

# Introduction to Git & GitHub

Terminal, RStudio

Andreas Scharmüller, Prof. Ralf B. Schäfer

AG Landscape Ecology

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# Why Git?

- Version control software
- Modern software development
  - most R-packages
- Git is the **software**
- GitHub is the **platform**



## Other Platforms

- GitLab: <https://about.gitlab.com>
- BitBucket: <https://bitbucket.org>

# Install Git

<https://github.com/git-guides/install-git>

## On Linux

```
sudo apt update  
sudo apt install git-all
```

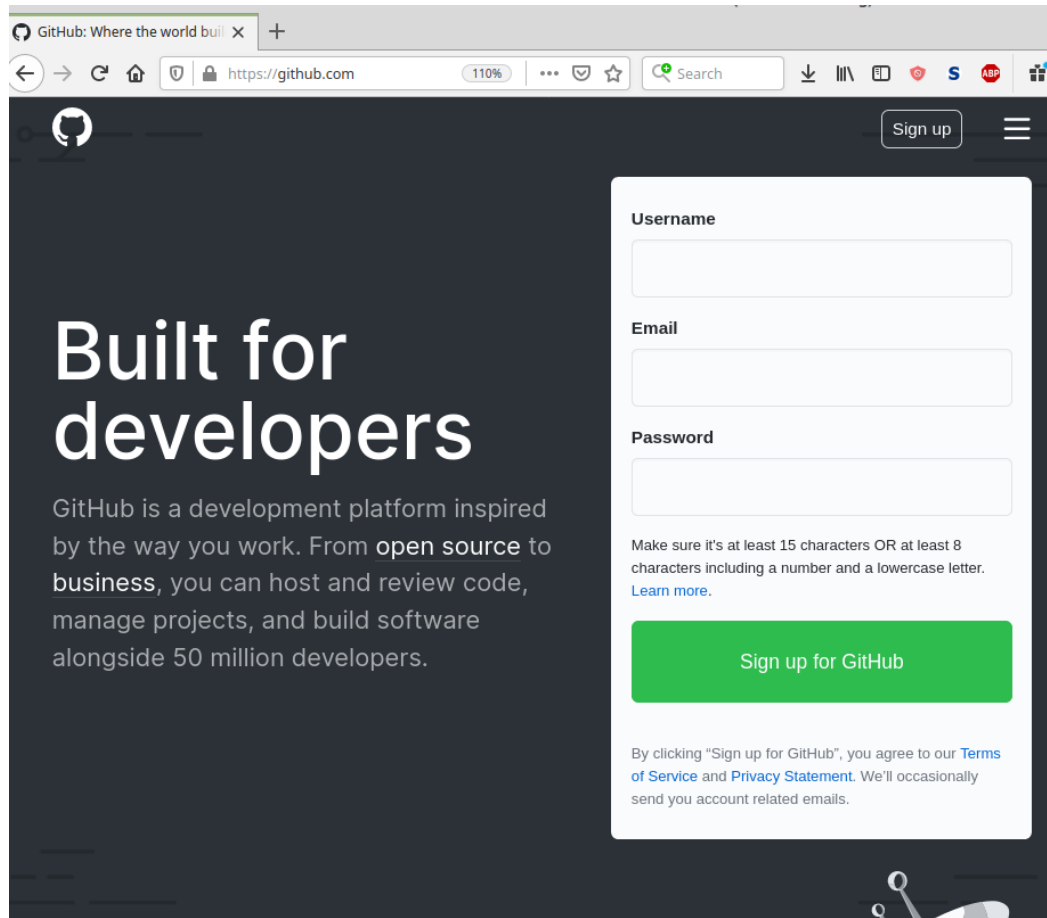
## On windows

Download manually

# Start Git

```
cd my_directory  
git init
```

# Create a GitHub account



The image is a screenshot of the GitHub website's sign-up page. The browser's address bar shows 'https://github.com' with a search icon and a '110%' zoom level. The GitHub logo is in the top left, and a 'Sign up' button is in the top right. The main heading 'Built for developers' is in large white text on a dark background. Below it, a paragraph describes GitHub as a development platform for open source, business, code hosting, project management, and software building, mentioning 50 million developers. To the right is a white sign-up form with fields for 'Username', 'Email', and 'Password'. The password field has a note: 'Make sure it's at least 15 characters OR at least 8 characters including a number and a lowercase letter.' with a 'Learn more' link. A large green button says 'Sign up for GitHub'. At the bottom of the form, it states that clicking 'Sign up for GitHub' agrees to the 'Terms of Service' and 'Privacy Statement', and mentions occasional emails.

GitHub: Where the world builds software

Sign up

## Built for developers

GitHub is a development platform inspired by the way you work. From **open source** to **business**, you can host and review code, manage projects, and build software alongside 50 million developers.

**Username**

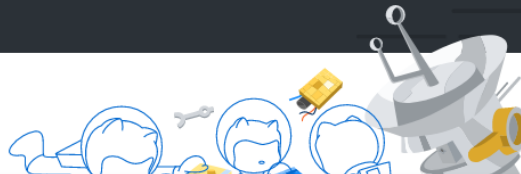
**Email**

**Password**

Make sure it's at least 15 characters OR at least 8 characters including a number and a lowercase letter. [Learn more.](#)

Sign up for GitHub

By clicking "Sign up for GitHub", you agree to our [Terms of Service](#) and [Privacy Statement](#). We'll occasionally send you account related emails.

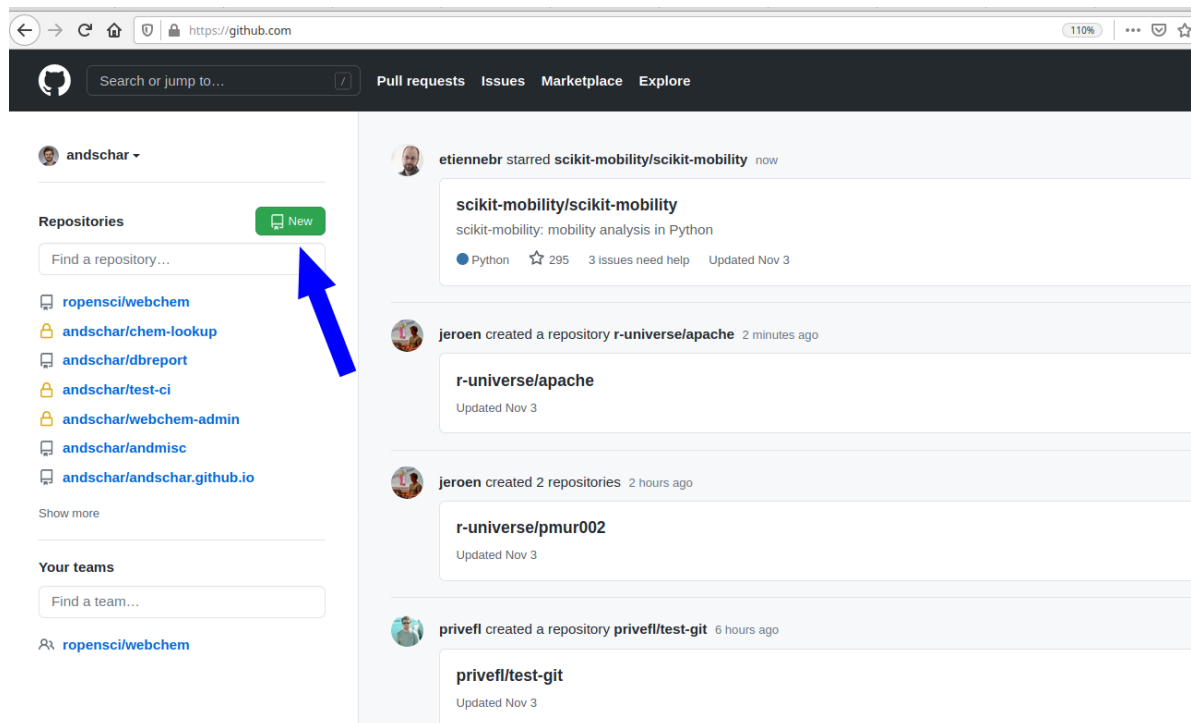


# Create (initialize) repository

## Locally

```
git init
```

## Remote



# Create (initialize) repository

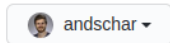
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## Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere?

[Import a repository.](#)

Owner \*



Repository name \*

/

Great repository names are short and memorable. Need inspiration? How about **psychic-invention**?

Description (optional)



**Public**

Anyone on the internet can see this repository. You choose who can commit.



**Private**

You choose who can see and commit to this repository.

---

### Initialize this repository with:

Skip this step if you're importing an existing repository.



**Add a README file**

This is where you can write a long description for your project. [Learn more.](#)



**Add .gitignore**

Choose which files not to track from a list of templates. [Learn more.](#)



**Choose a license**

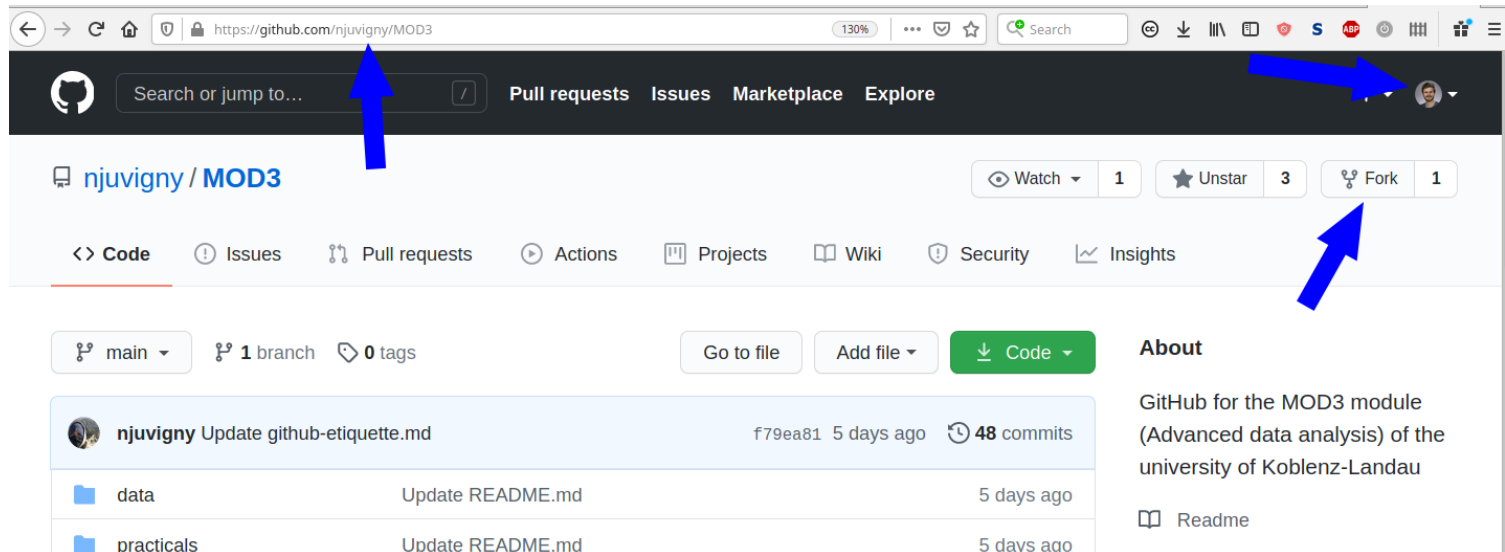
A license tells others what they can and can't do with your code. [Learn more.](#)

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Create repository

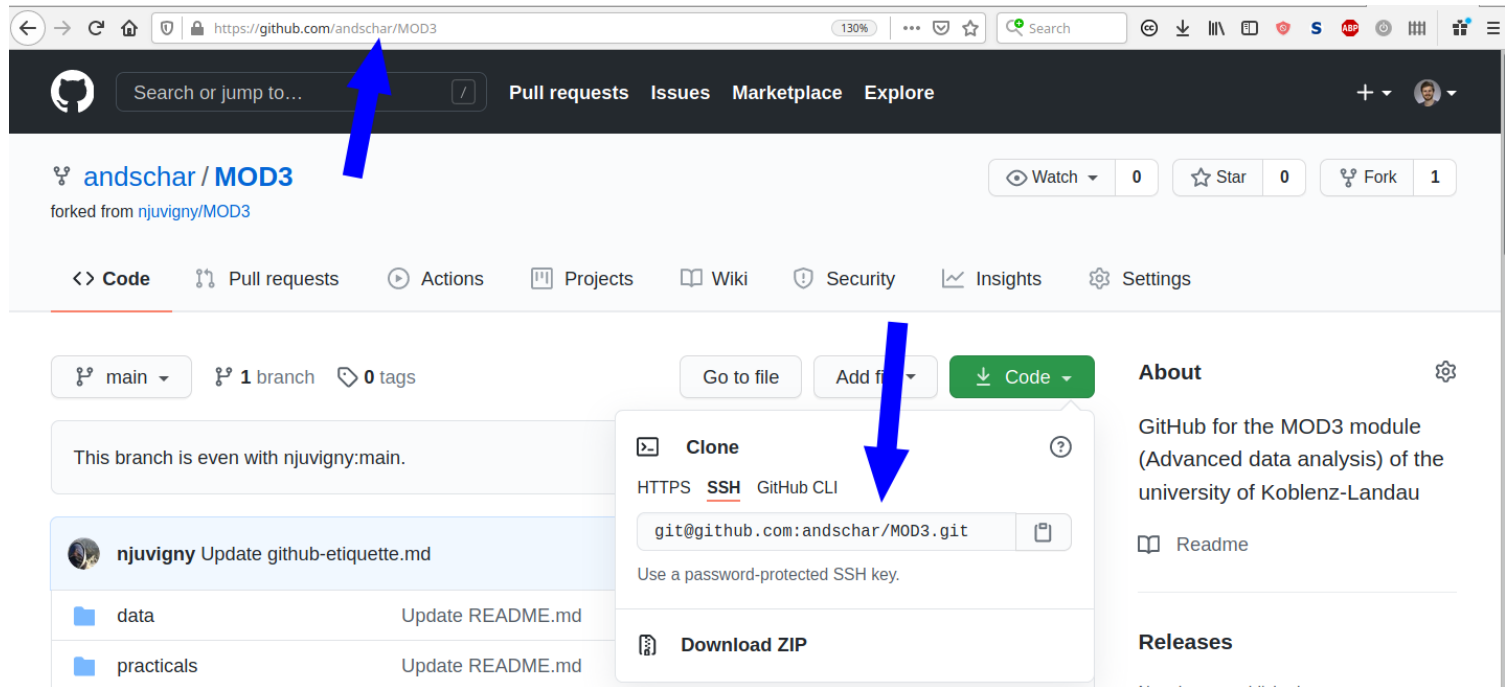
# Fork a repository

- Fork someone's repo to your GitHub account



# Clone a repository

- Clone **your** fork (i.e. version) to your local machine



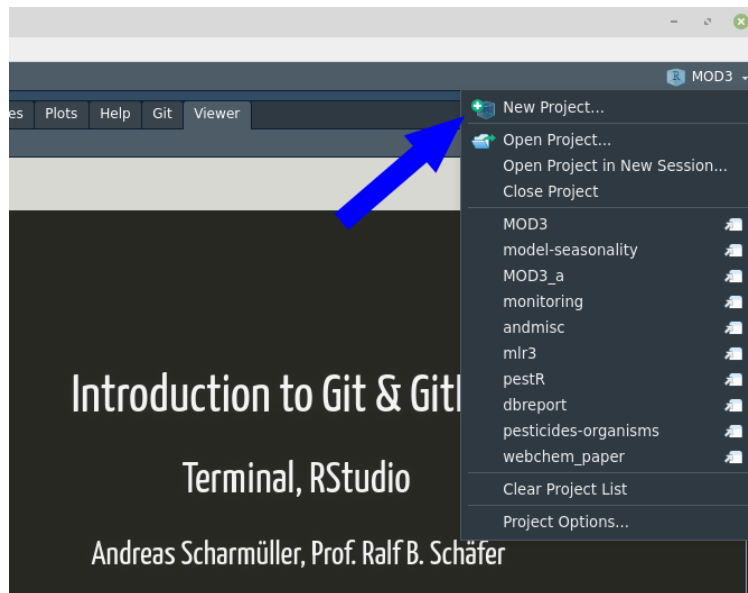


# Clone a repository

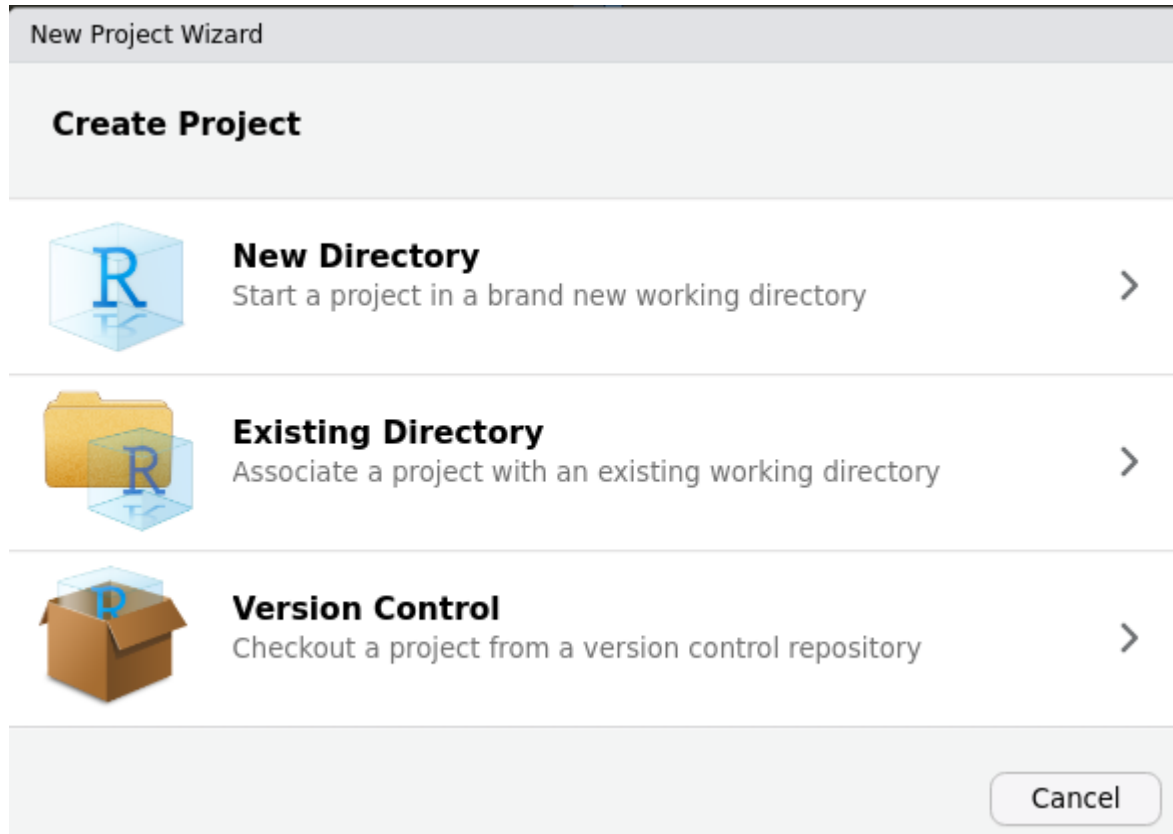
## Command line

```
cd Projects  
git clone git@github.com:njuvigny/MOD3.git # SSH  
git clone https://github.com/njuvigny/MOD3.git # HTTPS
```

## RStudio




# RStudio



# RStudio

New Project Wizard

**Back** **Clone Git Repository**



Repository URL:

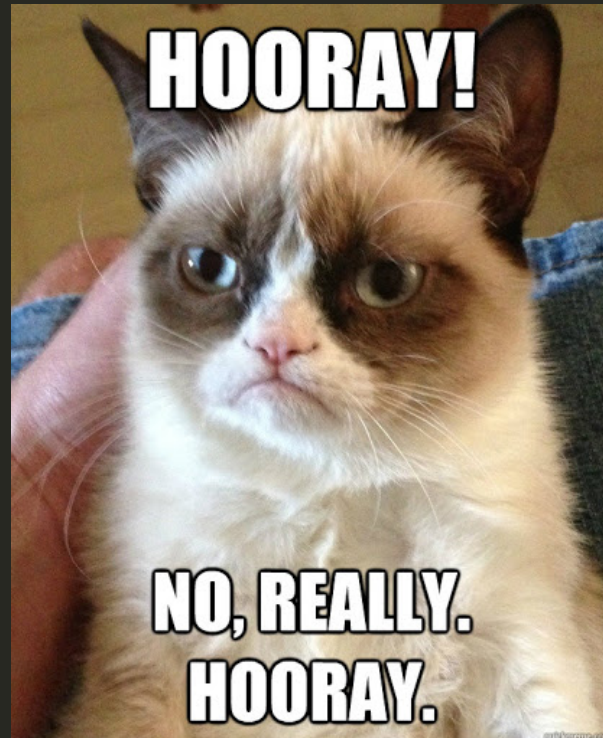
Project directory name:

Create project as subdirectory of:  
 **Browse...**

☐ Open in new session

**Create Project** **Cancel**

First repository!!



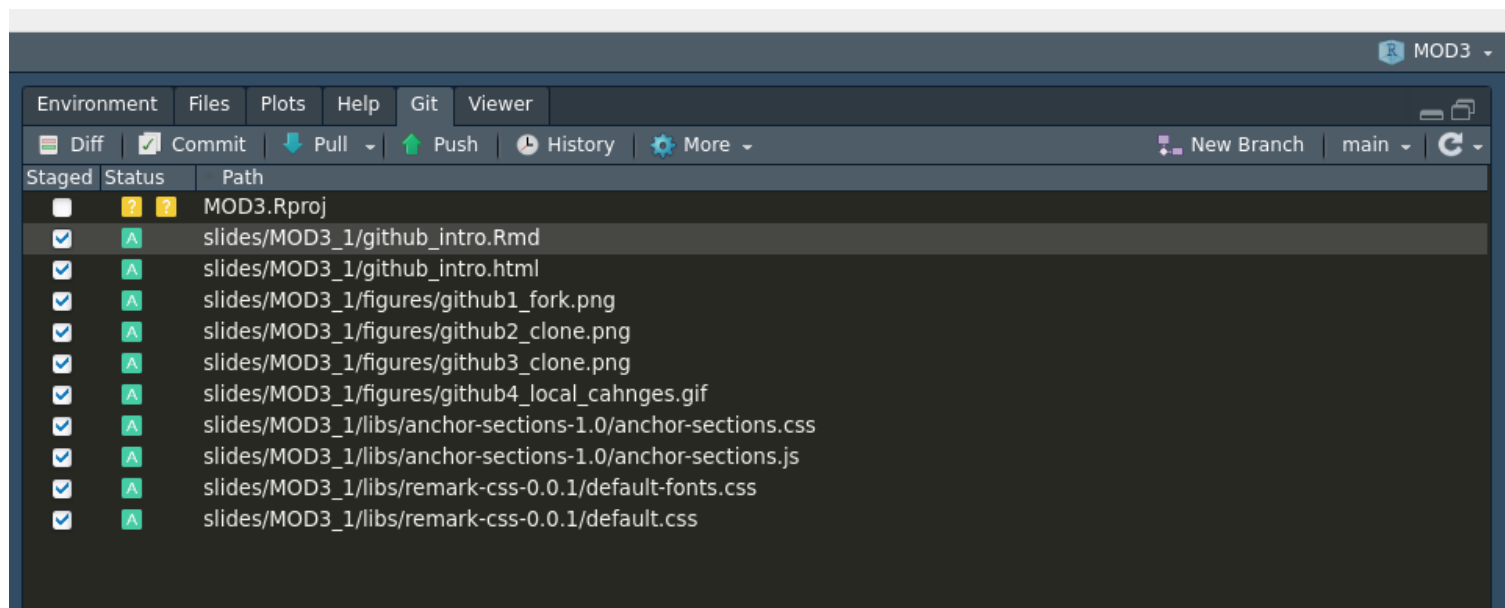
# Local changes

Make changes to the .txt, .R, .python or to whatever file...



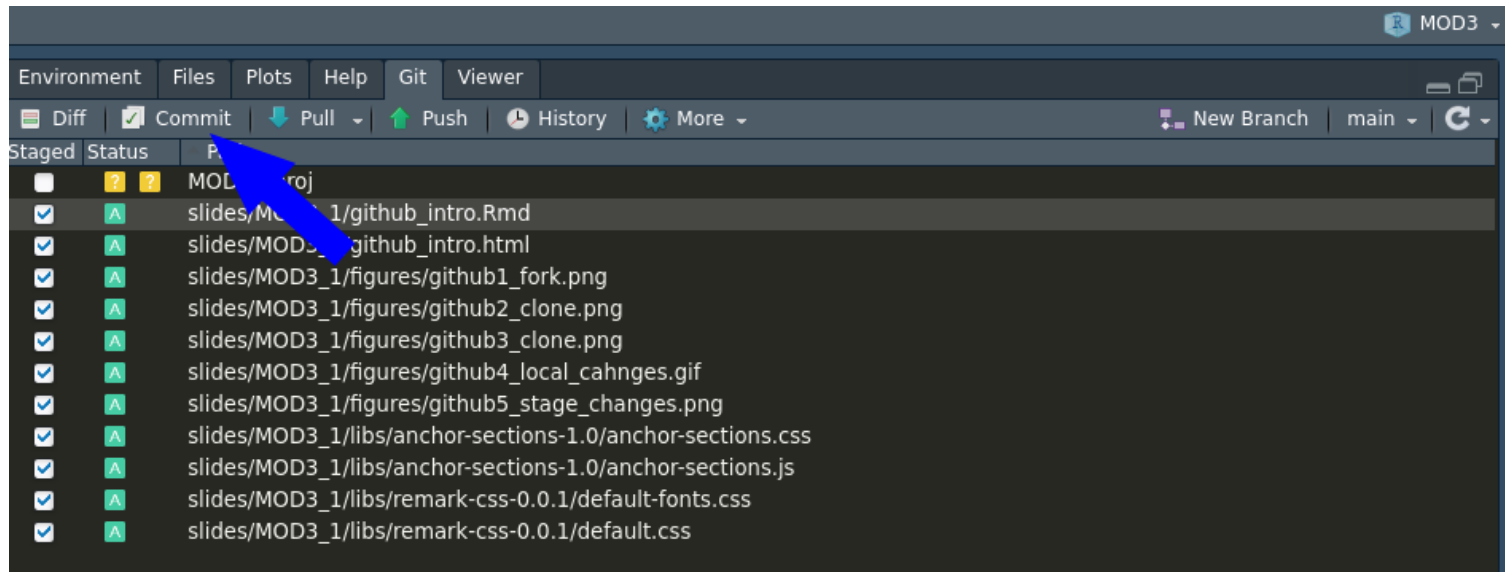
# Stage your changes

```
git add file.txt  
git add *.txt  
git add -A
```



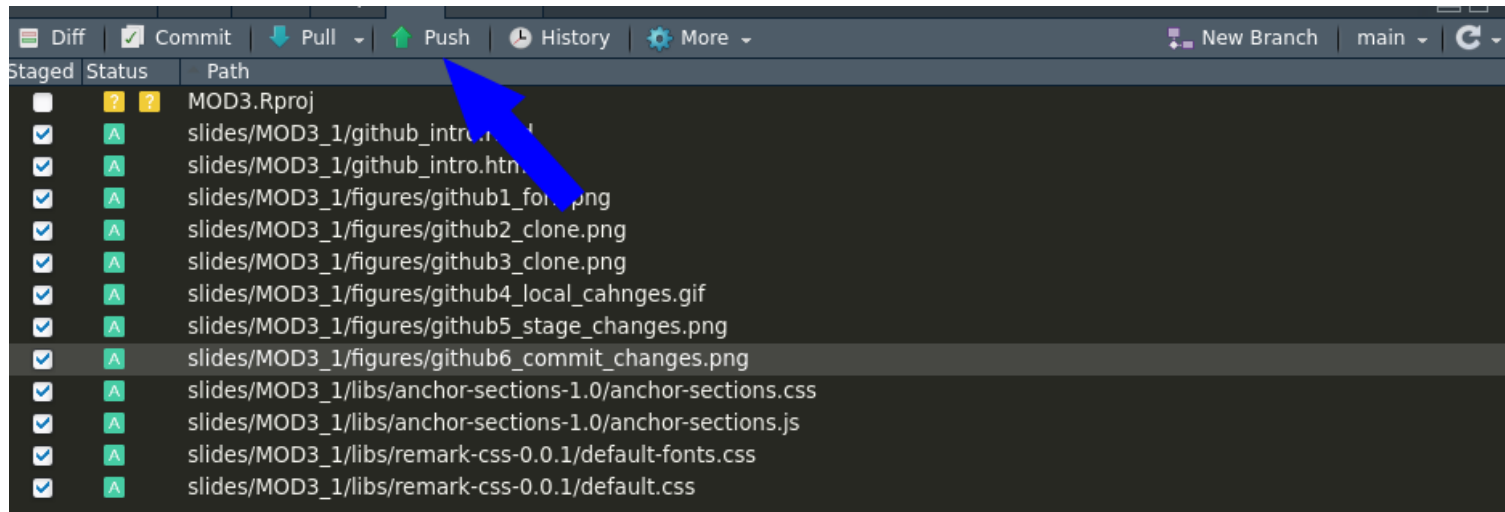
# Commit changes

```
git commit -m 'Patch-1'
```



# Push to your repo (origin)

```
git push origin master  
git push origin main
```





# Pull Request

From your main branch to the remote main branch

The screenshot shows the GitHub interface for the repository 'andschar / MOD3', which is a fork of 'njuvigny/MOD3'. The repository has a 'main' branch selected, indicated by a blue circle around the 'main' dropdown menu. The status bar shows 'This branch is 1 commit ahead, 9 commits behind njuvigny:main.' and a 'Pull request' link with a blue arrow pointing to it. The repository also has 0 tags and 49 commits. The 'Pull request' link is located next to the 'Compare' link. The repository is viewed by 'andschar test'.

andschar / MOD3  
forked from njuvigny/MOD3

Code Pull requests Actions Projects Wiki Security Insights Settings

main branch 0 tags

Go to file Add file Code

This branch is 1 commit ahead, 9 commits behind njuvigny:main. Pull request Compare

andschar test 6 days ago 49 commits

# Git/Github Workflow

1. Create or Fork a repo
2. Clone the repo to local machine
3. Local changes
4. Stage (i.e. add) & Commit changes to Git tree
5. Push to origin
6. Create a Pull-Request against the remote repository

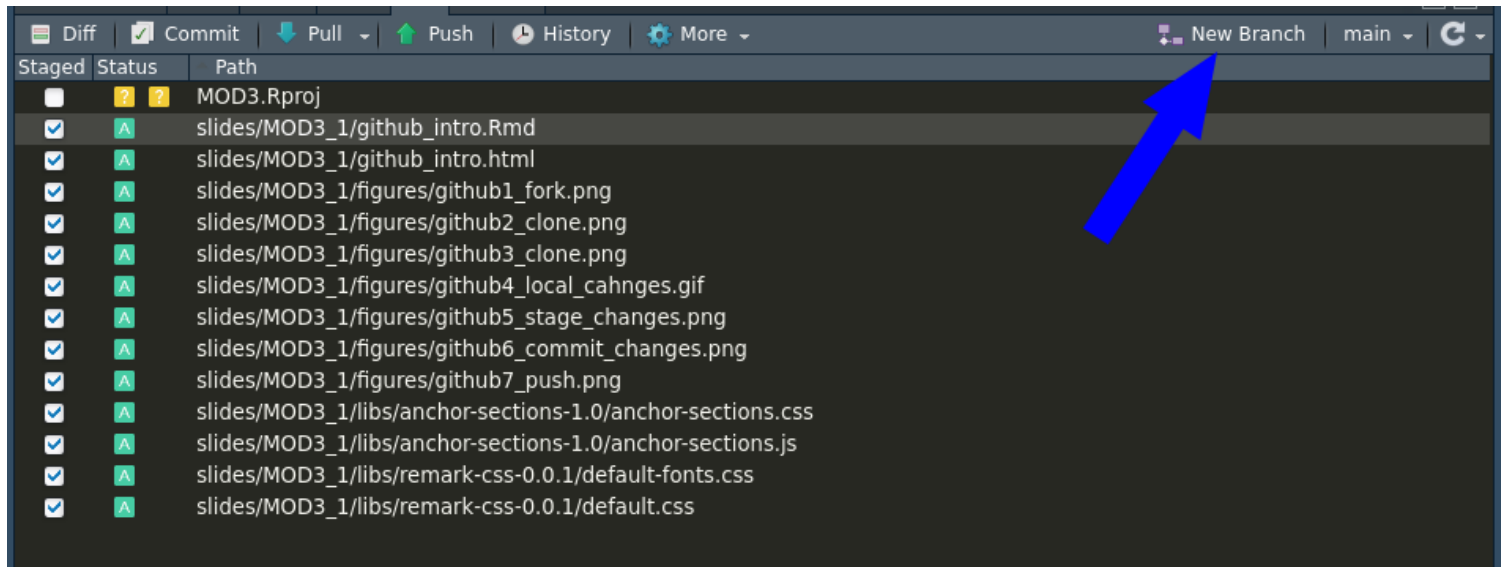
# Branches



# Branch

## Create/Switch Branch

```
git checkout -b dev_scharmuel  
git checkout main  
git status  
git branch
```



# Branch

## Merge Branch

```
git checkout master  
git merge dev_scharmueLLer
```

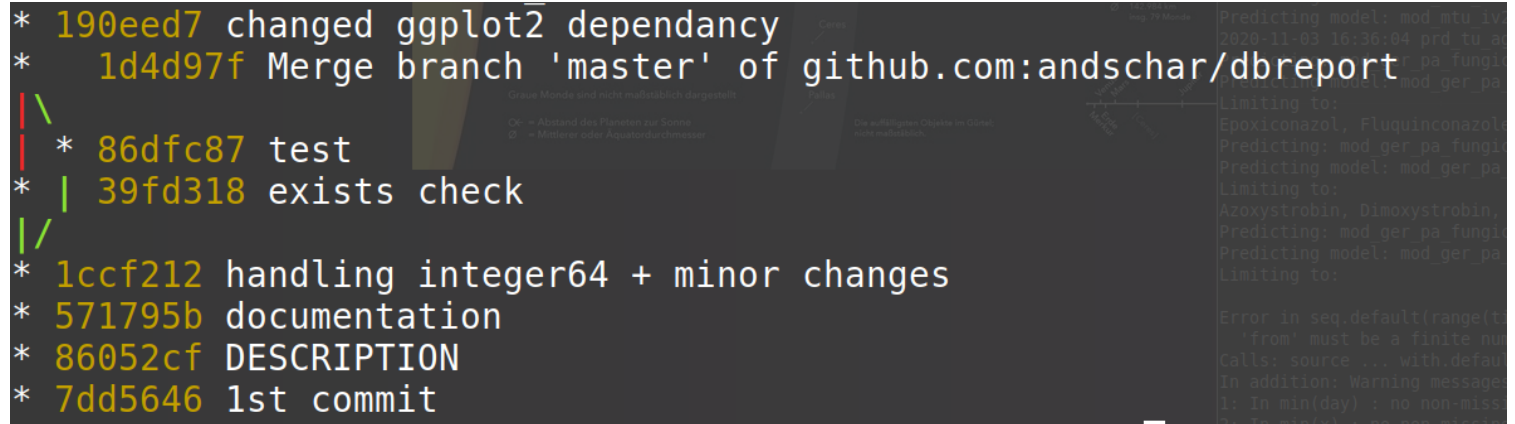
# Branch

## Merge example

First 8 commits of my R-package repo: **andschar/dbreport**

```
git log --all --decorate --oneline --graph
```


```
* 190eed7 changed ggplot2 dependancy
* 1d4d97f Merge branch 'master' of github.com:andschar/dbreport
| \
| * 86dfc87 test
| * | 39fd318 exists check
|/
* 1ccf212 handling integer64 + minor changes
* 571795b documentation
* 86052cf DESCRIPTION
* 7dd5646 1st commit
```



# Branch

## Pull Request


From your dev\_XXX branch to a new remote dev\_XXX branch


 **andschar / MOD3**


forked from [njuvigny/MOD3](#)


Watch


<> Code


 Pull requests


 Actions


 Projects

 Wiki


 Security


 Insights


 Settings

 **dev\_scharm Mueller** had recent pushes 2 minutes ago

Compare & pull request


 dev\_scharm uell... ▾

 **2** branches


 **0** tags


Go to file


Add file ▾

 Code ▾


This branch is 2 commits ahead, 9 commits behind njuvigny:main.

 Pull request

 Compare

 **andschar** updated feature

fc54e9e 3 minutes ago

 **50** commits





# Material

- OpenOlat
- StackOverflow
- YouTube
- <https://guides.github.com/activities/hello-world>
- <https://support.rstudio.com/hc/en-us/articles/200532077-Version-Control-with-Git-and-SVN>

## Made with

- <https://github.com/rstudio/rmarkdown>
- <https://github.com/yihui/knitr>
- <https://github.com/yihui/xaringan>

# Task

- Fork Noel's repo: <https://github.com/njuvigny/MOD3>
- Clone it to local machine
- Create a new branch named dev\_YOURSURNAME
- Change the file **git\_intro/task.Rmd** according to the steps described in said file
- Create a .html out of the .Rmd file
- Add & Commit both files in the new branch
- Push local changes to your repo (HINT: this might cause some trouble ;))
- Create a Pull Request against Noel's repo

**Thank you for your attention!**