GitHub Campus Advisors

Teacher training to master Git and GitHub

GitHub Education

Module 1

Basics

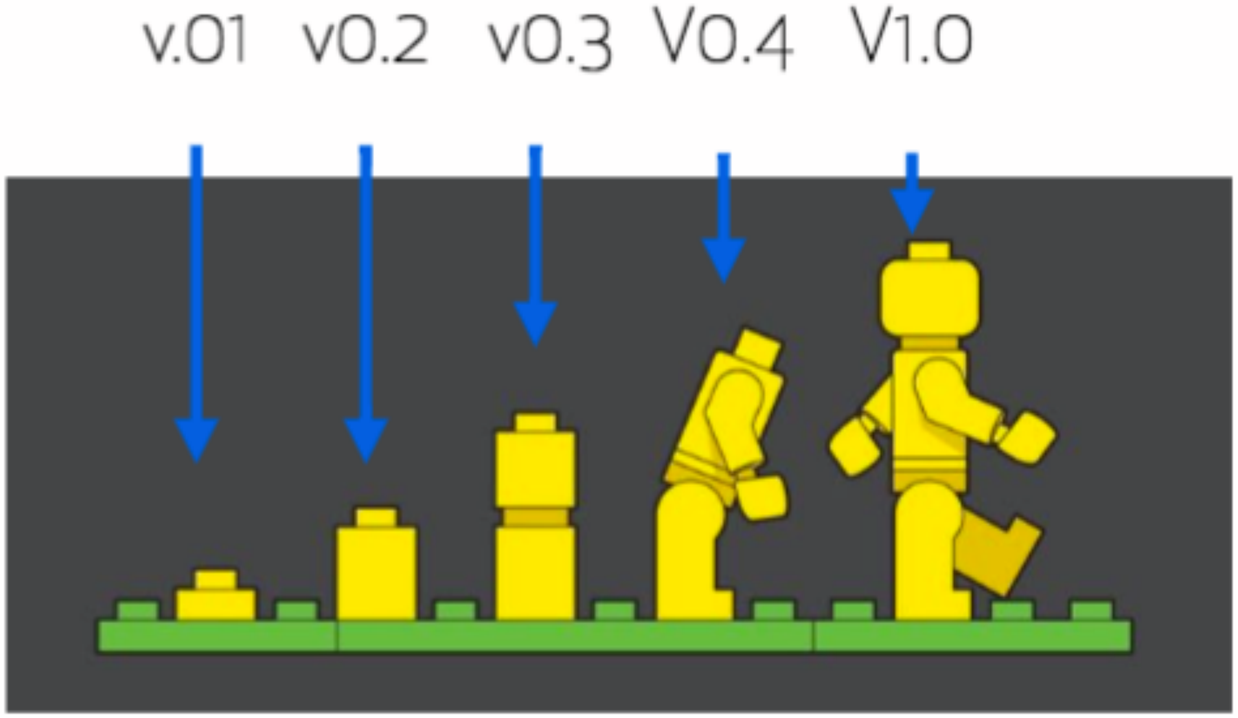
Introduction to Git
Understanding the state of your repository
Being selective with Git
Inside a commit

Questions
Exercises

Git basics
(a.k.a. ‘the internals’)

Git is a *version control system*

A tool that lets you track your progress over time.

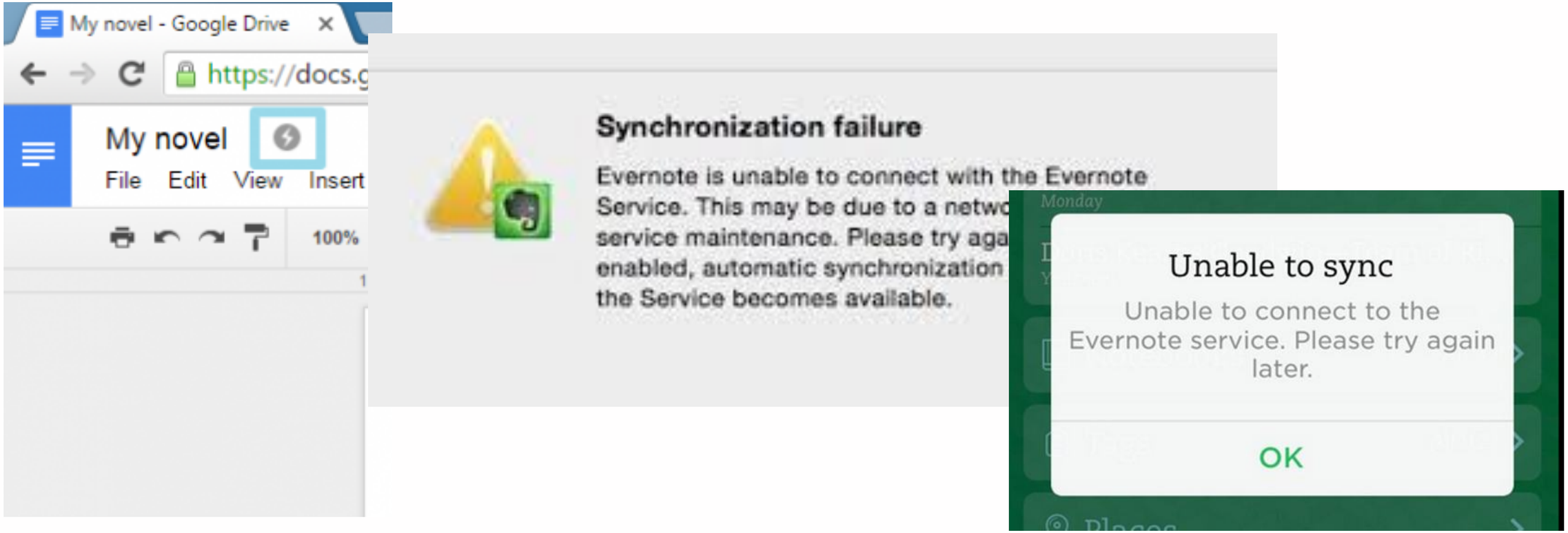


Git takes snapshots

Save snapshots to your history to retrace your steps.

Also keeps others up-to-date with your latest work.

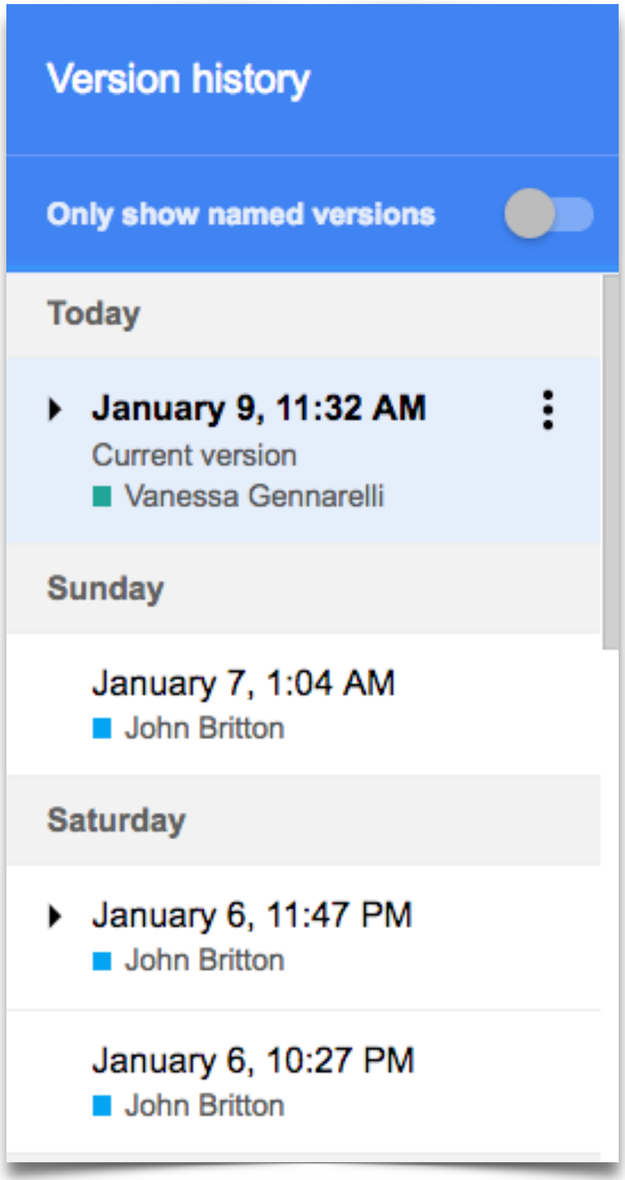
Centralized systems require coordination…



Order with coordination:

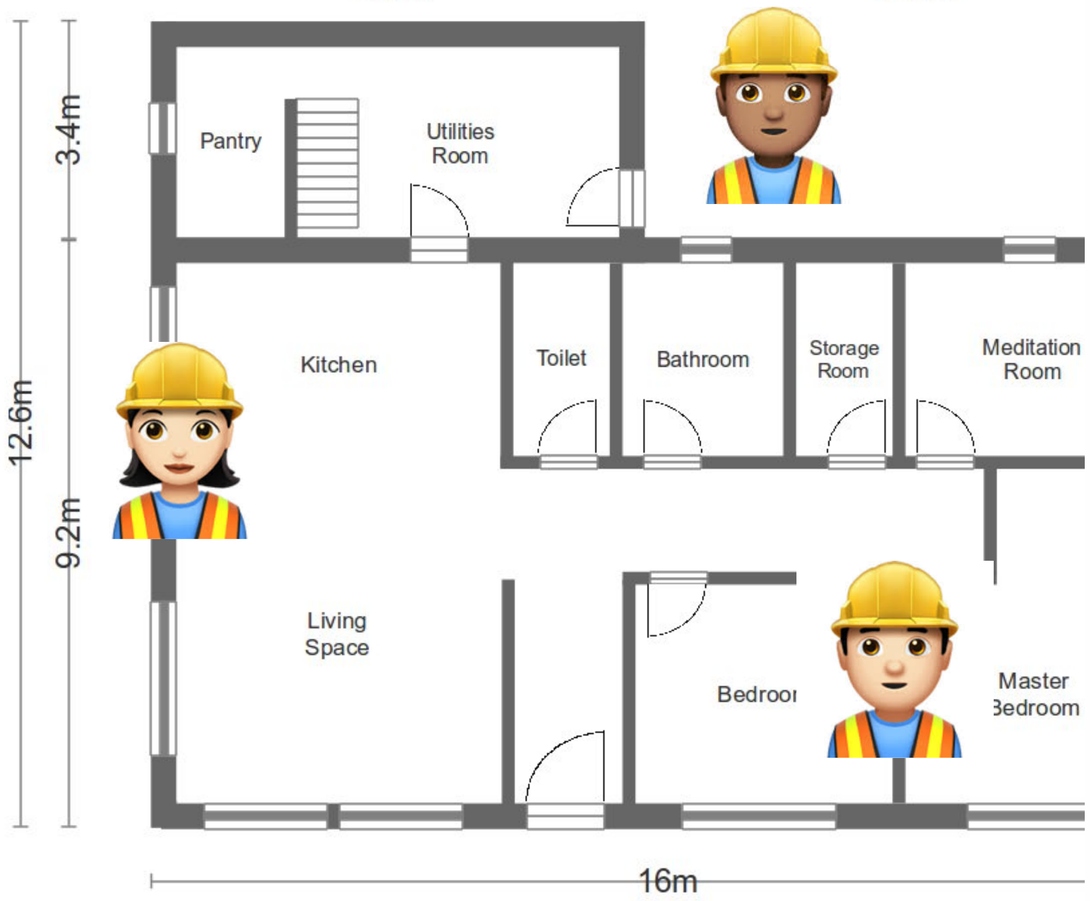
In a centralized system, you can objectively call versions a numerical progression: version 1, version 2, version 3…

Since John made a new version before Vanessa, his is n+1, and Vanessa is n+2.



Working in parallel: order without coordination

Git goes after this idea of distributed version control, so you can keep track of your versions without coordination.



In your terminal, check to see if you have Git installed.

```
git --version
```

If it's not installed, configure Git to recognize you:

```
git config user.name "Mona Lisa"

git config --global user.email
"email@example.com"
```

A repository holds the entire history of your project

A repository is the unit of separation between projects in Git.

Each project, library or discrete piece of software should have it's own repository.

Create a repository

```
cd desktop
git init exercise-1
cd exercise-1
ls -al
```

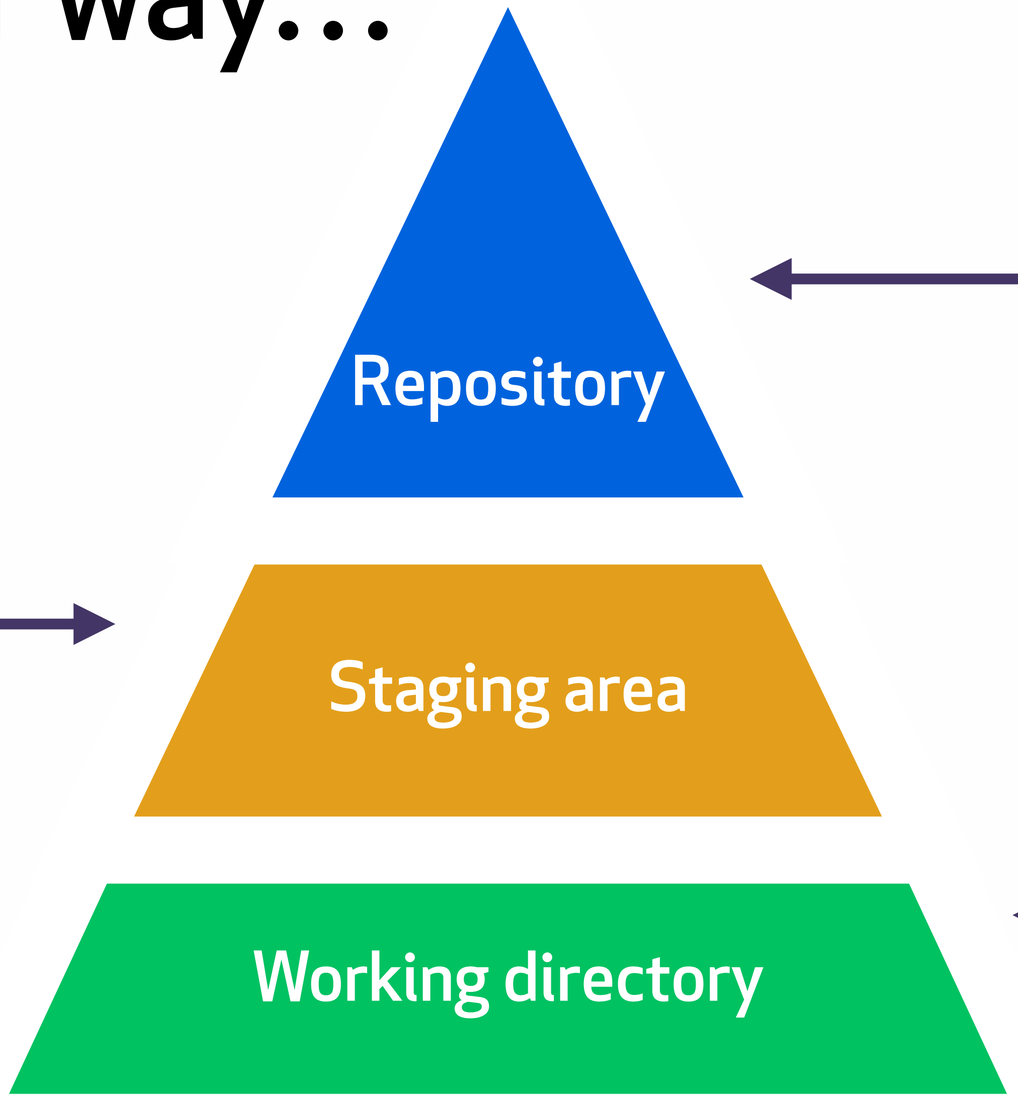
Git is like a desk

Working directory
where you write

Staging area
rough draft, in a
manila folder

Repository
final draft
in the filing cabinet

Put another way…

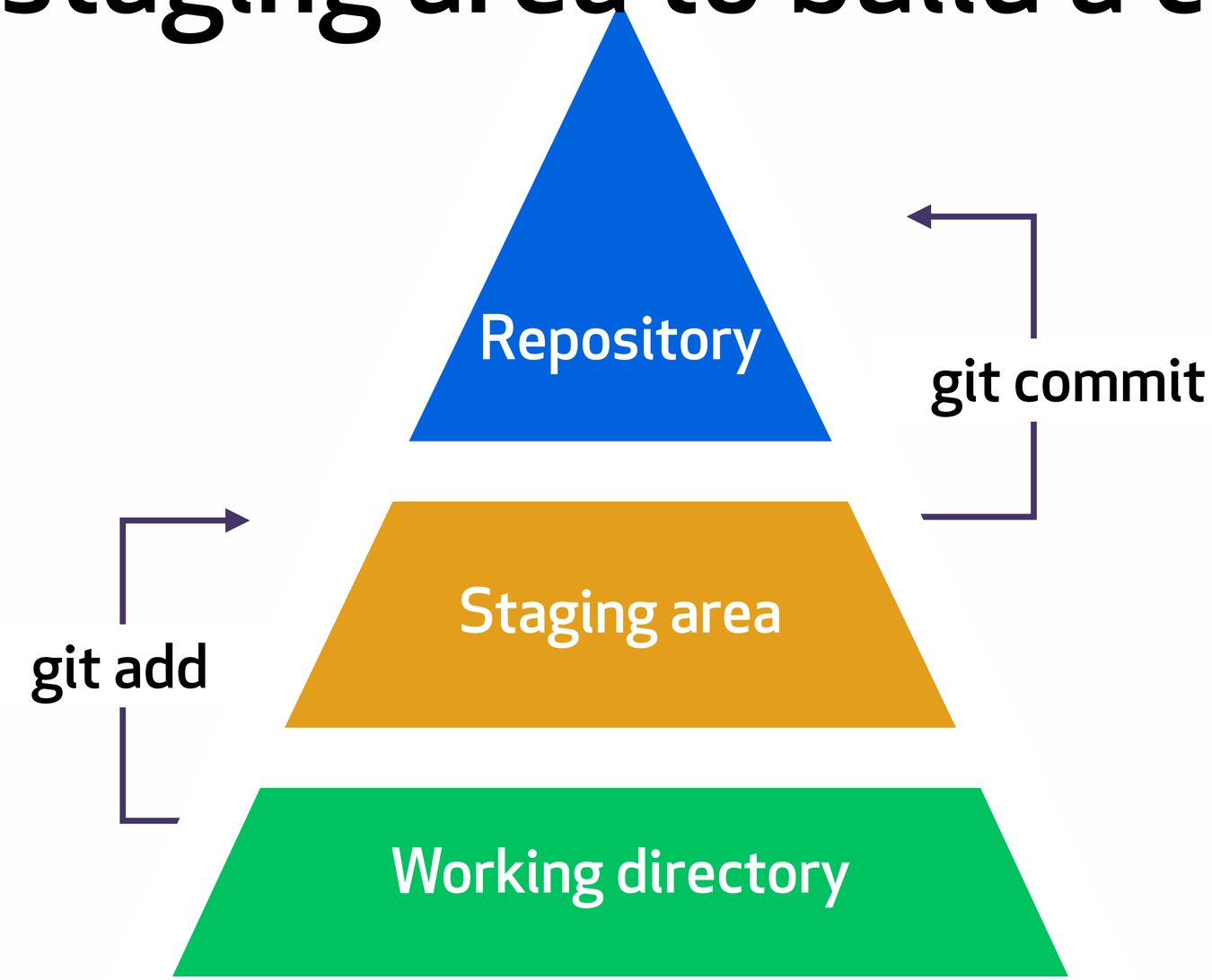


Repository
Final draft,
permanent

Staging area
Your rough draft

Working directory
Your workspace,
local on your machine

Use the staging area to build a commit



Create a file in your Git repository + add it to staging.

```
touch readme.md
git status
git add readme.md
git status
```

Making commits

`‘git commit’`

tells Git to save that portion of the project from the staging area into the repository history.

Understanding the state of your repository

Let’s put together an exercise-1 for your students

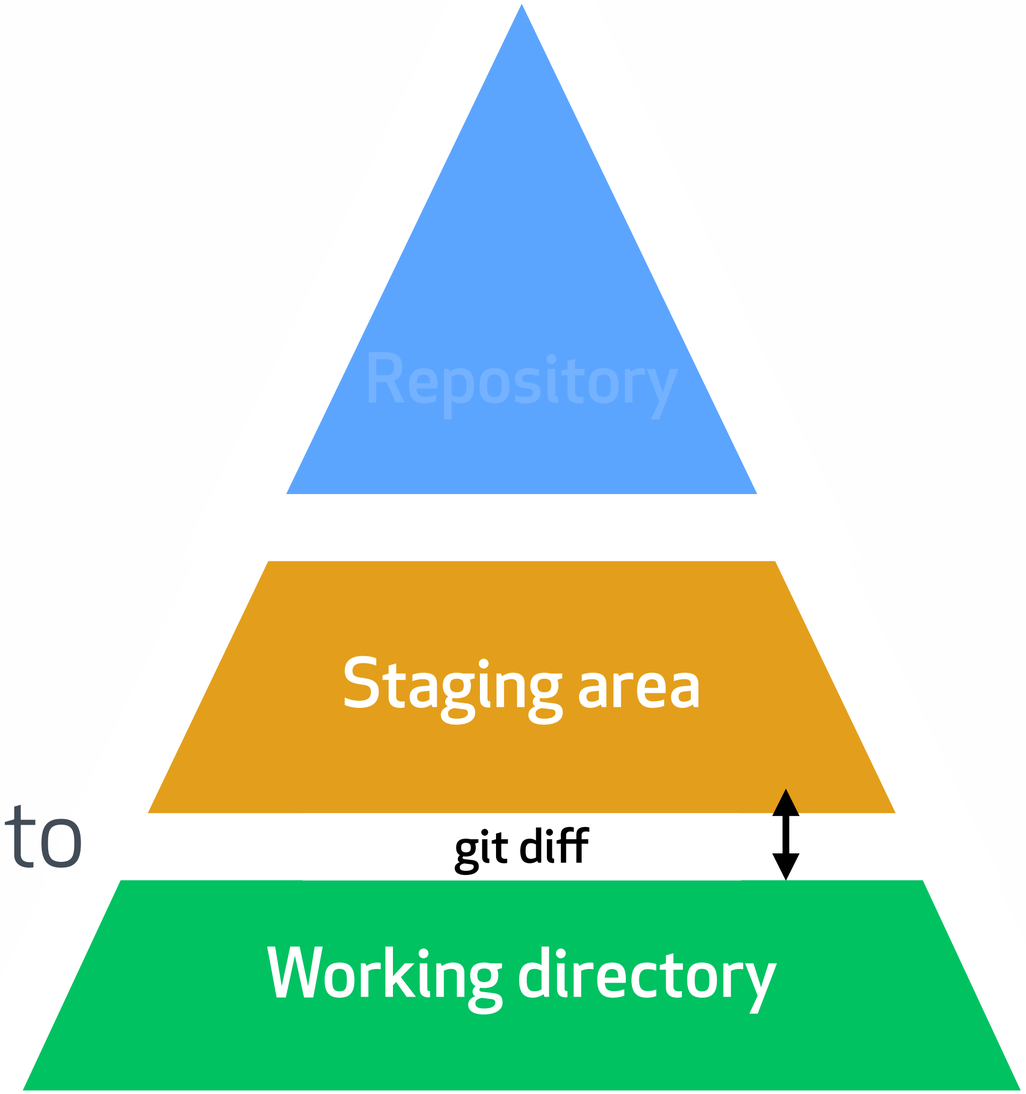
1. Edit the readme with directions for exercise-1.
2. We’re going to add the changes to the staging area.
3. Commit those changes.
4. 🎉

Understanding the state of your repository

```
git status
git diff
git diff --staged
```

When we run git diff
what two things are we comparing?

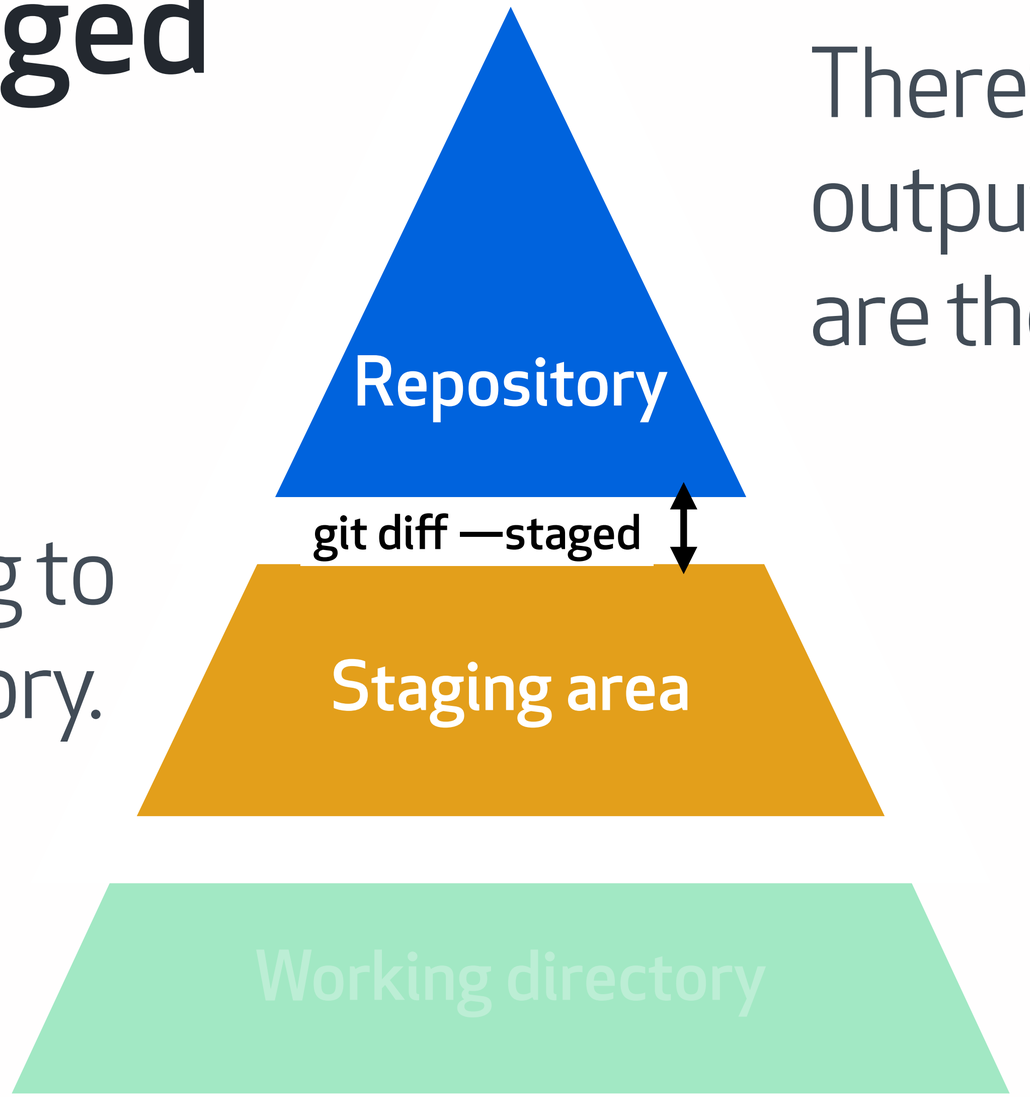
git diff



Compares staging to working directory.

There's no output if they are the same.

git diff --staged



There's no output if they are the same.

Compares staging to repository directory.

Git allows you to be selective

You can fix a bug across several different files in the same commit.

```
git commit –m ‘new TA email’
```

But commits should be logically grouped

Don't mix typo corrections and new features.

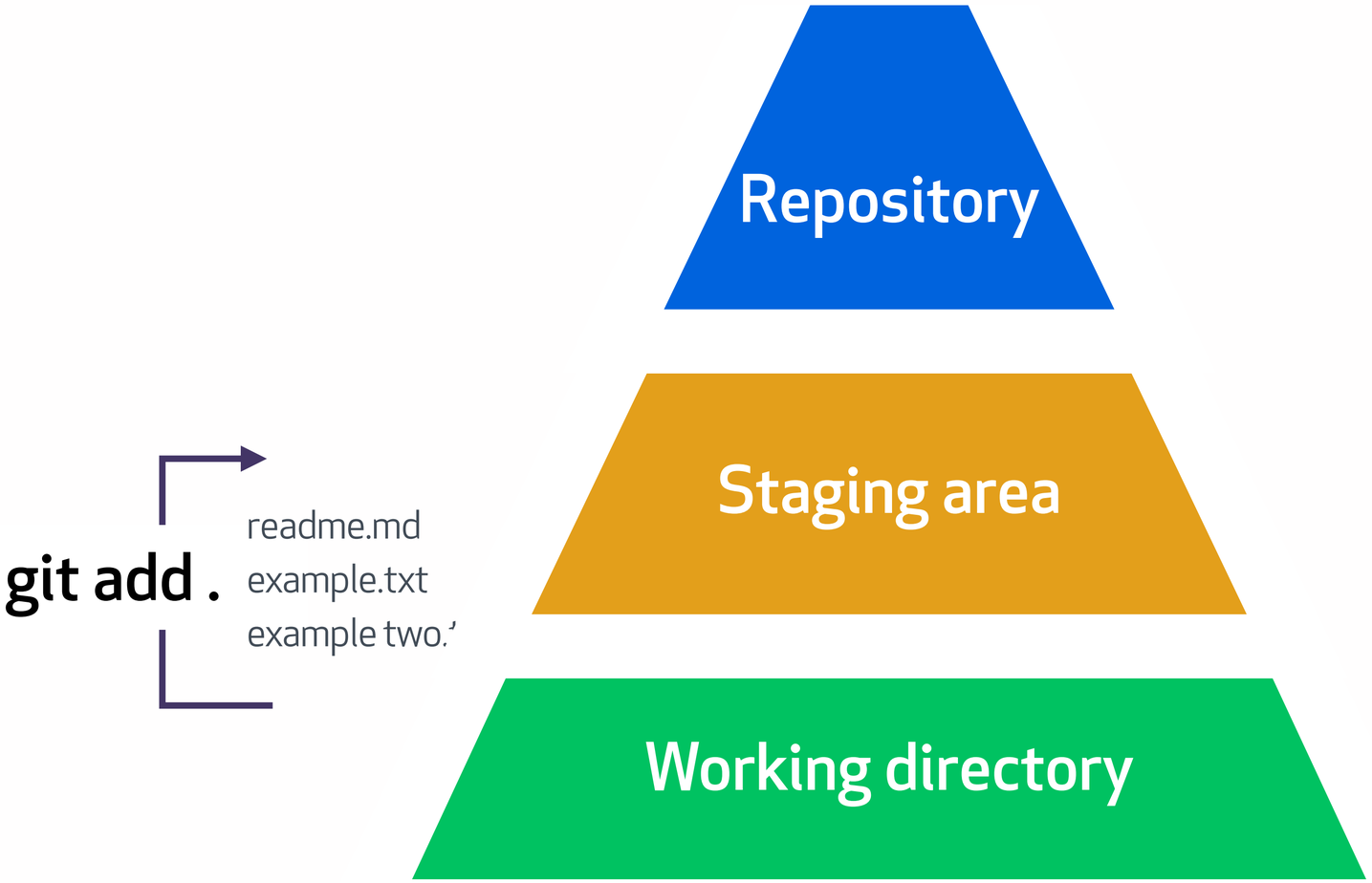
If the feature gets rolled back, you re-introduce the typo.

```
git commit -m 'typo in readme.md'
```

```
git commit -m 'new signup flow.'
```

```
git commit -m 'fix typo, add
field to signup flow, create
parallax effect'
```

It's why you should never use `git add .`



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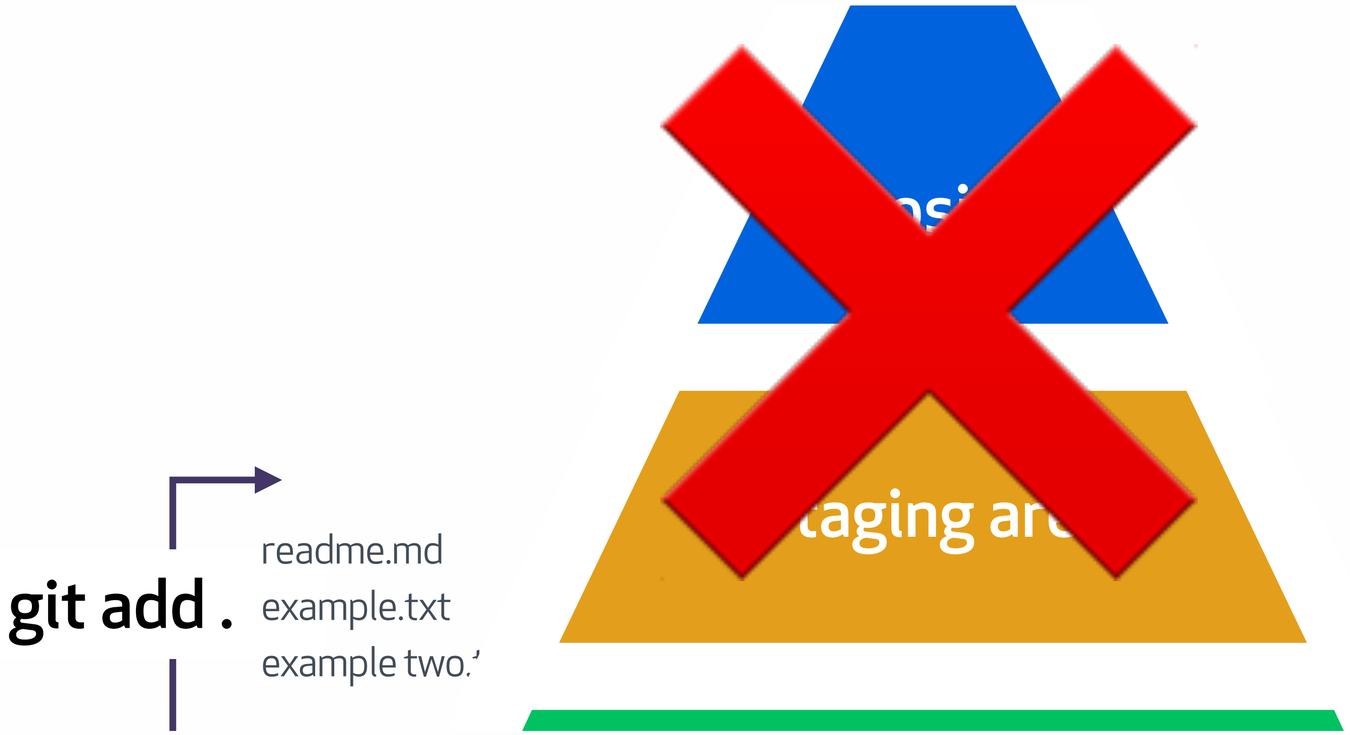


it stages changes that aren't logically related…

Imagine if you revealed solutions in exercise-1

You'd need to update Exercise-1, but you don't need to touch 2 or 3.

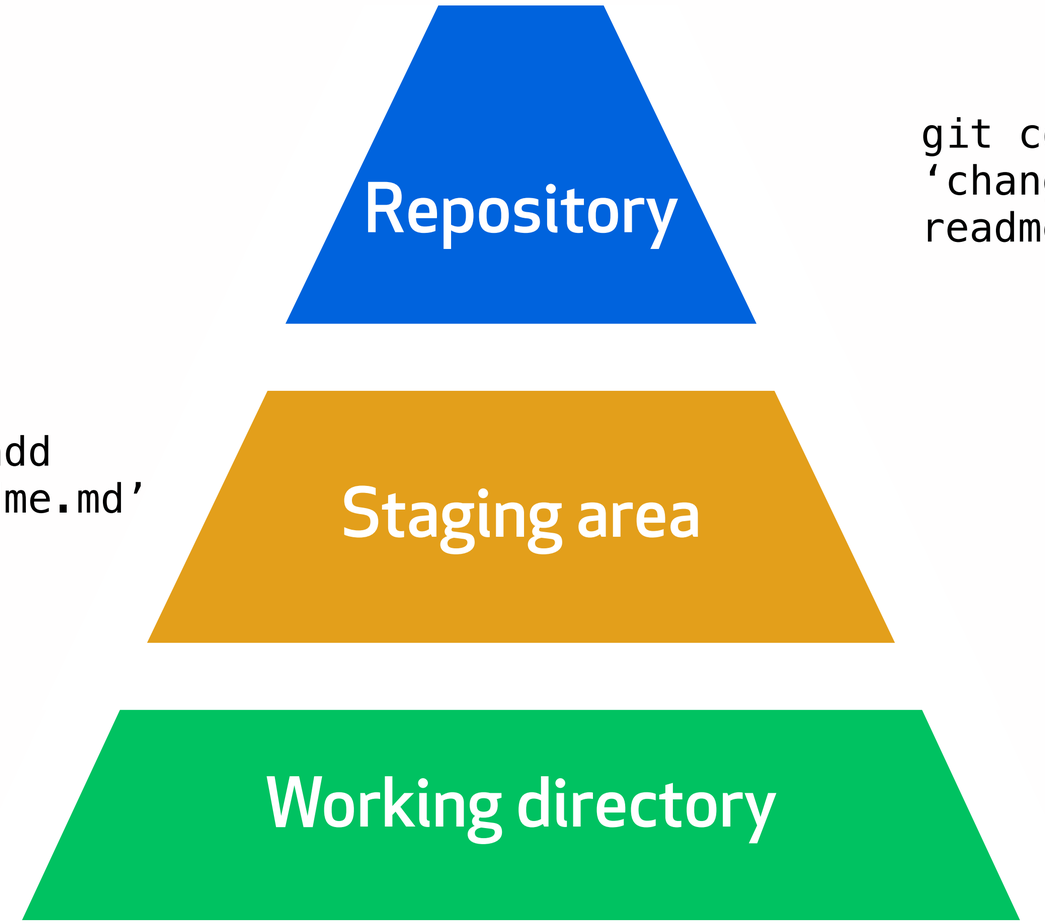
```
git commit –m 'remove key data'
```

Order of operations:

First, we stage the modifications we've made

git add .

```
git add
'readme.md'
```



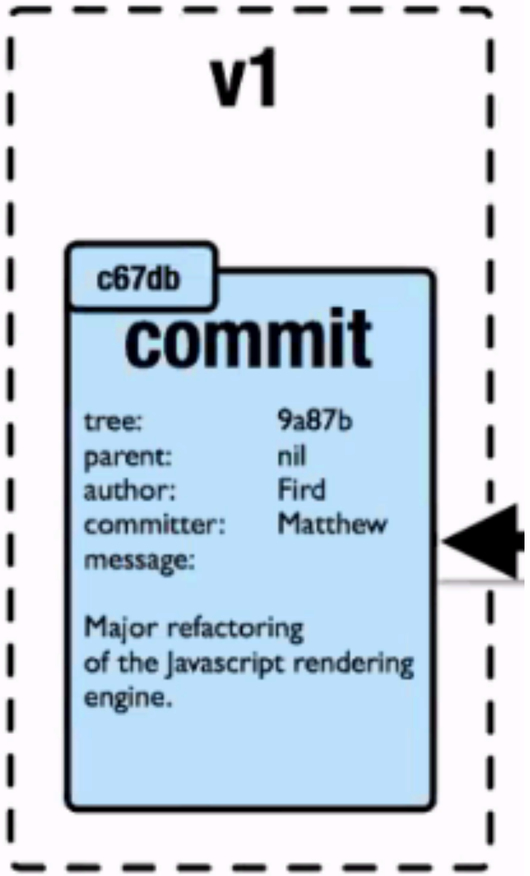
Then, commit the modifications to Repository.

```
git commit -m
'changes to
readme.md'
```

git commit

Now..
a bit of theory

Inside a repository



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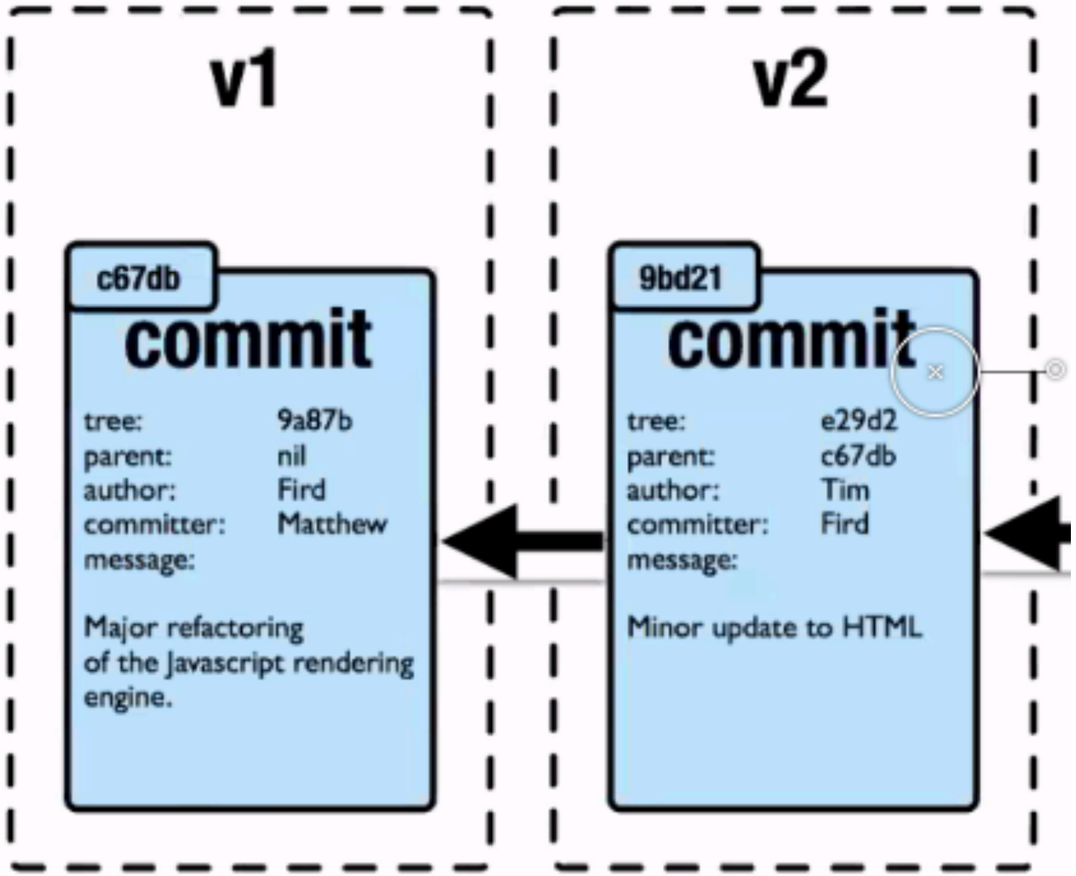

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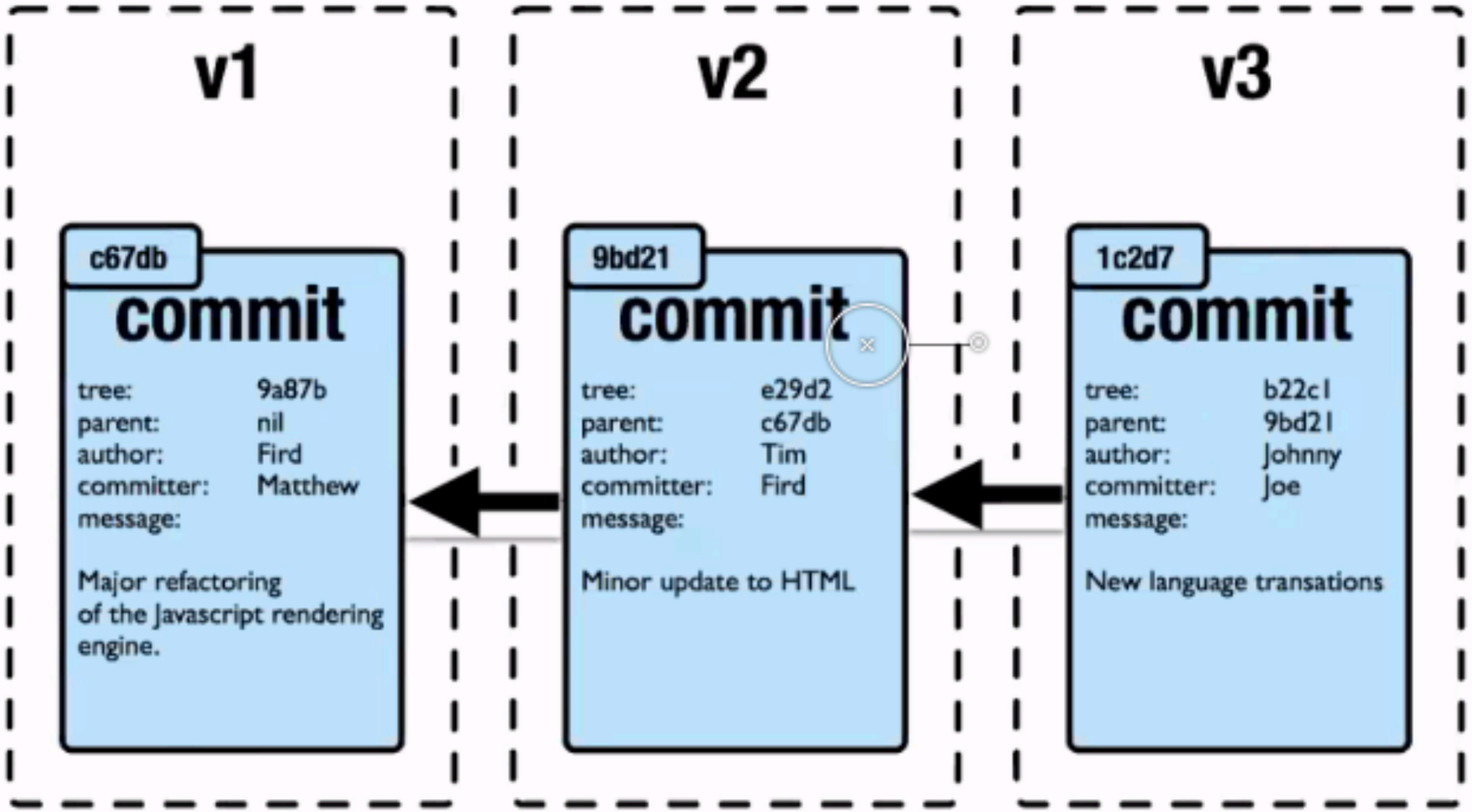
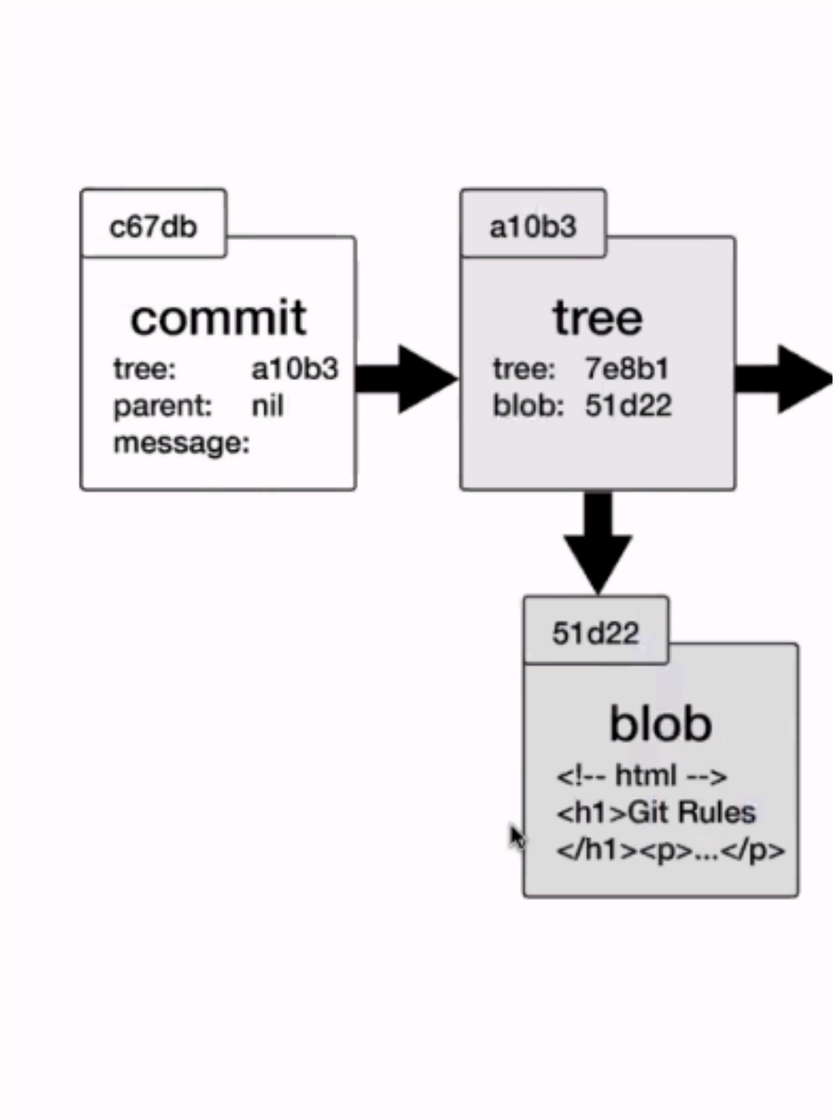
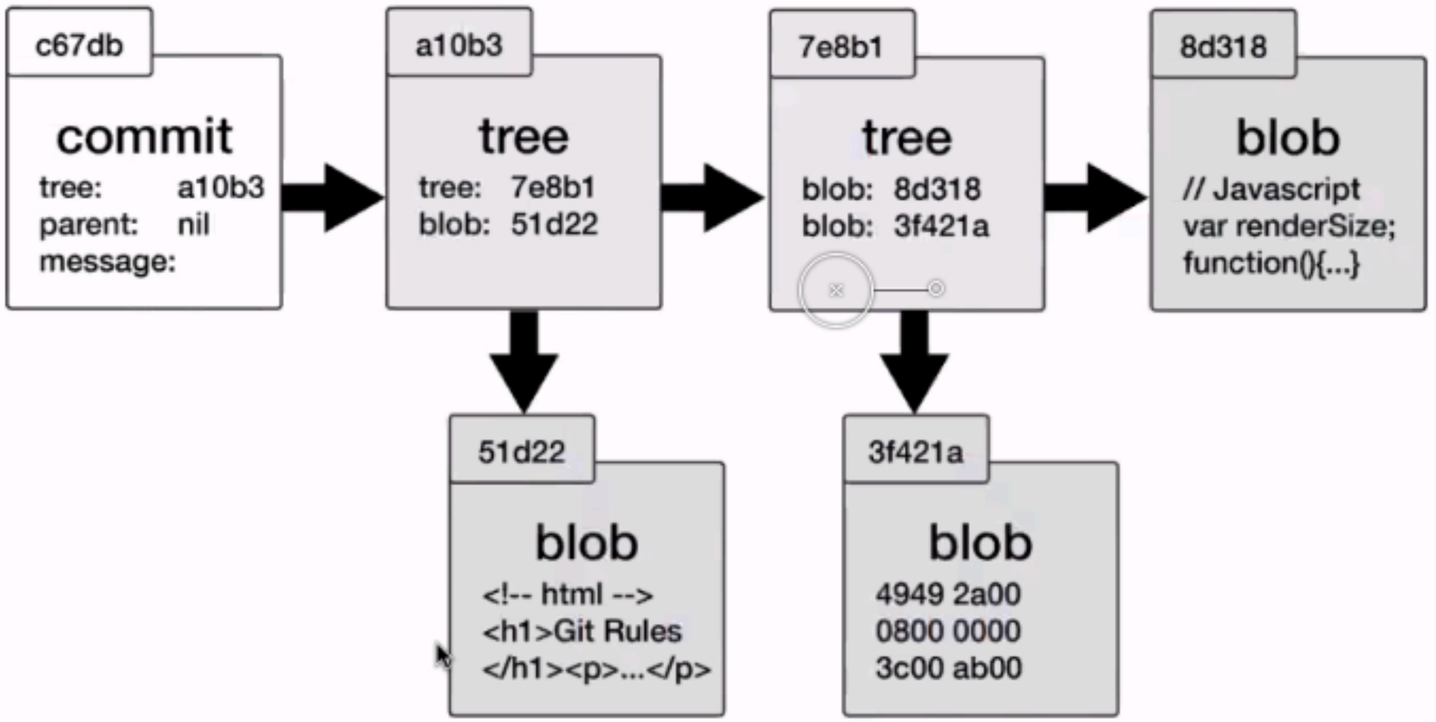


Inside the commit



It's a Merkle tree if that's your thing



Congrats!
You now know the basics
(a.k.a ‘the internals’)

In your terminal, create a demo project that replicates these steps:

- git init demo (cd into it)
- touch readme.md
- git add readme.md
- git reset readme.md
- git add readme.md (to get it back in the staging area)
- git commit -m ‘commit empty readme’