git and GitHub tutorial

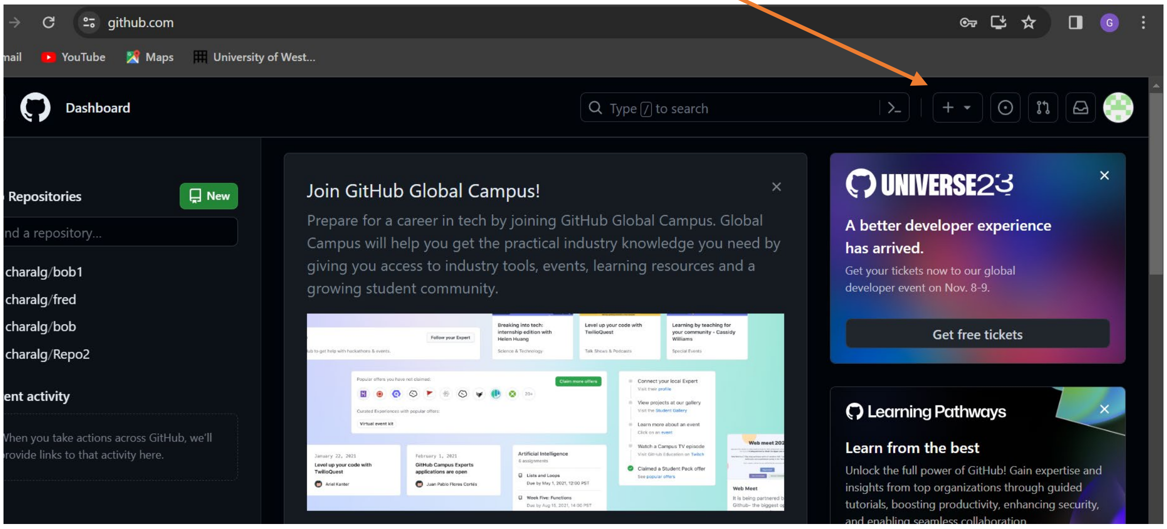
step 1 go to https://github.com/

and register as a student for a free account

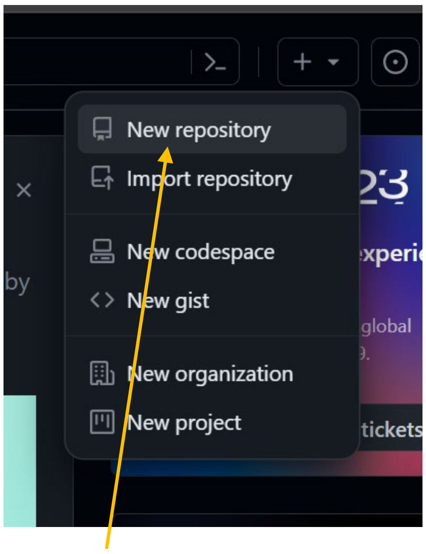
step 2 to create a repository

A repository is where github will store all the changes you make in your project

To do this click the **+** icon on the top right once you login



Once you click the + button it will give the following options:



To create a new repository, click New repository

This will open a new page

Add the name of the Repository

Give a short description of project

Make your project private

Not visible to everyone

You can add later the team members

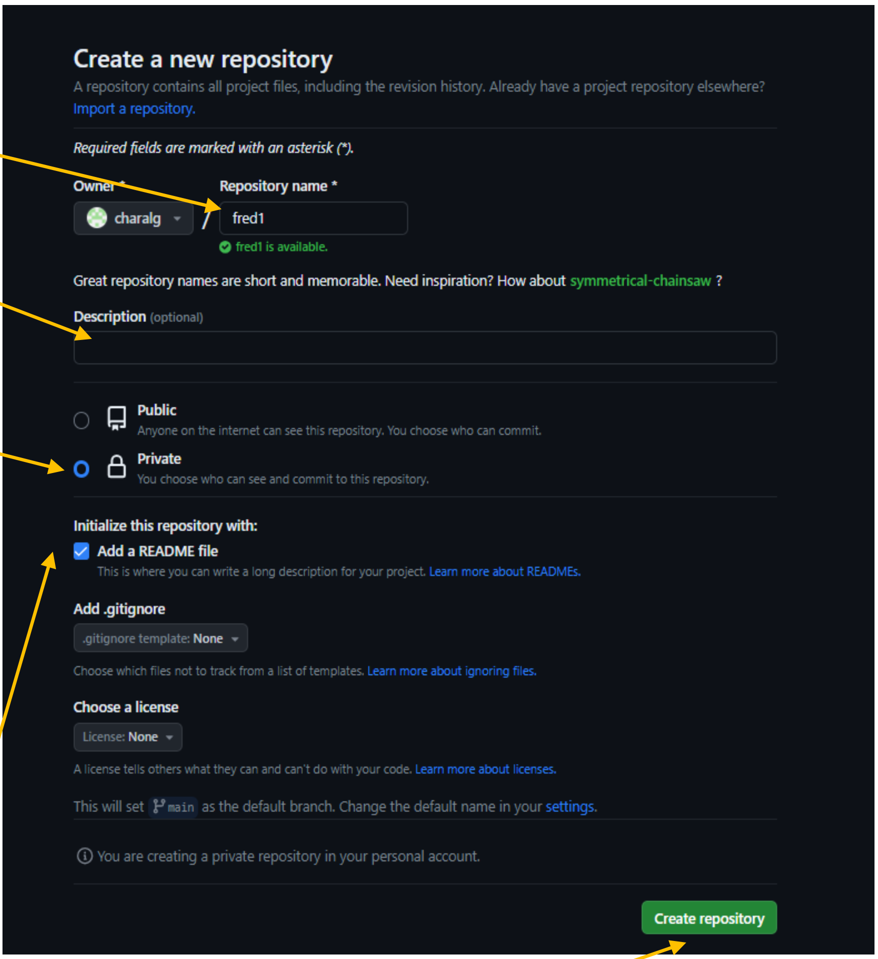
You can choose files that you wish github to ignore, so these won't be part of the repository

e.g. say binary files, log files etc.

this offers a drop down menu of the type of files you wish to choose

you can choose none and add file types later on but for now just

add a README file by checking box



Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.

Required fields are marked with an asterisk (*).

Owner * charalg / Repository name * fred1

fred1 is available.

Great repository names are short and memorable. Need inspiration? How about symmetrical-chainsaw ?

Description (optional)

Public — Anyone on the internet can see this repository. You choose who can commit.

[✓ Private] — You choose who can see and commit to this repository.

Initialize this repository with:

[✓] Add a README file — This is where you can write a long description for your project. Learn more about READMEs.

Add .gitignore — .gitignore template: None

Choose which files not to track from a list of templates. Learn more about ignoring files.

Choose a license — License: None

A license tells others what they can and can't do with your code. Learn more about licenses.

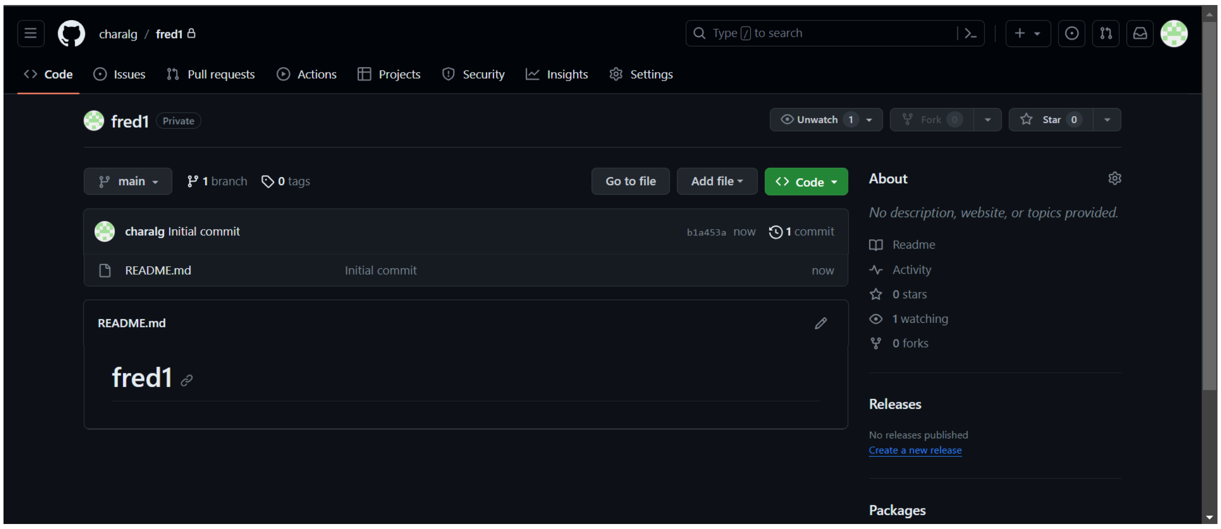
This will set `main` as the default branch. Change the default name in your settings.

You are creating a private repository in your personal account.

After adding a README file

Press button Create Repository to create the repository

This opens your project window



charalg Initial commit — b1a453a now — 1 commit

README.md	Initial commit	now

README.md

fred1

About

No description, website, or topics provided.

Readme · Activity · 0 stars · 1 watching · 0 forks

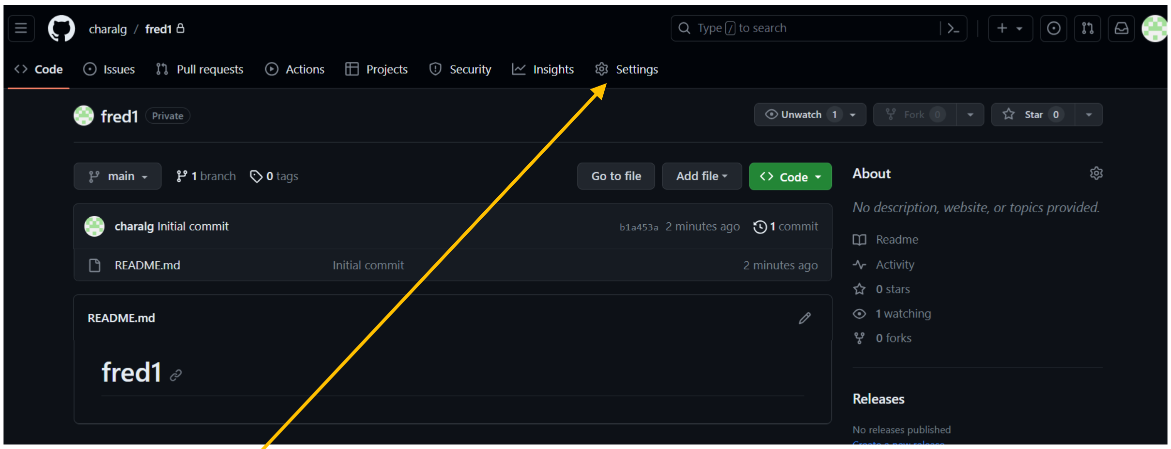
Releases

No releases published

Create a new release

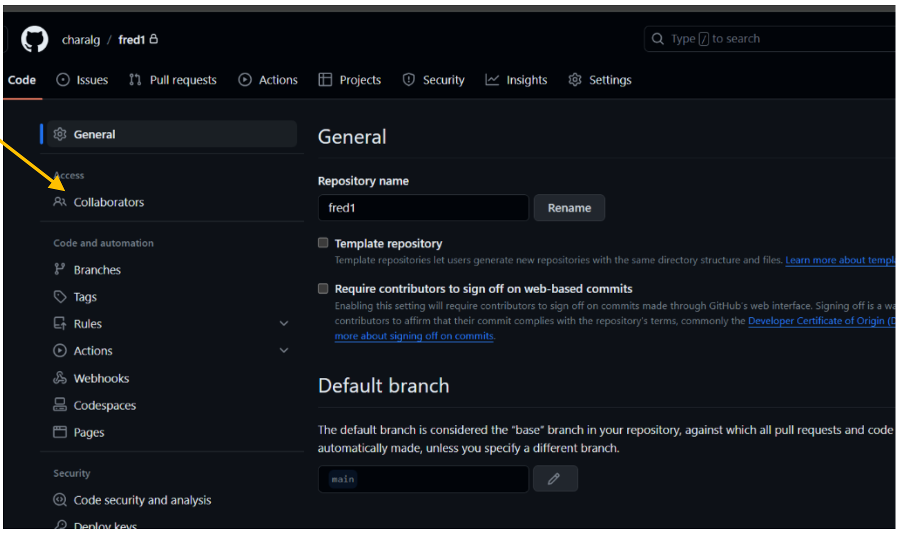
Packages

To add collaborators

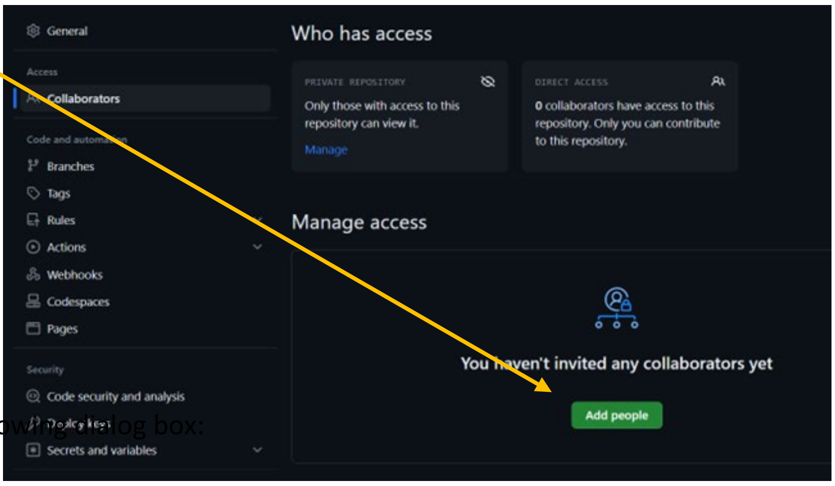


Click on settings

Then click on collaborators



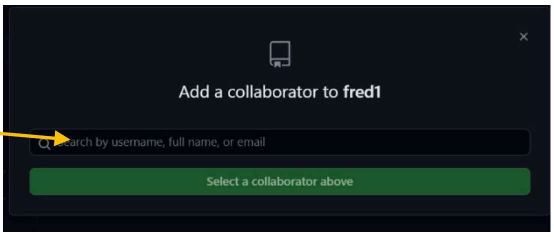
Click Add people to invite a collaborator


General
Access
Collaborators
Code and automation
Branches
Tags
Rules
Actions
Webhooks
Codespaces
Pages
Security
Code security and analysis
Deploy keys
Secrets and variables
Who has access
PRIVATE REPOSITORY
Only those with access to this repository can view it.
Manage
DIRECT ACCESS
0 collaborators have access to this repository. Only you can contribute to this repository.
Manage access
You haven't invited any collaborators yet
Add people

This will open the following dialog box:

Type in e-mail of username of collaborator

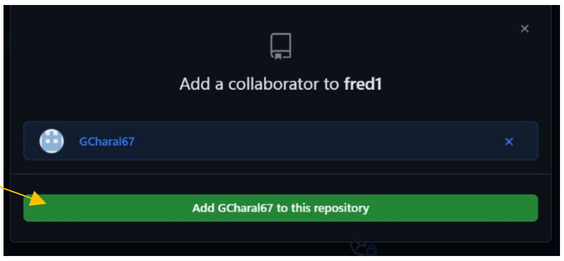
Click to invite collaborator


Add a collaborator to fred1
Search by username, full name, or email
Select a collaborator above

Then Add user to repository.

They will be e-mailed and will have to accept,

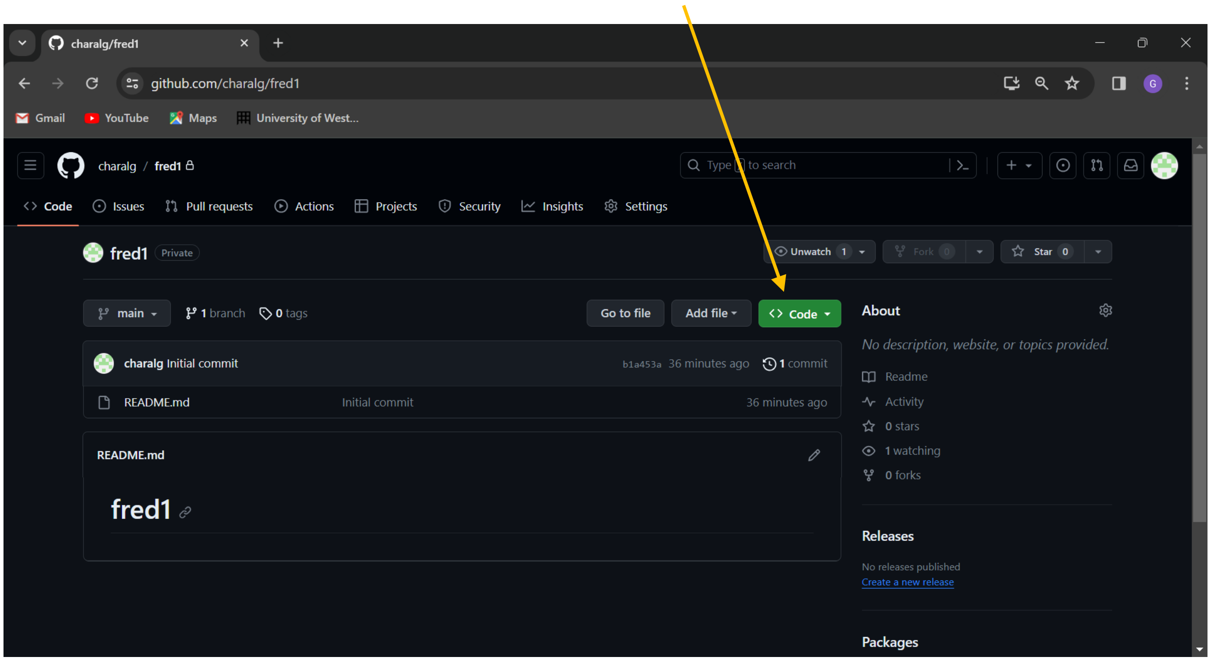
login and click accept invitation



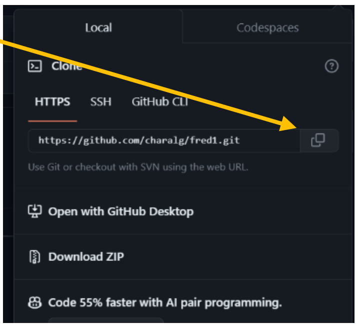
Using git to clone (make a copy of a github repository)

1. click code tab; copy the URL of the repository you wish to copy locally on your machine i.e. clone

On GitHub's repositories code page click green code button:



Copy URL



```
https://github.com/charalg/fred1.git
```

Use Git or checkout with SVN using the web URL.

Click on Git Bash on Windows/ or on linux/ Mac open a terminal;

Type: $ cd folder to where you wish to copy repository

EXAMPLE

$ **cd Desktop/L7SDE23**

Then: $ git clone <URL> <**localdest>**

e.g. git clone https://github.com/charalg/fred1.git FRED

Where <localdest> is the local repository name e.g. FRED

You will prompted for your username and **personal access token** (see pdf separate doc on how to create)

```
charalg@compute0:~/L7SDE23$ git clone https://github.com/charalg/fred1.git FRED
Cloning into 'FRED'...
Username for 'https://github.com': GCharal67
Password for 'https://GCharal67@github.com':
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 585 bytes | 21.00 KiB/s, done.


charalg@compute0:~/L7SDE23$
```

Move into the repository folder

$ cd FRED

charalg@compute0:~/L7SDE23/FRED$

type ls to list the files in the repository

README.md

charalg@compute0:~/L7SDE23/FRED$

To create a file use your editor and create these in the repository folder

e.g. nano test1.c

etc..

create 2 files created test1.c and test2.c

To add files to the repository use add command

First add to these go into staging/ index area

git add filename

git add *.c etc..

git add -A --- this is for all the files to be added

to see the status type

git status (full detailed version)

git status -s (short version)

EXAMPLE

```
charalg@compute0:~/L7SDE23/FRED$ echo test1 > test1.c

charalg@compute0:~/L7SDE23/FRED$ echo test2 > test2.c

charalg@compute0:~/L7SDE23/FRED$ git add *.c

charalg@compute0:~/L7SDE23/FRED$ git status

On branch main

Your branch is up-to-date with 'origin/main'.


Changes to be committed:

  (use "git restore --staged <file>..." to unstage)

        new file:   test1.c

        new file:   test2.c


charalg@compute0:~/L7SDE23/FRED$ git status -s

A  test1.c

A  test2.c
```

To commit the files to the Repository

git commit file(s) -m “add notes”git

then we move them into the repository by using the commit command

```
charalg@compute0:~/L7SDE23/FRED$ git commit test1.c -m "test 1 added"
[main d6957d6] test 1 added
1 file changed, 1 insertion(+)
create mode 100644 test1.c


charalg@compute0:~/L7SDE23/FRED$ git commit test2.c -m "test 2 added"
[main 5ae5c66] test 2 added
1 file changed, 1 insertion(+)
 create mode 100644 test2.c
charalg@compute0:~/L7SDE23/FRED$
```

These will be local additions

To upload local files to the GitHub repository

1st need to download any changes made by other collaborators using the pull command

git pull

```
charalg@compute0:~/L7SDE23/FRED$ git pull

Username for 'https://github.com': charalg@wmin.ac.uk

Password for 'https://charalg@wmin.ac.uk@github.com':  <paste pass code here>
```

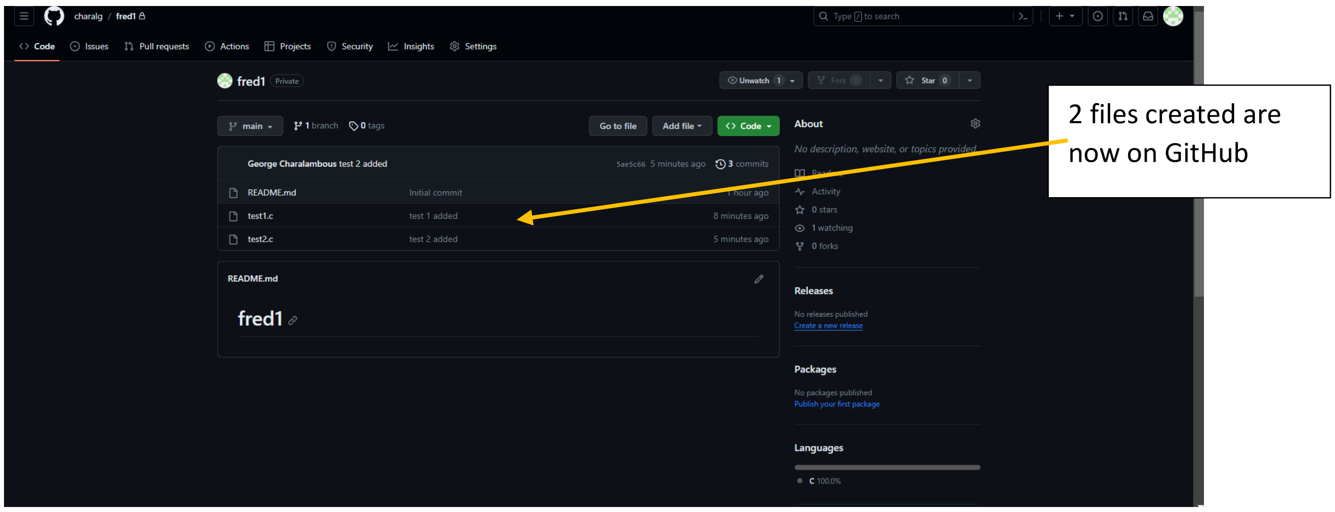
Already up-to-date.

Then if there are no changes that need editing, we can the push these onto the repository

EXAMPLE

```
charalg@compute0:~/L7SDE23/FRED$ git push
Username for 'https://github.com': charalg@wmin.ac.uk
Password for 'https://charalg@wmin.ac.uk@github.com': <paste pass code here>
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 2 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (6/6), 513 bytes | 102.00 KiB/s, done.
Total 6 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
To https://github.com/charalg/fred1.git
   b1a453a..5ae5c66  main -> main$
```

The files should appear on GitHub



George Charalambous test 2 added   5ae5c66 5 minutes ago   3 commits

README.md	Initial commit	1 hour ago
test1.c	test 1 added	8 minutes ago
test2.c	test 2 added	5 minutes ago

README.md

fred1

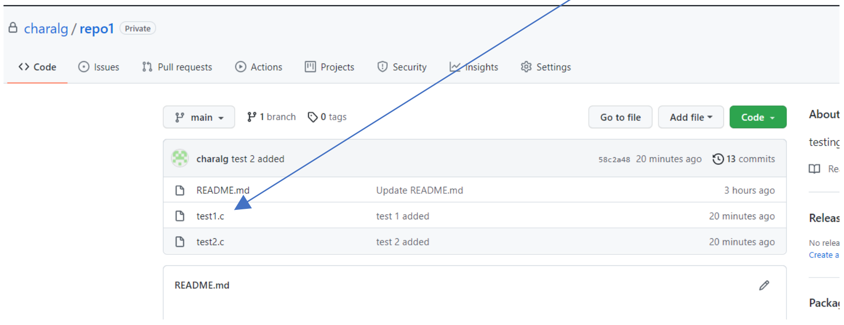
If we have multiple modules that the team is working on or even in the same file

We can create a branch that can be separate from main, this will be a copy of the files but kept separate until they are merged

These can be worked on independently and only when the component is complete, we can merge the branch

Before branch always pull the latest files

I made a change on GitHub to file test1.c by clicking the name of file

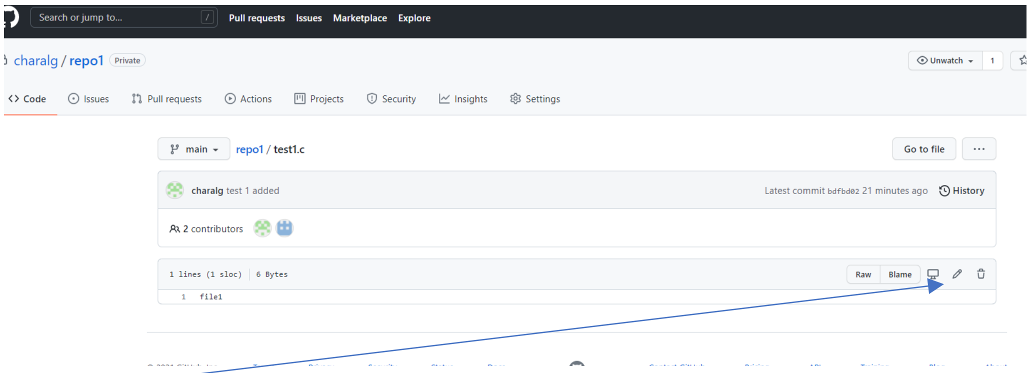


charalg / repo1 Private

charalg test 2 added — 58c2a48 20 minutes ago — 13 commits

README.md	Update README.md	3 hours ago
test1.c	test 1 added	20 minutes ago
test2.c	test 2 added	20 minutes ago

This opens GitHubs edit mode



charalg / repo1 Private

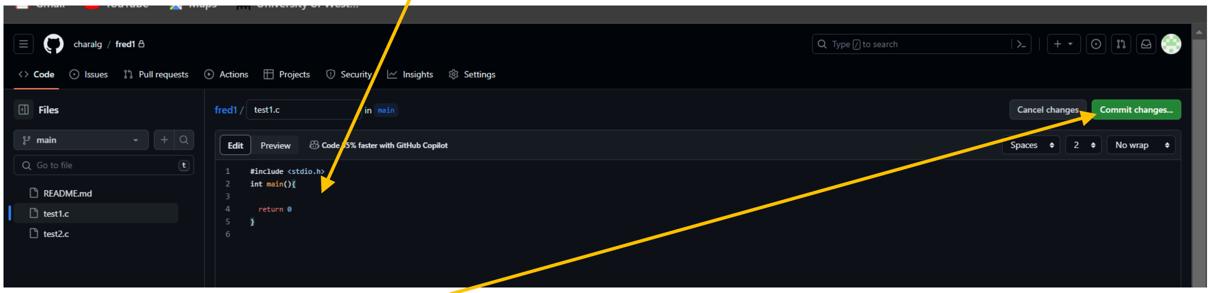
main — repo1 / test1.c

charalg test 1 added — Latest commit bdfbd02 21 minutes ago — History

2 contributors

```
1 lines (1 sloc) | 6 Bytes
file1
```

Click pen and type in text changes

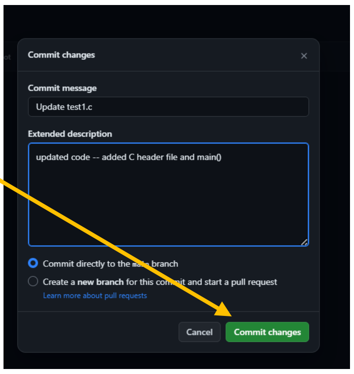


fred1 / test1.c in main

```
#include <stdio.h>
int main(){

  return 0
}
```

You can add further comments if needed the click commit changes and this will only update GiHubs repository



Commit changes

Commit message: Update test1.c

Extended description: updated code -- added C header file and main()

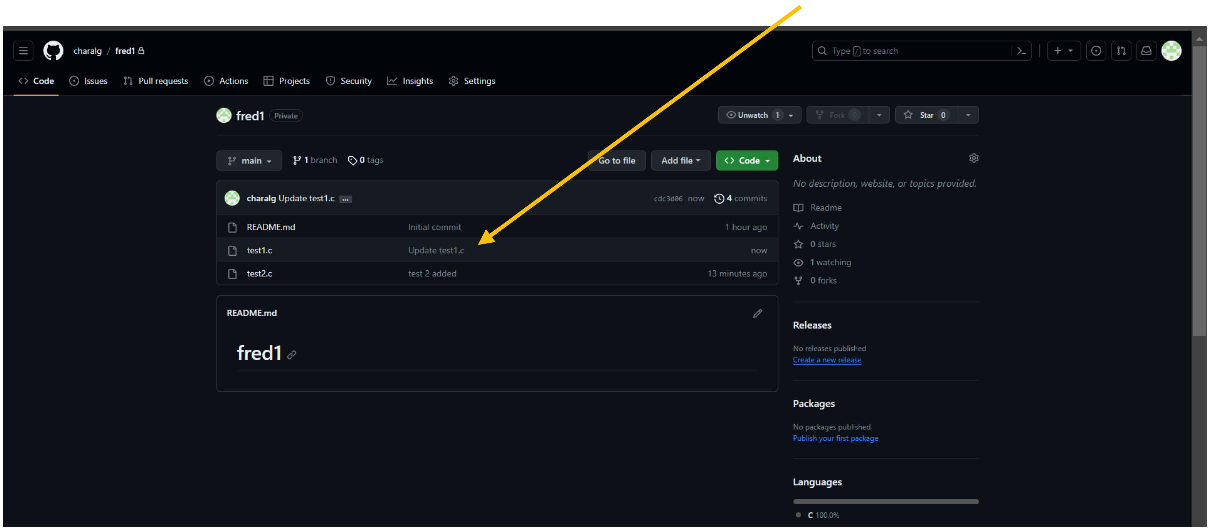
[✓ Commit directly to the main branch]

Create a **new branch** for this commit and start a pull request

Learn more about pull requests

Cancel | Commit changes

Go back to your repository we can see that test1.c has been updated



charalg Update test1.c … cdc3d06 now 4 commits

README.md	Initial commit	1 hour ago
test1.c	Update test1.c	now
test2.c	test 2 added	13 minutes ago

From your Linux terminal

Now use git pull to obtain the latest files from GitHub

```
charalg@compute0:~/L7SDE23/FRED$ git pull
Username for 'https://github.com': charalg@wmin.ac.uk
Password for 'https://charalg@wmin.ac.uk@github.com': <paste pass code here>
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 755 bytes | 27.00 KiB/s, done.
From https://github.com/charalg/fred1
   5ae5c66..cdc3d06  main       -> origin/main
Updating 5ae5c66..cdc3d06
Fast-forward
 test1.c | 6 +++++-
 1 file changed, 5 insertions(+), 1 deletion(-)
charalg@compute0:~/L7SDE23/FRED$
```

we are given info of the changes made and have the latest files

we can now safely branch

git branch <branch name>

EXAMPLE

```
$ git branch data_mod
charalg@compute0:~/L7SDE23/FRED$ git branch data_mod
charalg@compute0:~/L7SDE23/FRED$
```

This has created a copy of main called data_mod which is local (not on GitHub)

To move to the new named branch we use the checkout command

git checkout <branch name>

EXAMPLE

```
charalg@compute0:~/L7SDE23/FRED$ git checkout data_mod

Switched to branch 'data_mod'

charalg@compute0:~/L7SDE23/FRED$ git checkout data_mod
Switched to branch 'data_mod'
```

Typing ls show the files in the branch

```
charalg@compute0:~/L7SDE23/FRED$ ls
README.md  test1.c  test2.c
```

Add text to test2.c

```
charalg@compute0:~/L7SDE23/FRED$ echo "append to end" >> test2.c
```

create and add test top new file called test3.c

```
charalg@compute0:~/L7SDE23/FRED$ echo "add this to new file" > test3.c
```

ADD ALL FILES to BRANCH INDEX/STAGGED

```
charalg@compute0:~/L7SDE23/FRED$ git add -A
```

COMMIT THE FILES TO THE BRANCH REPOSITRY

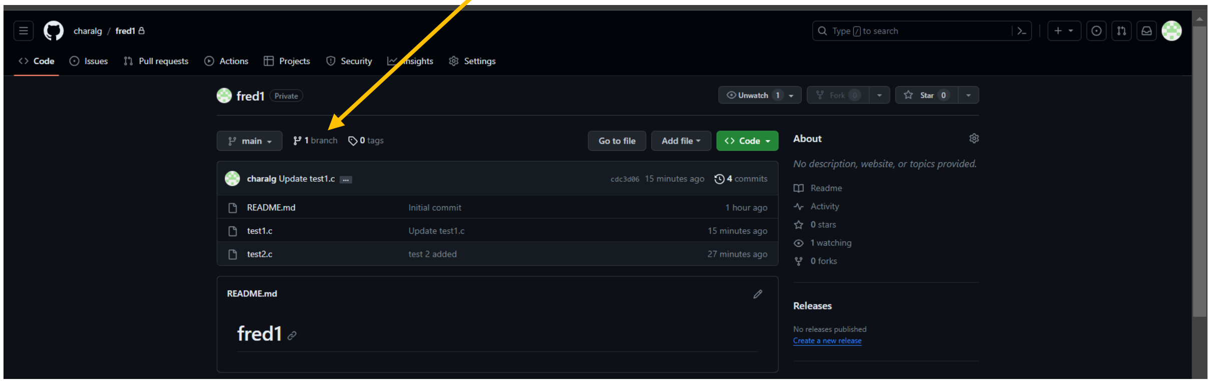
```
charalg@compute0:~/L7SDE23/FRED$ git commit test2.c -m "added an extra line at end"
[data_mod 11ef2d2] added an extra line at end
1 file changed, 1 insertion(+)
charalg@compute0:~/L7SDE23/FRED$

charalg@compute0:~/L7SDE23/FRED$ git commit test3.c -m "new file"
[data_mod e2be048] new file
1 file changed, 1 insertion(+)
 create mode 100644 test3.c
charalg@compute0:~/L7SDE23/FRED$
```

CHECK STATUS

```
charalg@compute0:~/L7SDE23/FRED$ git status -s
charalg@compute0:~/L7SDE23/FRED$
```

If we look at GitHub only 1 branch is showing



```
charalg Update test1.c          cdc3d06 15 minutes ago   4 commits
README.md    Initial commit     1 hour ago
test1.c      Update test1.c     15 minutes ago
test2.c      test 2 added       27 minutes ago
```

README.md

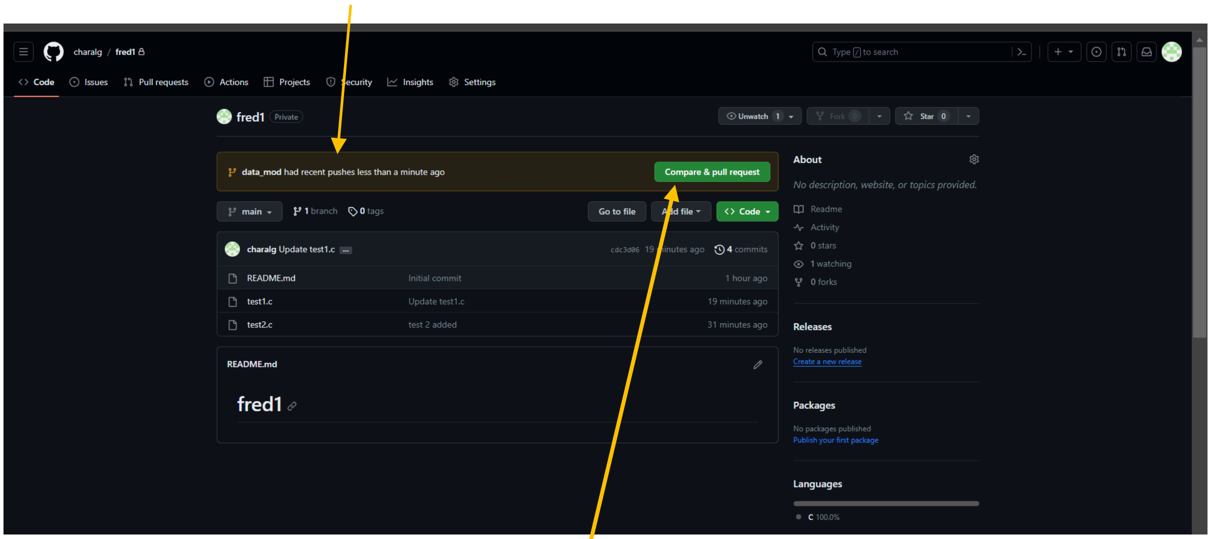
fred1

To update need to push branch to GitHub use **`git push --set-upstream origin <branch name>`**

EXAMPLE

```
charalg@compute0:~/L7SDE23/FRED$ git push --set-upstream origin data_mod
Username for 'https://github.com': charalg@wmin.ac.uk
Password for 'https://charalg@wmin.ac.uk@github.com': <paste pass code here>
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 2 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (6/6), 577 bytes | 96.00 KiB/s, done.
Total 6 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
remote:
remote: Create a pull request for 'data_mod' on GitHub by visiting:
remote:      https://github.com/charalg/fred1/pull/new/data_mod
remote:
To https://github.com/charalg/fred1.git
 * [new branch]      data_mod -> data_mod
Branch 'data_mod' set up to track remote branch 'data_mod' from 'origin'.
charalg@compute0:~/L7SDE23/FRED$
```

On GitHub we have a notification



charalg / fred1

fred1 Private

data_mod had recent pushes less than a minute ago

charalg Update test1.c	cdc3d06 19 minutes ago	4 commits
README.md	Initial commit	1 hour ago
test1.c	Update test1.c	19 minutes ago
test2.c	test 2 added	31 minutes ago

README.md

fred1

About

No description, website, or topics provided.

Releases

No releases published

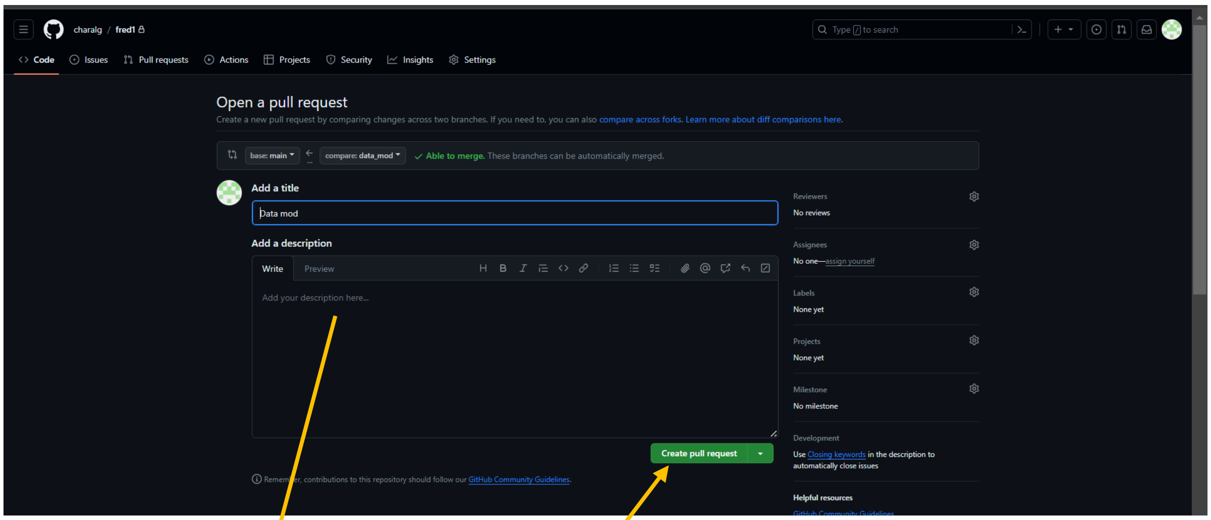
Packages

No packages published

Languages

C 100.0%

On the GitHub site we can compare and pull request clicking gives:



Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also compare across forks. Learn more about diff comparisons here.

base: main ← compare: data_mod ✓ Able to merge. These branches can be automatically merged.

Add a title: Data mod

Add a description: Add your description here...

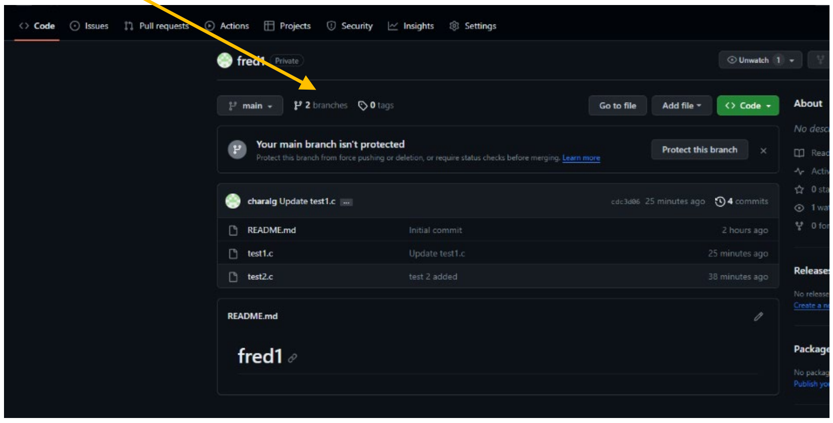
Reviewers: No reviews
Assignees: No one—assign yourself
Labels: None yet
Projects: None yet
Milestone: No milestone
Development: Use Closing keywords in the description to automatically close issues

Remember, contributions to this repository should follow our GitHub Community Guidelines.

We can add a description then create a pull request to merge

Go back to code by clicking code tab

We can click on the branches to check the files



fred1 Private

main · 2 branches · 0 tags

Your main branch isn't protected
Protect this branch from force pushing or deletion, or require status checks before merging. Learn more

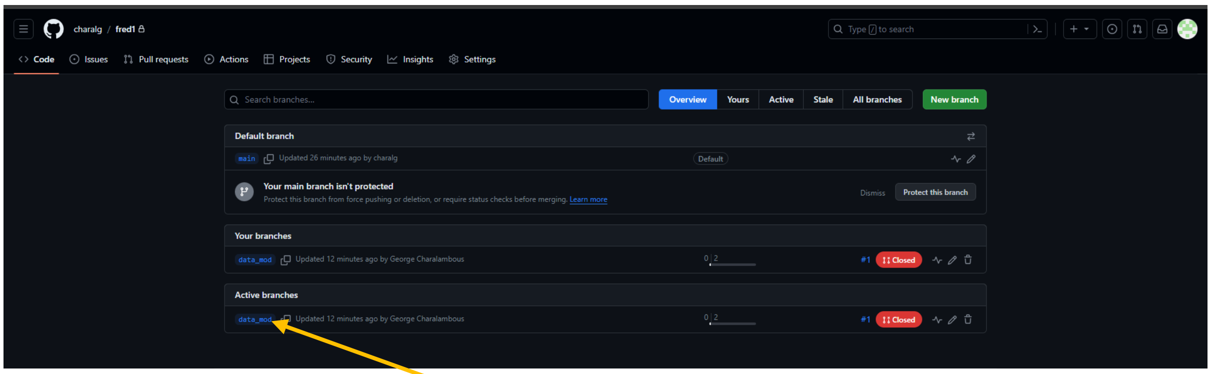
charalg Update test1.c · cdc3d86 25 minutes ago · 4 commits

README.md	Initial commit	2 hours ago
test1.c	Update test1.c	25 minutes ago
test2.c	test 2 added	38 minutes ago

README.md

fred1

This lists the branches:



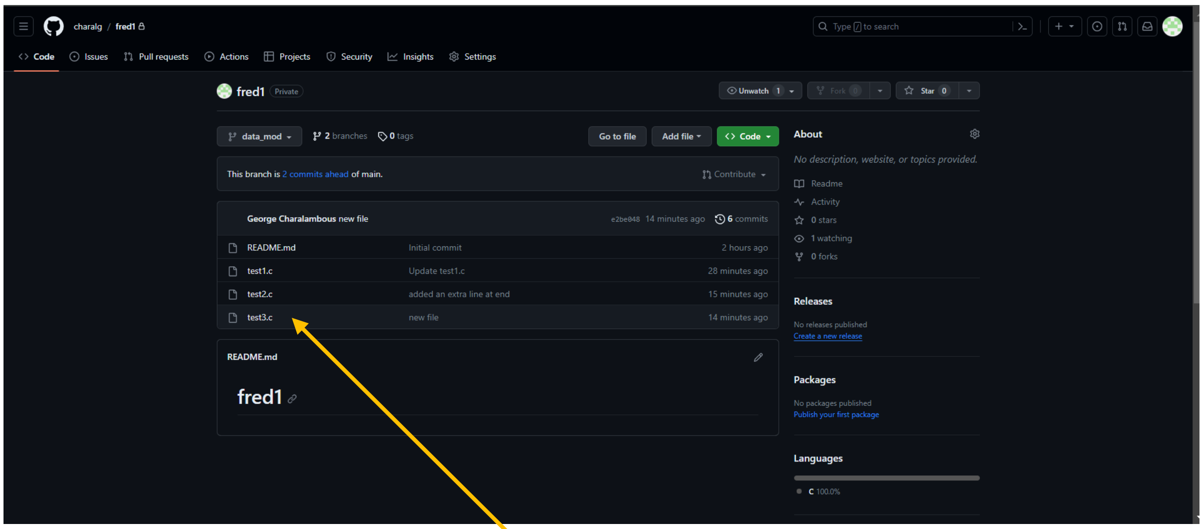
Default branch
main · Updated 26 minutes ago by charalg · Default

Your main branch isn't protected
Protect this branch from force pushing or deletion, or require status checks before merging. Learn more

Your branches
data_mod · Updated 12 minutes ago by George Charalambous · 0 | 2 · #1 Closed

Active branches
data_mod · Updated 12 minutes ago by George Charalambous · 0 | 2 · #1 Closed

If we click the name of branch it will show the files



This branch is 2 commits ahead of main.

No description, website, or topics provided.

No releases published

No packages published

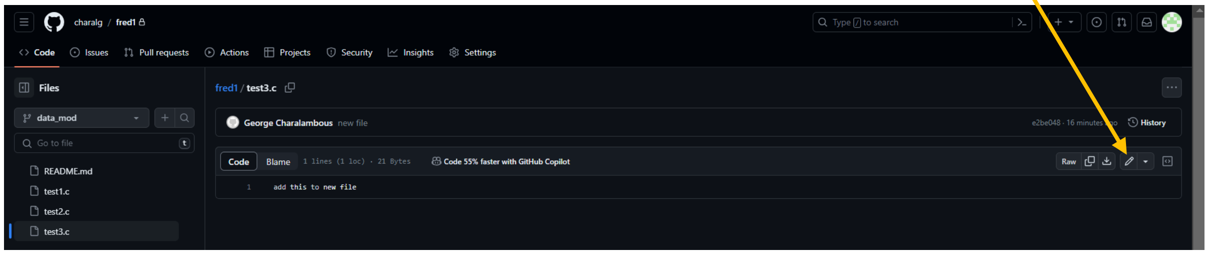
George Charalambous new file	e2be048 14 minutes ago	6 commits
README.md	Initial commit	2 hours ago
test1.c	Update test1.c	28 minutes ago
test2.c	added an extra line at end	15 minutes ago
test3.c	new file	14 minutes ago

README.md

fred1

And we can click and edit files as before by clicking and editing and then committing

Make changes to test3.c on GitHub click on the filename then click the edit symbol (pen) on the RHS

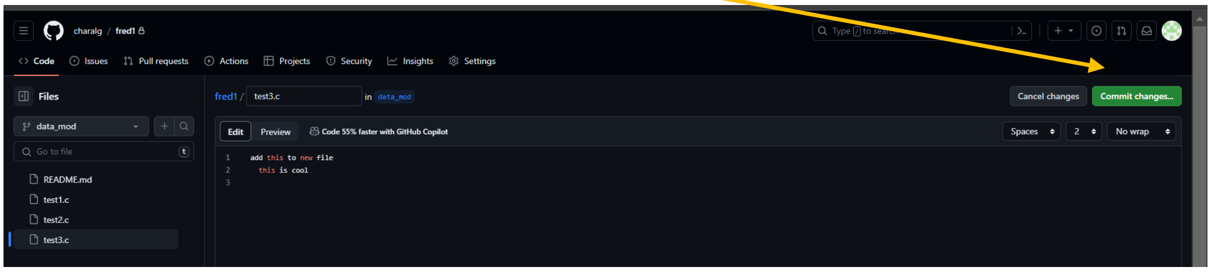


George Charalambous new file   e2be048 · 16 minutes ago

1 lines (1 loc) · 21 Bytes

```
add this to new file
```

Once you finish typing text commit changes

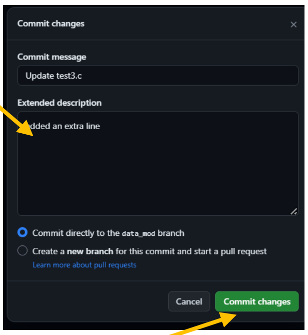


fred1 / test3.c in data_mod

```
add this to new file
  this is cool

```

You can then add comment.



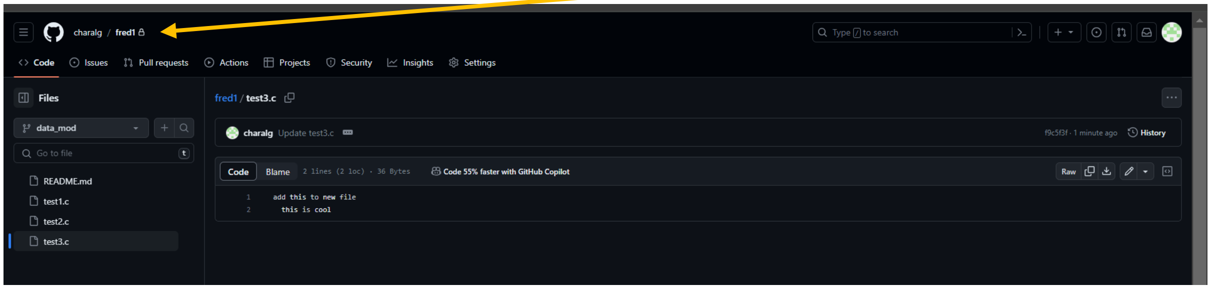
Commit message: Update test3.c

Extended description: added an extra line

[✓ Commit directly to the data_mod branch]
Create a new branch for this commit and start a pull request

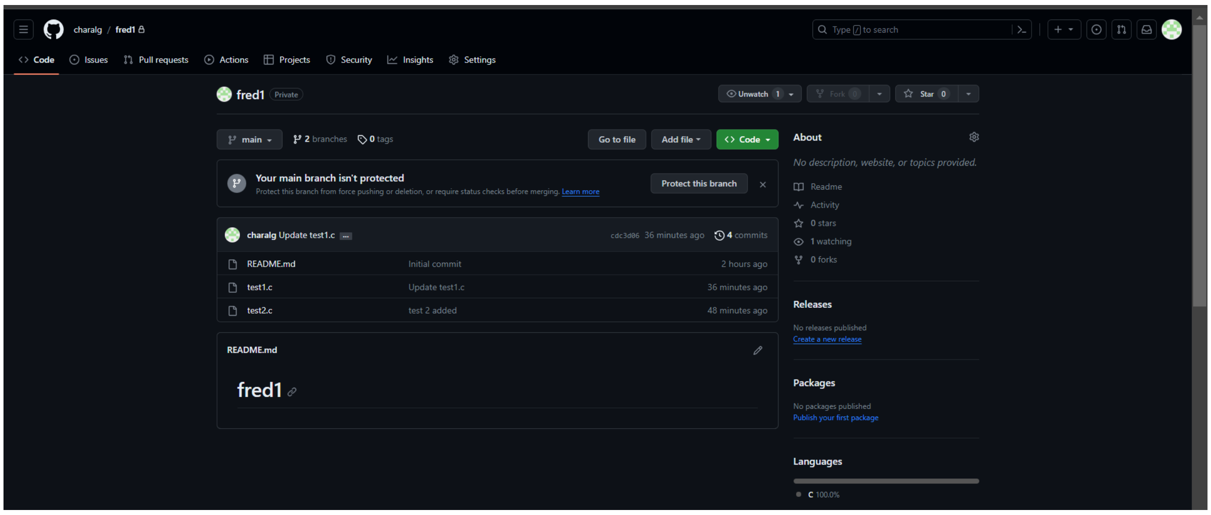
Then commit, by clicking Commit changes

Go back to your repository window by clicking main repository name (in example its fred1)



```
add this to new file
  this is cool
```

This shows



README.md	Initial commit	2 hours ago
test1.c	Update test1.c	36 minutes ago
test2.c	test 2 added	48 minutes ago

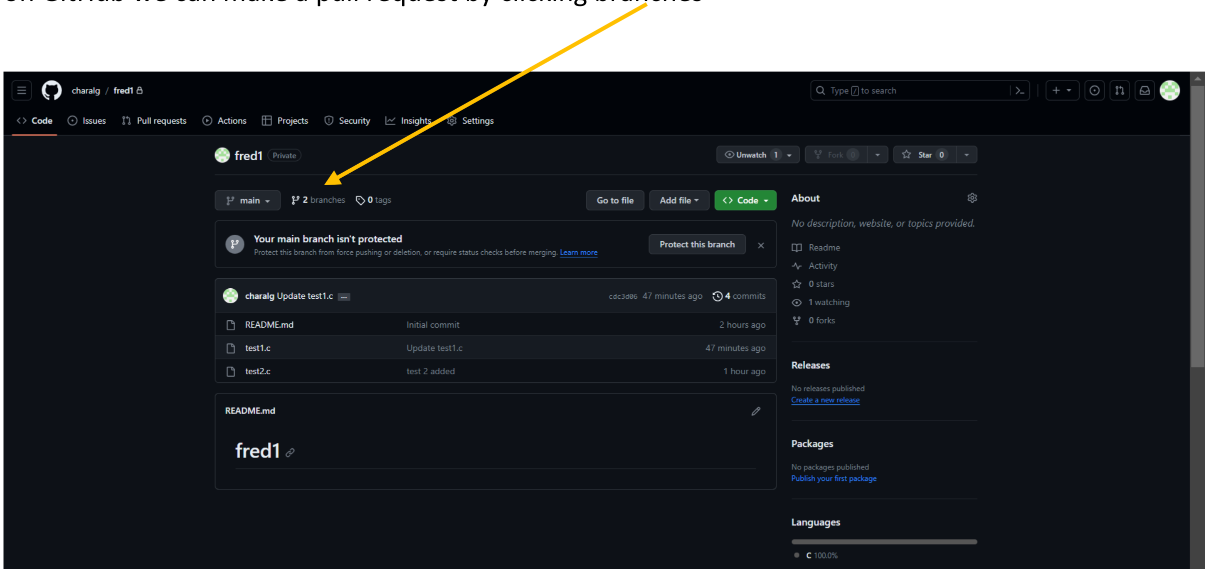
To locally update the files in the branch, use the pull command on your terminal

```
charalg@compute0:~/L7SDE23/FRED$ git pull
Username for 'https://github.com': charalg@wmin.ac.uk
Password for 'https://charalg@wmin.ac.uk@github.com': <paste pass code here>
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 666 bytes | 22.00 KiB/s, done.
From https://github.com/charalg/fred1
   e2be048..f9c5f3f  data_mod    -> origin/data_mod
Updating e2be048..f9c5f3f
Fast-forward
 test3.c | 1 +
 1 file changed, 1 insertion(+)
charalg@compute0:~/L7SDE23/FRED$
```

we can update as many times as needed, by adding files locally and then using commit command then use push command

```
charalg@compute0:~/L7SDE23/FRED$  echo "append to test3.c" >> test3.c
charalg@compute0:~/L7SDE23/FRED$ git commit test3.c -m "added further lines"
[data_mod 86af8de] added further lines
1 file changed, 3 insertions(+)
charalg@compute0:~/L7SDE23/FRED$ git push
Username for 'https://github.com': charalg@wmin.ac.uk
Password for 'https://charalg@wmin.ac.uk@github.com':  <paste pass code here>
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 2 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 316 bytes | 105.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/charalg/fred1.git
   f9c5f3f..86af8de  data_mod -> data_mod
charalg@compute0:~/L7SDE23/FRED$
```

on GitHub we can make a pull request by clicking branches



Your main branch isn't protected
Protect this branch from force pushing or deletion, or require status checks before merging. Learn more
Protect this branch

charalg Update test1.c   cdc3d06 47 minutes ago   4 commits

README.md	Initial commit	2 hours ago
test1.c	Update test1.c	47 minutes ago
test2.c	test 2 added	1 hour ago

README.md

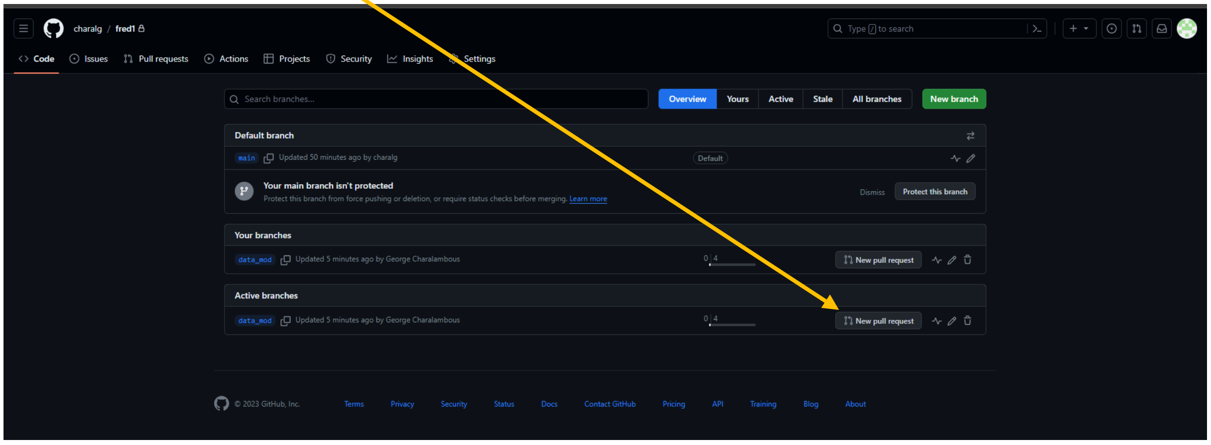
fred1

No description, website, or topics provided.

No releases published
Create a new release

No packages published
Publish your first package

Then click new pull request



Default branch

main Updated 50 minutes ago by charalg

Your main branch isn't protected

Protect this branch from force pushing or deletion, or require status checks before merging. Learn more

Your branches

data_mod Updated 5 minutes ago by George Charalambous 0 | 4

Active branches

data_mod Updated 5 minutes ago by George Charalambous 0 | 4

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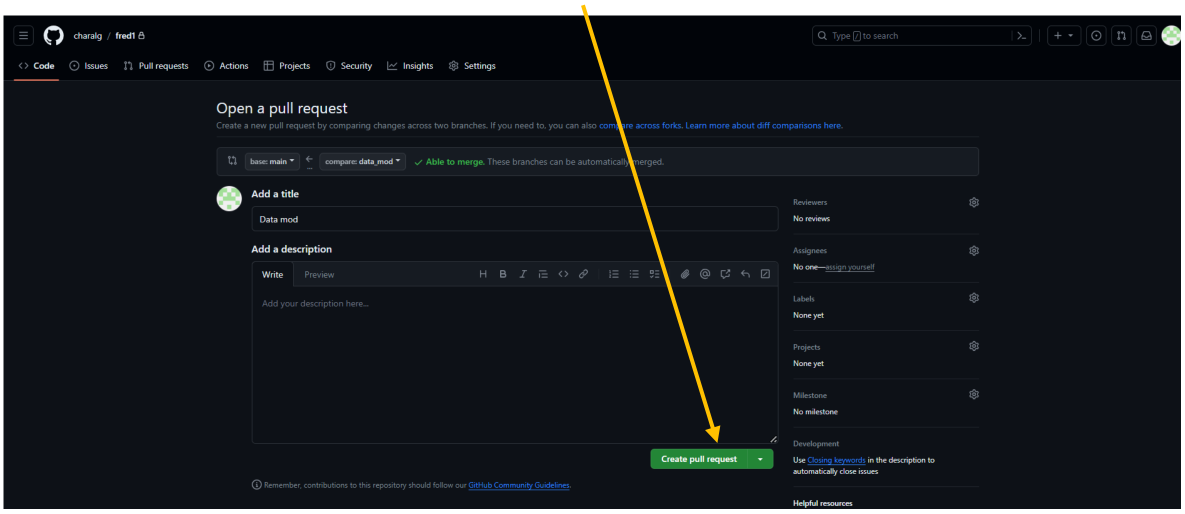
This will compare and gives us the option to merge with main



Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also compare across forks. Learn more about diff comparisons here.

✓ Able to merge. These branches can be automatically merged.

Add a title

Data mod

Add a description

Add your description here...

No reviews

No one—assign yourself

None yet

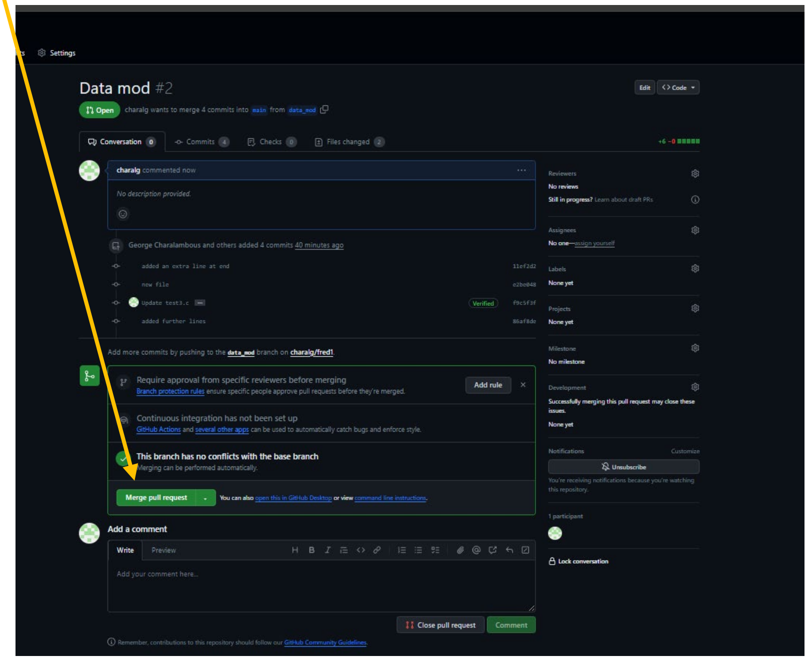
None yet

No milestone

Use Closing keywords in the description to automatically close issues

Remember, contributions to this repository should follow our GitHub Community Guidelines.

We can then click merge pull request



Data mod #2

Open charalg wants to merge 4 commits into `main` from `data_mod`

charalg commented now

No description provided.

George Charalambous and others added 4 commits 40 minutes ago

```
added an extra line at end     11ef2d2
new file                       e2be048
Update test3.c       Verified  f9c5f3f
added further lines            86af8de
```

Add more commits by pushing to the **data_mod** branch on **charalg/fred1**.

Require approval from specific reviewers before merging
Branch protection rules ensure specific people approve pull requests before they're merged.

Continuous integration has not been set up
GitHub Actions and several other apps can be used to automatically catch bugs and enforce style.

This branch has no conflicts with the base branch
Merging can be performed automatically.

You can also open this in GitHub Desktop or view command line instructions.

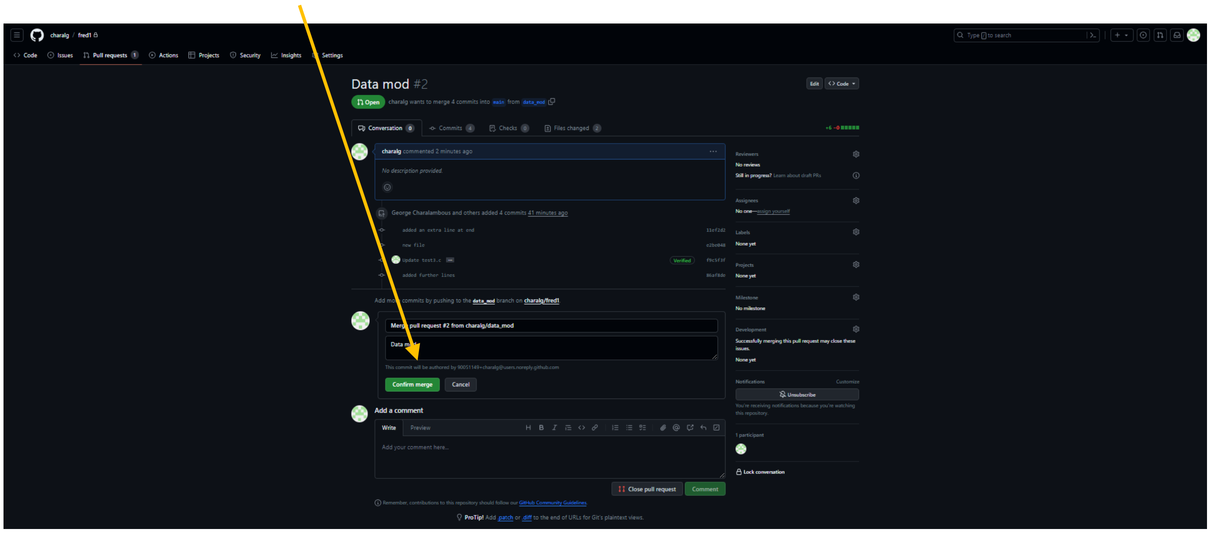
Add a comment

Add your comment here...

Remember, contributions to this repository should follow our GitHub Community Guidelines.

No reviews
Still in progress? Learn about draft PRs
No one—assign yourself
None yet
None yet
No milestone
Successfully merging this pull request may close these issues.
None yet
You're receiving notifications because you're watching this repository.
1 participant

Then we need to confirm merge



Data mod #2

Open charalg wants to merge 4 commits into `main` from `data_mod`

charalg commented 2 minutes ago

No description provided.

George Charalambous and others added 4 commits 41 minutes ago

```
added an extra line at end     11ef2d2
new file                       e2be048
Update test3.c       Verified  f9c5f3f
added further lines            86af8de
```

Add more commits by pushing to the **data_mod** branch on **charalg/fred1**.

Merge pull request #2 from charalg/data_mod

Data mod

This commit will be authored by 90051149+charalg@users.noreply.github.com

Add a comment

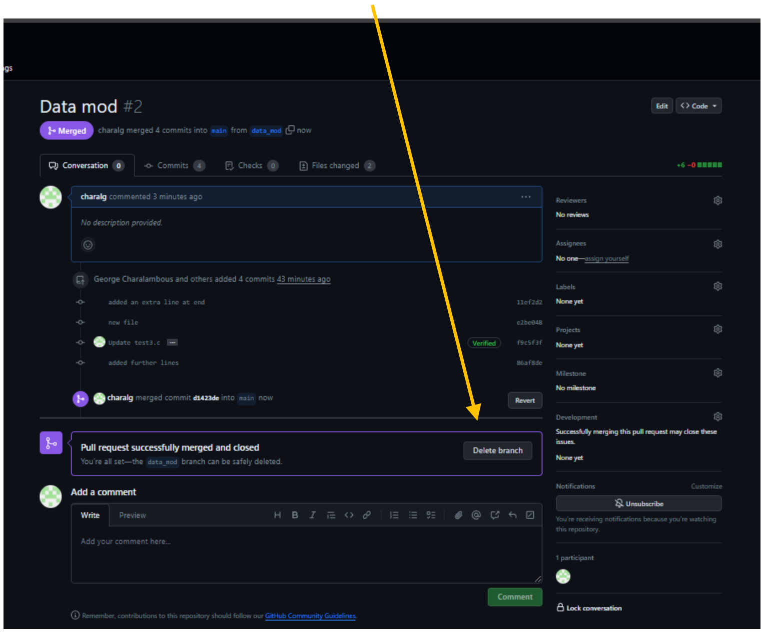
Add your comment here...

Remember, contributions to this repository should follow our GitHub Community Guidelines.

ProTip! Add .patch or .diff to the end of URLs for Git's plaintext views.

No reviews
Still in progress? Learn about draft PRs
No one—assign yourself
None yet
None yet
No milestone
Successfully merging this pull request may close these issues.
None yet
You're receiving notifications because you're watching this repository.
1 participant

We have now merged, and we can now delete branch



Data mod #2

Merged charalg merged 4 commits into main from data_mod now

charalg commented 3 minutes ago

No description provided.

George Charalambous and others added 4 commits 43 minutes ago

```
added an extra line at end        11ef2d2
new file                          e2be048
Update test3.c           Verified f9c5f3f
added further lines               86af8de
```

charalg merged commit d1423de into main now

Pull request successfully merged and closed

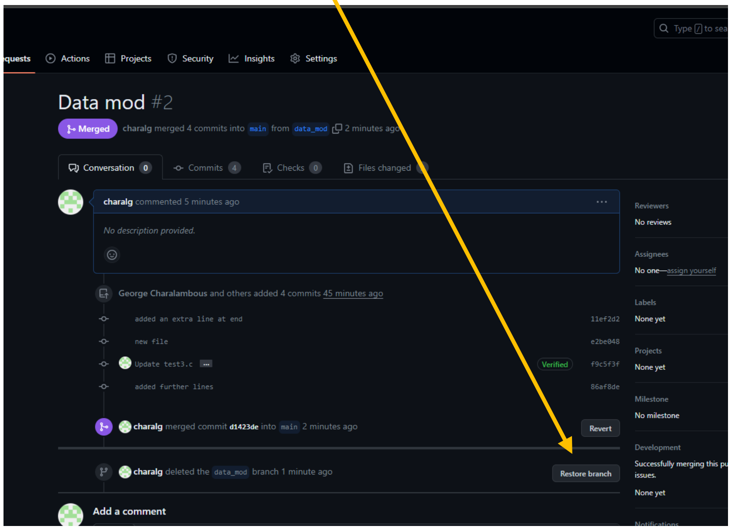
You're all set—the data_mod branch can be safely deleted.

Successfully merging this pull request may close these issues.

You're receiving notifications because you're watching this repository.

Remember, contributions to this repository should follow our GitHub Community Guidelines.

Branch deleted but can be restored if needed



Data mod #2

Merged charalg merged 4 commits into main from data_mod 2 minutes ago

charalg commented 5 minutes ago

No description provided.

George Charalambous and others added 4 commits 45 minutes ago

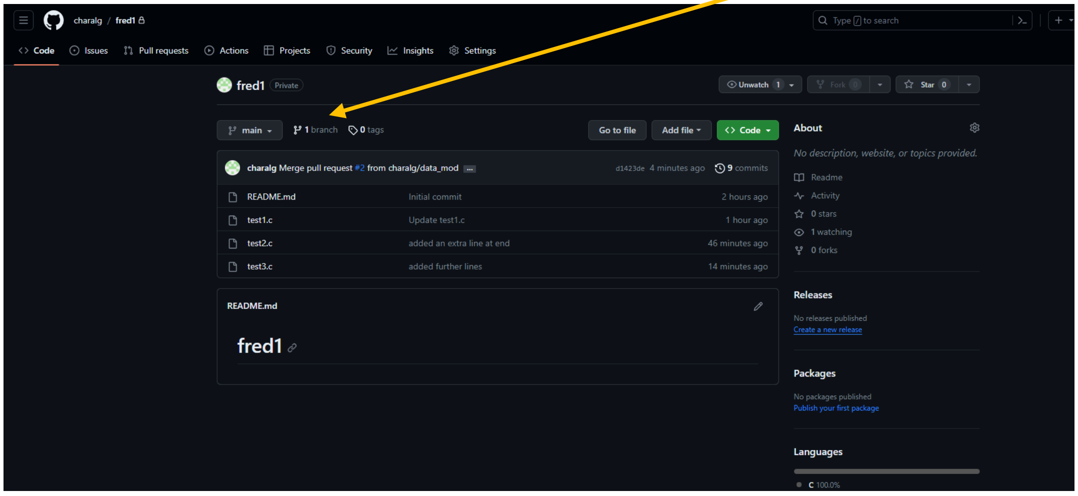
```
added an extra line at end        11ef2d2
new file                          e2be048
Update test3.c           Verified f9c5f3f
added further lines               86af8de
```

charalg merged commit d1423de into main 2 minutes ago

charalg deleted the data_mod branch 1 minute ago

Go back to you main repository (click on its name e.g. fred1)

In the code tab of GitHub we now only have 1 branch with the merged files



charalg Merge pull request #2 from charalg/data_mod … d1423de 4 minutes ago 9 commits

README.md	Initial commit	2 hours ago
test1.c	Update test1.c	1 hour ago
test2.c	added an extra line at end	46 minutes ago
test3.c	added further lines	14 minutes ago

README.md

fred1

No description, website, or topics provided.

No releases published

No packages published

Locally move back to main and update

```
charalg@compute0:~/L7SDE23/FRED$ git checkout main
Switched to branch 'main'
Your branch is up-to-date with 'origin/main'.
charalg@compute0:~/L7SDE23/FRED$ git pull
Username for 'https://github.com': charalg@wmin.ac.uk
Password for 'https://charalg@wmin.ac.uk@github.com': <paste pass code here>
remote: Enumerating objects: 1, done.
remote: Counting objects: 100% (1/1), done.
remote: Total 1 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (1/1), 617 bytes | 44.00 KiB/s, done.
From https://github.com/charalg/fred1
   cdc3d06..d1423de  main       -> origin/main
Updating cdc3d06..d1423de
Fast-forward
 test2.c | 1 +
 test3.c | 5 +++++
 2 files changed, 6 insertions(+)
 create mode 100644 test3.c
charalg@compute0:~/L7SDE23/FRED$
```

finally, to delete a local branch use `git branch -d <branch name>`

```
charalg@compute0:~/L7SDE23/FRED$ git branch -d data_mod
Deleted branch data_mod (was 86af8de).
charalg@compute0:~/L7SDE23/FRED$
```

list the files locally using ls

```
charalg@compute0:~/L7SDE23/FRED$ ls
README.md  test1.c  test2.c  test3.c
charalg@compute0:~/L7SDE23/FRED$
```