

# INTRO TO GIT

How version control systems give us  
superpowers

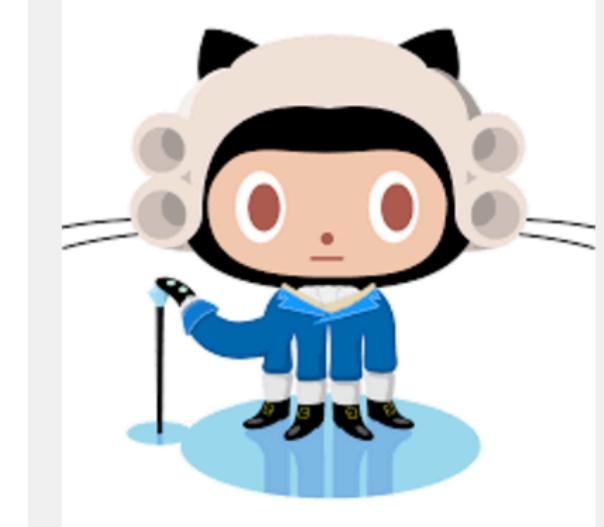


# WHAT IS GIT?

- a version control system (VCS) for software development(/anything) 🌈✨
- initial release: April 2005 almost 11 years ago! 😎
- written by **Linus Torvalds** ❤️
- enables distributed, non-linear workflows



GIT ≠ GITHUB

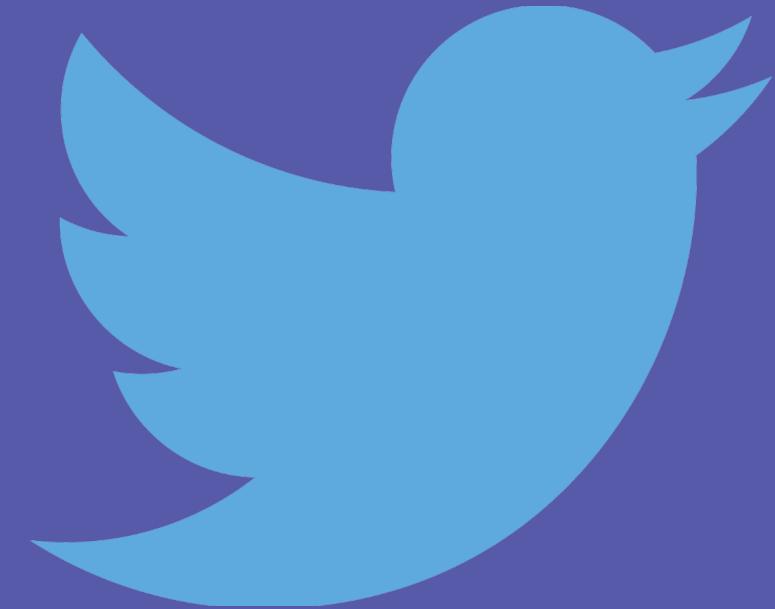


**git** is a version control system (think of it as a series of snapshots of your code) while **GitHub** is a company/website that is one of the most popular places on the internet to publish git repositories

# THESE ORGANIZATIONS PUBLISH CODE ON GITHUB



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# The White House

Washington, D.C.

<https://www.whitehouse.gov/developers>[Repositories](#)[People 23](#)

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Find a repository...

## omb\_place

Federal Place-based Initiatives Map

Updated 7 days ago

CSS ★ 42 ⚡ 15

## software-policy

Category Management Policy 16-1: Improving the Acquisition and Management of Common Information Technology: Software Licensing

Updated 8 days ago

CSS ★ 2 ⚡ 5

## api-standards

★ 1,289 ⚡ 227

Updated 21 days ago

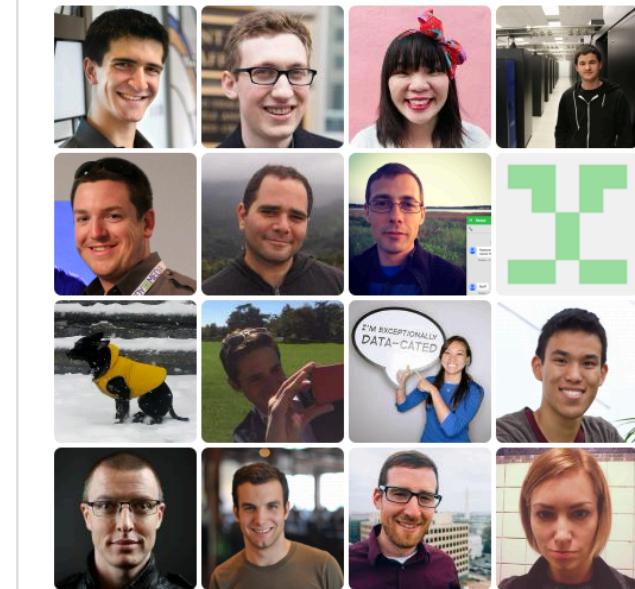
## petitions

PHP ★ 934 ⚡ 231

Drupal installation profile powering We The People at [petitions.whitehouse.gov](http://petitions.whitehouse.gov)

## People

23 &gt;





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Graphs

Federal Place-based Initiatives Map <https://whitehouse.gov/omb/place/>

127 commits

3 branches

4 releases

5 contributors

Branch: master ▾

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git@github.com:WhiteHouse/omb\_place



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ryanbharvey Fixed bug where points were missing from popups. Refactored functions...

Latest commit 455c10d on Sep 18, 2015

|  |                        |   |              |
|--|------------------------|---|--------------|
|  | assets                 | Fixed bug where points were missing from popups. Refactored functions...  | 4 months ago |
|  | buildtools             | Updated build script to fix bug that created nested data directories.     | 4 months ago |
|  | colors                 | Updated colors to work with new dataset catalog structure.                | 4 months ago |
|  | data                   | Fixed bug where points were missing from popups. Refactored functions...  | 4 months ago |
|  | dist                   | Fixed bug where points were missing from popups. Refactored functions...  | 4 months ago |
|  | .gitignore             | Final changes for release readiness. Deploy everything in ./dist.         | 6 months ago |
|  | README.md              | Close #2 - Updated README.md with information on installing build scr...  | 5 months ago |
|  | datasets-minified.html | Updated data files, fixed bug where map title displayed in map window ... | 5 months ago |
|  | datasets.html          | Modified about the data page to split datasets into categories.           | 6 months ago |
|  | favicon.ico            | Moved CSS into main stylesheet file, added favicon and associated lin...  | 8 months ago |
|  | index-minified.html    | Updated data files, fixed bug where map title displayed in map window ... | 5 months ago |
|  | index.html             | Replaced Leaflet.zoomhome control with leaflet.defaultextent control ...  | 5 months ago |
|  | print-minified.html    | Updated data files, fixed bug where map title displayed in map window ... | 5 months ago |
|  | print.html             | Removed unnecessary files and remaining reference to them.                | 5 months ago |



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Federal Place-based Initiatives Map <https://whitehouse.gov/omb/place/>

● CSS 64.6%

● JavaScript 23.8%

● HTML 6.8%

● Shell 4.8%

Branch: master ▾

New pull request

New file

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SSH ▾

git@github.com:WhiteHouse/omb\_place



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## WhiteHouse / omb\_place

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Branch: master ▾

Commits on Sep 18, 2015



**Fixed bug where points were missing from popups. Refactored functions...** ...

ryanbharvey committed on Sep 18, 2015



455c10d



**Updated build script to fix bug that created nested data directories.**

ryanbharvey committed on Sep 18, 2015



e0b99cf



Commits on Sep 12, 2015



**Updated colors to work with new dataset catalog structure.**

ryanbharvey committed on Sep 12, 2015



35e353f



Commits on Sep 4, 2015



**Merge pull request #3 from mchelen/master** ...

ryanbharvey committed on Sep 4, 2015



0519f3b



Commits on Sep 1, 2015



**suppress "directory exists" warning unless we have specifically just ...** ...

mchelen committed on Aug 26, 2015



c4f8c33



Commits on Aug 28, 2015



**Merge pull request #4 from harry-wood/patch-1** ...

ryanbharvey committed on Aug 28, 2015



613cd3b



Commits on Aug 27, 2015



# IMPORTANT TERMS



- **repository**: a set of commit objects, stored in the root directory of your project
  - **commit**: a snapshot of all the files in your directory
- **branch**: a series of commits, generally used to develop features

committ

A commit in a git repository records a snapshot of all the files in your directory. It's like a giant copy and paste, but even better!

Git wants to keep commits as lightweight as possible though, so it doesn't just blindly copy the entire directory every time you commit.

It can (when possible) compress a commit as a set of changes, or a "delta", from one version of the repository to the next.

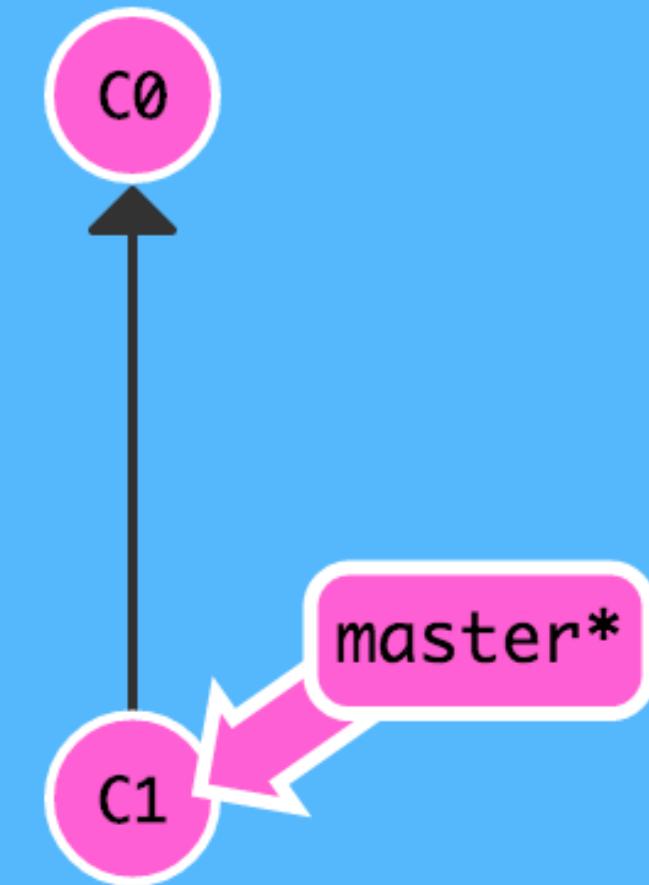
Git also maintains a history of which commits were made when. That's why most commits have ancestor commits above them -- we designate this with arrows in our visualization.

Maintaining history is great for everyone working on the project!

On the right we have a visualization of a (small) git repository.

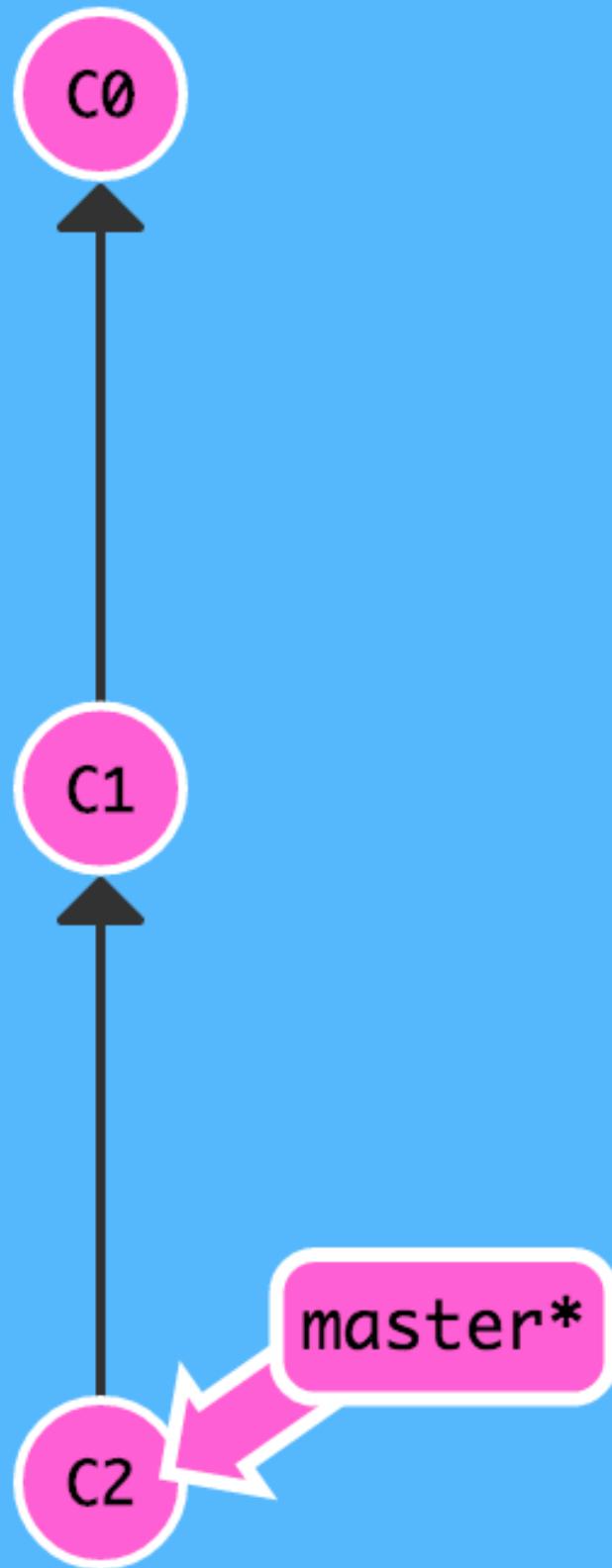
There are two commits right now -- the first initial commit, C<sub>0</sub>, and one commit after that, C<sub>1</sub>, that might have some meaningful changes.

What happens if we commit a change?



There we go! We just made changes to the repository and saved them as a commit 😊

The commit we just made has a parent, C1, which references which commit it was based off of.



branch

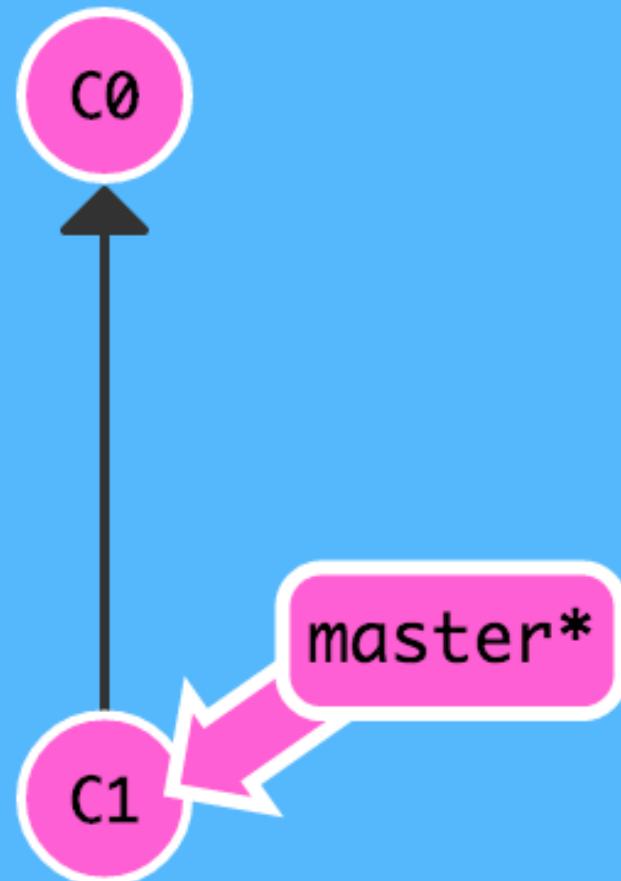
# BRANCHES ARE...

- pointers to a **specific commit**
- a way to work on features outside of the master branch (your production code, hopefully free of 🐛)

Let's see what branches look  
like in practice

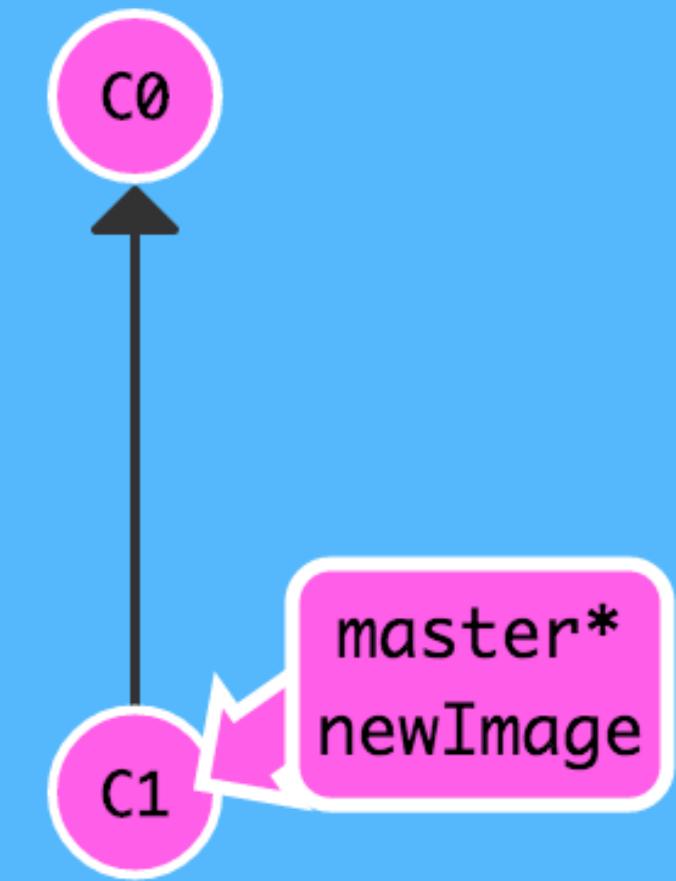
Here we will create a new  
branch named `newImage`  
with

`git branch newImage`

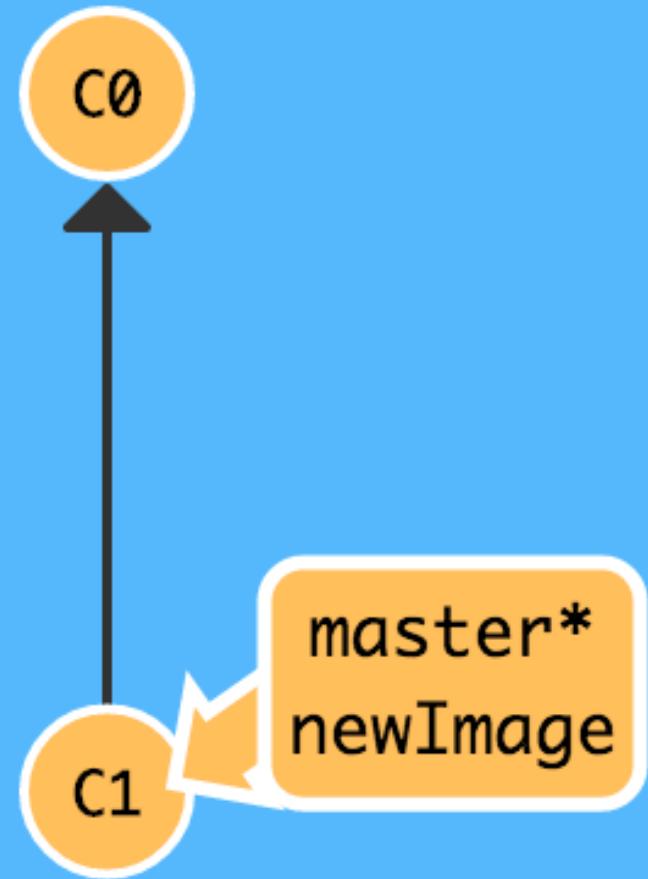


There, that's all there is to branching! 

The branch newImage now refers to commit C1

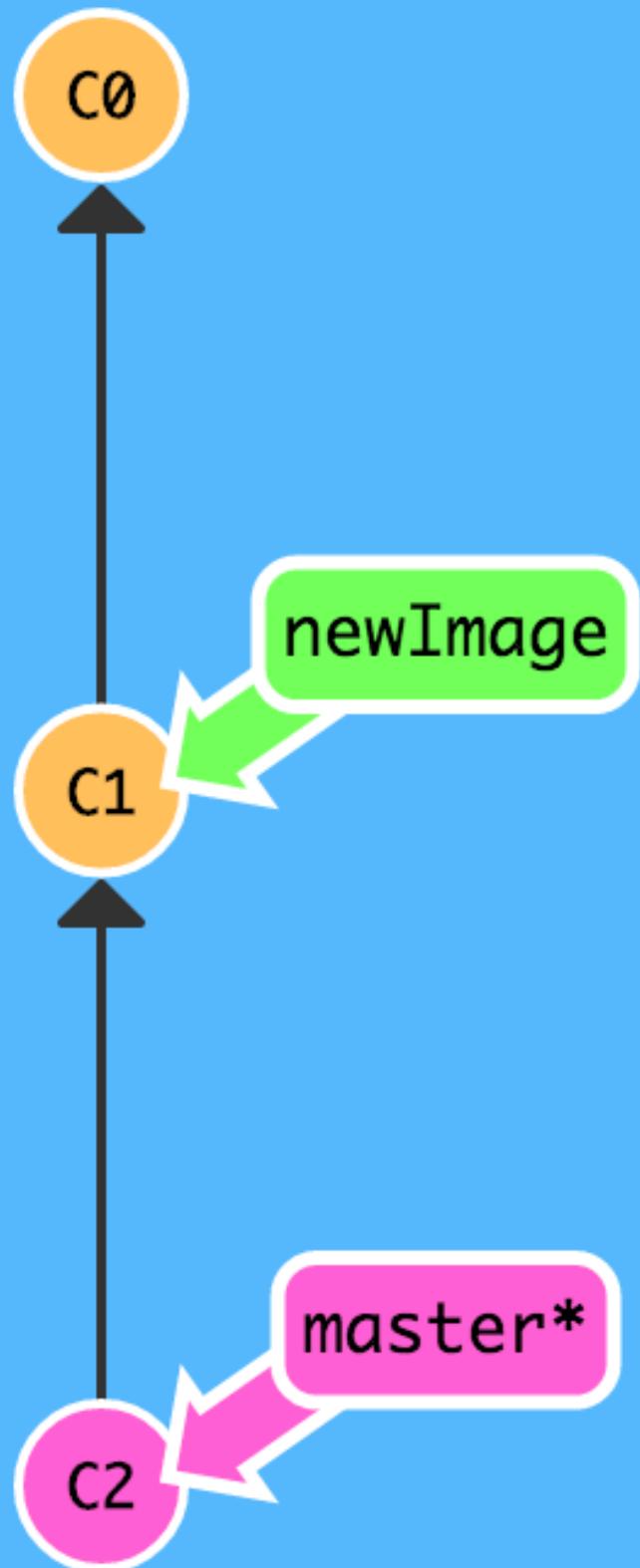


Let's try to put some work on  
this new branch...



Oh no! The master branch moved but the newImage branch didn't! 😞

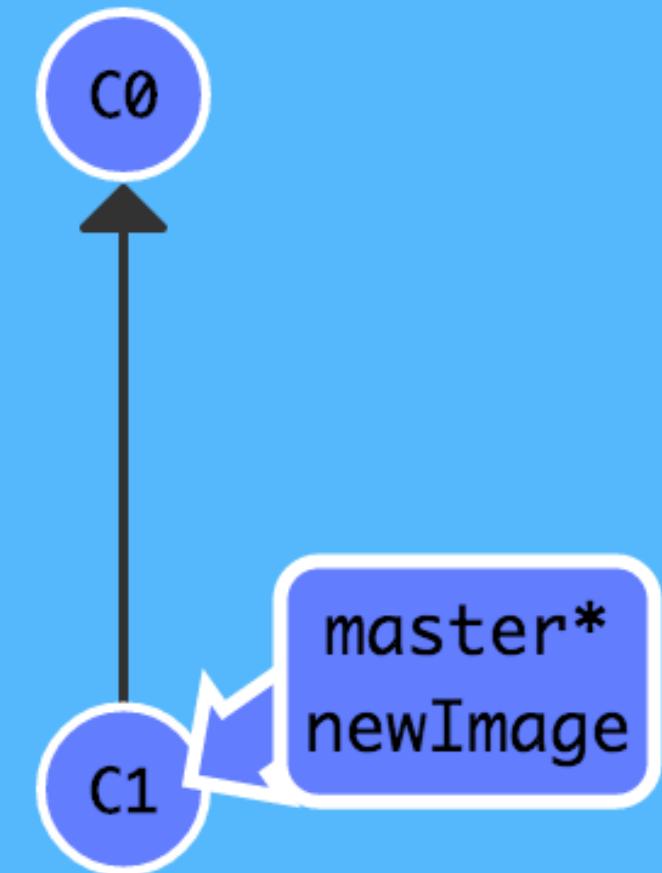
That's because we weren't "on" the new branch, which is why the asterisk was on master



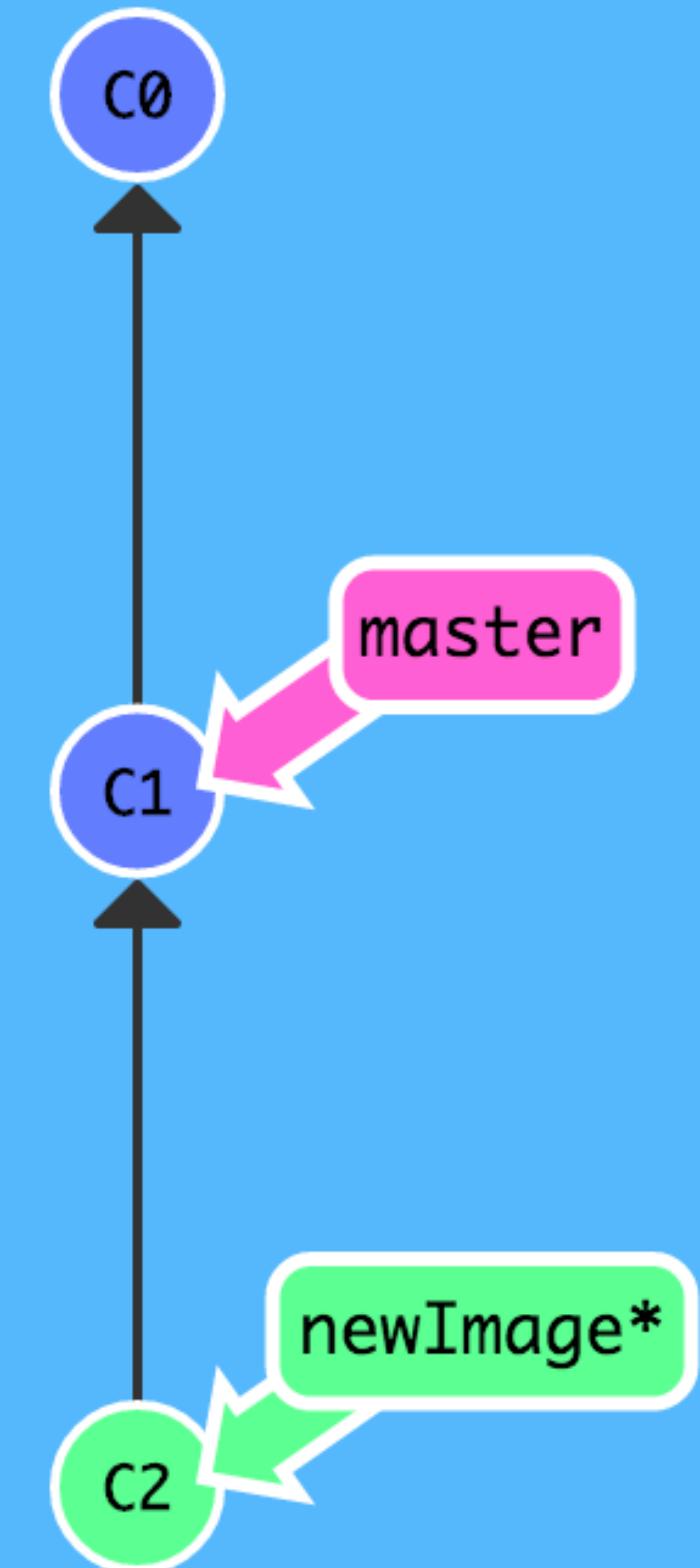
Let's tell git we want to  
checkout the branch with  
`git checkout newImage`

This will move us onto the new  
branch before committing our  
changes with

`git commit`



There we go!  
Our changes were recorded on  
the new branch



BUT HOW DO WE COMBINE  
BRANCHES?

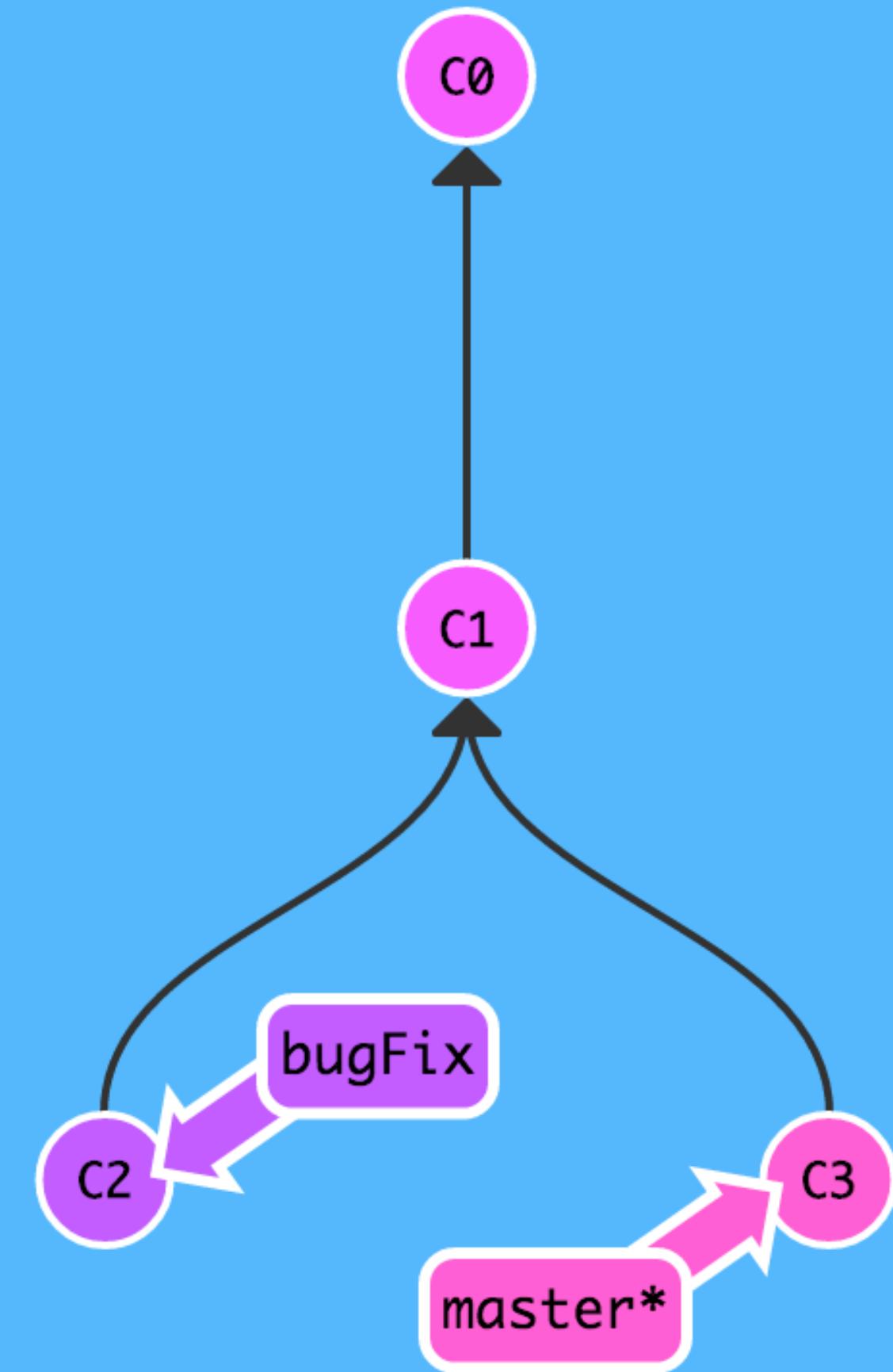


git merge

Here we have two branches; each has one commit that's unique. This means that neither branch includes the entire set of "work" in the repository that we have done.  
Let's fix that with merge

We will merge the branch bugFix into master with

`git merge bugFix`



**master** now points to a commit that has two parents

If you follow the arrows up the commit tree from **master**, you will hit every commit along the way to the root

This means that **master** contains all the work in the repository now

