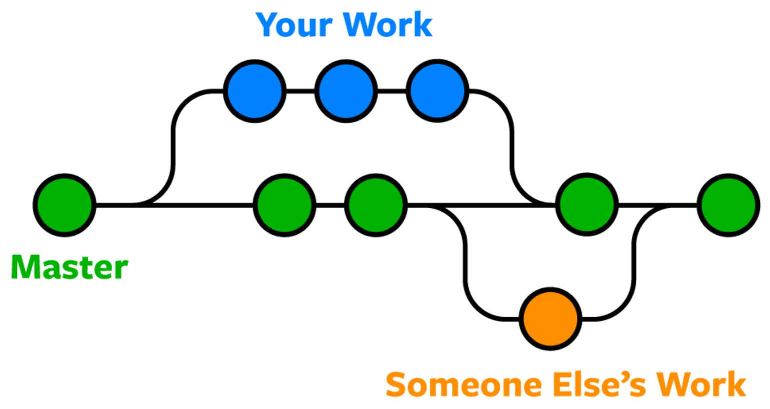
CPSC 233 – Tutorial Session

Introduction to Git

Sepehr Sabour



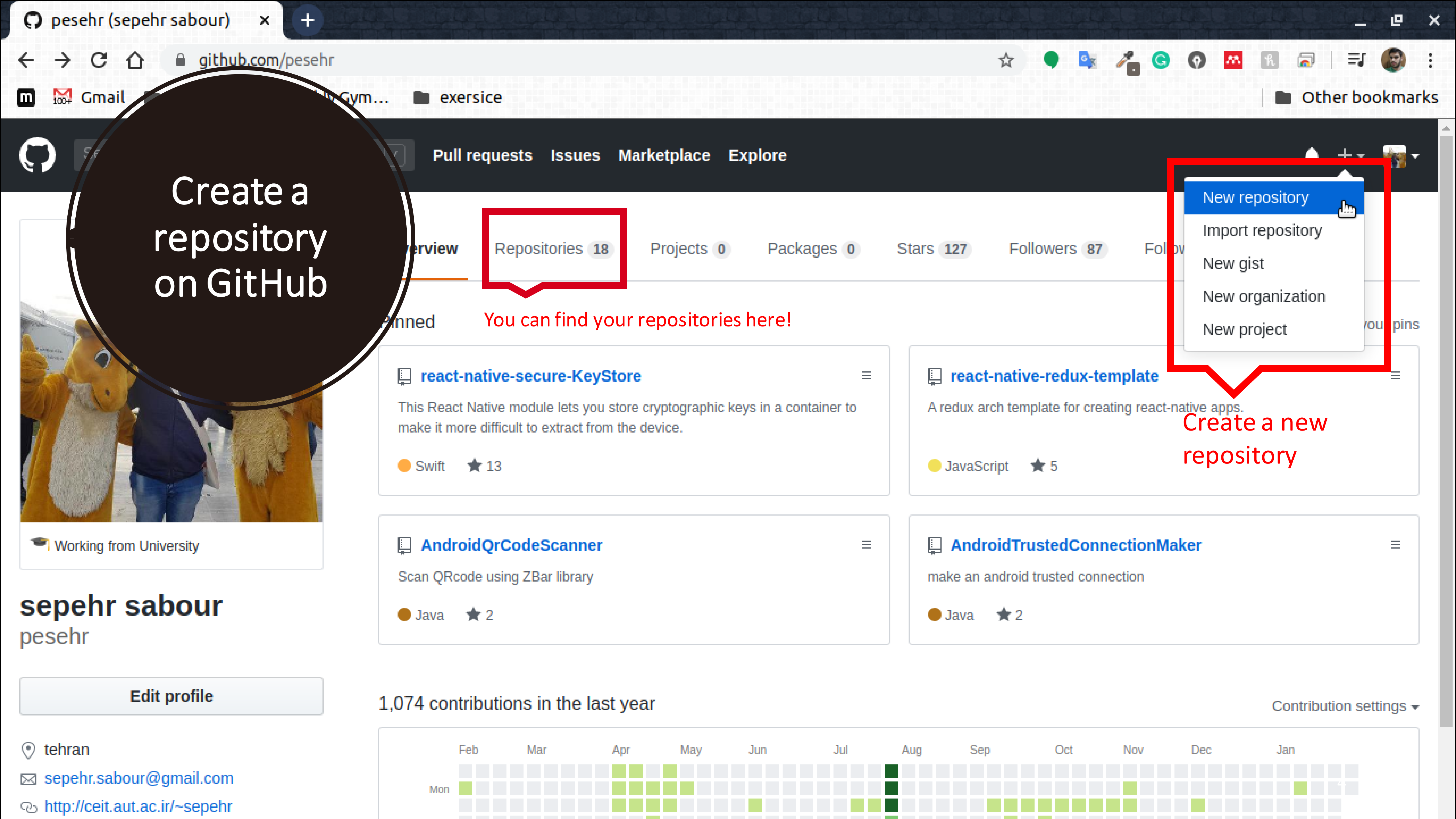
What is Git?

- Git is a distributed version-control system for software development.
- Designed for coordinated work among programmers.
- It’s free and open source
- Available for all OSs
- Easily install on Windows
  - https://git-scm.com/download/win

You need to use a git hosting website

- GitHub
- GitLab
- Bitbucket

Create a repository on GitHub


pesehr (sepehr sabour)
github.com/pesehr
Gmail
exersice
Other bookmarks
Pull requests
Issues
Marketplace
Explore
New repository
Import repository
New gist
New organization
New project
Repositories 18
Projects 0
Packages 0
Stars 127
Followers 87
Working from University
sepehr sabour
pesehr
Edit profile
tehran
sepehr.sabour@gmail.com
http://ceit.aut.ac.ir/~sepehr
react-native-secure-KeyStore
This React Native module lets you store cryptographic keys in a container to make it more difficult to extract from the device.
Swift 13
react-native-redux-template
A redux arch template for creating react-native apps.
JavaScript 5
AndroidQrCodeScanner
Scan QRcode using ZBar library
Java 2
AndroidTrustedConnectionMaker
make an android trusted connection
Java 2
1,074 contributions in the last year
Contribution settings
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Mon

You can find your repositories here!

Create a new repository

Create a new repository

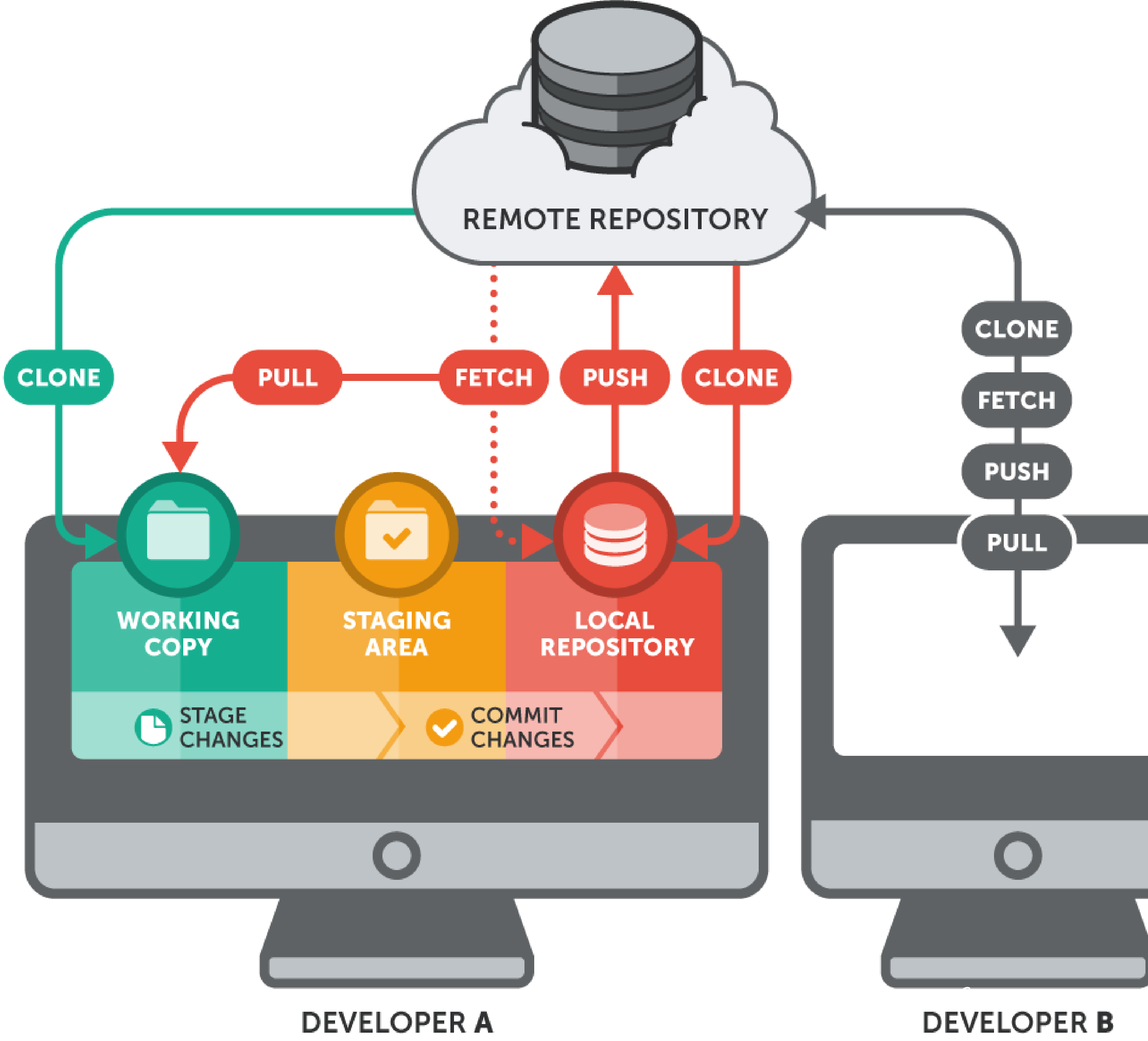
Create a new eclipse project,
open it and perform a

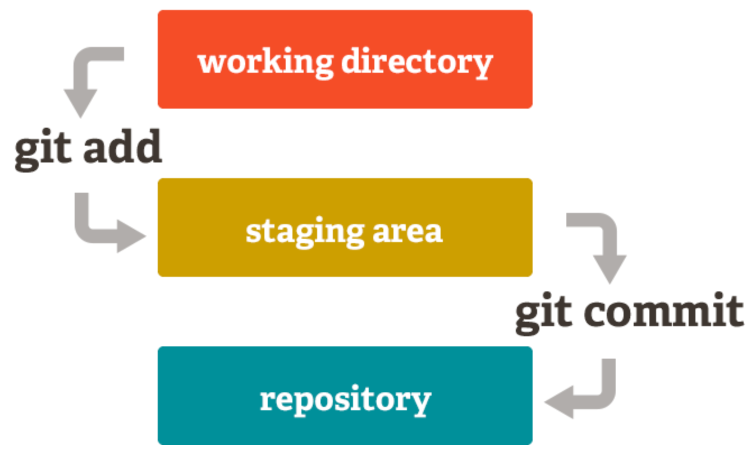
```
git init
```

to create a new git repository.

Local repository vs. Remote repository

- Now, you have two repository one local (on your computer) and one remote (on GitHub servers)
- You should always keep these two repositories synchronized





How does Git work?

- Your local repository consist of three directories:
- **Working Directory** which holds actual files
- **Index Directory** which compares your working directory with committed files
- **Head Directory** which holds your last committed files

How to track changes using git?

- Each file that you have changed has one of the following states:
- Not added to index file
- Not committed to head directory
- Ignored

You should first add your changes to index directory and after that commit them to head directory.

How to add files to index directory

You can propose changes (add it to the Index) using

```
git add <filename>
```

to add all changes

```
git add .
```

How to commit files

UNIVERSITY OF CALGARY

To actually commit the changes use

```
git commit –m "Commit message"
```

Now the files are committed to the HEAD,

but not in your remote repository yet

How to connect to a remote repository

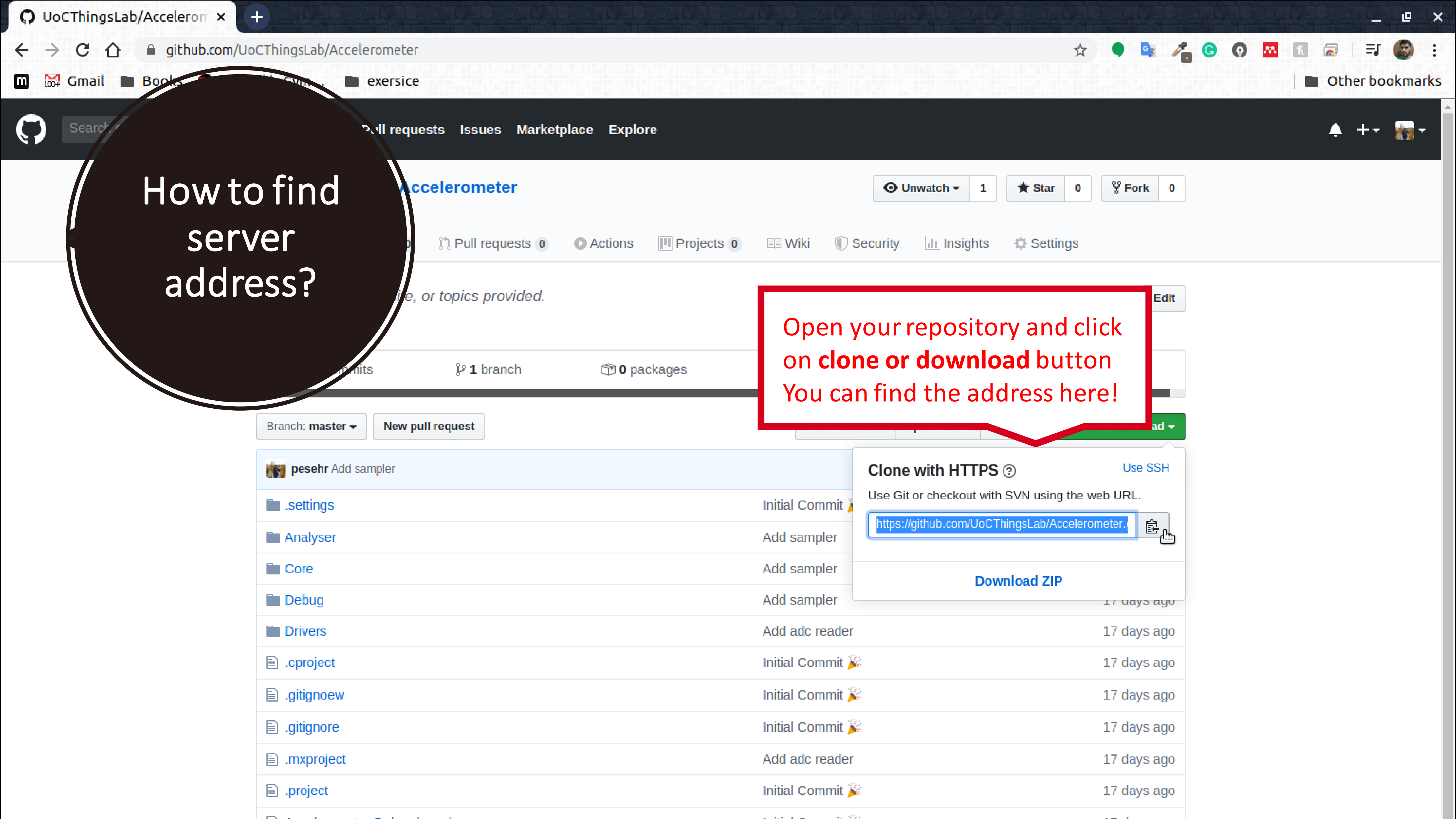
First time that you create a local repository you need to connect your working directory to the remote repository

to connect to the remote repository, execute

```
git remote add origin <server address>
```

How to find server address?

Open your repository and click on **clone or download** button
You can find the address here!



Clone with HTTPS

Use SSH

Use Git or checkout with SVN using the web URL.

https://github.com/UoCThingsLab/Accelerometer.

Download ZIP

pesehr Add sampler

.settings	Initial Commit 🎉	
Analyser	Add sampler	
Core	Add sampler	
Debug	Add sampler	17 days ago
Drivers	Add adc reader	17 days ago
.cproject	Initial Commit 🎉	17 days ago
.gitignoew	Initial Commit 🎉	17 days ago
.gitignore	Initial Commit 🎉	17 days ago
.mxproject	Add adc reader	17 days ago
.project	Initial Commit 🎉	17 days ago

How to push changes to remote repository

Your changes are now in the HEAD of your local repository.

To send those changes to your remote repository, execute

```
git push origin master
```

How to clone an existing remote repository?

If you want to download codes from remote repository you should perform

```
git clone <server address>
```

Note! In this case you do not need to initialize git or connect to remote repository

How to keep our local and remote repository synchronized?

to update your local repository to the newest commit, execute

```
git pull origin master
```

in your working directory to fetch and merge remote changes

How to monitor changes?

To monitor your files use

```
git status
```

You can see changed files

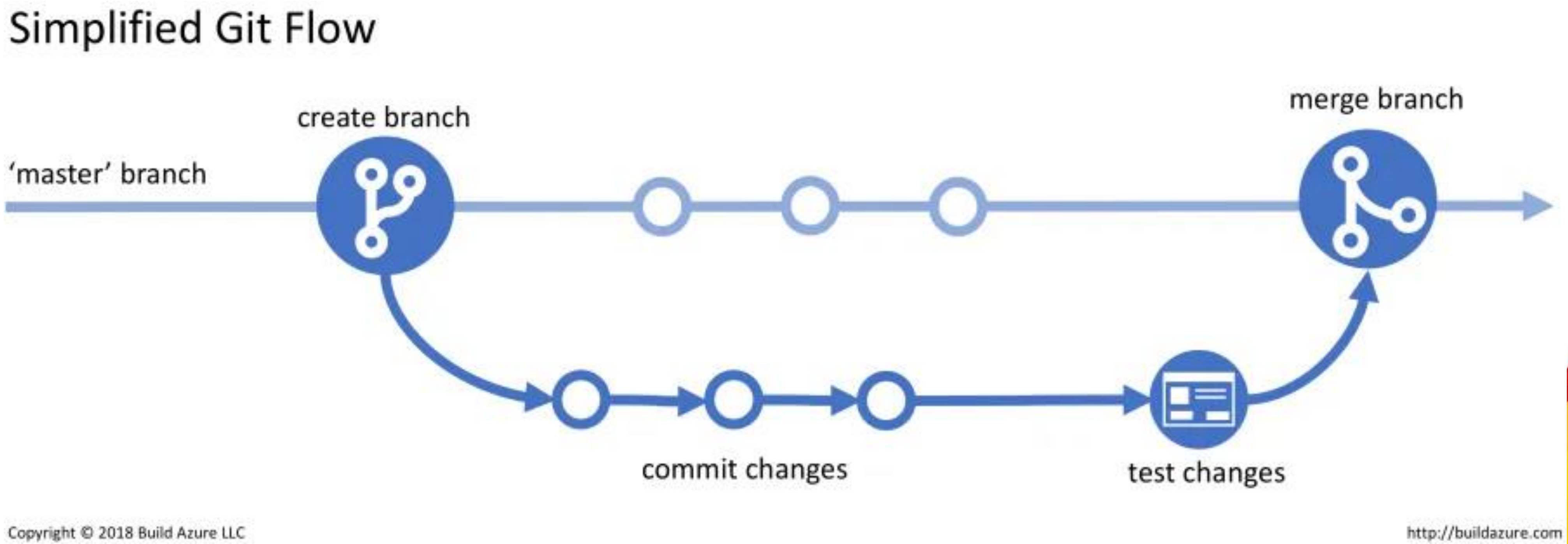
The red files have not been added to Index directory

The green files have been added to Index directory

You cannot find committed files here

Branching

Branches are used to develop features isolated from each other. The master branch is the "default " branch when you create a repository. Use other branches for development and merge them back to the master branch upon completion



How to create a new branch?

Create a new branch and switch to it using

```
git checkout –b <branch name>
```

switch to an existing branch

```
git checkout <branch name>
```

and delete the branch

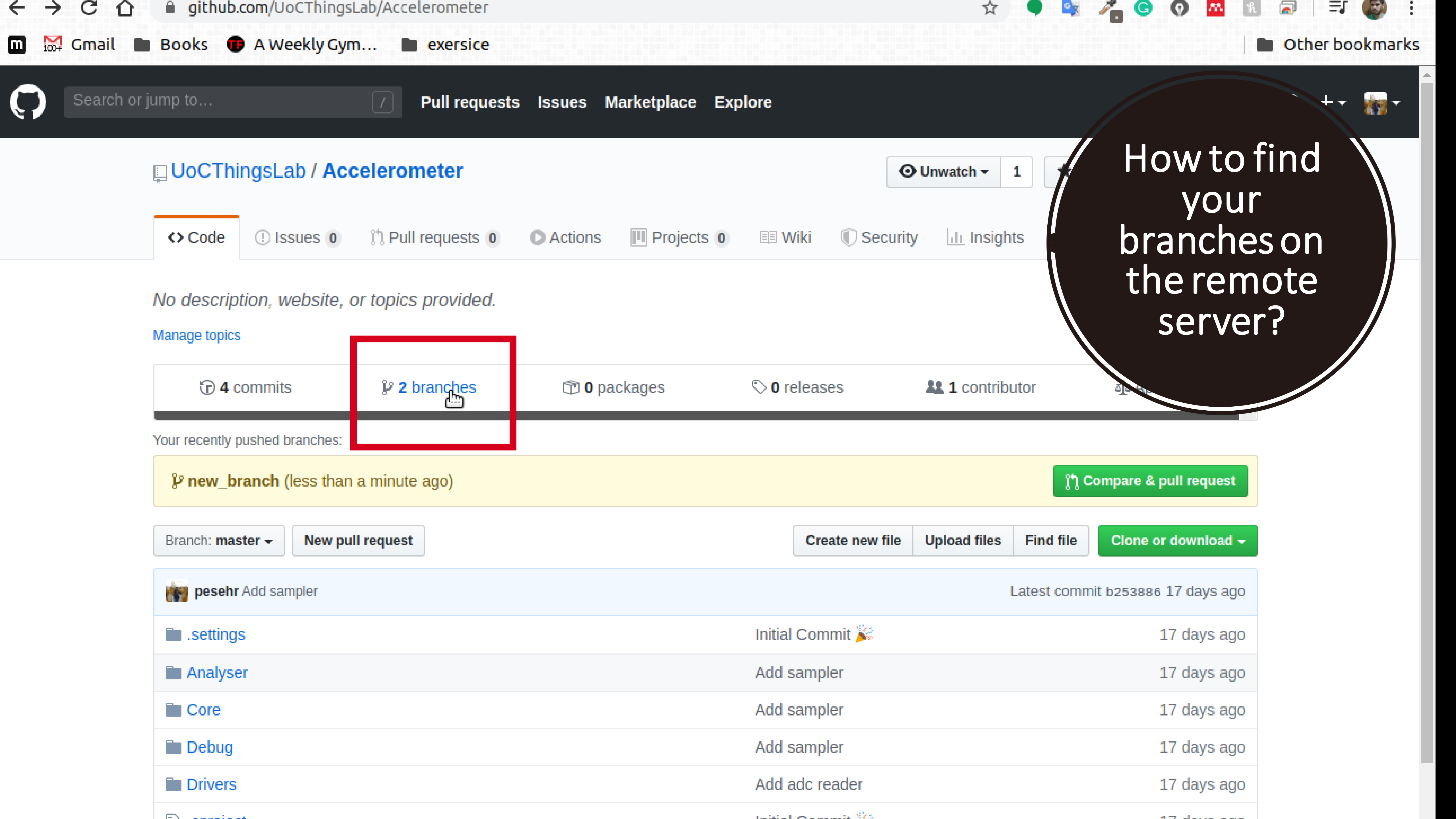
```
git branch –d <branch name>
```

Push and pull a branch

- You can use the mentioned commends for your new branch

```
git pull origin  <branch name>
```

```
git push origin <branch name>
```



How to find your branches on the remote server?

github.com/UoCThingsLab/Accelerometer

Gmail · Books · A Weekly Gym... · exersice · Other bookmarks

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

UoCThingsLab / Accelerometer

Unwatch 1

Code · Issues 0 · Pull requests 0 · Actions · Projects 0 · Wiki · Security · Insights

No description, website, or topics provided.

Manage topics

4 commits · 2 branches · 0 packages · 0 releases · 1 contributor

Your recently pushed branches:

new_branch (less than a minute ago) · Compare & pull request

Branch: master · New pull request · Create new file · Upload files · Find file · Clone or download

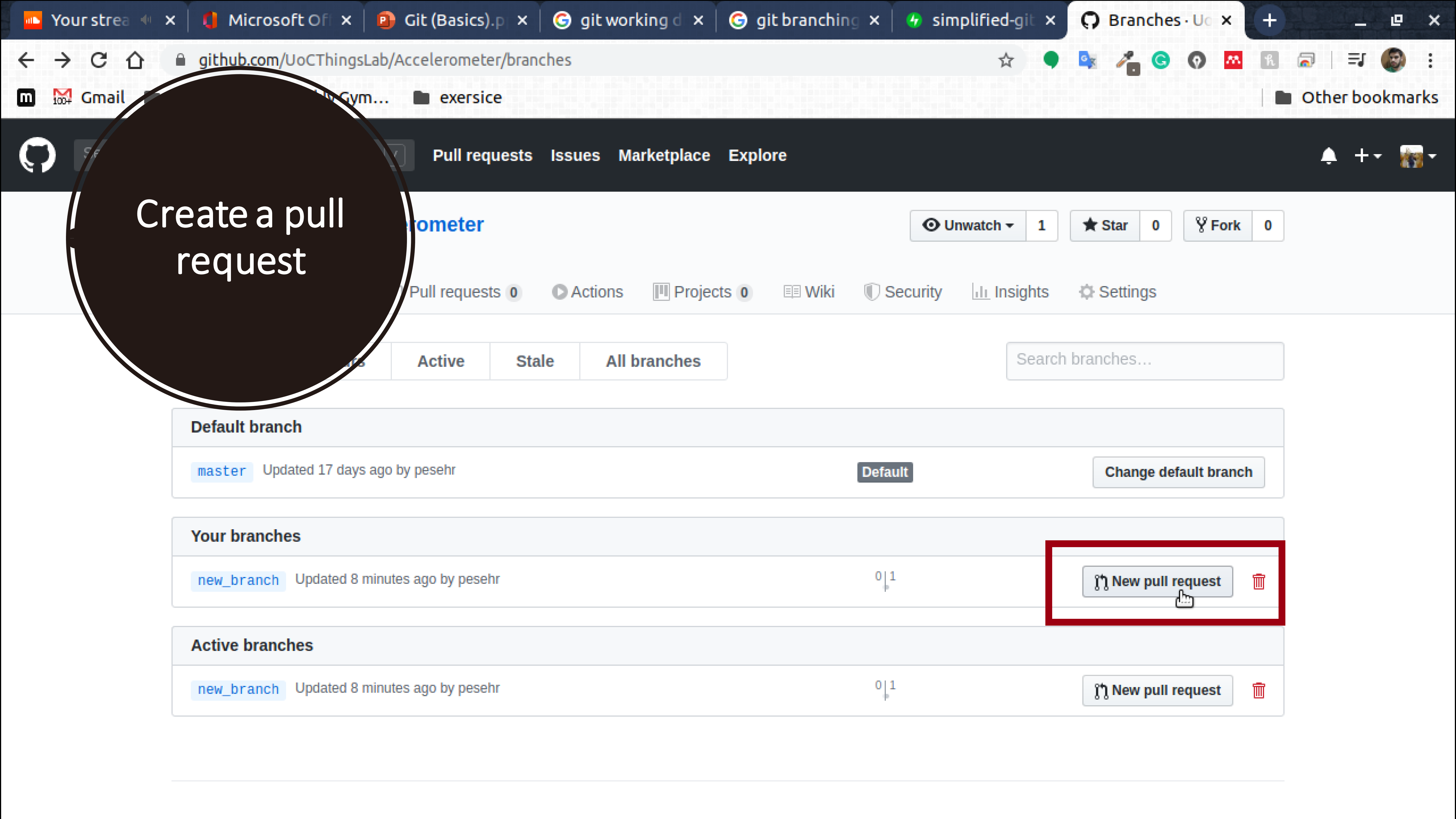
pesehr Add sampler — Latest commit b253886 17 days ago

.settings	Initial Commit 🎉	17 days ago
Analyser	Add sampler	17 days ago
Core	Add sampler	17 days ago
Debug	Add sampler	17 days ago
Drivers	Add adc reader	17 days ago

How to merge a branch into your active branch (e.g. master) on remote server

- Create a pull request
- Compare pull request with master branch
- Make sure that the new branch does not have any error, bug or messy code
- Merge pull request with your active branch

Create a pull request



github.com/UoCThingsLab/Accelerometer/branches

Default branch

master Updated 17 days ago by pesehr Default Change default branch

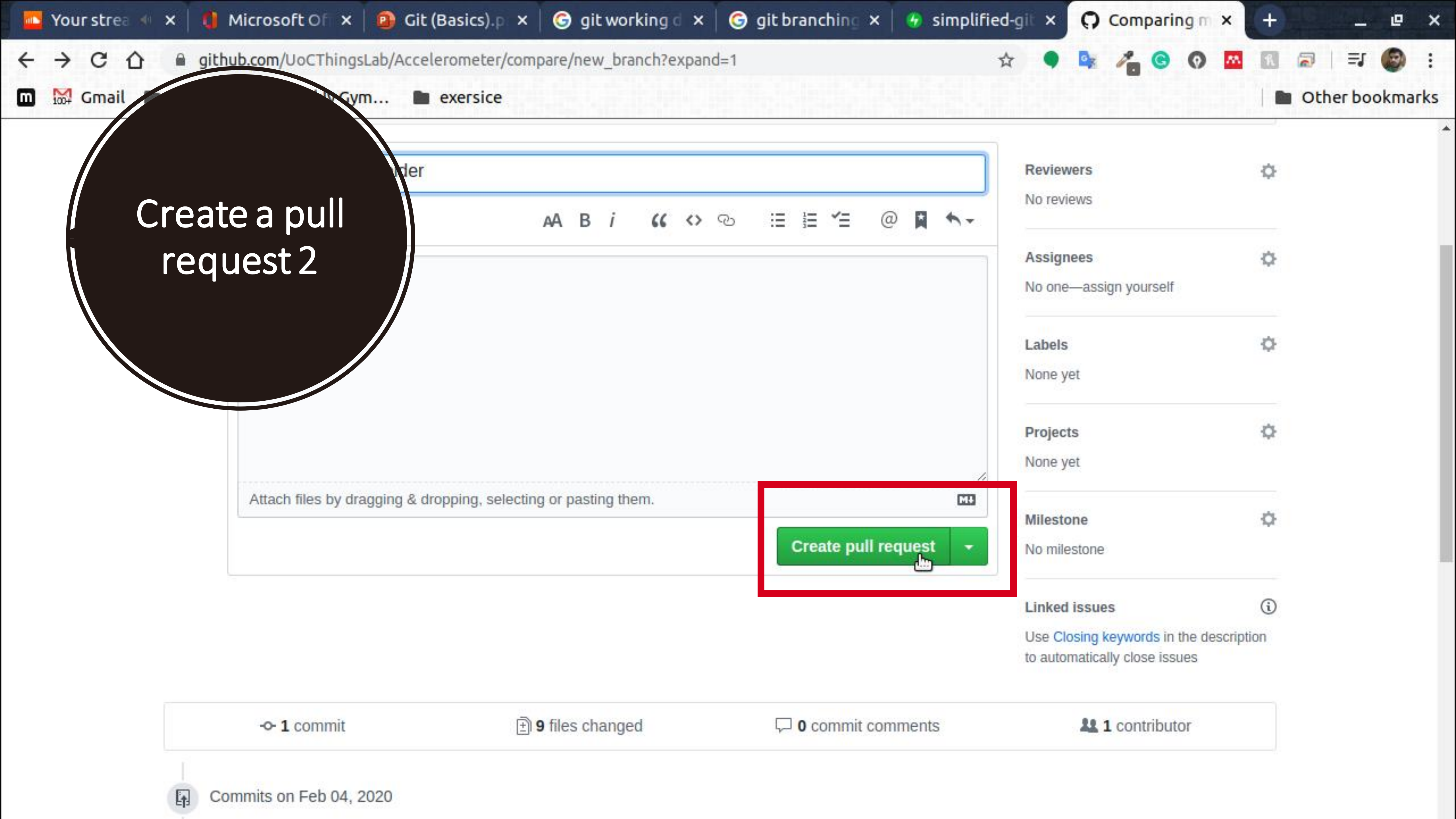
Your branches

new_branch Updated 8 minutes ago by pesehr 0|1 New pull request

Active branches

new_branch Updated 8 minutes ago by pesehr 0|1 New pull request

Create a pull request 2



Reviewers
No reviews

Assignees
No one—assign yourself

Labels
None yet

Projects
None yet

Milestone
No milestone

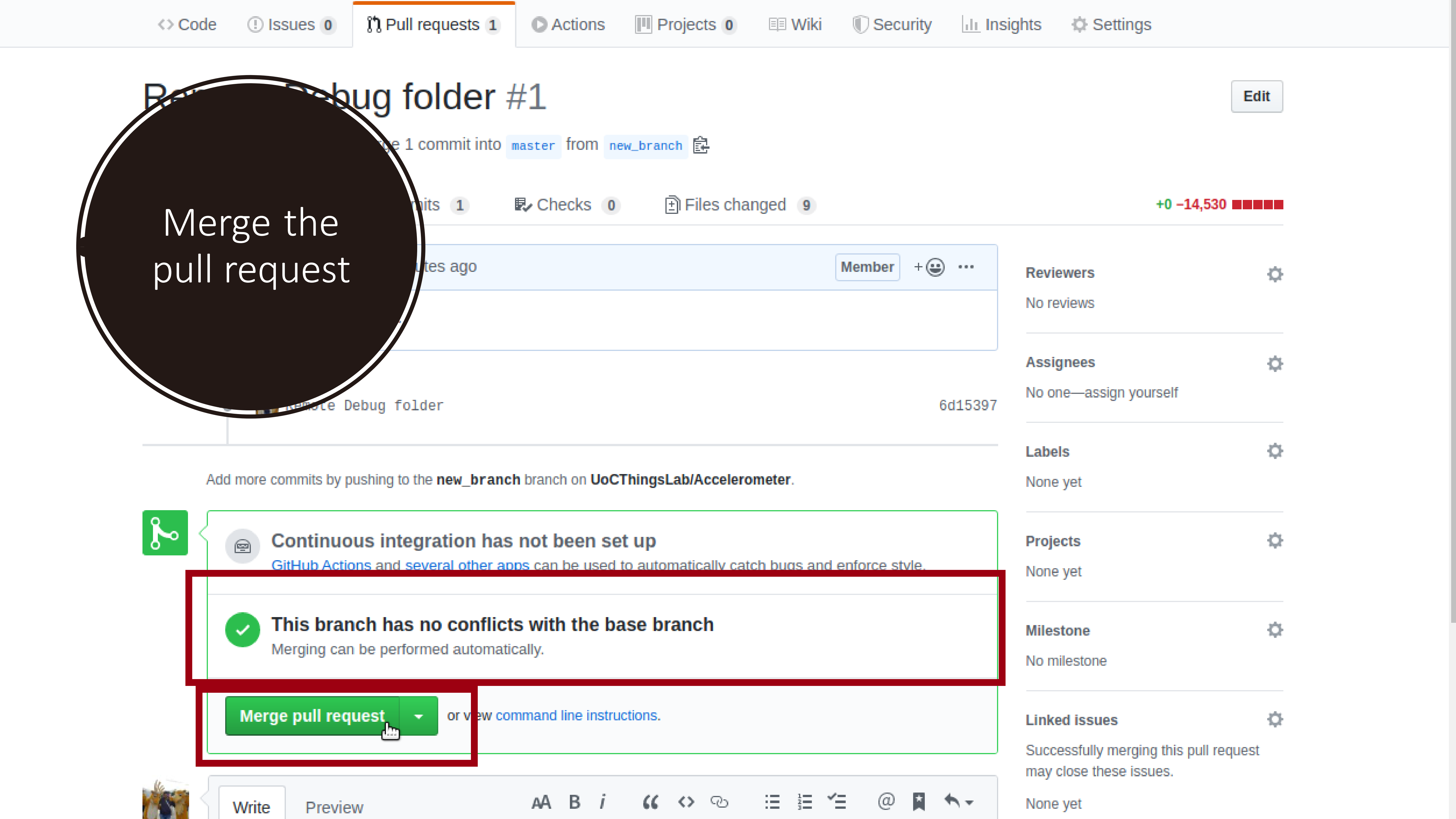
Linked issues
Use Closing keywords in the description to automatically close issues

Attach files by dragging & dropping, selecting or pasting them.

1 commit · 9 files changed · 0 commit comments · 1 contributor

Commits on Feb 04, 2020

github.com/UoCThingsLab/Accelerometer/compare/new_branch?expand=1
Create pull request



Merge the pull request

Re... ...bug folder #1

Edit

...e 1 commit into master from new_branch

...its 1 Checks 0 Files changed 9 +0 −14,530

...tes ago

Member

...ve Debug folder 6d15397

Add more commits by pushing to the **new_branch** branch on **UoCThingsLab/Accelerometer**.

Continuous integration has not been set up
GitHub Actions and several other apps can be used to automatically catch bugs and enforce style.

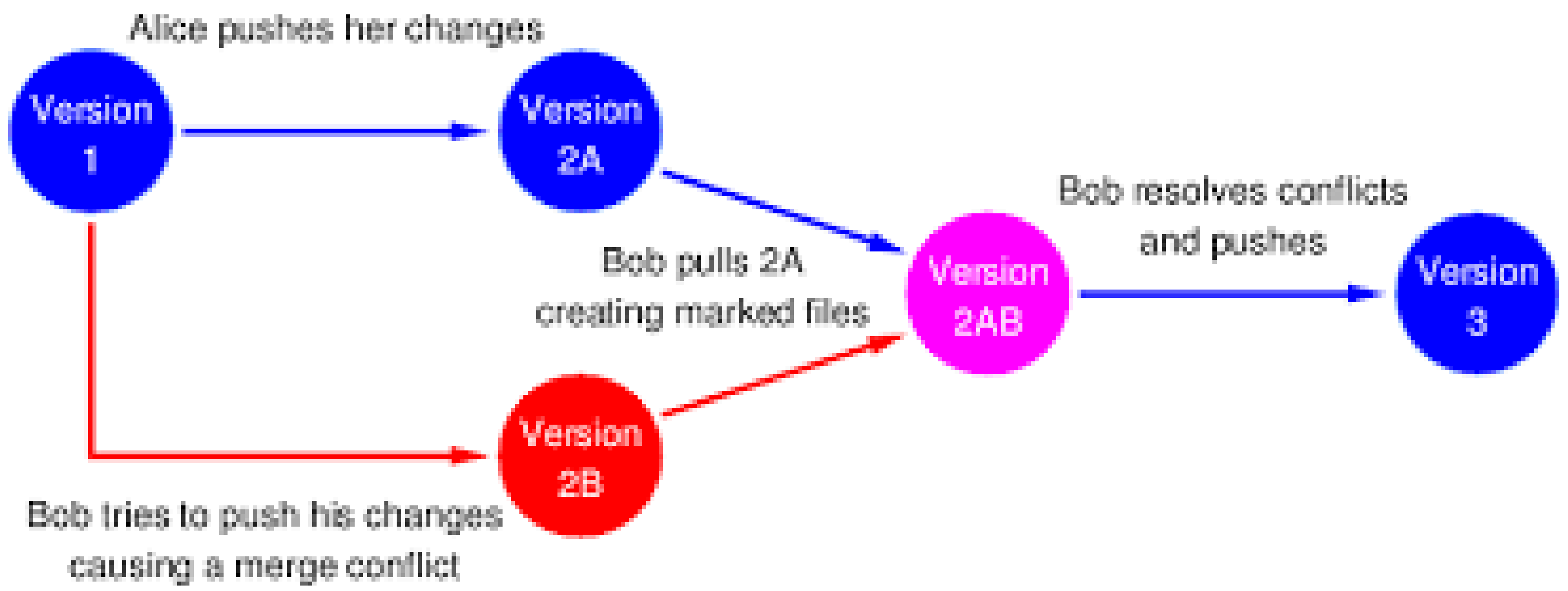
This branch has no conflicts with the base branch
Merging can be performed automatically.

Merge pull request

or view command line instructions.

Conflicts, git monsters

A **merge conflict** is an event that occurs when Git is unable to automatically resolve differences in code between two commits. When all the changes in the code occur on different lines or in different files, Git will successfully **merge** commits without your help.


Alice pushes her changes
Version 1
Version 2A
Bob pulls 2A creating marked files
Version 2AB
Bob resolves conflicts and pushes
Version 3
Version 2B
Bob tries to push his changes causing a merge conflict

How to resolve merge conflicts?

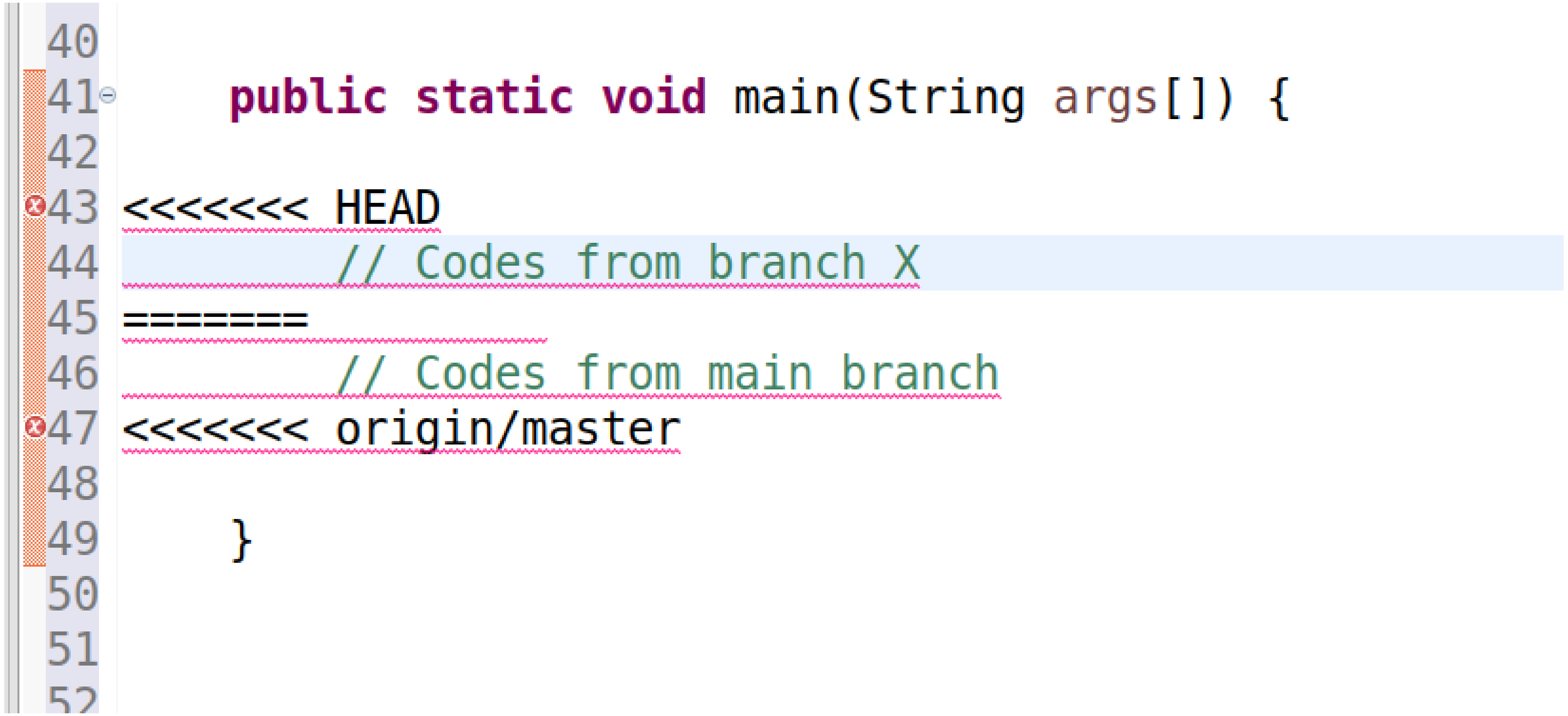
Assume that you want to merge branch X and main but there are some conflicts between these two branches

1. First checkout to branch X
2. Next perform

```
git merge main
```

Note! Before merging update main branch to the last version

A conflict



```

    public static void main(String args[]) {

<<<<<<<< HEAD
            // Codes from branch X
========
            // Codes from main branch
<<<<<<<< origin/master

    }


```

Now, you should decide which code you want to keep

Conclusion!

Always merge the last version of the active branch into your working branch before pushing the code

Always keep active branch without any bug, error, and merge conflicts

5 Commit tips

- 1. Commit early, commit often
- 2. Make your commit messages meaningful using a semantic style
- 3. Make your changes in each commit atomic
- 4. Push your code to a remote (if you have one)
- 5. Never rewrite shared history
- **Read more:** https://medium.com/walmartlabs/check-out-these-5-git-tips-before-your-next-commit-c1c7a5ae34d1