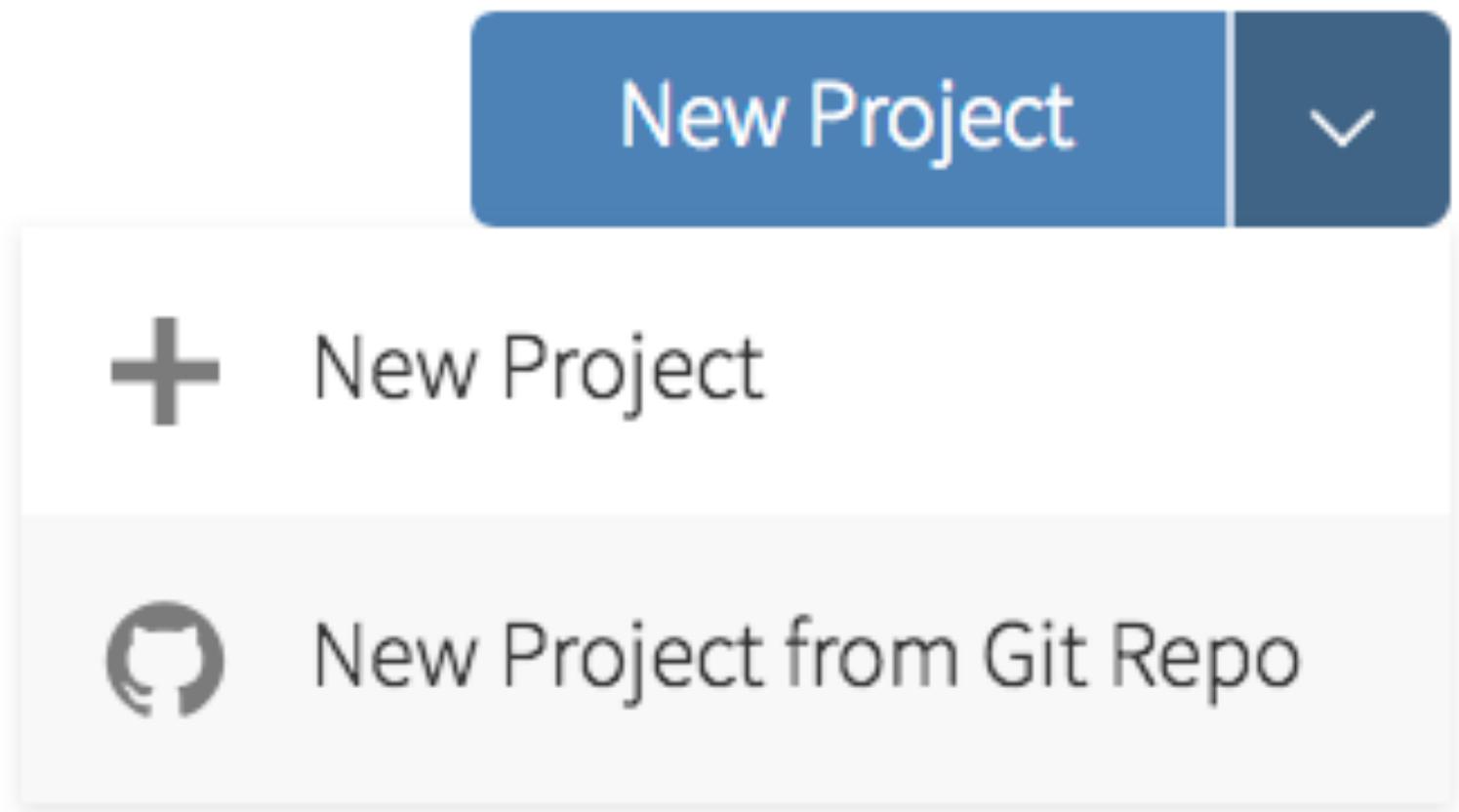
is a new project in RStudio



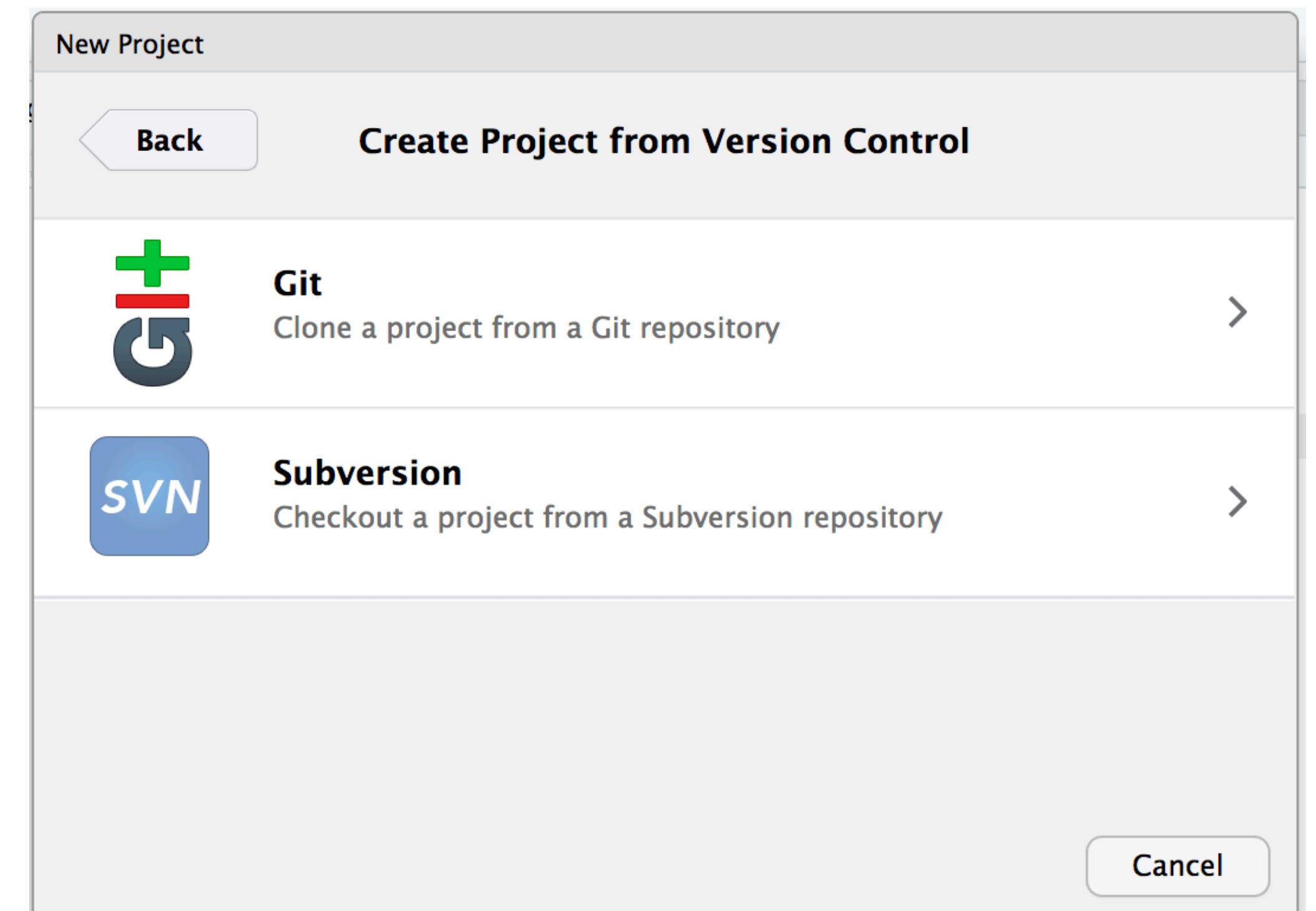
If you use RStudio, use projects! Trust me, you won't regret it.
Find out more at r4ds.had.co.nz/workflow-projects.html.

projects from git

a new project from Git Repo
in RStudio Cloud

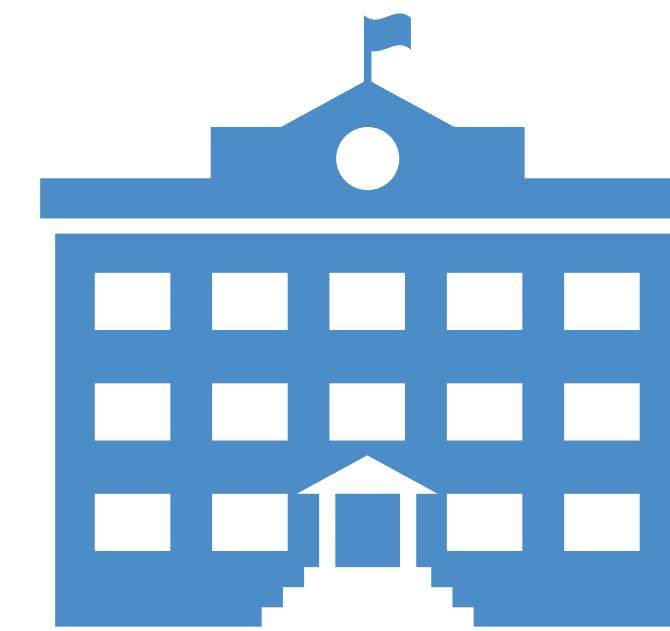


is creating (cloning) a project
from a Git repository RStudio





teaching a
short workshop



teaching a
longer course



teaching a
short workshop

teaching a
longer course



Mine CetinkayaRundel

@minebocek

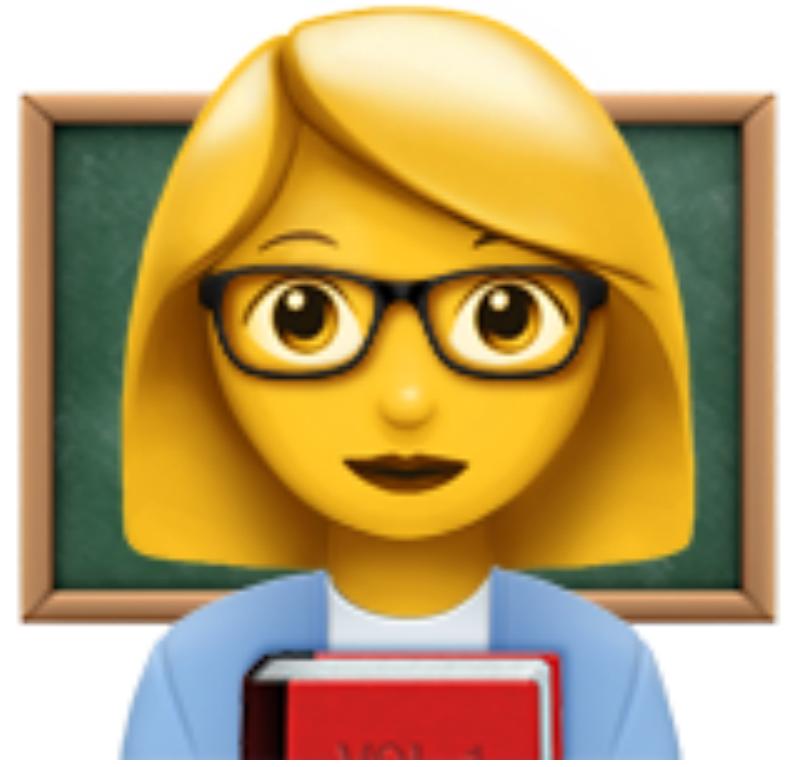


Replying to @noamross @rstudio

Easy peasy, it'll even fit in a tweet:

- Go to [rstudio.cloud](#) -> Login -> New Project
- Install packages, add scripts, Rmds etc.
- Gear icon -> Access -> Everyone
- Copy URL and share

3:06 PM - 29 May 2019



instructor

student

RStudio Cloud

https://rstudio.cloud/projects

Your Workspace Projects Info

Mine Cetinkaya-Rundel

Spaces

Your Workspace

New Space

Learn

Guide

What's New

Primers

Cheat Sheets

Feedback and Questions

Info

Terms and Conditions

System Status

Your Projects

No Projects

New Project

Options

Search Projects

Sort Projects

By name

By date created

Capacity

This is your personal workspace, where you can create a virtually unlimited number of projects.

Learn more about Your Workspace in the [Guide](#).

[rstd.io/cloud-classroom](#)

R Studio Cloud alpha

Terms and Conditions System Status

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rstd.io/cloud-workshop-project

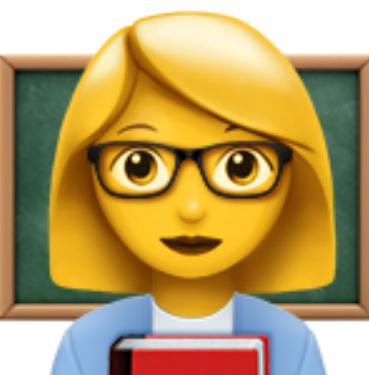
The screenshot shows the RStudio Cloud interface. At the top, there's a navigation bar with tabs for 'File', 'Edit', 'Code', 'View', 'Plots', 'Session', 'Build', 'Debug', 'Profile', 'Tools', and 'Help'. Below the navigation bar is a toolbar with various icons for file operations like 'New File', 'Open', 'Save', etc., and a search bar. The main workspace is titled 'Your Workspace / Workshop Materials'. On the left, there's an 'Environment' tab showing an 'Global Environment' with the message 'Environment is empty'. On the right, there's a 'Files' tab showing a list of files in the 'Cloud > project' directory:

Name	Size	Modified
..	0 B	Jun 5, 2019, 9:41 AM
.Rhistory	205 B	Jun 5, 2019, 9:41 AM
project.Rproj	828 B	Jun 5, 2019, 9:43 AM
template.Rmd		

At the bottom left, there's a 'Console' tab showing the output of an R session. The session starts with installing packages like 'readxl', 'tidyverse', 'broom', and 'modelr'. It also shows the download of source packages to '/tmp/RtmpUxq2A/downloaded_packages'. A blue arrow points from the top center towards the 'Environment' tab.

```
installing binary package 'readxl' ...
* DONE (readxl)
* installing *binary* package 'tidyverse' ...
* DONE (tidyverse)
* installing *binary* package 'broom' ...
* DONE (broom)
* installing *binary* package 'modelr' ...
* DONE (modelr)
* installing *binary* package 'tidyverse' ...
* DONE (tidyverse)

The downloaded source packages are in
  '/tmp/RtmpUxq2A/downloaded_packages'
>
```





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<https://www.google.com>[Incognito](#) [About](#) [Store](#)[Gmail](#) [Images](#)

M

[Google Search](#)[I'm Feeling Lucky](#)

United Kingdom

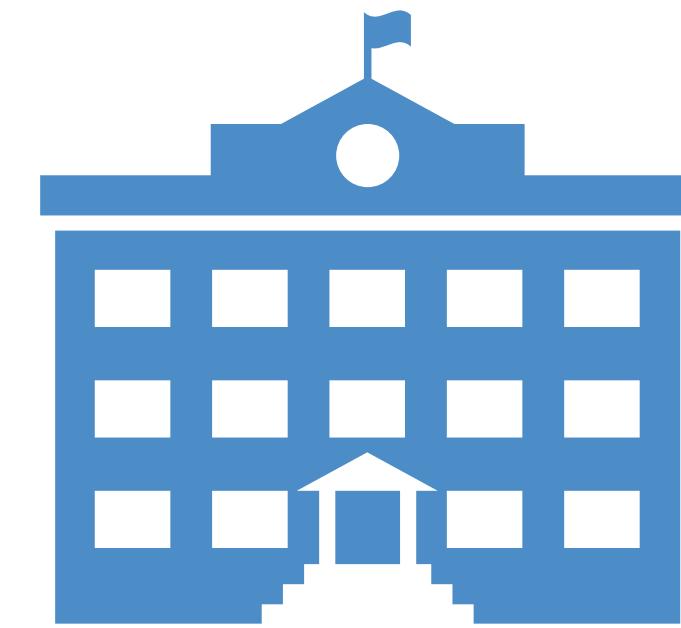
[Advertising](#) [Business](#)[Privacy](#) [Terms](#) 

sharing an individual project

try it out at rstd.io/cloud-workshop-project

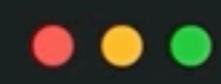
- ✓ students land directly in a project upon login
- ✓ works well for workshops where all work will be completed in a single project
- ✓ also great for sharing code in general, e.g. collaboration, reprexes, etc.

- ! students need to remember to make a copy of the project (which means you need to remember to remind them!)
- ! changes you make after student launches the project won't propagate to their project



teaching a
short workshop

teaching a
longer course



Your Workspace

Projects

Info



Mine Cetinkaya-Rundel

Spaces

Your Workspace

+ New Space

Learn

Guide

! What's New

Primers

Cheat Sheets

Feedback and Questions

Info

Terms and Conditions

System Status

Your Projects

New Project

Delete

Workshop Materials

Created Jun 5, 2019 9:40 AM

Options

Search Projects



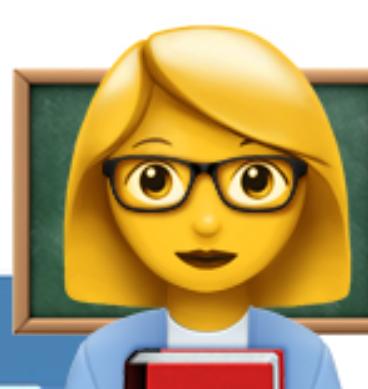
Sort Projects

 By name By date created

Capacity

This your personal workspace, where you can create a virtually unlimited number of projects.

Learn more about [Your Workspace](#) in the [Guide](#).



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



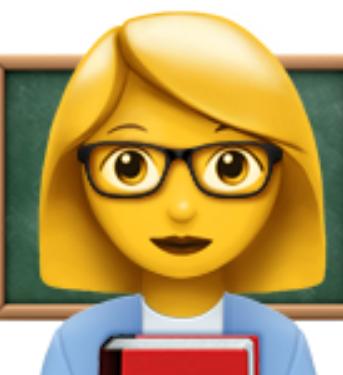
permission levels

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**



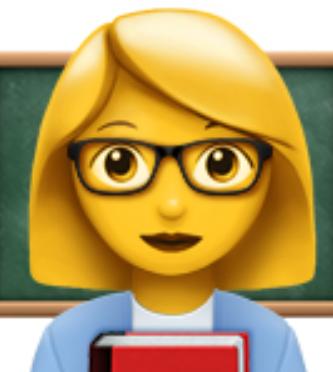
permissions

Permissions

- Contributors can see the members list
- Contributors can make their projects visible to all members
- Viewers can see the members list

students can see each others' names, but cannot change the visibility of their projects

auditors / visitors can't see students' names



capacity

Capacity

This space can have up to 9 more members.

[Request More Members](#)



Request More Members

Total number of members you'd like in this space (approximate)

20

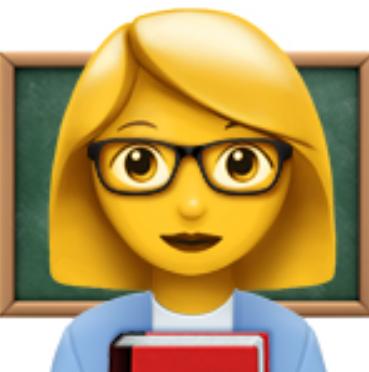
What you're using this space for

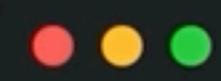
You should hear from us via our support system within 24 hours.

Thanks,

The RStudio Cloud Team

[Request More Members](#)





RStudio Cloud Webinar

Projects

Members

Info



Mine Cetinkaya-Rundel

All Projects

New Project



Options



No Projects

Search Projects



List Projects

 All Shared with everyone Yours

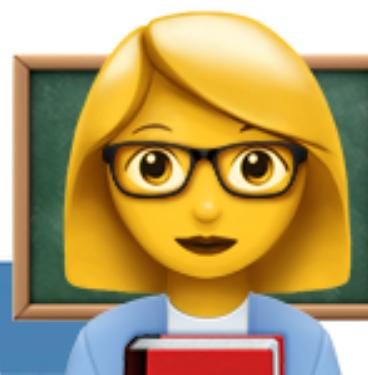
Sort Projects

 By name By date created

Capacity

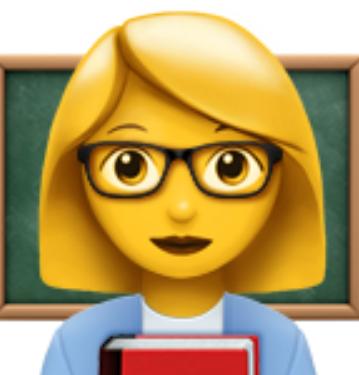
This space can have up to 25 more projects.

Request More Projects



rstd.io/cloud-course-workspace

The screenshot shows the RStudio Cloud interface for managing members in a workspace. The top navigation bar includes tabs for 'RStudio Cloud Webinar', 'Projects', 'Members' (which is selected), and 'Info'. The user profile at the top right is 'Mine Cetinkaya-Rundel'. The main area displays a table titled 'All Members' with two tabs: 'Current Members' (selected) and 'Invitations'. The table has columns for 'Name' and 'Role'. A single row is shown for 'Mine Cetinkaya-Rundel' with a role of 'Admin'. To the right of the table is a modal window for 'Add Member'. The modal has sections for 'Access' (radio buttons for 'Invitation required' and 'Shared' - which is selected), 'Initial Role' (dropdown set to 'Contributor'), and 'Permissions' (checkboxes for 'Contributors can see the members list' (checked), 'Contributors can make their projects visible to all members' (unchecked), and 'Viewers can see the members list' (unchecked)). A blue curved arrow points from the text 'rstd.io/cloud-course-workspace' at the top to the 'Shared' access option in the modal.





Google

<https://www.google.com>[Incognito](#) [⋮](#)[About](#) [Store](#)[Gmail](#) [Images](#) [Sign in](#) [Google Search](#)[I'm Feeling Lucky](#)

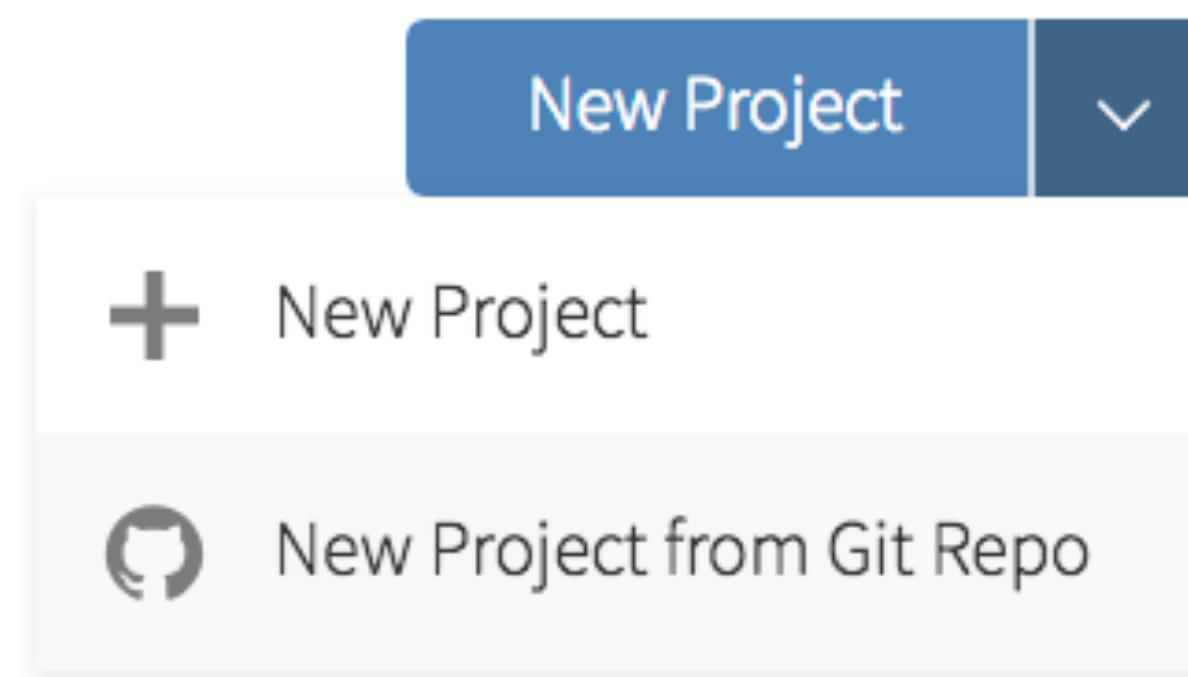
A privacy reminder from Google

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United Kingdom

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git integration

A screenshot of a dialog box titled "New Project from Git Repo". It contains a text input field labeled "URL of your Git repository" with a placeholder " ". Below it is a section labeled "Packages" with a checkbox labeled "Add packages from the base project" which is checked. In the bottom right corner is a blue "OK" button.

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

sharing a workspace

try it out at rstd.io/cloud-course-workspace

- ✓ various permission levels
- ✓ base projects with desired packages installed
- ✓ assignments, which remove the need to remind students to make a copy of the project before starting work
- ✓ ability to peek into students' projects

- ! students land in the workspace, may need to provide instructions for the next steps
- ! you can update the base project throughout the course, but it will only be applied to projects created going forward

parting remarks

tips



each project is allocated 1GB of RAM



💡 test things out before assignments involving large datasets



what your students see is not always what you see



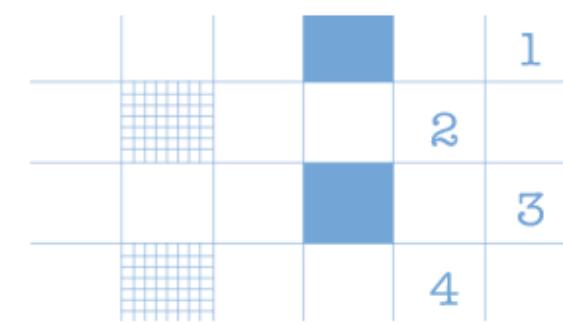
💡 create a secondary account and add as a student

The Basics



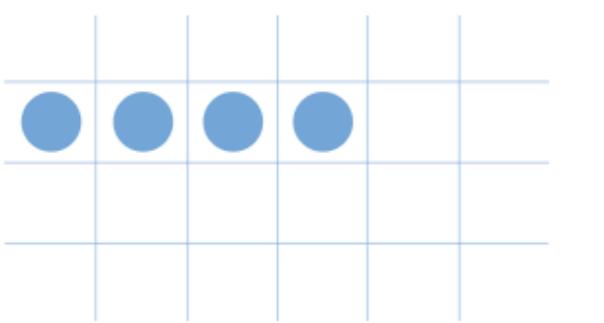
Start here to learn the skills that you will rely on in every analysis (and every primer that follows): how to inspect, visualize, subset, and transform your data, as well as how to run code.

Work with Data

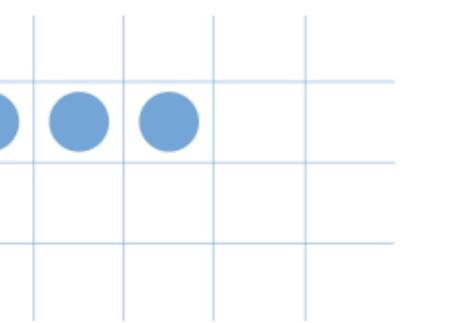


Learn the most important data handling skills in R: how to extract values from a table, subset tables, calculate summary statistics, and derive new variables.

Visualize Data

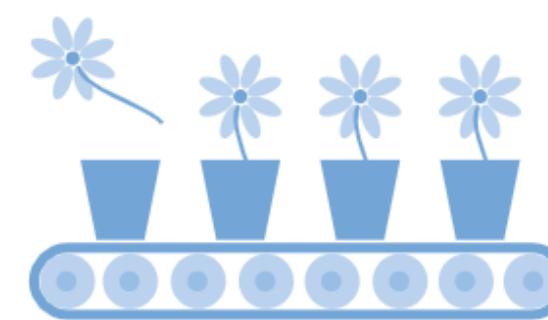


Learn how to use ggplot2 to make any type of plot with your data. Then learn the best ways to visualize patterns within values and relationships between variables.



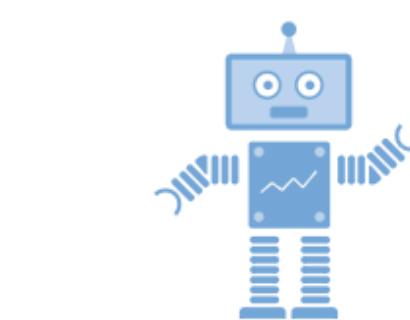
Unlock the tidyverse by learning how to make and use tidy data, the data format designed for R.

Iterate



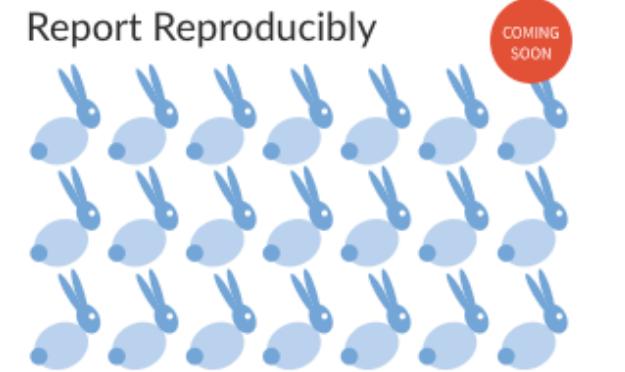
Master a core programming paradigm with the purrr package: for each ____ do ____.

Write Functions



Functions are the key to programming in R. This primer will teach you how to write and use your own reusable functions.

Report Reproducibly



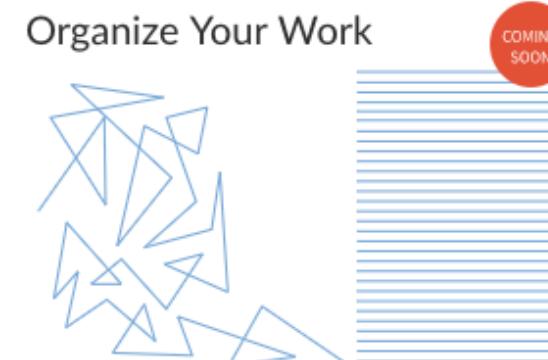
Learn to report, reproduce, and parameterize your work with the best authoring format for Data Science: R Markdown.

Build Interactive Web Apps



Say hello to Shiny, R's package for building interactive web apps. Learn to turn your analyses into elegant tools to share with others.

Organize Your Work



Become an R guru by mastering all of the tools built into the RStudio IDE. Discover best practices for programming, debugging, version control, package building and more.

built-in learnr primers

WIP

A large, stylized orange Greek letter alpha (α) is centered on the page. It has a thick, rounded font style and a white circular cutout in the center of the left vertical stroke.

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>.



FREE LUNCH?

RStudio Cloud is currently free to use. As we learn what it costs to operate the service and how it is used by the community, we will offer free and paid plans, as we do with shinyapps.io. We will be asking you for feedback on our ideas along the way.

\$ \$ \$



rstd.io/cloud-classroom



@minebocek



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mine@rstudio.com