

Git(Hub) 401

Intermediate/Advanced git/GitHub Tutorial

.astronomy 2018

Instructors:

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Outline

- Installation/Setup
- Collaborative Workflows
- Merging vs Rebasing
- Release Workflow
- Exercise: Propose Changes via a Pull Request
- Exercise: Keeping a fork up-to-date (Rebase) (if time allows)
- Exercise: Squashing history (if time allows)

Setup

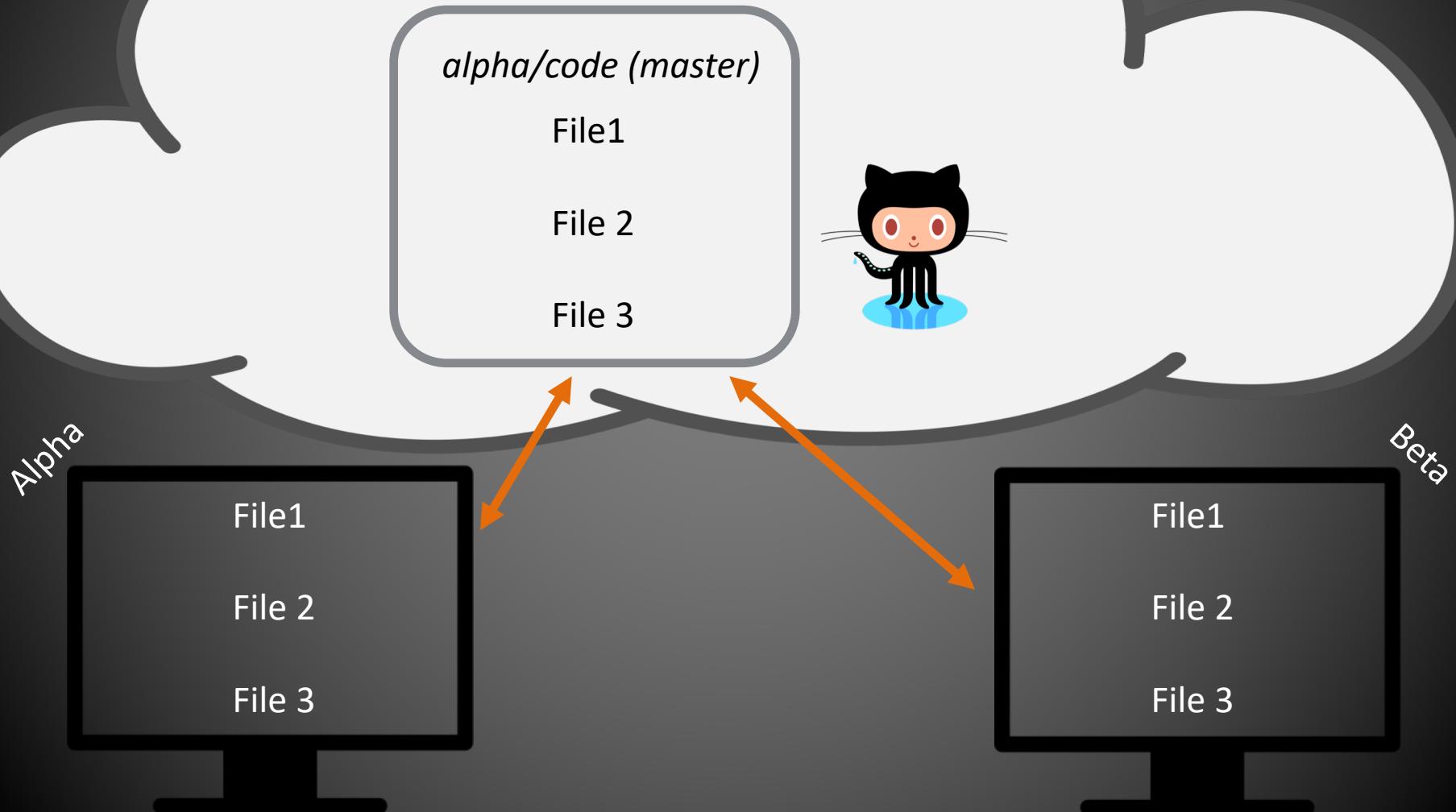
- Slack channel: #github-401
- Post-It notes
- Install git:
 - Linux/Mac (with Anaconda)
 - `conda install git`
 - Linux (without Anaconda)
 - <https://git-scm.com/download/linux>
 - Mac (without Anaconda)
 - <https://git-scm.com/download/mac>
 - Windows
 - <https://gitforwindows.org/>
- Set up SSH key (if using SSH):
 - <https://help.github.com/articles/generating-a-new-ssh-key-and-adding-it-to-the-ssh-agent/>
- Sign up/sign into GitHub Account
- Configure git (if necessary):
 - `git config --global user.name "Your Name"`
 - `git config --global user.email "YourEmail@email.edu"`

Assumed Level of Knowledge

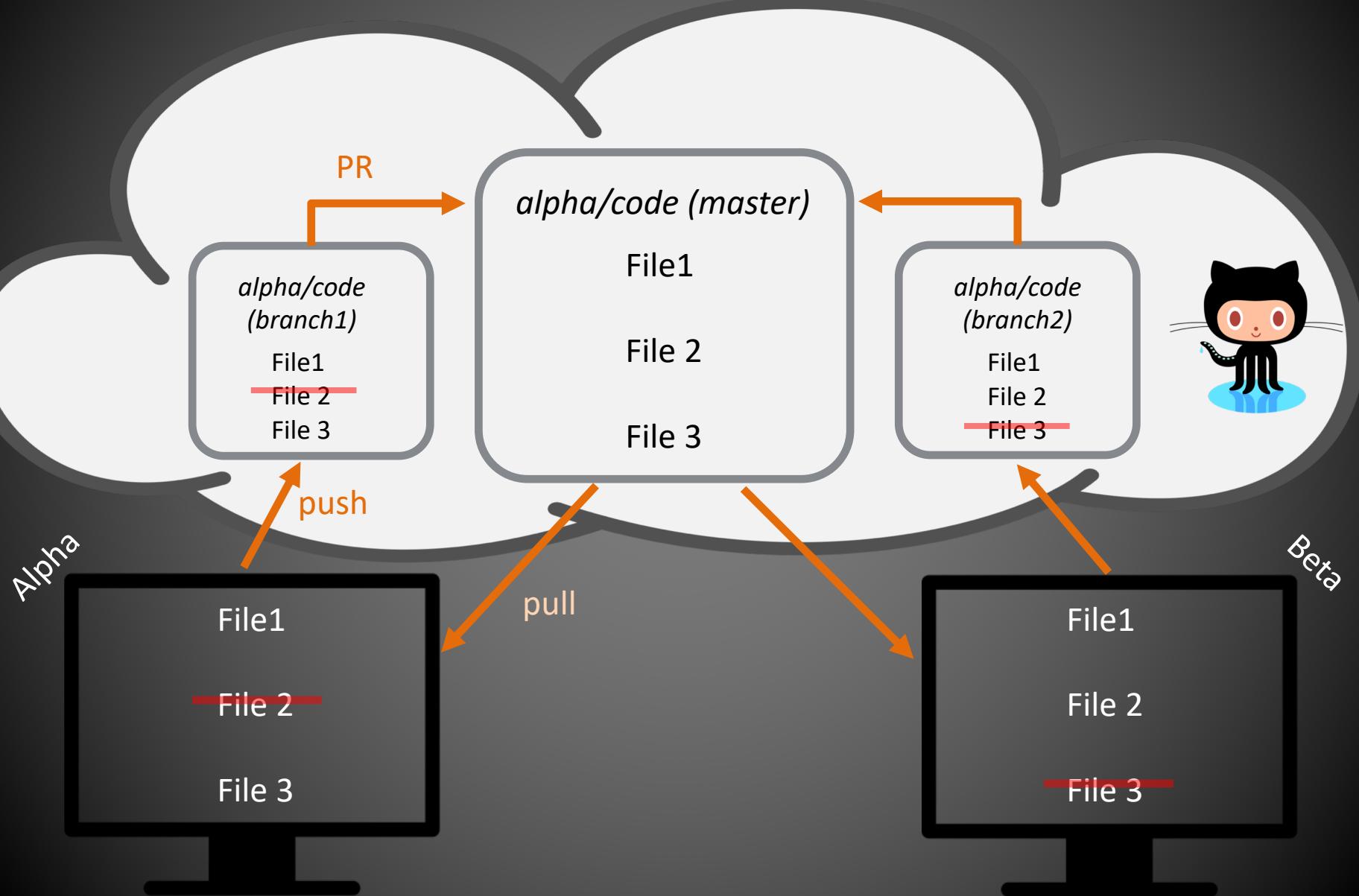
- git clone
- git add/commit
- git push/pull
- git branch/checkout

Git(Hub) 101 class: 15:30 – 16:30 Café Con

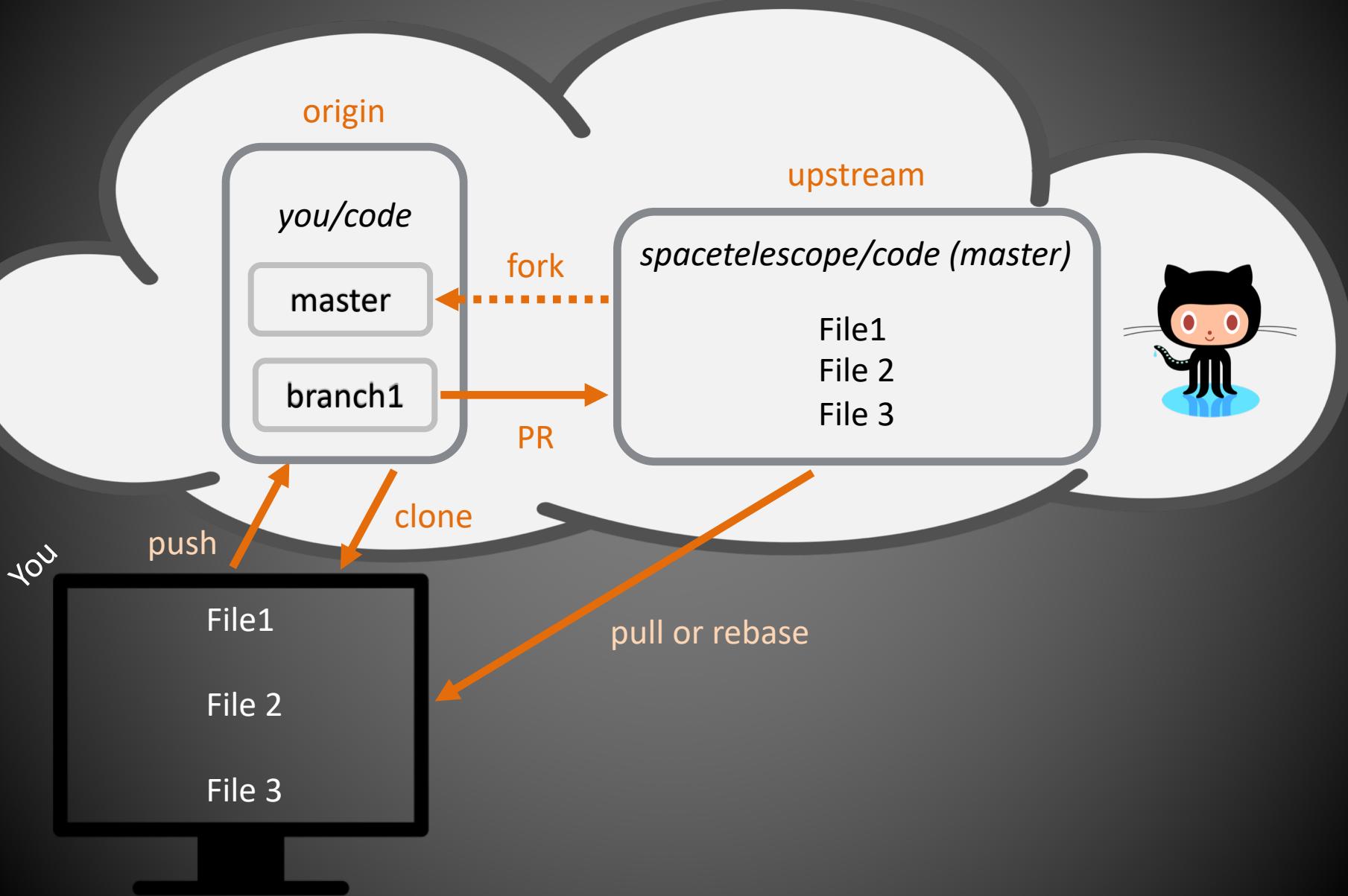
The simplest workflow



A better workflow



An even better workflow



Let's dig down...

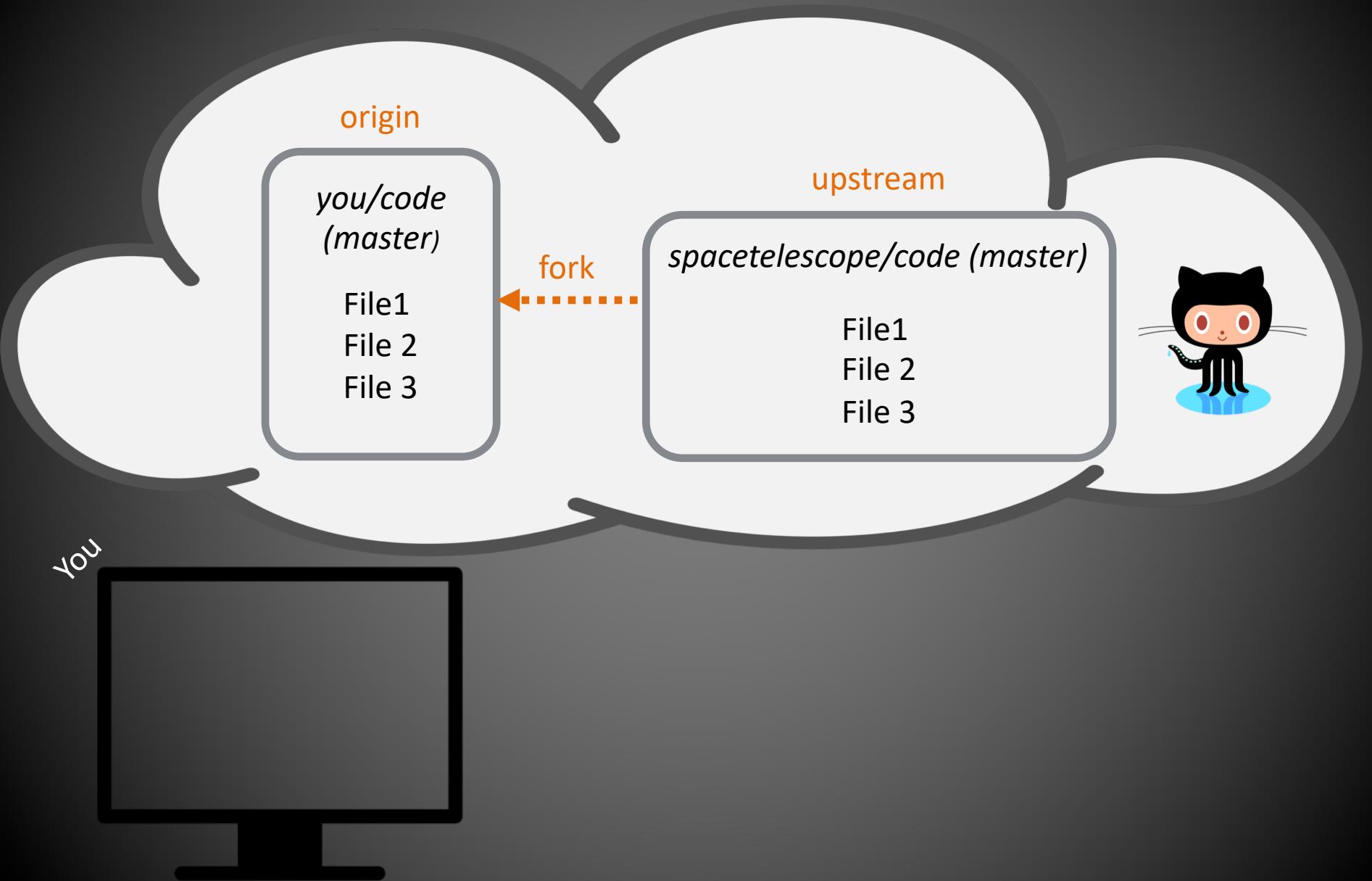
You

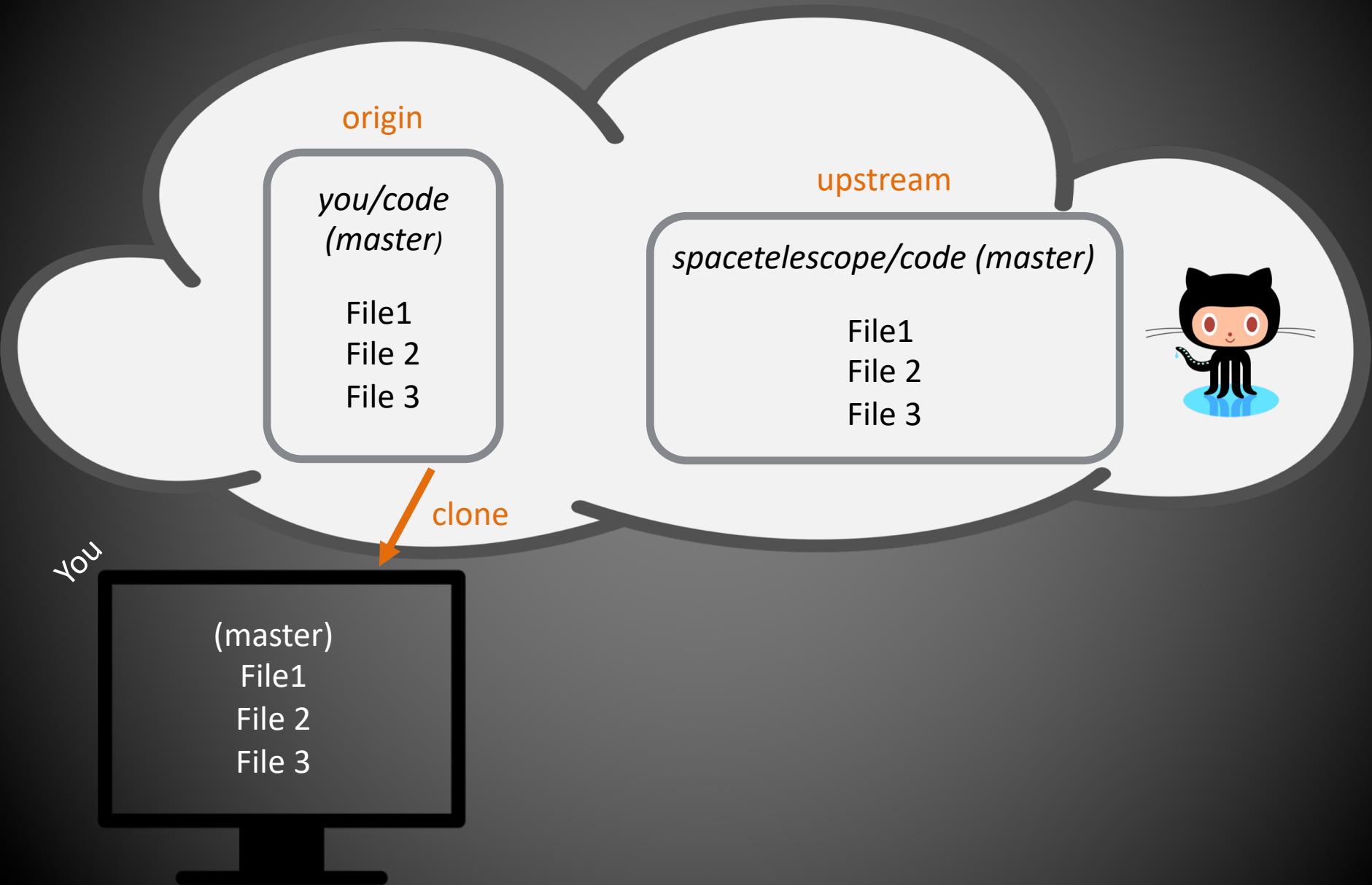


spacetelescope/code (master)

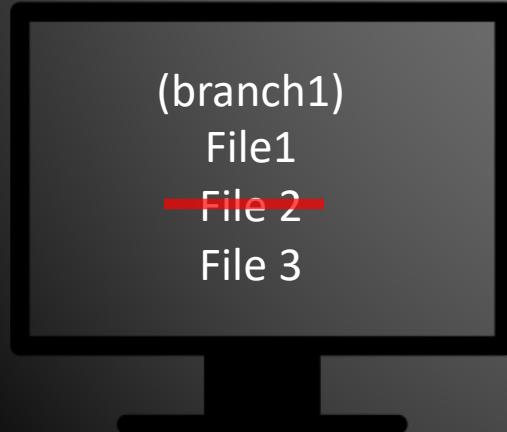
File1
File 2
File 3







You



origin

*you/code
(master)*

File1
File 2
File 3

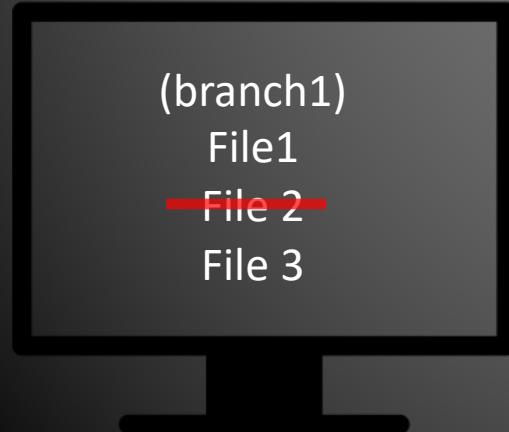
upstream

spacetelescope/code (master)

File1
File 2
File 3



You



push

origin

*you/code
(branch1)*

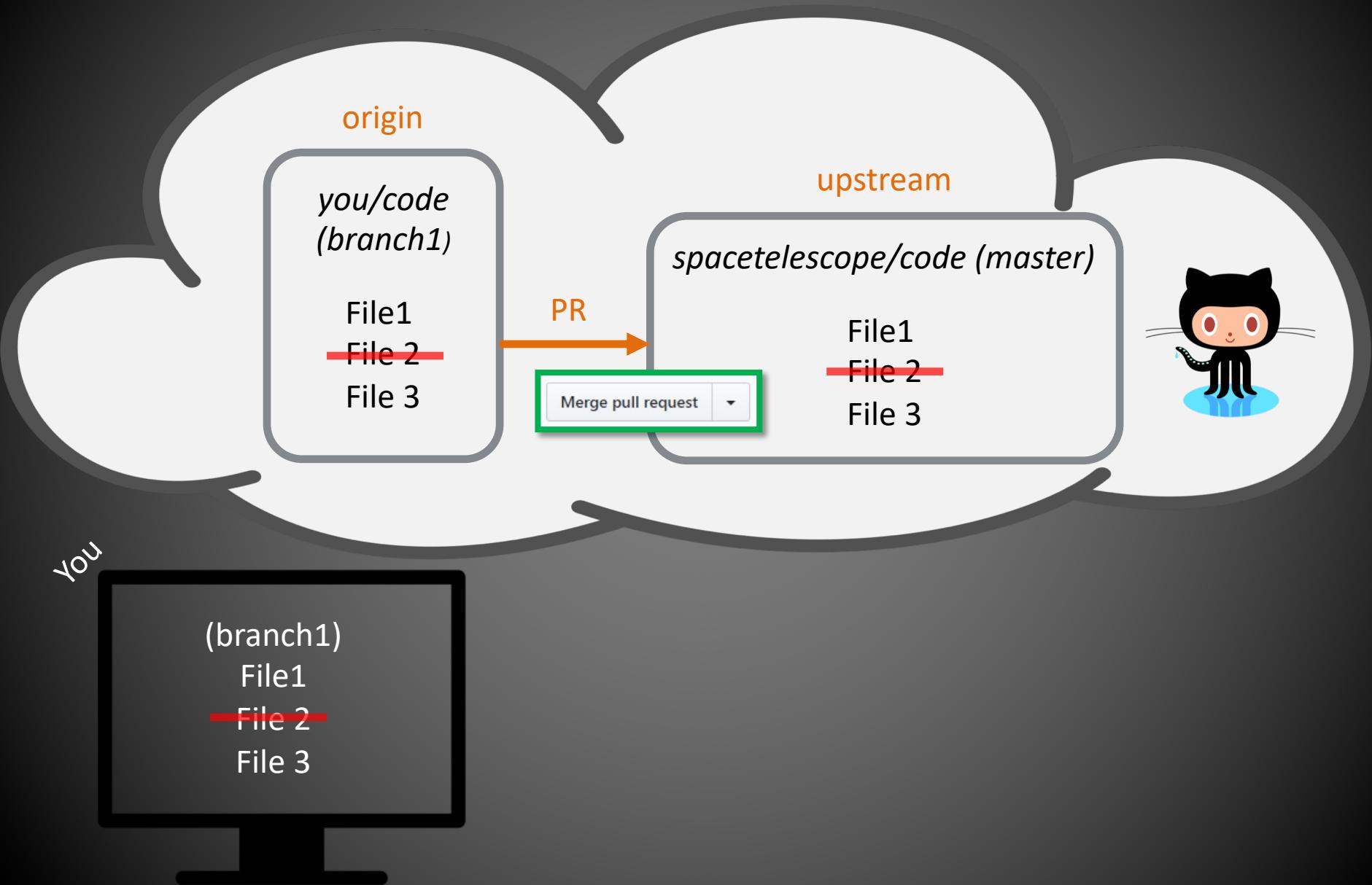
File1
~~File 2~~
File 3

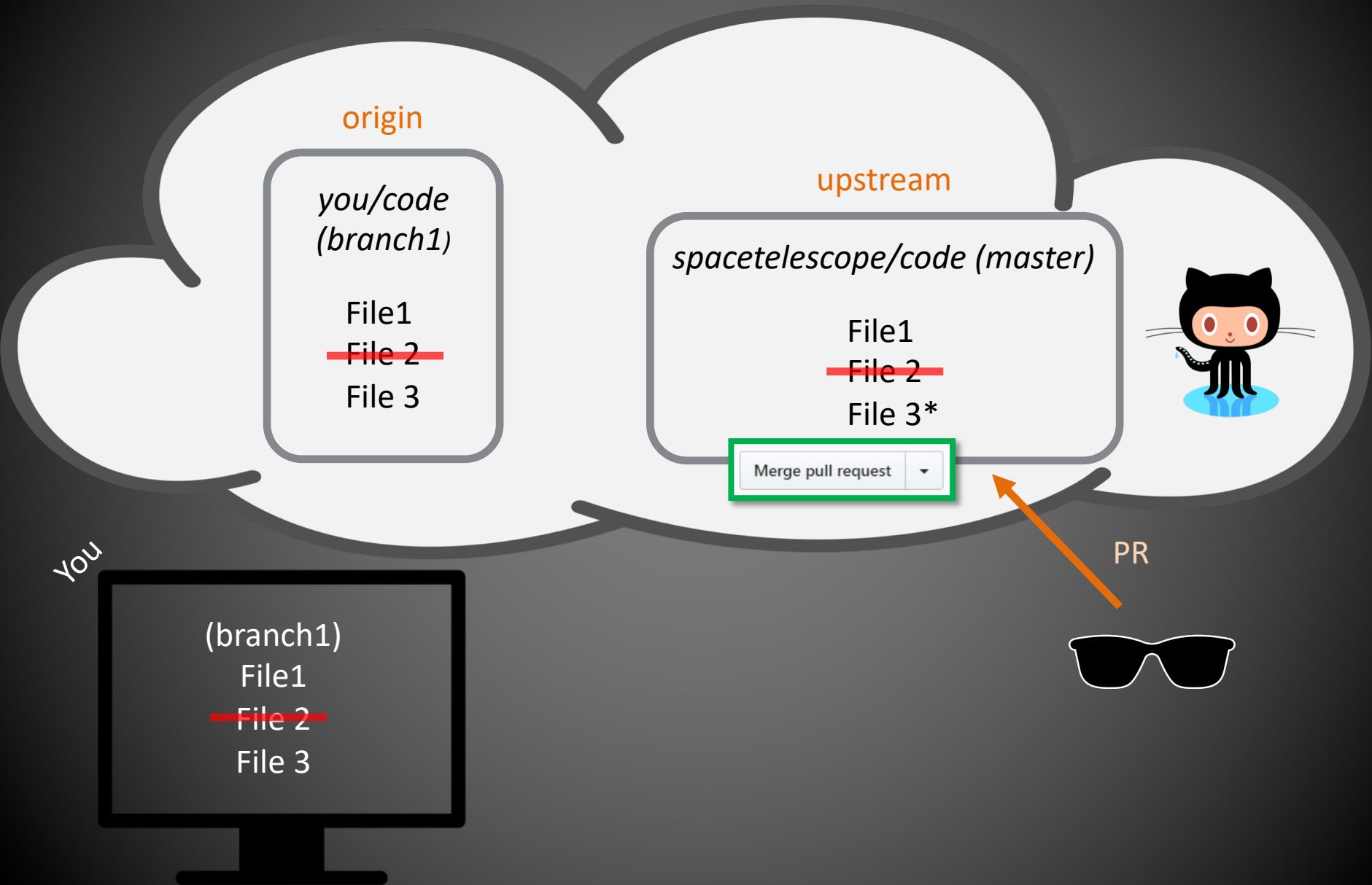
upstream

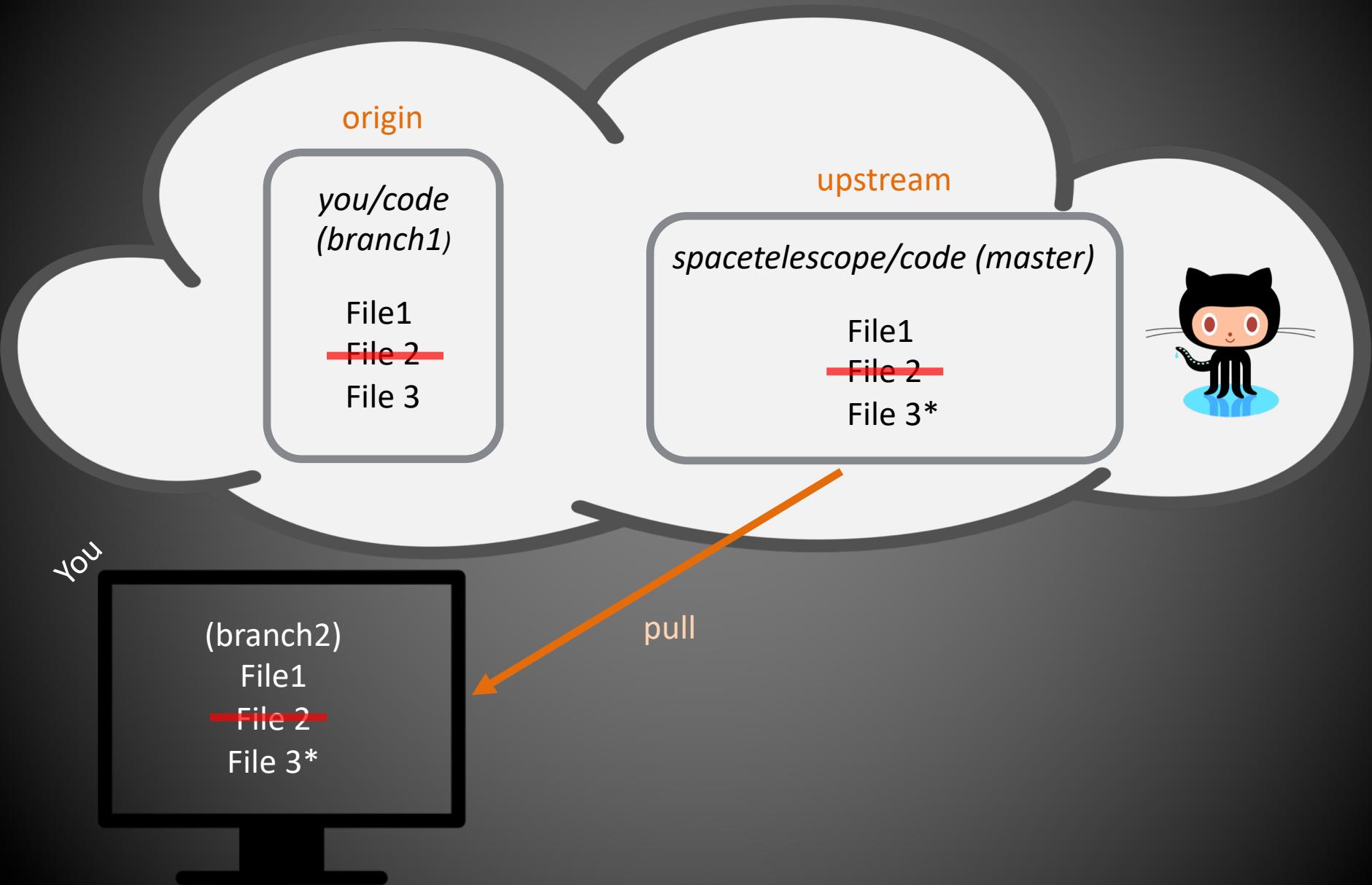
spacetelescope/code (master)

File1
File 2
File 3

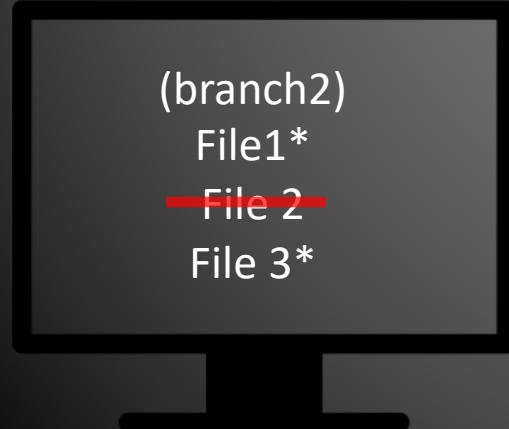








You



origin

*you/code
(branch1)*

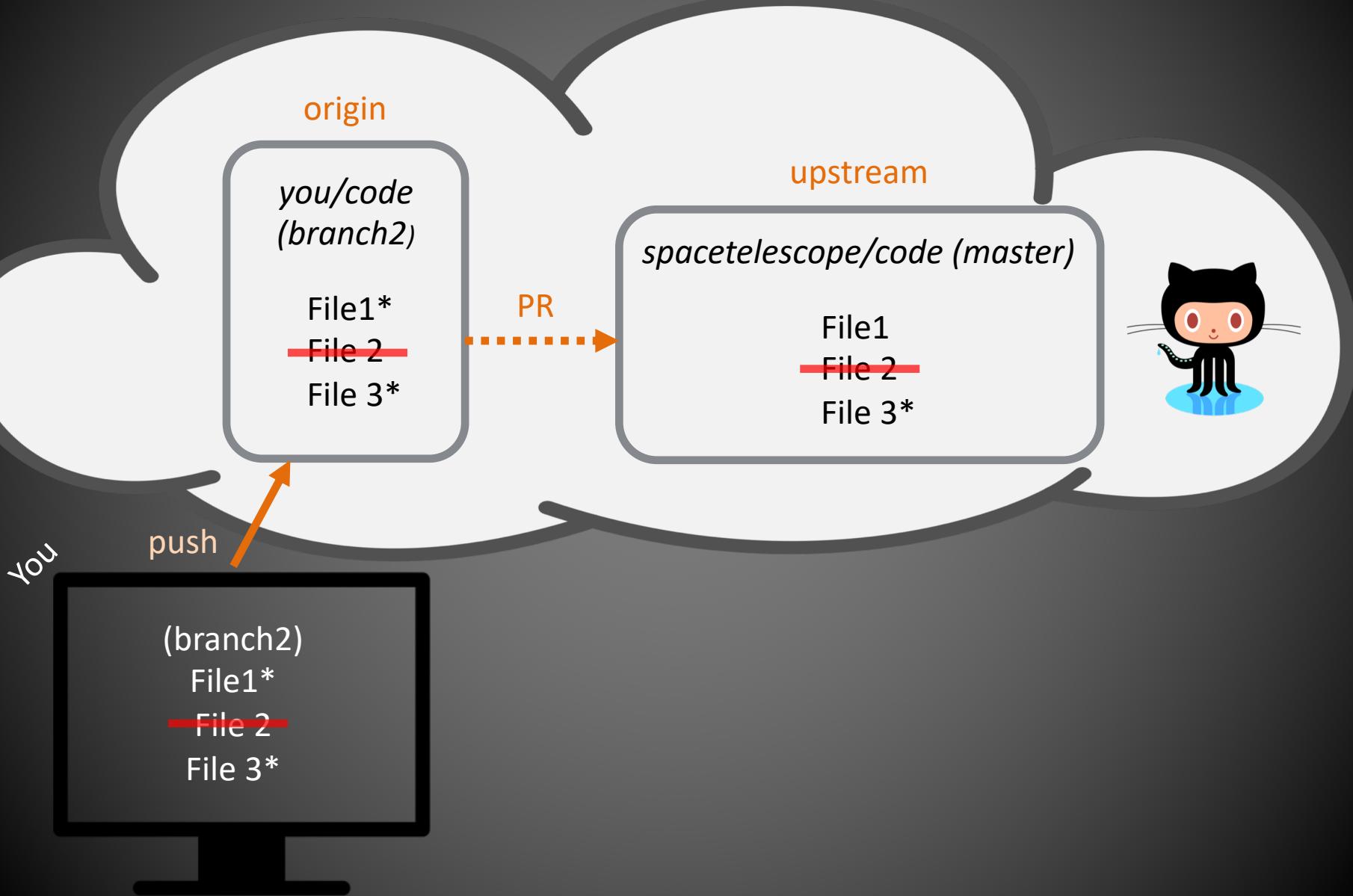
File1
~~File 2~~
File 3

upstream

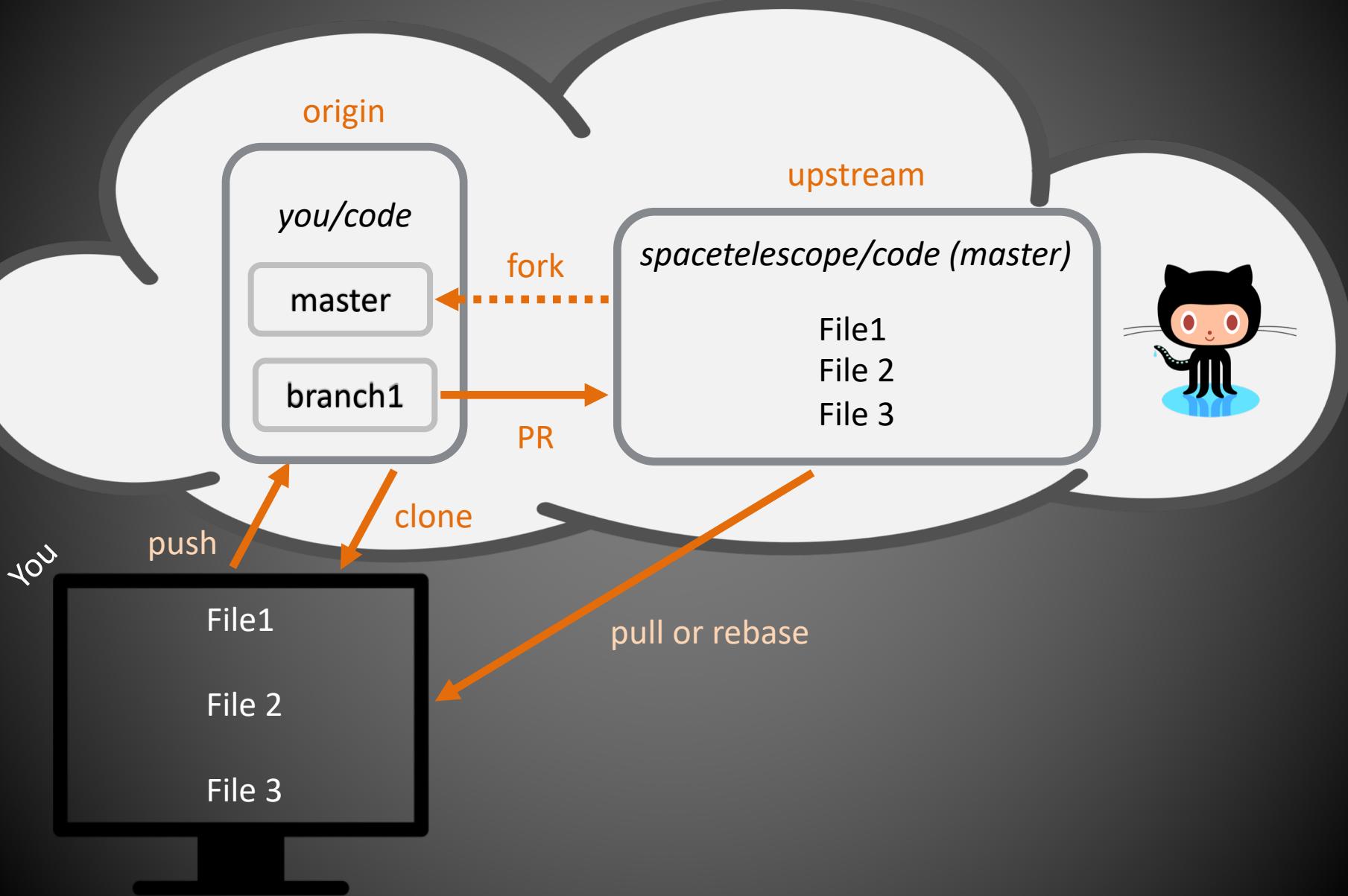
spacetelescope/code (master)

File1
~~File 2~~
File 3*

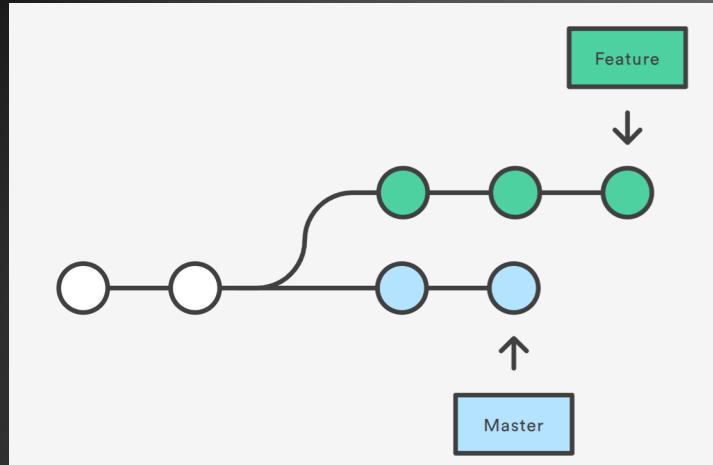




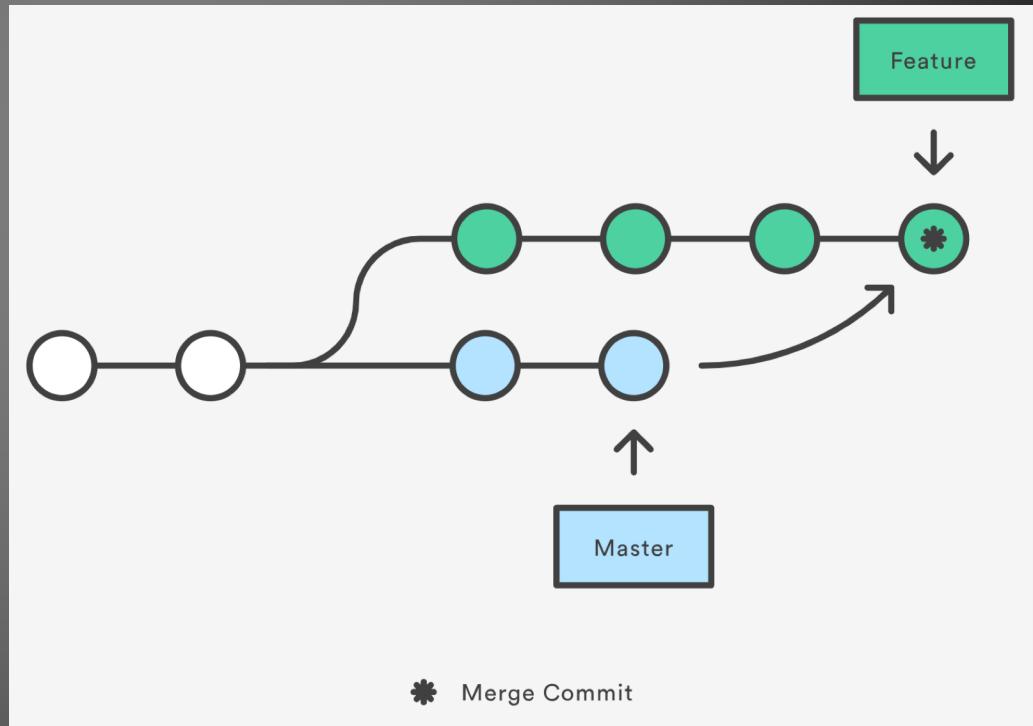
A even better workflow



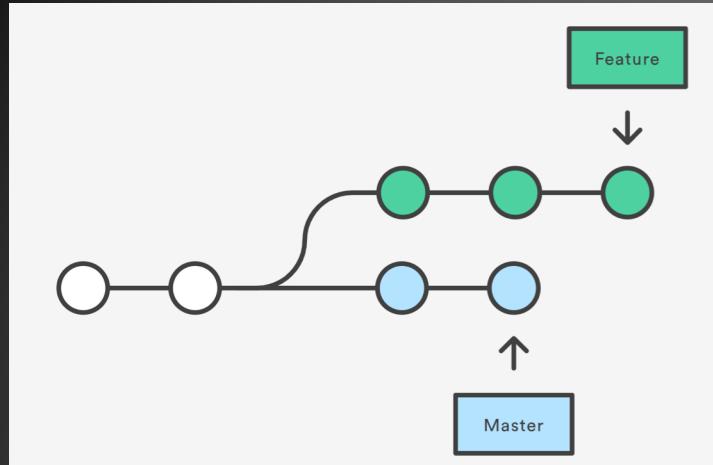
Merging



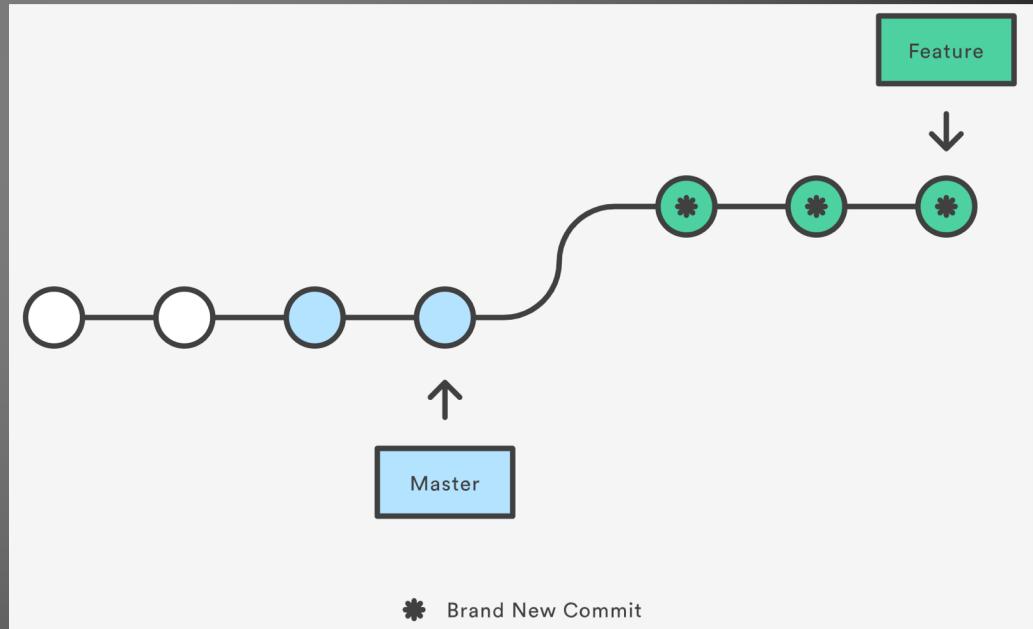
- git checkout feature
- git merge master
- non-destructive – history of existing branches are not changed
- Extra merge commit every time you incorporate upstream changes



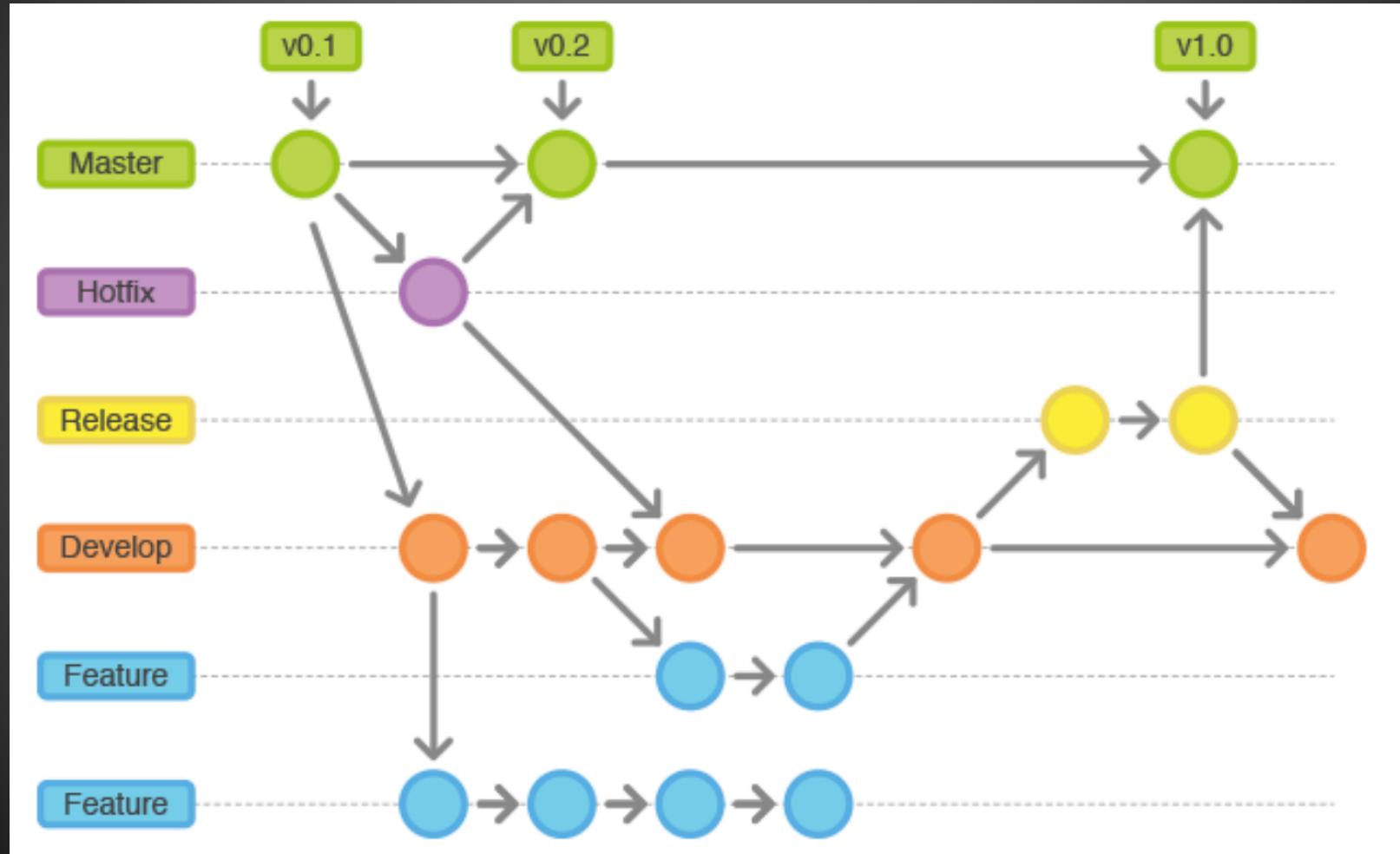
Rebasing



- git checkout feature
- git rebase master
- Moves entire feature branch to begin at tip of master branch
- Instead of merge commit, rebasing re-writes history by creating brand new commits
- Linear project history – you can follow tip of feature branch all the way to the beginning of the project



Release Workflow



Exercise: Propose Changes via Pull Request

1. Fork the `spacetelescope/github-401` repository to your GitHub `<username>`
2. Clone your `<username>/github-401` repository to your local machine
3. In your local clone, create a branch called `<username>-feature` and switch to it
4. Add your name to the `README.md` file
5. Create a new file called `<username>-time.py`
6. In `<username>-time.py` write a program that prints the current time using your favorite method
7. Commit your changes and push your branch to your fork
8. Open a Pull Request that compares your branch to the `spacetelescope/github-401 master` branch
9. Assign `bourque` as a reviewer
10. Review the pull request of someone else in the class. Make at least one comment on their code with something you would have done differently or suggest an improvement
11. BONUS: Make improvements to your code based on the suggestions you receive from other participants and update the pull request

Exercise: Updating your fork via rebase

1. Instructor will commit change to
spacetlescope:master branch
2. Add a new remote that points to the
spacetlescope/github-401 repository:
 - git remote add upstream <url>
3. Perform the rebase:
 - git fetch upstream master
 - git rebase upstream/master
4. Resolve any conflicts
5. You should now see any changes that occurred in
spacetlescope:master branch in your
<username>-feature branch

Exercise: Squashing History

1. Squash your two latest edits into one
 - git rebase -i HEAD~2
 - Follow terminal instructions
2. Push your branch out again (with --force)
3. Inspect your pull request: What has changed?



Special Thanks

- STScI git Training Team
- Software Carpentry
- Azalee Bostroem
- Erik Tollerud