Git and GitHub In-depth

Working with Git and GitHub

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Be Boulder.

What is version control?

Version control is the practice of tracking and managing changes to files.

- Why do I need it?
  - Revert to various states of files
    - You can think of this as a backup
  - Allows you to modify items without harming the original copy
  - Not limited to code
    - Can be used for documents, images, etc.
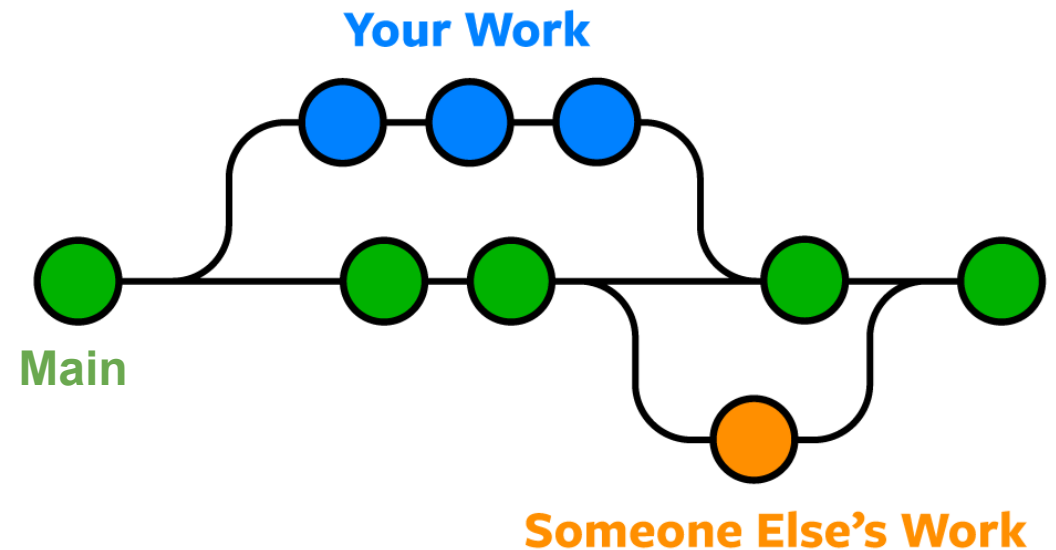
What is version control?

- Google Docs includes "Version History"

- This allows you to see what changes were made, when those changes happened, and who made them

- You can also revert to a previous version of your file
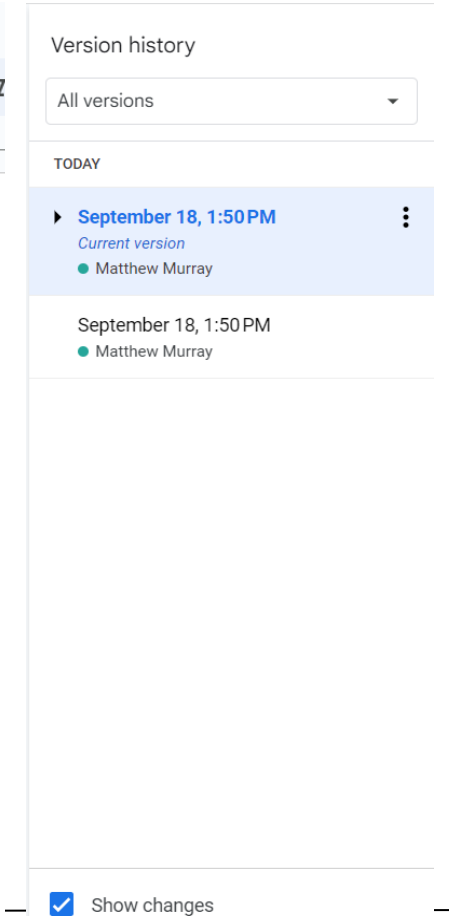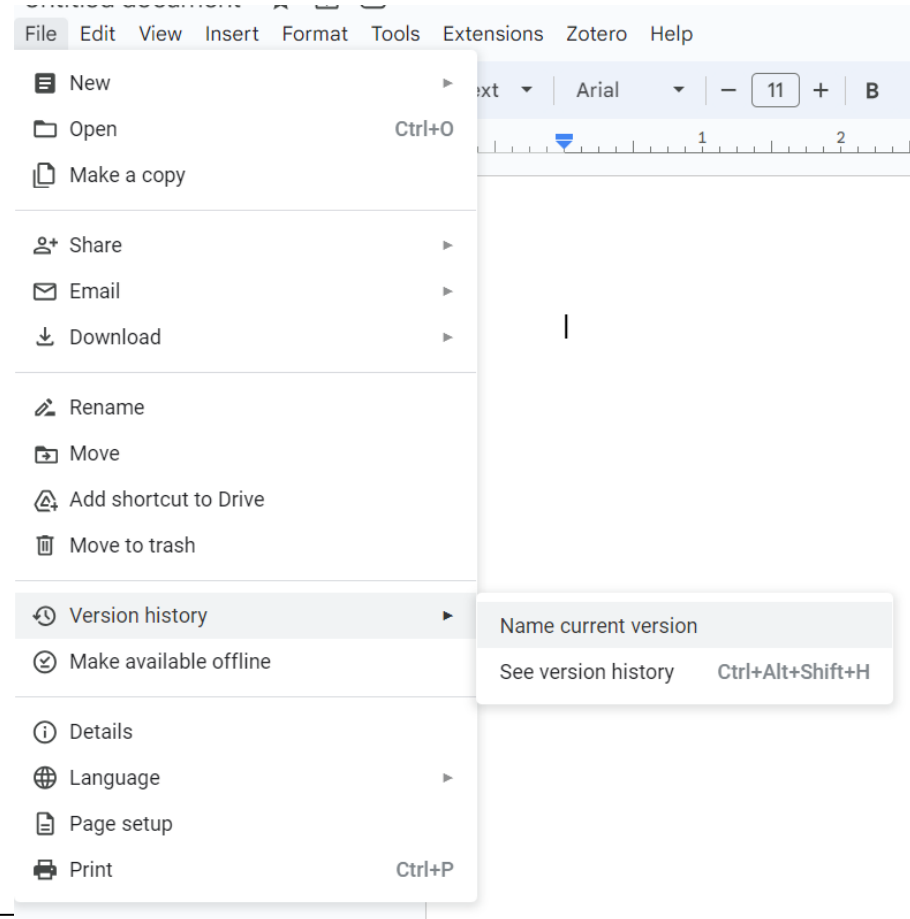
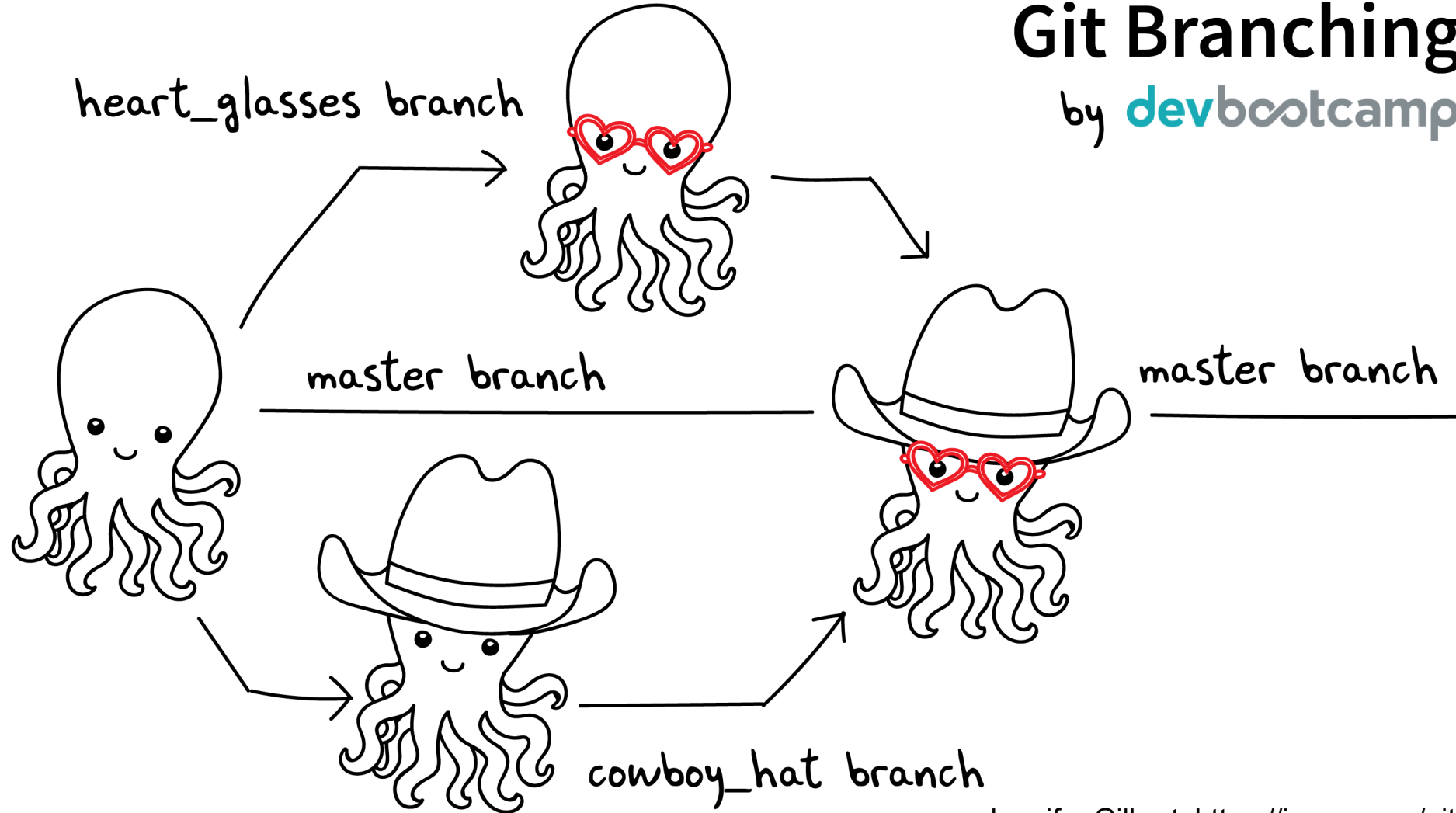# Additional benefits of version control

- Using version control provides
  - Clear tracking of the repo's history
  - Management and view of different branches (work)
  - Collaboration through merging of branches

Your Work

Main

Someone Else's Work

Images: nobledesktop.com

Branching & Merging

heart_glasses branch

Git Branching
by devbootcamp

master branch

master branch

cowboy_hat branch

Git vs GitHub

- Git: version control system
  - the actual software

- GitHub
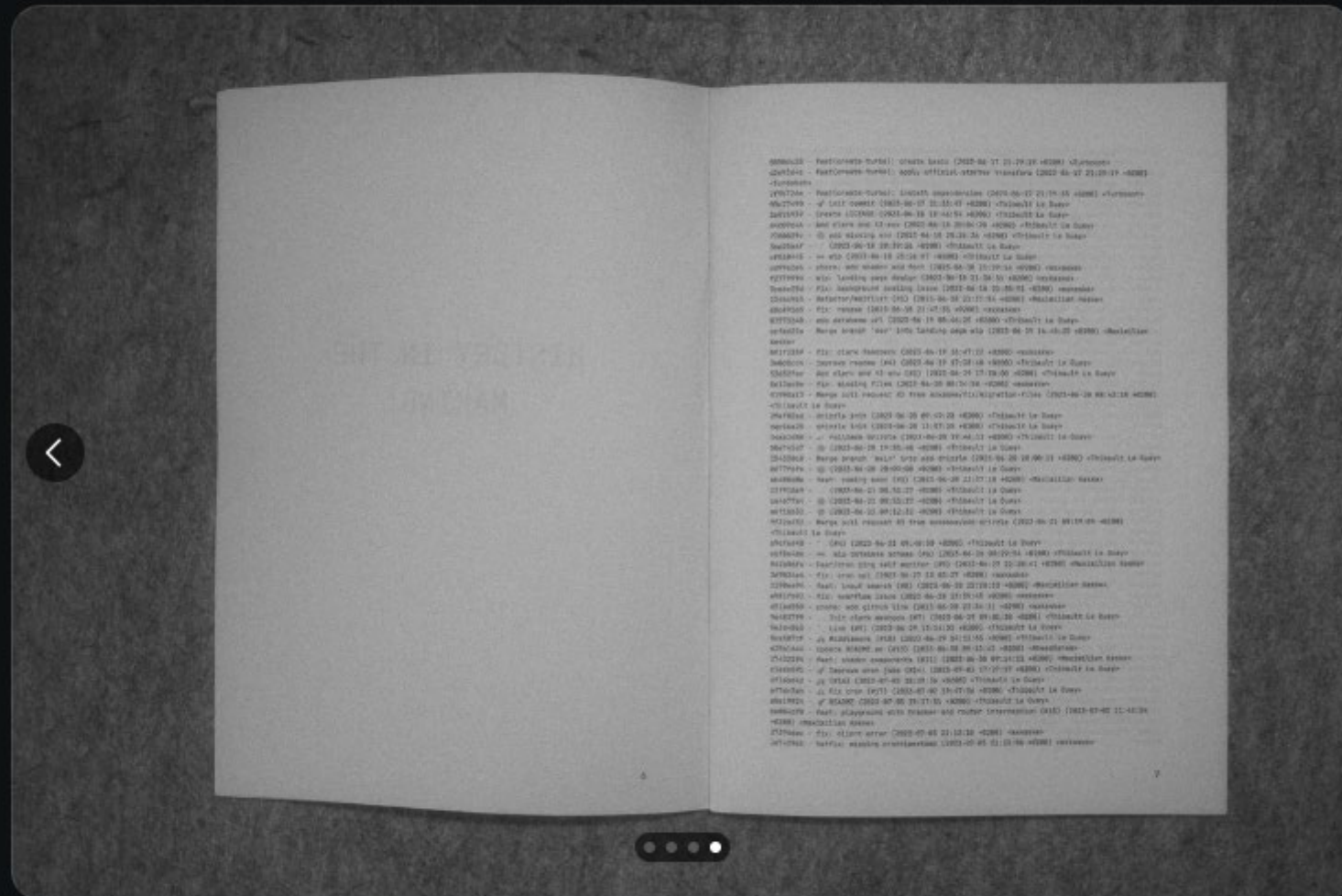 - cloud-based storage website

What is Git?

- Git is version control software, created by Linus Torvalds, the same person who created the Linux operating system.

- Monitor files on your computer and tracks changes made to them over time

- Uses the command line

We made a zine from our Git history

We are an open-source project, so we decided to print our Git history to celebrate our 2nd anniversary.

https://www.reddit.com/r/zines/comments/1miy3bs/we_made_a_zine_from_our_git_history/

Why is it called "Git"?

- Linus Torvalds: "I'm an egotistical bastard, and I name all my projects after myself. First 'Linux', now 'Git'".

- Git: "A silly, incompetent, stupid or annoying person (usually a man)." (Wikitionary)

git / README

Linus Torvalds Initial revision of "git", the information manager from hell

| Code | Blame | 168 lines (135 loc) · 8.2 KB |

```
 1
 2            GIT - the stupid content tracker
 3
 4    "git" can mean anything, depending on your mood.
 5
 6     - random three-letter combination that is pronounceable, and not
 7       actually used by any common UNIX command.  The fact that it is a
 8       mispronounciation of "get" may or may not be relevant.
 9     - stupid. contemptible and despicable. simple. Take your pick from the
10       dictionary of slang.
11     - "global information tracker": you're in a good mood, and it actually
12       works for you. Angels sing, and a light suddenly fills the room.
13     - "goddamn idiotic truckload of sh*t": when it breaks
14
```

What is GitHub?

- GitHub is a Microsoft subsidiary that offers cloud hosting for Git repositories
- Provides a GUI (Graphical User Interface) for Git
  - Most (but not all) features are available in the GitHub Desktop client
- Allows for easy collaboration and sharing
  - Issue queues for bugs and features, pull requests, and more
- GitHub basic is free (up to 5GB of storage)
  - Hosts both open and private repositories
- GitHub Enterprise (free for CU affiliates)
  - Includes cloud-based development environments
  - https://oit.colorado.edu/services/business-services/github-enterprise

Alternatives to…

- Git (version control)
  - Apache Subversion (SVN)
  - Mercurial SCM
  - CVS (Concurrent Versions System)
- GitHub (hosting)
  - Codeberg
  - GitLab
  - Forgejo
  - Bitbucket

When not to use GitHub

- When you are looking for long-term preservation
  - There's no guarantee Microsoft will keep GitHub around forever
  - Lots of source-code-hosting platforms no longer exist
  - Thousands of URLs in research articles no longer work as they point to code hosted by defunct services
- When you want your code to be cited
  - Zenodo is an Open Access repository that can be linked to GitHub
  - Allows you to archive a specific release of public GitHub projects
  - Creates a DOI for the archive that you can use in citations

September 2, 2023

`Software` `Open Access`

PyGMT: A Python interface for the Generic Mapping Tools

ⓘ Tian, Dongdong; ⓘ Uieda, Leonardo; ⓘ Leong, Wei Ji; ⓘ Schlitzer, William; ⓘ Fröhlich, Yvonne; ⓘ Grund, Michael; ⓘ Jones, Max; ⓘ Toney, Liam; ⓘ Yao, Jiayuan; ⓘ Magen, Yohai; ⓘ Jing-Hui, Tong; ⓘ Materna, Kathryn; ⓘ Belem, Andre; ⓘ Newton, Tyler; ⓘ Anant, Abhishek; ⓘ Ziebarth, Malte; ⓘ Quinn, Jamie; ⓘ Wessel, Paul

PyGMT is a library for processing geospatial and geophysical data and making publication quality maps and figures. It provides a Pythonic interface for the Generic Mapping Tools (GMT), a command-line program widely used in the Earth Sciences.

Preview   ▾

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Publication date:

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September 2, 2023

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Sciences.

The development of PyGMT has been supported by N

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  ○ 📄 test_basemap_polar.png

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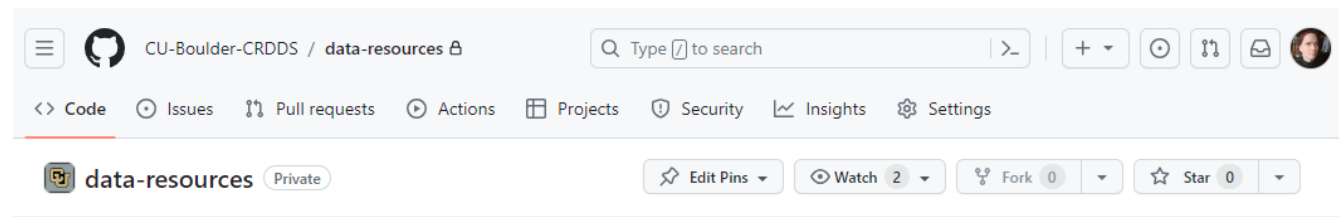
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Publication date:

Ways to interact with GitHub

- The website
- GitHub Desktop
- Using Git and the command line

Website

- Create and manage projects

- Upload and download files

- Write documentation

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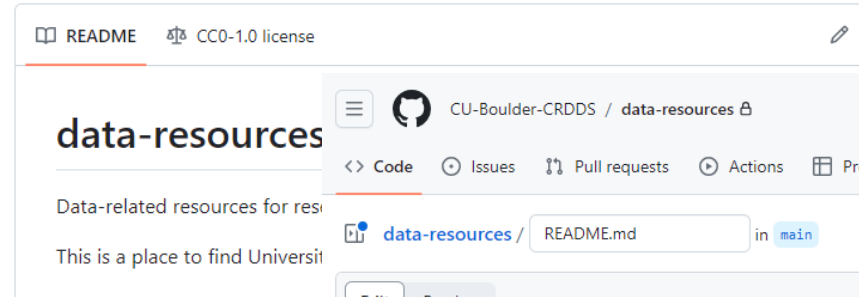
GitHub Desktop

- Create, clone, and fork projects
- Commit changes and submit contributions
- Many people who use Git frequently prefer to use the command line
- Other graphical Git interfaces exist

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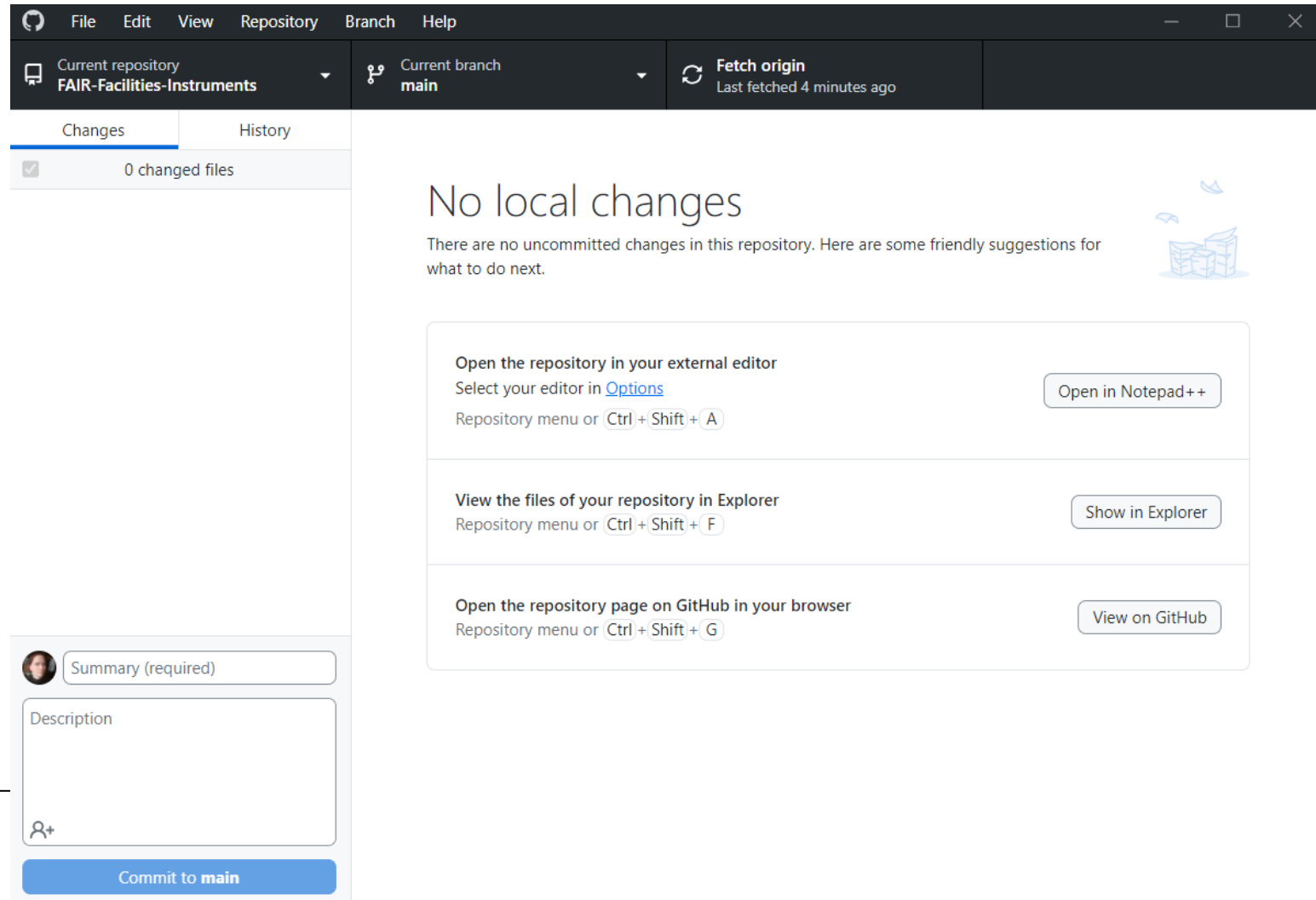
Be careful where you put your GitHub directory

- Microsoft OneDrive uploads a lot of stuff to the cloud, which you don't always want