LABCLASS 1

SIMU2WS2017/18

INTRODUCTION TO GIT AND GITHUB CLASSROOM

Introduction to Git and GitHub

Submitted assignment work must be developed under Git control and pushed to GitHub

- Git is an open source version control system
- GitHub is a web-based hosting platform for Git repositories
- The key concept in Git is a **commit**. A commit is a version of your system, a snapshot of it in time.
- A **commit** should make sense. Commit every time you added functionality to your program or fixed a bug.

- In the coming slides we will discuss a suitable workflow for the assignments in the module.

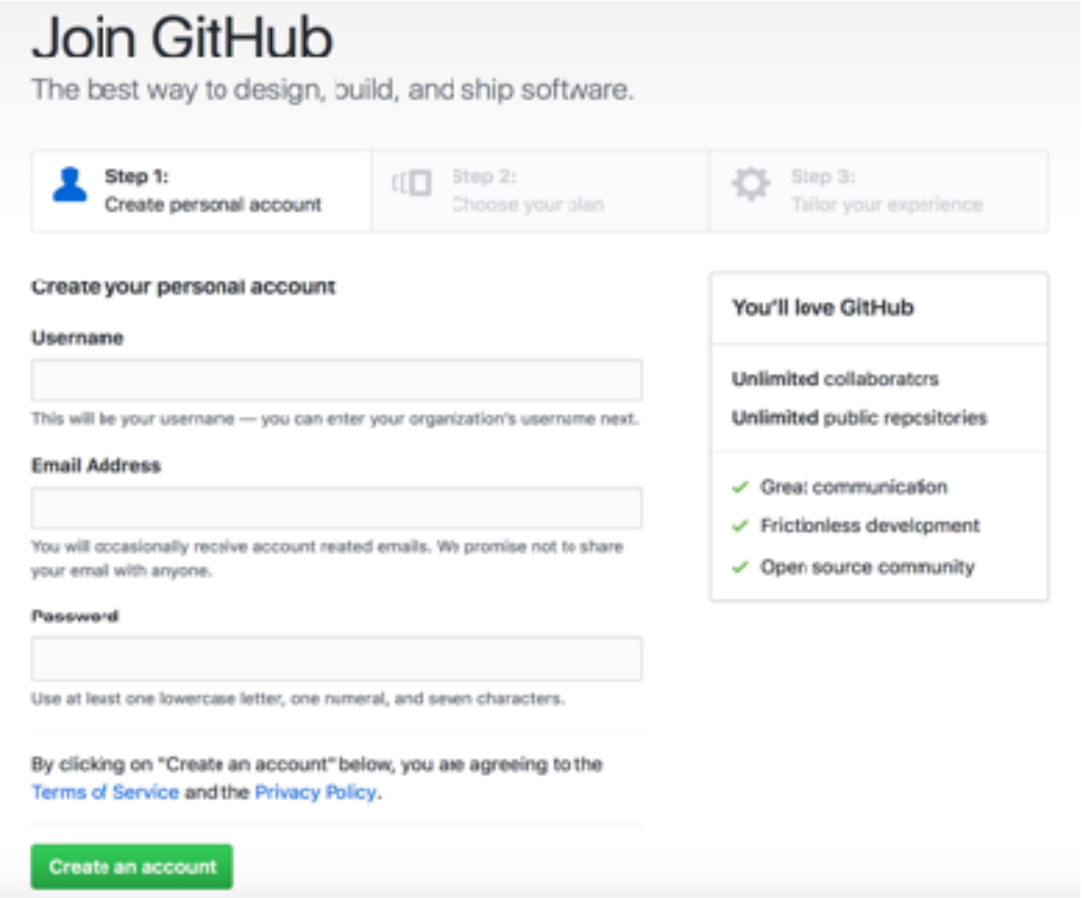
Lifecycle of a file in Git

Three different states

- Modified: You have changed your local copy of the file, so now it's different from your latest committed version.
- Staged: You have taken a snapshot of your file so it's ready to be committed on the next commit.
- Committed: You have committed the file to the repository and your local copy is identical to the committed one.

Introduce yourself to Git/GitHub

- GitHub: Go to *www.github.com* and create an account, if you haven’t already.



Join GitHub

The best way to design, build, and ship software.

Step 1: Create personal account

Step 2: Choose your plan

Step 3: Tailor your experience

Create your personal account

Username

This will be your username — you can enter your organization's username next.

Email Address

You will occasionally receive account related emails. We promise not to share your email with anyone.

Password

Use at least one lowercase letter, one numeral, and seven characters.

By clicking on "Create an account" below, you are agreeing to the Terms of Service and the Privacy Policy.

Create an account

You'll love GitHub

Unlimited collaborators

Unlimited public repositories

✓ Great communication

✓ Frictionless development

✓ Open source community

- Git: Git keeps track of who did what and when they did it, so it needs to know who you are.

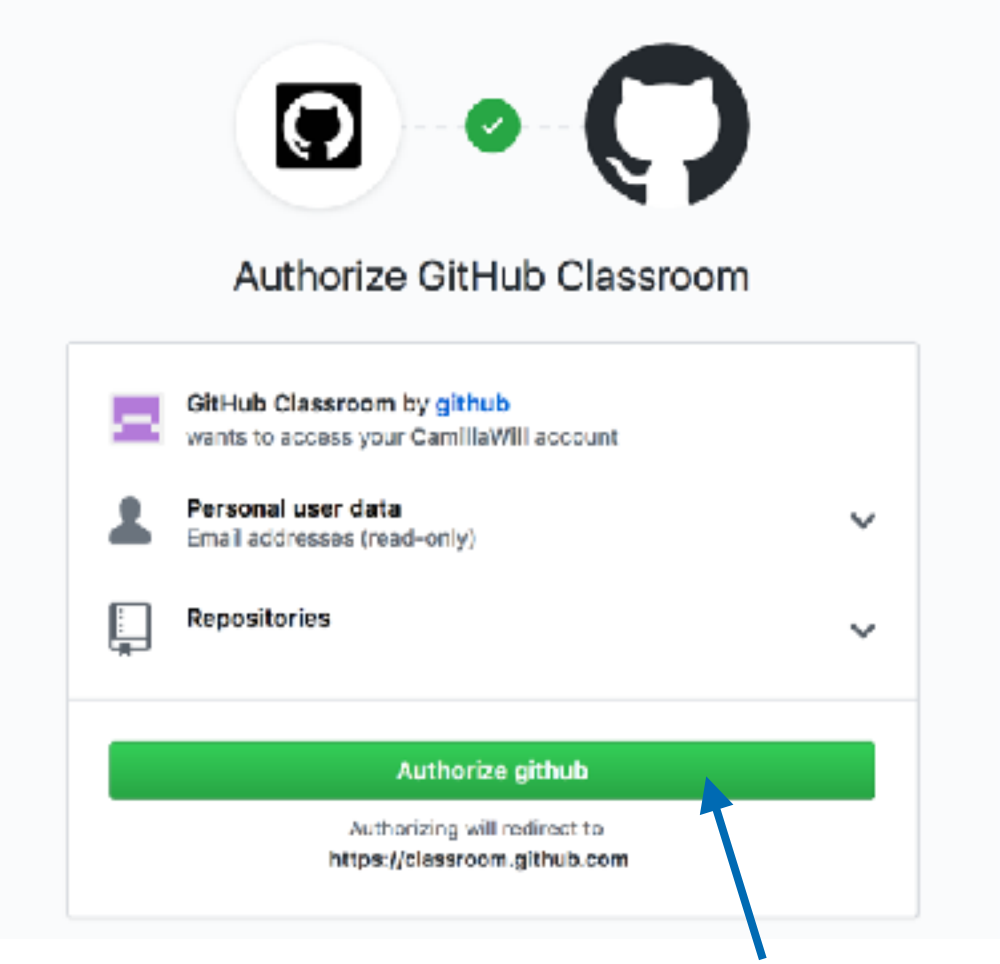
Open a terminal and type in the following:

```
git config --global user.name “Max Mustermann”
git config --global user.email “Max.Mustermann@gmail.com”
```

You only need to do it once on each machine you’re using Git on.

Starting with GitHub Classroom

- Each assignment will be a repository in the organisation TP1-HHU.
- We will use the TP1-GitHubpage to distribute new assignments.
- Use the link https://github.com/TP1-HHU and click on the assignment link for todays lab class.



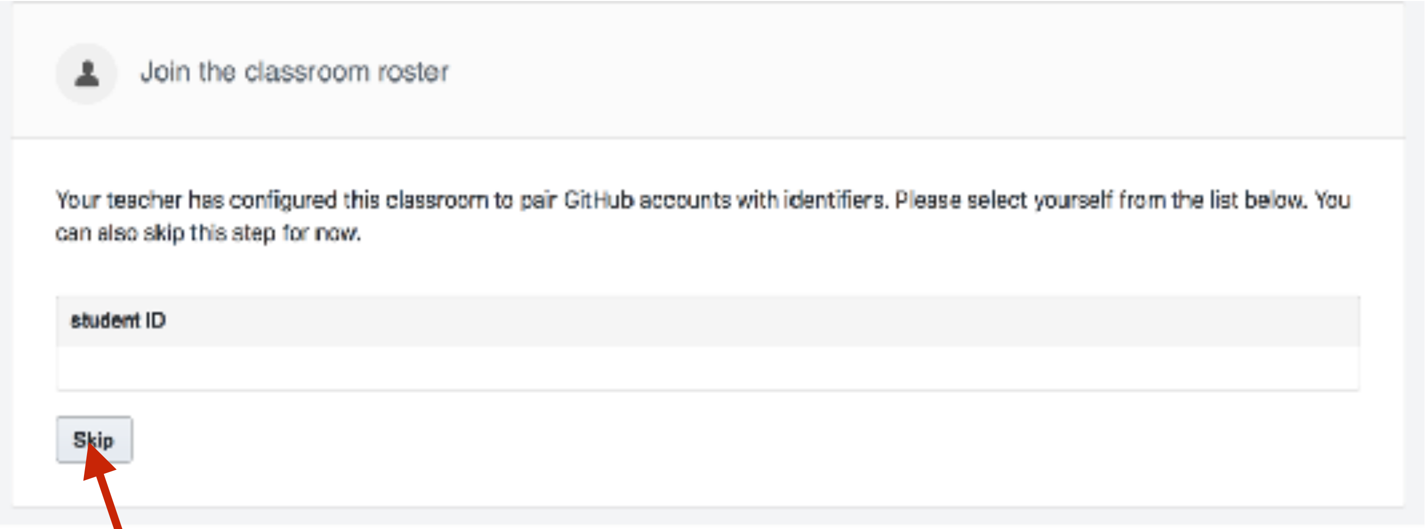
Authorize GitHub Classroom

GitHub Classroom by github
wants to access your CamillaWill account

Personal user data
Email addresses (read-only)

Repositories

Authorizing will redirect to
https://classroom.github.com



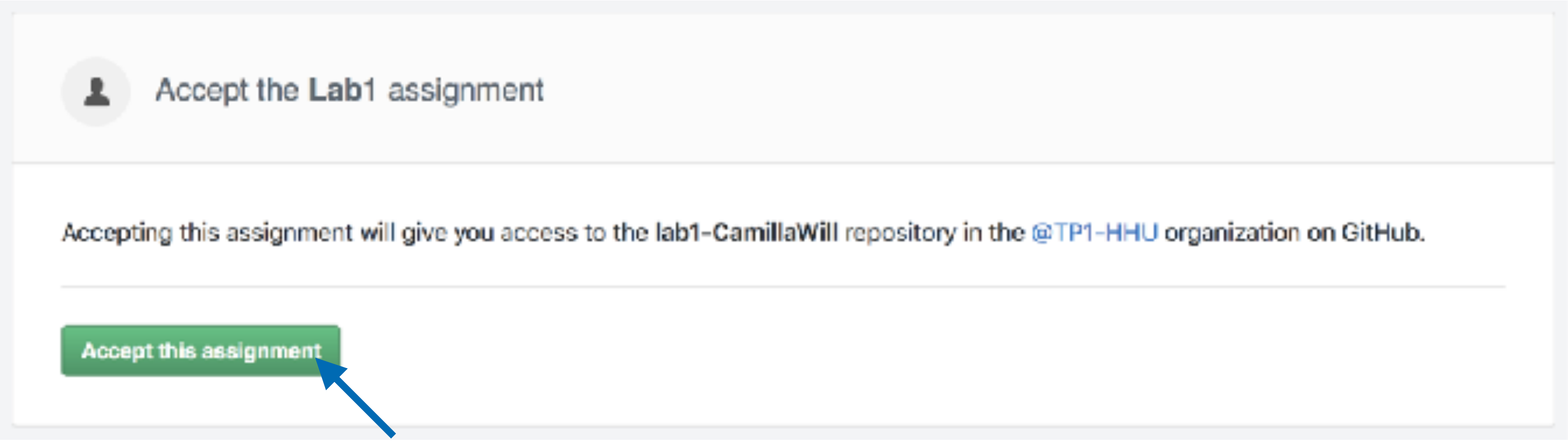
Join the classroom roster

Your teacher has configured this classroom to pair GitHub accounts with identifiers. Please select yourself from the list below. You can also skip this step for now.

student ID

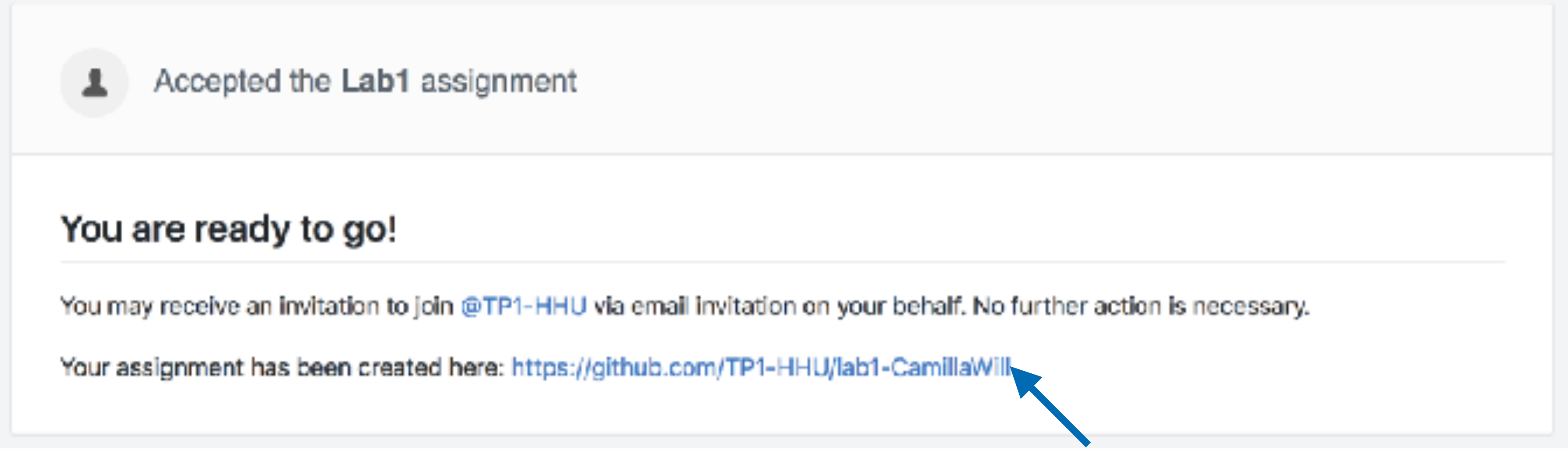
skip only today!

Starting with GitHub Classroom



Accept the **Lab1** assignment

Accepting this assignment will give you access to the **lab1-CamillaWill** repository in the @TP1-HHU organization on GitHub.

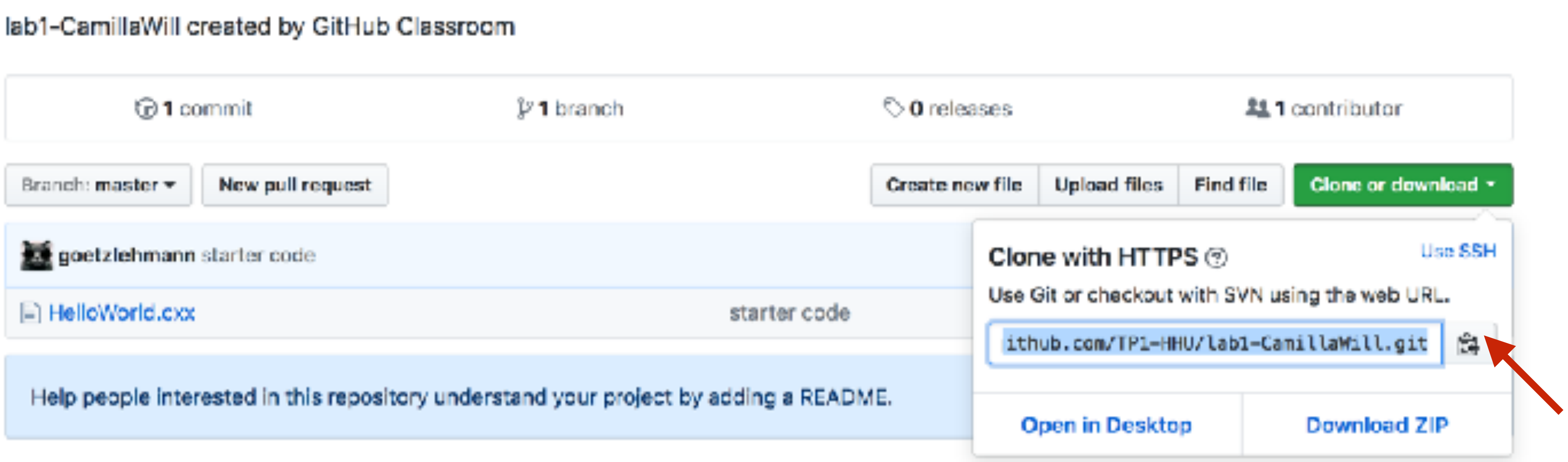


Accepted the **Lab1** assignment

You are ready to go!

You may receive an invitation to join @TP1-HHU via email invitation on your behalf. No further action is necessary.

Your assignment has been created here: https://github.com/TP1-HHU/lab1-CamillaWill



lab1-CamillaWill created by GitHub Classroom

goetzlehmann starter code

HelloWorld.cxx starter code

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

Clone with HTTPS

Use Git or checkout with SVN using the web URL.

```
ithub.com/TP1-HHU/lab1-CamillaWill.git
```

for copying
to terminal

Creating Git project locally

- After you accepted the assignment you'll have access to the repository.
- The GitHub repository with your assignment is identified by an URL
- **Copy** the URL. You can find it by clicking this button:

- Open the terminal and **navigate to the folder** (use the command `cd`) where you want to store your project.
- Now you can clone the repository on GitHub:

```
git clone https://github.com/TP1-HHU/test-MaxMustermann.git
```

- A folder called **test** (example case) will be created. Your local Git repository is now linked to remote repository on GitHub.

Starting Development

- Start by opening a file called HelloWorld.cxx
- Write a code to output the text “Hello World”.
- Test your code to make sure all is going well.

```
g++ -o helloworld HelloWorld.cxx
./helloworld
```

- **Now:** Tell Git to track your file. The file will be staged by using the command: `git add HelloWorld.cxx`

- **Next step:** Commit the staged file to the repository:

```
git commit -m “output hello world”
```

Pushing to GitHub

- So far you have only interacted with the local Git repository.
- Push your changes to the remote repository on GitHub:

```
git push origin master
```

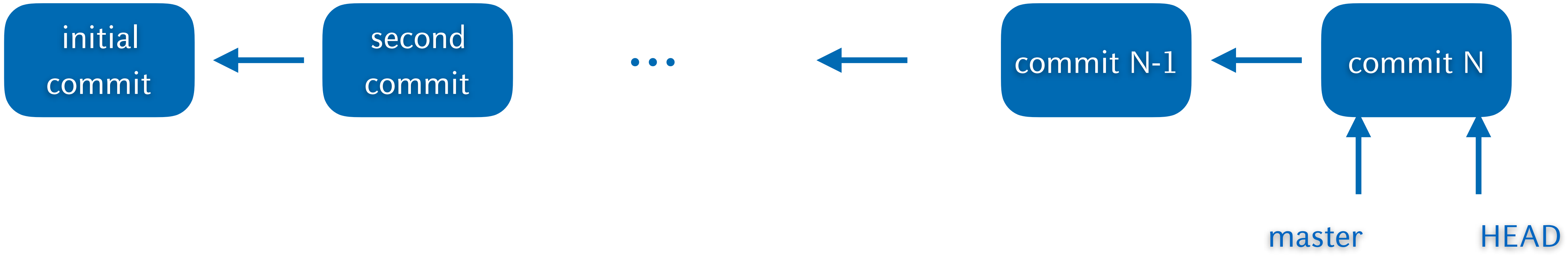
- **origin** refers to the remote repository on GitHub and **master** refers to the local branch.
- After this push, we can view your code.

What is happening in the repository

If you want to know whats going on in your repository, you can use the following commands

- `git log`: shows a log of all commands starting from HEAD back to the initial commit (quit with Q)
- `git status`: shows which files have changed between the current repository stage and HEAD
- `git diff`: shows the diff between HEAD and the current repository state
- `git diff --cached`: shows the diff between HEAD and the files that have been staged

Terminology



- A **head** is a reference to a commit.
- One head is called the **master** or the master branch.
- The currently active head is termed HEAD.
- After committing a new commit object with HEAD as its parent is created and HEAD is moved to the new commit.
- In our case a **branch** is essentially a pointer to a commit.