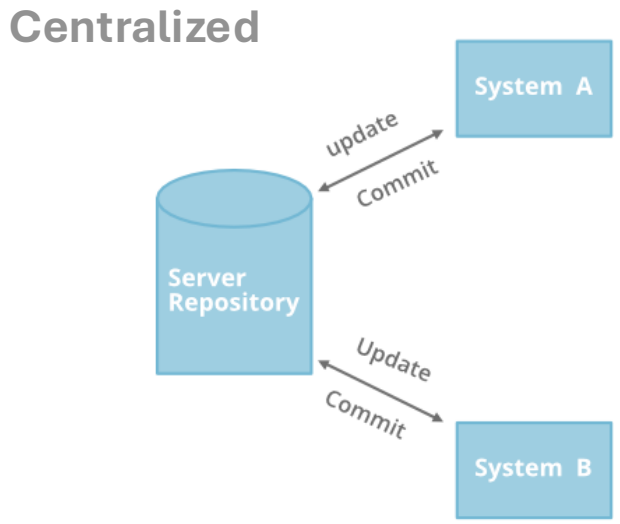
Quick guide to

Flash talk

24.10.2024

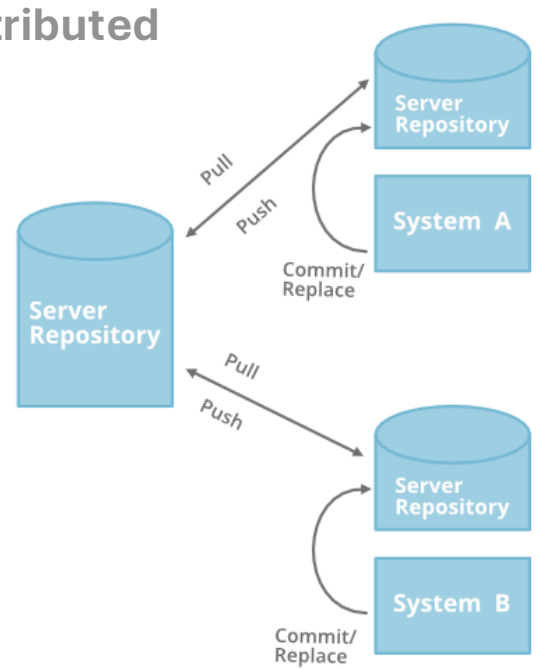
What is Git?

- **distributed** version-control system
- command line
- usually pre-installed (Mac / Linux)



What is GitHub?

- online application that provides:
  - visual interface for `git`
  - free cloud storage for projects' code and files



Why is GitHub useful?

Version control

- No more *script*, *script_v2*, *script_final*, etc…
- Can go back to any previous versions

Collaboration

- Integrates edits from multiple users
- Keeps record of who did what and when

Documentation

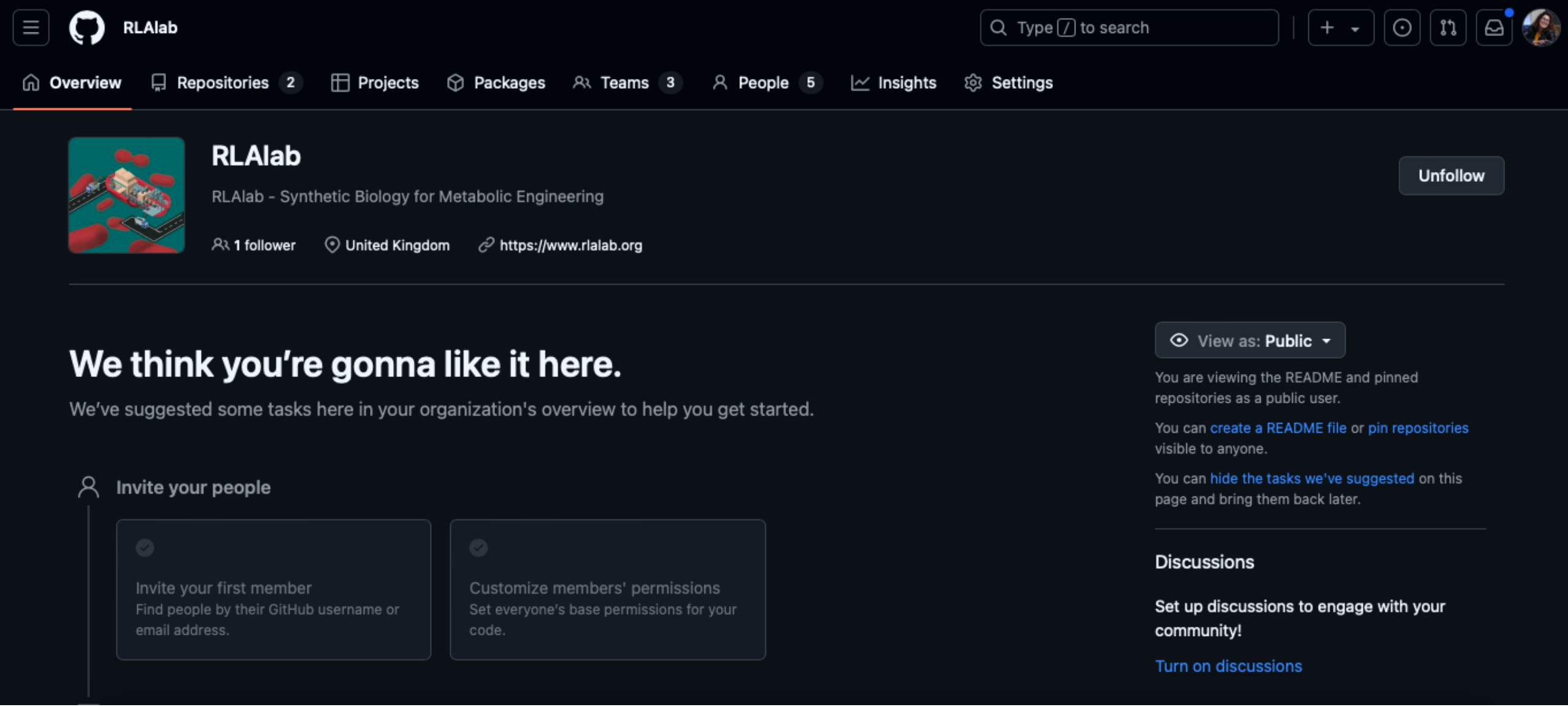
- All the scripts and files of your project are in a single place
- README.md files and Wiki pages

Reproducibility

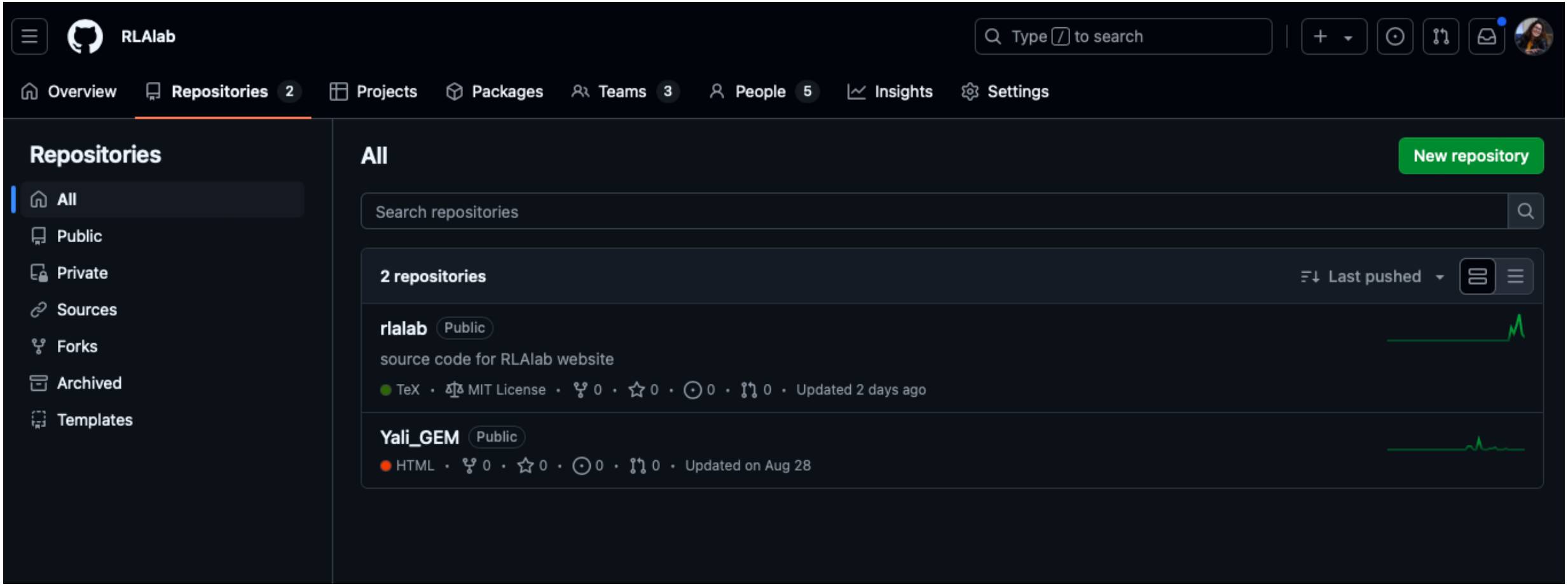
- You and other researchers can recreate and / or modify any script you created

Visibility

- Showcase your work to others
- Promote your lab’s work and facilitate the use of your pipelines



https://github.com/RLAlab


RLAlab
Type / to search
Overview
Repositories 2
Projects
Packages
Teams 3
People 5
Insights
Settings
Repositories
All
Public
Private
Sources
Forks
Archived
Templates
All
New repository
Search repositories
2 repositories
Last pushed
rlalab Public
source code for RLAlab website
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Yali_GEM Public
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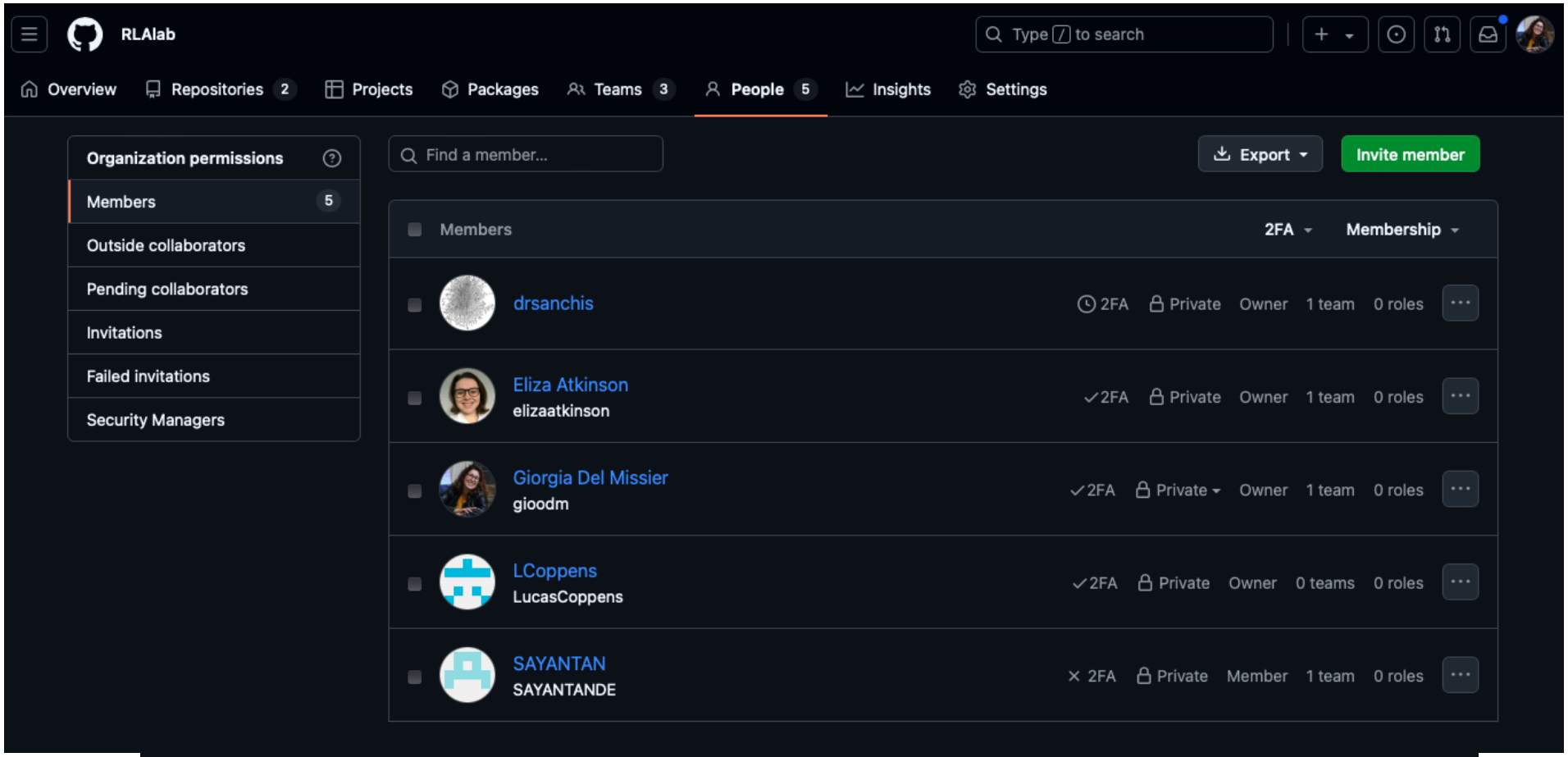
RLAlab
Type / to search
Overview
Repositories 2
Projects
Packages
Teams 3
People 5
Insights
Settings
Organization permissions
Members 5
Outside collaborators
Pending collaborators
Invitations
Failed invitations
Security Managers
Find a member...
Export
Invite member
Members
2FA
Membership
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2FA Private Owner 1 team 0 roles
Eliza Atkinson
elizaatkinson
2FA Private Owner 1 team 0 roles
Giorgia Del Missier
gioodm
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LucasCoppens
2FA Private Owner 0 teams 0 roles
SAYANTAN
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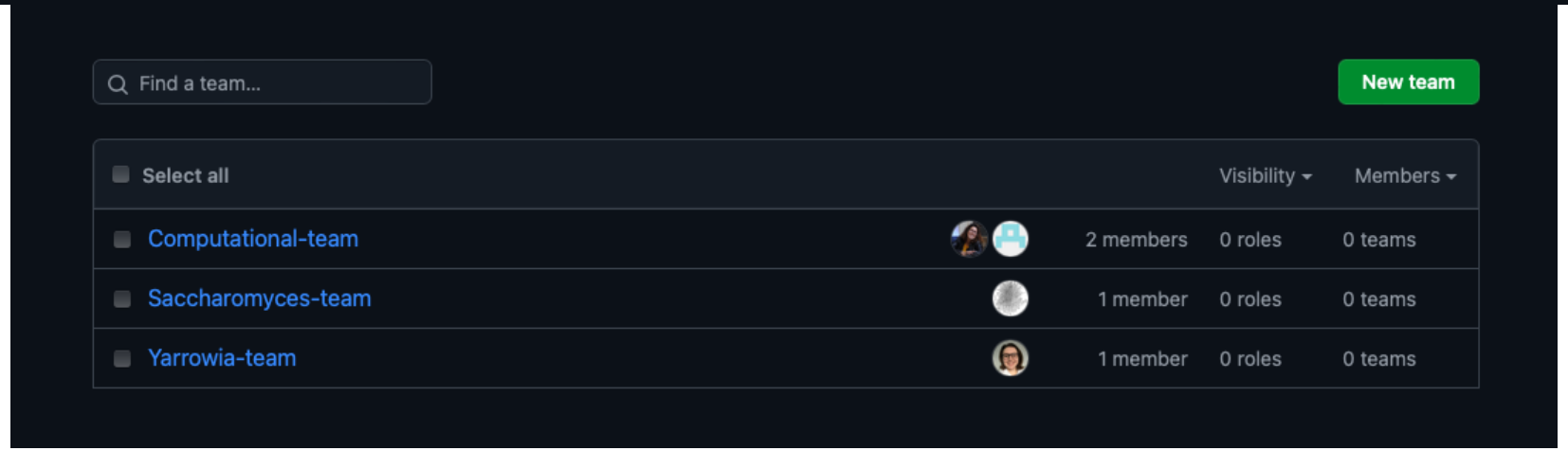
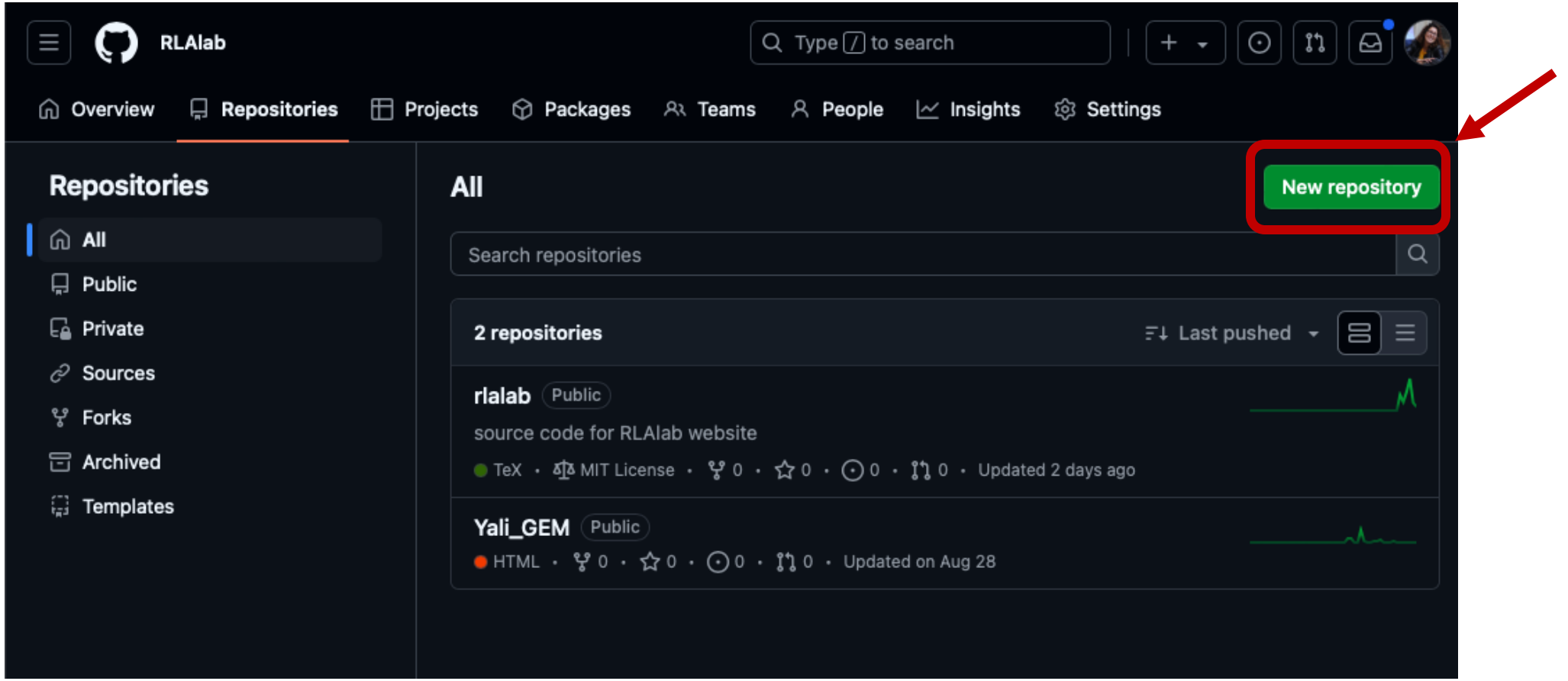
2FA Private Member 1 team 0 roles


Find a team...
New team
Select all
Visibility
Members
Computational-team
2 members 0 roles 0 teams
Saccharomyces-team
1 member 0 roles 0 teams
Yarrowia-team
1 member 0 roles 0 teams

10 most common **git** terms

1. Repository (repo)

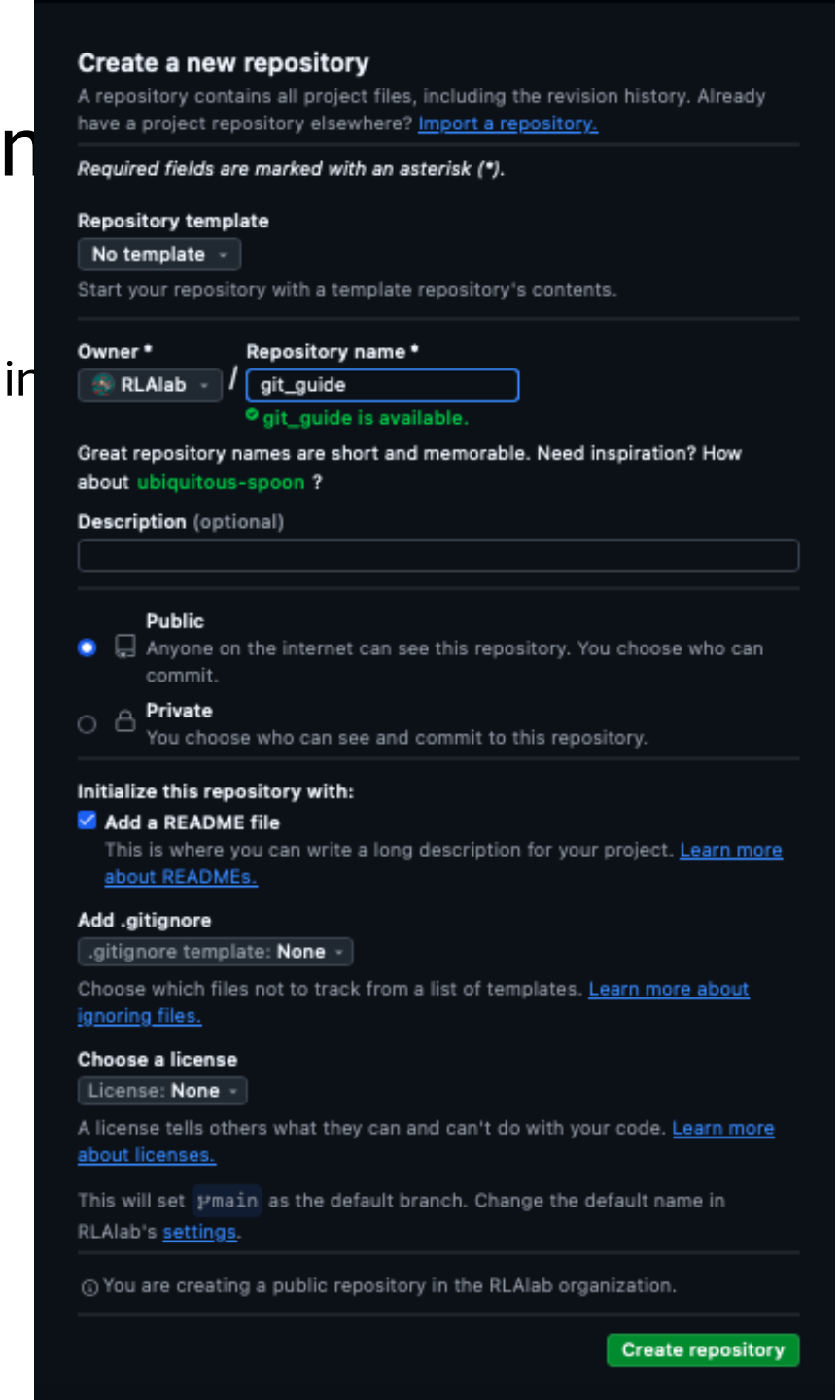
   a project that contains all your files, history, ...



10 most common

1. Repository (repo)

a project that contain



10 most common **git** terms

1. Repository (repo)

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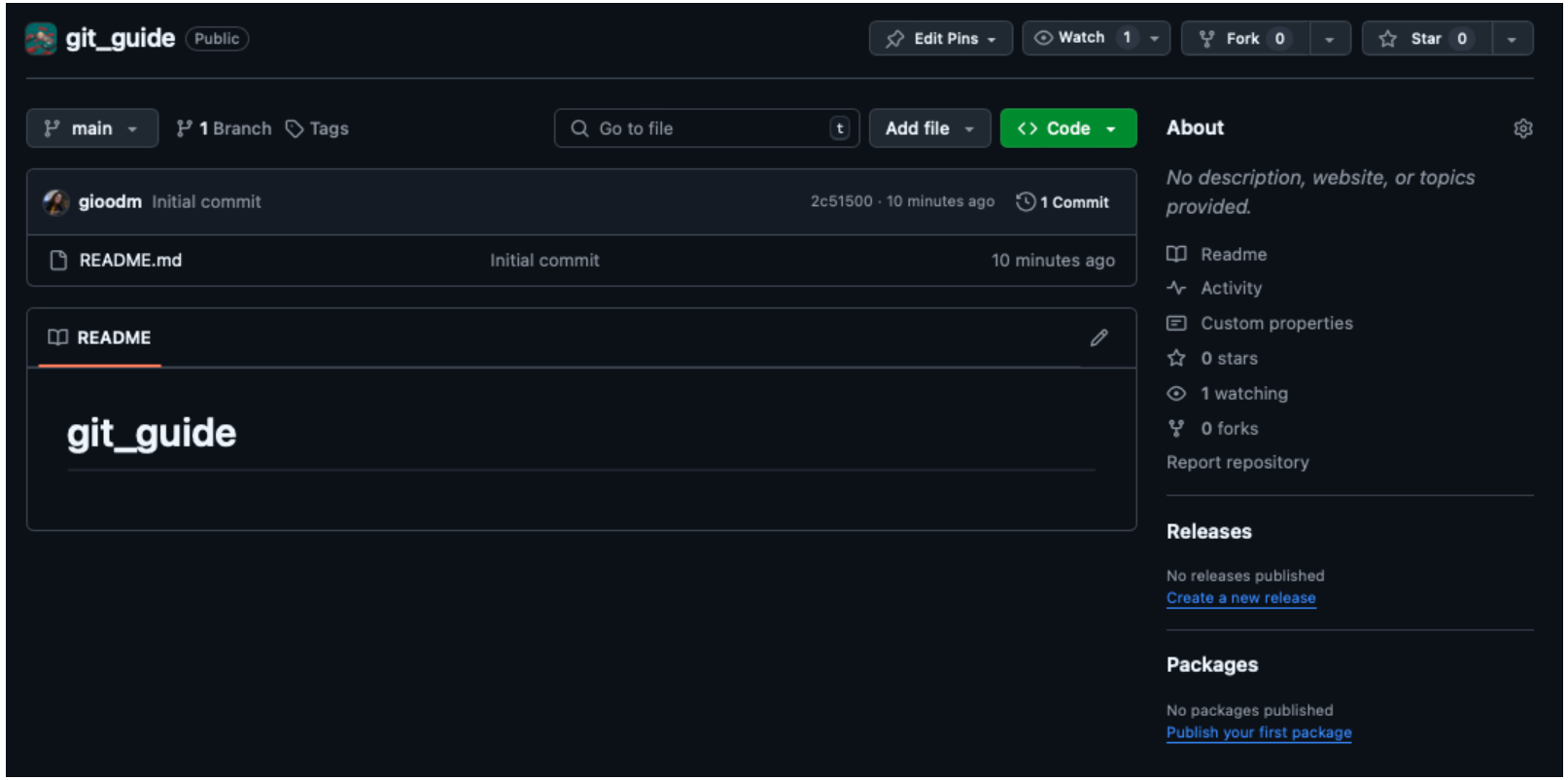
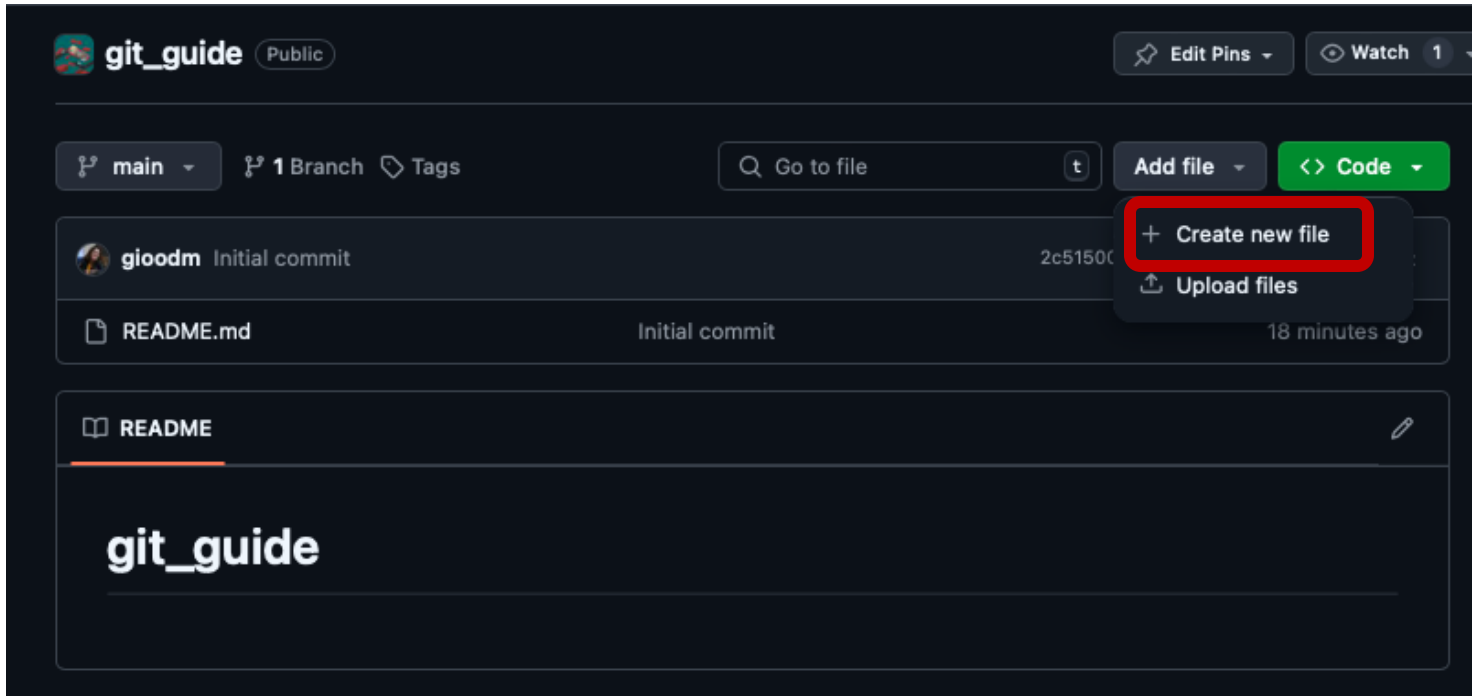


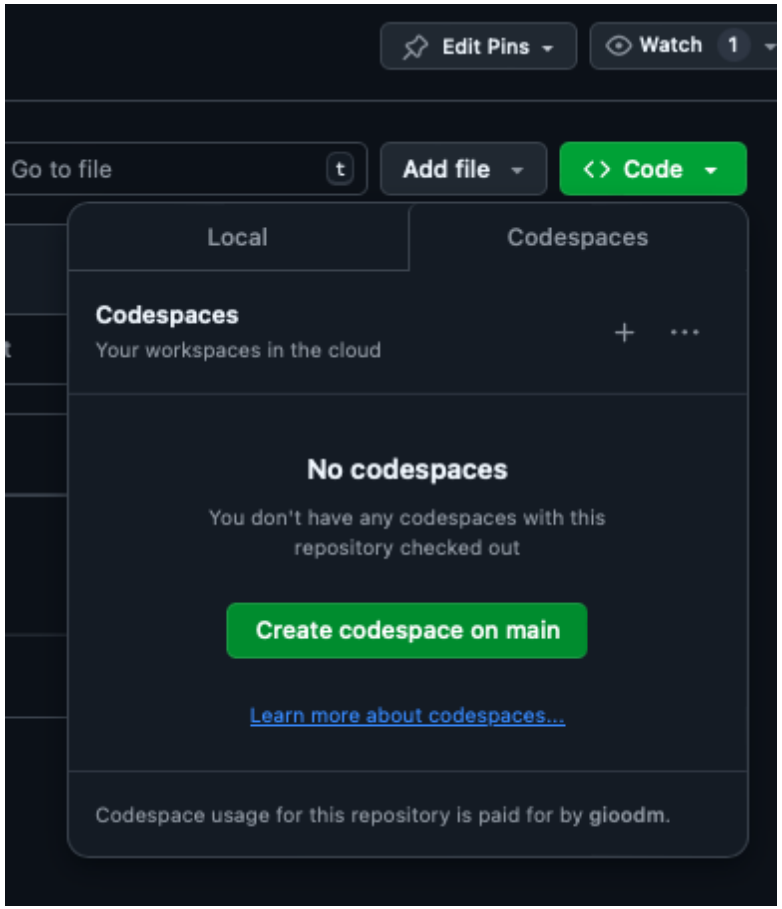

```
~% mkdir git_guide
~% cd git_guide
~% git init
```

10 most common **git** terms

2. commit

a snapshot of changes in the repository





10 most common **git** terms

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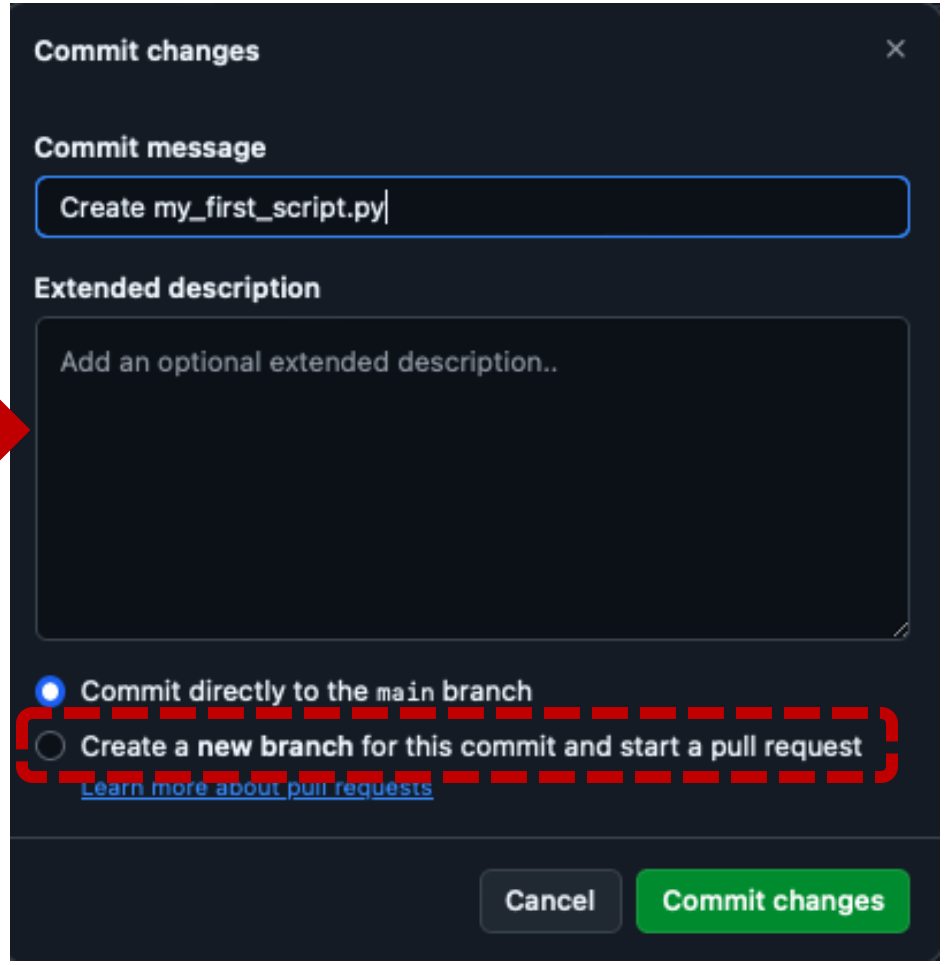


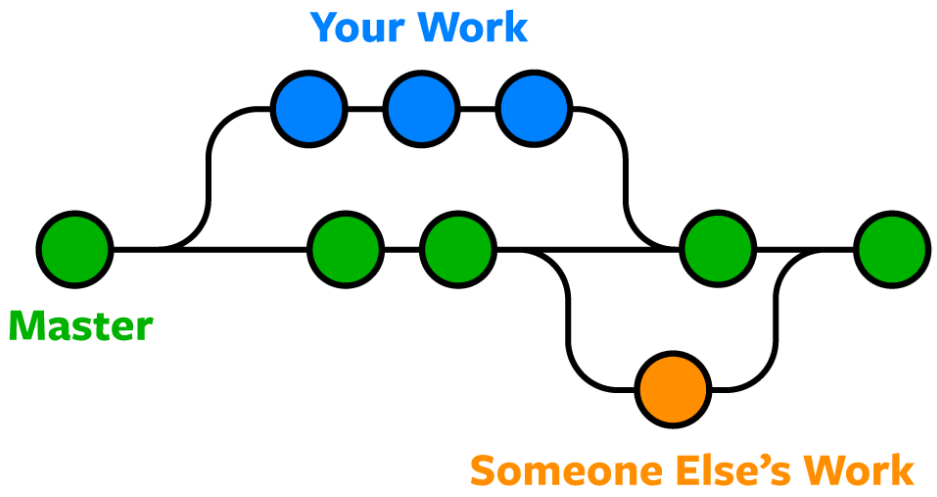
~% **git commit –m** ”message”

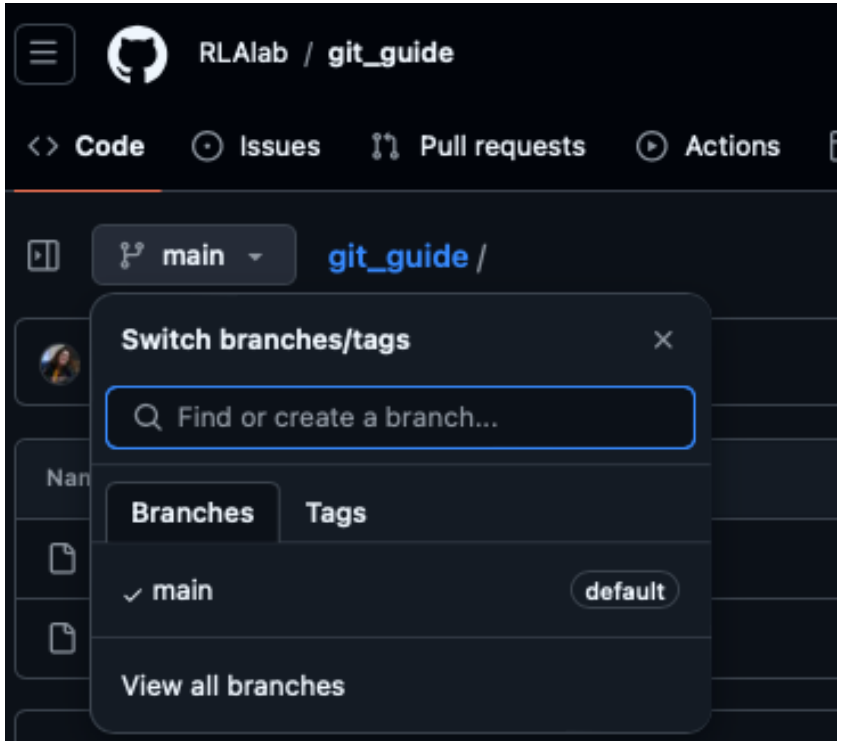
10 most common **git** terms

3. branch

a separate line of development

`master` / `main` is the default branch





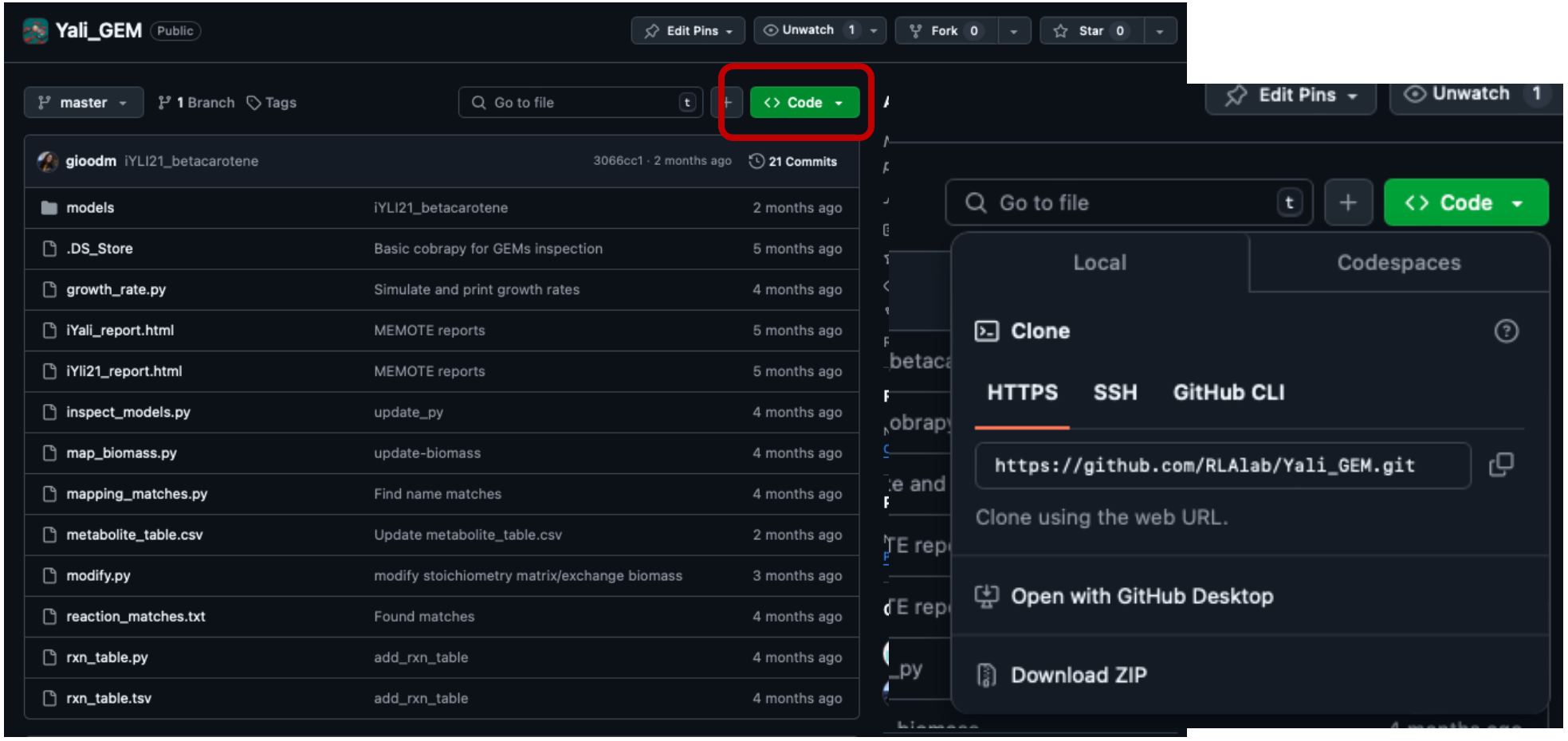

```
~% git branch                    # to list branches
~% git checkout –b branch-name   # to create a new branch and switch to it

~% git branch branch-name        # creates a branch
~% git checkout branch-name      # switch to the new branch
```

10 most common **git** terms

4. clone

a local copy of a remote repository

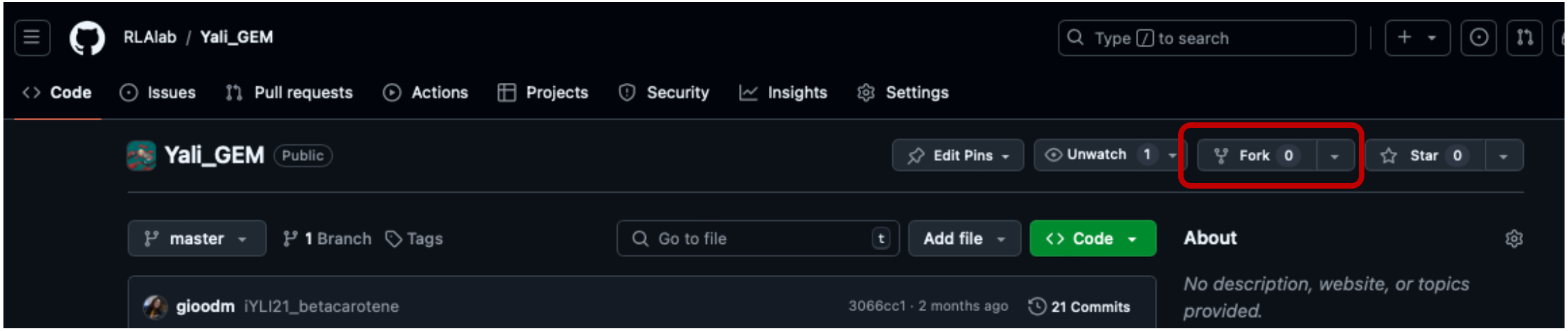


~% **git clone** <url>

10 most common **git** terms

5. fork

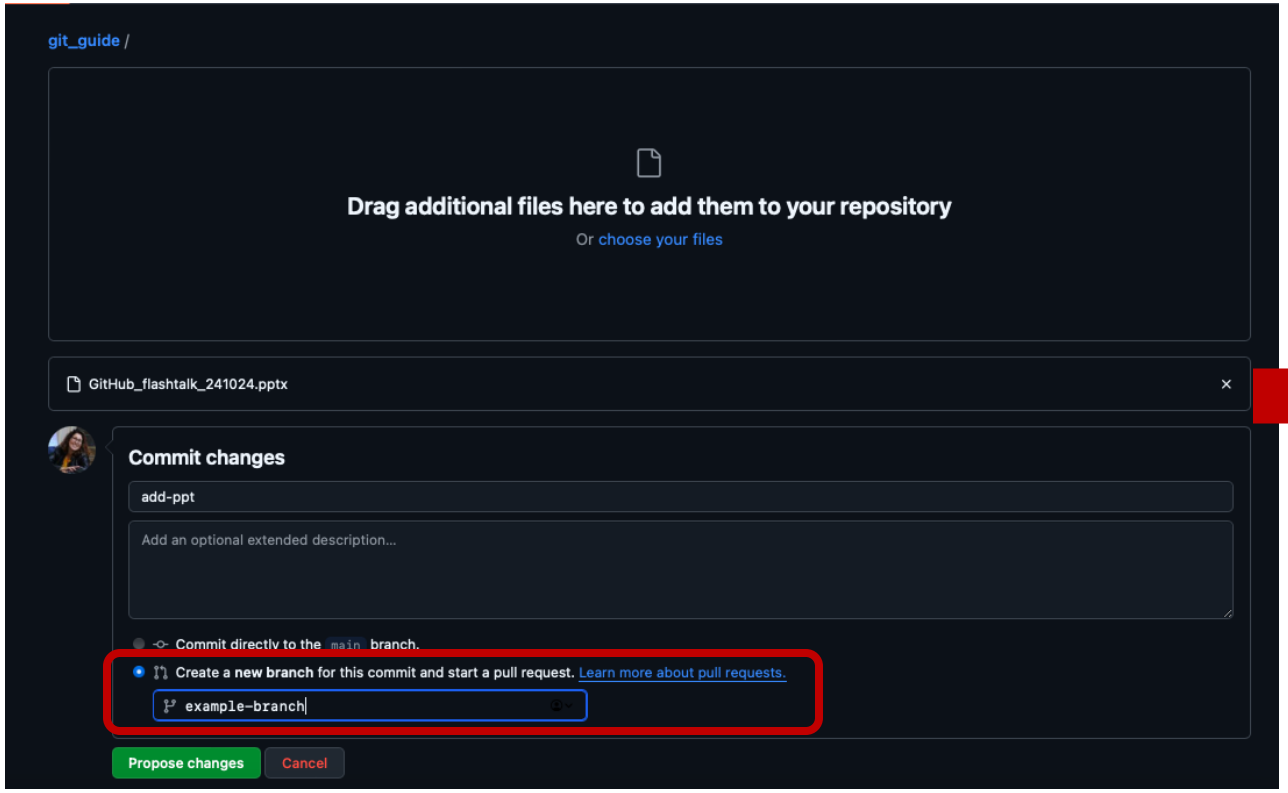
a copy of someone else’s repository on your account

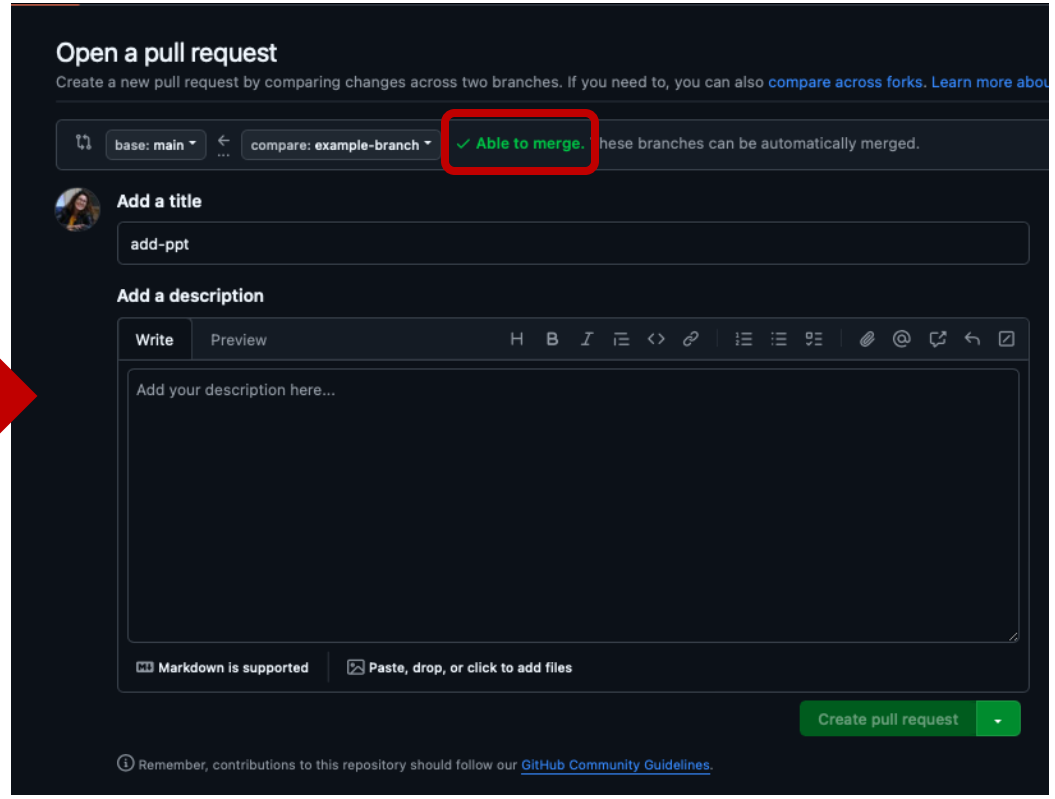


10 most common **git** terms

6. pull request (PR)

a request to merge changes from one branch into another
(usually from a feature branch into the main branch)



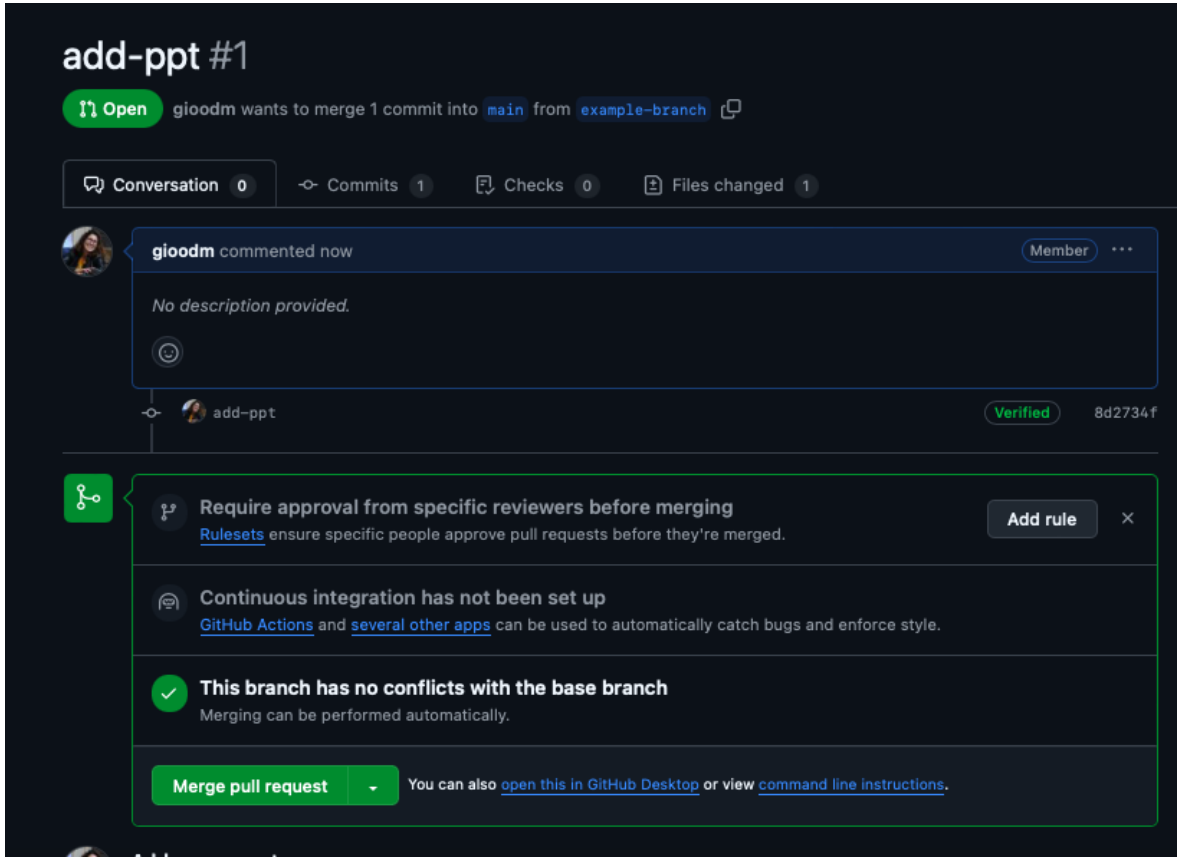


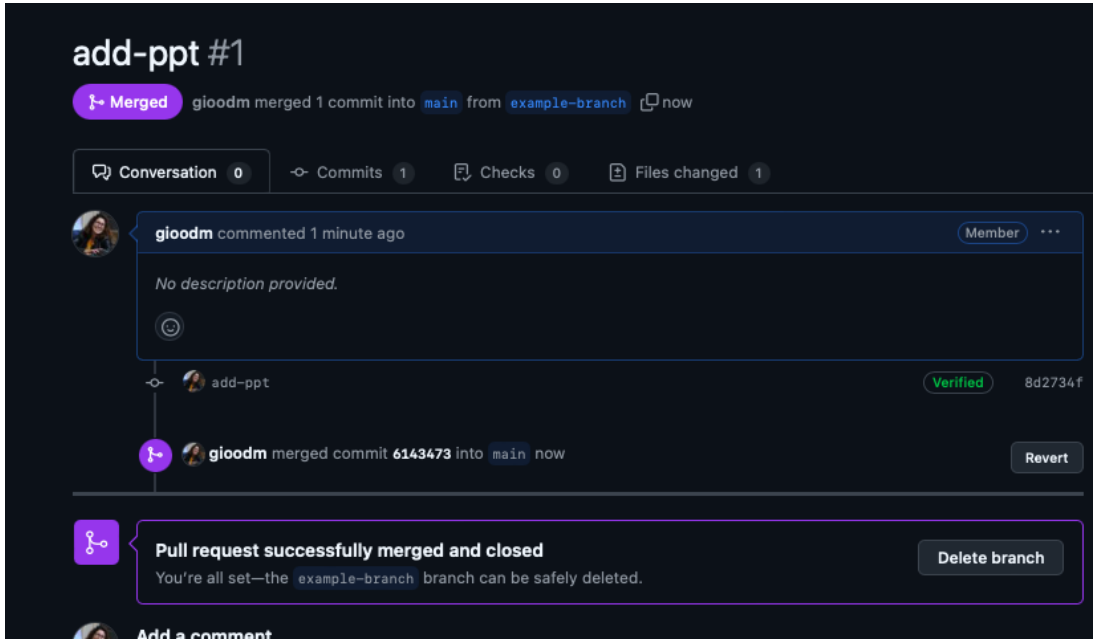
~% **git push** origin branch-name

10 most common **git** terms

7. merge

combining changes from one branch into another





~% **git merge** branch-name

10 most common **git** terms

8. pull

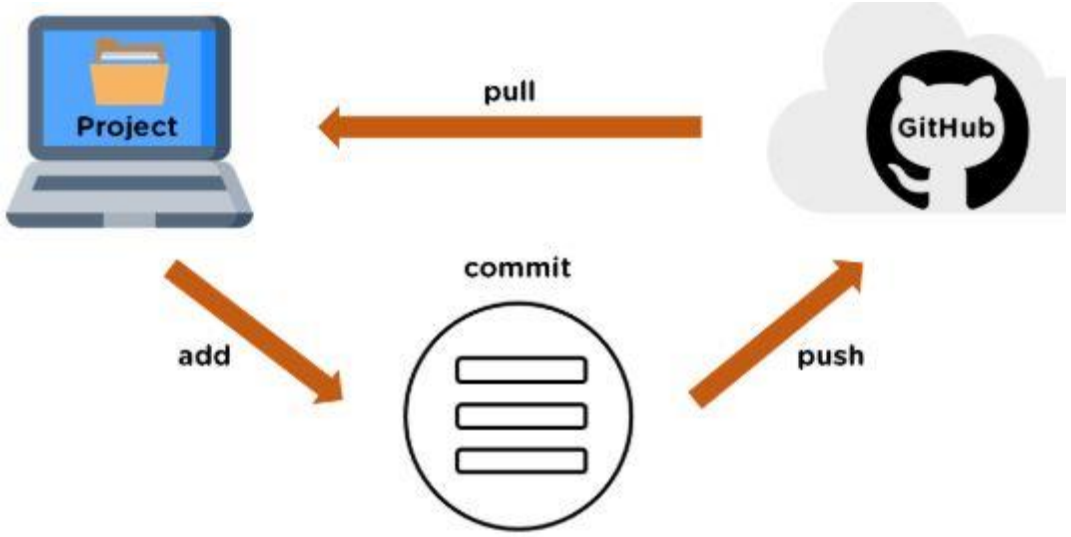
fetch and integrate changes from the remote repository into your local copy

9. staging (area)

the area where changes are prepared before committing

10. push

sending local commits to the remote repository



~% **git pull**
~% **git add** <file>
~% **git push** origin branch-name

Cheat sheet

Create a Repository

From scratch -- Create a new local repository

```
$ git init [project name]
```

Download from an existing repository

```
$ git clone my_url
```

Observe your Repository

List new or modified files not yet committed

```
$ git status
```

Show the changes to files not yet staged

```
$ git diff
```

Show the changes to staged files

```
$ git diff --cached
```

Show all staged and unstaged file changes

```
$ git diff HEAD
```

Show the changes between two commit ids

```
$ git diff commit1 commit2
```

List the change dates and authors for a file

```
$ git blame [file]
```

Show the file changes for a commit id and/or file

```
$ git show [commit]:[file]
```

Show full change history

```
$ git log
```

Show change history for file/directory including diffs

```
$ git log -p [file/directory]
```

Working with Branches

List all local branches

```
$ git branch
```

List all branches, local and remote

```
$ git branch -av
```

Switch to a branch, my_branch, and update working directory

```
$ git checkout my_branch
```

Create a new branch called new_branch

```
$ git branch new_branch
```

Delete the branch called my_branch

```
$ git branch -d my_branch
```

Merge branch_a into branch_b

```
$ git checkout branch_b
$ git merge branch_a
```

Tag the current commit

```
$ git tag my_tag
```

Make a change

Stages the file, ready for commit

```
$ git add [file]
```

Stage all changed files, ready for commit

```
$ git add .
```

Commit all staged files to versioned history

```
$ git commit -m "commit message"
```

Commit all your tracked files to versioned history

```
$git commit -am "commit message"
```

Unstages file, keeping the file changes

```
$ git reset [file]
```

Revert everything to the last commit

```
$ git reset --hard
```

Synchronize

Get the latest changes from origin (no merge)

```
$ git fetch
```

Fetch the latest changes from origin and merge

```
$ git pull
```

Fetch the latest changes from origin and rebase

```
$ git pull --rebase
```

Push local changes to the origin

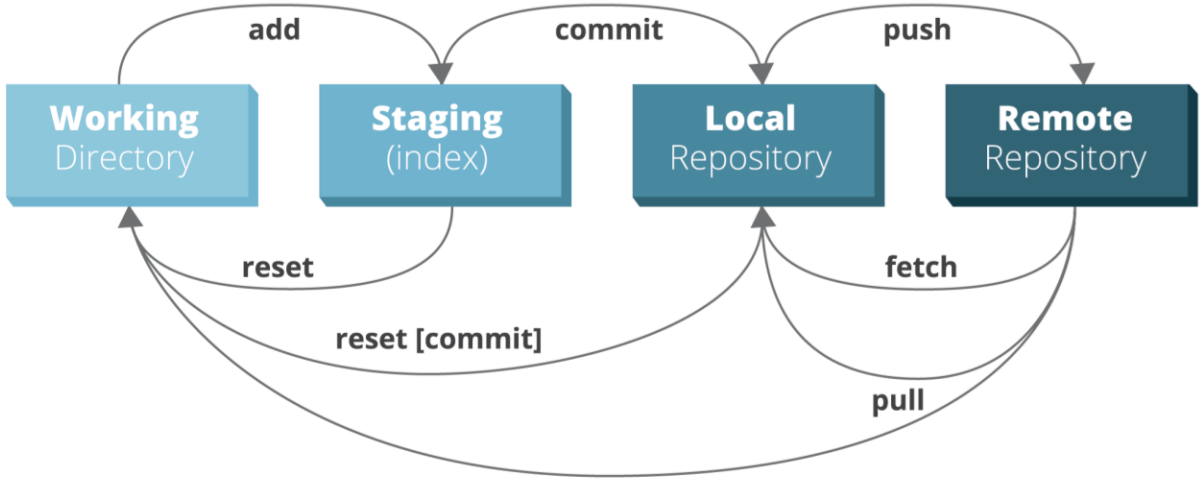
```
$ git push
```

Finally!

When in doubt, use git help

```
$ git command --help
```

Or visit **https://training.github.com/** for official GitHub training.



- https://www.dataschool.io/git-quick-reference-for-beginners/
- https://www.dataschool.io/simple-guide-to-forks-in-github-and-git/
- https://www.dataschool.io/how-to-contribute-on-github/
- https://www.geeksforgeeks.org/ultimate-guide-git-github/
- https://medium.com/@sachinsoni600517/complete-tutorial-of-git-and-github-for-basic-to-advanced-1dd34d12b90b