GitHub and Git
An Overview

Dr. Atef Bader

What is version control?

- A system that records changes to a file so that you can recall specific versions later.
- Source code versions are controlled in the industry.
- Helps revert a file to a previous change, even an entire project.
- Helps compare changes to the file.
- See who has made changes to the file, who introduced an issue in the code and so on.
- Helps recover projects or files to a stable state with very little overhead.
- Git, Mercurial, SVN are a few version control tools that are commonly used.

How it works?

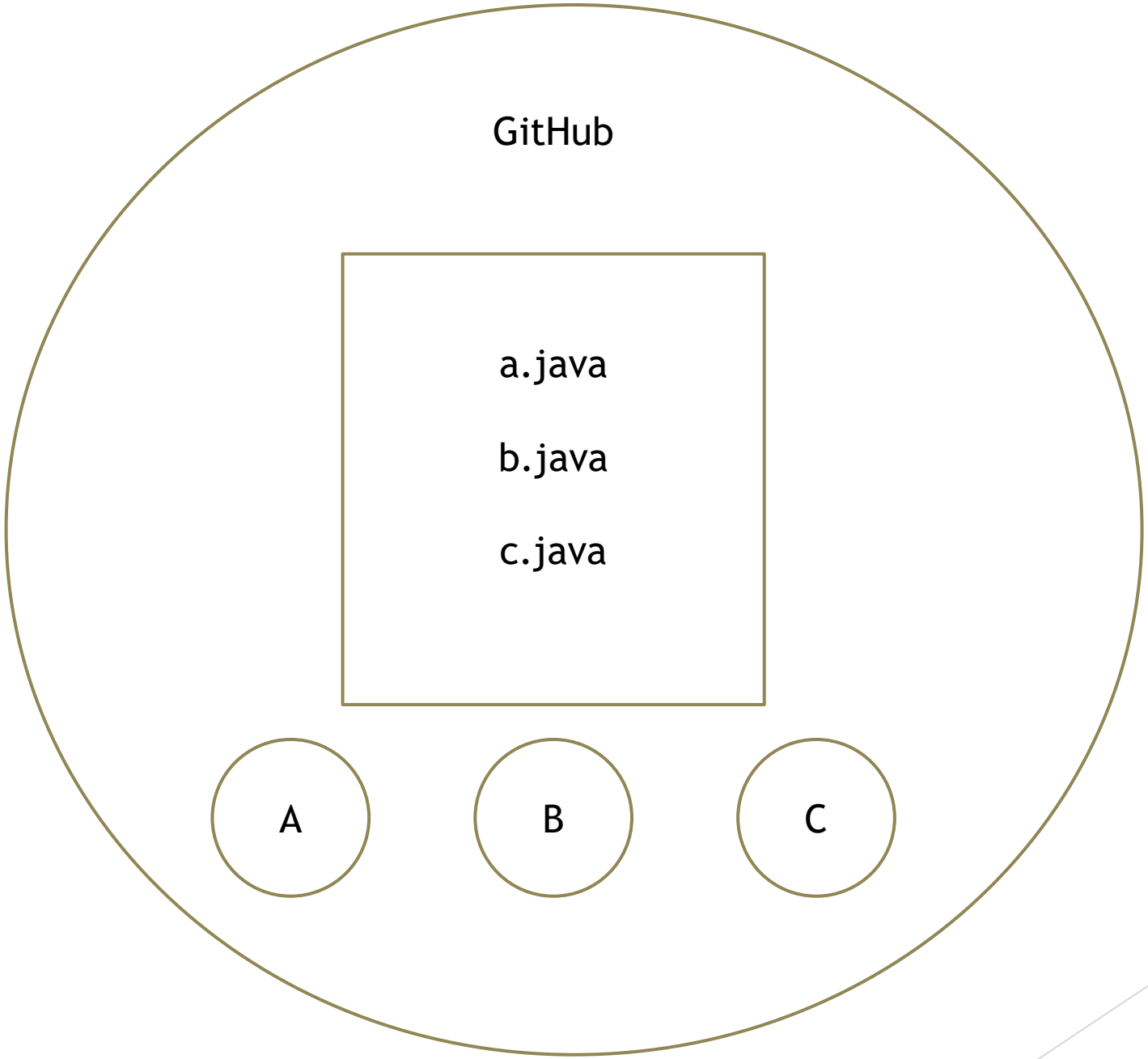
- It helps pull a repository into your local machine on which you can work.
- This just means that you have a local copy of the entire repository or a file that you have chosen to be on your machine.
- Any changes that you make will be local to your machine till you publish it.
- Once it is published the changes that you have made will be present in the centralized repository.
- Anyone who has access to the repository will be able to view your changes.
- In case you have made some mistakes you can easily revert the changes you made and move it back to the previous version before your changes.

Why is it needed?

- Many engineers will be working on a single project. Version controls maintain the access to files for different users.
- It can also limit control of a file to a single user at a time so that multiple users do not try to modify it at the same time.
- Version Control helps maintains multiple versions of files.
- It also maintains details of the author and the timestamp of files.
- This helps identifying stable versions in the project.
- Also to revert to a previous version with very little overhead.

Git and GitHub

- Git is the version control tool that we will be using for our coursework.
- We will be using GitHub to make our repositories.
- So every student must have a GitHub account. Those who do not have can signup for a new account at GitHub at www.github.com


GitHub
a.java
b.java
c.java
A
B
C

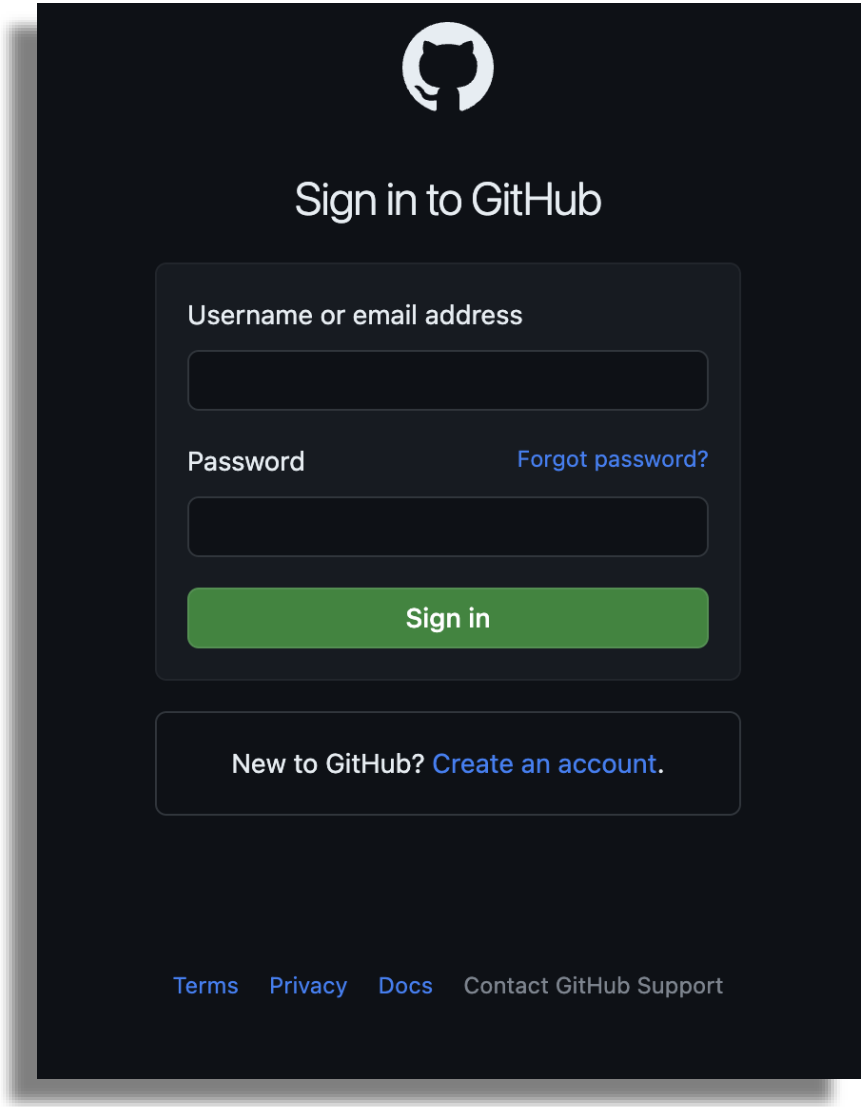
Setting up GIT on Windows

- Download and install the latest version of GitHub Desktop. This will automatically install Git *and* keep it up-to-date for you.
- Once your installation is done you just have to login with your username and password. It will ask you for email id which you can enter. Or alternatively you can do the following steps.
- On your computer, open the **Git Shell** application.
- Tell Git your *name* so your commits will be properly labeled. Type everything after the $ here.
  - $ git config --global user.name “Your Name”
- Tell Git the *email address* that will be associated with your Git commits. This should be the email address that you have registered your GitHub account with. To keep your email address hidden, see "Keeping your email address private".
  - $ git config --global user.email “Your Email Address”

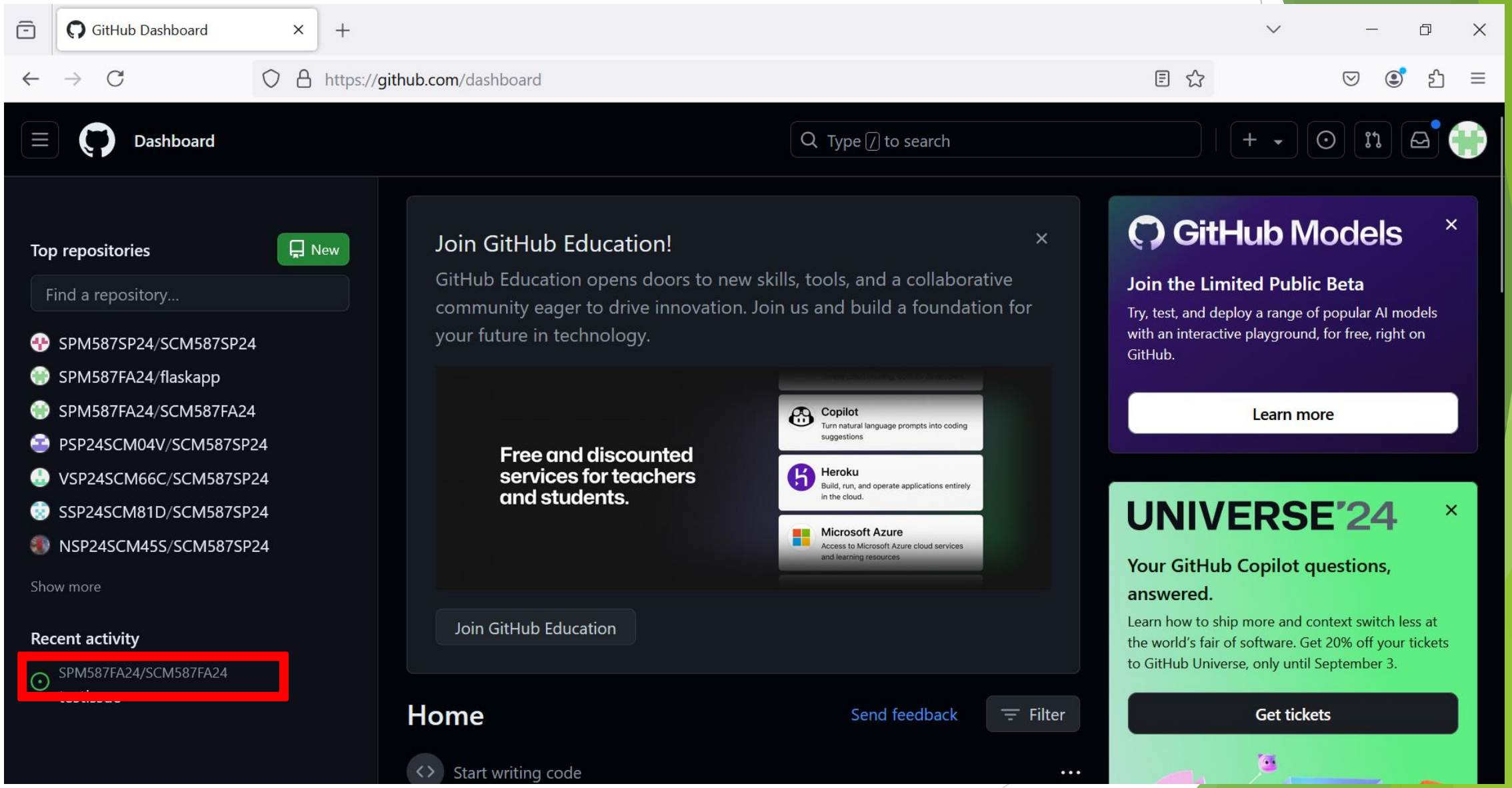
Connecting over HTTPS

- The https:// clone URLs are available on all repositories.
- You can use SSH as well but HTTPS is the preferred method.
- When you are using the git commands like git clone, git pull etc you will be asked for your GitHub username and password.
- You can use a credential helper so Git will remember your GitHub username and password.

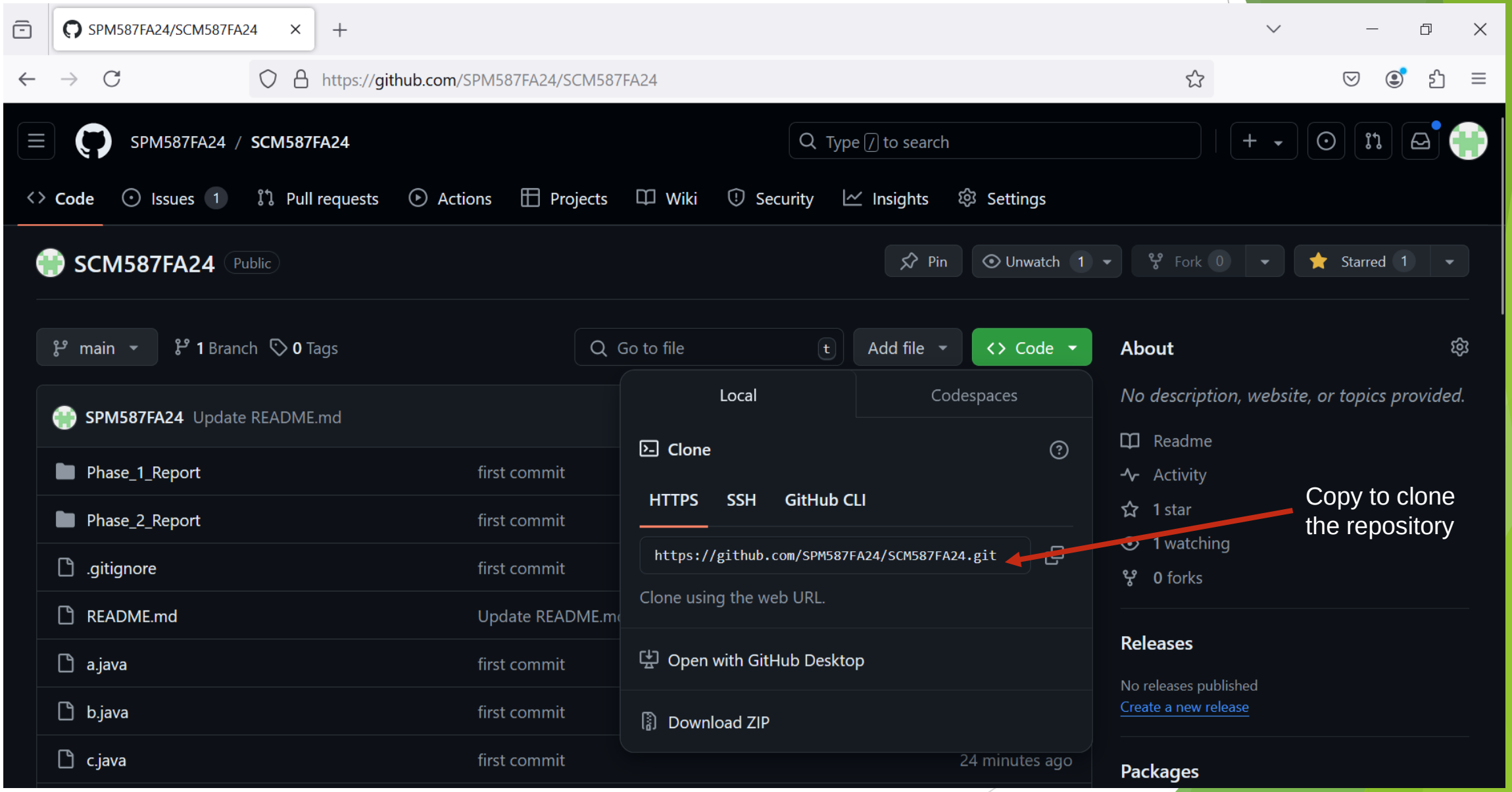
Login


Sign in to GitHub
Username or email address
Password
Forgot password?
Sign in
New to GitHub? Create an account.
Terms
Privacy
Docs
Contact GitHub Support

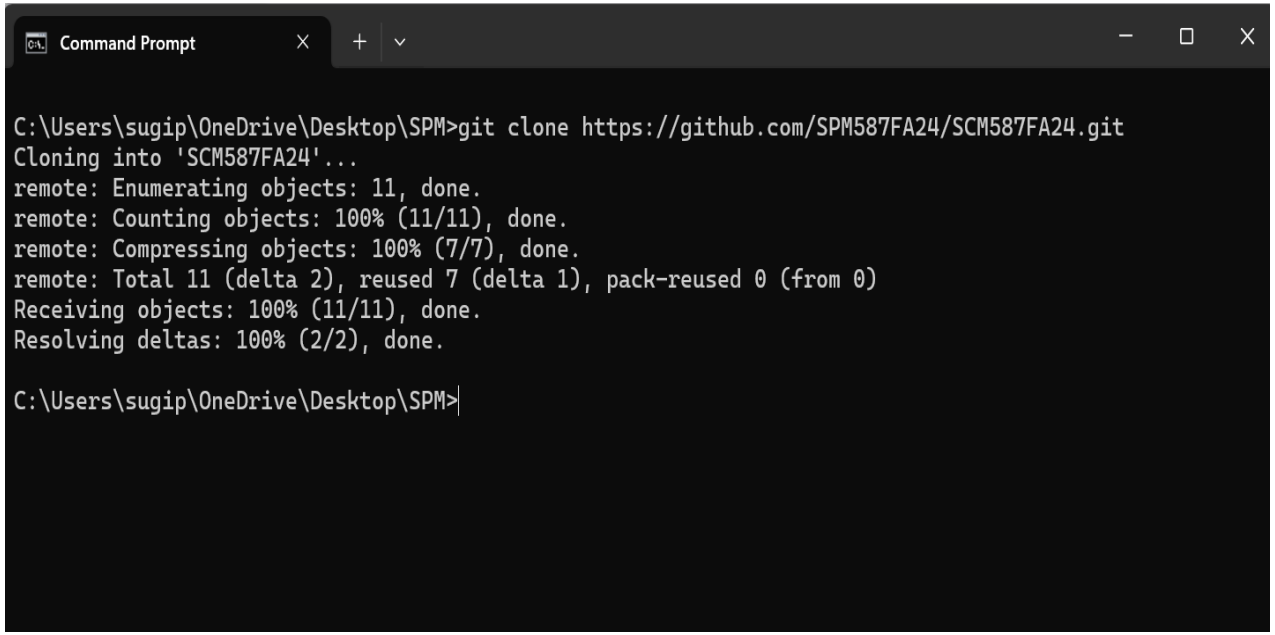
Main Screen

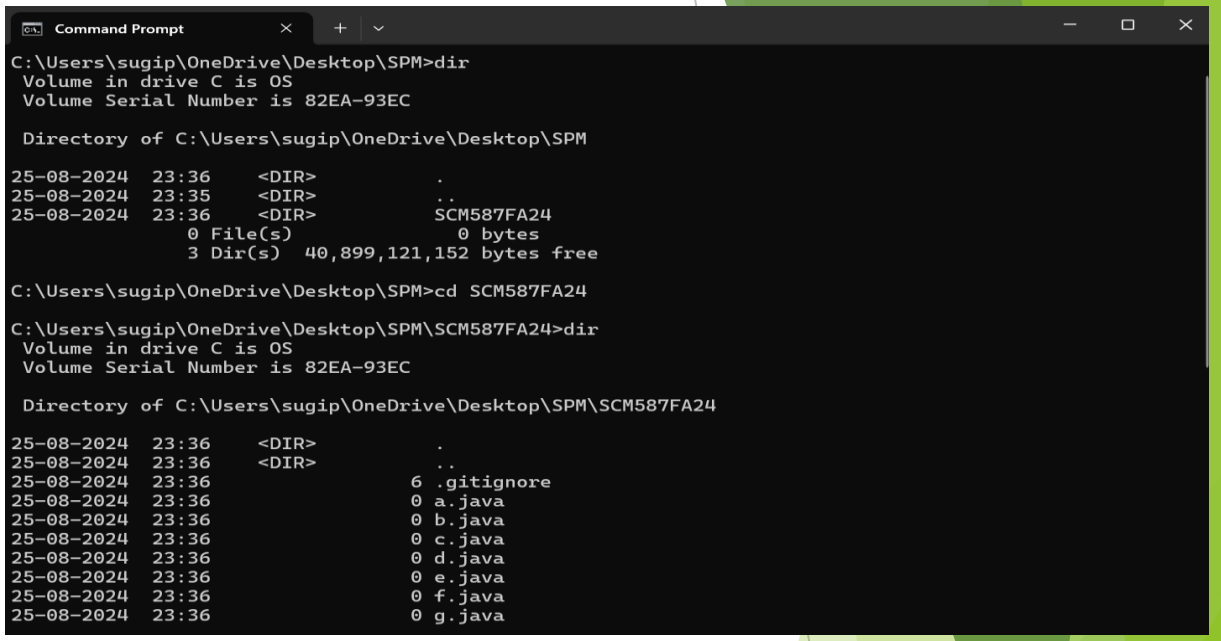

GitHub Dashboard
https://github.com/dashboard
Dashboard
Type / to search
Top repositories
New
Find a repository...
SPM587SP24/SCM587SP24
SPM587FA24/flaskapp
SPM587FA24/SCM587FA24
PSP24SCM04V/SCM587SP24
VSP24SCM66C/SCM587SP24
SSP24SCM81D/SCM587SP24
NSP24SCM45S/SCM587SP24
Show more
Recent activity
SPM587FA24/SCM587FA24
Join GitHub Education!
GitHub Education opens doors to new skills, tools, and a collaborative community eager to drive innovation. Join us and build a foundation for your future in technology.
Free and discounted services for teachers and students.
Copilot
Turn natural language prompts into coding suggestions
Heroku
Build, run, and operate applications entirely in the cloud.
Microsoft Azure
Access to Microsoft Azure cloud services and learning resources
Join GitHub Education
Home
Send feedback
Filter
Start writing code
GitHub Models
Join the Limited Public Beta
Try, test, and deploy a range of popular AI models with an interactive playground, for free, right on GitHub.
Learn more
UNIVERSE'24
Your GitHub Copilot questions, answered.
Learn how to ship more and context switch less at the world's fair of software. Get 20% off your tickets to GitHub Universe, only until September 3.
Get tickets

Selecting a Repository to Clone



Selecting a Repository to Clone





Viewing and Navigating Files

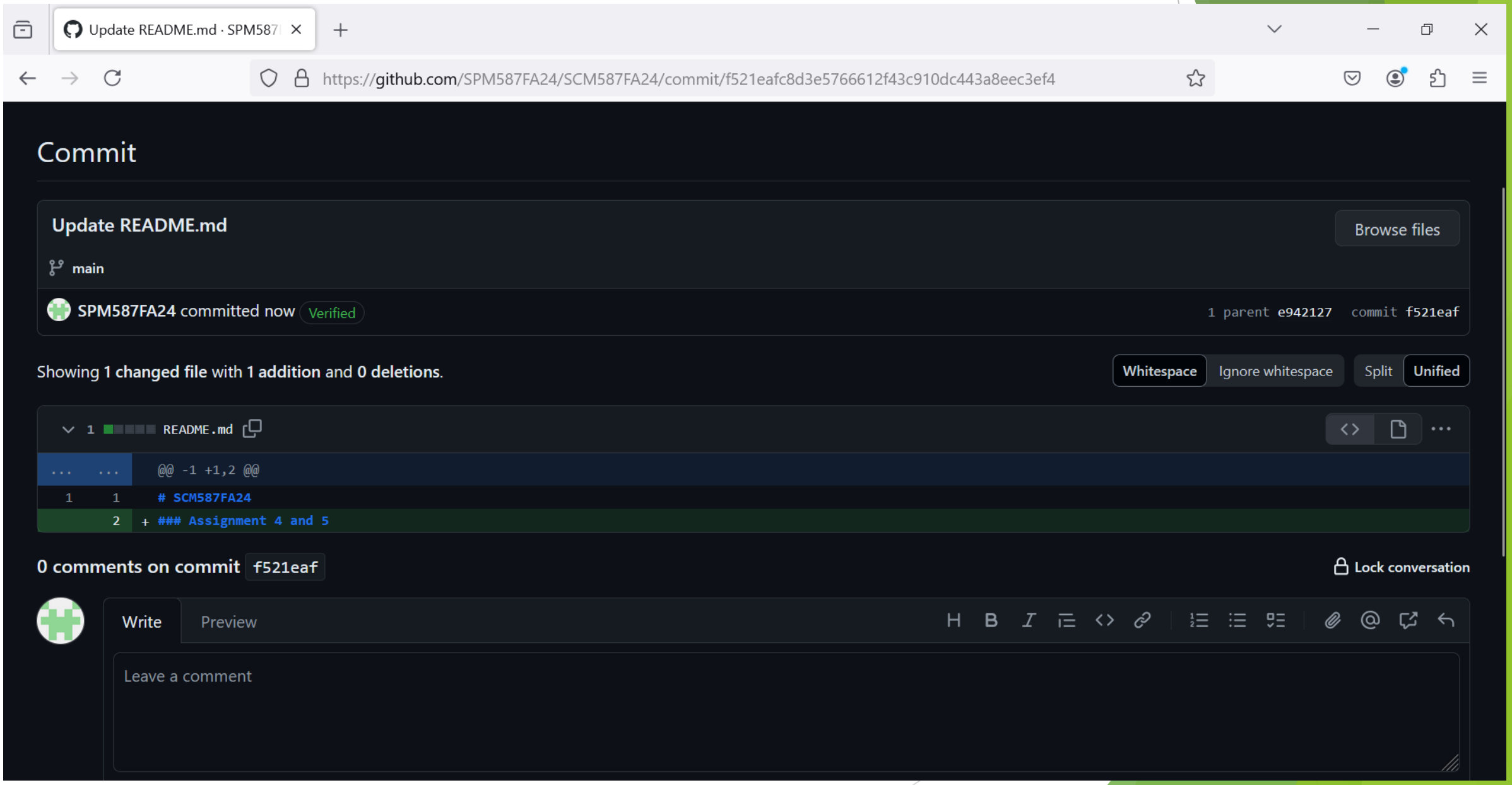
Windows Command Prompt

- View Files: `dir`
- Change Directory: `cd [directory_name]`

macOS/Linux / Any IDE:

- View Files: `ls`
- Change Directory: `cd [directory_name]`

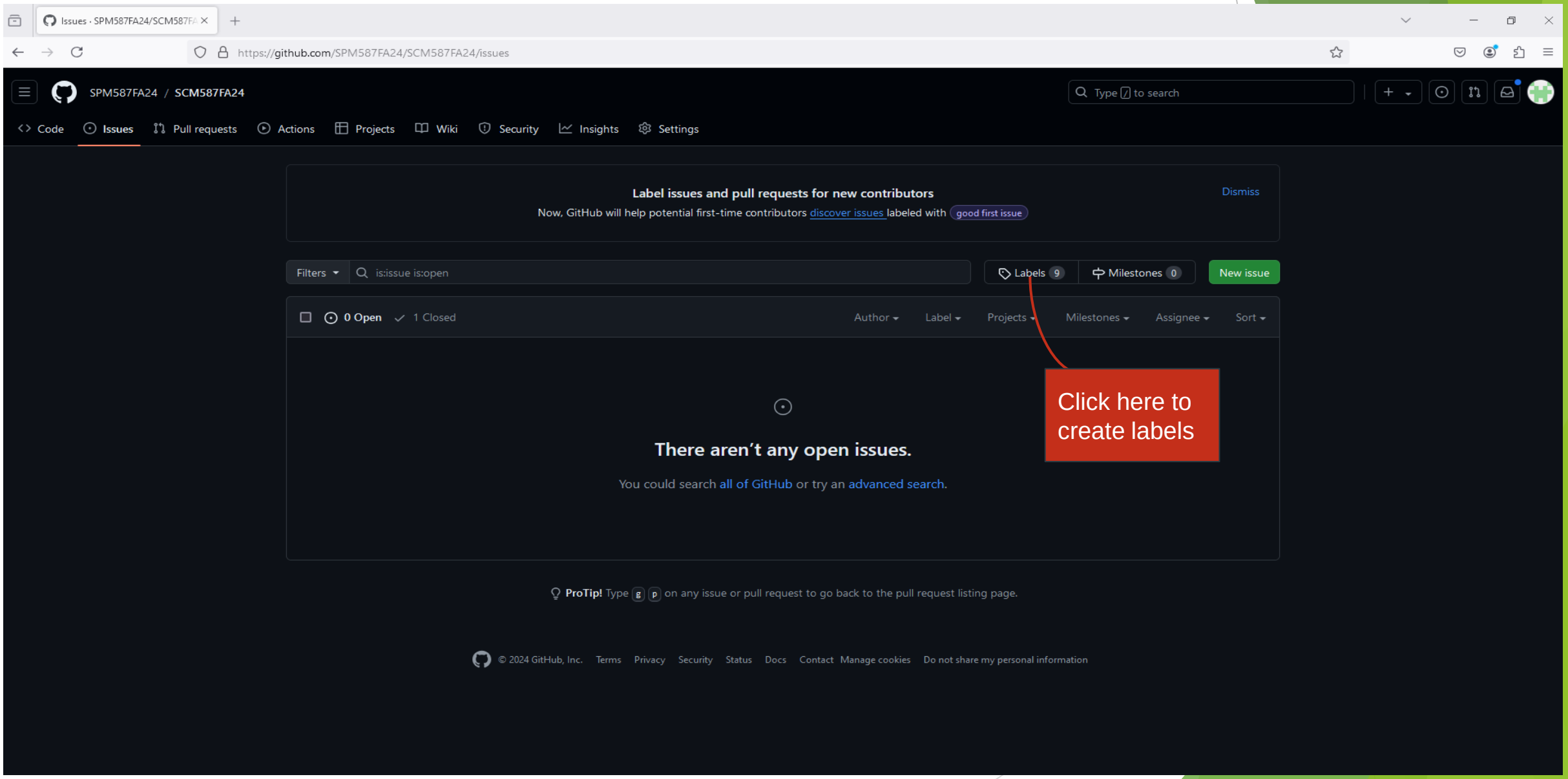
Viewing a Cloned Repository



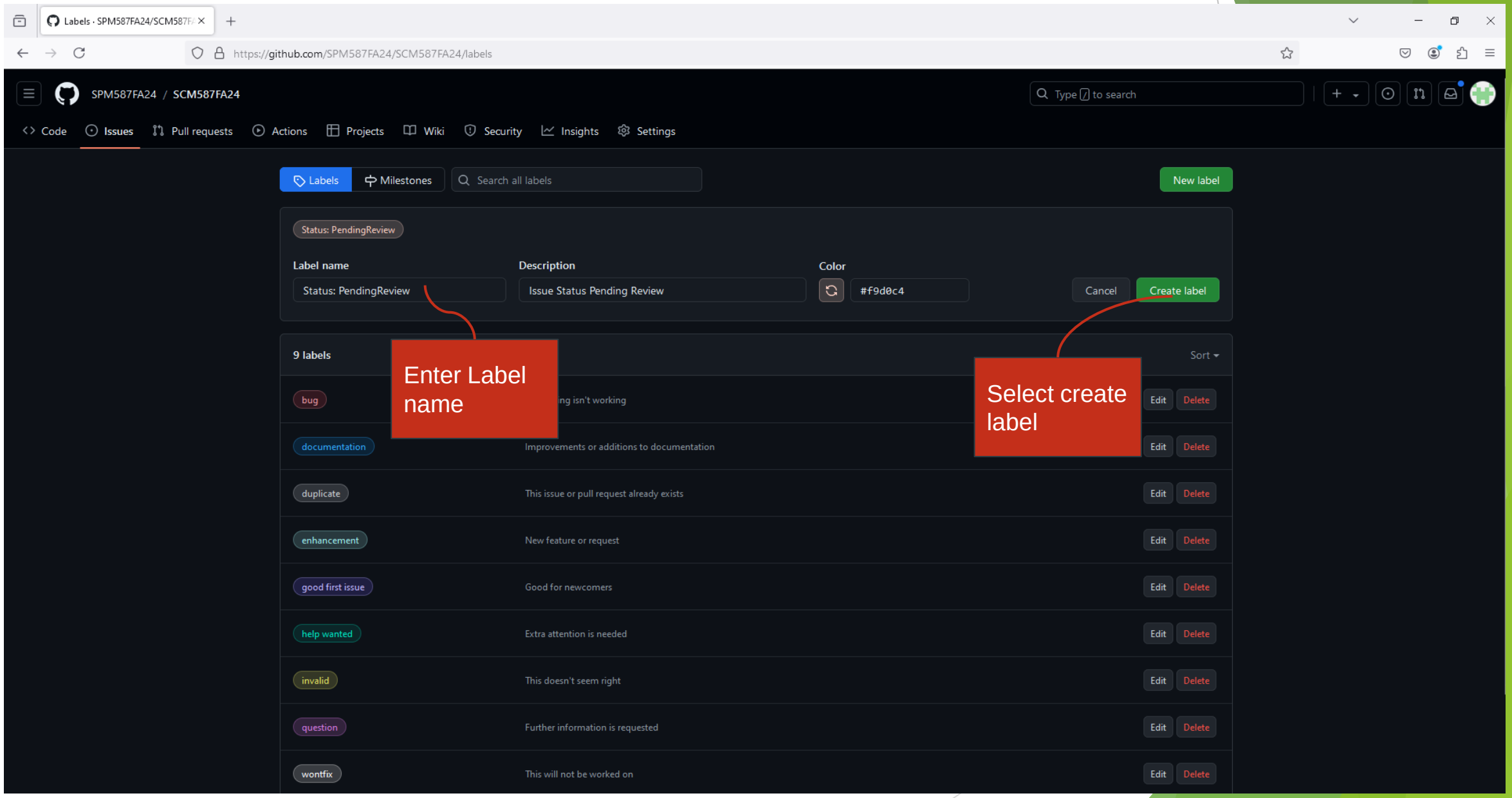
Issues and Labels

- Issues option in GitHub is a bug tracking tool for GitHub.
- Let’s say you find some bugs in your code.
- You can raise an issue with labels for each bug that you find.
- Issues can be created with different labels for different phases (Requirement, Design, Coding, Testing, Documentation)
- Labels are a great way to organize different types of issues. Issues can have as many labels as you want, and you can filter by one or many labels at once.
- There are some existing labels (Bug, Enhancement) but you can also create user defined label.
- Once you fix that code and the bug is cleared you will be making a commit to your repo.
- At this time you can close that issue.

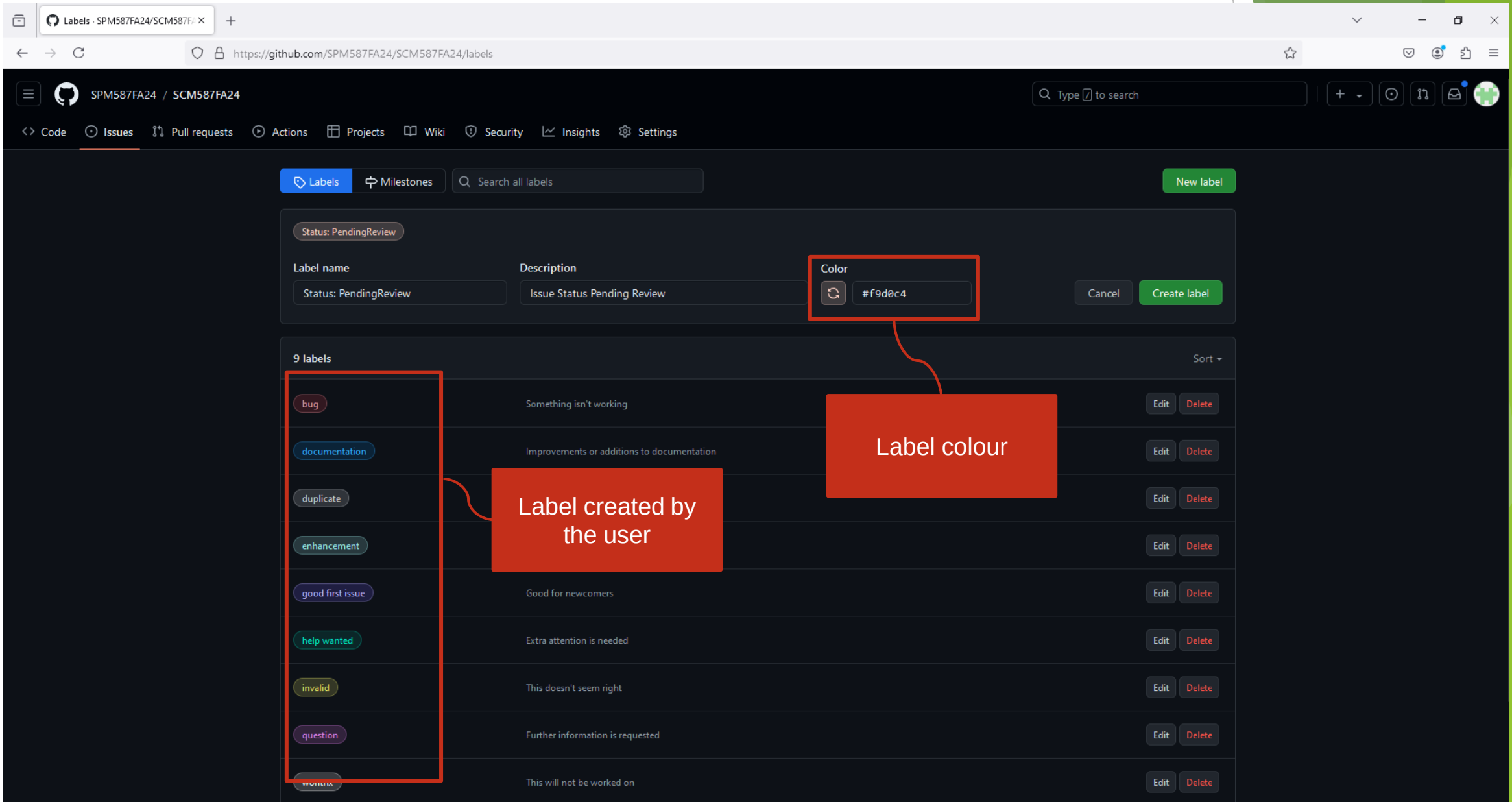
Create Labels



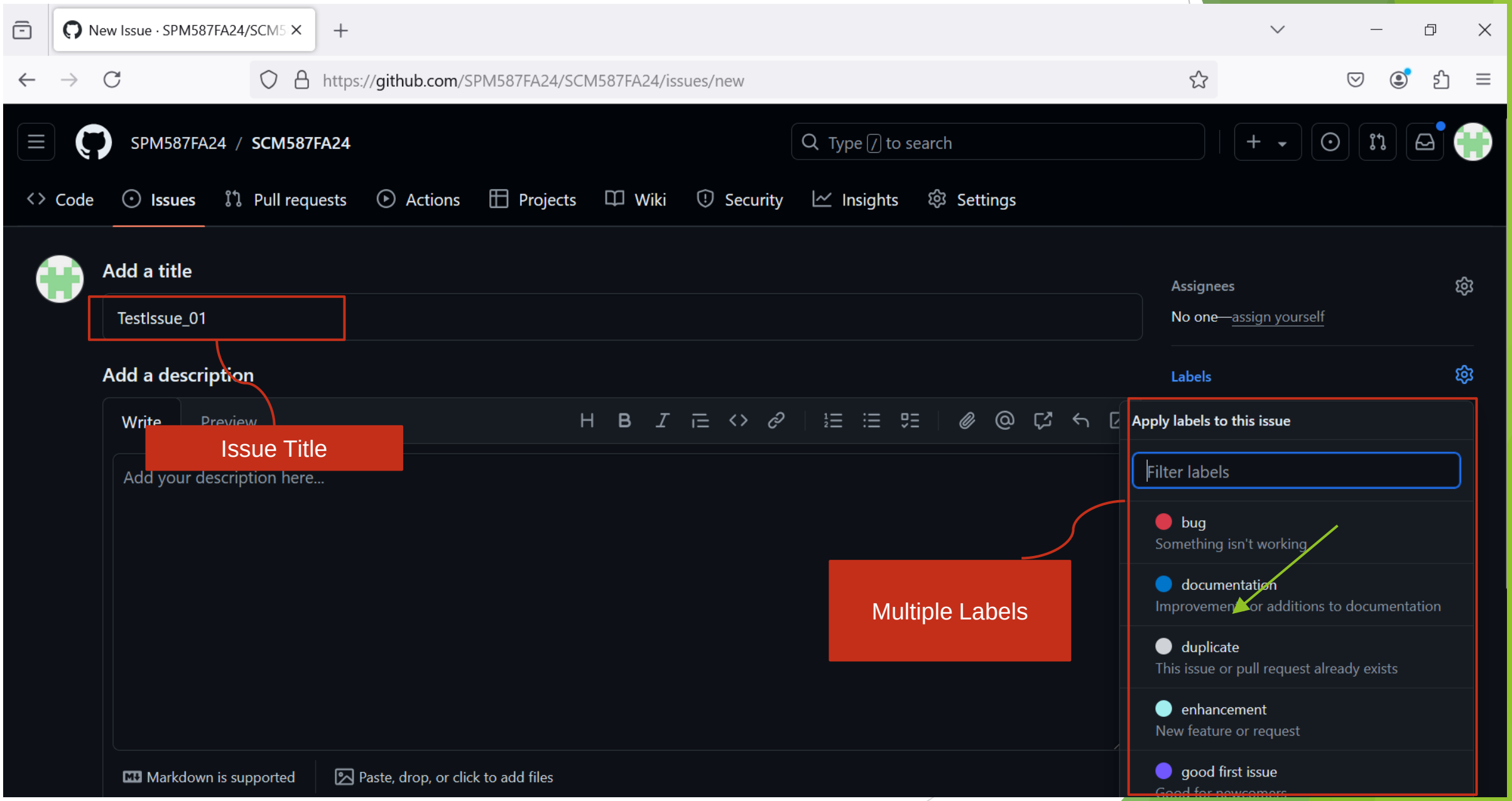
Labels


Labels · SPM587FA24/SCM587FA
https://github.com/SPM587FA24/SCM587FA24/labels
SPM587FA24 / SCM587FA24
Type / to search
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
Labels
Milestones
Search all labels
New label
Status: PendingReview
Label name
Description
Color
Status: PendingReview
Issue Status Pending Review
#f9d0c4
Cancel
Create label
Enter Label name
Select create label
9 labels
Sort
bug
ing isn't working
documentation
Improvements or additions to documentation
duplicate
This issue or pull request already exists
enhancement
New feature or request
good first issue
Good for newcomers
help wanted
Extra attention is needed
invalid
This doesn't seem right
question
Further information is requested
wontfix
This will not be worked on
Edit
Delete

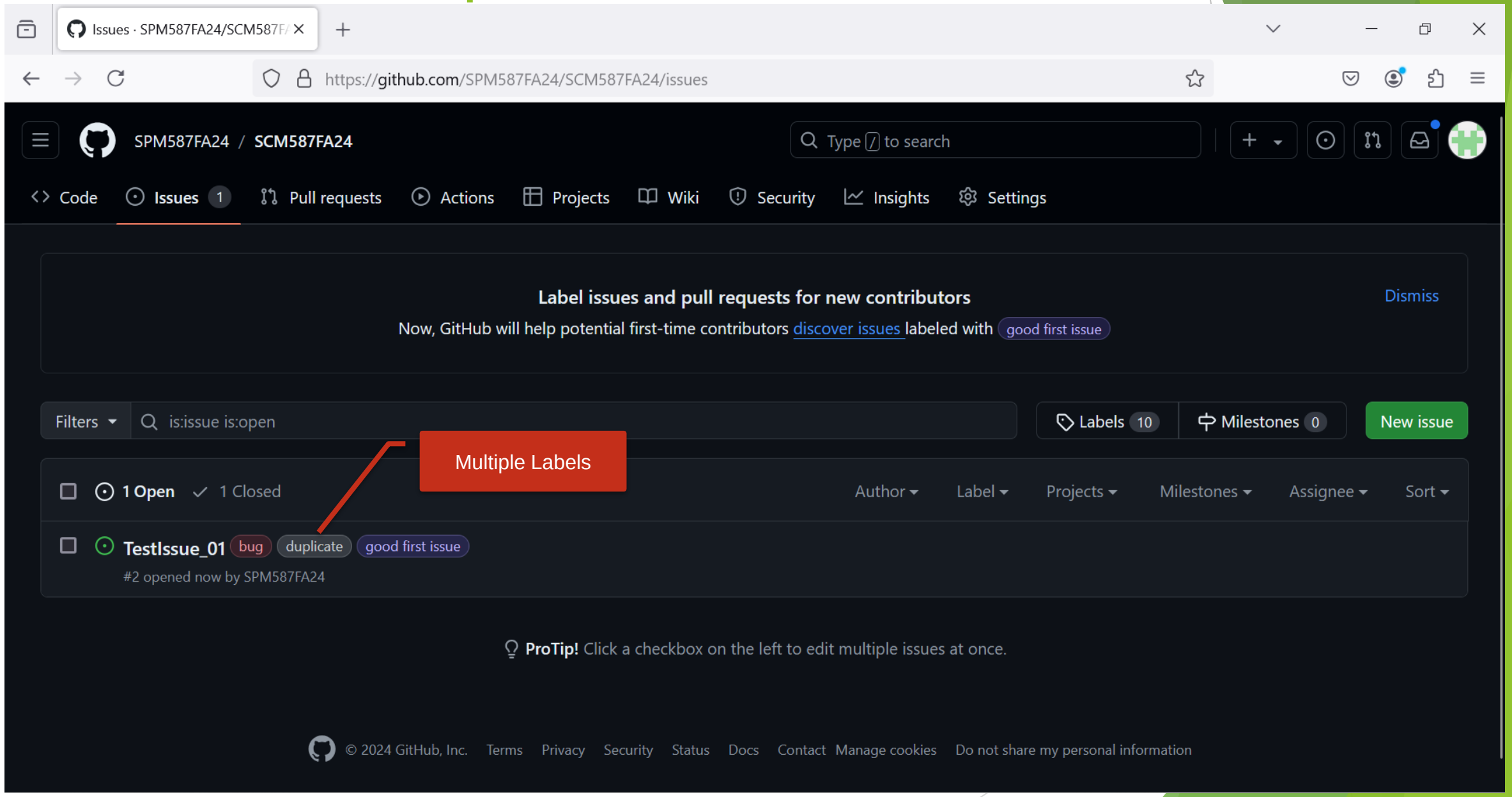
Labels


Labels · SPM587FA24/SCM587FA24
https://github.com/SPM587FA24/SCM587FA24/labels
SPM587FA24 / SCM587FA24
Type / to search
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
Labels
Milestones
Search all labels
New label
Status: PendingReview
Label name
Status: PendingReview
Description
Issue Status Pending Review
Color
#f9d0c4
Cancel
Create label
9 labels
Sort
bug
Something isn't working
documentation
Improvements or additions to documentation
duplicate
enhancement
good first issue
Good for newcomers
help wanted
Extra attention is needed
invalid
This doesn't seem right
question
Further information is requested
This will not be worked on
Edit
Delete
Label colour
Label created by the user

Multiple Labels

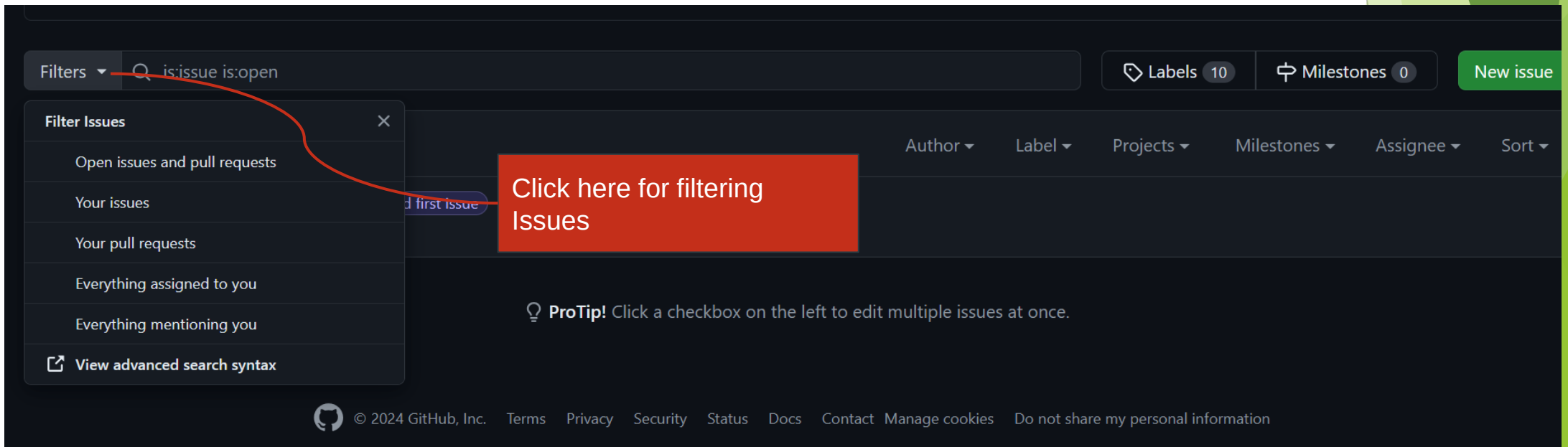


Issues with Multiple labels

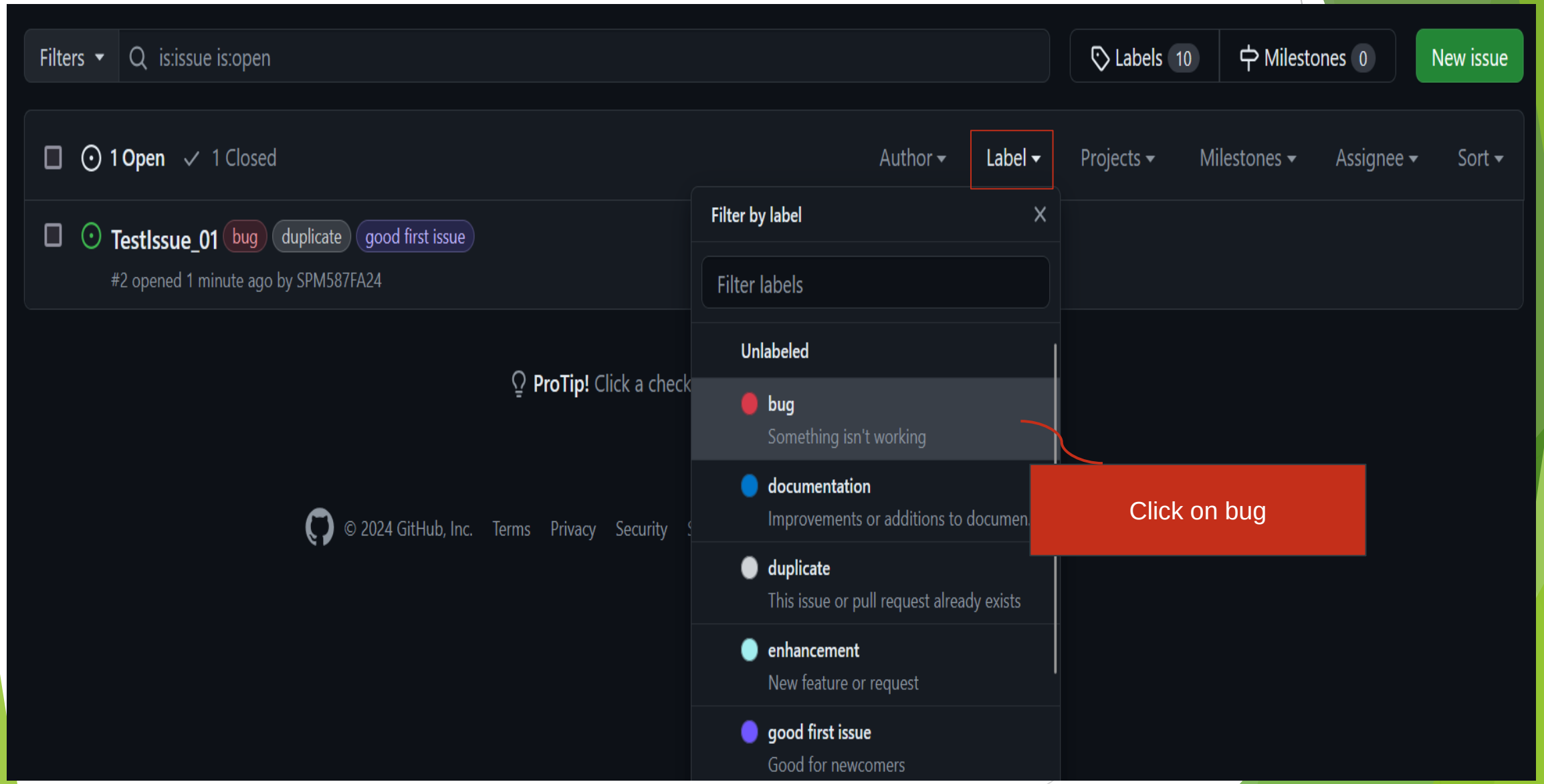


Filter Issues

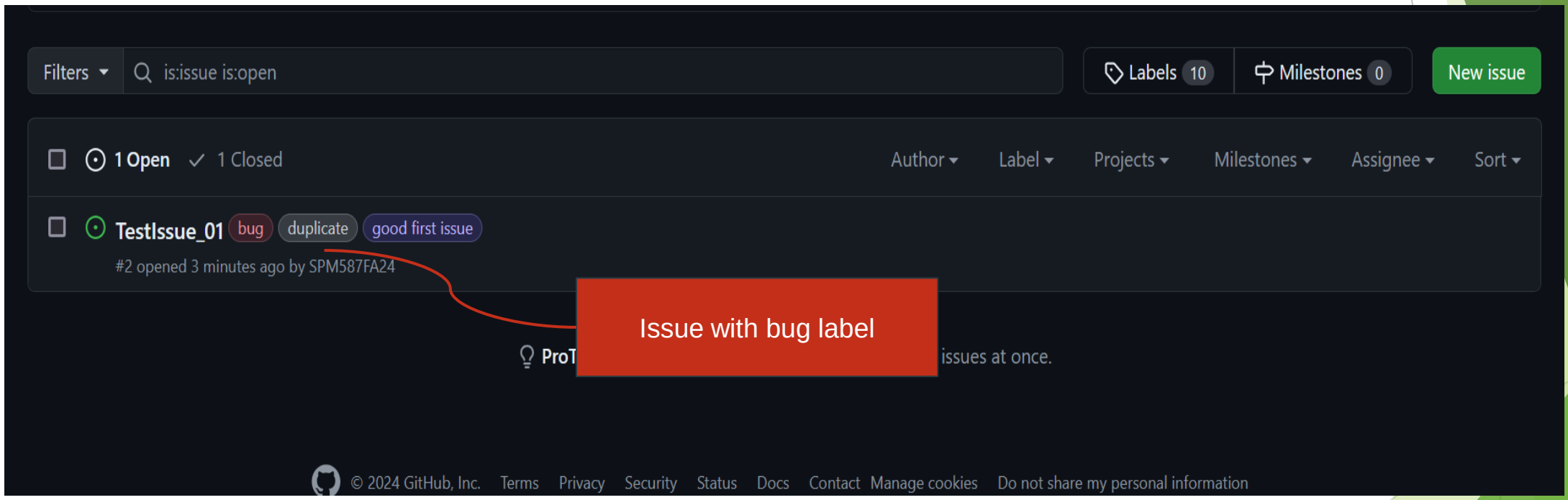
- You can filter issues and pull requests to find:
  - All open issues and pull requests
  - Issues and pull requests that you've created
  - Issues and pull requests that are assigned to you
  - Issues and pull requests where you're @mentioned
- You can also Filtering issues and pull requests by labels.



Filter Issues



Filter issues



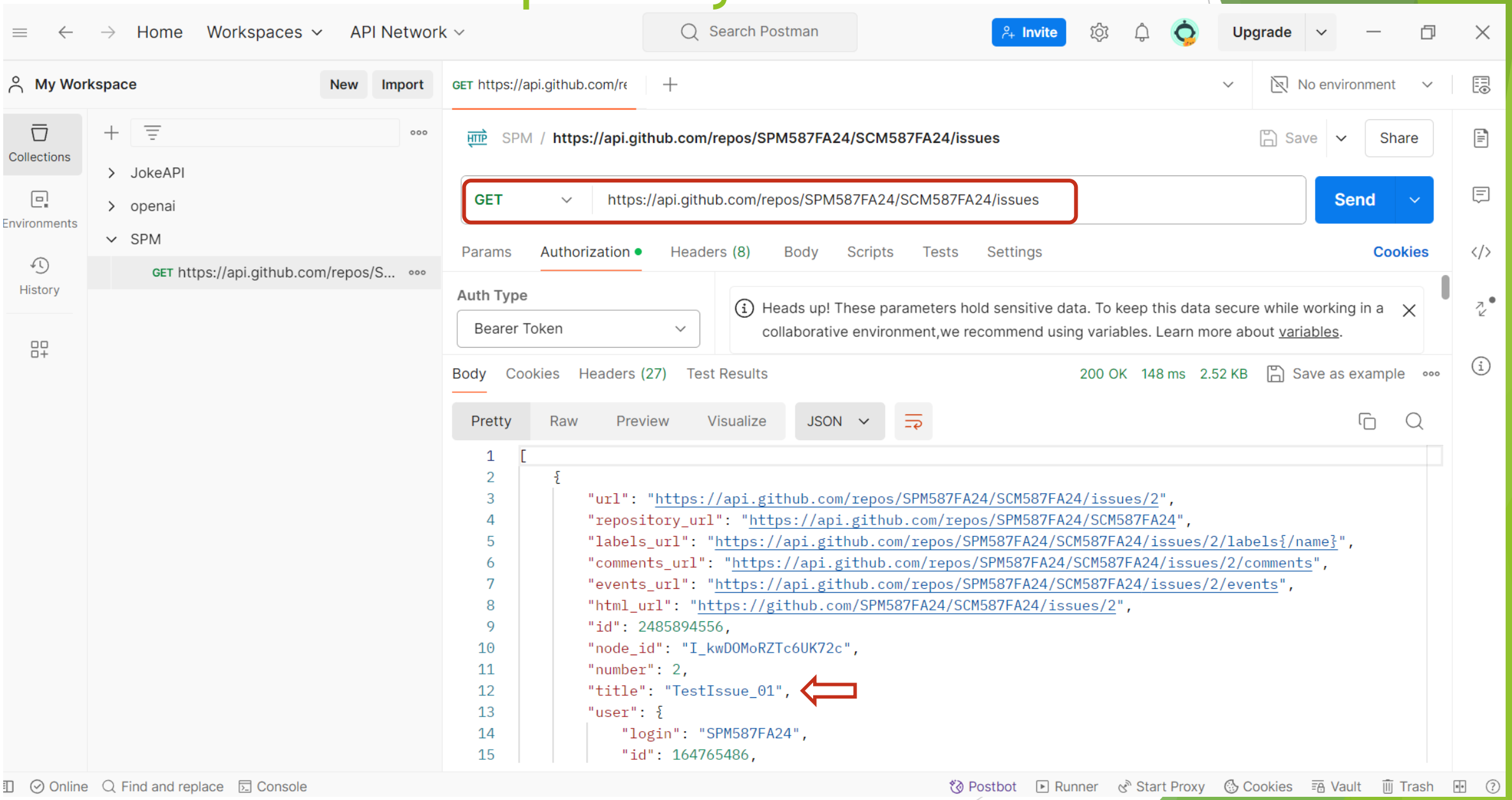
List issues for a Repository

```
GET /repos/:owner/:repo/issues
```

Parameters

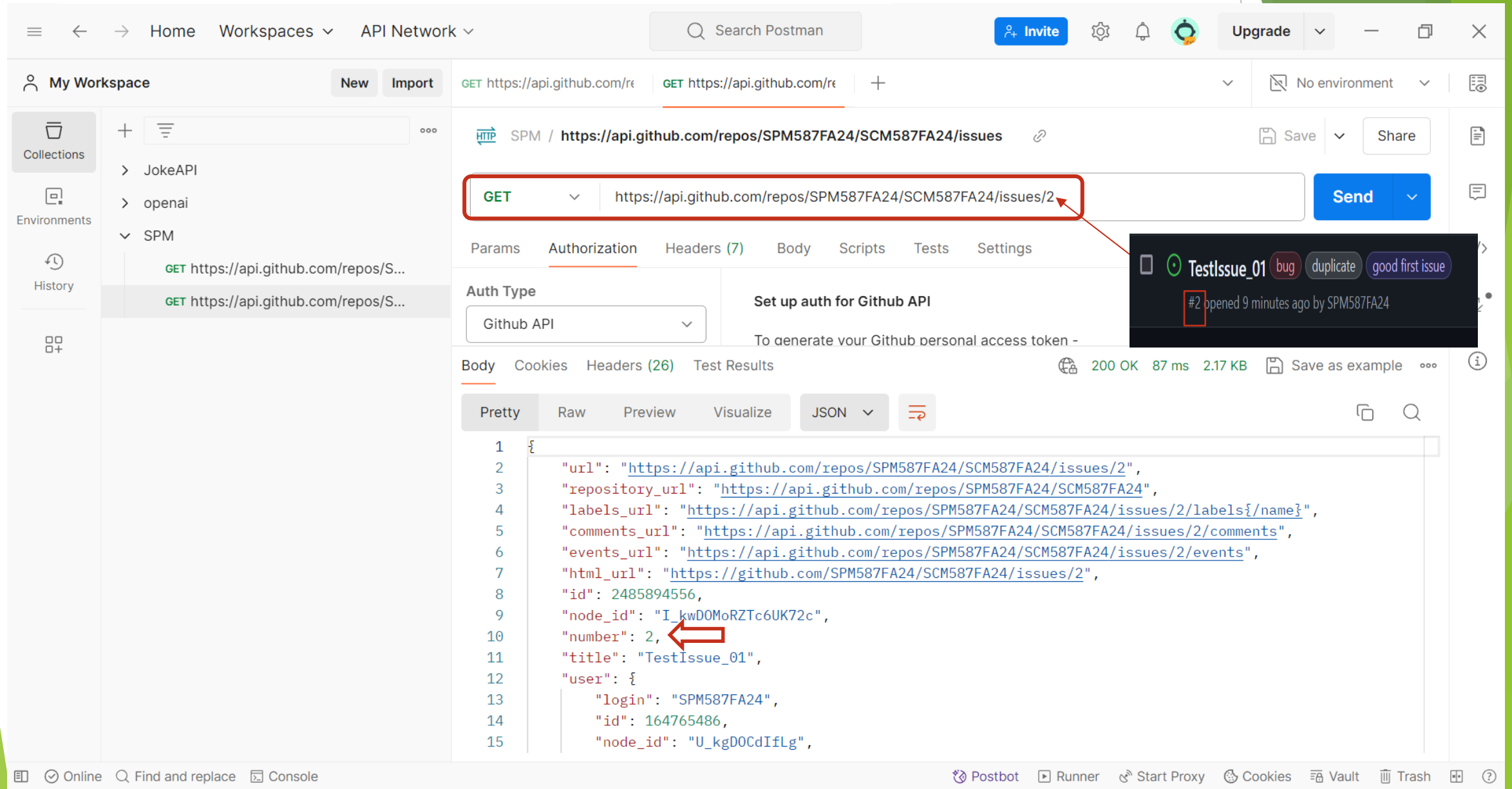
Name	Type	Description
`milestone`	`integer` or `string`	If an `integer` is passed, it should refer to a milestone by its `number` field. If the string `*` is passed, issues with any milestone are accepted. If the string `none` is passed, issues without milestones are returned.
`state`	`string`	Indicates the state of the issues to return. Can be either `open`, `closed`, or `all`. Default: `open`
`assignee`	`string`	Can be the name of a user. Pass in `none` for issues with no assigned user, and `*` for issues assigned to any user.
`creator`	`string`	The user that created the issue.
`mentioned`	`string`	A user that's mentioned in the issue.
`labels`	`string`	A list of comma separated label names. Example: `bug,ui,@high`
`sort`	`string`	What to sort results by. Can be either `created`, `updated`, `comments`. Default: `created`
`direction`	`string`	The direction of the sort. Can be either `asc` or `desc`. Default: `desc`
`since`	`string`	Only issues updated at or after this time are returned. This is a timestamp in ISO 8601 format: `YYYY-MM-DDTHH:MM:SSZ`.

List issues for a Repository



Get a Single issue

```
GET /repos/:owner/:repo/issues/:number
```



List Labels for an Issue

Home Workspaces API Network Search Postman Invite Upgrade

My Workspace New Import

GET https://api.github.com/re GET https://api.github.com/re GET https://api.github.com/re No environment

Collections Environments History

JokeAPI
openai
SPM
GET https://api.github.com/repos/S...
GET https://api.github.com/repos/S...
GET https://api.github.com/repos/S...

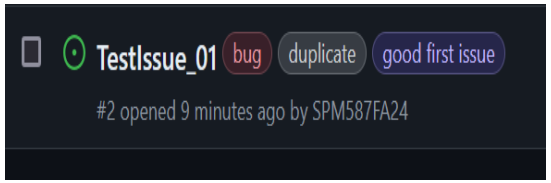
SPM / https://api.github.com/repos/SPM587FA24/SCM587FA24/issues/2/labels Save Share

GET https://api.github.com/repos/SPM587FA24/SCM587FA24/issues/2/labels Send

Params Authorization Headers (7) Body Scripts Tests Settings Cookies

Body Cookies Headers (26) Test Results 200 OK 230 ms 1.59 KB Save as example

Pretty Raw Preview Visualize JSON




```
[
    {
        "id": 7375253950,
        "node_id": "LA_kwDOMoRZTc8AAAABt51xvg",
        "url": "https://api.github.com/repos/SPM587FA24/SCM587FA24/labels/bug",
        "name": "bug",
        "color": "d73a4a",
        "default": true,
        "description": "Something isn't working"
    },
    {
        "id": 7375253955,
        "node_id": "LA_kwDOMoRZTc8AAAABt51xww",
        "url": "https://api.github.com/repos/SPM587FA24/SCM587FA24/labels/duplicate",
        "name": "duplicate",
        "color": "cfd3d7",
        "default": true,
        "description": "This issue or pull request already exists"
    },
```


Online Find and replace Console Postbot Runner Start Proxy Cookies Vault Trash

To Do

- Sign Up on GitHub and create a new ID in the following format.
- Assume the name of the user is John Doe and his A-number is A12345678.
  - His ID would be JFA24SCM78D.
  - Here the first J is the first letter of his first name John.
  - The last D is the first letter of his last name Doe.
  - And 78 is the last two numbers of his A-number.
  - The term FA24SCM will be the same for everyone.
- Download and Install Git for Windows.
  - https://desktop.github.com/

Questions?