1st CCU Workshop on Git and VS Code Integration

Today’s Schedule

Git Fundamentals

VS Code Integration with Git

Break – Questions time

Hands on Lab

Conflicts

You might remember me from ...

You might remember me from ...

Data analysis meetings began in 2022 with Jacob Davidson and myself as organizers

Jacob Davidson

Daniel S. Calovi

IMPRS – Introduction to Scientific Coding workshop

The Data Science Consultancy

Join our CASCB Slack channel

Schedule a meeting with me

Why are we offering this workshop?

Documentation/Versioning - Git is the industry/academia standard for documentation and versioning nowadays

- *“Almost 95% of developers reported using Git as their primary version control system”*

Code sharing – When working on large projects, sharing your code, tool or analysis becomes extremely likely, Git will help with synchronization while working with others

- Portfolio/Publishing – Even when not collaborating, a GitHub account will serve as your portfolio or location to publish algorithms that you publish.

Data Management Plan – One can think of Git as the first step to organizing your project and building a data management plan to have everything securely backed up

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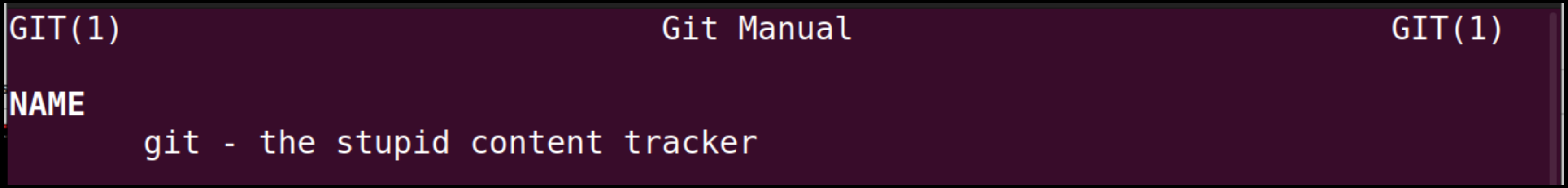
Data Management Plan – One can think of Git as the first step to organizing your project and building a data management plan to have everything securely backed up

Contact Ilja Werner for creating your DMP

Don’t forget to create a Data Management Plan

What is Git?



```
GIT(1)                     Git Manual                     GIT(1)

NAME
       git - the stupid content tracker
```

“Git is a distributed version control system that tracks versions of files. It is often used to control source code by programmers who are developing software collaboratively.”

Git was created by Linus Torvalds to be used in the development of Linux (which he is also the creator)

Unlike other Version control systems, Git uses snapshots instead of just difference files

Git is local, you don’t actually need to host any of your Git projects online

Git generally only adds Data (and it’s difficult to really delete things once published)

- **Never upload a password or sensitive information to to a repository**

Git Terminology

Add / stage – Adding a file to be tracked

- turning track changes on

Commit – Creating the snapshot of your project's current state

- Track changes via snapshots, not in real time

Branch – A branch allows you to develop new features or test changes independently from the last stable version

Fork – Related to a branch, a fork is a personal copy of another user's repository that resides in your GitHub account.

Merge – Merging combines the changes from one branch into another, synchronizing them

Clone – Cloning creates a local copy of a remote repository on your machine, including its entire history

- Differs from Fork since it does it locally and not in your GitHub account

Git Terminology

Workspace – current working directory

Local Repository – The commits that are in your local machine, but not yet pushed to a Remote Repository

Remote/Remote Repository – A repository hosted online (*e.g.* GitHub)

Master/Main – Default branch

Origin – Name given to a Remote repository that was cloned

Git basic commands

Git init – Initializes a new Git repository in the current folder, creating a .git subfolder

Git add – Adds (Stages) files to be tracked (new, modified, or deleted files)

Git commit – Creates a snapshot of the tracked (staged) files along with a log/description given by the user

Git status – Shows the current status of the working folder, listing staged changes, files not being tracked, etc

Git log – Displays a log of commits, showing the commit history along with details like author, date, and commit message.

Git clone – Creates a local copy of an existing remote repository on your machine.

Git branch – Manages branches; use it to list, create, or delete branches in your repository.

Git checkout – Switches between branches or restores files to a previous state.

Git merge – Integrates changes from one branch into another.

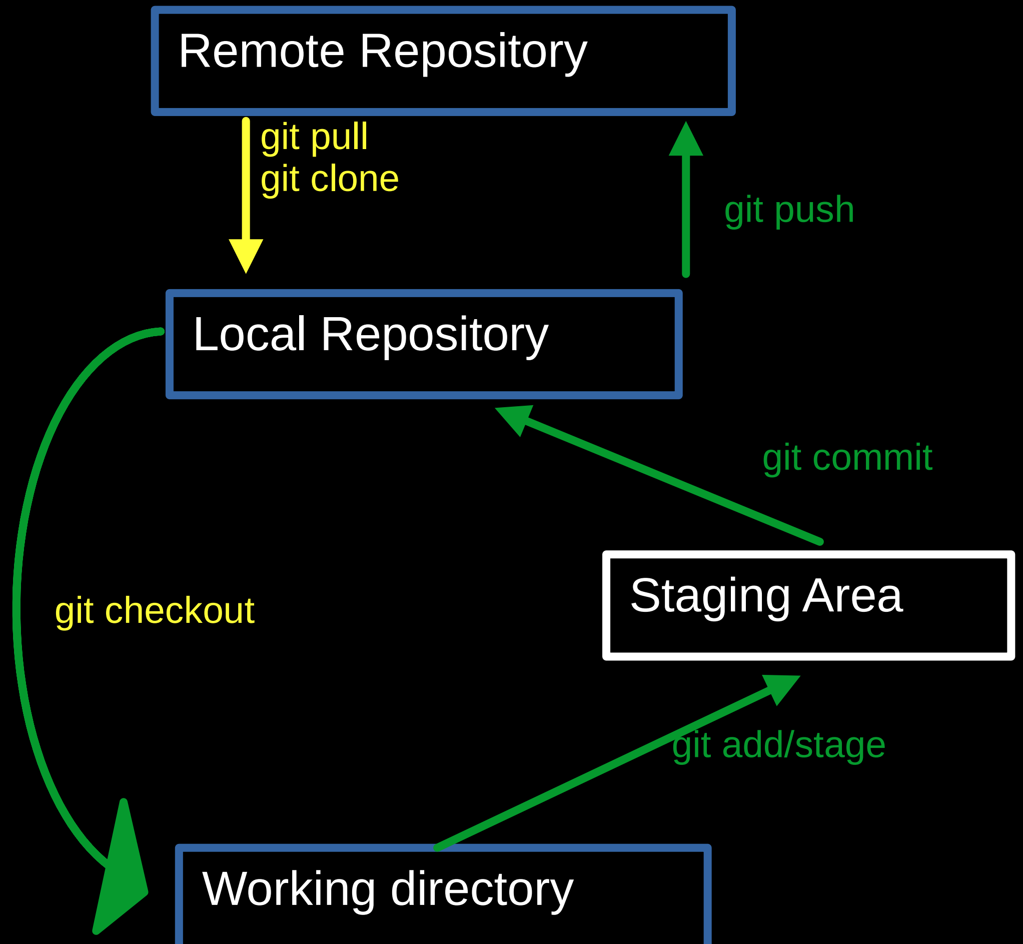
Git push – Uploads your local commits to a remote repository.

Git Logic

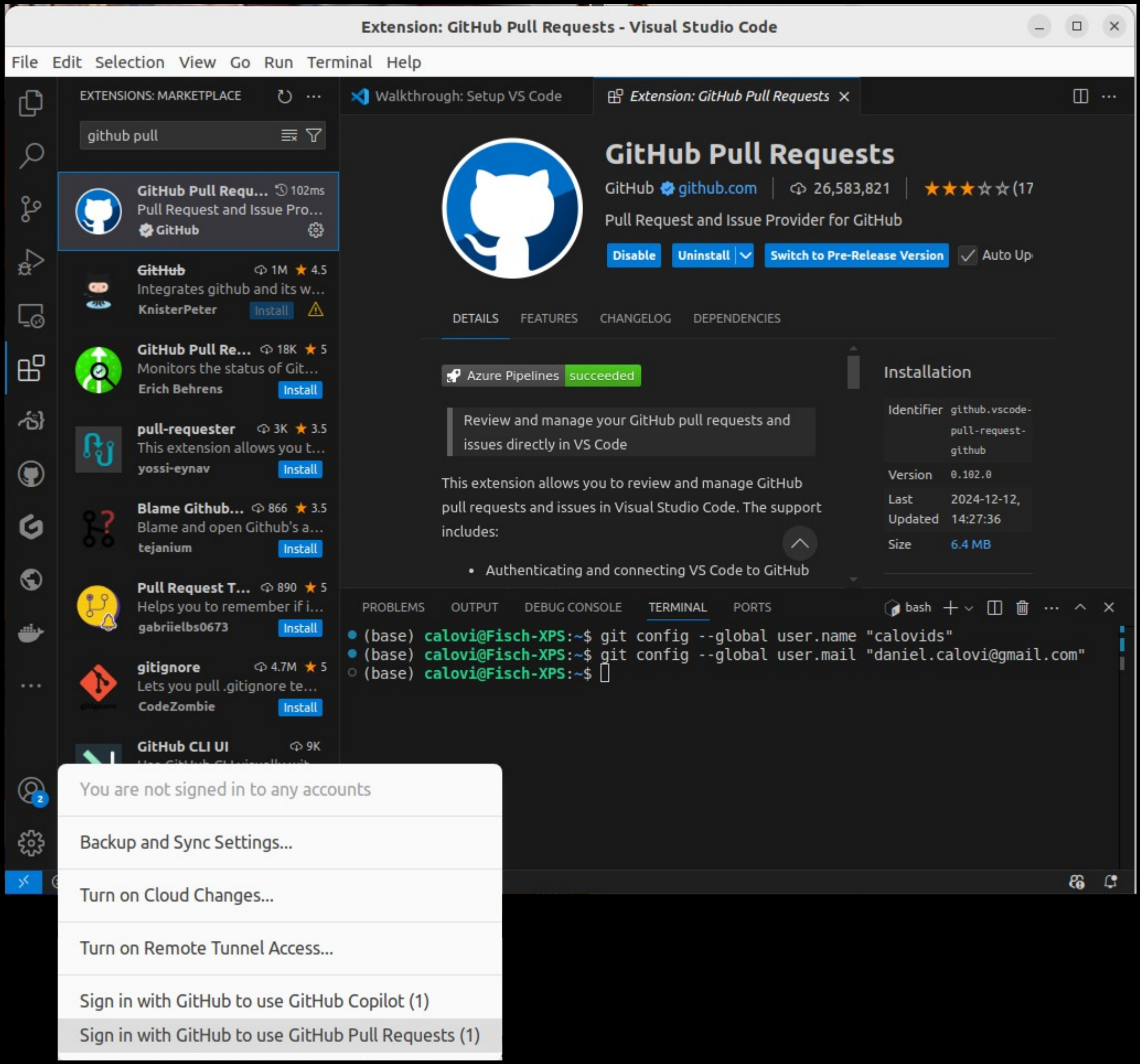
One can start their logic at any blue box

Green commands and arrows are the standard flow of actions

Yellow arrows and commands are possible (but not essential) paths



VS Code Extensions


Extension: GitHub Pull Requests - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXTENSIONS: MARKETPLACE
github pull
Walkthrough: Setup VS Code
Extension: GitHub Pull Requests
Disable
Uninstall
Switch to Pre-Release Version
Auto Up
DETAILS FEATURES CHANGELOG DEPENDENCIES
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash

Extension	Downloads	Rating	Description	Publisher
GitHub Pull Requ…	102ms		Pull Request and Issue Pro…	GitHub
~~GitHub~~	1M	4.5	Integrates github and its w…	KnisterPeter
GitHub Pull Re…	18K	5	Monitors the status of Git…	Erich Behrens
pull-requester	3K	3.5	This extension allows you t…	yossi-eynav
Blame Github…	866	3.5	Blame and open Github's a…	tejanium
Pull Request T…	890	5	Helps you to remember if i…	gabriielbs0673
gitignore	4.7M	5	Lets you pull .gitignore te…	CodeZombie
GitHub CLI UI	9K			

GitHub Pull Requests

GitHub github.com | 26,583,821 | ★★★☆☆ (17

Pull Request and Issue Provider for GitHub

Azure Pipelines succeeded

Review and manage your GitHub pull requests and issues directly in VS Code

This extension allows you to review and manage GitHub pull requests and issues in Visual Studio Code. The support includes:

- Authenticating and connecting VS Code to GitHub

Installation

Identifier	github.vscode-pull-request-github
Version	0.102.0
Last Updated	2024-12-12, 14:27:36
Size	6.4 MB

```
(base) calovi@Fisch-XPS:~$ git config --global user.name "calovids"
(base) calovi@Fisch-XPS:~$ git config --global user.mail "daniel.calovi@gmail.com"
(base) calovi@Fisch-XPS:~$ 
```

You are not signed in to any accounts

Backup and Sync Settings...

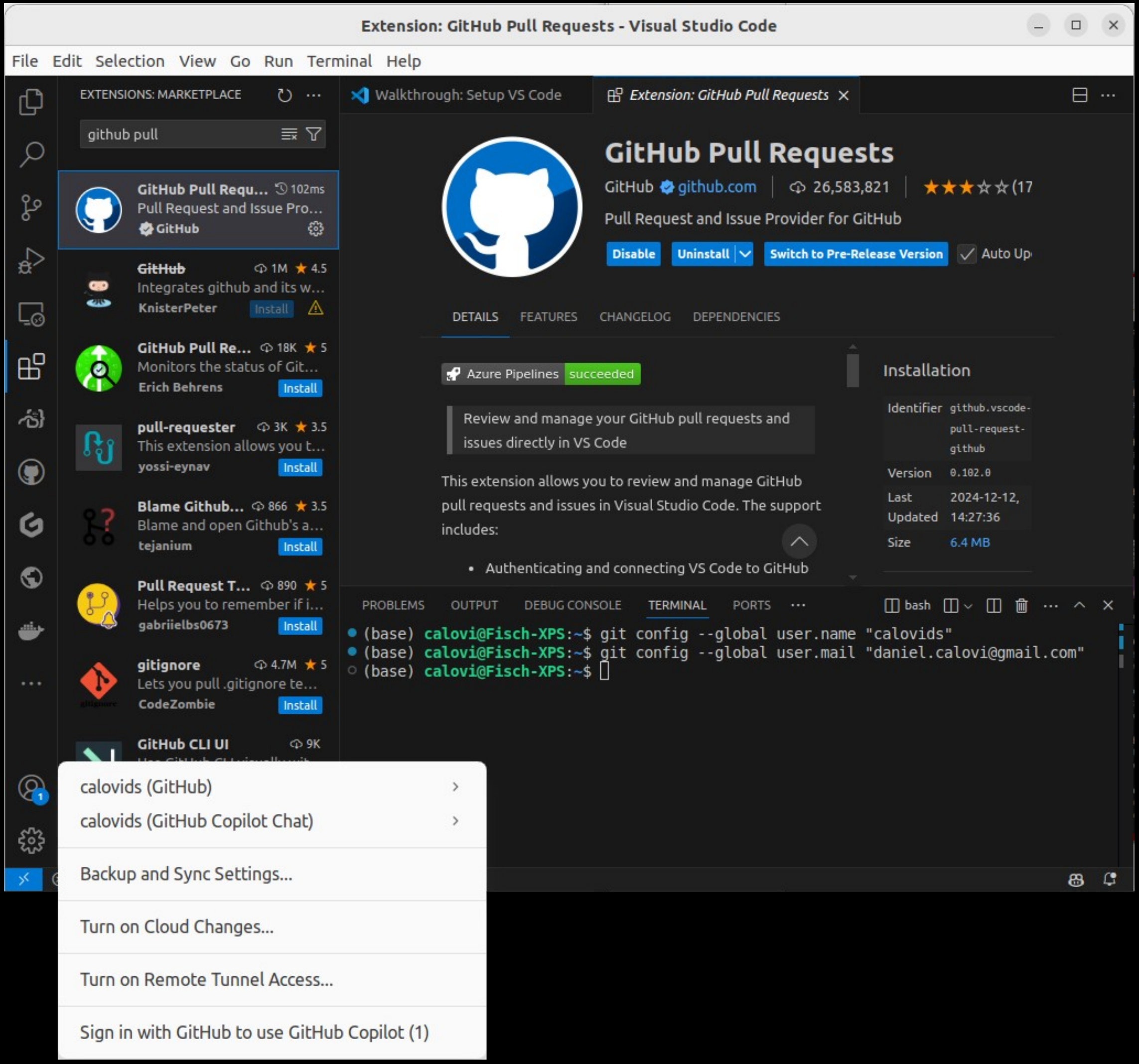
Turn on Cloud Changes...

Turn on Remote Tunnel Access...

Sign in with GitHub to use GitHub Copilot (1)

Sign in with GitHub to use GitHub Pull Requests (1)

Setting up Git in VS Code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GitHub github.com 26,583,821
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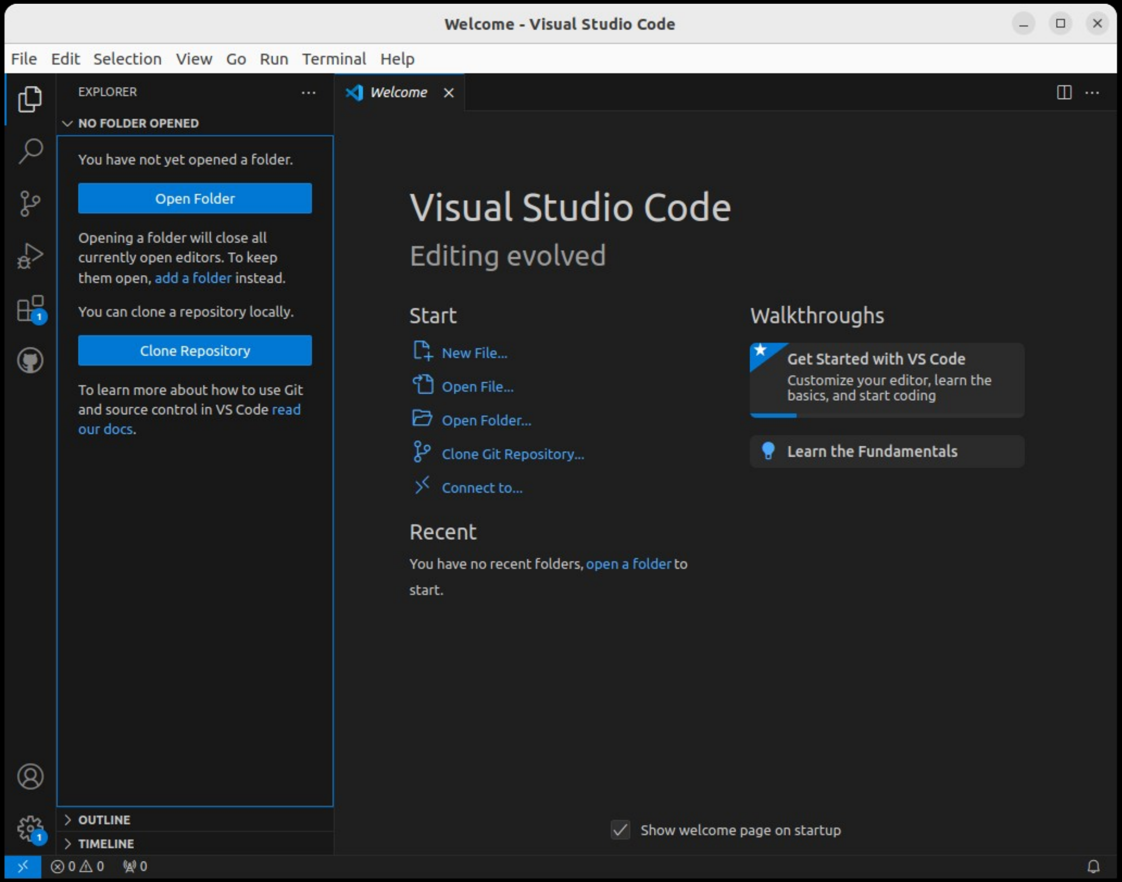
DETAILS FEATURES CHANGELOG DEPENDENCIES
Installation
calovids (GitHub)
calovids (GitHub Copilot Chat)
Backup and Sync Settings...
Turn on Cloud Changes...
Turn on Remote Tunnel Access...
Sign in with GitHub to use GitHub Copilot (1)

```
(base) calovi@Fisch-XPS:~$ git config --global user.name "calovids"
(base) calovi@Fisch-XPS:~$ git config --global user.mail "daniel.calovi@gmail.com"
(base) calovi@Fisch-XPS:~$
```

Creating a new project (create/open a folder)



You have not yet opened a folder.

Opening a folder will close all currently open editors. To keep them open, add a folder instead.

You can clone a repository locally.

To learn more about how to use Git and source control in VS Code read our docs.

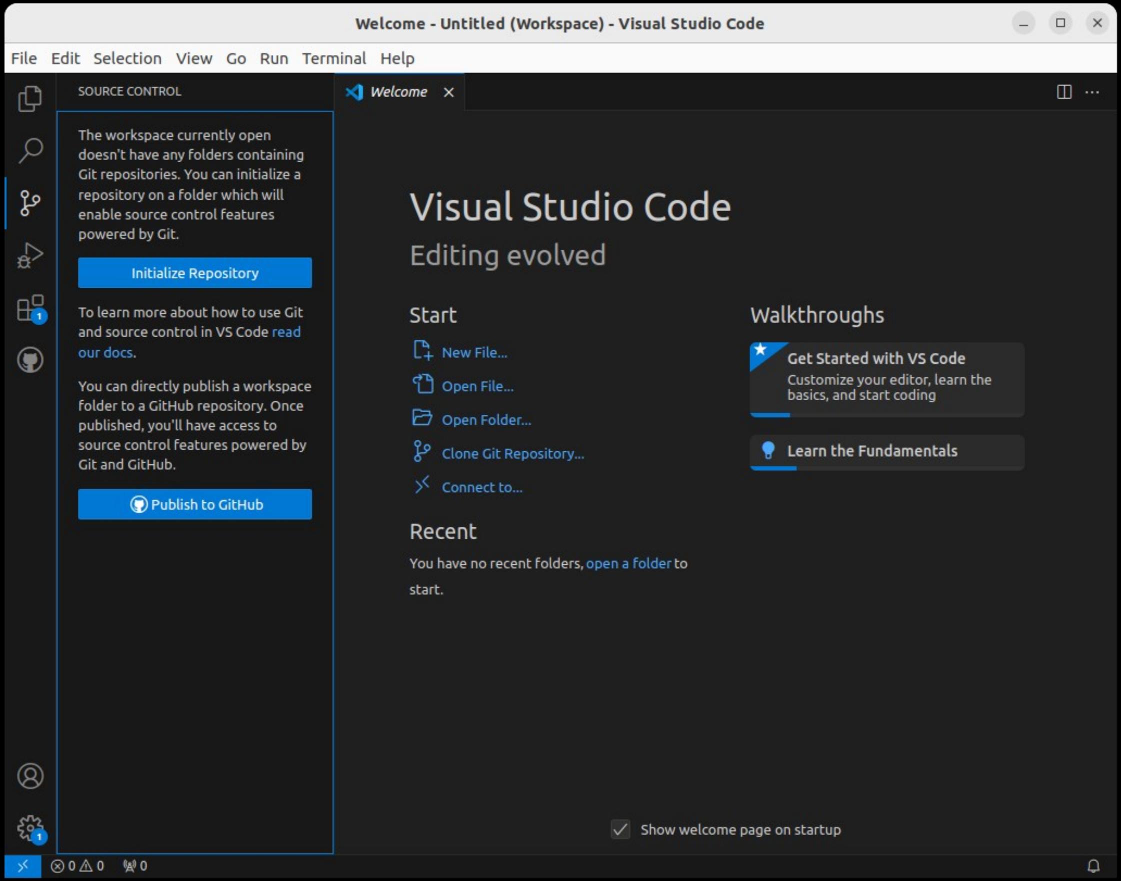
Visual Studio Code

Editing evolved

Customize your editor, learn the basics, and start coding

You have no recent folders, open a folder to start.

Initialize Repository (git init)


Welcome - Untitled (Workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help
SOURCE CONTROL
Welcome

The workspace currently open doesn't have any folders containing Git repositories. You can initialize a repository on a folder which will enable source control features powered by Git.

To learn more about how to use Git and source control in VS Code read our docs.

You can directly publish a workspace folder to a GitHub repository. Once published, you'll have access to source control features powered by Git and GitHub.

You have no recent folders, open a folder to start.

Walkthroughs
Get Started with VS Code
Customize your editor, learn the basics, and start coding
Learn the Fundamentals
Show welcome page on startup

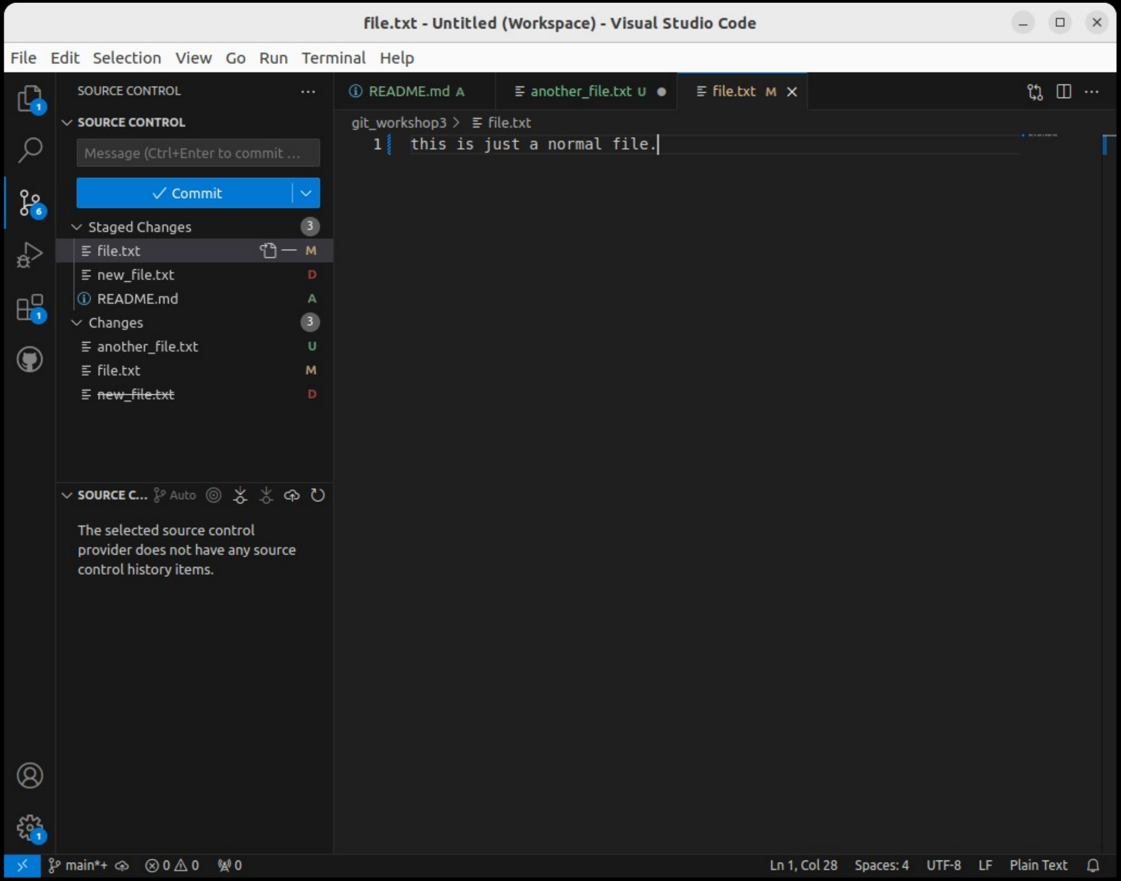
Staging and Source Control Panel

U for untracked

M for modified

A for added

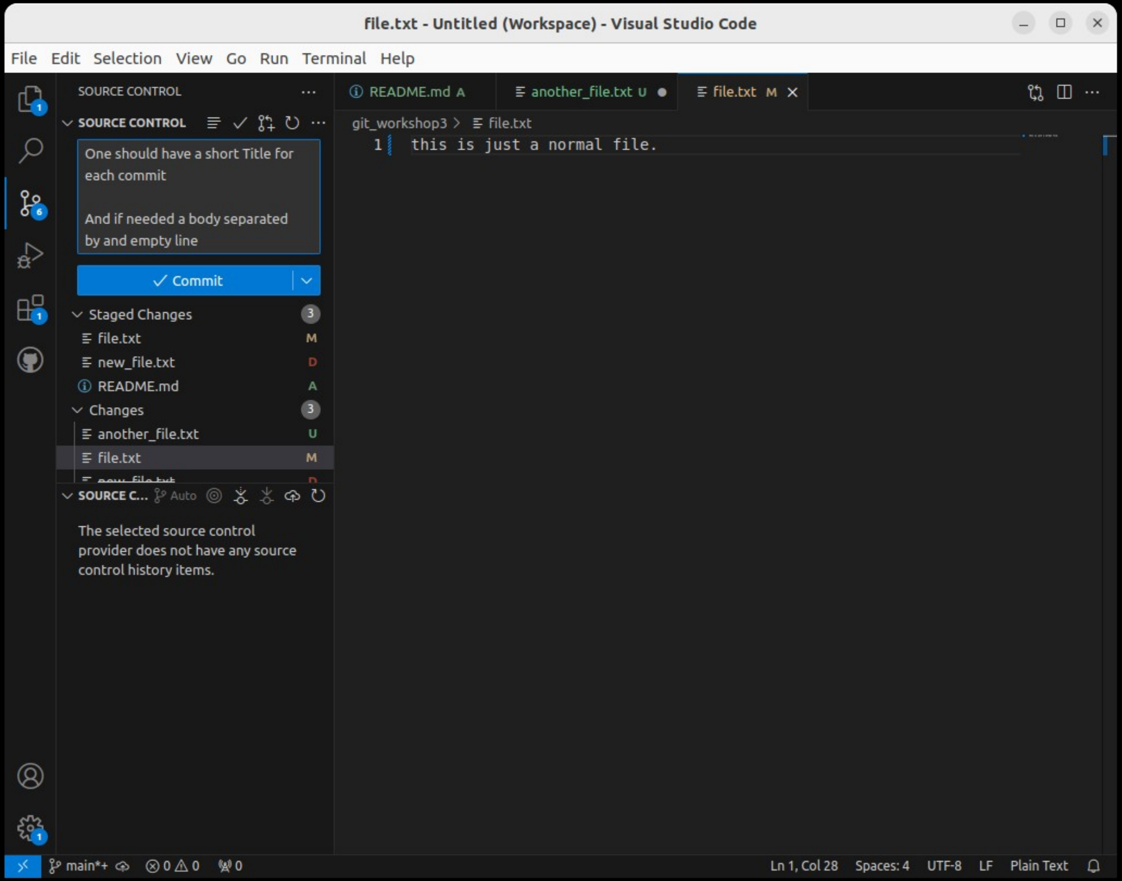
D for deleted



```
this is just a normal file.
```

The selected source control provider does not have any source control history items.

Commit



One should have a short Title for each commit

And if needed a body separated by and empty line

```
this is just a normal file.
```

The selected source control provider does not have any source control history items.

Effective use of git commit

Commit often – Regular commits help reducing the risk of conflicts

(Try to) Commit one feature at a time – Group single logical changes to a single commit

Avoid committing incomplete work – Only commit once you finished a feature

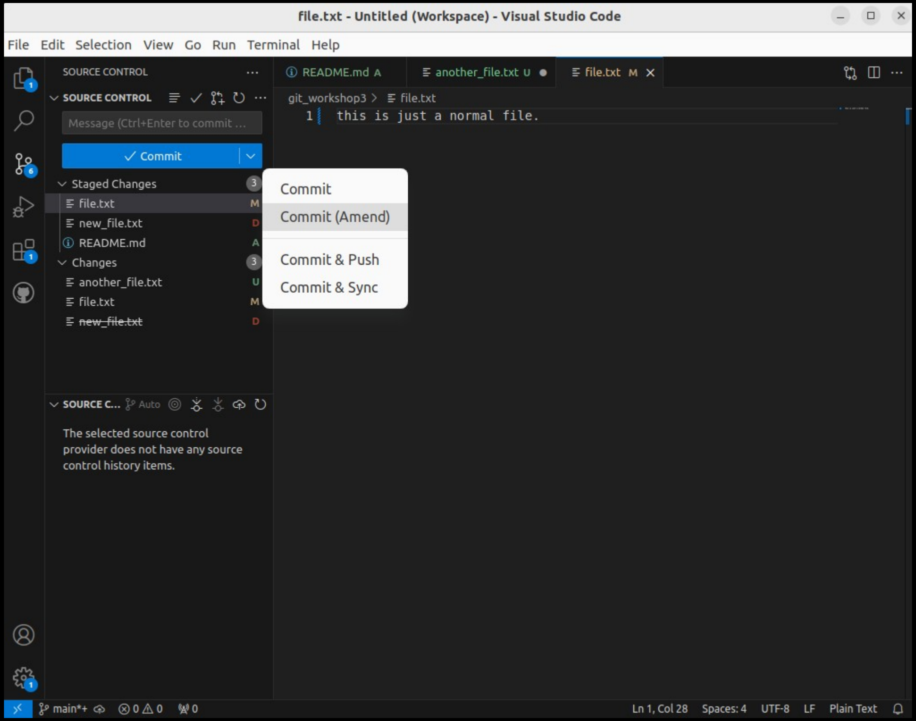
- Use stashing to avoid loosing progress without committing
- Use Branches if a new feature is needed while another one is still in development

Write clear commit Messages

- Short subjects
- Separate a body from the subject by adding a blank line

Commit Amend is your friend – Just submitted and there were files or changes missing?

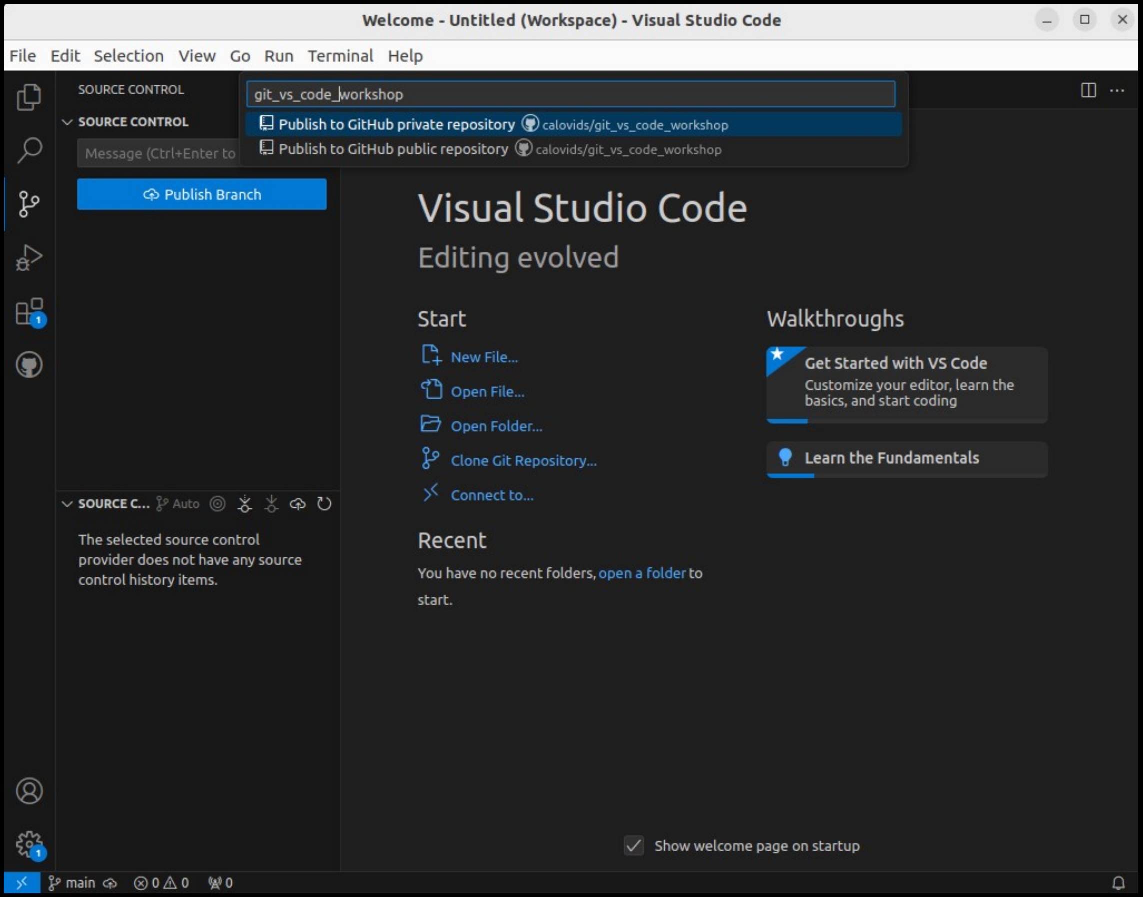
- $ git commit -m 'Initial commit'
- $ git add forgotten_file
- $ git commit --amend



```
this is just a normal file.
```

The selected source control provider does not have any source control history items.

Publish (pushing for the 1st time)


Welcome - Untitled (Workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help
SOURCE CONTROL
SOURCE CONTROL
Message (Ctrl+Enter to
Publish Branch
SOURCE C... Auto
main
0 0
0

git_vs_code_workshop

Publish to GitHub private repository calovids/git_vs_code_workshop

Publish to GitHub public repository calovids/git_vs_code_workshop

The selected source control provider does not have any source control history items.

Visual Studio Code

Editing evolved

Start

New File...

Open File...

Open Folder...

Clone Git Repository...

Connect to...

Recent

You have no recent folders, open a folder to start.

Walkthroughs

Get Started with VS Code

Customize your editor, learn the basics, and start coding

Learn the Fundamentals

Show welcome page on startup

Branching

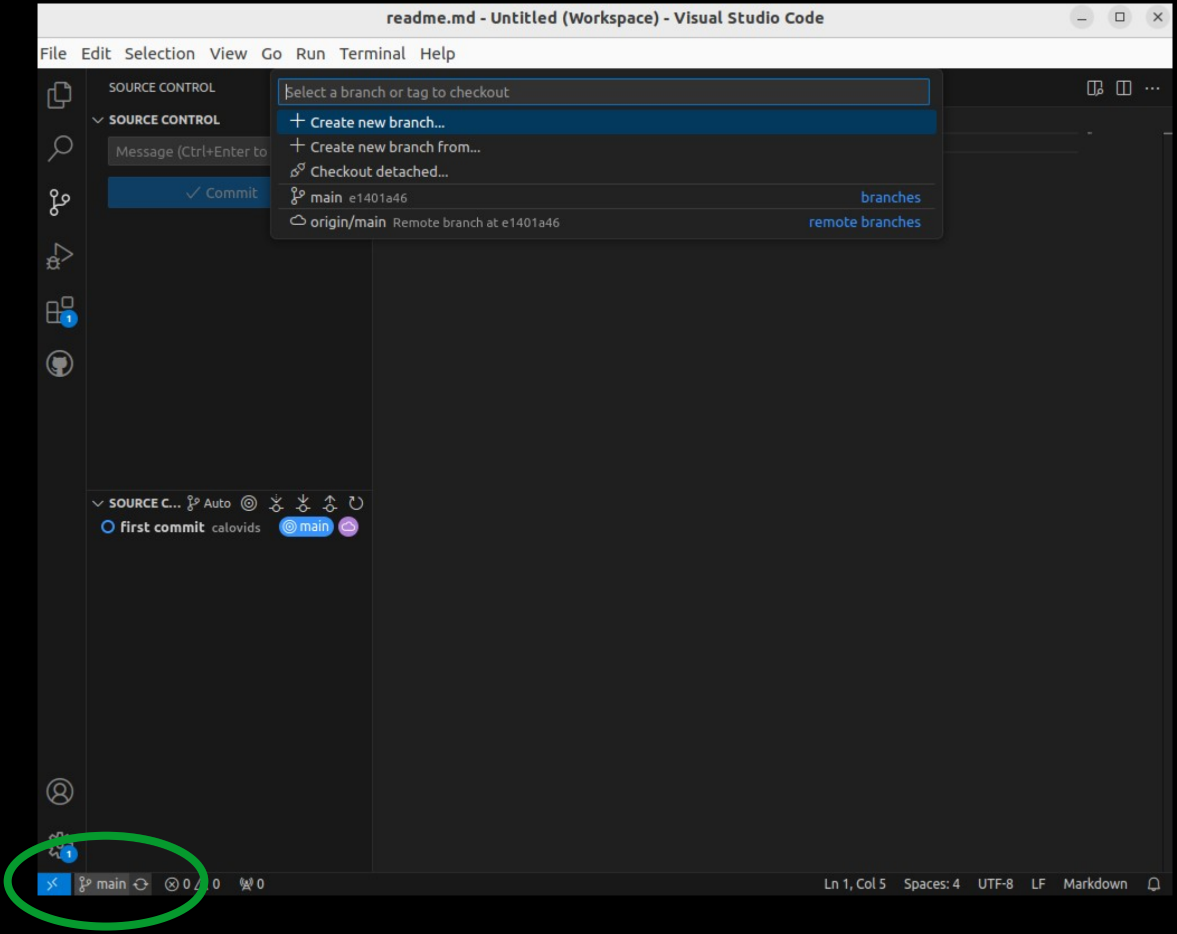
A branch is like a parallel timeline of your project

A new feature, a bug correction, or multiple fixes for releasing a new version

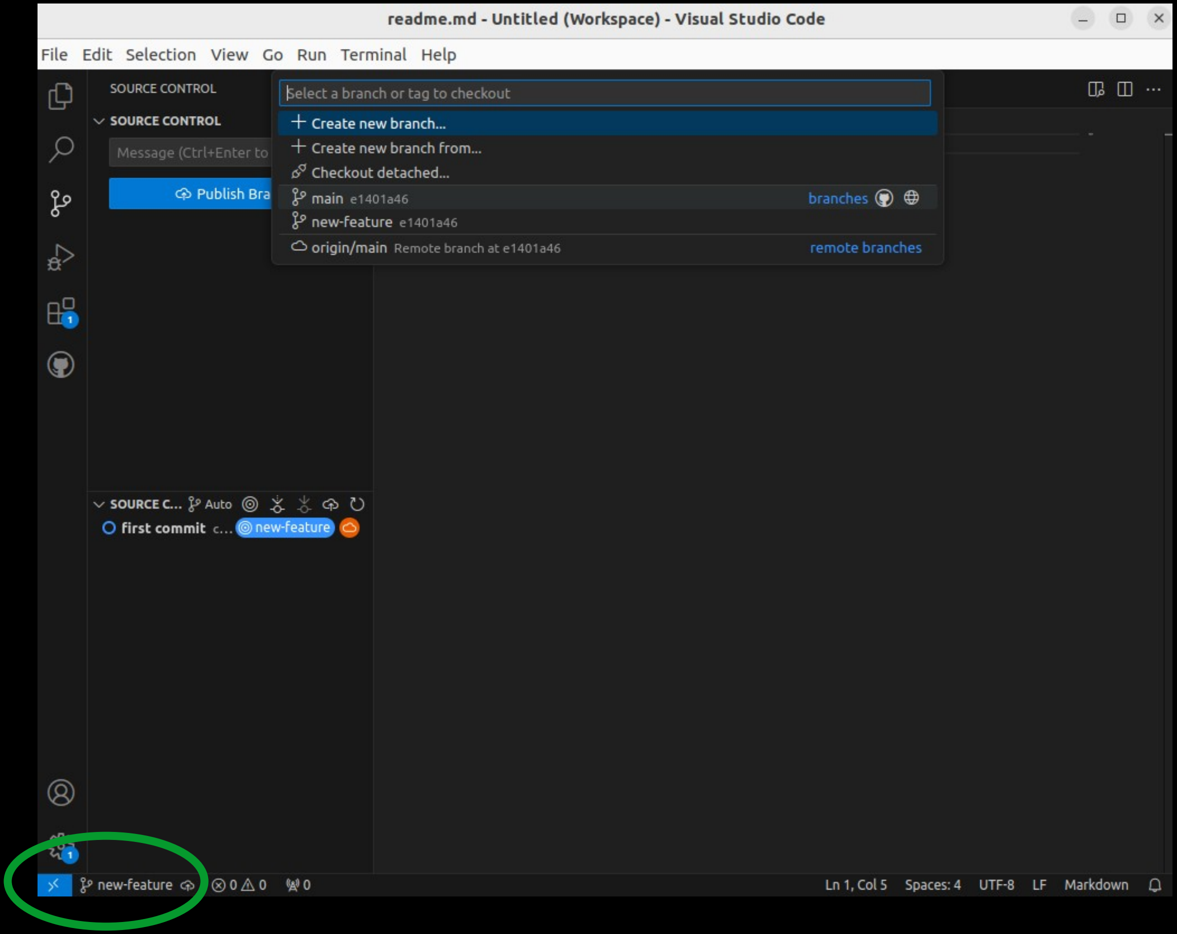
Imagine this case

- You want to add a new feature to your code
- After weeks of trying it’s not working out
- You need go to back and use the old code for something else

Branching


readme.md - Untitled (Workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help
SOURCE CONTROL
SOURCE CONTROL
Message (Ctrl+Enter to
✓ Commit
Select a branch or tag to checkout
+ Create new branch...
+ Create new branch from...
Checkout detached...
main e1401a46 branches
origin/main Remote branch at e1401a46 remote branches
SOURCE C... Auto
first commit calovids main
main
Ln 1, Col 5 Spaces: 4 UTF-8 LF Markdown

checkout

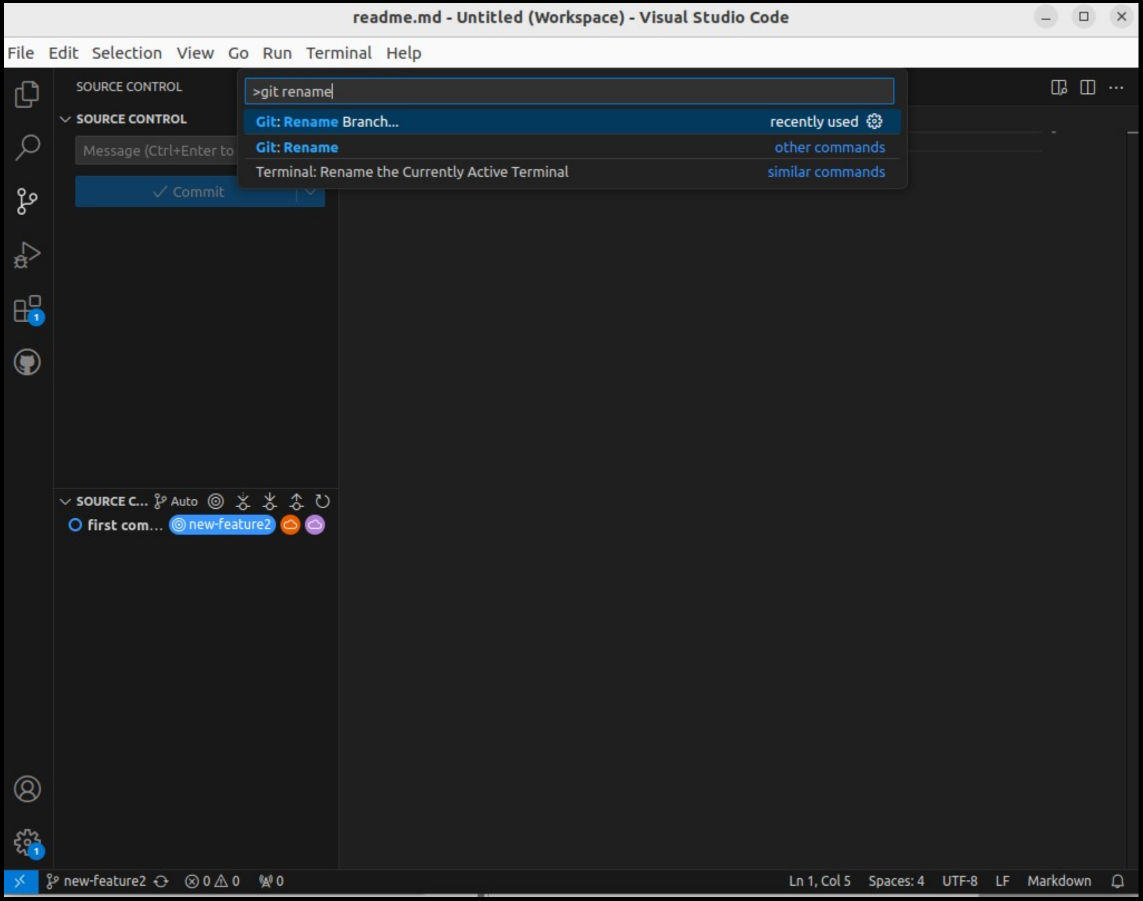


Select a branch or tag to checkout
+ Create new branch...
+ Create new branch from...
Checkout detached...
main e1401a46 branches
new-feature e1401a46
origin/main Remote branch at e1401a46 remote branches

Renaming a branch

A simpler way to rename branches in VS Code:

- Ctrl+Shift+P (Windows/Linux)
- Cmd+Shift+P (MacOS)


readme.md - Untitled (Workspace) - Visual Studio Code

>git rename

Git: Rename Branch... recently used

Git: Rename other commands

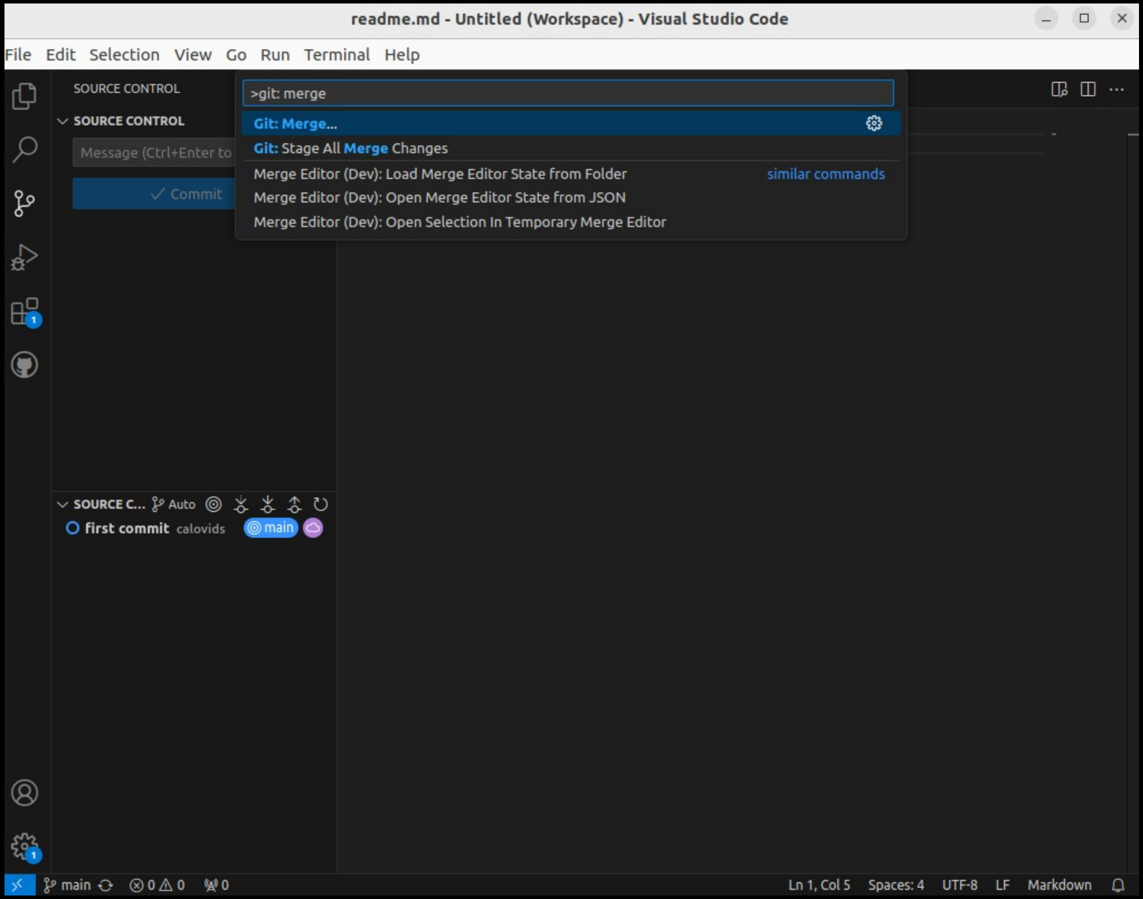
Terminal: Rename the Currently Active Terminal similar commands

File Edit Selection View Go Run Terminal Help
SOURCE CONTROL
Message (Ctrl+Enter to
Commit
first com...
new-feature2
new-feature2
Ln 1, Col 5 Spaces: 4 UTF-8 LF Markdown

Merging

Merges a different brant into current branch

- Ctrl+Shift+P (Windows/Linux)
- Cmd+Shift+P (MacOS)



readme.md - Untitled (Workspace) - Visual Studio Code

```
>git: merge
Git: Merge...
Git: Stage All Merge Changes
Merge Editor (Dev): Load Merge Editor State from Folder          similar commands
Merge Editor (Dev): Open Merge Editor State from JSON
Merge Editor (Dev): Open Selection In Temporary Merge Editor
```

.gitignore File

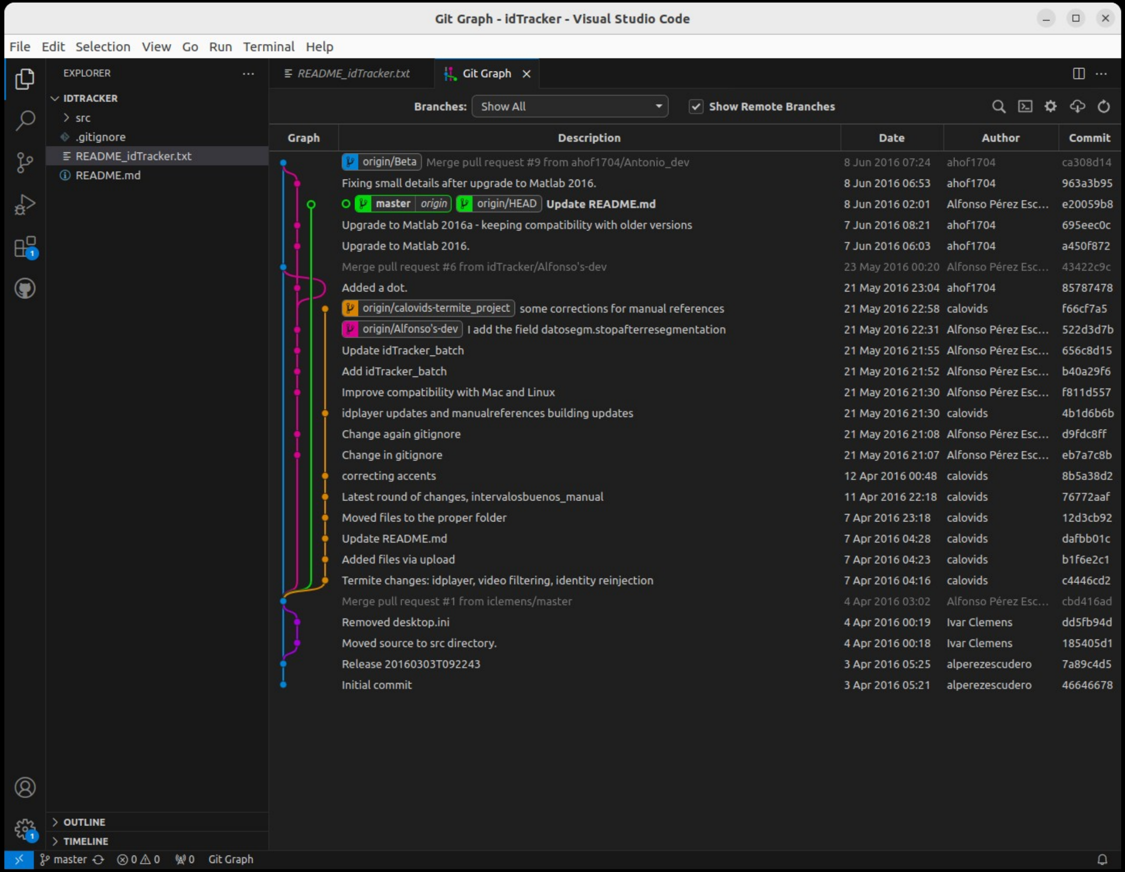
In your working folder there will be files that change often and don’t need to be tracked

- Log files
- Thumbnail libraries
- Recently changed files

Also files that you simply do not want to be tracked

- Environment files (.eenv)
- Secrets

VS code extensions – Git Graph



Branches: Show All ✓ Show Remote Branches

Graph	Description	Date	Author	Commit
	origin/Beta Merge pull request #9 from ahof1704/Antonio_dev	8 Jun 2016 07:24	ahof1704	ca308d14
	Fixing small details after upgrade to Matlab 2016.	8 Jun 2016 06:53	ahof1704	963a3b95
	master origin origin/HEAD **Update README.md**	8 Jun 2016 02:01	Alfonso Pérez Esc...	e20059b8
	Upgrade to Matlab 2016a - keeping compatibility with older versions	7 Jun 2016 08:21	ahof1704	695eec0c
	Upgrade to Matlab 2016.	7 Jun 2016 06:03	ahof1704	a450f872
	Merge pull request #6 from idTracker/Alfonso's-dev	23 May 2016 00:20	Alfonso Pérez Esc...	43422c9c
	Added a dot.	21 May 2016 23:04	ahof1704	85787478
	origin/calovids-termite_project some corrections for manual references	21 May 2016 22:58	calovids	f66cf7a5
	origin/Alfonso's-dev I add the field datosegm.stopafterresegmentation	21 May 2016 22:31	Alfonso Pérez Esc...	522d3d7b
	Update idTracker_batch	21 May 2016 21:55	Alfonso Pérez Esc...	656c8d15
	Add idTracker_batch	21 May 2016 21:52	Alfonso Pérez Esc...	b40a29f6
	Improve compatibility with Mac and Linux	21 May 2016 21:30	Alfonso Pérez Esc...	f811d557
	idplayer updates and manualreferences building updates	21 May 2016 21:30	calovids	4b1d6b6b
	Change again gitignore	21 May 2016 21:08	Alfonso Pérez Esc...	d9fdc8ff
	Change in gitignore	21 May 2016 21:07	Alfonso Pérez Esc...	eb7a7c8b
	correcting accents	12 Apr 2016 00:48	calovids	8b5a38d2
	Latest round of changes, intervalosbuenos_manual	11 Apr 2016 22:18	calovids	76772aaf
	Moved files to the proper folder	7 Apr 2016 23:18	calovids	12d3cb92
	Update README.md	7 Apr 2016 04:28	calovids	dafbb01c
	Added files via upload	7 Apr 2016 04:23	calovids	b1f6e2c1
	Termite changes: idplayer, video filtering, identity reinjection	7 Apr 2016 04:16	calovids	c4446cd2
	Merge pull request #1 from iclemens/master	4 Apr 2016 03:02	Alfonso Pérez Esc...	cbd416ad
	Removed desktop.ini	4 Apr 2016 00:19	Ivar Clemens	dd5fb94d
	Moved source to src directory.	4 Apr 2016 00:18	Ivar Clemens	185405d1
	Release 20160303T092243	3 Apr 2016 05:25	alperezescudero	7a89c4d5
	Initial commit	3 Apr 2016 05:21	alperezescudero	46646678

Test time

Create a new repository

Add a readme file

- Stage and commit

Create a new branch

- Add a new file
- commit & sync

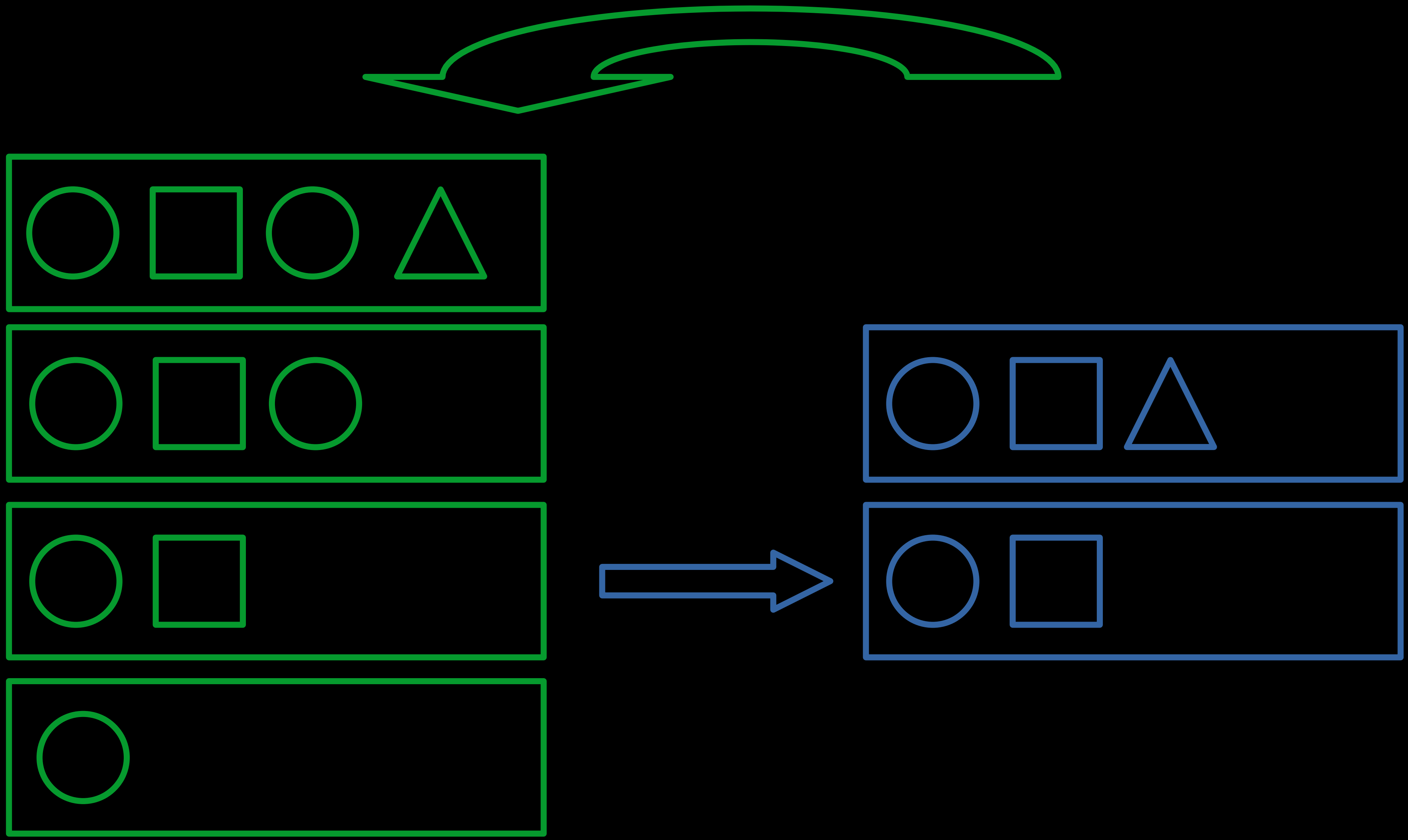
Merge back into main branch

Sync

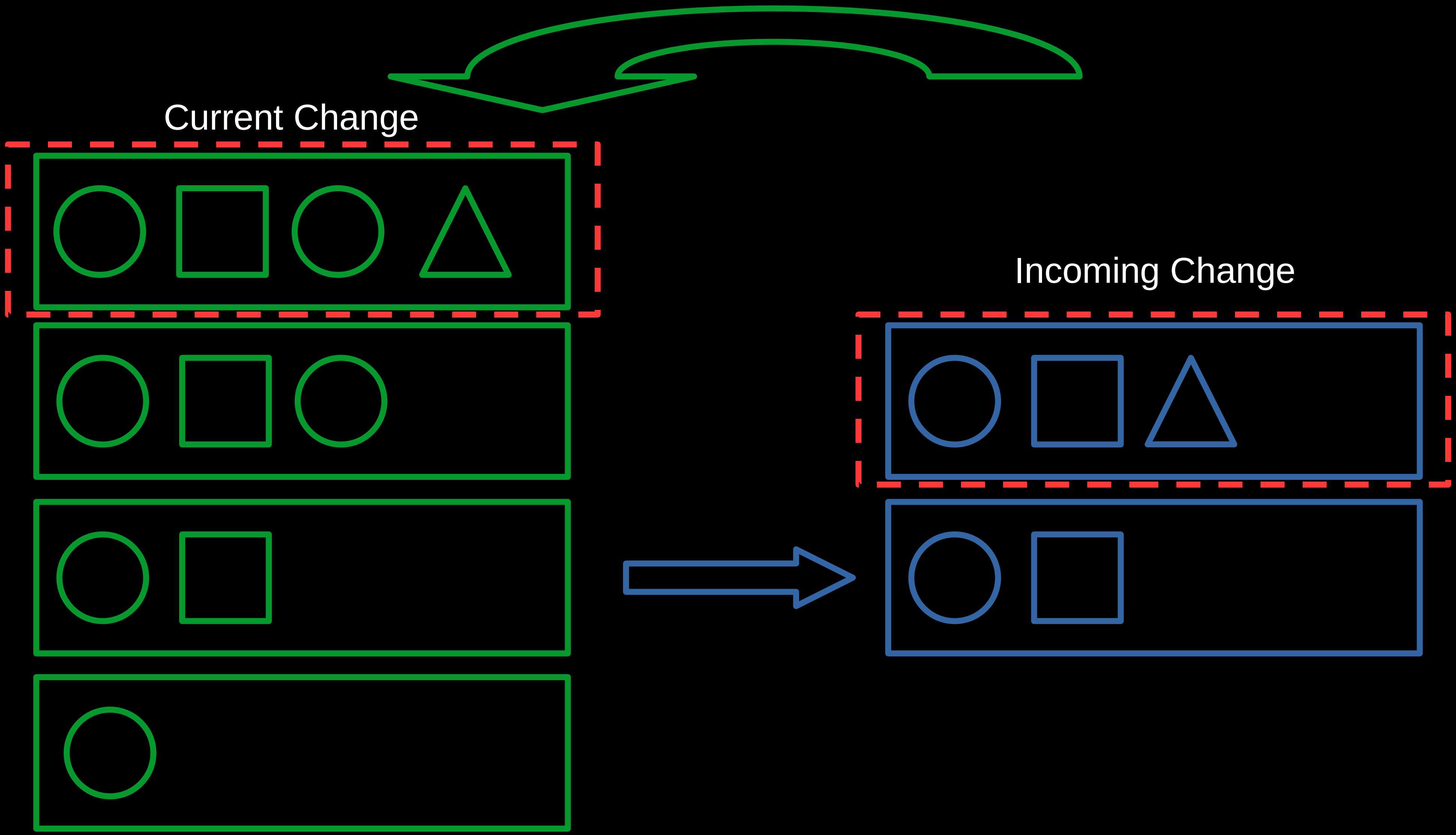
Send me a screenshot of your Git Graph by email

What are conflicts?

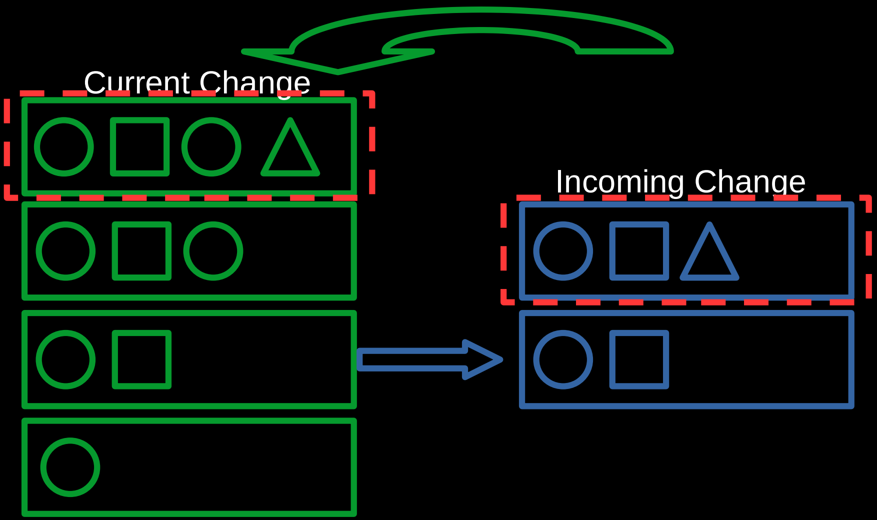
Conflicts

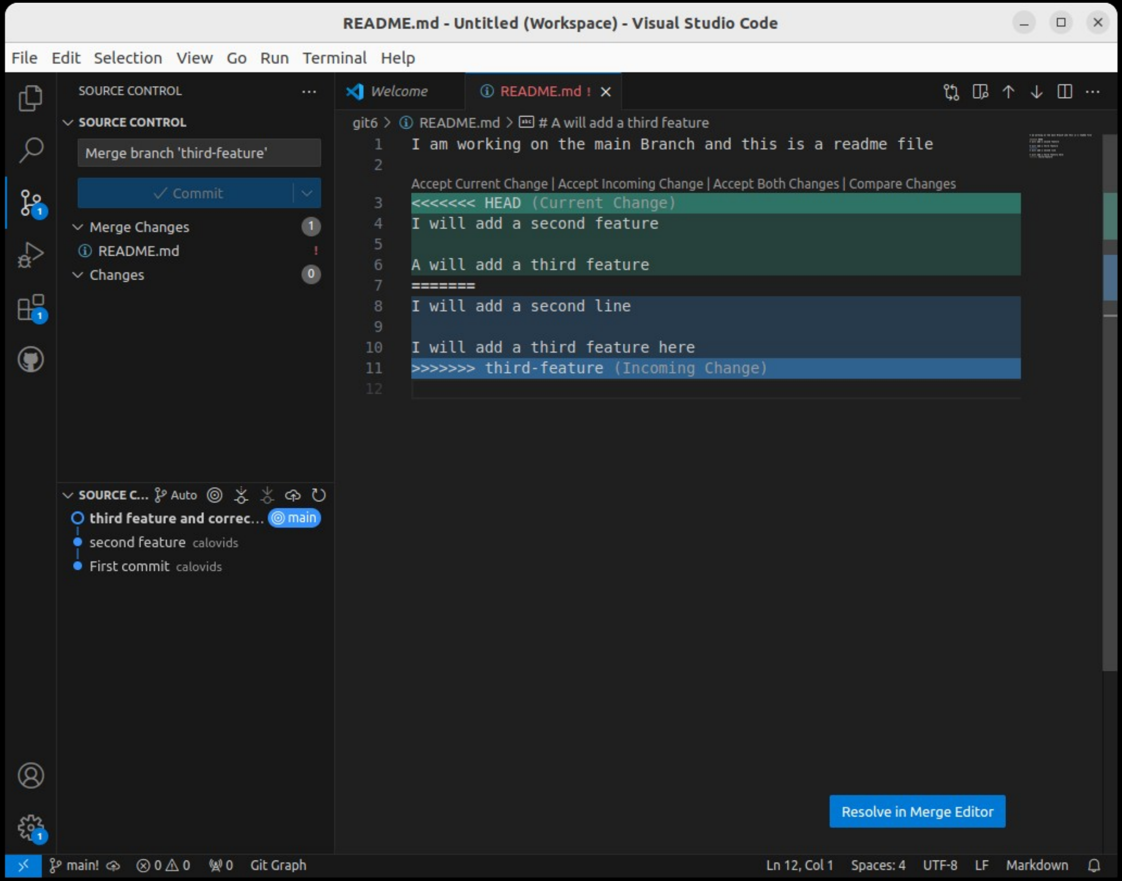


Conflicts



Conflicts




README.md - Untitled (Workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help
SOURCE CONTROL
Merge branch 'third-feature'
Commit
Merge Changes
README.md
Changes
Welcome
README.md
git6 > README.md > # A will add a third feature
Accept Current Change | Accept Incoming Change | Accept Both Changes | Compare Changes
third feature and correc... main
second feature calovids
First commit calovids
Resolve in Merge Editor
main! Git Graph Ln 12, Col 1 Spaces: 4 UTF-8 LF Markdown

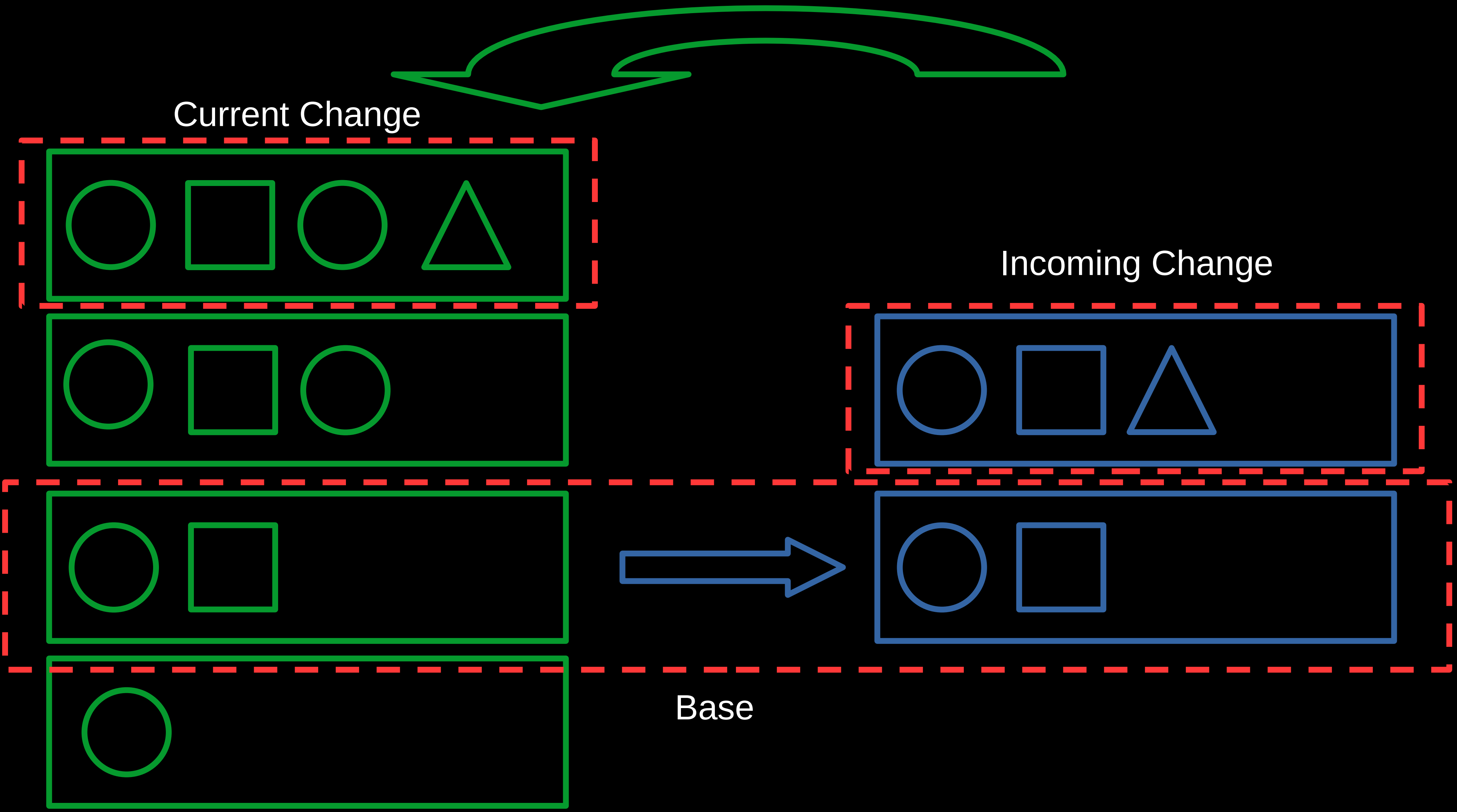
```
I am working on the main Branch and this is a readme file

<<<<<<< HEAD (Current Change)
I will add a second feature

A will add a third feature
=======
I will add a second line

I will add a third feature here
>>>>>>> third-feature (Incoming Change)
```

Conflicts



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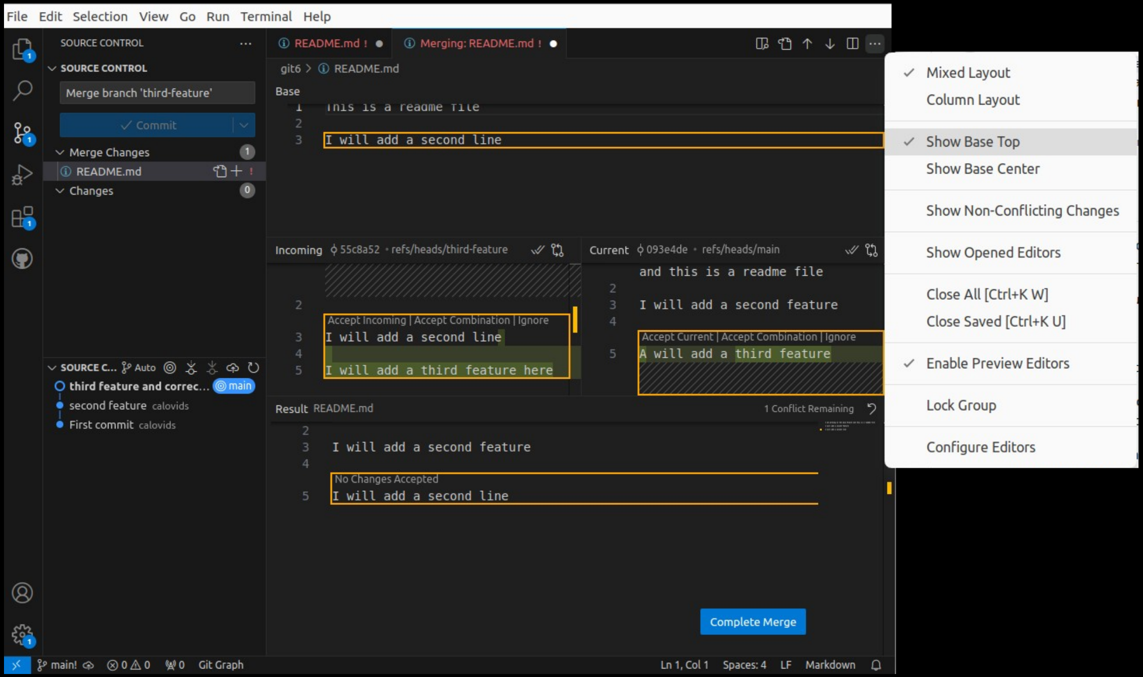

Base

```
This is a readme file

I will add a second line
```

Incoming 55c8a52 • refs/heads/third-feature

```
I will add a second line

I will add a third feature here
```

Current 093e4de • refs/heads/main

```
and this is a readme file

I will add a second feature

A will add a third feature
```

Result README.md

```
I will add a second feature

I will add a second line
```

Questions/Feedback

Please send any feedback to: daniel.calovi@uni-konstanz.de