Git/GitHub

Git Book: https://git-scm.com/book/en/v2

Reproducible Research Workshop: http://www.geo.uzh.ch/microsite/reproducible_research/post/rr-rstudio-git

Wickham: http://r-pkgs.had.co.nz/git.html

Git Basics

https://git-scm.com/book/en/v2/Getting-Started-Git-Basics

- Git stores snapshots of current files (changed files are updated, unchanged files are not).
- Data is only added
- File states
    - Committed: Data stored in repository
    - Modified: Changes have been made, but not committed
    - Staged: Modified files that are to be committed
- File locations
    - Working directory (checked out files)
    - Staging area (staged fixes)
    - Repository (committed)
- Workflow
    1. Modify files
    2. Stage changes to be committed
    3. Commit changes

Local Git setup

Configure Git

```
git config --global user.name 'yourGitHubUsername'
git config --global user.email 'name@provider.com'
```

Create a local project and make first commit

1. Create new R project in a new folder
    - if using New Project|Create Project|New Directory, check "Create Git repository
    - or create folder, create standard project in Existing Directory, then from the terminal, use `git init`
2. Create new R Markdown document in new project and save it.
3. Stage document by "adding" it.
4. Write commit message and commit document to repository.

Modify the document

5. Add a line to the document and save - note that it shows up with "M" in the Git tab for "modified".
6. Stage the document and commit again.

Modify the document again

7. Add another line and repeat steps 5 and 6 to commit this modification

Revert to previous commit

8. Select the commit that you want to revert to and copy the SHA hash
9. Open a terminal or shell window in this directory
10. Issue the command: `git reset --hard <SHA hash>`

Branching

https://git-scm.com/book/en/v2/Git-Branching-Basic-Branching-and-Merging

Create a branch

```
git branch newbranch
```

Switch to branch

```
git checkout newbranch
```

Create and switch

```
git checkout -B secondbranch
```

Merge branch into master

```
git checkout master
git merge newbranch
```

Delete branch

```
git branch -d newbranch
```

GitHub

Add a local repository to GitHub

1. Copy the URL of the github repository to the clipboard

2. In a terminal window in the folder of the current local repository, set the new remote repository:

   ```
   $ git remote add origin <remote repository URL>
   ```

3. Verify the new remote URL

   ```
   git remote -v
   ```

4. Push the changes in the local repository to GitHub

   ```
   git push -u origin master
   ```

Push commits to GitHub

5. Make a change in the R Markdown document, save it, stage it, and commit it.
6. Push change up to GitHub

Create local repository/project from GitHub

Same as above, but a local repository first needs to be initialized. First create a folder and then create an RStudio project in it. Then on the command line, initialize the local repository.

`git init`

Close and re-open the project.

Add a user to a GitHub repo

1. Modify
2. Stage
3. Commit
4. Pull
5. Push

Forking

- Copy of another repository
- Merges with parent repository are made via a 'pull request'