Helicopter Introduction to Github[1]

Min-Yang Lee

Northeast Fisheries Science Center
Woods Hole, MA, 02536

March 7, 2022

[1] https://github.com/NEFSC/READ-SSB-Lee-WorkingEfficiently/blob/main/presentations/github_overview.Rmd

Goal:

- Understand what github is and why it's a useful tool.
- Use the web editor to make a change to a repository.

Pre-work:

- Get a github account.
  - This will take you about 15 minutes of actual time, plus some emails to ITD.
  - Follow the github rules, which are long and complicated.
- Look through one of these two pages and find a mistake or a gap in the information.
  - https://github.com/NEFSC/READ-SSB-Lee-metadata or
  - https://github.com/NEFSC/READ-SSB-Lee-WorkingEfficiently
- Spend 10-15 minutes looking though your own code, emails, 3 ring binders, or documentation. Find a widget that you'd like to share.

What is Github?

- Github is a tool to help you produce reproducible research.
- Github is Google Docs for code.
- Github is track changes for projects.
- Github has *some* lightweight project management tools. You can:
  - Track issues and assign them to people.
  - Aggregate related problems into a project.
  - Break down a long range project goal into smaller chunks.

What are the downsides?

- Adds 2-3 steps to your workflow.
  - Yes, it's a little annoying at first.
  - Yes, the annoyance disappears quickly.
- Take care not to upload any sensitive information
  - Passwords, data, server addresses
  - Yes, you can automate this.

Why use it?

- Collaborate with colleagues.
  - Work simultaneously and iterate quickly when developing code.
  - No emailing code back and forth.
  - Write collaboratively: Paper and repository
- Makes your life easier (maybe) when you do your revisions after 6 months in review.
- Project continuity when there is staff turnover
- You can't "break" someone's code.
  - Every version that you tell Github to save is saved.
  - You can always go back to a previous version. If you've written a good enough note that you can find that version quickly.

Privacy and Control

- The owner of the repository can control who can see the repository
  - Anyone
  - Certain people

- The owner of the repository can control who can make changes to the repository:
  - Anyone
  - Certain people

Getting Started with Editing a Document

- You can use github's online editor for simple things.
- Just need a github account.

- Workflow 1:
  - Edit a document using Github's online editor.
  - Write a *commit message*
  - "Save and *Fork*" the repository.
  - Submit a *pull request*: ask the owner to review and integrate changes.
  - **After** the changes are integrated, delete your Fork.
  - You can always do this

Getting Started II

- Workflow 2:
  - Edit a document.
  - Write a *commit message*: a note about what you did
  - Save it by *committing* to the main *branch*.
  - This is my favorite for small things? What's small – you know it when you see it.

- Workflow 3:
  - Create a *new branch* in the repository.
  - Edit a document.
  - Write a *commit message*
  - Commit to that branch.
  - Submit a *pull request*: ask the someone to review, approve, and integrate changes.
  - **After** the changes are integrated, delete the branch.

For more complicated tasks:

- Ask IT-helpdesk to install "git" and either "Github desktop" or "Rstudio" on your computer.

- Workflow 4:
  - *Clone* the project to your computer.
  - Create a *new branch* in the repository.
  - Edit lots of documents.
  - Write a *commit message*
  - Commit to that branch.
  - *Push* the changes up to Github.
  - Submit a *pull request* for the owner to review and integrate your changes.
  - **After** the changes are integrated, delete the branch.
- Lots of guides on the internet on how to use git and github.

A few guidelines

- *main* should always work. For everyone.
- No passwords, API keys, PII, or confidential data
  - Environment variables or
  - .gitignore
  - Load in data from Oracle or from locations on the network.
- Small data on the repository is fine.

Working Efficiently

https://github.com/NEFSC/READ-SSB-Lee-WorkingEfficiently is a table of contents to some of the things I've collected, including links to

- Oracle metadata
- A project template with data extraction code
- Some code to run R on the NEFSC Servers.
- Code to construct Affiliated Firms for the RFA Analyses.
- Code to assemble custom rasters.