git and GitHub!

Hopefully cutting through the fogginess

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Week 1, Class 2

Agenda

- *git* vs GitHub vs GitKraken
- Two ways to create a repo
- Adding collaborators
- Branching
- Pull requests
- Forking
- Stashing
- General recommendations

Setup

I'm assuming you're all setup. If not, please do the following

- Download and install *git*
- Register for a GitHub account
- Download and install GitKraken

git vs GitHub

git and GitHub are somewhat analogous to R and RStudio

- R is the "engine", RStudio is the IDE
- *git* is the "engine", GitHub is the web–based hosting service

It's somewhat easy to conflate these things, but it's important to keep them separate... Why?


GitKraken
A visual interface for interacting with *git*

Why GitKraken

You could argue it would be better to focus on the command line interface.

My experience

Most people have an easier time grasping the *concepts* of *git* (like branching) when there's a visual interface

GitKraken allows you to do 95%+ of the work you need to do without moving to the CLI

Why GitKraken

If you decide to go with CLI eventually, that's totally fine. You'll probably need to for some operations. But as Jenny Bryan notes

> No one is giving out Git Nerd merit badges

So use the tools that make you most effective

Big picture

Why do we use *git*?

We use *git* to:

- Contain version control and track changes to documents over time
- Increase transparency and reproducibilty in process
- Collaborate with others efficiently and effectively
- Share our work with others

Warning

This will be painful at times – you've probably already had painful experiences. I believe the payoff is worth the effort.

The vocabulary is probably half the battle

GitHub

Creating repositories: Starting with an empty project

GitHub first

If you are starting a new project and you're going to use version control, I suggest going GitHub first

- Create a new empty repo on Github
- Clone the repo locally
- Start your project (i.e., RStudio Projects)
- Commit your initial changes
- Push the changes to the remote

[demo]

GitHub

Creating repositories: Starting with an existing project

Project first

If you already have an existing project, you need to:

- Initialize the repo locally
- Create an empty repo on GitHub
- Connect your local repo to the remote

[demo]

Vocabulary pop quiz

What do the following mean?

- Stage
- Commit
- Push
- Pull
- Clone
- Branch
- Fork

Merge conflicts

- Merge conflicts only occur if you try to edit *the same line* of an out–of–date file
- Let's create and resolve one with the README file.

Branching

Super powerful approach to collaborating with *git*. Essentially create a copy of the repo at a given point.

- Create and *checkout* a new branch.
- Make changes and commits *on the branch*, which frees you up to play and experiment without fear of "breaking" the main branch
- Push the branch to the remote
- When you're ready, submit a *pull request* to merge the branch with the main branch
- Note – any changes on the branch *will not be visible* if you don't have that branch checked out

[demo]

Pull requests

Submit a PR for a branch when you're ready

Consider tagging others to review the changes before they are merged in

Link the PR to any relevant Issues.

Consider adding labels (e.g., bug fix, enhancement)

[demo]

Forking

Similar process to branching, with a few major differences:

- You don't have to be (and shouldn't be) a direct collaborator
- You copy the entire repo *to your account*
    - You can then make whatever changes you want and push the changes to your fork
- If you want your changes implemented, you *must* submit a pull request (you can't contribute to the repo directly unless you're a collaborator) and *compare across forks*

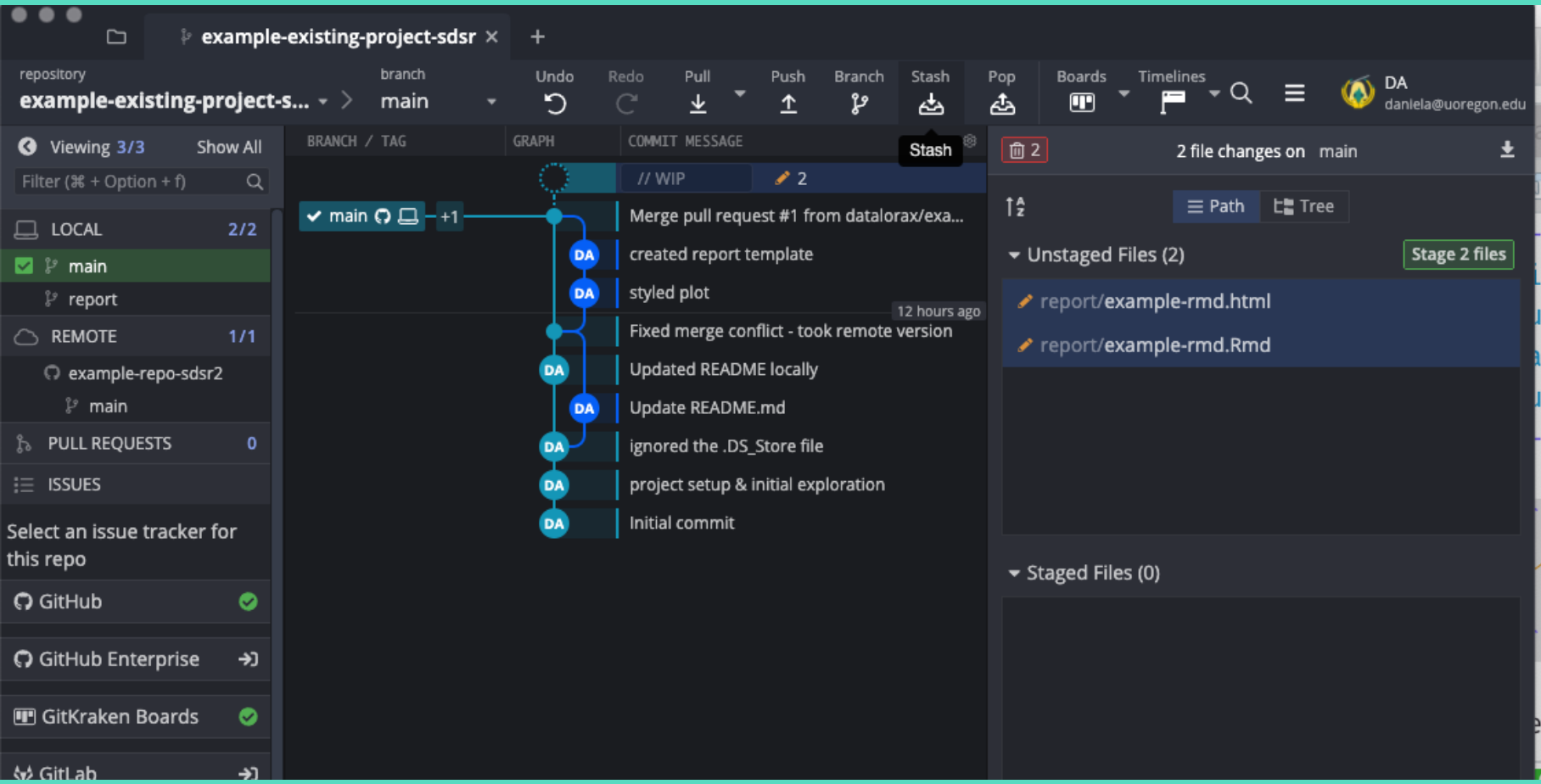
Stashing

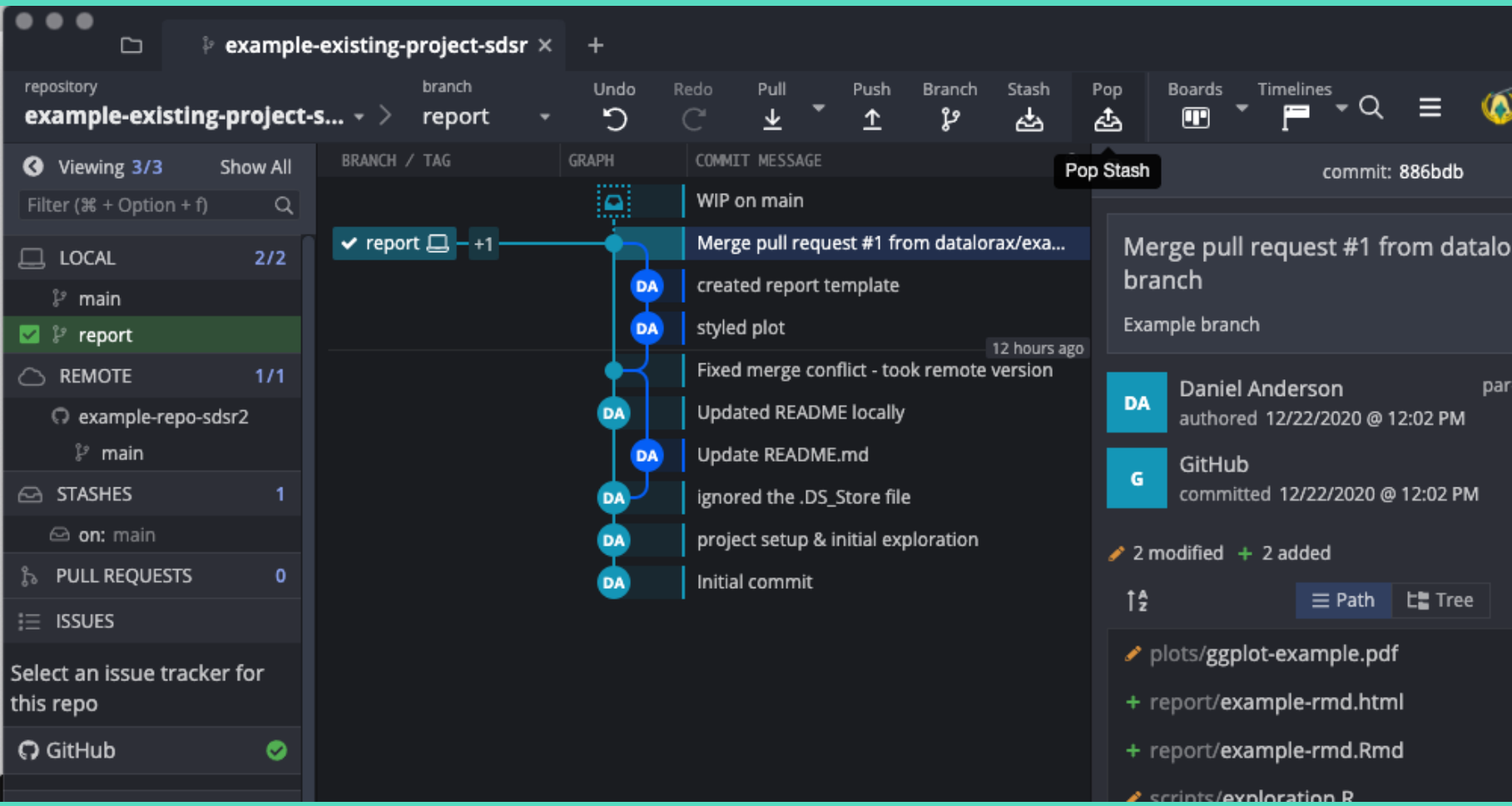
Last topic for the day

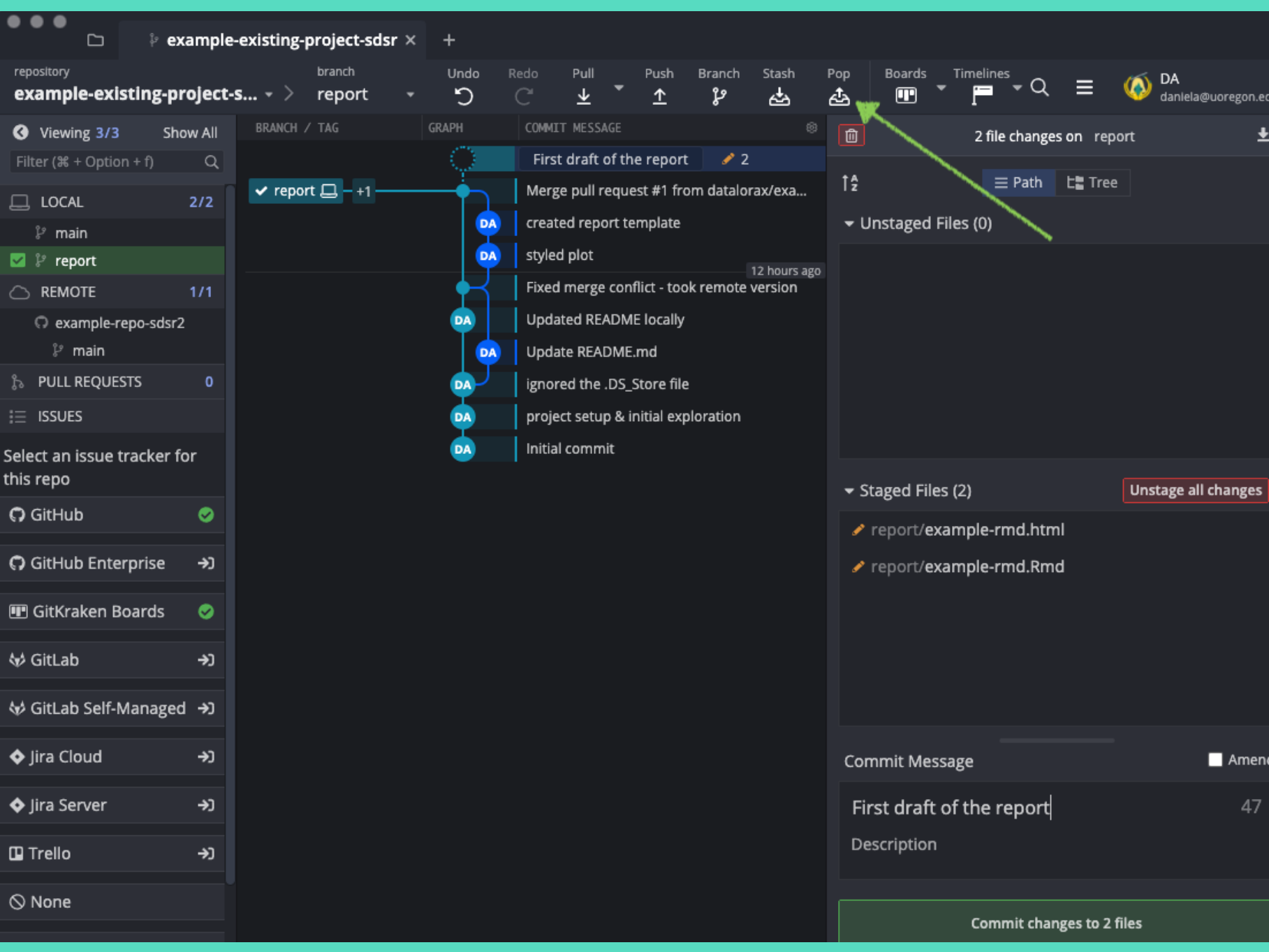
When working across multiple branches, you might find yourself occassionally making edits on the wrong branch

You can't commit those changes, but you don't want to lose them either

Stashing allows you to basically create a temporary branch, store the changes there, then "pop" them on the correct branch


example-existing-project-sdsr
repository
example-existing-project-s...
branch
main
Undo
Redo
Pull
Push
Branch
Stash
Pop
Boards
Timelines
DA
daniela@uoregon.edu
Viewing 3/3
Show All
Filter (⌘ + Option + f)
LOCAL 2/2
main
report
REMOTE 1/1
example-repo-sdsr2
main
PULL REQUESTS 0
ISSUES
Select an issue tracker for this repo
GitHub
GitHub Enterprise
GitKraken Boards
GitLab
BRANCH / TAG
GRAPH
COMMIT MESSAGE
Stash
// WIP
2
main +1
Merge pull request #1 from datalorax/exa...
created report template
styled plot
12 hours ago
Fixed merge conflict - took remote version
Updated README locally
Update README.md
ignored the .DS_Store file
project setup & initial exploration
Initial commit
2
2 file changes on main
Path
Tree
Unstaged Files (2)
Stage 2 files
report/example-rmd.html
report/example-rmd.Rmd
Staged Files (0)


example-existing-project-sdsr
repository
example-existing-project-s...
branch
report
Undo
Redo
Pull
Push
Branch
Stash
Pop
Boards
Timelines
Viewing 3/3
Show All
Filter (⌘ + Option + f)
LOCAL 2/2
main
report
REMOTE 1/1
example-repo-sdsr2
main
STASHES 1
on: main
PULL REQUESTS 0
ISSUES
Select an issue tracker for this repo
GitHub
BRANCH / TAG
GRAPH
COMMIT MESSAGE
Pop Stash
commit: 886bdb
WIP on main
report +1
Merge pull request #1 from datalorax/exa...
created report template
styled plot
12 hours ago
Fixed merge conflict - took remote version
Updated README locally
Update README.md
ignored the .DS_Store file
project setup & initial exploration
Initial commit
Merge pull request #1 from datalo
branch
Example branch
Daniel Anderson
authored 12/22/2020 @ 12:02 PM
GitHub
committed 12/22/2020 @ 12:02 PM
2 modified
2 added
Path
Tree
plots/ggplot-example.pdf
report/example-rmd.html
report/example-rmd.Rmd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Viewing 3/3
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LOCAL 2/2
main
report
REMOTE 1/1
example-repo-sdsr2
main
PULL REQUESTS 0
ISSUES
Select an issue tracker for this repo
GitHub
GitHub Enterprise
GitKraken Boards
GitLab
GitLab Self-Managed
Jira Cloud
Jira Server
Trello
None
BRANCH / TAG
GRAPH
COMMIT MESSAGE
First draft of the report
2
report
+1
Merge pull request #1 from datalorax/exa...
created report template
styled plot
12 hours ago
Fixed merge conflict - took remote version
Updated README locally
Update README.md
ignored the .DS_Store file
project setup & initial exploration
Initial commit
2 file changes on report
Path
Tree
Unstaged Files (0)
Staged Files (2)
Unstage all changes
report/example-rmd.html
report/example-rmd.Rmd
Commit Message
First draft of the report
47
Description
Commit changes to 2 files

General advice

- Create a repo
- Add collaborators
- Always pull before starting new work
- Always commit all changes before finishing your work
    - If you don't do this, you might end up with automatic stashing
- File Issues to track work that should be completed
    - Include assignments for individuals
    - Tag issues to help with organization

General advice

- Use branches to create new changes
    - A good rule of thumb – one branch for each issue
- Submit pull requests when the work on a given branch is complete, and link it to the corresponding issue
    - Tag collaborators to review the pull request
    - Use GitHub's review resources to comment on individual lines of code, as needed
    - Use the PR to have conversations about the changes and any revisions needed

General advice

- Merge pull requests and delete the remote branch
  - Move back to your local, checkout the main branch, pull the merged changes, delete the local branch

Next time

Introduction to visualizations