

EPH Lunchtime hacks, June 29th 2021

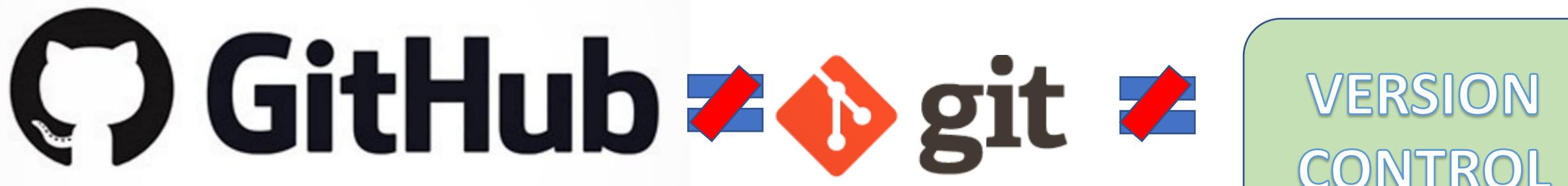
Version control, git, and GitHub

Carlos Valencia-Hernández



Outline

- Version control, git, GitHub
- Frequently used terms
- GitHub in Mac/Windows
- Integration with R?



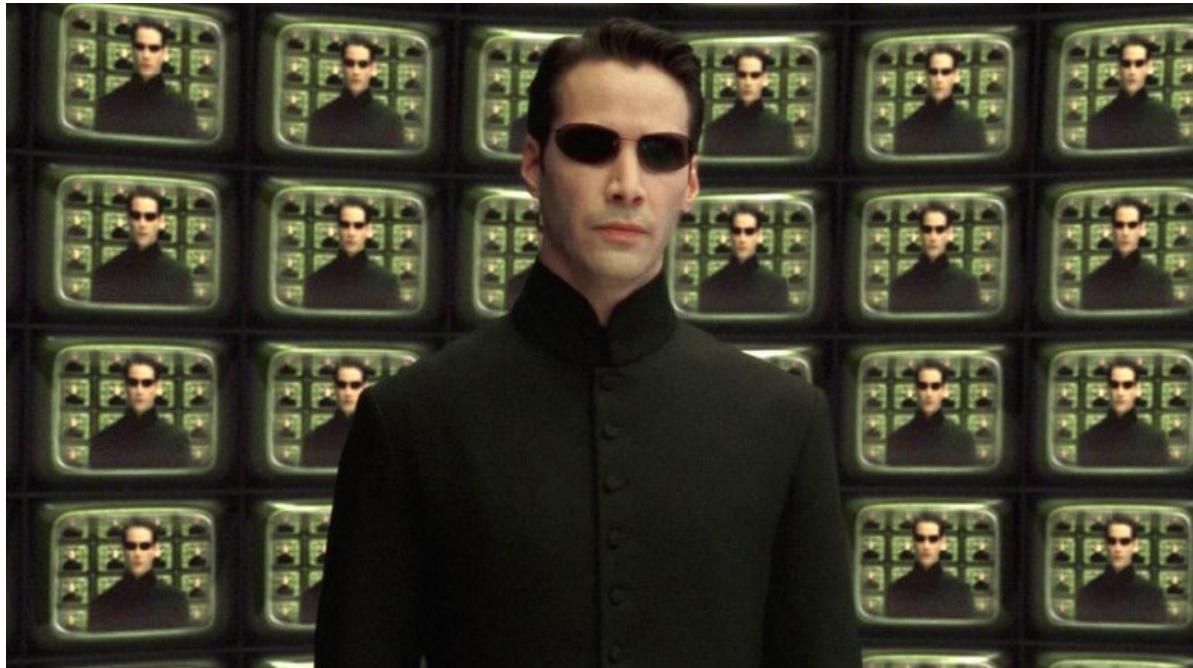
What is git?



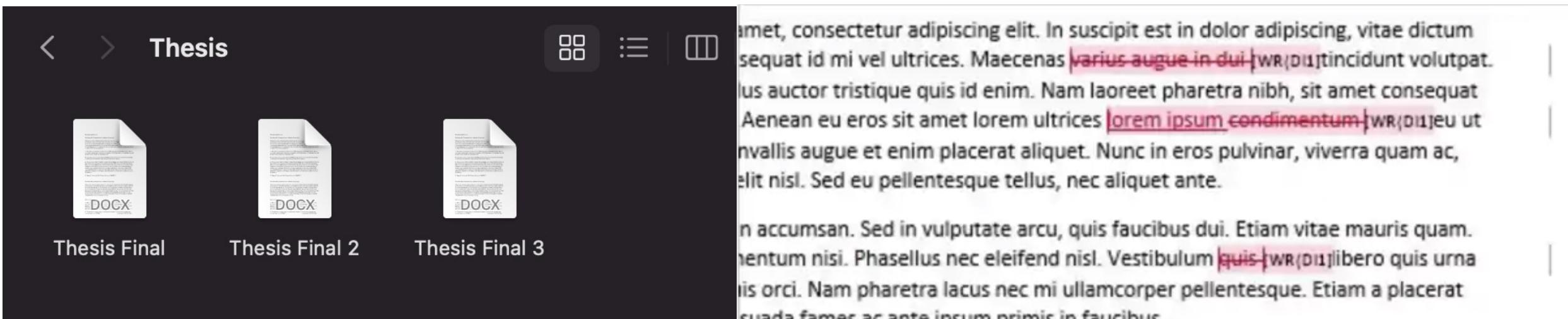
“A **free** and **open source** distributed
version control system designed to
handle everything from small to very
large projects with speed and efficiency”

Version control

- Record changes over time
- Management of changes to documents, programs, web sites, or any other information
- Snapshots of every change you make
- Revert changes if needed



Track changes in MS Word

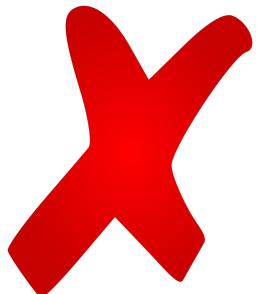


The screenshot shows the Microsoft Word ribbon interface with the title "Thesis". Below the ribbon, there are three document icons labeled "Thesis Final", "Thesis Final 2", and "Thesis Final 3". The "Thesis Final 3" icon is highlighted. The main content area displays a block of Latin text with several tracked changes. A large green checkmark is positioned to the left of the word processing window, and a large red X is to its right.

met, consectetur adipiscing elit. In suscipit est in dolor adipiscing, vitae dictum
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Initial commit of lecture 18, Big data (no script)	Jane Everyday Doe <jane.Everyday.Doe@gmail.com>	2018-05-02	ec9f5a78
Initial commit of lecture 16, Data science questions (no script)	Jane Everyday Doe <jane.Everyday.Doe@gmail.com>	2018-05-02	e01f81d0
Initial commit of Lecture 14, Projects under version control (no script)	Jane Everyday Doe <jane.Everyday.Doe@gmail.com>	2018-05-02	ab1d8e53
Initial commit of Lecture 13, Linking Git, GitHub, and RStudio	Jane Everyday Doe <jane.Everyday.Doe@gmail.com>	2018-05-02	f98618ab
Initial commit of Lecture 12, GitHub and Git (no script)	Jane Everyday Doe <jane.Everyday.Doe@gmail.com>	2018-05-02	6f2a13e9
Initial commit of Lecture 10, Projects in R	Jane Everyday Doe <jane.Everyday.Doe@gmail.com>	2018-05-02	6dfd7958
Updated with finished lectures to date	Jane Everyday Doe <jane.Everyday.Doe@gmail.com>	2018-05-02	135b736e
Exchanging XKCD images for links + small edits	Jane Everyday Doe <jane.Everyday.Doe@gmail.com>	2018-05-02	9a157dfb
Small update to summary	Jane Everyday Doe <jane.Everyday.Doe@gmail.com>	2018-05-02	84e4aebe

Commits 1-100 of 102

SHA ec9f5a78

Author Jane Everyday Doe <jane.Everyday.Doe@gmail.com>

Date 2018-05-02 21:08

Subject Initial commit of lecture 18, Big data (no script)

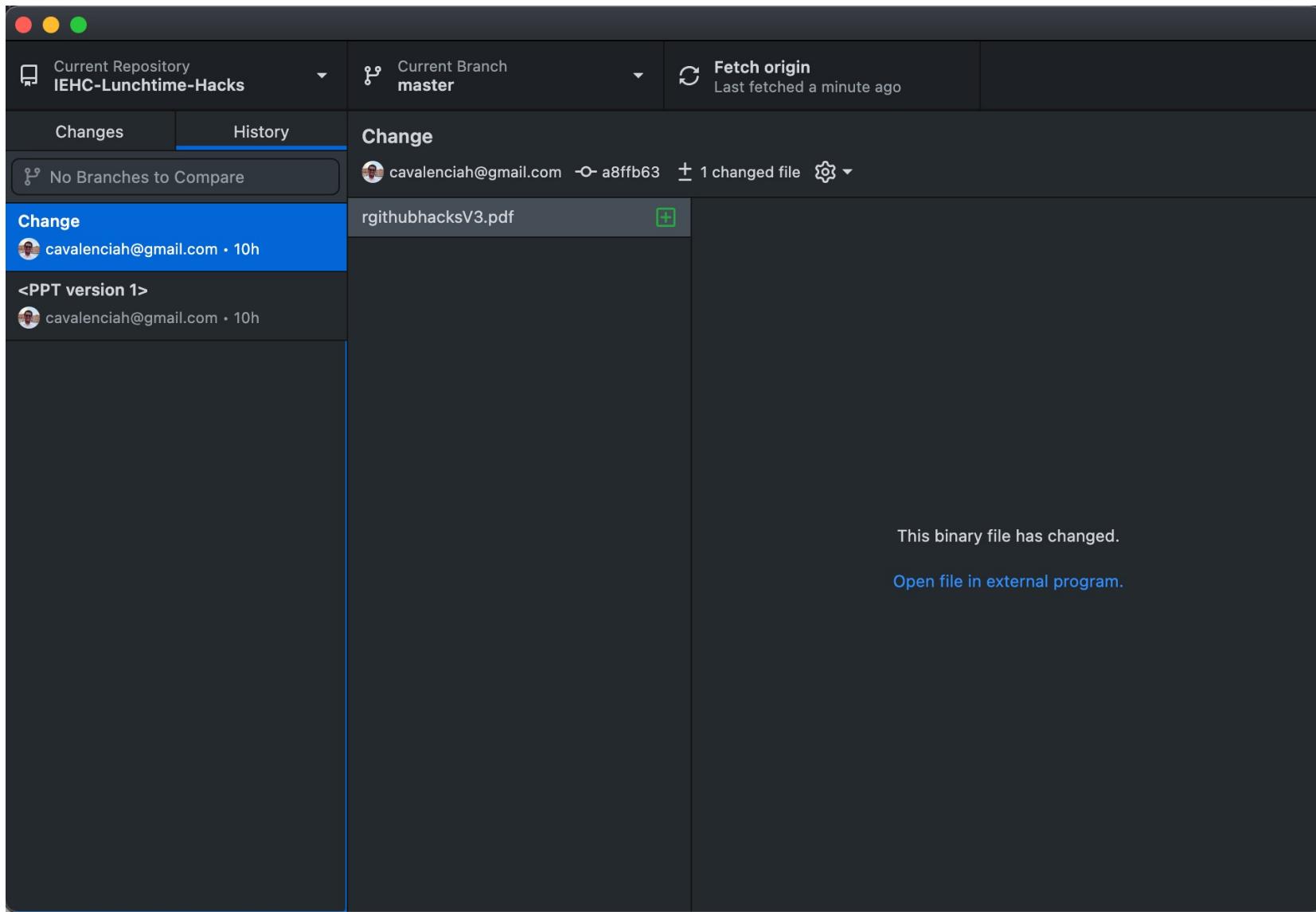
Parent e01f81d0

manuscript/18_Big_data.md

manuscript/18_Big_data.md

View file @ ec9f5a78

```
@@ -0,0 +1,58 @@
1 # Big Data
2
3 A term you may have heard of before this course is "Big Data" - there have always been large datasets, but it seems like
lately, this has become a buzzword in data science. But what does it mean?
4
5 ### What is big data?
6
7 We talked a little about big data in the very first lecture of this course. As the name suggests, big data are very large data
sets. We previously discussed three qualities that are commonly attributed to big data sets: Volume, Velocity, Variety. From
these three adjectives, we can see that big data involves large data sets of diverse data types that are being generated very
```



Online version control?



GitHub

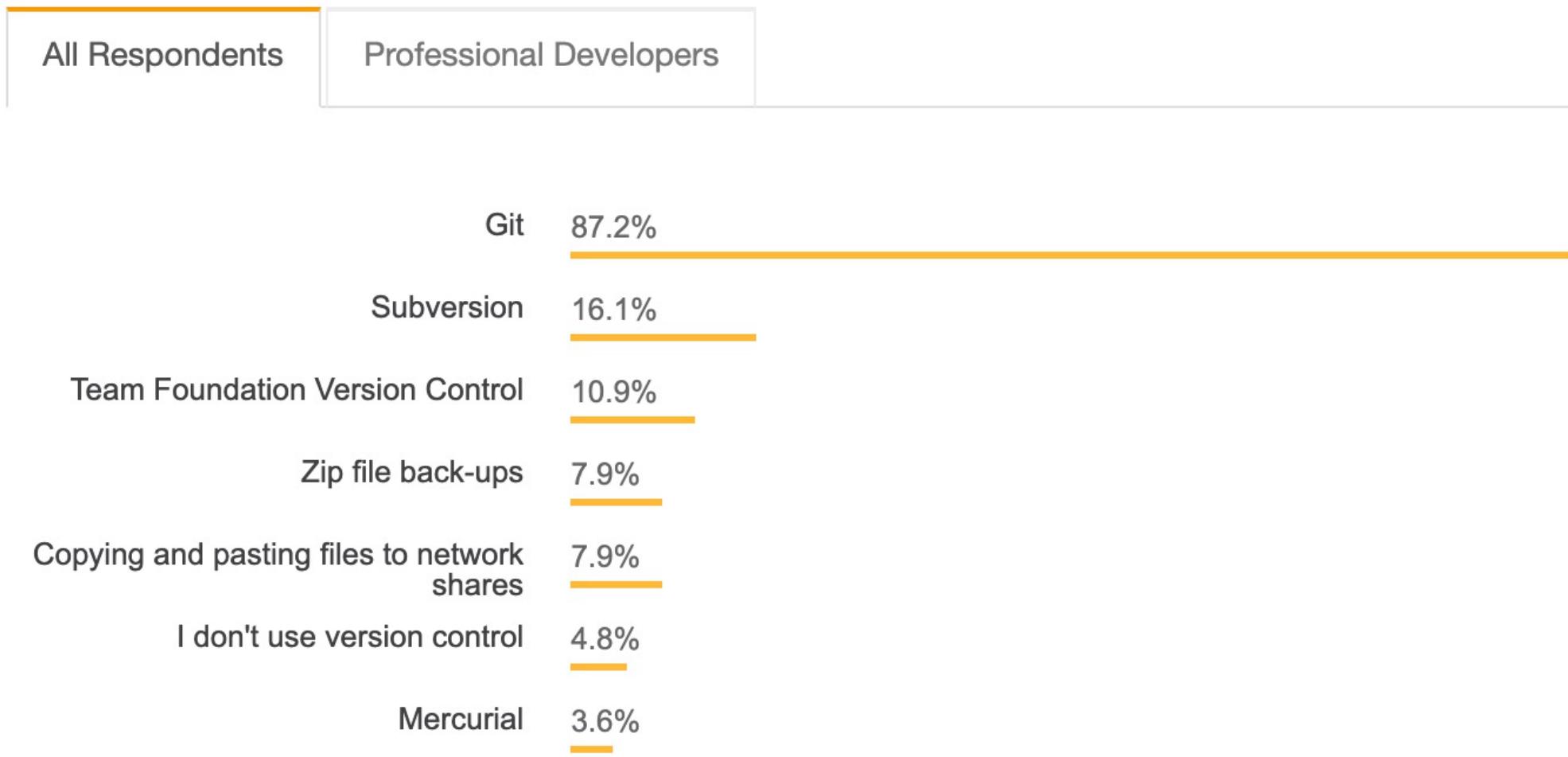


 **GitLab**

 **SUBVERSION**

Atlassian
Bitbucket

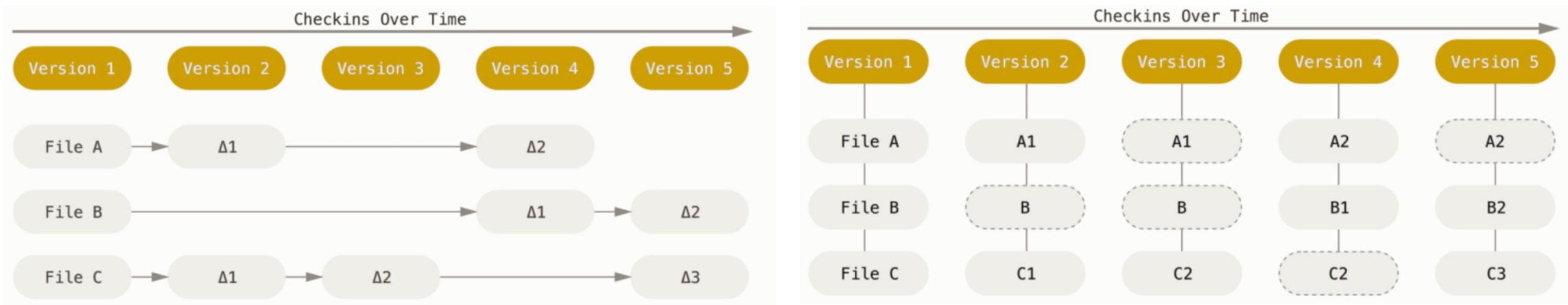
Version Control



74,298 responses; select all that apply

Snapshots, not differences

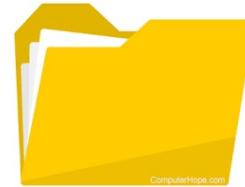
- Other version control software
- Git (snapshots)



Frequently used terms

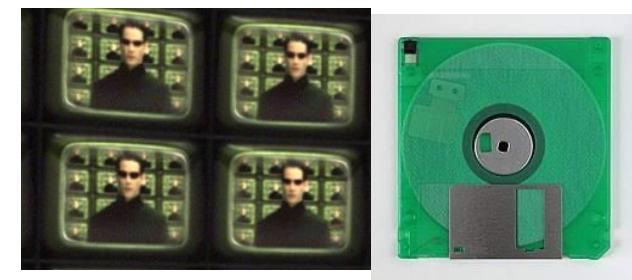
- **Repository**

A folder that contains a project. (Although you can have multiple projects inside a repository)



- **Commit**

Each snapshot or version of the project (locally)



- **Branch**

A sequence of commits that has an order. (A *Master* branch)

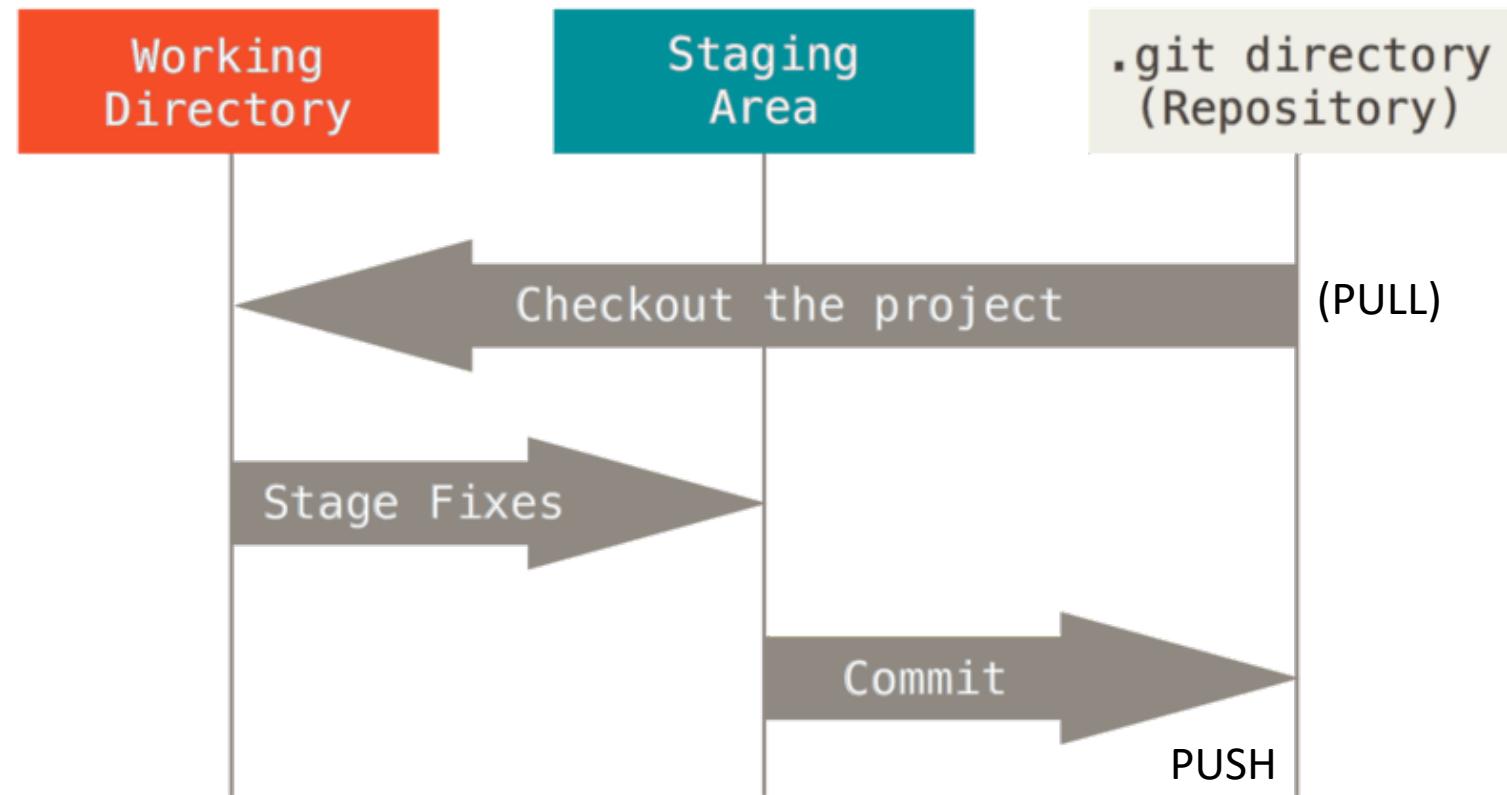
- **Push**



- **Pull**

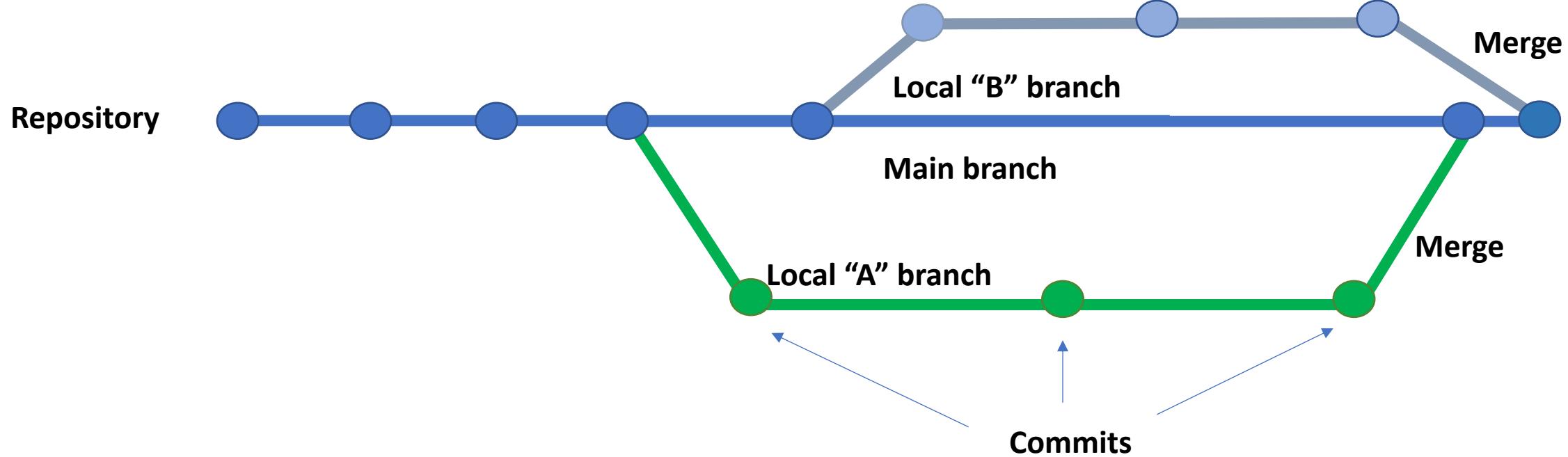


Main sections of a Git project



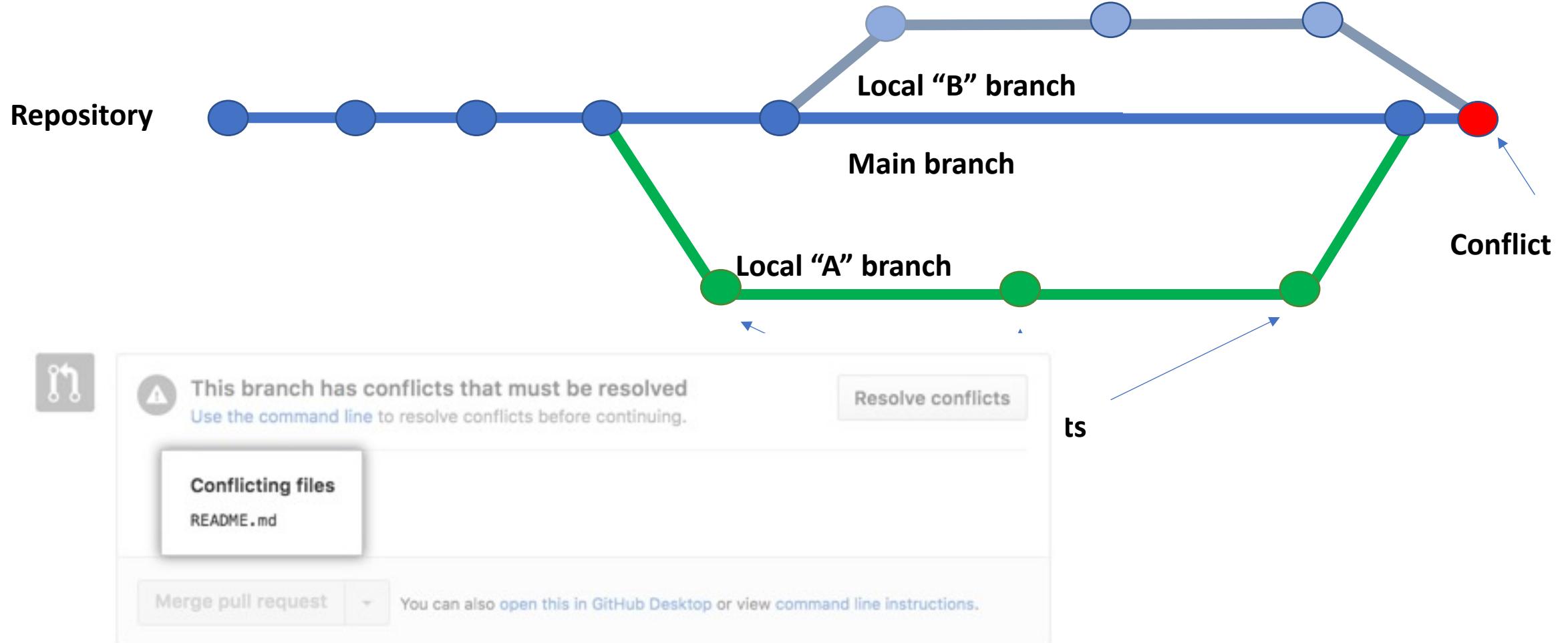
Branches

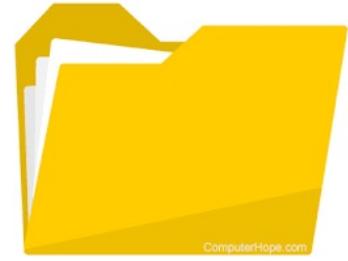
- Files with two copies that are *simultaneous*



Conflict

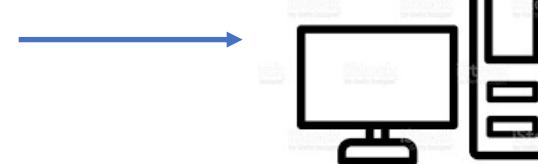
- Merging branches with competing commits





github/repository

clone



localgithub/repository

branch

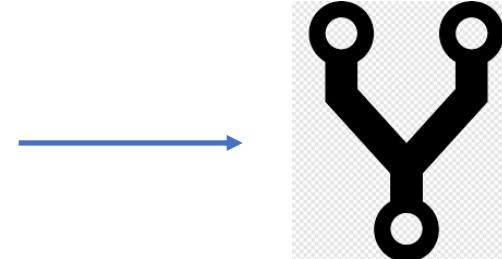


PULL REQUEST→ OWNER



github/repository

fork



mygithub/repository

What is Git(Hub)?



The GitHub

- Open source program for version control
- Multiple programming languages (**Also Stata**)

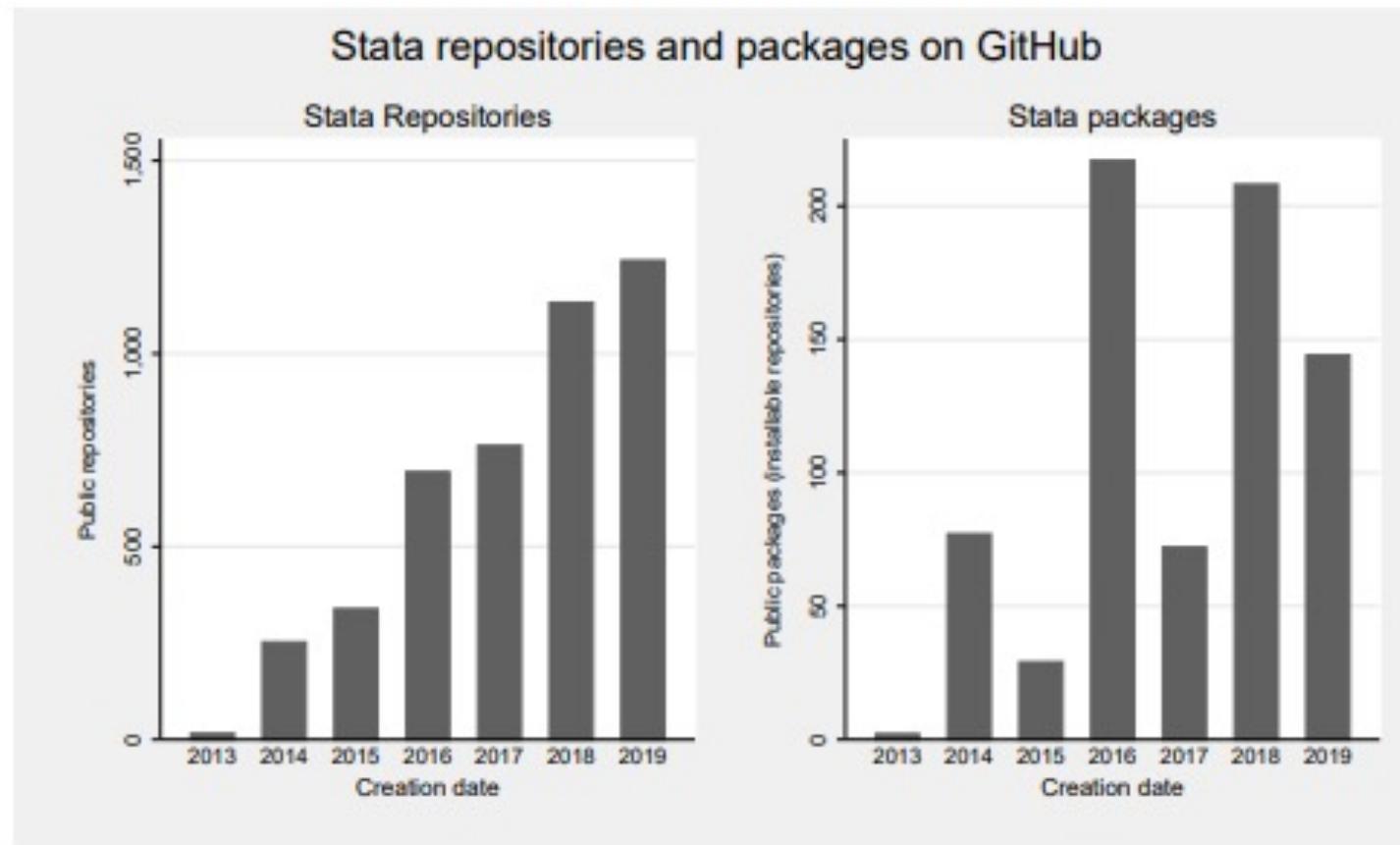
The GitHub

- A collaboration platform
- Showcase
- Repository

Most popular languages on GitHub

Place	Language	%
1	JavaScript	18.756% (+0.053%)
2	Python	16.628% (+0.390%)
3	Java	11.680% (+0.742%)
4	Go	7.829% (-1.176%)
5	Ruby	7.588% (+0.776%)
6	C++	6.985% (-0.439%)
7	TypeScript	6.604% (-0.164%)
8	PHP	5.081% (-0.046%)
9	C#	3.614% (-0.221%)
10	C	3.253% (+0.072%)

Growing popularity of Stata in GitHub



A screenshot of a web browser displaying the GitHub homepage. The page features a large, stylized globe in the background with glowing blue and purple lines representing network connections. Overlaid on the globe is the GitHub logo icon. The main heading reads "Where the world builds software" in large white text. Below the heading is a paragraph describing GitHub's role as the largest development platform. At the bottom left, there is a form field for an email address and a green "Sign up for GitHub" button. At the top right, there is a search bar labeled "Search GitHub", followed by "Sign in" and "Sign up" buttons. The "Sign in" button is highlighted with a red rectangular box. The browser interface includes standard window controls (red, yellow, green circles) and a tab bar with the URL "github.com".

github.com

Why GitHub? Team Enterprise Explore Marketplace Pricing

Search GitHub

Sign in Sign up

Where the world builds software

Millions of developers and companies build, ship, and maintain their software on GitHub—the largest and most advanced development platform in the world.

Email address

Sign up for GitHub



Sign in to GitHub

Username or email address

Password

[Forgot password?](#)

[Sign in](#)

[New to GitHub? Create an account.](#)

The screenshot shows the GitHub homepage with several UI components highlighted by white arrows:

- A search bar at the top left labeled "Search or jump to...".
- A navigation bar with links: Pull requests, Issues, Marketplace, Explore, and a user icon.
- A sidebar on the left containing:
 - "Repositories" section with a "New" button and a search input field.
 - A list of repositories: Carvalenc/github-slideshow, Carvalenc/IEHC-Lunchtime-Hacks, Carvalenc/ggplot2training, Carvalenc/regressionwithr, Carvalenc/github-upload, Carvalenc/iehc0046, and maxwellflitton/ucl-example.
 - A "Show more" link.
 - A "Recent activity" section with a "Add a slide with the most p..." link.
 - A "Working with a team?" section with a "Create an organization" button.
- A central "All activity" section featuring an "Introduce yourself" guide for creating a README.md file, showing a sample content and "Dismiss this" and "Continue" buttons.
- A "Discover interesting projects and people to populate your personal news feed" section with a "ProTip!" note and a "Subscribe to your news feed" button.
- A sidebar on the right with sections for "Notifications", "User settings", and "Help files".
- A banner for the "2021 Octoverse Survey" with a "Take survey" button.
- Footer links at the bottom: © 2021 GitHub, Inc., Blog, API, Terms, About, Training, Privacy, Shop, Status, Docs, Contact, GitHub, Security, Pricing, and a "ProTip!" section.

 Search or jump to...  Pull requests Issues Marketplace Explore  + 



Carvalenc
PhD student at University College London
[Edit profile](#)

0 followers · 2 following · 3 contributions

Location: London

 Overview  Repositories 8  Projects  Packages

Popular repositories

Stantraining
Stan training
R 1

github-slideshow
A robot powered training repository 📸
HTML

github-upload

uwa
Forked from zmcucunuba/uwa
HTML

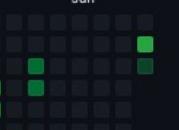
IEHC-Lunchtime-Hacks
Shared code from the tips and tricks sessions at UCL-IEHC

iehc0046
Forked from ljwright/iehc0046
R

Customize your pins

24 contributions in the last year

Contribution settings ▾

Less  More

Learn how we count contributions



Carvalenc

Your personal account

[Go to your personal profile](#)

Account settings

Profile

Account

Appearance

Account security

Billing & plans

Security log

Security & analysis

Emails

Notifications

SSH and GPG keys

Repositories

Packages

Organizations

Saved replies

Applications

Developer settings

Moderation settings

Public profile

Name

Your name may appear around GitHub where you contribute or are mentioned. You can remove it at any time.

Public email

Select a verified email to display ▾

You have set your email address to private. To toggle email privacy, go to [email settings](#) and uncheck "Keep my email address private."

Bio

PhD student at University College London

You can @mention other users and organizations to link to them.

URL

Twitter username

Company

You can @mention your company's GitHub organization to link it.

Profile picture



Edit

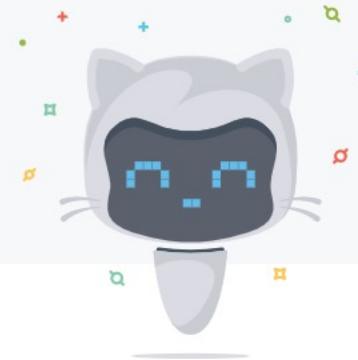


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Find your first course

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the [GitHub Terms of Service](#).



Our most popular courses

Introduction to GitHub

The GitHub Training Team

If you are looking for a quick and fun introduction to GitHub, you've found it. This class will get you started using GitHub in less than an hour.

- Git
 - GitHub Pages
 - Branches
 - Commits
 - Pull Requests

GitHub Actions: Hello World

The GitHub Training Team

Create a GitHub Action and use it in a workflow.

- GitHub Actions ● Workflows
● Hello World

Communicating using Markdown

The GitHub Training Team

This course will walk you through everything you need to start organizing ideas and collaborating using Markdown, a lightweight language for text formatting.

 [Carvalenc / github-slideshow](#)

 Unwatch ▾ 2  Star 0  Fork 0

 Code Issues 1 Pull requests 1 Actions Projects Wiki Security 2 Insights Settings

master · [github-slideshow](#) / _posts /

Go to file

Add file ▾

• • •

 githubteacher Initial commit

Upload files

0000-01-01-intro.md

Initial commit

3 years ago



Pull request

- Propose a work in progress to be pulled into the project

Creating a new repository

The screenshot shows the GitHub interface for creating a new repository. At the top, there's a dark header bar with the GitHub logo, a search bar, and navigation links for 'Pull requests', 'Issues', 'Marketplace', and 'Explore'. On the right side of the header are icons for notifications, a plus sign, and user profile.

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere?
[Import a repository.](#)

Owner *

Carvalenc /

Repository name *

Great repository names are short and memorable. Need inspiration? How about [fictional-couscous](#)?

Description (optional)



Public

Anyone on the internet can see this repository. You choose who can commit.



Private

You choose who can see and commit to this repository.

Initialize this repository with:

Skip this step if you're importing an existing repository.

Add a README file

This is where you can write a long description for your project. [Learn more](#).

Add .gitignore

Choose which files not to track from a list of templates. [Learn more](#).

Choose a license

A license tells others what they can and can't do with your code. [Learn more](#).

docs.gitlab.com/ee/topics/git/how_to_install_git/index.html

GitLab Docs Search the docs... GitLab.com (13.12-pre) Get free trial

Subscriptions Installation Administration Analytics Projects Groups User Get started Report abuse Account Discussions Git Get started Installing Git Create branch File editing Partial clone Rebase, force-push, merge conflicts Tags Troubleshooting Git Undo with Git Useful commands GitLab basics GitLab.com settings Keyboard shortcuts Markdown

GitLab Docs > Topics > Git > Installing Git

Installing Git ALL TIERS

To begin contributing to GitLab projects, you must install the Git client on your computer. This article shows you how to install Git on macOS, Ubuntu Linux and Windows. Information on [installing Git](#) is also available at the official Git website.

Install Git on macOS using the Homebrew package manager

Although you can use the version of Git shipped with macOS or install the latest version of Git on macOS by downloading it from the project website, we recommend installing Git with Homebrew to get access to an extensive selection of dependency-managed libraries and applications. If you don't need access to any additional development libraries or don't have approximately 15 GB of available disk space for Xcode and Homebrew, use one of the previously mentioned methods.

Installing Xcode

To build dependencies, Homebrew needs the XCode Command Line Tools. Install it by running in your terminal:

```
xcode-select --install
```

Click [Install](#) to download and install it. Alternatively, you can install the entire [XCode](#) package through the macOS App Store.

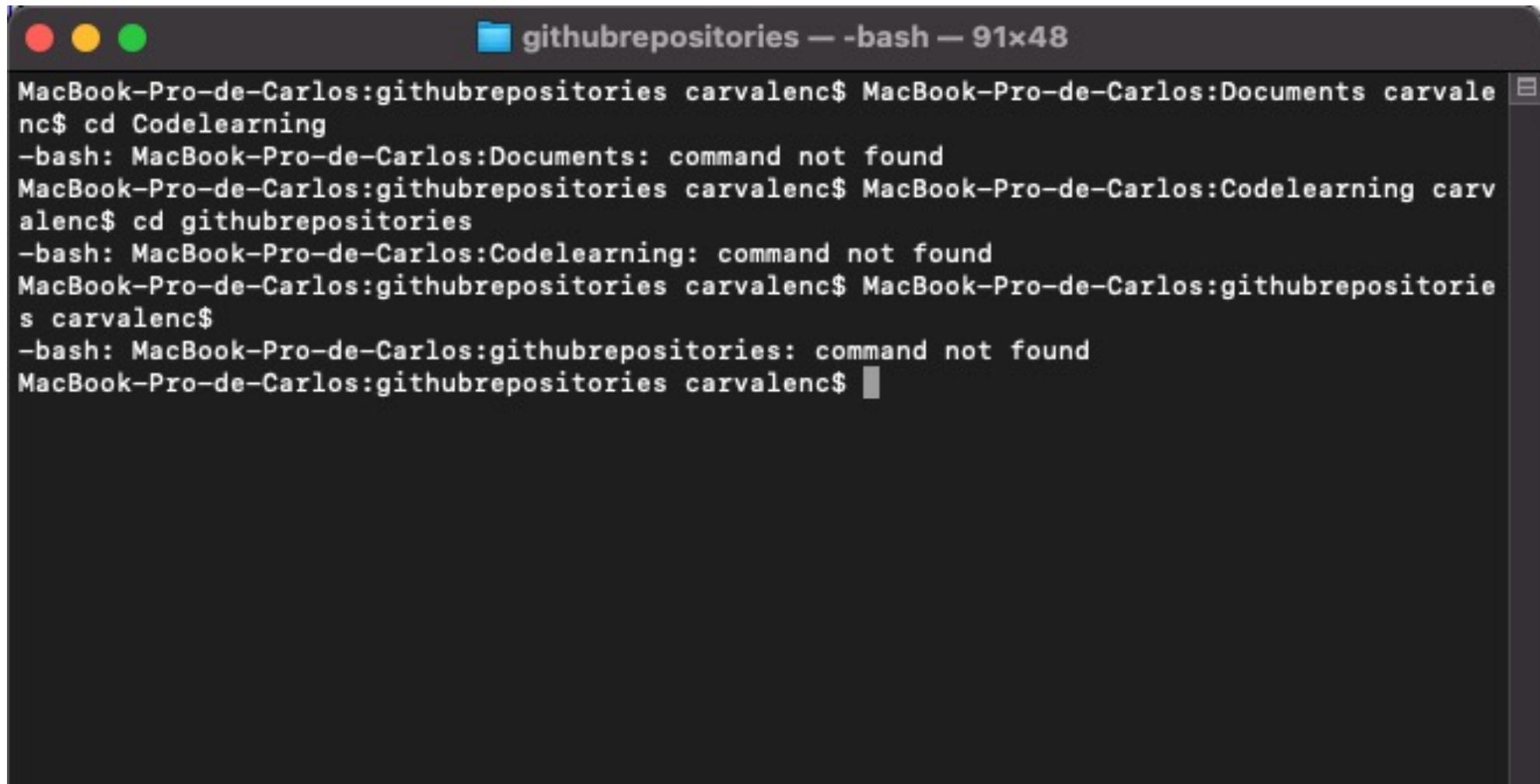
Installing Homebrew

With Xcode installed, browse to the [Homebrew website](#) for the official Homebrew installation instructions.

On this page

- Install Git on macOS using the Homebrew package manager
- Installing Xcode
- Installing Homebrew
- Installing Git via Homebrew
- Install Git on Ubuntu Linux
- Installing Git on Windows from the Git website
- Help and feedback

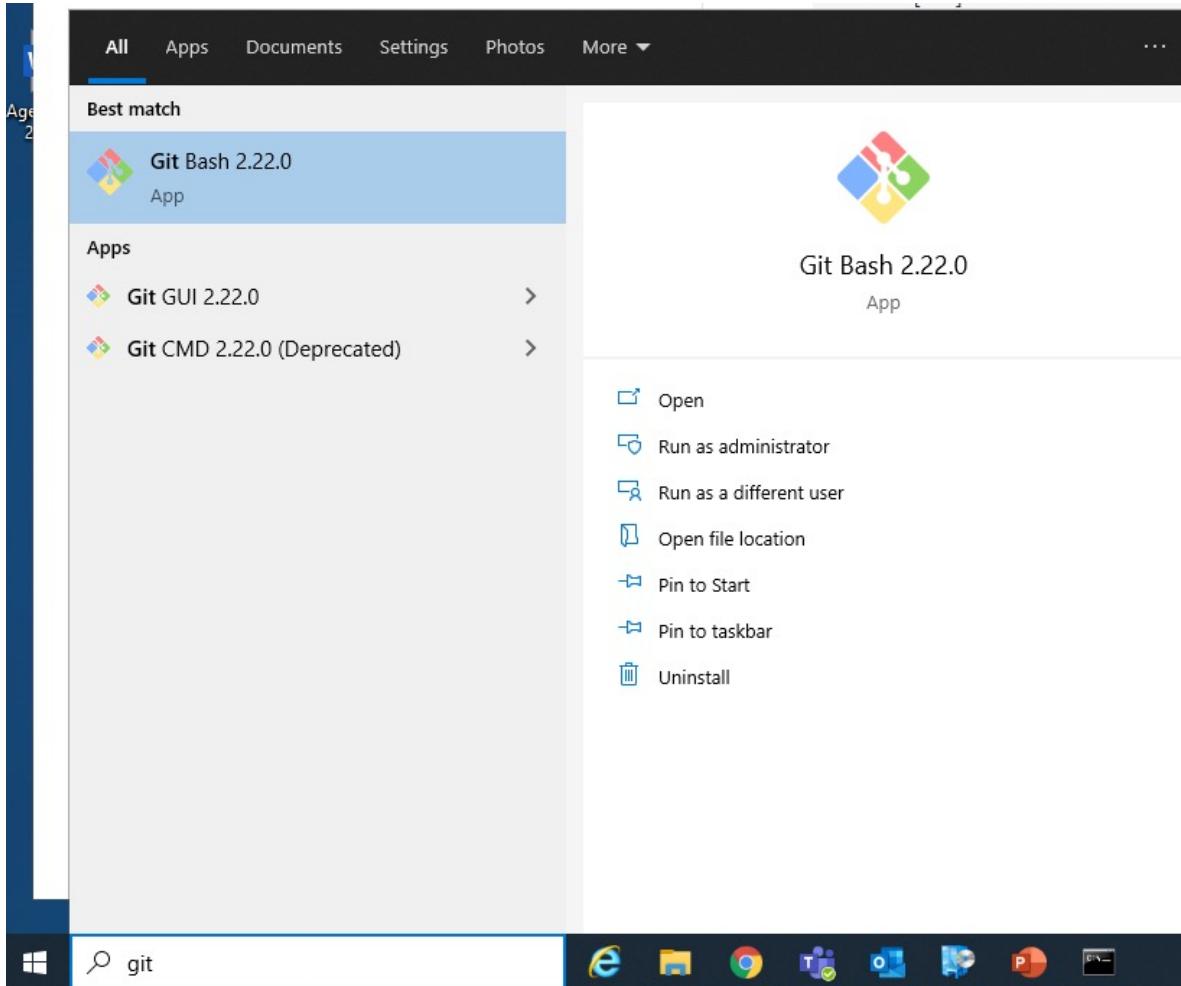
MAC terminal



The screenshot shows a Mac OS X terminal window with a dark theme. The title bar reads "githubrepositories — -bash — 91x48". The terminal content is as follows:

```
MacBook-Pro-de-Carlos:githubrepositories carvalenc$ MacBook-Pro-de-Carlos:Documents carvale nc$ cd Codelearning  
-bash: MacBook-Pro-de-Carlos:Documents: command not found  
MacBook-Pro-de-Carlos:githubrepositories carvalenc$ MacBook-Pro-de-Carlos:Codelearning carv alenc$ cd githubrepositories  
-bash: MacBook-Pro-de-Carlos:Codelearning: command not found  
MacBook-Pro-de-Carlos:githubrepositories carvalenc$ MacBook-Pro-de-Carlos:githubrepository es carvalenc$  
-bash: MacBook-Pro-de-Carlos:githubrepositories: command not found  
MacBook-Pro-de-Carlos:githubrepositories carvalenc$
```

Windows on a UCL computer



Clone the repository

The screenshot shows a web browser window with the GitHub URL `github.com/Carvalenc/regressionwithr`. The GitHub interface displays the repository's main branch, which has 1 commit. The commit history includes four initial commits: 'Carvalenc Initial commit', '.gitignore', 'LICENSE', and 'README.md'. A modal window titled 'GitHub Login' is overlaid on the page, prompting for 'Username or email' and 'Password'. Below the login form, there are links for 'Login', 'Cancel', 'Don't have an account? Sign up', and 'Forgot your password?'. At the bottom of the page, a terminal window shows the command `git clone https://github.com/Carvalenc/regressionwithr` being run in a directory path `/d/Documents/Desktop/UCL/Cavalec/PhD/R learning`.

Carvalenc/regressionwithr · Text · 1 commit · 1 branch · 0 tags

Carvalenc / regressionwithr · Private

Code Issues Pull requests Actions Projects Security Insights Settings

main · 1 branch · 0 tags

Carvalenc Initial commit · 1 hour ago · 1 commit

.gitignore · Initial commit · 1 hour ago

LICENSE · Initial commit · 1 hour ago

README.md · Initial commit · 1 hour ago

README.md

regressionwithr

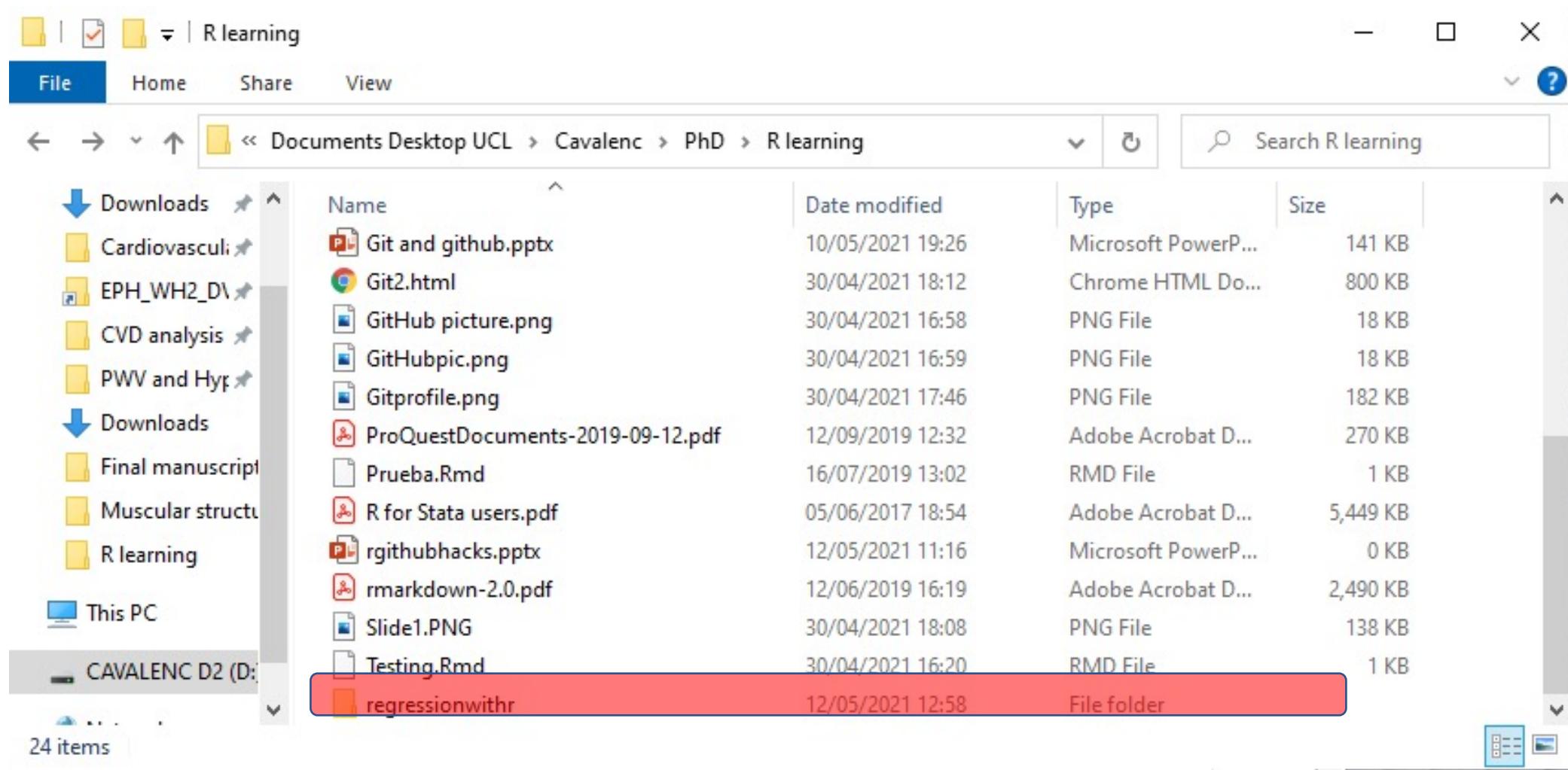
Text and script in R studio for the exercises of the book "Linear Regression with R, from Martin Sheather"

Select MINGW64:/d/Documents/Desktop/UCL/Cavalec/PhD/R learning

```
rmjjava@CS00035589 MINGW64 /d/Documents/Desktop/UCL/Cavalec/PhD/R learning
$ git clone https://github.com/Carvalenc/regressionwithr
Cloning into 'regressionwithr'...
```

© 2021 GitHub, Inc. Terms Privacy Security

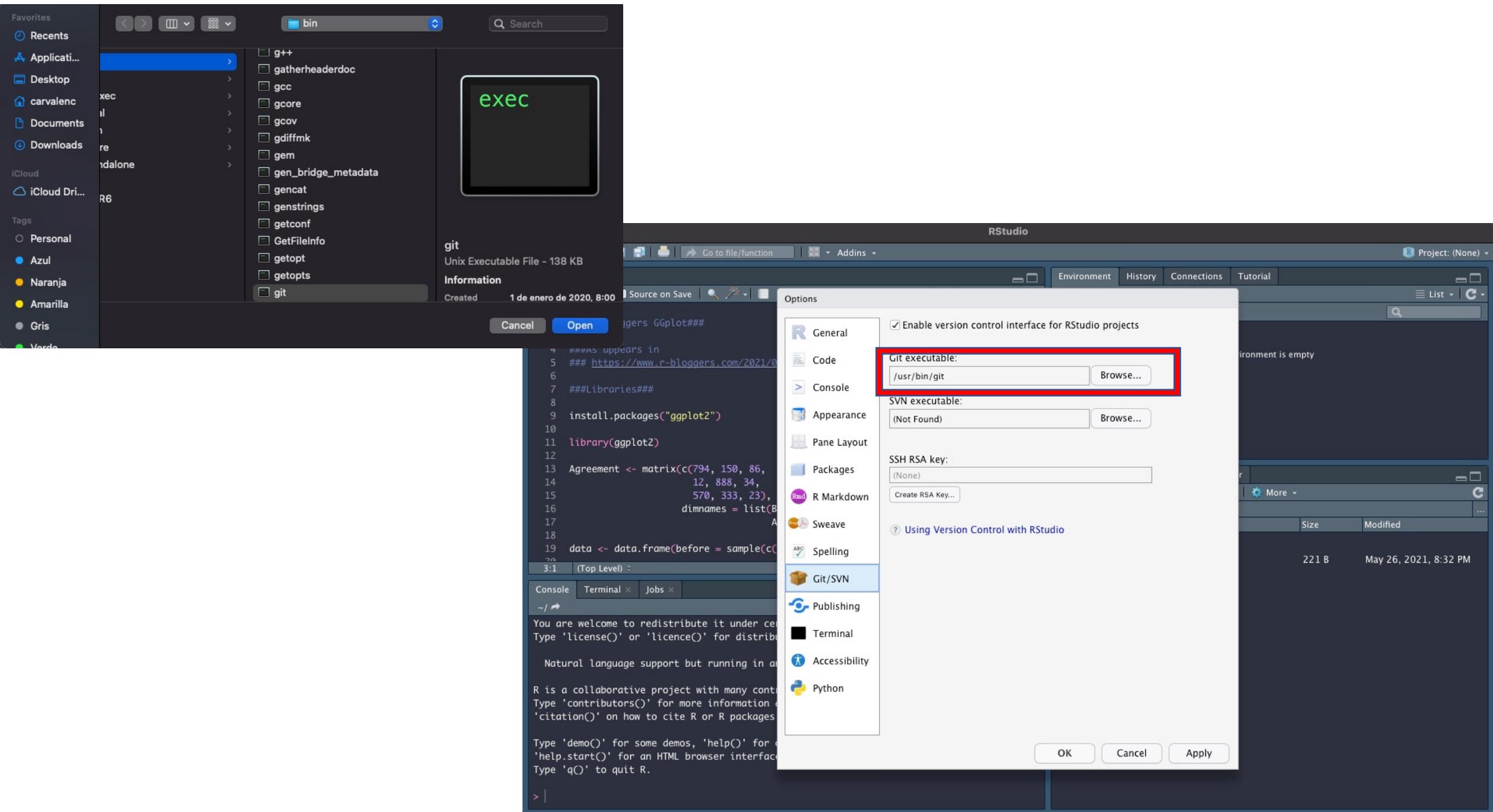
Now we can see the cloned repository

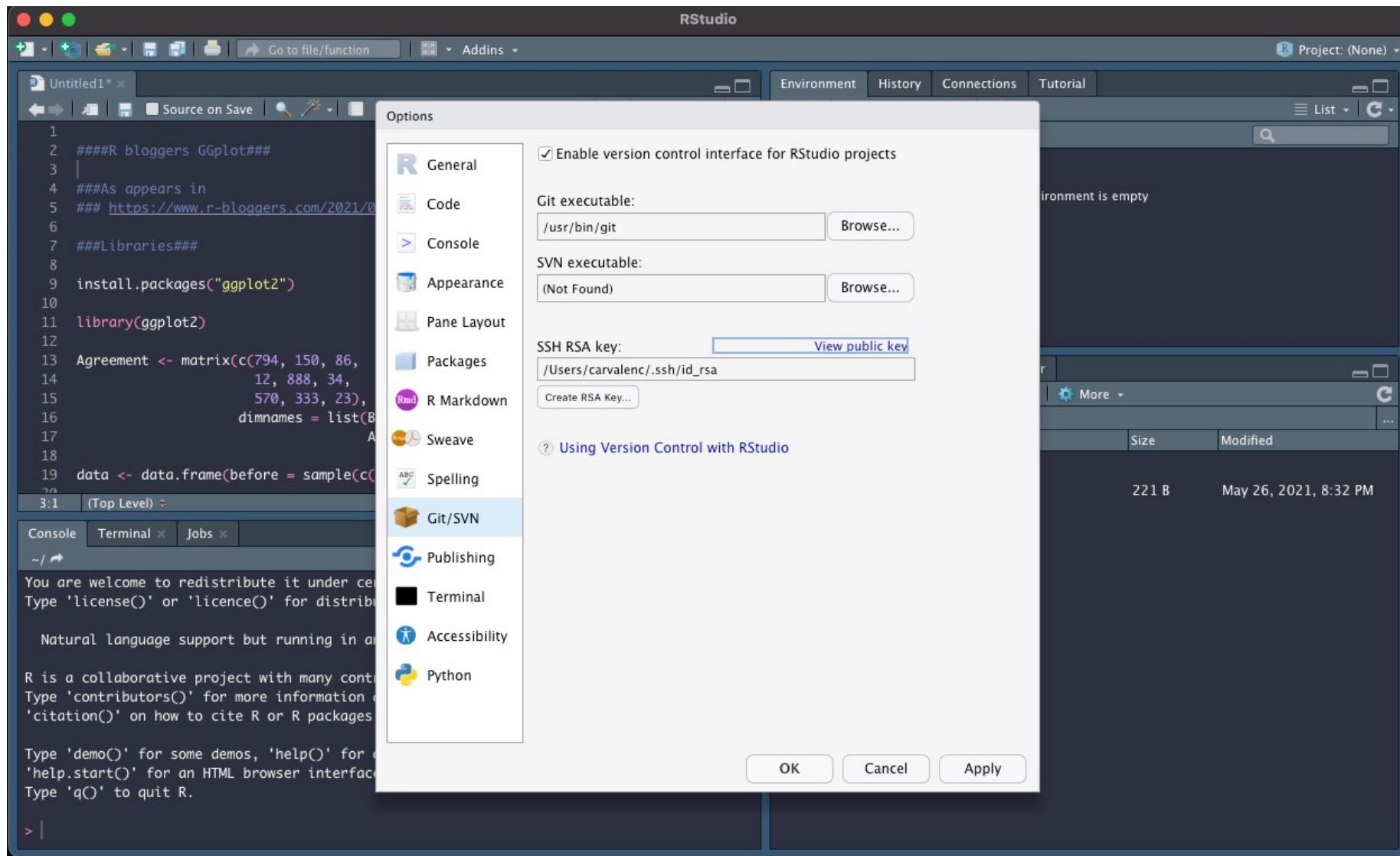


Linking Github and R Studio

The screenshot shows the RStudio interface with several panels:

- Script Editor:** On the left, a script named "ggplot.R" is open. It contains R code for generating a ggplot2 visualization. The code includes library imports, matrix creation, and data frame manipulation.
- Global Environment:** The top-right panel shows the Global Environment, which is currently empty.
- File Browser:** The bottom-right panel displays a file tree for the current directory, showing files like ".r", ".rhistory", and various folders.
- Terminal:** The bottom-left panel shows the R command-line interface (CLI) output, including the R version information and standard copyright notices.
- Tools Menu:** A dropdown menu is open from the Tools menu, with "Global Options..." highlighted.





 **Carvalenc**
Your personal account

[Go to your personal profile](#)

Account settings

[Profile](#)

[Account](#)

[Appearance](#)

[Account security](#)

[Billing & plans](#)

[Security log](#)

[Security & analysis](#)

[Emails](#)

[Notifications](#)

SSH and GPG keys

[Repositories](#)

[Packages](#)

[Organizations](#)

[Saved replies](#)

[Applications](#)

[Developer settings](#)

SSH keys

New SSH key

This is a list of SSH keys associated with your account. Remove any keys that you do not recognize.

 **RStudio-key**
SHA256:z8UL+sGlp6dXY03Z4Zx/HfNjigSq37e1KVMpXCh6xYk
Added on 2 Jun 2021
Never used — Read/write

[Delete](#)

Check out our guide to [generating SSH keys](#) or troubleshoot [common SSH problems](#).

GPG keys

New GPG key

There are no GPG keys associated with your account.

Learn how to [generate a GPG key](#) and add it to your account.

Vigilant mode Beta

Flag unsigned commits as unverified
This will include any commit attributed to your account but not signed with your GPG or S/MIME key.
Note that this will include your existing unsigned commits.

[Learn about vigilant mode.](#)

Then we create a new repository

The screenshot shows a GitHub profile page for a user named Carvalenc. The profile picture is a circular photo of a man with dark hair and sunglasses, smiling, set against a background of buildings and water. Below the profile picture, the name "Carvalenc" is displayed, followed by the text "PhD student at University College London". A "Edit profile" button is visible. At the bottom of the profile section, it shows "0 followers · 2 following · 3" contributions.

The main content area displays "Popular repositories" with five cards:

- Stantraining**: Stan training, Forked from stan-dev/stan. Language: R.
- github-slideshow**: A robot powered training repository, Forked from jakevdp/github-slideshow. Language: HTML.
- IEHC-Lunchtime-Hacks**: Shared code from the tips and tricks sessions at UCL-IEHC, Forked from ijc/IEHC-Lunchtime-Hacks. Language: HTML.
- github-upload**: Forked from jakevdp/github-upload. Language: R.
- iehc0046**: Forked from ijc/iehc0046. Language: R.

At the top right of the page, there is a context menu with the following options:

- New repository (selected)
- Import repository
- New gist
- New organization
- New project

Below the repositories, there is a "25 contributions in the last year" chart and a "Contribution settings" dropdown.

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository](#).

Owner *

Repository name *



Carvalenc ▾

testing|



Great repository names are testing is available. Table. Need inspiration? How about [probable-winner](#)?

Description (optional)

This repository will be linked with RStudio

A small circular icon with a blue dot, followed by a square icon with a smaller square inside, representing a public sharing option.

Public
Anyone

Public
Anyone on the internet can see this repository. You choose who can commit.

Private

Private
You ch

Private
You choose who can see and commit to this repository.

Initialize this repository with:

Skip this step if you're importing an existing repository.

Add a README file

This is where you can write a long description for your project. [Learn more.](#)

Add .gitignore

Add right-clicks Choose which files not to track from a list of templates. Learn more.

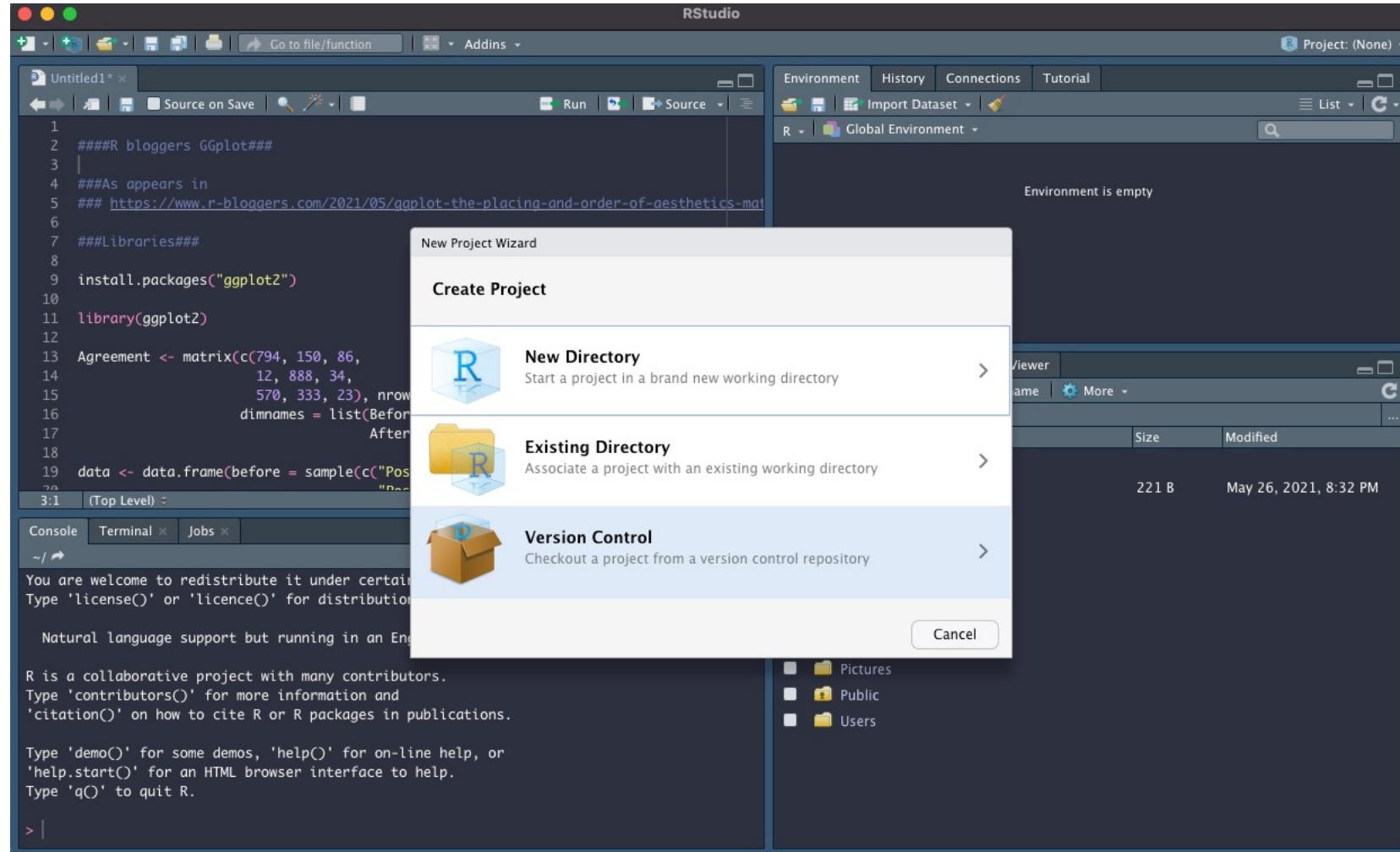
Choose a license

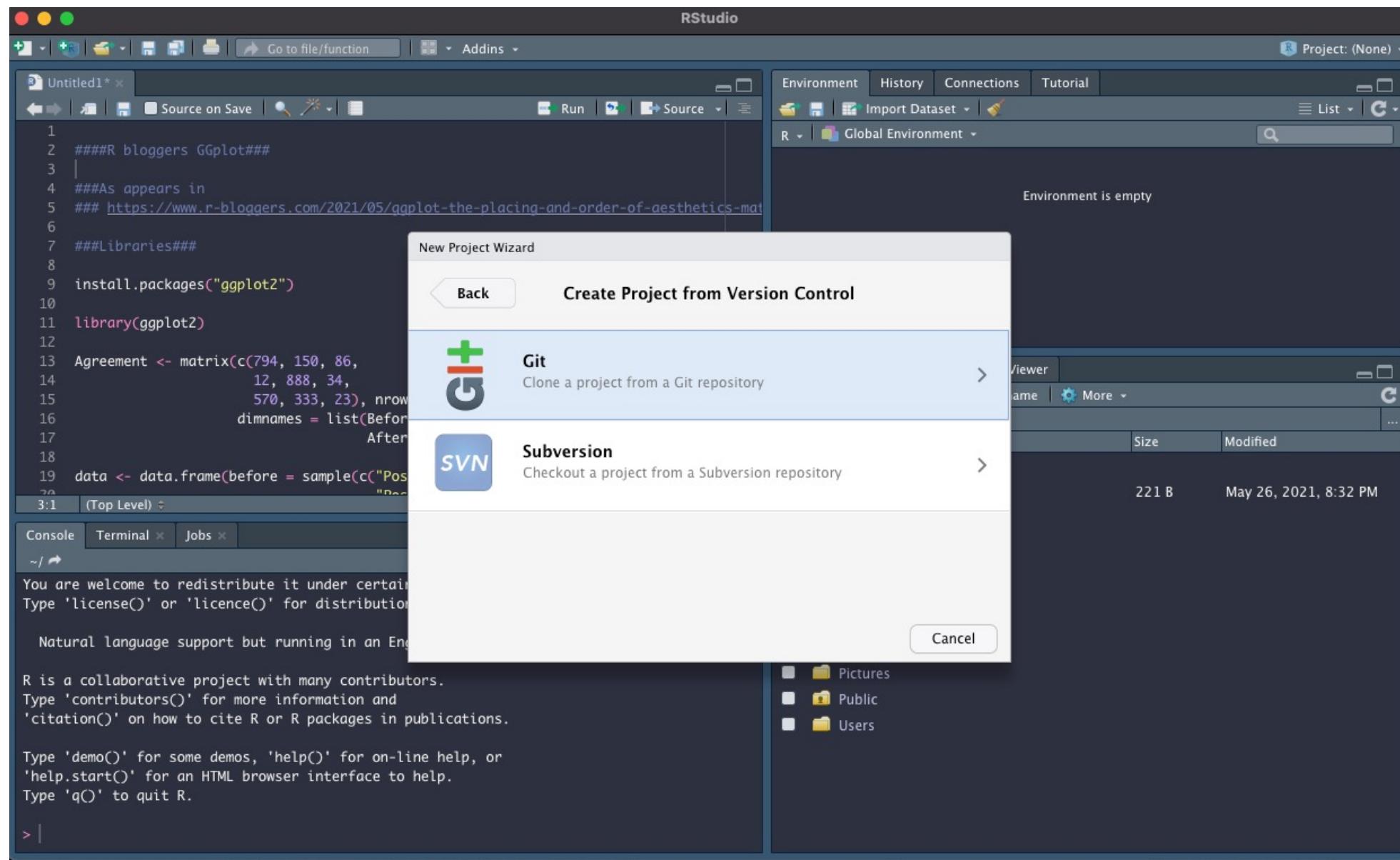
Choose a license

A license tells others what they can and can't do with your code. Learn more.

A license tells others what they can and can't do with your code. Learn more.

Create repository





RStudio

Untitled1* | Go to file/function | Addins | Project: (None)

```
1 ####R bloggers GGplot###
2 |
3 |
4 ###As appears in
5 ### https://www.r-bloggers.com/2021/05/ggplot-the-placing-and-order-of-aesthetics-mat
6 |
7 ###Libraries###
8 |
9 install.packages("ggplot2")
10 library(ggplot2)
11 |
12 Agreement <- matrix(c(794, 150, 86,
13                         12, 888, 34,
14                         570, 333, 23), nrow = 3)
15 dimnames(Agreement) <- list(Before = c("Before", "After"))
16 |
17 data <- data.frame(before = sample(c("Position", "Before", "After"), 1000, replace = TRUE),
18                      after = sample(c("Position", "Before", "After"), 1000, replace = TRUE))
19
```

3:1 (Top Level) | Console Terminal Jobs ~/ 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.

New Project Wizard

Clone Git Repository

Repository URL:

Project directory name:

Create project as subdirectory of:

Open in new session

Environment History Connections Tutorial

Import Dataset

Global Environment

Environment is empty

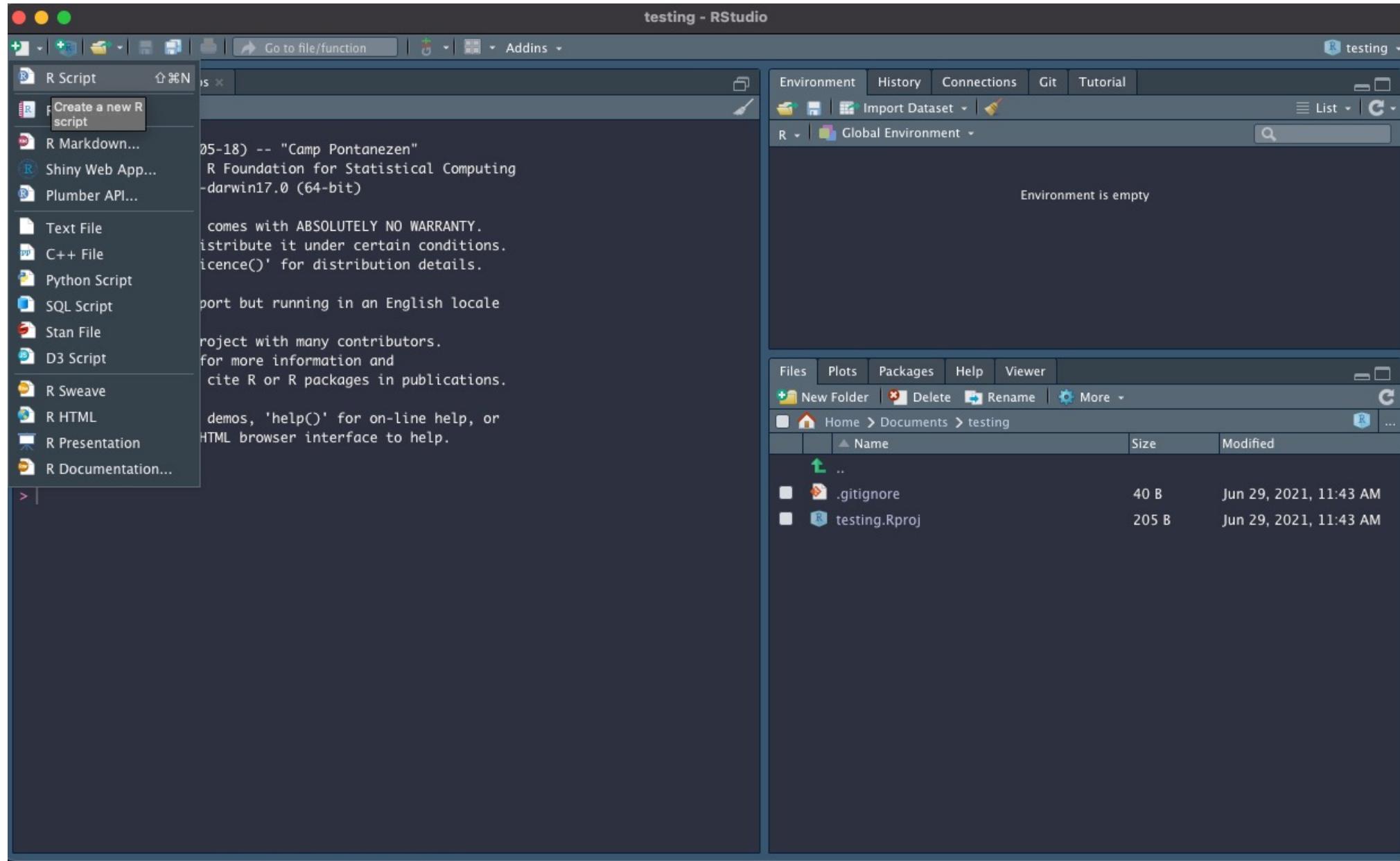
File Viewer

Name More ...

Size Modified

221 B May 26, 2021, 8:32 PM

Pictures Public Users



testing - RStudio

Testing.R x

Source on Save | Run | Source

```
1 print("Tis file was created within RStudio")
2
3 print("And now it lives on GitHub")
```

Environment History Connections Git Tutorial

Commit (no branch) C

Staged	Status	Path
■	?	.gitignore
■	?	Testing.R
✓	A	testing.Rproj

Files Plots Packages Help Viewer

New Folder Delete Rename More

Home > Documents > testing

Name	Size	Modified
..		
.gitignore	40 B	Jun 29, 2021, 11:43 AM
testing.Rproj	205 B	Jun 29, 2021, 11:43 AM
Testing.R	81 B	Jun 29, 2021, 11:45 AM

3:34 (Top Level) R Script

Console Terminal x Jobs x

~/Documents/testing/ ↵

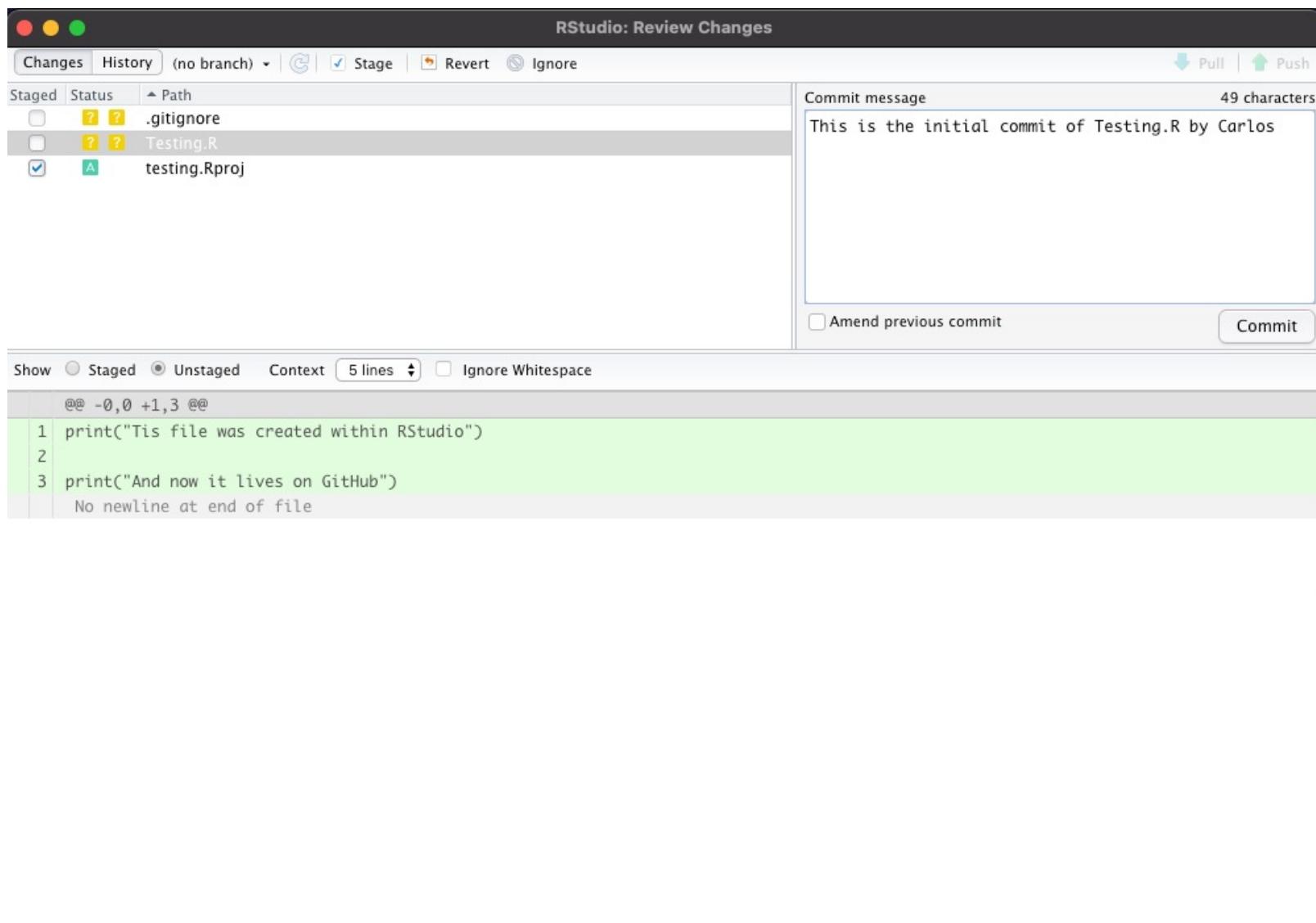
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

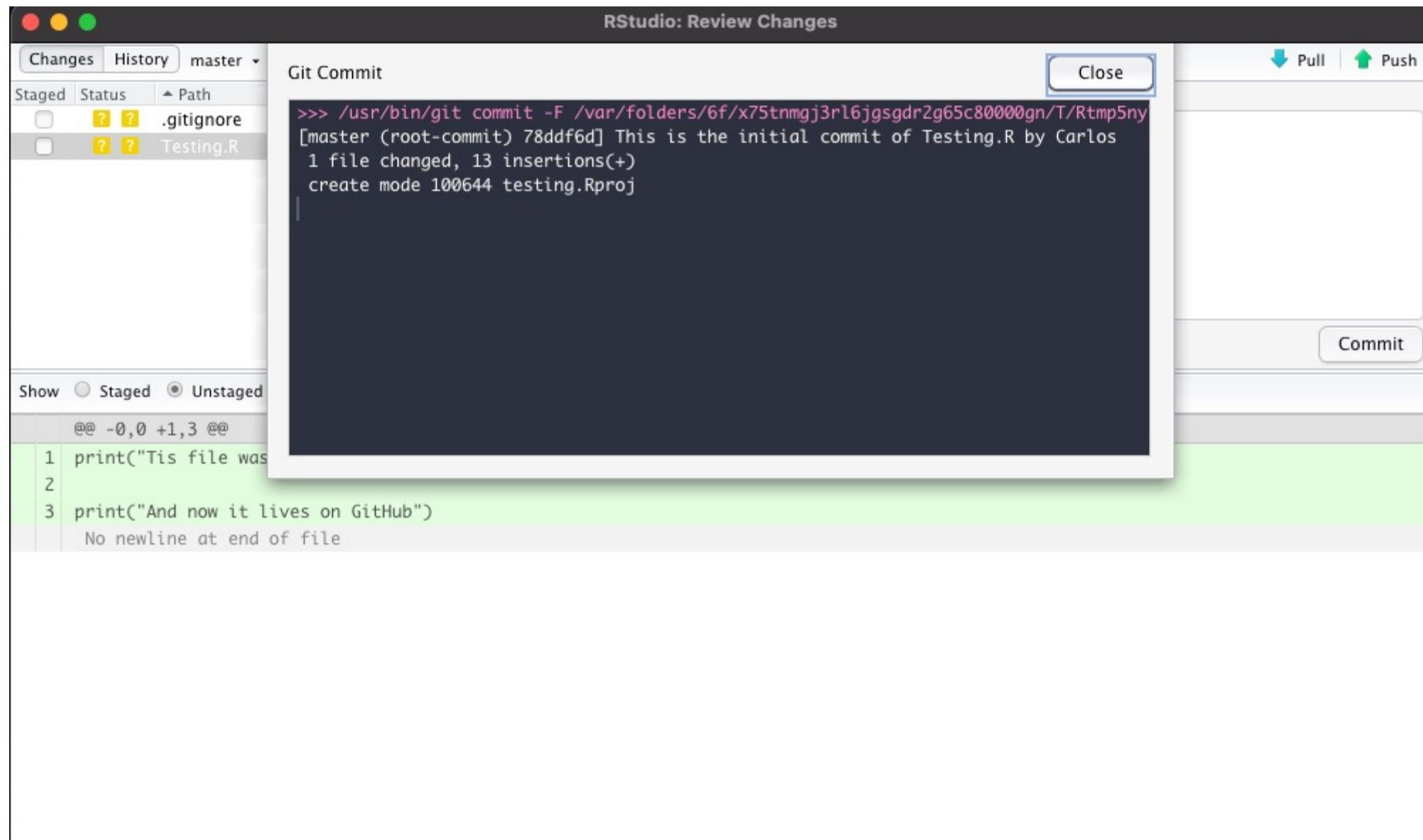
Natural language support but running in an English locale

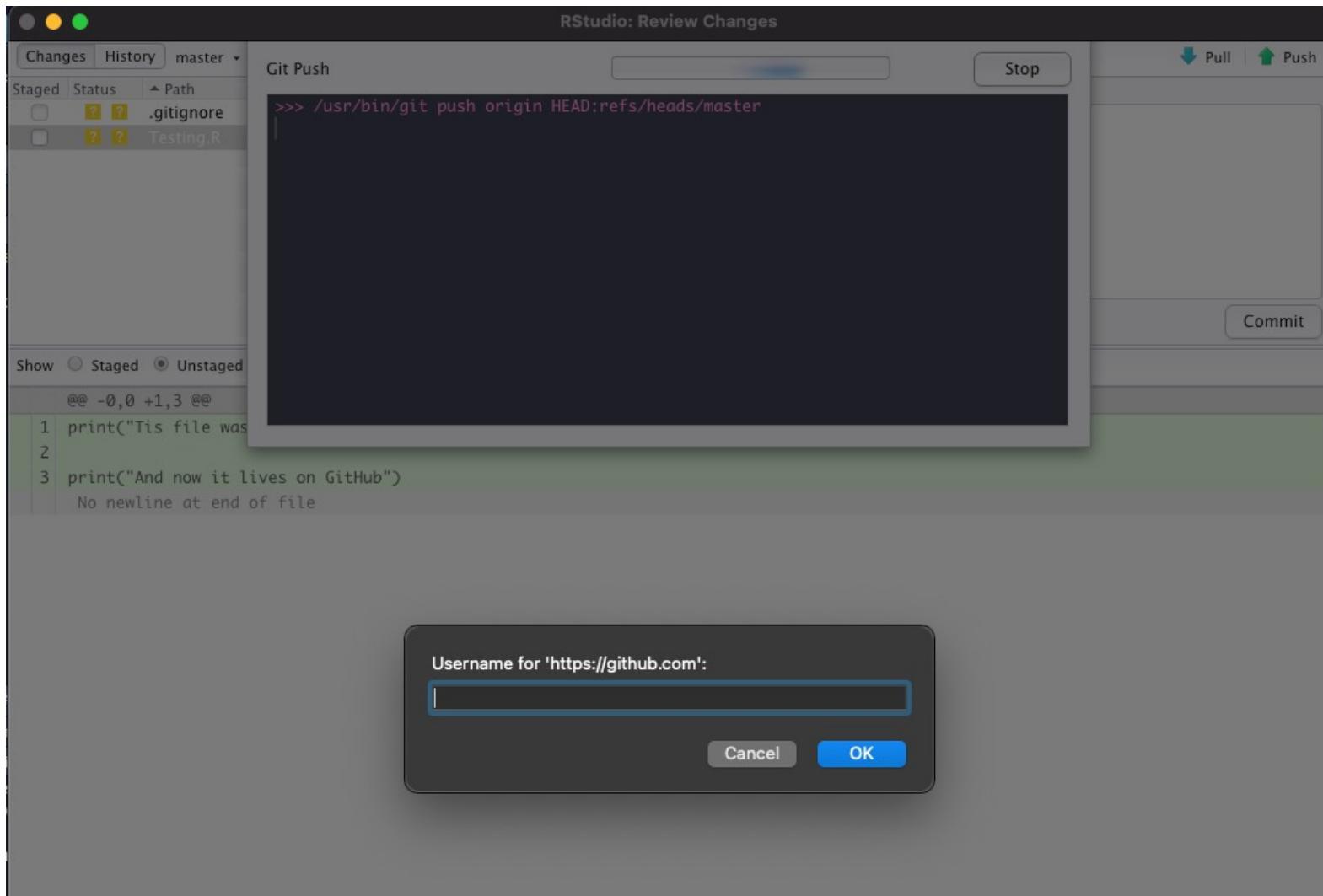
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

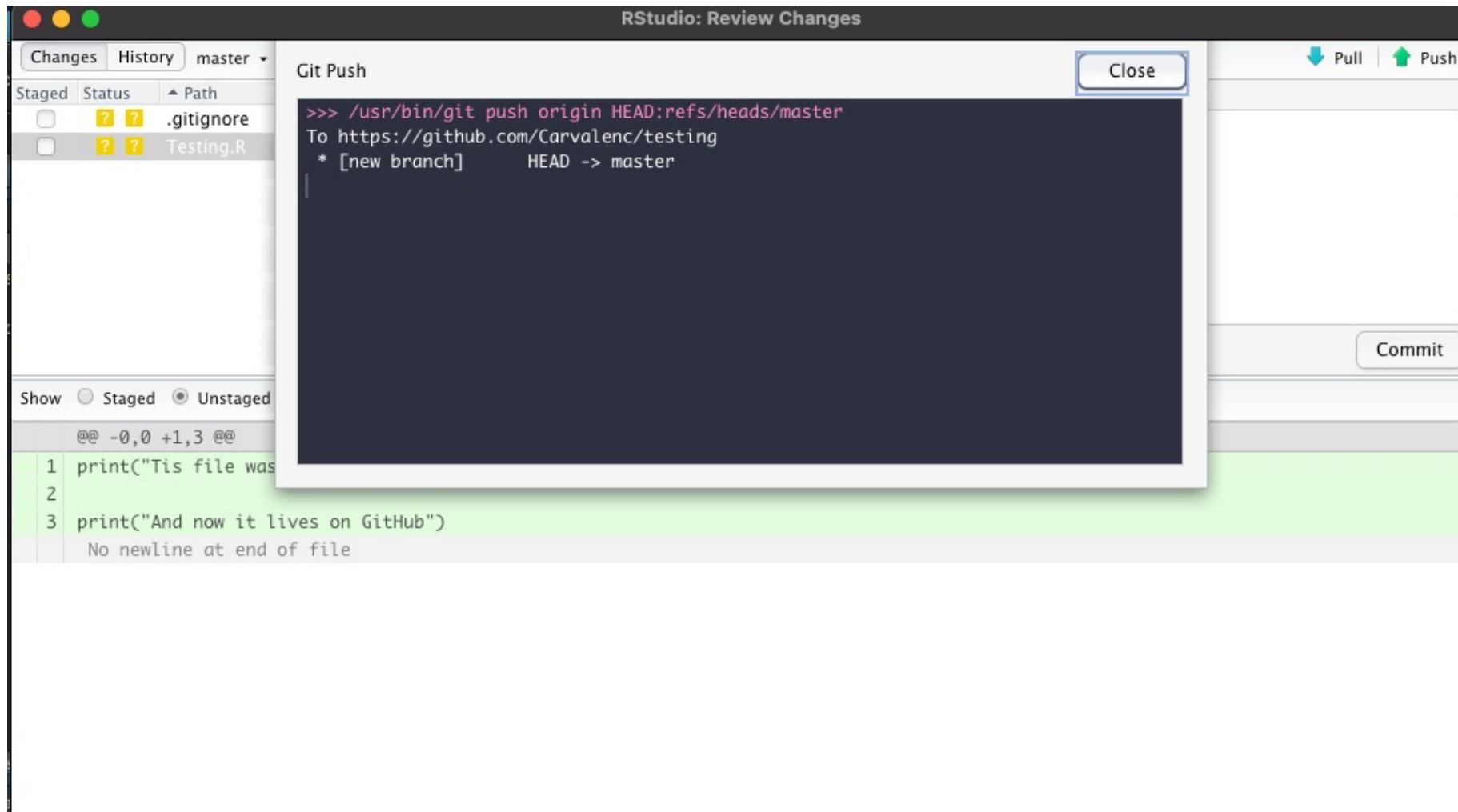
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> |









 Carvalenc / testing

 Unwatch ▼ 1

 Star 0

 Fork 0

 Code

 Issues

 Pull requests

 Actions

 Projects

 Wiki

 Security

 Insights

 Settings

 master ▼

 1 branch

 0 tags

 Go to file

 Add file ▼

 Code ▼



Carvalenc This is the initial commit of Testing.R by Carlos

78ddf6d 2 minutes ago  1 commit

 testing.Rproj

This is the initial commit of Testing.R by Carlos

2 minutes ago

Help people interested in this repository understand your project by adding a README.

 Add a README

About



This repository will be linked with
RStudio

Releases

No releases published
[Create a new release](#)

Packages

No packages published
[Publish your first package](#)

Useful resources:

- The Git book

<https://git-scm.com/book/en/v2>

- Set up Git course

<https://docs.github.com/en/get-started/quickstart/set-up-git>

