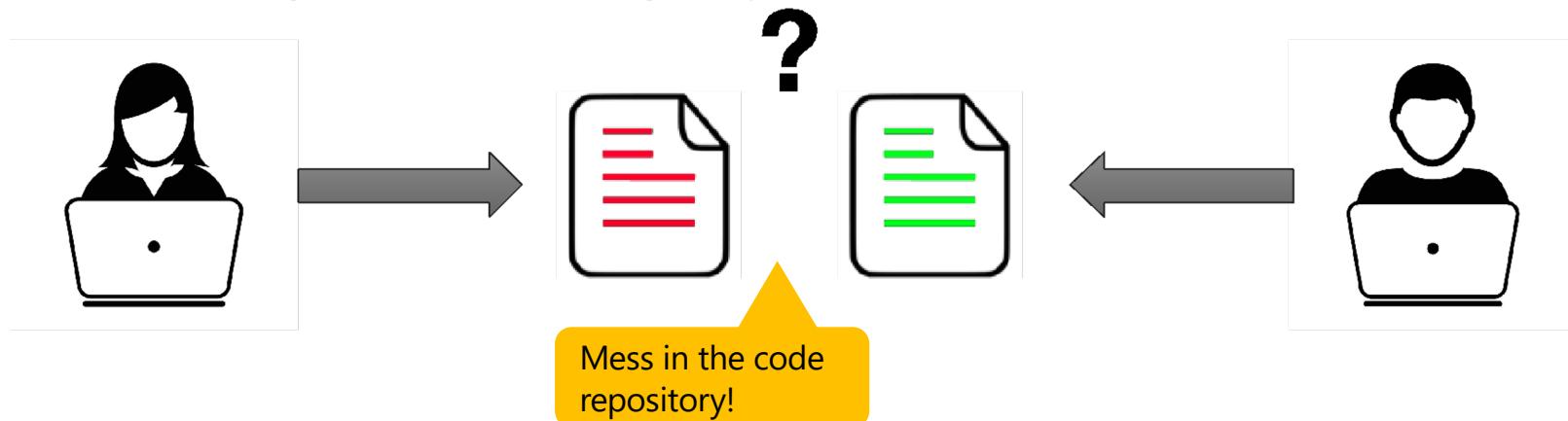


Why version control? What is Git?

Why do we have to bother anyway?

Teamwork in coding projects is a struggle

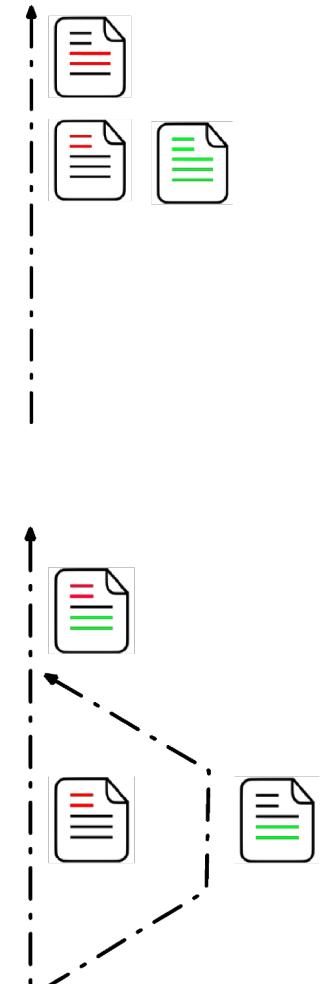
- Accidentally overwrite new files with old files.
- You messed up, but you cannot revert to the last "working version".
- Who edited which files and when?
- Which file contains the latest code?
- You need to merge the latest changes by hand?



Solution: Git

Git is a **version control system** that allows us to:

- track changes of files and projects (long term history).
- revert to any previous stage of a file.
- work on one project at the same time.
- work on different versions of a project at the same time.
- automatically merge changes.



Simple example for a Git workflow

RStudio: Review Changes

Changes History master (all commits) Pull

Subject	Author	Date	SHA
HEAD -> refs/heads/master	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-25	87fa5353
Final Version	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-24	6e53ffe4
Fixed Typos	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-24	f1ac4240
Added Number of Transactions	Markus Meierer <mmeierer@users.noi>	2017-01-23	9348f66b
Added Literature part	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-23	09bca0e4
Added Literature part	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-23	ccde15de
Summary Statistics	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-23	a2bab2e2
Added Data overview	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-23	e5665fe0
Added Description	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-23	3d39d204
Added r setup	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-23	0c0c60d5
Created Markdown file with header	Patrick Bachmann <patrick.bachmann@business.uzh.ch>	2017-01-23	ae783e10

Commits 1-15 of 15

Different "stages" of a project including author.

Two authors worked on the same project at the same time.

SHA 87fa5353
Author Patrick Bachmann <patrick.bachmann@business.uzh.ch>
Date 2017-01-25 08:35
Subject Changed meta data
Parent 6e53ffe4

LE4_RMarkdown_Render.Rmd

```
@@ -1,6 +1,6 @@
1 1 ---
2 title: "Create Word files"
3 author: "John Smith"
2 title: "Export Report to Word"
3 author: "Patrick Bachmann"
4 4 date: "February 6th,2017"
5 5 output:
6 6   word_document: default
```

View file @ 87fa5353

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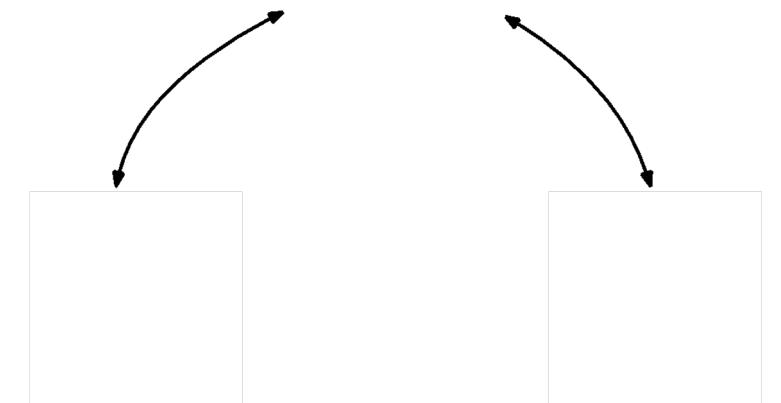
Highlights changes between every commit

Git works with distributed "repositories" i.e. folders that are under version control

A full copy of the repository is available on your computer

- Offline work is possible.
- You are not dependent on others.

Hosted Repository



"Pull": Download all changes of the hosted repo.

"Push": Upload changes to the hosted repo.

Sometimes both
actions together are
referred as "Sync".

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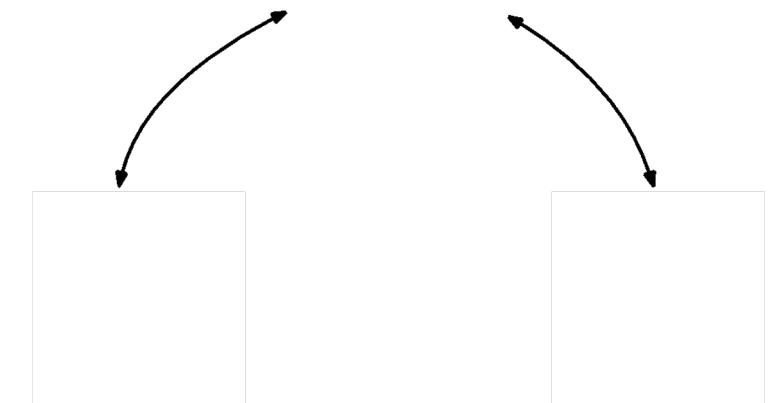
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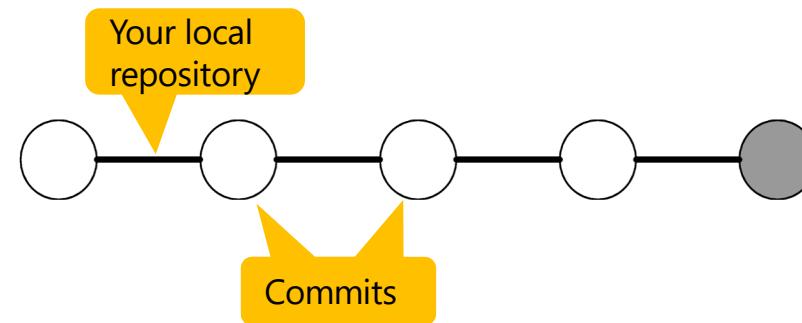
Local Repository
on your computer

Local Repository
on some else's computer

Commit your changes to your repository

"Commit":

- Commits are a snapshots of your project.
- You can revert a file to any commit in the project.
- You need to comment your commits (message).

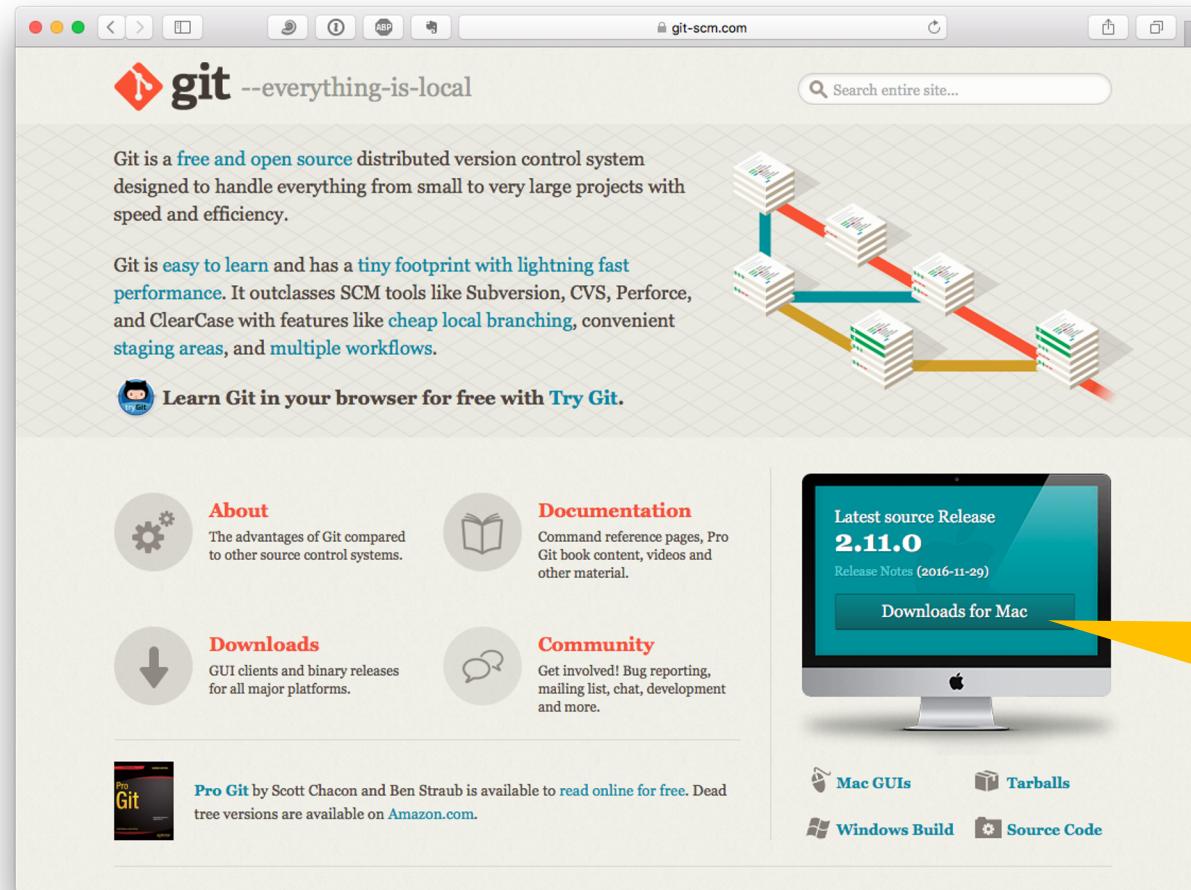


Summary of basic workflow with Git



1. **Pull** updates to your local repo.
2. **Revise** the code in your local repo.
3. **Commit** your changes to your local repo.
4. **Push** all your commits to the hosted repository.

Install Git



Execute the installer and follow the instructions.

Git is integrated in RStudio

We focus on the integrated Git client in RStudio.



Alternative Git clients are:

- Command Line Tools
- GitHub Desktop
- SourceTree

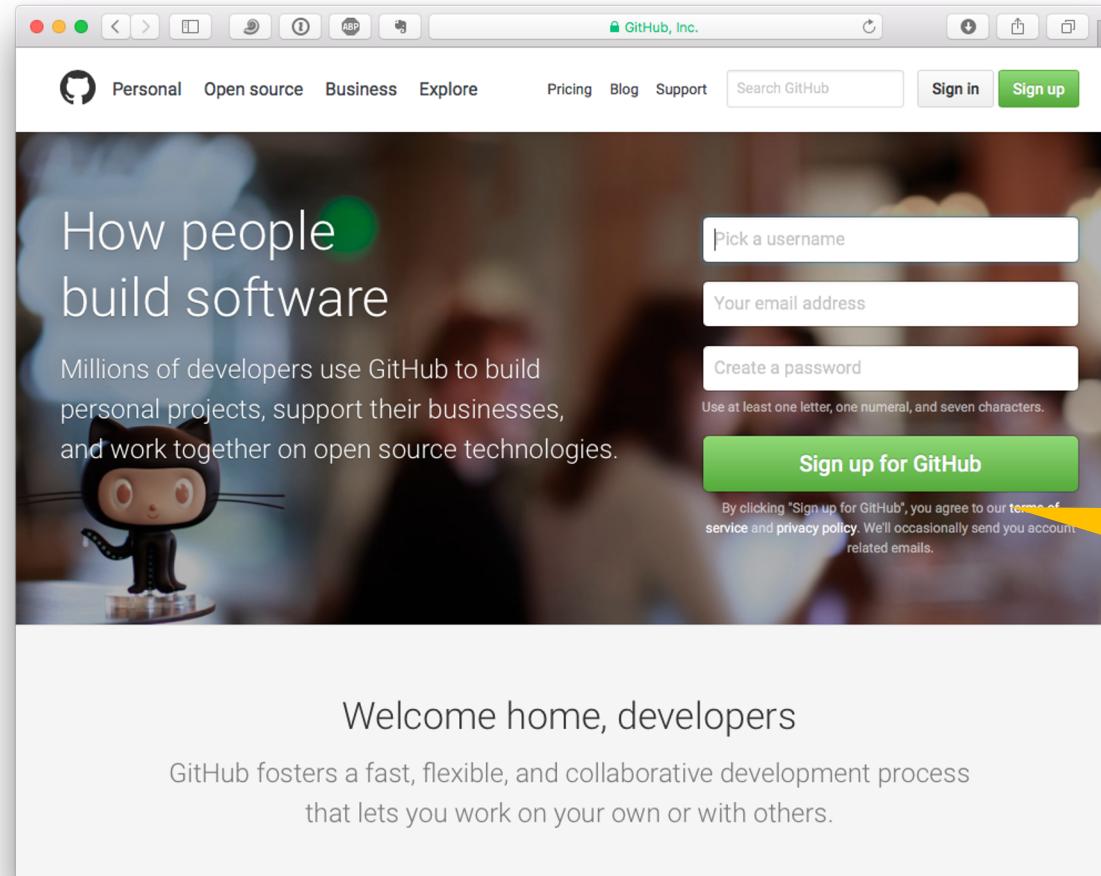
We host our repository on Github.com

- Web-based graphical interface for Git
- Basic features are free (Student Pack available)
- Integrated in RStudio
- Additional collaboration tools are provided, e.g.:
 - "Issue" section to report bugs
 - Graphical contribution tracking



Github.com

Setup Github



Use your **UZH email address** to be eligible for a free student account.

[Github.com](https://github.com)

Now it's your turn!