GitHub Fundamentals:

What you need to know about Version Control Systems (VCS)

Women in Tech @ UAB

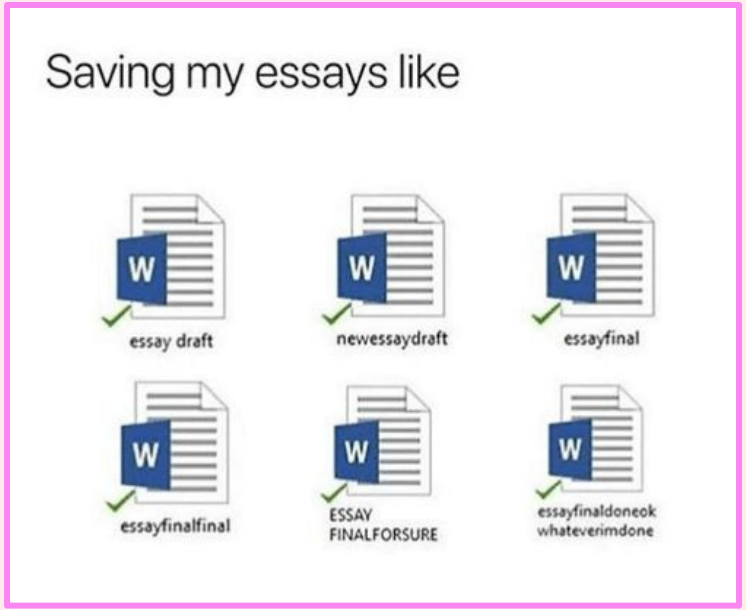
Table of Contents

Background Information

What is Git?

Have you ever done this?

Git serves as a solution to problems like this!



What is Git?

Version Control Software

Keeps a record of the changes you make to your file, allowing you to look back at previous versions of your file later. Think of it like a save function, but better.

Have you ever looked at your Version History in Google Docs? Its similar!

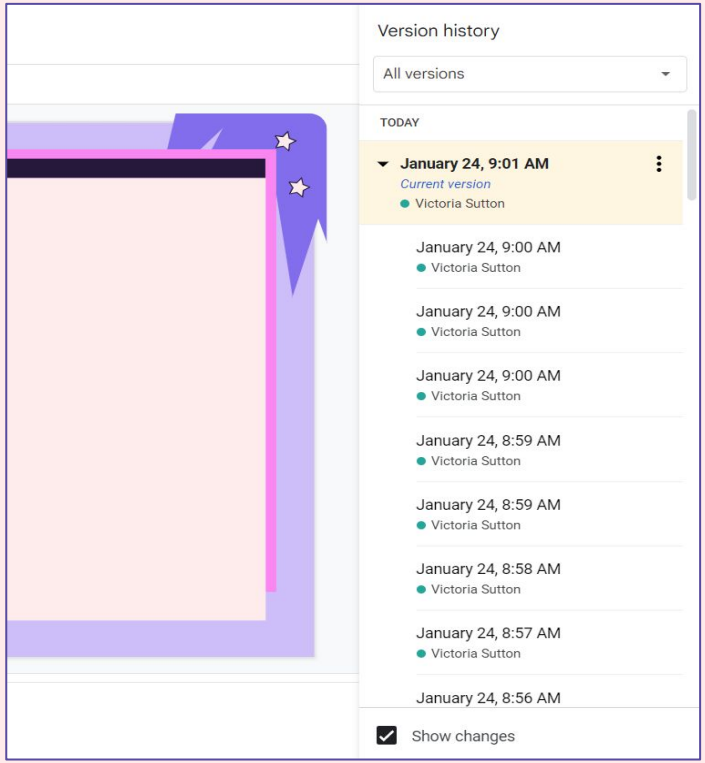
Difference between Git and GitHub

Git is a version control system, which allows you to track the changes you make to your code. Git works locally.

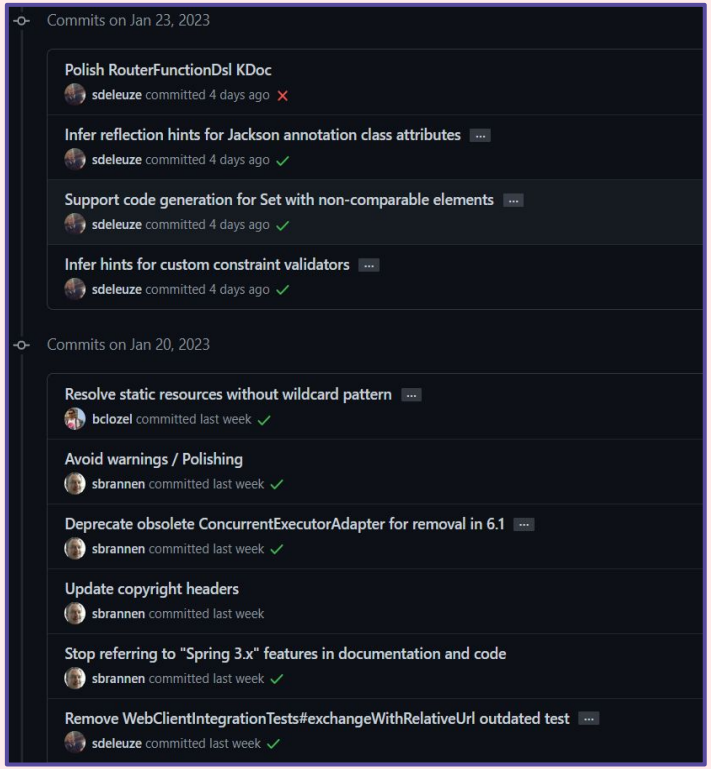
GitHub is a cloud-based hosting service that lets you manage Git repositories via a user interface. It's especially useful when working on a team! GitHub works remotely.

⭐Learn more here: https://devmountain.com/blog/git-vs-github-whats-the-difference/ ⭐

Google Docs



GitHub



Setting Up

Set up instructions adapted from: https://www.theodinproject.com/lessons/foundations-setting-up-git

Step 1

Create a GitHub Account

https://github.com/signup

Step 2

Install Git on Your Machine

https://git-scm.com/

Configuring Git

- Let's start by configuring Git so that it recognizes you as the user.
  - For MacOS, use Terminal
  - For Windows, use Terminal.
    - Command Prompt may not work, so you might need to install Terminal here.
- Run the following commands, entering your information inside the quotes. Be sure to **INCLUDE** quotation marks!
  - `git config --global user.name "Your Name"`
  - `git config --global user.email "yourname@example.com"`
- Next, we want to change our default branch to main
  - `git config --global init.defaultBranch main`
- If you want to add colorful output to your git command in the terminal, do this
  - `git config --global color.ui auto`
- Finally, do this to set your default branch reconciliation behavior to merging
  - `git config --global pull.rebase false`

Configuring Git *Cont...*

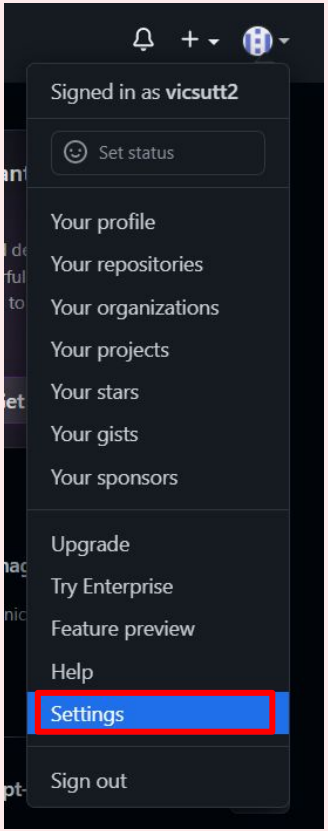
- Now let's double check that Git is recognizing you properly by running these two commands
  - `git config --get user.name`
  - `git config --get user.email`
- *For MacOS Only*
  - `echo .DS_Store >> ~/.gitignore_global`
  - `git config --global core.excludesfile ~/.gitignore_global`
    - This allows Git to ignore .DS_Store files, which macOS applies to folders on your system. These Git commands stop .DS_Store files from showing up in your commits.

Creating an SSH Key

- Your SSH key lets you skip inputting a username and password every time you modify or upload to your repository.
- Let's see if you already have an SSH key on your computer!
  - `ls ~/.ssh/id_ed25519.pub`
    - If you receive a message saying "No such file or directory", you'll need to create an SSH by running the following command
      - Replace the last part with your GitHub email. Do **not** include the brackets!
      - `ssh-keygen -t ed25519 -C <youremail>`
      - Press `Enter` if it asks you for a location to save the key.
      - A password is optional.

Linking your SSH Key

- Let's link your SSH Key to your GitHub. This will let you bypass needing a password when using the terminal to work with GitHub.
- Run this command to get your public SSH key
  - `cat ~/.ssh/id_ed25519.pub`
    - Be sure to highlight and copy the result, starting from `ssh-ed25519` and ending with your email address!
- We're almost done! Let's put it into GitHub!
  - On GitHub.com, hover over your profile icon and click on **Settings**.
  - From there, navigate to **SSH and GPG keys** > click **New SSH Key**.
  - Title the key something that lets you know where it came from. Ex. your laptop model.
  - The **Key type** drop down should be set to Authentication Key/
  - Paste your SSH key that you copied earlier into the large **Key** text box.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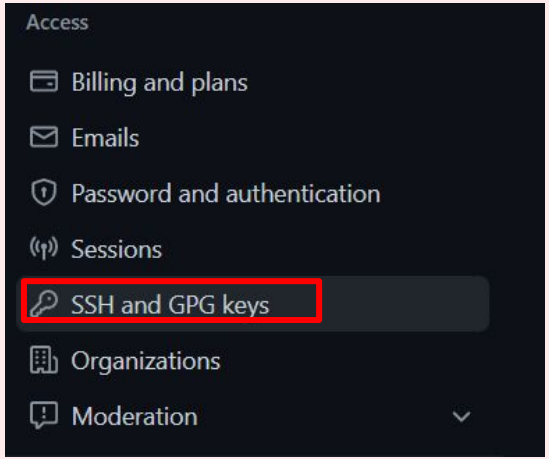
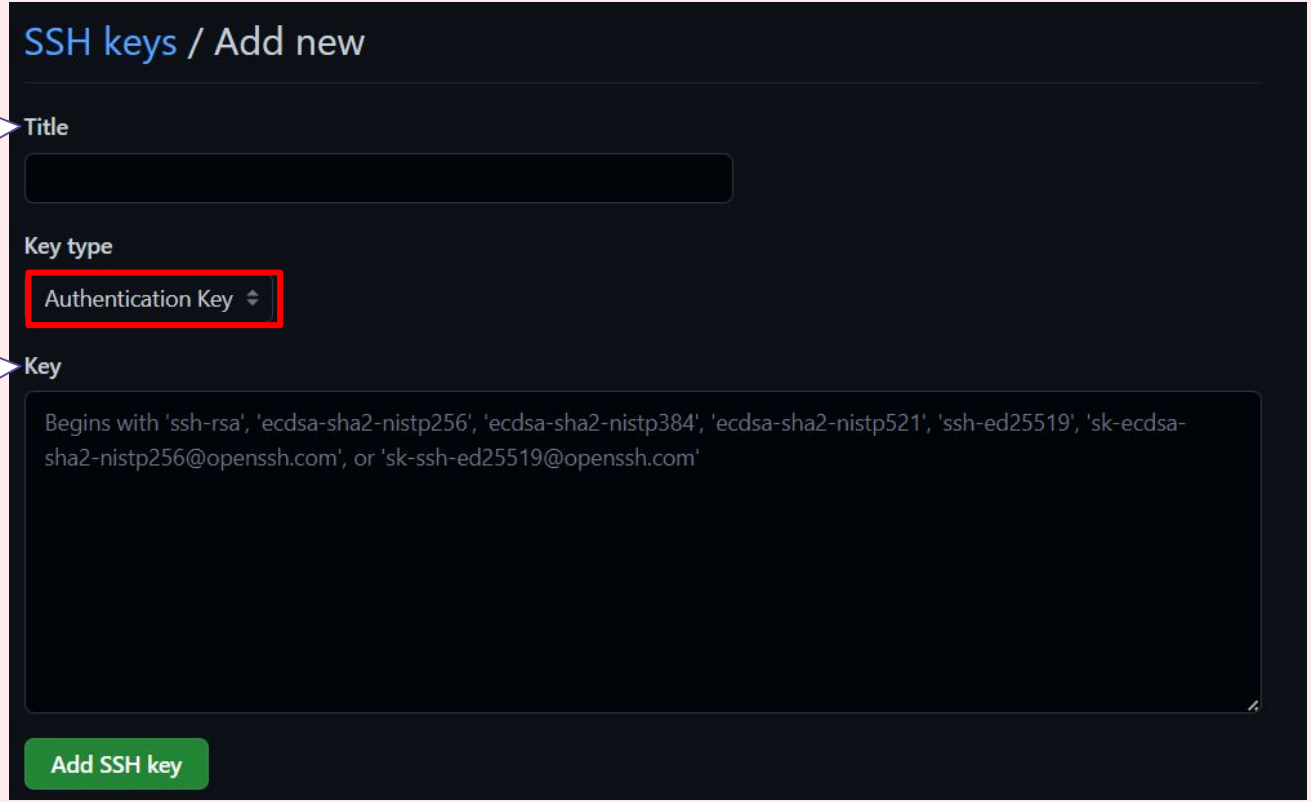
Set status
Your profile
Your repositories
Your organizations
Your projects
Your stars
Your gists
Your sponsors
Upgrade
Try Enterprise
Feature preview
Help
Settings
Sign out


Access
Billing and plans
Emails
Password and authentication
Sessions
SSH and GPG keys
Organizations
Moderation


New SSH key

Title it something that lets you remember which device it came from

Paste the SSH key you copied from the terminal.



Testing your SSH Key

- Finally, let's double check that your SSH has been added properly
  - Follow the instructions in this article:
    - https://help.github.com/en/articles/testing-your-ssh-connection
  - If you receive the following response, you did it right!
    - `Hi <username>! You've successfully authenticated, but GitHub does not provide shell access.`

Getting Started

Keywords

Repository

Similar to a directory and stores everything related to your project, including files, versions, commits, deletions, and more.

Fork

Creates an independent copy of a repository.

Clone

Creates a linked copy of a repository that will sync with the original.

Branch

A version of your repository that allows you to experiment, alter, or test changes without damaging the main repository.

Keywords *cont...*

Add

When you make a change to a file, using add stores it on a staging area within your computer, where it will wait to be included in the next commit.

Commit

A snapshot of the changes you made to your file, branch, or repository. A commit may contain multiple changes, and is similar to a save button.

Push

Updates your remote repository with the commit you made. “Pushing” your commit into the repository.

Origin

The primary or original version of a repository.

Let's Try It!

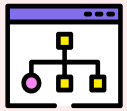
Navigate to this page and follow the instructions on the README.md file.

Let us know if you need any help!

*Make sure you clone with SSH,
NOT HTTPS!

Overview of What You Learned

How to fork and clone a repository.



How to create a branch.

How to check, add, commit, push, and submit changes.

Common Commands

Quick Note:

Basic Git Syntax

program | action | destination

A large part of your workflow will involve these common commands.
It helps to memorize them early!

⭐Official Git Cheatsheet: https://education.github.com/git-cheat-sheet-education.pdf⭐

Most Common Git Commands

clone

```
git clone <url of repository>
```

Retrieves a repository from a remote location onto your local machine.

add

```
git add .
```

Adds all of your changes to your next commit.

commit

```
git commit -m "message"
```

Creates a snapshot of all your added changes.

push

```
git push origin main
```

Pushes your commit to your original repository's main branch.

status

```
git status
```

Shows files ready for your next commit.

log

```
git log
```

Shows the commit history for your branch.

Best Practices

Atomic Commits:

A commit that changes only one feature or task of your code.

Debugging:
Atomic commits make it easier to identify which change in your code caused an issue in your program, allowing you to revert back to a version before you made that change.

Readability:
Atomic commits encourage you to write more specific commit messages, which allow teammates to have a better understanding of what changes are being made.

Importance of Commit Messages

Employers

Good commit messages will make you stand out as reliable and organized to employers.

Collaboration

Good commit messages will allow collaborators to quickly see what changes were made to a project.

Revisiting Projects

Good commit messages allow you to quickly pick up where you left off.

Good vs. Bad Commit Messages

Good

- Add test cases for fibonacci
- Rename oldName to newName
- Add sponsor button
- Remove badFunction
- Drop deprecated API

VS

Bad

- fixed bugs.
- added more stuff to functions
- ugh another commit…
- Added functionality
- Consolidated Util and MutableAnnotationUtils classes into existing AsmUtils

⭐Read more about good commit messages here: https://cbea.ms/git-commit/⭐

Conclusion

Git and GitHub are fantastic ways to keep track of your projects, develop your technical skills, and impress potential employers!

Thank you for joining us!

Coming Up

Building Your Portfolio: Personal Projects

Wednesday, February 8th, 2023
12:10pm - 1:10pm
UH 1008

Contact Us!



GitHub: https://github.com/WiT-UAB
Linktr.ee: https://linktr.ee/uab_womenintech
Instagram: @uab_womenintech