The background of the slide is a dense, abstract pattern of small, overlapping circles and triangles in various colors including red, blue, green, yellow, and purple. The pattern is more concentrated in the center and fades out towards the edges.

Git versioning: Keep track of your changes

Physalia course 2023

Instructor: Jacques Serizay

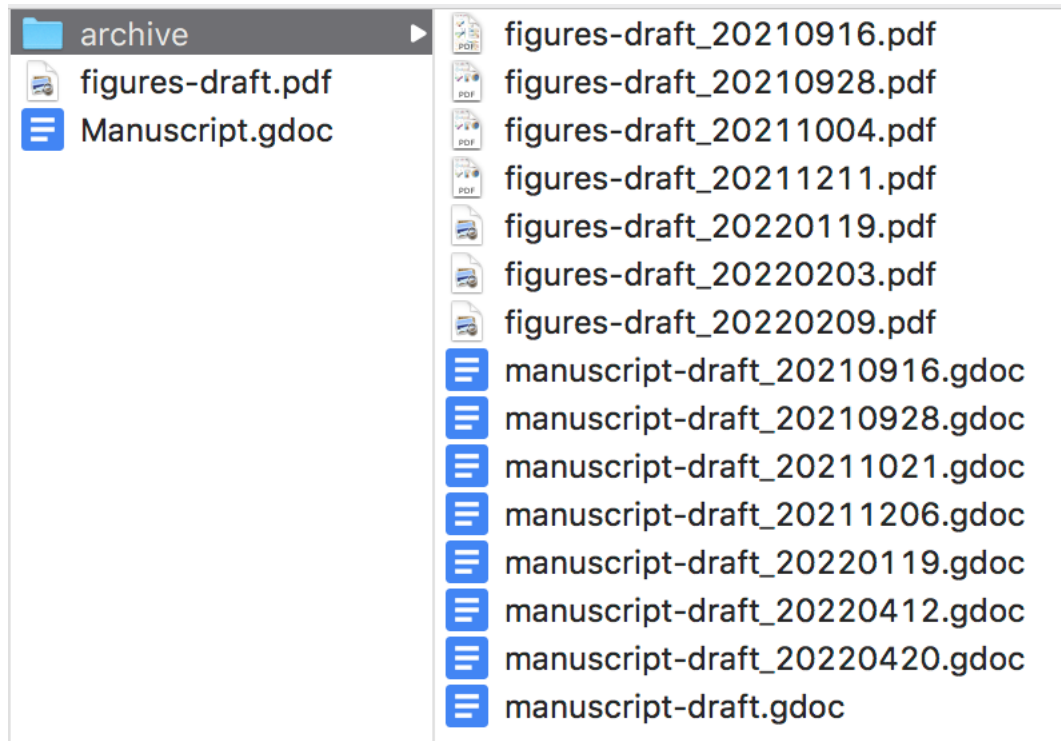
Keeping track of changes with git

<https://happygitwithr.com/>

- Git is a version control system.
- Git manages the evolution of a set of files – called a **repository** – in a sane, highly structured way.
- Its original purpose was to help groups of developers work collaboratively on big software projects.
- Essentially, this is “Track Changes” features from Microsoft Word on steroids.

Keeping track of changes with git

- Ever time-stamped a file? Git does the same, for one or several files, and allows you to revert back to previous files or compare changes (for text files).



Keeping track of changes with git

- Your working directory only contains the 2 files (pdf and gdoc) you are working on, and changes of these files are stored in the `.git` subfolder, in a compressed way.

```
.git
├── HEAD
├── config
├── description
├── hooks
│   └── README.sample
├── index
├── info
│   └── exclude
├── logs
│   ├── HEAD
│   └── refs
│       └── heads
│           └── master
├── objects
│   ├── 1c
│   │   └── a0315760167990e895dcd07abd5181179b3699
│   ├── 6a
│   │   └── e926839dd1829f1016a96f766d970ff184ad97
│   ├── 7b
│   │   └── a2dac56624b91528a273e6ba1b358c7c81a099
│   ├── 7e
│   │   └── f6e8d05a9051e3900191b5fef2fcceb95c7d60
│   ├── 89
│   │   └── 03184a2696c73f1d7d9b5dd69186f4d09e08df
│   ├── d9
│   │   └── d7c3933e45f627d030675caedf81db94d69cdf
│   ├── ef
│   │   └── 7cf2cbb7014bb9b4cef6ce71a853b278f4601d
│   ├── fc
│   │   └── 3a3d8df795817cd78de1d180385bfaa5c220b1
│   ├── info
│   └── pack
├── refs
│   ├── heads
│   │   └── master
│   └── tags
```

Keeping track of changes with git

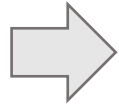
Git's main downside is... git is not user-friendly!

- It's painful to visualize changes, to browse history, to compare files, ...
- No native graphical interface

Git vs github

- Git is a software, locally installed on one's computer

```
$> git --help
```

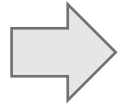


“Track Changes” features

Git vs github

- Git is a software, locally installed on one's computer

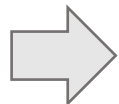
```
$> git
```



"Track Changes" features

- Github is an Internet hosting service, storing your local `git` repository (files AND changes) on-line ("remotely"):

```
https://github.com/
```



Dropbox features

Git vs github

- You are working on your manuscript draft in Word: you may rewrite sentences, resolve previous comments, reply to others still open, ... As long as you are working on your own, this works.
- Now you want to share it with others → you decide to put the document online as a Google Doc, allow access to others, and enable synchronization with your local Google Drive.
- Your colleagues will eventually rewrite/resolve/reply together with you (sometimes with conflicting changes!), and everyone will see who is doing what, etc.

The Google Doc is your “remote repository” and your local Google Drive folder is your “local repository”

Typically, both are continuously synced, whereas Git and Github are not sync-ed “live”, you do it manually and whenever you want.

Git vs github

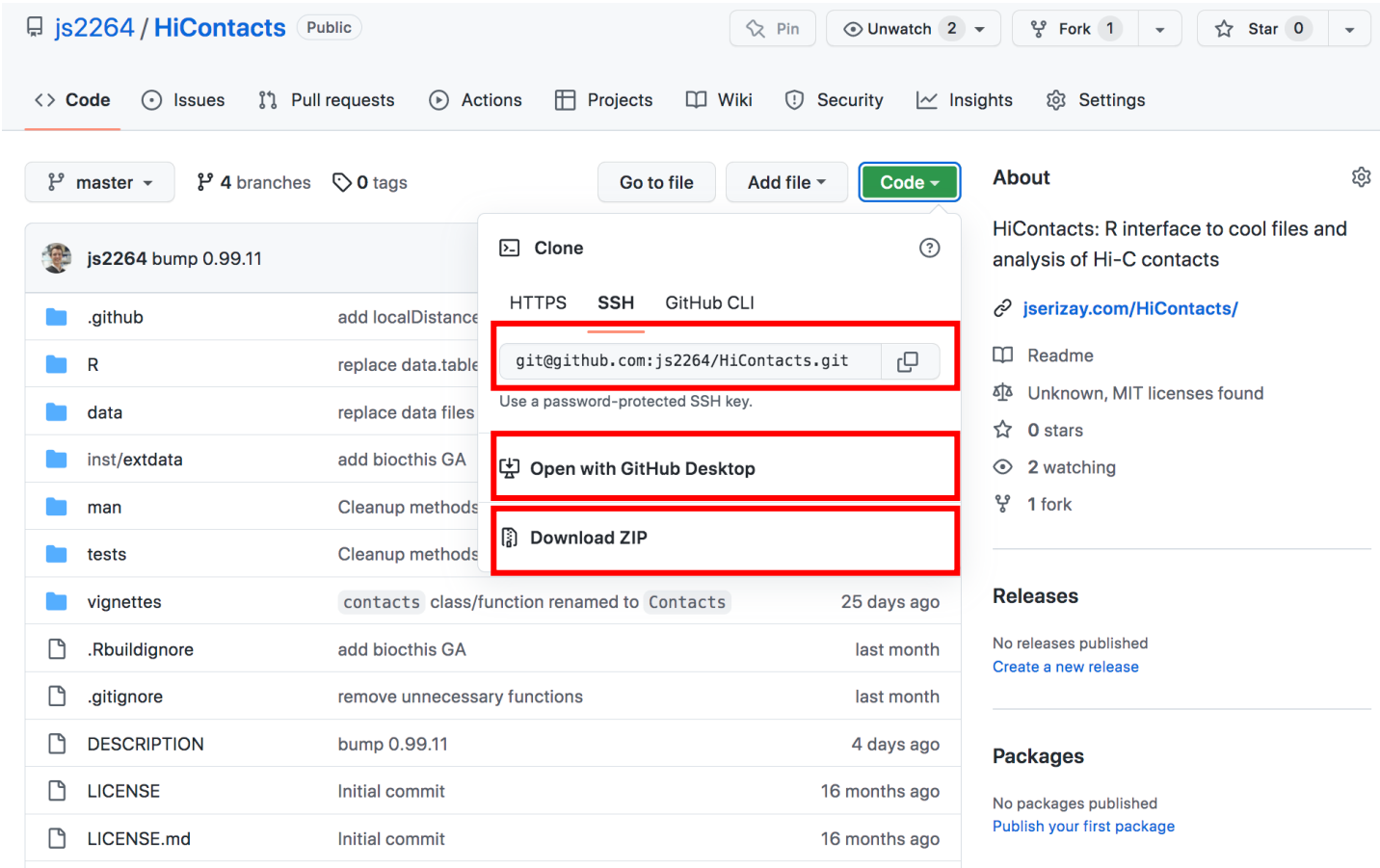
Github, gitlab, bitbucket: all different internet hosting services doing the same thing:

1. Storing your local git repositories online, to make available to others.
2. Allow specific online-based features: issues and pull requests
3. Easy "time-travel" (i.e. browsing files back in time) with permanent links
4. Search function!

Git vs github

Github, gitlab, bitbucket: all different internet hosting services doing the same thing:

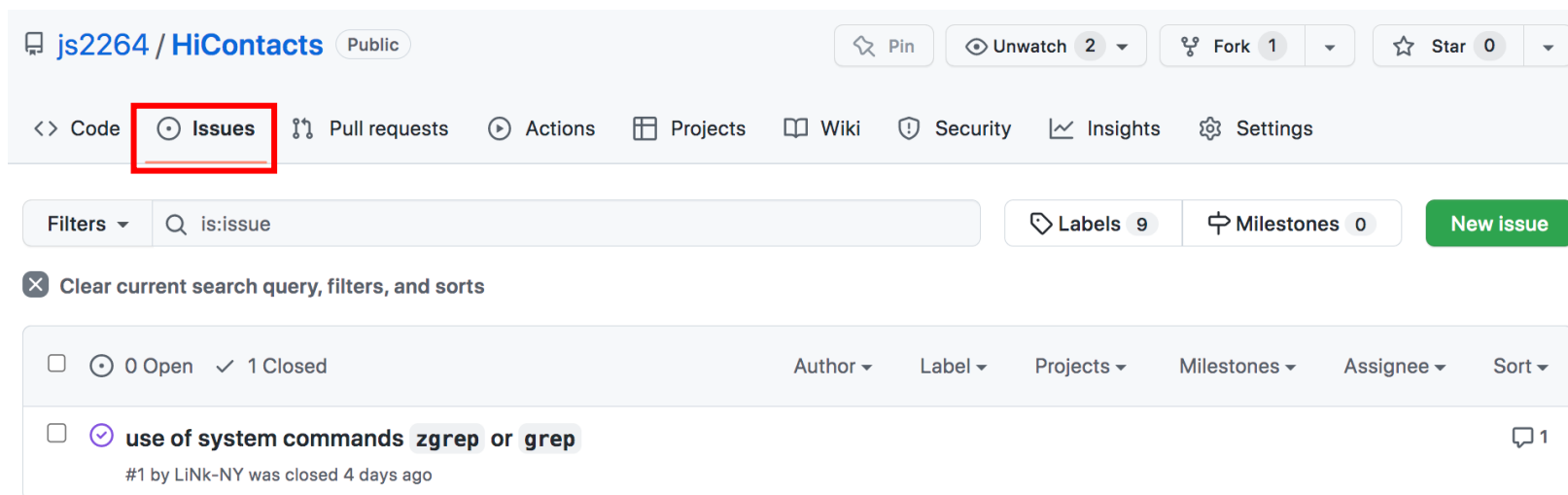
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Git vs github

Github, gitlab, bitbucket: all different internet hosting services doing the same thing:

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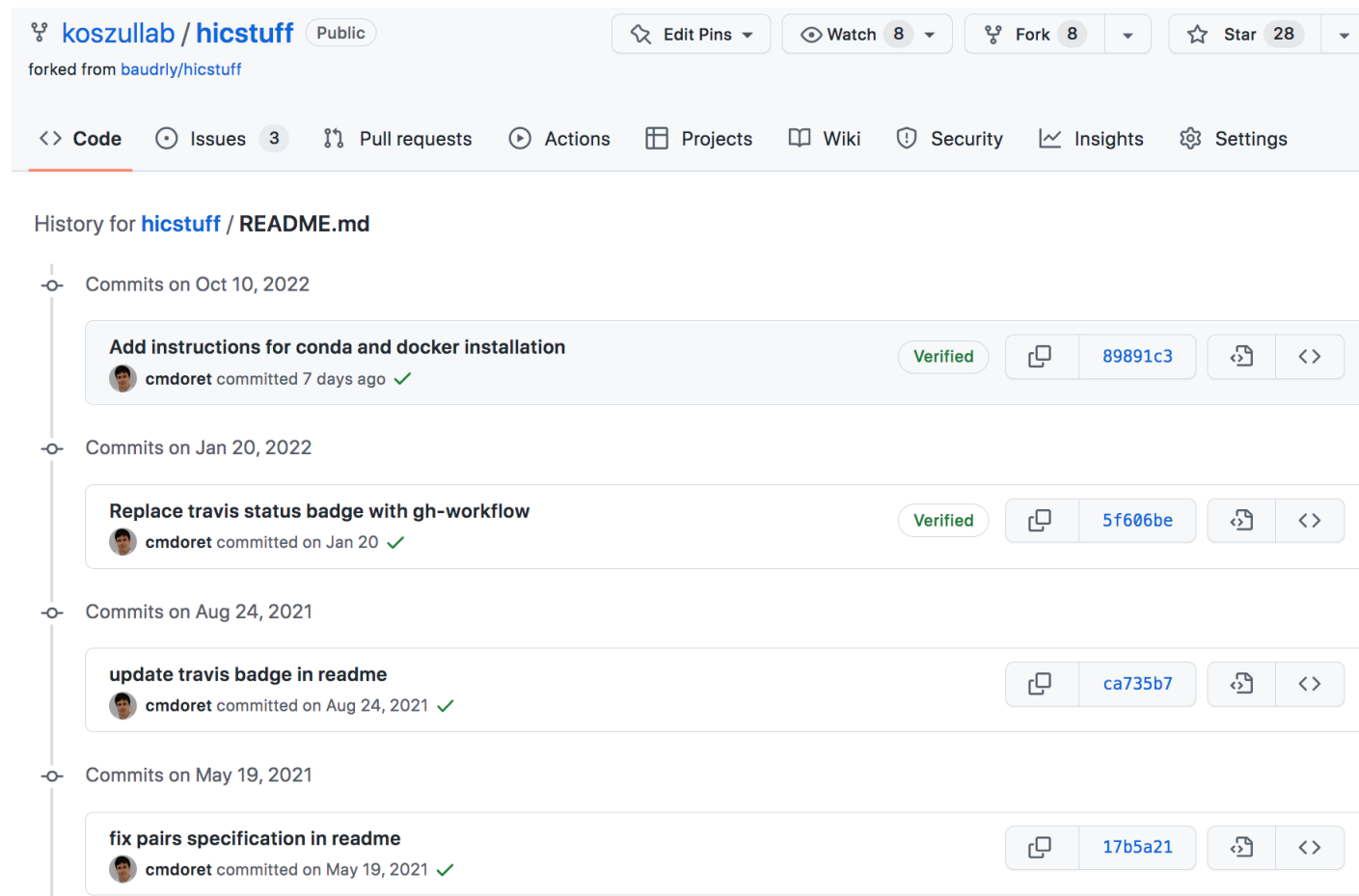
The screenshot shows the GitHub interface for the repository 'koszullab / hicstuff'. The 'Pull requests' tab is highlighted with a red box. The repository is public and has 8 forks and 28 stars. The navigation bar includes links for Code, Issues (3), Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. Below the navigation bar, there is a search bar with the query 'is:pr' and a 'New pull request' button. The main content area displays a list of pull requests with columns for checkboxes, status (Open/Closed), author, label, projects, milestones, reviews, assignee, and sort order. The list includes pull requests for 'add prefix to fig_dir', 'Replace travis with github workflow', 'Digest map', 'Move to BSD 3-Clause License', and 'Throw instead of returning input in normalization'.

| Author | Label | Projects | Milestones | Reviews | Assignee | Sort |
|----------|-------|----------|------------|---------|----------|------|
| js2264 | | | | 1 | | |
| cmdoret | | | | 1 | | |
| ABignaud | | | | 1 | | |
| cmdoret | | | | 1 | | |
| scovit | | | | 2 | | |

Git vs github

Github, gitlab, bitbucket: all different internet hosting services doing the same thing:

3. Easy “time-travel” (i.e. browsing files back in time) with permanent links



The screenshot displays the GitHub interface for the repository `koszullab / hicstuff`, which is public and forked from `baudrly/hicstuff`. The repository has 8 forks and 28 stars. The navigation bar includes links for Code, Issues (3), Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings.


The commit history for `hicstuff / README.md` is shown, with a vertical timeline on the left. The commits are as follows:

- Commits on Oct 10, 2022**
 - Add instructions for conda and docker installation** (Verified) by `cmdoret` committed 7 days ago. Commit hash: `89891c3`.
- Commits on Jan 20, 2022**
 - Replace travis status badge with gh-workflow** (Verified) by `cmdoret` committed on Jan 20. Commit hash: `5f606be`.
- Commits on Aug 24, 2021**
 - update travis badge in readme** by `cmdoret` committed on Aug 24, 2021. Commit hash: `ca735b7`.
- Commits on May 19, 2021**
 - fix pairs specification in readme** by `cmdoret` committed on May 19, 2021. Commit hash: `17b5a21`.

Git vs github

Github, gitlab, bitbucket: all different internet hosting services doing the same thing:

3. Easy “time-travel” (i.e. browsing files back in time) with permanent links

 **koszullab / hicstuff** Public

forked from baudrly/hicstuff

Edit Pins

Watch 8

Fork 8

Star 28

<> Code

Issues 3

Pull requests

Actions

Projects

Wiki

Security









Insights

Settings

hicstuff / README.md

100644 | 390 Lines (287 sloc) | 18.1 KB

Raw | Normal view | History

| | | | | |
|---|---|--------------|----|---|
|  | Initial commit | 7 years ago | 1 | # hicstuff |
|  | Update README.md | 7 years ago | 2 | |
| | Packaging, merging hicstuff and yahcp | 4 years ago | 3 | [![PyPI version](https://badge.fury.io/py/hicstuff.svg)](https://pypi.org/project/hicstuff/) |
| | | | 4 | [![PyPI - Python Version](https://img.shields.io/pypi/pyversion/hicstuff.svg)](https://img.shields.io/pypi/pyversion/hicstuff.svg) |
|  | Add instructions for conda and docker installation | 7 days ago | 5 | [![install with bioconda](https://img.shields.io/badge/install%20with%20bioconda-bioconda.svg)](https://bioconda.github.io/recipes/hicstuff/README.html) |
|  | Replace travis status badge with gh-workflow | 9 months ago | 6 | [![Build Status](https://github.com/koszullab/hicstuff/actions/workflows/build.yml/badge.svg)](https://github.com/koszullab/hicstuff/actions/workflows/build.yml) |
|  | Add zenodo DOI badge to README | 3 years ago | 7 | [![DOI](https://zenodo.org/badge/DOI/10.5281/zenodo.2620601.svg)](https://doi.org/10.5281/zenodo.2620601) |
| | Coverage badge | 4 years ago | 8 | [![codecov](https://codecov.io/gh/koszullab/hicstuff/branch/main/graph/badge.svg)](https://codecov.io/gh/koszullab/hicstuff/branch/main) |
| | Packaging, merging hicstuff and yahcp | 4 years ago | 9 | [![Read the docs](https://readthedocs.org/projects/hicstuff/badge)](https://readthedocs.org/projects/hicstuff/) |
|  | Binder link | 4 years ago | 10 | [![Binder](https://mybinder.org/badge_logo.svg)](https://mybinder.org/v2/gh/koszullab/hicstuff/main) |
| | Packaging, merging hicstuff and yahcp | 4 years ago | 11 | [![Code style: black](https://img.shields.io/badge/code%20style-black-000000.svg)](https://github.com/ambv/black) |
|  | Update README.md | 7 years ago | 12 | |
| | update readme with new pipeline commands | 4 years ago | 13 | A lightweight library that generates and handles Hi-C contact matrices |
| | | | 14 | |
| | | | 15 | The goal is to make generation and manipulation of Hi-C matrices easy |
| | Packaging, merging hicstuff and yahcp | 4 years ago | 16 | |
| | Fix hicstuff pipeline help in README, add TOC and list p... | 4 years ago | 17 | ## Table of contents |
| | | | 18 | |
|  | Add instructions for conda and docker installation | 7 days ago | 19 | * [Installation](#installation) |
| | | | 20 | * [pip](#pip) |
| | | | 21 | * [conda](#conda) |
| | | | 22 | * [docker](#docker) |
| | | | 23 | * [Usage](#usage) |
| | | | 24 | * [Full pipeline](#full-pipeline) |
| | | | 25 | * [Individual components](#individual-components) |
| | | | 26 | * [Library](#library) |
| | | | 27 | * [Connecting the modules](#connecting-the-modules) |
| | | | 28 | * [File formats](#file-formats) |
| | | | 29 | * [Contributing](#contributing) |

Github and organizations

- A public repository is readable by the world. The owner can grant higher levels of permission to others, such as the ability to push commits.
- A private repository is invisible to the world. The owner can grant read, write (push), or admin access to others.
- There is also a notion of an organization, which can be useful for managing repository permissions for entire teams of people.

Github and organizations

- A public repository is readable by the world. The owner can grant higher levels of permission to others, such as the ability to push commits.
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 - There is also a notion of an organization, which can be useful for managing repository permissions for entire teams of people.
- Git has been re-purposed by the data science community.
- We now also use it, IN COLLABORATION WITH A CLOUD-BASED GIT HOST, to manage the diverse collection of files that make up typical data analytical projects, which often consist of data, figures, reports, and, yes, source code.

Github and organizations



R infrastructure

Overview Repositories 136 Projects Packages People 15

Pinned



devtools

Public

Tools to make an R developer's life easier

R 2.2k 747



roxygen2

Public

Generate R package documentation from inline R comments

R 521 208



testthat

Public

An R to make testing

R 810 299



pkgdown

Public

Generate static html documentation for an R package

R 636 307



usethis

Public

Set up commonly used components

R 718 233



httr

Public

httr: a friendly http package for R

R 959 2k



tidyverse

The tidyverse is a collection of R packages that share common principles and are designed to work together seamlessly

361 followers http://tidyverse.org Verified

Overview Repositories 37 Projects Packages People 27

Pinned



dplyr

Public

dplyr: A grammar of data manipulation

R 4.2k 1.5k



ggplot2

Public

An Implementation of the Grammar of Graphics in R

R 5.6k 1.9k



readr

Public

Read flat files (csv, tsv, fwf) into R

R 924 278



purrr

Public

A functional programming toolkit for R

R 1.1k 229



tidyr

Public

Tidy Messy Data

R 1.2k 393



rvest

Public

Simple web scraping for R

R 1.4k 332



Bioconductor

Software for the analysis and comprehension of high-throughput genomic data

49 followers https://bioconductor.org

Overview Repositories 260 Projects 2 Packages People 2

Pinned



Contributions

Public

Contribute Packages to Bioconductor

115 32



BlocStickers

Public

Stickers for some Bioconductor packages - feel free to contribute and/or modify.

R 110 77



bioconductor_docker

Public

Docker Containers for Bioconductor - NEW!

Shell 50 18



bioconductor.org

Public

Source code for the Bioconductor website

HTML 16 33

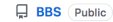


pkgrevdocs

Public

Training Material for Community Reviewers

TeX 6 11



BBS

Public

The Bioconductor Build System

Python 7 6



rOpenSci

190 followers Berkeley, CA https://ropensci.org/ @rOpenSci info@ropensci.org Verified

Overview Repositories 328 Projects 1 Packages People 79

README.md

Welcome to the rOpenSci Project on GitHub. Our repositories are currently distributed across a few different organizations.

You can explore our [resources page](#) to find what you're after, it includes a list of all our GitHub organizations.

Also refer to our [code of conduct](#).

Pinned



software-review

Public

rOpenSci Software Peer Review.

R 249 103



software-review-meta

Public

For organizing projects related to rOpenSci Software Peer Review

11 3



dev_guide

Public

rOpenSci Packages: Development, Maintenance, and Peer Review

R 133 49



rtweet

Public

R client for interacting with Twitter's [stream and REST] APIs

R 751 202

How to set things up

1. Register for a GitHub account
2. **MAKE SURE YOU ARE RUNNING R/RStudio/BiocManager WITH THE APPROPRIATE VERSION!**
3. Install Git: <https://git-scm.com/downloads>, or:
 - Linux: ``sudo apt-get install git``
 - Mac: ``xcode-select --install`` (needs Xcode)
 - Windows: ``choco install git.install`` (needs Chocolatey)

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 - Linux: `sudo apt-get install git`
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 - Windows: `choco install git.install` (needs Chocolatey)

4. Configure **git** from R (easy)

```
usethis::git_sitrep()
gert::git_config_global_set("user.name", "Jacques")
gert::git_config_global_set("user.email", "jacquesserizay@gmail.com")
usethis::git_vaccinate()
usethis::use_git()
usethis::use_git_ignore("*.Rproj")
```

Don't forget to make an initial commit!

How to set things up

5. Configure github (harder):

- Git can communicate with a remote server using one of two protocols, HTTPS or SSH, and the different protocols use different credentials.
- We must use SSH, as this means of communications is required later on, for Bioconductor submission.
- For that, we need to generate a pair of private/public SSH keys, connect to GitHub from R and push the public key to GitHub.

How to set things up

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- Git can communicate with a remote server using one of two protocols, HTTPS or SSH, and the different protocols use different credentials.
- We must use SSH, as this means of communications is required later on, for Bioconductor submission.
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```
gh::gh_whoami()
usethis::gh_token_help()

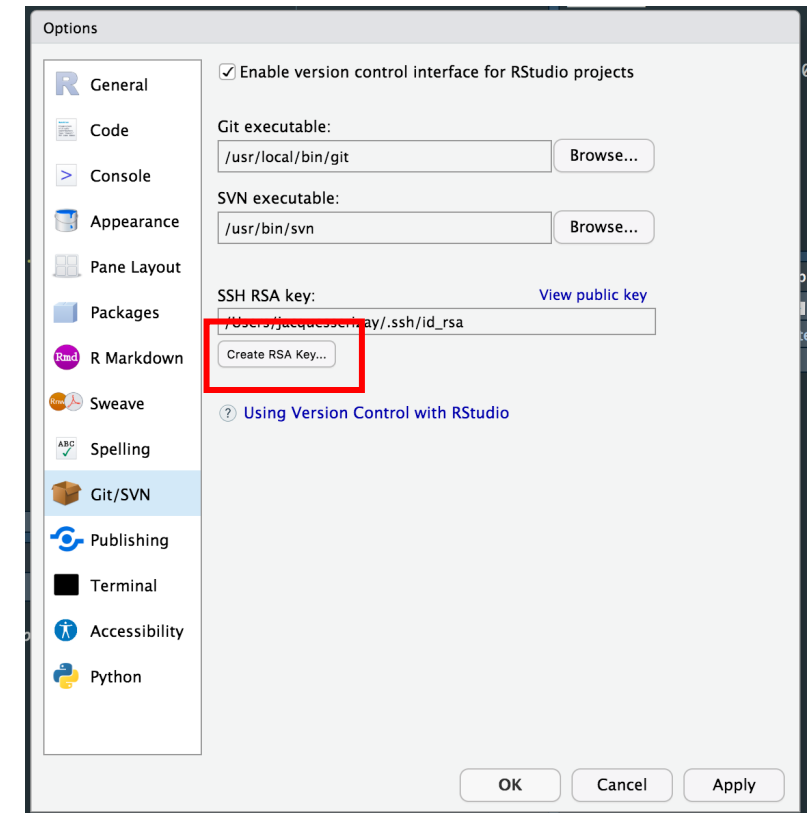
#Create a GH PAT
usethis ::create_github_token()
gitcreds ::gitcreds_set()
#Paste your GitHub token, not your password!

#Add an SSH key to GitHub
usethis ::use_github()
credentials::ssh_setup_github()
```

How to set things up

5. Configure github (harder):

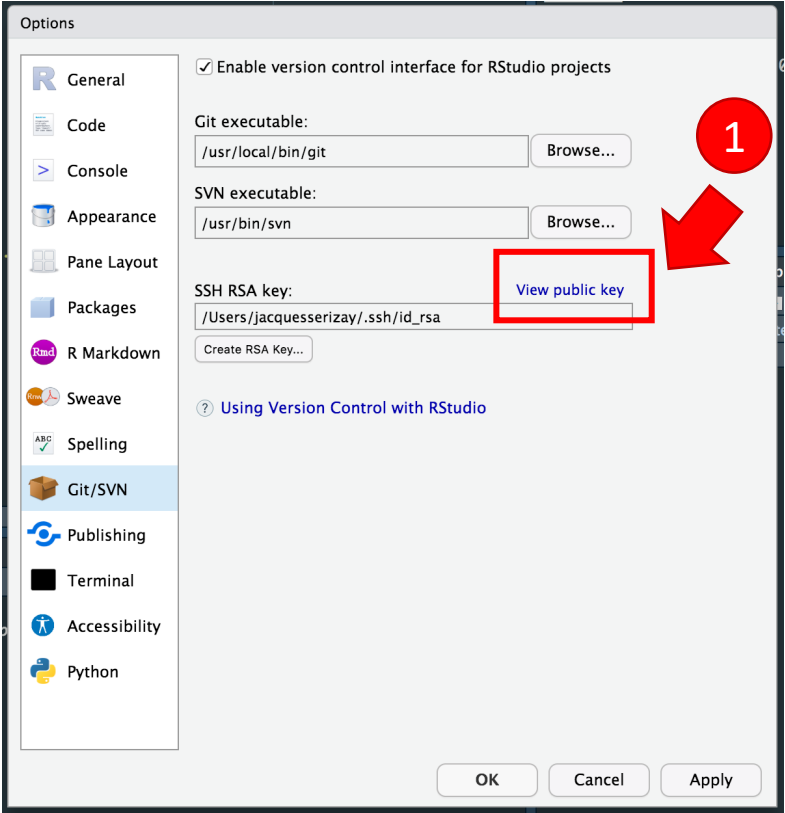
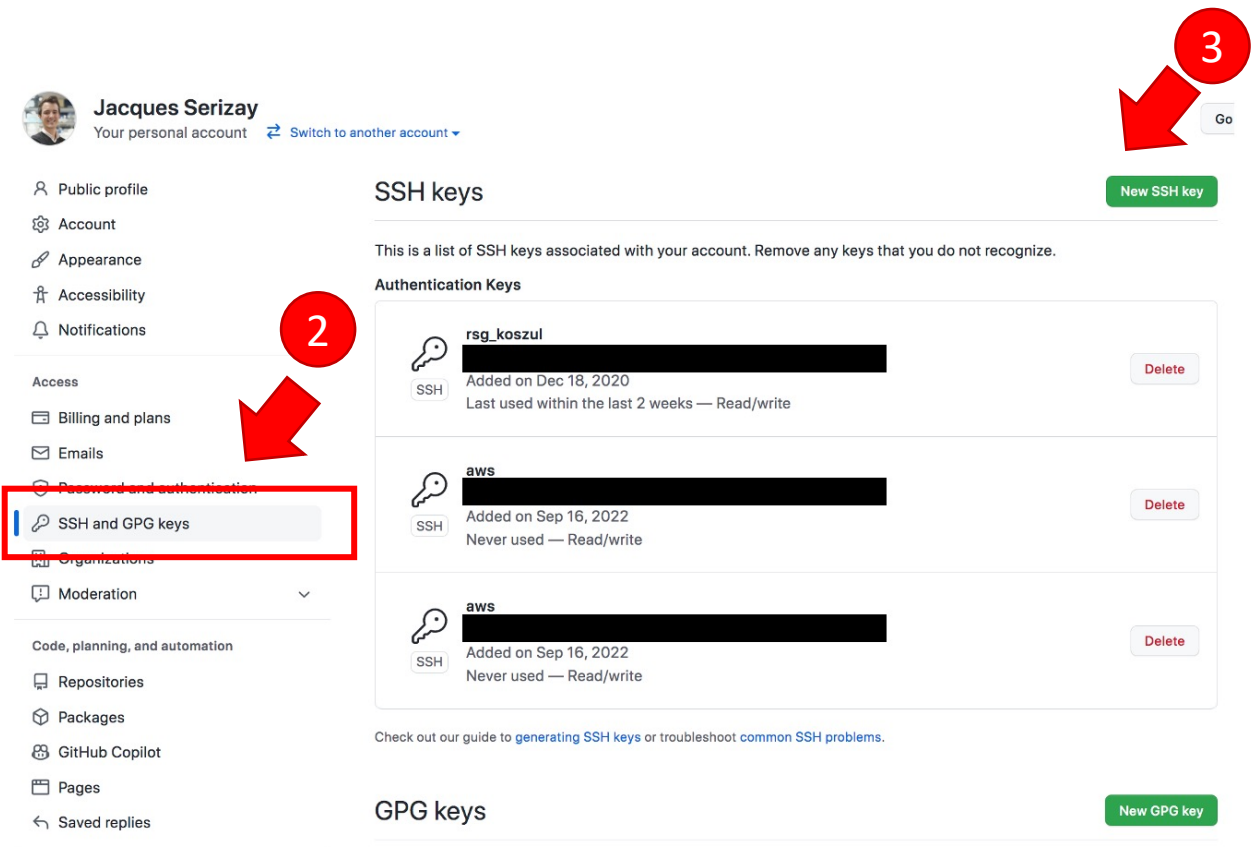
- Fallback approach: create a key in RStudio



How to set things up

5. Configure github (harder):

- Then, we need to upload the public key to GitHub



How to set things up

5. Configure github (harder):

- Test it with ``ssh -T git@github.com``

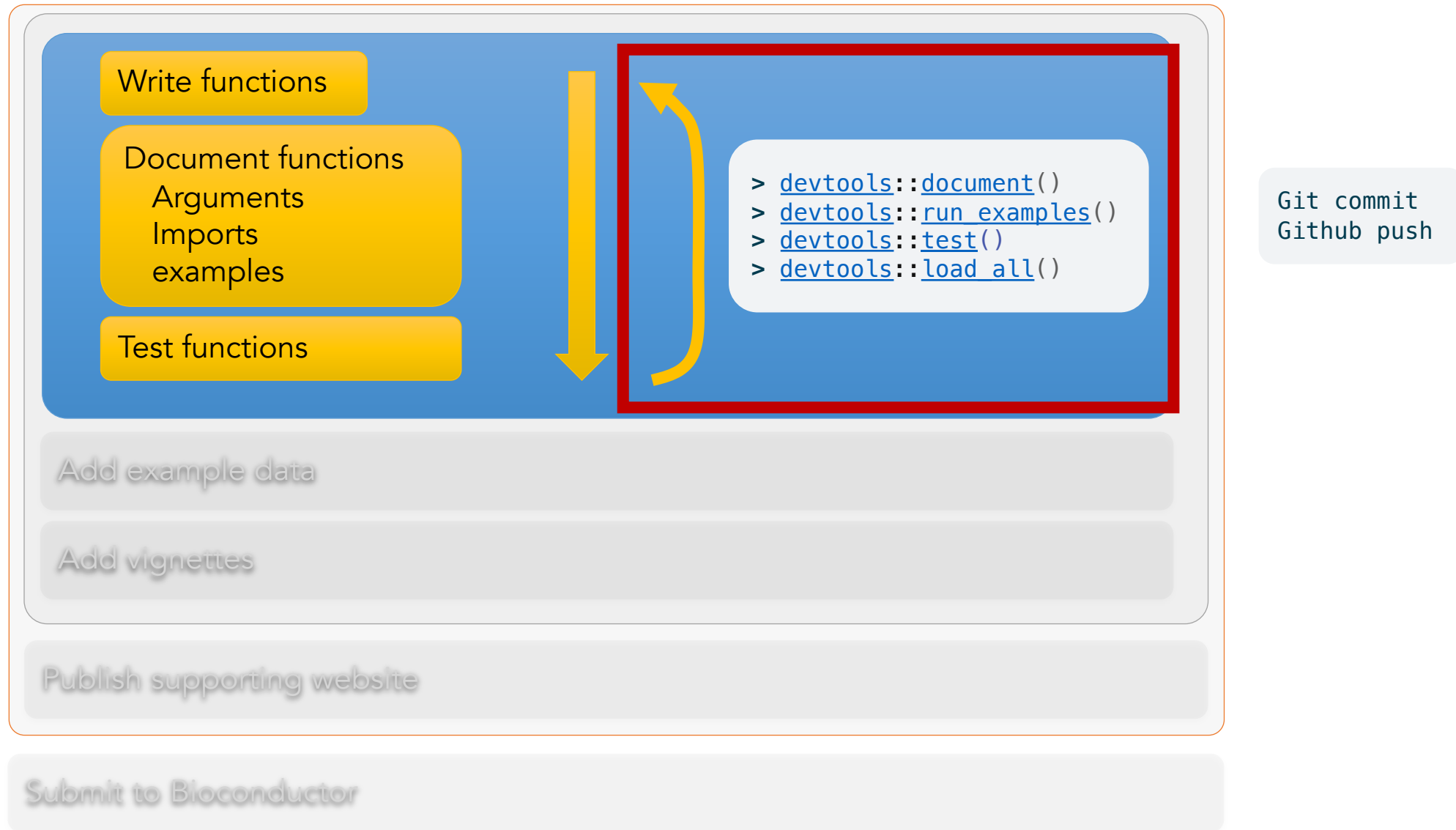
```
jacquesserizay@LOCAL[13:54:27]:~ $ ssh -T git@github.com  
Hi js2264! You've successfully authenticated, but GitHub  
does not provide shell access.
```


How to set things up

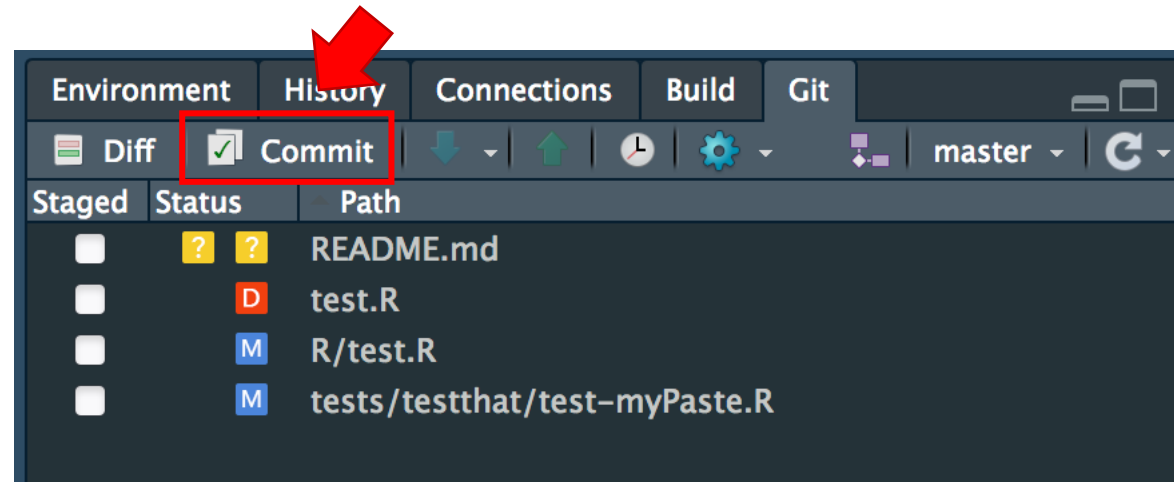
If you are still struggling...

<https://happygitwithr.com/usage-intro.html#usage-intro>

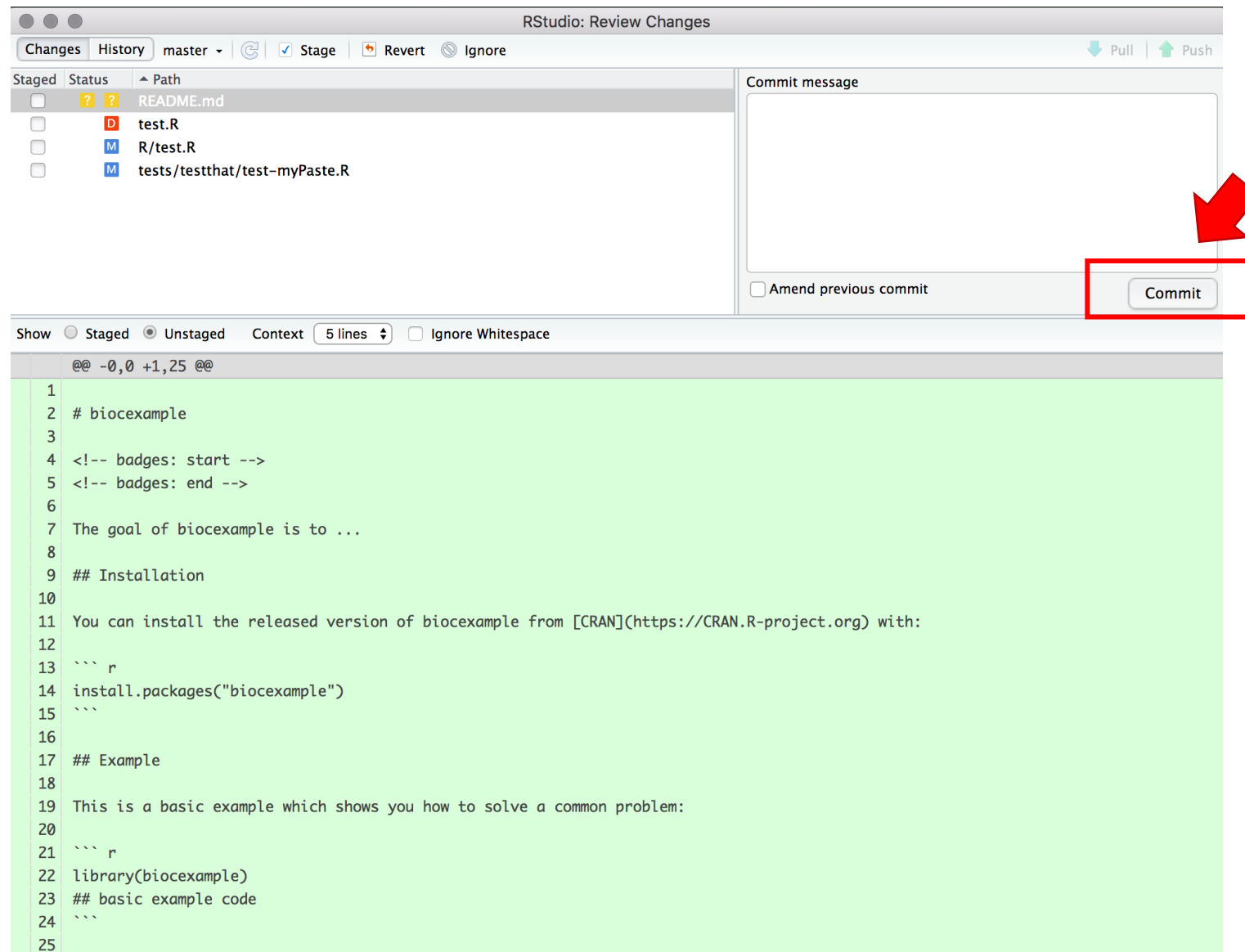
Lather-rinse-repeat



Lather-rinse-repeat



Lather-rinse-repeat



Lather-rinse-repeat

