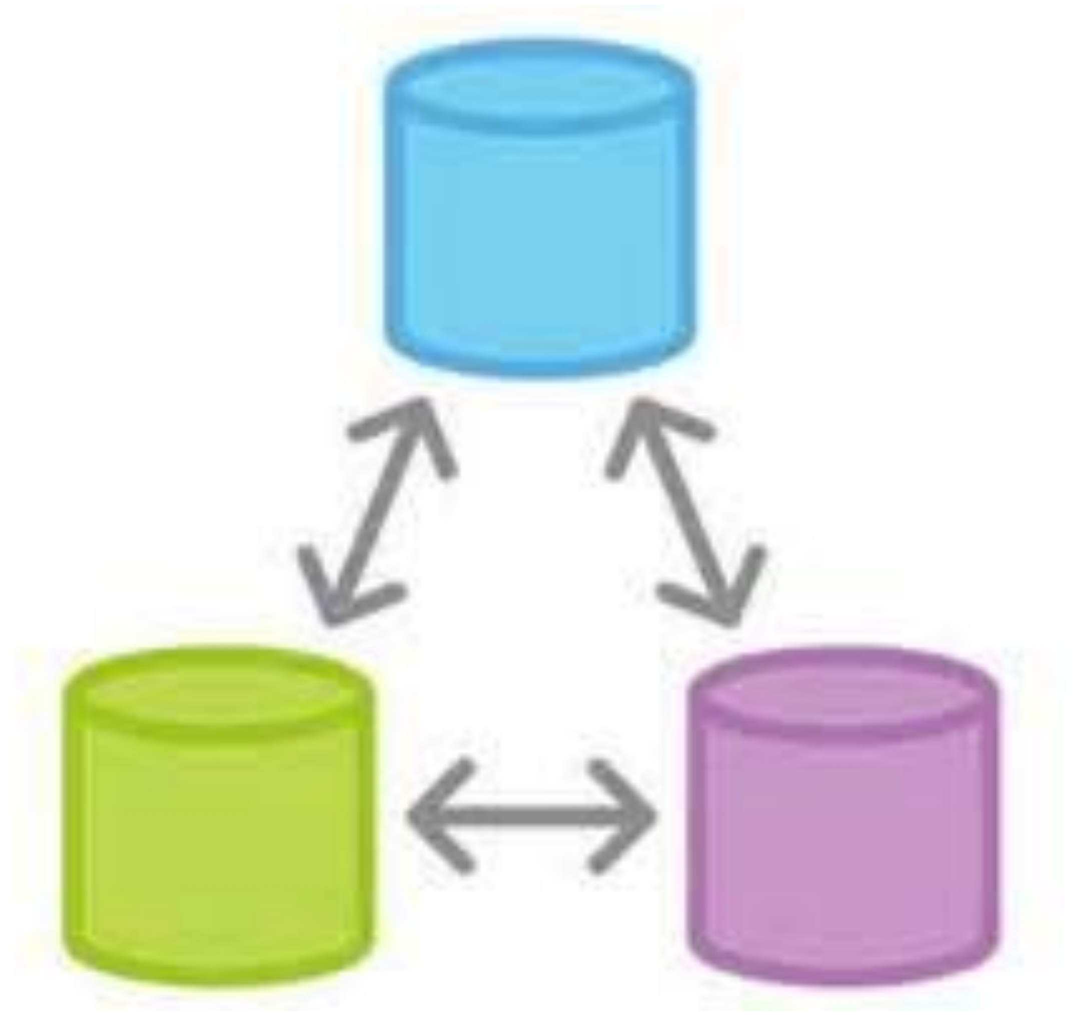
Lecture 6
Remotes



Sign in on the attendance sheet!

Midterm Review

- Everyone did great!

What We’ve Learned So Far

- Creating and cloning repositories

  `git init, git clone`

- Linear commit histories and diffs

  `git log, git show, git diff`

- Using the working directory and staging area and making commits

  `git add, git reset, git checkout, git commit`

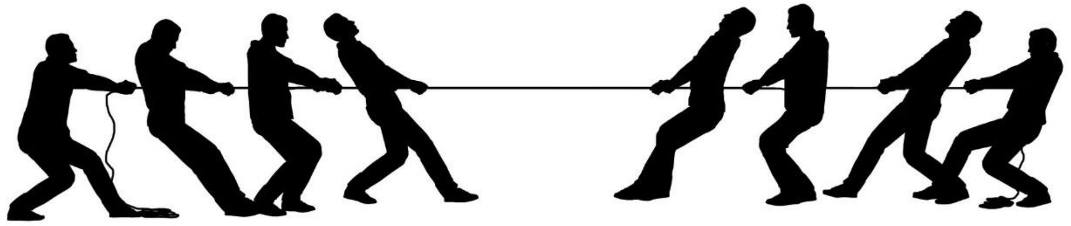
- Using branches

  `git branch, git checkout, git merge`

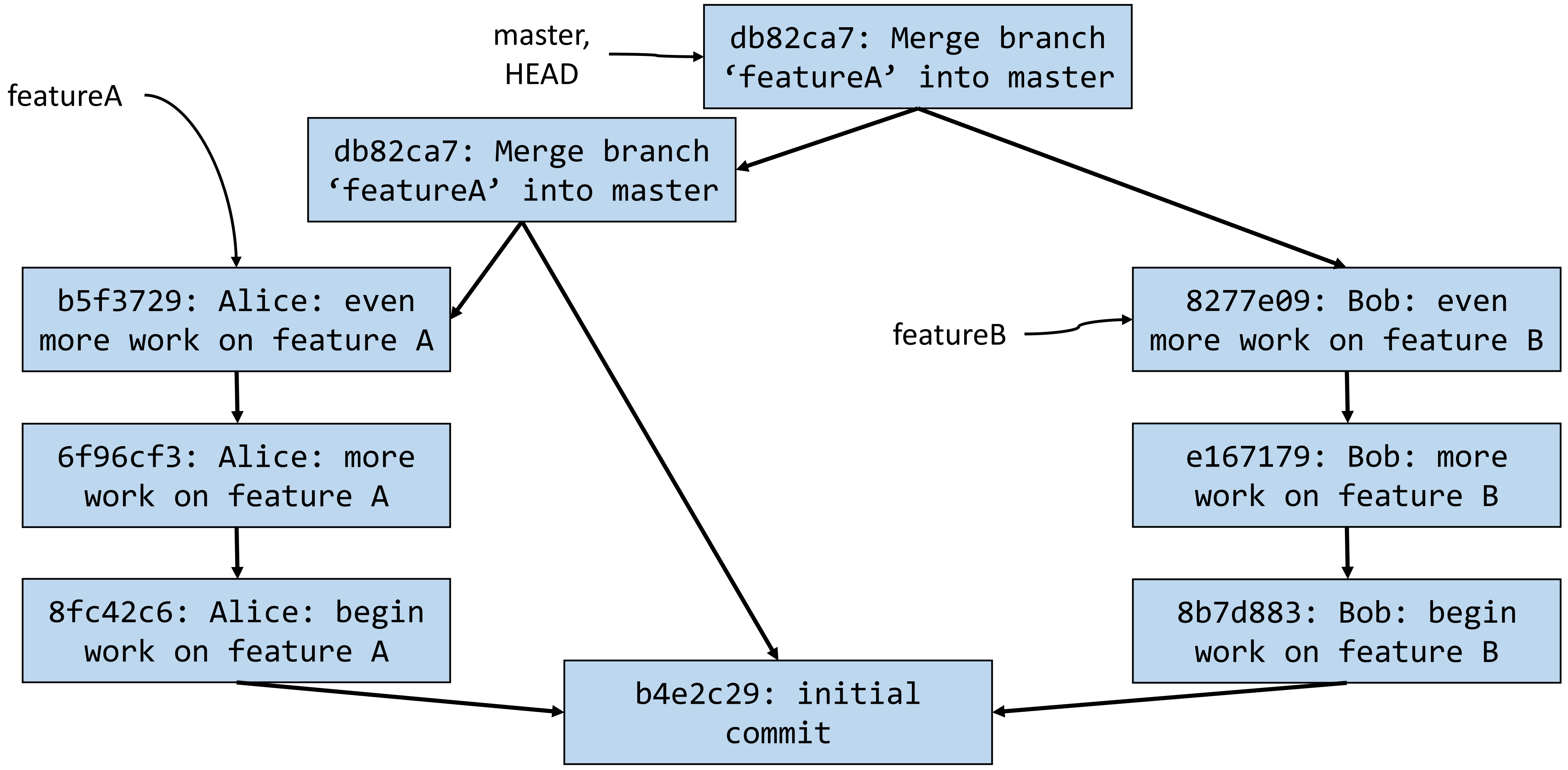
- How git’s model for commit histories works

Today

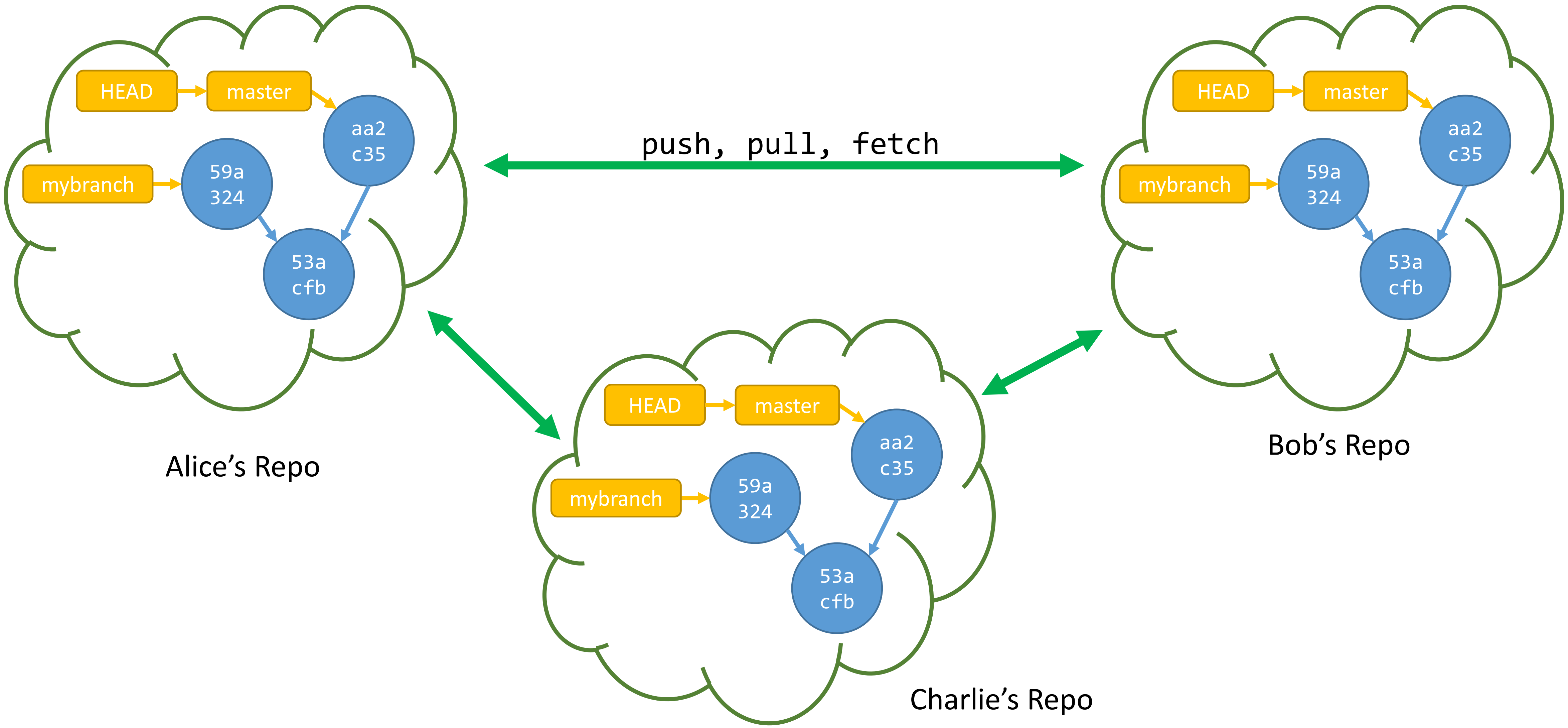
- Remotes
- `git remote`
- `git fetch`
- `git pull`
- `git push`
- Github



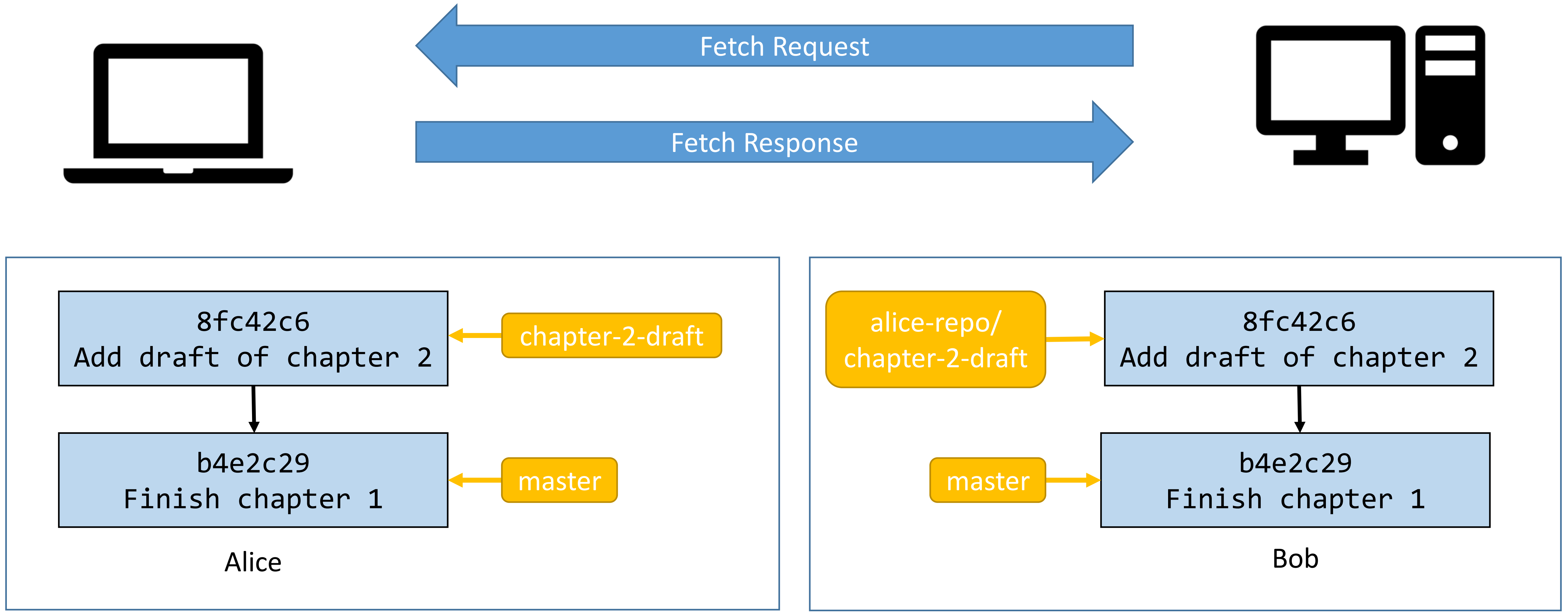
Last Time: Branches

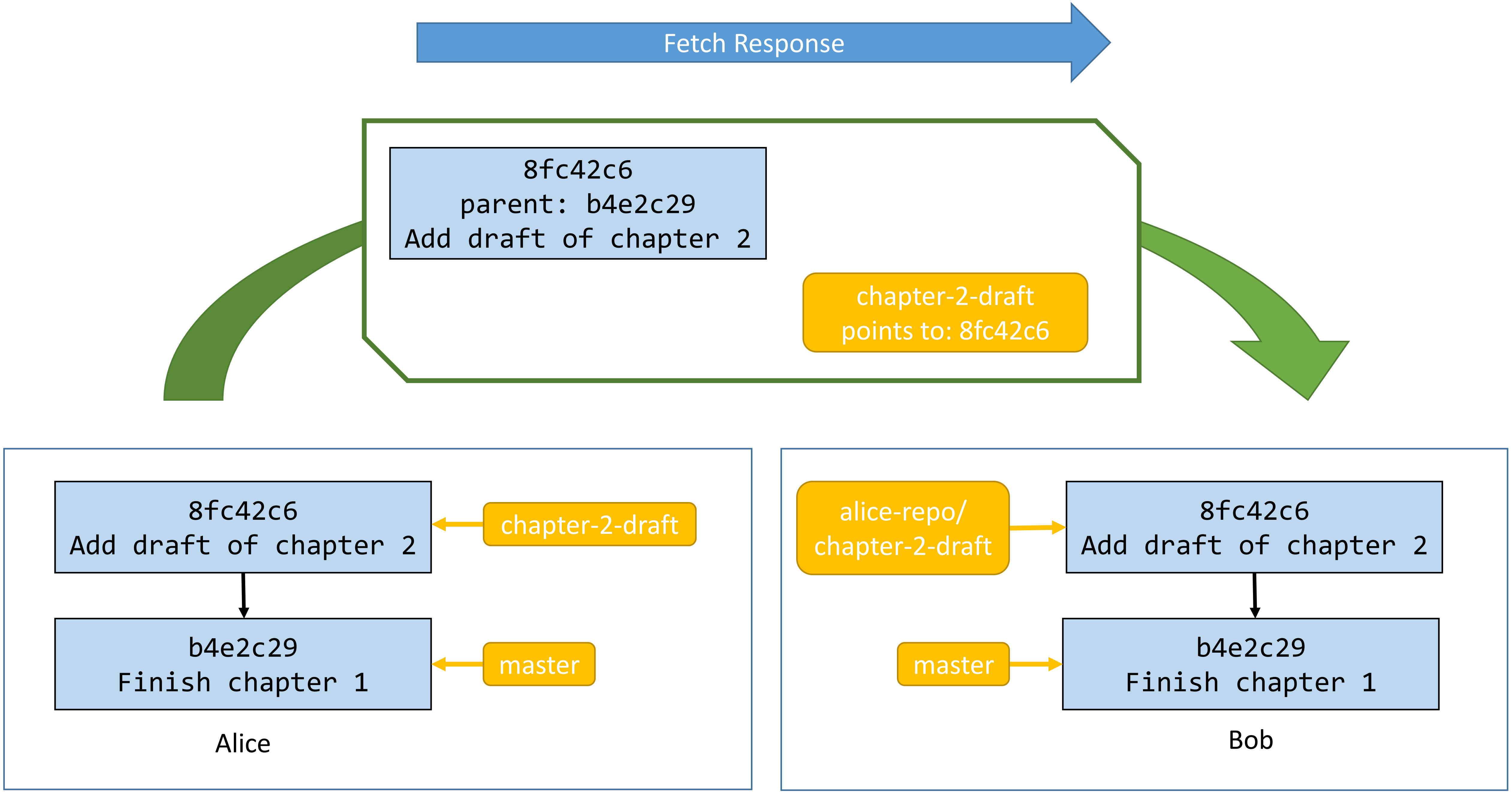

master,
HEAD
db82ca7: Merge branch ‘featureA’ into master
featureA
db82ca7: Merge branch ‘featureA’ into master
b5f3729: Alice: even more work on feature A
featureB
8277e09: Bob: even more work on feature B
6f96cf3: Alice: more work on feature A
e167179: Bob: more work on feature B
8fc42c6: Alice: begin work on feature A
8b7d883: Bob: begin work on feature B
b4e2c29: initial commit

From the First Lecture: Git is a DVCS



Scenario: Alice and Bob are writing a story about squirrels




Fetch Response
8fc42c6
parent: b4e2c29
Add draft of chapter 2
chapter-2-draft
points to: 8fc42c6
8fc42c6
Add draft of chapter 2
chapter-2-draft
b4e2c29
Finish chapter 1
master
Alice
alice-repo/
chapter-2-draft
8fc42c6
Add draft of chapter 2
b4e2c29
Finish chapter 1
master
Bob

Fetching

1. Tell git to set up Alice’s repository as a “remote repository” or a “remote”. This only happens once.
2. Tell git to download the commits and branch pointers that you don’t have from the remote repository

STEP 1

git remote add <remotename> <remoteurl>

Example use:

```
git remote add origin https://github.com/aperley/squirrel-story.git
```

- Adds a remote repository called “origin” located at https://github.com/aperley/squirrel-story.git
- “origin” is the default name for a remote, since often times the first remote you have is the one you clone from
- If you created the repository using `git clone` (rather than `git init`), the repository you cloned from is called “origin”

STEP 2

git fetch <remotename>

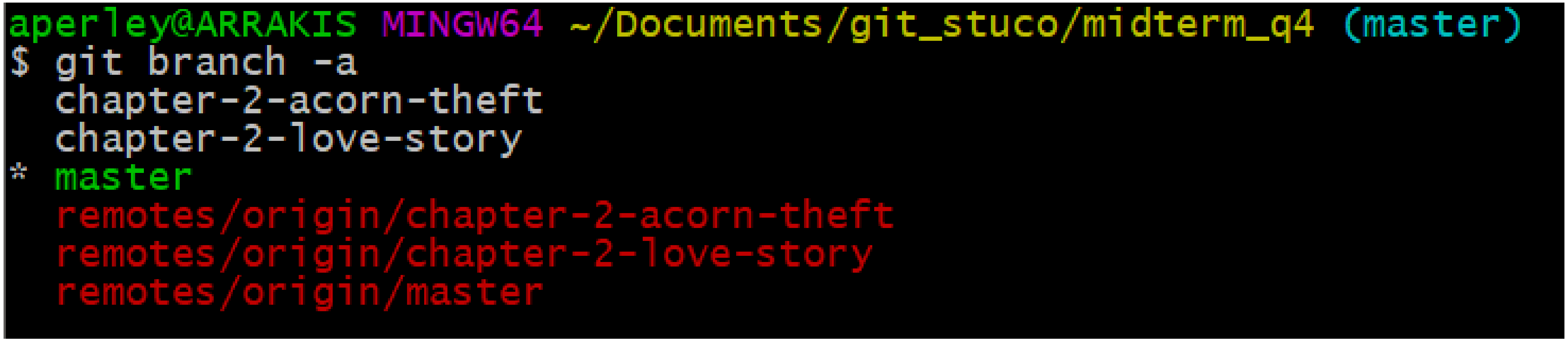
Example use:

```
git fetch origin
```

- **Downloads** and **updates** all branches published by the remote
- Stores these branches as `<remotename>/<branchname>`
- Does NOT affect your own branches, like `master`!

Listing Remote Branches

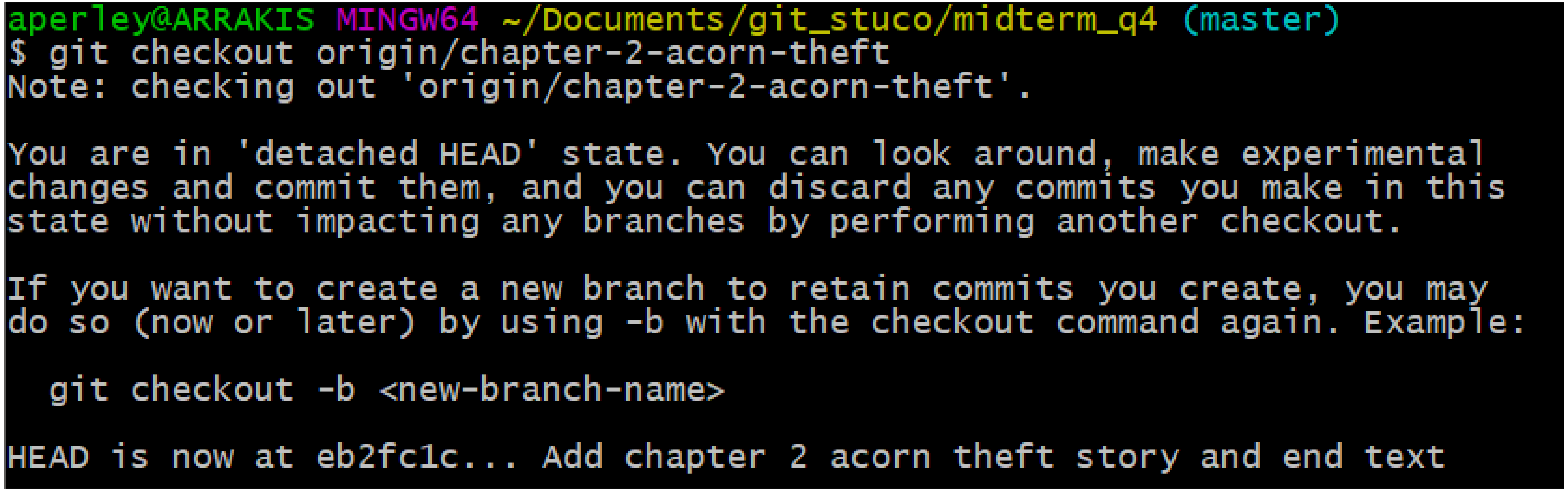
- `git branch –r` (only remote) or `git branch –a` (all branches)



```
aperley@ARRAKIS MINGW64 ~/Documents/git_stuco/midterm_q4 (master)
$ git branch -a
  chapter-2-acorn-theft
  chapter-2-love-story
* master
  remotes/origin/chapter-2-acorn-theft
  remotes/origin/chapter-2-love-story
  remotes/origin/master
```

You can checkout remote branches…

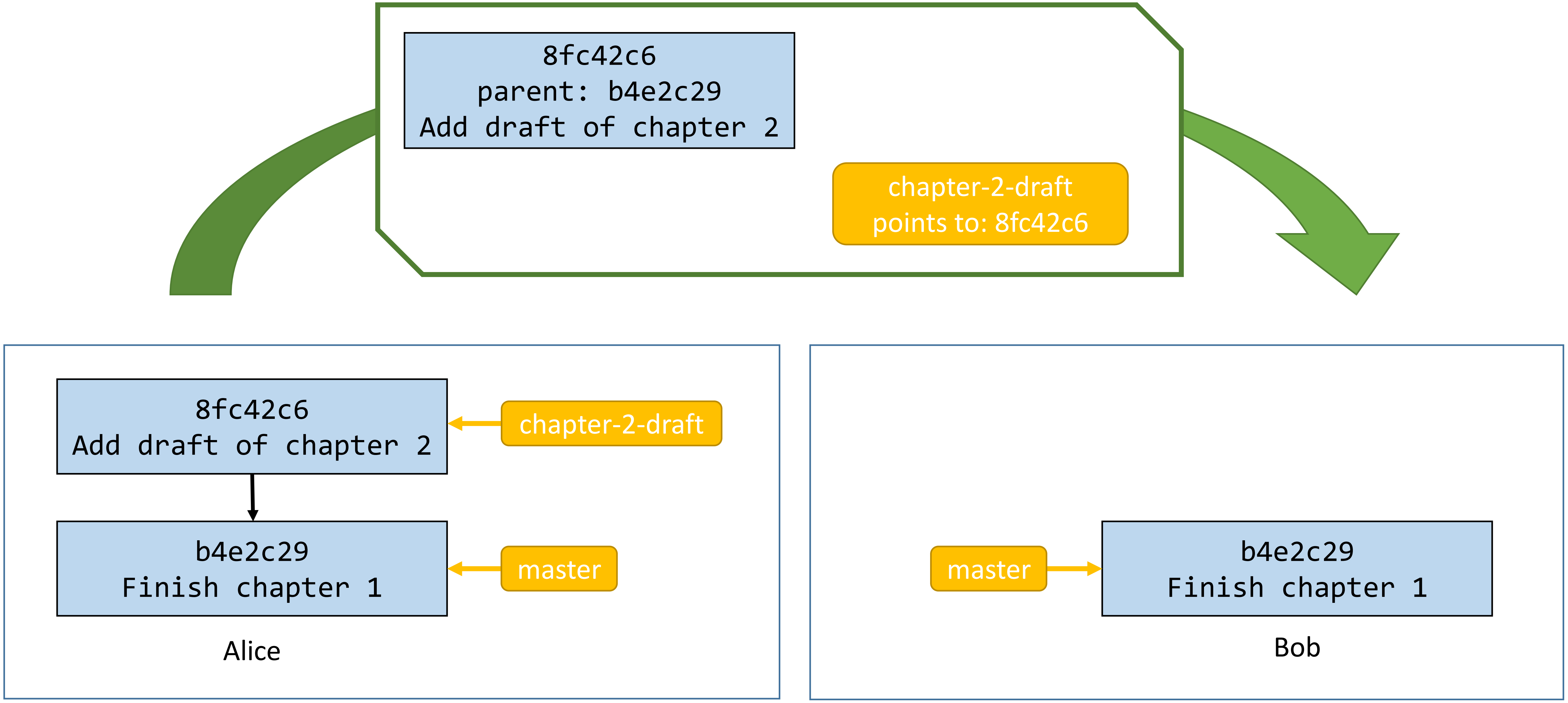
But you can’t make commits on them or move them like normal!



```
aperley@ARRAKIS MINGW64 ~/Documents/git_stuco/midterm_q4 (master)
$ git checkout origin/chapter-2-acorn-theft
Note: checking out 'origin/chapter-2-acorn-theft'.

You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by performing another checkout.

If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -b with the checkout command again. Example:

  git checkout -b <new-branch-name>

HEAD is now at eb2fc1c... Add chapter 2 acorn theft story and end text
```

Because they represent the state of the remote repository and are changed by git fetch!

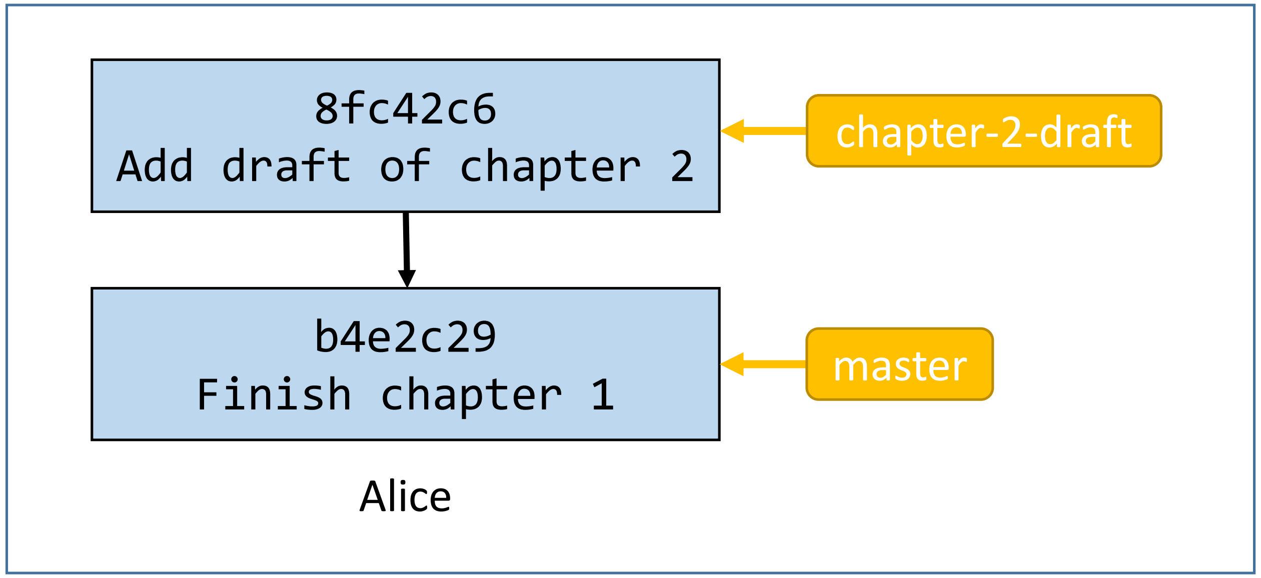
How do you actually bring in the remote changes?

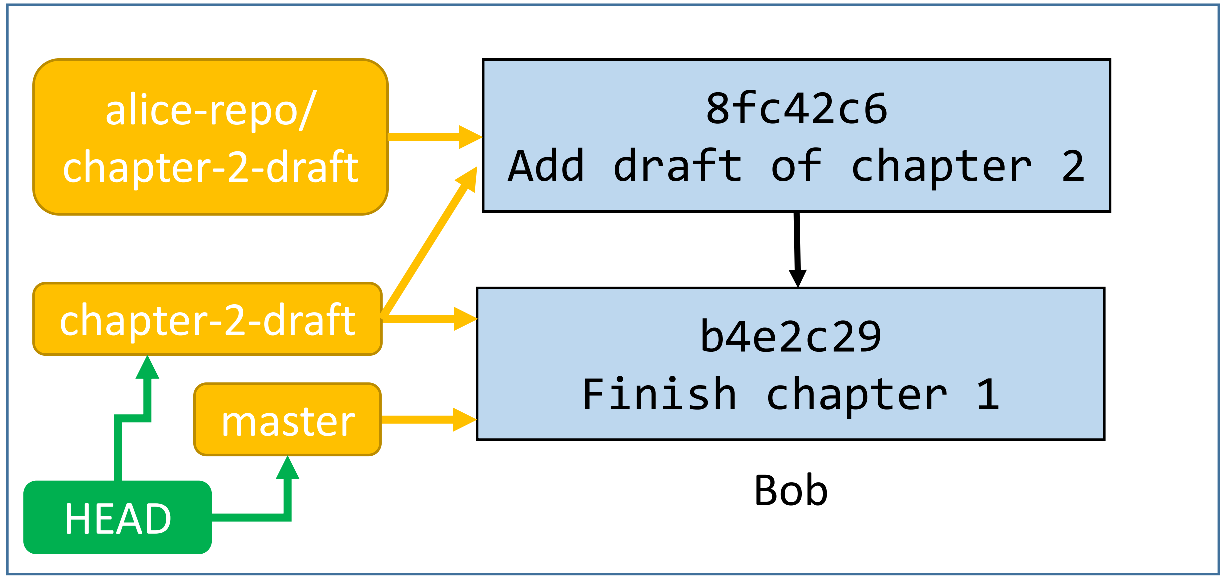


How do you actually *merge* in the remote changes?

```
git fetch alice-repo

git checkout -b chapter-2-draft

git merge alice-repo/chapter-2-draft
```

Everything is a branch!





git pull <remotename>

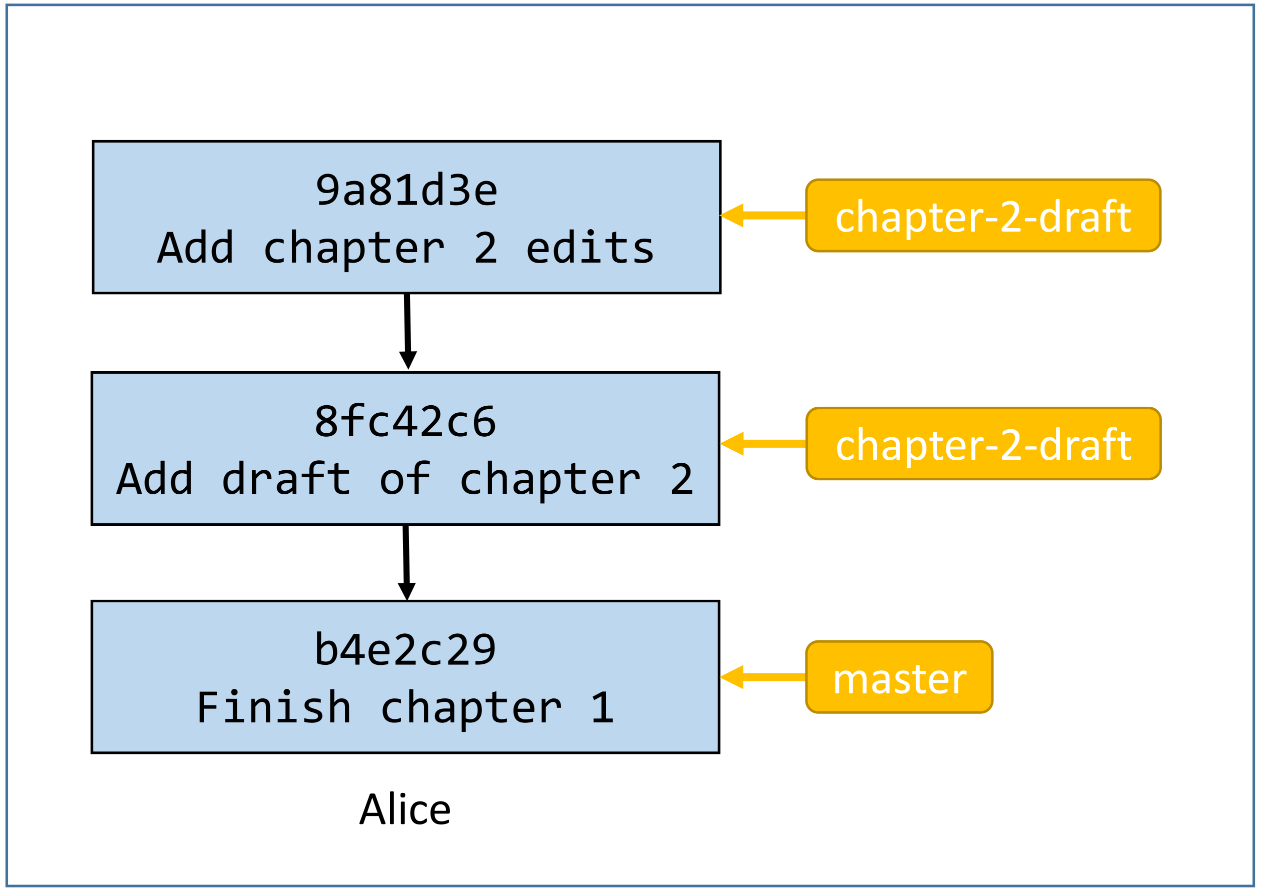
Example use:

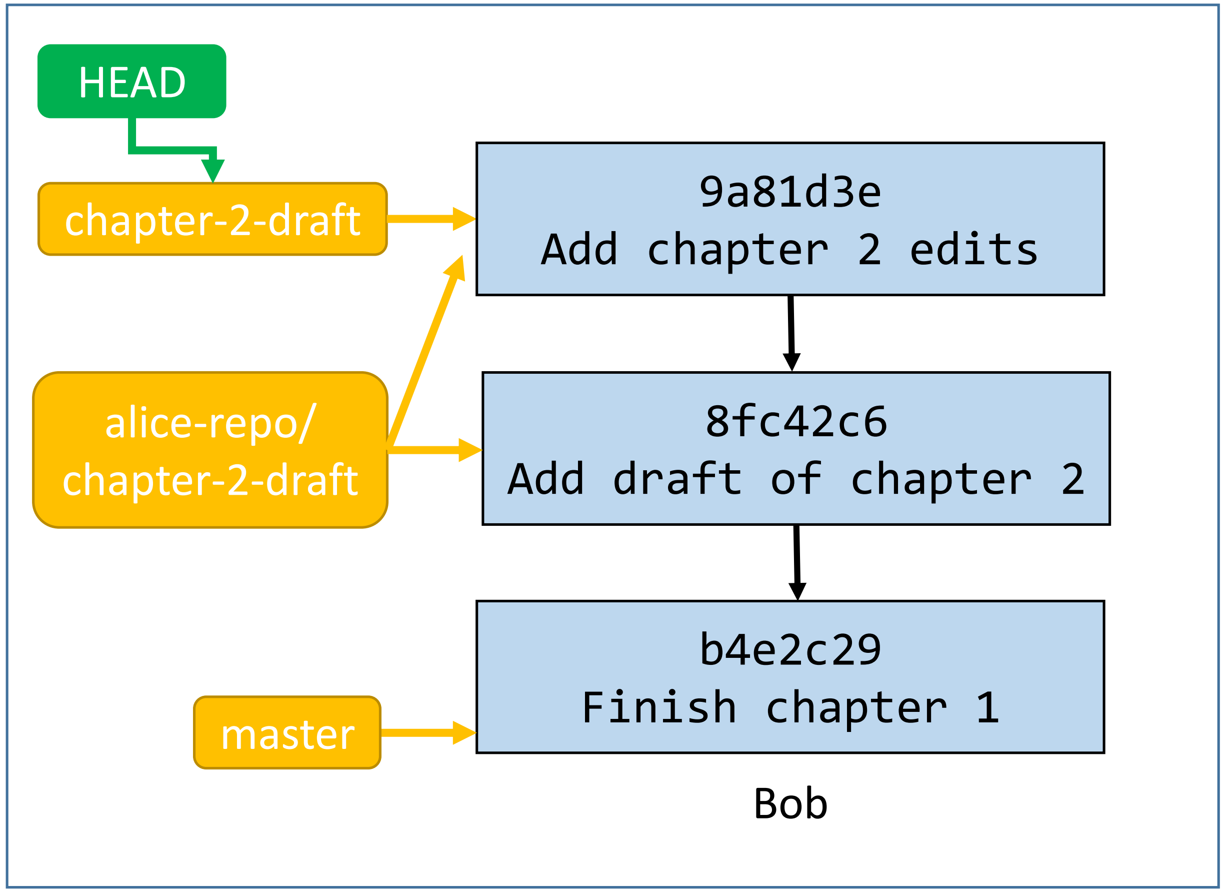
```
git pull origin
```

- Runs `git fetch <remotename>`, then `git merge <remotename>/<currentbranch>`
- Ex: runs `git fetch origin`, then `git merge origin/master`

What about giving back?

```
git push alice-repo chapter-2-draft:chapter-2-draft
```





git push

```
git push <remote_name> <local_branch>:<remote_branch>
```

- Uploads the necessary commits to <remote_name> and changes <remote_name>/<remote_branch> to point to the same commit <local_branch> points to.

Summary

- Configuring remotes:
    - git remote [-v] – lists remotes [verbosely]
    - git remote add <remotename> <remoteurl> - configure a new remote
    - git branch –r or –a – lists branches including remote tracking
- Fetching:
    - git fetch <remotename> - downloads updates to all remote-tracking branches to match the remote
    - git pull <remotename> - runs `git fetch`, then merges in updates to the current branch
- Pushing:
    - git push <remotename> <branchname> - uploads changes in your branches to the remote

Activity!

Clone:
`YOUR_ANDREW_ID@unix.andrew.cmu.edu:/afs/andrew.cmu.edu/course/98/174/public/lecture6-practice`

```
Create a branch named YOUR_ANDREW_ID
And make a commit to it

Push the branch up to origin
```