Intro to git/GitHub

INP Bootcamp 2024

Goal

- Know what git/GitHub do (if you don’t already)
  - Not going into how to actually use them
- Know where to look when you actually need them

Kind of problems you might encounter

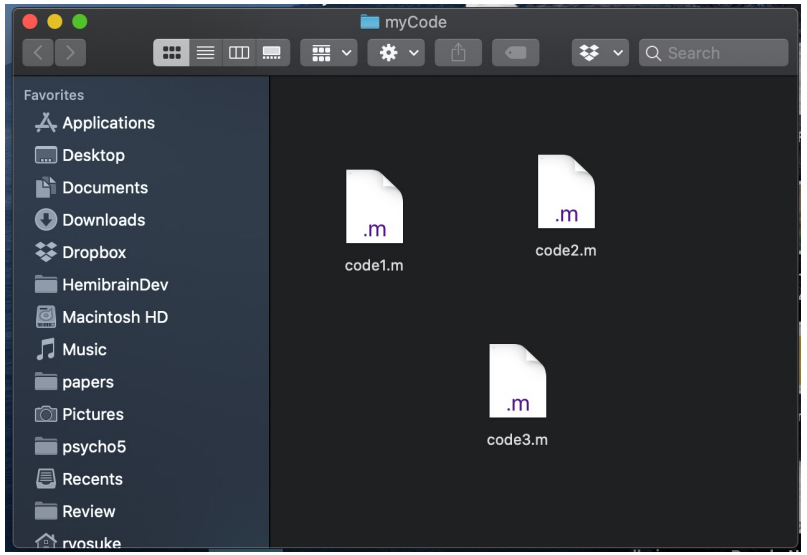
- Case 1
  You write some scripts to analyze your data, and later you add some improvements to the script. Then it turns out the new code doesn't work on old data, and you don't remember what the old code looked like anymore.

- Case 2
  You share a 2p microscope with your lab mate. The change you made to stimulus presentation code ended up causing error in your lab mates' experiments.

What git does

- Git lets you make an “official version” of your code

Bunch of codes in your folder



(Commit)

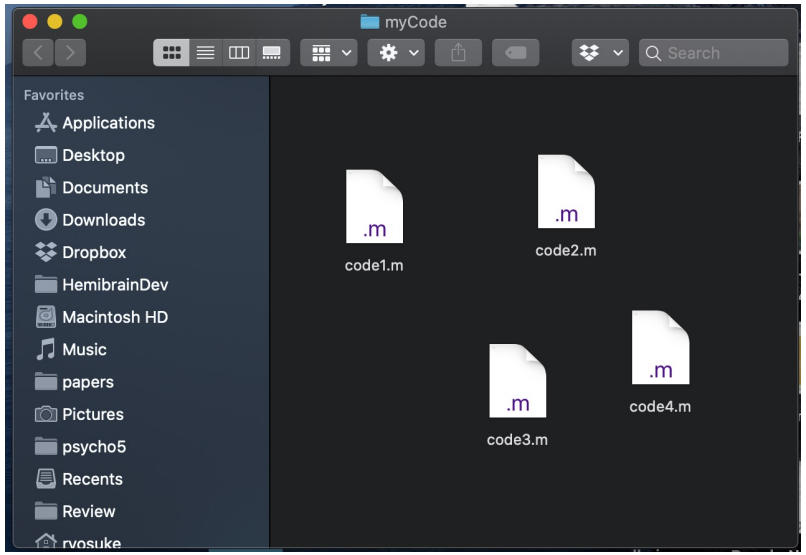
Register to the official version

- Code1.m
- Code2.m
- Code3.m

(Repository)

What git does

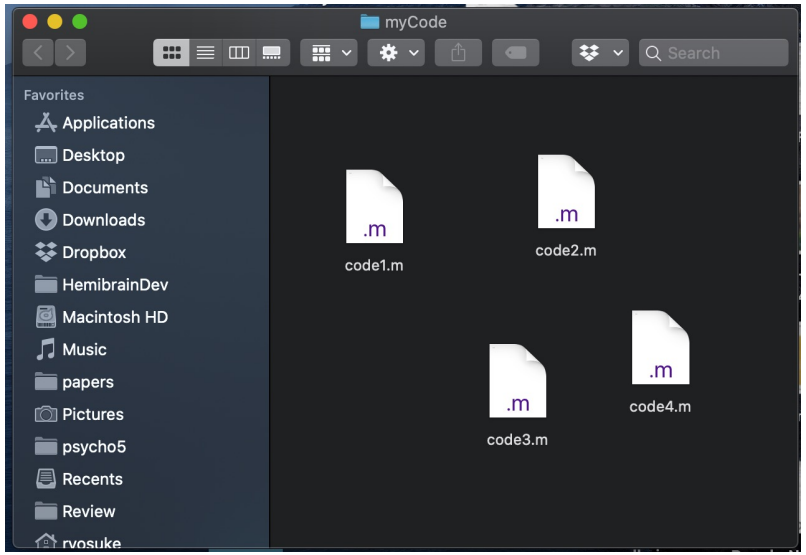
- Changes you make in the folder (e.g. more lines in existing codes, new files) are not reflected to the “official version” until you actively register them (“commit”)



- Code1.m
- Code2.m
- Code3.m

What git does

- Changes you make in the folder (e.g. more lines in existing codes, new files) are not reflected to the “official version” until you actively register them (“commit”)

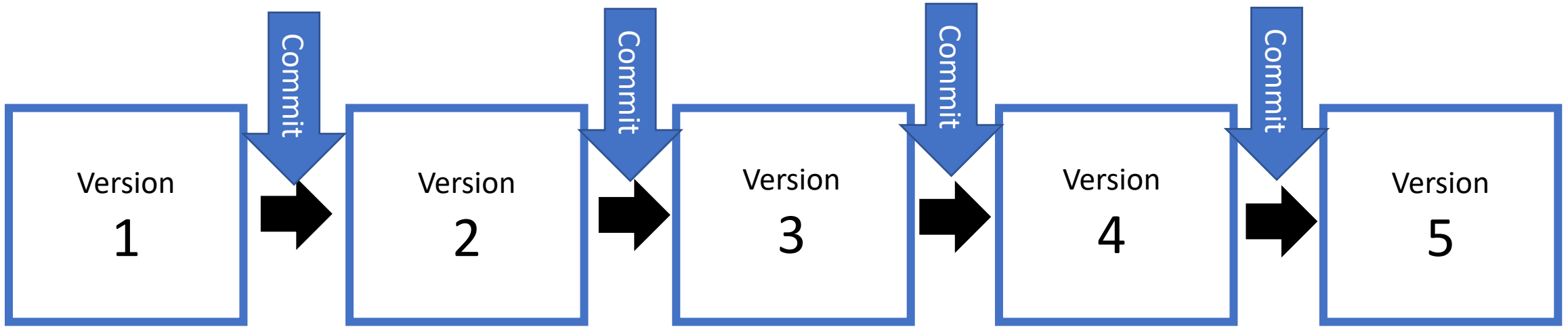


(Commit)

- Code1.m
- Code2.m
- Code3.m
- Code4.m

What git does

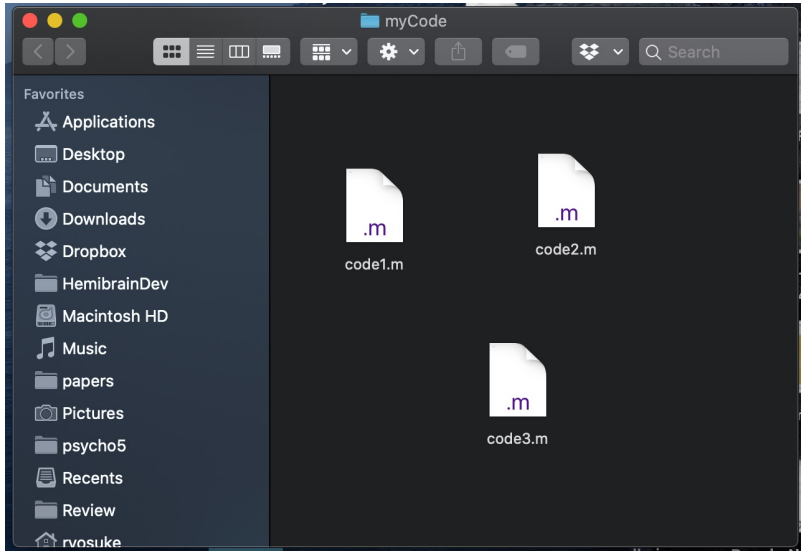
- Every time you register (“commit”) changes, you create a new version



What git does

- You can go back to previous versions (= backup)

Overwrite what you have in your code folder with the “official version”

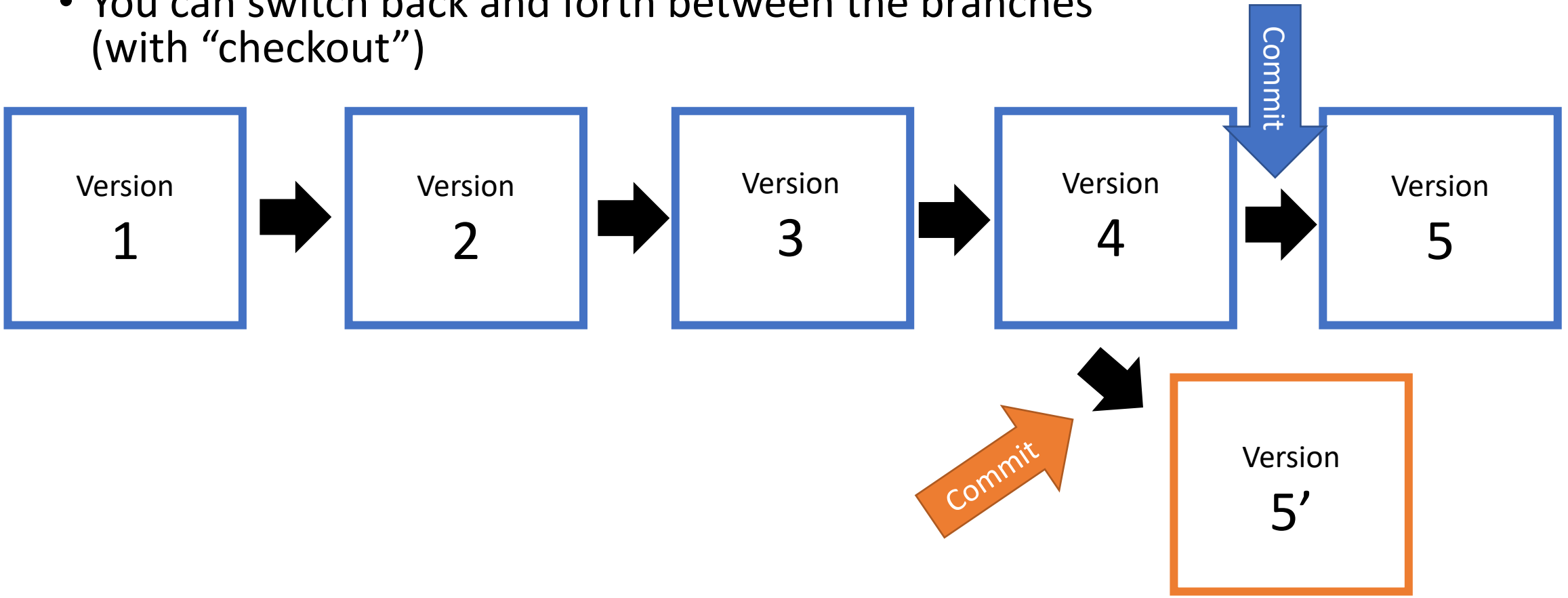


(Checkout)

Older version

What git does

- You can branch this chain of “official versions”
- You can switch back and forth between the branches (with “checkout”)



What GitHub does

- GitHub is a web service that lets you store the official versions (“repository”) of your code online
  - Online backup
  - Sharing code between computers
  - Sharing code to the world

Typical GitHub workflow

Online
“official version”
On GitHub
(“remote repository”)

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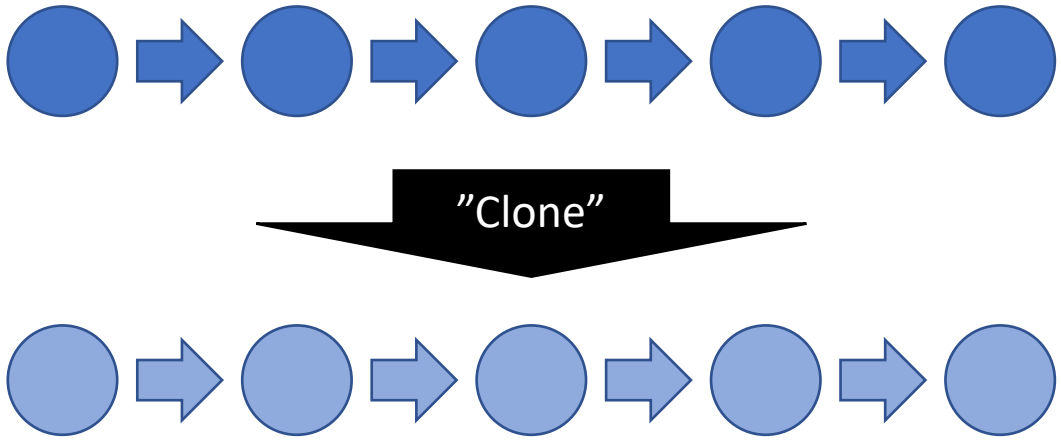
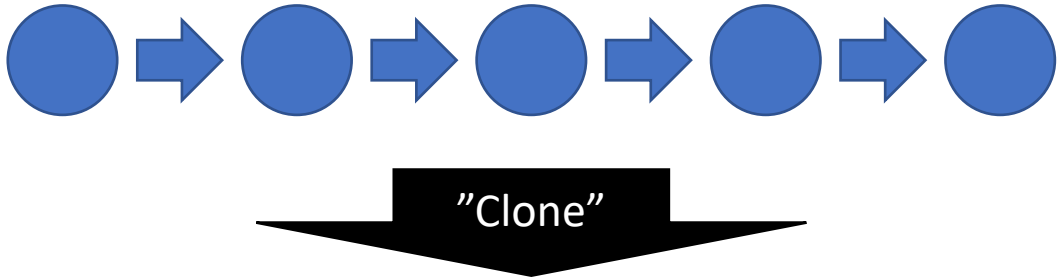


Your own official versions
(“local repository”)

Typical GitHub workflow

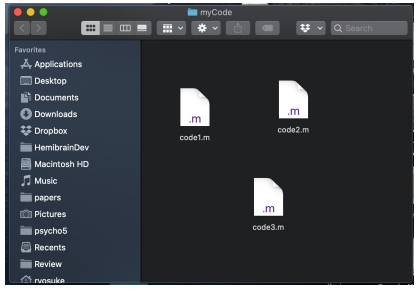
Online
“official versions”
On GitHub
(“remote repository”)



Your own official versions
(“local repository”)

Copied over

Your code folder

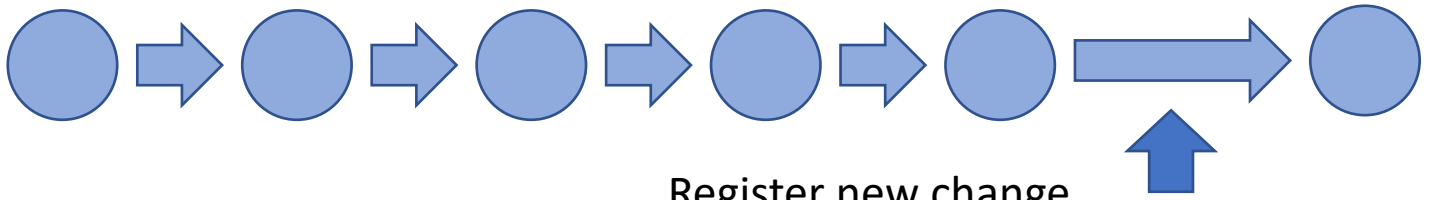


Typical GitHub workflow

Online
“official versions”
On GitHub
(“remote repository”)

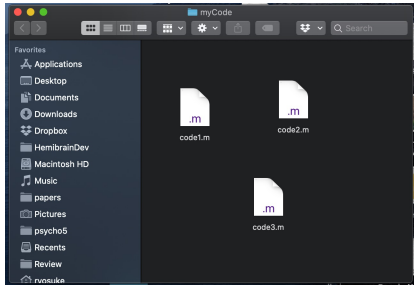
”Clone”

Your own official versions
(“local repository”)



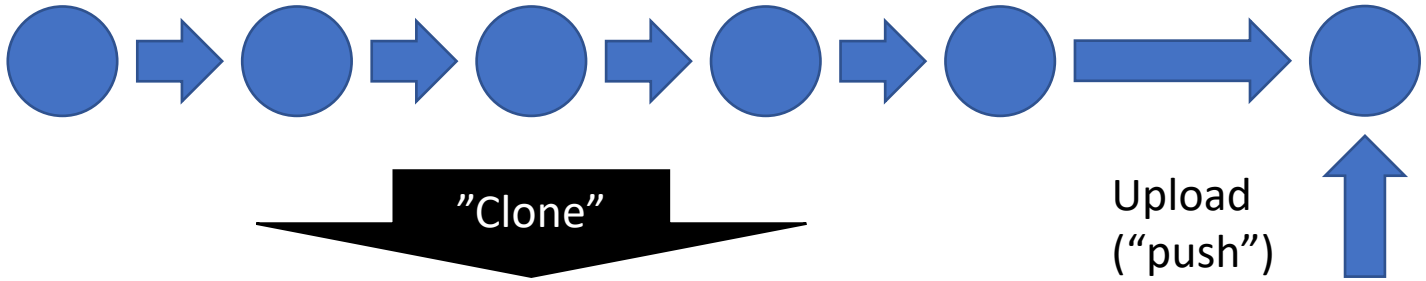
Register new change
(“commit”)

Your code folder



Typical GitHub workflow

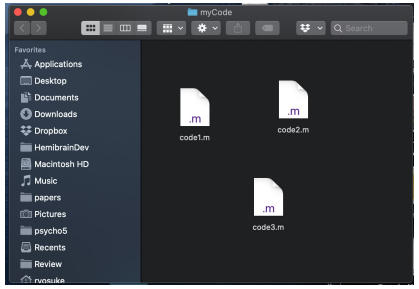
Online
“official versions”
On GitHub
(“remote repository”)



Your own official versions
(“local repository”)

Register new change
(“commit”)

Your code folder

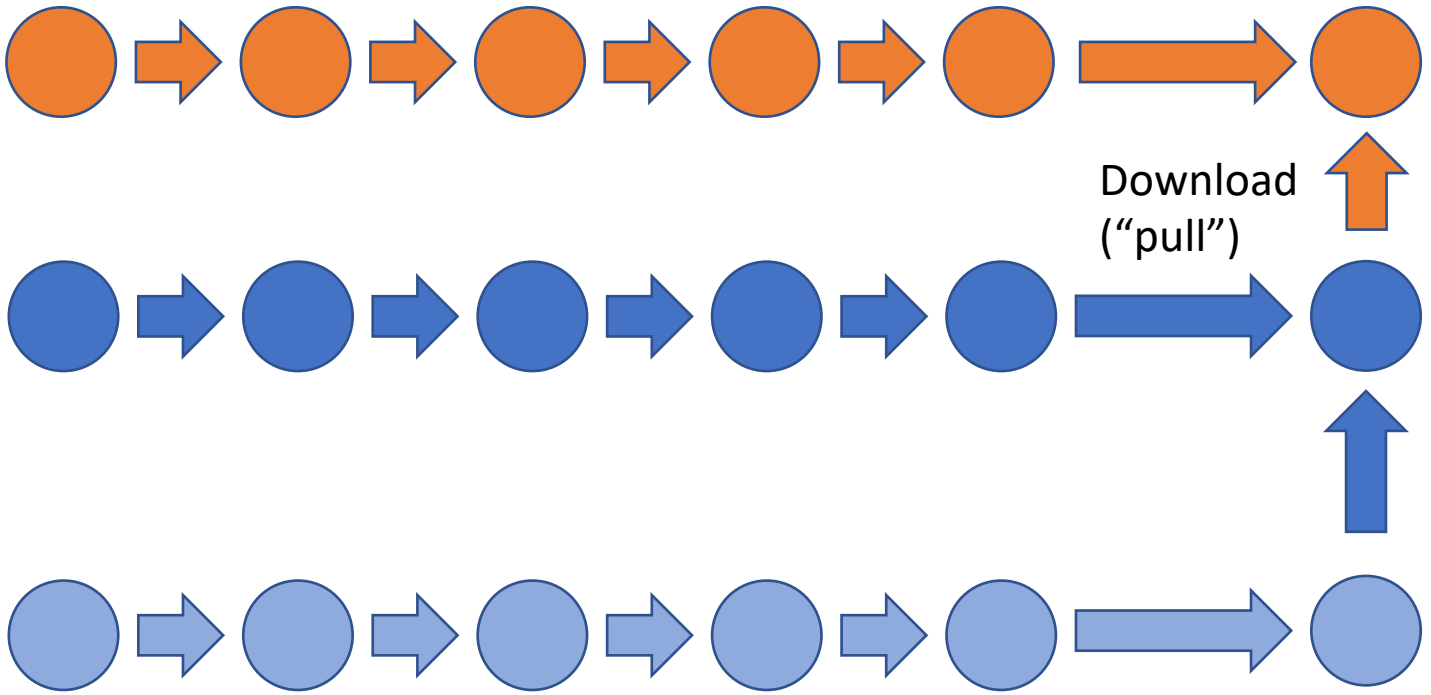


Typical GitHub workflow

Your friends'
official versions

Online
"official versions"
On GitHub
("remote repository")

Your own official versions
("local repository")



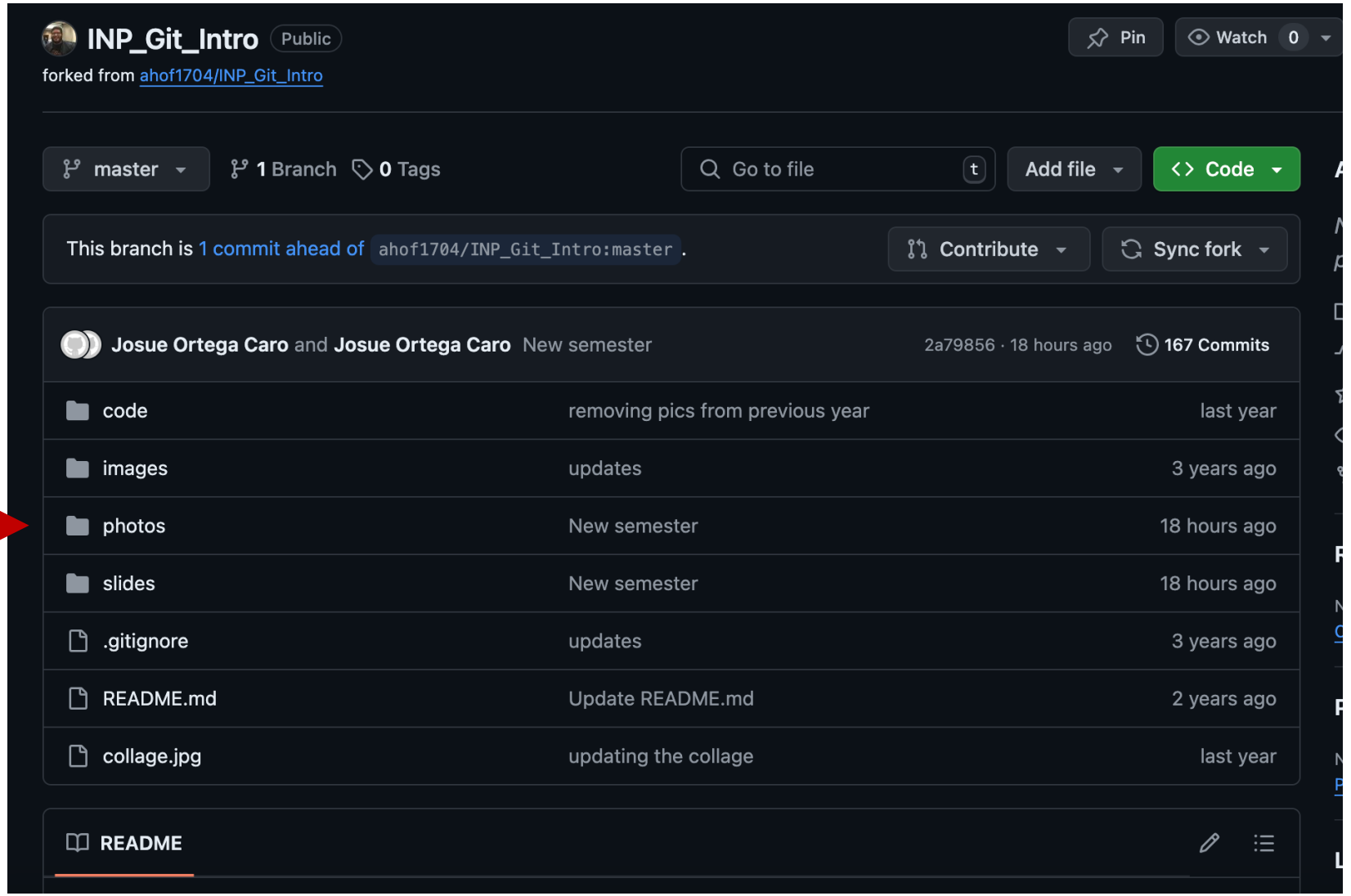
Other topics

- What if you and your friend are simultaneously working on the copy of the same branch?
  - Conflicts arise
  - Git usually nicely resolves these automatically unless you are working on the same line of same file
  - Otherwise manually you need to resolve the conflict manually

Summary

- Git lets you make “official copies (repository)” of your code folder
- Every time you register new changes to the official copy, a new version is created
- Git remembers all the past versions, which can be used as backup
- The chain of official copies can branch, and you can go back and forth between branches easily.
- GitHub allows you to store “official copies” online, which helps people work on the same sets of code across multiple computers

Example


INP_Git_Intro
Public
forked from ahof1704/INP_Git_Intro
Pin
Watch 0
master
1 Branch
0 Tags
Go to file
t
Add file
Code
This branch is 1 commit ahead of ahof1704/INP_Git_Intro:master.
Contribute
Sync fork
Josue Ortega Caro and Josue Ortega Caro New semester
2a79856 · 18 hours ago
167 Commits
code
removing pics from previous year
last year
images
updates
3 years ago
photos
New semester
18 hours ago
slides
New semester
18 hours ago
.gitignore
updates
3 years ago
README.md
Update README.md
2 years ago
collage.jpg
updating the collage
last year
README

Resources

- https://github.com/
  GitHub (recommend making a free account)
- https://www.sourcetreeapp.com/
  SourceTree (a free app that makes you do all this graphically)
- https://guides.github.com/activities/hello-world/
  GitHub tutorial – I'd recommend making a mock repository to understand the functioning of git/GitHub