Version control with Git exercise

In this exercise we will show how version control with Git can be implemented for an example R project. The project is the same that is created in the first workflow exercise, however to save time or in case you haven't completed this exercise we will start with the finished output from it.

Step 1: Download and configure Git

- Download Git from https://git-scm.com/downloads
- Once downloaded open the Git terminal window and type in the following with your credentials

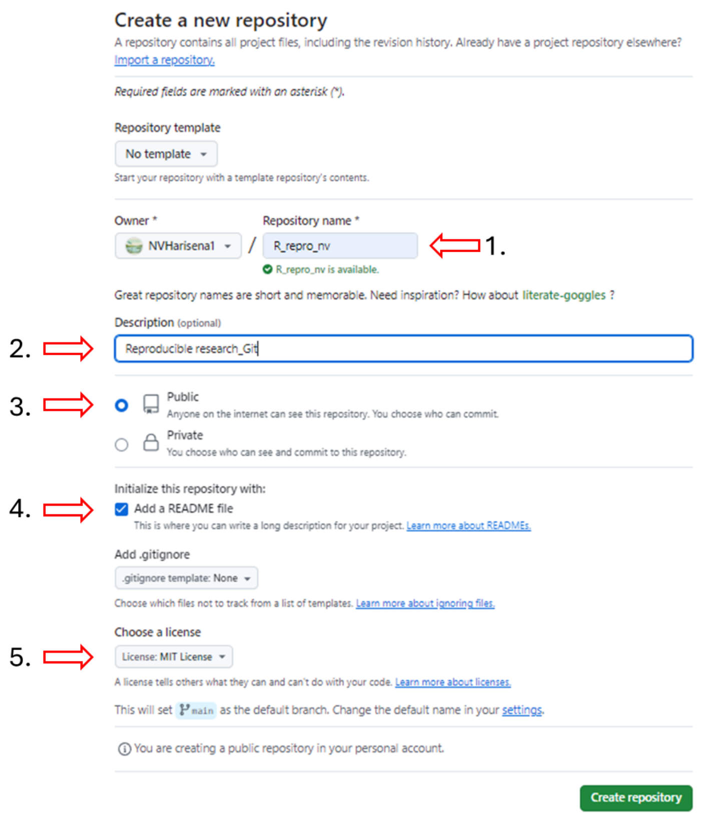
```
git config --global user.name "NVHarisena1" git config --global user.email
"NVHarisena1\@ethz.ch" git config --global --list
```

The third command should return your updated user-name and email id.

Step 2: Create a repository on Github

We will make a quick repository on Github for an individual project, without changing much of the specific configurations since it will be beyond the scope of this workshop.

- Login to your account at https://github.com/
- Create a new repository by clicking the '+' sign in the top right side of the website or in the 'Start new repository' section in the homepage
- Provide a clear name for the repository for e.g. "R_repro_nv" and a quick description like "Test for Reproducible research workshop"
- Set the visibility of the profile to "Public"
- Initialize this repository with: Add a README file.
- Select a license for your repository in the "Choose your license" section. Check out this website to identify which license works for you. Even though it is optional to add license information to a repository, it is good practice to include this (See more details).
- Click the green 'create repository' button



Create a new repository

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

Required fields are marked with an asterisk (*).

Repository template: No template

Start your repository with a template repository's contents.

Owner *: NVHarisena1 / Repository name *: R_repro_nv

R_repro_nv is available.

Great repository names are short and memorable. Need inspiration? How about literate-goggles ?

Description (optional): Reproducible research_Git

[✓ 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:

✓ Add a README file

This is where you can write a long description for your project. Learn more about READMEs.

Add .gitignore: .gitignore template: None

Choose which files not to track from a list of templates. Learn more about ignoring files.

Choose a license: License: MIT License

A license tells others what they can and can't do with your code. Learn more about licenses.

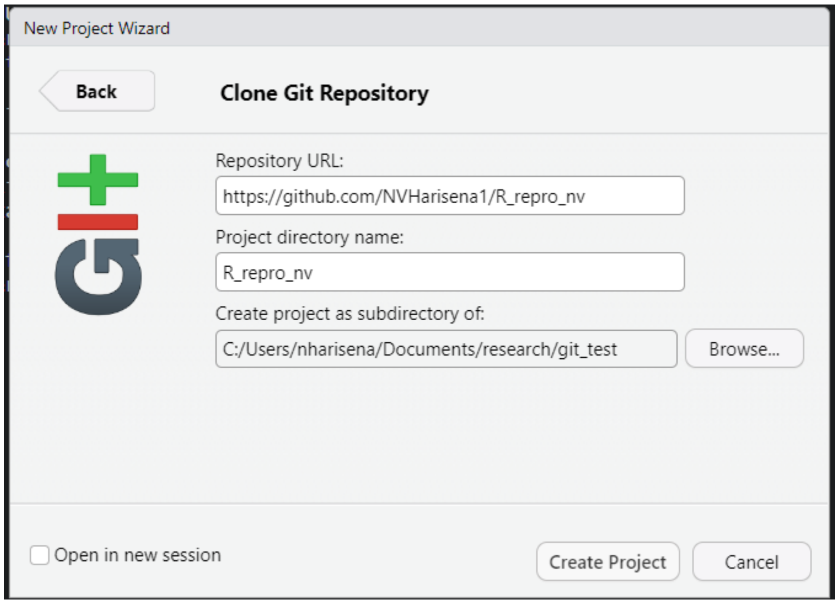
This will set main as the default branch. Change the default name in your settings.

You are creating a public repository in your personal account.

1: Setting up the repository

Step 3: Link created repository to R-Studio

- Open a new session in R studio and create a new project
- In the 'New Project Wizard' navigate to 'Version Control'>'Git'
- In the "repository URL" paste the URL of your new GitHub repository. It will be something like this https://github.com/nvharisena1/R_repro_test.
- Add folder location where you want the project to be saved locally in your computer in "Create project as subdirectory of" section
- Click 'Create project'



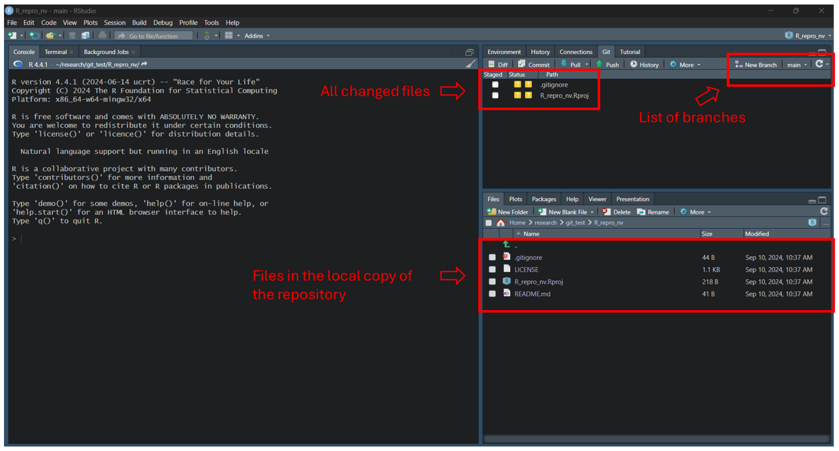
Repository URL: https://github.com/NVHarisena1/R_repro_nv

Project directory name: R_repro_nv

Create project as subdirectory of: C:/Users/nharisena/Documents/research/git_test

2: Linking repository to R-Studio

You will see R-studio has now been set up for your local clone of the project to communicate with your online repository. You can see a drop-down to the right of 'New Branch' button in the Git tab. This will show you all the branches available to pull or push data to. Your drop-down should show only a 'main' branch, since no new branches were created. As stated in the workflow introduction, creating branches is useful for projects with multiple collaborators or sub-themes. Pushing to different branches and then setting up a 'pull-request' to merge to the 'main' branch allows for systematic version control of the project.



```
R version 4.4.1 (2024-06-14 ucrt) -- "Race for Your Life"
Copyright (C) 2024 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

  Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

>
```

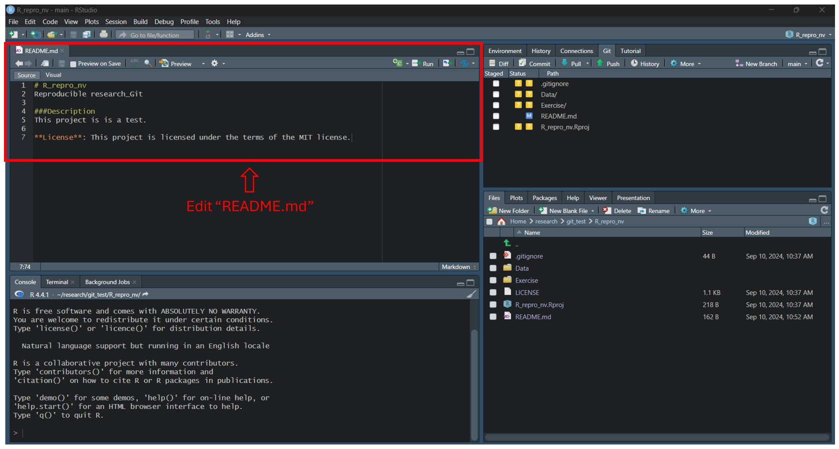
Staged	Status	Path
☐	? ?	.gitignore
☐	? ?	R_repro_nv.Rproj

Name	Size	Modified
..		
.gitignore	44 B	Sep 10, 2024, 10:37 AM
LICENSE	1.1 KB	Sep 10, 2024, 10:37 AM
R_repro_nv.Rproj	218 B	Sep 10, 2024, 10:37 AM
README.md	41 B	Sep 10, 2024, 10:37 AM

3: R-Studio new project session with git link

Step 5: Edit the `README.md` file

- Open the README.md from the file viewer pane
- Add a description section for the project with a heading and a describing sentence, for e.g. "This project is is a test".
- Add license information for the project, for e.g. "This project is licensed under the terms of the MIT license."
- Save the file.



```
# R_repro_nv
Reproducible research_Git

###Description
This project is is a test.

**License**: This project is licensed under the terms of the MIT license.
```

```
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Type 'q()' to quit R.

>
```

Staged	Status	Path
☐	? ?	.gitignore
☐	? ?	Data/
☐	? ?	Exercise/
☐	M	README.md
☐	? ?	R_repro_nv.Rproj

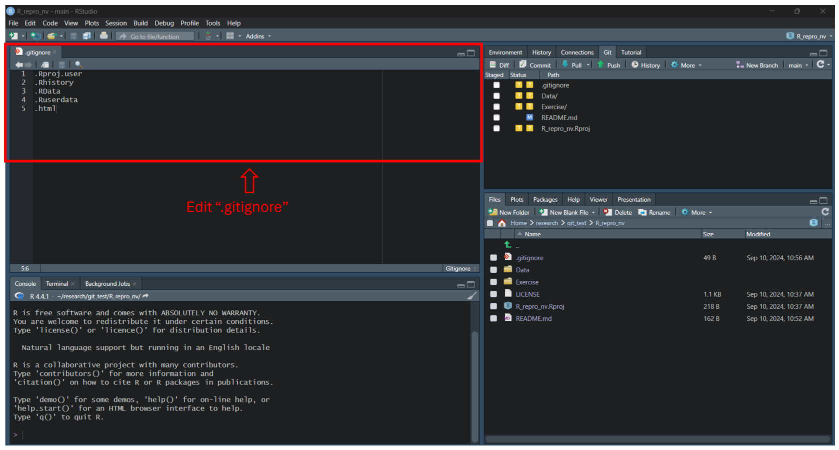
Name	Size	Modified
..		
.gitignore	44 B	Sep 10, 2024, 10:37 AM
Data		
Exercise		
LICENSE	1.1 KB	Sep 10, 2024, 10:37 AM
R_repro_nv.Rproj	218 B	Sep 10, 2024, 10:37 AM
README.md	162 B	Sep 10, 2024, 10:52 AM

4: Edit README.md

Step 6: Edit the `.gitignore` file

The git ignore functionality tells git which files to ignore while 'pushing' the local changes to the remote (online) repository see more details.In this example we will tell git to ignore all `.html` files. `.html` files are created when you preview a file, for example click preview on the edited `README.md` and a `.html` should be created.

- Open the `.gitignore` file and add `.html` in a new line and save the file



```
.Rproj.user
.Rhistory
.RData
.Ruserdata
.html
```

```
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You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

  Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
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Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

>
```
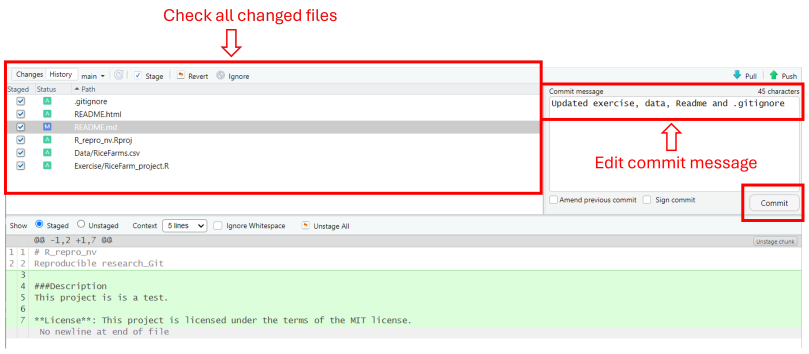

Name	Size	Modified
.gitignore	49 B	Sep 10, 2024, 10:56 AM
Data		
Exercise		
LICENSE	1.1 KB	Sep 10, 2024, 10:37 AM
R_repro_nv.Rproj	218 B	Sep 10, 2024, 10:37 AM
README.md	162 B	Sep 10, 2024, 10:52 AM

5: Editing the .gitignore file

Step 7: Commit and push

- Click the `Commit` button in the Git tab
- Check all the files listed in the top left section
- Write a sentence describing the changes i.e. *"Updated exercise, data, Readme and .gitignore"*
- Click `Commit` and close the window
- click `Push` in the Git tab, a window will pop up showing the interface with the remote system and details of the upload.



Staged	Status	Path
✓	A	.gitignore
✓	A	README.html
✓	M	README.md
✓	A	R_repro_nv.Rproj
✓	A	Data/RiceFarms.csv
✓	A	Exercise/RiceFarm_project.R

Commit message: `Updated exercise, data, Readme and .gitignore`

```
@@ -1,2 +1,7 @@
# R_repro_nv
Reproducible research_Git

###Description
This project is is a test.

**License**: This project is licensed under the terms of the MIT license.
 No newline at end of file
```

6: Commit changes

Great! You have finished your first project update (local changes committed and pushed) via Git on Rstudio.

<script type=”application/javascript” src=”light-dark.js”></script>