



Introduction to the use of GitHub and its applications in bioinformatics

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WHAT IS GIT?

GIT VS GITHUB



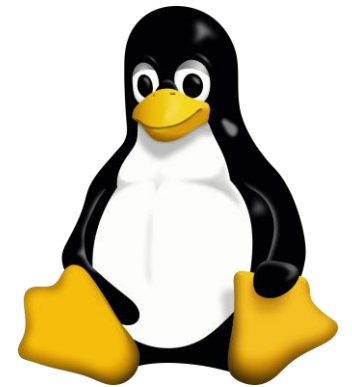
- Open-source version control system
- CLI
- Manage files & directories
- Track changes
- Ctrl + Z to previous versions

WHAT IS GIT?

GIT VS GITHUB



- Open-source version control system
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Alternatives



WHAT IS GIT?

GIT VS GITHUB



- Open-source version control system
- CLI
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- Ctrl + Z to previous versions

```
MINGW64/c/Users/Adrian.m... X + v
PT-IMD-86+Adrian.martin@PT-IMD-86 MINGW64 ~/GitHub/Khawaja_et_al_2023 (main)
$ git log
commit 6d787fb1260cadd69e5c9a7b9adcc75105c96c28 (HEAD -> main, origin/main, origin/HEAD)
Author: amsegura <adrian.martinsegura@pm.me>
Date: Thu Apr 18 22:40:06 2024 +0200

    Lung removed, interactive UMAP for IF.

commit eebc2c0943f0007d1308c205ee07b4b12266fb78
Merge: b108c59 9abf305
Author: Amsegura <84419385+amsegura@users.noreply.github.com>
Date: Tue Apr 16 00:19:00 2024 +0200

    Merge pull request #1 from amsegura/alternatives

    Figures V3

commit 9abf305ac0271459cfab19f9fa55d5491f5a3fe1
Author: amsegura <adrian.martinsegura@pm.me>
Date: Tue Apr 16 00:03:38 2024 +0200

    Last data update (heart area correction)

commit f849e71c618974964a0dffe732b90bbf1bdf198d
Author: amsegura <adrian.martinsegura@pm.me>
Date: Fri Mar 15 15:53:08 2024 +0100

    1st explanatory calculations
```



Bash terminal to use Git on windows

WHAT IS GIT?

GIT VS GITHUB



- Open-source version control system
- CLI
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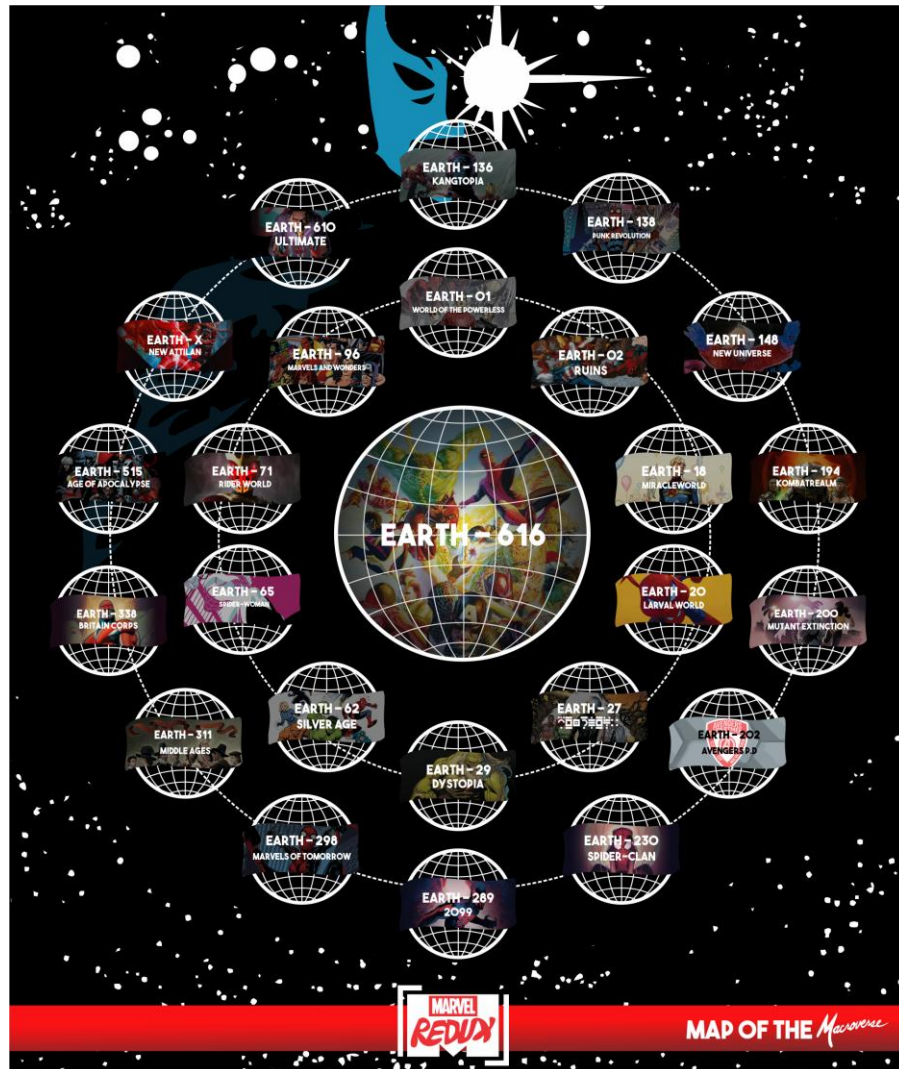


- Online hosting service for Git repos
- Collaboration hub



Why GitHub? What is the advantage?

Multiple versions & further merge

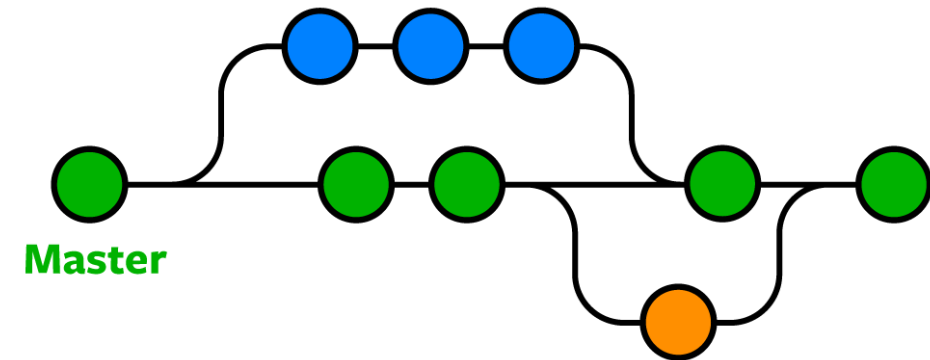


Why GitHub? What is the advantage?

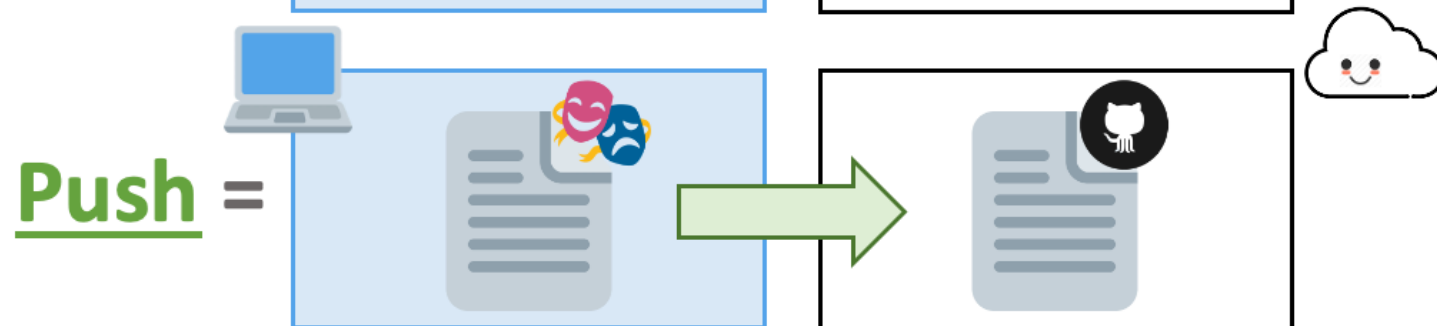
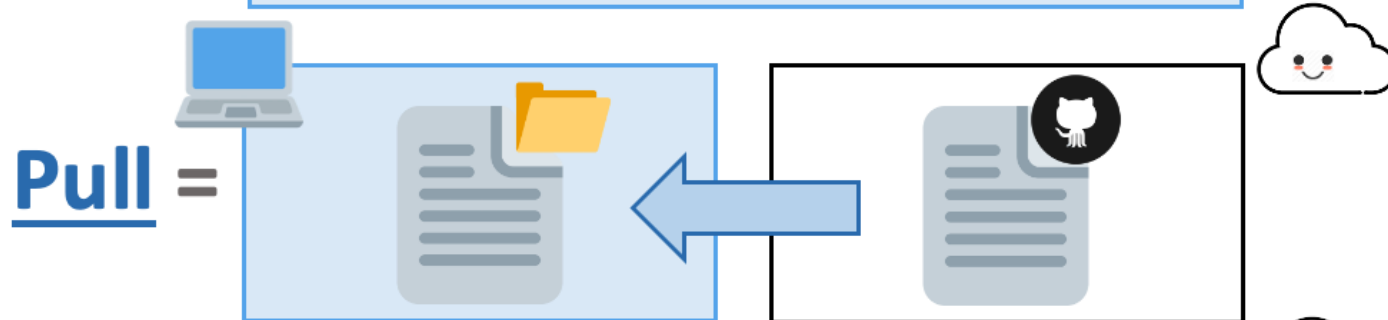
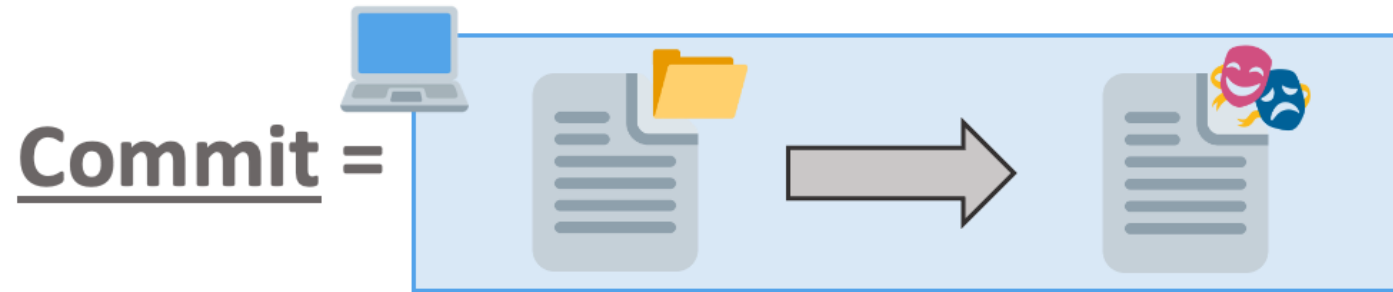
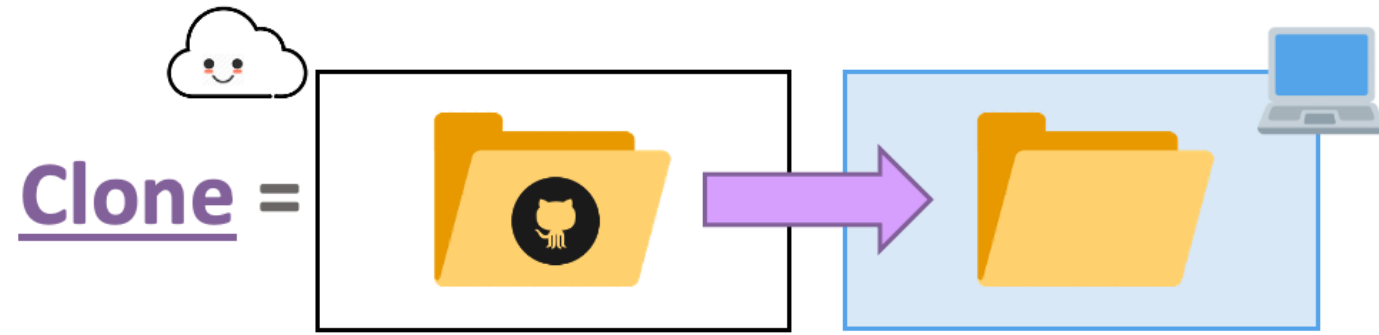
Multiple versions & further merge



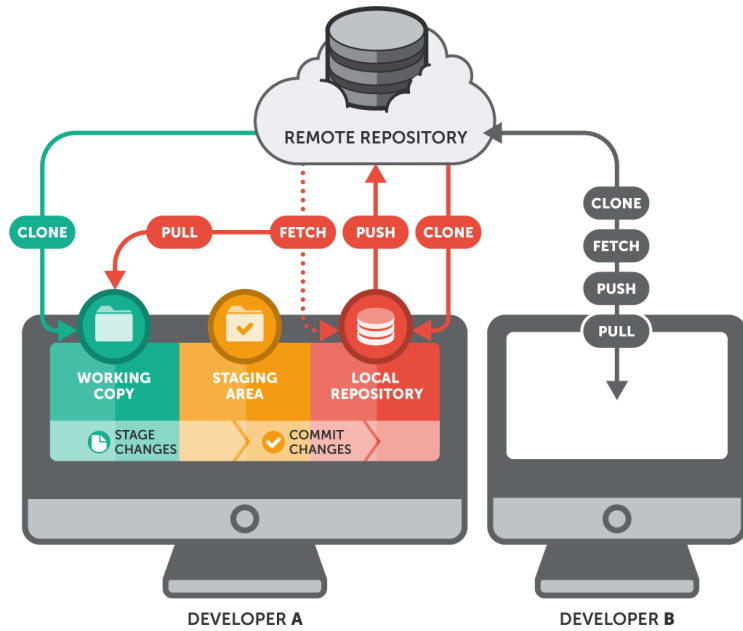
Your Work



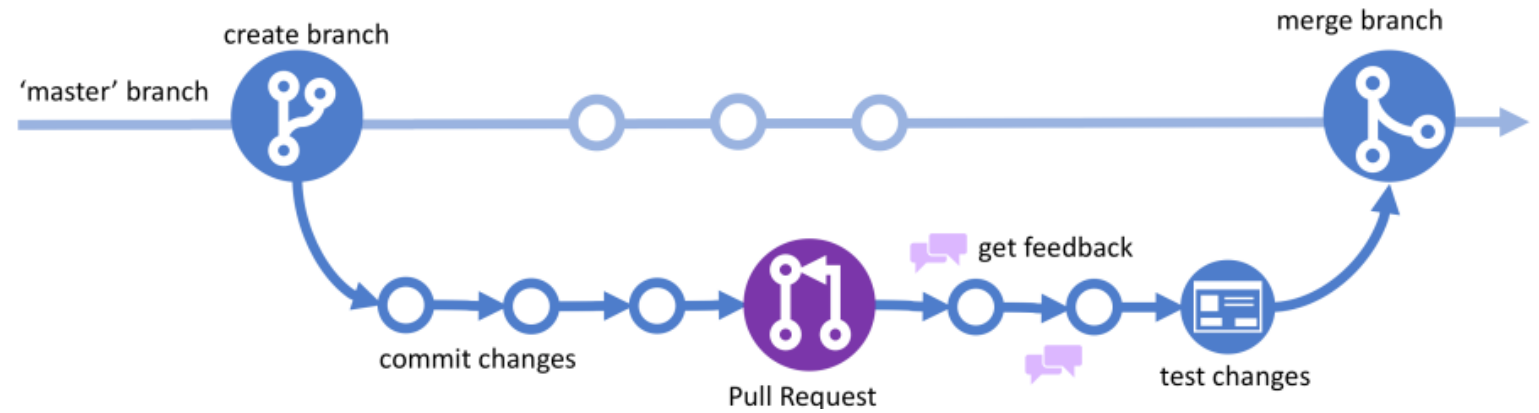
Someone Else's Work



Basic GitHub terms



GitHub Flow





Create a repository



```
cd route/to/your/directory
echo "# My first GitHub repo" >> README.md
git init
git add README.md
git commit -m "first commit"
git branch -M main
git remote add origin https://github.com/username/repo_name.git
git push -u origin main
```

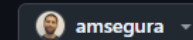
At this point it will ask you for a username and a password for pushing.

Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository](#).
Required fields are marked with an asterisk (*).

1 General

Owner *



Repository name *

Great repository names are short and memorable. How about **stunning-chainsaw**?

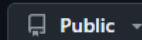
Description

0 / 350 characters

2 Configuration

Choose visibility *

Choose who can see and commit to this repository



Add README

READMEs can be used as longer descriptions. [About READMEs](#)

Off ☐

Add .gitignore

.gitignore tells git which files not to track. [About ignoring files](#)

No .gitignore

Add license


Licenses explain how others can use your code. [About licenses](#)





No license




Create repository



Create a repository






 **Training_repo** Public



 Pin  Watch 0  Fork 0  Star 0

 main  1 Branch  0 Tags

 Add file  Code

 **amsegura** Initial commit a97dc4a · now  1 Commit

 README.md Initial commit now






 **README** 

Training_repo

Example repo for UAM bioinformatics master class (Oct 25)

About

Example repo for UAM bioinformatics master class (Oct 25)

-  Readme
-  Activity
-  0 stars
-  0 watching
-  0 forks

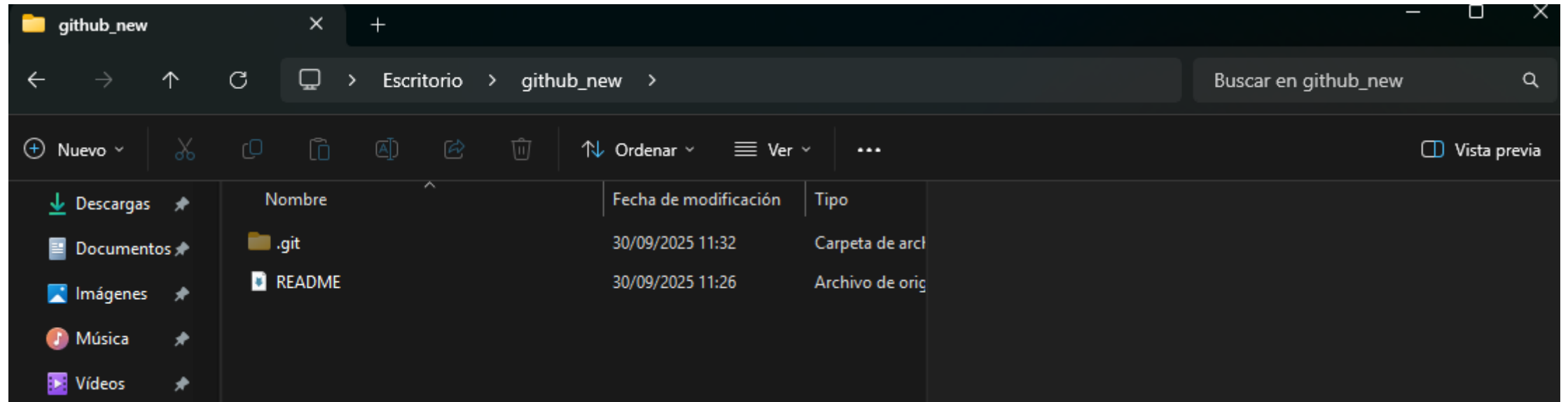
Releases

No releases published
[Create a new release](#)

Packages

No packages published
[Publish your first package](#)

Create a repository



Create a new branch

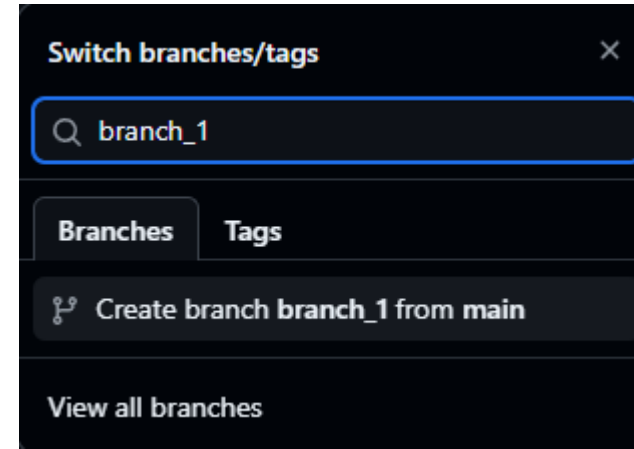


```
git branch branch_name # Create a new branch
git checkout branch_name # Move to new branch

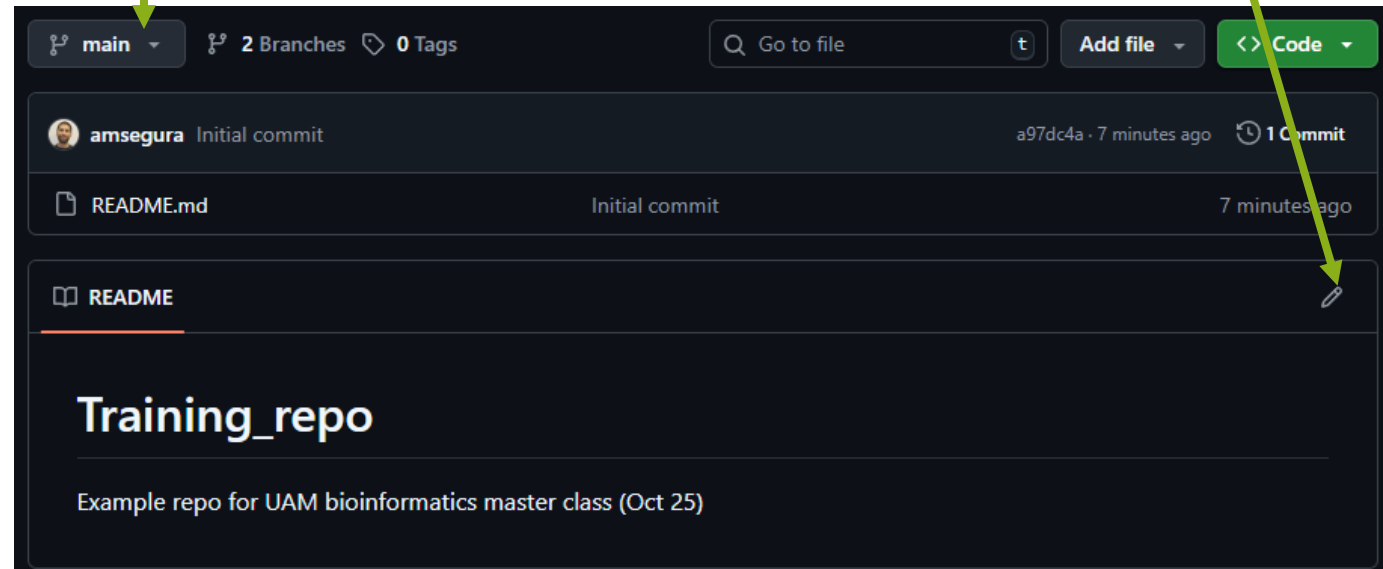
# One-step command
git checkout -b branch_name
```

```
PT-IMD-86+Adrian.martin@PT-IMD-86 MINGW64 ~/Desktop/github_new (branch_1)
$ |
```

Check & change
branches



Edit README



Modify Branch (commit)

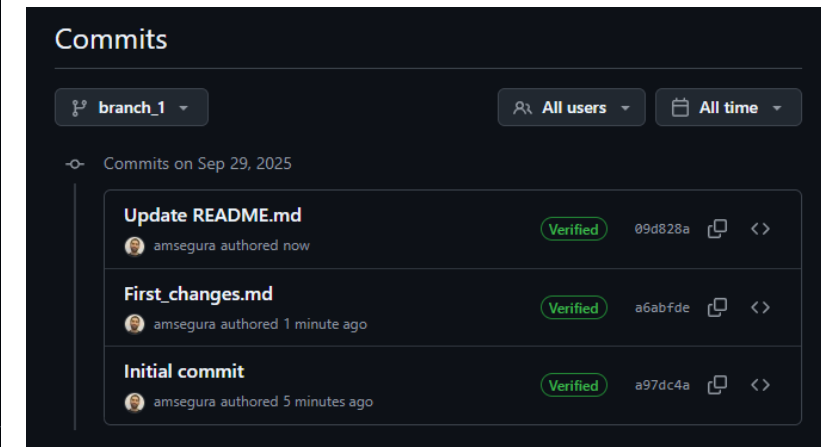
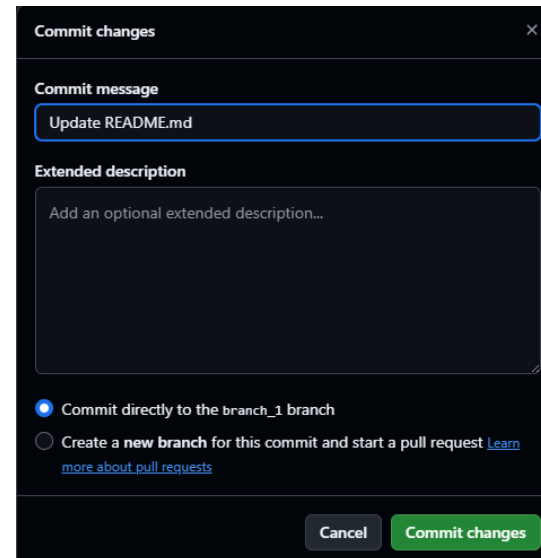



```
PT-IMD-86+Adrian.martin@PT-IMD-86 MINGW64 ~/Desktop/github_new (branch_1)
$ git branch
* branch_1
  main
```

```
git branch # Check branch
nano README.md # Edit README
git add README.md # Stage changes
git commit -m "Updating README.md via terminal"
git push -u origin branch_1 # Creating branch_1 remotely
```


Make changes



Commit




 **branch_1** had recent pushes 3 seconds ago

Compare & pull request

 **branch_1** ▾

 **2 Branches**  **0 Tags**


 Go to file


t


Add file ▾


<> Code ▾

This branch is 3 commits ahead of `main`.

 Contribute ▾


 **amsegura** example file uploaded

043331e · now  **4 Commits**

 README.md


Update README.md

6 minutes ago

 example.xlsx

example file uploaded

now

 **README**



Training_repo

Initial readme modified.

Uploading database in xlsx format, named "example.xlsx".

Checking changes

Click on the commit



Commits

branch_1 ▾ All users ▾ All time ▾

Commits on Sep 29, 2025

Update README.md	Verified	09d828a	📄 <>
amsegura authored now			
First_changes.md	Verified	a6abfde	📄 <>
amsegura authored 1 minute ago			
Initial commit	Verified	a97dc4a	📄 <>
amsegura authored 5 minutes ago			

Commit a6abfde

📄 Browse files

amsegura authored 1 minute ago Verified

First_changes.md

branch_1

1 parent a97dc4a commit a6abfde 📄

Filter files...



README.md

1 file changed +3 -1 lines changed

Search within code



README.md 📄

+3 -1



```
@@ -1,2 +1,4 @@
1 1 # Training_repo
2 - Example repo for UAM bioinformatics master class (Oct 25)
2 + Initial readme modified.
3 +
4 + Uploading database in xlsx format.
```

Checking changes



```
git log # Check commits
git show HEAD # Last commit
git show <hash_del_commit> # Specific commit
```

```
PT-IMD-86+Adrian.martin@PT-IMD-86 MINGW64 ~/Desktop/github_new (branch_1)
$ git log
commit 81bdff57154d2eeb1b3760a973c5f9180eb44d7a (HEAD -> branch_1, origin/branch_1)
Author: unknown <Adrian.martin@PT-IMD-86.IMDEAALI.local>
Date: Tue Sep 30 11:47:30 2025 +0200
```

Updating README.md via terminal

```
commit aaf757c7171d1f80d38af2027f5c57d22dc815e4 (origin/main, main)
Author: unknown <Adrian.martin@PT-IMD-86.IMDEAALI.local>
Date: Tue Sep 30 11:26:56 2025 +0200
```

first commit

```
PT-IMD-86+Adrian.martin@PT-IMD-86 MINGW64 ~/Desktop/github_new (branch_1)
$ git show HEAD
commit 81bdff57154d2eeb1b3760a973c5f9180eb44d7a (HEAD -> branch_1, origin/branch_1)
Author: unknown <Adrian.martin@PT-IMD-86.IMDEAALI.local>
Date: Tue Sep 30 11:47:30 2025 +0200
```


Updating README.md via terminal

```
diff --git a/README.md b/README.md
index 628d698..991b537 100644
--- a/README.md
+++ b/README.md
@@ -1,5 @@
 # This is my first GitHub repo
+
+Introducing changes in branch_1.
+
+Proceed to merge them using pull request.
```




You can use Tig(requires installation)



Pull request






 **branch_1** had recent pushes 12 minutes ago



Compare & pull request

 **main**  **2 Branches**  **0 Tags**

Go to file  Add file  Code

 **unknown** and **unknown** first commit aaf757c · 32 minutes ago  **1 Commit**

 README.md first commit 32 minutes ago

 README 

This is my first GitHub repo

Pull request



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: branch_1



Add a title

Merging branch_1

Add a description

Write

Preview

H

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📁

↩

📄

Hey, I just uploaded the excel file. Include it the main branch please

Markdown is supported

Paste, drop, or click to add files

Create pull request



Remember, contributions to this repository should follow our [GitHub Community Guidelines](#).

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

Helpful resources

[GitHub Community Guidelines](#)

Pull request



Merging branch_1 #1

Open amsegura wants to merge 3 commits into `main` from `branch_1`

Conversation **0** Commits **3** Checks **0** Files changed **2**

amsegura commented now

Owner ...

Hey, I just uploaded the excel file. Include it the main branch please

amsegura added 3 commits 12 minutes ago

First_changes.md

Verified a6abfde

Update README.md

Verified 09d828a

example file uploaded

Verified 043331e

No conflicts with base branch
Merging can be performed automatically.

Merge pull request

▼

You can also merge this with the command line. [View command line instructions.](#)

Add a comment

Write

Preview

H B I

Pull request



Changes from 1 commit ▾ File filter ▾ Conversations ▾ Jump to ▾ ⚙ ▾

Update README.md

branch_1 (#1)

amsegura authored 12 minutes ago Verified

2 README.md

...	...	@@ -1,4 +1,4 @@
1	1	+ # Training_repo
2	2	Initial readme modified.
3	3	
4		- Uploading database in xlsx format.
4		+ Uploading database in xlsx format, named "example.xlsx".

Commit message

Merge pull request #1 from amsegura/branch_1

Extended description

Merging branch_1 done

This commit will be authored by 84419385+amsegura@users.noreply.github.com.

Confirm merge Cancel

Pull request



Changes from 1 commit ▾ File filter ▾ Conversations ▾ Jump to ▾ ⚙ ▾

Update README.md

🔑 **branch_1** (#1)

amsegura authored 12 minutes ago Verified

2 README.md

...	...	@@ -1,4 +1,4 @@
1	1	+ # Training_repo
2	2	Initial readme modified.
3	3	
4		- Uploading database in xlsx format.
	4	+ Uploading database in xlsx format, named "example.xlsx".

amsegura merged commit **df98cad** into **main** now Revert

Pull request successfully merged and closed Delete branch

You're all set — the **branch_1** branch can be safely deleted.

Active branches

Branch	Updated	Check status	Behind Ahead	Pull request	
branch_1	9 minutes ago		1 0	#1	...

Pull request



```
git checkout main # Move to main branch
git pull origin main # Update main from remote
git merge branch_1 # Add branch 1 changes to main
```

Git Will let you now if there are conflicts.
Resolve them manually.

```
git add conflicted_file # Stage conflicted file
git commit -m "Solving conflicts and merging branch_1 on main"
git push origin main # Update main on remote
```

Clone repo



```
MINGW64/c/Users/Adrian.mi X + v
PT-IMD-86+Adrian.martin@PT-IMD-86 MINGW64 ~/Desktop/Clase
$ git clone https://github.com/amsegura/Training_repo
```

```
MINGW64/c/Users/Adrian.mi X + v
PT-IMD-86+Adrian.martin@PT-IMD-86 MINGW64 ~/Desktop/Clase
$ git clone https://github.com/amsegura/Training_repo
Cloning into 'Training_repo'...
remote: Enumerating objects: 13, done.
remote: Counting objects: 100% (13/13), done.
remote: Compressing objects: 100% (10/10), done.
remote: Total 13 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (13/13), 11.00 KiB | 3.67 MiB/s, done.
Resolving deltas: 100% (1/1), done.

PT-IMD-86+Adrian.martin@PT-IMD-86 MINGW64 ~/Desktop/Clase
$ |
```

