

GitHub Campus Advisors

Teacher training to master Git and GitHub



GitHub Education

Module 2

Individual work

Network activity

Remotes

Fetch/push

Branches

Managing student repositories

GitHub Classroom

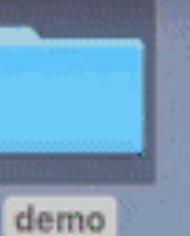
Permissions

Exercises



Individual work

Network activity



A terminal window titled "Desktop — bash — 80x24" is open in the center of the screen. The window title bar includes the file icon, the title, and the dimensions. The terminal prompt shows the path "C02T40YZFVH4:Desktop mozzadrella\$". Inside the terminal, there is a single character, the letter "I", centered on the screen.

GitHub

- Hosts your repositories
- Track student progress
- Social features to enable collaboration

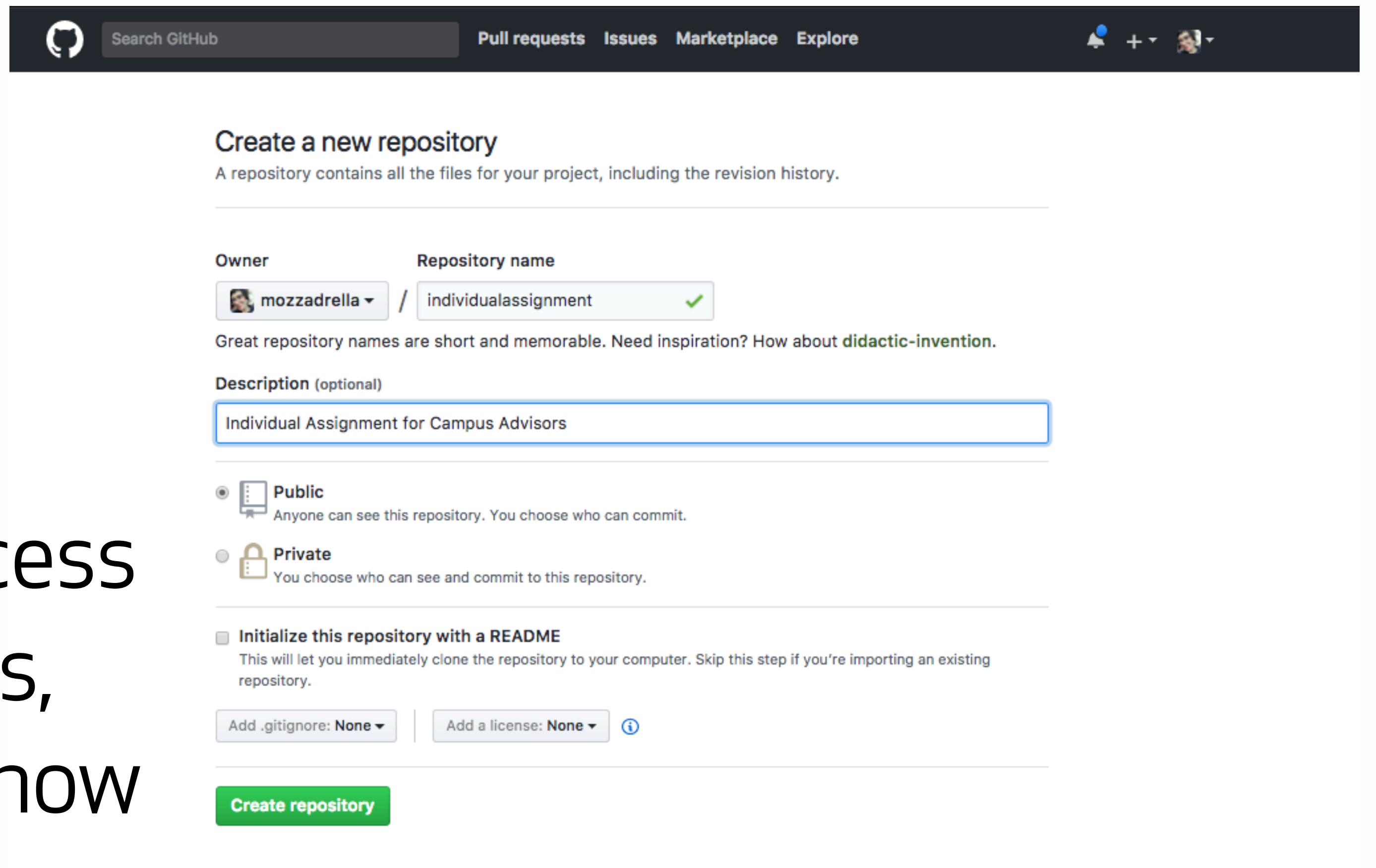


Individual assignments

**Let's create a repository in
GitHub!**

Let's set up a place to host your code

- A repository on GitHub!
- <https://github.com/new>
- As a teacher, you have access to free private repositories, but let's choose public for now



The screenshot shows the GitHub interface for creating a new repository. At the top, there is a dark header bar with the GitHub logo, a search bar labeled "Search GitHub", and navigation links for "Pull requests", "Issues", "Marketplace", and "Explore". On the far right of the header, there are user profile icons and a "+" button. Below the header, the main content area has a title "Create a new repository" and a subtitle explaining that a repository contains all files for a project, including revision history. The form includes fields for "Owner" (set to "mozzadrella") and "Repository name" ("individualassignment"). A note says "Great repository names are short and memorable. Need inspiration? How about didactic-invention.". There is a "Description (optional)" field containing "Individual Assignment for Campus Advisors". Below these fields are two radio buttons for repository visibility: "Public" (selected) and "Private". A note under "Public" says "Anyone can see this repository. You choose who can commit." and under "Private" says "You choose who can see and commit to this repository." There is also a checkbox for "Initialize this repository with a README", which is unchecked. Below the visibility options are buttons for "Add .gitignore: None" and "Add a license: None". At the bottom of the form is a prominent green "Create repository" button.



**Adding a remote
allows the transfer of
your commits to
another machine.**



Individual assignments

The bookmarked location is referred to as a “remote.”



Hello! I would like to send you my recent commits.

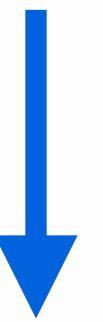
git remote add origin (REPO LOCATION)



Individual assignments

Add origin

Send my commits to a location.



```
git remote add origin (REPO LOCATION)
```



And origin is at this address.



This statement names the remote "origin."



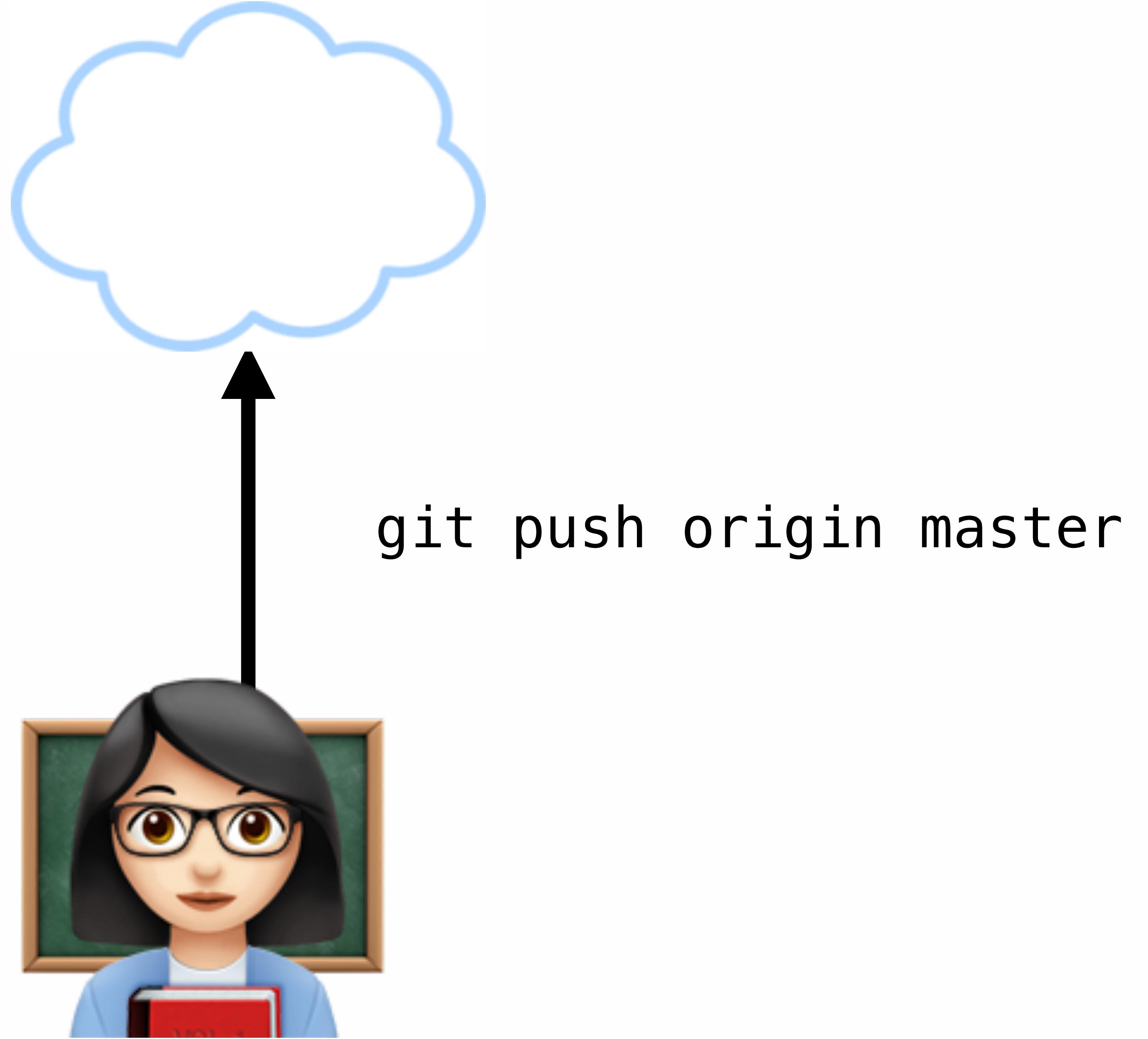
Back to the terminal!

Pushing to a remote



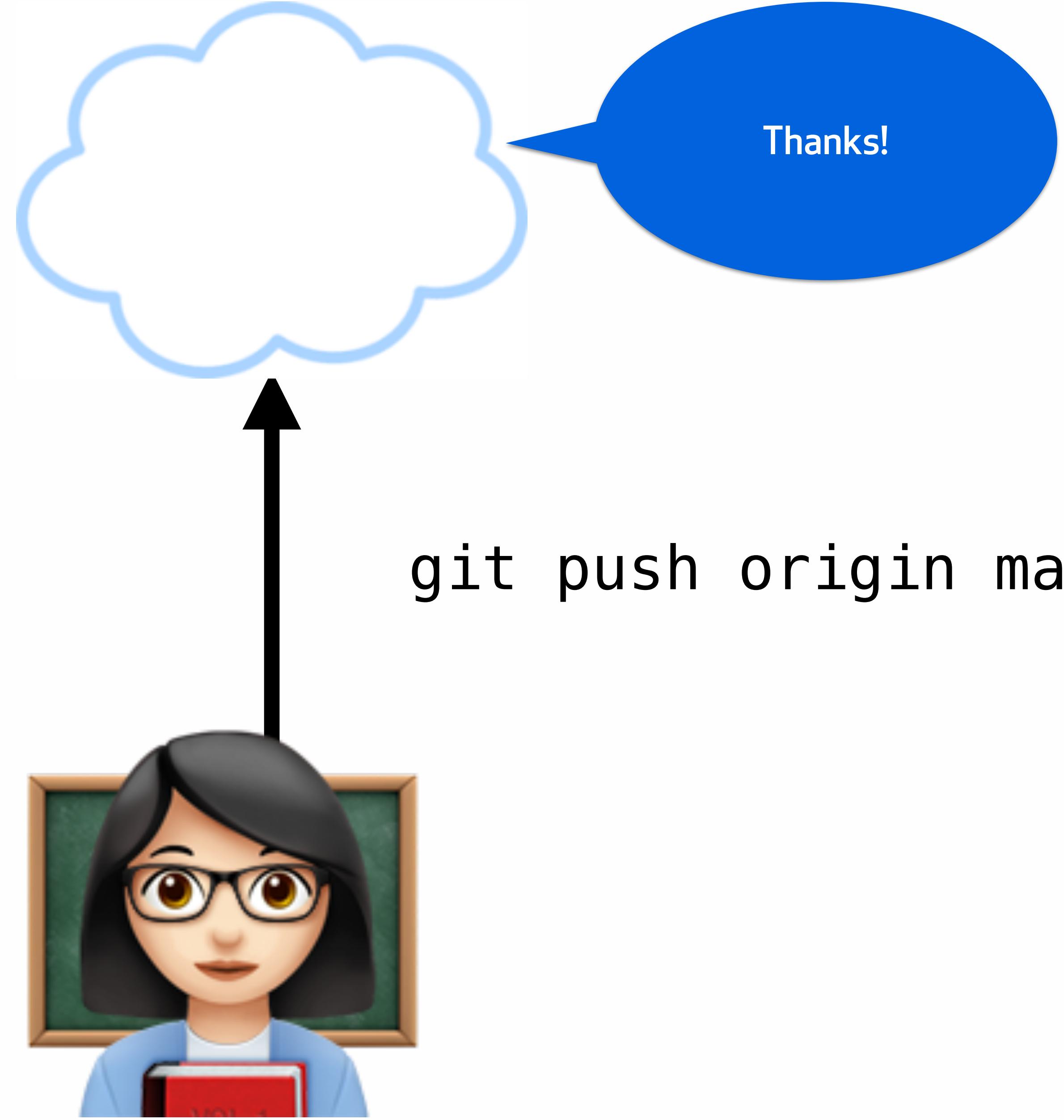
Individual assignments

How do you get your commits up to the remote?



Individual assignments

How do you get your commits up to the remote?



Individual assignments

Link remote with local.

-u is short for --set-
upstream

```
git push -u origin master
```



Useful because you can
just write "git push" when
you want to push future
commits.



Individual assignments

Types of remote addresses

- HTTP/HTTPS urls
- Git protocol over SSH and use the file path
- GitHub Desktop client (clone repository and open in Desktop)



Check remotes with -v

Where am I sending and receiving commits from?



```
C02T40YZFVH4:demo mozzadrella$ git remote -v  
origin https://github.com/mozzadrella/demo (fetch)  
origin https://github.com/mozzadrella/demo (push)  
C02T40YZFVH4:demo mozzadrella$
```



**Now: editing in the GitHub UI
(not recommended)**

Create a New Repository

GitHub, Inc. [US] | https://github.com/new

remove-an-inheritance Vanessa

Pull requests Issues Marketplace Explore

Create a new repository

A repository contains all the files for your project, including the revision history.

Owner mozzadrella /

Repository name

Great repository names are short and memorable. Need inspiration? How about didactic-invention.

Description (optional)
Individual Assignment for Campus Advisors

Public
Anyone can see this repository. You choose who can commit.

Private
You choose who can see and commit to this repository.

Initialize this repository with a README
This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

Add .gitignore: None Add a license: None

Create repository

Desktop/individual

gobs.md

Individual Assignments: Learning Objectives

demo

LF UTF-8 GitHub Markdown master 0 files

Fetch



I'd like the commits I don't
already have, please.



Fetch



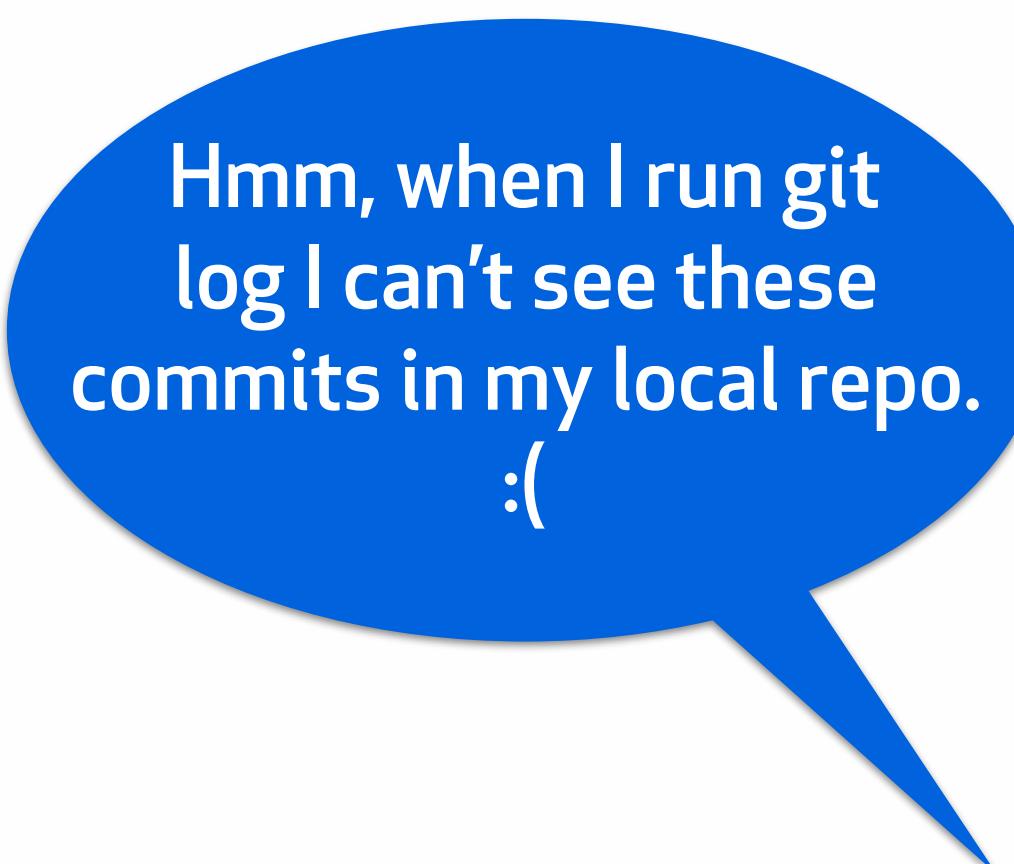
git fetch

```
-bash: /Users/mozzadrella/Desktop/individual: is a directory
[02T40YZFVH4:individual mozzadrella]$ git fetch
remote: Counting objects: 3, done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
From https://github.com/mozzadrella/individual
 22a8808..c0c7653 master      -> origin/master
[02T40YZFVH4:individual mozzadrella]$
```



Individual assignments

Fetch



git fetch

```
-bash: /Users/mezzadrella/Desktop/individual: is a directory
[082T4@YZFVH4:individual mozzadrella]$ git fetch
remote: Counting objects: 3, done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
From https://github.com/mezzadrella/individual
 22a8808..c0c7653 master      -> origin/master
[082T4@YZFVH4:individual mozzadrella]$
```

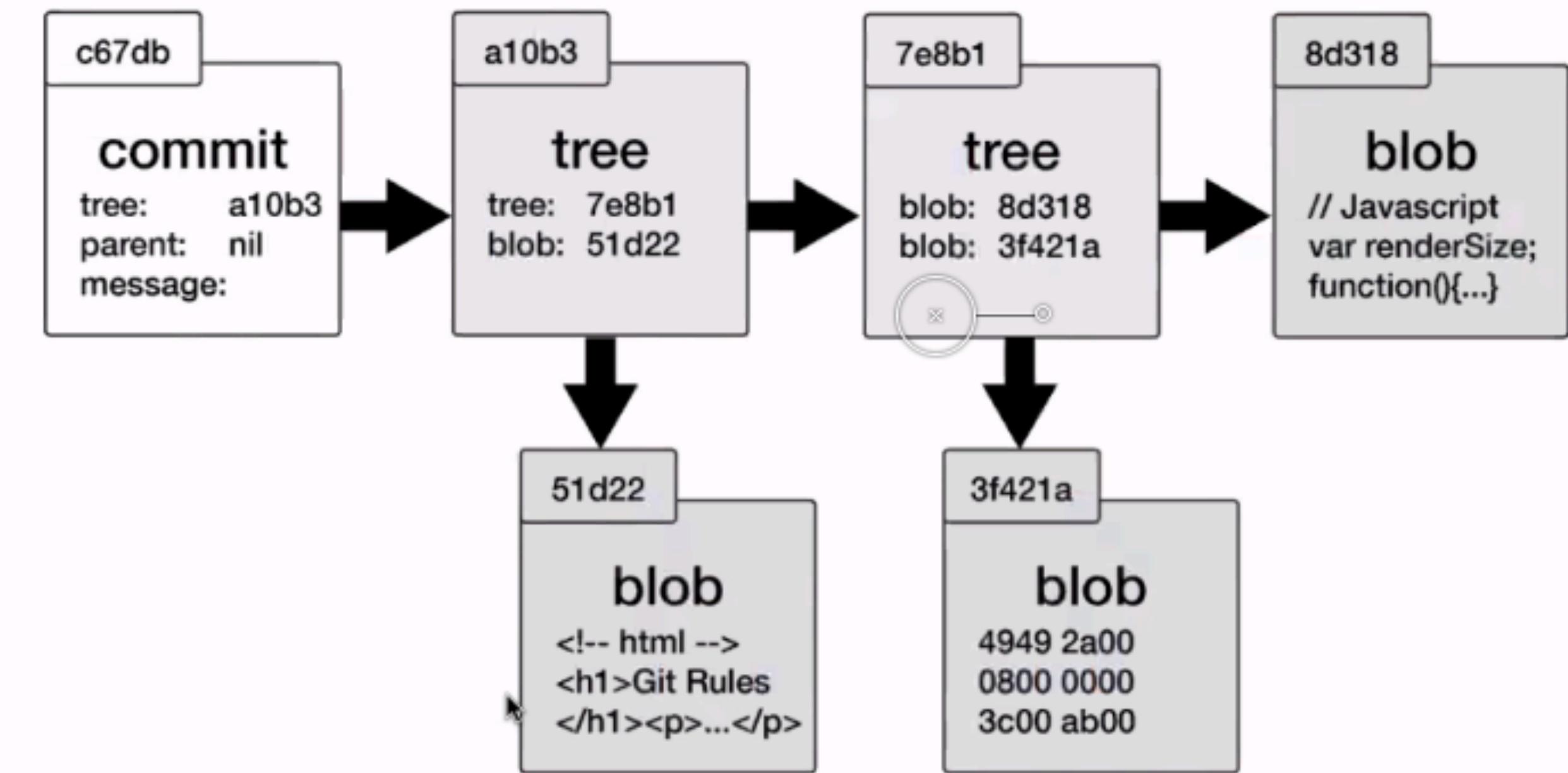


Counting objects

Git **only** transmits the necessary objects.

Push: sends objects the remote doesn't have.

Fetch: receives objects we don't have locally.



Work with remotes



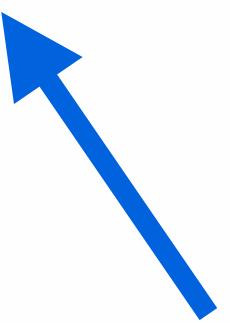
Work with remotes

- On the command line: create a repository from the command line called “individual-work.”
- On GitHub.com, create a repository.
- On GitHub.com, upload your first week’s assignments to the “Individual” repository.
- Use the command line to bring the commits back down to your local repository.



```
git push -u origin master
```

Which branch do you want to push?



You want to push master.
To origin, the remote.



Individual assignments

But what is “master”?



```
git push -u origin master
```



Individual assignments



You've been on a branch...
all along.



An aside to discuss
branches.

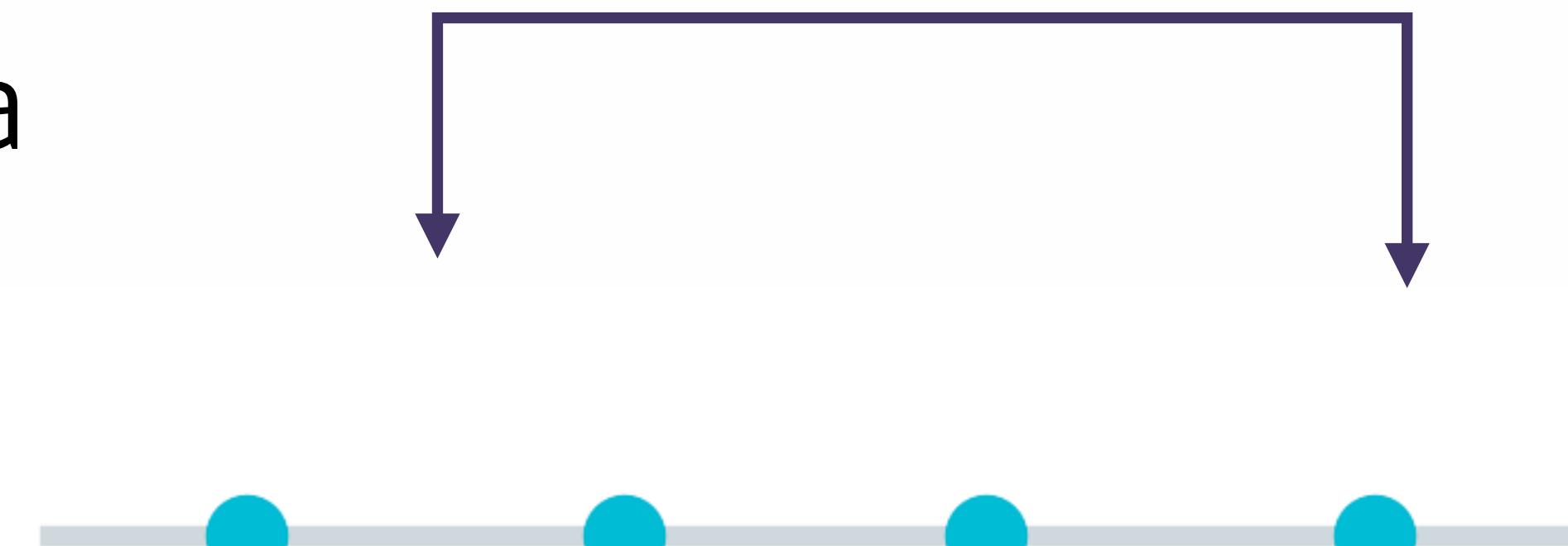
Branches are bookmarks to commits

“Master” is the default, it’s a naming convention.

Can think about branches as either a bookmark or a pointer for commits.

As we add commits, the active branch updates to point to the newest commit (HEAD).

“I’m a branch”



demo : master

Filter

Irella	cc30f26	Today at 1:28 PM
Irella	6c8bfc8	Today at 1:25 PM
Irella	83203d0	Today at 1:23 PM
Irella	bce46da	Today at 12:36 PM

demo

Changes All Commits

Branches

master 3↑

Remotes

origin

master

Tags

Stashes

Submodules

Commit Changes File Tree

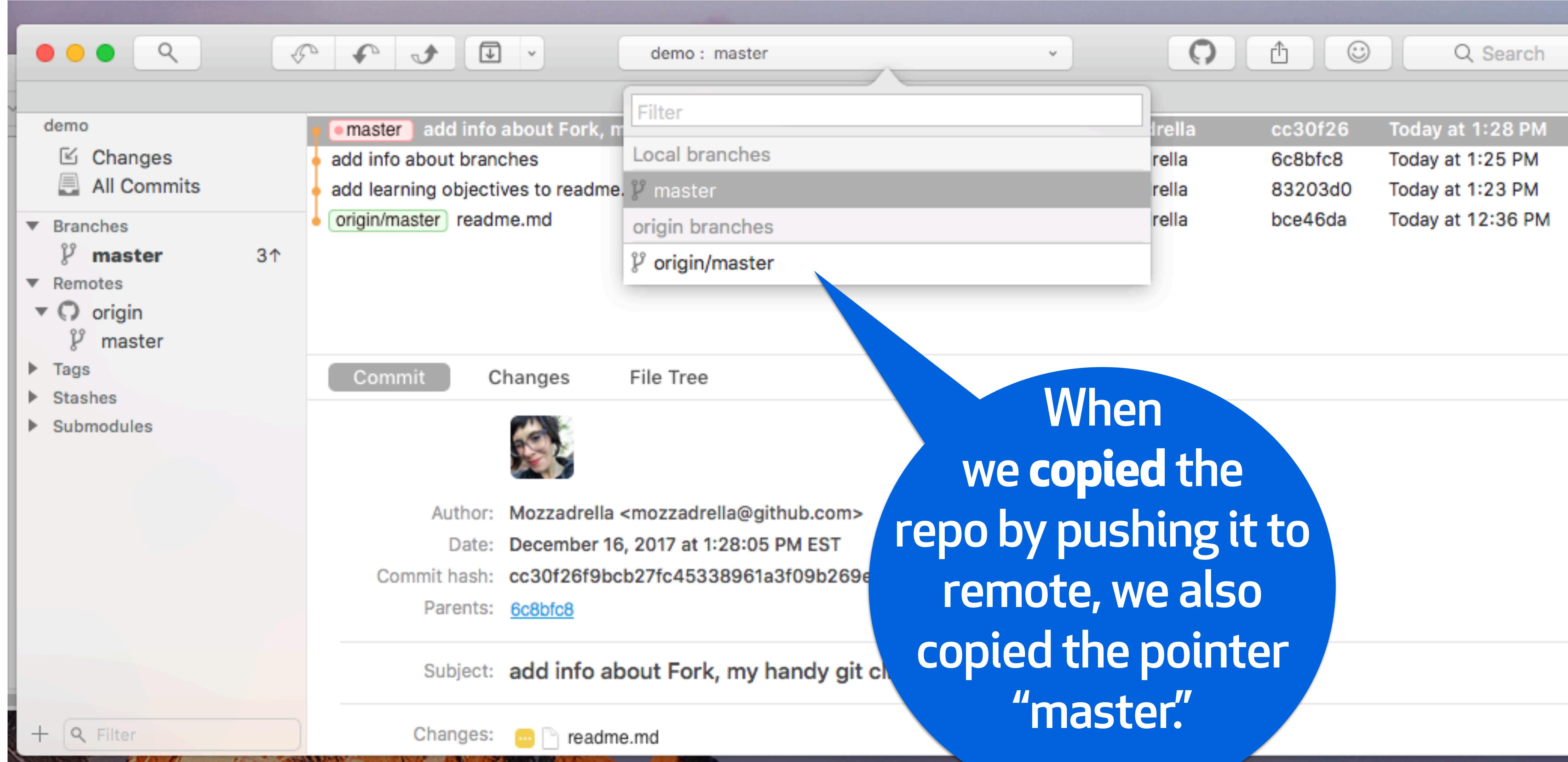


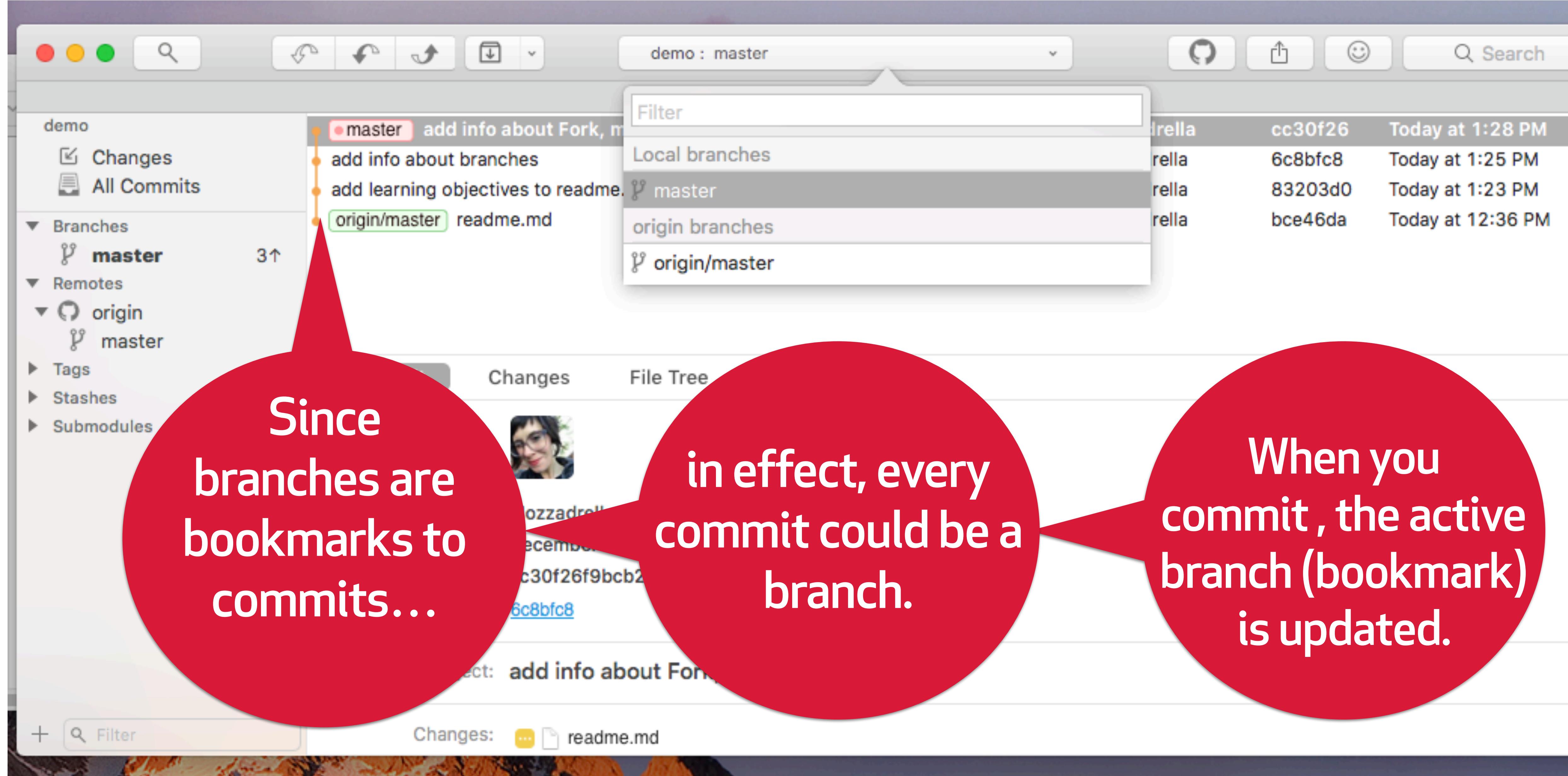
Author: Mozzadrella <mozzadrella@github.com>
Date: December 16, 2017 at 1:28:05 PM EST
Commit hash: cc30f26f9bcb27fc45338961a3f09b269ecd0931
Parents: [6c8bfc8](#)

Subject: add info about Fork, my handy git client

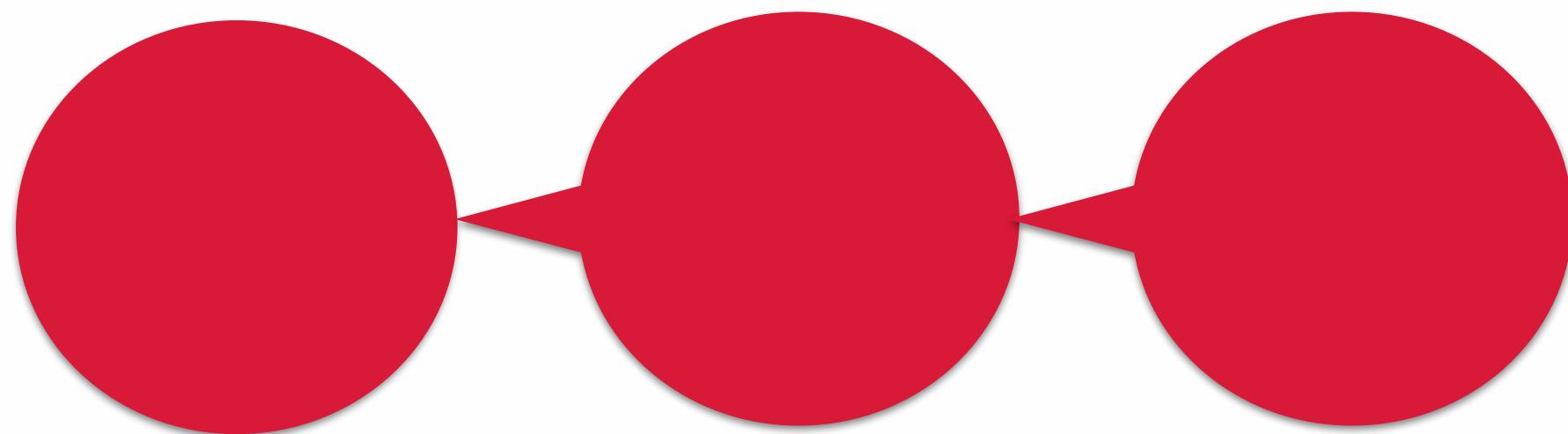
Changes:   readme.md







Using branches in your terminal



git show master

⋮

```
commit cc30f26f9bcb27fc45338961a3f09b269ecd0931
(HEAD -> master)
```

Author: Mozzadrella <mozzadrella@github.com>
Date: Sat Dec 16 13:28:05 2017 -0500

Remember, branches are pointers to commits.

If we say 'git show master' we'll see the commit master points to.



Finding the active branch

'Git branch' will show you the branches in your project...

and the "*" indicates your currently active branch.

If you made commits at that moment, the active branch would be updated to point to the new commit.

```
C02T40YZFVH4 : demo  
mozzadrella$ git branch  
* master
```



Creating a new branch

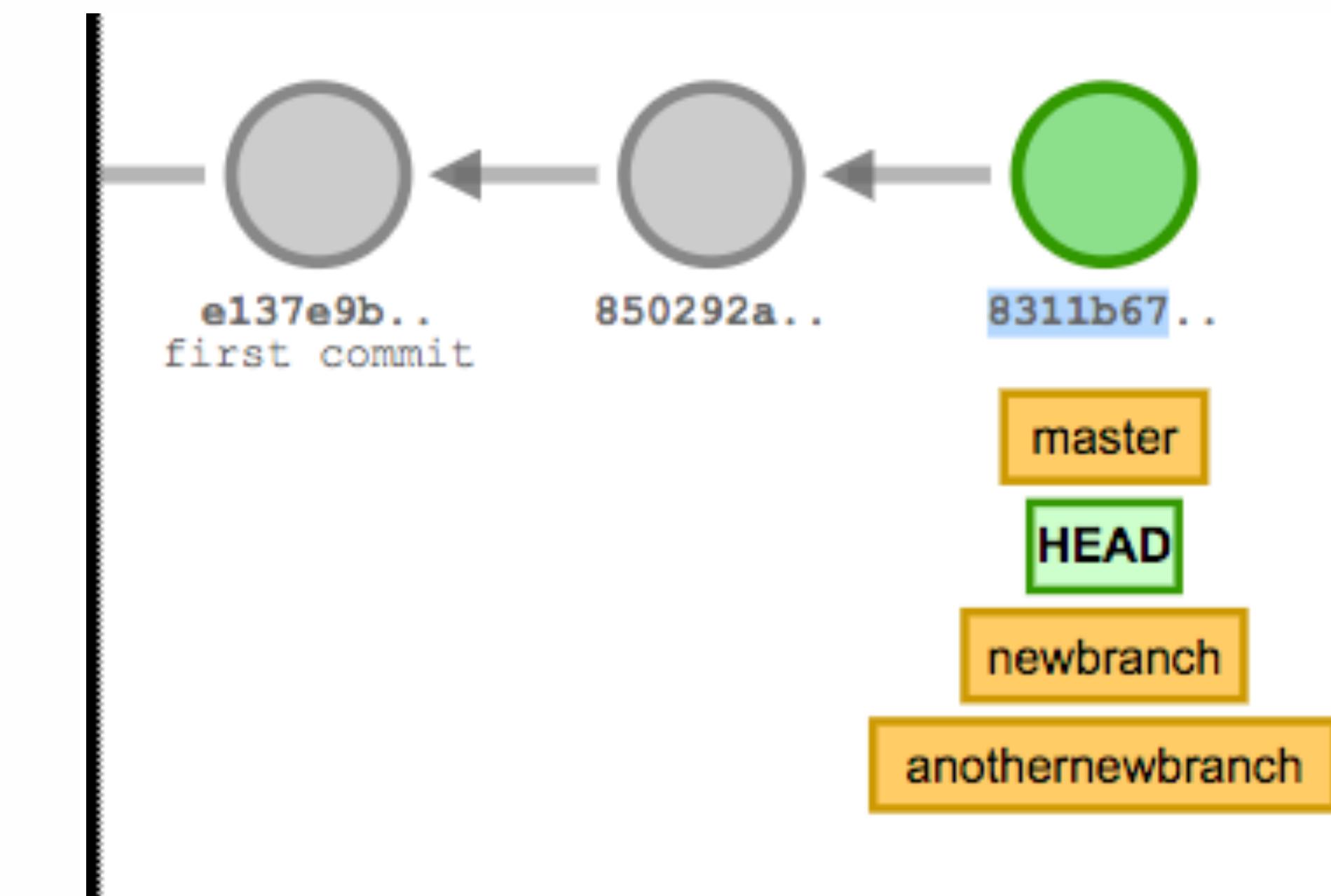
To summon a new branch, use 'git branch' and the new branch name. We'll call ours 'newbranch'

```
C02T40YZFVH4:demo mozzadrella$ git branch newbranch  
C02T40YZFVH4:demo mozzadrella$ git branch  
* master  
  newbranch
```



Branches point back to the currently active commit

If we created 2 new branches from
8311b67



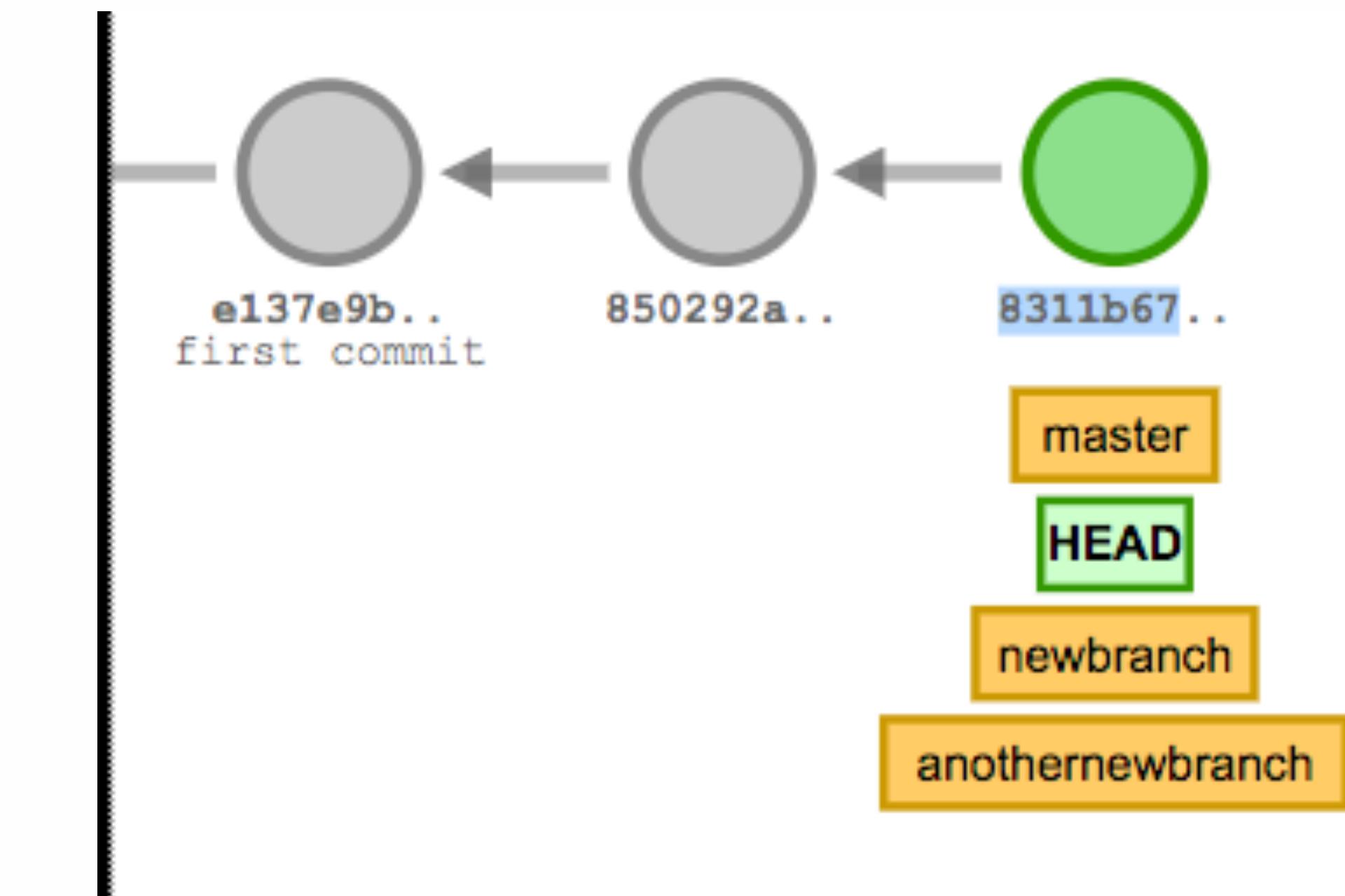
Branches point back to the currently active commit

If we created 2 new branches from

8311b67...

they would both point to

8311b67

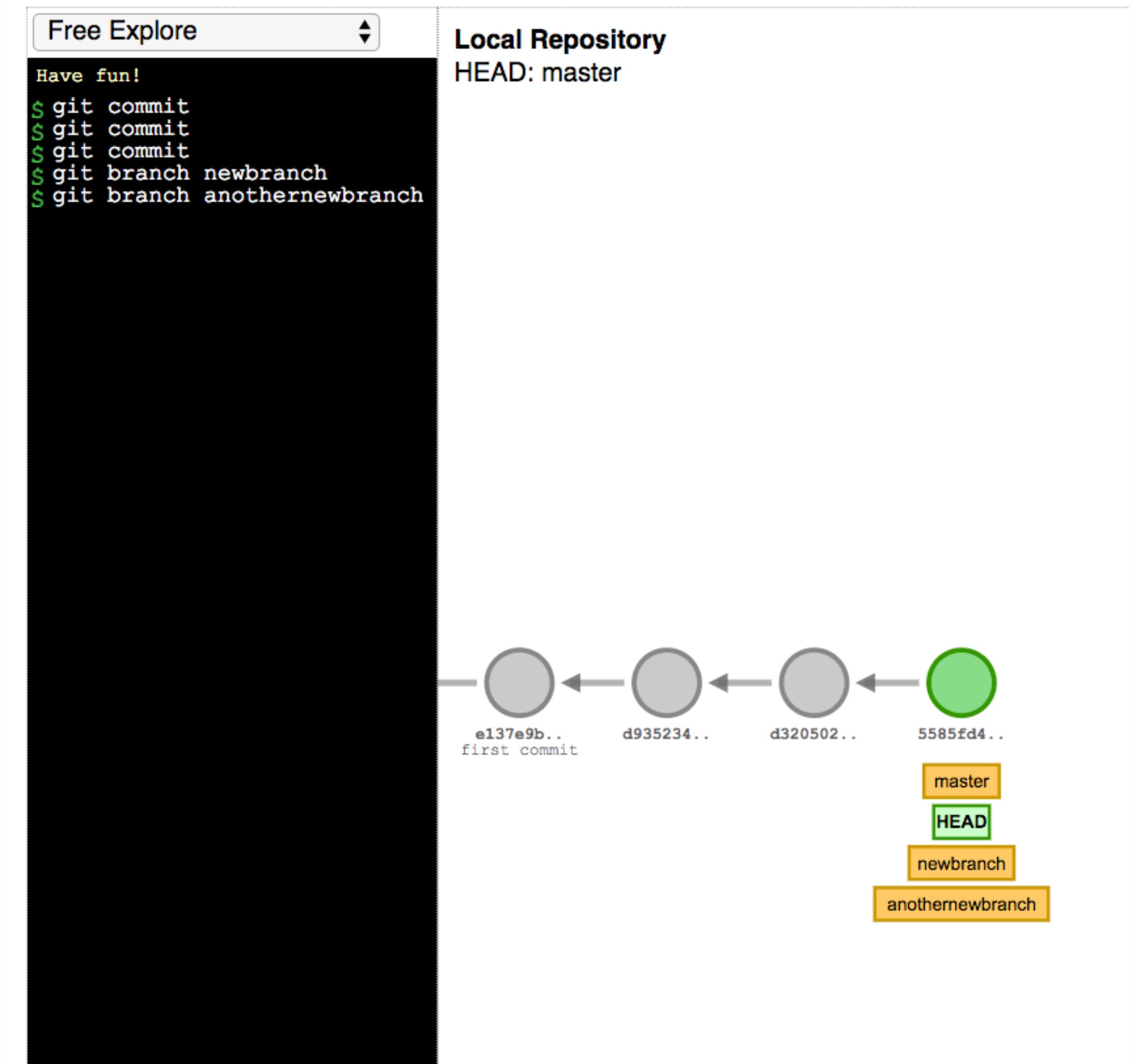


Branching from commits using references

`git branch <name>` creates a branch at HEAD

`git branch <name> <ref>` creates a branch at <ref>

<ref> can be HEAD, a branch name, a commit, or a commit-ish (e.g. HEAD[^] or master~3)



Or branch from previous commits

git branch planet master^

Free Explore

Local Repository
HEAD: master

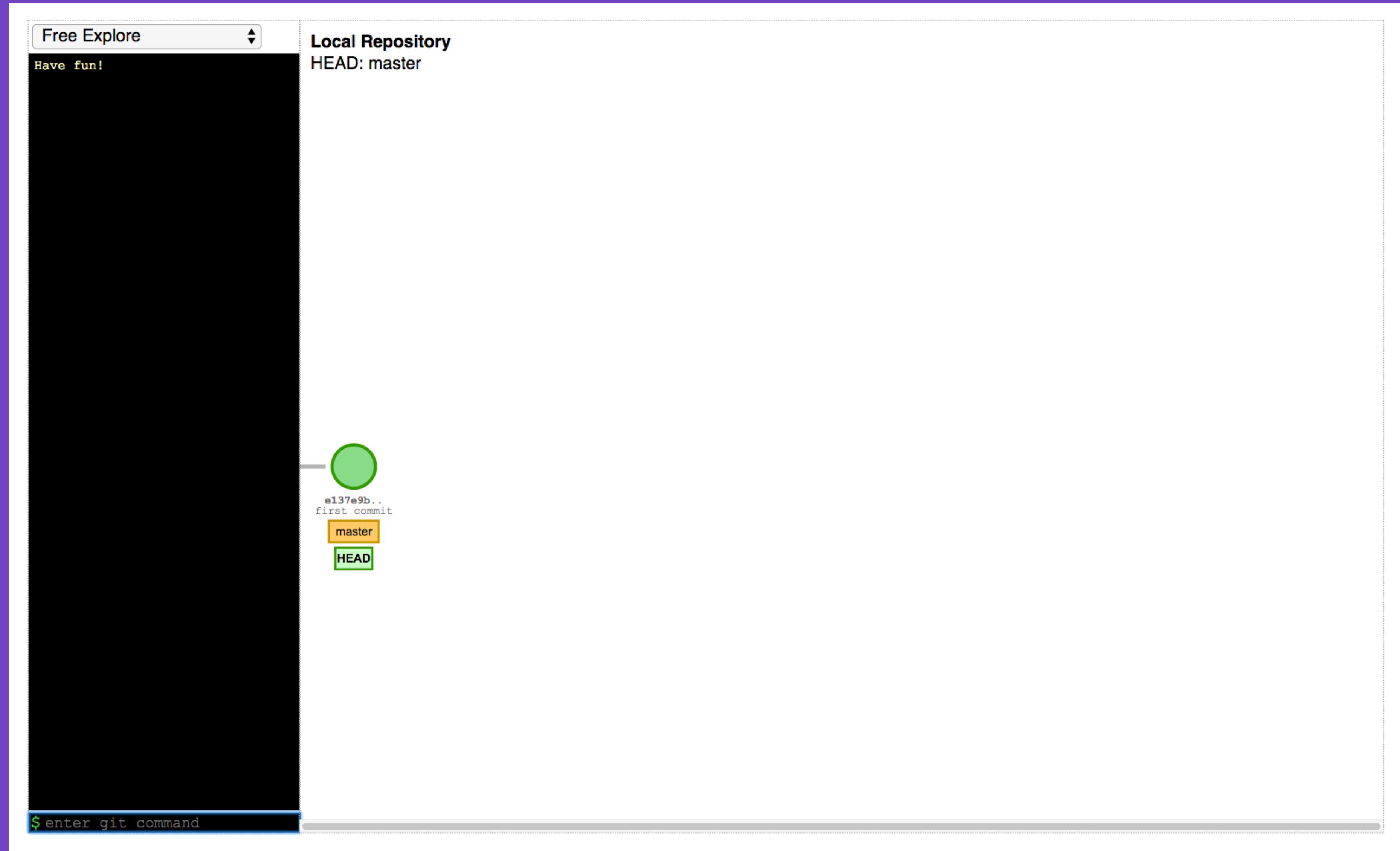
```
Have fun!
$ git commit
$ git commit
$ git branch newbranch
$ git branch anothernewbranch
$ git branch planet master^
```

\$ enter git command



Recreate your assignment workflow





Visit <http://git-school.github.io/visualizing-git/>

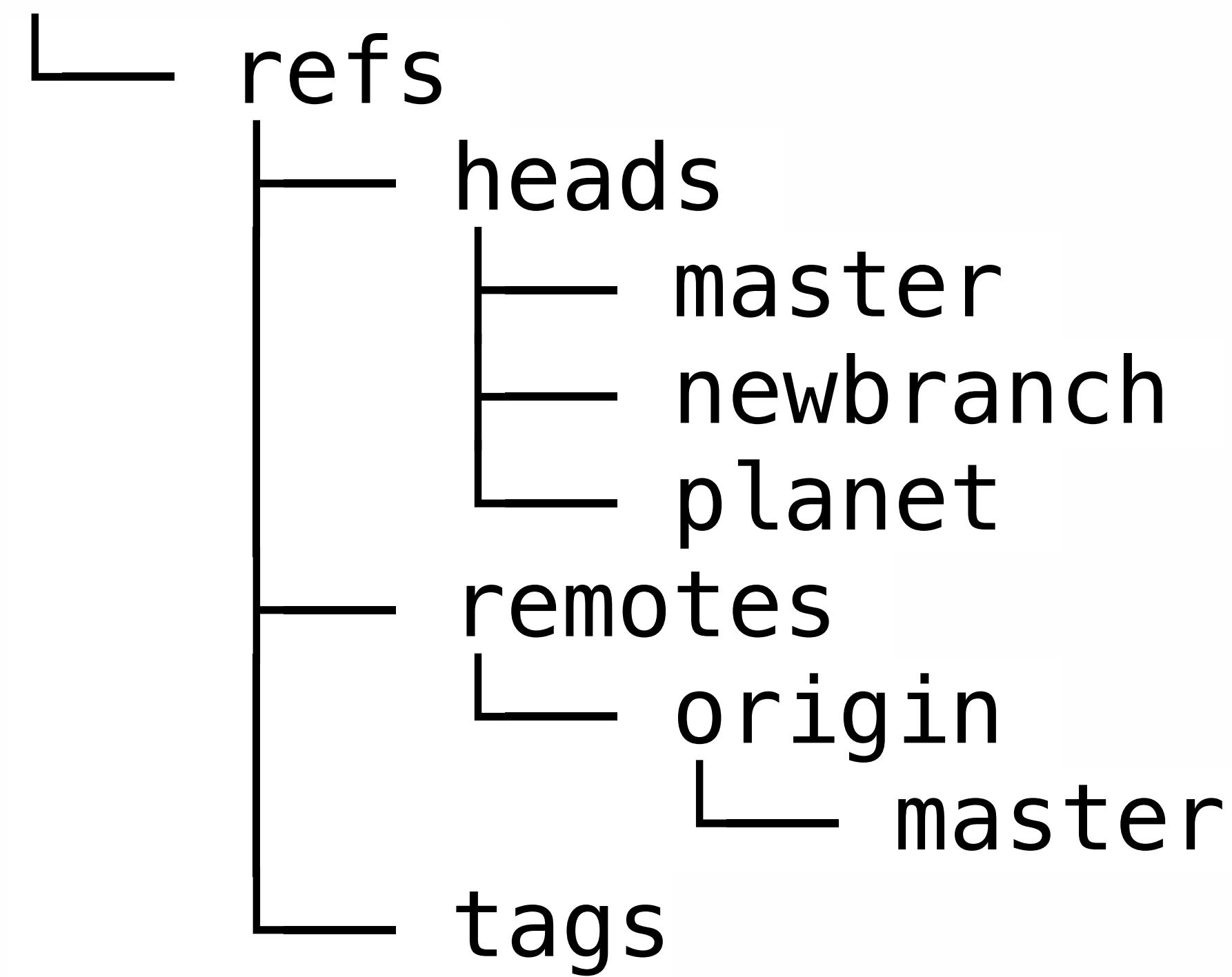


- You'll see the ability to make commits and branches.
- Choose an individual assignment from your course.
- Re-create the workflow you expect from your students to complete their assignment.
- Take a screenshot of your result from the visualization tool.



A final word on branches...

tree .git/refs



Those files contain
the commit ID...

```
C02T40YZFVH4:demo mozzadrella$ cat .git/refs/heads/planet  
6c8bfc88bb440844f18a5e0a6ca885998b461bb7
```



So the implementation for branches is a file with a hash in it.



**Back to the world of
network activity.**

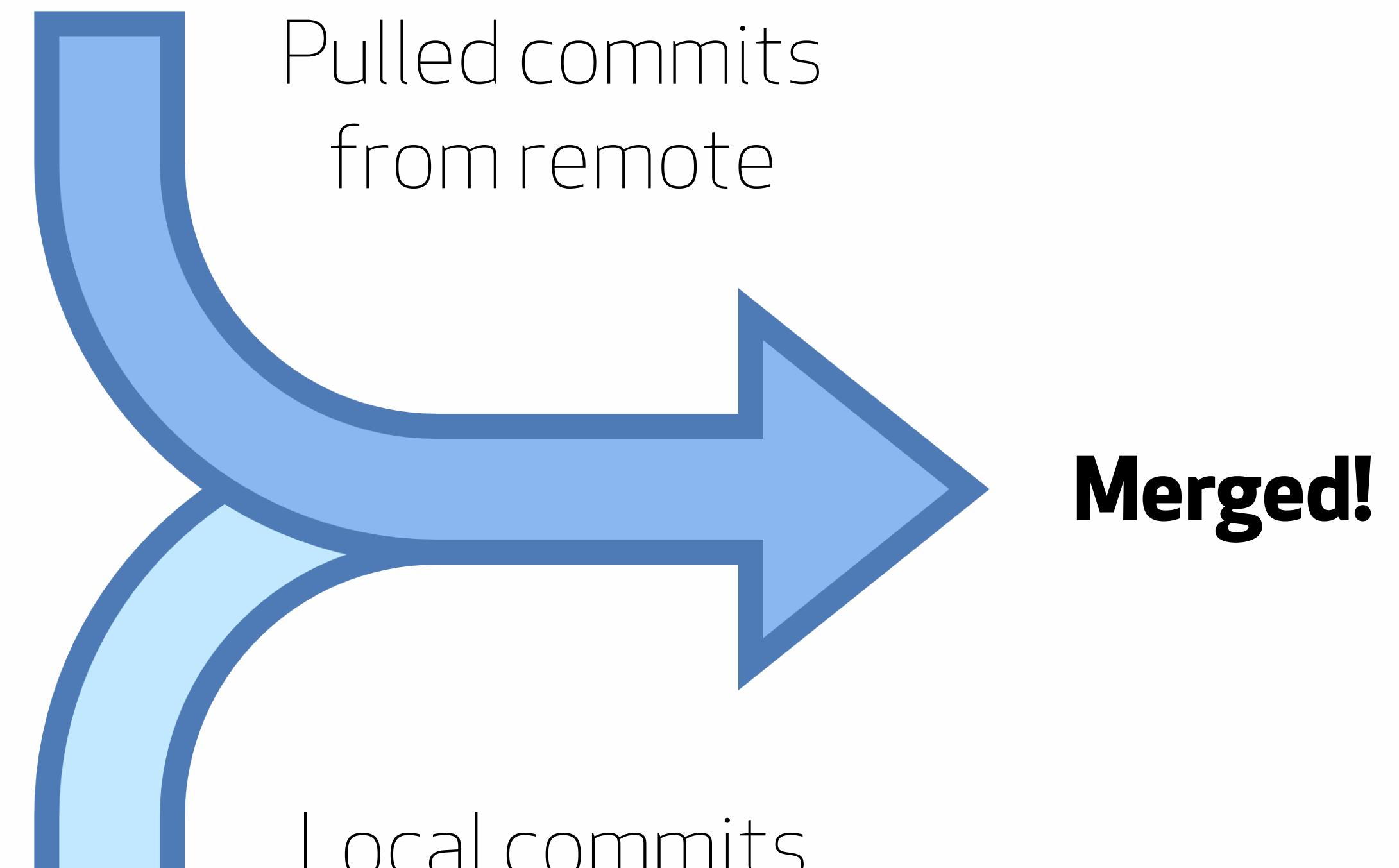
Pull = fetch + merge

Pull first fetches the commits and stores them locally.

Merge takes the two divergent commits, puts them together in the staging area and makes a new commit with two parents.

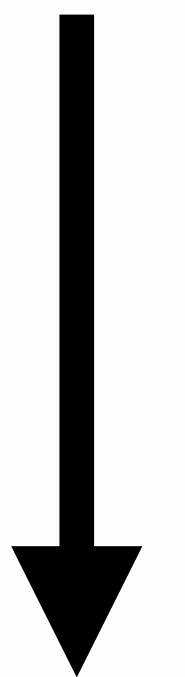
Merge updates the active branch to point to the new merge commit

You'll see the new commits reflected in your local project when you run "git log".



Watch what happens when we run “pull.”

I'd like the latest commits on the branch that my active branch tracks.

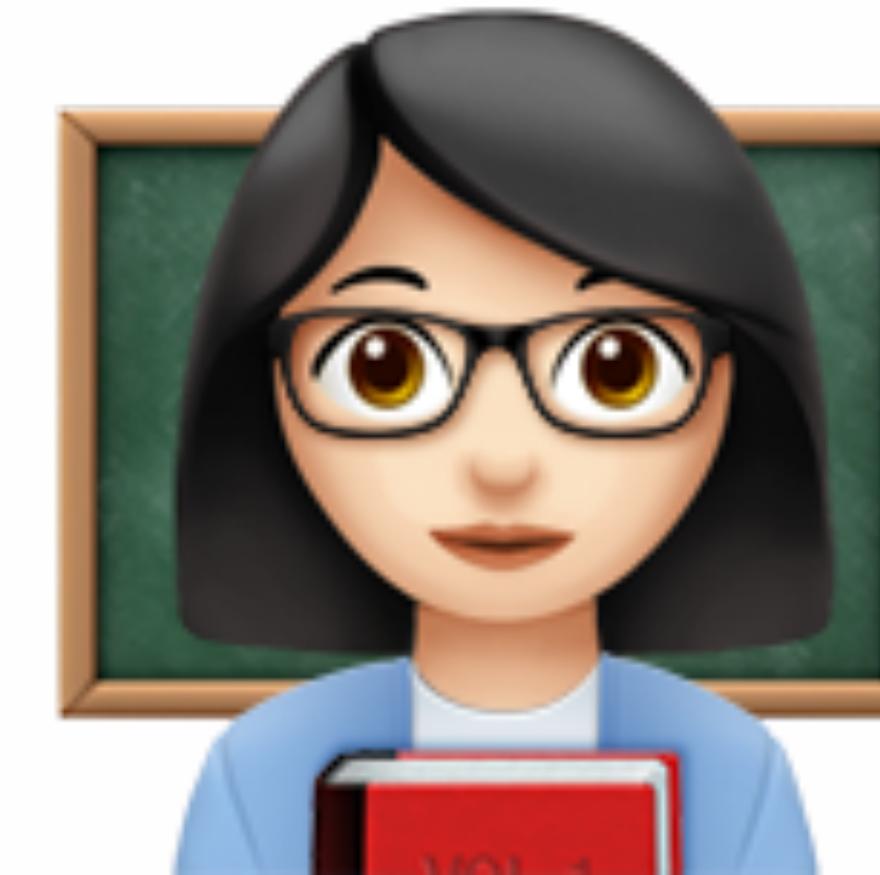


git pull origin master



Individual assignments

Watch what happens when we run “pull.”



```
git pull origin master
```

```
[C02T40YZFVH4:individual-work mozzadrella$ git pull origin master
From https://github.com/mozzadrella/Module-1-Individual-Work
 * branch            master      -> FETCH_HEAD
Updating 1fa65cf..0869a21
Fast-forward
 readme.md | 4 +++
 1 file changed, 4 insertions(+)
C02T40YZFVH4:individual-work mozzadrella$ ]
```



Individual assignments

To sum up, here are the commands with network activity:

git push

git fetch

git pull (fetch part, not merge)



Adding it all up



Wikipedia switcheroo

1. Create a repository on your desktop called 'planets' with a `readme.md` and commit it.
2. Choose a Wikipedia page about a planet of your choice.
3. Copy the first paragraph about the planet, paste it into your `readme.md` and commit it.
4. Create a new branch (`git branch <branchname>`) and switch to it (`git checkout <branchname>`).
5. In atom, add Wikipedia entry about **another** planet into that branch's `readme`.
6. Save, then commit, then close out of atom.
7. Does the file show your first planet? Or the second?



Managing student repositories



Individual assignments

GitHub Classroom

The power of the GitHub workflow, scaled for the needs of students.

Automatically create student repositories, track assignments, and free up your time to focus on teaching.



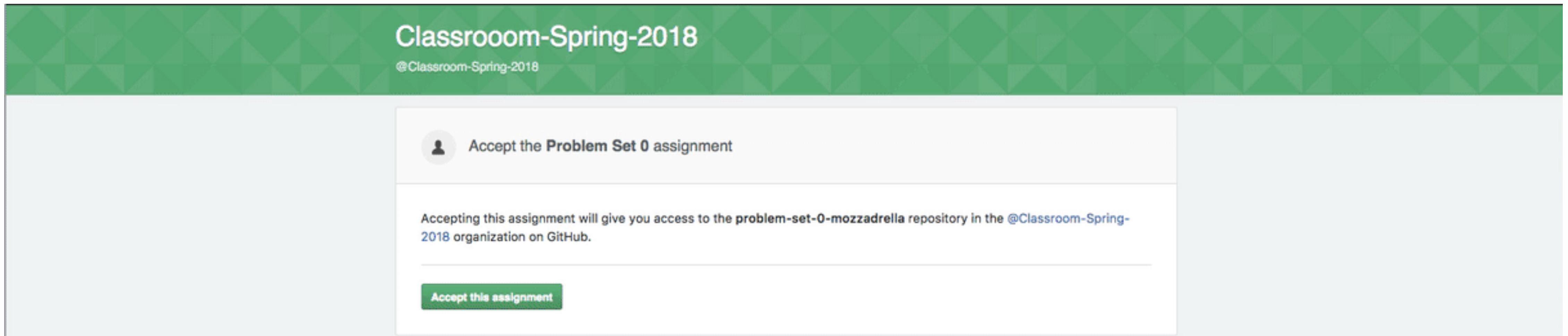
GitHub Classroom

Your course assignments on GitHub • classroom.github.com



Individual assignments

How a student experiences GitHub Classroom



A screenshot of a GitHub Classroom assignment acceptance dialog. The dialog is titled "Classrooom-Spring-2018" and is associated with the organization "@Classroom-Spring-2018". It shows a button to "Accept the Problem Set 0 assignment" with a user icon. Below the button, text explains that accepting the assignment will give access to the "problem-set-0-mozzadrella" repository in the specified organization. A green "Accept this assignment" button is at the bottom.



Individual assignments

How Dr. Root uses Classroom



I have 50 students
with one repository
per assignment.



Individual assignments

Distributing assignments



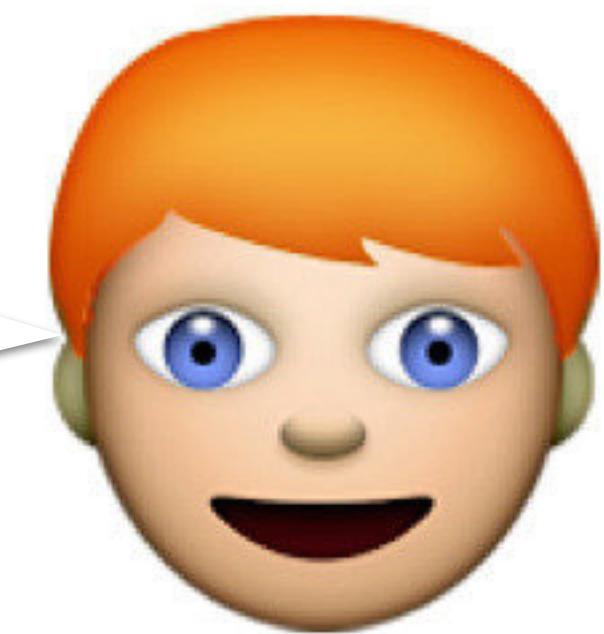
Here is the link to
Assignment 1,
class.

You'll all have
private
repositories with
all your starter
code.

assignment-1-
sarah



assignment-1-brian



assignment-1-alex



Individual assignments

Deliver feedback in-context

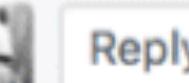
- BowlingScore is actually a mixture of classic
 - are Strike/Spare valid???
- tons of variables, could have been aggregated better
- huge switch statement
- sledgehammer drawing!
[numbers (letters)]
- some APIs are awkward.
(`getX/getY/gotZ` separation)

Before

dondi 27 days ago

Your biggest issue is this one. As the explanation in Jenkins states, "Abbreviation in name 'twoRA' must contain no more than '1' consecutive capital letters." Bottom line—no consecutive capital letters. That implies an acronym or abbreviation, and proper readability prefers full spelling.

I will agree with this—I don't see how `twoRA` can be a name for the tally table, which is what this is. I mean, `tallyTable` would be a more descriptive name. Or perhaps `solutionTable`. Bottom line, cryptic names are not desirable.



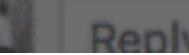
Reply...

```
99      for (int i = 0; i < denominations.length; i++) {  
100     +     twoRA[i][0] = new Tally(denominations.length);  
101     }  
102  
103     for (int i = 0; i < denominations.length; i++) {  
104         for (int j = 1; j < (amount + 1); j++) {  
105             Tally myTally = new Tally(denominations.length);  
106     +     myTally.setElement(i,j);
```

dondi 27 days ago

Two things wrong here: `myTally` starts 1 space too far (as the warning detail says), and there should be a space after the comma. The general rule with code punctuation is the same as written punctuation: no space before, but a space after. Keep that in mind and never let a computer become more natural.

After



Reply...



Individual assignments

Discussion:

How might you imagine
using this tool for your
courses?

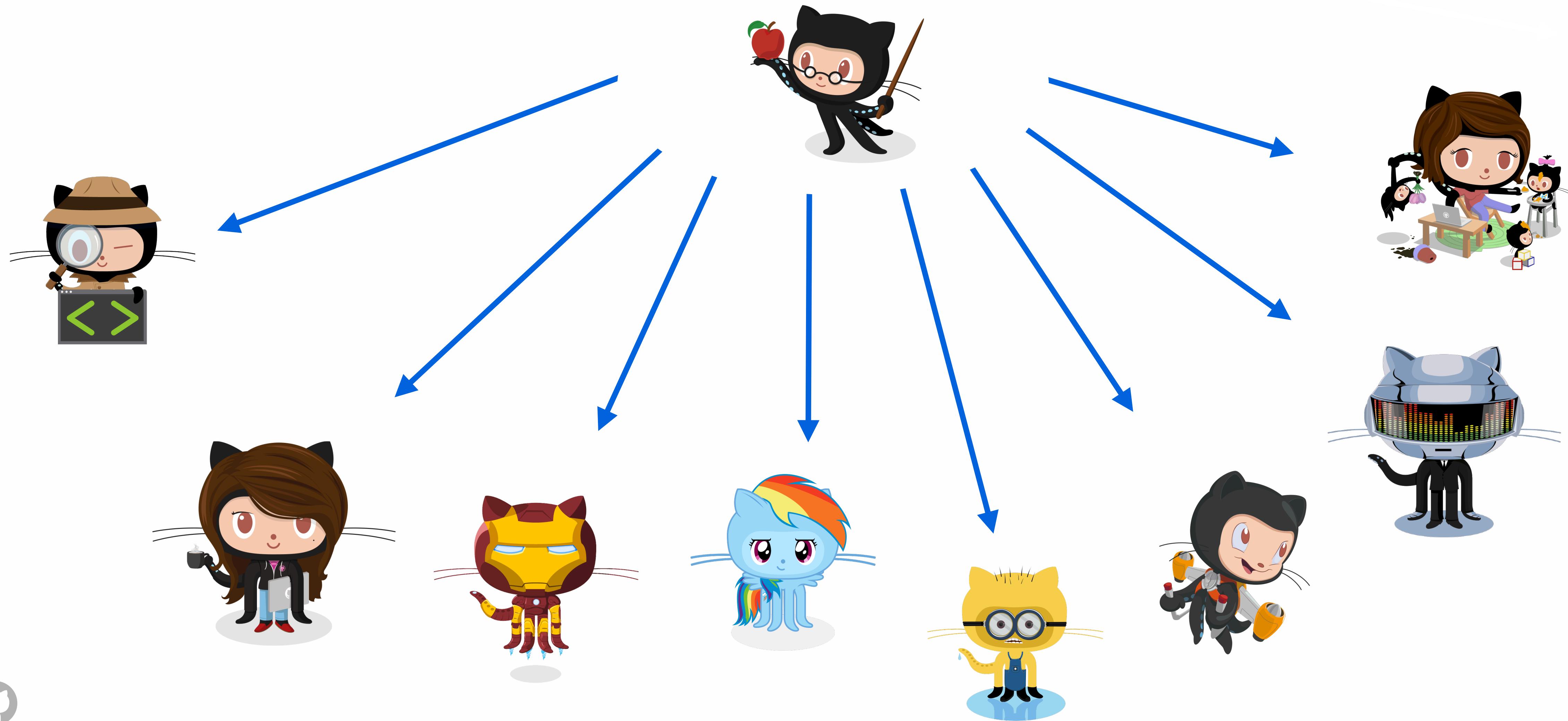


Setting up your Classroom

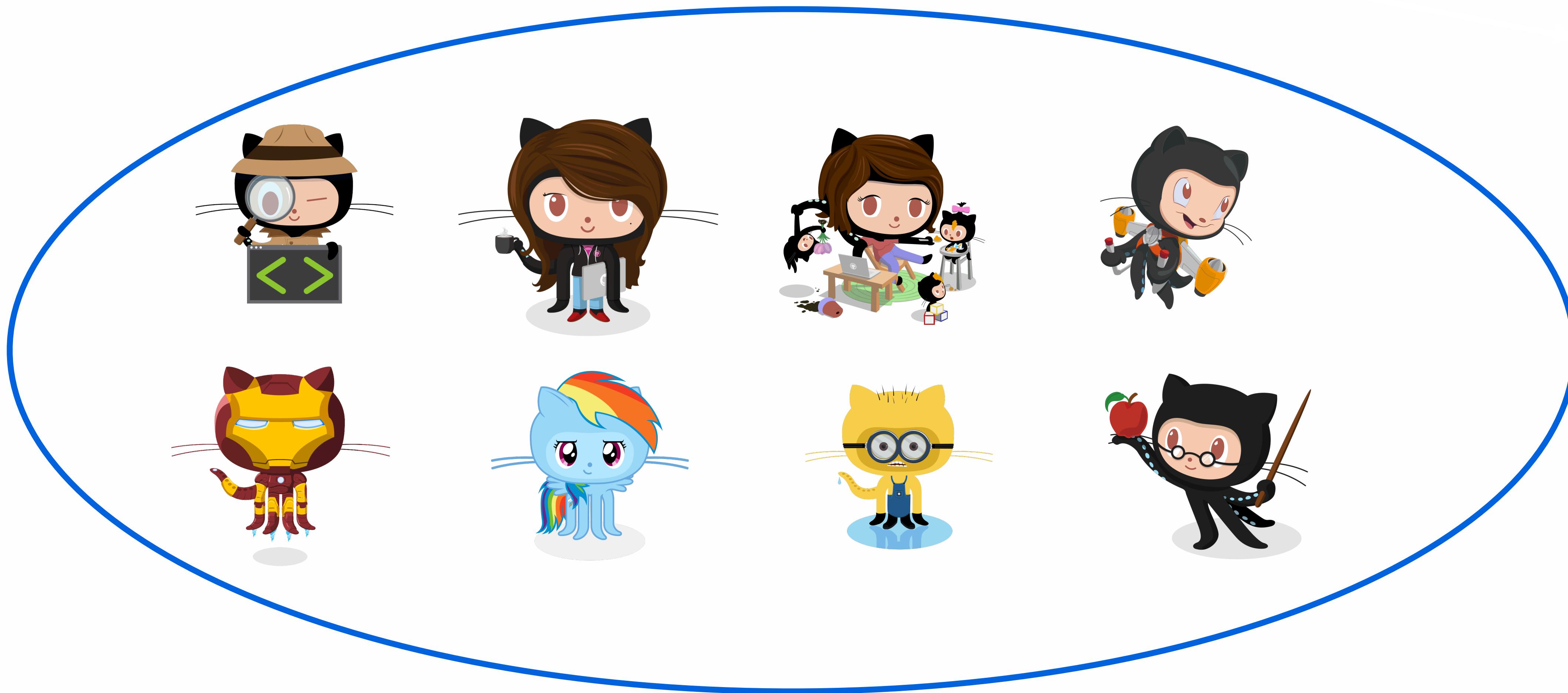


Individual assignments

Individual accounts on GitHub



Organizations



Permissions levels

Owner

Administrator

Collaborator

Public access



Quick setup math

1 repository per student per assignment

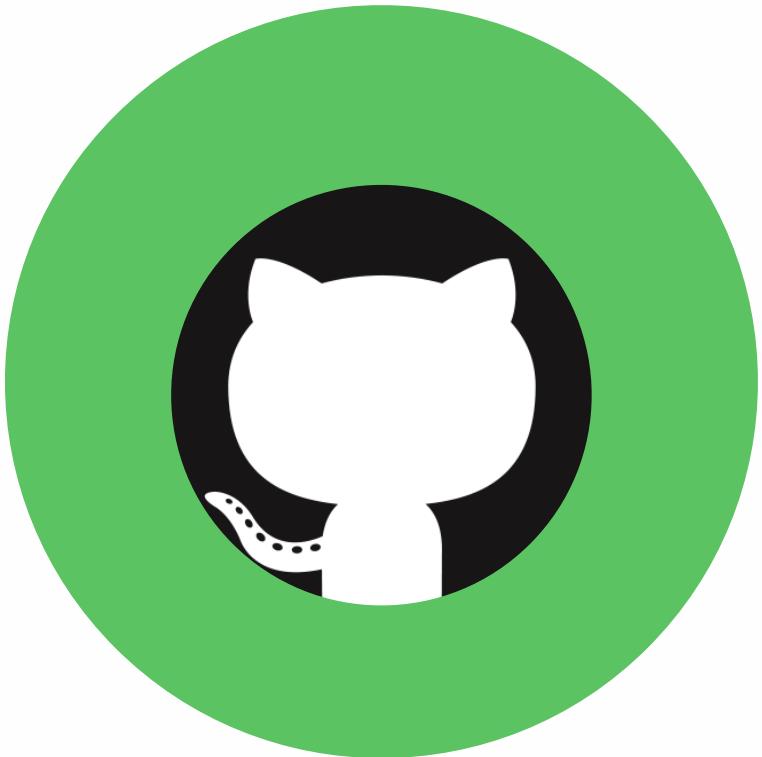
1 organization per course per semester

All are free through GitHub Education



Individual assignments

Set up a Classroom



- On [GitHub.com](https://github.com), create an organization for your course.
- Create repositories with assignment materials.



- Sign in to classroom.github.com
- Select your organization and authorize the application.



- Upload a roster of student identifiers.



Individual assignments

Set up an Assignment



Individual assignment

Each participant works individually on their own repository.

[Create an individual assignment](#)

Create an individual assignment.

Set it to public or private.

Add your Assignment's repository for starter code.



[Individual assignments](#)

Add your starter code from GitHub (optional)

classroom-spring-2018/p

Classroom-Spring-2018/Problem-1-Spring-CS1 Introduction to Parallel Programming class code

Classroom-Spring-2018/Problem-0-Spring-CS1 First programming assignment

commits are viewable on the assignment page.

Deadline (optional)

01/15/2018 17:00 -0500

January 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

Set a due date.

Give this to your students

<https://classroom.github.com/a/CBFrmeIY>

Distribute assignment link.

Working with repositories



Discussion:

- Will you keep all course materials in a repository? Or just assignments?
 - When will you expect students to commit?
 - What sort of commit messages should they use?
 - When do you want your students to push their code to GitHub?



Distributing assignments



Exercise:

- Create an organization with your course materials for one assignment in a repository.
- Create a Classroom, and an individual assignment.
- Send it to a colleague to accept.
- Take a snapshot of your teacher dashboard and post it to the forums.



GitHub Education Community

Where veteran teachers share tips, tricks and scripts.

Best practices on everything from pull requests to assignment design.

Ask for help, get feedback and share your expertise: education.github.community

A screenshot of a GitHub topic page. At the top, it shows basic statistics: created Apr '16, last reply 2h ago, 632 replies, 37.9k views, 19 users, 310 likes, and 50 links. Below this is a section titled "Frequent Posters" showing profile icons of active users. Further down is a "Popular Links" section listing several GitHub pages and their counts: GitHub Student Developer Pack - GitHub Education (643), Get a GitHub swag bag for your classroom (489), GitHub Classroom (489), GitHub Campus Experts - GitHub Education (253), and Supporting the student hacker community - GitHub (214). At the bottom of the page, a message states there are 632 replies with an estimated read time of 88 minutes, and a green button labeled "Summarize This Topic".



Individual assignments