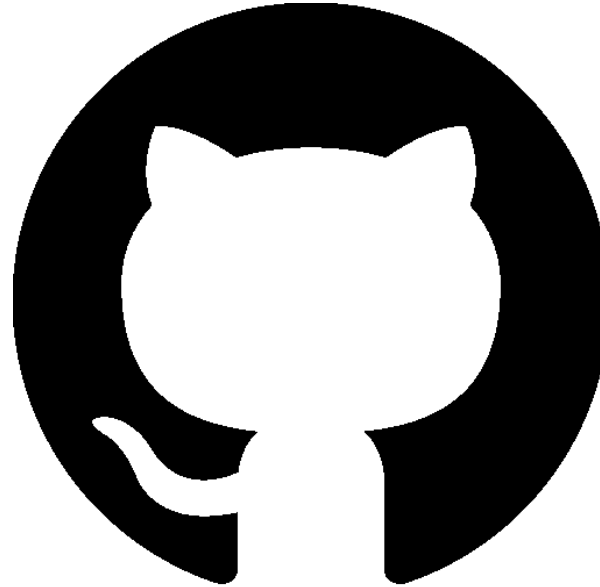
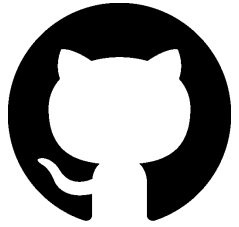

Introduction to Git and GitHub



Fondren Library
Digital Scholarship Services

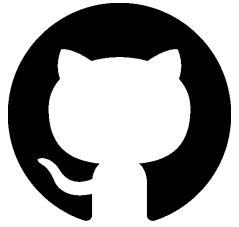
Original author: Corrin Fosmire, [GitHub/bakitybacon](https://github.com/bakitybacon)



WHAT IS GIT?

- The most widely used version-control system!
 - Remembers entire project history
 - Easily undo changes
 - Track contributions
- Free and Open-Source Software
- Fast & Simple
- Optimized for collaboration
 - Non-linear development

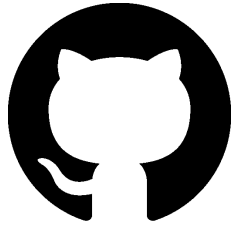




WHAT IS GIT NOT?

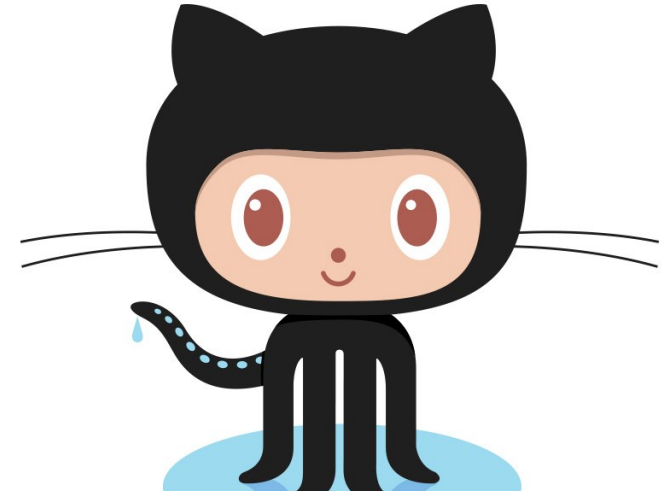
- Affiliated with GitHub (which is owned by Microsoft)
- A file editor
- A graphical user interface
 - Many user interfaces exist
- Proactive
 - Must tell git about everything we do!



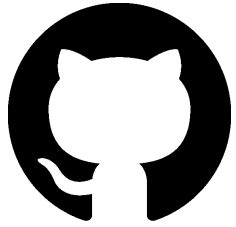


WHAT IS GITHUB?

- The largest host for Git repositories
- Free (for public repositories)
- A great place to collaborate
 - Support for unique features
 - Comment sections
 - Organizations
 - Issue tracking

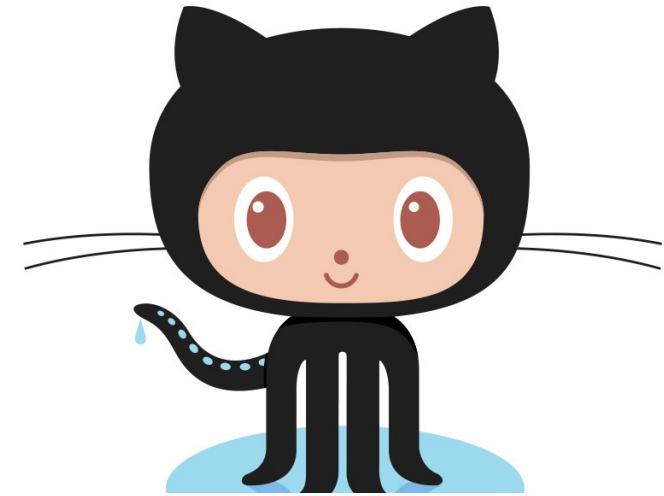


GitHub



WHAT IS GITHUB NOT?

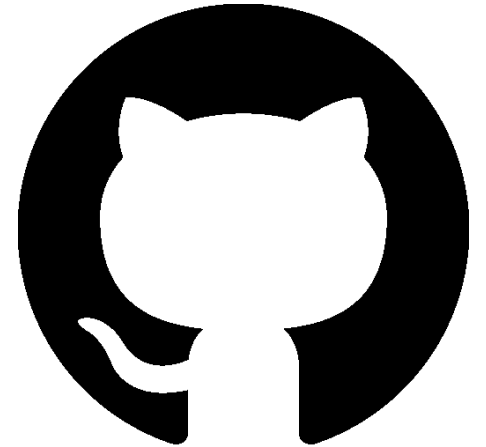
- The only option
 - GitLab, Bitbucket, ...
- A version-control system
 - Everything is on top of git
- Only for source code and programming
- Difficult!



GitHub

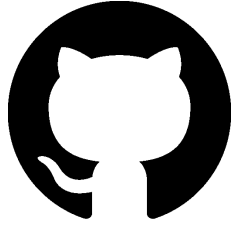
GITHUB & GITHUB DESKTOP

A walkthrough of the user interfaces





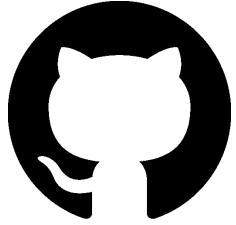
GETTING OUR BEARINGS: GITHUB.COM



GETTING OUR BEARINGS: USER PAGE



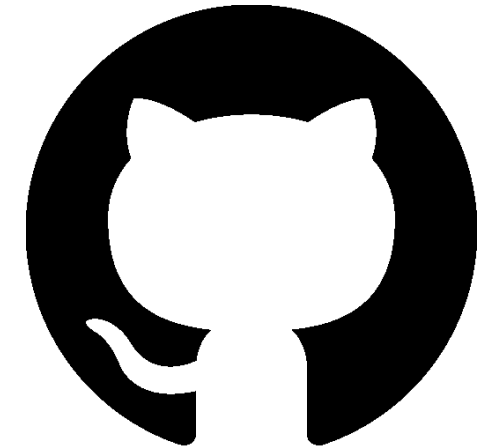
GETTING OUR BEARINGS: REPOSITORY

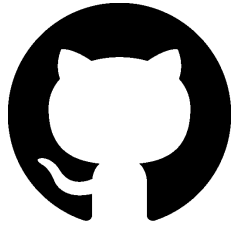


GETTING OUR BEARINGS: DESKTOP

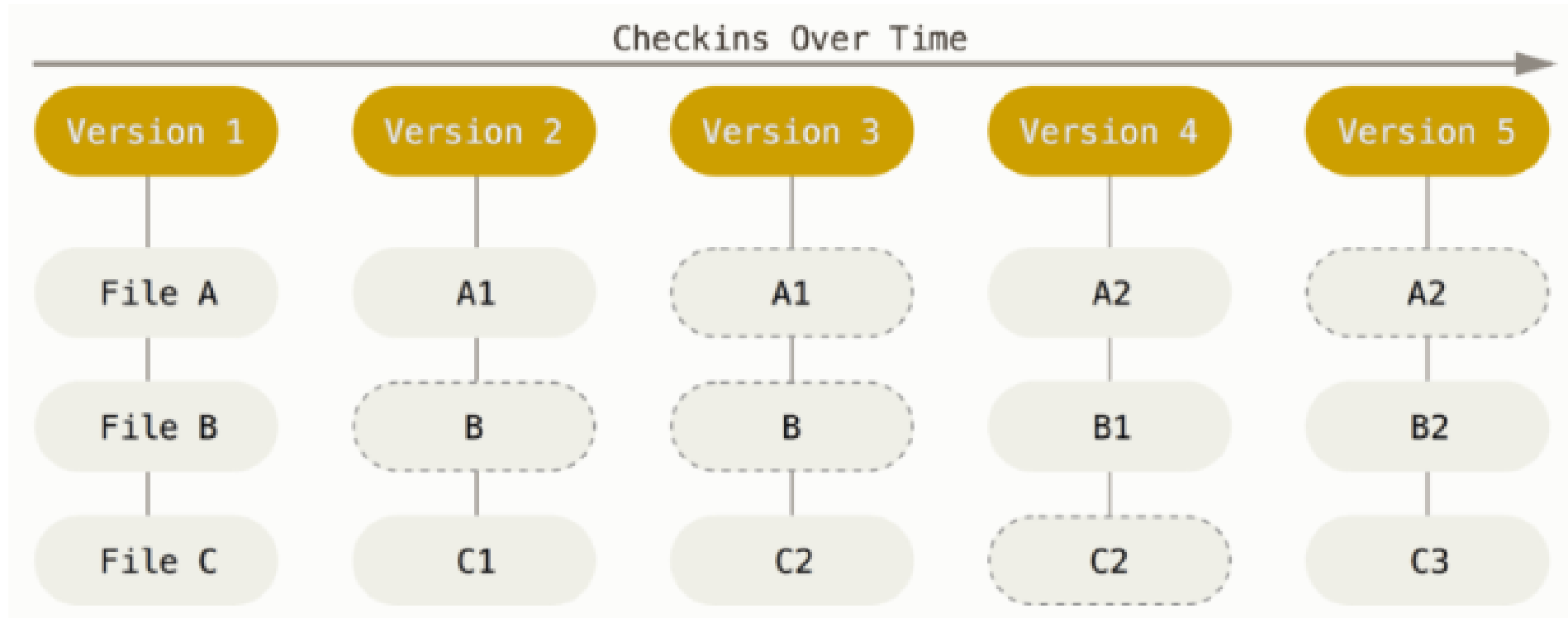
STRUCTURE OF A GIT REPOSITORY

Snapshots, Locality, File States

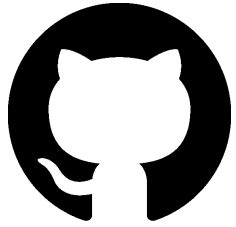




SNAPSHOTS

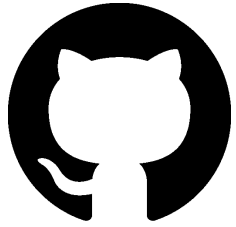


Stores the entire file structure at each snapshot, not a set of changes to one file!









SNAPSHOTS

brharrington try disabling gigahorse (#1062) ...		Latest commit 85a91b3 43 minutes ago
atlas-akka	add binding for materializer (#1050)	5 days ago
atlas-chart/src	sbt-scalafmt 2.0.0	26 days ago
atlas-config/src	update license headers for 2019 (#969)	6 months ago
atlas-core/src	cross build for 2.13.0-RC3 (#1048)	12 days ago
atlas-eval	add binding for materializer (#1050)	5 days ago
atlas-jmh/src/main/scala/com/netfli...	add benchmark for uri handling (#1057)	3 days ago
atlas-json/src	remove jackson-datatype-joda usage (#1045)	25 days ago
atlas-lwcapi/src	add binding for materializer (#1050)	5 days ago
atlas-module-akka/src	add binding for materializer (#1050)	5 days ago
atlas-module-cloudwatch/src	update license headers for 2019 (#969)	6 months ago



SNAPSHOTS

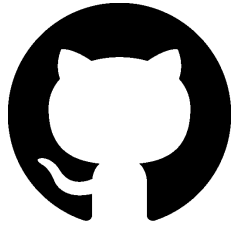
- Sample Snapshot: Caption and Set of Files

devtools: move topbar out of scrollable container (#9077)  Hoten committed 4 days ago ✓	Verified		7671166	
clients(devtools): ignore dark mode media query (#9082)  Hoten authored and brendankenny committed 4 days ago ✓			9a011a5	

- Can see all files present at any of these times!

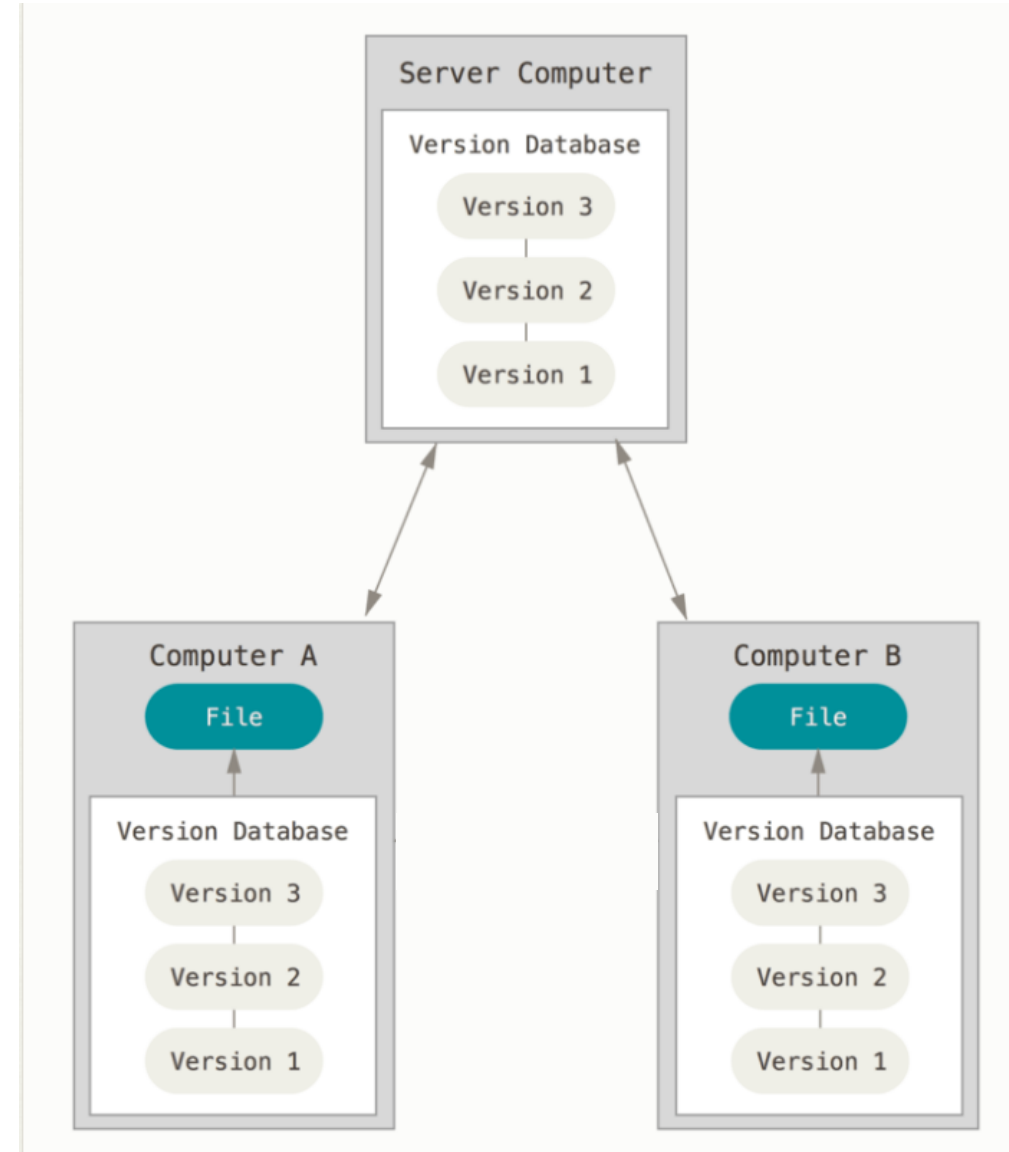
```
let turnOffTheLights = false;  
if (window.matchMedia('(prefers-color-scheme: dark)').matches) {  
  turnOffTheLights = true;  
}
```

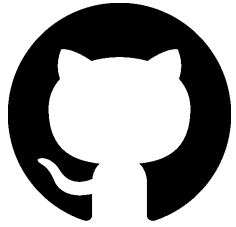
```
let turnOffTheLights = false;  
// Do not query the system preferences for DevTools - DevTools should only apply dark theme  
// if dark is selected in the settings panel.  
if (!this._dom.isDevTools() && window.matchMedia('(prefers-color-scheme: dark)').matches) {  
  turnOffTheLights = true;  
}
```



LOCALITY

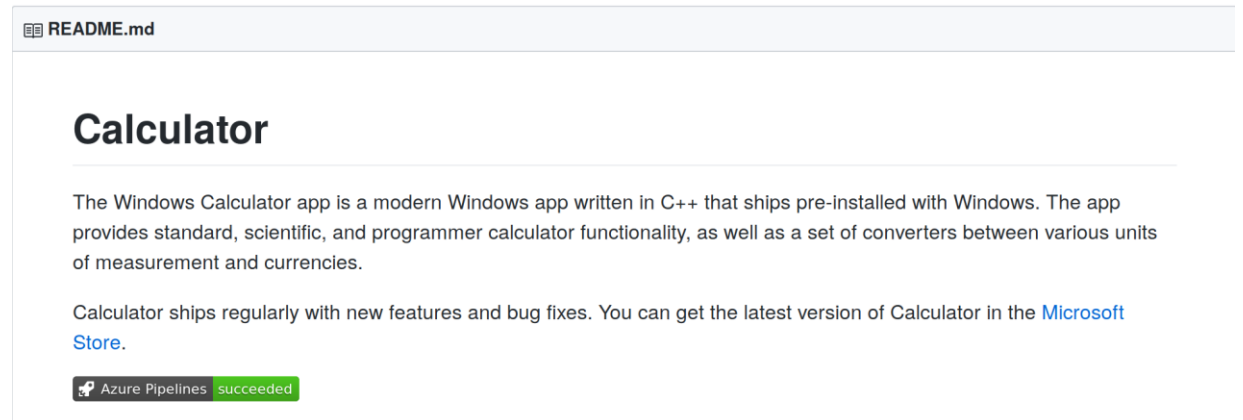
- Snapshots stored on your computer, not only on a server!
 - Hidden .git directory
 - Stores entire history of project (compressed!)

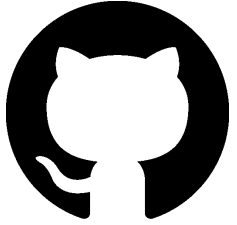




SPECIAL FILE: README.md

- README.md (note the case!)
 - A text-based description of a directory or project
 - Uses Markdown language

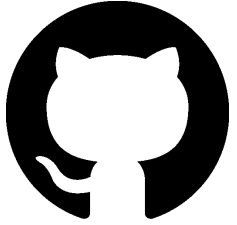




SPECIAL FILE: .GITIGNORE

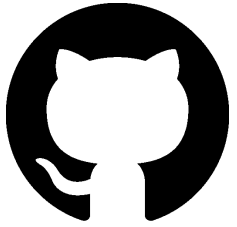
- .gitignore (note the period!)
 - A set of filenames.
 - No file in here will ever be tracked by git
 - Common Uses: backup and temporary files, stored passwords for APIs

```
.gitignore
1
2 github/~$Introduction to Git & Github.pptx
3 github/Introduction to Git & Github.pptx
4 scripts/key.txt
5 github/.~lock.Introduction to Git & GitHub.pptx#
6
```

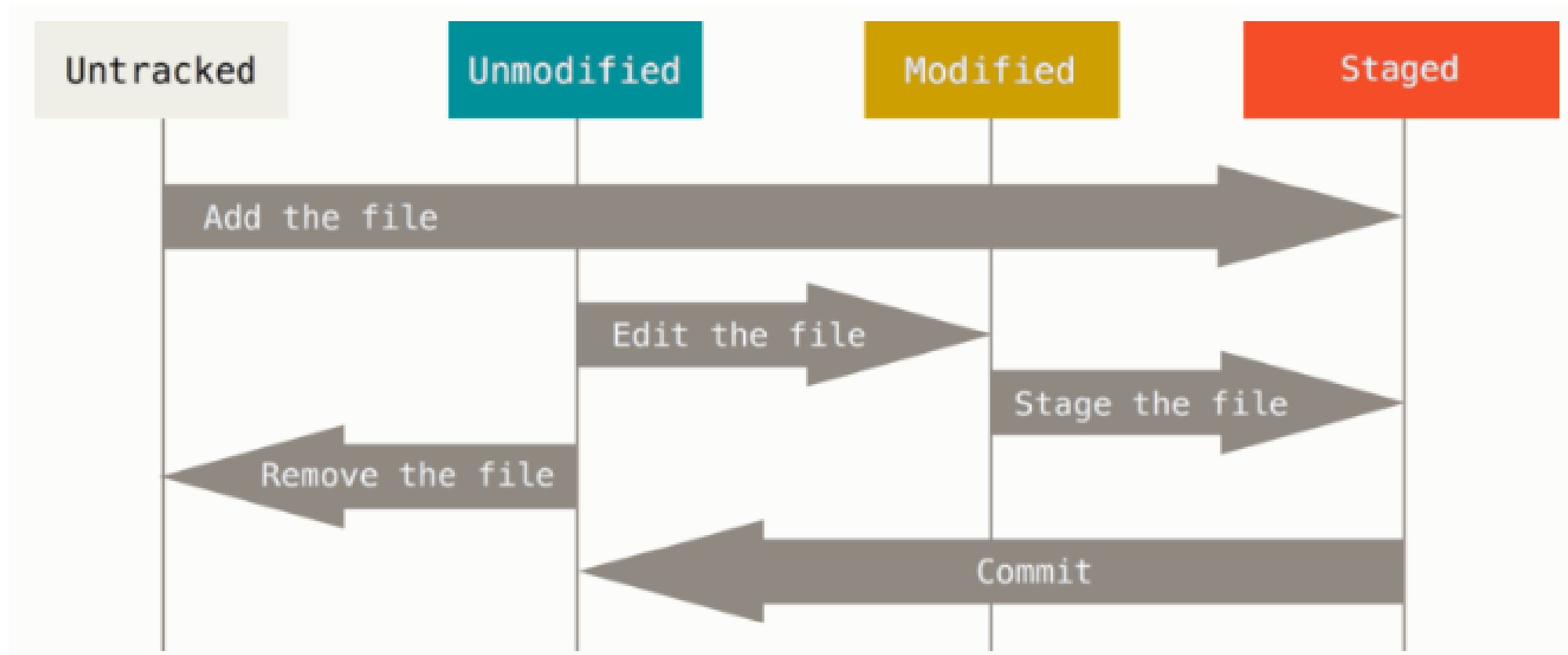


STATES OF FILES IN A REPOSITORY

- **untracked:** git has not been told about this file.
- **modified:** we told git about this file, but we've changed it without telling git to remember our change.
- **staged:** we have told git about this file and told git we will want it to remember our change.
- **committed:** we have made git take a snapshot of our file.

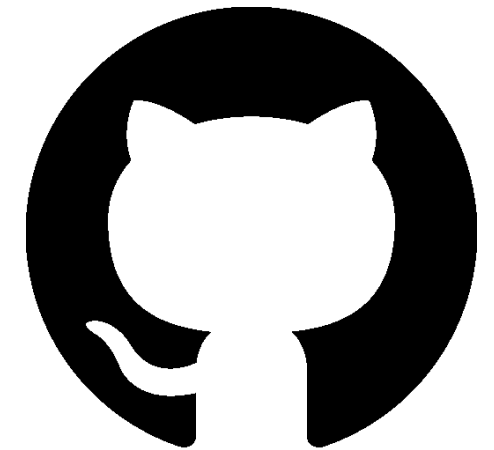


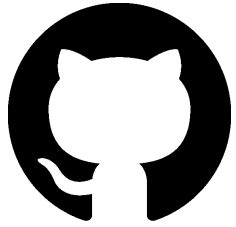
STATES OF FILES IN A REPOSITORY



CREATING & CLONING REPOSITORIES

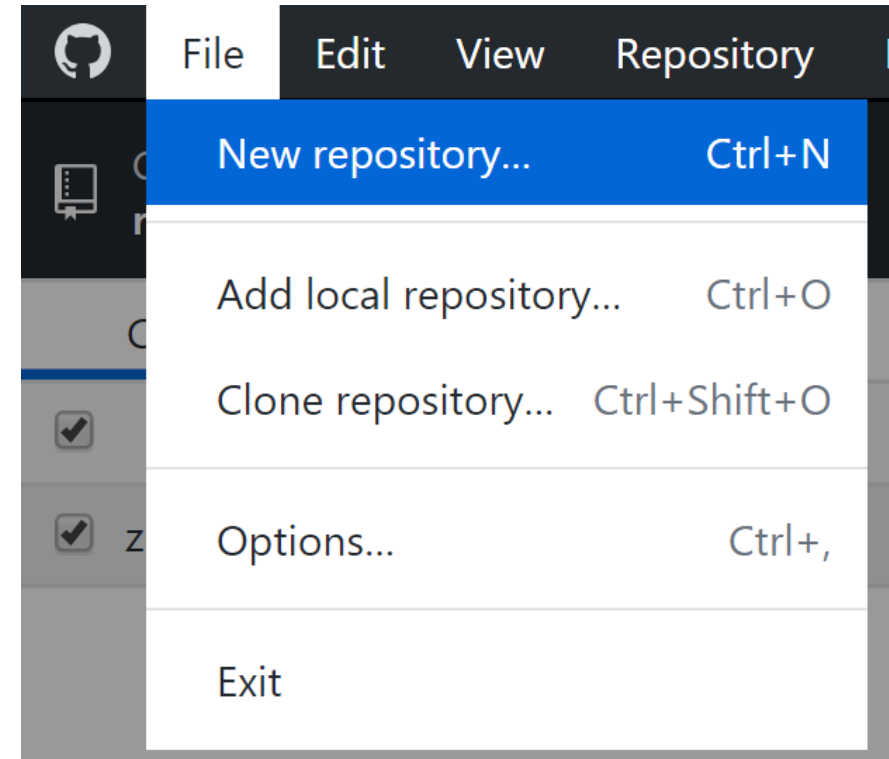
Initialization & Copying from a server

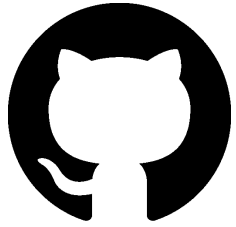




INITIALIZATION



- Create a repository, with a file index and database
- Stored in the hidden directory .git
- Note: No files are added to the repository by default!
 - We'll get to adding files a bit later

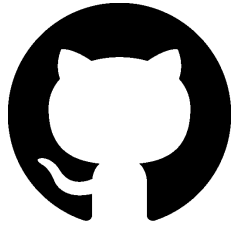




INITIALIZATION

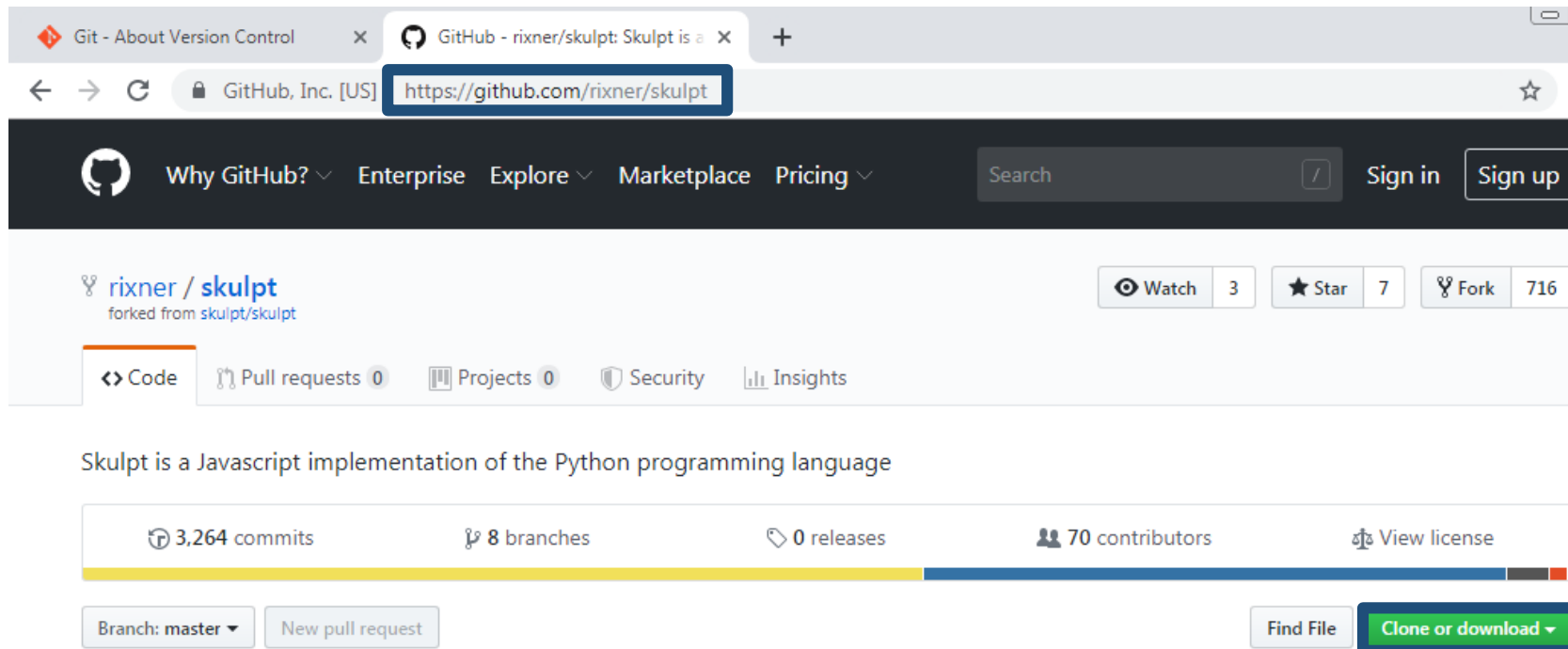
- Create a repository, with a file index and database
- Stored in the hidden directory `.git`
- Note: No files are added to the repository by default!
 - We'll get to adding files a bit later

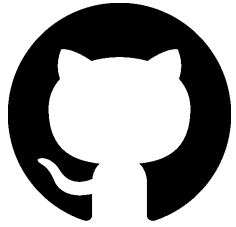
<input type="checkbox"/>	Name	Date modified	Type
<input checked="" type="checkbox"/>	 <code>.git</code>	6/3/2019 11:11 AM	File folder
	 <code>.gitattributes</code>	6/3/2019 11:11 AM	GITATTRIBUTES File



CLONING

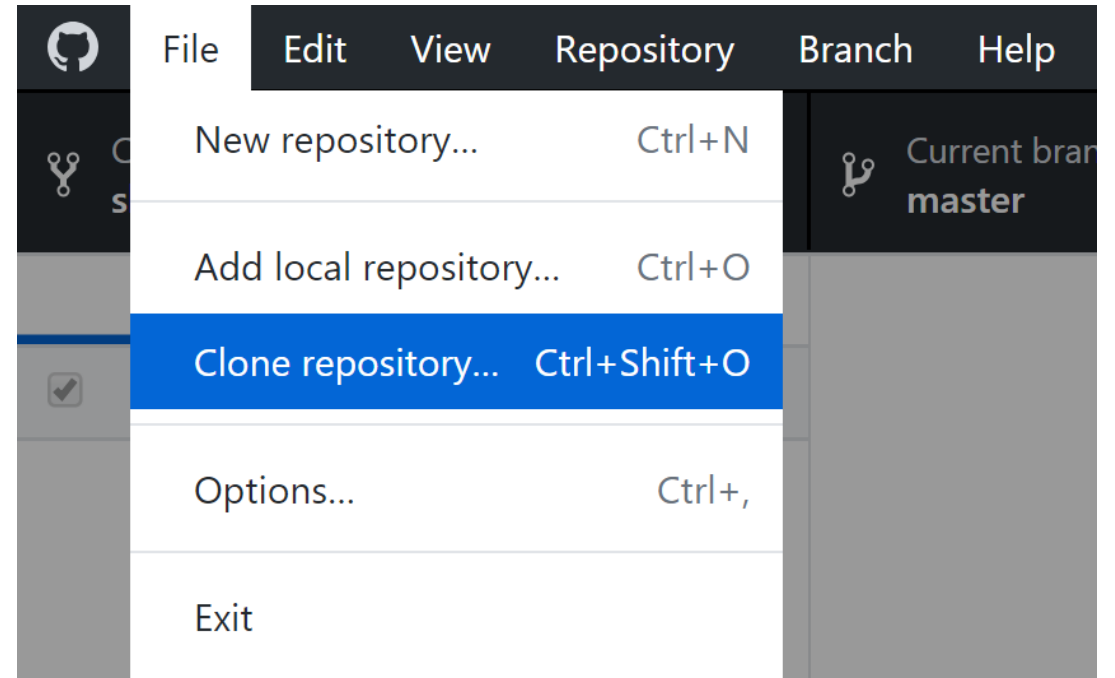
- Downloads entire history of a repository hosted on GitHub
- Two ways to get the URL:

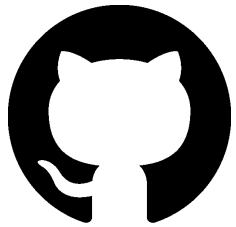




CLONING

- Most recent snapshot immediately available
- Full history needs to be downloaded as well. Takes time & space!





CLONING

Clone a repository

GitHub.com

Enterprise

URL

Repository URL or GitHub username and repository
(hubot/cool-repo)

rixner/skulpt

Local path

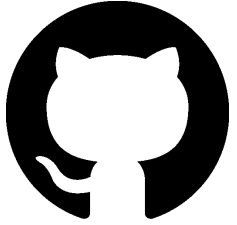
C:\Users\blanqui\Documents\GitHub\rixner

Choose...

Clone

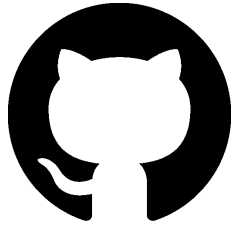
Cancel

Name	Date modified	Type	Size
.git	6/3/2019 11:17 AM	File folder	
debugger	6/3/2019 11:17 AM	File folder	
doc	6/3/2019 11:17 AM	File folder	
example	6/3/2019 11:17 AM	File folder	
gen	6/3/2019 11:17 AM	File folder	
repl	6/3/2019 11:17 AM	File folder	
src	6/3/2019 11:17 AM	File folder	
support	6/3/2019 11:17 AM	File folder	
test	6/3/2019 11:17 AM	File folder	
.bowerrc	6/3/2019 11:17 AM	BOWERRC File	1 KB



FORKING

- Downloads entire history of a repository hosted on GitHub
- Creates a copy of it:
 - You work on your own copy
 - The ***upstream*** / original repository remains untouched by your changes



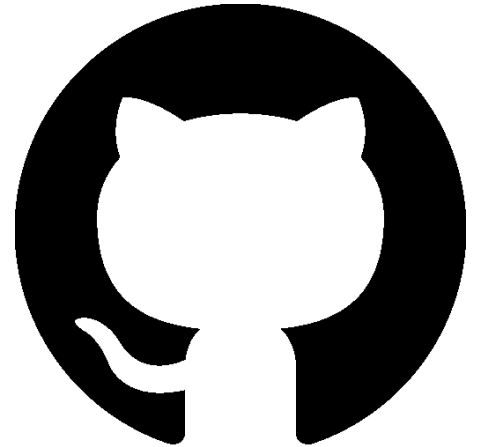
FORKING

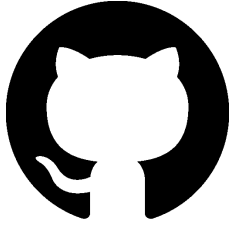
Fork this repository from GitHub now!

<https://github.com/chase-lab/biodiv-patterns-course-2022>

EDITING WORKFLOW

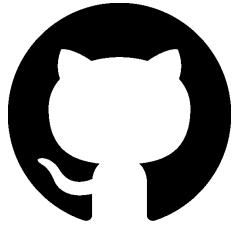
Editing, adding, staging, and committing





EDITING A FILE LOCALLY

- Open the .rproj (R project) file to easily open a working session in Rstudio
- Open and edit any file using any program

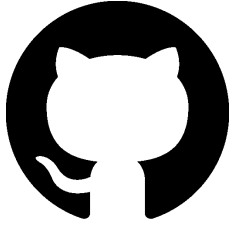


TELLING GIT ABOUT OUR CHANGES

- Git will automatically find what we changed. All we have to do is tell it what we want to save
- Toggle whether we want to add this change using check boxes
- Monitor changes to text files
 - Green: added in
 - Red: taken out
 - White: not changed

github\greeting.txt		
		@@ -1,6 +1,6 @@
1	1	Hello!
2	2	
3	3	-Hi!
		+Nice to meet you!
4	4	
5	5	Greetings!
6	6	

Changes 2	History
<input checked="" type="checkbox"/> 2 changed files	
<input checked="" type="checkbox"/> github\editing.PNG	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> github\greeting.txt	<input checked="" type="checkbox"/>

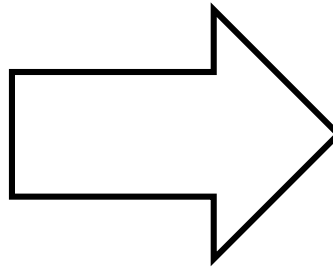


VIEWING CHANGES: DOCUMENTS

- Prose Diff: see word-by-word changes in formatting

```
... @@ -1,5 +1,9 @@
1  -# Rice Data and Donuts
2
3  Welcome to the GitHub workshop!
4
5  We're __so__ glad you could join us today.

1  +# Rice Data & Donuts
2
3  Welcome to the GitHub workshop!
4
5  We're __so__ glad you could join us today.
6  +
7  +We hope to see you again soon!
8  +
9  +:]!
```



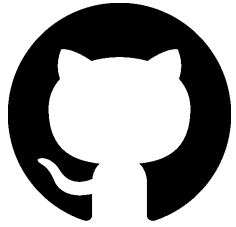
```
6 diff/sample.md
Rice Data and & Donuts

Welcome to the GitHub workshop!

We're so glad you could join us today.

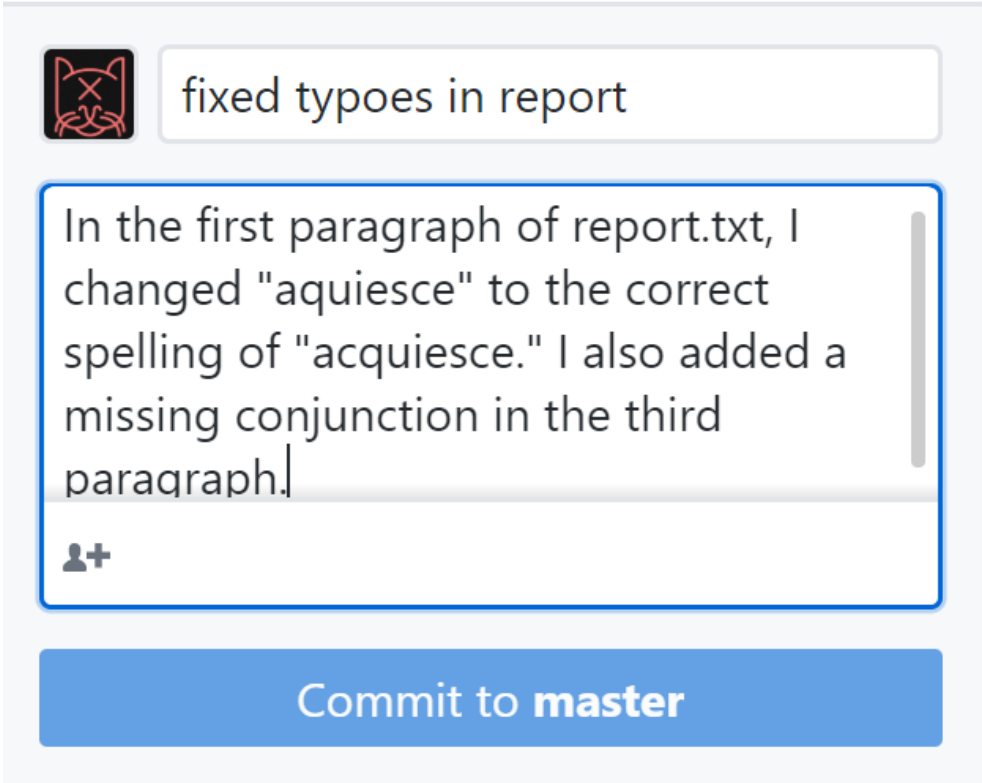
We hope to see you again soon!

:]!
```

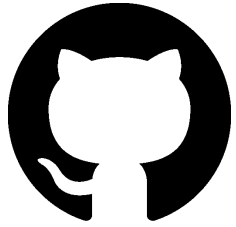


SNAPSHOTS OF OUR CHANGES: COMMIT

- Once we have reached a milestone, or we just want to quickly and reversibly save our changes
- Annotating our Snapshot
 - Short, simple **summary**. A few words
 - Extended **description** of approach. A few sentences
- Only changes locally!

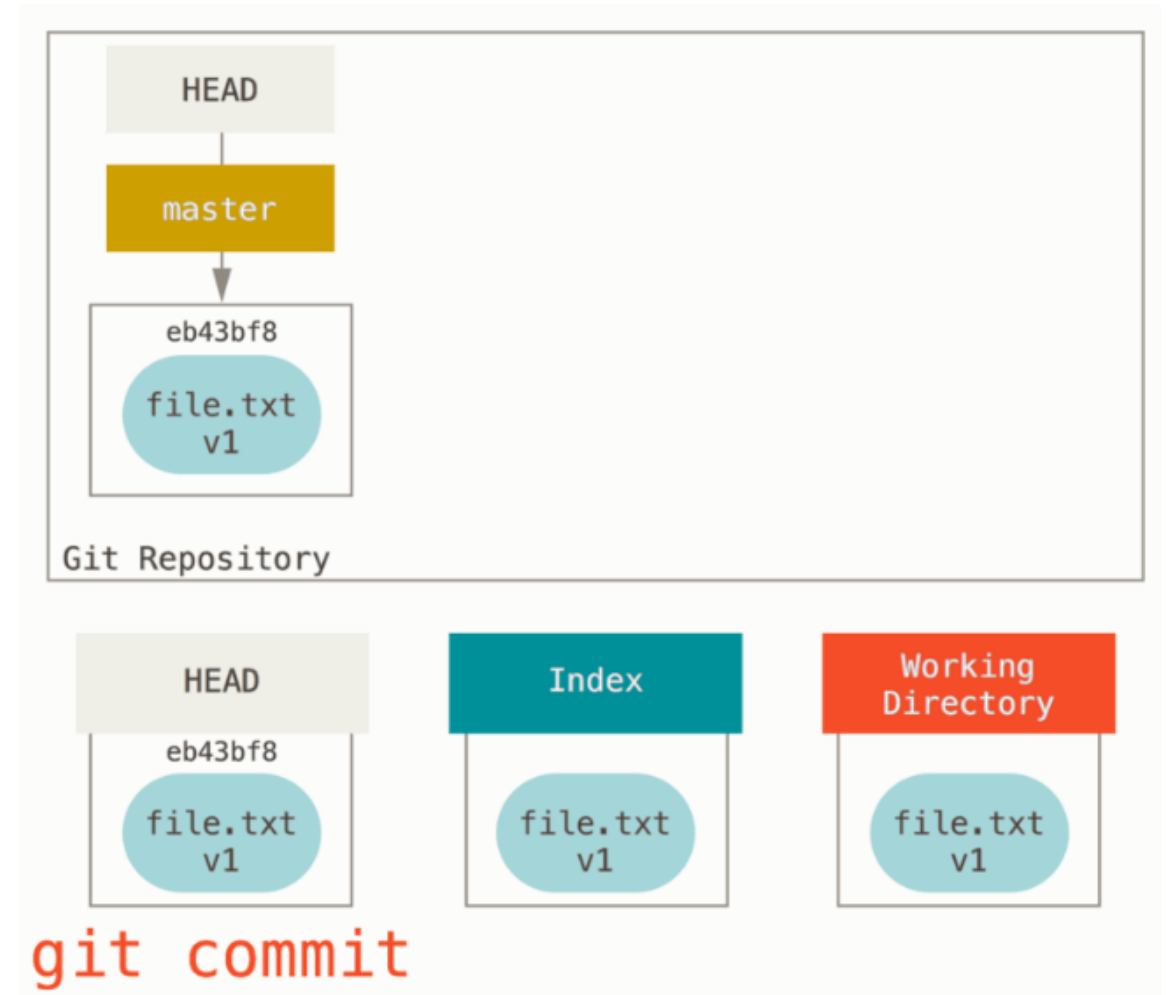


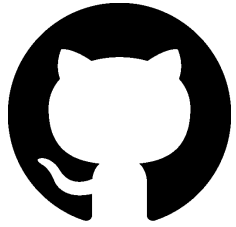
A screenshot of a GitHub commit interface. At the top left is a small icon of a cat with a red 'X' over its eyes. To its right is a text input field containing the text "fixed typos in report". Below this is a larger text area with a blue border containing the text: "In the first paragraph of report.txt, I changed 'acquiesce' to the correct spelling of 'acquiessce.'" I also added a missing conjunction in the third paragraph." Below the text area is a small icon of a person with a plus sign. At the bottom is a blue button with the text "Commit to master".



SNAPSHOTS OF OUR CHANGES: COMMIT

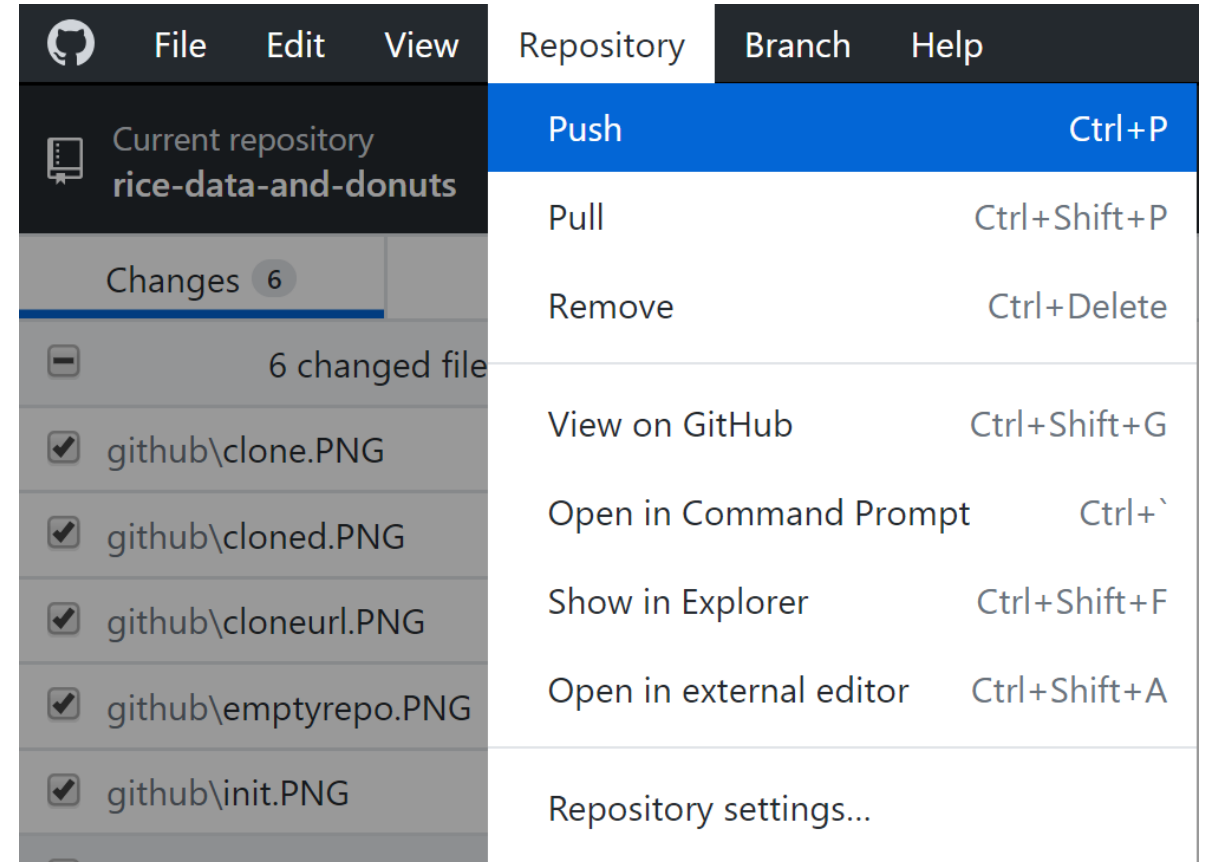
- Tell git to take a snapshot of our files!
 - Transition between which two states for file.txt?
 - Command: `git commit`
- **HEAD** now points to our most recent snapshot!

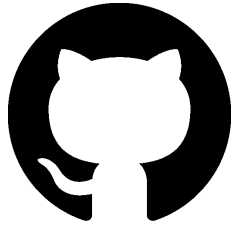




UPLOADING OUR CHANGES

- Once we have a commit, we can send it to GitHub
- This is called a **push**
- Note: Changes are not sent to the server by default!





GOING BACK IN TIME

- What if we accidentally made a change that deleted something we really needed?
- Solution: Revert to a previous commit!
- Note this doesn't delete the changes after the revert

Current repository: **rice-data-and-donuts** | Current branch: **master**

Changes | History

No branches to compare

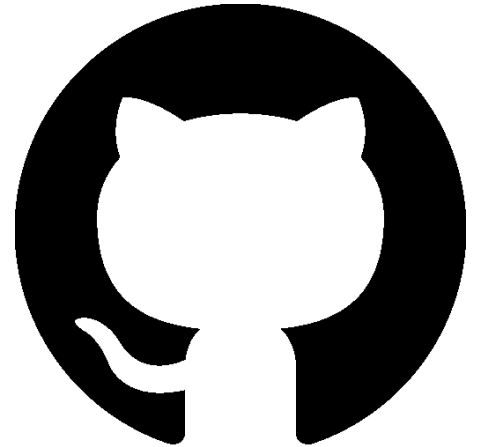
Commit Message	Author	Time
final revision of ppt for the day	Corrin Fosmire	committed a day ago
uncommit?	Corrin Fosmire	committed a day ago
swaggalicious	Corrin Fosmire	committed a day ago
editing showcase	Corrin Fosmire	committed a day ago
more greetings	Corrin Fosmire	committed a day ago
another update to greeting	Corrin Fosmire	committed a day ago
showcasing adding & monitoring changes	Corrin Fosmire	committed a day ago
add screenshots for slides	Corrin Fosmire	committed a day ago
add template and rough outline	Corrin Fosmire	committed a day ago
powerpoint edits		

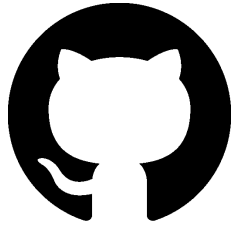
add screenshots for slides

- Revert this commit
- Copy SHA
- View on GitHub

BRANCHES & MERGING

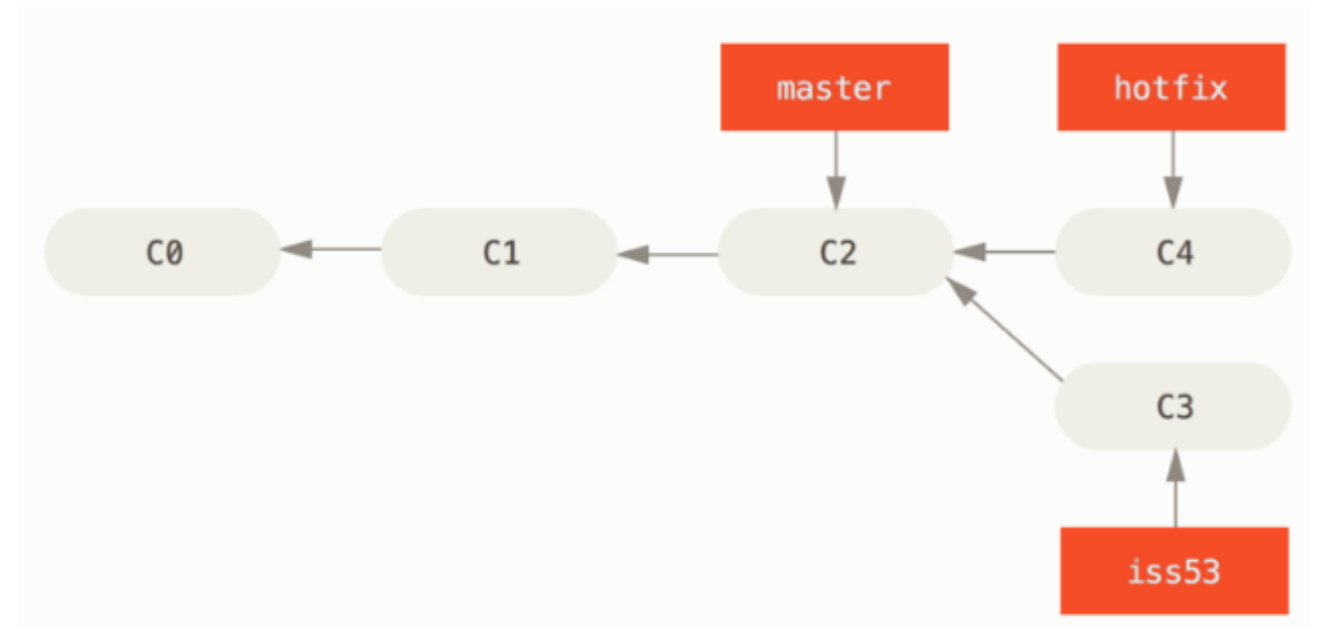
Creating, working on, combining, and switching branches

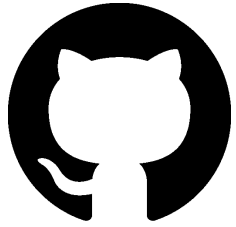




BRANCHES

- If you're working on different features or as part of a larger team
- Divergent history
- Independent files
 - Avoids unintended consequences!
- Easy integration





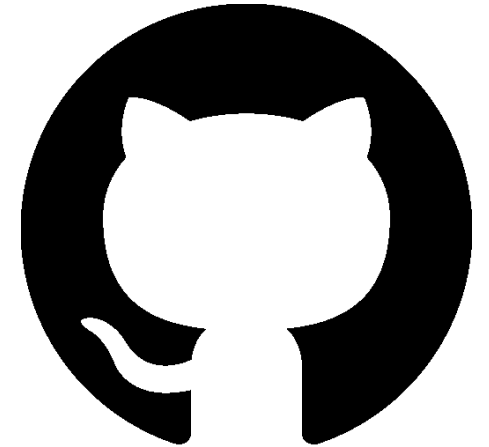
CREATING & SWITCHING BRANCHES

- Click on the “Current branch” tab
- If a branch isn’t listed, you may have to search for it
- Make sure to publish the branch to GitHub!

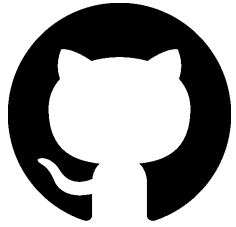
The screenshot shows the GitHub web interface for a repository. At the top, the 'Current branch' is 'master'. A 'Fetch origin' button is visible, indicating the last fetch was on Jun 5. Below this, there are tabs for 'Branches' and 'Pull requests' (0). A search bar labeled 'Filter' and a 'New branch' button are present. Under the 'Default branch' section, 'master' is selected with a checkmark, and it was updated 'a day ago'. The 'Recent branches' section lists 'second' and 'first', both updated 'a day ago'.

Publish branch
Publish this branch to GitHub

COLLABORATING ON GITHUB

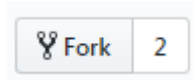


Extensions to collaborate within teams, organizations, and more.



GITHUB EXTENSIONS TO MERGING

- Fork

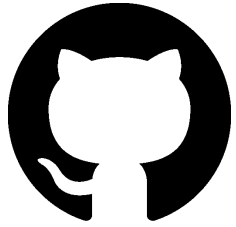


- Copy entire repository to your namespace
- Gives edit privileges

- Pull Request



- Ask the repository owner to make a change
- Can comment on and discuss with owner



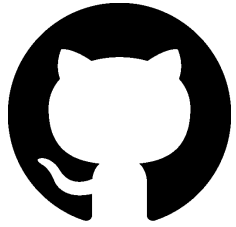
ISSUES

- Pointing out what's wrong
- Hope someone can figure it out!
 - Even if they're not the owner of the repository!
 - The benefit of open source
- Great way to get involved
- Supports discussions, fixes, etc

! Compute metrics on "slices" of the data?
#547 opened 2 days ago by jayleverett

🔥 Want to contribute to pytorch/ignite?

If you have a bug or an idea, read the [contributing guidelines](#) before opening an issue.
If you're ready to tackle some open issues, [we've collected some good first issues for you](#) .



ACKNOWLEDGMENTS

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