

CSE 391

Git branches, merging
Remote repositories

pollev.com/cse391

- How was the last homework assignment? How much time did it take?

AGENDA

- Logistics, be sure to check your homework scores
- More git
 - Branching
 - Merging
 - Working with remote repositories

ROADMAP

- Introduction to the command line
- Input/output redirection, pipes
- More input/output redirection, tee, xargs
- Git: Fundamentals
- **Git: Branches, merging, and remote repositories**
- Regular expressions
- More regular expressions, sed
- Users and permissions
- Bash scripting
- Industry applications

REVIEW: FOUR PHASES

Working Directory

Working changes

Staging Area/Index

Changes you're preparing to commit

Local Repository

Local copy of the repository with your committed changes

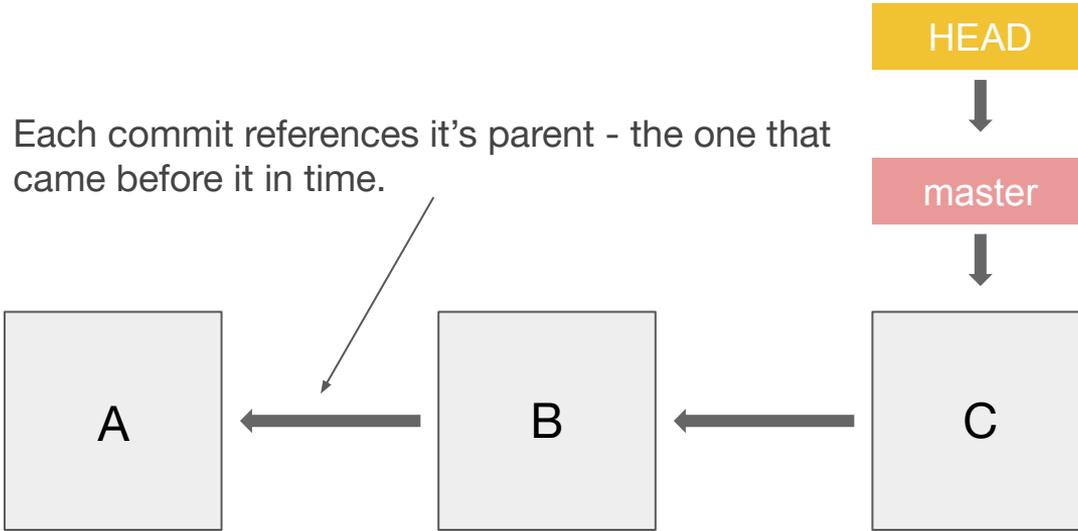
Remote Repository

Remote shared repository (Usually stored with a platform like GitHub/Gitlab)

GIT: BRANCHING

- So far, all the operations we've done have been on the master branch.
- However, it's very rare you'll be working on master directly. Instead, you'll work on a separate branch:
 - Master is the “single source of truth” - the history of the project
 - The code on master should be stable and compile
 - Because of this, it's difficult to share and collaborate on in progress work.
 - Working directly on master makes it difficult to work simultaneously on unrelated features.

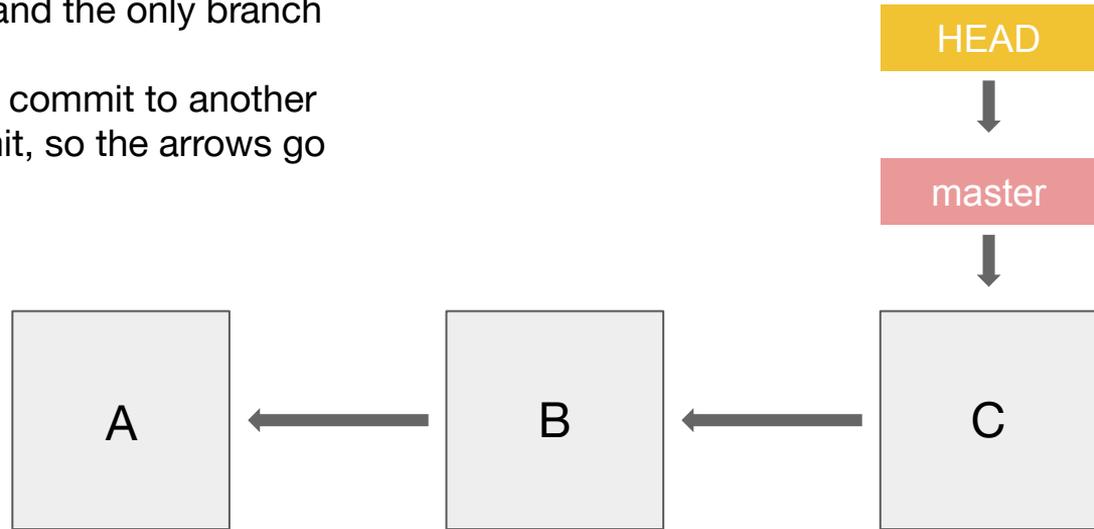
COMMIT HISTORY



These are commits. "A" is the first commit, "C" is the most recent

COMMIT HISTORY

- HEAD: This is a pointer, or reference, to the git branch that you are currently working on.
- Master: This the main branch of your repository, the single “source of truth”, and the only branch created by default.
- **NOTE**: The pointer from one commit to another points to the previous commit, so the arrows go back in time.



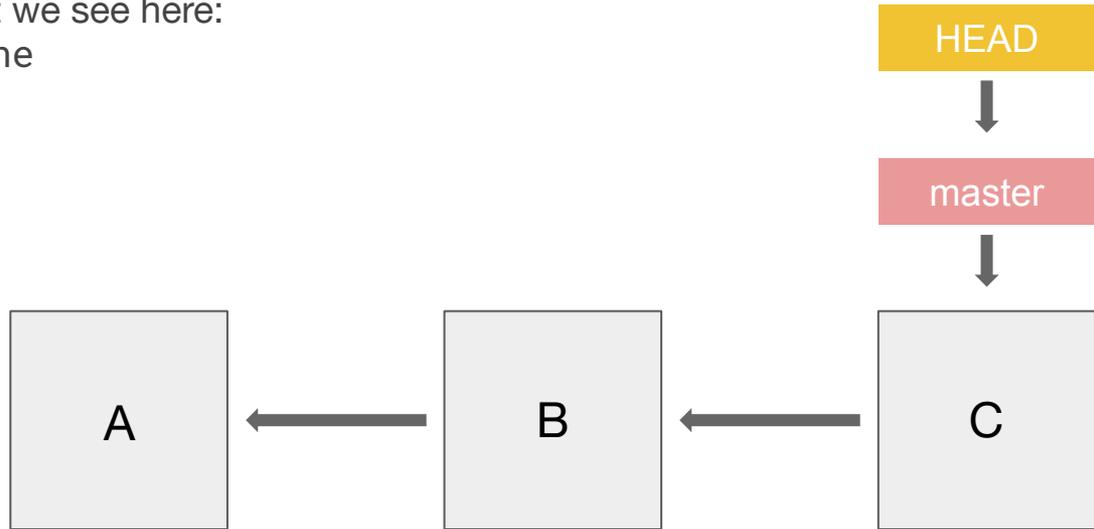
COMMIT HISTORY

To view this same information on the command line:

```
$ git log
```

Or, to make it more similar to what we see here:

```
$ git log --graph --oneline
```

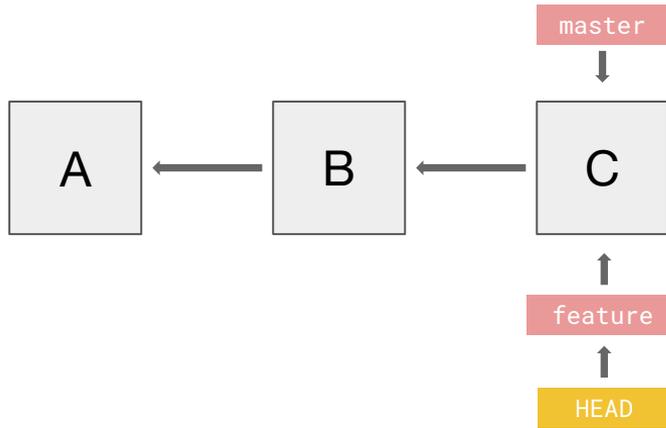




BRANCHING

Commands that have been run:

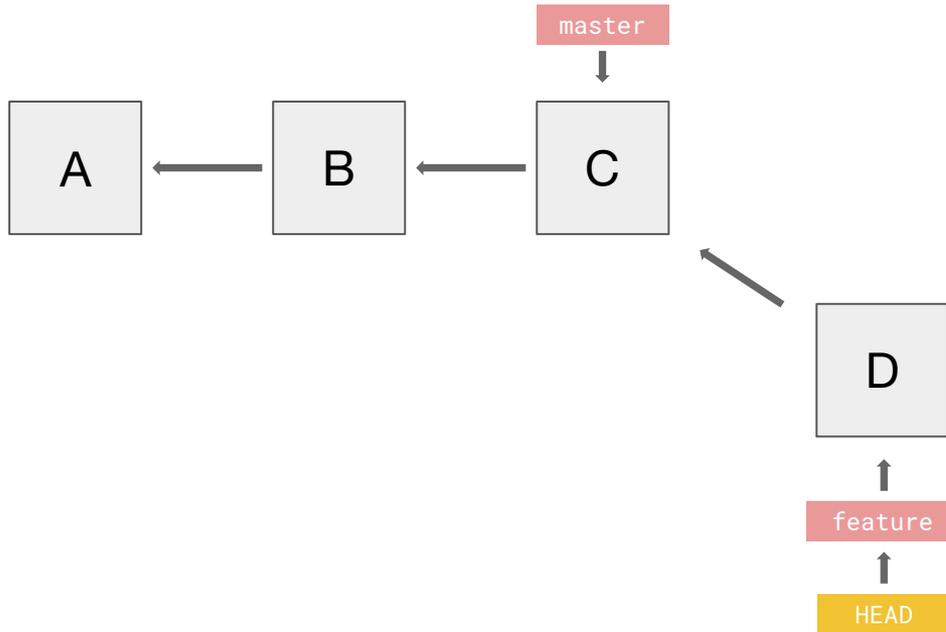
```
$ git branch feature  
$ git checkout feature
```



BRANCHING

Commands that have been run:

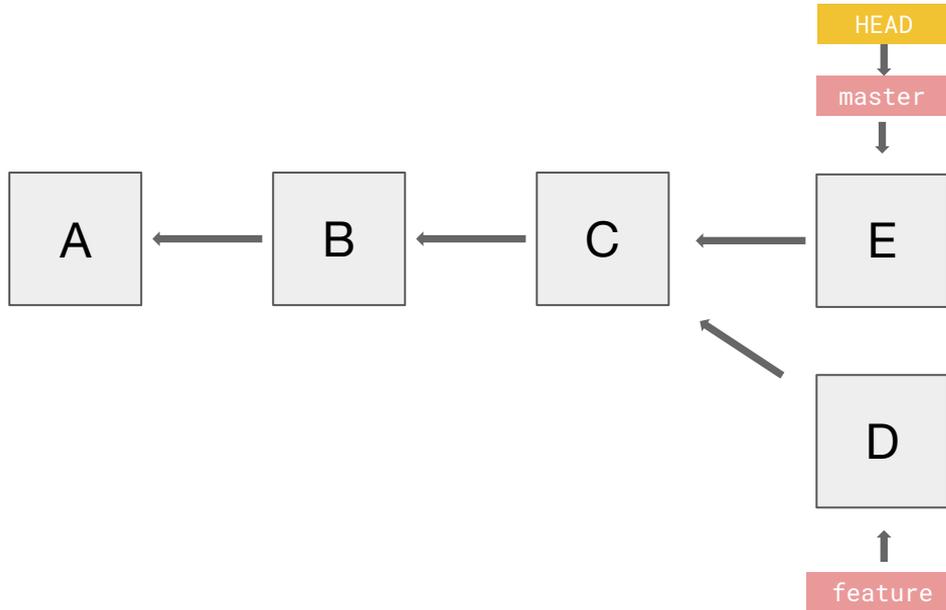
```
$ git branch feature
$ git checkout feature
$ echo "D" >> file.txt
$ git add file.txt
$ git commit -m "D"
```



BRANCHING

Commands that have been run:

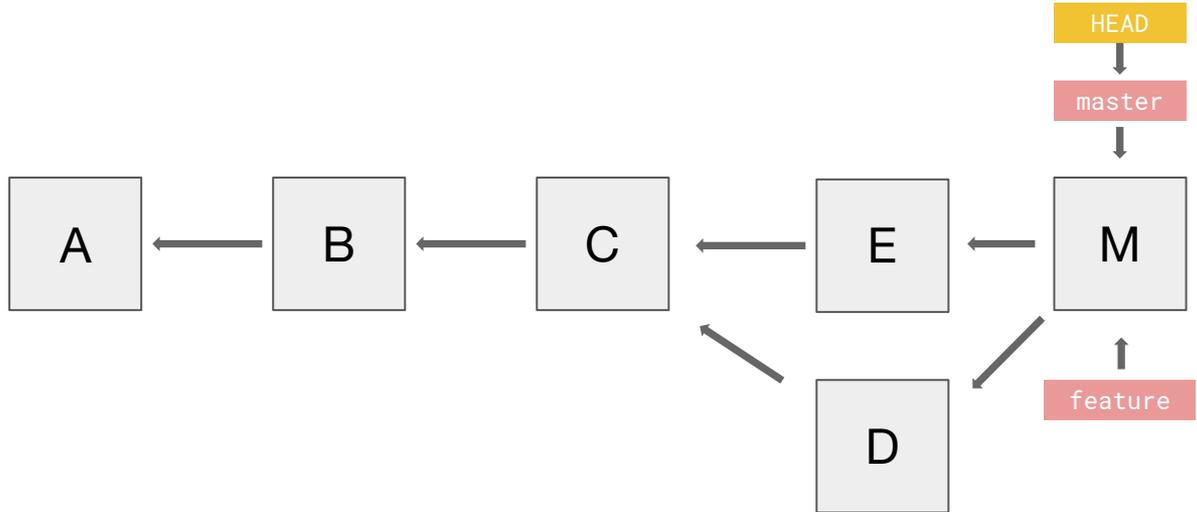
```
$ git branch feature
$ git checkout feature
$ echo "D" >> file.txt
$ git add file.txt
$ git commit -m "D"
$ git checkout master
$ echo "E" >> file.txt
$ git add file.txt
$ git commit -m "E"
```



BRANCHING

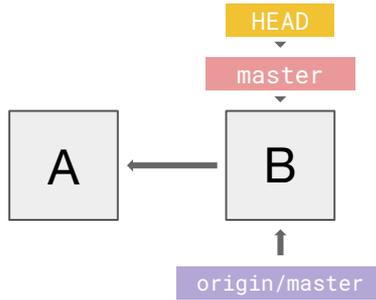
Commands that have been run:

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$ git branch feature
$ git checkout feature
$ echo "D" >> file.txt
$ git add file.txt
$ git commit -m "D"
$ git checkout master
$ echo "E" >> file.txt
$ git add file.txt
$ git commit -m "E"
$ git merge
```

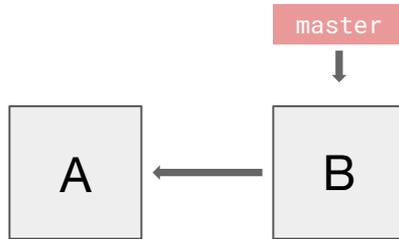


WORKING WITH REMOTE

Local

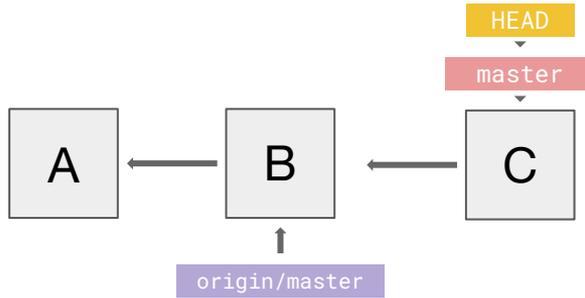


Remote

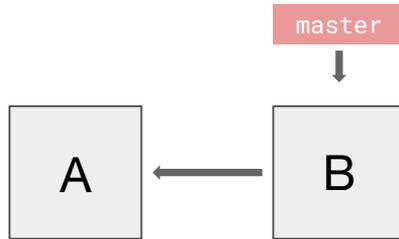


WORKING WITH REMOTE

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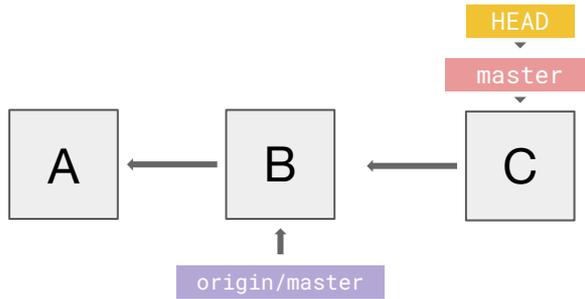


Remote

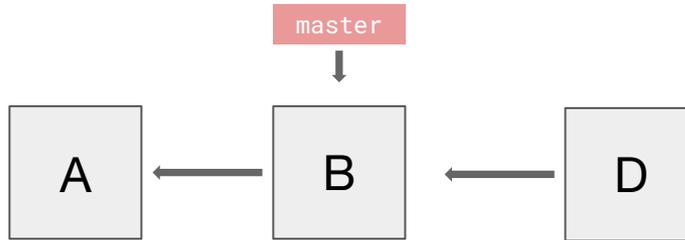


WORKING WITH REMOTE

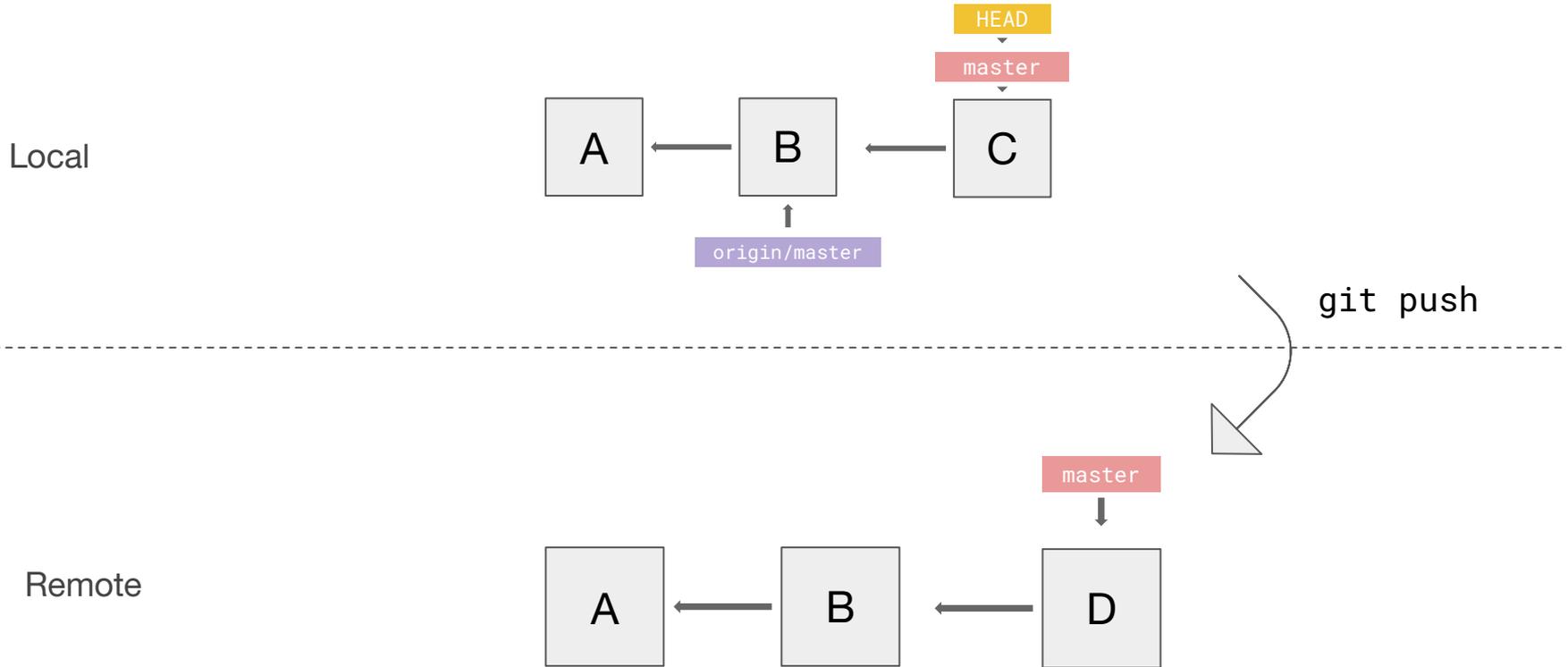
Local



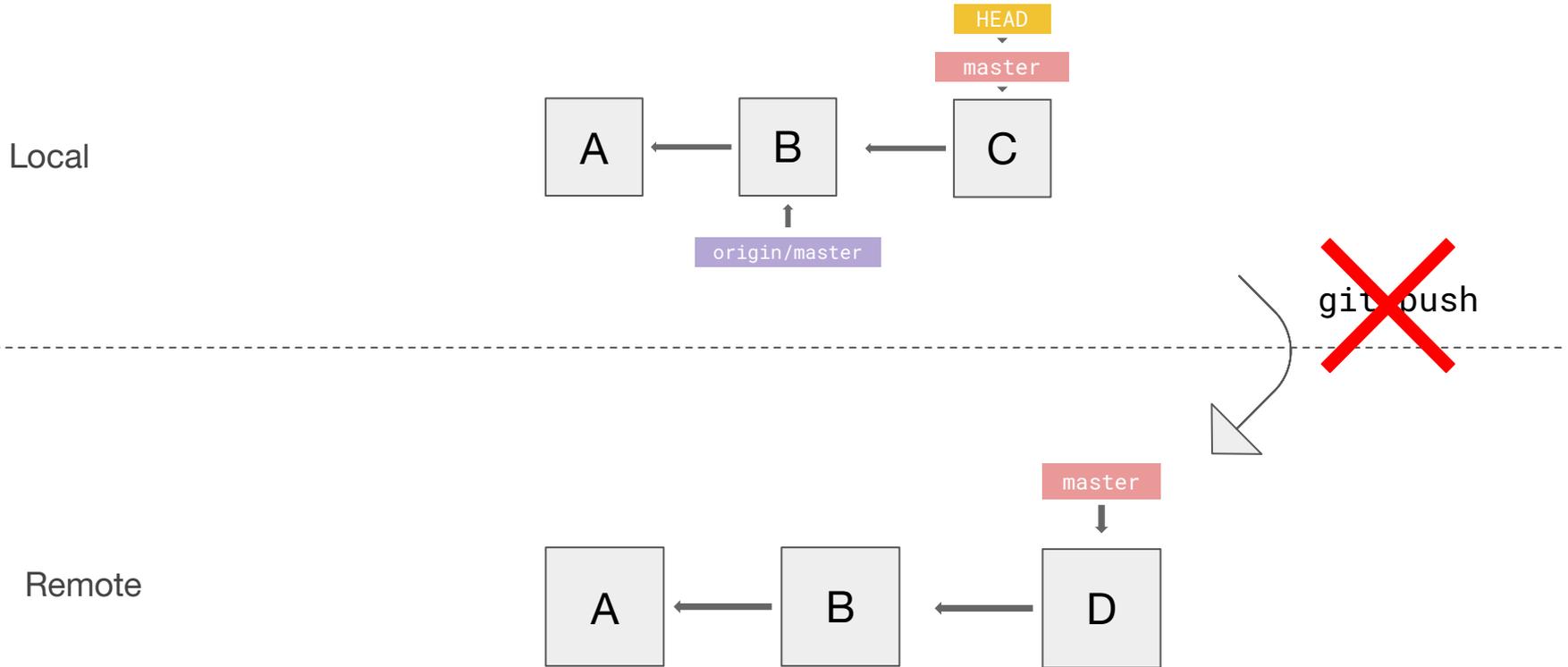
Remote



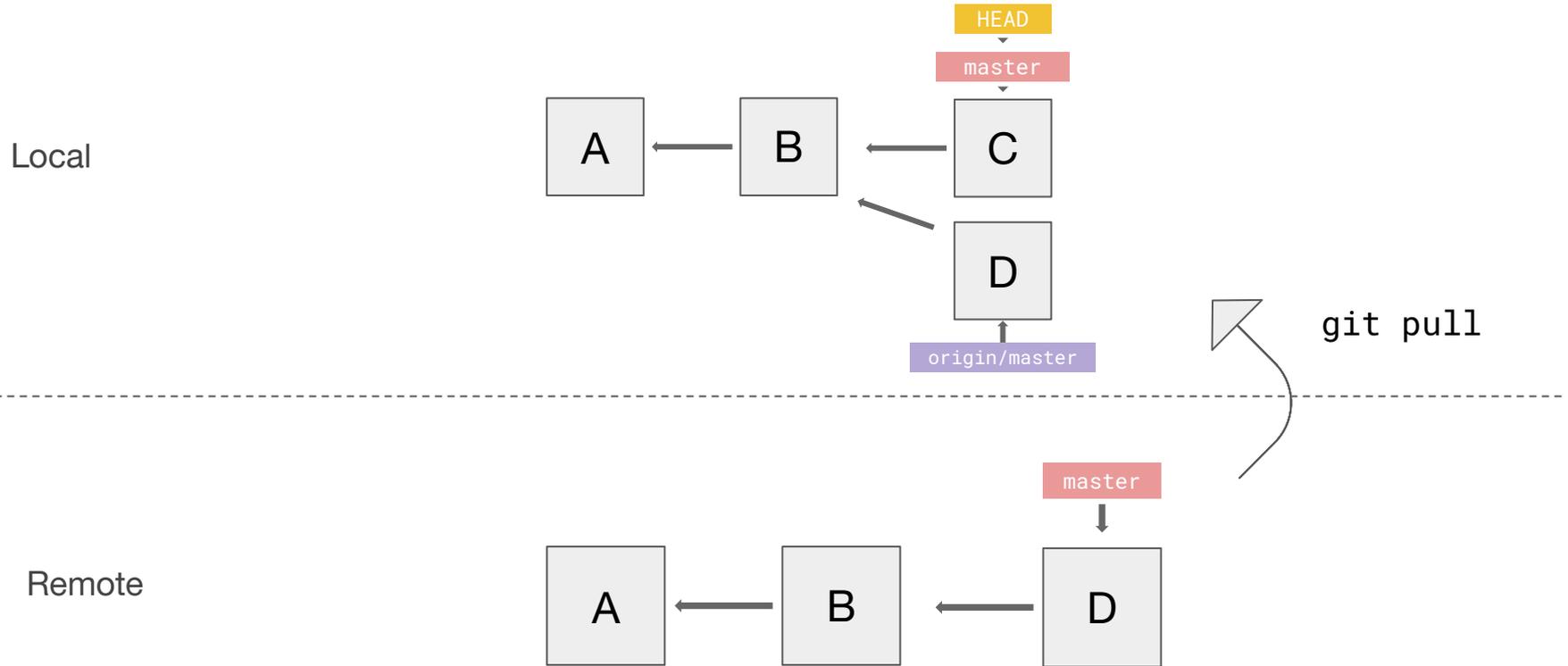
WORKING WITH REMOTE



WORKING WITH REMOTE

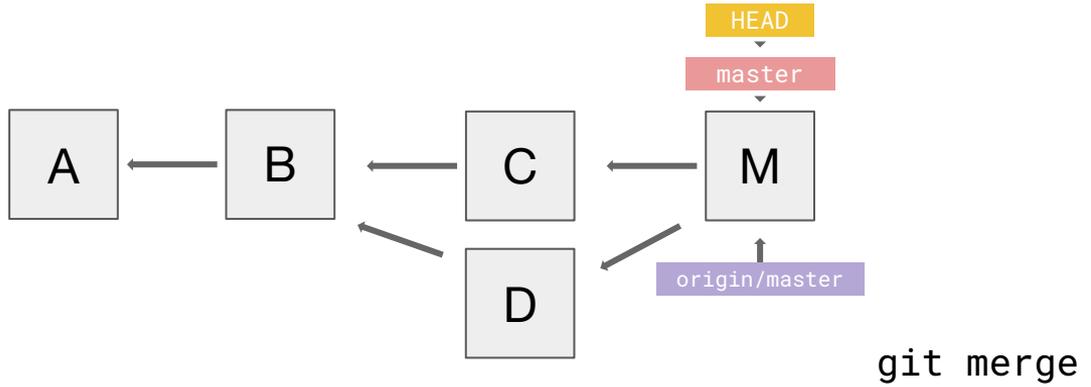


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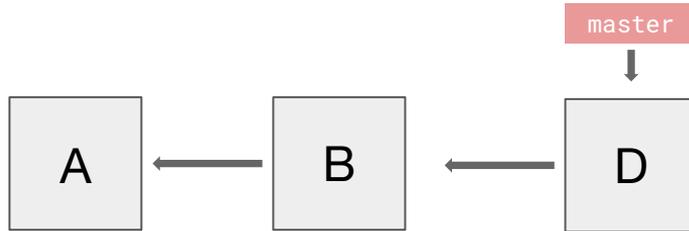


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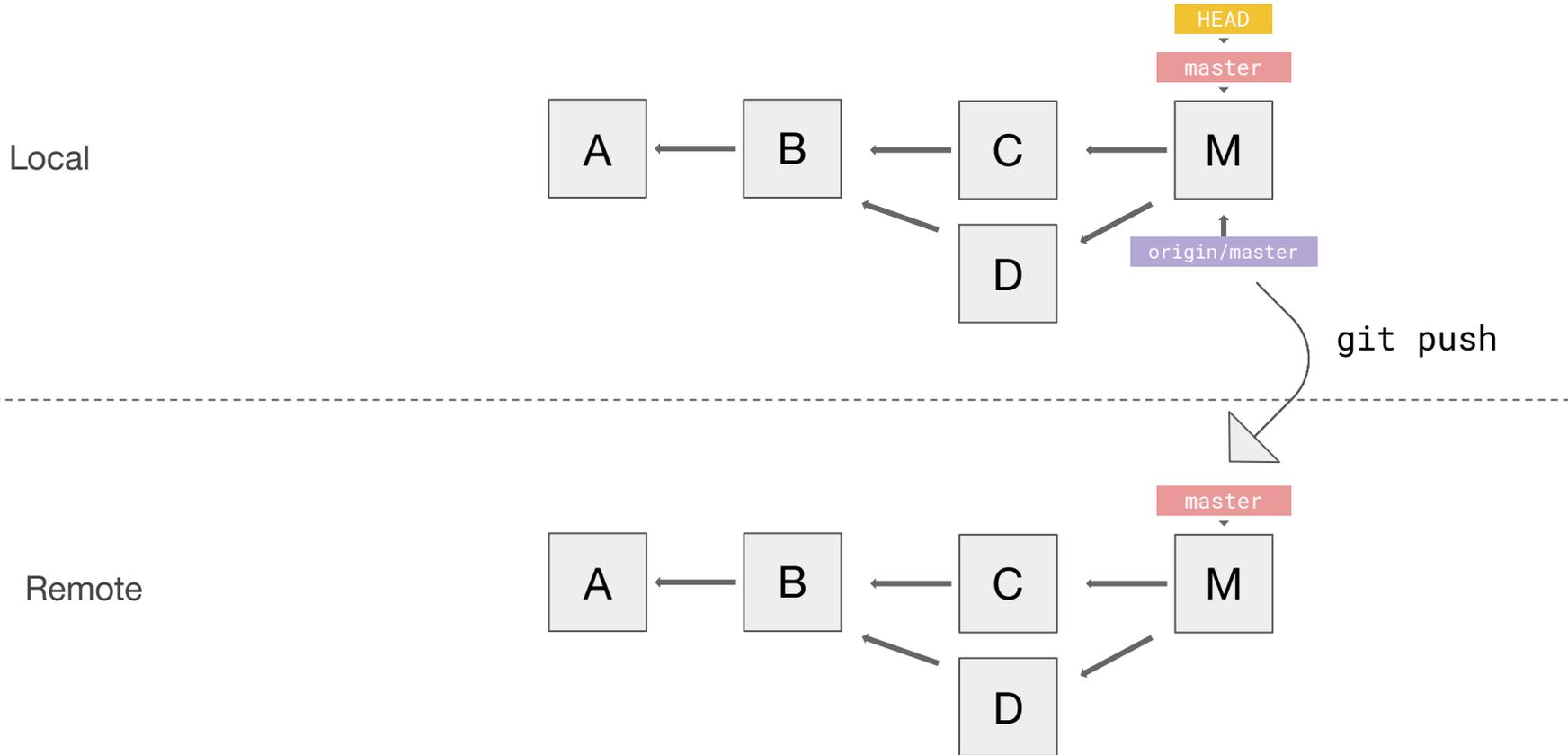
Local



Remote



WORKING WITH REMOTE





THINK: pollev.com/cse391

Suppose Josh and Hunter are both working on the 'abc' repository. The following sequence of events happen:

- 1) Josh creates a file named "lmno", adds it to the index, commits it, and pushes it
- 2) Hunter creates a file named "icv", adds it to the index, commits it, and pushes it

What happens on Hunter's computer? Does it tell him that the push was successful? Or did the push fail?



PAIR: pollev.com/cse391

Suppose Josh and Hunter are both working on the 'abc' repository. The following sequence of events happen:

- 1) Josh creates a file named "lmno", adds it to the index, commits it, and pushes it
- 2) Hunter creates a file named "icu", adds it to the index, commits it, and pushes it

What happens on Hunter's computer? Does it tell him that the push was successful? Or did the push fail?



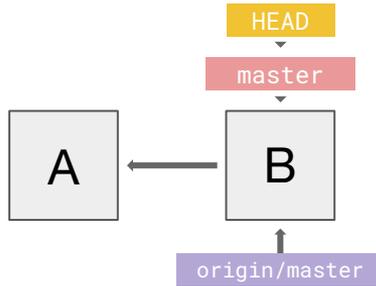
2:00

PULL REQUESTS

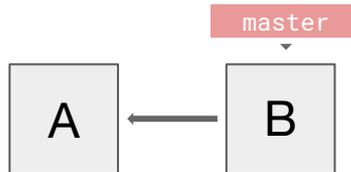
- In practice, it's very rare that we would merge branches locally and push them to remote.
- Instead, we use a service like GitHub or GitLab to help us:
 - Step 1: Create a local branch and make some commits
 - Step 2: Push those commits to remote
 - Step 3: Open a pull/merge request on GitLab
 - Step 4: Collaborate with others, leave comments, and fix conflicts
 - Step 5: Merge into master (or other branch)
- BUT, it's important to know what's going on when you branch and merge, because that's what's going on under the hood on GitHub/GitLab
- **The main goal here is to be very deliberate about what we put on master.**

WORKING WITH REMOTE

Local

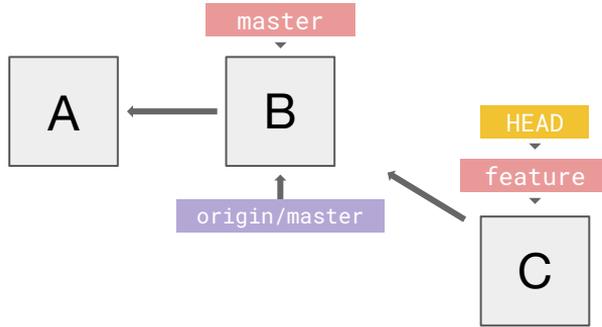


Remote

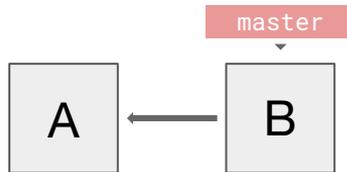


WORKING WITH REMOTE

Local

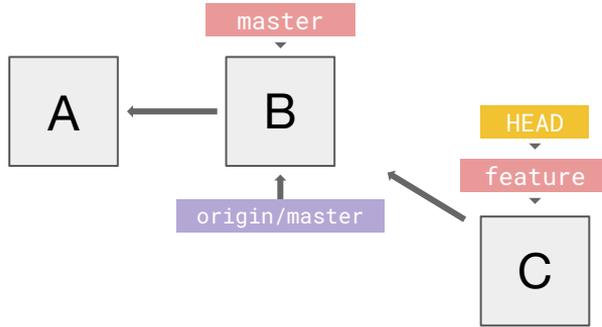


Remote

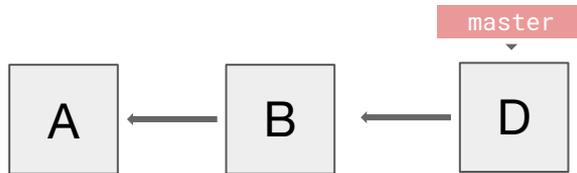


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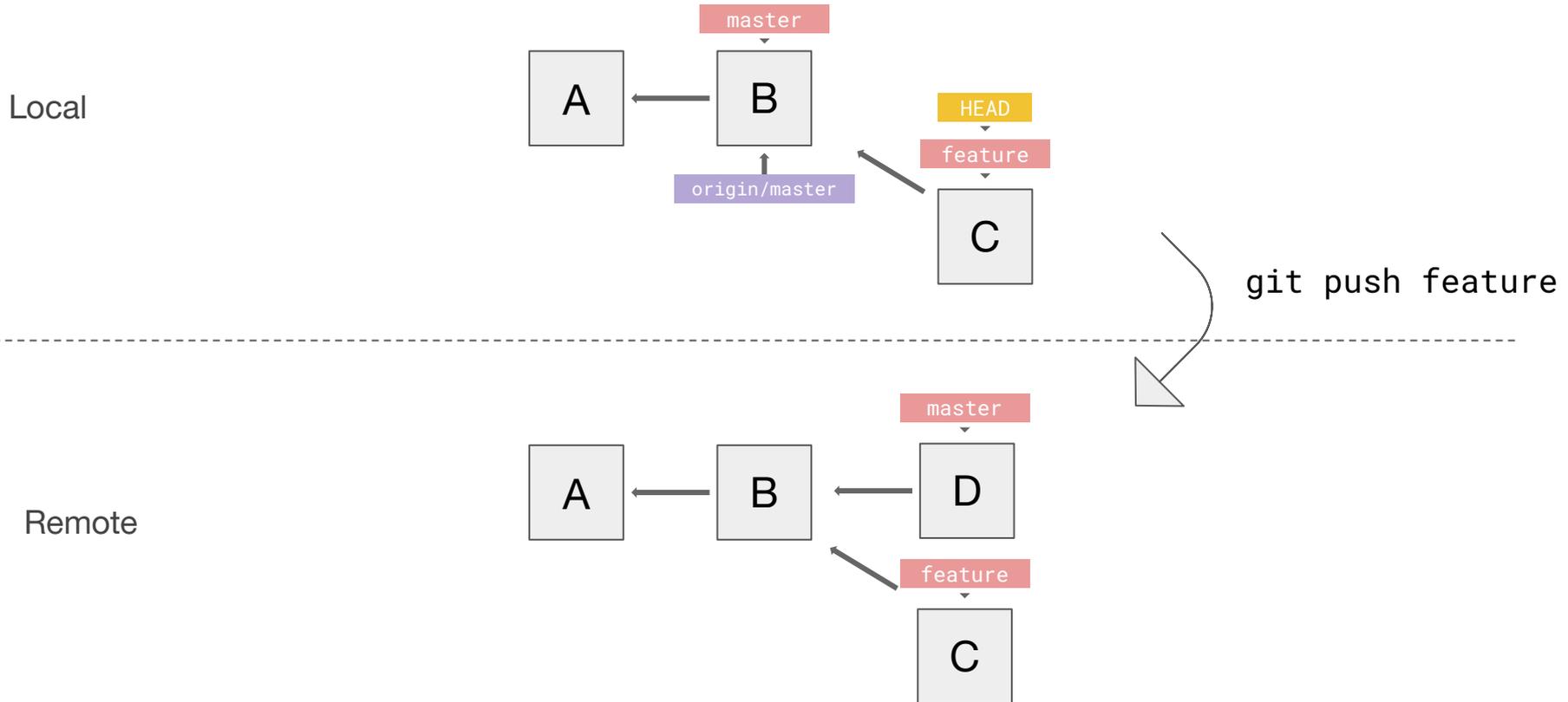
Local



Remote

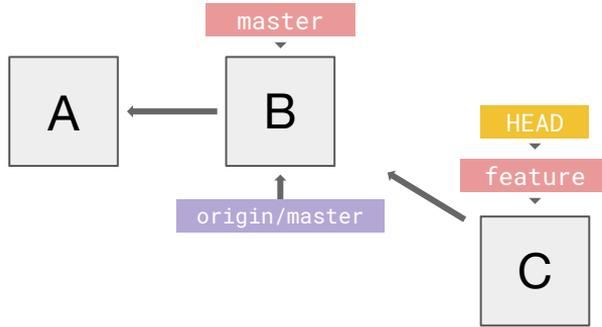


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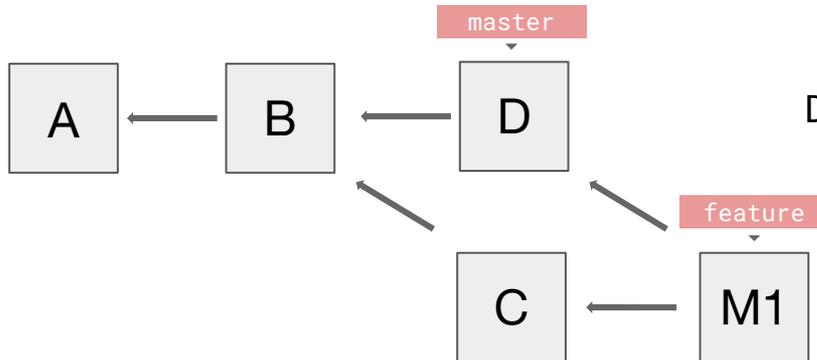


WORKING WITH REMOTE

Local



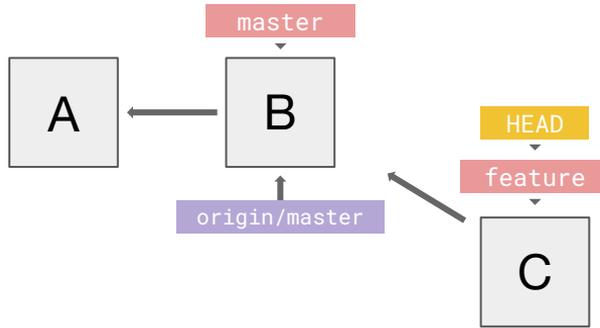
Remote



Do this on GitLab

WORKING WITH REMOTE

Local



PULL REQUEST!!!

Remote

