Version Control with Git and GitHub

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Version Control with Git and GitHub using R

- Basics of using version control system to keep track of all your important R code
- But also facilitate collaboration with collegues and the wider world.

Target

- Learning to use Git in combination with the web-based hosting service GitHub
- Looking at installing and configuring Git and GitHub
- Working with Git and Github stand alone
- Collaborate with someone else
- Preparation on next workshop on Distill
- All with R/RStudio

Set-up

- Github sites
- Presentation
- Working stand alone
- Collaborate with someone else
- Questions, discussion, preparation NSC-R website

Overall: We try to keep it simple

Caution

- Working with R and Git/GitHub, but the it's more elaborated with own menu system and syntax
- Git/Github can be complicated and can frustrate you
- Project can be restricted (try to get $<$50 MB and not bigger than 100 MB)

Why using version control?

Why using version control?

- Version control takes care of keeping a record of all versions of a particular file
- It allows you to revert back to previous version if you need to
- It keeps track of all your files in a single place
- It helps others (especially collaborators) to contribute to and reuse your work
- Files are always available from anywhere and on any computer if you are connected
- It helps you learn programming

What is Git?

- It is the version control system that lets you track changes to a set of files
- It can be any files that make up a project (.pdf, .rmd, .docc, .txt, .jpg etc)
- All the files that make up a project is called a **repository** (or just **repo**)

What is GitHub

- It is a web-based hosting service for Git repositories
- It allows you to create a remote copy of your local-version controlled project
- It can be a back up or archive of your projects
- It makes it accessible to you and others

Workproces

1. Typically (but not always) create a **remote** repository on GitHub
2. Then **clone** (say copying) this repository to our **local** computer
3. When it works, you work locally on your project as usual
4. You can take snapshots (call it **commits**) of these files after you've made important changes
5. Then we **push** these changes to the remote GitHub repository to make a backup or make it available for collaborators
6. If others work in the project/repository on their computer they make changes and you can **pull** it to your local repository

Workproces visual

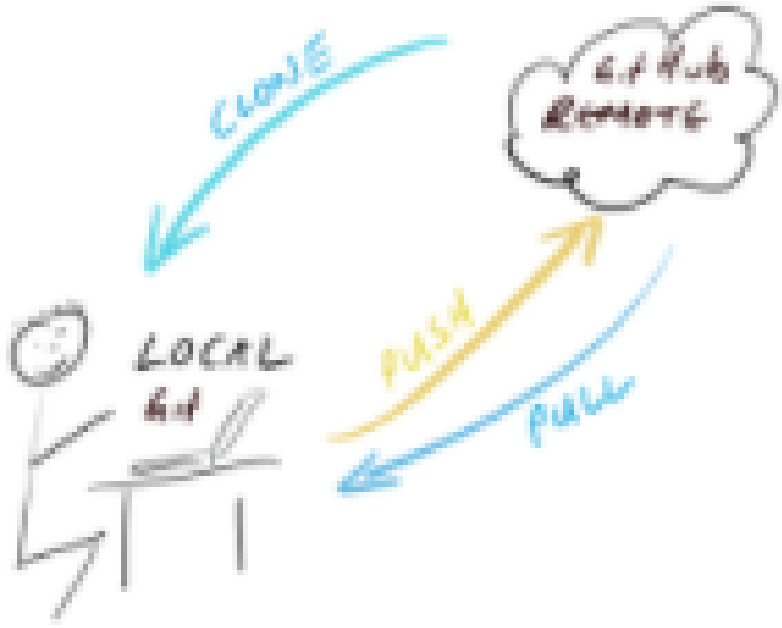


Figure 2: Workproces visual

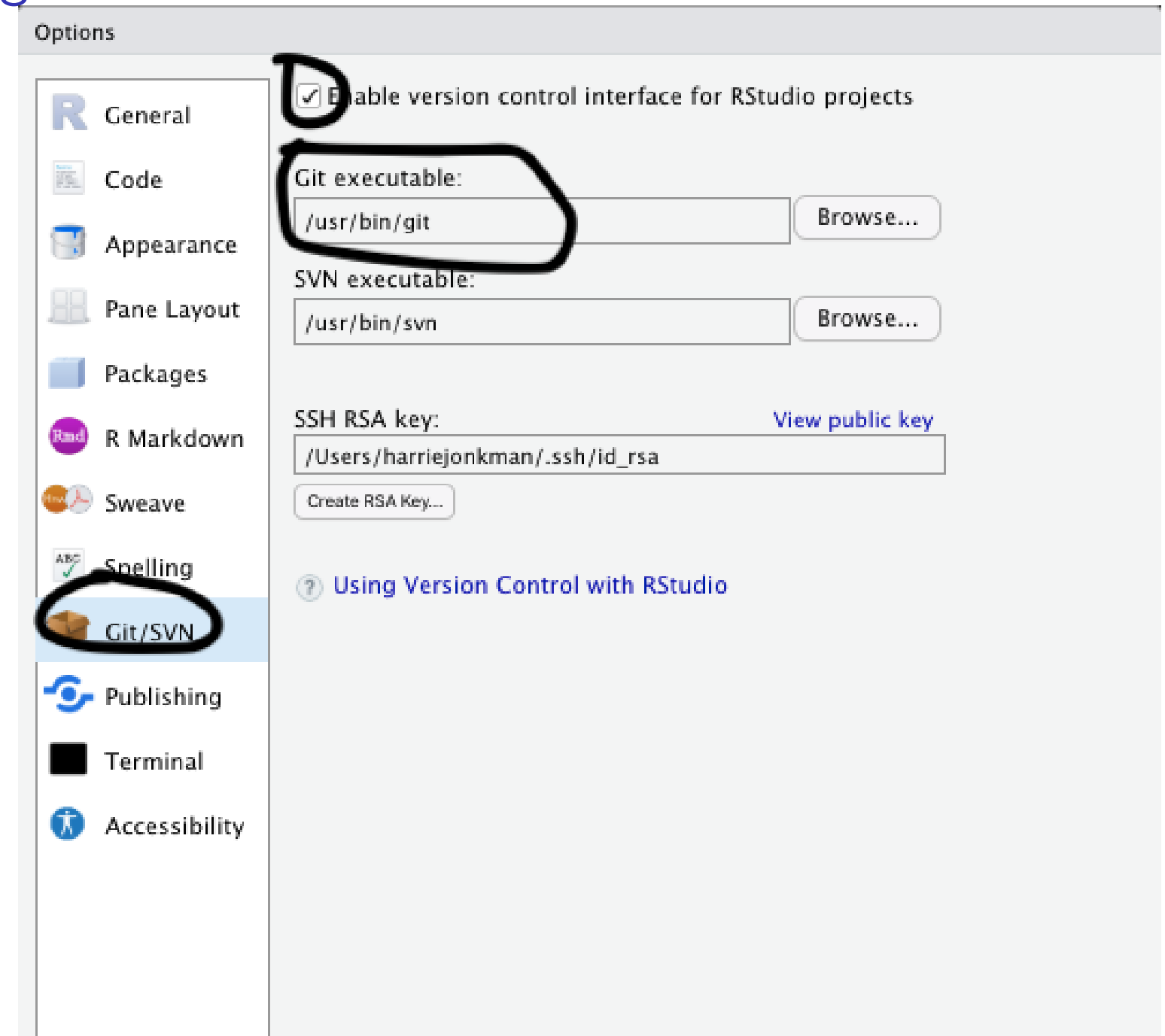
Installing R/RStudio

- Be sure you have the latest version of R, here
- And RStudio here

Installing Git

- Look at Bryan, J. *Happy Git and GitHub for the useR*, chapter 6 here

Configure Git from RStudio



Register a GitHub account

- See Bryan, J., *Happy Git and GitHub for the useR*, chapter 4, here

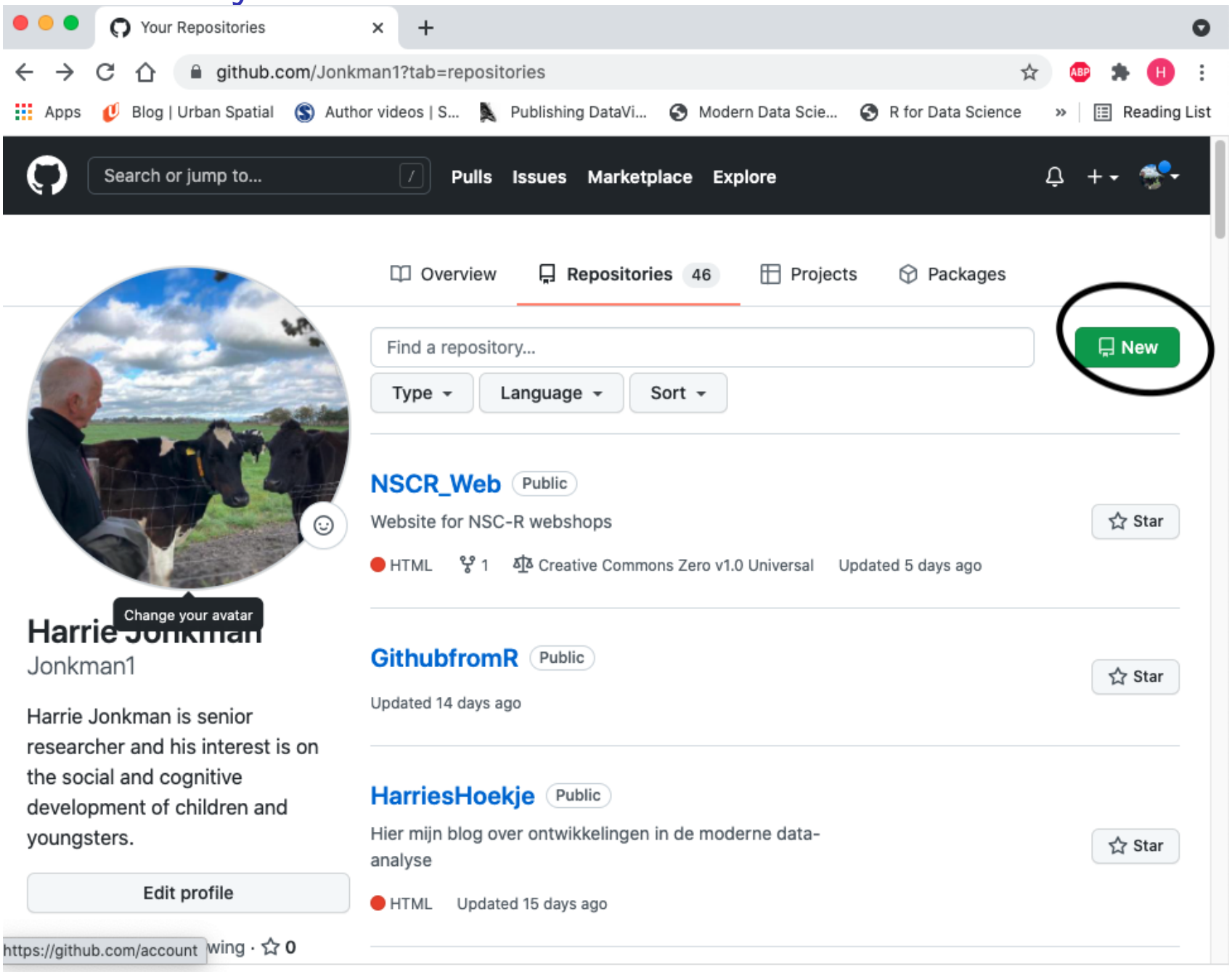
Setting up a project, different options:

- Option 1: Set up a remote GitHub repository first and then connect to an RStudio project to this repository (easier, showed here)
- Option 2: Connect an existing project to a GitHub repository (complexer, not showed)

GitHub first

- Create a **repository (repo)** on GitHub
- Go to the GitHub page and sign in if necessary
- Click on the ‘Repositories’ tab at the top
- Click on the green ‘New’ button on the right

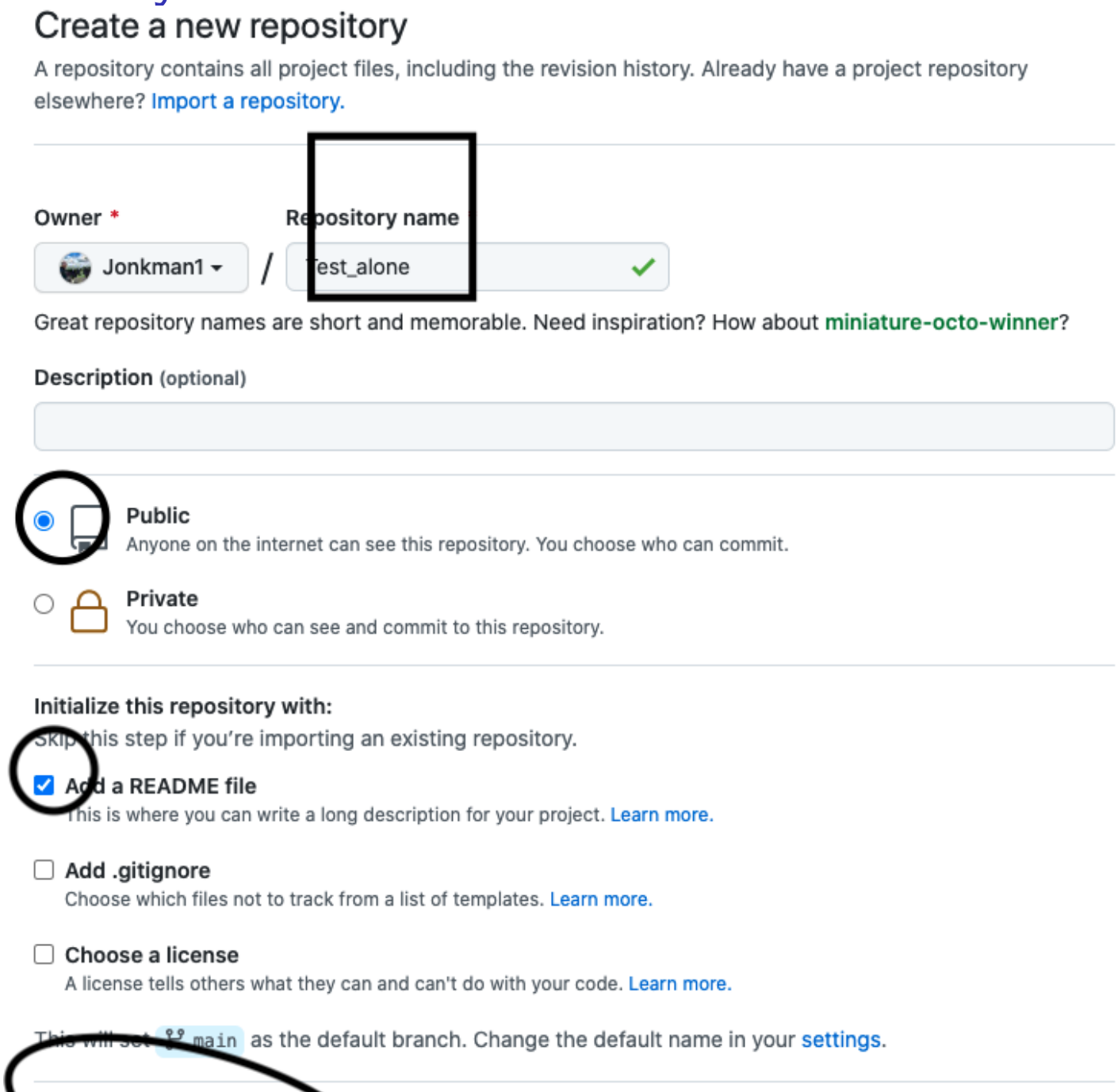
This is what you see



Test_alone

- Give your new repo a name(let us call it `Test_alone`)
- Select Public
- Tick on the ‘Initialize this repository with a README’
- Click on ’ Create repository‘

This is what you see



Clone or download to R/RStudio

- The new GitHub repository is created
- Now we **clone** (or download) it
- We copy the `https://..` URL that pops up

Switch to RStudio

- Click on `File -> New Project`
- Select `Version Control`

This is what you see

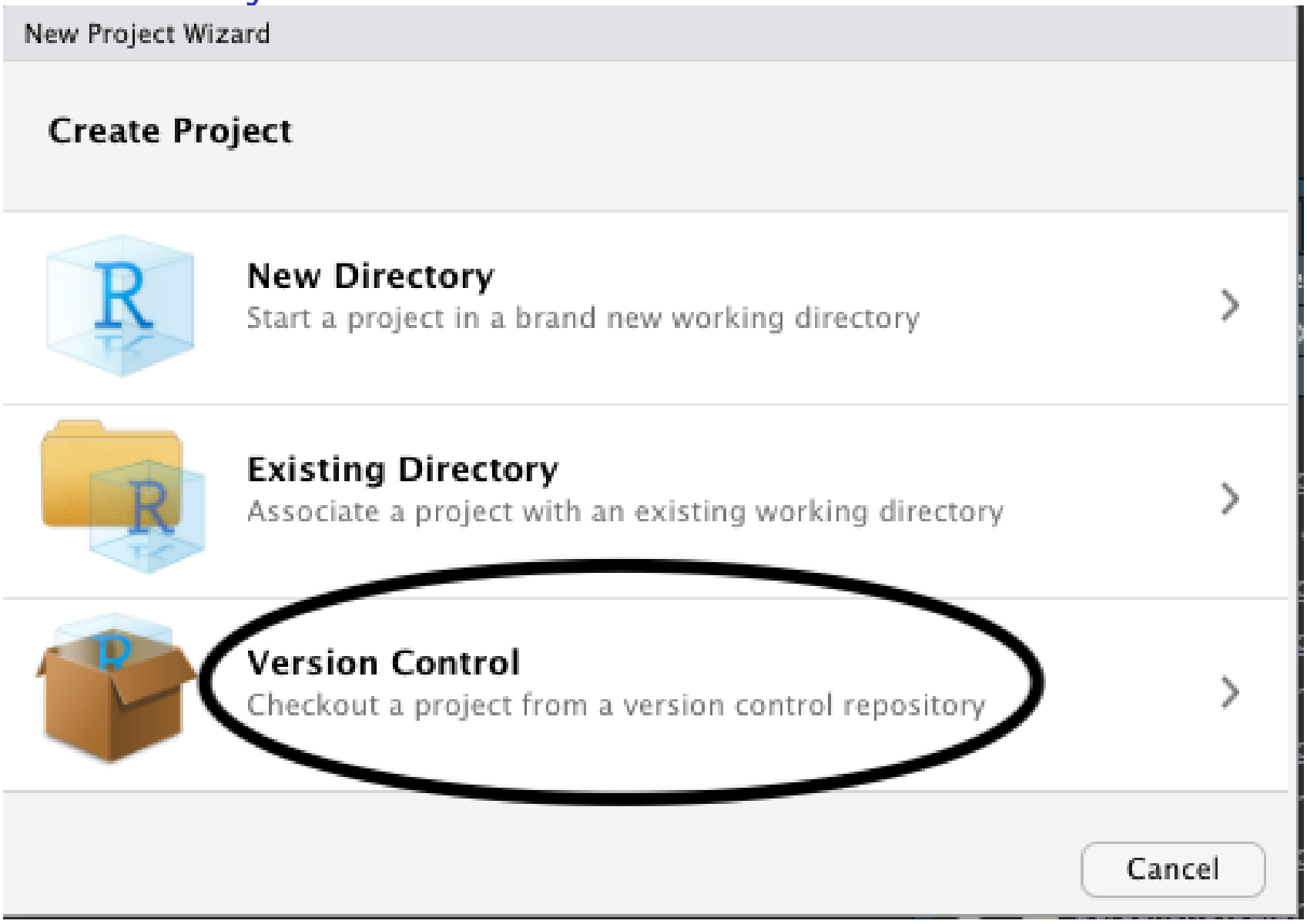


Figure 6: Create Project/Version Control

Paste it

- Now paste the URL you copied from GitHubin the `Repository URL` box
- It will fill out the `Project Directory Name:` with correct repository name
- Select where you want to place it on your machine (`Browse`)

This is what you see

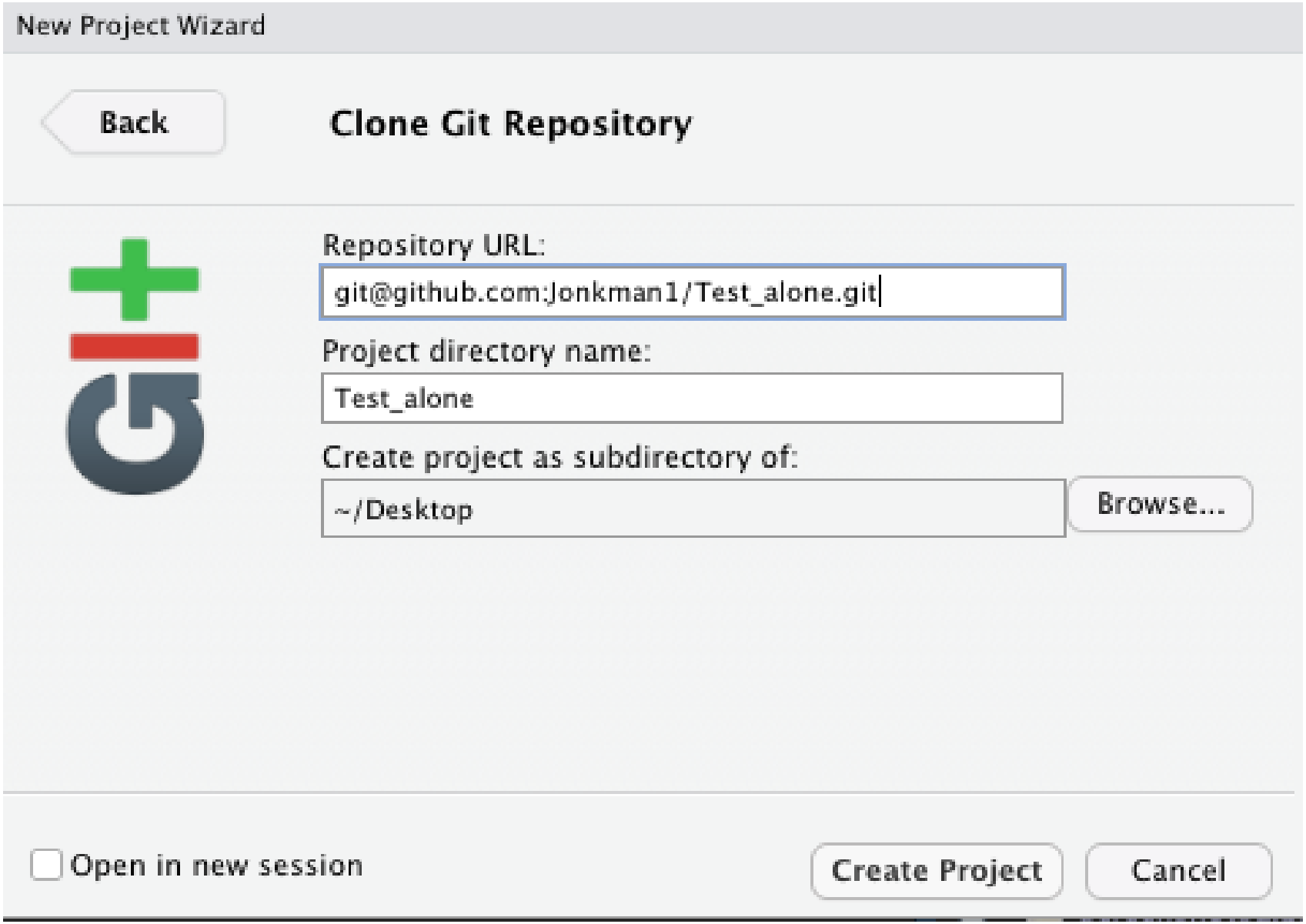
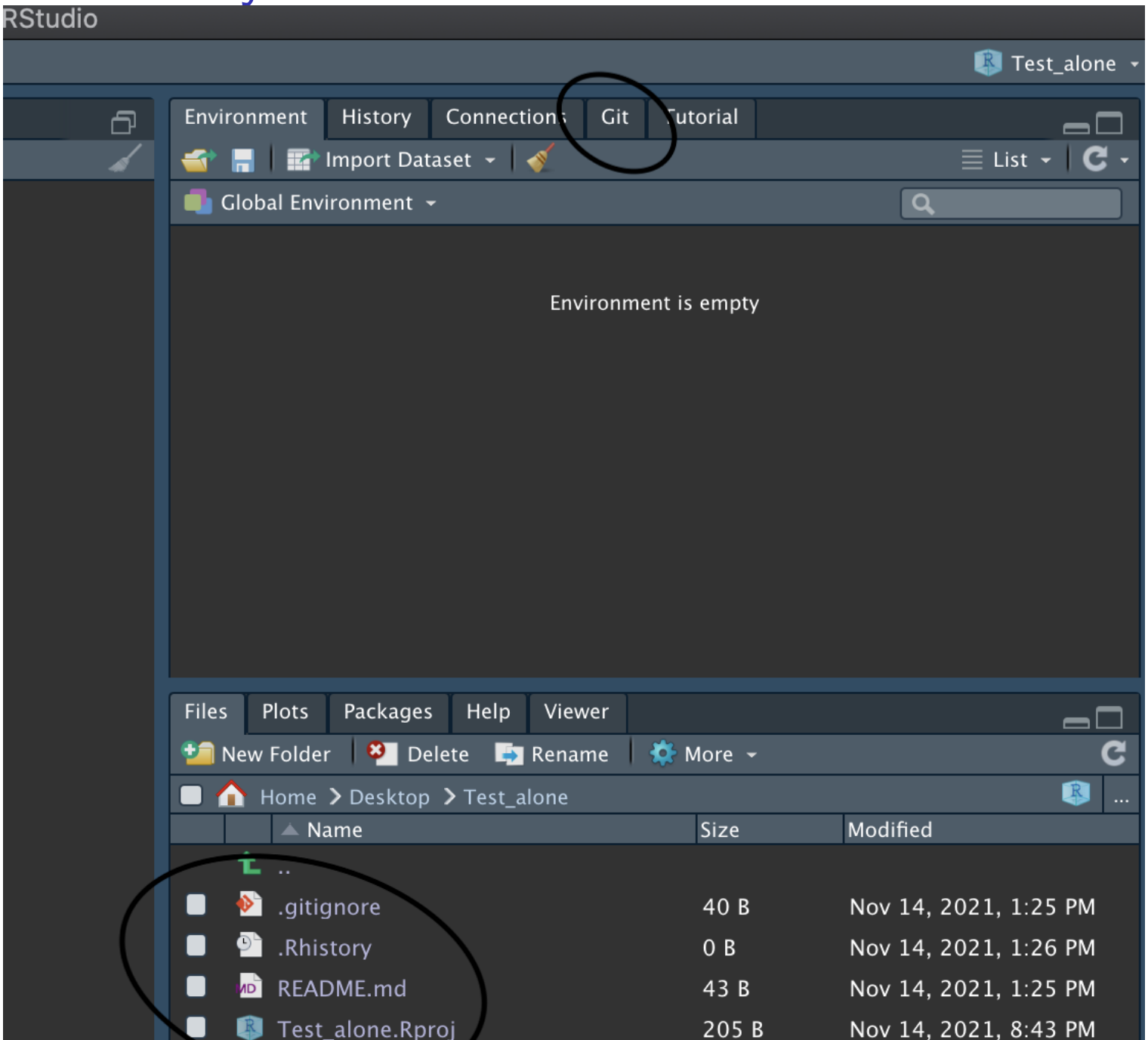


Figure 7: Git repo inside directory

Repo on your machine

- RStudio will create a new directory with the same name as your repo on your local computer
- Will **clone** your remote repository to this directory
- It will place three files: `Test_alone.Rproj`, README.md and `.gitignore`
- You will see a `Git` tab on your machine

This is what you see



Using Git by showing you two pracices

- Work on your own (test_alone)
- Working with some one else (test_together)

References

- Douglas, A., Roos, D., Mancini, F., Couto, A. and Lusseau, D., *An introduction to R*, chapter 9, here. Thank you.
- Bryan, J., *Happy Git and GitHub for the useR*, here
- Lendway, L., *github_for_collaboration*, here
- On youtube, here
- On youtube also, here