git and GitHub for use with R

Tools for versioning and sharing research

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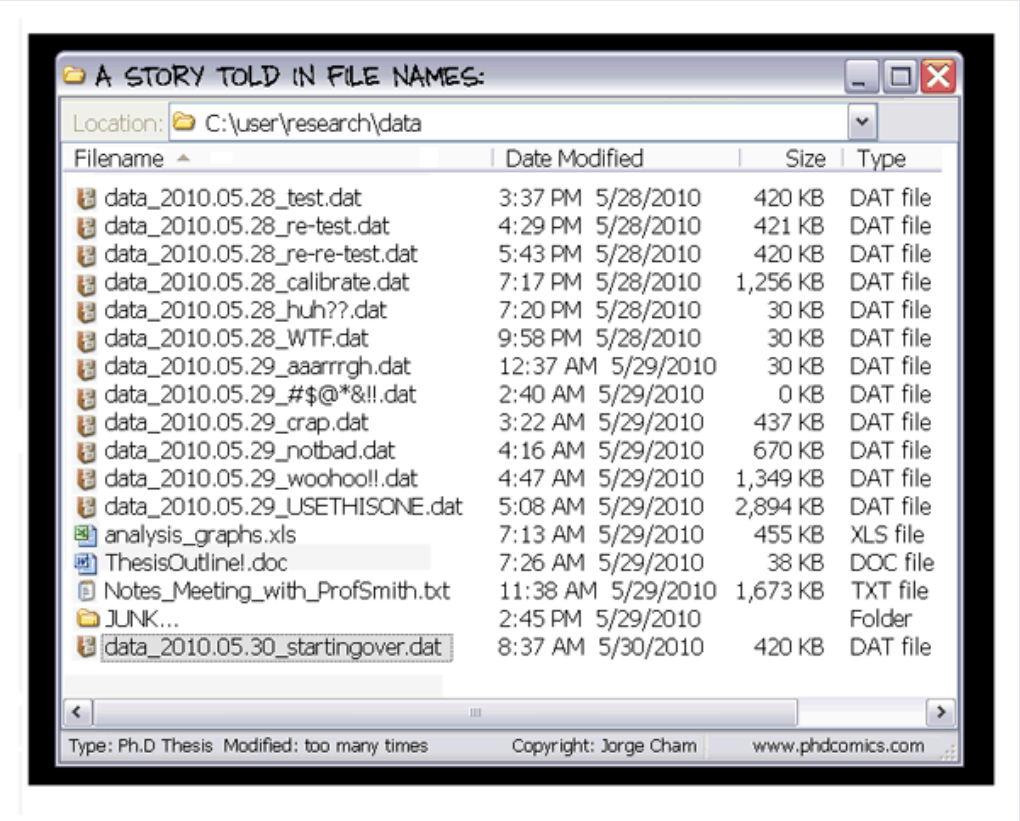
Outline

1. What is git? Why use git?
2. What is GitHub? Why use GitHub?
3. git and GitHub
4. git integration with RStudio
5. Practial session

What is git?

- Free and open source distributed **version control system**
- Built for software development for a group of developers to work collaboratively and to manage the evolution of a set of files
    - like *"Track Changes"* in Microsoft Word on steriods!
- Has been re-purposed to manage a collection of files that make up a typical data analytical project that consists of data, figures, reports, and source code

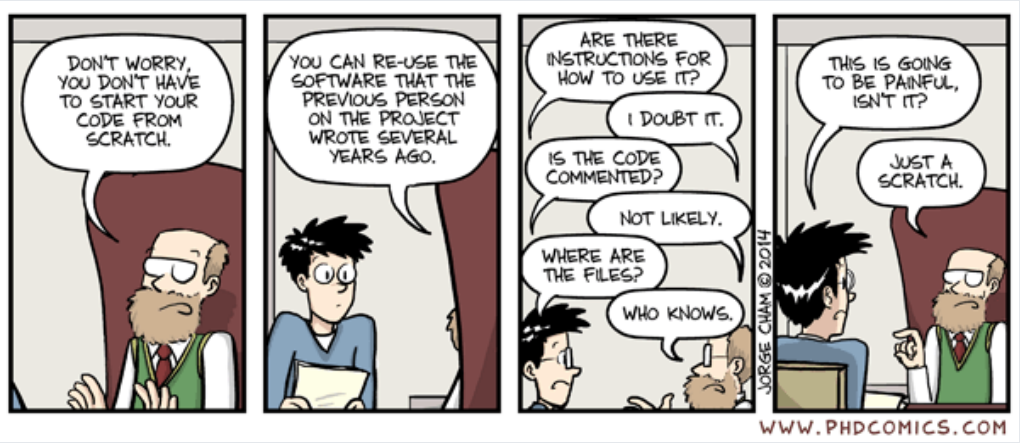
Why use git?



Version control

- Is the only reasonable and sane way to keep track changes in source code, manuscripts, presentations, and data analysis projects
- Documentation of differences between versions
- Exploration of differences between versions

Why use git?



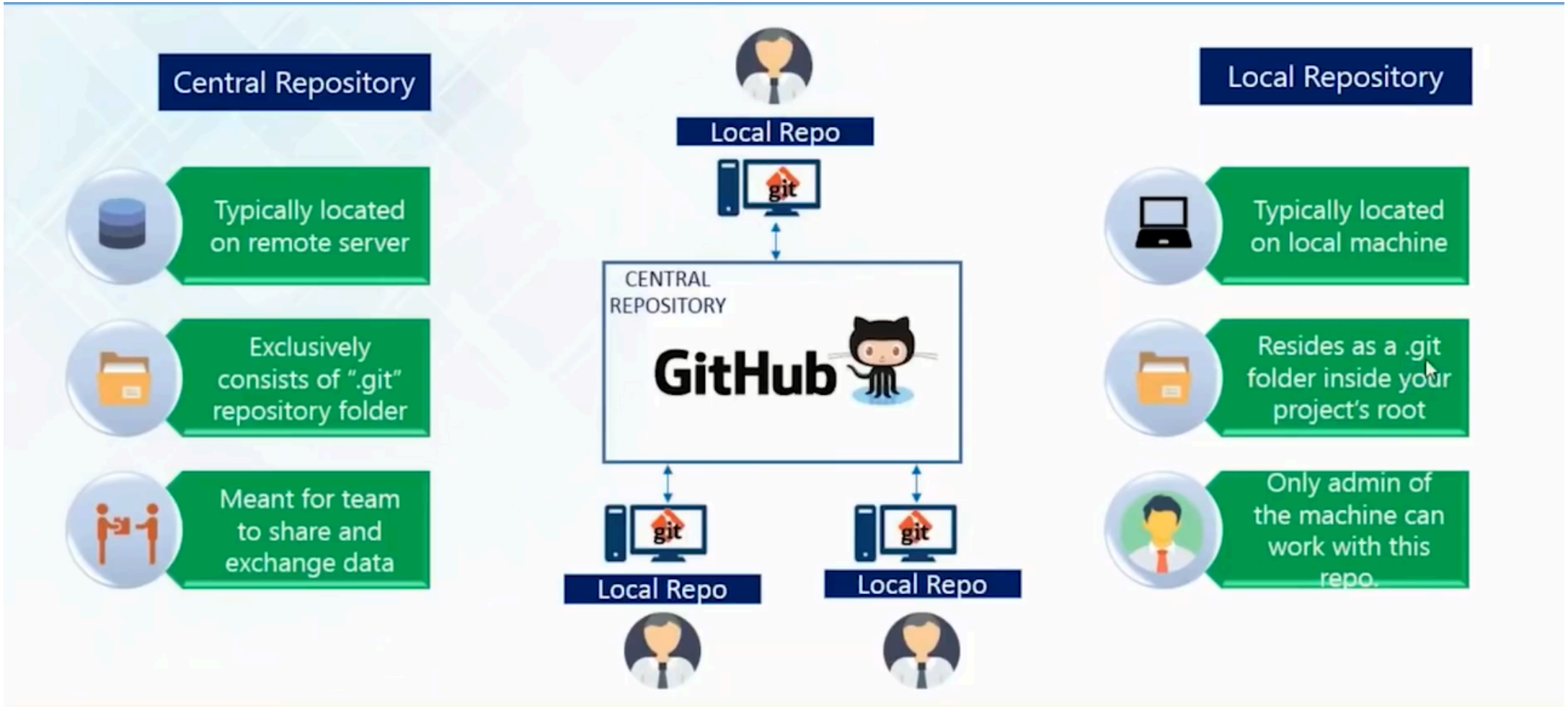
Communication and collaboration

- **Communicating** one's research project with other people is part of the scientific process - not just results but the whole process
- **Collaborating** with others on each other's research project allows us to build on each other's past work, using them for a different context/problem, or re-purposing them to come up with a new approach/solution
- Communication and collaboration on various aspects of the scientific process is faciliated by using git

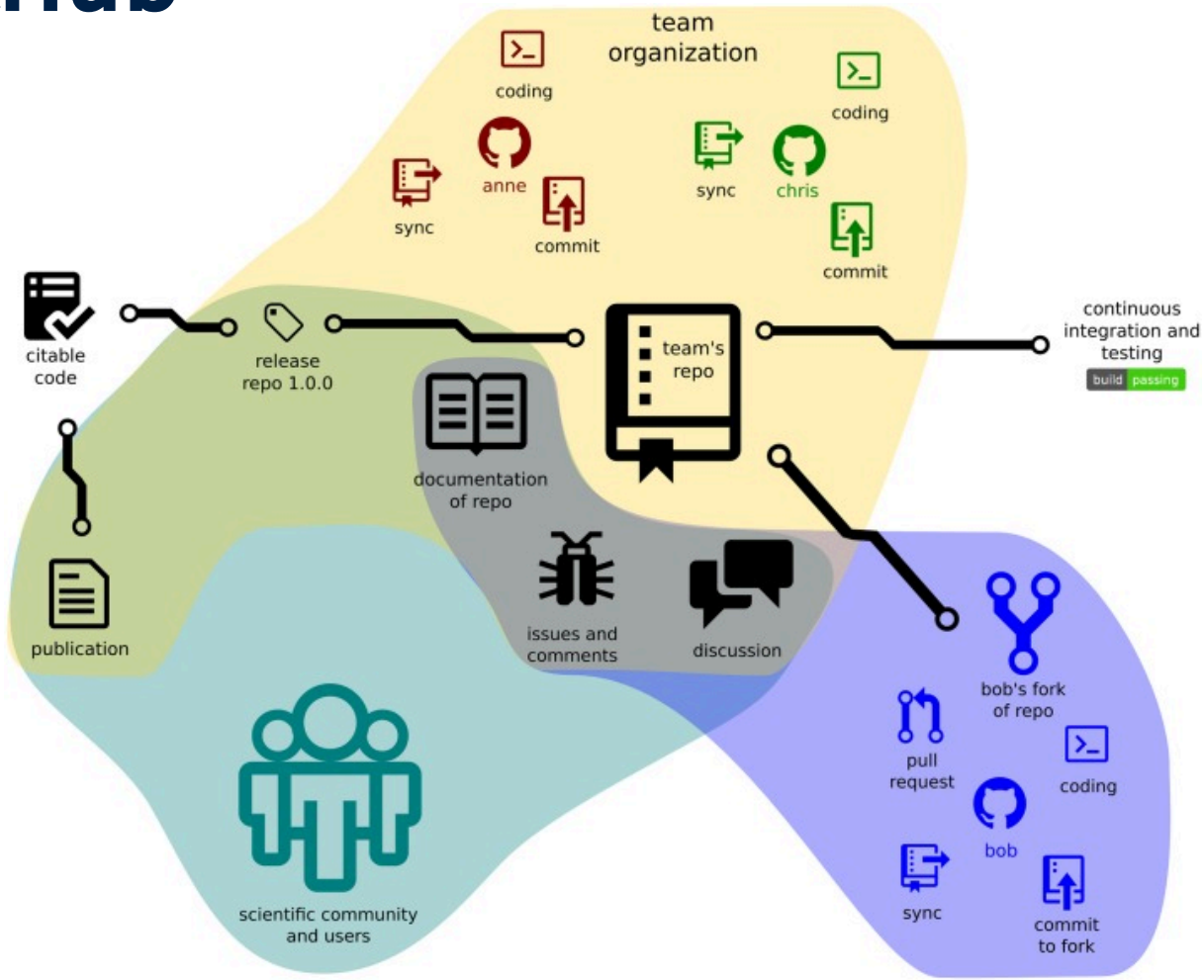
What is GitHub and Why use GitHub?

- Service provider of hosting for software development and version control using git
- Offers distributed version control and source code management functionality of git, plus its own features such as bug tracking, feature request, task management, continuous integration and wikis for every project
- Like *facebook* but for programmers
- Facilitates *"openness"* of **Open Source**
- Lowers the barriers to collaboration

git and GitHub



git and GitHub



Taken from Perez-Riverol, Y., Gatto, L., Wang, R., Sachsenberg, T., Uszkoreit, J., Leprevost, F., Fufezan, C., Ternent, T., Eglen, S. J., Katz, D. S., Pollard, T. J., Konovalov, A., Flight, R. M., Blin, K., & Vizcaíno, J. A. (2016). Ten Simple Rules for Taking Advantage of Git and GitHub. PLoS computational biology, 12(7), e1004947. https://doi.org/10.1371/journal.pcbi.1004947

git integration with RStudio

- RStudio is a popular integrated development environment (IDE) for R
- RStudio has built-in facilities for git and GitHub
- Within RStudio, one can create an RStudio project (a directory with some special files to describe specific RStudio options) which becomes your git repository
- One can easily turn a current git repository into an RStudio project.

Questions?

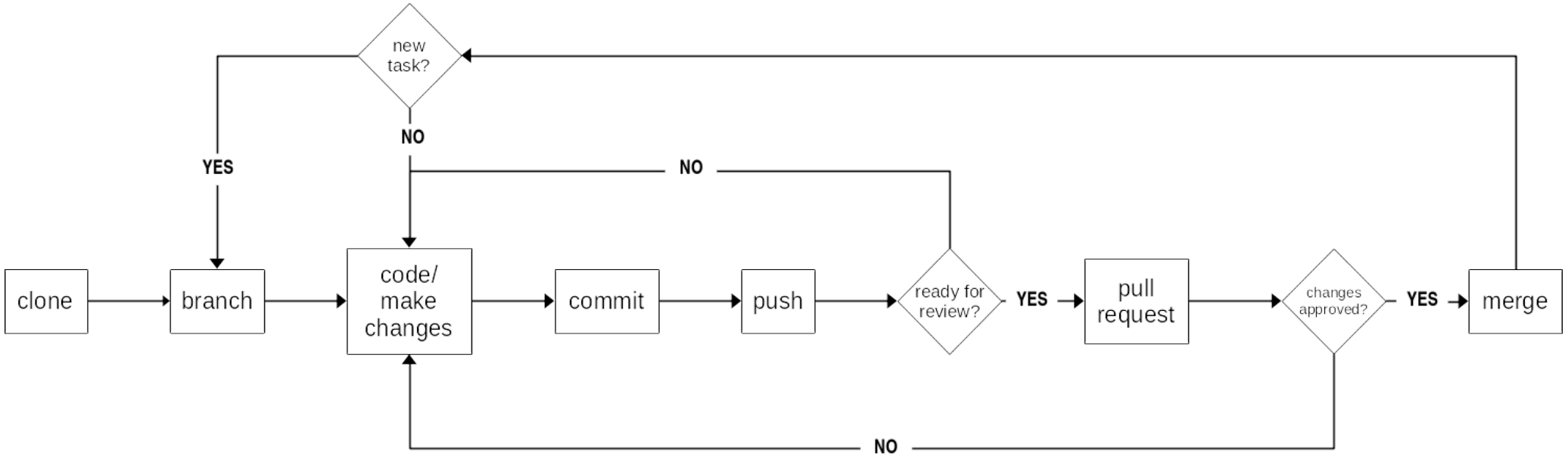
Practical session

- Register a GitHub account
- Install or upgrade R and RStudio
- Install git
- Introduce yourself to git
- Personal access token for HTTPS
- Connect RStudio to git and GitHub

Practical topics

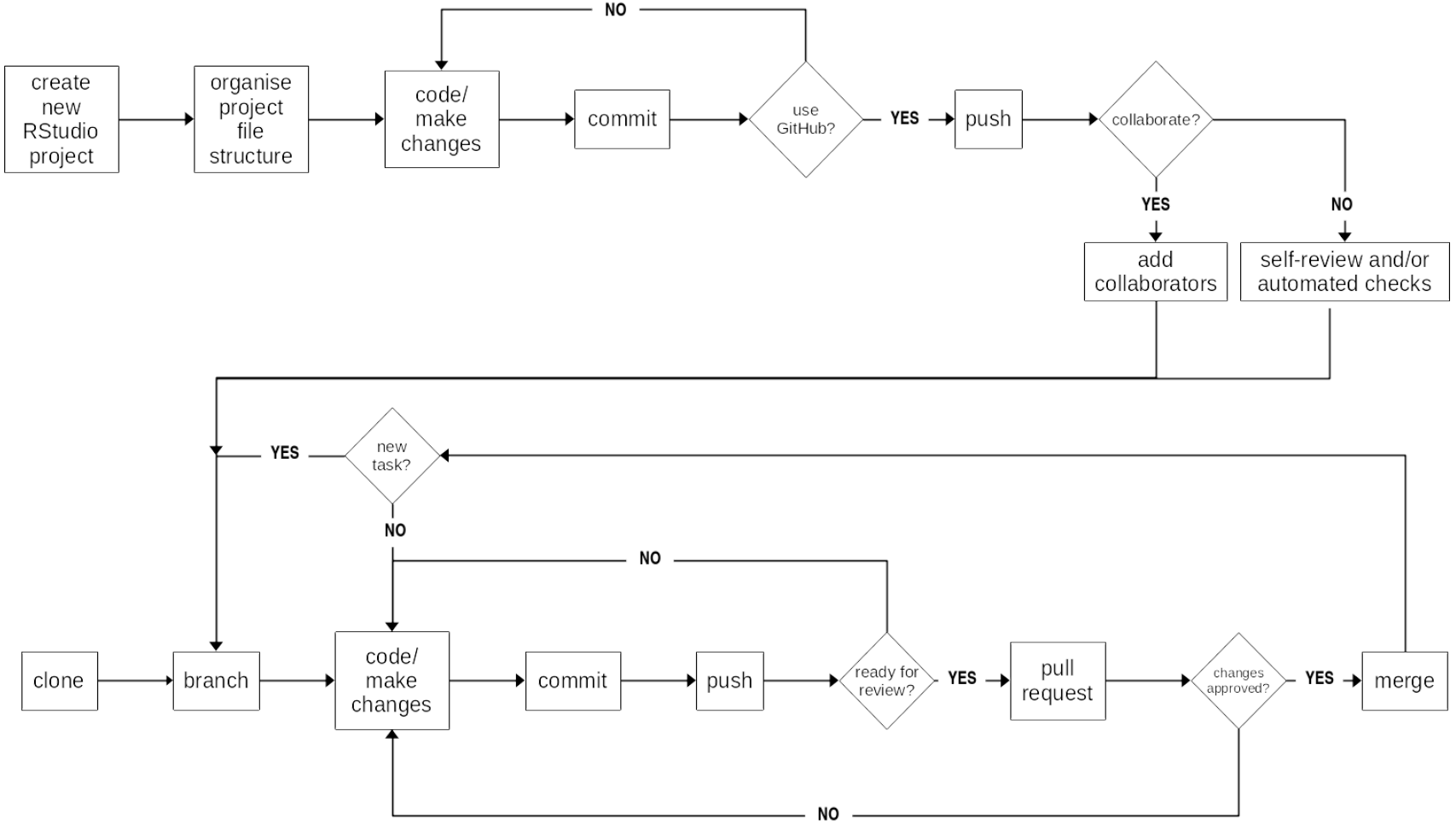
- RStudio, git, and GitHub process for participating in an R-based scientific project/workflow
- RStudio, git, and GitHub process for initiating your own R-based scientific project/workflow

Participating in an R-based scientific project/workflow



see details of this process in this Chapter of the IHTM handbook - https://oxford-ihtm.io/ihtm-handbook/participate-projects.html

Initiating your own R-based scientific project/workflow



see details of this process in this Chapter of the IHTM handbook - https://oxford-ihtm.io/ihtm-handbook/initiate-projects.html

Thank you!

Slides can be viewed at https://oxford-ihtm.io/open-reproducible-science/session7.html

PDF version of slides can be downloaded at https://oxford-ihtm.io/open-reproducible-science/pdf/session7-git-and-github-with-r.pdf

R scripts for slides available here