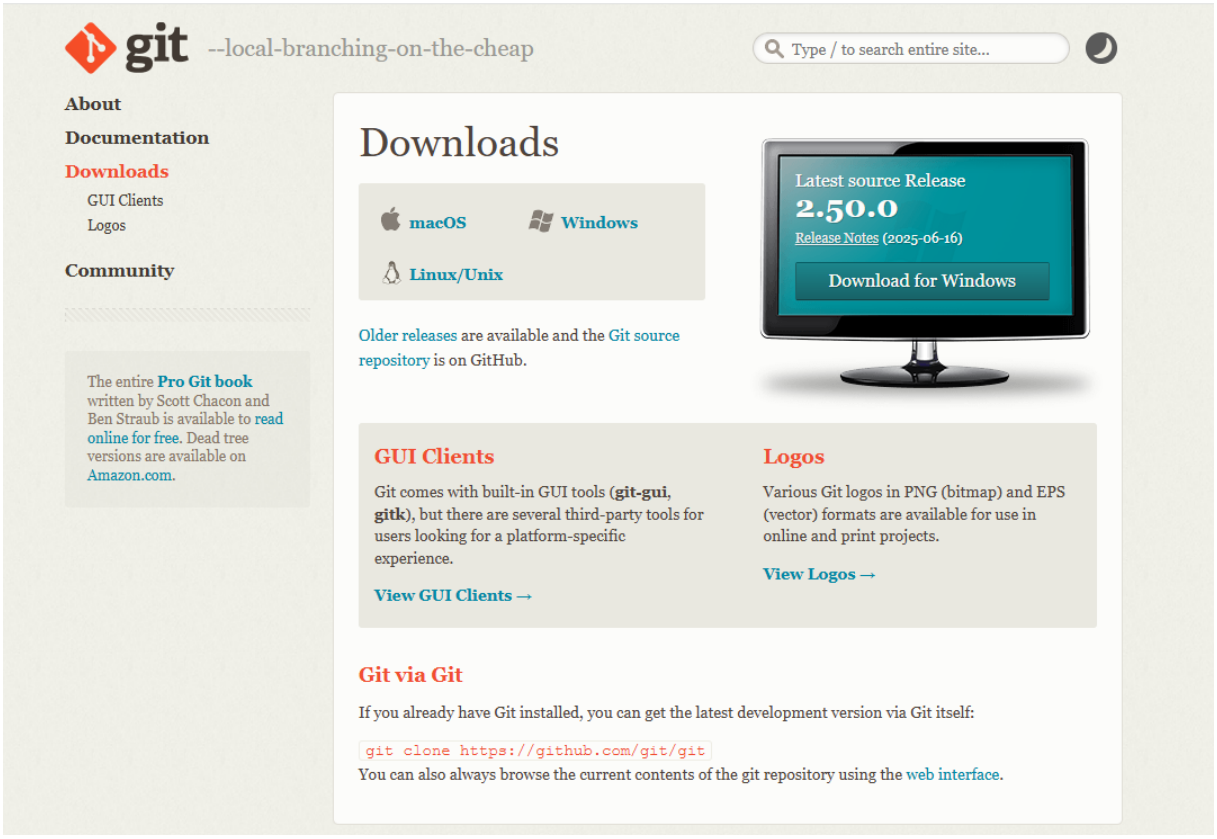
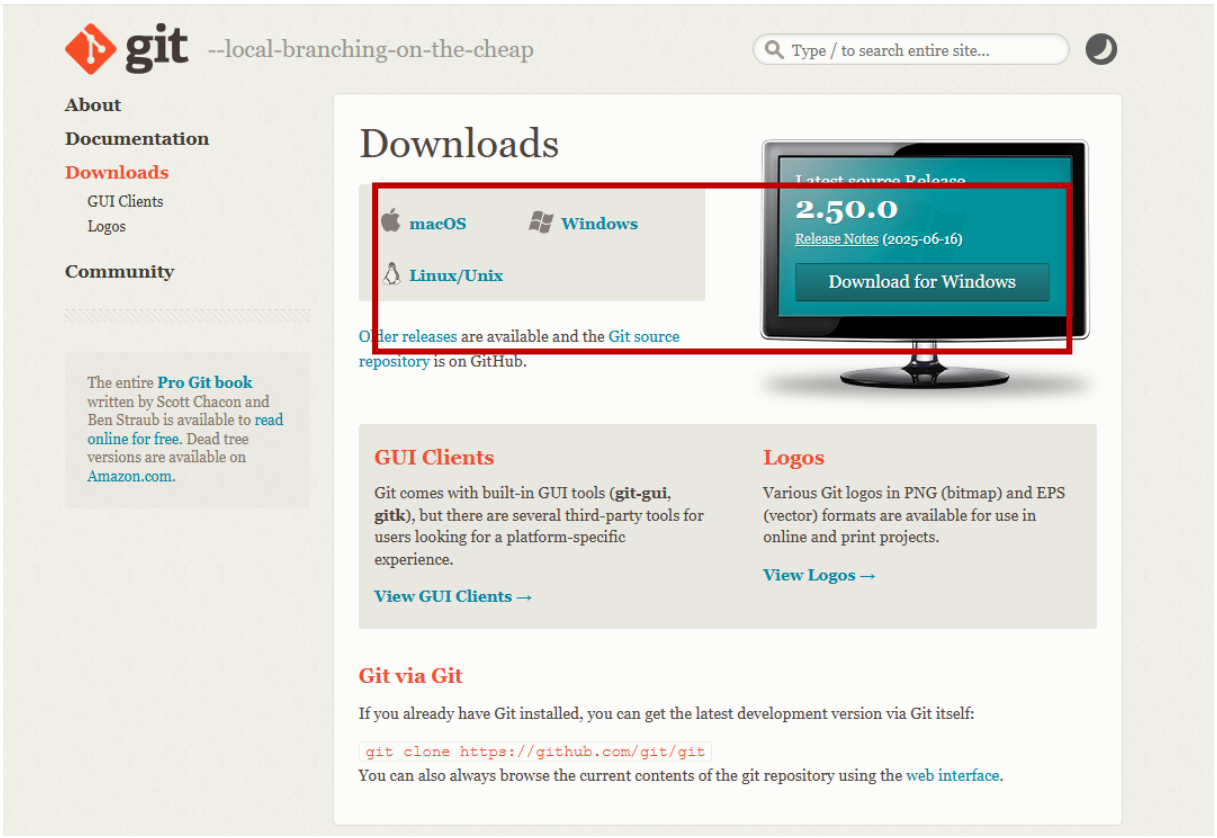
Git & GitHub Handout

Contents

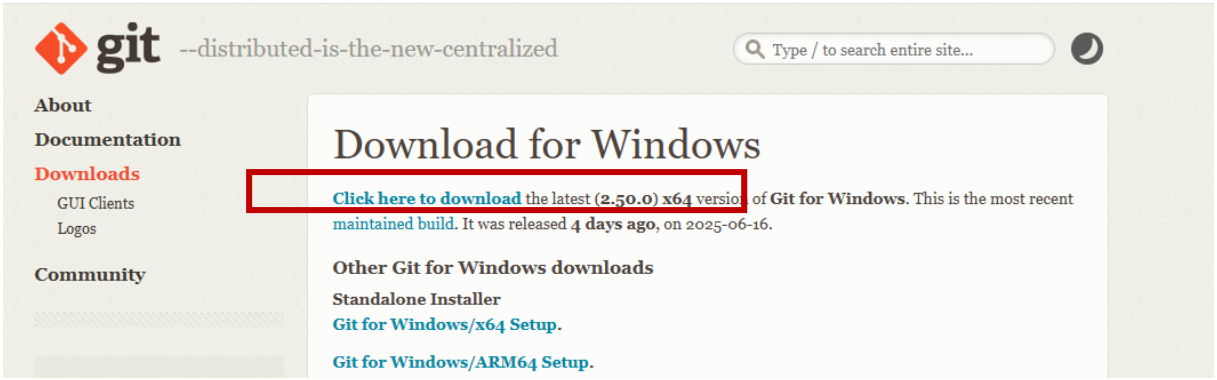
Installation

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

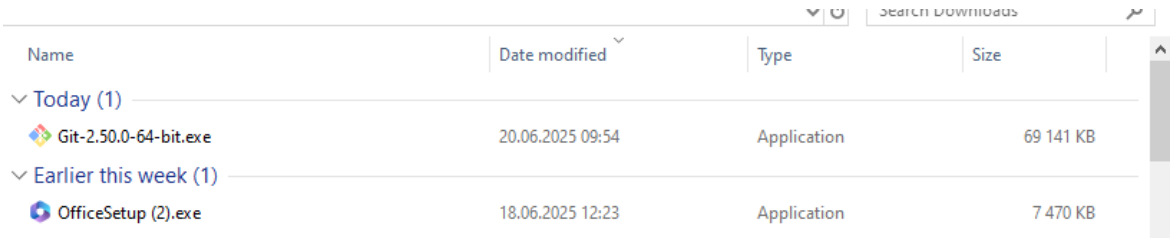




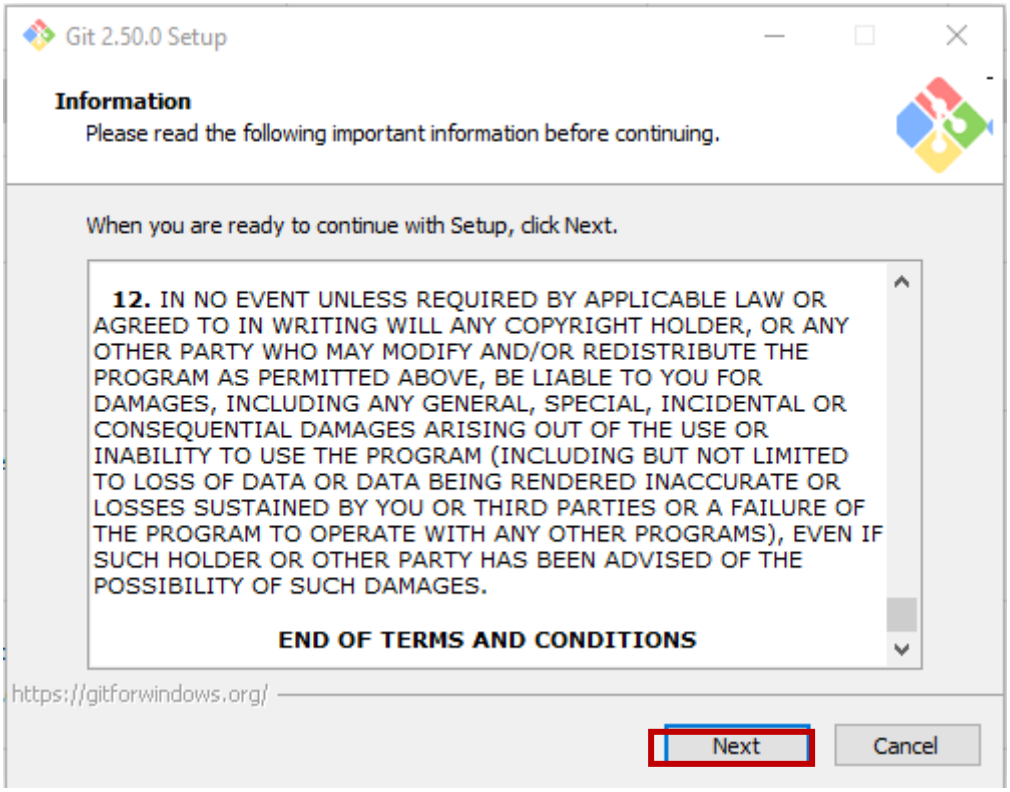
Download installation file



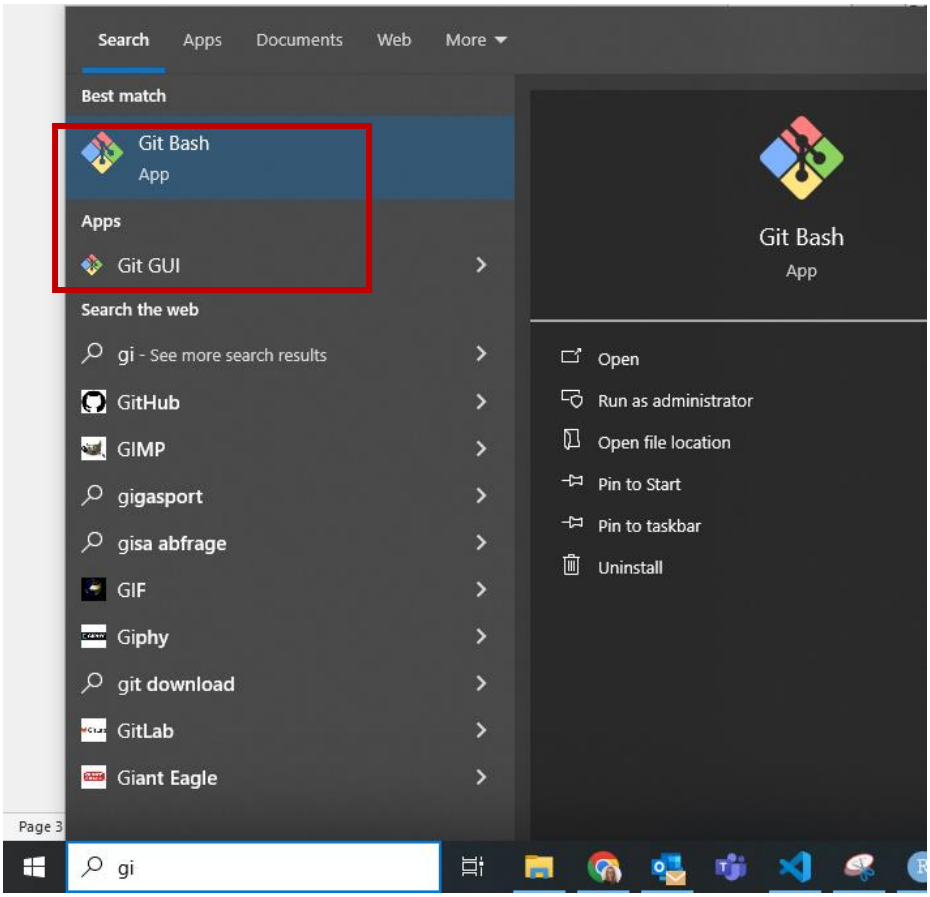
Open installation file from your Downloads



Install (Next -> ”Leave Default Settings” -> Install)

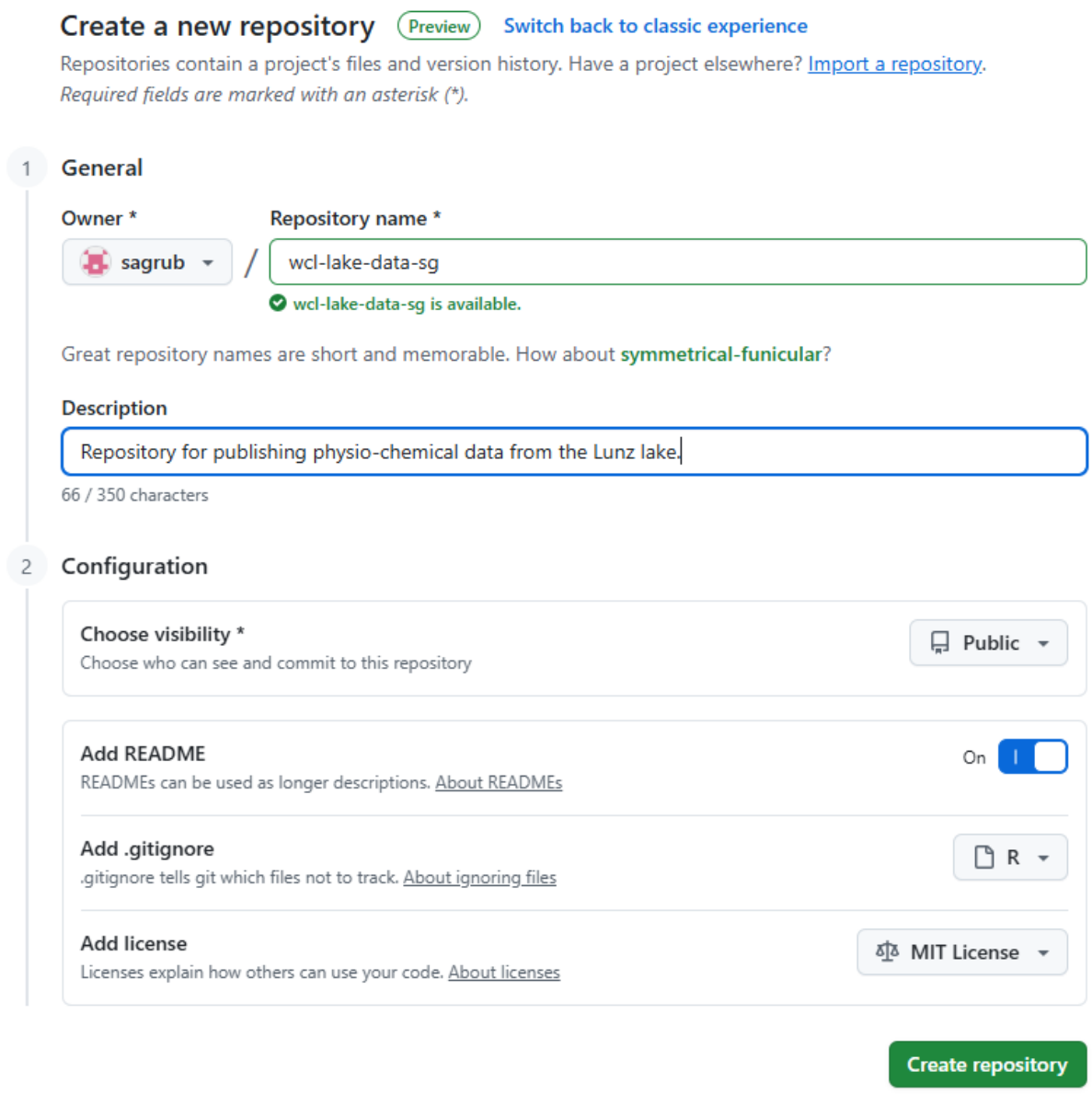


Check for Git Apps after installation

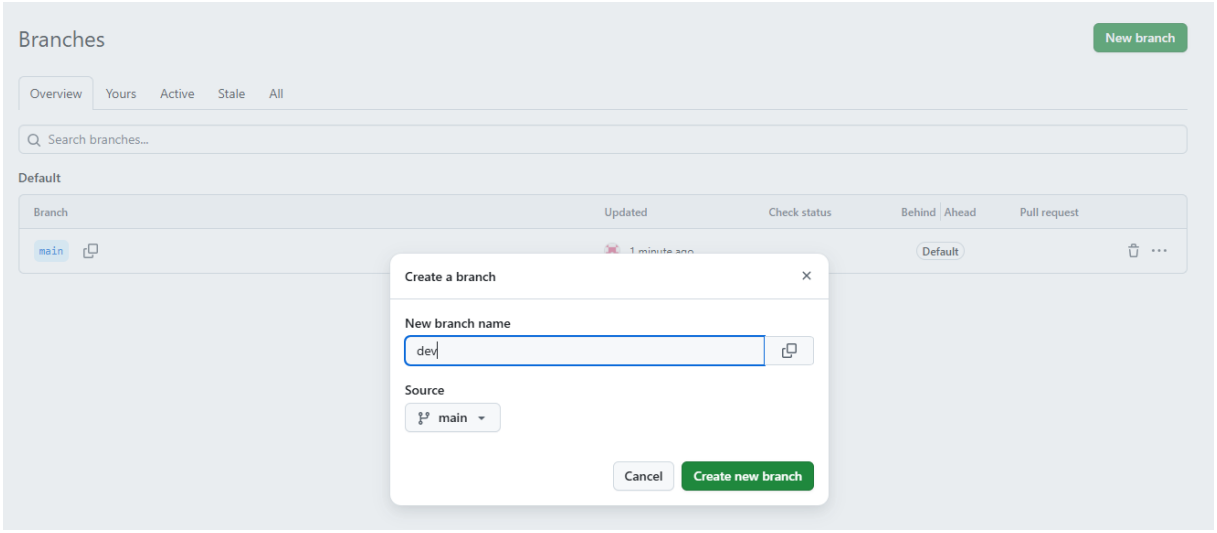


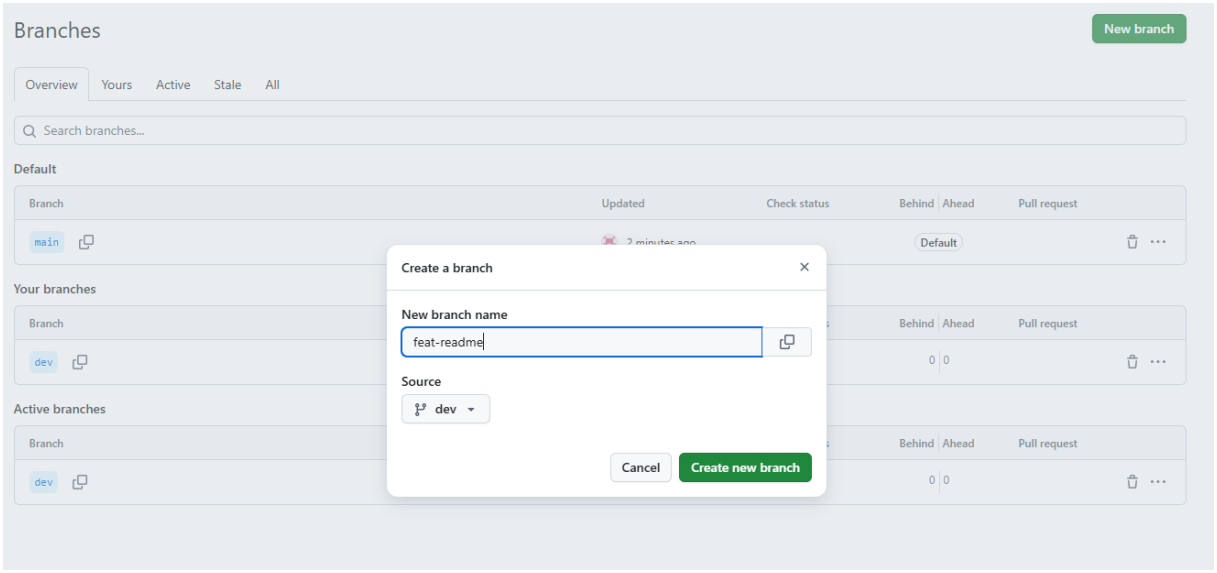
Recall: Git & GitHub Basics

Create a new repo

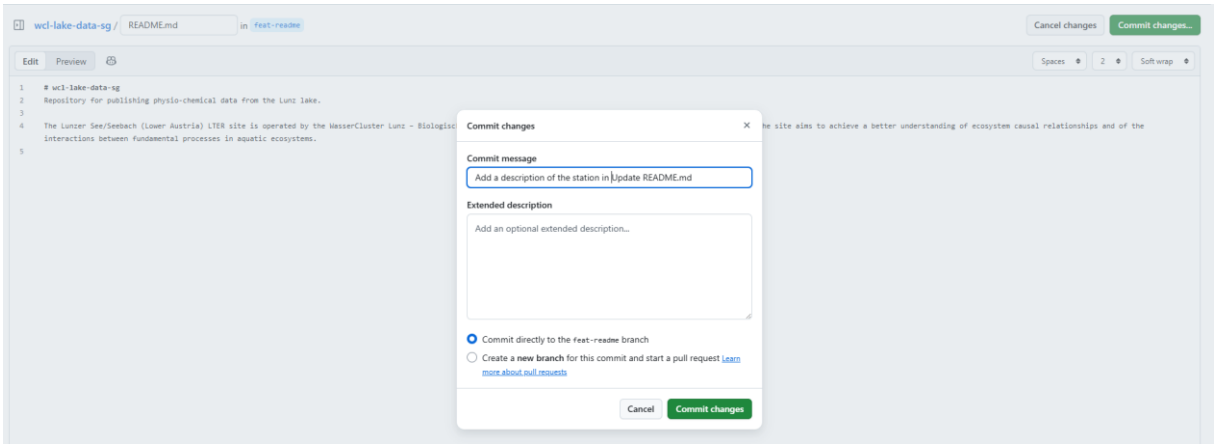


Create a new branch (dev and feat-branch

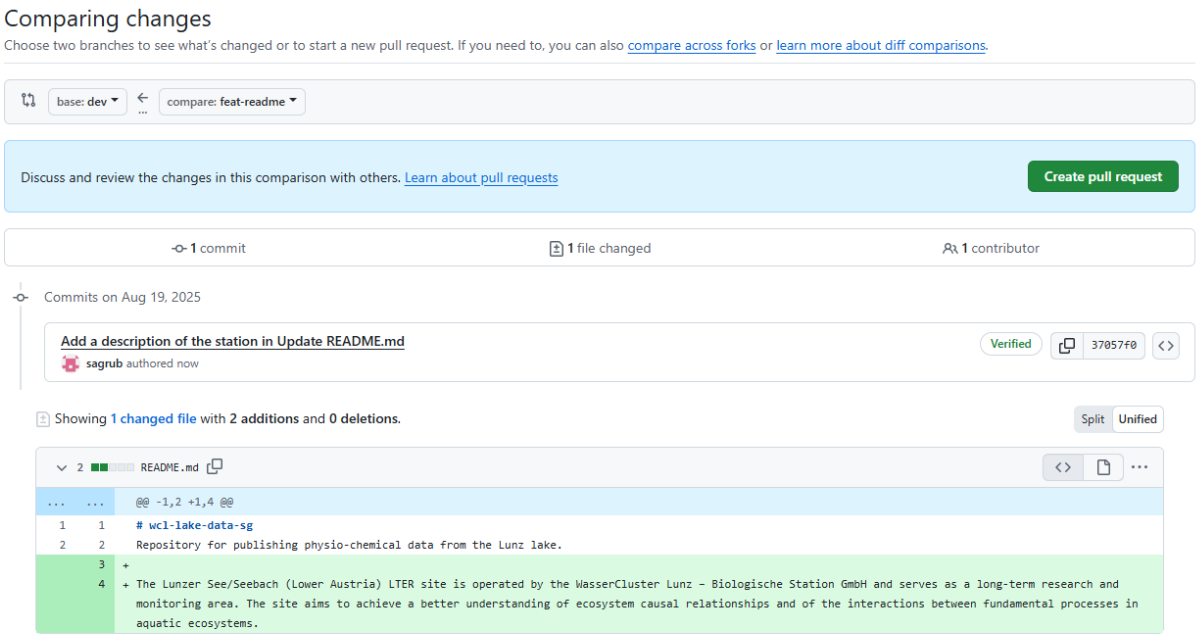




Commit



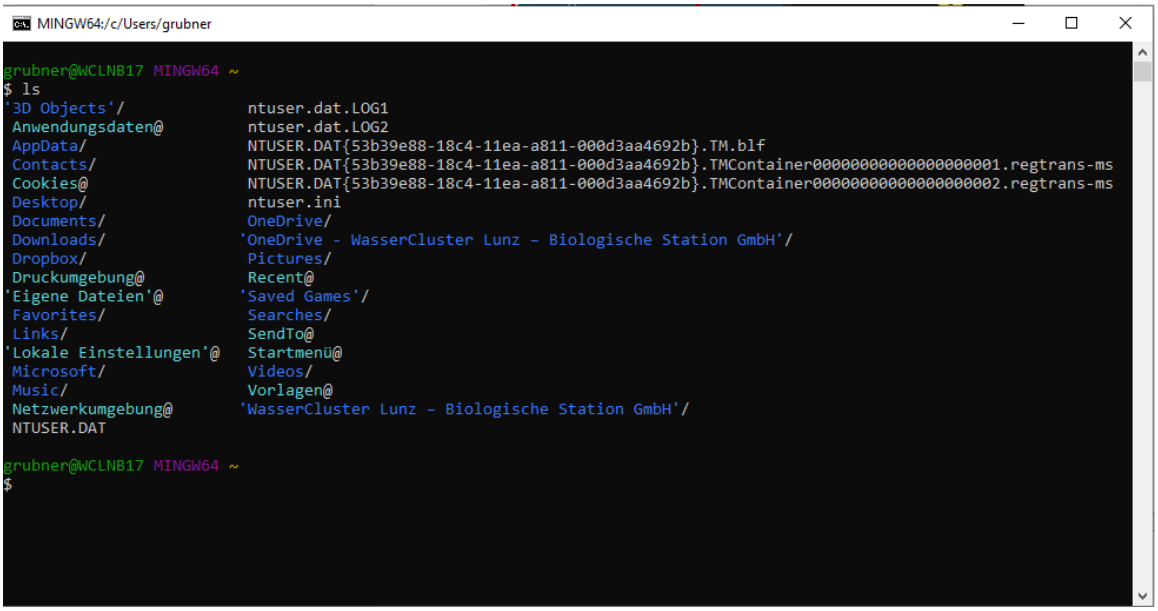
Create a pull request



Git Bash

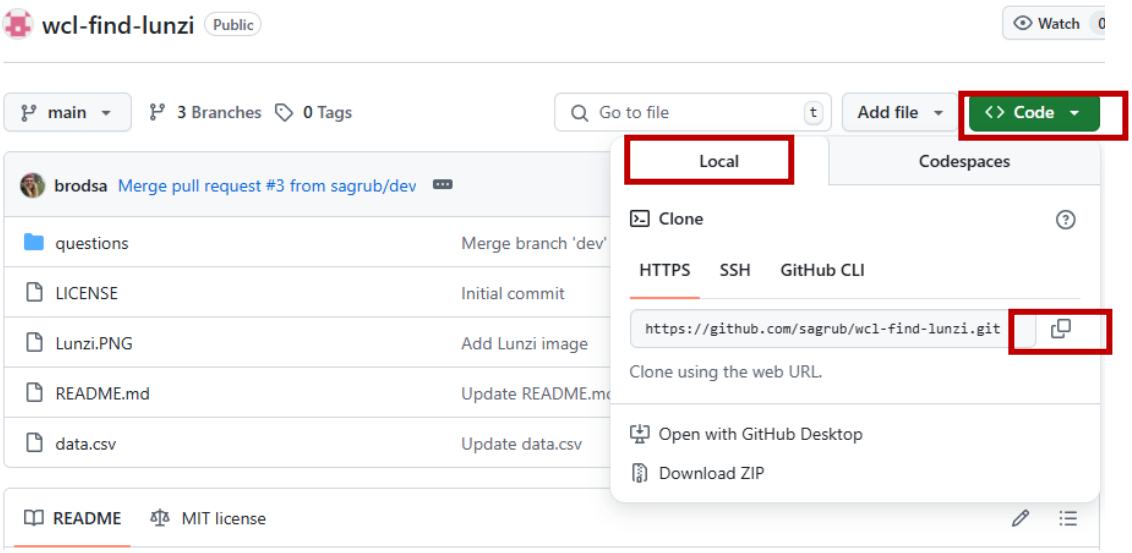
Open Git Bash and type following commands

- ls … to list files
- cd Documents or cd Dokumente … to go to Documents
- ls … to list files in Documents
- mkdir git … to create git folder
- cd git … to change the working directory to git
- touch file.txt … to create a new file
- rm file.txt … to remove the file



git clone

Copy the url adresse of your remote git repository



Clone your remote repository – git clone

```
grubner@WCLNB17 MINGW64 ~/Documents/github
$ git clone https://github.com/sagrub/wcl-find-lunzi.git
```

```
grubner@WCLNB17 MINGW64 ~/Documents/github
$ git clone https://github.com/sagrub/wcl-find-lunzi.git
Cloning into 'wcl-find-lunzi'...
remote: Enumerating objects: 49, done.
remote: Counting objects: 100% (49/49), done.
remote: Compressing objects: 100% (40/40), done.
remote: Total 49 (delta 14), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (49/49), 61.70 KiB | 30.85 MiB/s, done.
Resolving deltas: 100% (14/14), done.
```

Check the local repository – use ls and cd command

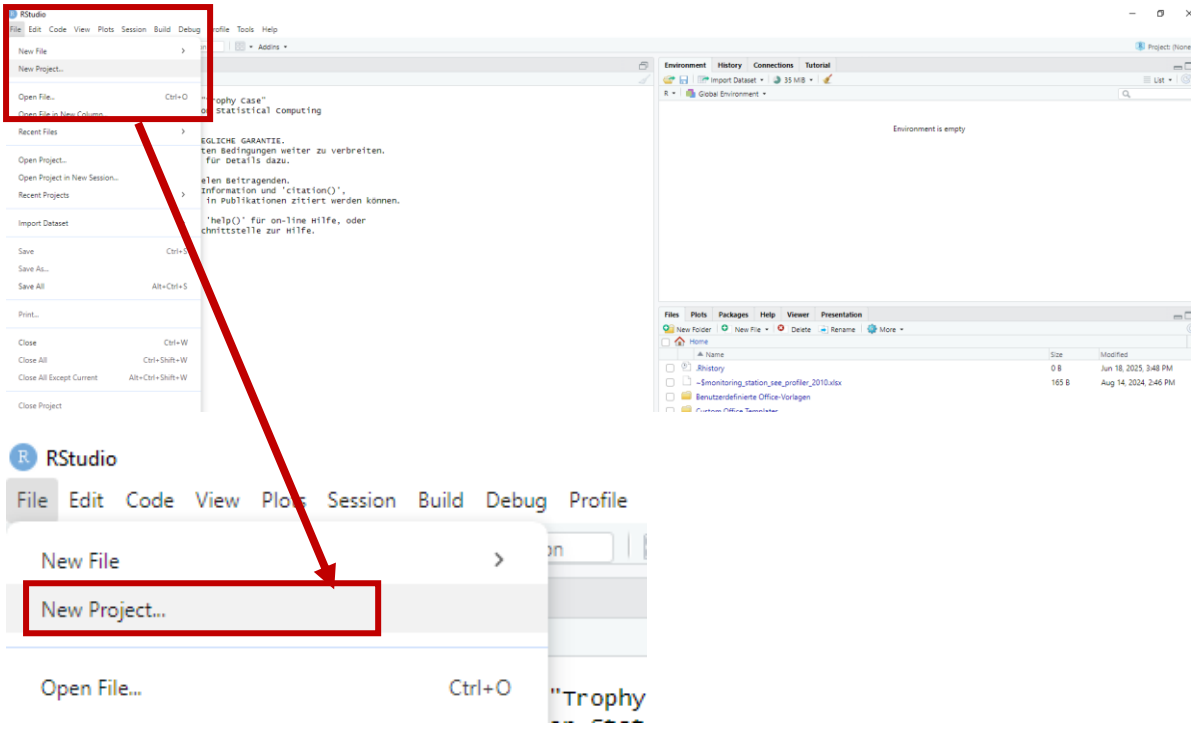
```
grubner@WCLNB17 MINGW64 ~/Documents/github
$ ls
dwh_wcl/  loopitoy/  synchro_local_to_cloud/  test/  wcl-find-lunzi/

grubner@WCLNB17 MINGW64 ~/Documents/github
$ cd wcl-find-lunzi/

grubner@WCLNB17 MINGW64 ~/Documents/github/wcl-find-lunzi (main)
$ ls
data.csv  LICENSE  Lunzi.PNG  questions/  README.md
```

git branch & git checkout branch

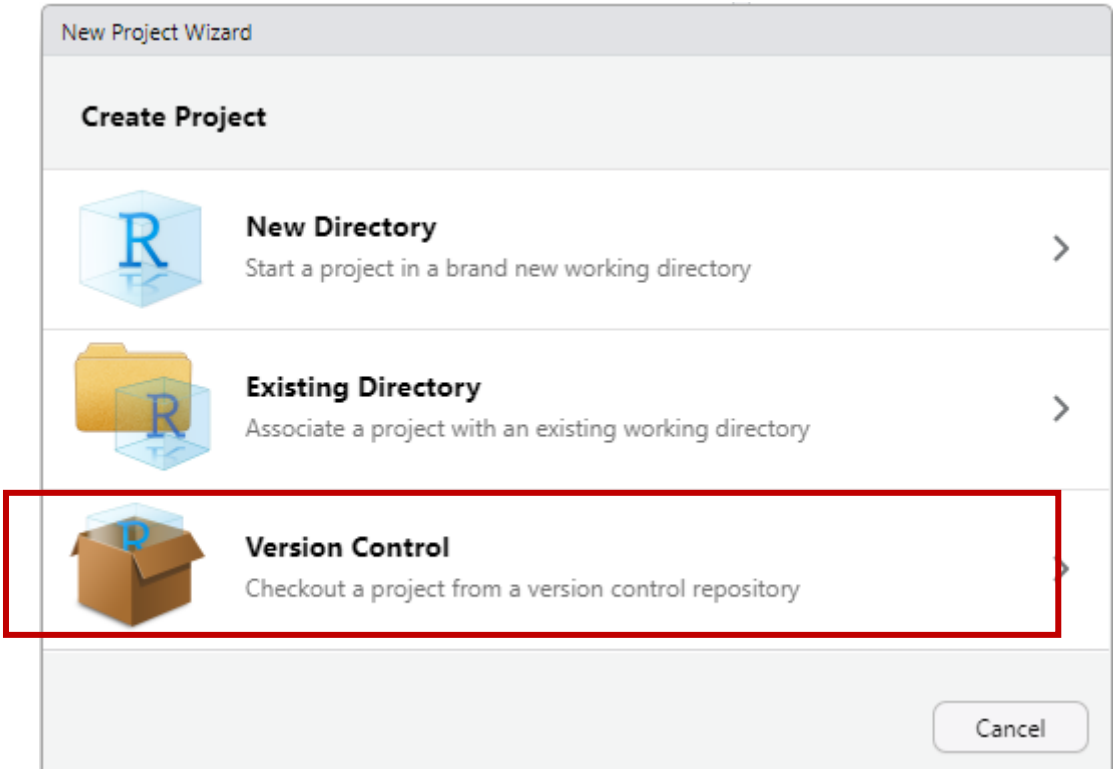
```
grubner@WCLNB17 MINGW64 ~/Documents/git/find-lunzi-sg (dev)
$ git branch -r
  origin/HEAD -> origin/main
  origin/dev
  origin/feat-question-2
  origin/main

grubner@WCLNB17 MINGW64 ~/Documents/git/find-lunzi-sg (dev)
$ git checkout feat-question-2
Switched to a new branch 'feat-question-2'
branch 'feat-question-2' set up to track 'origin/feat-question-2'.

grubner@WCLNB17 MINGW64 ~/Documents/git/find-lunzi-sg (feat-question-2)
$
```

Git in RStudio

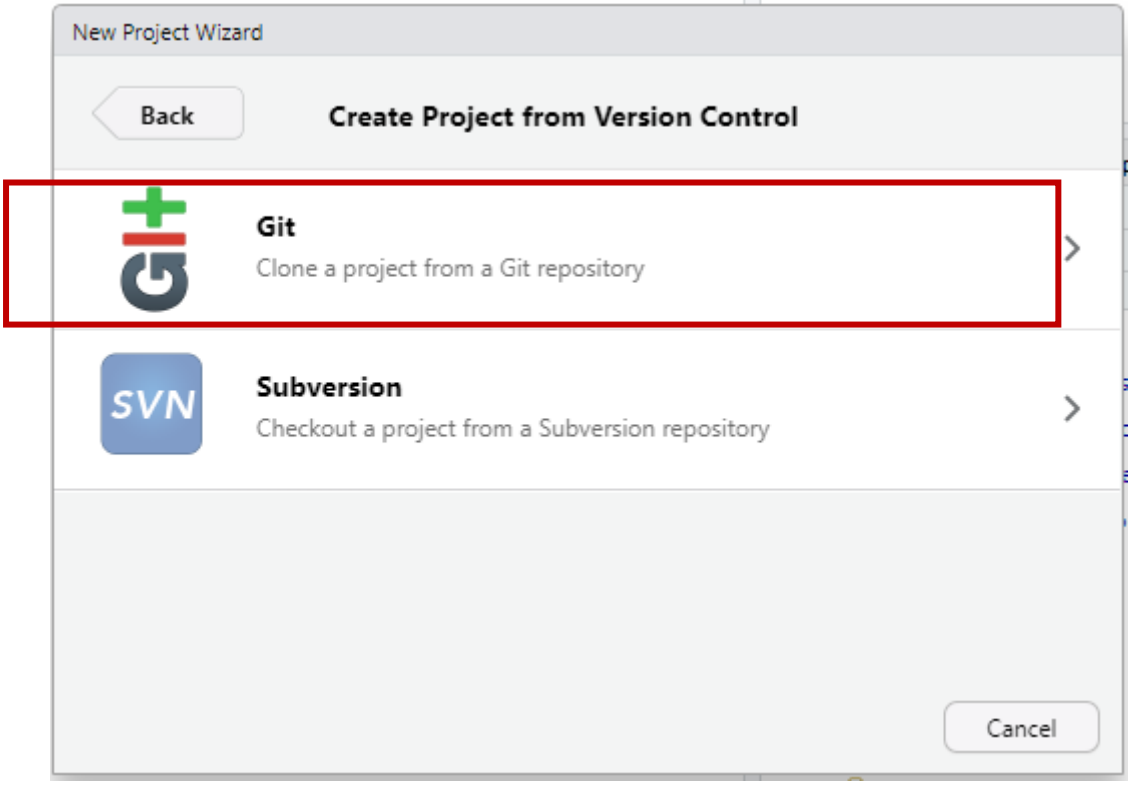
Open RStudio and Create New Project (File -> New Project)



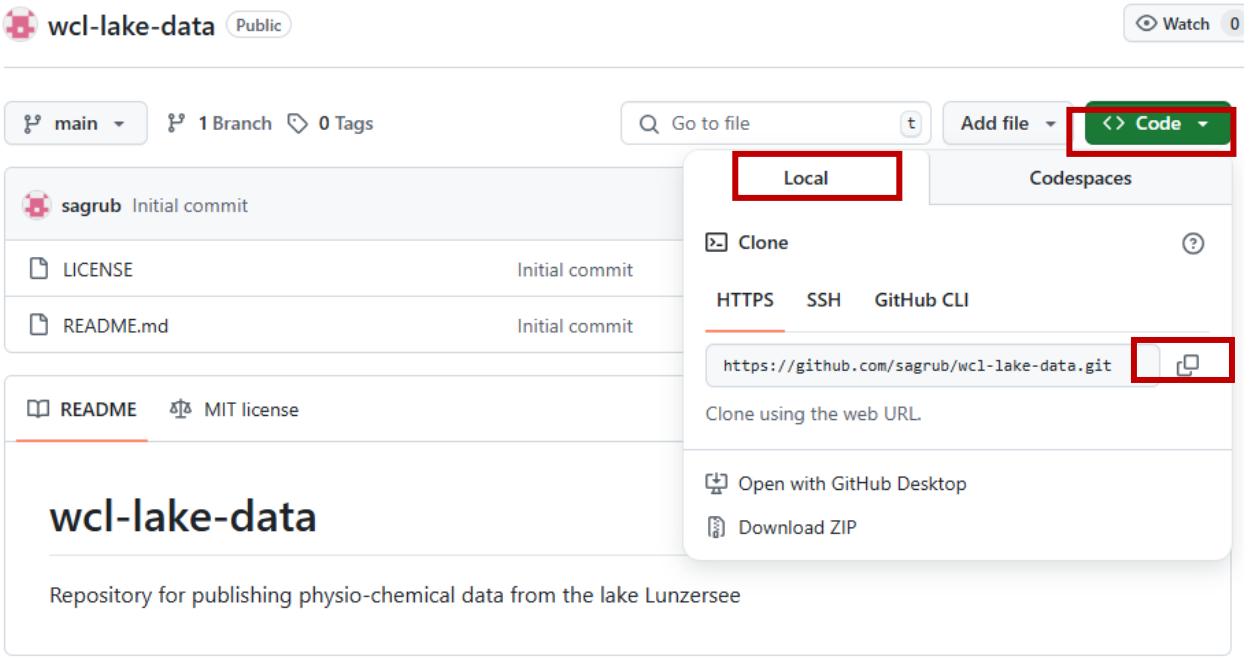
Select Version Control



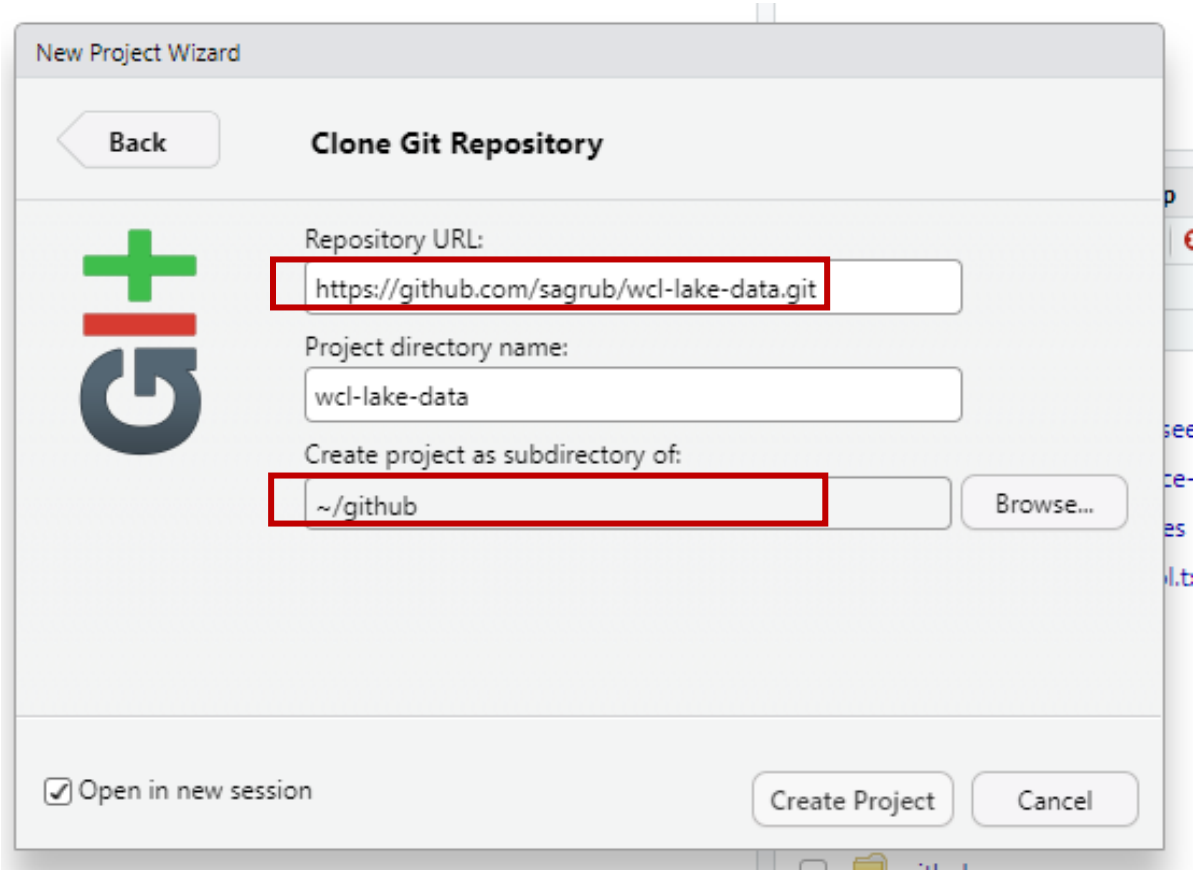
Chose Git



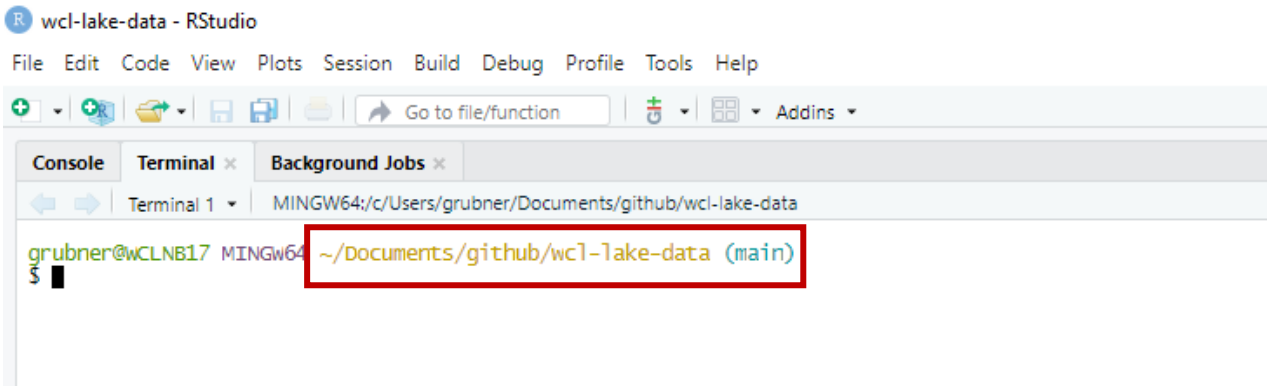
Copy the URL address of your remote GitHub repository (web-browser)



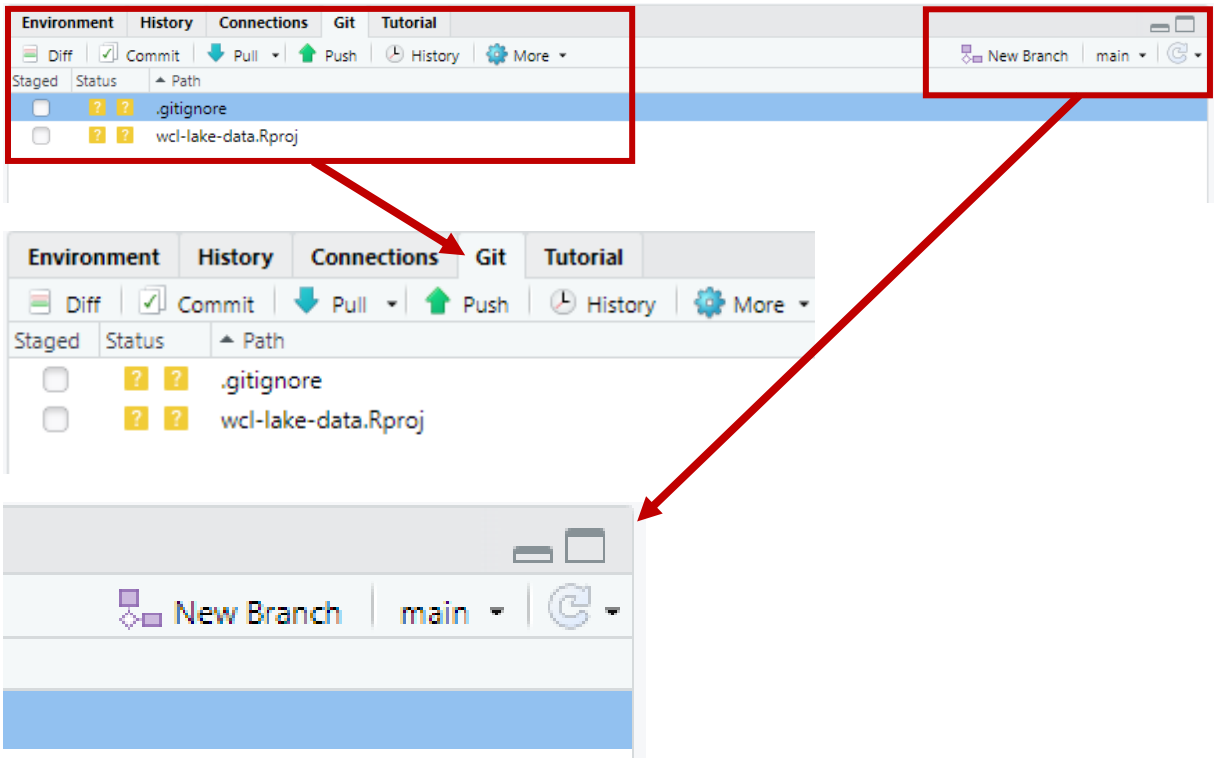
Insert the URL and select subdirectory:



Terminal Window



Git & Terminal Window



git branch & git checkout in Terminal Window

```
grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (main)
$ git branch -r
  origin/HEAD -> origin/main
  origin/dev
  origin/feat-readme
  origin/main

grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-readme)
$ git checkout feat-readme
Already on 'feat-readme'
Your branch is up to date with 'origin/feat-readme'.

grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-readme)
$ git checkout -b feat-get-data
Switched to a new branch 'feat-get-data'
```

git status & git restore

1. Make a small change in README.md
2. Check the status – git status
3. Restore the changes – git restore README.md
4. Geck the status – git status

```
grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-readme)
$ git status
On branch feat-readme
Your branch is up to date with 'origin/feat-readme'.

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   README.md

no changes added to commit (use "git add" and/or "git commit -a")

grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-readme)
$ git restore README.md

grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-readme)
$ git status
On branch feat-readme
Your branch is up to date with 'origin/feat-readme'.

nothing to commit, working tree clean

grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-readme)
$
```

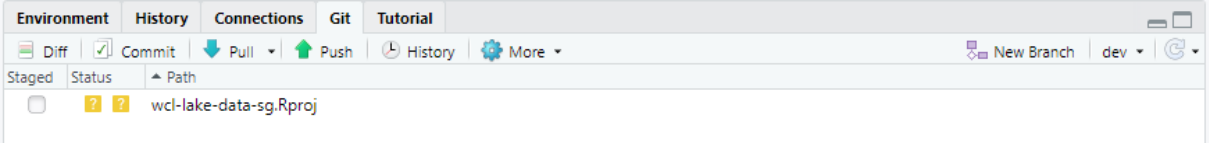
git config

```
git config --global user.name "Your Name"
git config --global user.email you@example.com
```

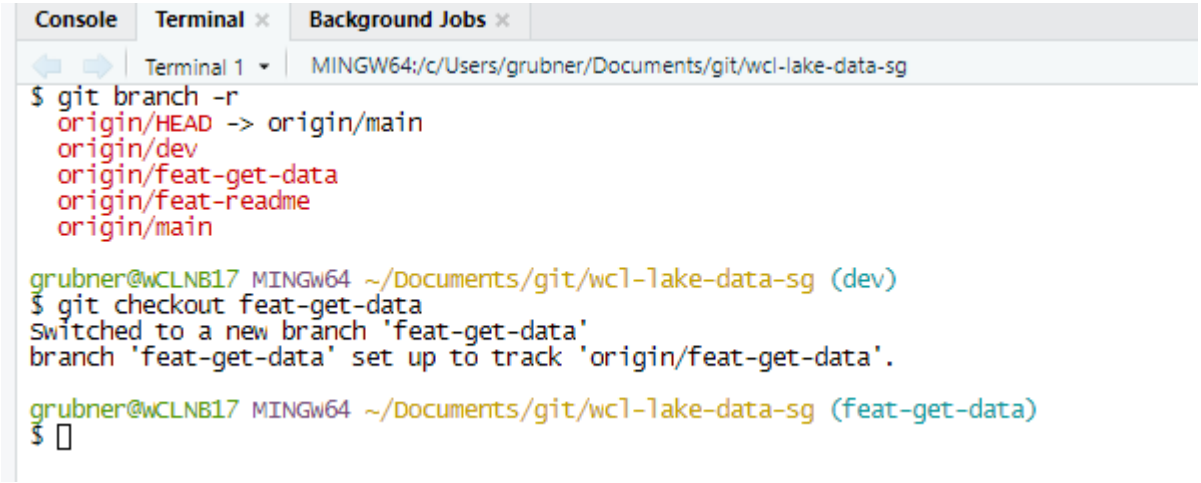
git add & git commit & git push

Make sure you have created the branch **feat-get-data** on GitHub before cloning the repository. If not, proceed with **git pull** to get the feature branch to your local repository.

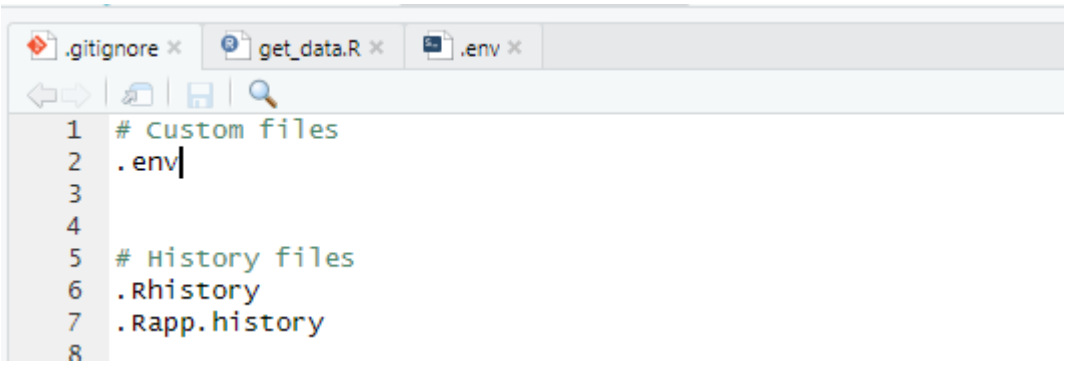
1. Switch to dev branch from the Git Window



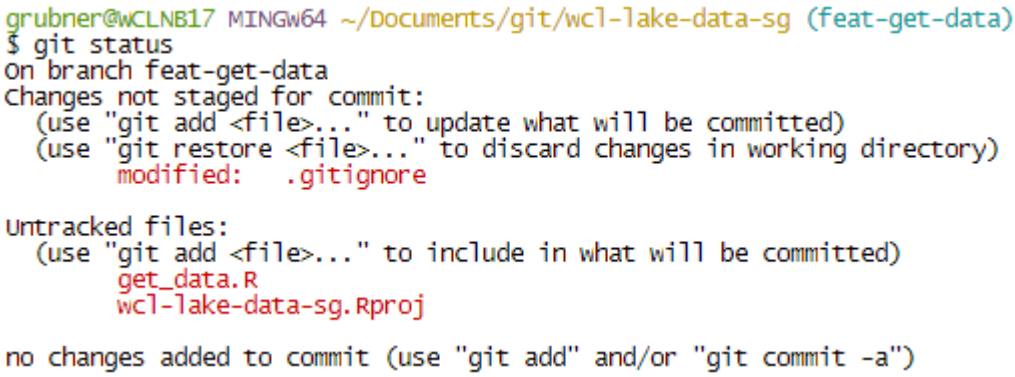
2. Switch to feat-get-data from the Terminal using **git checkout feat-get-data**



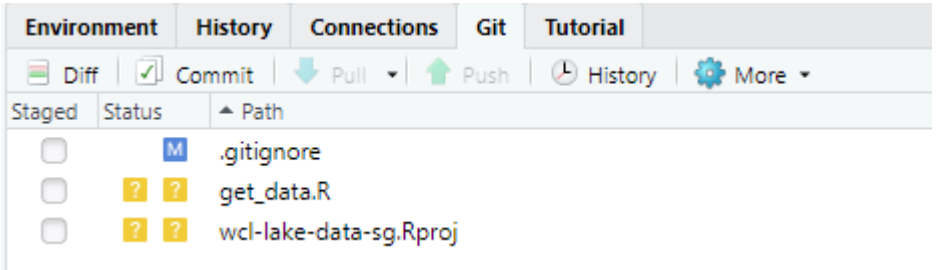
3. Copy get_data.R and .env into your project
4. Update gitignore file to exclude .env from the git repository



5. Check if it was excluded by checking the status of staging are using **git status**



6. Another check of excluding .env file with credentials is looking at the Git Window (M-modified, ?-new file, D-deleted file, A-added file into stagining)



7. Git add all files by using **git add .** and check the status of staging area by **git status**

```
grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-get-data)
$ git commit -m "create the code to get raw lake data"
[feat-get-data a5c5024] create the code to get raw lake data
 Committer: Sarka Grubner <grubner@wkl.local>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

 3 files changed, 117 insertions(+)
 create mode 100644 get_data.R
 create mode 100644 wcl-lake-data-sg.Rproj
```

8. Use **git push** to upload the changes to your remote repository

```
grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-get-data)
$ git push
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 12 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 2.39 KiB | 2.39 MiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/brodsa/wcl-lake-data-sg.git
   a5a615f..28985a9  feat-get-data -> feat-get-data

grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-get-data)
$
```

9. Check the branch on GitHub (i.e. the remote repository)
10. Pull the changes from feature branch into dev on GitHub

git fetch & git pull

Make sure you have changed the readme file on GitHub

1. Switch to feat-readme branch on your local computer

```
grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (dev)
$ git checkout feat-readme
Switched to branch 'feat-readme'
Your branch is behind 'origin/feat-readme' by 1 commit, and can be fast-forwarded.
  (use "git pull" to update your local branch)

grubner@WCLNB17 MINGW64 ~/Documents/git/wcl-lake-data-sg (feat-readme)
$
```

2. Get the changes using **git fetch.** Something has changed but your files are untouched.

```
grubner@WCLNB17 MINGw64 ~/Documents/git/wcl-lake-data-sg (feat-readme)
$ git fetch
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (3/3), 927 bytes | 132.00 KiB/s, done.
From https://github.com/brodsa/wcl-lake-data-sg
   476d508..494dec4  feat-readme -> origin/feat-readme
```

```
1  # wcl-lake-data-sg
2  Repository for publishing physio-chemical data from the lake Lunzersee.
3
4  ## Site description
5  The Lunzer See/Seebach (Lower Austria) LTER site is operated by the Wassercluster Lunz - Biolog
6
```

3. Check for changes
    a. git log feat-readme..origin/feat-readme
    b. git log –-online feat-readme..origin/feat-readme
    c. git diff feat-readme..origin/feat-readme
    d. git diff feat-readme..origin/feat-readme README.md – if you know the file
    e. git diff commit-key
4. If everything is fine, you can pull the changes using **git pull**

git merge

Prepare a feat-readme for pull (merge) request. Make sure you have pushed all changes from your local feat-readme to remote repository.

1. On git
    a. Switch to dev - **git checkout dev**
    b. Fetch and check for changes - **git fetch & git log & git diff**
    c. Get the changes – **git pull**
    d. Switch to feat-readme – **git checkout feat-readme**
    e. Merge dev into feat-readme – **git merge dev**
    f. Resolve conflicts if needed
        i. To get the list of files with conflicts
        ii. git diff --name-only --diff-filter=U
2. on GitHub
    a. create pull request
    b. merge feat-readme into dev

Git & GitHub Workflow

1. Create new feature/fix/doc branch from dev branch on GitHub
2. Get & Check for the remote changes (git fetch & git log & git diff)
3. Pull the remote changes to your local repository
4. Switch to the new feature branch (git checkout)
5. Develop and commit your changes (git add & git status & git commit & git push)
6. Switch to the dev (source) branch of the feature branch
7. Get & Check the latest version (git fetch & git log & git diff)
8. Switch back to the feature branch
9. Merge the feature branch with the source branch
10. Resolve conflicts if necessary (git diff --name-only --diff-filter=U)
11. Push your feature branch to GitHub and create a Pull Request
12. Merge Pull request and provide a clear merge commit message
13. Check GitHub if the remote source branch contains your changes