GIT-Training mit Pycharm (Starter)

Agenda

1. Geschichte / Grundlagen
    - GIT Pdf
2. Best practices
    - Best practices
3. Basics - pycharm
    - Put project under version control
    - Add unversionend files and commit
    - Branch erstellen
4. Commit "rückgängig" machen
    - Die letzte Commit-Nachricht ändern
5. Merging - pycharm
    - Merge branch into main
6. Logs - pycharm
    - Add commit-id to logs in pycharm
    - Show reflog
7. Interaction with Online (codecommit)
    - Publish Project to codecommit
8. Tipps & Tricks - pycharm
    - Which files to put under version control / which to ignore
    - Disable ESC when using vi as editor
9. Workflows
    - git workflows
10. Kommandzeile (mit tipps & tricks)
    - git add + Tipps & Tricks
    - git commit
    - git log
    - git config
    - git show
    - Needed commands for starters
    - git branch
    - git checkout
    - git merge
    - git tag
    - git push/pull
    - git reset

11. Branches / Branching

- Branch Overview with origin image

12. Advanced Commands

- git reflog
- git reset - Back in Time

13. Tipps & tricks

- Beautified log
- Change already committed files and message
- Best practice - Delete origin,tracking and local branch after pull request/merge request
- Einzelne Datei auschecken
- Always rebase on pull - setting
- Arbeit mit submodules
- Integration von Änderungen (commits, einzelne Dateien) aus anderen commits in den Master
- Fix conflict you have in merge-request (gitlab)
- SETUP.sql zu setup.sql in Windows (Groß- und Kleinschreibung)
- Force specfic commit message
- Alle Dateien, die sich geändert haben anzeigen z.B. heute

14. Exercises

- merge feature/4712 - conflict
- merge request with bitbucket

15. Snippets

- publish lokal repo to server - bitbucket
- failure-on-push-fix
- failure-on-push-with-conflict

16. Extras

- Best practices
- Using a mergetool to solve conflicts

17. Help

- Help from commandline

18. submodules

- submodules

19. Authentication

- Work with different credentials

20. Shells

- color for zsh-shell under osx
- branch mit anzeigen in zsh-shell und osx

21. Documentation

- GIT Pdf
- GIT Book EN

- GIT Book DE
- GIT Book - submodules
- GIT Guis
- Third Party Tools
- Specification Conventional Commits
- https://www.innoq.com/de/talks/2019/05/commit-message-101/
- https://github.com/GitAlias/gitalias/blob/main/gitalias.txt
- https://education.github.com/git-cheat-sheet-education.pdf
- .gitignore
- learn branching

22. Datenbank - Versionierung

    - Methode 1
    - Methode 2

Backlog

1. Installation

    - GIT auf Ubuntu/Debian installieren
    - GIT unter Windows installieren

2. Tipps & Tricks (Aufräumen)

    - Tracking Branches (shadow branches) nach Integration Online löschen

3. Tipps & Tricks (editor)

    - Notepad als Editor verwenden- Windows
    - TextEdit als Editor unter mac verwenden

Geschichte / Grundlagen

GIT Pdf

- http://schulung.t3isp.de/documents/pdfs/git/git-training.pdf

Best practices

Best practices

Repos anlegen

- Kein git init sondern Versionsverwaltung über pycharm

Commits

- Zeile 1: 50 Zeichen
- Bestehend aus [Ticket-ID oder Modul/Bereich] Kurztitel
- Sollte so sein, dass die Kollegen das verstehen
- Evtl. ab Zeile 3 weitere Bemerkungen (eher selten)

Wie oft ?

- Häufig committen, wenig pushen (z.B durchaus 10-15 commits und 1-2 pushen)

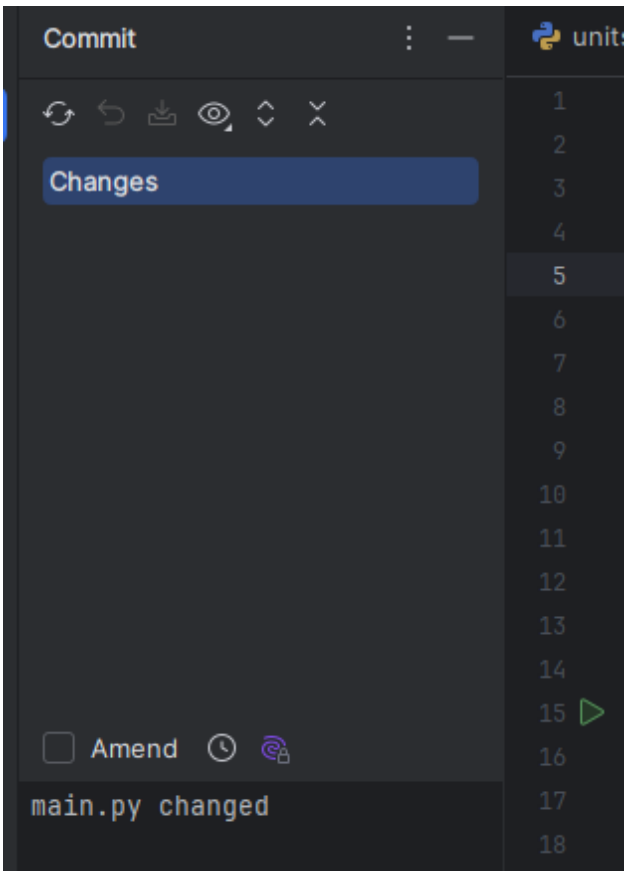
Branches

Allgemein

- Nicht zuviele Unterbranches erstellen
  - nur eine Ebene feature-branches
- Alle Branches, die integriert worden sind, löschen (Feng Shui)

Branchwechsel

- Vor Branchwechsel, sollte mein Branch sauber sein



Thema: no-ff

- Besser: no-ff als fast-forward (wird aber online ohnehin automatisch gemacht)
  - Warum: Damit wir sehen, was in ein Feature integriert wurde (welche commits)

Wann ?

- Immer Branches verwenden, wenn mehr als 2 Leute im Team

Benamung ?

- feature/xxxx - wobei xxxx (Ticket-Id oder Kurzbezeichnung) ist

Reset / amend (kommandos, die die Historie verändern

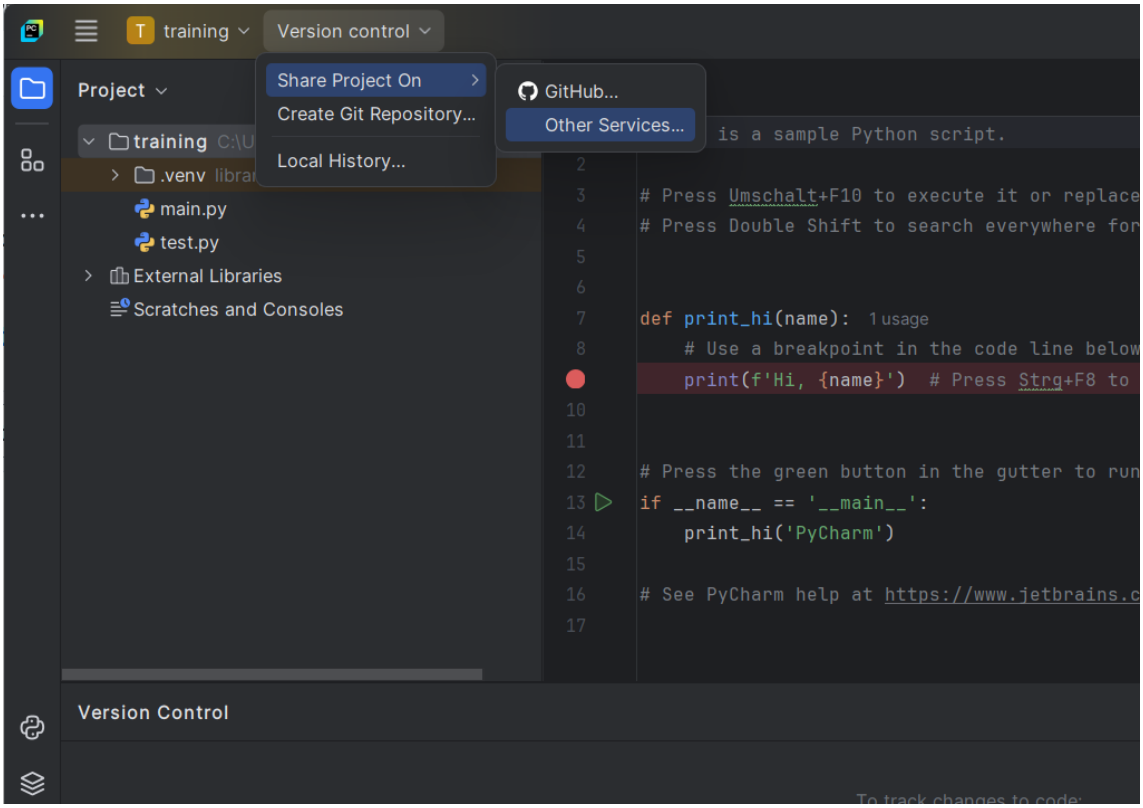
- Nicht mehr für commits machen, die veröffentlicht wurden (ge-pushed zum Server)

Basics - pycharm

Put project under version control

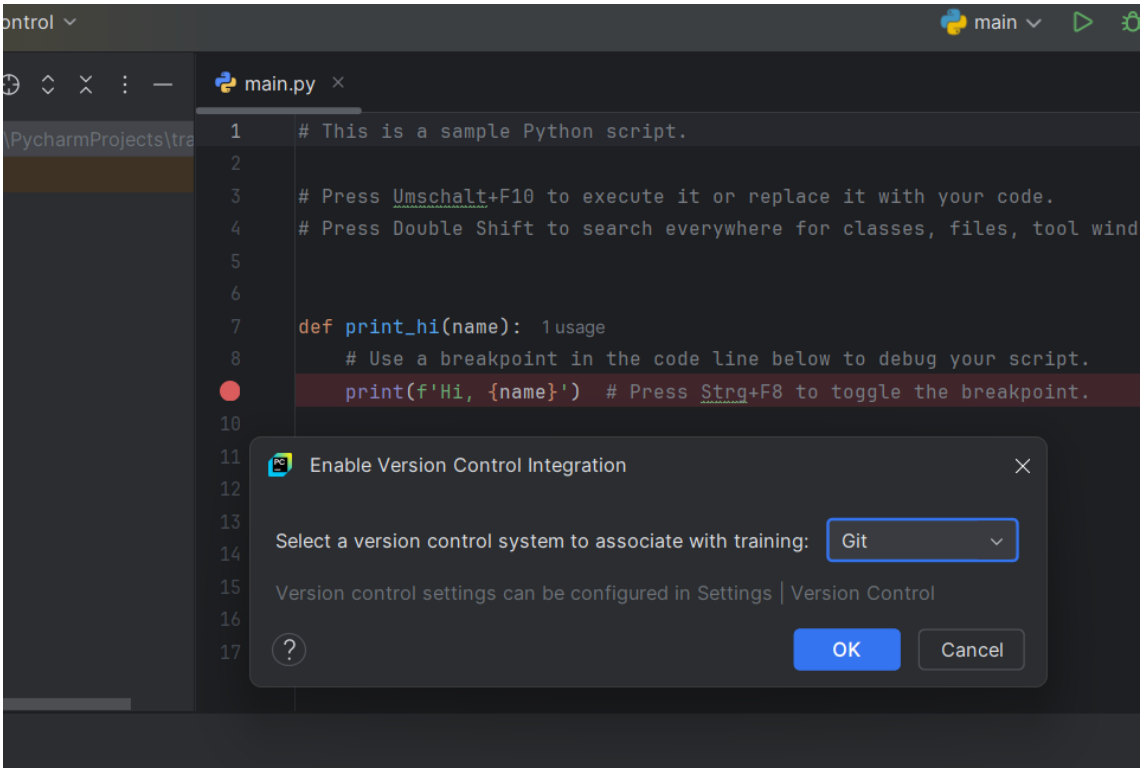
Version 1: Use Share-Project

Use share - menu item



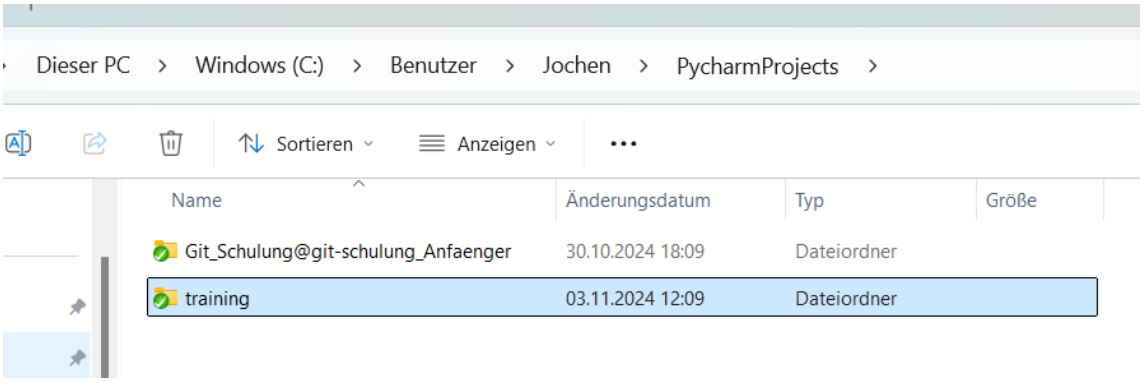
Go ahead with o.k.

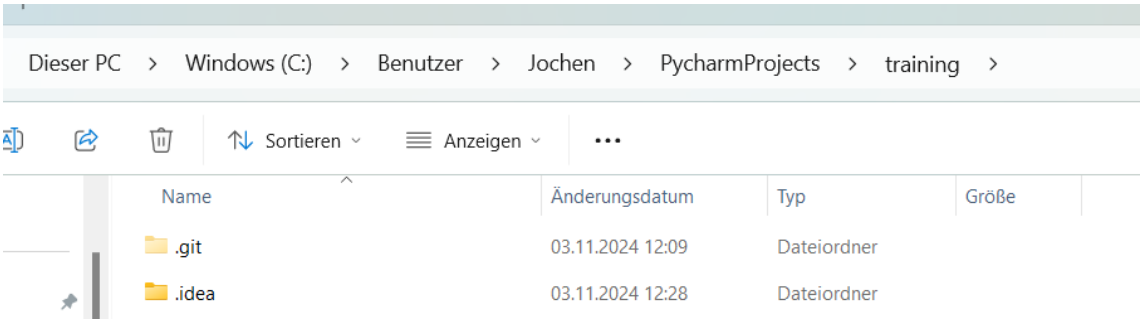
- Simply press o.k.



Where is it stored ?

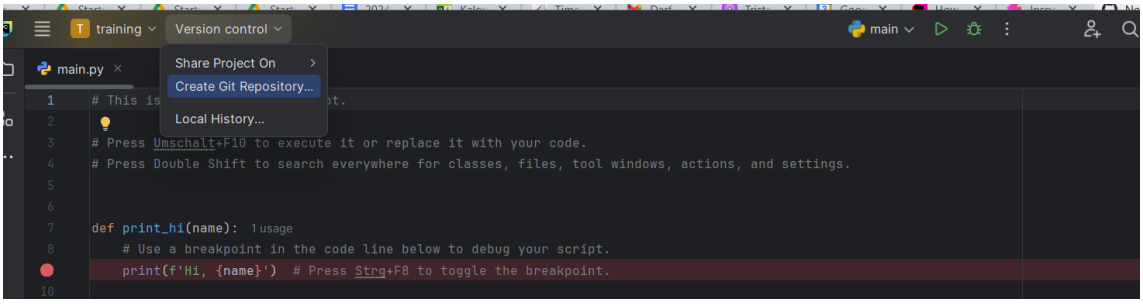
- Let's look into the explorer, it has now create a new subfolder .git



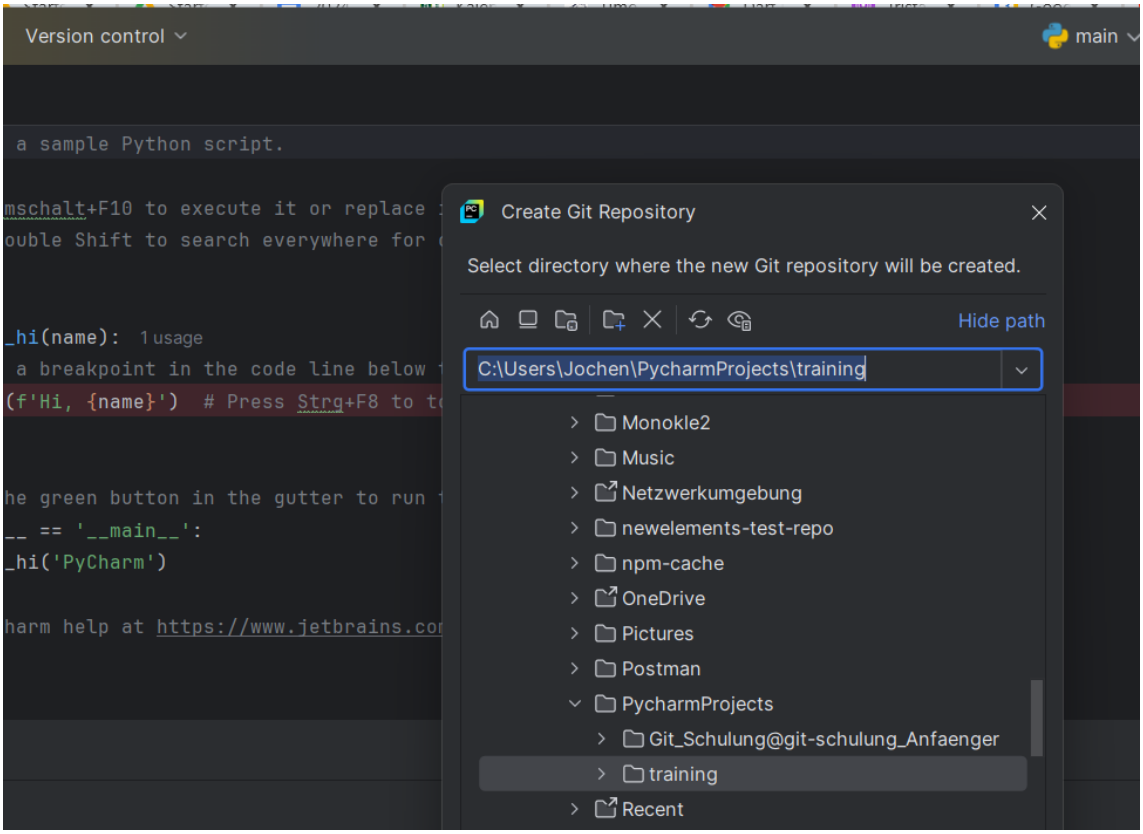


Version 2:

Create git - repository



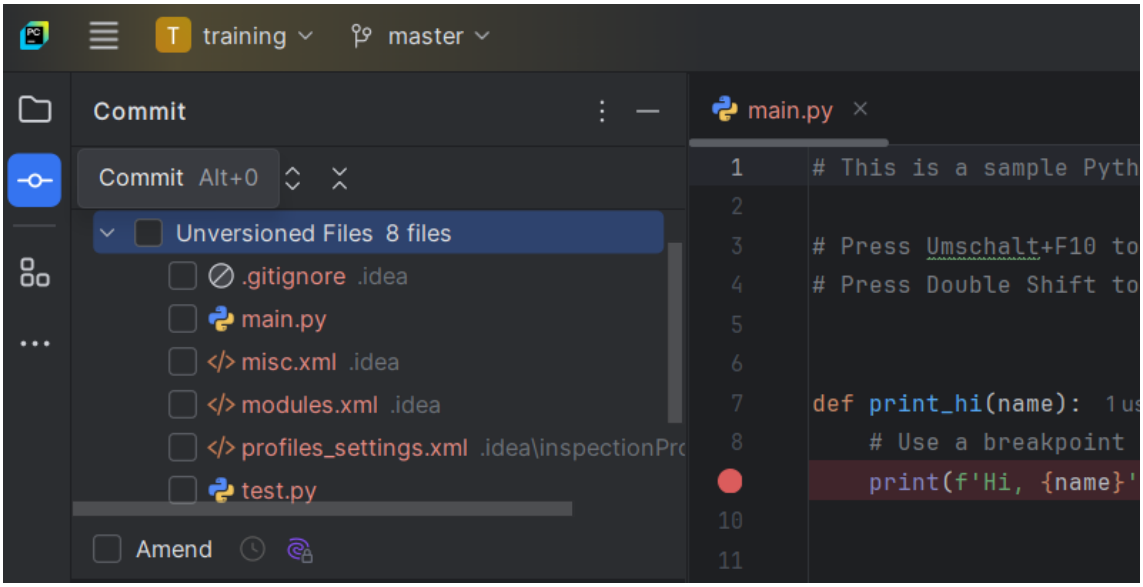
Decide which folder (Best Option: Use the same folder as project)



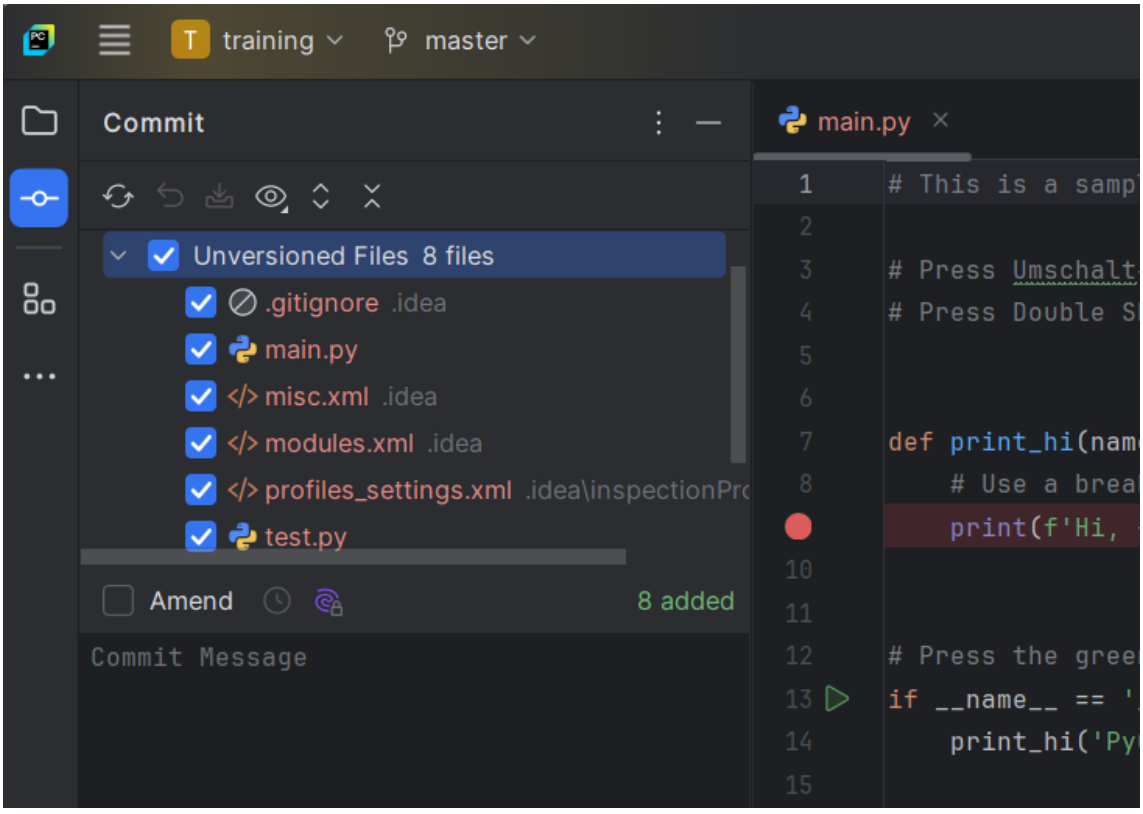
- AND press o.k.

Add unversionend files and commit

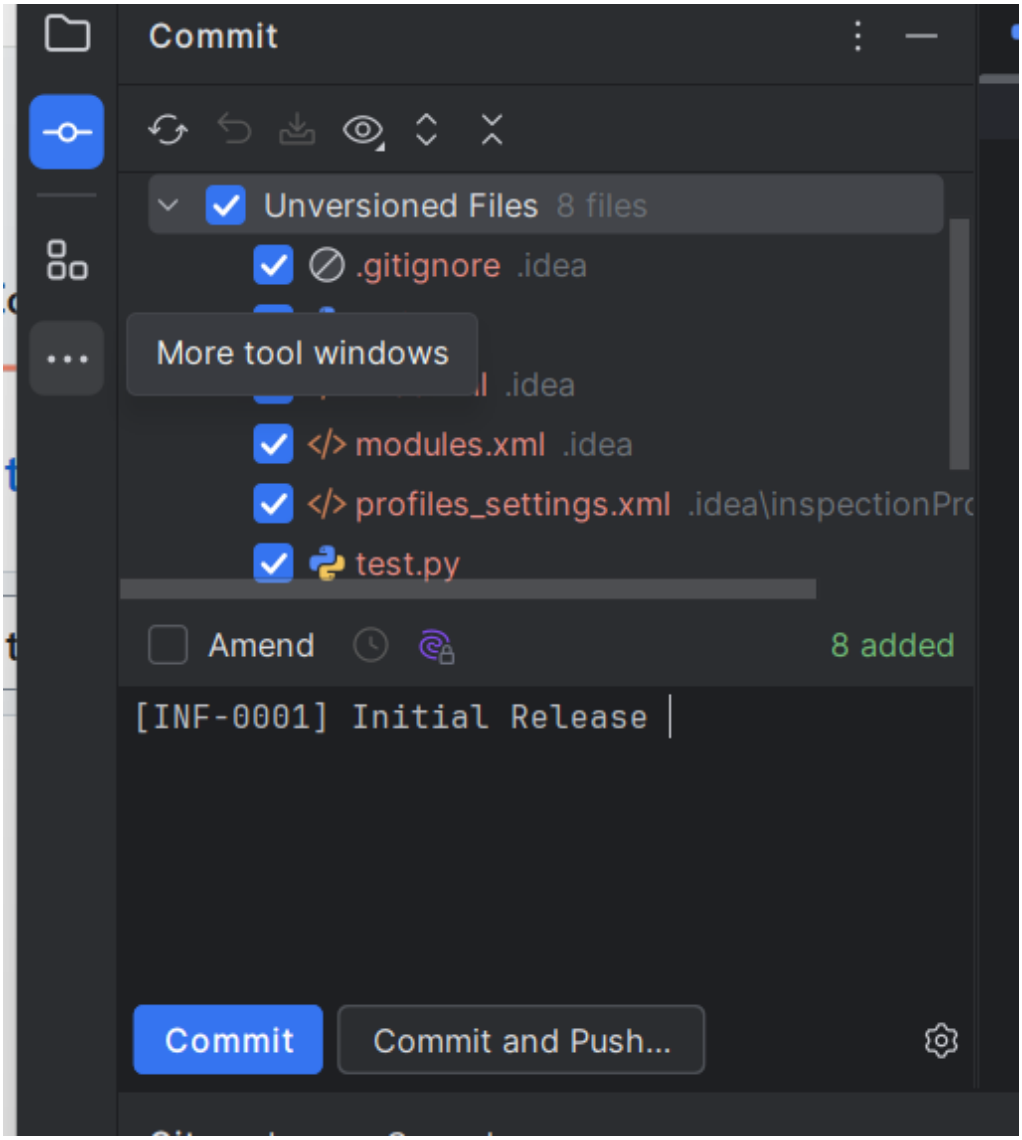
Step 1: see what files are unversioned

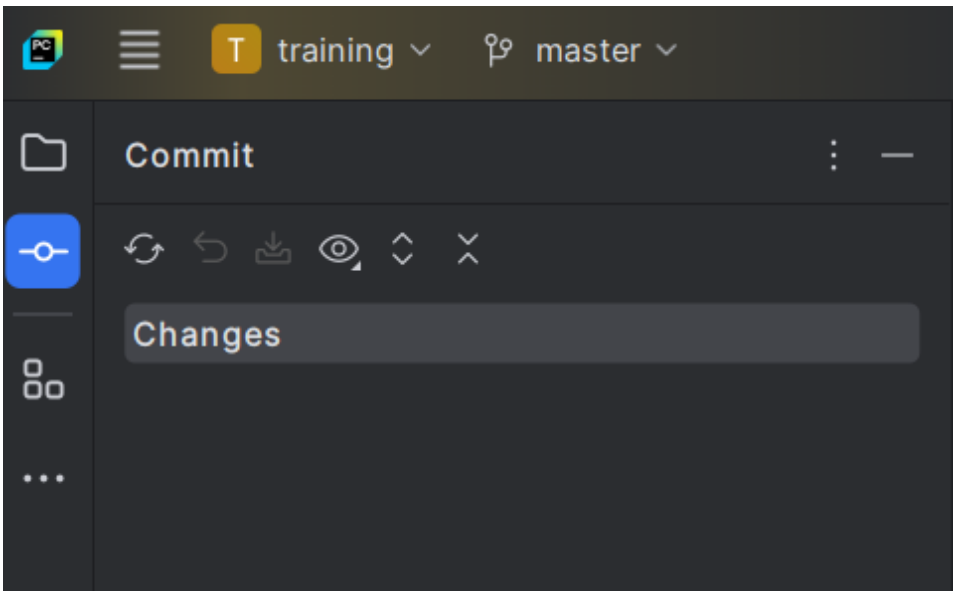


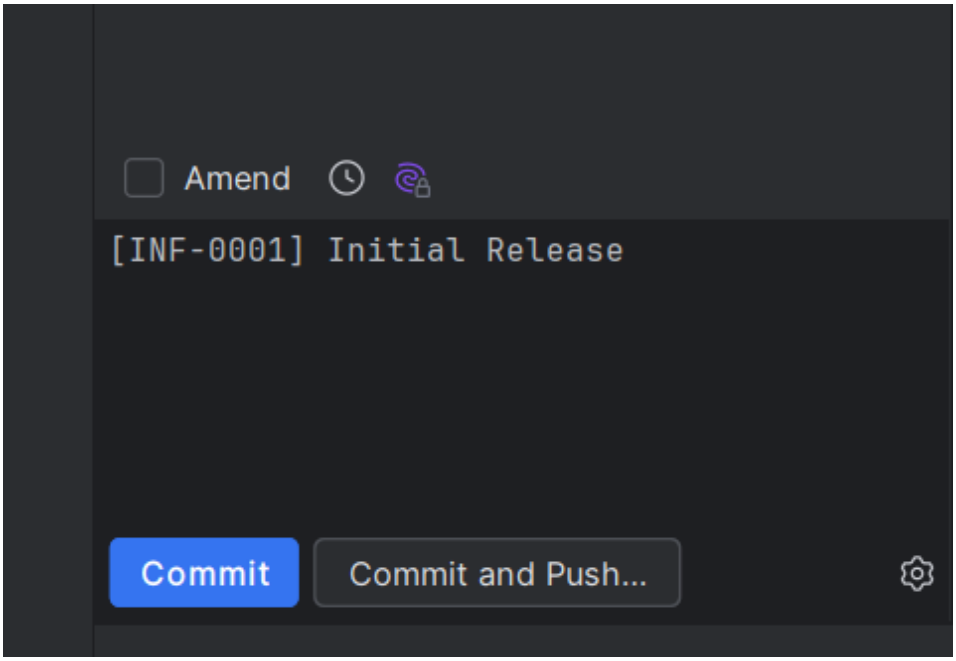
Step 2: click on unversioned files



Step 3: Add commit message + press commit

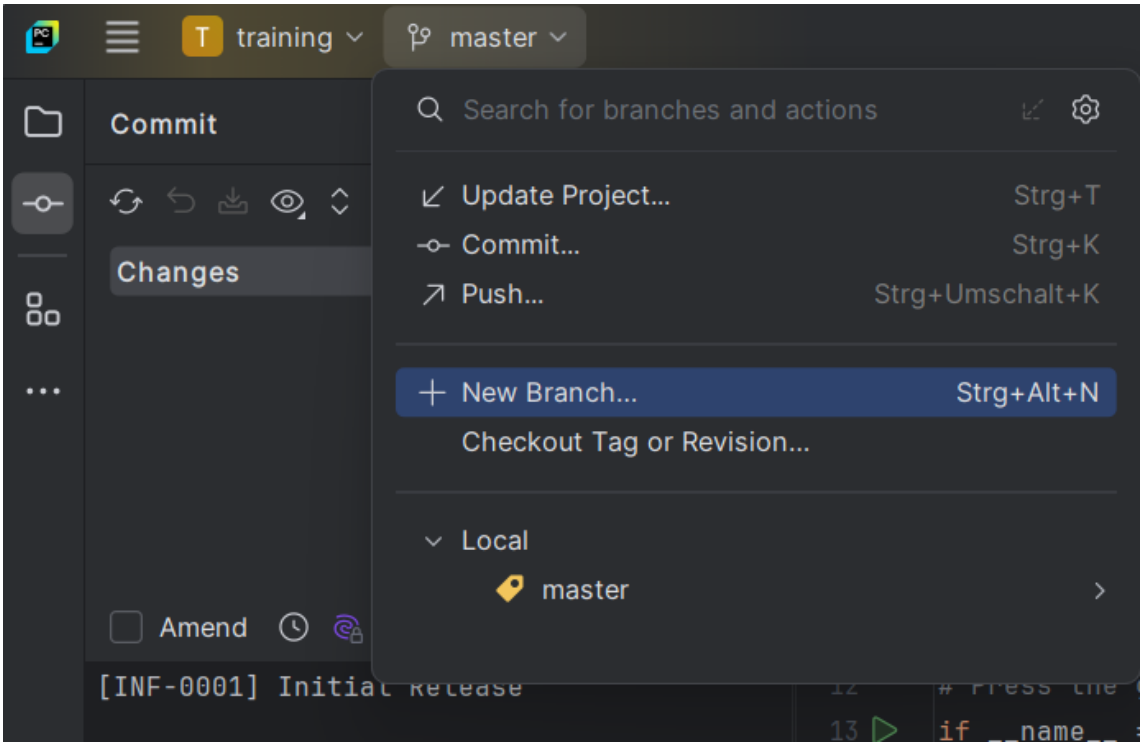

Commit
Unversioned Files 8 files
.gitignore .idea
More tool windows
.idea
modules.xml .idea
profiles_settings.xml .idea\inspectionPro
test.py
Amend
8 added
[INF-0001] Initial Release
Commit
Commit and Push...

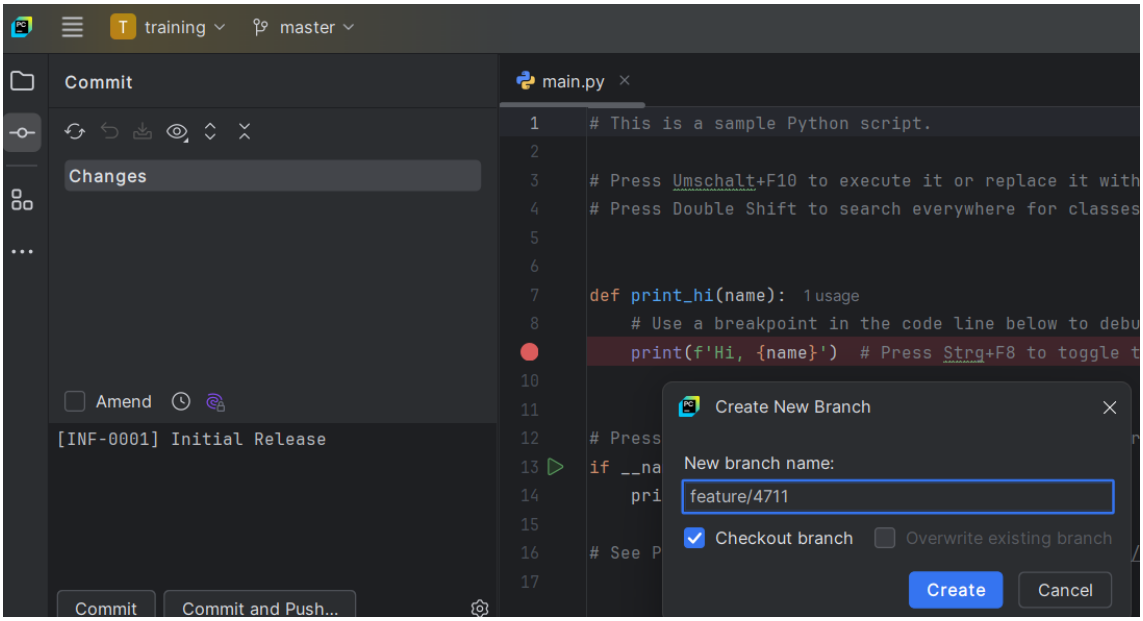

training
master
Commit
Changes



Branch erstellen

- Branch wird auf Basis des aktuellen Commits erstellt.

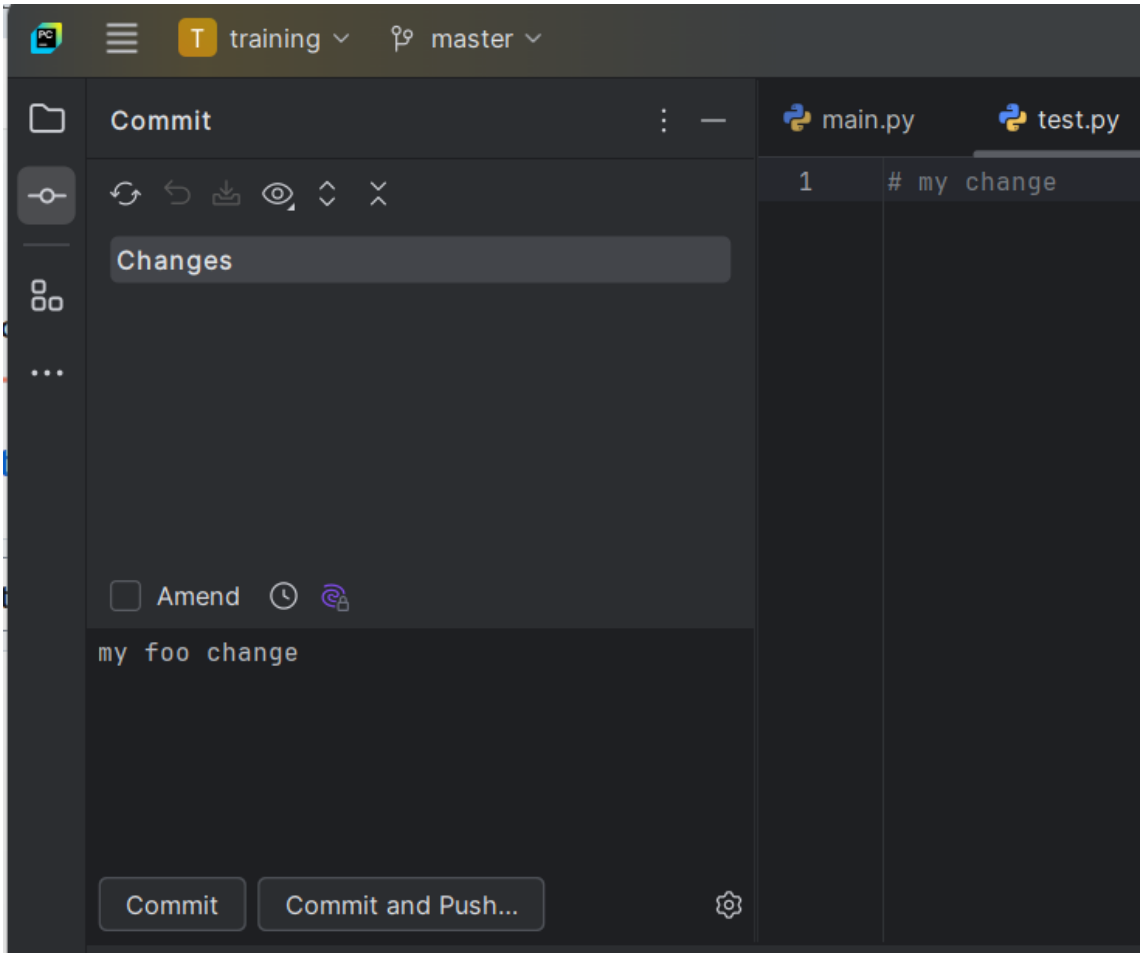




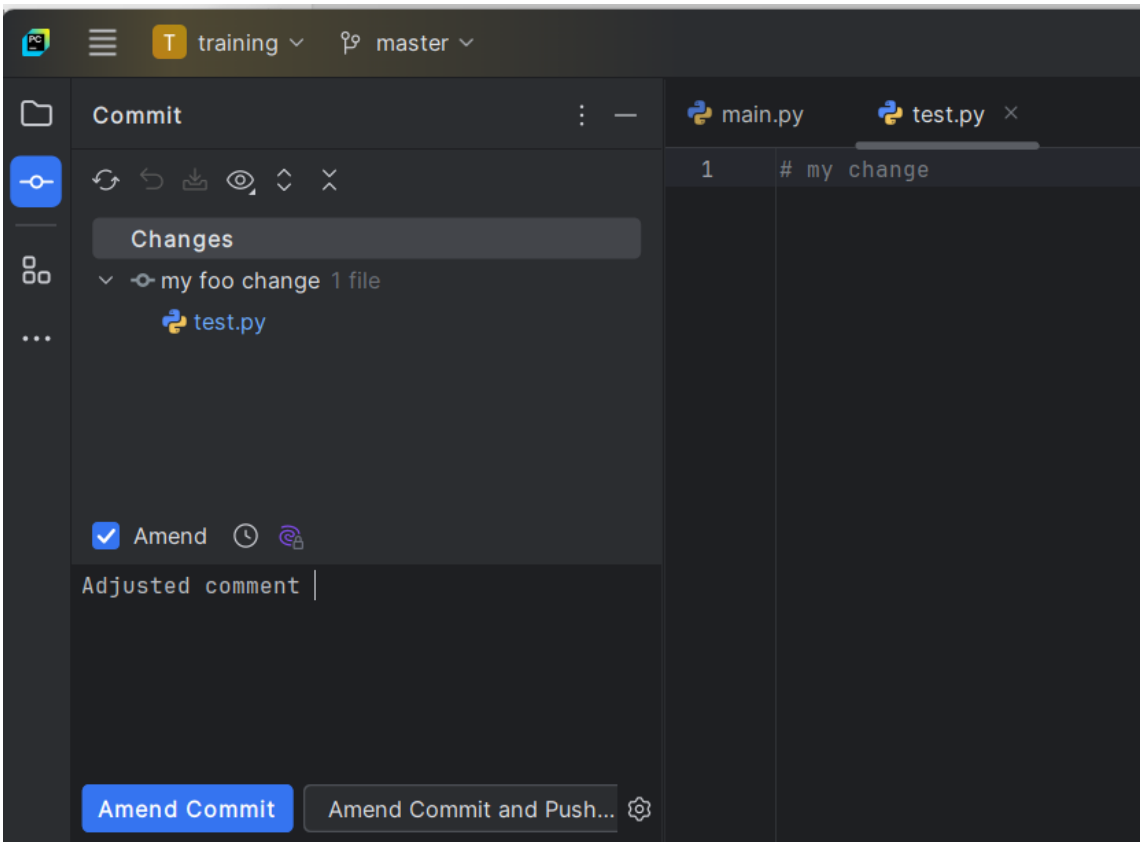
- Checkout branch (please keep checked)
- Press "Create Branch"

Commit "rückgängig" machen

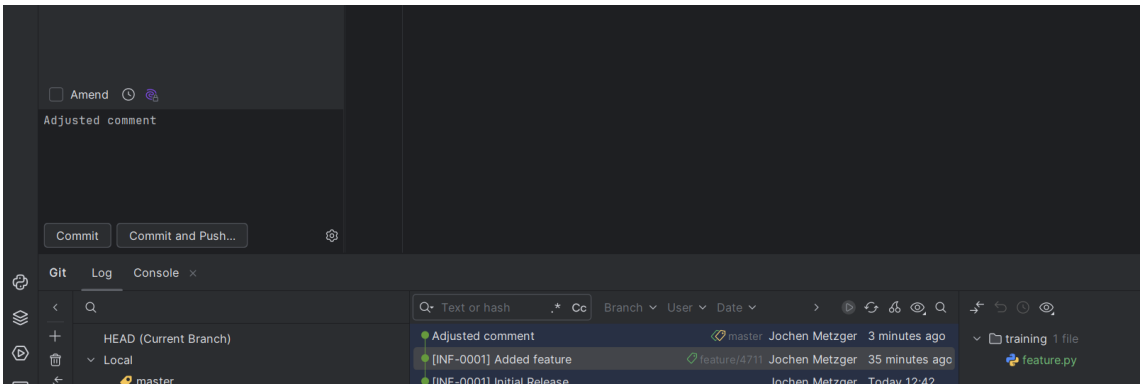
Die letzte Commit-Nachricht ändern



- Simply check "Amend" and cheange your commit accordingly



- Press "Amend Commit"
- Now you can see 1. a new commit-id and 2. the changed commit-message

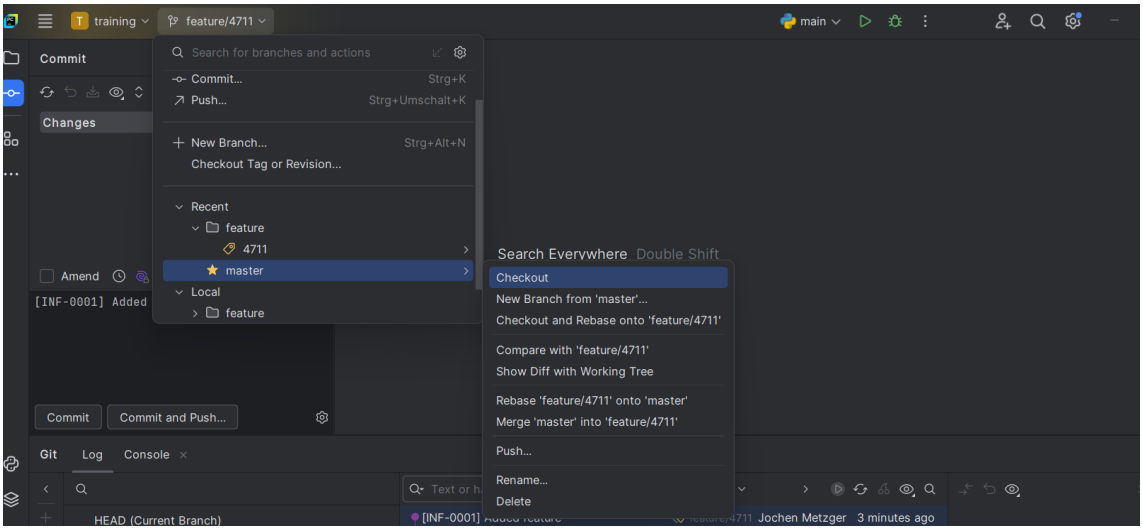


Merging - pycharm

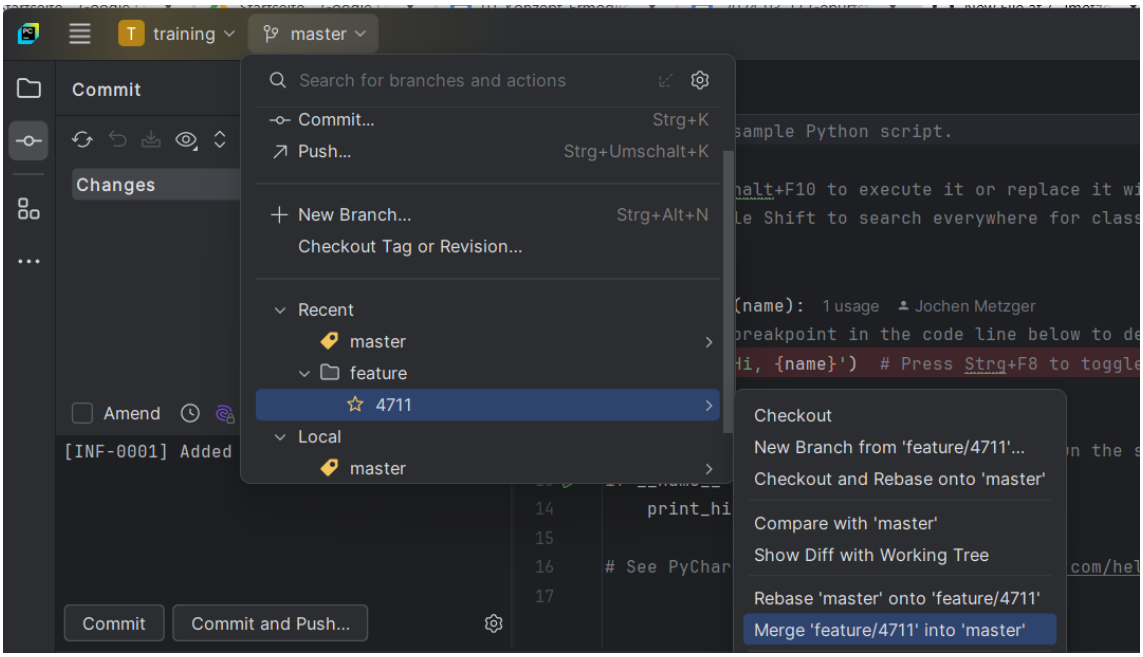
Merge branch into main

- We want a change we made in feature/4711 to merge into main

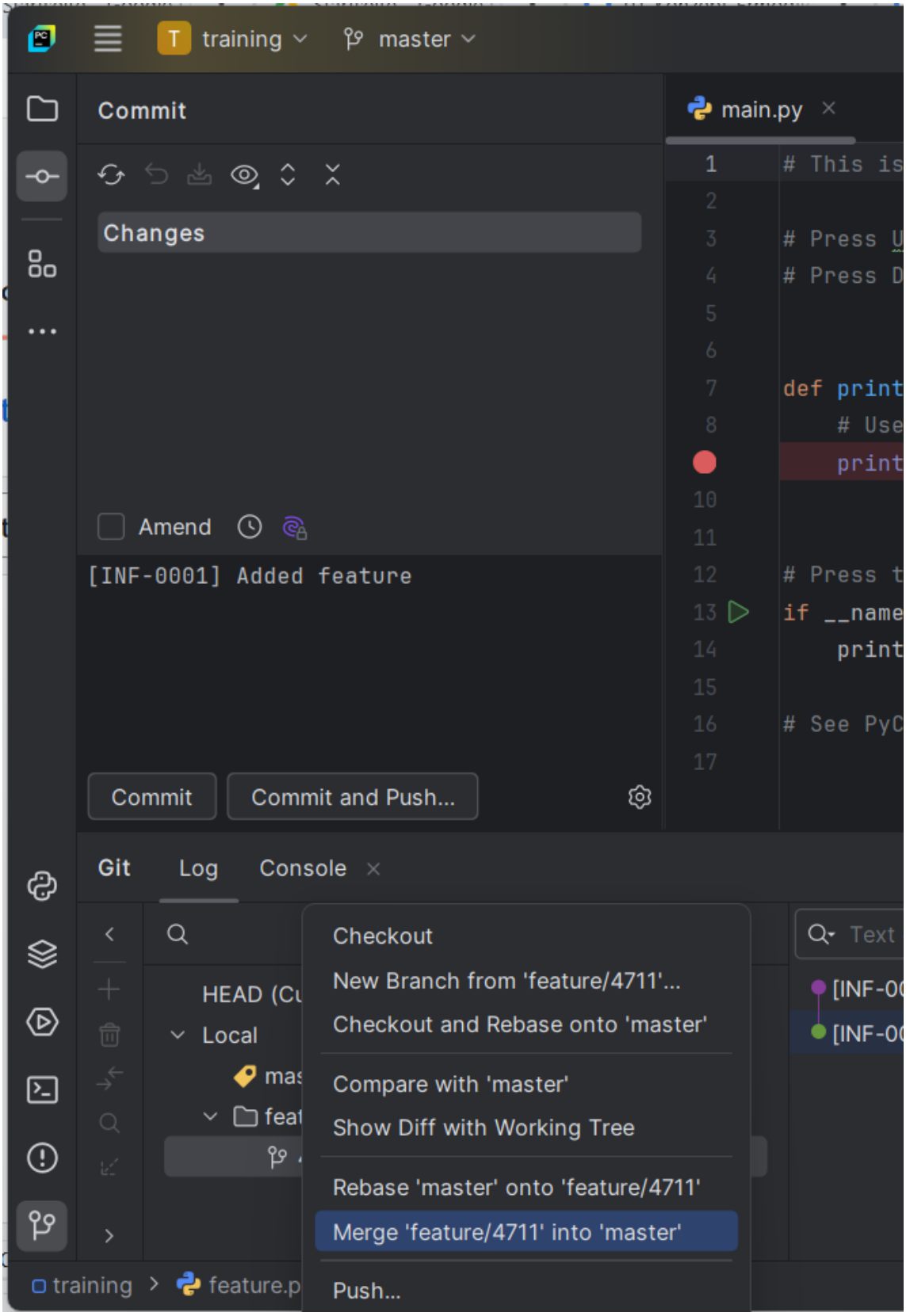
Step 1: Change branch back to main



Step 2: merge feature/4711 into main

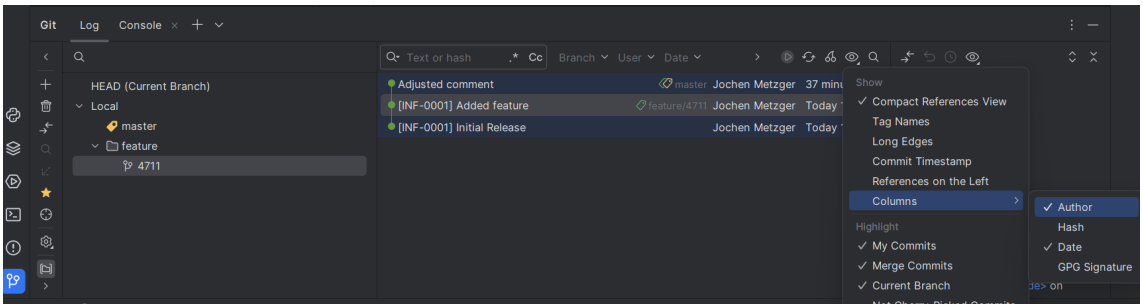


- or from the git - menu (left side - nearly at bottom)

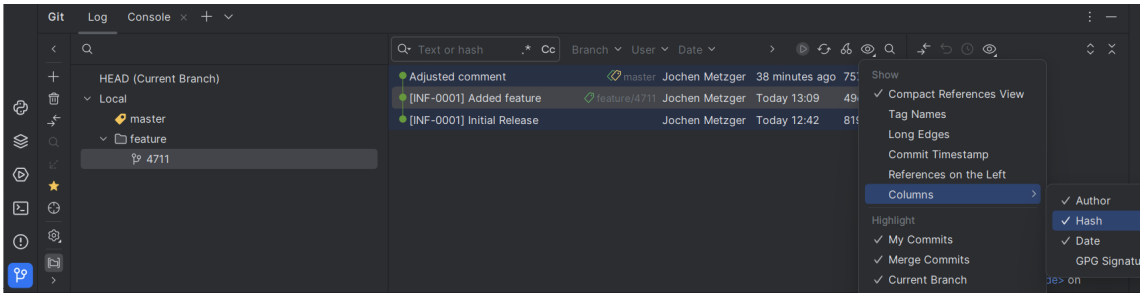

training
master
Commit
main.py
Changes
Amend
[INF-0001] Added feature
Commit
Commit and Push...
Git
Log
Console
Checkout
New Branch from 'feature/4711'...
Checkout and Rebase onto 'master'
Compare with 'master'
Show Diff with Working Tree
Rebase 'master' onto 'feature/4711'
Merge 'feature/4711' into 'master'
Push...
HEAD (Cu
Local
Text
training
feature.p

Logs - pycharm

Add commit-id to logs in pycharm

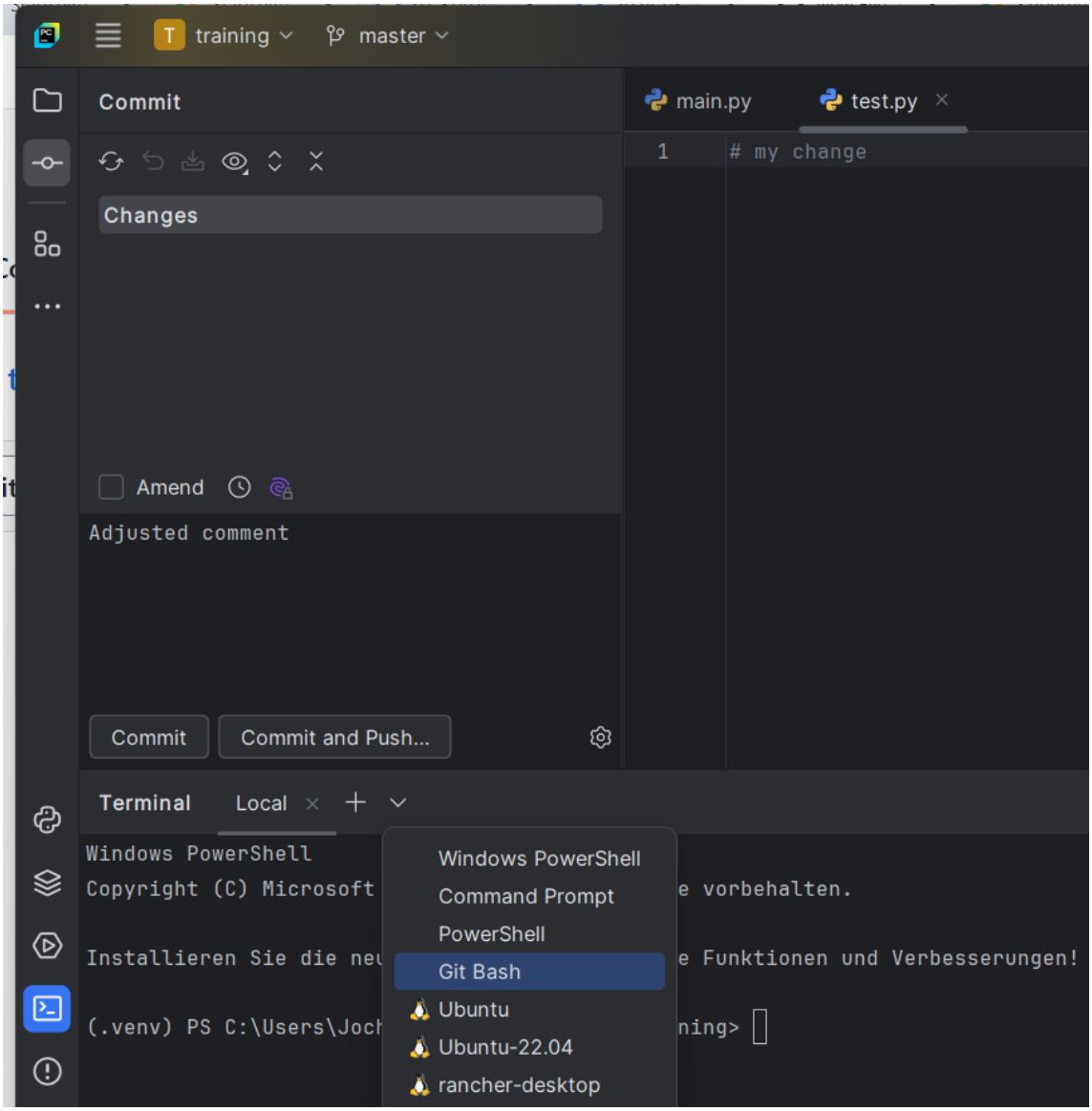


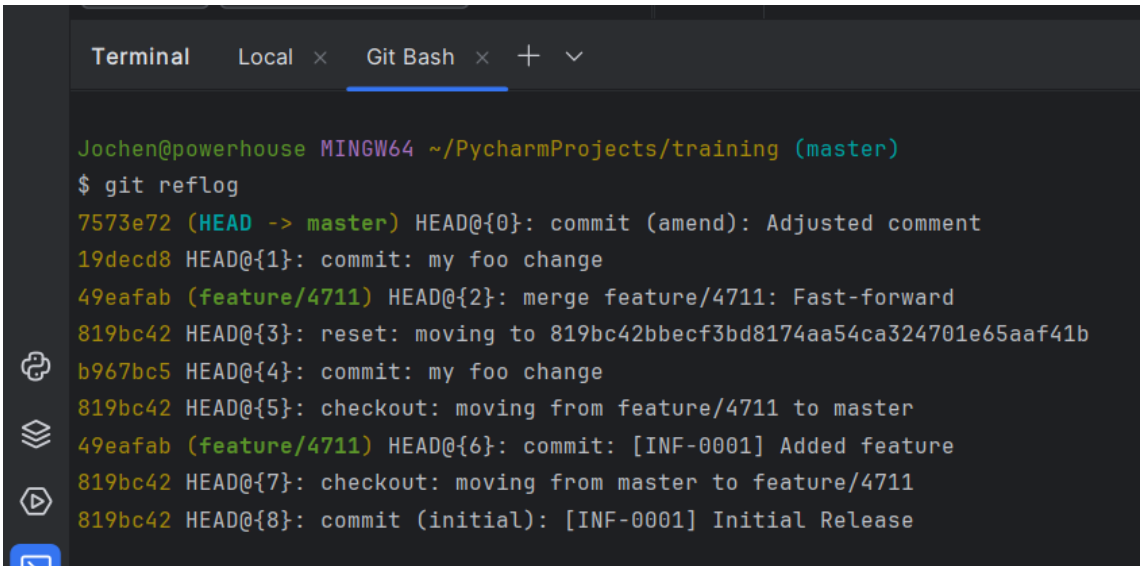
- Set checkbox next to 'Hash'



Show reflog

- reflog is not available in pycharm, so we need to use it on the commandline

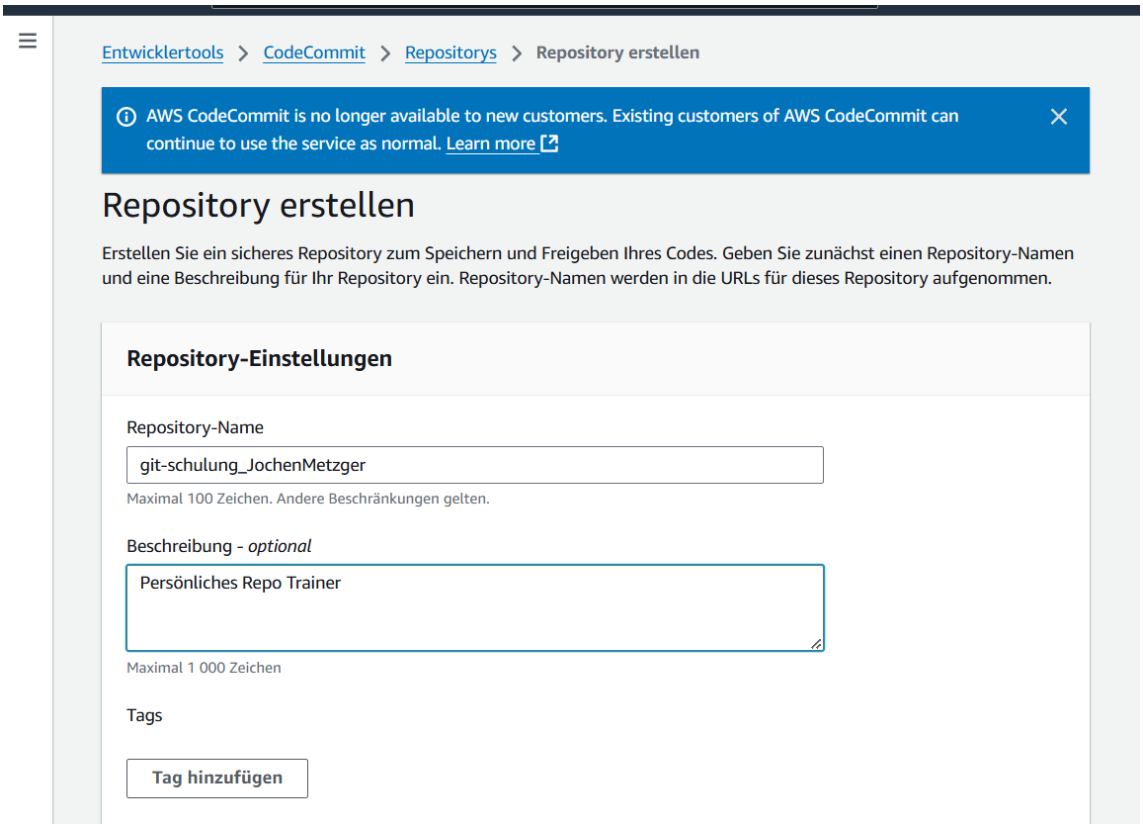

training
master
Commit
main.py
test.py
1
my change
Changes
Amend
Adjusted comment
Commit
Commit and Push...
Terminal
Local
Windows PowerShell
Copyright (C) Microsoft
e vorbehalten.
Installieren Sie die neu
e Funktionen und Verbesserungen!
(.venv) PS C:\Users\Joch
ning>
Windows PowerShell
Command Prompt
PowerShell
Git Bash
Ubuntu
Ubuntu-22.04
rancher-desktop


Terminal
Local
Git Bash
Jochen@powerhouse MINGW64 ~/PycharmProjects/training (master)
$ git reflog
7573e72 (HEAD -> master) HEAD@{0}: commit (amend): Adjusted comment
19decd8 HEAD@{1}: commit: my foo change
49eafab (feature/4711) HEAD@{2}: merge feature/4711: Fast-forward
819bc42 HEAD@{3}: reset: moving to 819bc42bbecf3bd8174aa54ca324701e65aaf41b
b967bc5 HEAD@{4}: commit: my foo change
819bc42 HEAD@{5}: checkout: moving from feature/4711 to master
49eafab (feature/4711) HEAD@{6}: commit: [INF-0001] Added feature
819bc42 HEAD@{7}: checkout: moving from master to feature/4711
819bc42 HEAD@{8}: commit (initial): [INF-0001] Initial Release

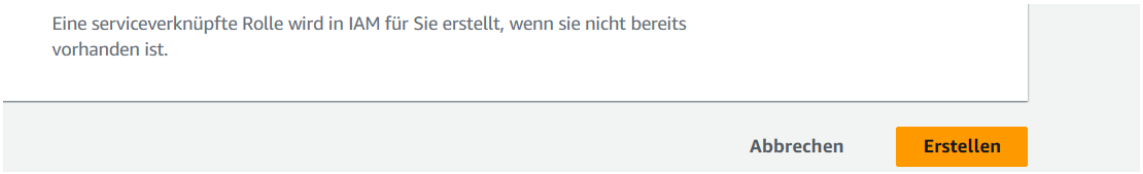
Interaction with Online (codecommit)

Publish Project to codecommit

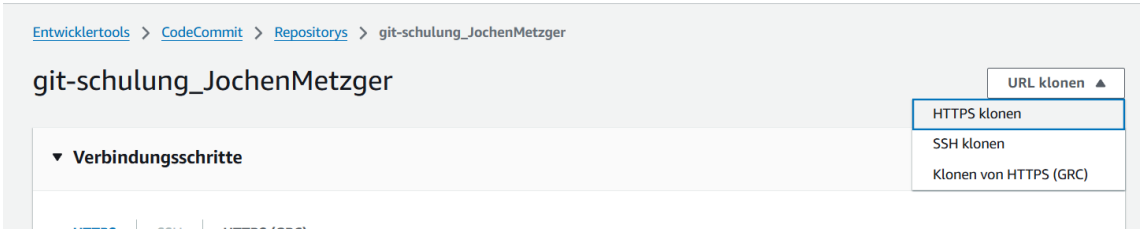
Step 1: Create Repo in code-commit



- Finally: Click on "Erstellen"



- Click on "URL klonen" -> HTTPS clonen



- URL will be copied to clipboard

Step 2: Reconnect to aws (if you have not been there for a while = token expired)

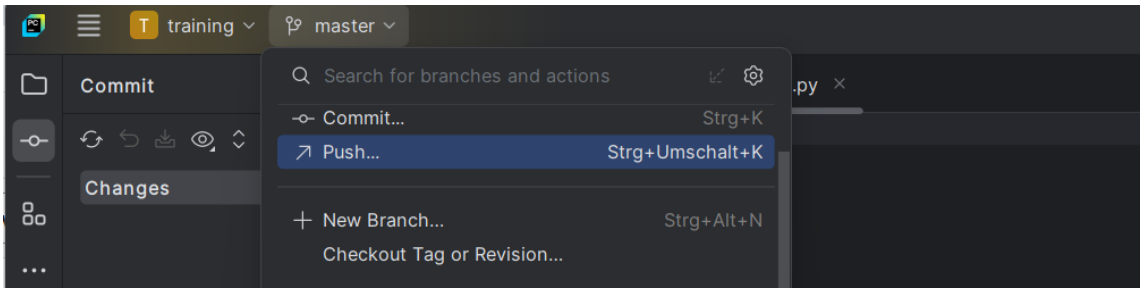
```
## in the terminal
aws sso login --sso-session my-sso
```

Step 3: Rewrite url and use for pushing in PyCharm

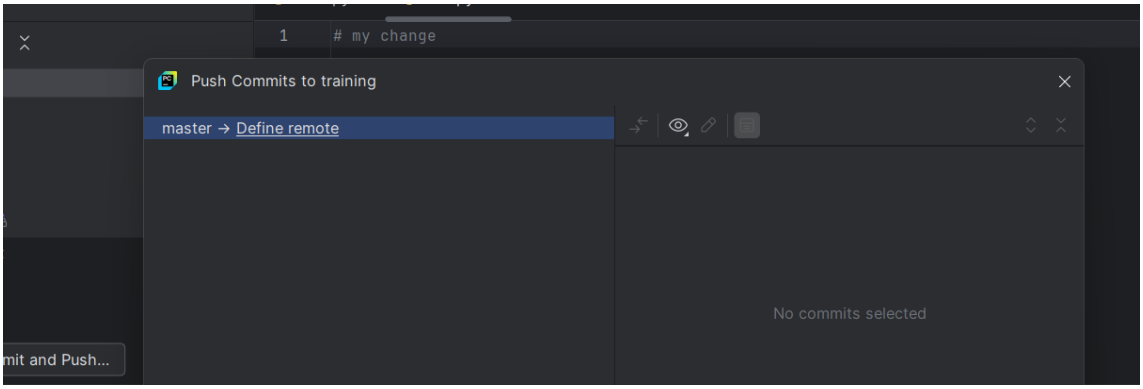
- You must have a profile setup, in my case it is: Git_Schulung, because my profile looks like this:

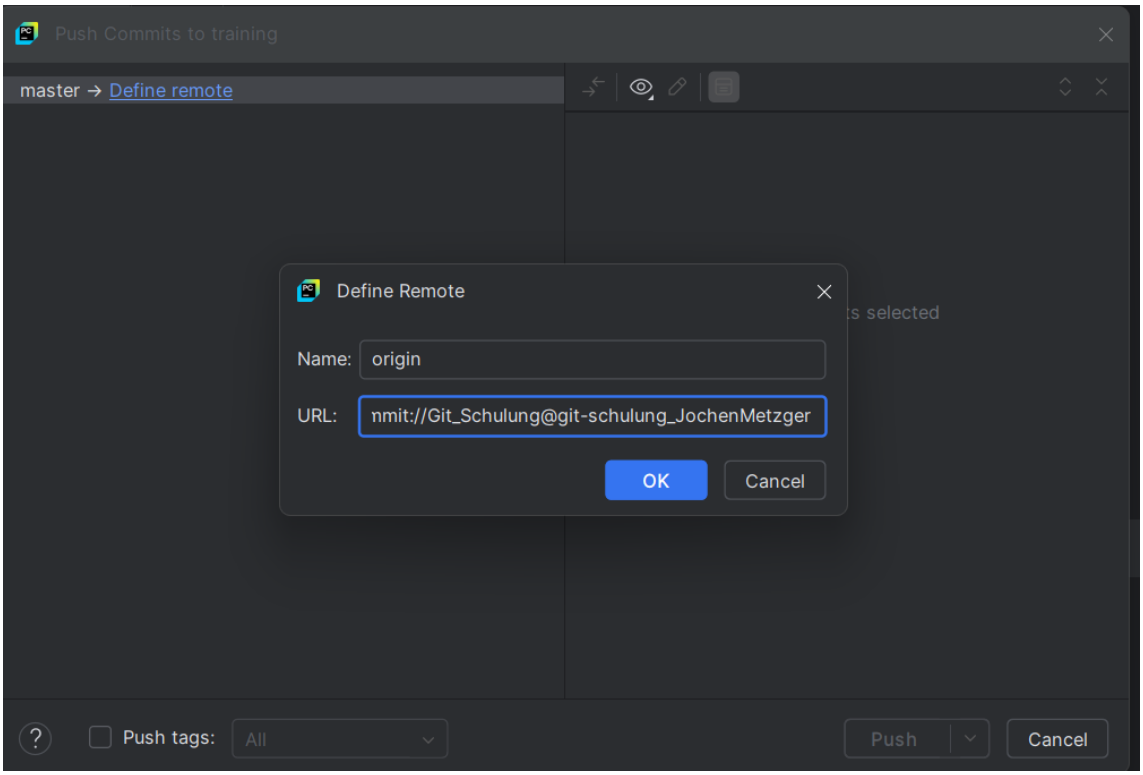
```
sso_registration_scopes = sso:account:access

Jochen@powerhouse MINGW64 ~/.aws
$ pwd
/c/Users/Jochen/.aws

Jochen@powerhouse MINGW64 ~/.aws
$ cat config
[profile Git_Schulung]
sso_session = my-sso
sso_account_id = 661251475365
sso_role_name = Git_Schulung_PS
region = eu-central-1
output = json
[sso-session my-sso]
sso_start_url = https://d-99670675d5.awsapps.com/start
sso_region = eu-central-1
sso_registration_scopes = sso:account:access
```

```
## Put url in editor and rewrite it as follows:
## e.g.
https://git-codecommit.eu-central-1.amazonaws.com/v1/repos/git-schulung_JochenMetzger
## rewrite to: (Git_schuluung is your profile)
codecommit://Git_Schulung@git-schulung_JochenMetzger
```



- Click on Define Remote





- Press "OK" and Pycharm shows what to push -> now press Push

Tipps & Tricks - pycharm

Which files to put under version control / which to ignore

- You need to exclude personal files/settings
- In general pycharm do this perfectly for you

Reference:

- https://intellij-support.jetbrains.com/hc/en-us/articles/206544839-How-to-manage-projects-under-Version-Control-Systems

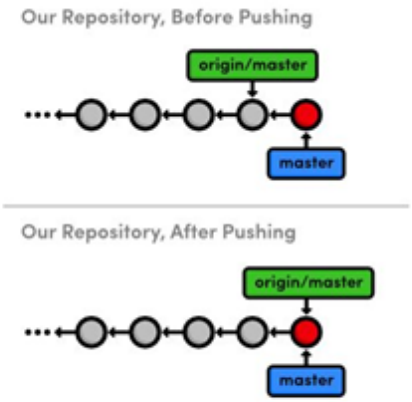
Disable ESC when using vi as editor

- https://intellij-support.jetbrains.com/hc/en-us/community/posts/360003508579-How-to-stop-Escape-from-Leaving-Terminal

Workflows

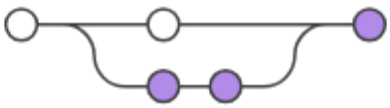
git workflows

Centralized Workflow



Pushing master to the central repository

Feature Workflow



gitflow workflow

Kommandzeile (mit tipps & tricks)

git add + Tipps & Tricks

Trick with -A

```
## only adds from the folder you are in recursively
## but not above (you might miss some files, when you are in a subfolder
git add .

### Fix -A
## adds everything no matter in which folder you are in your project
git add -A
```

git commit

commit with multiple lines on commandline (without editor)

```
 git commit -am "New entry in todo.txt

* nonsene commit-message becasue of missing text-expertise"
## enter on last line
```

Change last commit-mesage (description)

```
git commit --amend
## now you can change the description, but you will get a new commit-id
```

git log

Show last x entries

```
##
## git log -x
## Example: show last 2 entries
git log -2
```

Show all branches

```
git log --all
## oder wenn alias alias.lg besteht:
## git lg --all
```

Show first log entry

```
## Step 1 - log needs to only show one line per commit
git log --oneline --reverse

## Step 2: combine with head
git log --oneline --reverse | head -1
```

Multiple commands with an alias

```
git config --global alias.sl '!git log --oneline -2 && git status'
```

git config

How to delete an entry from config

```
## Important: Find exact level, where it was added --global, --system, --local
## test before
## should contain this entry
git config --global --list

git config --unset --global alias.log
```

git show

Show information about an object e.g. commit

```
## Show commit info and what has changed
git show <commit-ish>
## example with commit-id
git show 342a
```

Needed commands for starters

```
git add -A
git status
git log  // git log -4 // or beautified version if setup as alias git lg
git commit -am  "commit message" // "commit message" can be freely chosen
## for more merge conflict resultion use only
git commit # to not change commit - message: must be message with merge
## the first time
git push -u origin master
## after that
git push
git pull
```

git branch

Create branch based on commit (also past commit)

```
git branch lookaround 5f10ca
```

Delete unmerged branch

```
git branch -d branchname # does not work in this case
git branch -D branchname # <- is the solution
```

git checkout

Checkout (change to) existing branch

```
git checkout feature/4711
```

Checkout and create branch

```
## Only possible once
git checkout -b feature/4712
```

File aus einem Commit holen (oder HEAD)

```
git checkout HEAD -- todo.txt
```

git merge

Merge without conflict with fast-forward

```
## Disadvantage: No proper history, because only one branch visible in log
## after fast-forward - merge


## Important that no changes are in master right before merging
git checkout master
git merge feature/4711
```

Merge (3-way) also on none-conflict (no conflicts present)

```
git merge --no-ff feature/4711
```

git tag

Creating tags, Working with tags

```
## set tag on current commit -> HEAD of branch
git tag -a v1.0 -m "my message for tag"
## publish
git push --tags

## set on specific commit
git tag -a v0.1 -m "Initial Release" a23c

## checkout files of a specific tag
git checkout v0.1
## or
git checkout tags/v0.1
```

git delete tag

```

## Tag local löschen und danach online löschen
git tag -d test.tag
git push --delete origin test.tag

## Tag online löschen und danach lokal
## Schritt 1: Über das interface (web) löschen
## Schritt 2: aktualisieren
git fetch --prune --prune-tags
```

Misc

```
## Fetch new tags from online
git fetch --tags

## Update master branch (rebase) and fetch all tags in addition from online
git checkout master
git pull --rebase --tags
```

git push/pull

Neuen Branch pushen

```
git push -u origin neuer-branch
```

Unseren lokalen master auf dem Stand mit online master halten

```
git pull --rebase origin master
```

Wir arbeiten an einem branch und wollen diesen täglich mit dem master aktualiseren

```
## Initial beim ersten mal damit arbeiten
git checkout master
git checkout -b feature/neuer-branch

## danach täglich im feature/neuer-branch
git pull --rebase origin master
```

git reset

Why ?

- Back in time -> reset
- e.g. git reset –-hard e2d5
- attention: only use it, when changes are not published (remotely) yet.
- → It is your command, IN CASE your are telling yourself, omg, what's that, what did i do here, let me undo that

Example

```
git reset --hard 2343
```

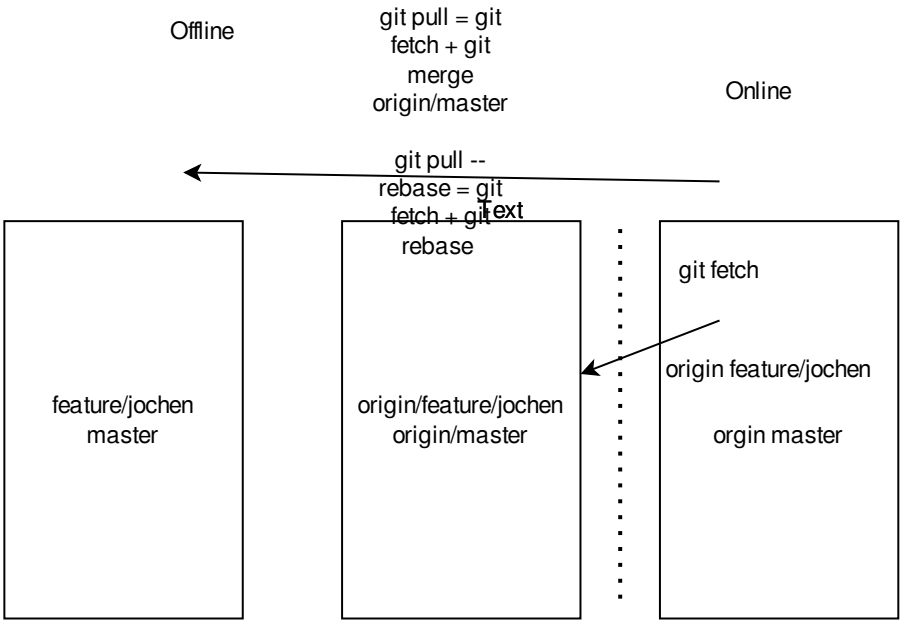
Example (Arbeitsumgebung auf den Stand des letzten Commits setzten)

```
## linux befehl -legt leere datei an.
touch myfile
git add myfile
## ich will dieses file nicht !!!!!
git reset --hard HEAD
```

Branches / Branching

Branch Overview with origin image

master vs. origin/master vs origin master



Advanced Commands

git reflog

command

- show everything you (last 30 days), also stuff that is not visible in branch anymore

Example

```
git reflog
```

when many entries a pager like less (aka man less) will be used

```
## you can get out of the page with pressing the key 'q'
```

git reset - Back in Time

Why ?

- Back in time -> reset
- e.g. git reset –-hard e2d5
- attention: only use it, when changes are not published (remotely) yet.
- → It is your command, IN CASE your are telling yourself, omg, what's that, what did i do here, let me undo that

Example

```
git reset --hard 2343
```

Example (Arbeitsumgebung auf den Stand des letzten Commits setzten)

```
## linux befehl -legt leere datei an.
touch myfile
git add myfile
## ich will dieses file nicht !!!!!
git reset --hard HEAD
```

Tipps & tricks

Beautified log

Walkthrough

```
git config --global alias.lg "log --color --graph --pretty=format:'%Cred%h%Creset \
-%C(yellow)%d%Creset %s %Cgreen(%cr) %C(bold blue)<%an>%Creset'"
```

PRETTY FORMATS

- all documented in git help log (section PRETTY FORMAT)
- https://git-scm.com/docs/git-log

Change already committed files and message

```
## Walkthrough
touch newfile.txt
git add .
git commit -am "new file added"

## Uups forgotten README
touch README
git add .
git commit --amend # README will be in same commit as newfile.txt
## + you can also changed the commit message
```

Best practice - Delete origin,tracking and local branch after pull request/merge request

```
## After a succesful merge or pull request und gitlab / github
## Follow these steps for a succesful cleanup

## 1. Delete feature branch in web interface (e.g. gitlab / github)
## e.g. feature/4811

## 2. Locally on your system prune the remote tracking branch
git fetch --prune

## 3. Switch to master or main (depending on what you master branch is)
git checkout master

## 4. Delete local branch
git branch -d feature/4811
```

Einzelne Datei auschecken

aus anderem Commit

```
## aus commit 11ed

git checkout 11ed -- todo.txt
## unterverzeichnis
git checkout 11ed -- tmp/test.txt
```

...und direkt umbenennen

```
## datei todo.txt aus 11ae -> Inhalt anzeigen und direkt neue datei umleiten
git show 11ae^:todo.txt > todoneu.txt
```

Always rebase on pull - setting

```
git config branch.master.rebase true
```

Arbeit mit submodules

Walkthrough

```
##
## uses the same branch as main repo
git submodule add https://github.com/jmetzger/training-git-pycharm

## tracking is done here:
## cat .gitmodules
```

clone repo with submodules (done afaik automatically by pycharm)

```
git clone --recurse-submodules --remote-submodules <repo-url>
```

Updating commands for updating subfolder

```
git submodule update --remote
## use other branch from submodule then master
git config -f .gitmodules submodule.training-git-pycharm.branch stable
```

Task: Set submodule to a specific tag

```
cd submodule_directory
git checkout v1.0
cd ..
git add submodule_directory
git commit -m "moved submodule to v1.0"
git push
```

pycharm notes

- There is no action for "git submodule add" in IDE
- Once you do it from CLI, you can add it to PyCharm's Version Control here: `Version Control > Directory Mappings`

Ref.

- https://git-scm.com/book/de/v2/Git-Tools-Submodule

Integration von Änderungen (commits, einzelne Dateien) aus anderen commits in den Master

Walkthrough

```
## 1. Schritt - erstellen integrationsbranch von dev/staging branch
git checkout -b integrate/1

## Möglichkeit 1: cherry-pick - komplette commit inkl. aller Änderungen mit reinnehmen
## Hier wird gemerged: Gemerged
## Evtl. Konflikt, den muss ich dann lösen
git cherry-pick c5906c0

## Möglichkeit 2: Einzelne files aus commit: Achtung, wenn im Work-Directory
## bereits vorhanden überschrieben
## commit wird bereits durchgeführt
git checkout ddb0 -- armin3.txt

## Möglichkeit 3: cherry-pick ohne commit
git cherry-pick -n 4497
git status
## alle files rausnehmen, die wir nicht haben möchten, wie folgt.
git restore --staged agenda.txt
## Achtung, jetzt sind diese so im Working Directory als unstaged
## d.h. die alte Version aus dem letzten Commit holen
git checkout HEAD -- agenda.txt

## 3. Schritt
## änderungen commiten
git commit -am "Revised version"

## 4. Nach online pushed
git push -u origin integrate/1

## 5. Merge request in gitlab: integrate/1 -> master
## und dann mergen online
```

Fix conflict you have in merge-request (gitlab)

Walkthrough

```
## create feature-branch and worked on it
git checkout -b feautre/4711
## ... changes
git add .; git commit -am "new feature"
## pushed branch online
git push -u origin feature/4711
## then created merge online
## feature/4711 --> master

###### TaDa - It was NOT possible to merge because of conflict
## unfortunately advice on gitlab/bitbucket is not worth the dime

## locally, update you feature-branch like so
## NO git pull --rebase please, otherwice, you have to redo you merge_request
afterwards
## get changes from master
git pull origin master

## fix conflicts
git add .
git commit

## push new version of feature - branch online
git push

## now you can merge in the merge-request interface on gitlab
```

SETUP.sql zu setup.sql in Windows (Groß- und Kleinschreibung)

Problem

- Windows erkennt in git keine Änderung der Groß- und Kleinschreibung
- Workaround: git rm --cached; git commit -am

Walkthrough

```
touch SETUP.sql
git add .; git commit -am "SETUP neu"

## Uups, verschrieben ! Was jetzt ?
git rm --cached SETUP.sql # Datei wird aus git rausgenommen
git commit -am "und dingfest machen"
## Beweis
git show HEAD # letztes commit mit Änderungen anzeigen


## Jetzt auf ein Neues
## oder im Explorer
mv SETUP.sql setup.sql
git add .; git commit -am "setup.sql neu"
git show HEAD
```

Force specfic commit message

Basics

- Done on Server-Side
- Specific to server - Software (like github/gitlab)

Example - pre-receive-hook

- https://git-scm.com/book/en/v2/Customizing-Git-An-Example-Git-Enforced-Policy

Ref:

- https://docs.gitlab.com/ee/user/project/repository/push_rules.html (not free)
- https://docs.gitlab.com/ee/administration/server_hooks.html

Alle Dateien, die sich geändert haben anzeigen z.B. heute

Files

git log --after="2015-11-05T16:36:00-02:00" --before="2022-09-28" --pretty=format:"" --name-only | sort -u

Mit loop

```
for i in $(git log --after="2022-09-26" --before="2022-09-27" --pretty=format:"" --
name-only | sort -u); do  git log -- $i; done
```

Änderungen einer datei

```
git log --after="2022-09-26" --before="2022-09-27" --pretty=format:"" --follow -p --
todo.txt
```

Exercises

merge feature/4712 - conflict

Exercise

```
1. You are in master-branch
2. Checkout new branch feature/4712
3. Change line1 in README.md
4. git add -A; git commit -am "feature-4712 done"
5. Change to master
6. Change line1 in README.md
7. git add -A; git commit -am "change line1 in todo.txt in master"
8. git merge feature/4712
```

merge request with bitbucket

```
## Local
git checkout -b feature/4822
ls -la
touch f1.txt
```

```
git add .
git commit -am "f1.txt"
touch f2.txt
git add .
git commit -am "f2.txt"
git push -u origin feature/4822
```

Online bitbucket / gitlab

```
## create merge request
## and merge
```

Delete branch online after merge

Cleanup locally

```
git fetch --prune
git checkout master
git branch -D feature/4822
git pull --rebase
```

Snippets

publish lokal repo to server - bitbucket

```
# Step 1: Create repo on server without README and .gitignore /set both to NO when
creating

# Step 2: on commandline locally
cd /path/to/repo
git remote add origin https://erding2017@bitbucket.org/erding2017/git-remote-
jochen.git
git push -u origin master

# Step 3: for further commits
echo "test" > testdatei
git add .
git commit -am "added testdatei"
git push
```

failure-on-push-fix

```
## Step 1: push produces error
## you have done git push -u origin master the last to setup remote tracking branch by
option -u
git push
Password for 'https://erding2017@bitbucket.org':
To https://bitbucket.org/erding2017/git-remote-jochen.git
 ! [rejected]        master -> master (fetch first)
error: failed to push some refs to 'https://erding2017@bitbucket.org/erding2017/git-
```

```
remote-jochen.git'
hint: Updates were rejected because the remote contains work that you do
hint: not have locally. This is usually caused by another repository pushing
hint: to the same ref. You may want to first integrate the remote changes
hint: (e.g., 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
## Step 2: Integrate changes from online
git pull
## Step 2a: Editor opens and you need to save and ext (without changing anything)

## Step 3: re-push
git push
```

failure-on-push-with-conflict

Failure push

```
## Step 1: push produces error
## you have done git push -u origin master the last to setup remote tracking branch by
option -u
git push
Password for 'https://erding2017@bitbucket.org':
To https://bitbucket.org/erding2017/git-remote-jochen.git
 ! [rejected]        master -> master (fetch first)
....
## Step 2: Integrate changes from online
git pull

## Step 3: Solve conflict
Auto-merging agenda.txt
CONFLICT (content): Merge conflict in agenda.txt
Automatic merge failed; fix conflicts and then commit the result.
kurs@ubuntu-tr01:~/training$ git status
On branch master
Your branch and 'origin/master' have diverged,
and have 1 and 1 different commits each, respectively.
  (use "git pull" to merge the remote branch into yours)

## Step 3a: Open file agenda.txt
## Decide for which version
## - remove all <<<<<< and ====== and >>>>>>>>>>  - lines

## Step 3b: then: save + exit from editor


## Step 3c: mark resolution
git status
git add todo.txt

## Step 3d:
git status
```

```
## as written there
git commit


## Step 4: re-push
git push
```

recipe

```
git push # failure
git pull
git add todo.txt
git commit
git push
```

Extras

Best practices

- Delete branches, not needed anymore
- git merge --no-ff -> for merging local branches (to get a good history from local)
- from online: git pull --rebase // clean history from online, not to many branches
- nur auf einem Arbeiten mit max. 2 Teilnehmern, wenn mehr feature-branch

Teil 2:

- Be careful with git commands that change history.
  - never change commits, that have already been pushed
- Choose workflow wisely
- Avoid git push -f in any case // should not be possible
- Disable possibility to push -f for branch or event repo

Using a mergetool to solve conflicts

Meld (Windows) - Install

- https://meldmerge.org/

Find out if mergetool meld is available

```
git mergetool --tool-help
```

Configure, when it is found by mergetool --tool-help

```
## you have to be in a git project
git config --global merge.tool meld
git config --global diff.tool meld
git config --global mergetool.keepBackup false
git config --list
```

If not found bei mergetool --tool-help :: Configuration in Git for Windows (git bash)

```
## you have to be in a git project
git config --global merge.tool meld
git config --global diff.tool meld
## Should be on Windows 10
git config --global mergetool.meld.path
“/c/Users/Admin/AppData/Local/Programs/Meld/Meld.exe”
## sometimes here
git config --global mergetool.meld.path "/c/Program Files/Meld/Meld.exe"
## do not create an .orig - file before merge
git config --global mergetool.keepBackup false
```

How to use it

```
## when you have conflict you can open the mergetool (graphical tool with )
git mergetool
```

Help

Help from commandline

On Windows

```
## on git bash enter
git help <command>
## e.g.
git help log

## --> a webpage will open with content
```

submodules

submodules

Walkthrough

```
##
## uses the same branch as main repo
git submodule add https://github.com/jmetzger/training-git-pycharm

## tracking is done here:
## cat .gitmodules
```

clone repo with submodules (done afaik automatically by pycharm)

```
git clone --recurse-submodules --remote-submodules <repo-url>
```

Updating commands for updating subfolder

```
git submodule update --remote
## use other branch from submodule then master
git config -f .gitmodules submodule.training-git-pycharm.branch stable
```

Task: Set submodule to a specific tag

```
cd submodule_directory
git checkout v1.0
cd ..
git add submodule_directory
git commit -m "moved submodule to v1.0"
git push
```

pycharm notes

- There is no action for "git submodule add" in IDE
- Once you do it from CLI, you can add it to PyCharm's Version Control here: `Version Control > Directory Mappings`

Ref.

- https://git-scm.com/book/de/v2/Git-Tools-Submodule

Authentication

Work with different credentials

Ref:

https://de.linkedin.com/pulse/mehrere-gitlabgithub-accounts-bzw-ssh-keys-zum-host-mit-mindermann

Shells

color for zsh-shell under osx

- https://gist.github.com/chrisnolet/d3582cd63eb3d7b4fcb4d5975fd91d04

branch mit anzeigen in zsh-shell und osx

- https://github.com/romkatv/powerlevel10k

Documentation

GIT Pdf

- http://schulung.t3isp.de/documents/pdfs/git/git-training.pdf

GIT Book EN

- https://git-scm.com/book/en/v2

GIT Book DE

- https://git-scm.com/book/de/v2

GIT Book - submodules

- https://git-scm.com/book/de/v2/Git-Tools-Submodule

GIT Guis

- https://git-scm.com/downloads/guis/

Third Party Tools

Continuous Integration / Continous Deployment (CI/CD)

```
## Test often / Test automated (CI)

* Jenkins
* Github Actions
* Git Webhooks

## Publish new versions frequently (CD)

* Jenkins
* Github Action
* Git Webhooks
```

Specification Conventional Commits

- https://www.conventionalcommits.org/en/v1.0.0/

.gitignore

- https://git-scm.com/docs/gitignore

learn branching

- https://learngitbranching.js.org/?locale=de_DE

Datenbank - Versionierung

Methode 1

- https://github.com/sergiosbx/pyway

Methode 2

- https://flywaydb.org/

Installation

GIT auf Ubuntu/Debian installieren

Installation

```
sudo apt update
sudo apt install git
```

Language to english please !!

```
sudo update-locale LANG=en_US.UTF-8
su - kurs
```

```
## back to german

sudo update-locale LANG=de_DE.UTF-8
su - kurs

## Reference:
https://www.thomas-krenn.com/de/wiki/Locales_unter_Ubuntu_konfigurieren

## update-locale does a change in
$ cat /etc/default/locale
LANG=en_US.UTF-8
```

GIT unter Windows installieren

- https://git-scm.com/download/win

Tipps & Tricks (Aufräumen)

Tracking Branches (shadow branches) nach Integration Online löschen

```
git checkout master
git pull --rebase origin master

## Davor: Online branch (neuer feature-branch löschen)
## Löscht Schattenbranch
git fetch --prune

## Und lokaler branch löschen
git branch -d feature/mein-feature-branch
```

Tipps & Tricks (editor)

Notepad als Editor verwenden- Windows

```
git config --global core.editor notepad
```

TextEdit als Editor unter mac verwenden

```
git config --global core.editor "open -W -n"
```