Collaborating Using GitHub

(GW Libraries) Informal Workshop
February 12, 2018

go.gwu.edu/gwlibgithubworkshop ("old" slides)

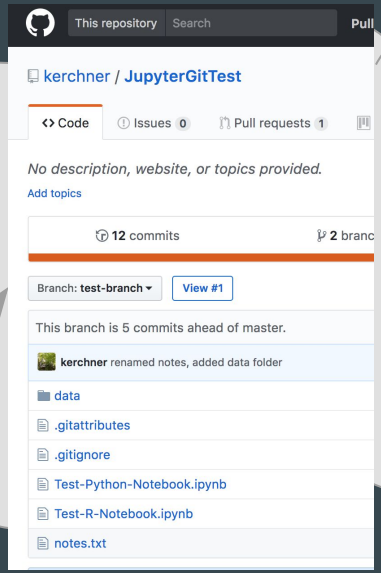
Agenda

- Why GitHub?
- A tour of a repository
- Hands-on:
  - Create your own new repository
  - Collaborate on a repository
  - Fork an existing repository

Why GitHub?

- Version Control
- Collaboration
- Open (or Not)
- Pricing - free for open, cheap for private, and free for students education.github.com (and /pack)

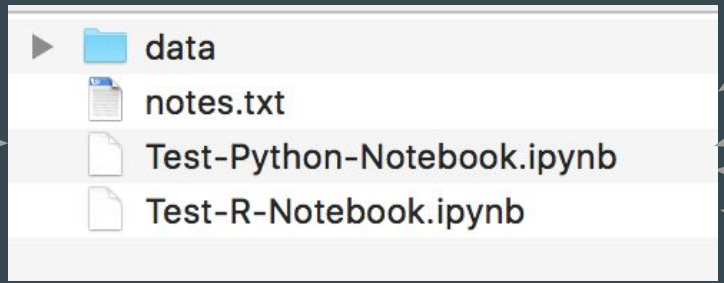
Your repository on GitHub



Apps you use that modify your files

GitHub Desktop

Files on your computer - your *local* git repository



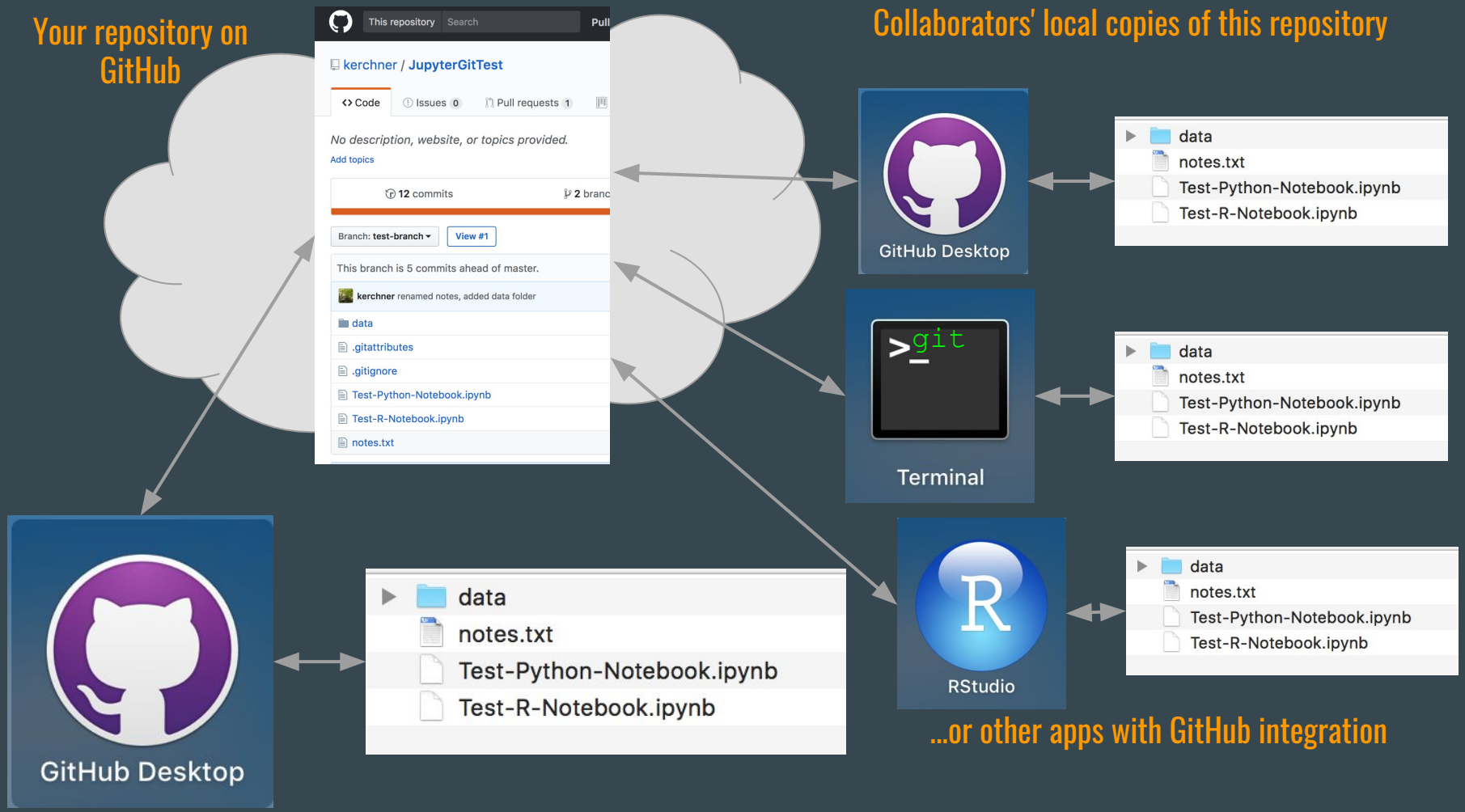
jupyter

Atom

RStudio

Microsoft Excel

** or command-line git, RStudio, Atom, etc.*


Your repository on GitHub
This repository
Search
Pull
kerchner / JupyterGitTest
Code
Issues 0
Pull requests 1
No description, website, or topics provided.
Add topics
12 commits
2 branc
Branch: test-branch
View #1
This branch is 5 commits ahead of master.
kerchner renamed notes, added data folder
data
.gitattributes
.gitignore
Test-Python-Notebook.ipynb
Test-R-Notebook.ipynb
notes.txt
Collaborators' local copies of this repository
GitHub Desktop
data
notes.txt
Test-Python-Notebook.ipynb
Test-R-Notebook.ipynb
>_git
Terminal
data
notes.txt
Test-Python-Notebook.ipynb
Test-R-Notebook.ipynb
GitHub Desktop
data
notes.txt
Test-Python-Notebook.ipynb
Test-R-Notebook.ipynb
R
RStudio
data
notes.txt
Test-Python-Notebook.ipynb
Test-R-Notebook.ipynb
...or other apps with GitHub integration

What makes a Git repository a Git repository?

- Open the folder containing your local git repository. Notice:

  `.git` directory - contains all the metadata about the repository (that is, local copy)
  `.gitignore` file (usually)
  `.gitattributes` file (sometimes)

Some Terminology

Add/remove - puts changes in a staging area

Commit - commits staged changes to the (local) repository

Push - pushes local repository changes to the remote repository

Pull - pulls remote repository changes to the local repository

Tour of a Repository

- Features (just a few!)
  - README.md (showcase your work!)
  - Markdown
  - Code - history of commits on a branch, and on a file
  - Issues - tags, assignment, releases, comments
  - Watch, mentions, integrations
  - Pull requests
  - Milestones and Releases
  - Comments on issues, commits, etc.
  - Wiki
  - Branches
  - Insights (graphs)
  - Commits (and buttons next to each commit)
  - License

Let's Try It!

Create your own GitHub repository

Create a repository

Two ways:

1. Create it on GitHub, then clone it.

2. In GitHub desktop, go to File→Add New Repository... then Publish it

Collaborate on a repository

Collaborate on a Repository

- One person: Create the repository, add collaborators
- Everyone else: Clone the repository
- Create some issues, assign tickets
- Work on issues in branches
  - Use commit messages like *'Adds title to plot. **Fixes #3**'*
- Push branches and create pull requests
- Review a pull request:

    Check out someone else's branch and test it

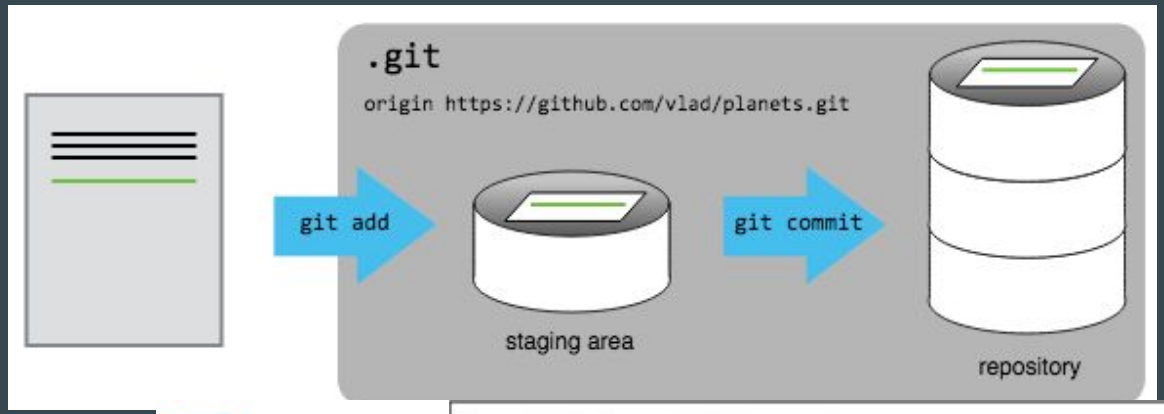
    Merge it if it looks good

Fork a Repository

Fork a repository

- Let's use https://github.com/gwu-libraries/git-sandbox
- First, fork on Github.com (press the Fork button)
  - Go to ***your*** repositories - notice that you now have a fork of git-sandbox
- Create a branch and modify some file(s)
- Create a pull request with this branch

add ~ commit ~ push



← local

←on GitHu

Advanced Topics

- Merges that require manual merging
- Resetting
- Re-basing
- Squashing
- Reverting

Ways To Use Git

- Git command line
- GitHub Desktop App
- Github Mobile App
- Integrations w/Editors, IDEs, and other apps

Git (Command Line)

```
git config --global user.email
git config --global user.password
git init <name>  # creates new repository in this folder
git clone <URL for repo>
git status
git branch <branch-name>    # creates a branch
git checkout <branch-name>  # switches to a branch
git diff    /  git diff --staged
git add <file(s)>  /  git rm <file(s)>  /  git mv <file>
git commit -m 'Comment goes here'
git push origin <branch> # When working with forks, you might
git pull origin <branch> # use remotes other than "origin"
```

Git (Command Line), continued

```
git log
git merge <branch to merge from>
git rebase <branch to rebase off of>
git reset --hard  # Warning! You'll lose your changes!
git stash
git fetch   # like git pull, but without merging
```

Other Uses for Github Repositories (besides code)

- Sharing data
- "Document" collaboration (e.g. legislation)
- Course sites (e.g. DSCN 6279; ISTM 6212)
- Github Sites (e.g. https://gwu-libraries.github.io/sfm-ui/)
- Publishing and Citing your code (you can use Zenodo to mint a DOI for a Github repository)
- and more

To Learn More...

- *Pro Git* book, free online: **git-scm.com**
- Lynda.com: *Up and Running with Git and GitHub*
- github.com:
  - help.github.com
  - guides.github.com
  - try.github.io (codeschool)
  - services.github.com/on-demand/
  - resources.github.com/webcasts/

A few takeaways from today

- The GitHub Desktop app seems useful, but we had at least one case of it freezing up. It also is useful mainly for "basic" things. Ultimately, it's probably good to learn and use git shell commands. (Especially good on your resume!)
- For team projects, one person can create the repository on their git account and add others as collaborators. (Or, you can create an "organization" account.)

More takeaways

- Insights → Network is a good way to visualize what's going on with the branches.
- When working together (or even alone), use branches. Merge a branch using a pull request.
- When you're working on a branch for an extended period, consider merging (or rebasing) from the master branch, so your branch doesn't diverge too far from the code on master.

Even more takeaways

- This workshop may have been a bit informal, there was a lot to cover, and the room was hot. You are likely to have questions when you try this on your own. If you get stuck, contact me and I will try to help.

Thanks!

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Coding Consultations: go.gwu.edu/coding