Using git and dance around it

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About Me

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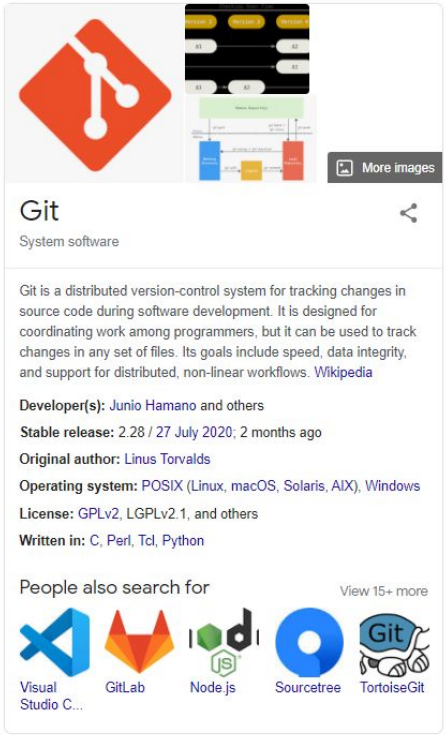
What is git?



A content tracker

A file system

Git tracks content – files and directories.

Why git?

the way Git thinks about its data

Conceptually, most other systems store information as a list of file-based changes

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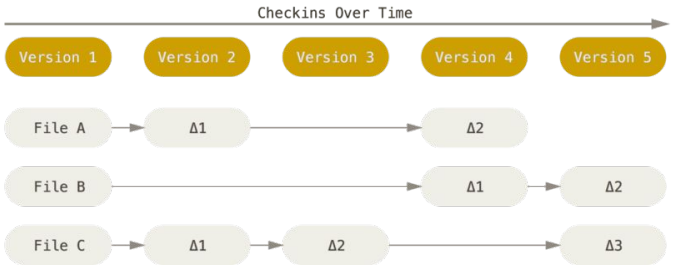
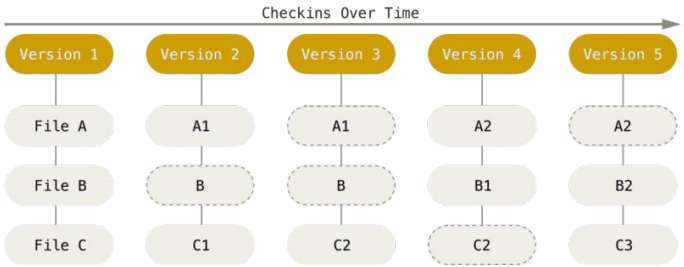
Why git?

When most SCMs store a new version of a project, they store the code delta or diff.

When Git stores a new version of a project, it stores a new tree.





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Git workflow

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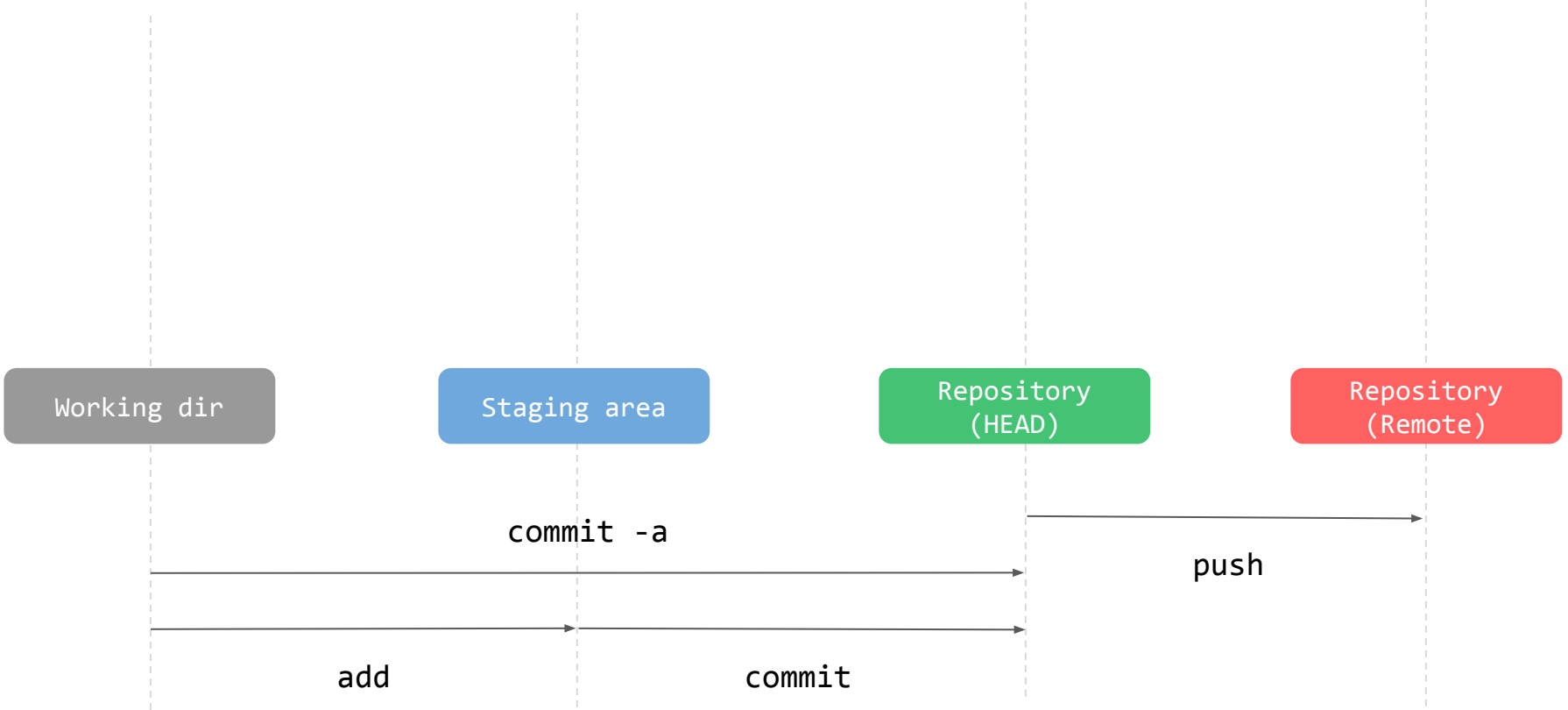
Git workflow



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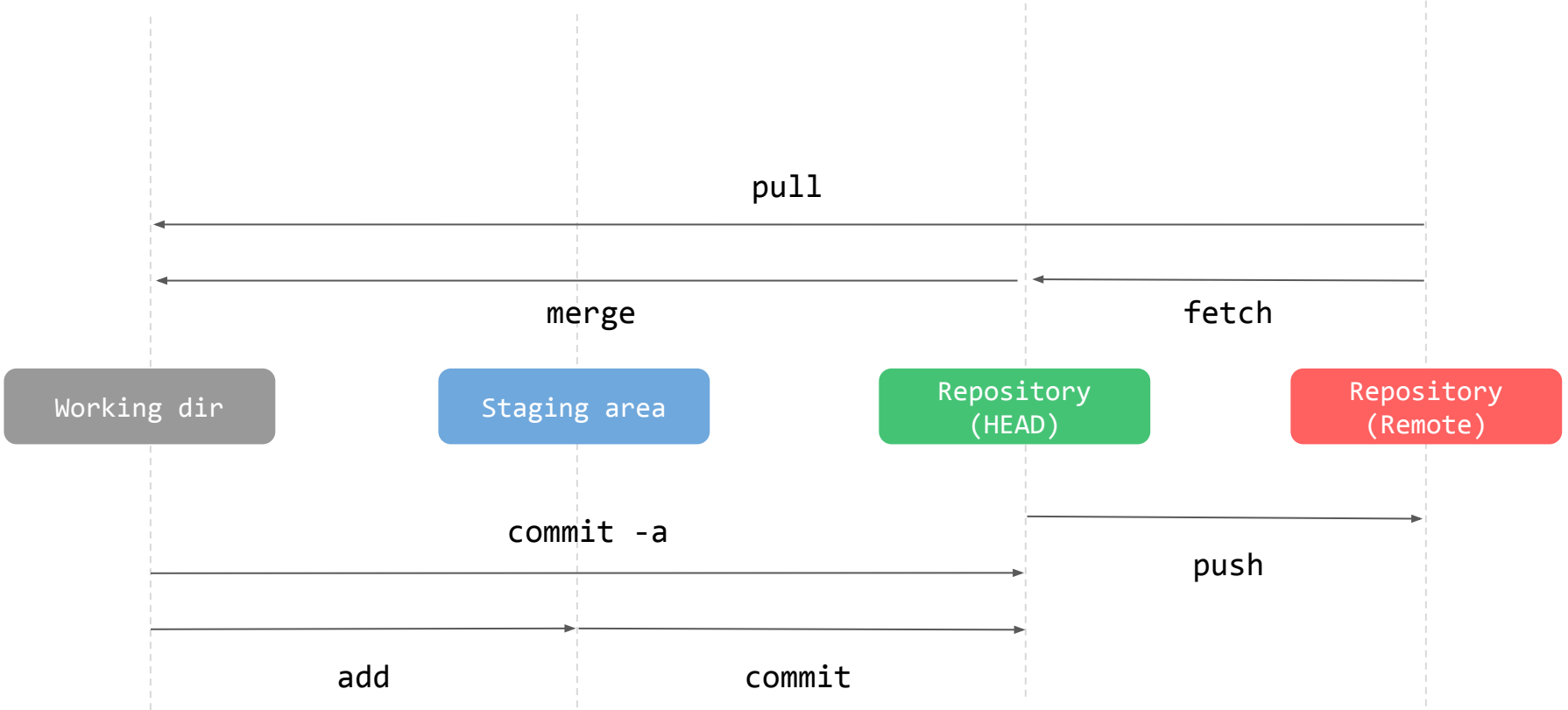
Git workflow



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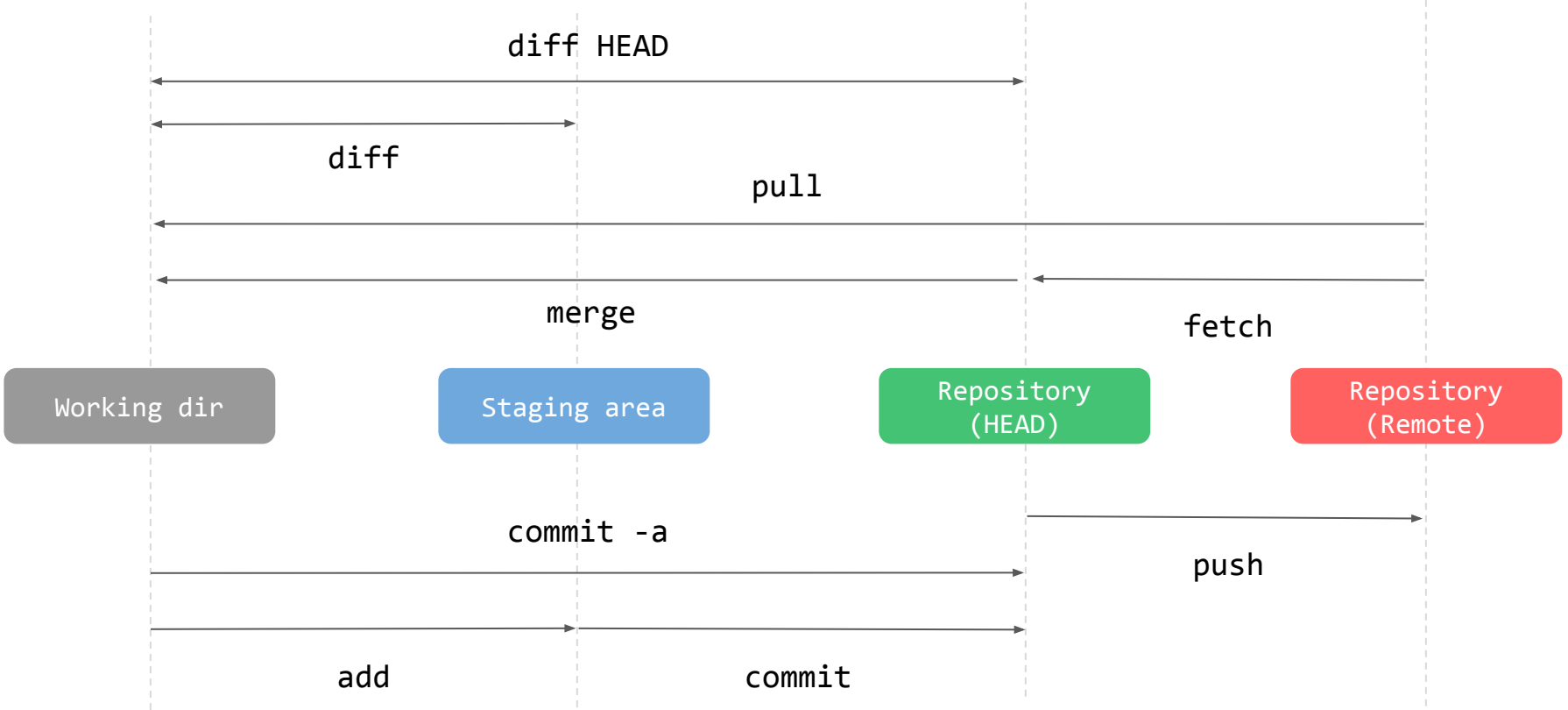
Git workflow



$ git init

Initialized empty Git repository in <directory>

The beginning of everything.

This command creates a file system inside .git directory.

The Git Directory

```
$ ls -F1
config
description
HEAD
hooks/
info/
objects/
refs/
```

Git data model

Git objects are the actual data of Git, the main thing that the repository is made up of.

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- Commit
- Tree
- Blob
- Tag

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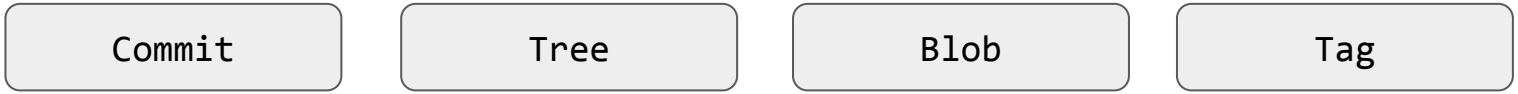


Blobs - Binary large objects

* doesn’t contain file name kind of things. Only raw data.

Git data model

All of these types of objects are stored in the Git Object Database, which is kept in the Git Directory.

Git data model

When there is a new object, Git stores it in your .git/objects directory (the object database).

Git data model

Each object identified uniquely by 40 character hex value(SHA-1 hash key).

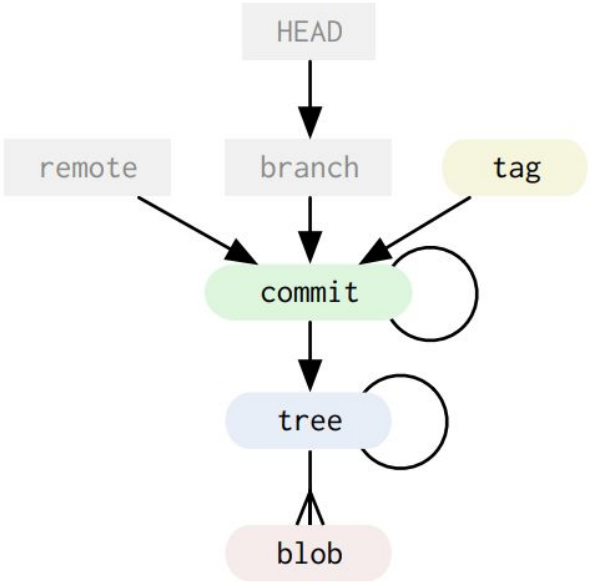
eg: ca82a6dff817ec66f44342007202690a93763949

SHA-1 Hash keys for objects

SHA stands for Secure Hash Algorithm. A SHA creates an identifier of fixed length that uniquely identifies a specific piece of content. SHA-1 succeeded SHA-0 and is the most commonly used algorithm. Wikipedia (http://en.wikipedia.org/wiki/SHA1) has more on the topic.

Git data model

The basic data model I've been explaining looks something like this.



Uni-directional acyclic graph

Git data model

Git objects are immutable. They cannot ever be changed.

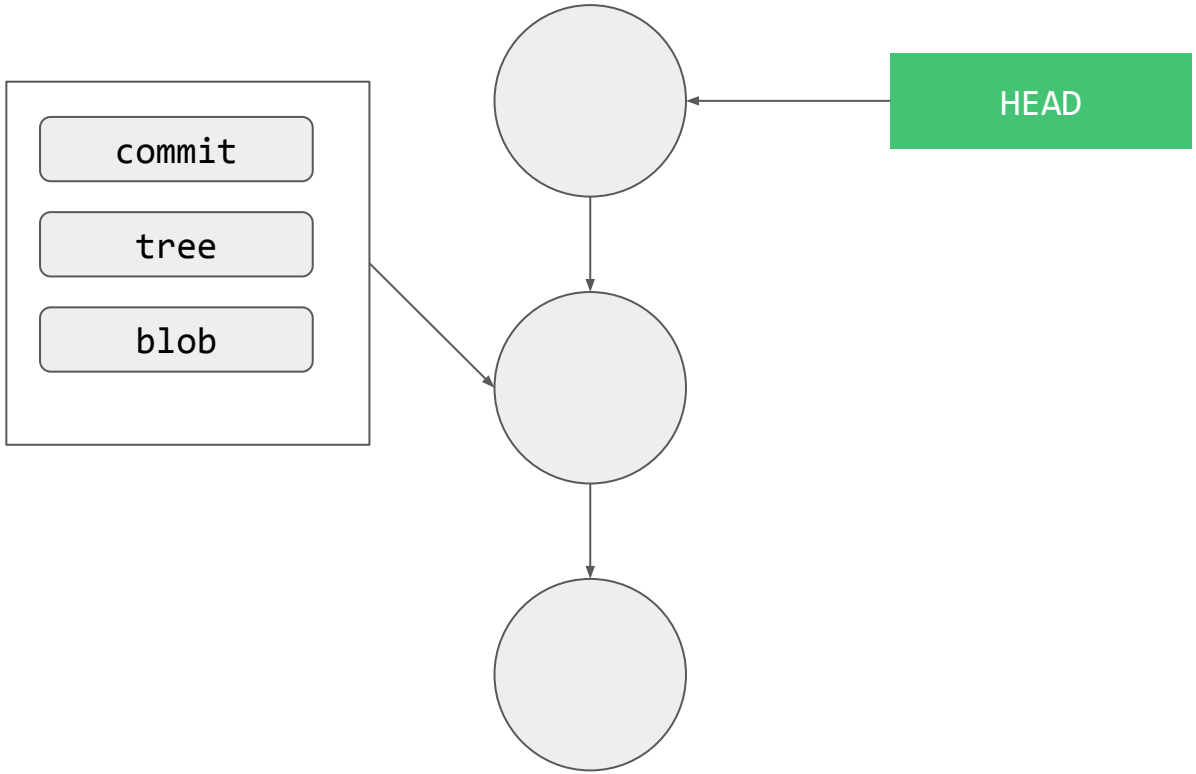
There are references also stored in Git.

Unlike the objects, references can constantly change. They are simple pointers to a particular commit, but easily moveable.

Git branching

Branches is git specifies collection of commits which connected in parent child relation.

Git branching



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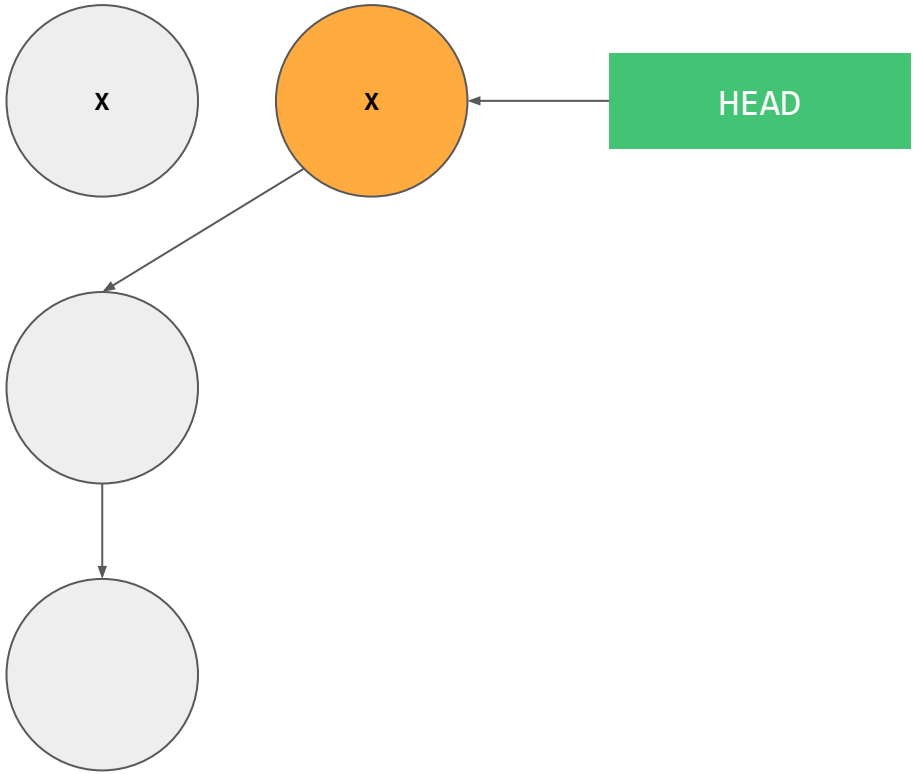
Git branching



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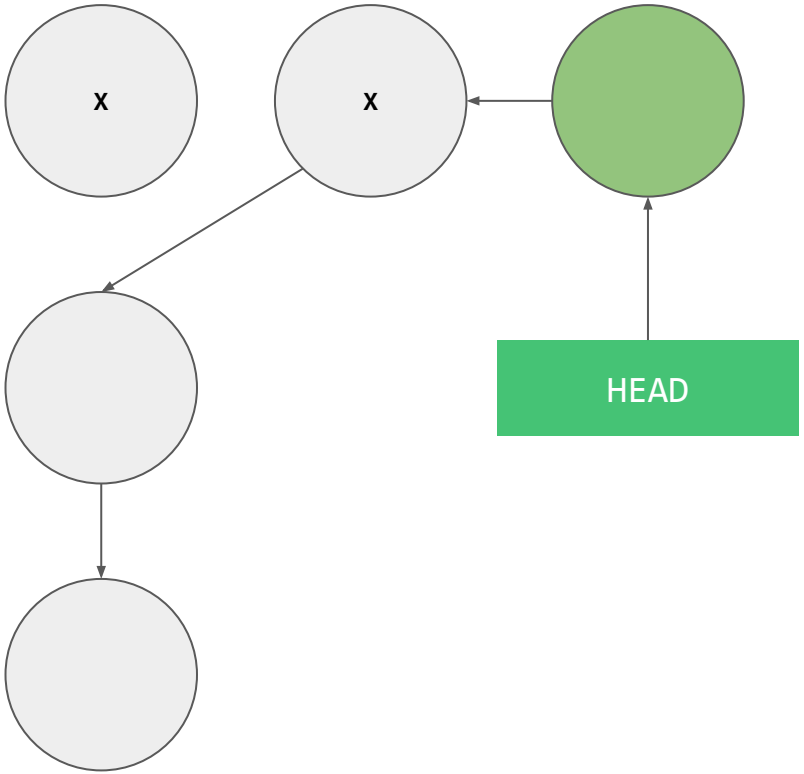
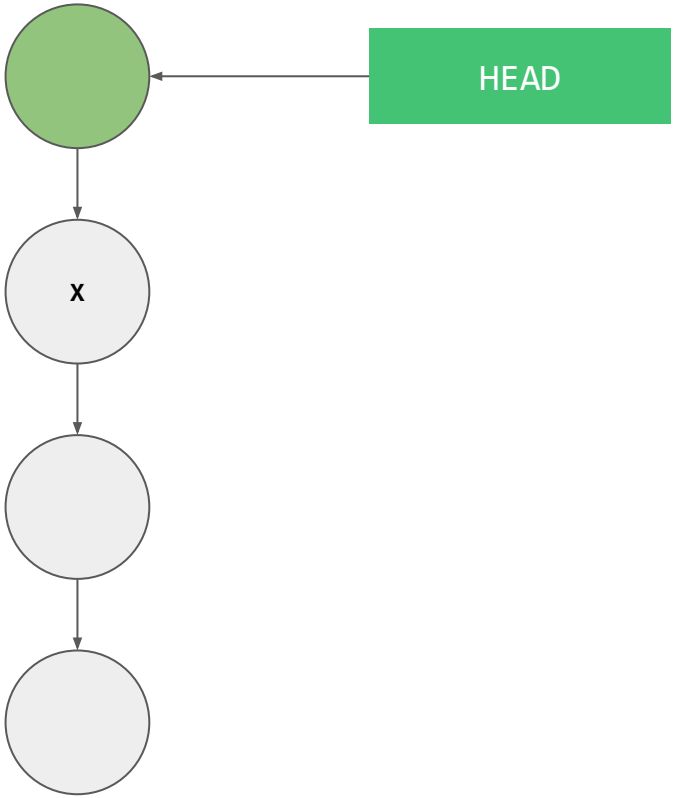
Git merging



Git merging



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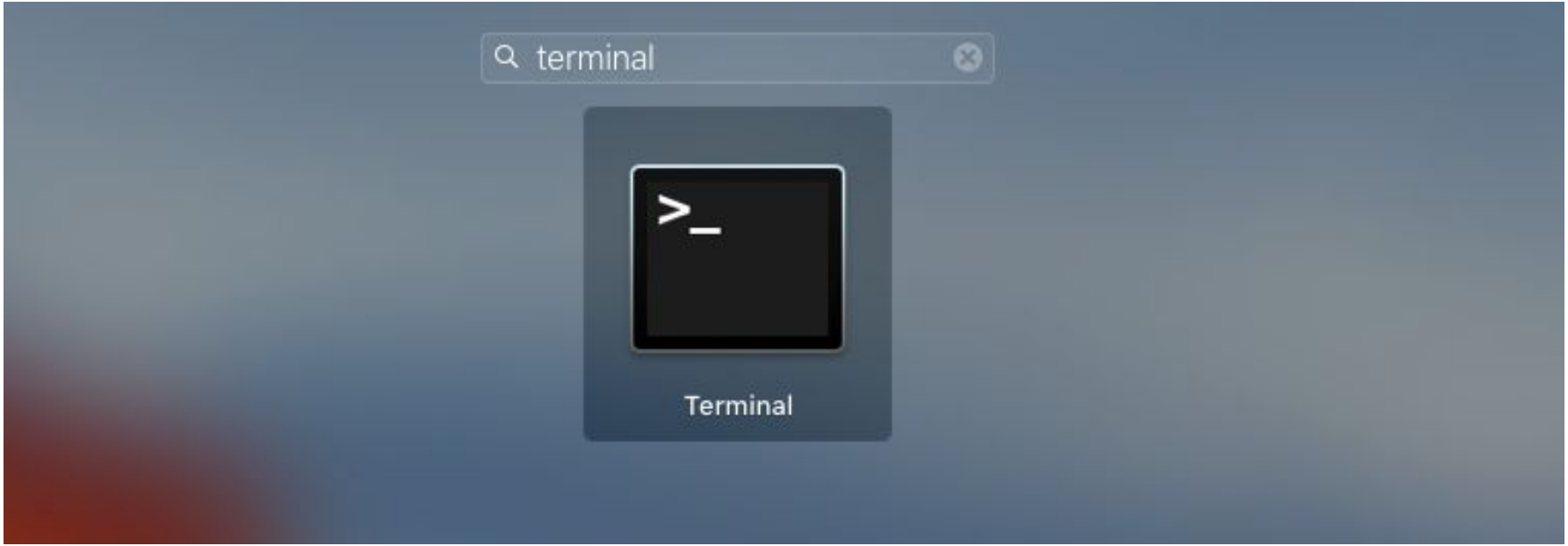
Let’s spend some time with git



https://www.hostinger.com/tutorials/wp-content/uploads/sites/2/2017/03/macos-terminal-from-louncher.png

Plumbing and Porcelain commands

Plumbing

subcommands that do low-level work and were designed to be chained together UNIX-style or called from scripts.

eg: update-ref, cat-file, show-ref

Porcelain

User-friendly commands.

eg: add, commit, push, reset

Git commands recap

```
git init
git add
git commit
git clone
git rm
git status
git branch
git merge
git reset
git rebase
git diff
gitk
git stash
git update-ref
git reflog
```

```
git checkout
git remote
git switch
git fetch
git pull
git push
git log
git show
git ls-tree
git cat-file
git show-ref
git fsck
git prune
git gc
```

git fsck

```
C:\Files\Projects\Other\hacktoberfestLK\git-test>git fsck
Checking object directories: 100% (256/256), done.
dangling tree 4b825dc642cb6eb9a060e54bf8d69288fbee4904

C:\Files\Projects\Other\hacktoberfestLK\git-test>git prune -n
4b825dc642cb6eb9a060e54bf8d69288fbee4904 tree

C:\Files\Projects\Other\hacktoberfestLK\git-test>git prune

C:\Files\Projects\Other\hacktoberfestLK\git-test>git fsck
Checking object directories: 100% (256/256), done.
```

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References

Git Docs

https://git-scm.com/docs

Pro Git book

https://git-scm.com/book/en/v2

Using git and ~~dance~~ around it

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Thank you!

STAY SAFE!!! & Happy hacking with #hacktoberfest

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