Git, GitHub and Markdown

https://github.com/heig-vd-dai-course

<u>Web</u> · <u>PDF</u>

L. Delafontaine and H. Louis, with the help of GitHub Copilot.

This work is licensed under the <u>CC BY-SA 4.0</u> license.

Objectives

- Understand Git, GitHub, and Markdown
- Develop crucial collaboration skills
- Emphasize the significance of documentation for code usability and project visibility



Git

More details for this section in the <u>course material</u>. You can find other resources and alternatives as well.

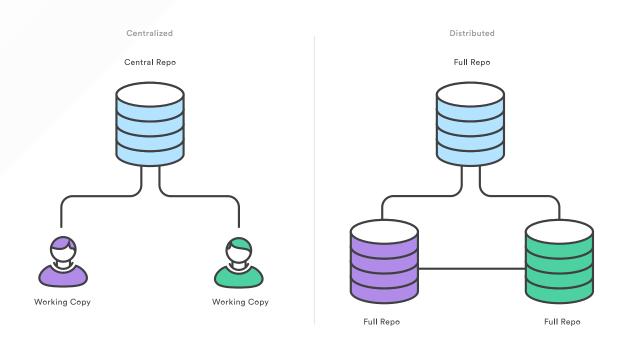
Git

- A version control system (VCS)
- Created in 2005 by Linus Torvalds
- Efficiently tracks changes in files
- Used to manage source code and documentation within a project



Architecture

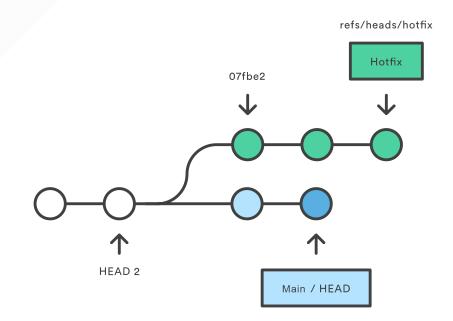
- Git operates with a clientserver structure:
 - Remote repositories (server)
 - Local repositories (local copies known as *clones*)
- Fully distributed VCS for offline work: each clone contains the full history



Commits, hashes and tags

- Commits represent snapshots of the repository
- Each commit has a unique, unalterable hash
- Tags serve as references, often for releases
- Commit signing enhances security

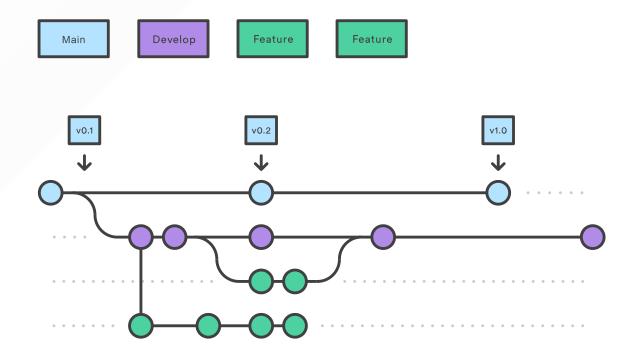
HEIG-VD - DAI Course 2024-2025 - CC BY-SA 4.0



Many ways of referring to a commit

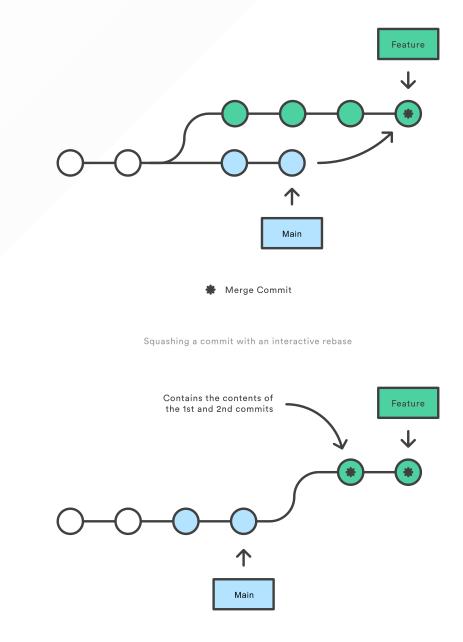
Branches

- Tracks distinct repository versions
- Default branch is typically named main
- Branches have names and commit pointers (heads)
- Allow to work on features or bug fixes without affecting the main branch



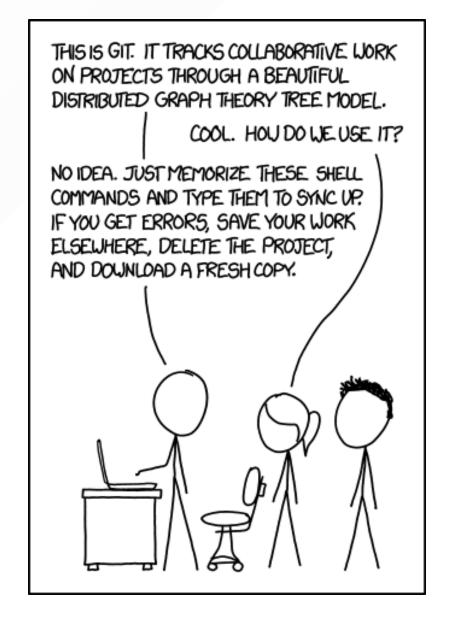
Merging branches

- Collaborative project workflow
- Three primary merging methods:
 - Merge
 - Rebase
 - \circ Squash
- In this course, you will focus on the merge method



Conflicts

- Arise from simultaneous file edits
- Git detects and requires resolution
- Conflicts must be resolved to decide which changes to keep
- It can be tricky but is a crucial skill



Ignore Files

- gitignore files omit specific files that should not be on the repository
- Improves repository cleanliness and security (avoid sensitive data leaks)
- Tip: avoid online gitignore generators, they generate a lot of unnecessary rules

	heig-vd-dai-course / heig-vd-dai-course	Q + • 💿 [n 🖻 🌒
<> Code (⊙ Issues 🖏 Pull requests 🖓 Discussions ⊙ Actions	E Projects 1 🤨 Secur	ity ····
۲ P ma	ain 👻 heig-vd-dai-course / .gitignore	Q Go to file	t
🤶 ludelafo	o Add contributing guide	0a84215 · 3 weeks ago	🕒 History
Code B	lame 23 lines (15 loc) · 220 Bytes	Raw 🖸 🛃	
	## Linux		
2			
	# Temporary files		
	*~		
5			
	## macOS		
7	# Siles anothed by marco Sindar		
	# Files created by macOS Finder		
	.DS_Store		
10	## Marp and Pandoc		
12	## Marp and Fandoc		
	# Outputs		
	*.html		
	*.pdf		
16			
	## Windows		
18			
	# Windows thumbnail cache files		
	Thumbs.db		
21			
22	# Folder config file		
	[Dd]esktop.ini		

Summary

- Git is a distributed VCS
- Git uses commits to track changes
- Git uses branches to track different versions of the repository
- Git can pull changes from a remote repository
- Git can merge, rebase or squash branches/commits
- Git can detect and resolve conflicts

We encourage you to learn how to use Git from the command line, so you can still use it everywhere (even on a server).

GitHub

More details for this section in the <u>course material</u>. You can find other resources and alternatives as well.

GitHub

- Git hosting platform
- Created in 2008
- Web-based Git hosting
- Popular for open source projets



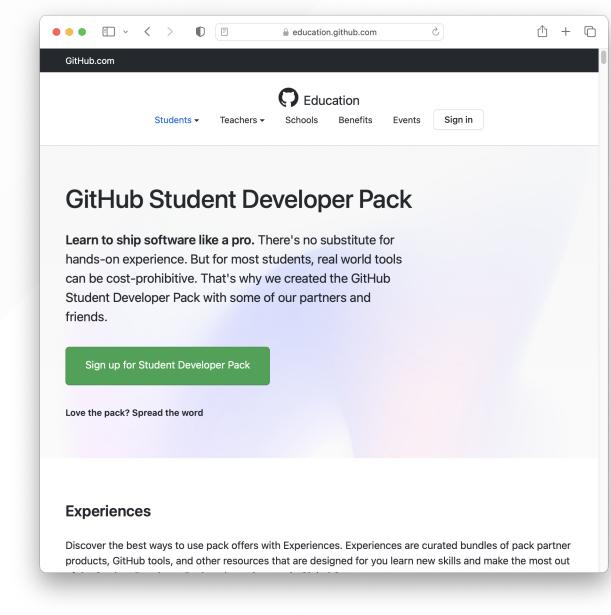
Social platform

- Social interactions:
 - \circ Follow users
 - Star projects
 - Discover new projects
- Forking repositories
 - Create a copy of a repository
 - Make changes and contribute back

● ● E ~ < > D A github.com	Ú S
Sign up	E
Explore Topics Trending Collections Events GitHub Spa	onsors
Trending See what the GitHub community is this month.	
Repositories Developers Spoken Language: Any + Image: Oven-sh / bun	Language: Any → Date range: This month →
Repositories Developers Spoken Language: Any ▼ □ oven-sh / bun Incredibly fast JavaScript runtime, bundler, test runner, and package in one ● Zig ☆ 60,536 ¥ 1,715 Built by 🐑 🔍 🐑 🕥	र्द्र Star 👻
oven-sh / bun Incredibly fast JavaScript runtime, bundler, test runner, and package in one	e manager – all ☆ Star マ ☆ Star マ
 □ oven-sh / bun Incredibly fast JavaScript runtime, bundler, test runner, and package in one ■ Zig ☆ 60,536 양 1,715 Built by 愛 愛 愛 □ krahets / hello-algo 《Hello 算法》: 动画图解、一键运行的数据结构与算法教程,支持 JavaScript runtime, bundler, test runner, and package 	e manager – all ☆ Star マ ☆ Star マ
 □ oven-sh / bun Incredibly fast JavaScript runtime, bundler, test runner, and package in one 2 Ig ☆ 60,536 ♀ 1,715 Built by ♀ ♀ ♀ ♀ □ krahets / hello-algo 《Hello 算法》: 动画图解、一键运行的数据结构与算法教程,支持 Japper Applython, Go, JS, TS, C#, Swift, Rust, Dart, Zig 等语言。 	e manager – all ☆ 17,309 stars this month 과 12,260 stars this month 값 12,260 stars this month

Free features and PRO features

- Enhanced features with PRO
 - Access to premium features and software
- Free for students you can apply!



Users and organizations

- Users or organizations ownership
- Users can be part of multiple organizations

Image: Control of the second seco				
	$\bullet \bullet \bullet \Box \mid \cdot < > \blacksquare$	🔒 github.com	Ś	ů + C
Organization permissions Find a member Members 2 Outside collaborators Pending collaborators Invitations Failed invitations Failed invitations Ludovic Delafontaine Vertice Delafontaine Vertice Vertice Vertice Outside collaborators Invitations Failed invitations Ludovic Delafontaine Ludovic Delafontaine Ludeafo Terms Privace Security Status Docs Contact GitHub Pricing API Training Blog About	= () heig-vd-dai-course		Q + •	o n e 🌒
Members 2 Outside collaborators Pending collaborators Invitations Failed invitations Failed invitations Ludovic Delafontaine udelafo Terms Privacy Security Status Docs Contact GitHub Pricing API Training Blog About	⑦ Overview ☐ Repositories 3	🖓 Discussions E Projects 1 🔅) Packages 🛛 २२ Team	s 3
Outside collaborators Image: Collaborators <t< th=""><th>Organization permissions ③</th><th>Q Find a member</th><th>⊥ Export -</th><th>Invite member</th></t<>	Organization permissions ③	Q Find a member	⊥ Export -	Invite member
Outside collaborators Pending collaborators Invitations Failed invitations Ludovic Delafontaine Udelafo V2FA Private Owner 1team Iteam Invitations Item Invitations Invitations Invitations Item Invitations Invitations Invitations Invitations Invitations Invitations Invitations Invitations Item Invitations Invitations Invitations Invitations Invitations Invitations Invitations Invitations	Members 2	Members		2FA ▼ Role ▼
Invitations Failed invitations				
Failed invitations Image: Delafontaine ludelafo Image: De			✓2FA 🔒 Private	Owner 1 team …
		Delafontaine	✓2FA 💧 Private -	Owner 1 team …
	Terms Privacy Se		API Training Blog /	About

Issues, pull requests and forks

- Contribution workflow
 - Issues
 - \circ Forks
 - Pull requests
- Approval process
- Project management tools (wiki, planning, etc.)

Ì aithub.com + - 0 11 0 \equiv spotin / spotin Q 1 Pull requests () Actions II Projects 1 ① Security 2 /~ Insights ···· Filters - Q is:pr is:closed ♦ Labels 9 中 Milestones 0 New pull request Clear current search guery, filters, and sorts 11 0 Open 🗸 57 Closed Author - Label -Projects 🗸 Milestones 🗸 Reviews 🗸 Assignee -Sort -Spots cannot be created with an empty JSON payload ·• 1 #123 by ludelafo was merged on Aug 18 Enable CORS ●1 #121 by ludelafo was merged on Aug 18 Fix token generation and hashing $\odot 1$ #120 by ludelafo was merged on Aug 18 Implement /api/spots/{id}/configure the same as <u></u>1 /spots/{id}/configure #116 by Nortalle was merged on Aug 18 $\odot 1$ **4** Add a field in spots to store a payload in Json #115 by Nortalle was merged on Jul 4 Add GitHub workflow to create a docker registry $\odot 1$ #114 by Nortalle was merged on Jul 4 Check configured by default on view $\odot 1$ #112 by Nortalle was merged on Jul 4 add AGPL v3 license (\cdot) 1 #111 by Nortallo was margad on Jun 27

Summary

The whole process would be as follow:

1. Open an issue to discuss the feature (optional, but recommended)

2. Clone or fork the project and checkout to a new branch

3. Make your changes, commit and push them as often as you want

- 4. Create the pull request
- 5. The maintainers review and merge if OK

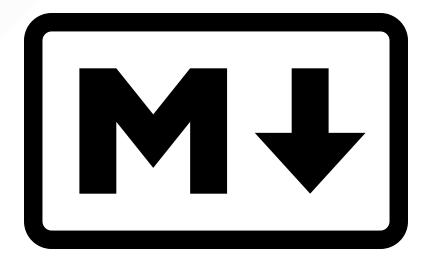
6. You can delete the branch or the fork

Markdown

More details for this section in the <u>course material</u>. You can find other resources and alternatives as well.

Markdown

- Lightweight markup language
- Created by John Gruber and Aaron Swartz in 2004
- Simple and versatile
- Used by many platforms and tools



Markdown and output formats

- Multiple output formats
- Supports HTML integration
- Used in web pages, presentations, documentation

•••	$\blacksquare \lor \ \ \checkmark \ \ \land \ \ \bullet \ \ \bullet$	🔒 marp.	app Č	Û	+	G
		BLOG	GITHUB			
	Built-in themes and CSS theming		Sometimes simple text content isn't enough to emphasize your voice, so Marp supports a variety of directives and extended syntax (image syntax, math typesetting, auto-scaling, etc) to create beautiful slides.			
	Our core engine has <u>3 built-in themes</u> <u>called default, gaia, and uncover</u> , to tell your story beautifully. If you'd rather customize your design, you can use Marp to tweak styles with Markdown, or create your own Marp theme with plain CSS.		Export to HTML, PDF, and PowerPoint			
	Marp family: The official toolset		Have you finished writing? It's time to share your deck! Marp can convert Markdown into presentation-ready HTML, PDF and PowerPoint files directly! (Powered by Google Chrome / Chromium)			
	The Marp ecosystem contains a rich toolset to assist your work. Marp for VS Code is an extension that allows you to edit and preview slide Markdown and custom theming within VS Code. Marp CLI is a command line tool allows you to convert Markdown with a simple CLI interface and much more!		CC Pluggable architecture As a matter of fact, <i>Marp is essentially just</i>			1

Syntax

- Markup language with special characters (#, *, -, [], !_, etc.)
- Discord and Telegram uses Markdown for formatting
- Supports headings, text formatting, code blocks, lists, links, images, and tables

Markdown Cheat Sheet

A quick reference to the Markdown syntax.

Overview

This Markdown cheat sheet provides a quick overview of all the Markdown syntax elements. It can't cover every edge case, so if you need more information about any of these elements, refer to the reference guides for basic syntax and extended syntax. Overview Basic Syntax Extended Syntax Downloads

Basic Syntax

These are the elements outlined in John Gruber's original design document. All Markdown applications support these elements.

Element	Markdown Syntax
Heading	# H1 ## H2 ### H3
Bold	**bold text**
Italic	<pre>*italicized text*</pre>

Specifications

- No single standard
- CommonMark and GitHub Flavored Markdown are the most popular
- Custom extensions for additional features on some platforms

● ● ● ● · · · · · · ● ● Commonmark.org

CommonMark

A strongly defined, highly compatible specification of Markdown

What is Markdown?

It's a plain text format for writing structured documents, based on formatting conventions from email and usenet.

LEARN MARKDOWN IN 60 SECONDS

Who created Markdown?

It was developed in 2004 by John Gruber in collaboration with Aaron Swartz. Gruber wrote the first markdown-to-html converter in Perl, and it soon became widely used in websites. By 2014 there were dozens of implementations in many languages.

Why is CommonMark needed?

John Gruber's canonical description of Markdown's syntax does not specify the syntax unambiguously.

In the absence of a spec, early implementers consulted the original Markdown.pl code to resolve these ambiguities. But Markdown.pl was quite buggy, and gave manifestly bad results in many cases, so it was not a satisfactory replacement for a spec. Markdown.pl was last updated December 17th, 2004.

Because there is no unambiguous spec, implementations have diverged considerably over the last 10 years. As a result, users are often surprised to find that a document that renders one way on one system (say, a GitHub wiki) renders differently on another (say, converting to docbook using Pandoc). To make matters worse, because nothing in Markdown counts as a "syntax error," the divergence often isn't discovered right away.

There's no standard test suite for Markdown; MDTest is the closest thing we have. The

Summary

- Markdown is easy to learn and use
- Markdown can be used to create documentation
- Markdown can be used to create slides
- Markdown can be exported to many formats

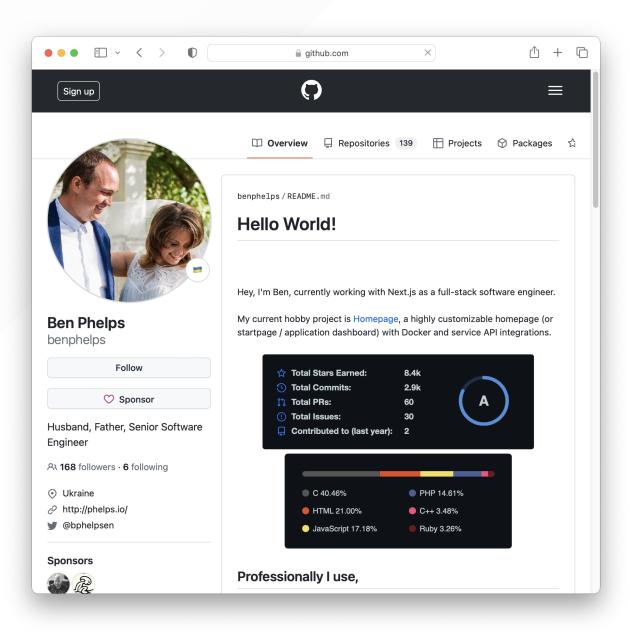


Do you have any questions?

Practical content

What will you do?

- Install and configure Git
- Create and configure your GitHub account
- Create your own GitHub profile README
- Add yourself to the GitHub organization README



Find the practical content

You can find the practical content for this chapter on <u>GitHub</u>.



Finished? Was it easy? Was it hard?

Can you let us know what was easy and what was difficult for you during this chapter?

This will help us to improve the course and adapt the content to your needs. If we notice some difficulties, we will come back to you to help you.

➡ GitHub Discussions

You can use reactions to express your opinion on a comment!

What will you do next?

In the next chapter, you will learn the following topics:

- Java: why is Java a popular programming language?
- IntelliJ IDEA: tips and tricks for a better (collaborative) experience
- Maven: Java project structure, dependencies and build tool



Sources

- Main illustration by <u>Roman Synkevych</u> on <u>Unsplash</u>
- Illustration by <u>Aline de Nadai</u> on <u>Unsplash</u>
- Git logo by Git
- Git illustrations by <u>Atlassian</u> <u>1</u>, <u>2</u>, <u>3</u>, <u>4</u>
- Git strip by <u>xkcd</u>
- Illustration by Nathan Dumlao on Unsplash