

# Git and You

## a beginners guide to commitment issues

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M&M Meeting  
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# Introduction to

- Version Control 101
- Git
  - Terminology
  - An illustrated diagram through time of a project using git
- Introduction to Github
- Git with R
  - Demo

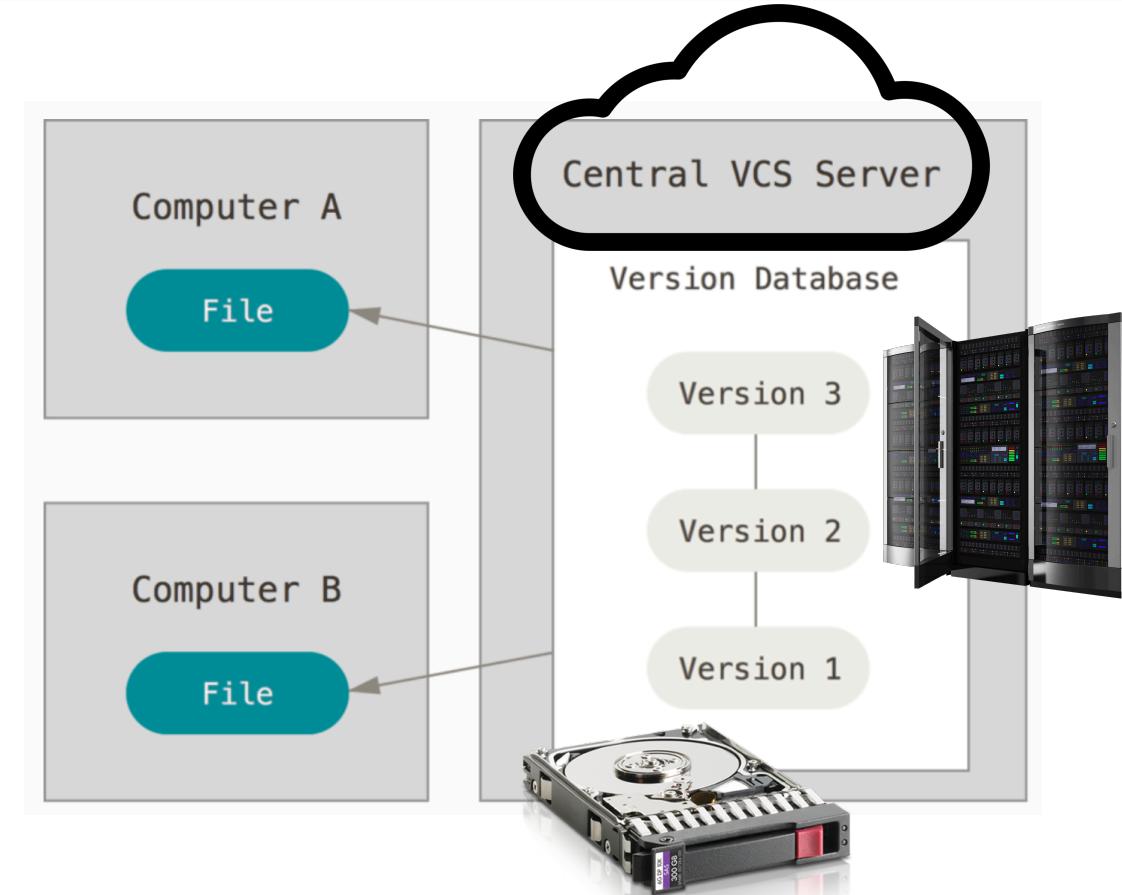
# Version Control

# Version Control: What is it?

- **Version control** is a system that records changes to files over time so that you can go back to specific **versions** later
- Most people use home-grown version control systems already
  - (“iva\_paper\_1”, “iva\_paper\_final”...maybe even “iva\_paper\_1127\_0803”)
  - We all know where this is going....
    - iva\_paper\_final\_final
      - iva\_paper\_final\_final\_final
      - iva\_paper\_final\_final\_final\_final
- Many different types of Version Control systems
  - Local — your computer only
  - Centralized — one server everybody reads from
  - Distributed — everybody has all the information and history

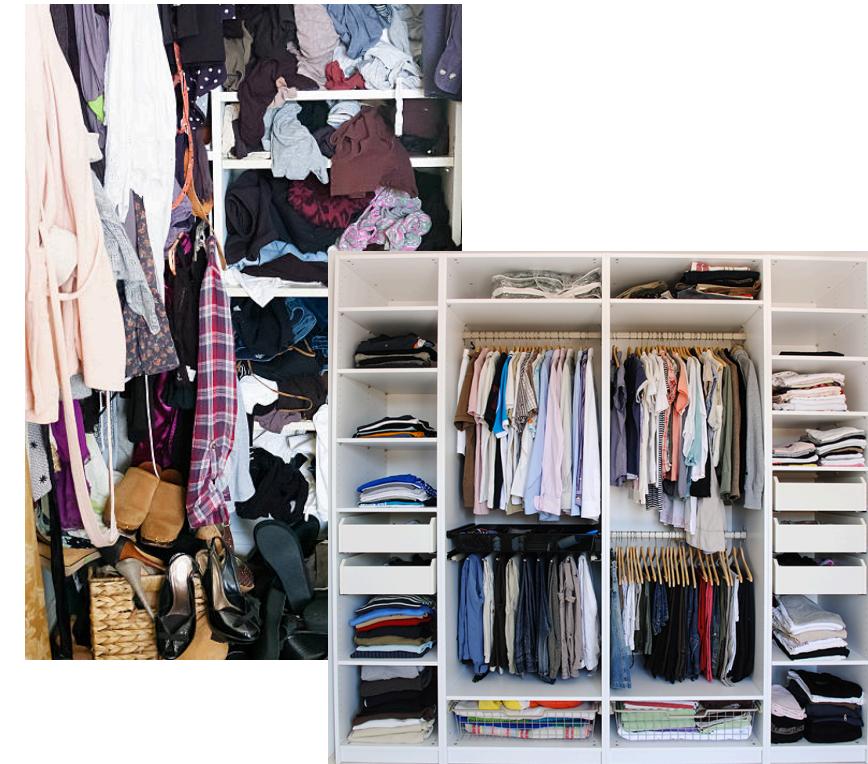
## Version Control: Centralized & Distributed Systems

- One place for everything, accessible from multiple computers
  - Google Drive
  - Overleaf (LaTeX)
  - Github

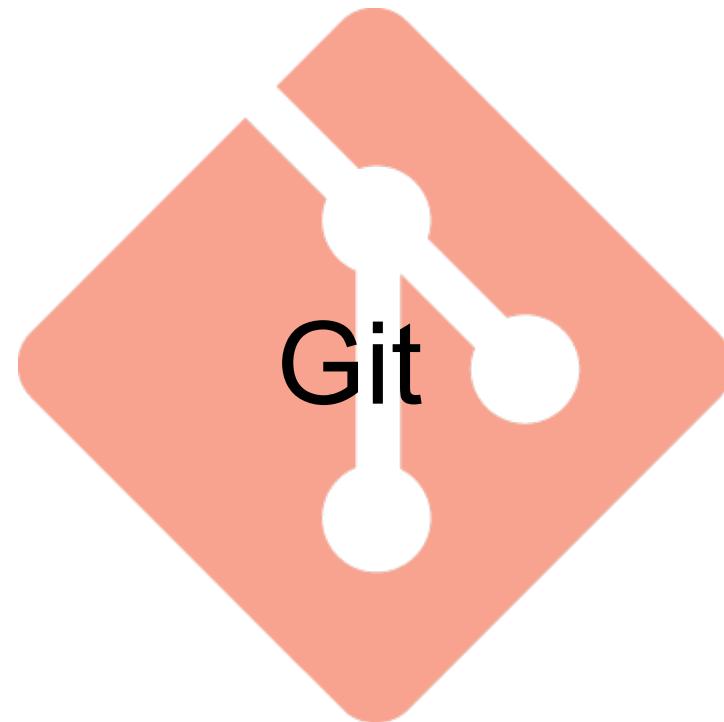


# Version Control 101: Why Bother?

- Cannot lose work
  - Impervious to “oh shit” moments
- Go back in time
- Neat and tidy changes
  - Know who’s responsible for what
  - Auto-Organized drafts
  - Manageable chunks

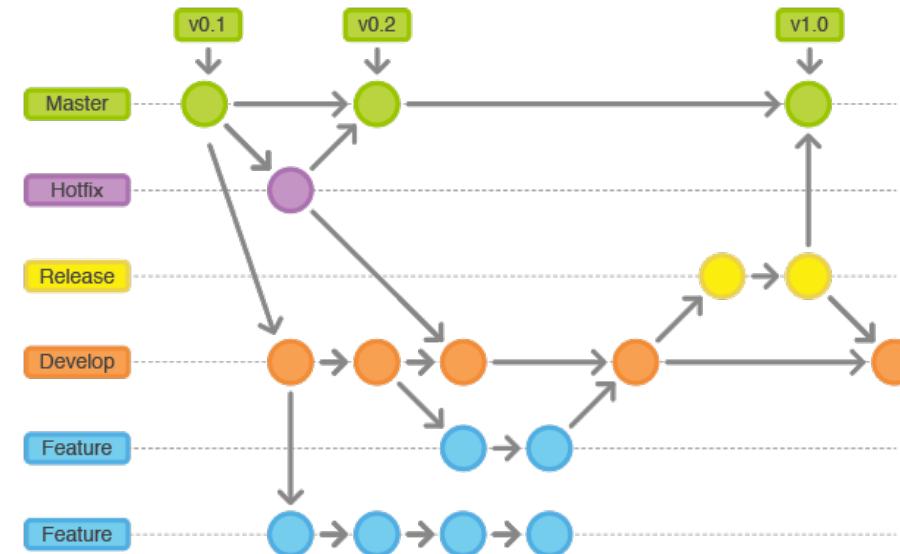


# Version Control and Git are not the same thing



# Git: A Network-Based, Collaborative, Graphical Revision Control Tool

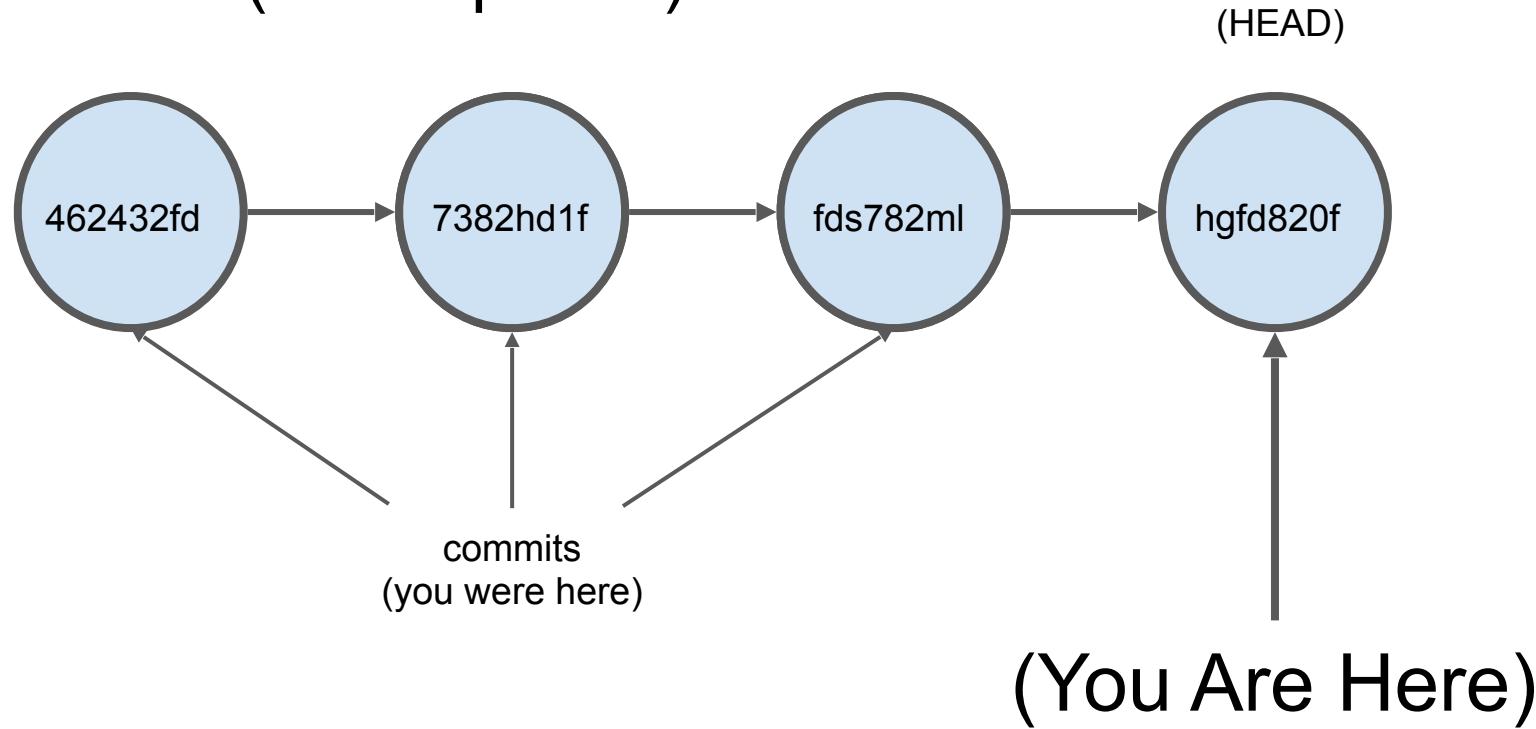
- Network-Based: Online and offline copies
- Collaborative: Multi-user change integration
- Graphical: Not *visual*, graphical as in *graphs*



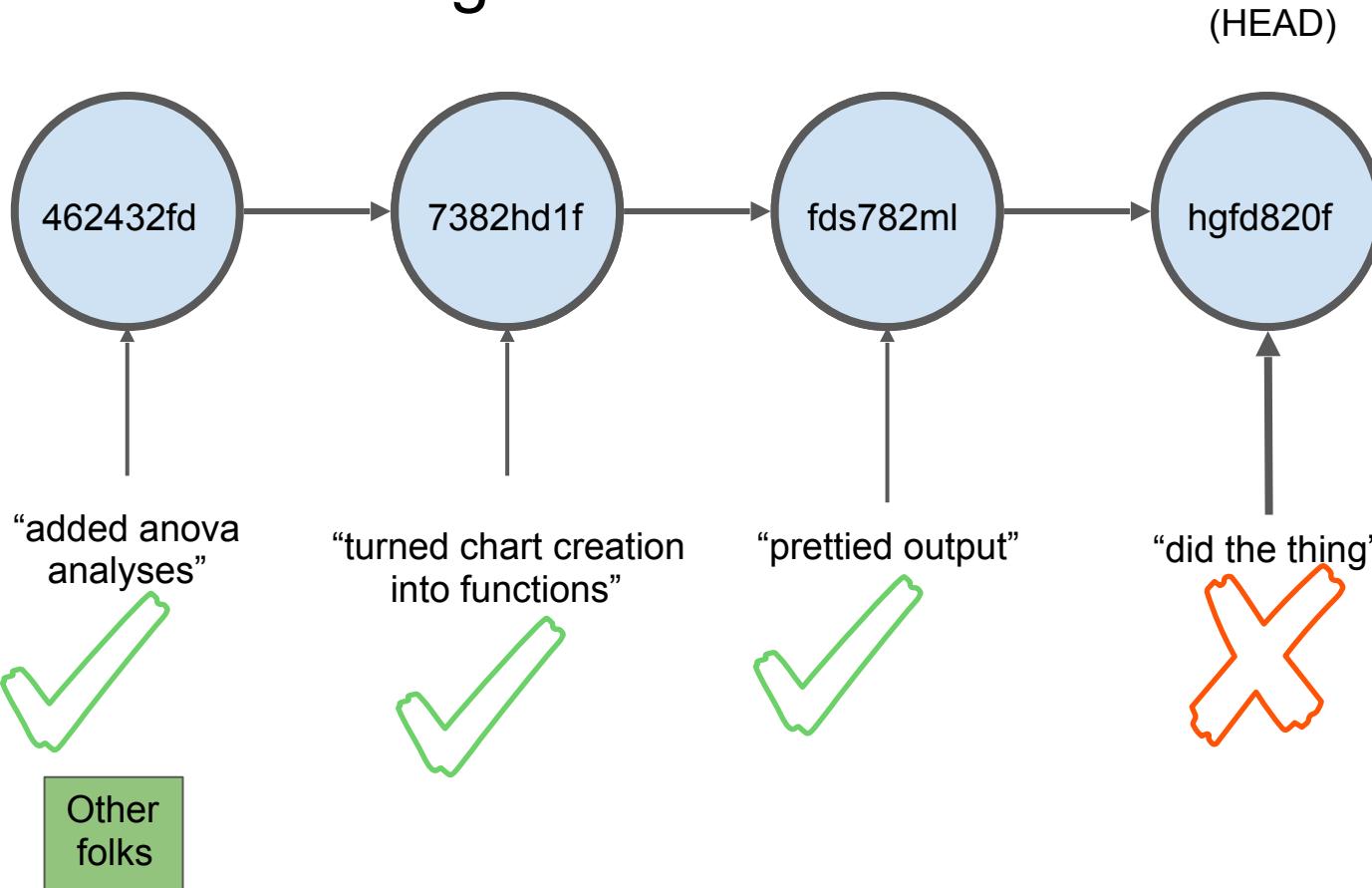
# Terminology: there's a lot of it

| <b>Git terminology</b> | <b>Normal language</b>  |
|------------------------|---|
| commit                 | checkpoint  |
| HEAD                   | Current position in history   |
| add/stage              | include files in a checkpoint                                       |
| branch                 | draft / working copy  |
| Master branch          | “Good” copy   |
| push/pull              | Saving changes/Getting new changes                                  |
| Merge conflict         | Slightly more advanced incorporate good draft changes into my draft |
| checkout               | Go back to earlier draft  |

# Commits (Checkpoints)

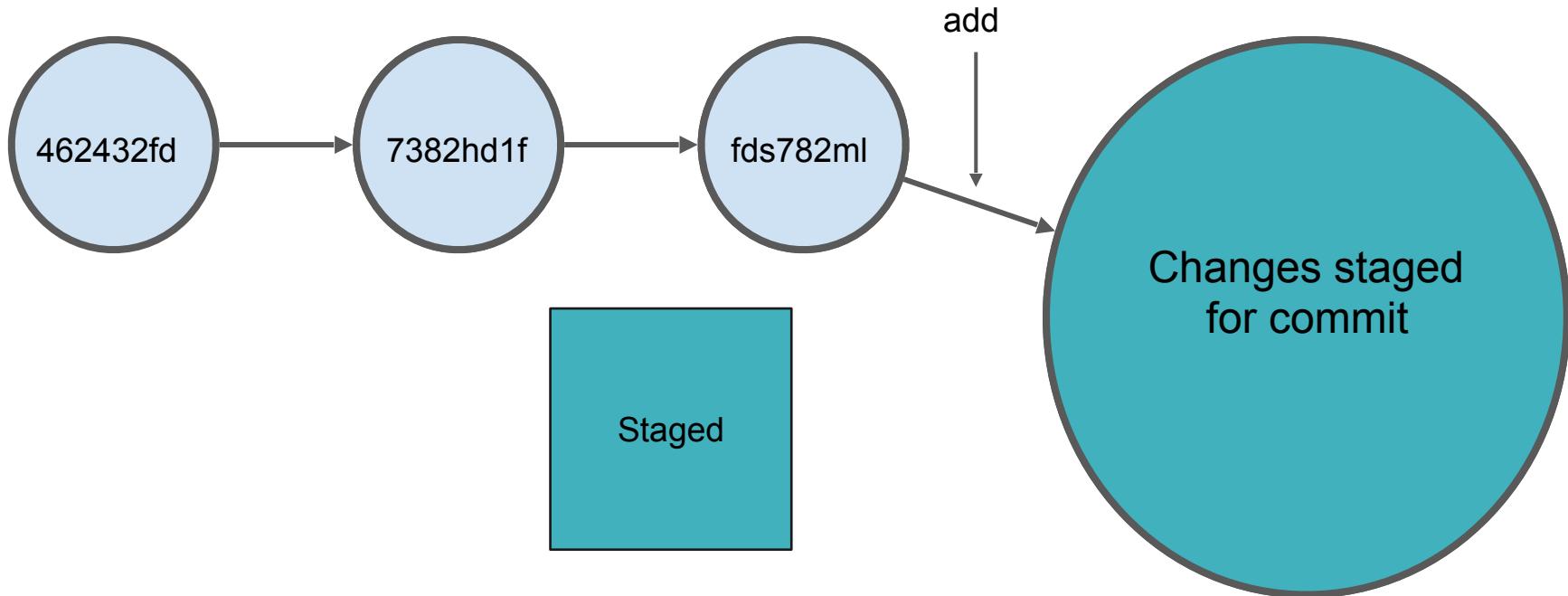


# Commits Messages



# Staging (Adding Files to a Commit)

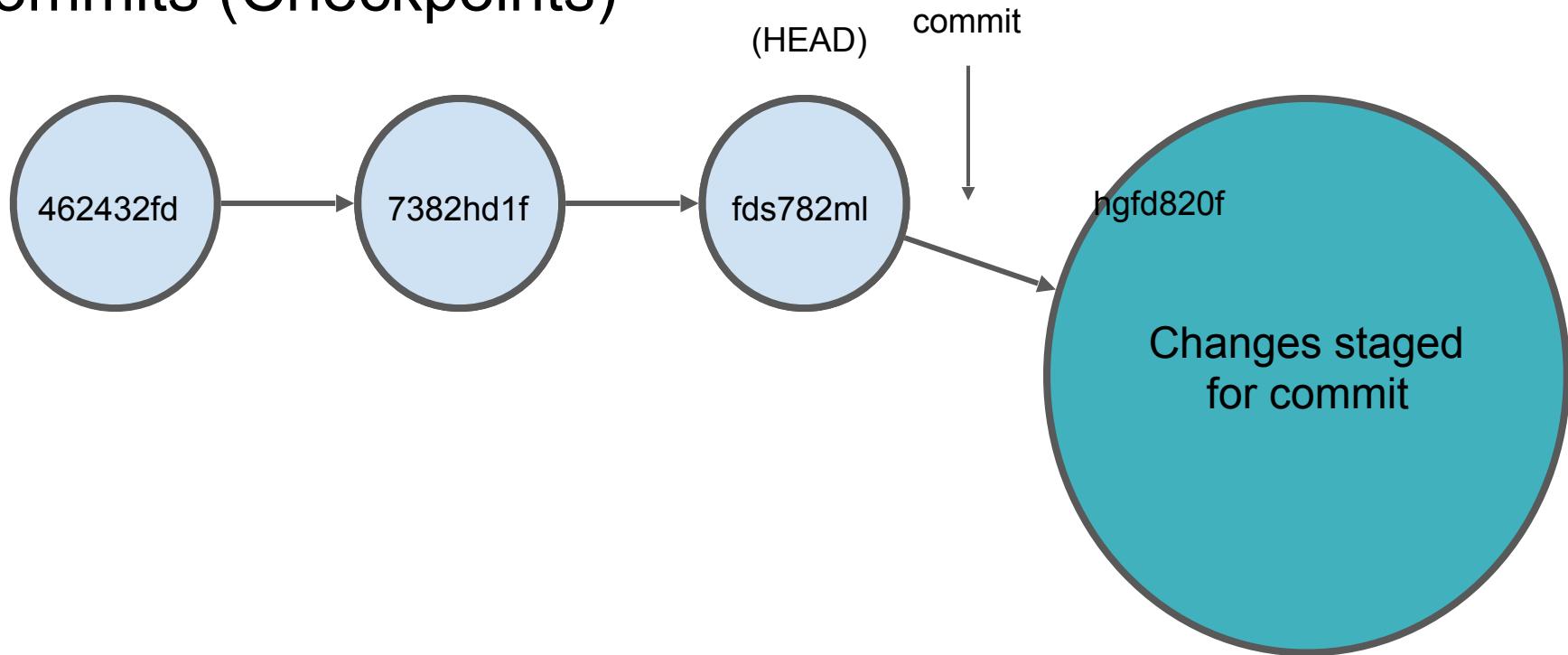
(HEAD)



you

Other  
folks

# Commits (Checkpoints)

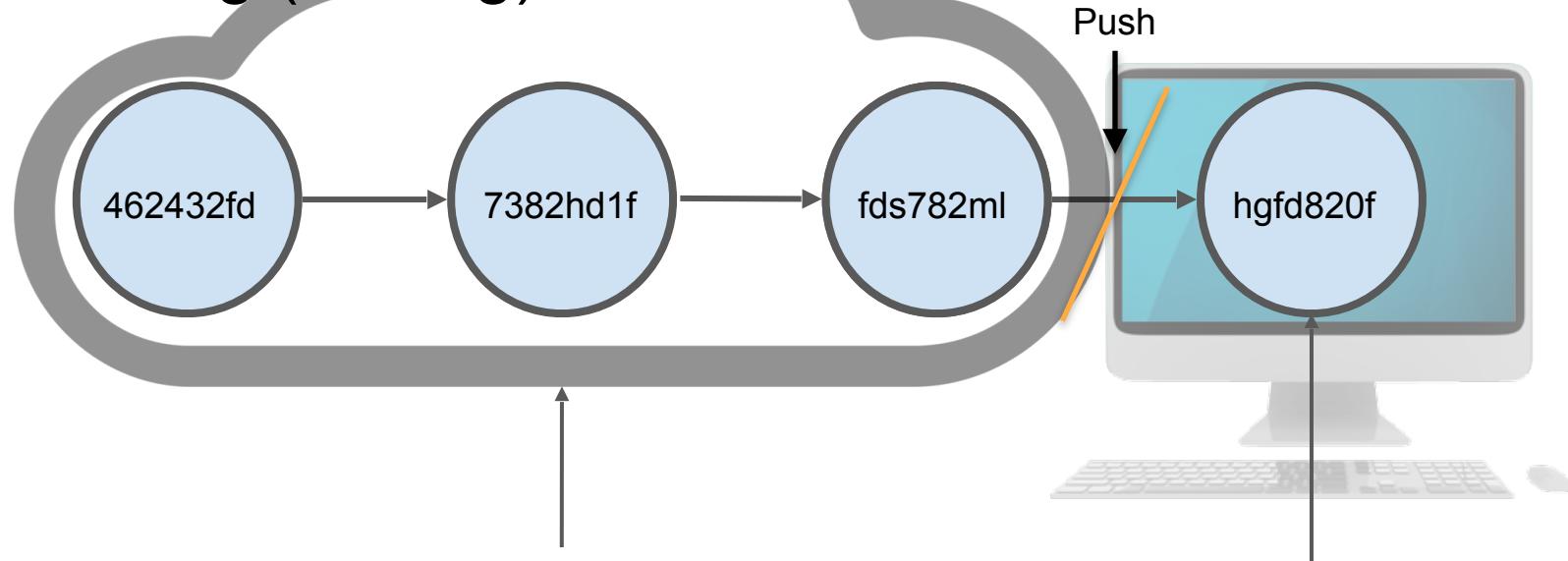


you

Other  
folks

Staged

# Pushing (Saving)



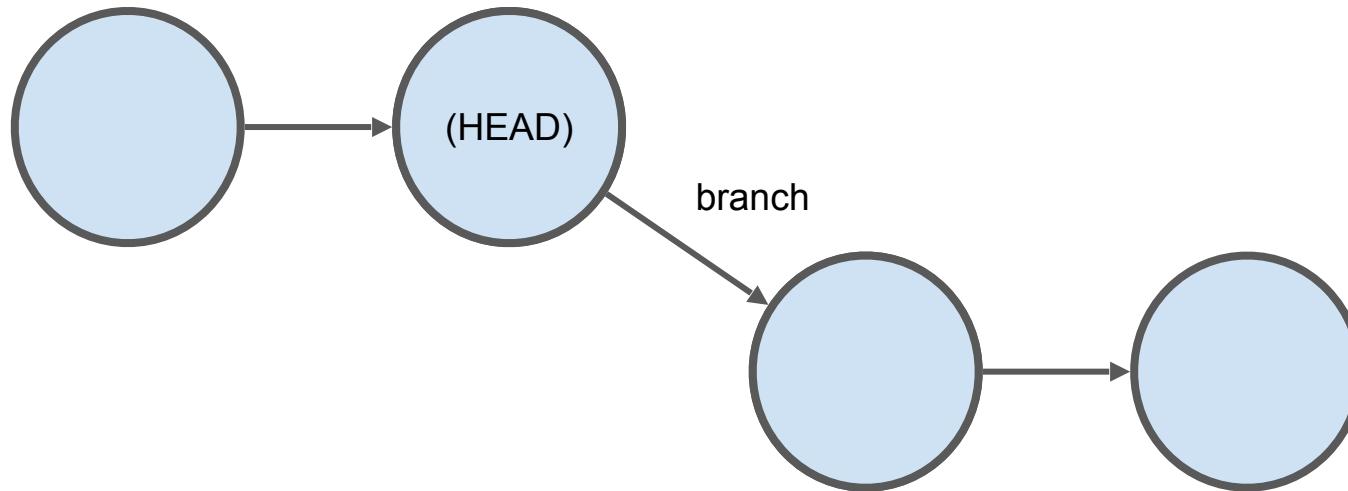
These commits live  
on the network  
(remote)

Right now this  
commit is on our  
computer (local)

you

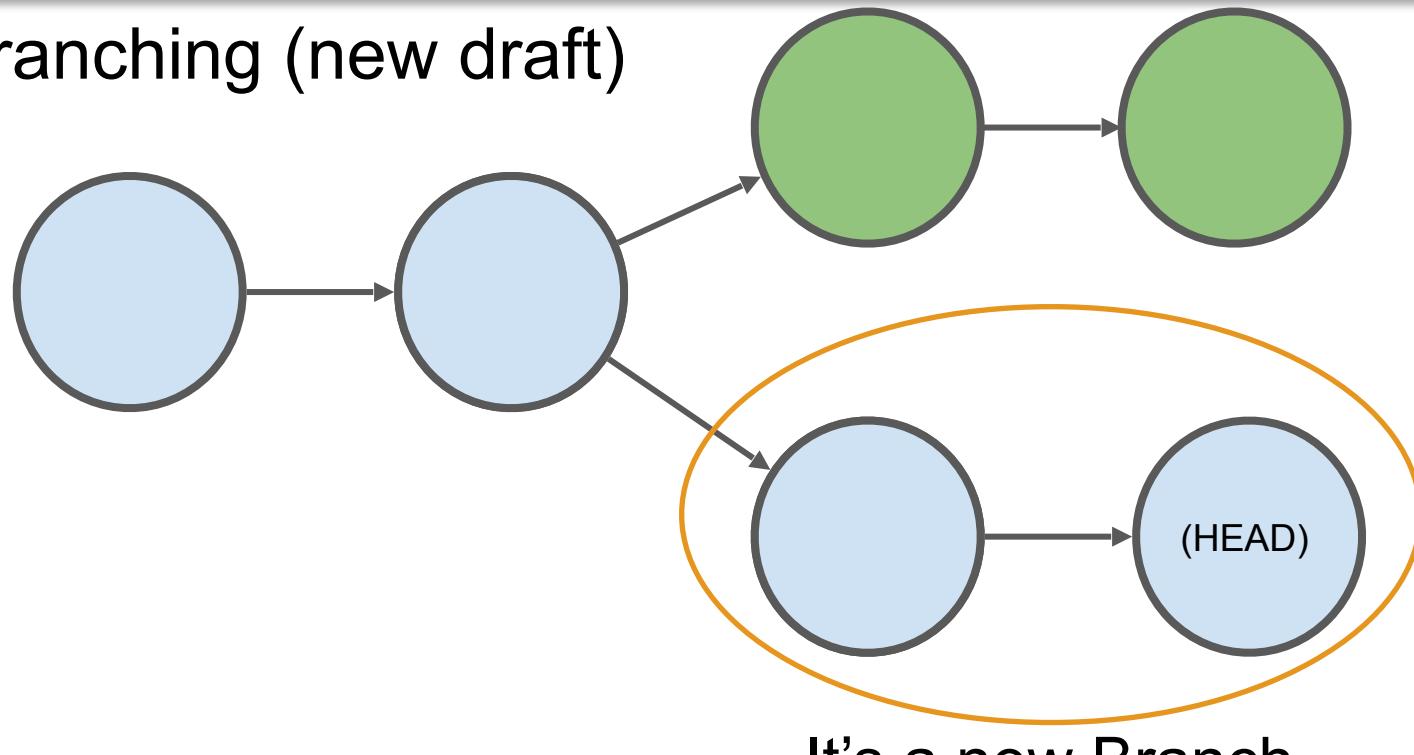
Other  
folks

# Branching (new draft)



It's a new Branch

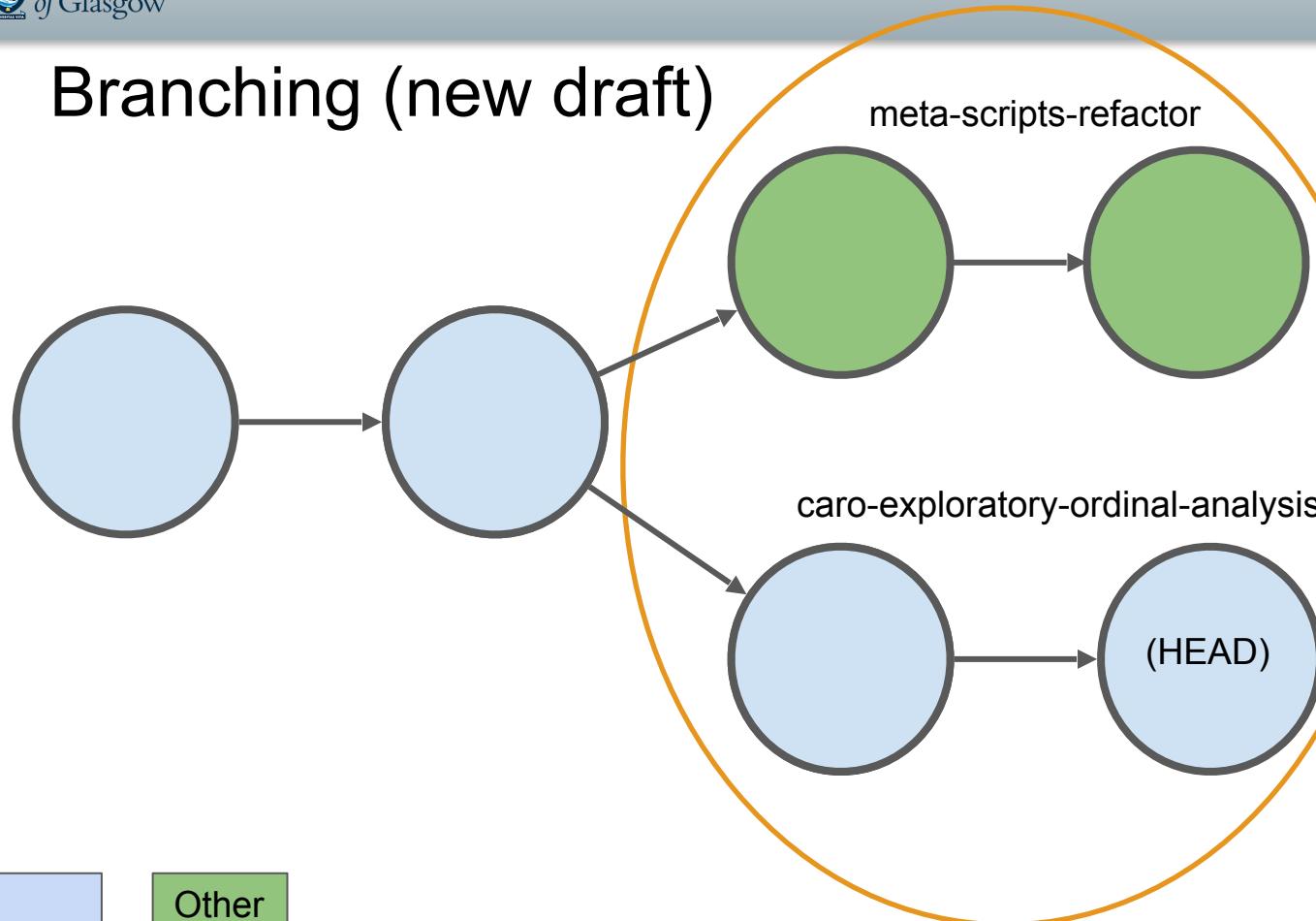
# Branching (new draft)



you

Other  
folks

# Branching (new draft)



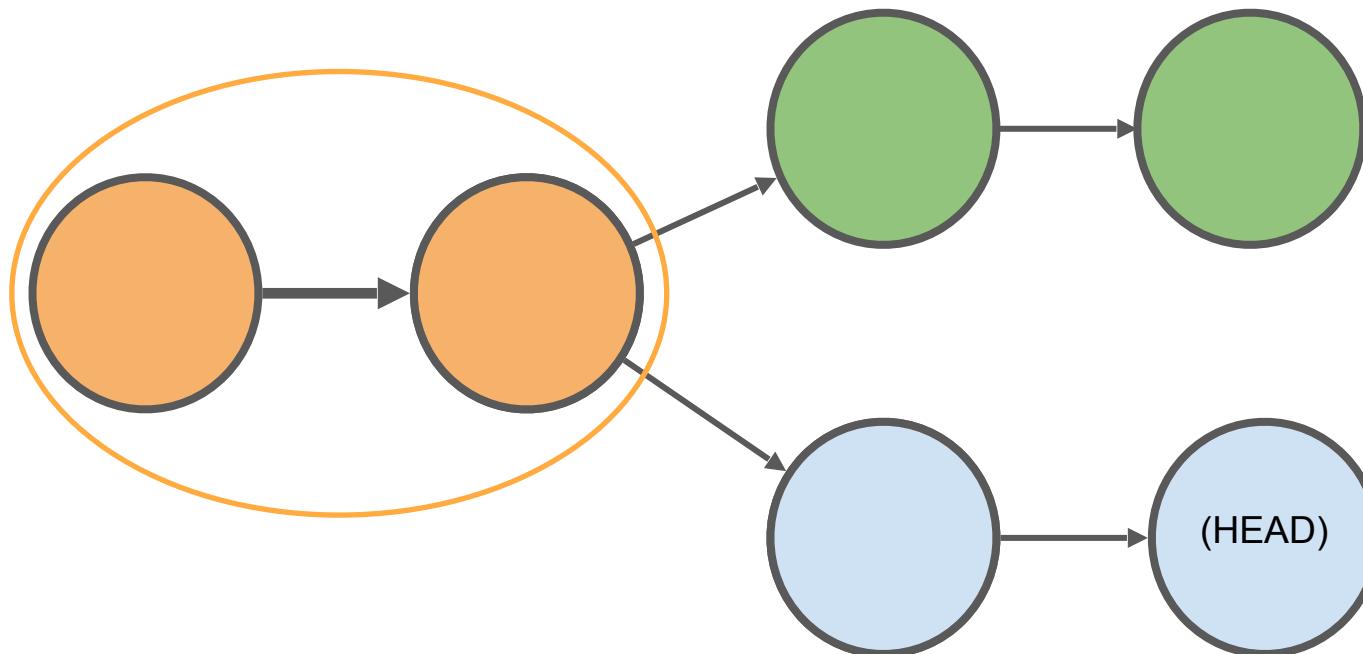
## Reasons to Branch:

1. Organize new features
2. Keep track of individual work
3. Explore something you suspect might muck up the repository

you

Other  
folks

# The Master Branch (“Good” Copy)

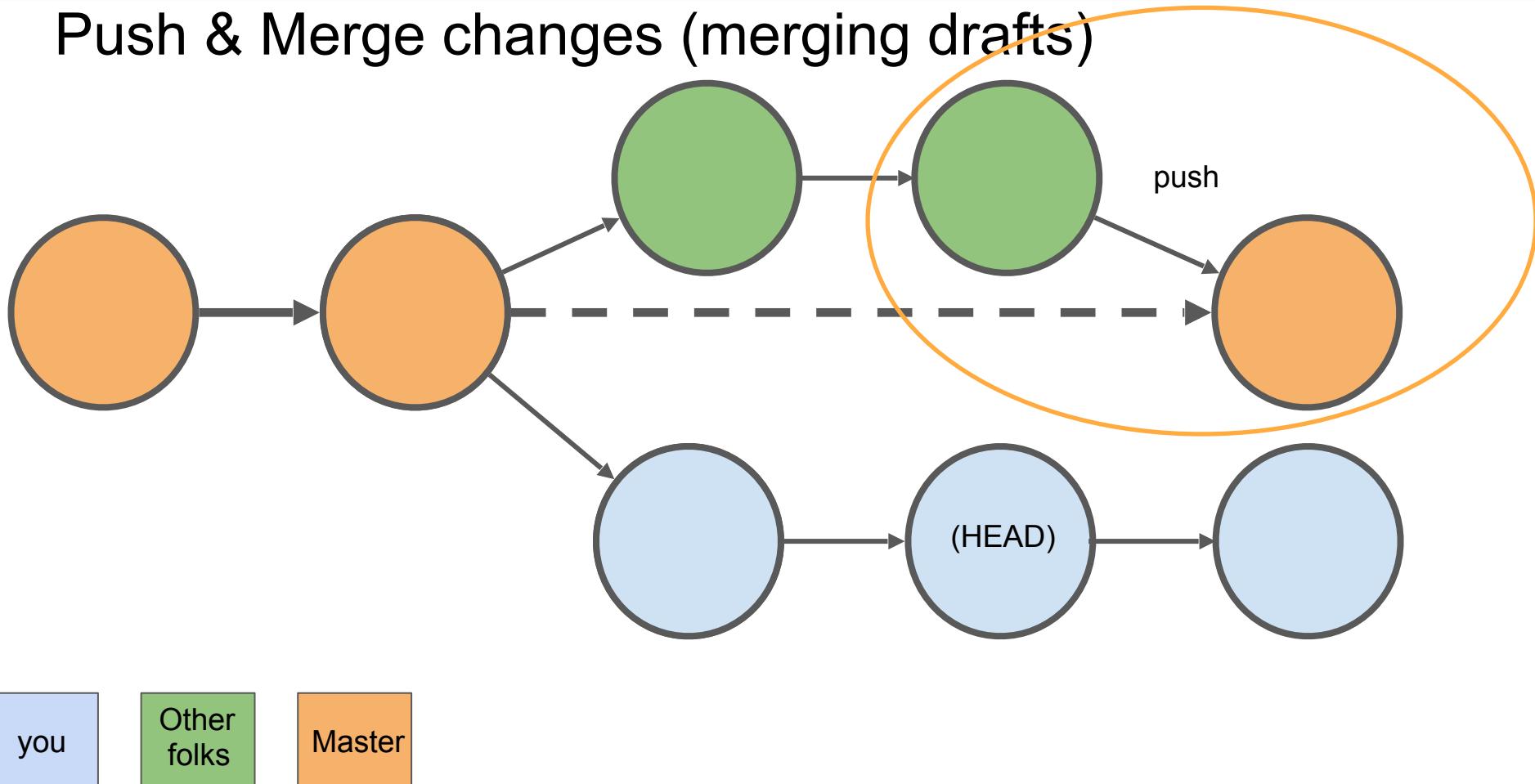


you

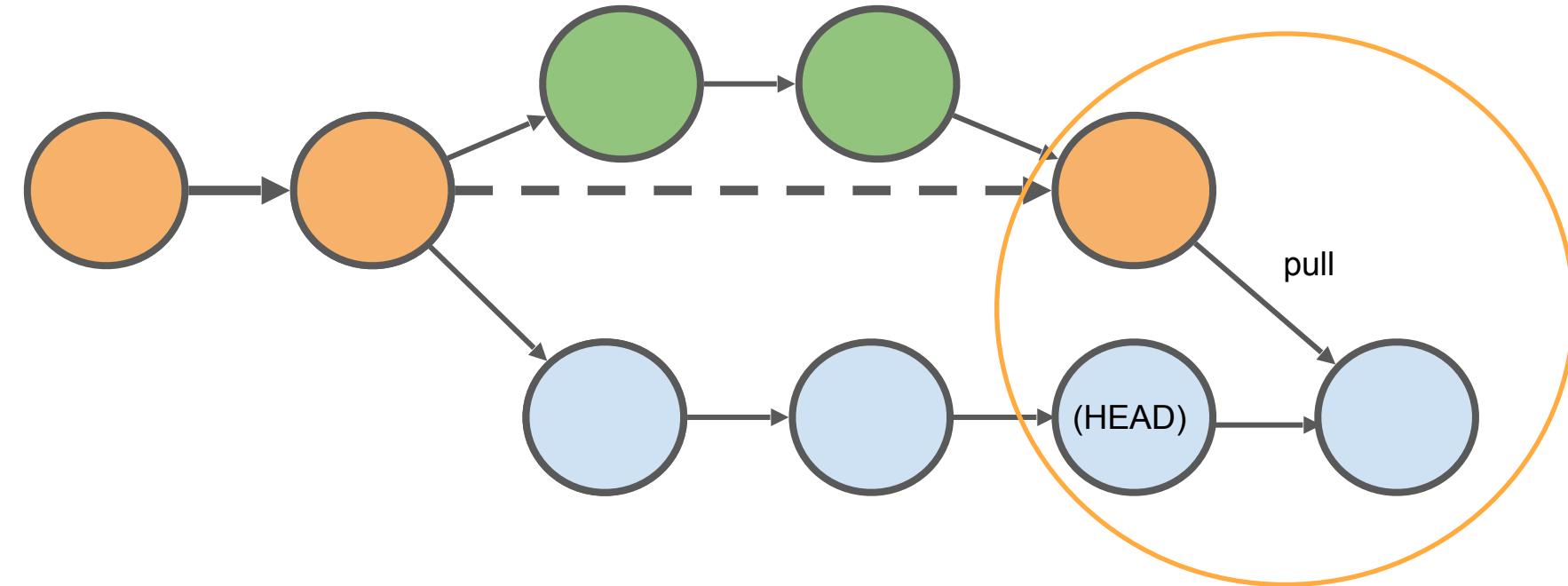
Other  
folks

Master

# Push & Merge changes (merging drafts)



# Pulling/Merging changes (Getting recent changes)

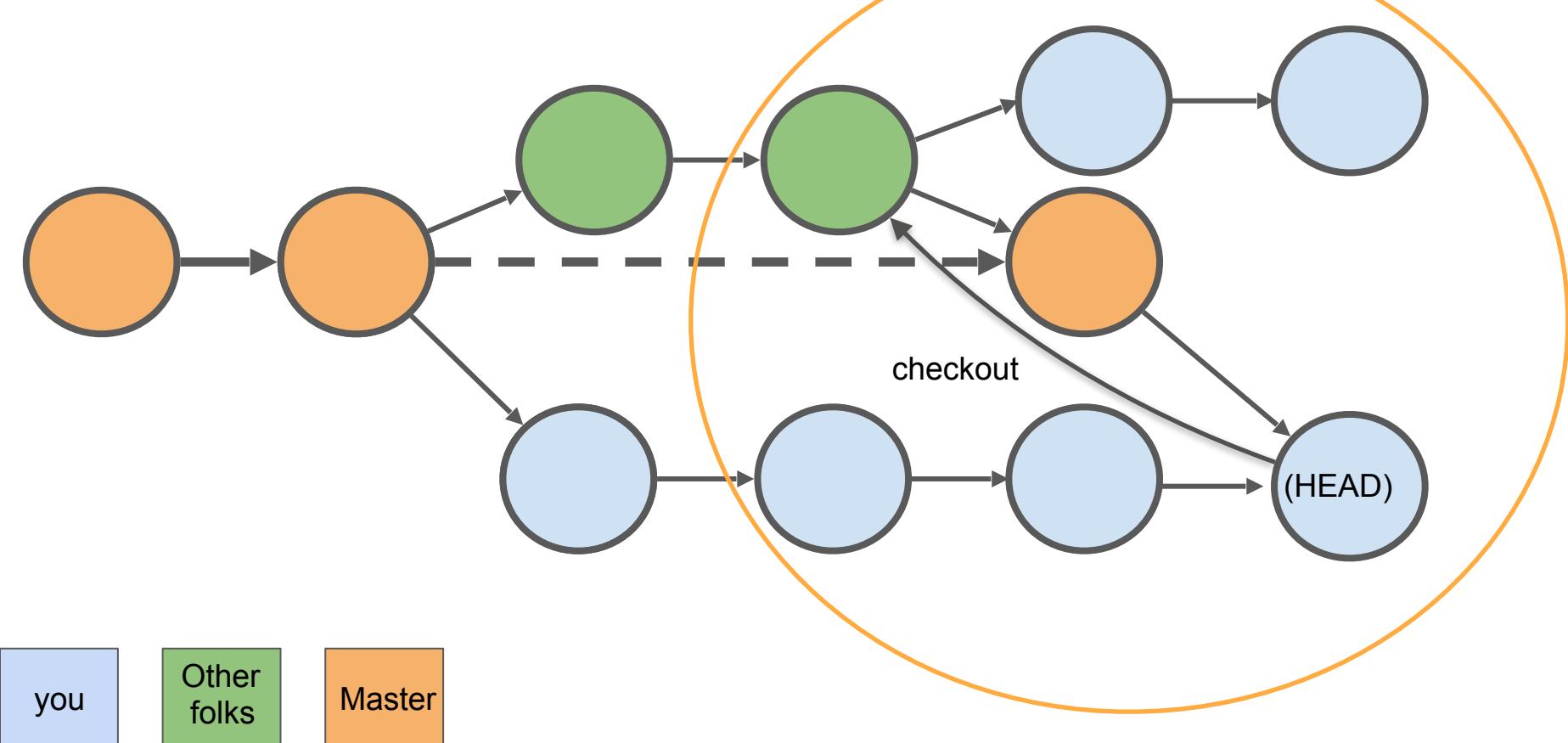


you

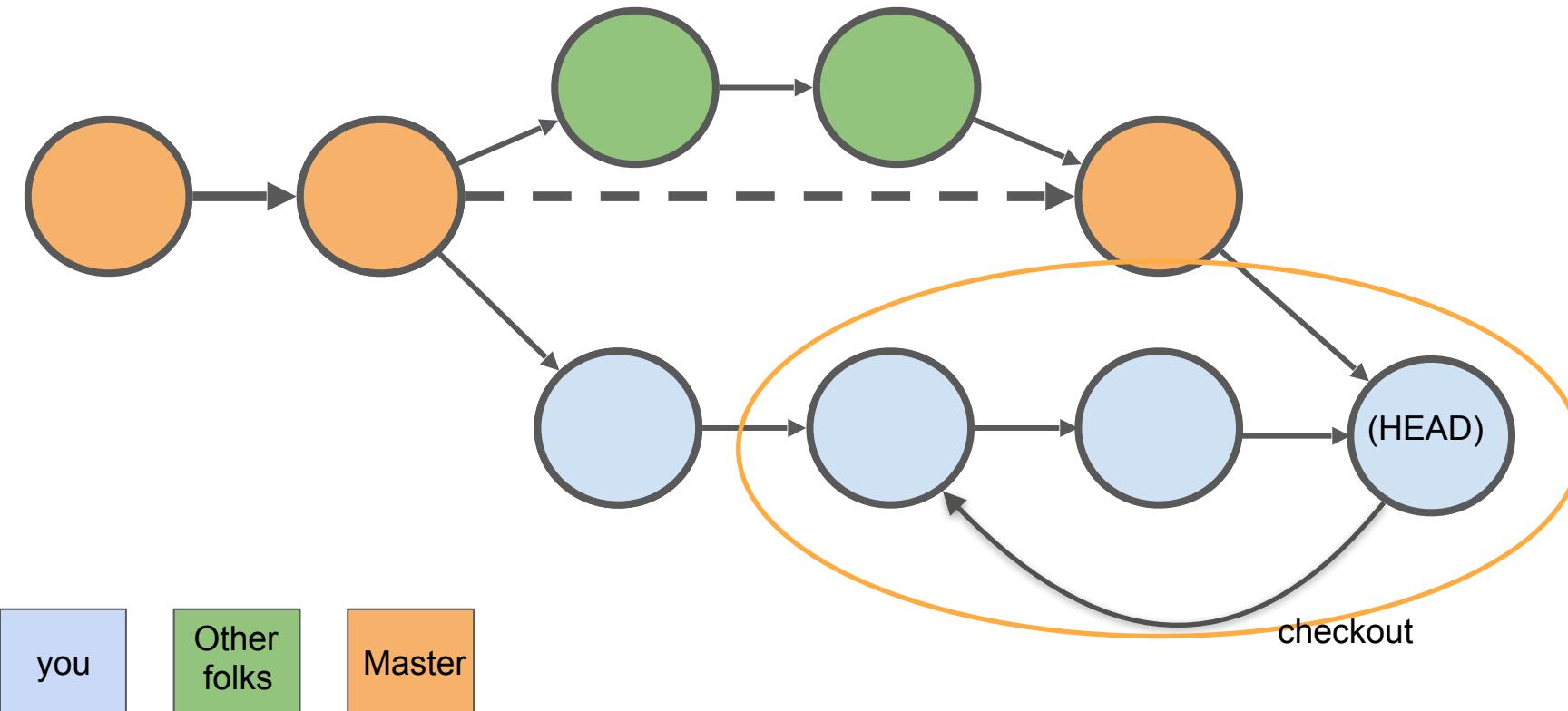
Other  
folks

Master

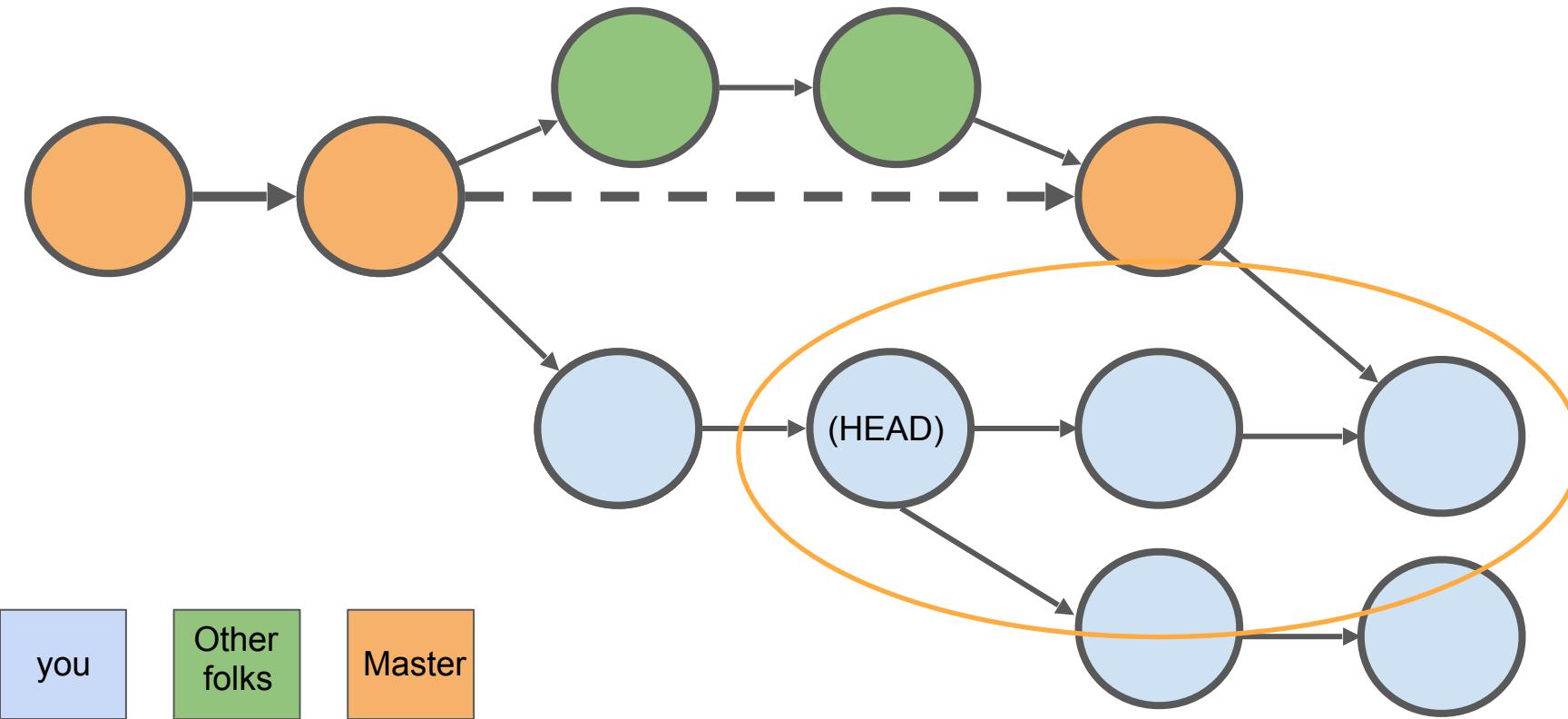
# Checkout a branch (go back to a previous checkpoint)



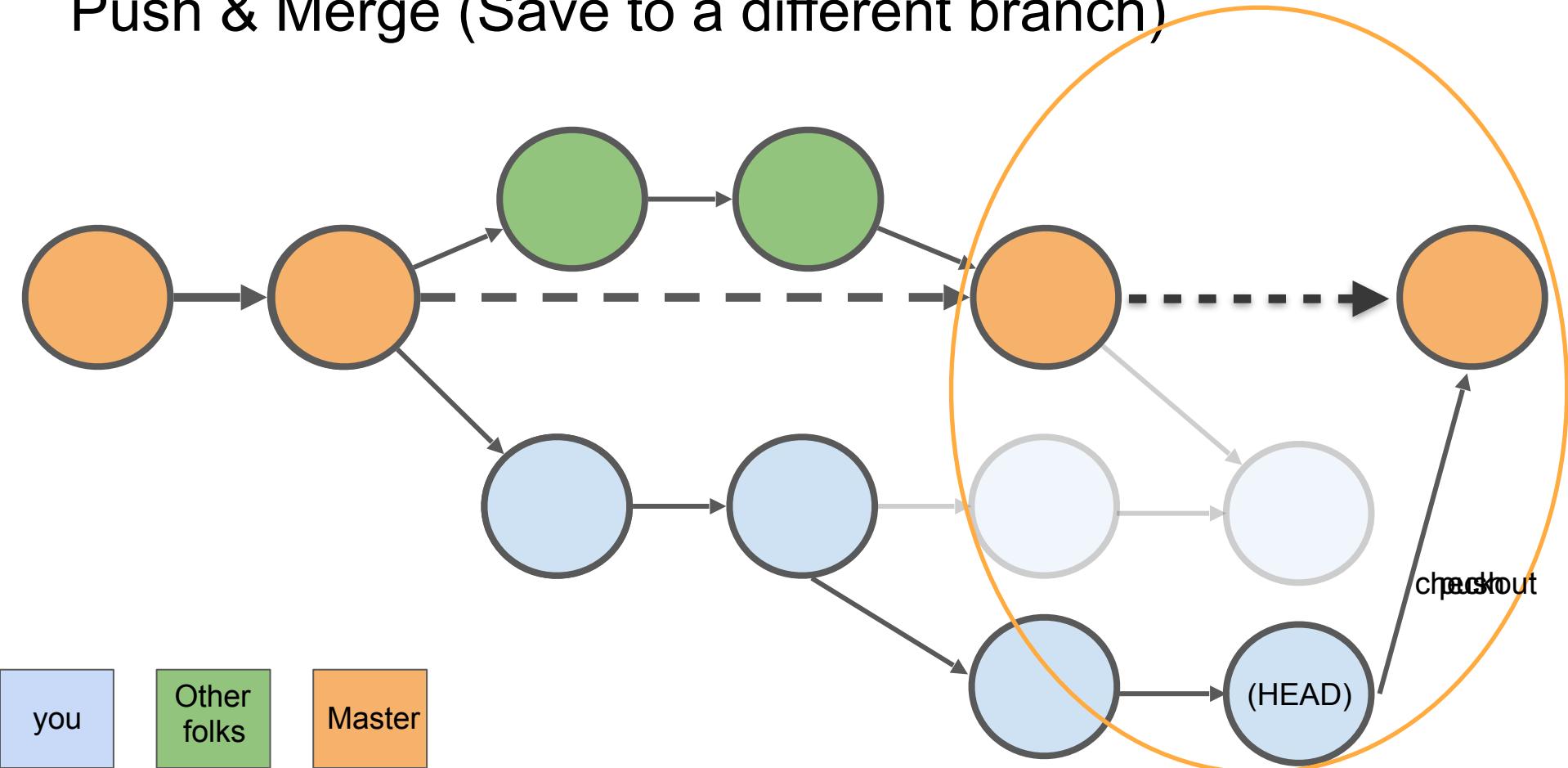
# Checkout a commit (go back to a previous checkpoint)



Checkout a commit (go back to a previous checkpoint)



# Push & Merge (Save to a different branch)



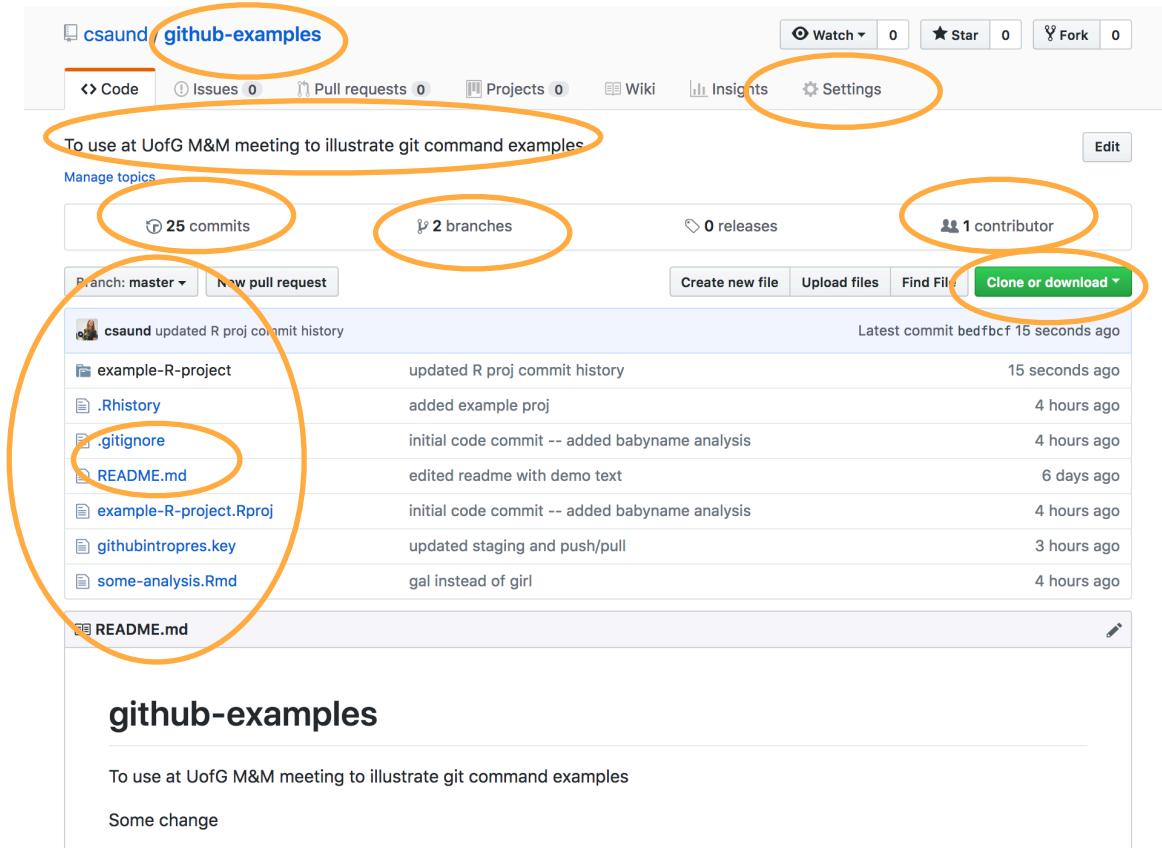
That's (basically) it!



# GitHub

# Github - An Interface for Git

- Repository Name
- Description
- Files
- README
- History
- Branches
- Recent Changes
- Lots more stuff



The screenshot shows a GitHub repository page for 'csaund/github-examples'. The repository name is at the top left, with a 'Watch' button, star count (0), fork count (0), and a 'Settings' button. Below the header is a note: 'To use at UoG M&M meeting to illustrate git command examples'. A 'Manage topics' link is also present.

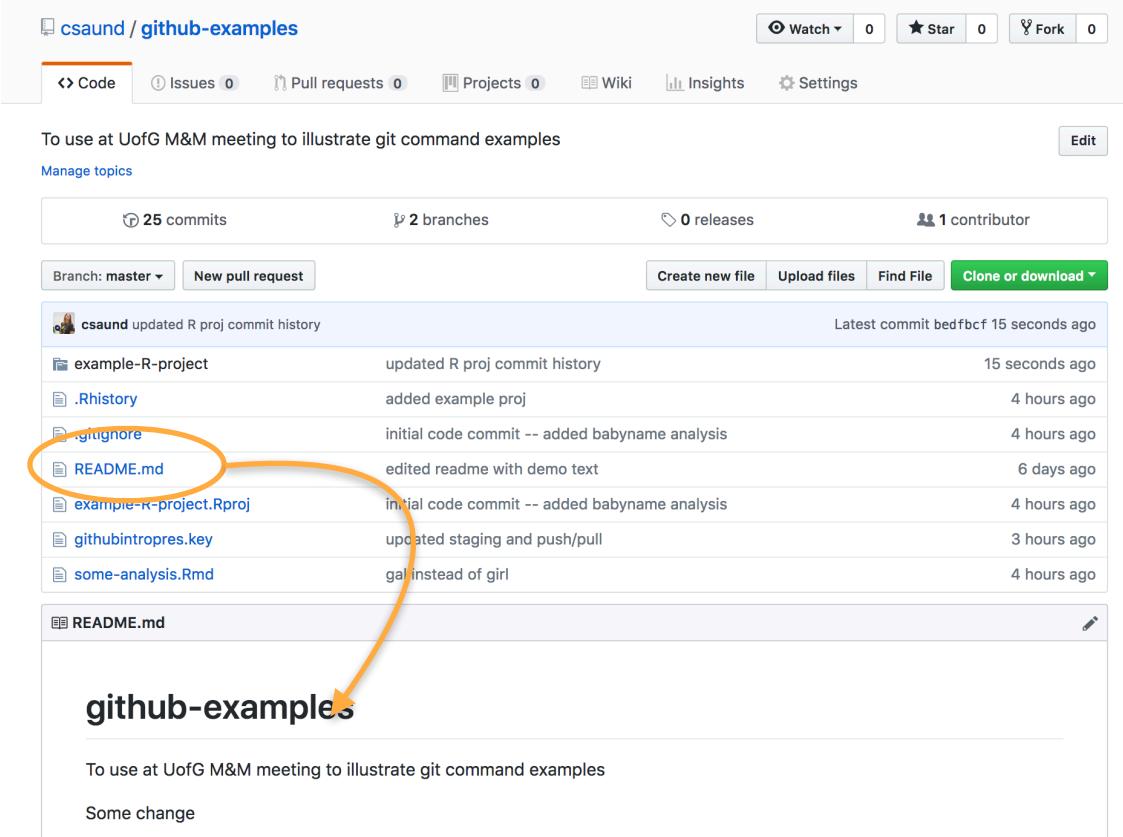
Key statistics are displayed: 25 commits, 2 branches, 0 releases, and 1 contributor. A 'Clone or download' button is highlighted with an orange circle. The commit history lists several recent changes:

- csaund updated R proj commit history (15 seconds ago)
- example-R-project updated R proj commit history (15 seconds ago)
- .Rhistory added example proj (4 hours ago)
- .gitignore initial code commit -- added babynname analysis (4 hours ago)
- README.md edited readme with demo text (6 days ago)
- example-R-project.Rproj initial code commit -- added babynname analysis (4 hours ago)
- githubintropres.key updated staging and push/pull (3 hours ago)
- some-analysis.Rmd gal instead of girl (4 hours ago)

A large orange circle highlights the file list on the left, which includes .gitignore, README.md, example-R-project.Rproj, githubintropres.key, some-analysis.Rmd, and README.md again. At the bottom, there's a note: 'To use at UoG M&M meeting to illustrate git command examples' and the text 'Some change'.

# Github - An Interface for Git

- README
  - Just another file
  - Everything you need to know “at a glance” about the repository
    - how to run
    - TOC
- Shows up in the splash page of the repo!



The screenshot shows a GitHub repository page for 'csaund/github-examples'. The page includes a header with repository statistics (25 commits, 2 branches, 0 releases, 1 contributor), a commit list, and a detailed view of the 'README.md' file.

**Repository Header:**

- Code
- Issues 0
- Pull requests 0
- Projects 0
- Wiki
- Insights
- Settings

To use at UoG M&M meeting to illustrate git command examples

**Commit List:**

| File                    | Commit Message                                  | Time Ago                             |
|-------------------------|---|--------------------------------------|
| .Rproj                  | updated R proj commit history                   | Latest commit bedfbfc 15 seconds ago |
| example-R-project       | updated R proj commit history                   | 15 seconds ago                       |
| .Rhistory               | added example proj                              | 4 hours ago                          |
| .gitignore              | initial code commit -- added babynames analysis | 4 hours ago                          |
| README.md               | edited readme with demo text                    | 6 days ago                           |
| example-R-project.Rproj | initial code commit -- added babynames analysis | 4 hours ago                          |
| githubintropres.key     | updated staging and push/pull                   | 3 hours ago                          |
| some-analysis.Rmd       | gal instead of girl                             | 4 hours ago                          |

**README.md Detail View:**

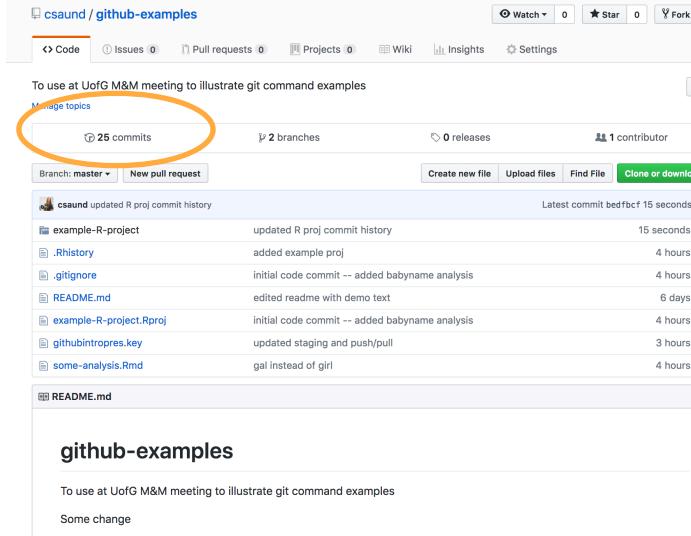
github-examples

To use at UoG M&M meeting to illustrate git command examples

Some change

# Github - An Interface for Git

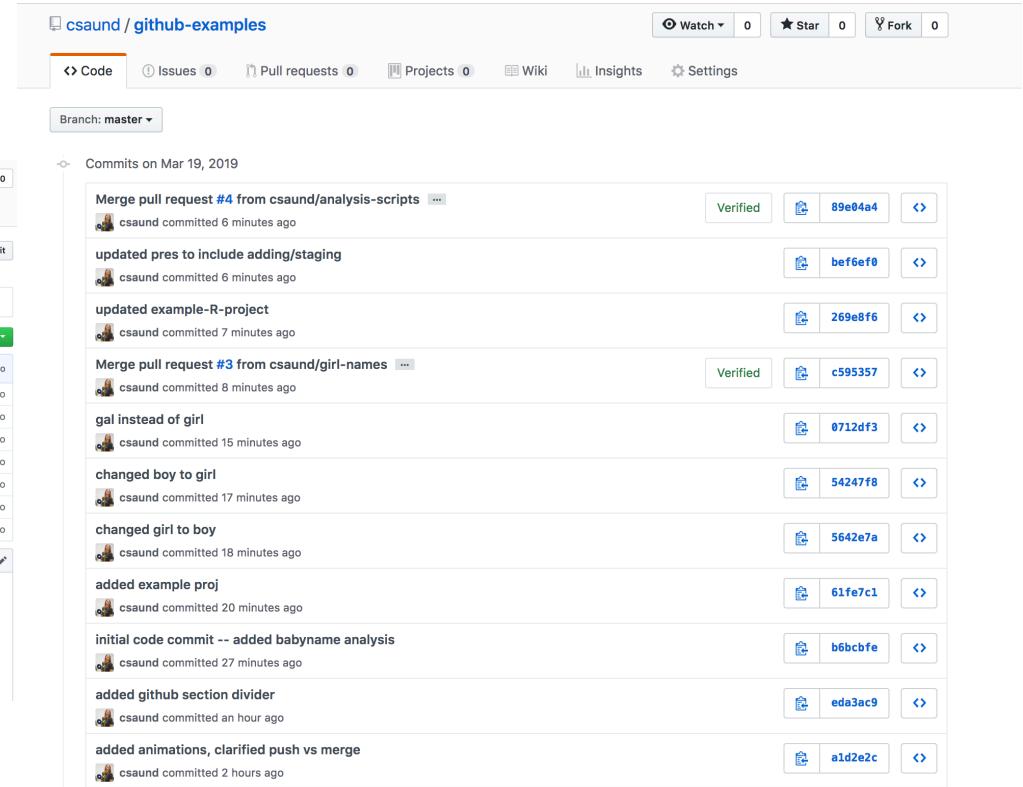
- History



The screenshot shows a basic GitHub repository interface. At the top, it displays the repository name "csaund / github-examples" and various navigation links: Watch (0), Star (0), Fork (0). Below this, a summary bar shows 25 commits, 2 branches, 0 releases, and 1 contributor. A dropdown menu indicates the branch is "master". A prominent orange circle highlights the "25 commits" link. The main content area lists recent commits:

- csaund updated R proj commit history (Latest commit bedfbefc 15 seconds ago)
- example-R-project updated R proj commit history (15 seconds ago)
- .Rhistory added example proj (4 hours ago)
- .gitignore initial code commit -- added babynname analysis (4 hours ago)
- README.md edited readme with demo text (6 days ago)
- example-R-project.Rproj initial code commit -- added babynname analysis (4 hours ago)
- githubintros.key updated staging and push/pull (3 hours ago)
- some-analysis.Rmd gal instead of girl (4 hours ago)

At the bottom, there's a "README.md" file section with the text "To use at UoG M&M meeting to illustrate git command examples" and a note "Some change".



The screenshot shows a more detailed GitHub repository interface for "csaund / github-examples". At the top, it shows the repository name, a summary bar (Code: 0, Issues: 0, Pull requests: 0, Projects: 0, Wiki, Insights, Settings), and a "Branch: master" dropdown. A dropdown menu also shows "Branch: master" and "New pull request".

The main content area shows a list of commits on March 19, 2019:

- Merge pull request #4 from csaund/analysis-scripts (Verified, 89e04a4) by csaund committed 6 minutes ago: updated pres to include adding/staging
- updated example-R-project (269e8f6) by csaund committed 6 minutes ago
- Merge pull request #3 from csaund/girl-names (Verified, c595357) by csaund committed 8 minutes ago: gal instead of girl
- changed boy to girl (54247f8) by csaund committed 17 minutes ago
- changed girl to boy (5642e7a) by csaund committed 18 minutes ago
- added example proj (61fe7c1) by csaund committed 20 minutes ago
- initial code commit -- added babynname analysis (b6bcbe) by csaund committed 27 minutes ago
- added github section divider (eda3ac9) by csaund committed an hour ago
- added animations, clarified push vs merge (a1d2e2c) by csaund committed 2 hours ago

# Github - An Interface for Git

- Branches

[csaund / github-examples](#)

To use at UoG M&M meeting to illustrate git command examples

Manage topics

25 commits 2 branches 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find File Clone or download

csaund updated R proj commit history Latest commit bedfbfc 15 seconds ago

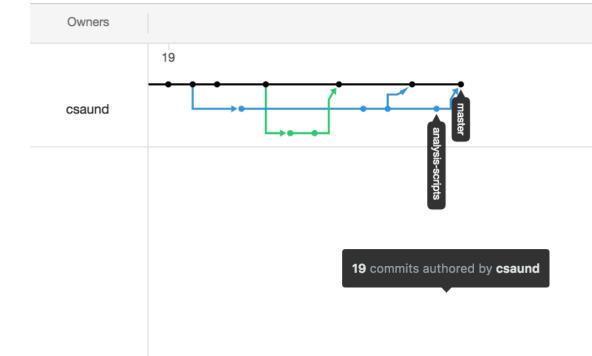
|                         |   |                |
|-------------------------|---|----------------|
| example-R-project       | updated R proj commit history                   | 15 seconds ago |
| .Rhistory               | added example proj                              | 4 hours ago    |
| .gitignore              | initial code commit -- added babynname analysis | 4 hours ago    |
| README.md               | edited readme with demo text                    | 6 days ago     |
| example-R-project.Rproj | initial code commit -- added babynname analysis | 4 hours ago    |
| githubintros.key        | updated staging and push/pull                   | 3 hours ago    |
| some-analysis.Rmd       | gal instead of girl                             | 4 hours ago    |

README.md

**github-examples**

To use at UoG M&M meeting to illustrate git command examples

Some change



[csaund / github-examples](#)

Code Issues Pull requests Projects Wiki Insights Settings

Overview Yours Active Stale All branches Search branches...

**Default branch**

master Updated 12 minutes ago by csaund Default Change default branch

**Your branches**

analysis-scripts Updated 4 hours ago by csaund 8 | 0 #5 Merged

**Active branches**

analysis-scripts Updated 4 hours ago by csaund 8 | 0 #5 Merged

# Pull Requests (Merging drafts together)

[csaund / github-examples](#)

To use at UoG!

Manage topics

15 commits

Your recently pushed

- analysis-scri
- girl-names (1)

Branch: master

Commits on Mar 19, 2019

- csaund changed boy analysis to girl
- csaund added some commits: changed boy to girl instead of girl
- csaund added some commits 9 minutes ago: changed boy to girl, gal instead of girl
- csaund merged commit c595357 into master just now

Continuous integration has passed. Several apps are available to review this pull request.

This branch has no conflicts (Merge can be performed automatically).

Merge pull request

You can also open this in GitHub Desktop

Leave a comment

Attach files by dragging & dropping, selecting or pasting them.

Styling with Markdown is supported

ProTip! Add comments to specific lines under Files changed.

Watch 0 Star 0 Fork 0

Girl names #3

csaund wants to merge 2 commits

Conversation 0 Commits 2 Checks 0 Files changed 1

csaund commented just now: change boy analysis to girl

csaund added some commits: changed boy to girl instead of girl

csaund commented 25 seconds ago: change boy analysis to girl

csaund added some commits 9 minutes ago: changed boy to girl, gal instead of girl

csaund merged commit c595357 into master just now

Pull request successfully merged and closed

You're all set—the girl-names branch can be safely deleted.

Delete branch

Write Preview

Leave a comment

Attach files by dragging & dropping, selecting or pasting them.

Styling with Markdown is supported

Comment

Reviewers

No reviews

Assignees

No one—assign yourself

Labels

None yet

Projects

None yet

Milestone

No milestone

Notifications

Unsubscribe

You're receiving notifications because you modified the open/close state.

1 participant

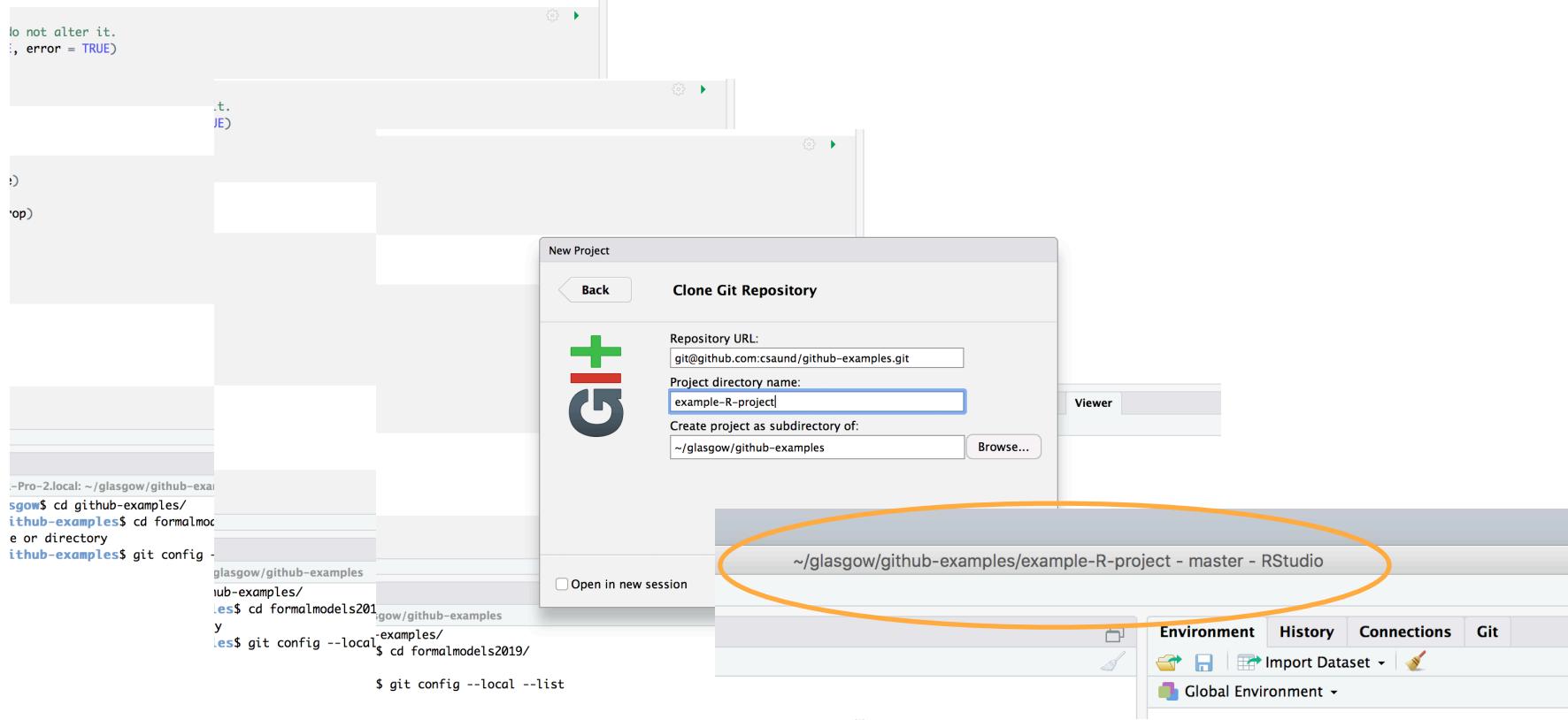
Lock conversation

# FAQ:

- What's the difference between Git and Github?
  - Git is a revision control tool
    - Can be used in the command line
  - Github is a web-based GUI (graphical user interface) for Git repositories
    - Lots of other programs have Git integration, including many text editors (like R Studio)
- Can I only add code to github?
  - No! Upload any files you like. Analyses, papers, even powerpoints!
- Is there a limit to the number of branches that can be created?
  - NOPE. Go branch CRAZY.
  - but keep it neat pls
- Can everyone see what I create?
  - Only if you want them to.
  - Git is private by default — Github allows public access for convenience

# Using Git with R Studio

# Create a new project



The screenshot shows the RStudio interface with a terminal window at the bottom and a 'New Project' dialog in the center.

**Terminal Window (bottom left):**

```
-Pro-2.local: ~/glasgow/github-examples$ cd github-examples/
github-examples$ cd formalmodels2019/
github-examples$ git config --local examples/
github-examples$ cd formalmodels2019/
github-examples$ git config --local --list
```

**New Project Dialog (center):**

**Clone Git Repository**

- Repository URL:** `git@github.com:csaund/github-examples.git`
- Project directory name:** `example-R-project` (highlighted)
- Create project as subdirectory of:** `~/glasgow/github-examples`
- Viewer:** `~/glasgow/github-examples/example-R-project - master - RStudio` (highlighted with an orange oval)

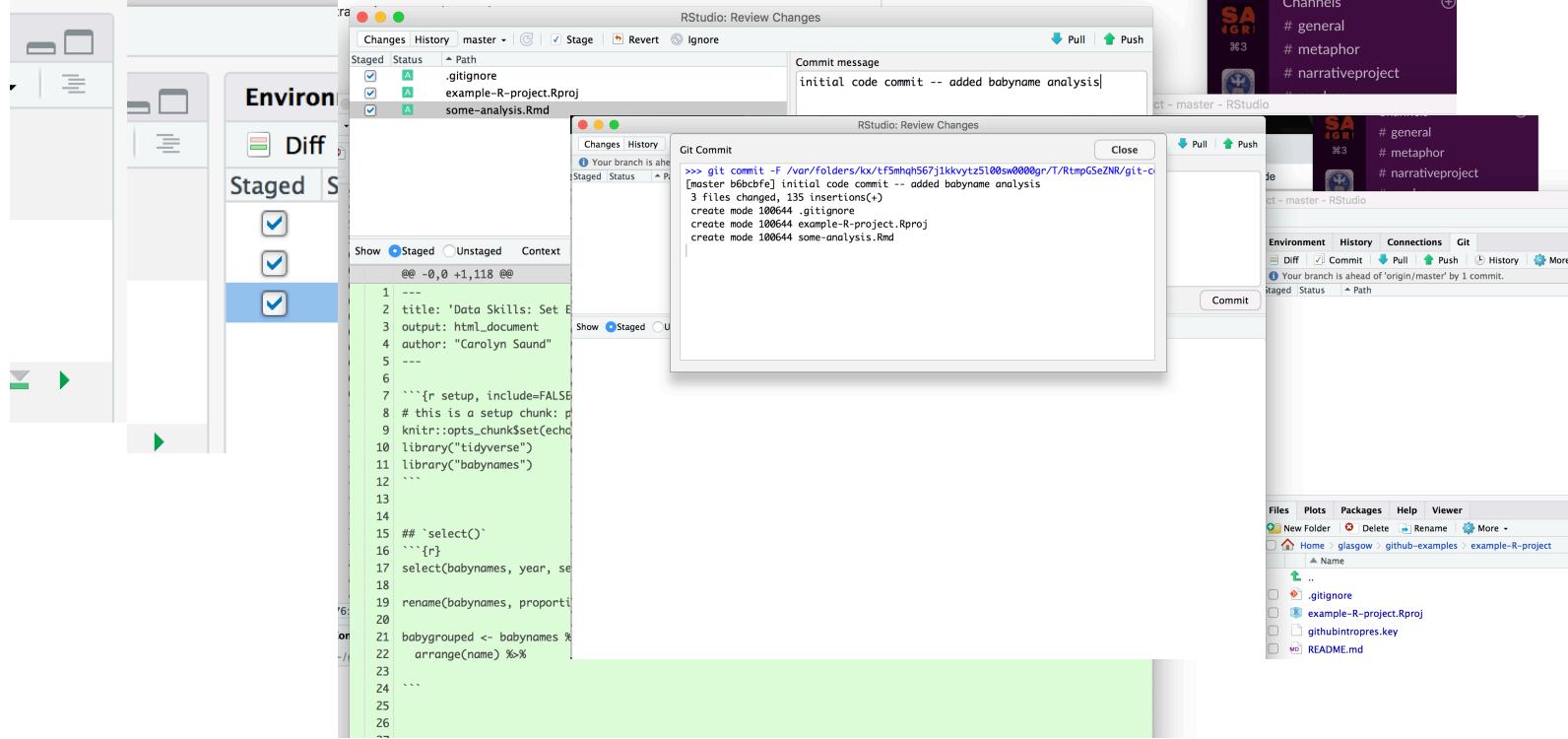
**Bottom Right:**

- Environment, History, Connections, Git tabs
- Import Dataset button
- Global Environment dropdown

# Committing

file-R-project - master - RStudio

-R-project - master - RStudio



The screenshot shows the RStudio interface for a GitHub repository named "file-R-project". The main window displays the code editor with a file named "some-analysis.Rmd". The code in the editor is:

```
1 ---  
2 title: 'Data Skills: Set B'  
3 output: html_document  
4 author: "Carolyn Sound"  
5 ---  
6  
7 ```{r setup, include=FALSE}  
8 # this is a setup chunk:  
9 knitr::opts_chunk$set(echo=FALSE)  
10 library("tidyverse")  
11 library("babynames")  
12  
13  
14  
15 ## `select()`  
16 ```{r}  
17 select(babynames, year, sex)  
18  
19 rename(babynames, proportion)  
20  
21 babygrouped <- babynames %>%  
22   arrange(name) %>%  
23  
24  
25  
26
```

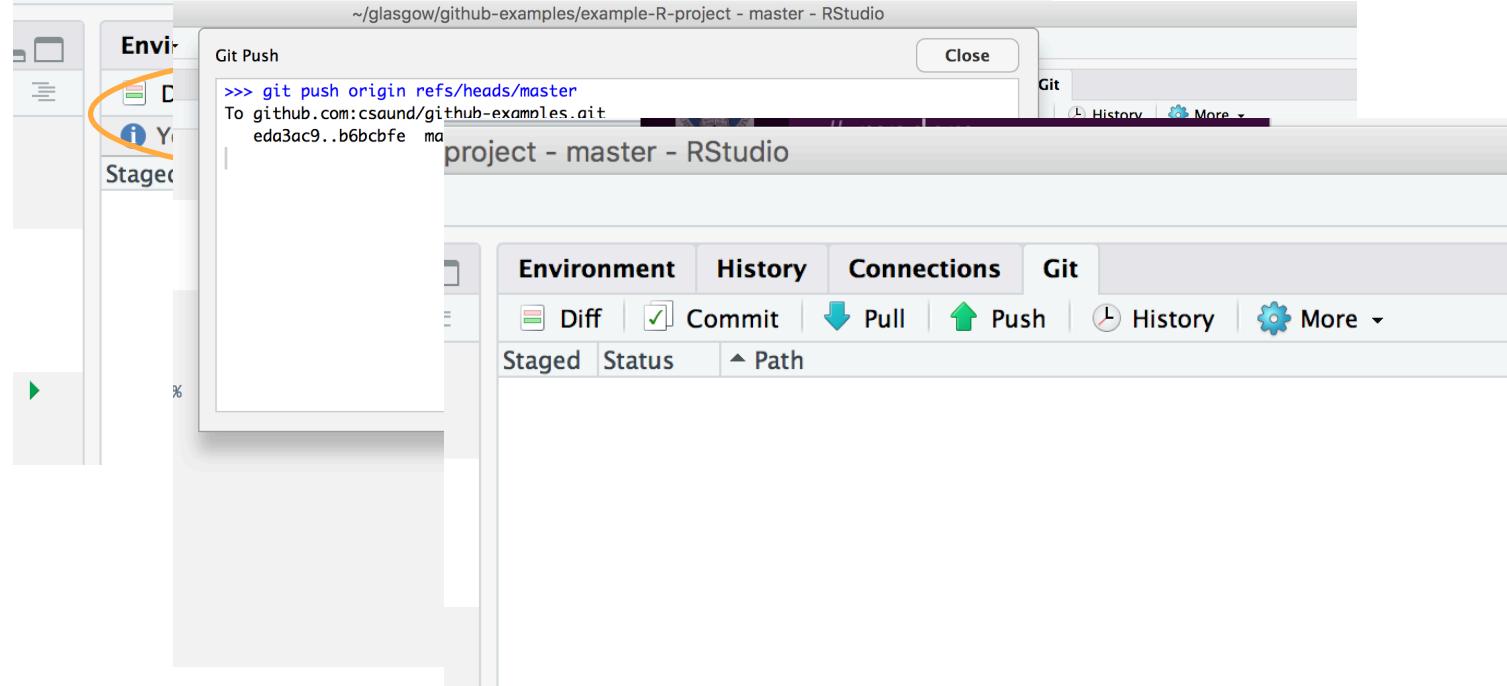
A modal dialog titled "RStudio: Review Changes" is open, showing the staged files: ".gitignore", "example-R-project.Rproj", and "some-analysis.Rmd". The "Commit message" field contains "initial code commit -- added babyname analysis". Below this, the "Git Commit" log shows the commit details:

```
>>> git commit -F /var/folders/kx/tf5mhqhs67j1kkvvtz5l00sw000gr/T/RtmpGSeZNR/git-commits/66bcbe6 initial code commit -- added babyname analysis  
[master b66bcbe] initial code commit -- added babyname analysis  
3 files changed, 135 insertions(+)  
create mode 100644 .gitignore  
create mode 100644 example-R-project.Rproj  
create mode 100644 some-analysis.Rmd
```

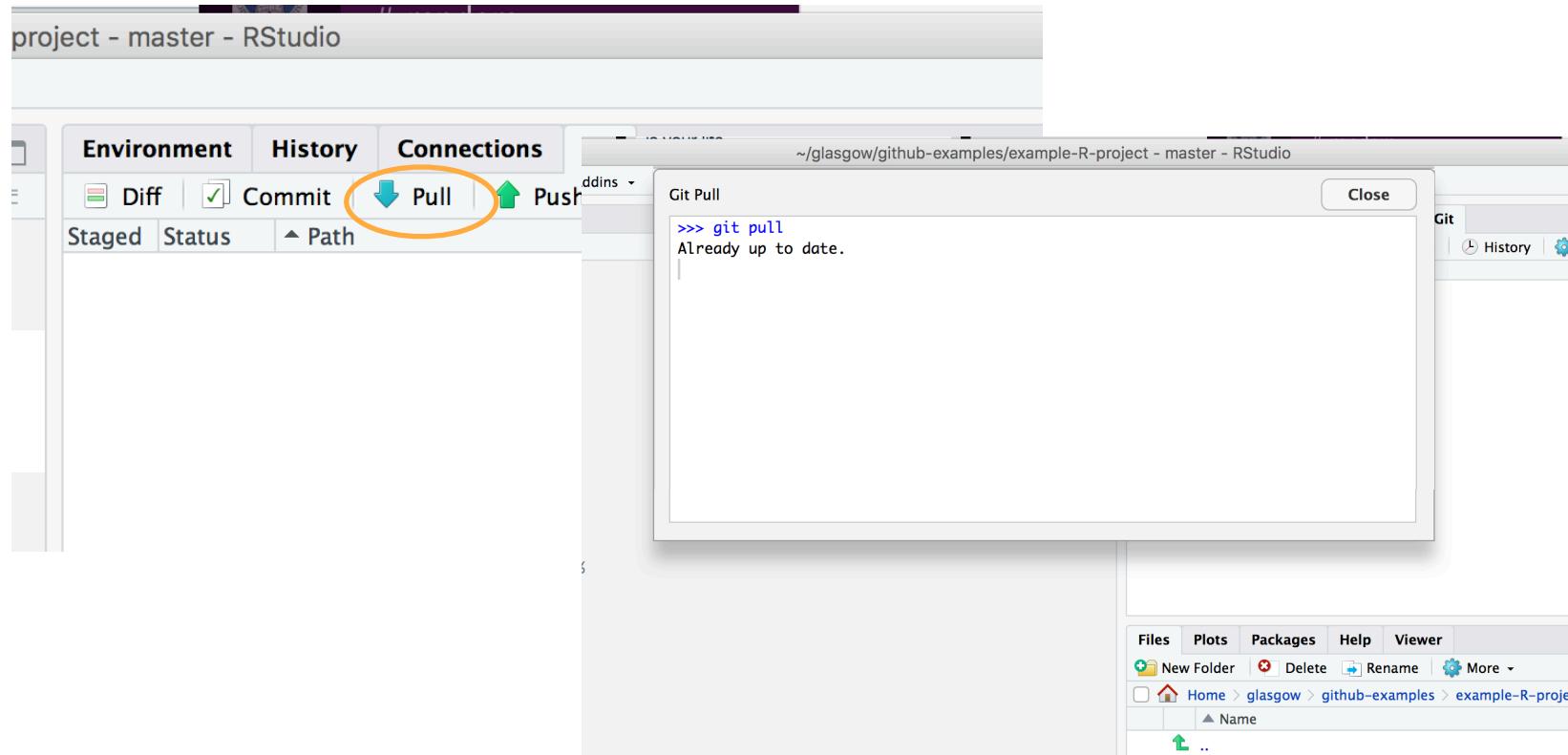
The RStudio interface includes a sidebar for "Environment", "Diff", and "Staged" files. On the right, there are two panes for "Channels" showing "# general", "# metaphor", and "# narrativeproject". At the bottom, the "Files" tab of the navigation bar is active, showing the contents of the repository: ".gitignore", "example-R-project.Rproj", "github-intro.rproj", and "README.md".

# Pushing

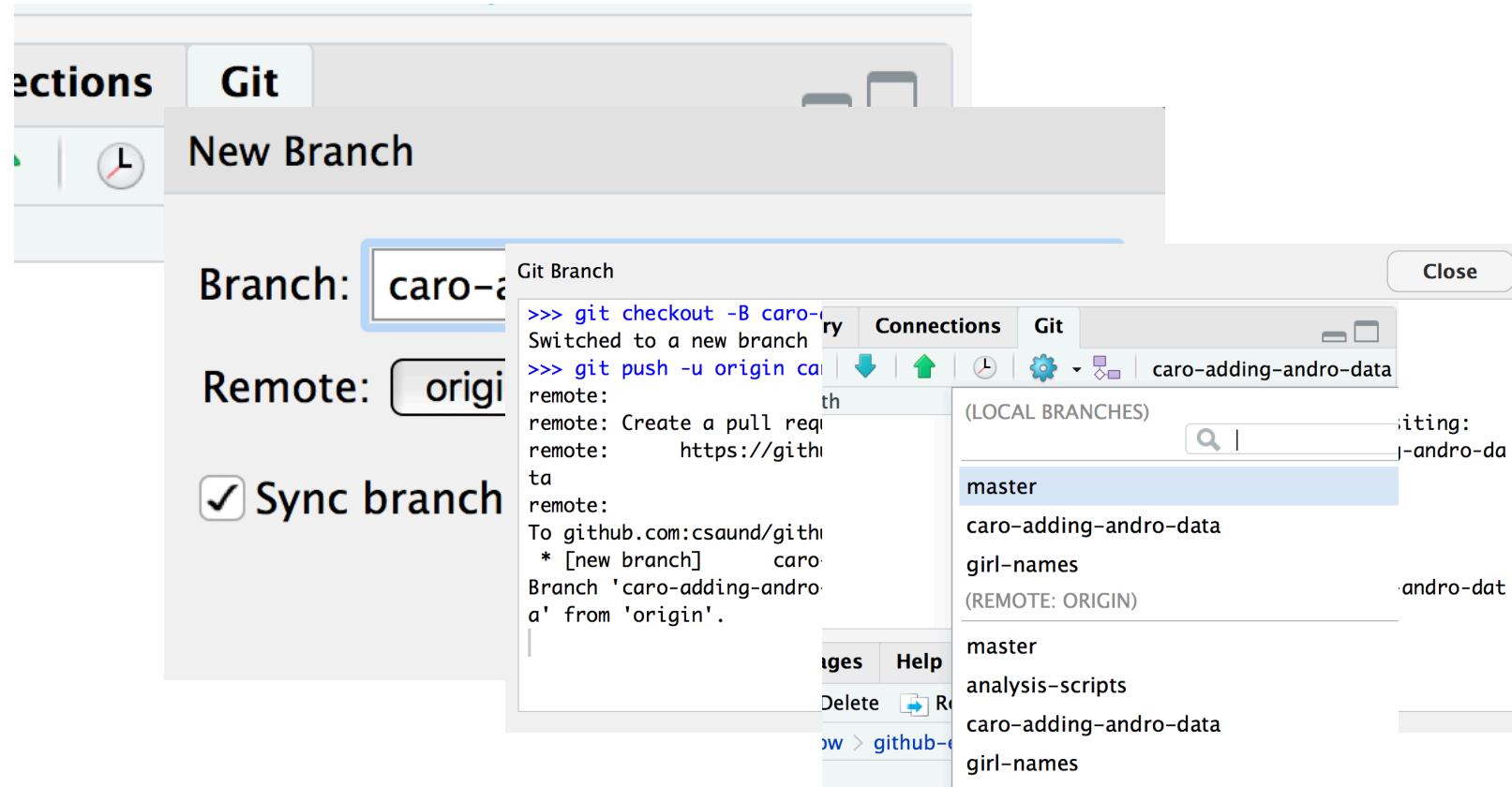
R-project - master - RStudio



# Pulling



# Branching



# Demo

## (from the command line!!)