

Lecture 7 - Collaborating on GitHub

DSE 511

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2022-09-15

Announcements

- Nothing unresolved from last time
- Homework soon (some time next week)
 - Probably 2 parts
 - "Give the command(s) to ..."
 - A set of git tasks, published to GH
 - **SET UP SSH KEYS NOW** (Lecture 6)
- Questions?

Collaboration

- With others
- *With yourself!*

Content

- Public vs Private Repos
- Licensing
- Issues
- Pull requests

Public vs Private Repos

Private Repos

- GitHub (and others) offer "private" repos
- You can see it, others can't

Pros

- Only work with who you want to work with
- Release to the public when you want (including never!)
- Develop proprietary codebases even!

Cons

- No opportunistic collaborations
- No dopamine hits

Not a Strict Binary Choice

Many people use both

- Start private
- Project reaches a desired level of maturity
- Released to the public

Open Science

- "Publication" jobs
- Open source is *the standard*
- Many editors/journals will reject out of hand papers with no (appropriately licensed) software!
- **I am one of them**

Licensing

Licensing

- This is an unpleasant topic (at least imo)
- But it's very important!
- First, some misconceptions...

Some Misconceptions

- *Source available* not the same as *open source*
- *Open source* and *free software* are basically the same thing
- *Open source* is **not** the same as *public domain*

So What Is Open Source?

Open source software is software with source code that anyone can inspect, modify, and enhance.

Source: <https://opensource.com/resources/what-open-source>

What Is Free Software?

Free software is software that gives you the user the freedom to share, study and modify it. We call this free software because the user is free.

Source: <https://www.fsf.org/about/what-is-free-software>

Open Source vs Source Available

- Open source
 - Linux kernel
 - R
 - Python
 - ...
- Source available (proprietary)
 - Numerical Recipes
 - Any public GitHub repo without a license!

Open Source vs Free Software

- A philosophical spat that nobody cares about anymore
- Strictly speaking, Open Source encompasses Free Software (and more)
- "Copyleft"
 - "Free" as in beer (gratis)
 - "Free" as in speech (libre)
- Free Software Foundation (FSF) vs Open Source Initiative (OSI)

Why?

- You want to
- Your job requires it
- Good for your resume

Why not?

- You don't want to
- Your job won't let you
- Bad for your resume?

Some Example Licenses by Restrictiveness

- Public domain
 - Unlicense
 - "True" public domain
- Permissive licenses
 - MIT
 - BSD (2- or 3-clause, not 4-clause)
 - LGPL
 - Boost Software License (BSL)
 - Apache
- Non-permissive Free Software licenses
 - GPL and AGPL
- Non-free/non-open source licenses
 - Proprietary

Did You Know?

- Stack Overflow posts are copyrighted
<https://stackoverflow.com/help/licensing>
- All content is one variety of CC-BY-SA
- **Be very careful when copy/pasting from stack overflow**
 - I would generally recommend against it
 - Also most of their code is wrong/bad anyway

Choosing a License


- Ultimately, up to you and your colleagues
- What do you want to allow? Restrict?
- What is the purpose of the software?
 - Is this a prototype for a paper?
 - Real production software?
 - Something you want to build a business around?

Why License At All?

- ***LIABILITY***
- Share only what/how you want
- You may actually be **required** to use an open source license in some circumstances
 - Journals/companies
 - "Infecting" licenses in dependencies!

What About Non-Software Artifacts?

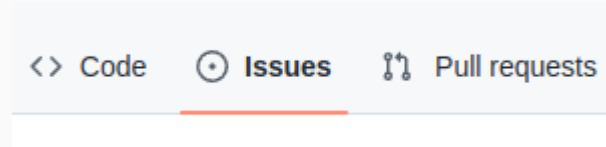
- So far we've focused on software
- All intellectual property products can be licensed
- The slides for this course are publicly available as CC-BY-SA 4.0

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Issues

Issues

- All GitHub repos have an issue tracker
 - Bugs
 - Tasks
 - Future features
- Searchable, taggable, ...

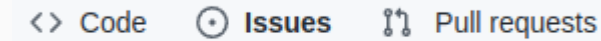


The image shows a screenshot of the GitHub repository navigation bar. It contains three tabs: 'Code' with a code icon, 'Issues' with a circle icon and a red underline, and 'Pull requests' with a fork icon.

<> Code ⊕ Issues ↗ Pull requests

Social/Community Management


- Can generally create issues on any repo
 - Sometimes these are disabled
 - Usually only unavailable for "read-only" repos
- Tag other users ("@" them)
- Use the search feature!







<> Code ⓘ Issues 🔗 Pull requests

The image shows a snippet of the GitHub repository navigation bar. It contains three tabs: 'Code' with a code icon, 'Issues' with an issue icon and a red underline, and 'Pull requests' with a pull request icon.

Searching Issues


 [wrathematics](#) / [CSODS](#) Public


 Pin  Unwatch 1  Fork 2  Star 14


[Code](#) [Issues](#) [Pull requests](#) [Actions](#) [Projects](#) [Wiki](#) [Security](#) [Insights](#) [...](#)


Label issues and pull requests for new contributors [Dismiss](#)

Now, GitHub will help potential first-time contributors [discover issues](#) labeled with [good first issue](#)



Filters 

 is:issue is:open

 Labels 9

 Milestones 0

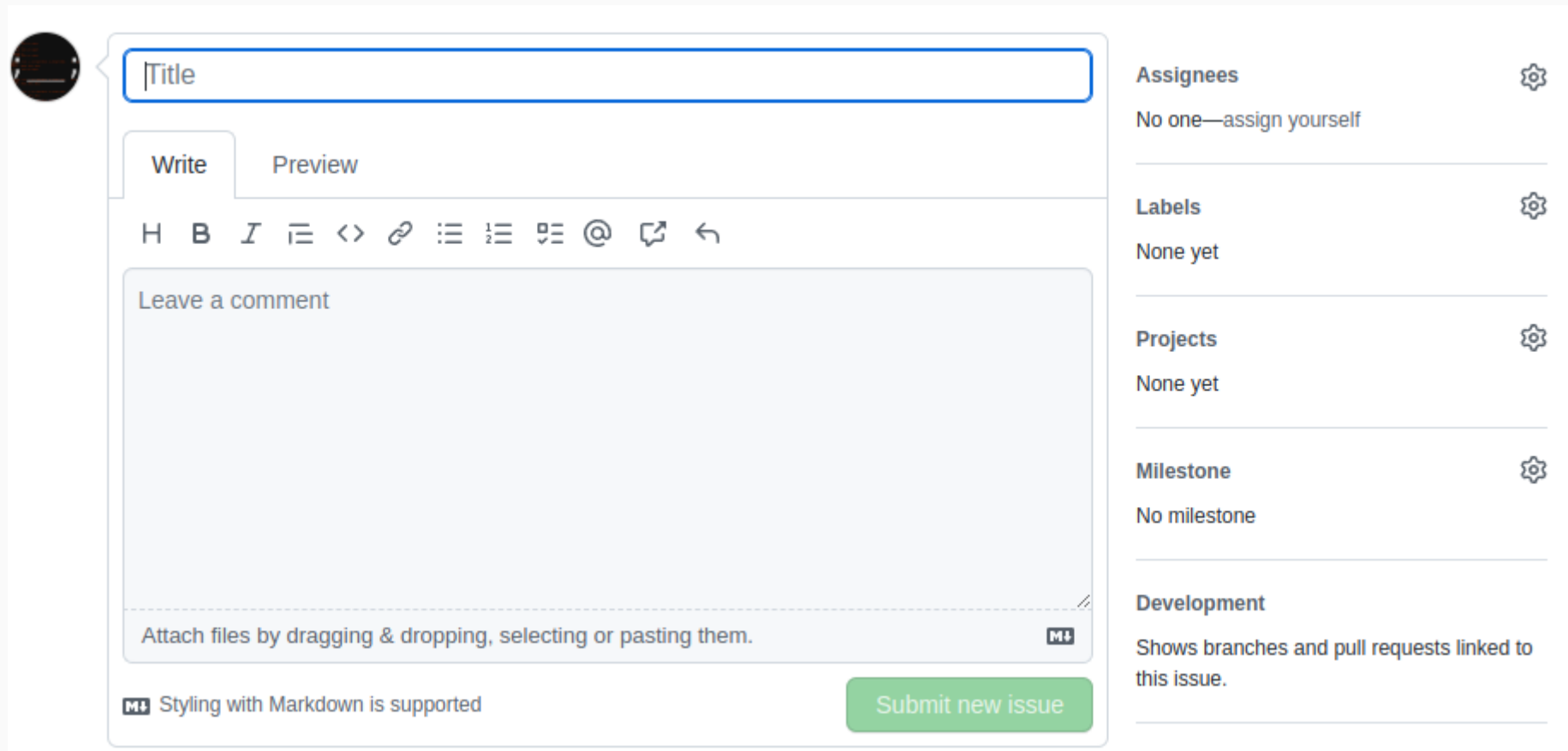
New issue

 **0 Open**  **0 Closed**

General Advice

- Treat GitHub like you would your work/office/job
 - Don't be a jerk
 - Careful with your language
 - Don't use a stupid username like "wrathematics"
- Not all help is wanted
- Use markdown! Especially code snippets!
- Search!!!

Creating a New Issue



The screenshot shows the GitHub interface for creating a new issue. On the left, there is a sidebar with a profile icon and a search bar. The main content area is divided into two sections: a form for creating the issue and a sidebar for issue metadata.

Form Section:

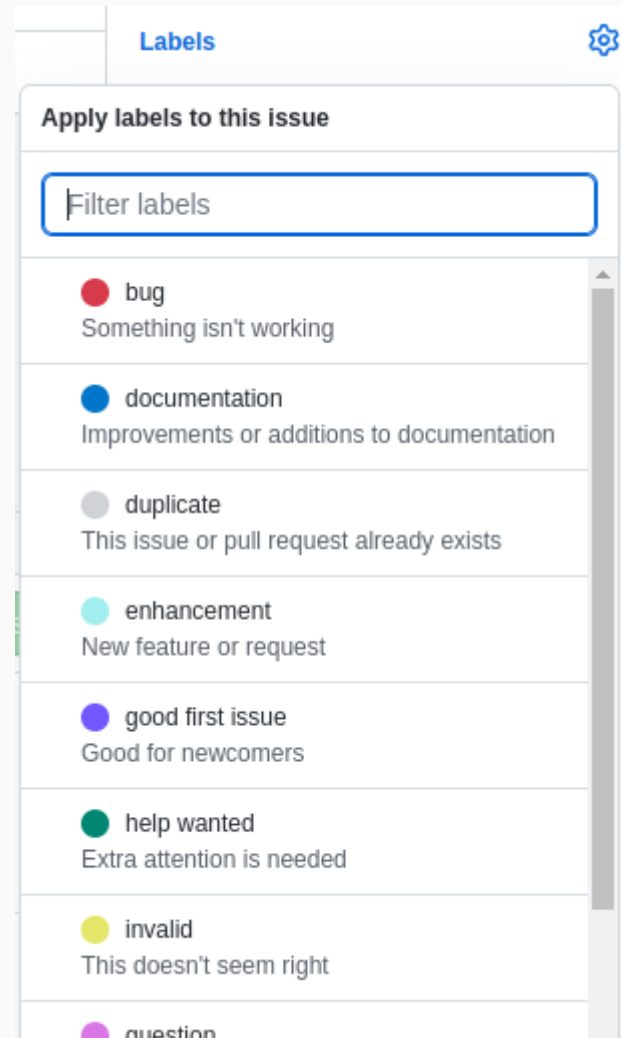
- Title:** A text input field with the placeholder text "Title".
- Write / Preview:** Two tabs for editing the issue body. The "Write" tab is active.
- Rich Text Editor:** A toolbar with icons for bold (B), italic (I), underline (U), code (<>), link, list, ordered list, quote, mention (@), image, and undo.
- Body:** A large text area with the placeholder text "Leave a comment".
- Footer:** A dashed line indicating where to attach files, with the text "Attach files by dragging & dropping, selecting or pasting them." and a small "M" icon.
- Markdown Support:** A small icon and text "Styling with Markdown is supported".
- Submit Button:** A green button labeled "Submit new issue".

Metadata Section (Right Sidebar):

- Assignees:** A section with a gear icon, showing "No one—assign yourself".
- Labels:** A section with a gear icon, showing "None yet".
- Projects:** A section with a gear icon, showing "None yet".
- Milestone:** A section with a gear icon, showing "No milestone".
- Development:** A section showing "Shows branches and pull requests linked to this issue."

Applying Labels

- Organize issues by topics
- Probably don't set them on someone else's repo
- Highly recommend using them on your own!



Other Features

- Projects
- Milestones
- Linking issues to PR's
- Issue templates <https://docs.github.com/en/communities/using-templates-to-encourage-useful-issues-and-pull-requests>

Pull Requests

What Is a Pull Request?

A pull request (PR) is a process for integrating a change to a repo's codebase.



Pull Request Etiquette

- Not all PR's are wanted
- Some people NEVER want PR's (don't get me started)
- Usually best to start with an issue
 - Identify bug/missing feature
 - Create issue
 - Discuss with repo owner
 - Agree on solution
 - Implement it!
- Not strictly necessary, but may save you a lot of time!

Pull Request Workflow

- Usual pipeline (distributed model)
 1. fork
 2. make changes
 3. create pull request (PR)
- For centralized codebases (e.g. proprietary ones), forking may be blocked
 1. branch
 2. make changes
 3. create PR

More Detail

1. Fork the repository (copy repo to your account)
2. Clone *your* fork of the repo
3. Create changes (bug fix, new feature, ...)
4. Push to *your* fork of the repo
5. Initiate pull request

Step 1: Fork the repo

The screenshot shows the GitHub interface for the repository **wrathematics / devilutionX**, which is a public fork of **diasurgical/devilutionX**. The top navigation bar includes the GitHub logo, a search bar, and links to Pulls, Issues, Marketplace, and Explore. Below the repository name, there are buttons for Pin, Watch (0), and a fork icon. A secondary navigation bar contains links for Code (selected), Pull requests, Actions, Projects, Wiki, Security, and a comparison icon. The main content area shows the **master** branch selected, with buttons for Go to file, Add file, and Code. A status bar indicates the branch is 1439 commits behind the upstream master and provides links to Contribute and Sync fork. A commit by **heinermann** is highlighted, titled "Implement Discord rich presence (dia...)", dated Dec 15, 2021, with 8,317 views. Below the commit, a file named **.circleci** is shown, with a description "Remove NIGHTLY_BUILD and BINARY_R..." and a timestamp of 9 months ago.

Step 2: Clone the fork

```
git clone https://github.com/wrathematics/devilutionX
```

Cloning into 'devilutionX'...

remote: Enumerating objects: 60099, done.

remote: Counting objects: 100% (8/8), done.

remote: Compressing objects: 100% (8/8), done.

remote: Total 60099 (delta 2), reused 2 (delta 0), pack-reused 60091

Receiving objects: 100% (60099/60099), 47.00 MiB | 7.92 MiB/s, done.

Resolving deltas: 100% (47003/47003), done.

Step 3: Make changes

- This is just the git workflow from Lecture 5
- Repeat until done:
 - Add/modify/delete file(s)
 - `git add ...`
 - `git commit -m "relevant commit message"`

Step 4: Push changes

```
git remote -v
```

```
origin    https://github.com/wrathematics/devilutionX (fetch)  
origin    https://github.com/wrathematics/devilutionX (push)
```

```
git push origin master
```

```
Username for 'https://github.com': wrathematics
```

```
Password for 'https://wrathematics@github.com':
```

```
remote: Support for password authentication was removed on August 13, 2021.
```

```
remote: Please see https://docs.github.com/en/get-started/getting-started-with-git/about-remote-repo
```

```
fatal: Authentication failed for 'https://github.com/wrathematics/devilutionX/'
```

```
vim .git/config
```

Step 4: Push changes

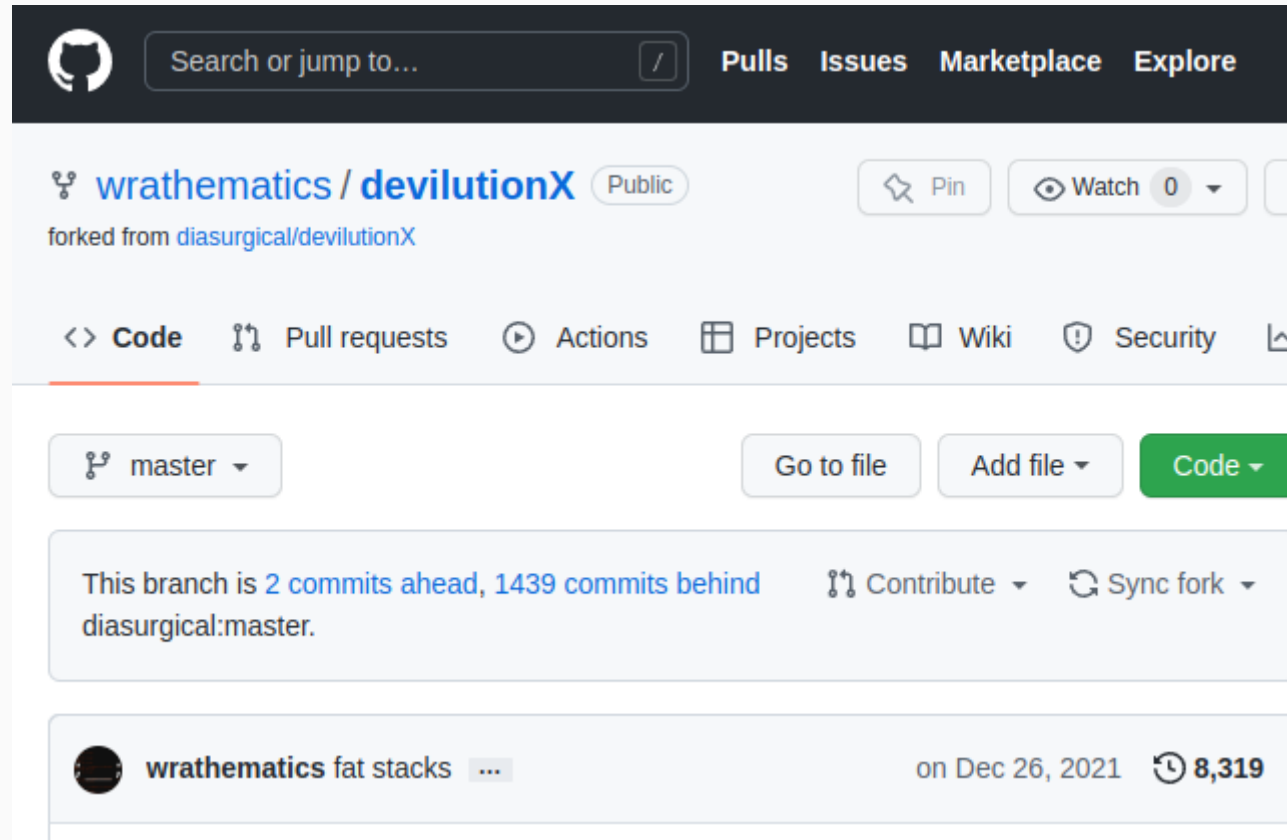
```
git remote -v
```

```
origin    git@github.com:wrathematics/devilutionX (fetch)
origin    git@github.com:wrathematics/devilutionX (push)
```

```
git push origin master
```

```
Enumerating objects: 12, done.
Counting objects: 100% (12/12), done.
Delta compression using up to 16 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (8/8), 750 bytes | 750.00 KiB/s, done.
Total 8 (delta 6), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (6/6), completed with 4 local objects.
To github.com:wrathematics/devilutionX
    1484b4d8..fc522826  master -> master
```

Step 4: Push changes



The screenshot shows the GitHub interface for the repository **wrathematics / devilutionX**, which is a public fork of **diasurgical/devilutionX**. The top navigation bar includes the GitHub logo, a search bar, and links to Pulls, Issues, Marketplace, and Explore. Below the repository name, there are buttons for Pin, Watch (0), and a fork icon. A secondary navigation bar contains links for Code (selected), Pull requests, Actions, Projects, Wiki, Security, and a recent commits icon. The main content area shows the **master** branch selected, with buttons for Go to file, Add file, and Code. A status box indicates the branch is 2 commits ahead and 1439 commits behind the upstream. At the bottom, a commit by **wrathematics** titled "fat stacks" is shown, dated Dec 26, 2021, with 8,319 views.

GitHub logo Search or jump to... / Pulls Issues Marketplace Explore

wrathematics / devilutionX Public
forked from diasurgical/devilutionX

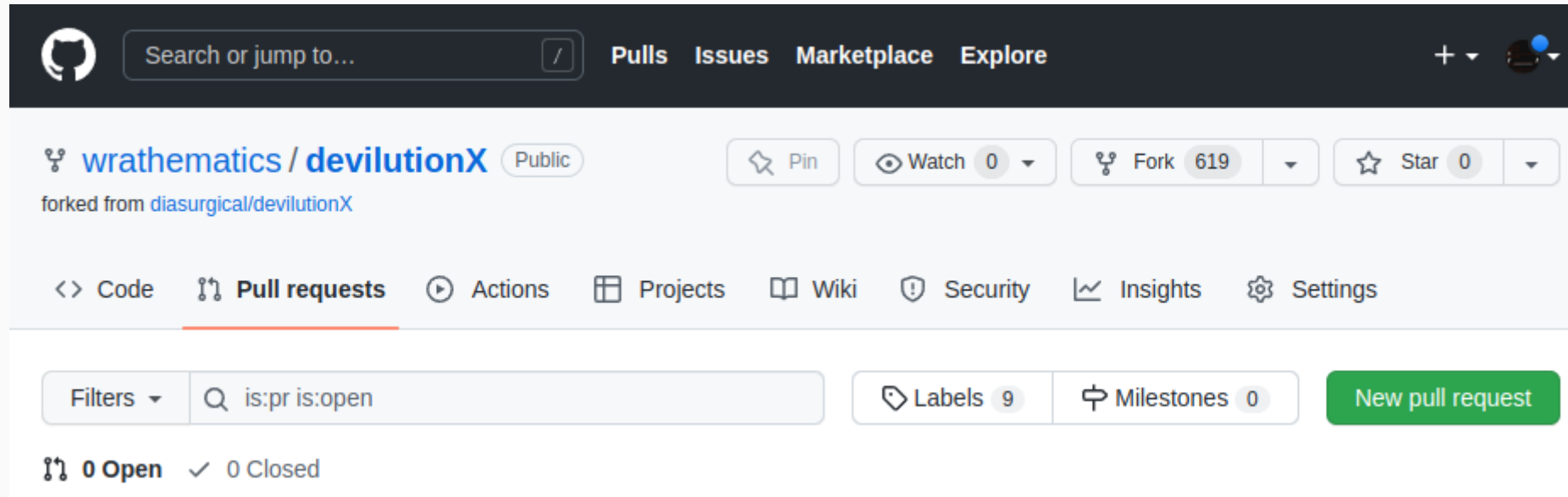
<> **Code** Pull requests Actions Projects Wiki Security

master Go to file Add file Code

This branch is 2 commits ahead, 1439 commits behind diasurgical:master. Contribute Sync fork

wrathematics fat stacks ... on Dec 26, 2021 8,319

Step 5: Open the PR



The screenshot shows the GitHub interface for the repository **wrathematics / devilutionX**, which is marked as **Public**. It is a fork of [diasurgical/devilutionX](#). The repository has 0 Watchers, 619 Forks, and 0 Stars. The **Pull requests** tab is selected, showing 0 Open and 0 Closed requests. The search filter is set to `is:pr is:open`. A green button labeled **New pull request** is visible.

Search or jump to... / Pulls Issues Marketplace Explore

wrathematics / devilutionX Public
forked from diasurgical/devilutionX

Pin Watch 0 Fork 619 Star 0

Code Pull requests Actions Projects Wiki Security Insights Settings

Filters is:pr is:open Labels 9 Milestones 0 New pull request

0 Open 0 Closed

Step 5: Open the PR

Wrapup

Wrapup

- Licensing is complicated.
- Open source (and/or free software)
 - Usually expected for "publication" jobs.
 - But not always! Double check!
- GitHub issues are a great way to
 - Report bugs
 - See if bugs are already reported
 - Track features/work
- Pull requests are how you actually get your work into a repo.

Questions?