# Using Git, GitHub Desktop, and GitHub for novice and experienced users

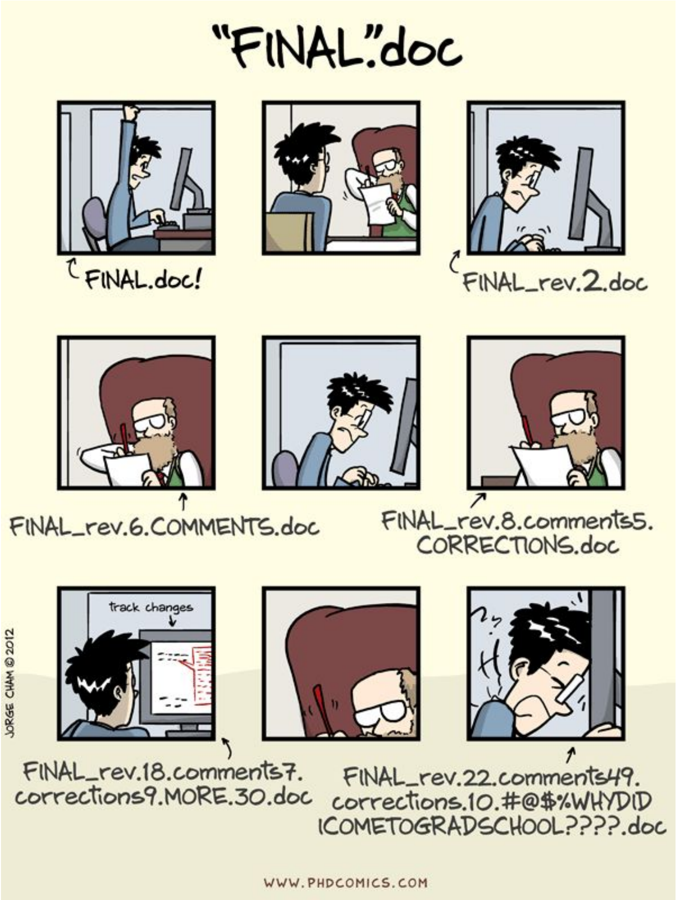
Yi Liu and Tom Palmer
1st December 2023

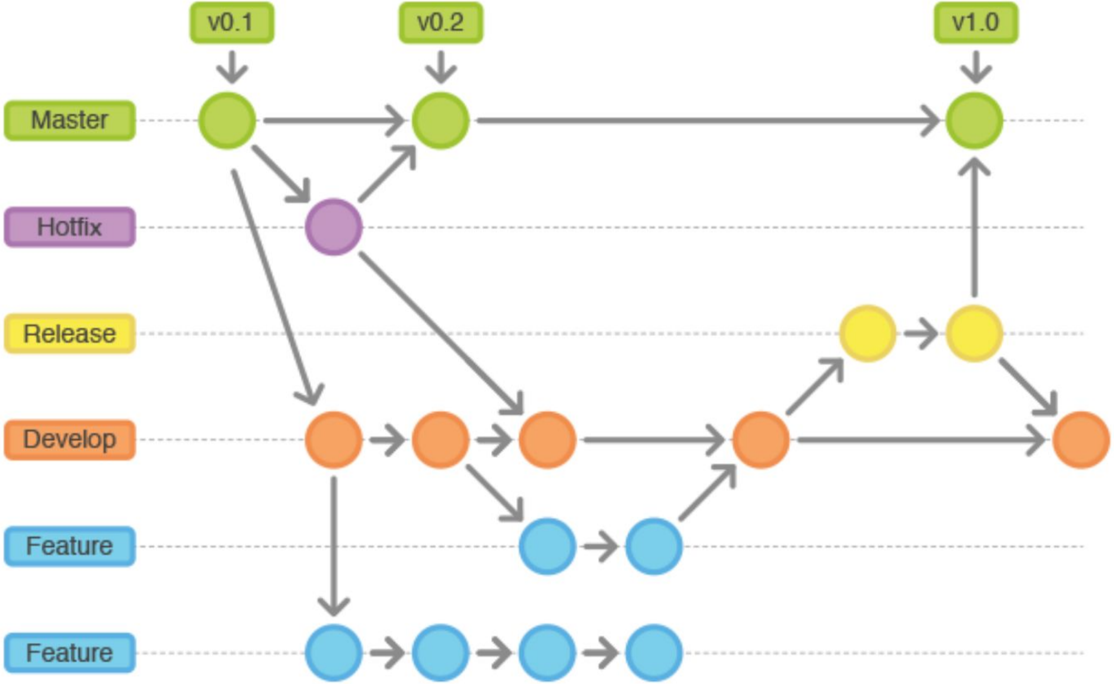
# Learning outcomes

- Novice users: be able to make and commit into a repo on GitHub
- Experienced users: how to avoid some common pitfalls

- Understand that Git and GitHub can be used in different ways for different projects
- Understand that Git provides certain features and GitHub provides additional features
- Be able to use a graphical Git GUI, e.g., GitHub Desktop, VS Code extension
- Be able to use Git, GitHub Desktop/VS Code and GitHub with confidence
- Be able to competently contribute to other Git repositories

# Why Git


"FINAL".doc
FINAL.doc!
FINAL_rev.2.doc
FINAL_rev.6.COMMENTS.doc
FINAL_rev.8.comments5. CORRECTIONS.doc
track changes
FINAL_rev.18.comments7. corrections9.MORE.30.doc
FINAL_rev.22.comments49. corrections.10.#@$%WHYDID ICOMETOGRADSCHOOL????.doc
JORGE CHAM © 2012
WWW.PHDCOMICS.COM



v0.1

v0.2

v1.0

Master

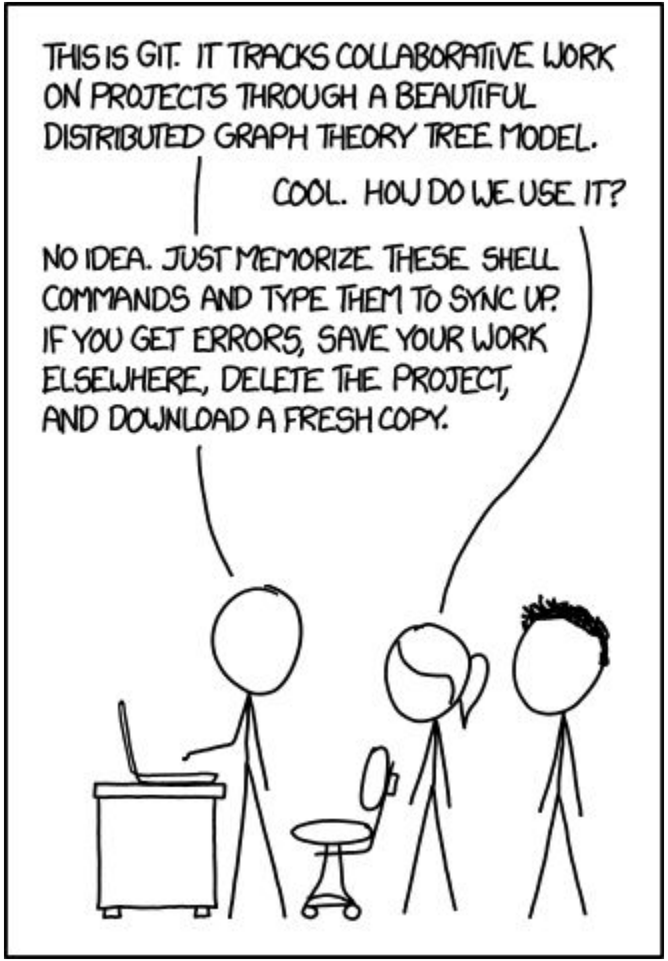
Hotfix

Release

Develop

Feature

Feature


THIS IS GIT. IT TRACKS COLLABORATIVE WORK ON PROJECTS THROUGH A BEAUTIFUL DISTRIBUTED GRAPH THEORY TREE MODEL.
COOL. HOW DO WE USE IT?
NO IDEA. JUST MEMORIZE THESE SHELL COMMANDS AND TYPE THEM TO SYNC UP. IF YOU GET ERRORS, SAVE YOUR WORK ELSEWHERE, DELETE THE PROJECT, AND DOWNLOAD A FRESH COPY.

https://xkcd.com/1597/

# Installation links

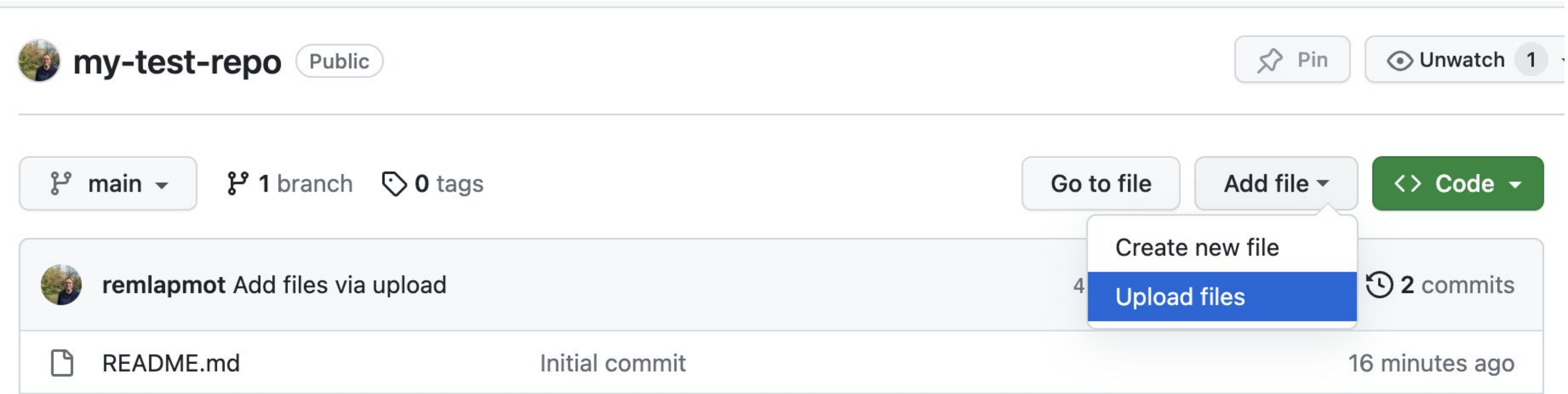
- GitHub Desktop https://desktop.github.com/
- Git for Windows https://git-scm.com/download/win , https://gitforwindows.org/
- macOS install with homebrew: `brew install git`

# 3 researcher use cases

- Helena
- Des
- Dom

# Helena

- Wants to make code/supplementary material available online for her journal article
- Does not need either Git nor GitHub Desktop installed on computer
- Doesn't need her code folders initialised as Git repos
- Simply drag and drop files from computer into GitHub web interface, commit message: "Add files via upload"
- Recommend turning off GitHub repository features such as Issues, Releases, Discussions, etc (through About pane | settings). If someone wants to contact her they can email



remlapmot Add files via upload

| | | |
|---|---|---|
| README.md | Initial commit | 16 minutes ago |

# Des

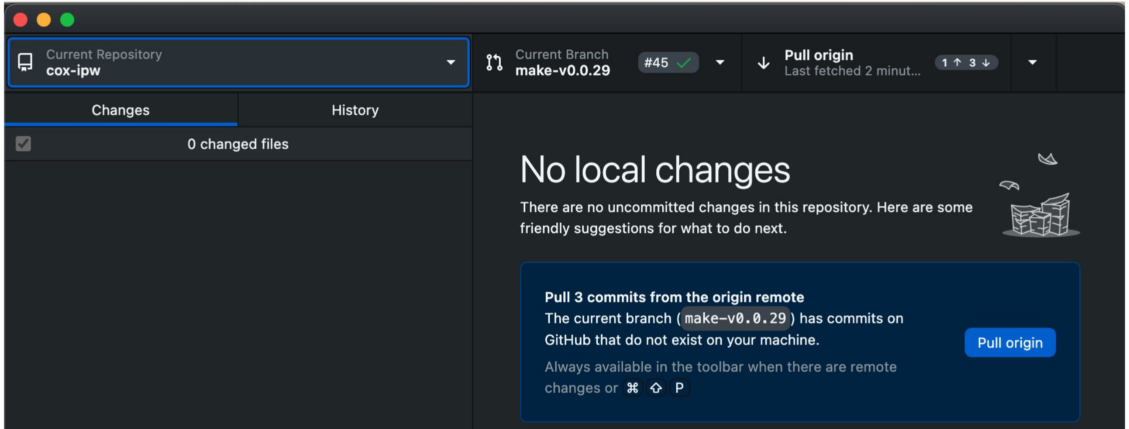
- Coding an R package
- Essentially working alone, occasionally might receive a pull request from a supervisor/interested user
- Needs GitHub Desktop installed (which has a version of Git within it)
- Needs project folders initialised as Git repos
- Needs to take care to write meaningful commit messages
- Does it really matter if he always works on the main branch?
- Question: Why might you want to send a PR to your own repo even if you are the only contributor?
- Helpful to make Releases in the GitHub repo (and/or use Git tags)

# Dom

- Coding R packages and additionally wants to send pull requests to other people's projects on GitHub
- Needs both Git and GitHub Desktop installed
- Needs to understand
    - How to fork a repo
    - Never send a PR from his own main/master/default branch - why??
    - Needs to understand how to rebase a branch
    - When is it acceptable/required to force push (i.e., rewrite Git history) a branch??
    - Will need to understand some Git Terminal commands (`git cmdname`)
    - Needs to know how to resolve Git merge conflicts

# A scenario

- Dom starts work on his home PC on a new branch (pushes it up to GitHub)
- Goes to work, works on the branch on his work PC but at some point force pushes to the branch (up to GitHub)
- When he goes home, how does he get the updated version of his branch?
- At home in GitHub Desktop in top right box he will see both arrows - be careful when you see these!!



Current Repository
cox-ipw

Current Branch
make-v0.0.29

Pull origin
Last fetched 2 minut...

0 changed files

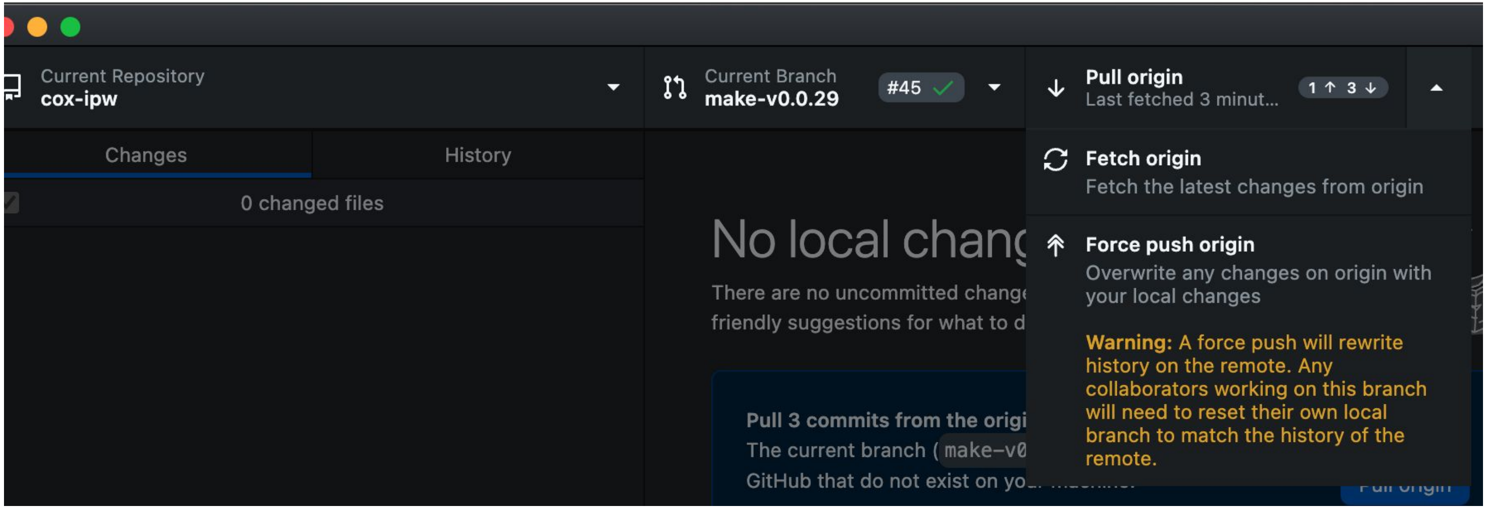
No local changes

There are no uncommitted changes in this repository. Here are some friendly suggestions for what to do next.

**Pull 3 commits from the origin remote**
The current branch (`make-v0.0.29`) has commits on GitHub that do not exist on your machine.

Always available in the toolbar when there are remote changes or ⌘ ⇧ P

- (For show) Expanding the dropdown arrow - in this box **do not** select either option



Fetch the latest changes from origin

Overwrite any changes on origin with your local changes

**Warning:** A force push will rewrite history on the remote. Any collaborators working on this branch will need to reset their own local branch to match the history of the remote.

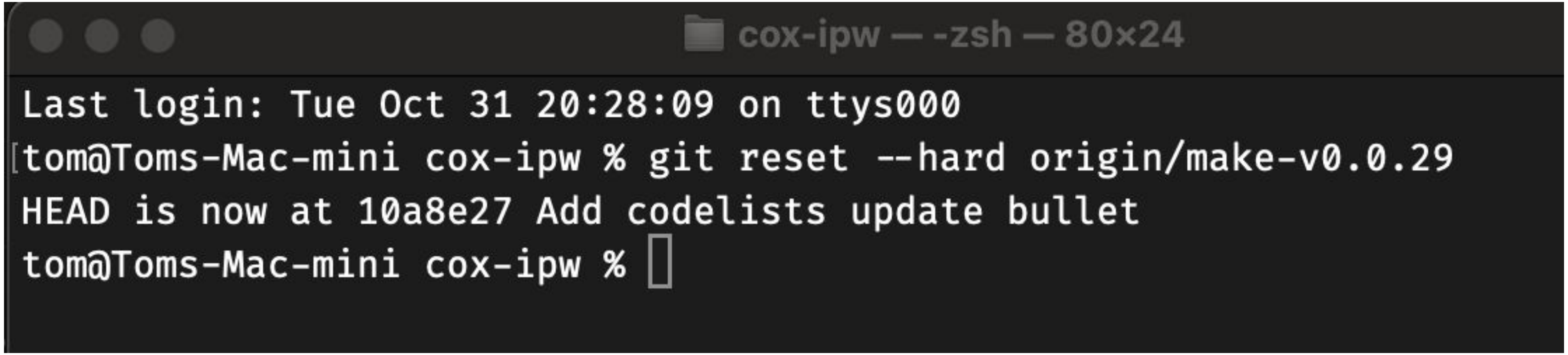
No local chang

There are no uncommitted change friendly suggestions for what to d

**Pull 3 commits from the origi**

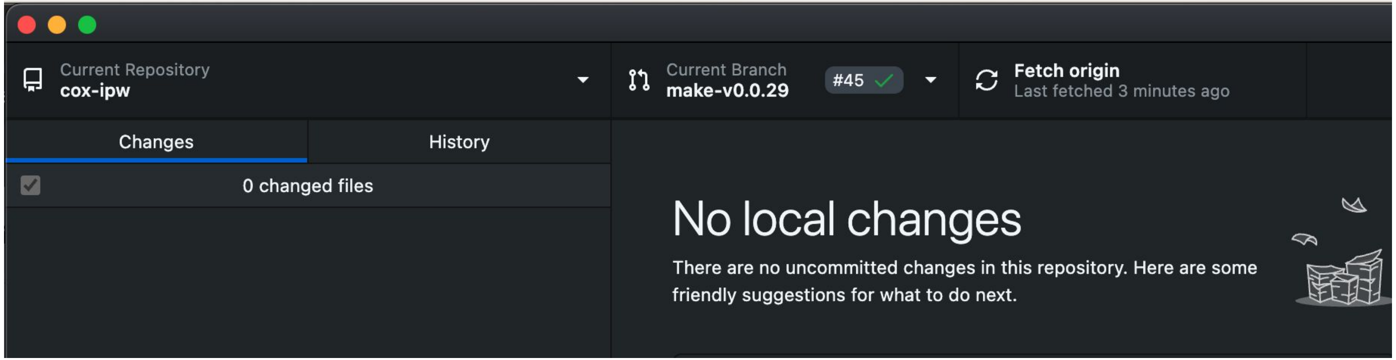
The current branch (`make-v0` GitHub that do not exist on yo

- `git reset` is your friend



```
Last login: Tue Oct 31 20:28:09 on ttys000
tom@Toms-Mac-mini cox-ipw % git reset --hard origin/make-v0.0.29
HEAD is now at 10a8e27 Add codelists update bullet
tom@Toms-Mac-mini cox-ipw % 
```

- GitHub Desktop is happy again



Current Repository
cox-ipw

Current Branch
make-v0.0.29 #45 ✓

Fetch origin
Last fetched 3 minutes ago

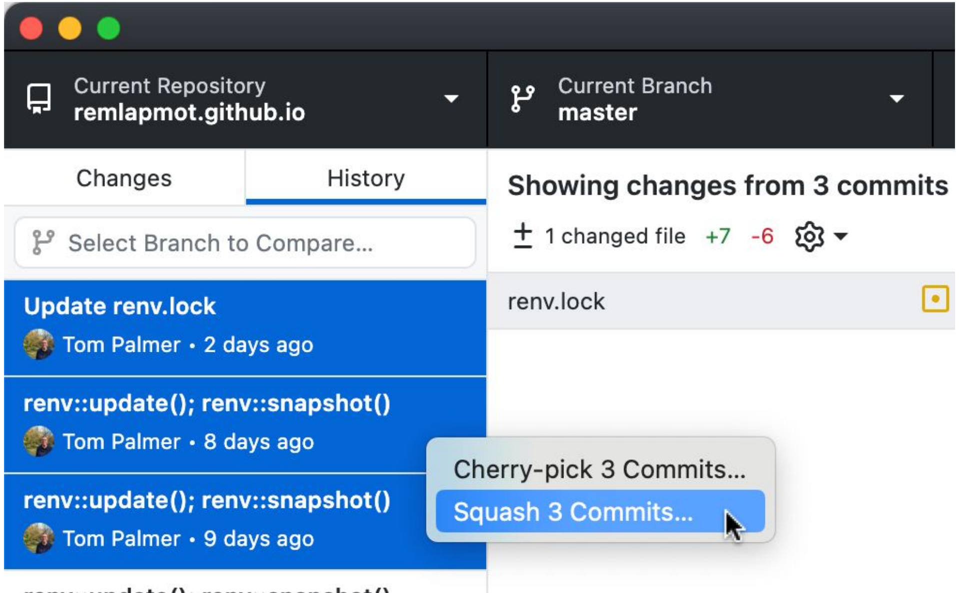
☑ 0 changed files

No local changes

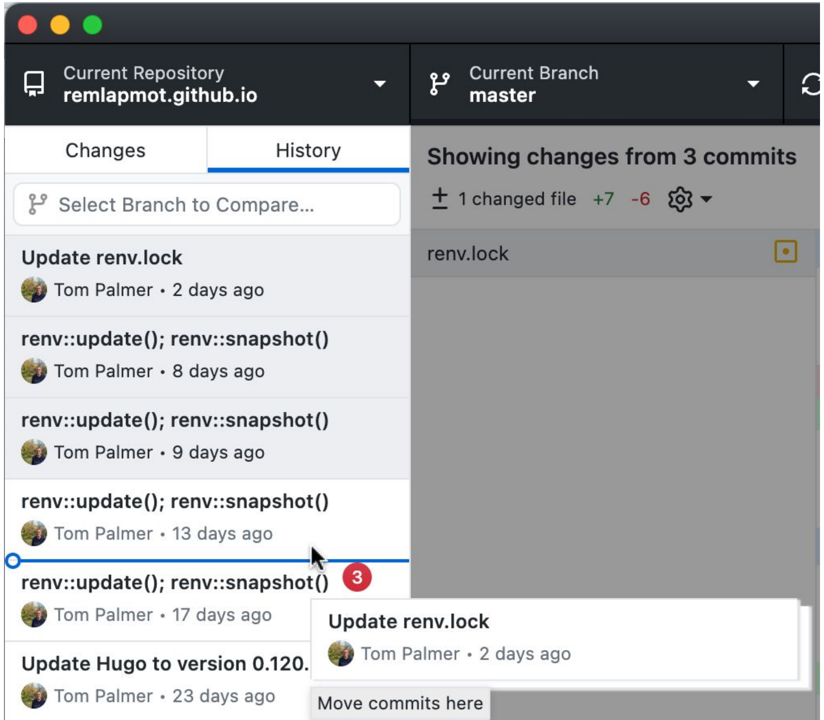
There are no uncommitted changes in this repository. Here are some friendly suggestions for what to do next.

# Squashing and reordering commits

- Select commits and reorder/squash
- Occasionally GitHub Desktop can hang and fail to complete such operations
- In which case open a terminal in your repo and run: `git rebase --abort`



# Reordering example (select commits | drag and drop where you want)



Showing changes from 3 commits

1 changed file +7 -6

renv.lock

Update renv.lock
Tom Palmer • 2 days ago

renv::update(); renv::snapshot()
Tom Palmer • 8 days ago

renv::update(); renv::snapshot()
Tom Palmer • 9 days ago

renv::update(); renv::snapshot()
Tom Palmer • 13 days ago

renv::update(); renv::snapshot()
Tom Palmer • 17 days ago

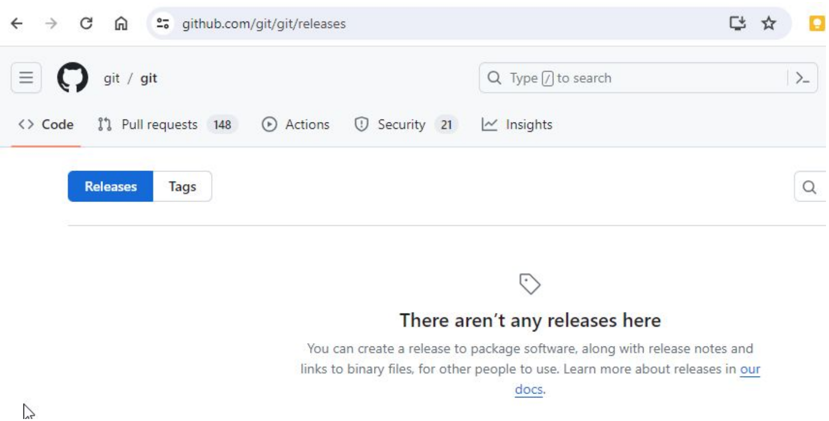
Update Hugo to version 0.120.
Tom Palmer • 23 days ago

Update renv.lock
Tom Palmer • 2 days ago

Move commits here

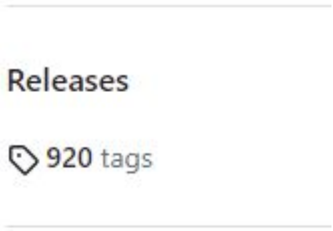
# Git features versus GitHub features

- GitHub provides alot of features on top of Git features
- E.g., Git has the concept of tags (for a version release), GitHub extends this with its Releases
  - This is why alot of projects which are mailing list based only use Git features, e.g., Git itself https://github.com/git/git/

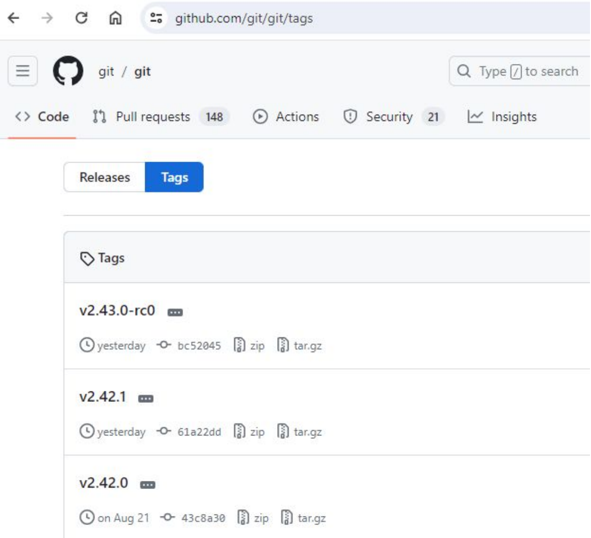


There aren't any releases here

You can create a release to package software, along with release notes and links to binary files, for other people to use. Learn more about releases in our docs.


Releases

920 tags



Tags

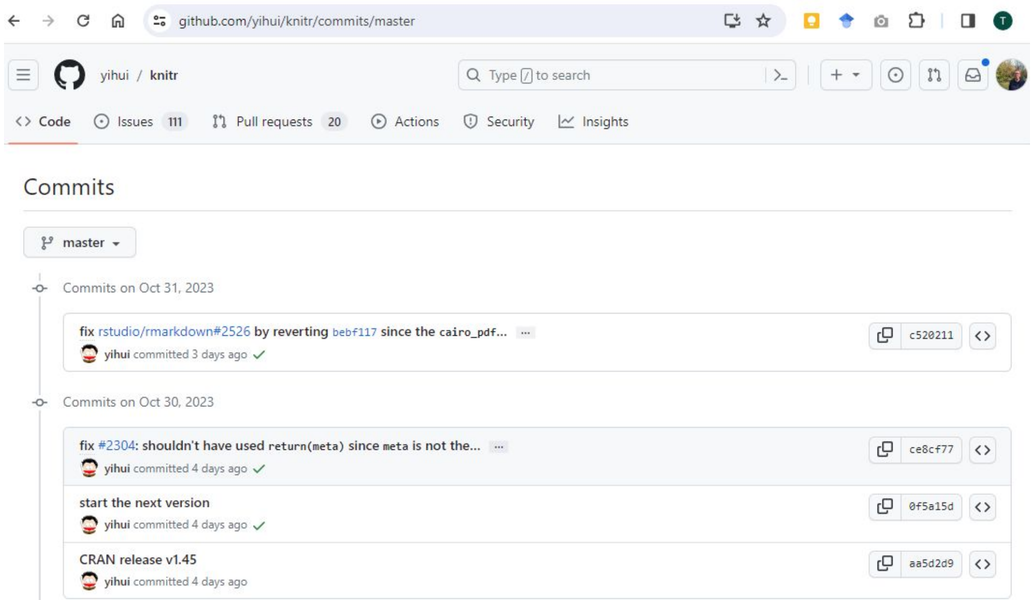
v2.43.0-rc0
yesterday bc52045 zip tar.gz

v2.42.1
yesterday 61a22dd zip tar.gz

v2.42.0
on Aug 21 43c8a30 zip tar.gz

# My R package is on CRAN - what's my workflow?

- Once you have made a release to CRAN and release/tag in your repo you can continue committing on the default branch e.g., https://github.com/yihui/knitr



Commits

Commits on Oct 31, 2023

fix rstudio/rmarkdown#2526 by reverting bebf117 since the `cairo_pdf`... ···
yihui committed 3 days ago ✓ — c520211

Commits on Oct 30, 2023

fix #2304: shouldn't have used `return(meta)` since `meta` is not the... ···
yihui committed 4 days ago ✓ — ce8cf77

start the next version
yihui committed 4 days ago ✓ — 0f5a15d

CRAN release v1.45
yihui committed 4 days ago — aa5d2d9

# My R package is not on CRAN - what's my workflow?

- Users are (likely) installing your package from the latest commit on the main branch, e.g., `remotes::install_github("TwoSampleMR")`
- Should you declare a new version with each commit onto main/master??
- We could instruct users to install the latest release, i.e.,

```
remotes::install_github("MRCIEU/TwoSampleMR@*release")
```

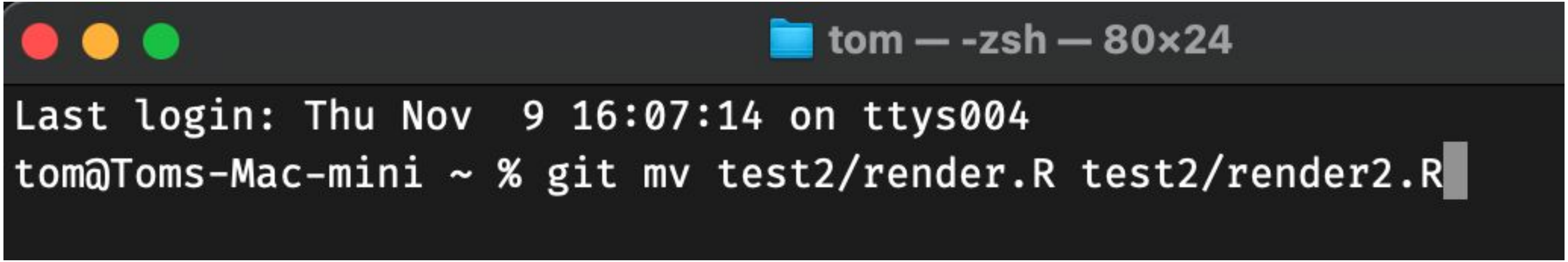
# Under what circumstances do merge conflicts occur?

https://docs.github.com/en/pull-requests/collaborating-with-pull-requests/addressing-merge-conflicts/about-merge-conflicts

- Editing same line of same file (or editing a file that someone else deletes)

# Renaming a file to retain its Git history: git mv

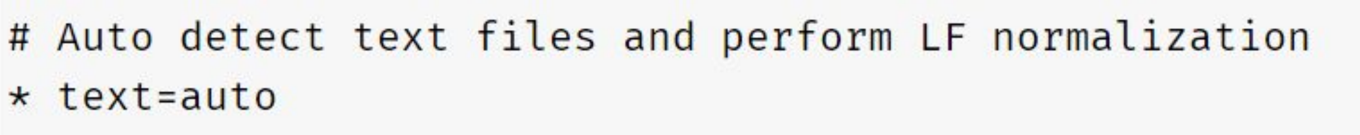
- Do not just commit in deletion of old file and creation of new one
- `git mv existing-filename new-filename`



```
Last login: Thu Nov  9 16:07:14 on ttys004
tom@Toms-Mac-mini ~ % git mv test2/render.R test2/render2.R
```

# Gotcha: Windows (CRLF) versus macOS/Linux/Unix (LF) line endings

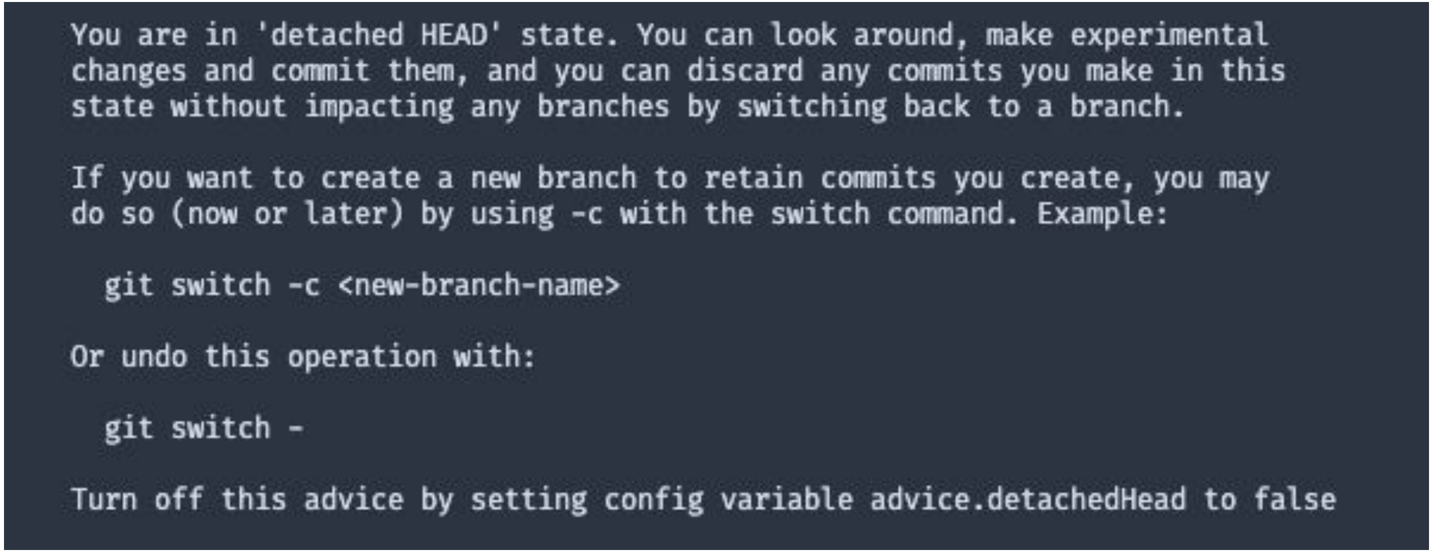
- Secretly Git wants text files to have LF line endings, and this is how they are stored on GitHub
- Include a .gitattributes file in your repo to be safe



```
# Auto detect text files and perform LF normalization
* text=auto
```

- https://grpehr.github.io/training/01-08-common-errors.html#no-content-changes-found
- Be careful if all text files in a repo show as changed - give away you might be about to make this mistake

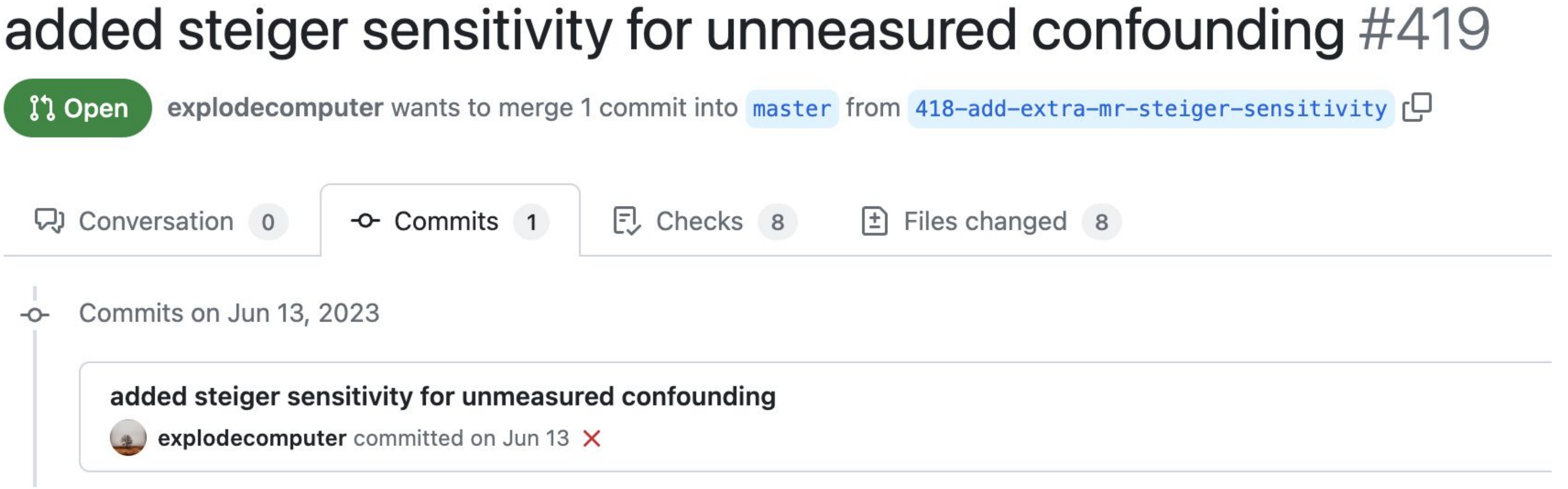
# Perhaps the best worst error/warning message



```
You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by switching back to a branch.

If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -c with the switch command. Example:

  git switch -c <new-branch-name>

Or undo this operation with:

  git switch -

Turn off this advice by setting config variable advice.detachedHead to false
```

# How can we improve the commits in this PR?

https://github.com/MRCIEU/TwoSampleMR/pull/419



added steiger sensitivity for unmeasured confounding #419

explodecomputer wants to merge 1 commit into master from 418-add-extra-mr-steiger-sensitivity

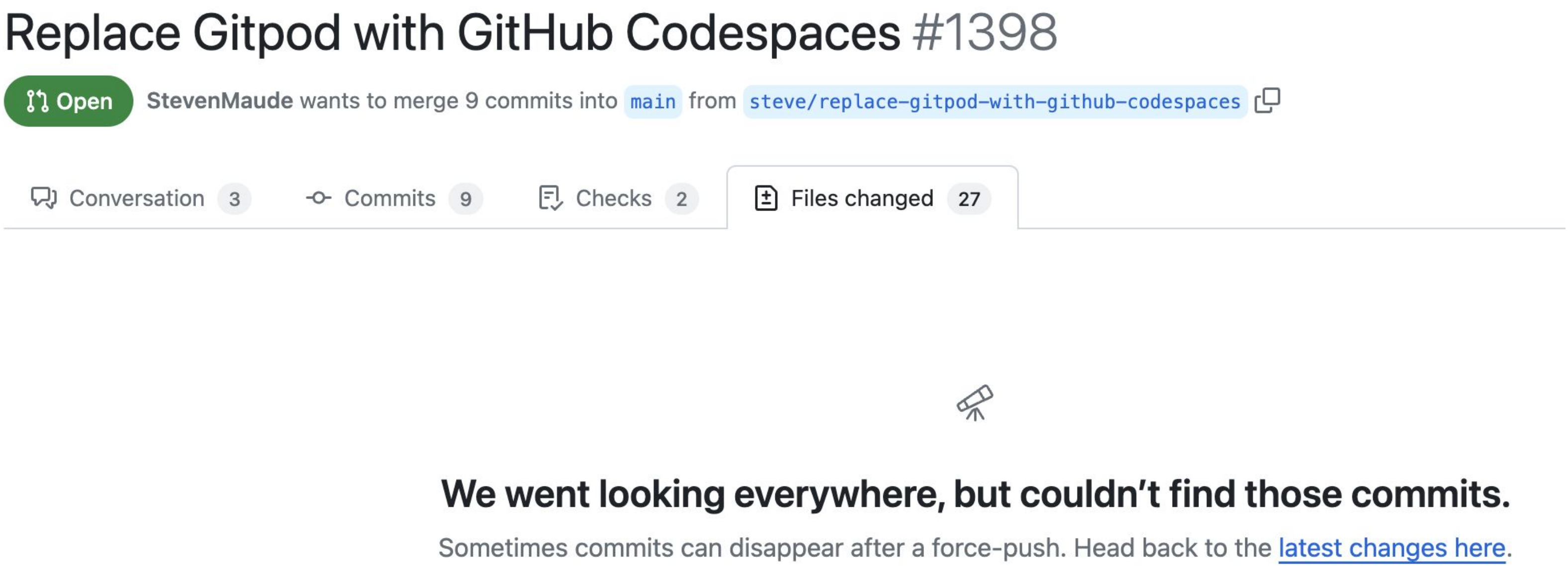
Commits on Jun 13, 2023

added steiger sensitivity for unmeasured confounding

explodecomputer committed on Jun 13 ✗

- Try to make sure each commit does a specific thing - so that it could be reverted later if necessary
- (Arguably this should be 3 PRs)
    - the addition of the new Steiger code
    - ggplot2 size to linewidth argument
    - mr_keep fix

# GitHub message … but couldn't find those commits



## Replace Gitpod with GitHub Codespaces #1398

**StevenMaude** wants to merge 9 commits into `main` from `steve/replace-gitpod-with-github-codespaces`

**We went looking everywhere, but couldn’t find those commits.**

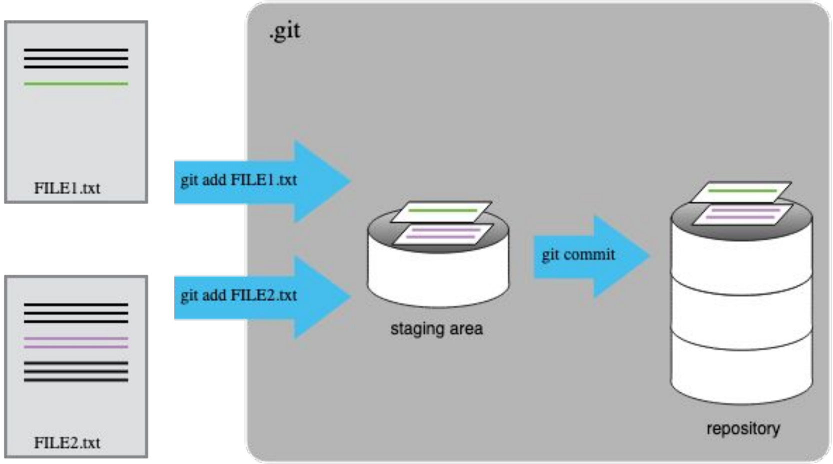
Sometimes commits can disappear after a force-push. Head back to the latest changes here.

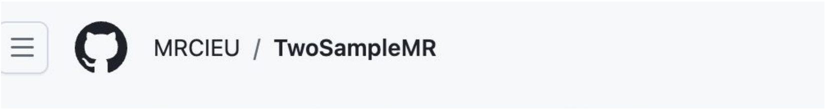
# Empty subdirectories … don't show up in Git

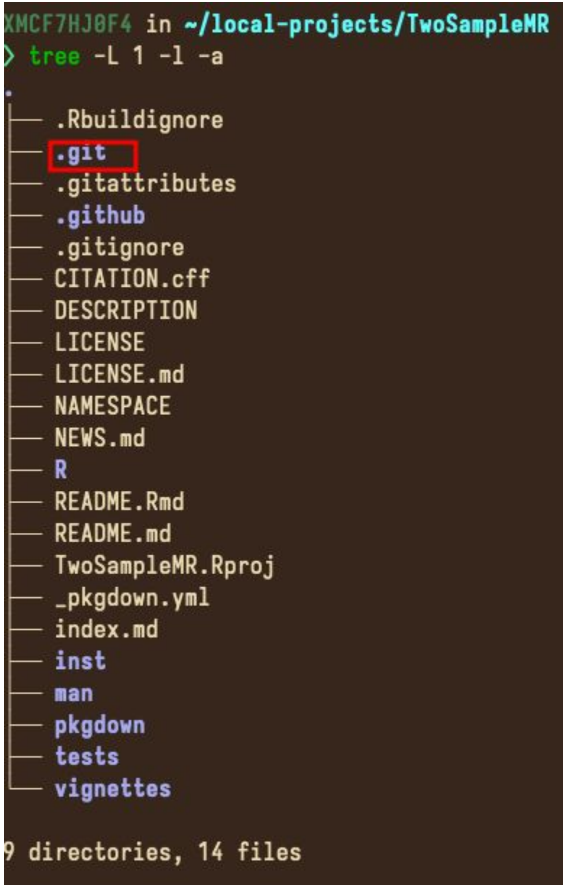
- Git tracks file contents
- If a new subdirectory of your repo is empty it will not show as a change in Git (nor in GitHub Desktop)
- If you want to keep a subdirectory add a blank text file named .gitkeep and check that in

# git concepts: working tree

A git repository (or repo) is a directory tracked by git, and the version control information is stored under the ./.git directory. This external directory is called the **working tree**.







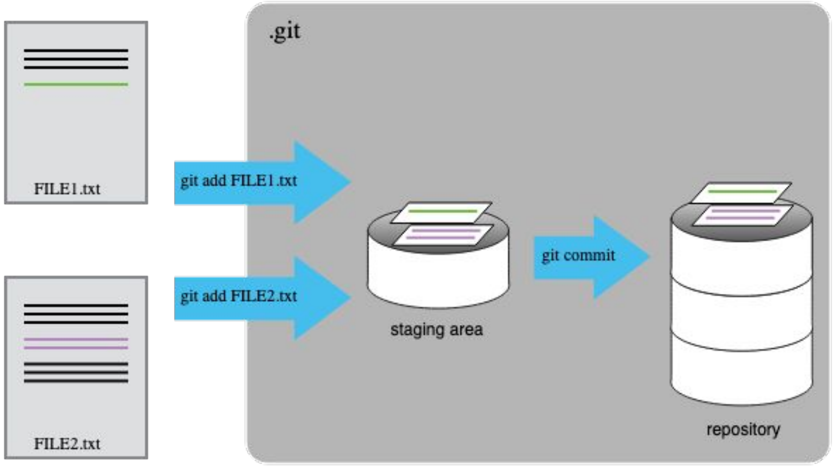
```
XMCF7HJ0F4 in ~/local-projects/TwoSampleMR
❯ tree -L 1 -l -a
.
├── .Rbuildignore
├── .git
├── .gitattributes
├── .github
├── .gitignore
├── CITATION.cff
├── DESCRIPTION
├── LICENSE
├── LICENSE.md
├── NAMESPACE
├── NEWS.md
├── R
├── README.Rmd
├── README.md
├── TwoSampleMR.Rproj
├── _pkgdown.yml
├── index.md
├── inst
├── man
├── pkgdown
├── tests
└── vignettes

9 directories, 14 files
```

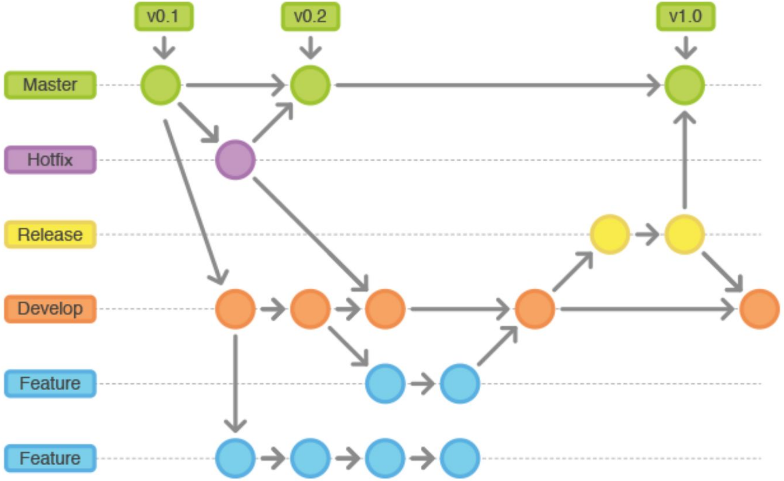
# git concepts: commits, branches

Your source version history consists of **commits** as basic units

A **branch** is a collection of commits.

As a convention, for a big repo, extensive changes should be first done in their own branches, e.g. a branch involving development for a big feature. After the development reaches a good level of maturity, this branch gets **merge**d back to the default **master** / **main** branch.





# git concepts: the **remote** repository

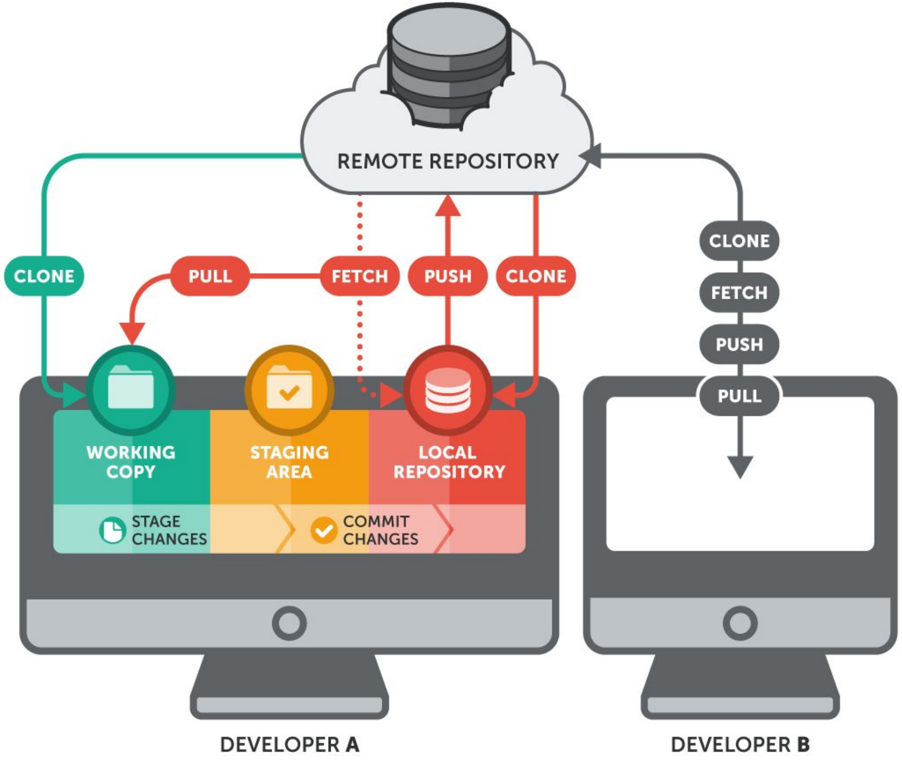
git is a *decentralised* system -- your **local** repo contains all source history already.

Nevertheless you can pair your local repo with an **upstream** remote repo to use it as a

- Backup
- *Centralised* source for collaboration between multiple colleagues, or yourself across multiple machines

Your local repo can be synced with a remote via **git pull (fetch & rebase)** and **git push.**

GitHub is one of the platforms to host your remote repos.



# Common git operations

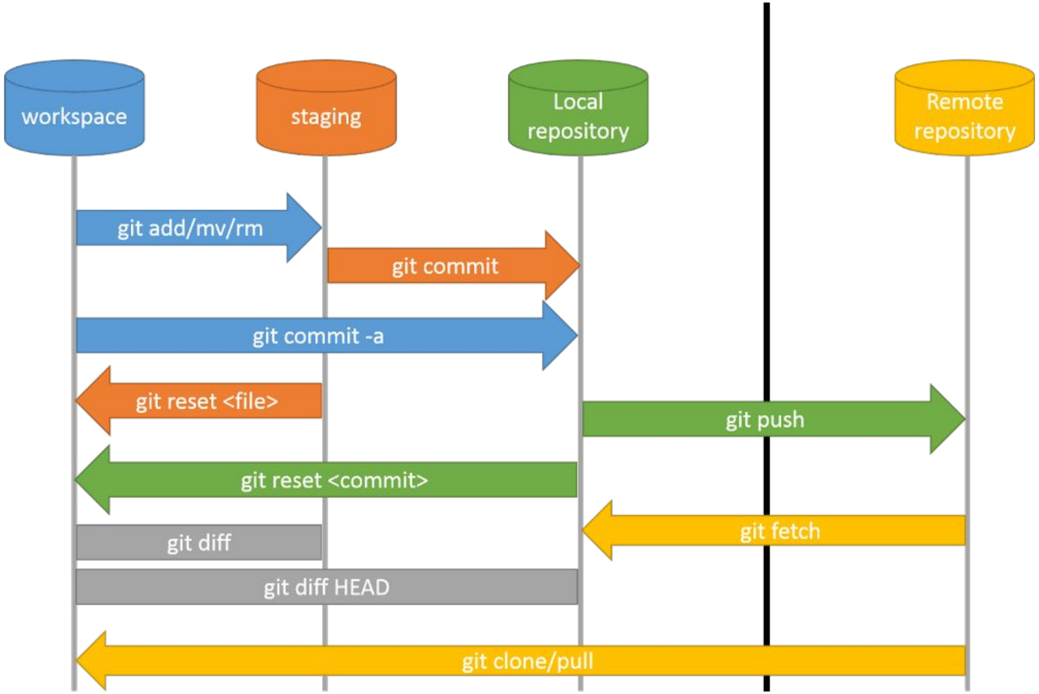
- View git history
  - repo
  - file
- See what has been changed (git diff)
- Try make some changes (git add, git commit)
- Reset those changes (git reset)!
  - NB: git revert is a different command
- Branches
- Remote

Tips for starters:

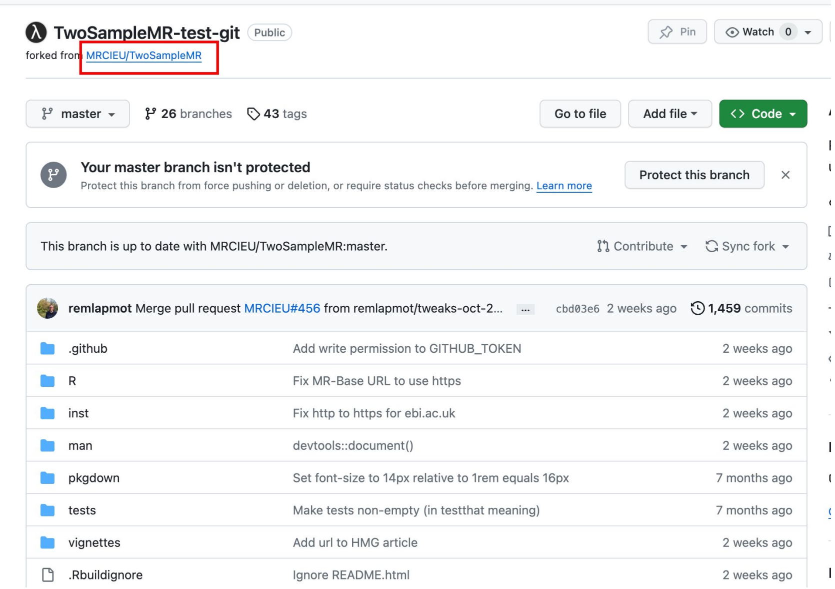
1. Billions of tutorials on git out there
2. Use a graphical client for those git commands

Here I use the Visual Studio Code text editor as my git client.

Extra extension: Git History



# https://github.com/YiLiu6240/TwoSampleMR-test-git



**TwoSampleMR-test-git** Public

forked from MRCIEU/TwoSampleMR

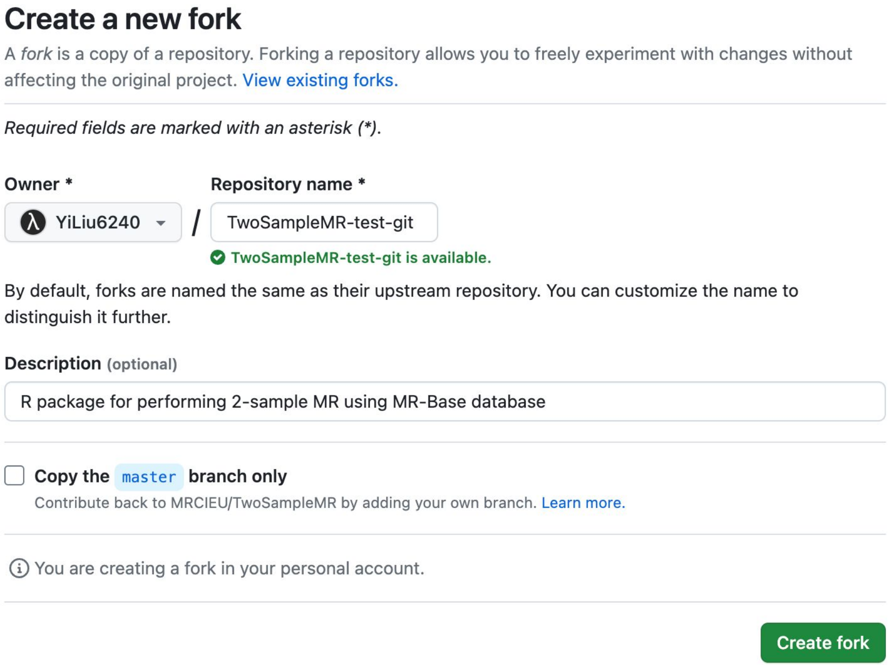
**Your master branch isn't protected**

Protect this branch from force pushing or deletion, or require status checks before merging. Learn more

This branch is up to date with MRCIEU/TwoSampleMR:master.

**remlapmot** Merge pull request MRCIEU#456 from remlapmot/tweaks-oct-2... ... cbd03e6 2 weeks ago 1,459 commits

| | | |
|---|---|---|
| .github | Add write permission to GITHUB_TOKEN | 2 weeks ago |
| R | Fix MR-Base URL to use https | 2 weeks ago |
| inst | Fix http to https for ebi.ac.uk | 2 weeks ago |
| man | devtools::document() | 2 weeks ago |
| pkgdown | Set font-size to 14px relative to 1rem equals 16px | 7 months ago |
| tests | Make tests non-empty (in testthat meaning) | 7 months ago |
| vignettes | Add url to HMG article | 2 weeks ago |
| .Rbuildignore | Ignore README.html | 2 weeks ago |



## Create a new fork

A *fork* is a copy of a repository. Forking a repository allows you to freely experiment with changes without affecting the original project. View existing forks.

*Required fields are marked with an asterisk (*).*

**Owner *** YiLiu6240 / **Repository name *** TwoSampleMR-test-git

✓ TwoSampleMR-test-git is available.

By default, forks are named the same as their upstream repository. You can customize the name to distinguish it further.

**Description** (optional)

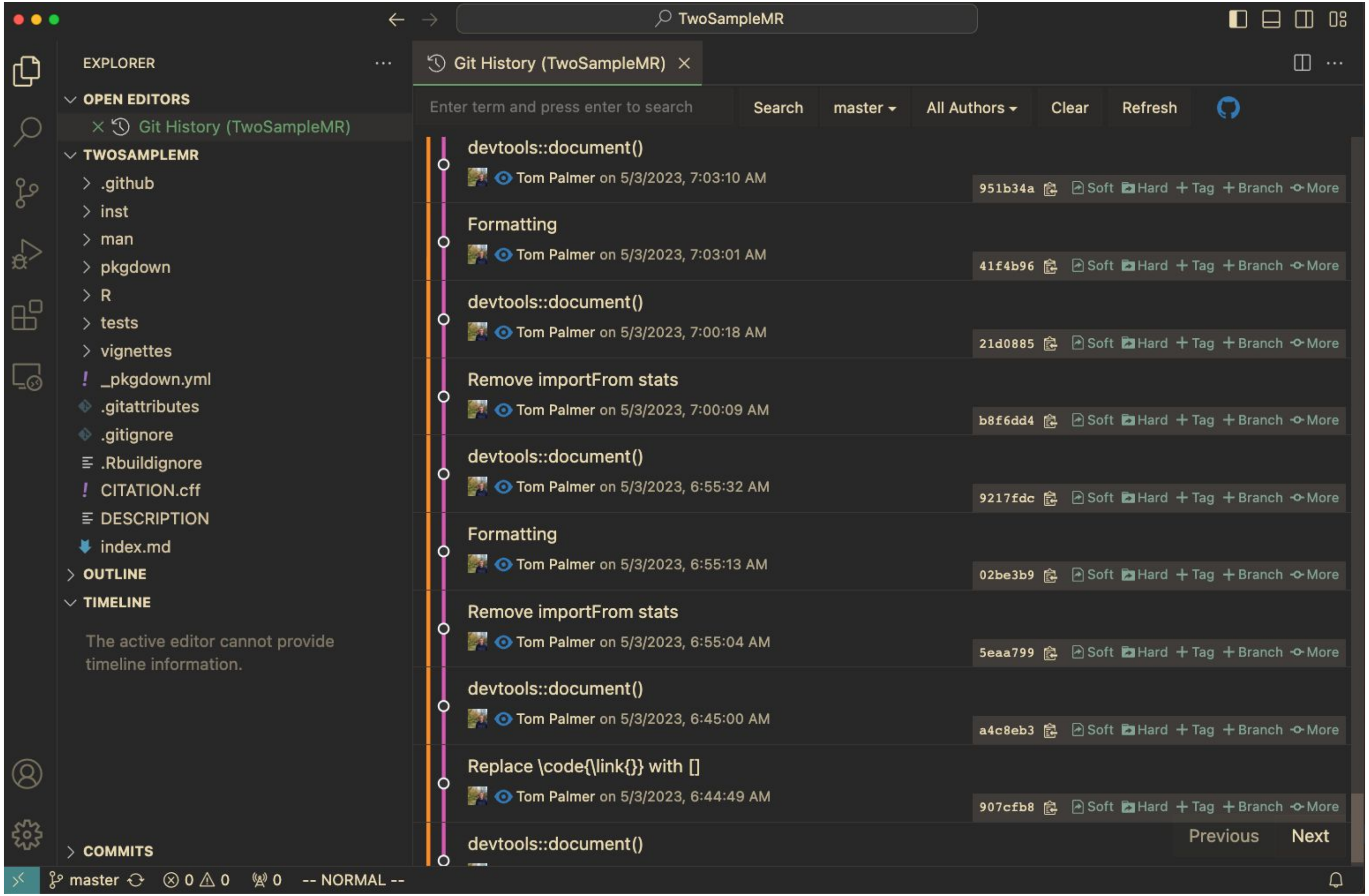
R package for performing 2-sample MR using MR-Base database

□ **Copy the `master` branch only**

Contribute back to MRCIEU/TwoSampleMR by adding your own branch. Learn more.

ⓘ You are creating a fork in your personal account.

# git history



The active editor cannot provide timeline information.

devtools::document()
Tom Palmer on 5/3/2023, 7:03:10 AM 951b34a

Formatting
Tom Palmer on 5/3/2023, 7:03:01 AM 41f4b96

devtools::document()
Tom Palmer on 5/3/2023, 7:00:18 AM 21d0885

Remove importFrom stats
Tom Palmer on 5/3/2023, 7:00:09 AM b8f6dd4

devtools::document()
Tom Palmer on 5/3/2023, 6:55:32 AM 9217fdc

Formatting
Tom Palmer on 5/3/2023, 6:55:13 AM 02be3b9

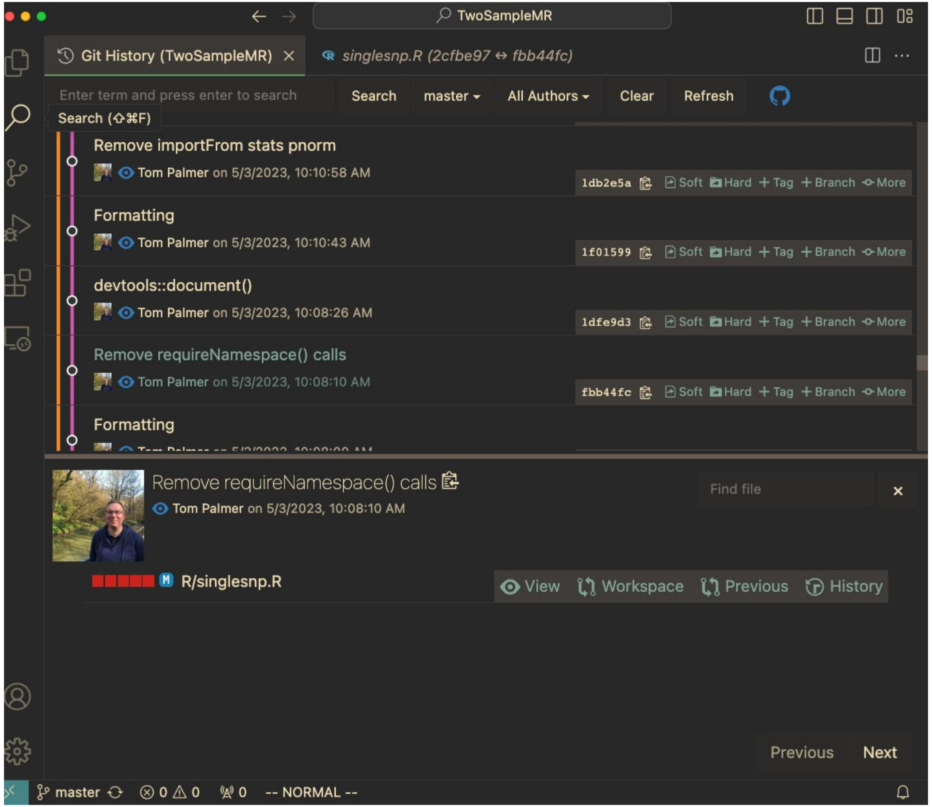
Remove importFrom stats
Tom Palmer on 5/3/2023, 6:55:04 AM 5eaa799

devtools::document()
Tom Palmer on 5/3/2023, 6:45:00 AM a4c8eb3

Replace \code{\link{}} with []
Tom Palmer on 5/3/2023, 6:44:49 AM 907cfb8

devtools::document()

# git diff



Remove importFrom stats pnorm
Tom Palmer on 5/3/2023, 10:10:58 AM
1db2e5a

Formatting
Tom Palmer on 5/3/2023, 10:10:43 AM
1f01599

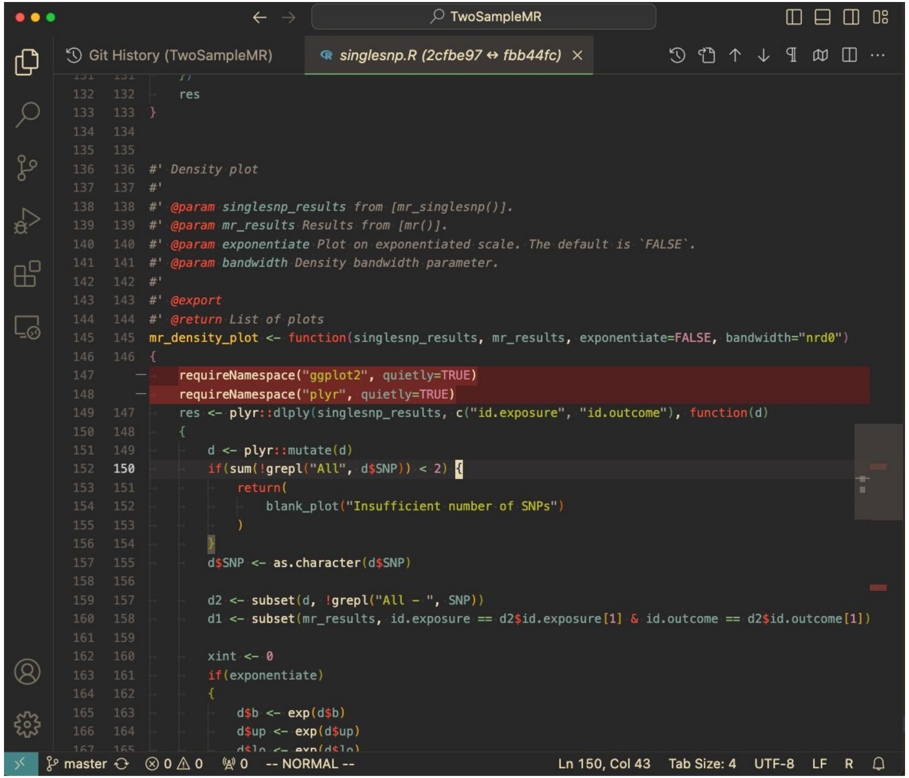
devtools::document()
Tom Palmer on 5/3/2023, 10:08:26 AM
1dfe9d3

Remove requireNamespace() calls
Tom Palmer on 5/3/2023, 10:08:10 AM
fbb44fc

Formatting

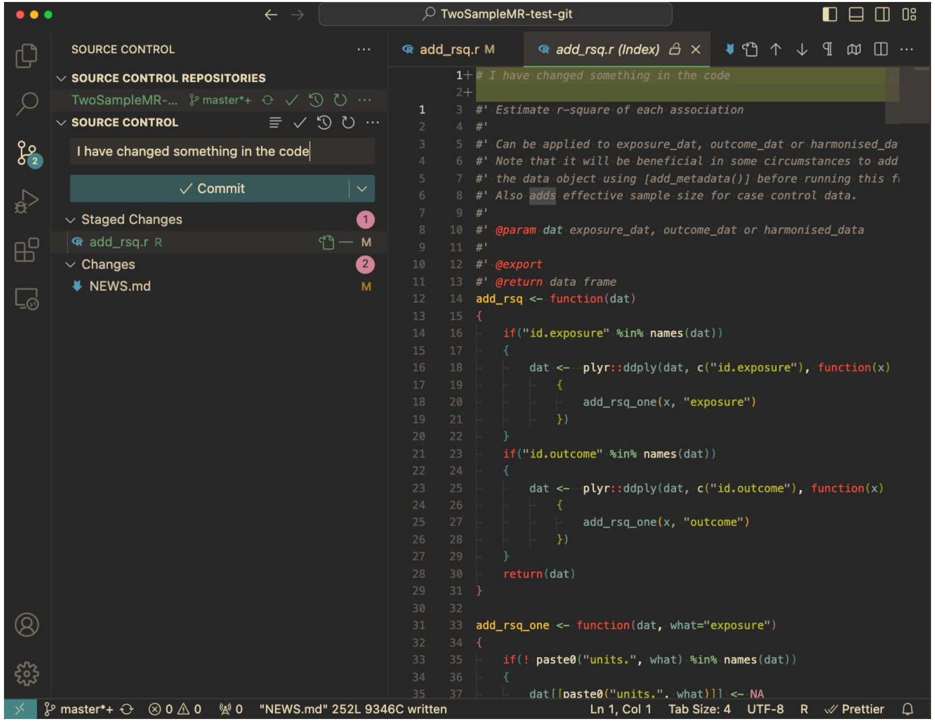
Remove requireNamespace() calls
Tom Palmer on 5/3/2023, 10:08:10 AM

M R/singlesnp.R



```r
    })
    res
}


#' Density plot
#'
#' @param singlesnp_results from [mr_singlesnp()].
#' @param mr_results Results from [mr()].
#' @param exponentiate Plot on exponentiated scale. The default is `FALSE`.
#' @param bandwidth Density bandwidth parameter.
#'
#' @export
#' @return List of plots
mr_density_plot <- function(singlesnp_results, mr_results, exponentiate=FALSE, bandwidth="nrd0")
{
    requireNamespace("ggplot2", quietly=TRUE)
    requireNamespace("plyr", quietly=TRUE)
    res <- plyr::dlply(singlesnp_results, c("id.exposure", "id.outcome"), function(d)
    {
        d <- plyr::mutate(d)
        if(sum(!grepl("All", d$SNP)) < 2) {
            return(
                blank_plot("Insufficient number of SNPs")
            )
        }
        d$SNP <- as.character(d$SNP)

        d2 <- subset(d, !grepl("All - ", SNP))
        d1 <- subset(mr_results, id.exposure == d2$id.exposure[1] & id.outcome == d2$id.outcome[1])

        xint <- 0
        if(exponentiate)
        {
            d$b <- exp(d$b)
            d$up <- exp(d$up)
            d$lo <- exp(d$lo)
```

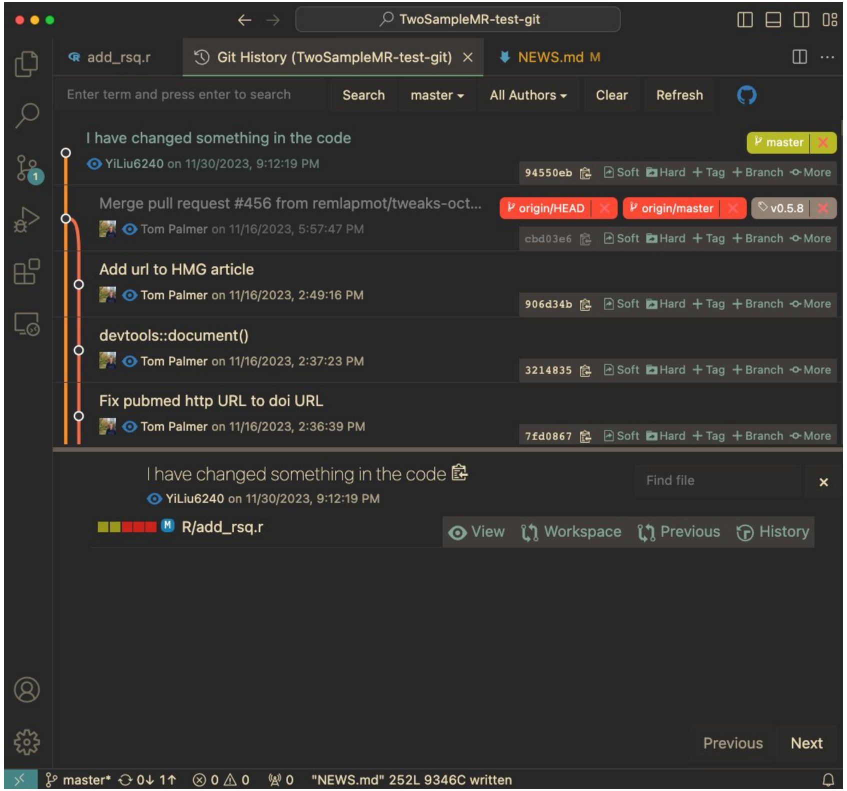
# Make some changes and commit



I have changed something in the code

```
# I have changed something in the code

#' Estimate r-square of each association
#'
#' Can be applied to exposure_dat, outcome_dat or harmonised_da
#' Note that it will be beneficial in some circumstances to add
#' the data object using [add_metadata()] before running this fu
#' Also adds effective sample size for case control data.
#'
#' @param dat exposure_dat, outcome_dat or harmonised_data
#'
#' @export
#' @return data frame
add_rsq <- function(dat)
{
    if("id.exposure" %in% names(dat))
    {
        dat <- plyr::ddply(dat, c("id.exposure"), function(x)
            {
                add_rsq_one(x, "exposure")
            })
    }
    if("id.outcome" %in% names(dat))
    {
        dat <- plyr::ddply(dat, c("id.outcome"), function(x)
            {
                add_rsq_one(x, "outcome")
            })
    }
    return(dat)
}

add_rsq_one <- function(dat, what="exposure")
{
    if(! paste0("units.", what) %in% names(dat))
    {
        dat[[paste0("units.", what)]] <- NA
```

master*+ ⊗ 0 ⚠ 0 ⑃ 0 "NEWS.md" 252L 9346C written Ln 1, Col 1 Tab Size: 4 UTF-8 R ✓ Prettier



I have changed something in the code
YiLiu6240 on 11/30/2023, 9:12:19 PM — 94550eb

Merge pull request #456 from remlapmot/tweaks-oct...
Tom Palmer on 11/16/2023, 5:57:47 PM — cbd03e6

Add url to HMG article
Tom Palmer on 11/16/2023, 2:49:16 PM — 906d34b

devtools::document()
Tom Palmer on 11/16/2023, 2:37:23 PM — 3214835

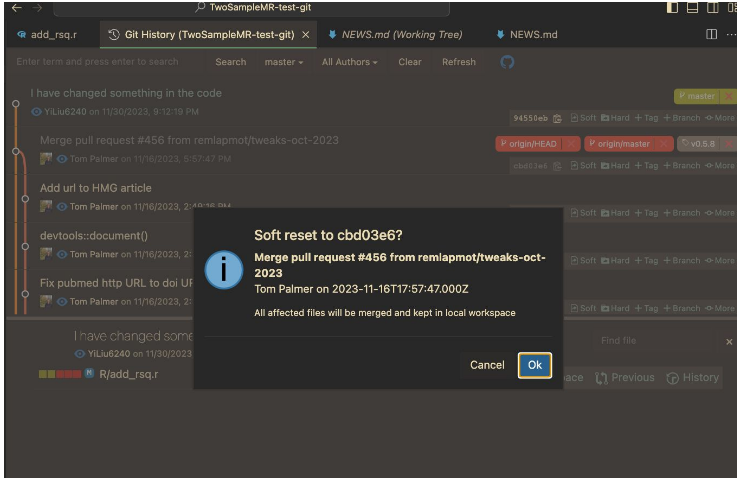
Fix pubmed http URL to doi URL
Tom Palmer on 11/16/2023, 2:36:39 PM — 7fd0867

I have changed something in the code
YiLiu6240 on 11/30/2023, 9:12:19 PM

M R/add_rsq.r

master* 0↓ 1↑ ⊗ 0 ⚠ 0 ⑃ 0 "NEWS.md" 252L 9346C written

# resetting changes



I have changed something in the code
YiLiu6240 on 11/30/2023, 9:12:19 PM

Merge pull request #456 from remlapmot/tweaks-oct-2023
Tom Palmer on 11/16/2023, 5:57:47 PM

Add url to HMG article
Tom Palmer on 11/16/2023, 2:49:16 PM

devtools::document()
Tom Palmer on 11/16/2023, 2:

Fix pubmed http URL to doi UF
Tom Palmer on 11/16/2023, 2:

I have changed some
YiLiu6240 on 11/30/2023

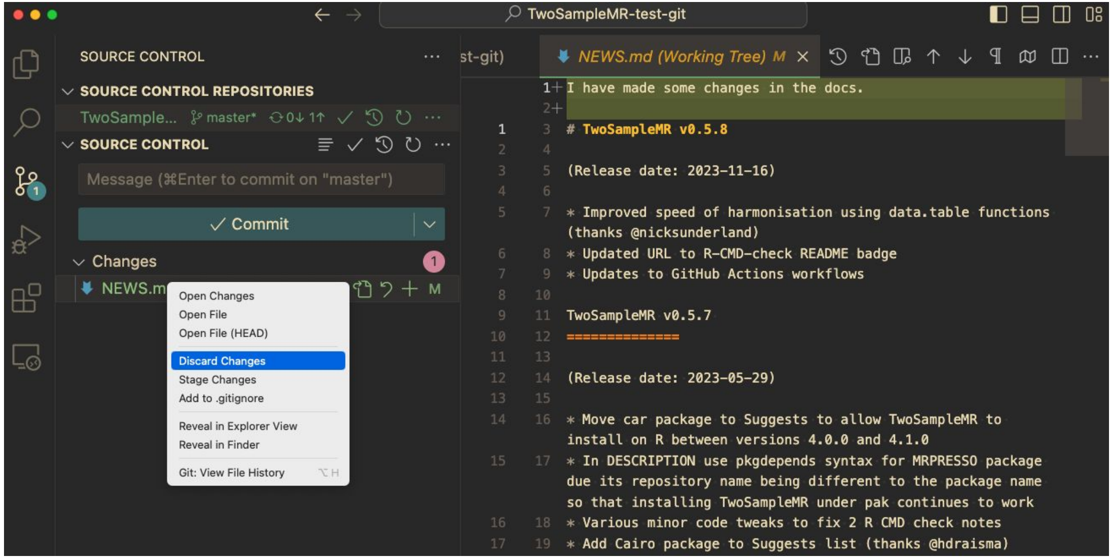
R/add_rsq.r

**Soft reset to cbd03e6?**

**Merge pull request #456 from remlapmot/tweaks-oct-2023**
Tom Palmer on 2023-11-16T17:57:47.000Z

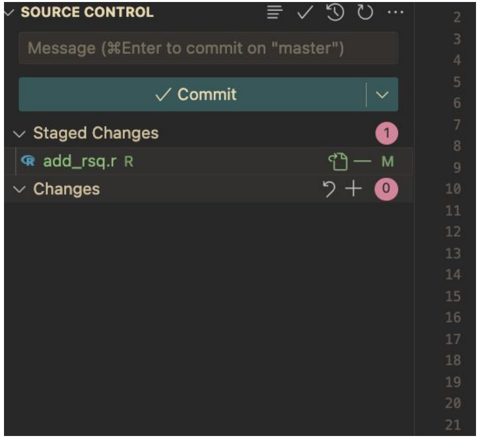
All affected files will be merged and kept in local workspace

Cancel | Ok



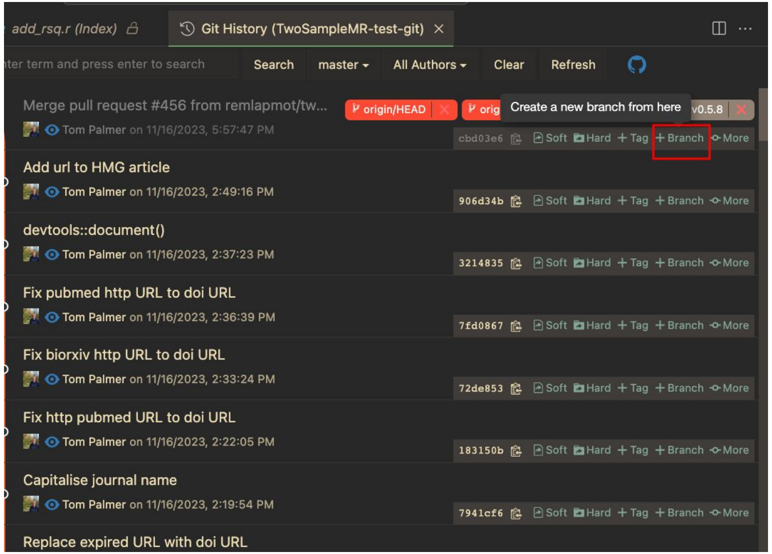
Message (⌘Enter to commit on "master")

```
+I have made some changes in the docs.
+
# TwoSampleMR v0.5.8

(Release date: 2023-11-16)

* Improved speed of harmonisation using data.table functions
(thanks @nicksunderland)
* Updated URL to R-CMD-check README badge
* Updates to GitHub Actions workflows

TwoSampleMR v0.5.7
==============

(Release date: 2023-05-29)

* Move car package to Suggests to allow TwoSampleMR to
install on R between versions 4.0.0 and 4.1.0
* In DESCRIPTION use pkgdepends syntax for MRPRESSO package
due its repository name being different to the package name
so that installing TwoSampleMR under pak continues to work
* Various minor code tweaks to fix 2 R CMD check notes
* Add Cairo package to Suggests list (thanks @hdraisma)
```



Message (⌘Enter to commit on "master")

# branches


add_rsq.r (Index)
Git History (TwoSampleMR-test-git)
nter term and press enter to search
Search
master
All Authors
Clear
Refresh
origin/HEAD
orig
Create a new branch from here
v0.5.8
Soft
Hard
+ Tag
+ Branch
More

Merge pull request #456 from remlapmot/tw...
Tom Palmer on 11/16/2023, 5:57:47 PM cbd03e6

Add url to HMG article
Tom Palmer on 11/16/2023, 2:49:16 PM 906d34b

devtools::document()
Tom Palmer on 11/16/2023, 2:37:23 PM 3214835

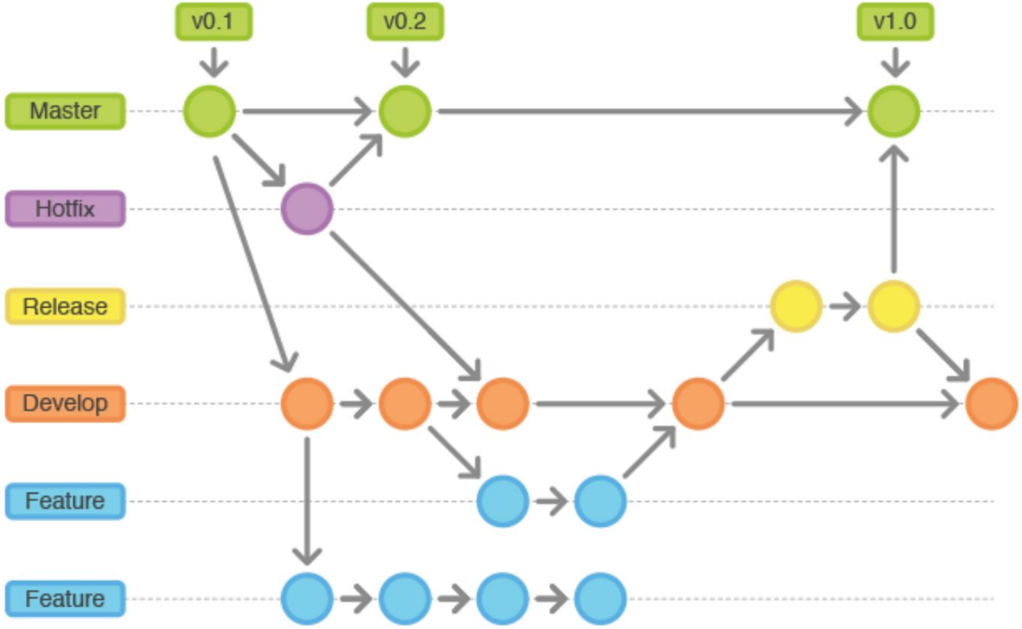
Fix pubmed http URL to doi URL
Tom Palmer on 11/16/2023, 2:36:39 PM 7fd0867

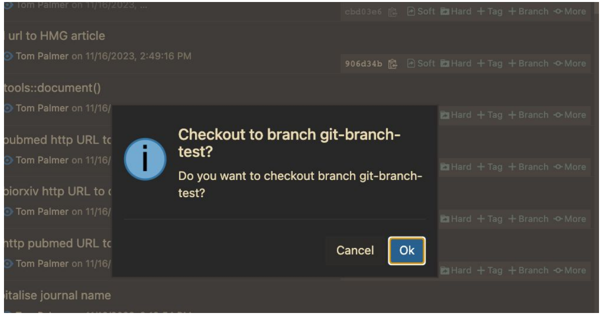
Fix biorxiv http URL to doi URL
Tom Palmer on 11/16/2023, 2:33:24 PM 72de853

Fix http pubmed URL to doi URL
Tom Palmer on 11/16/2023, 2:22:05 PM 183150b

Capitalise journal name
Tom Palmer on 11/16/2023, 2:19:54 PM 7941cf6

Replace expired URL with doi URL





Tom Palmer on 11/16/2023, ... cbd03e6

url to HMG article
Tom Palmer on 11/16/2023, 2:49:16 PM 906d34b

tools::document()
Tom Palmer on 11/16/

pubmed http URL to
Tom Palmer on 11/16/

biorxiv http URL to
Tom Palmer on 11/16/

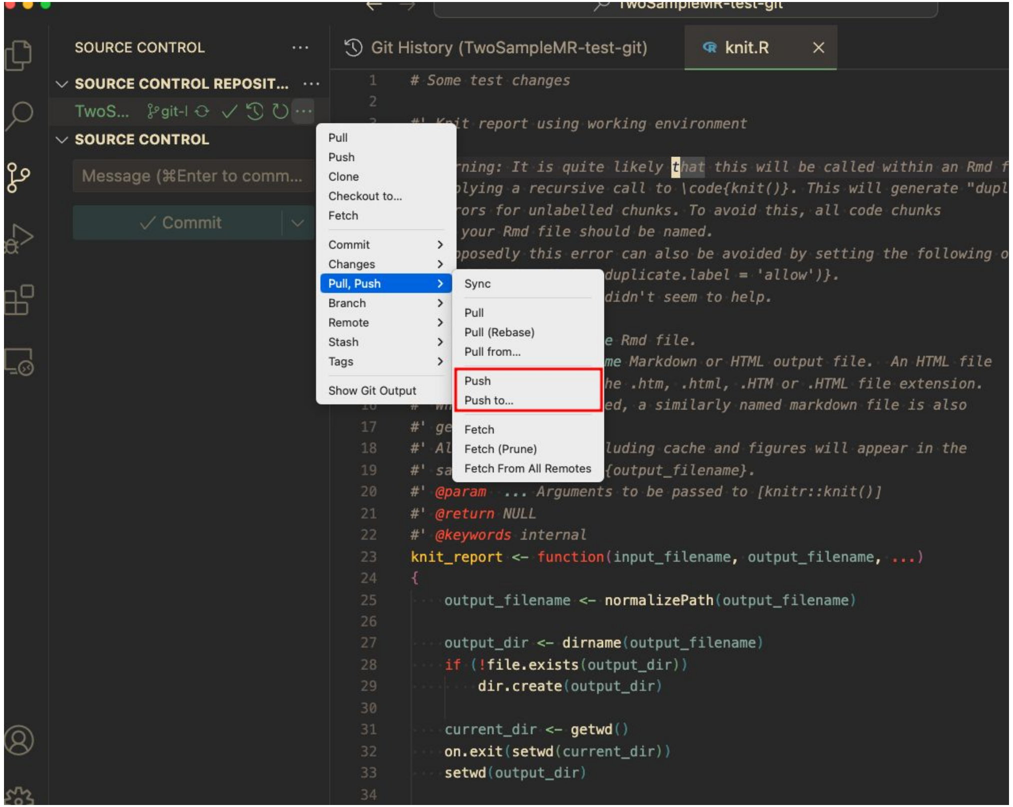
http pubmed URL to
Tom Palmer on 11/16/

italise journal name

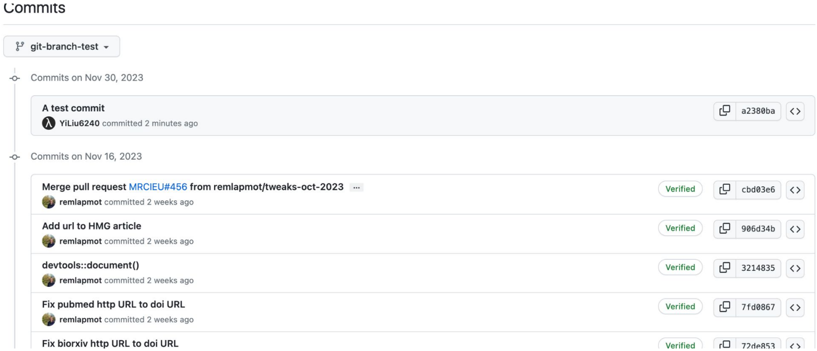
**Checkout to branch git-branch-test?**

Do you want to checkout branch git-branch-test?

# Push to remote



```
# Some test changes

#' K     it report using working environment

         rning: It is quite likely that this will be called within an Rmd f
         plying a recursive call to \code{knit()}. This will generate "dupl
         rors for unlabelled chunks. To avoid this, all code chunks
         your Rmd file should be named.
         pposedly this error can also be avoided by setting the following o
                  duplicate.label = 'allow')}.
                  didn't seem to help.

                  e Rmd file.
                  me Markdown or HTML output file.  An HTML file
                  he .htm, .html, .HTM or .HTML file extension.
# wi              ed, a similarly named markdown file is also
#' ge
#' Al             luding cache and figures will appear in the
#' sa             {output_filename}.
#' @param  ... Arguments to be passed to [knitr::knit()]
#' @return NULL
#' @keywords internal
knit_report <- function(input_filename, output_filename, ...)
{
    output_filename <- normalizePath(output_filename)

    output_dir <- dirname(output_filename)
    if (!file.exists(output_dir))
        dir.create(output_dir)

    current_dir <- getwd()
    on.exit(setwd(current_dir))
    setwd(output_dir)

```



Commits

git-branch-test

Commits on Nov 30, 2023

A test commit
YiLiu6240 committed 2 minutes ago — a2380ba

Commits on Nov 16, 2023

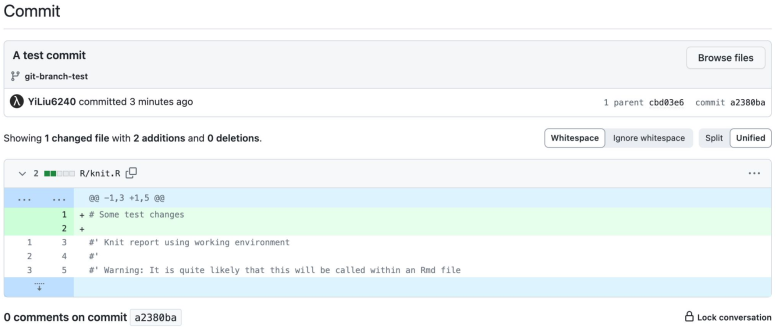
Merge pull request MRCIEU#456 from remlapmot/tweaks-oct-2023 …
remlapmot committed 2 weeks ago — Verified — cbd03e6

Add url to HMG article
remlapmot committed 2 weeks ago — Verified — 906d34b

devtools::document()
remlapmot committed 2 weeks ago — Verified — 3214835

Fix pubmed http URL to doi URL
remlapmot committed 2 weeks ago — Verified — 7fd0867

Fix biorxiv http URL to doi URL
Verified — 72de853



Commit

A test commit

git-branch-test

YiLiu6240 committed 3 minutes ago    1 parent cbd03e6    commit a2380ba

Showing **1 changed file** with **2 additions** and **0 deletions**.

2 R/knit.R

```
...  ...  @@ -1,3 +1,5 @@
       1  + # Some test changes
       2  +
 1     3    #' Knit report using working environment
 2     4    #'
 3     5    #' Warning: It is quite likely that this will be called within an Rmd file
```

**0 comments on commit** a2380ba

Lock conversation

# Resources

- Tutorials
  - https://swcarpentry.github.io/git-novice/
  - Training material for Electronic Health Records group https://grpehr.github.io/training/
- Technical details on Git
  - Linus Torvalds Google Tech Talk https://youtu.be/4XpnKHJAok8?si=4NNxxajwhbohJ3WI
  - Git Rev News https://git.github.io/rev_news/
  - Many excellent blog posts
    - Derrick Stolee https://github.blog/author/dstolee/
    - Elijah Newren https://blog.palantir.com/optimizing-gits-merge-machinery-1-127ceb0ef2a1
- Git clients
  - GitHub Desktop, Tower, GitKraken (GitLens VSCode Extension)
- … and a million tutorials about Git on Youtube and other platforms
- Nothing can replace your trial by error – don’t be afraid to make mistakes

# Summary

- Are you a Helena, Des, or Dom?
- Or maybe you'll have different use cases on different projects
- Any questions/problems working with Git and GitHub?