Git Tutorial: Presentation Outline

Slides - Motivation for a Version Controlled Workflow and GitHub - [10 min]

Overview: Through the next few slides, I hope to motivate the use of version control in general and show some examples of Git and GitHub being utilized in practice with my own projects.

1. The general coding workflow:
    - map out project on paper
    - Search via stack exchange and other online resources to identify solutions
    - Try various implementations for reaching a goal. Until you narrow in on a good method.
    - Use comments to explain how to use your code (for your self and others)
    - Difficult to locate old versions or manual versioning with file names: (e.g. `compute_1.1` , `compute_1.2`). (Dont know whats diff between versions)
    - Working on multiple computers can prove very difficult even if the code is in the cloud. Directory names are different, line endings get messed up.
    - Dropbox or Google Drive (potentially email) for sharing code with other people.
    - Large overhead to test and code on a computing cluster, possible with FTP, rsync, etc.
    - Troubleshooting exactly what changes created a new bug often rely on memory or copies of previous saves, or manually changing pecieces of code back.
    - Ususally only one working version of the code.
    - Keep track of projects problems and goals
2. The Version Controlled Workflow with GitHub
    - Con - Saving of the file itself alongside commits to a local and remote repository.
    - Simultaneous collaboration with as many people as desired
    - Sharing of software for release with
    - Published ReadMe to explain the purpose for your code and instructions for it's use.
    - Issue tracking with builtin tools
3. What is Git
    - "Git is a distributed version control system"
    - Basically everywhere that there is a copy of your project, the entire change history and in-progress parts are stored as well.
4. What is GitHub
5. Consolidation Example - MATLAB Utilities
    - **Git is a framework where copy-pasting is obsolete.**
6. Collaboration Example - Seaborn Pull Request

    - **GitHub is the forum where code is improved.**
    - Not only did this solve a problem for me, but there is now a public version of the Seaborn software with this feature which anyone can use at any time.
7. Released Software Example - Volume Point Picker
    - **GitHub is the platform for software to be released.**
    - See issue tracker
8. Yes this is a lot, but the Energy Barrier is low.
    - You could just throw all your code in a folder and commit once a day, just for the versioned backups.
    - Quick and dirty example: Put existing project on GitHub, then update.
    i. `$ cd to/my/project/`
    ii. `$ git init`
    iii. `$ git add -A`
    iv. `$ git commit -m "initial commit of existing proj."`
    v. `$ git remote add origin http://github.com/CorbanSwain/Example-Proj`
    vi. `$ git push -u origin master`
    vii. `$ emacs test.py` … *edit file* … *save file.*
    viii. `$ git add -A`
    ix. `$ git commit -m "Added feature to test"`
    x. `$ git push`

Slides - More Complex (But Important) Topics

- Managing code alongside large files
- Merging conflicting commits