



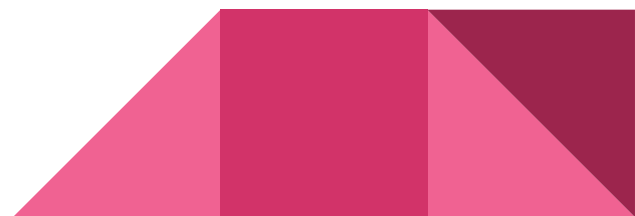
# Git & Github

Carter Rhea

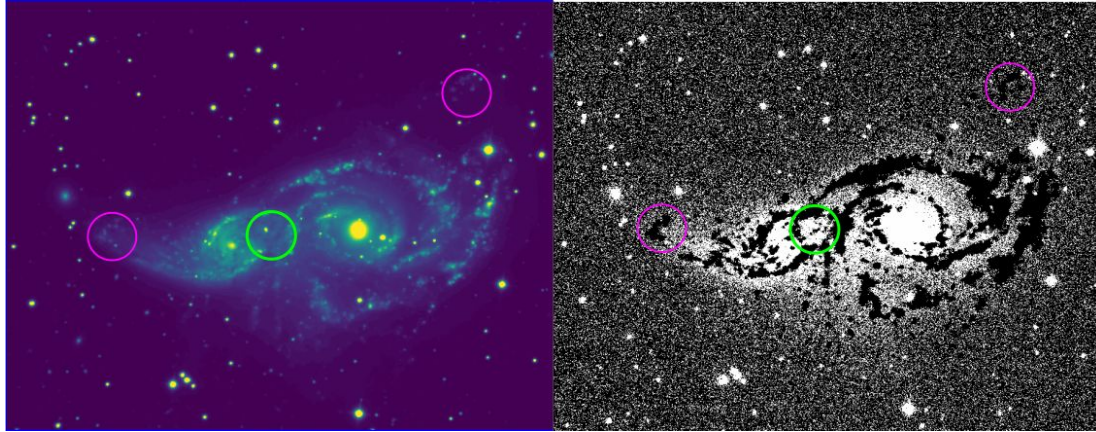
3rd Summer Particle Astrophysics Workshop

May 10, 2021

# Who am I?



# What do I do?



valence

<https://valence.cascadeinstitute.org/>



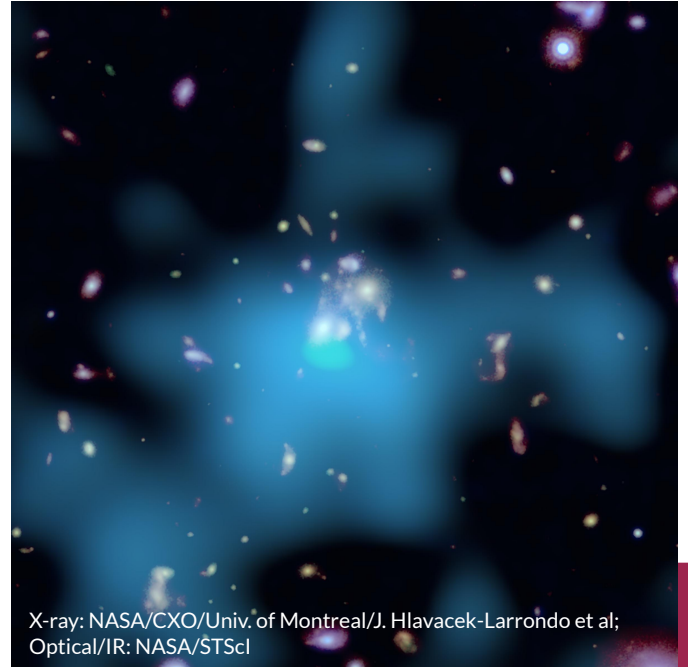
<https://www.cadena.ca>

Press Release:

[https://chandra.harvard.edu/press/20\\_releases/press\\_080320.html](https://chandra.harvard.edu/press/20_releases/press_080320.html)

Blog:

<https://chandra.harvard.edu/blog/node/766>



X-ray: NASA/CXO/Univ. of Montreal/J. Hlavacek-Larrondo et al;  
Optical/IR: NASA/STScI

# Overview

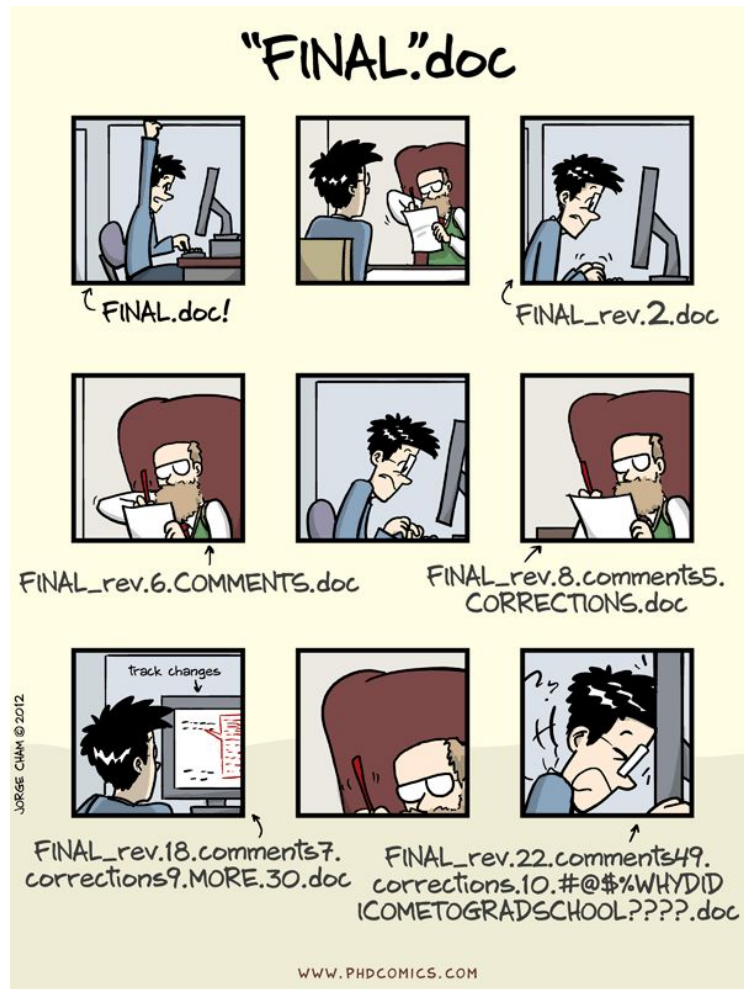
1. What is git?
2. How does git work?
3. Installing git
4. What is GitHub?
5. Creating a GitHub account
6. Example



**git**



# Why Git?



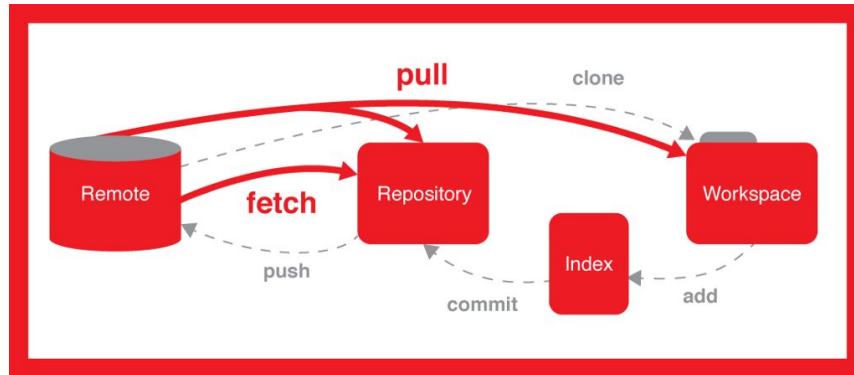
# Version Control

- A system for tracking changes made to code
- Easily Collaborative Platform
- You can figure out who introduced that pesky bug and when!
- Allows user to revert changes!
- Online and Local



# Brief History

- Created in 2005 by Linus Torvald
- Available for ALL Operating Systems
- Official Website: [git-scm.com](https://git-scm.com)



# How Does Git Work?

- Extremely daunting at first
- Several Key Concepts

## Common Git Commands



- `$git config`
- `$git init`
- `$git clone <path>`
- `$git add <file_name>`
- `$git commit`
- `$git status`
- `$git remote`
- `$git checkout <branch_name>`
- `$git branch`
- `$git push`
- `$git pull`
- `$git merge <branch_name>`
- `$git diff`
- `$git reset`
- `$git revert`
- `$git tag`
- `$git log`





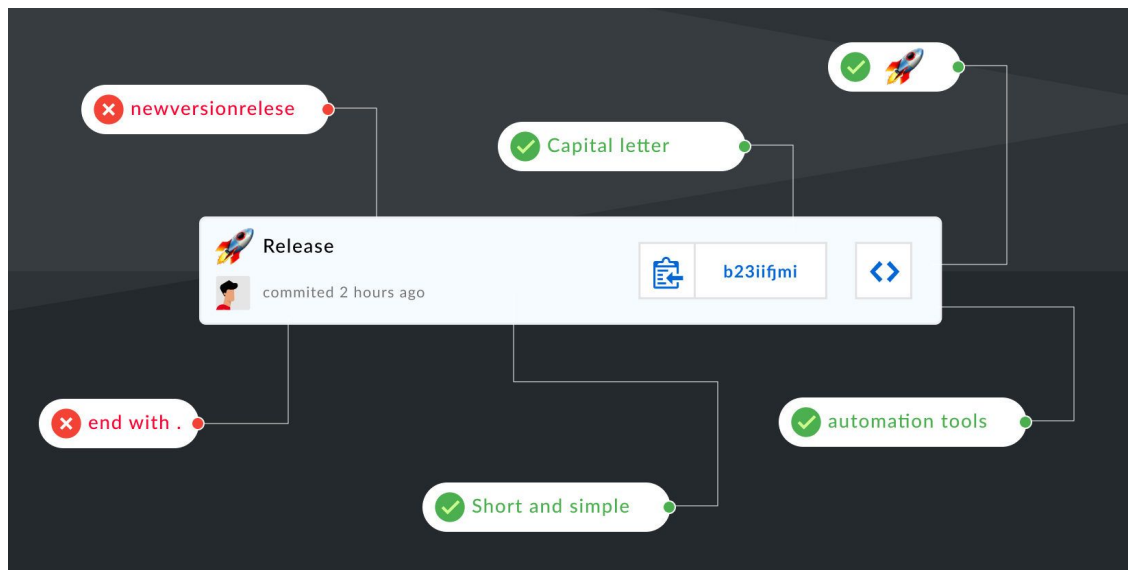
# Snapshots

- Git's method of tracking changes and history for project (repository)
- Basically a record keeping system
- You have complete control over when and what
- You can always revisit



# Git Commit

- The act of creating a snapshot
- Every project is made of commits!



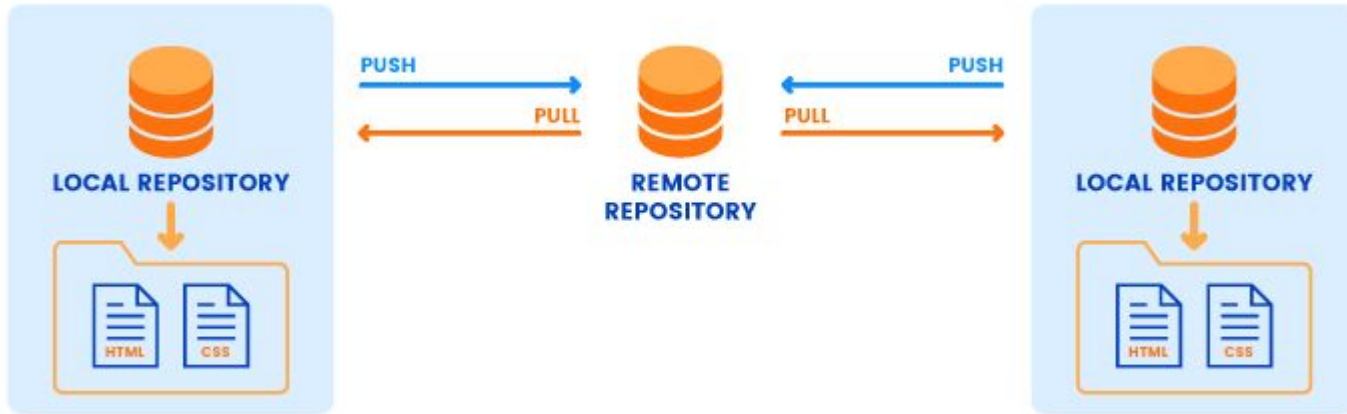
# What's in a Commit???

1. Information about new changes
2. A reference to the parent commit (i.e. previous commit)
3. Hash code (always horrendous to memorize...)



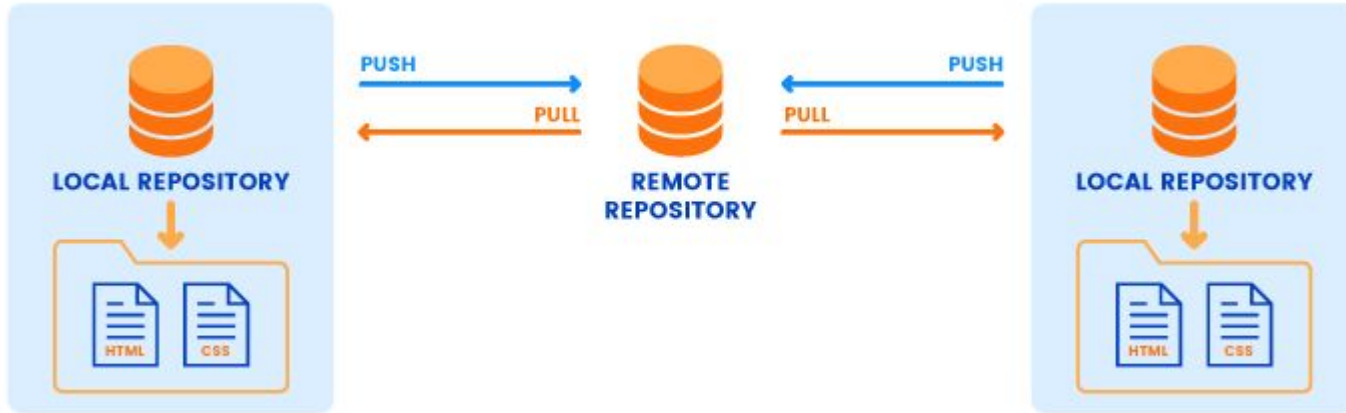
# Git Repository

Simply Put: A collection of files and commits



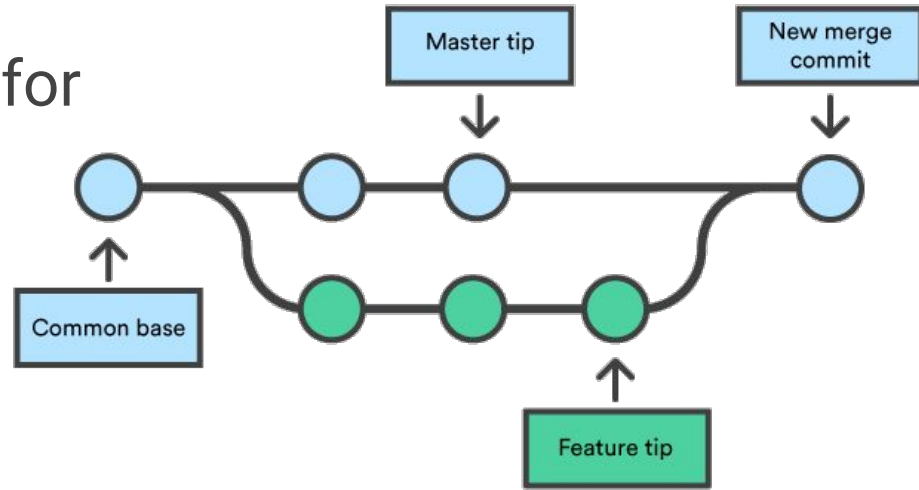
# Why Use Repositories (and Cloning)???

- Lives on both REMOTE and LOCAL
- Allows for collaboration



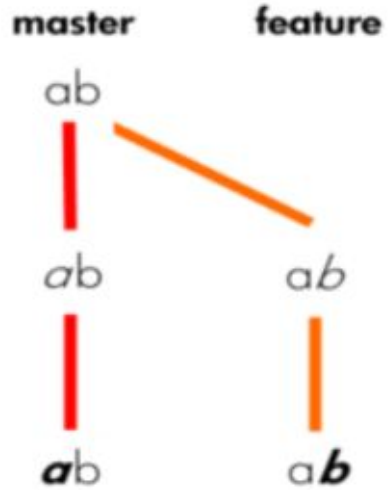
# Git Branches

- Everything is on a branch
- Can have as many as called for
- Primary Branch: **MASTER**

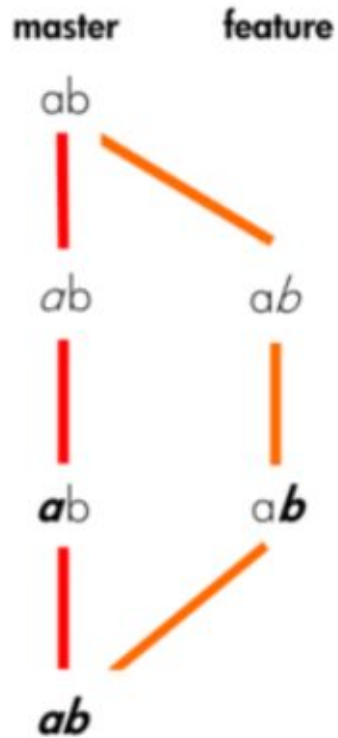


# Git Merge

## Commits

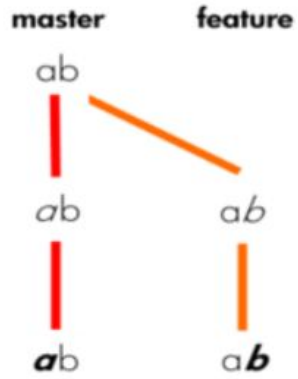


## Merge

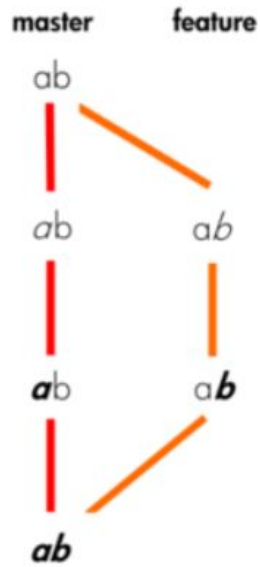


# Merge vs Rebase

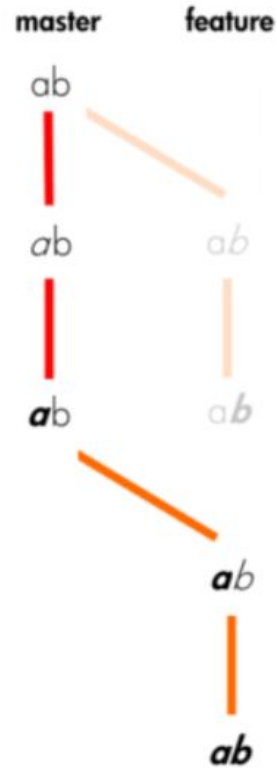
## Commits



## Merge



## Rebase

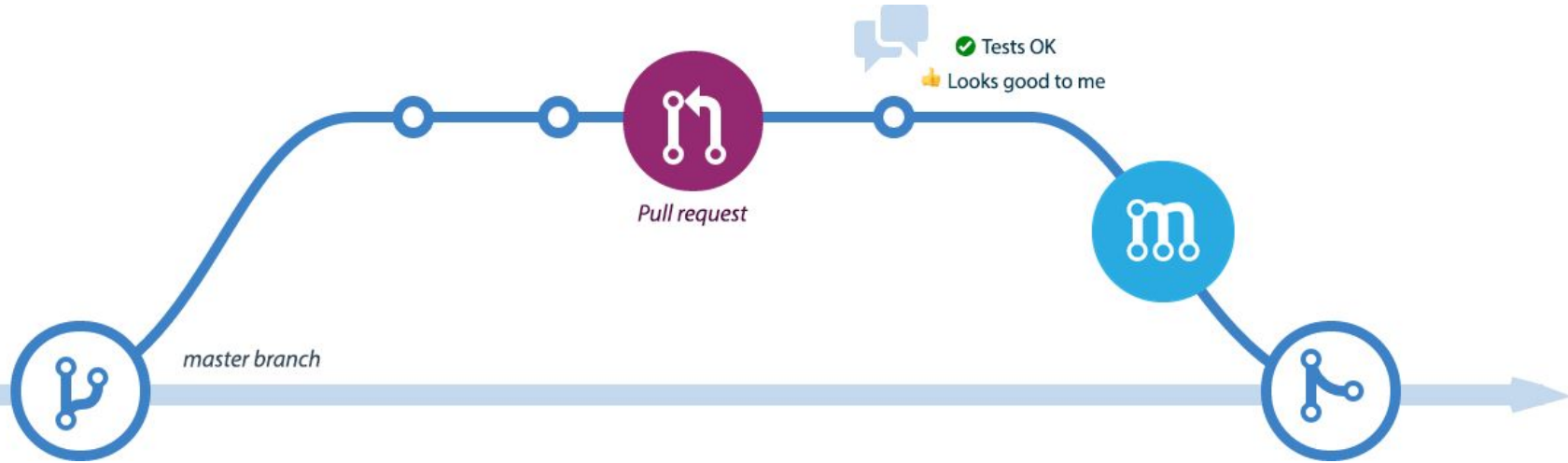




And if the merge fails...

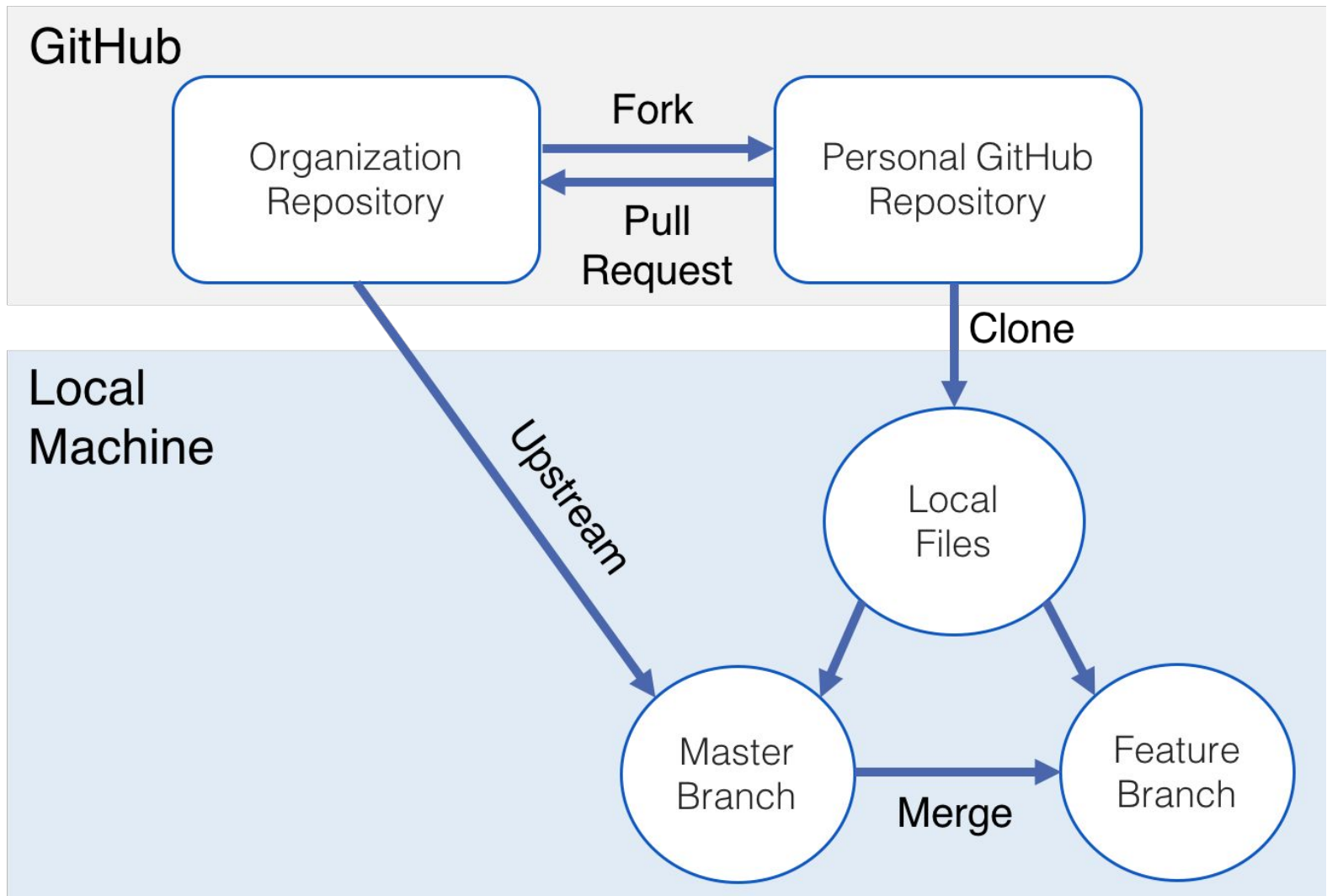


# Pull Request

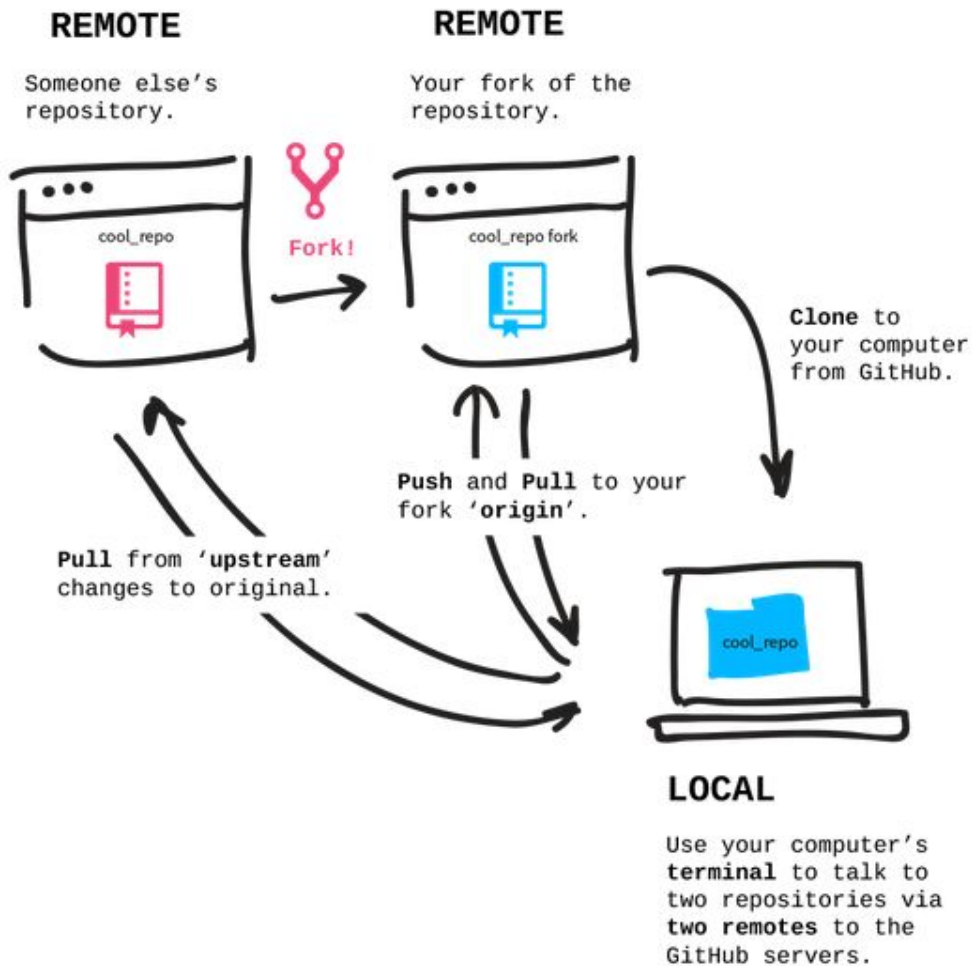


**ONE DOES NOT SIMPLY MERGE TO MASTER**

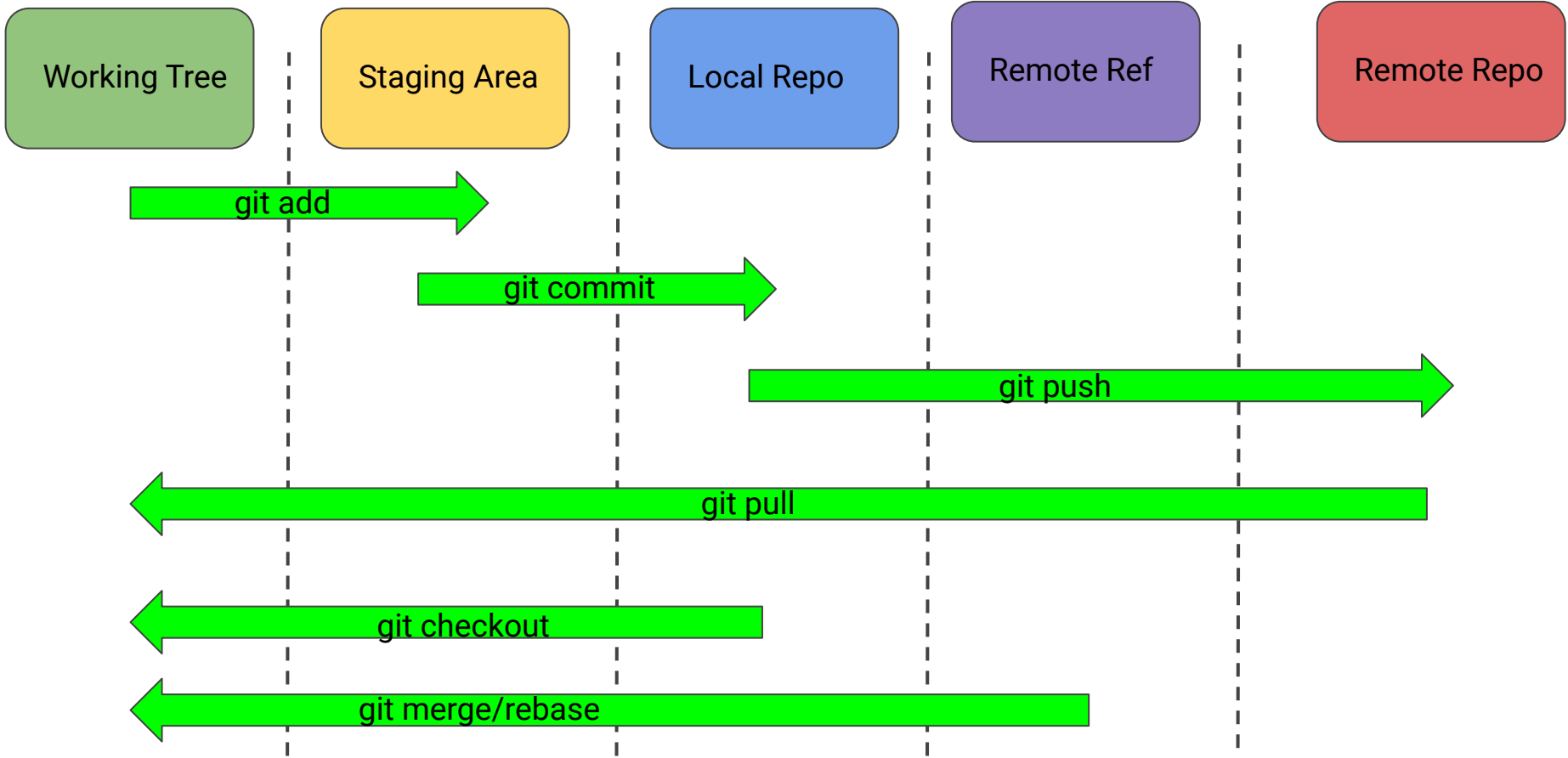
**WITHOUT A MERGE REQUEST**



# Forking



# Basic Workflow





# Let's Git Started!

After a small break





# GitHub Account

## Built for developers

GitHub is a development platform inspired by the way you work. From open source to business, you can host and review code, manage projects, and build software alongside 40 million developers.

**Username**

**Email**

**Password**

Make sure it's **at least 15 characters** OR **at least 8 characters including a number and a lowercase letter**. [Learn more](#).

Sign up for GitHub

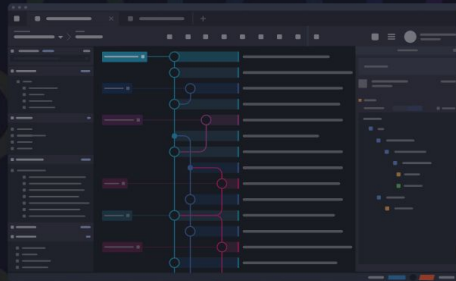
By clicking "Sign up for GitHub", you agree to our [Terms of Service](#) and [Privacy Statement](#). We'll occasionally send you account related emails.



# GitKraken

## Git GUI

Legendary Git Client for Windows, Mac & Linux



**NEW:** Associate issues with pull requests

 [Free Download](#)

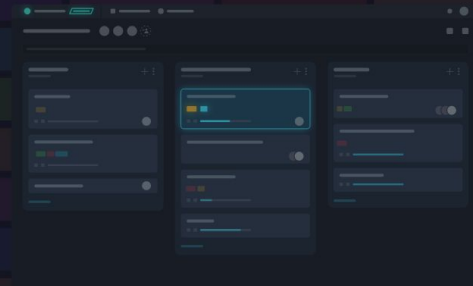
[Other Platforms](#)



axosoft  
**GitKraken**  
Legendary Dev Tools

## Glo Boards

Kanban Issue Tracking for a CI/CD World

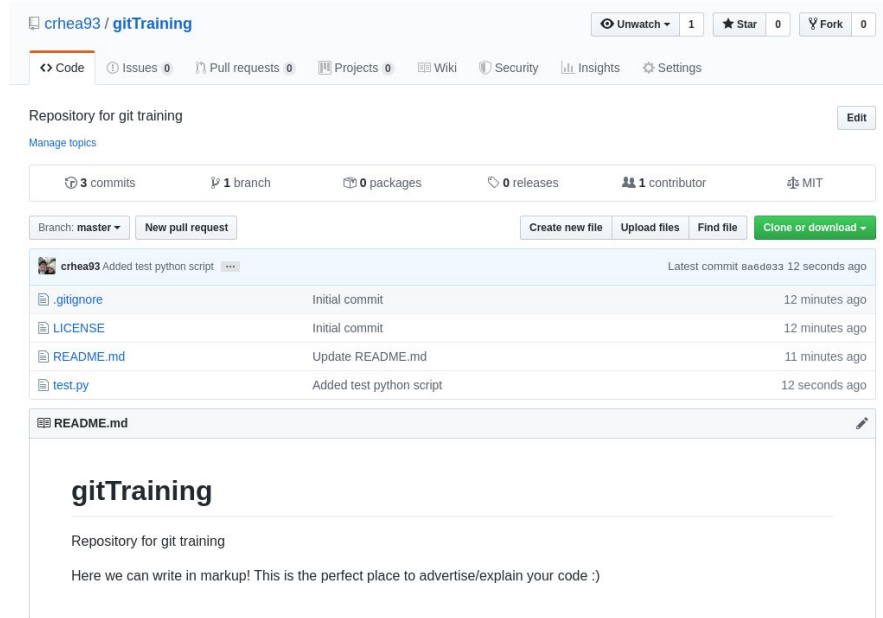


**NEW:** Pull request automation & linking

[Free Sign Up](#)

# Demonstration

1. Clone gitTraining Repository from crhea93 using GitKraken and Github
2. Create your own branch named “yourname”
3. Open test.py in your favorite editor
4. Complete the program and test that it works
5. Pull request!



The screenshot shows the GitHub interface for the repository `crhea93 / gitTraining`. The repository is currently on the `master` branch. The commit history shows the following changes:

File	Commit Message	Time Ago
<code>.gitignore</code>	Initial commit	12 minutes ago
<code>LICENSE</code>	Initial commit	12 minutes ago
<code>README.md</code>	Update README.md	11 minutes ago
<code>test.py</code>	Added test python script	12 seconds ago

The `README.md` file content is displayed below:

```
gitTraining

Repository for git training

Here we can write in markup! This is the perfect place to advertise/explain your code :)
```

# Demonstration 2: Collaboration

1. Find a partner(s)!
2. Friend 1: Create a new repository
3. Friend 2: Clone friend's repository and add some
4. Friend 2: Submit a pull request
5. Friend 1: Comment, review, and accept pull request
6. Friend 1: Make a change locally and push to remote
7. Friend 2: Pull from remote
8. Friend ½: Make an issue

In case of fire



1. `git commit`



2. `git push`



3. `leave building`

# Github Student Pack!

<https://education.github.com/pack>



# Resources

- <https://medium.com/flawless-app-stories/useful-git-commands-for-everyday-use-e1a4de64037d>
- <https://github.com/arslanbilal/git-cheat-sheet>
- <https://joeykee.github.io/friendly-github-intro/>
- <https://try.github.io/>
- <https://www.earthdatascience.org/workshops/intro-version-control-git/>
- <https://lab.github.com/>
- <https://www.pluralsight.com/courses/code-school-git-real>
- <https://git-scm.com/book/en/v1/Getting-Started-Git-Basics>
- <https://www.slant.co/topics/517/viewpoints/11/~best-resources-to-learn-git~think-like-a-git>
- <https://www.slant.co/topics/517/viewpoints/14/~best-resources-to-learn-git~git-reference>
- <https://www.atlassian.com/git/tutorials>