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THE UNIVERSITY OF UTAH

Visualization for Data Science
DS-4630 / CS-5630 / CS-6630

Managing Projects with Git

Git is a distributed version-control system

- Terminology: In git-speak, a “version” is called a “commit.”
- Git keeps track of the history of your commits, so you can go back and look at earlier versions or just give up on the current version and go back to some earlier version.
- Can be used to implement a variety of software configuration management models and workflows

Git is a distributed version-control system

- You keep your files in a *repository* on your local machine.
- You synchronize your repository with a remote repository on a server (in our case, GitHub).
  - You protect your code from system crashes by synchronizing with the server.
  - If you move from one machine to another, you can pick up the changes by synchronizing with the server.
  - If you work on a team, other people's uploads can be synchronized using the server.

Git Tools

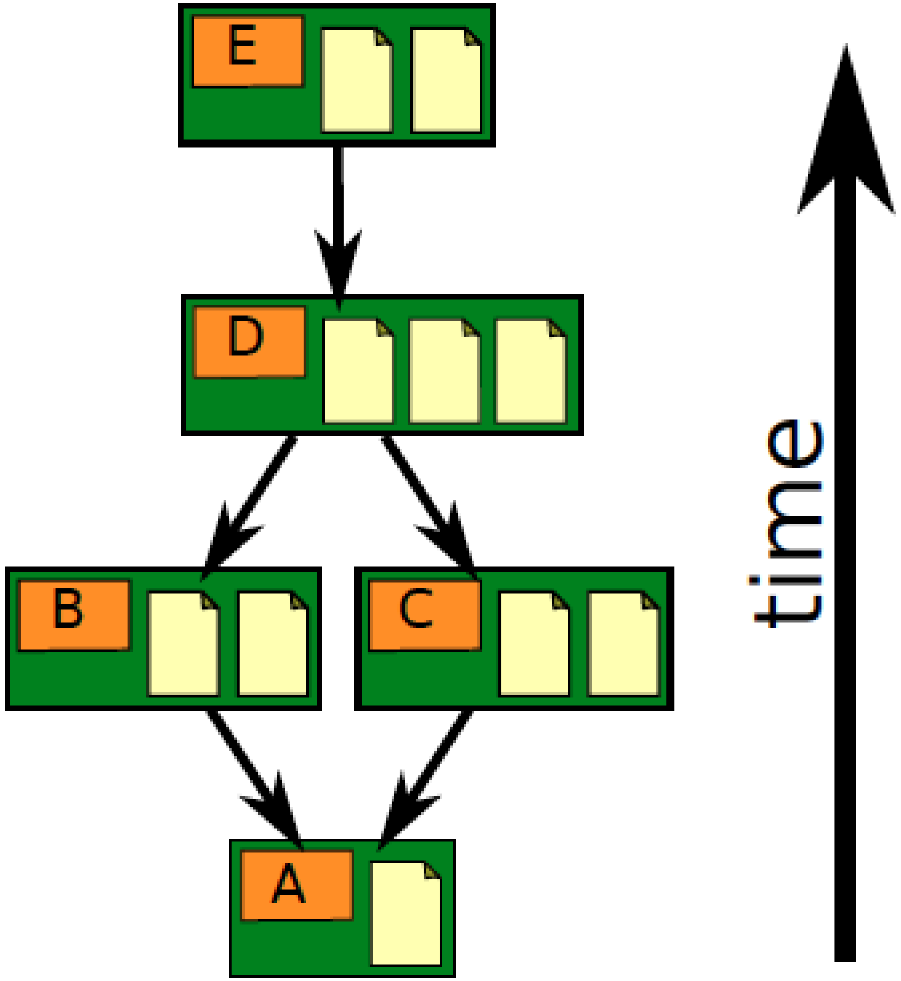
- A collection of <u>many</u> tools
  - Very flexible
- You can do anything the model permits
  - Including shooting yourself in the foot
- **<u>Need to understand the underlying model</u>**

Groups of Git commands

- Setup and branch management
  - init, checkout, branch, **clone**
- Modify
  - **add**, delete, rename, **commit**
- Get information
  - **status**, diff, log
- Create reference points
  - tag, branch
- Synchronization with remote
  - **push**, **pull**, fetch, sync

Repository Contains

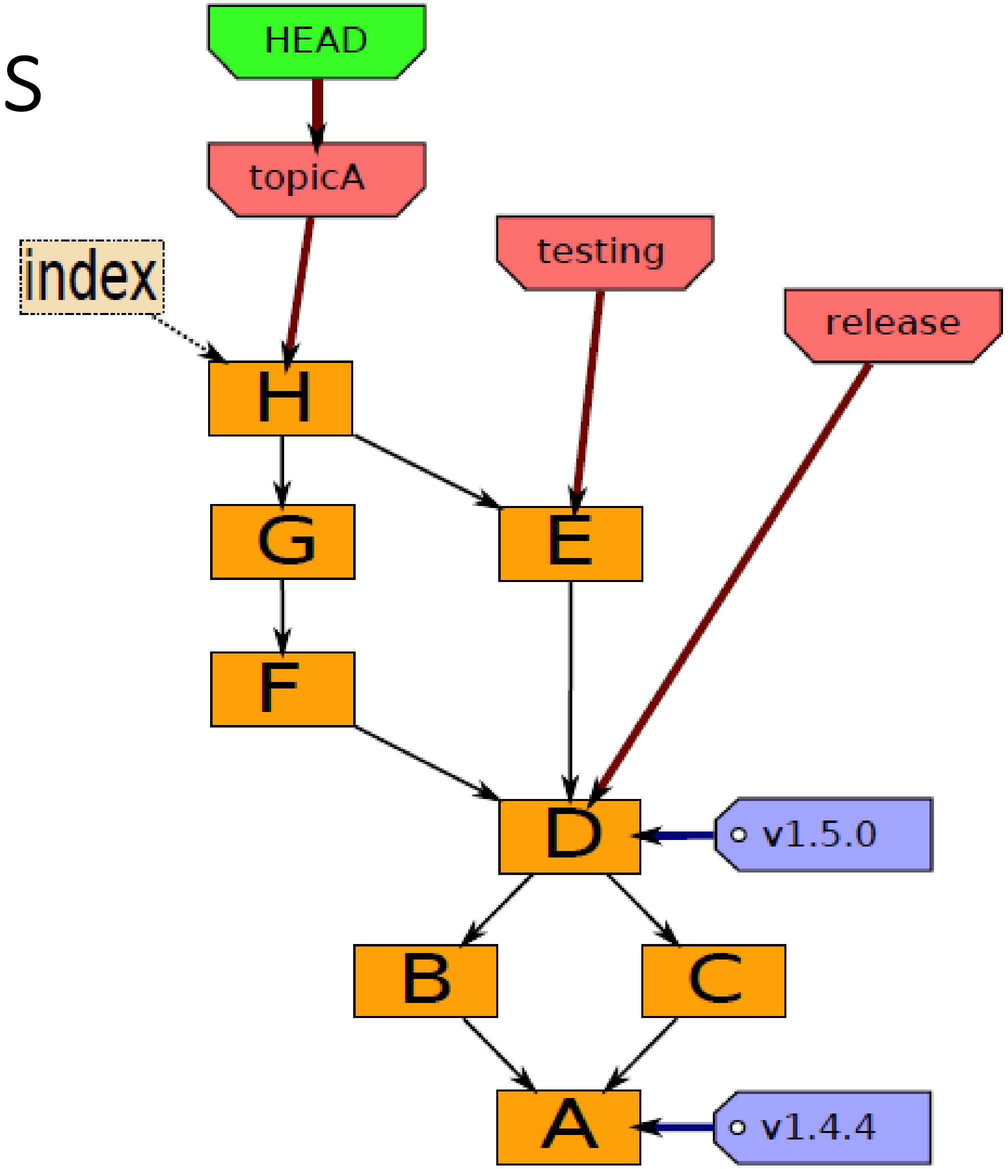
- files & directories
- commits
- ancestry relationships



- http://edgyu.excess.org/git-tutorial/2008-07-09/intro-to-git.pdf

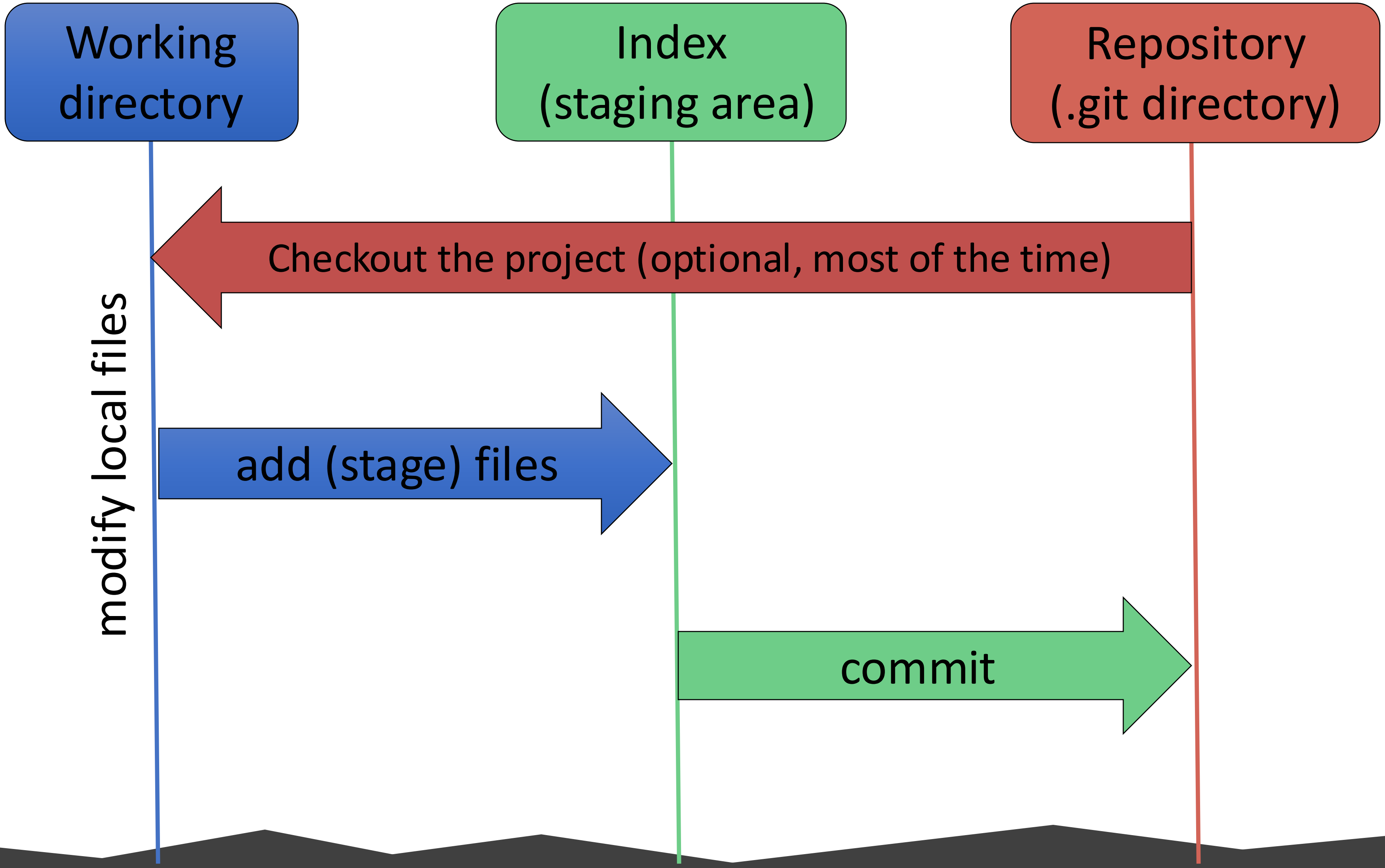
Ancestry graph features

- form a directed acyclic graph (DAG)
- Commits
  - Snapshots of file status
- Tags
  - identify versions of interest
  - including “releases”
- Branches
  - divergent path for source code modification
- HEAD
  - is current checkout
  - usually points to a branch
- Index
  - “staging area”
  - what is to be committed



- http://edgyu.excess.org/git-tutorial/2008-07-09/intro-to-git.pdf

Local Operations



Working directory

Index (staging area)

Repository (.git directory)

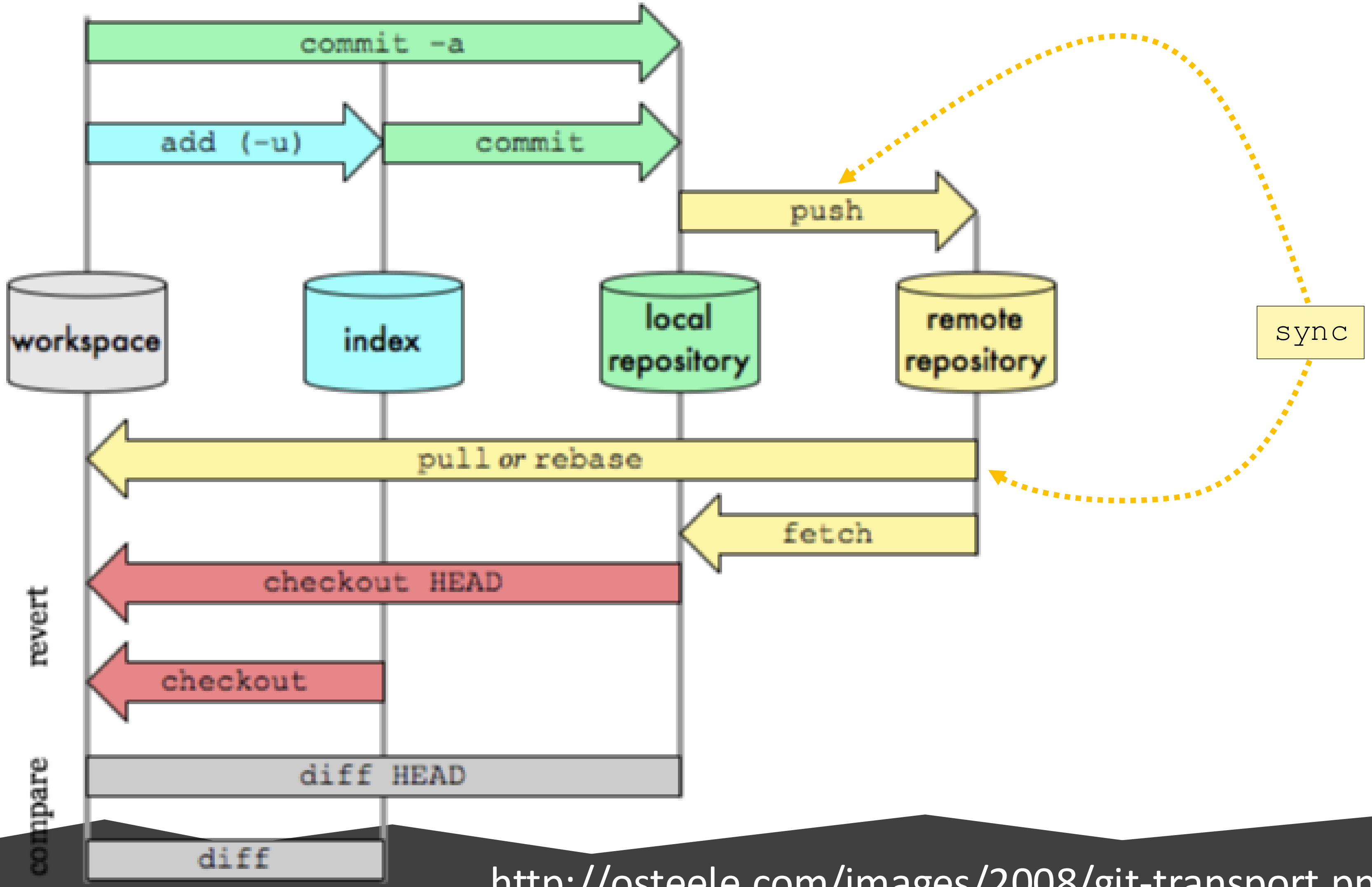
Checkout the project (optional, most of the time)

modify local files

add (stage) files

commit

Git transport commands



http://osteele.com/images/2008/git-transport.png

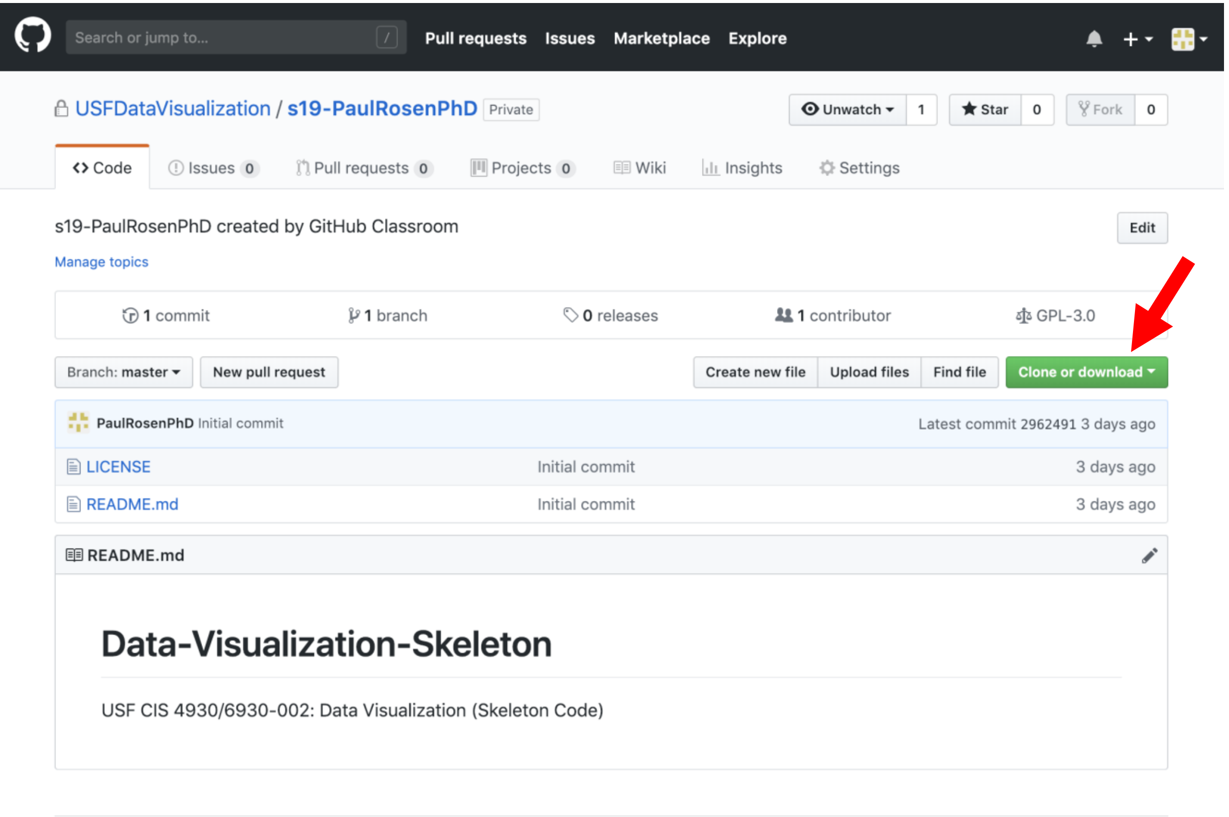
Git Software

- Windows
  - Git command line tools – https://git-scm.com/download/win
  - Git GUI – https://tortoisegit.org/ (also requires download of command line tools)
- MAC
  - Install xcode and the command-line tools
    - https://developer.apple.com/xcode/
    - http://railsapps.github.io/xcode-command-line-tools.html
- Linux
  - git should already be installed. If not, use the appropriate package manager (e.g. apt or yum) to install it.

Getting Started

- Create a GitHub account, if you don't already have one (https://github.com/)
  - GitHub Education account is optional (https://education.github.com/discount_requests/new)
- Checkout the assignments for link to setup your repositories
- Once the repository is created (this can take a few minutes) determine the remote path and pick a local directory for code.

Finding Remote Path



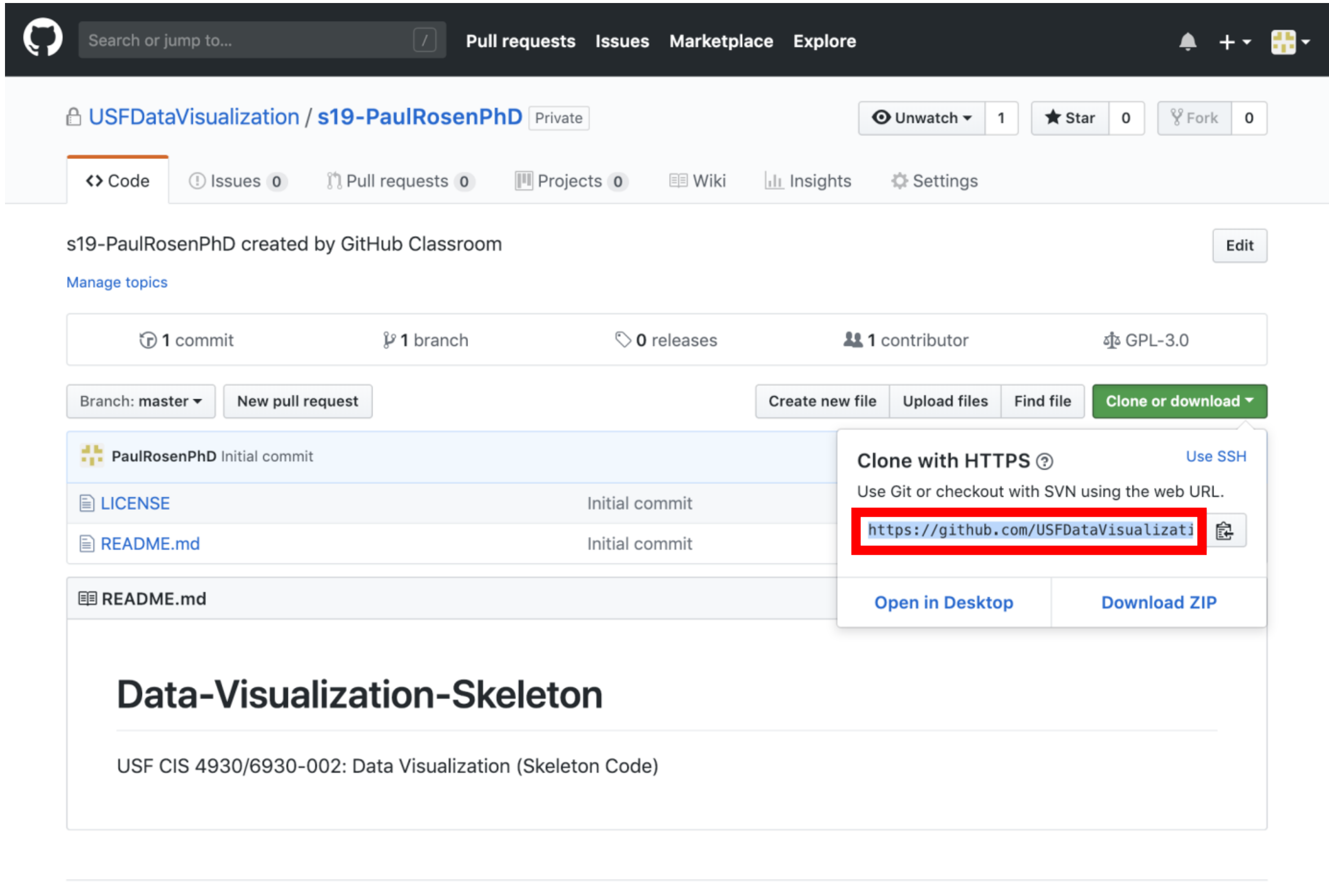
s19-PaulRosenPhD created by GitHub Classroom

PaulRosenPhD Initial commit — Latest commit 2962491 3 days ago

LICENSE	Initial commit	3 days ago
README.md	Initial commit	3 days ago

Data-Visualization-Skeleton

USF CIS 4930/6930-002: Data Visualization (Skeleton Code)



s19-PaulRosenPhD created by GitHub Classroom

PaulRosenPhD Initial commit

LICENSE	Initial commit
README.md	Initial commit

Clone with HTTPS

Use Git or checkout with SVN using the web URL.

`https://github.com/USFDataVisualizati`

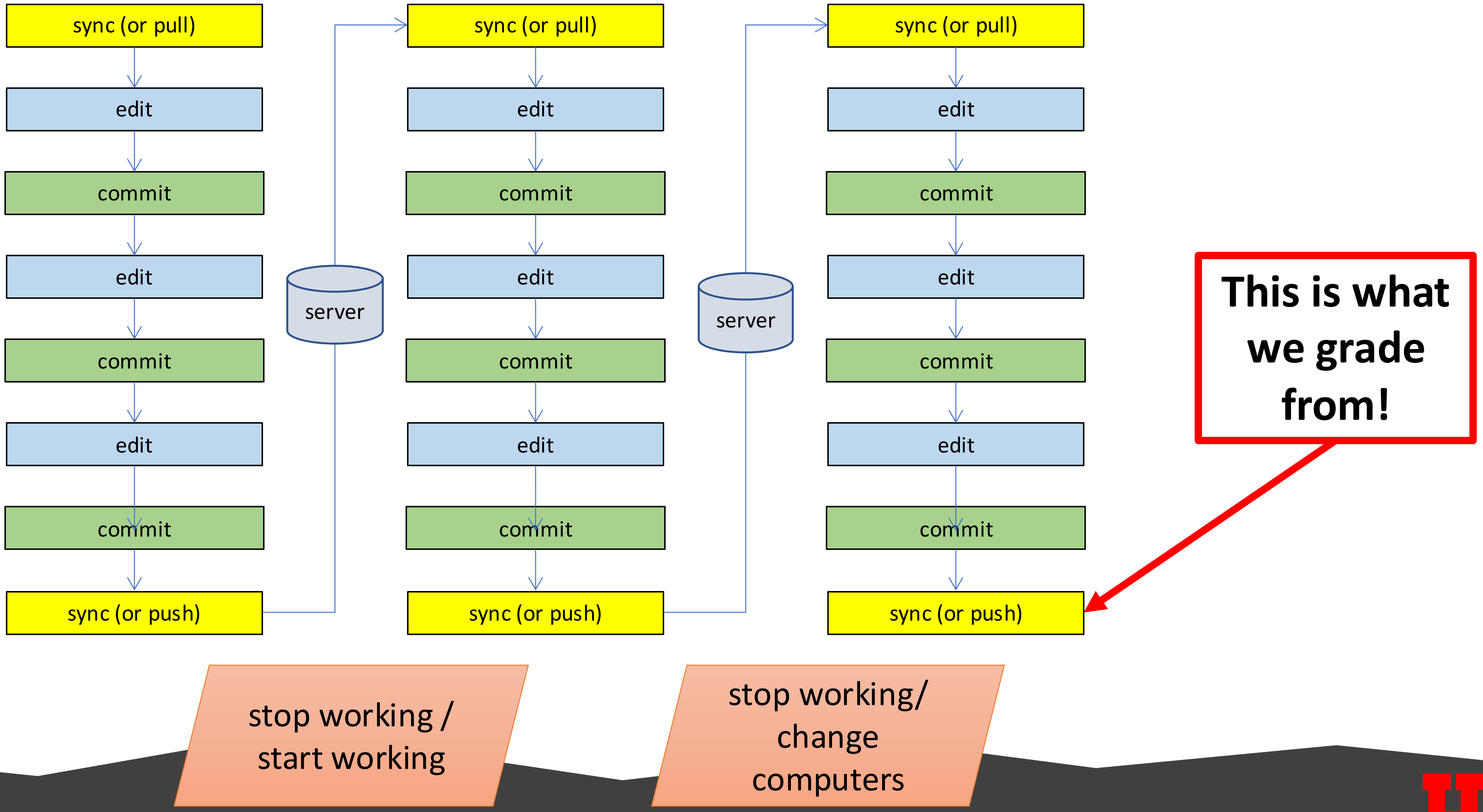
Data-Visualization-Skeleton

USF CIS 4930/6930-002: Data Visualization (Skeleton Code)

Sample session commands

```
> git clone <remote_path> <local_directory>
> cd <local_directory>
> git pull
> touch newfile.txt
> git add newfile.txt
> git commit –m “added a new file”
> git push
```

Suggested workflow



References

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- http://excess.org/article/2008/07/ogre-git-tutorial/
- http://www-cs-students.stanford.edu/~blynn/gitmagic/
- http://progit.org/book/
- http://www.geekherocomic.com/2009/01/26/who-needs-git/
- Many YouTube videos
  - ex. https://www.youtube.com/watch?v=HVsySz-h9r4