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LESSONS

Lesson 7. Submit a pull request on the GitHub website

Intro version control git

Leah Wasser, Max Joseph

Learning objectives

At the end of this activity, you will be able to:

- Submit a pull request to a repo suggesting changes using github.com
- Define base fork vs. head fork

What you need

- A GitHub user account
- A terminal running bash, and
- Git installed and configured on your computer.

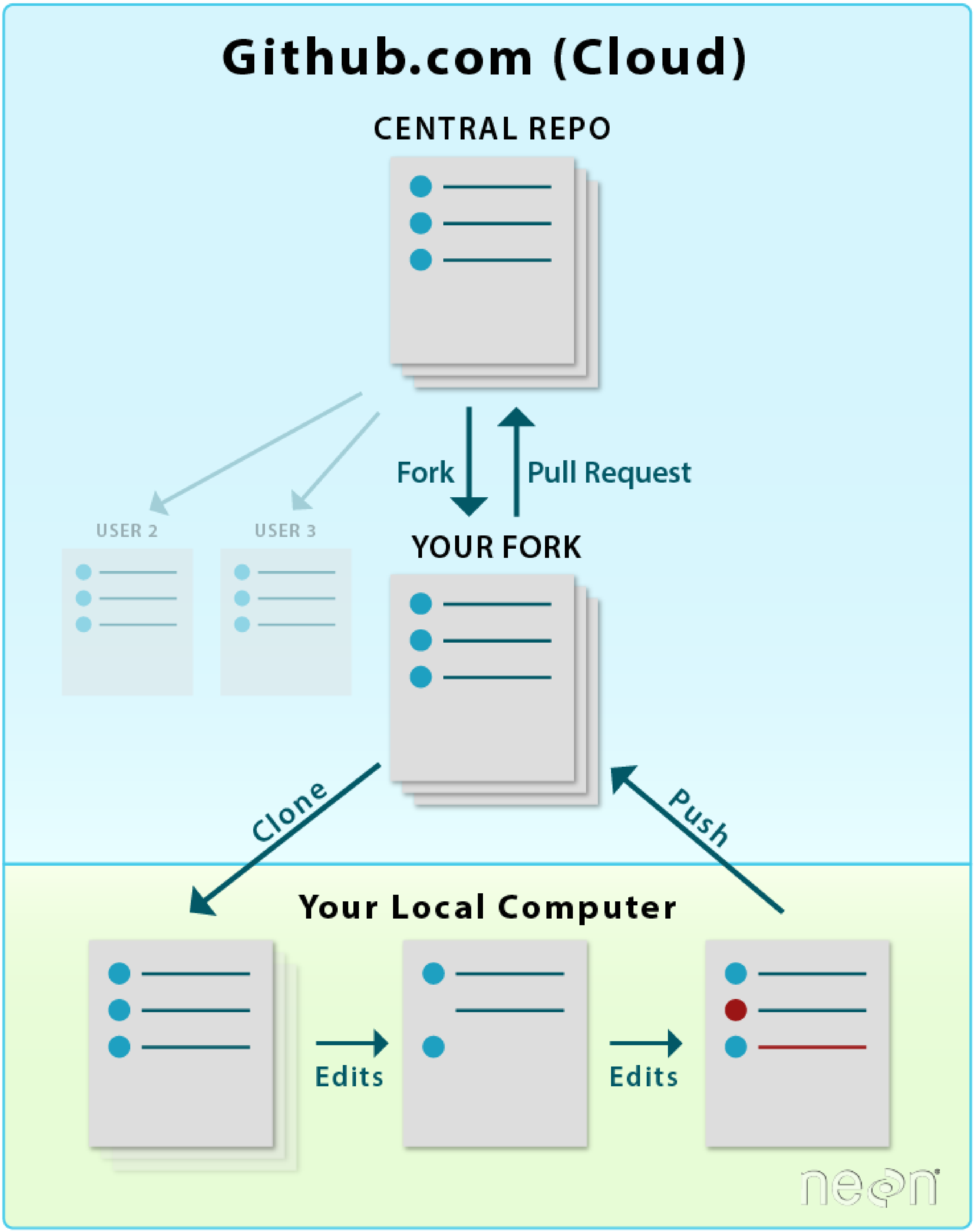
Follow the setup instructions here:

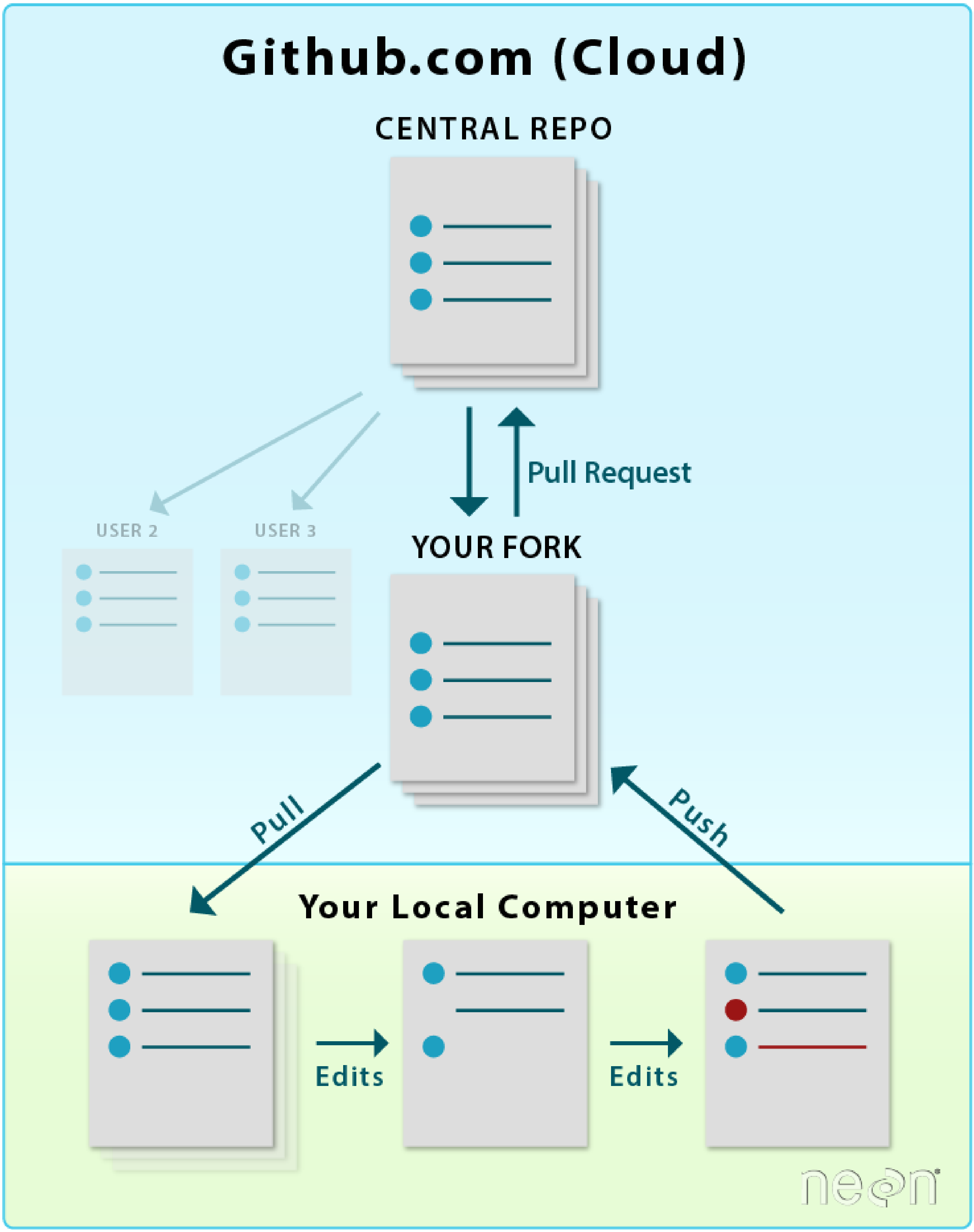
- Setup instructions

You have now learned how to:

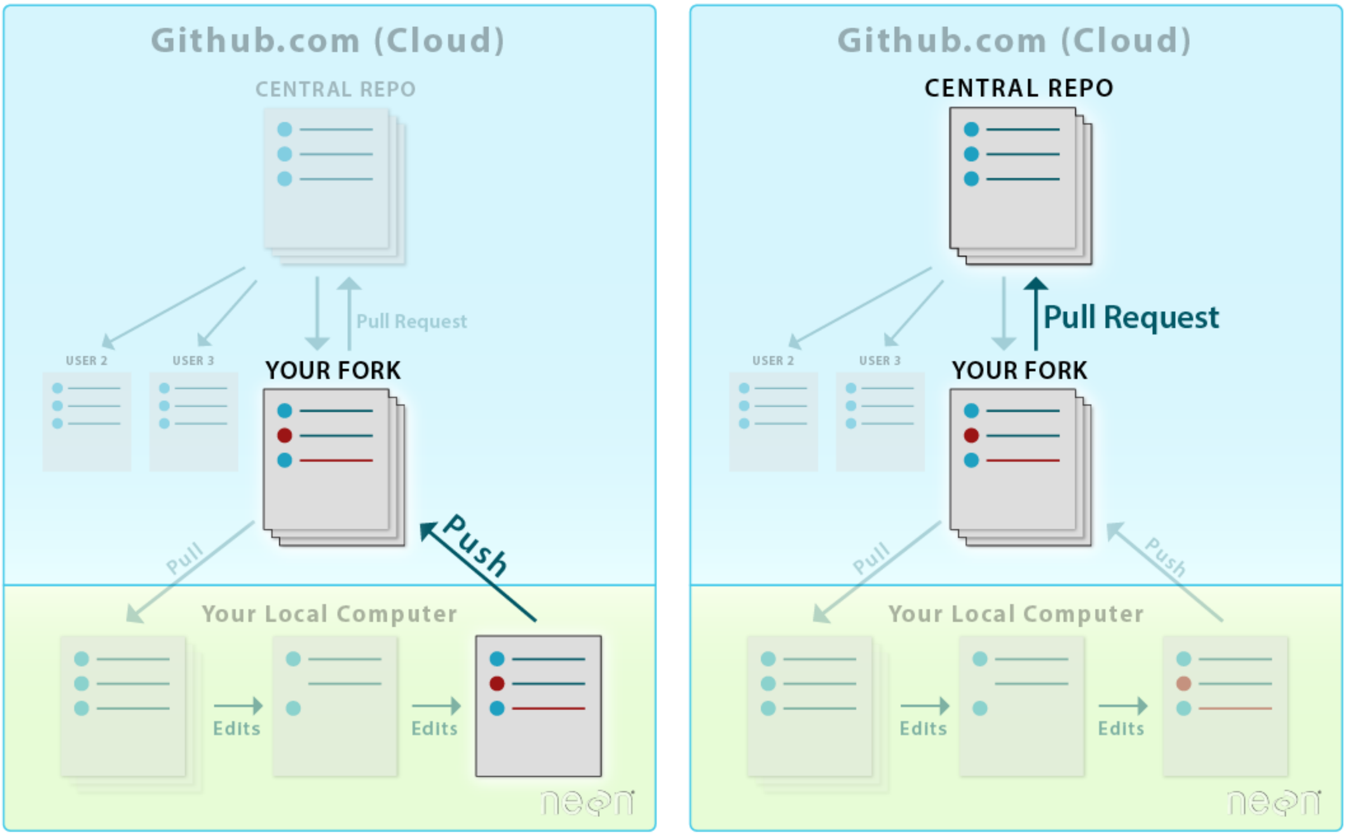
1. `Fork` a repo in someone else’s github account to your github account
2. `Clone` this repo to your local computer
3. Edit copies of that cloned repo locally on your computer
4. `add`, `commit` those edits to your git repo locally
5. `Push` the committed edits back to your fork

In this lesson, you’ll learn how to submit a **pull request** to suggest that your edits are included in another (the central Earth Lab) repo.


Github.com (Cloud)
CENTRAL REPO
Fork
Pull Request
USER 2
USER 3
YOUR FORK
Clone
Push
Your Local Computer
Edits
Edits
neon



LEFT: You will fork and clone a repo **ONCE** . RIGHT: After you have forked and cloned a repo, you will update your fork from the central repository using a **Pull Request.** You will update your local copy of the repo (on your computer) using `git pull`. Notice that the workflow is similar in both images above, however the commands are different the first time you setup your repo in your GitHub account and on your local computer! Source: National Ecological Observatory Network (NEON)



LEFT: To sync changes made and committed locally on your computer, to your github account, you **push** the changes from your computer to your fork on GitHub RIGHT: TO suggest changes to another repo, you submit a **Pull Request** to update the central repository. Source: Colin Williams, NEON

About pull requests

A pull request to another repo is similar to a "push". However it allows for a few things:

1. It allows you to contribute to another repo without needing administrative privileges to make changes to the repo.
2. It allows others to review your changes and suggest corrections, additions, edits, etc..
3. It allows repo administrators control over what gets added to their project repo.

The ability to suggest changes to ANY repo, without needing administrative privileges is a powerful feature of GitHub. In our case, you do not have privileges to make changes to the `earthlab/14ers-git` repo. However, you can make as many changes as you want in your fork, and then suggest that Earth Lab incorporate those changes into their repo, using a pull request.

Pull requests in GitHub

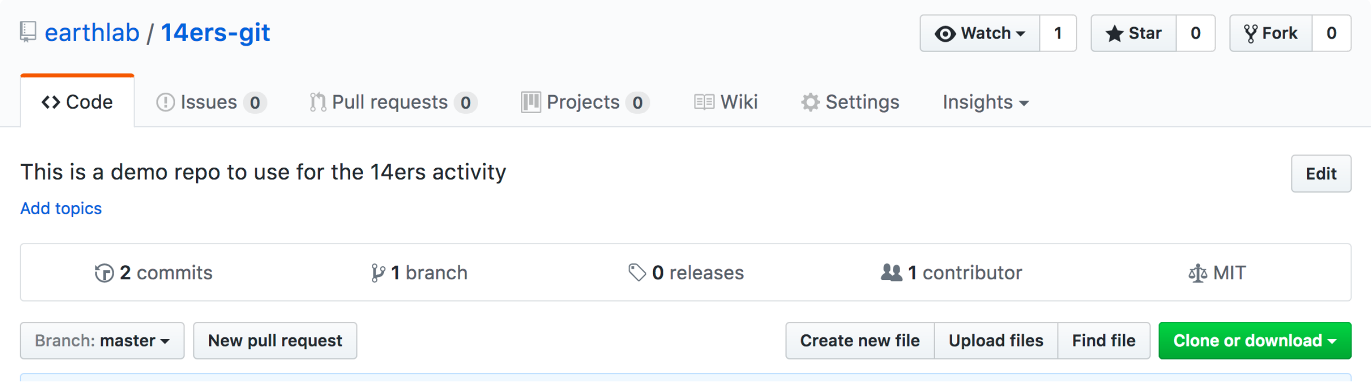
This section was adapted from the GitHub Hello World guide. They provide an animated version of these directions.

Pull requests are the heart of collaboration on GitHub. When you open a pull request, you're proposing your changes and requesting that someone review and pull in your contribution and merge them into their project.

Pull requests show diffs, (differences), of the content between your repo and the repo that you are submitting changes to. The changes, additions, and subtractions are shown in green and red.

Step 1 - Start Pull Request

To begin a pull request (PR), click the pull request button on the main repo page.



This is a demo repo to use for the 14ers activity

Location of the Pull Request button on the earthLab/14ers-git repo.

★ **Data Tip:** You can also click the “Pull requests” tab at the top of the page to submit a pull request. When the pull request page opens, click the “New pull request” button to initiate the PR.

Step 2 - Which repo to update - select your base & head

Next you need to select which repo you wish to update (the base repo) and which repo contains the content that you wish to use to update the base (the head repo). In this example, you want to update **earthLab/14ers-git** with commits in your fork **YOUR-USERNAME/14ers-git**.

Head vs Base

- **Base:** the repo that will be updated, the changes will be added to this repo.
- **Head:** the repo from which the changes come.

One way to remember this is that the “head” is *ahead* of the base. So we must add from the head to the base.

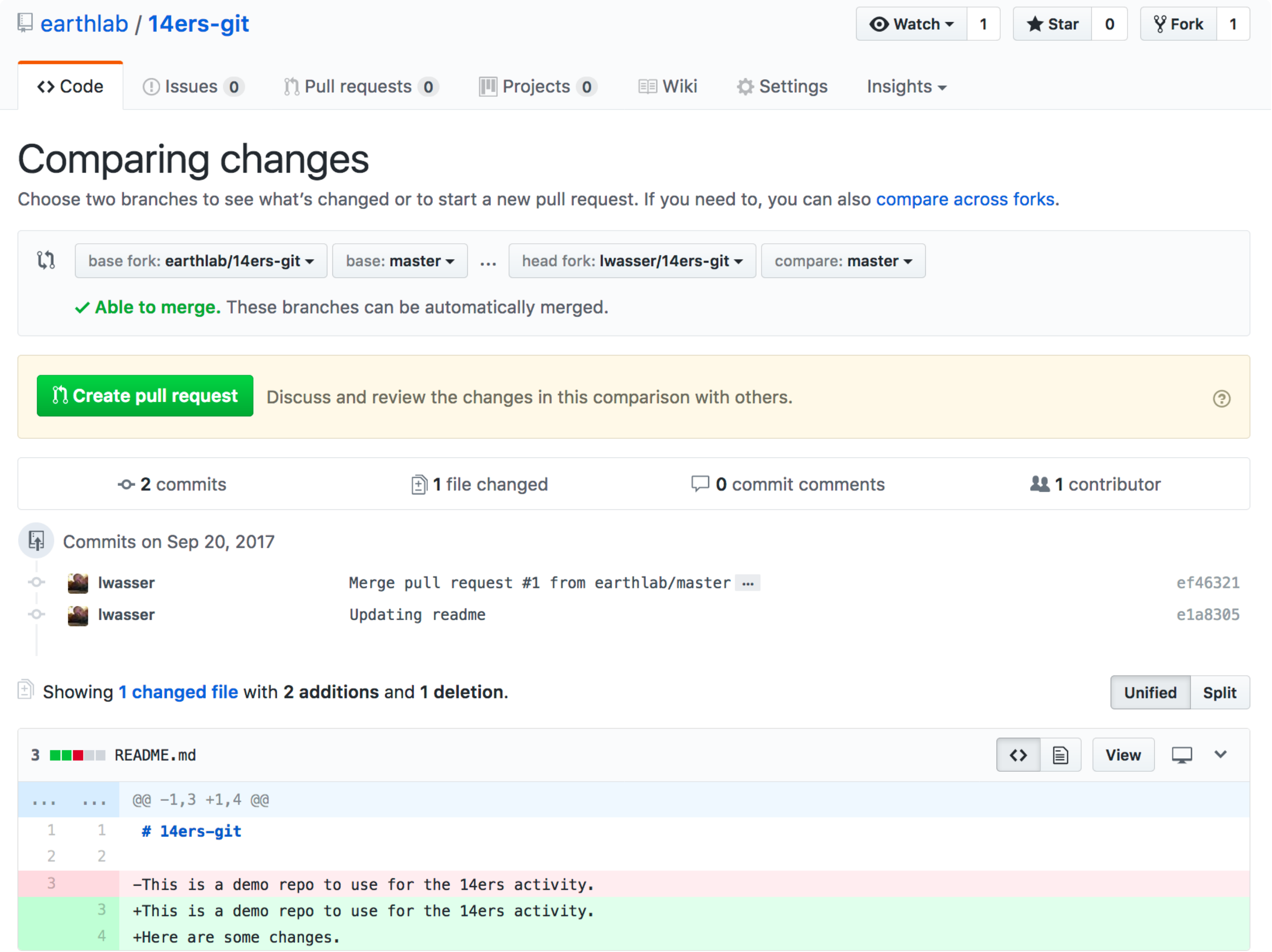
When you begin a pull request, the head and base will auto-populate as follows:

- base fork: **earthlab/14ers-git**
- head fork: **YOUR-USERNAME/14ers-git**

The above pull request configuration tells Git to update the Earth Lab repo with contents **from your repo**.

Step 3 - Verify changes

When you compare two repos in a pull request page, GitHub provides an overview of the differences (diffs) between the files. Look over the changes and make sure nothing looks surprising.



Comparing changes

Choose two branches to see what's changed or to start a new pull request. If you need to, you can also compare across forks.

base fork: earthlab/14ers-git | base: master | ... | head fork: lwasser/14ers-git | compare: master

✓ Able to merge. These branches can be automatically merged.

Create pull request — Discuss and review the changes in this comparison with others.

2 commits | 1 file changed | 0 commit comments | 1 contributor

Commits on Sep 20, 2017

lwasser	Merge pull request #1 from earthlab/master ...	ef46321
lwasser	Updating readme	e1a8305

Showing 1 changed file with 2 additions and 1 deletion.

3 README.md

```
@@ -1,3 +1,4 @@
 # 14ers-git

-This is a demo repo to use for the 14ers activity.
+This is a demo repo to use for the 14ers activity.
+Here are some changes.
```

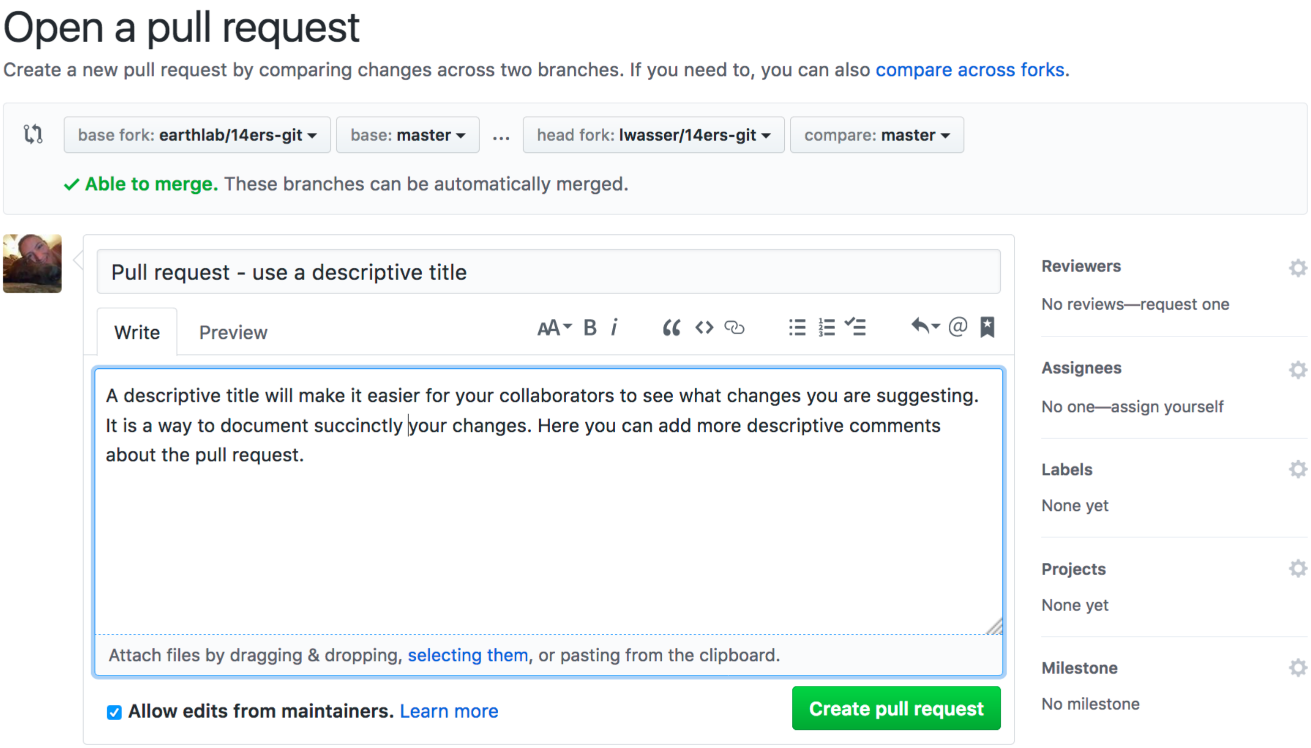
This screenshot shows the differences between the files on Earth Lab's version of the 14ers repo in red and your copy of the repo in green. Deletions are highlighted in red and additions are highlighted in green. Pull request diffs view can be changed between unified and split (arrow).

Step 4 - Create a pull request

If you are adding new commits to the Earth Lab repo, then the pull request button will be available. Click the green "Create Pull Request" button to submit your pull request.

Step 5 - Describe your pull request using a short title

Give your pull request a title and write a brief description of your changes. When you're done with your message, click "Create Pull Request".



Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also compare across forks.

base fork: earthlab/14ers-git · base: master ... head fork: lwasser/14ers-git · compare: master

✓ Able to merge. These branches can be automatically merged.

Pull request - use a descriptive title

A descriptive title will make it easier for your collaborators to see what changes you are suggesting. It is a way to document succinctly your changes. Here you can add more descriptive comments about the pull request.

☑ Allow edits from maintainers. Learn more

Reviewers: No reviews—request one

Assignees: No one—assign yourself

Labels: None yet

Projects: None yet

Milestone: No milestone

Write
Preview
Attach files by dragging & dropping, selecting them, or pasting from the clipboard.
Create pull request

Pull request titles should be concise and descriptive of the content in the pull request. More detailed notes can be left in the comments box. Source: National Ecological Observatory Network (NEON)

Notice the repo name up at the top (in your repo and in screenshot above) When creating the pull request you will be automatically transferred to the base repo. Since your fork was the base (we are updating it), GitHub will transfer you to your github.com fork landing page.

Challenge - Submit Pull Request to update a 14er markdown file

Within the 14er repo, you will find a list of `.md` - one for some of the tallest 14ers in Colorado.

On your computer, do the following

1. Select a 14er markdown file that you'd like to update.
2. Look up the elevation and location (longitude, latitude in decimal degrees) for the 14er
3. Add that information and an interesting fact or so about the 14er to the appropriate 14er markdown file.

Next

1. Save your file, add and commit your changes and then push the changes to your fork on GitHub.
2. Submit a pull request to the `earthLab/14ers-git` repo.

HINT:

- base fork: **earthlab/14ers-git**
- head fork: **YOUR-USER-NAME/14ers-git**
- Finally, go to the Earth Lab 14ers repo on GitHub. Look for the "Pull Requests" link at the top of the page. How many pull requests are there?
- Do you see your pull request?

★ **Data Tip:** While you can submit a pull request to any (public) repo on GitHub, you can only merge a PR if you own the repo or have appropriate permissions. You don't have contributor permissions to the Earth Lab repo. Thus the workshop instructors will merge the pull requests as they are submitted during the workshop.

Workflow summary

Syncing repos with pull requests

On GitHub:

- Fork the earthlab/14ers-git repo to your GitHub account.

On your computer:

- Clone the repo to your computer locally (you'll only do this once)
- Edit any files that you wish to change
  - `add` and `commit` your changes to your repository
  - `git push` your changes up to your fork on GitHub

On GitHub:

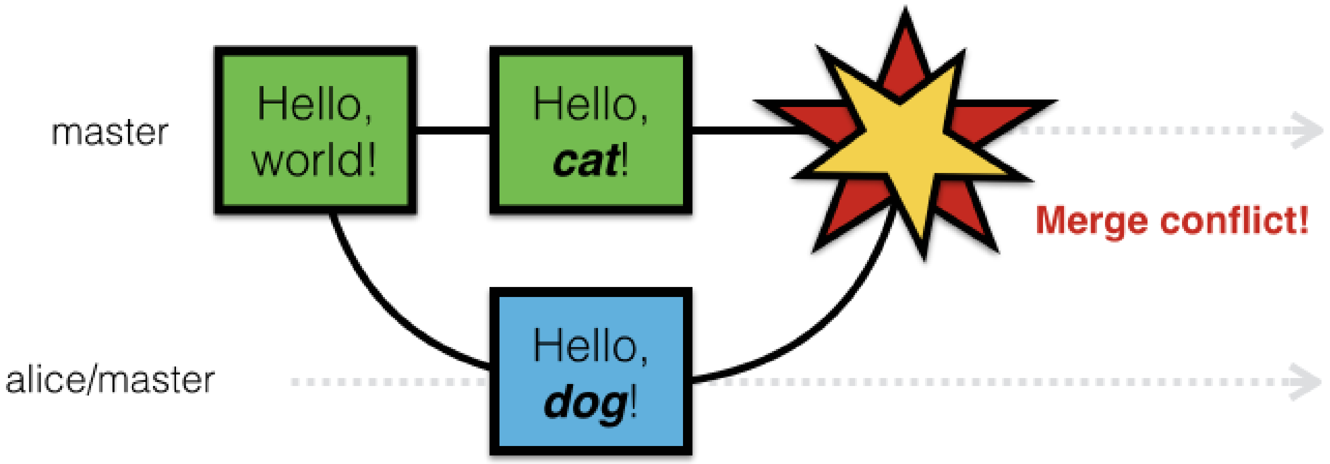
- Button: Create New Pull Request
- Set base: earthlab/14ers-git, set head: your fork
- Make sure changes are what you want to sync
- Button: Create Pull Request
- Describe the Pull Request using a succinct title & descriptive comments
- Button: Create Pull Request

Remember that you can only merge the pull request if you have contributor permissions to the repo!

★ **Data Tip:** Are you a Windows user and are having a hard time copying the URL into shell? You can copy and paste in the shell environment **after** you have the feature turned on. Right click on your bash shell window (at the top) and select "properties". Make sure "quick edit" is checked. You should now be able to copy and paste within the bash environment.

What's A Merge Conflict?

A merge conflict occurs when two users edit the same part of a file at the same time. Git cannot automatically determine which edit should be in the most current copy. Hence the conflict.



Merge conflicts occur when the same part of a script or document has been changed simultaneously. Source: Atlassian

Additional Resources

- Diagram of Git Commands – this diagram includes more commands than we will cover in this series but includes all that we use for our standard workflow.
- GitHub Help Learning Git resources.

Fork a GitHub repo

Tags **Reproducible science and programming:** git , version control

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