

Git Workshop

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Intro: Workshop Structure

Structure:

- 1 Background: how does Git work?
- 2 Example: managing homework
- 3 Example: larger project
- 4 Hands-on: solve Git 'puzzles' in browser

General:

- Ask questions! (want to know more? something isn't clear?)
- Reach out: `neuwireless.slack.com`

Intro: Teaching Git



Figure: XKCD 1597 'Git' — CC BY-NC 2.5

Background: What is Git?



Figure: Git Logo — CC BY 3.0

- broadly; *a tool used to track changes to files and folders.*
- facilitates collaboration on software projects
- captures 'snapshots' of a project
- maintains metadata
 - what was changed
 - who was it changed by
 - when was it changed
 - messages associated with changes

Background: What is Git used for?

Group Applications (Industry, co-op)

- large software projects
- resolve conflicts when multiple people are editing the same things
- who wrote this!?

Personal Applications

- “I swear this worked 10 minutes ago. . .”
- find what broke something and when
- separate tasks; work on bug fixing is isolated from work on new feature
- can use for class work!

Background: Big Idea of Git

QUESTION: Intuition

based on this description of what Git does, can you imagine how you would go about making these 'snapshots' manually?



homework1-final-FINAL-
HAVEMERCY.cpp

Background: Big Idea of Git

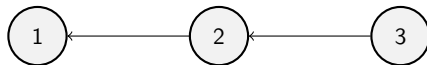


Figure: Linear History

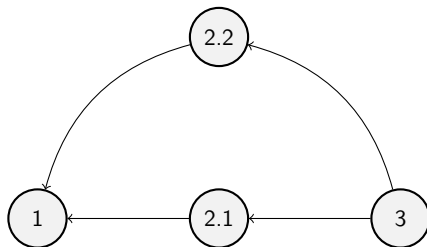


Figure: Branched History

Example: Managing Local Files

EXAMPLE: Homework Files

- ① *Init*: make a file
- ② *Add/Commit*: save file
- ③ *Branch/Checkout*: two new features
- ④ *Merge*: combine those new features
- ⑤ *Restore/Checkout*: restore save

Background: Git vs. GitHub?

What's the difference between Git and GitHub?

Git

- tool independent of GitHub
- provides interface for services like GitHub

GitHub

- centralized location to store git repositories
- alternatives: GitLab, SourceHut, BitBucket, self hosting, ...
- additional project management utilities
- CI, CD, hosting, ...

Example: Large Project

EXAMPLE: Larger Project

- Development workflow
- More complex histories

Hands-On: learngitbranching

HANDS-ON: learngitbranching

<https://learngitbranching.js.org/>

General

- MIT Missing Semester Lecture 6: Version Control (Git)
- Tim Pope: A Note About Git Commit Messages
- Implement git from scratch in Python
- How to contribute to code on GitHub

Git Documentation

- Git configuration documentation
- .gitignore documentation