Git

Amir Masoumzadeh

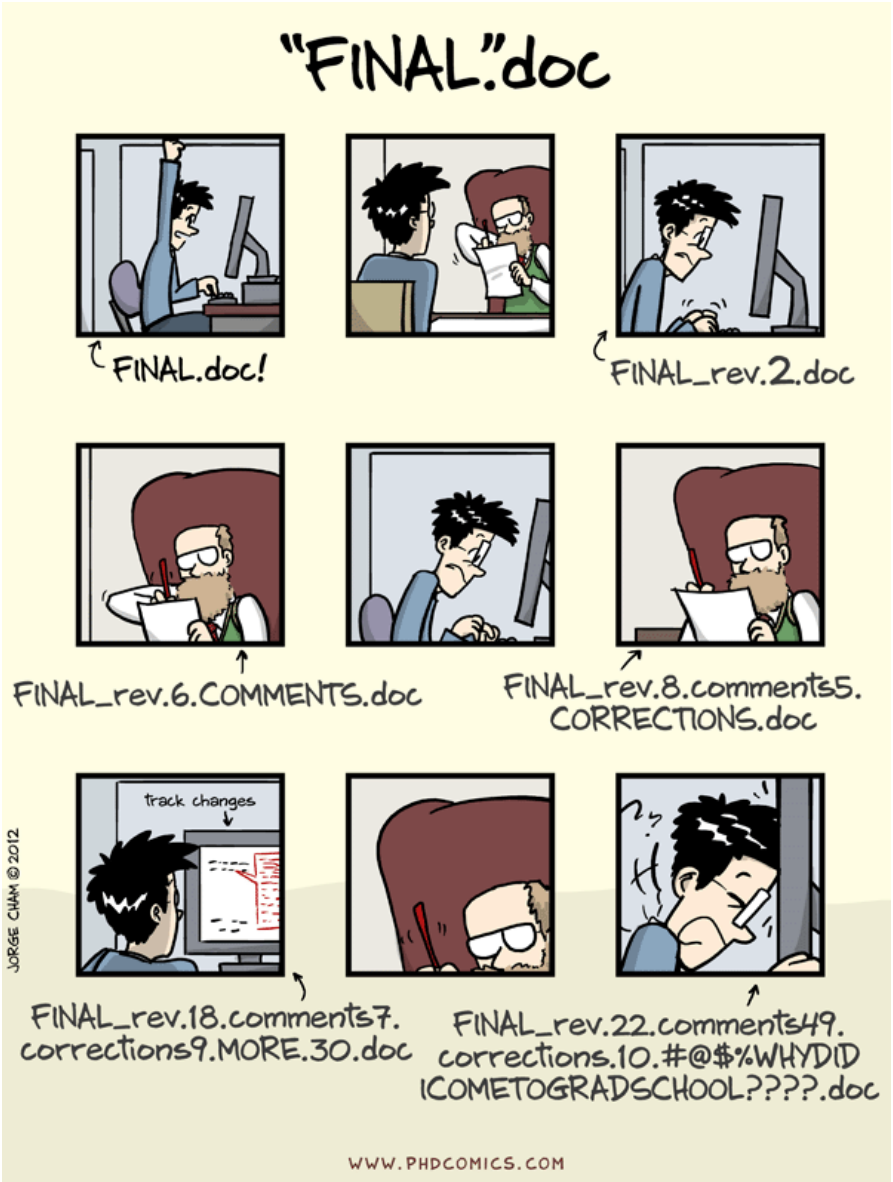
CSI 402 – Systems Programming

January 25, 2018

Administrivia

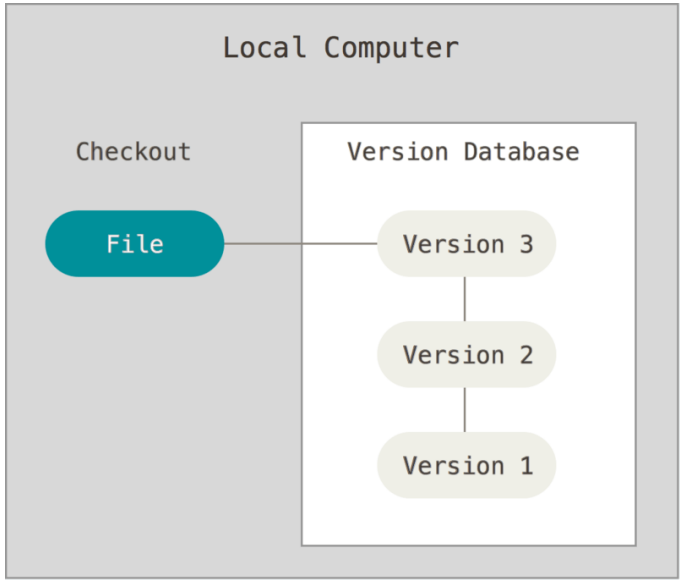
- GitHub ID
  - Have you submit it?
- 1st homework will be released by end of today
  - due next Tuesday (end of the day)
- TA_2 assigned (course page updated)
  - office hours Friday 2pm-4pm
- team names on Socrative

No version control



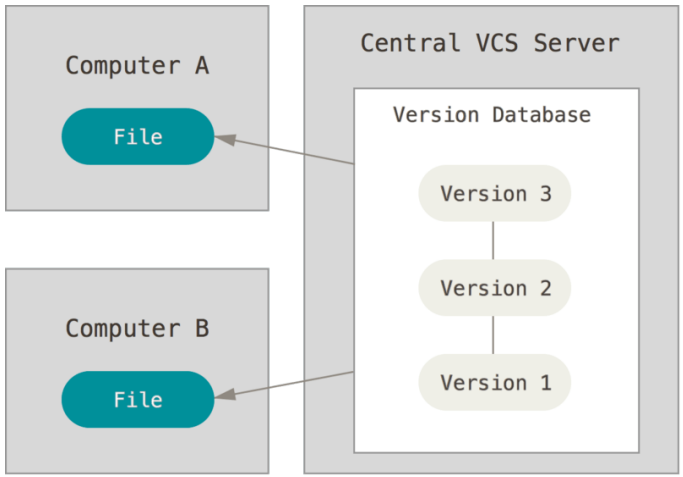
Local version control

- RCS
- simple database keeps all changes to files
- or, keeping patch sets



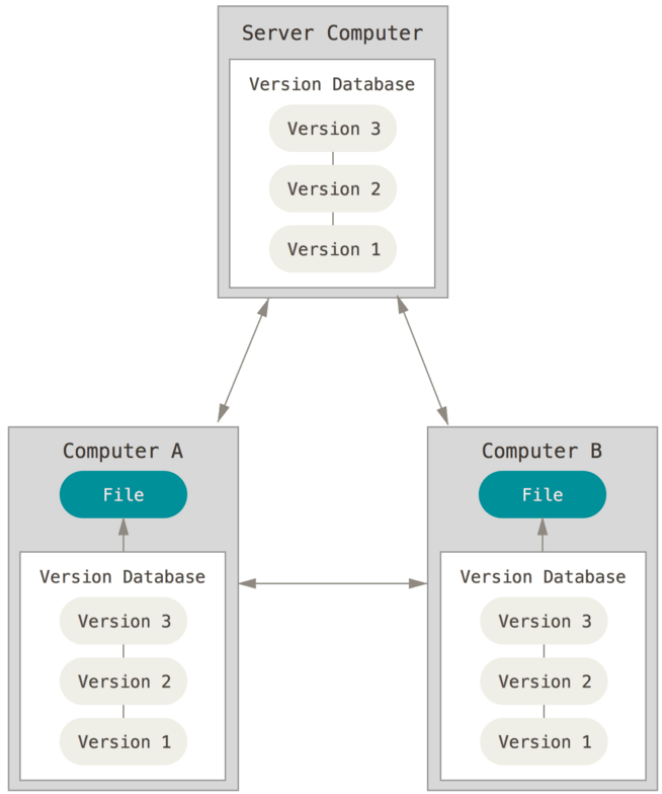
Centralized version control

- CVS, Subversion, Perforce, ...
- central server repository (repo) holds "official copy"
  - also sole version history of the repo
- you make "checkouts" of it to your local copy
  - you make local modifications
    - your changes are not versioned
- when done, you "check in" back to the server
  - your checkin increments repo's version



Distributed version control

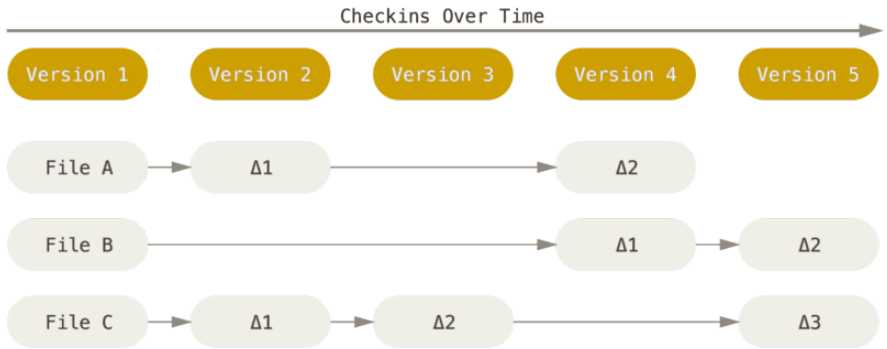
- Git, mercurial, ...
- you "clone" from a repo and "pull" changes from it
- your local repo is a complete copy of everything on the remote server
  - yours is "just as good" as theirs
- many operations are local:
  - check in/out from local repo
  - commit changes to local repo
  - local repo keeps version history
- when you're ready, you can "push" changes back to server



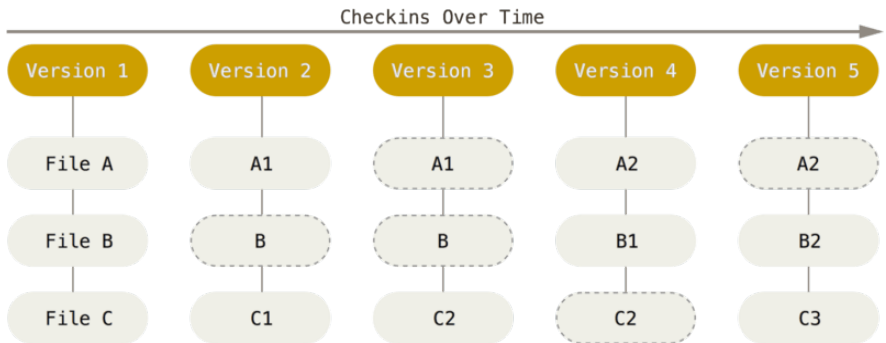
Git snapshots

- centralized VCSs track version data on each individual file
- Git keeps "snapshots" of the entire state of the project
  - each checkin version of overall code has a copy of each file in it
  - some files change on a given checkin, some do not
  - more redundancy, but faster

centralized VCS:



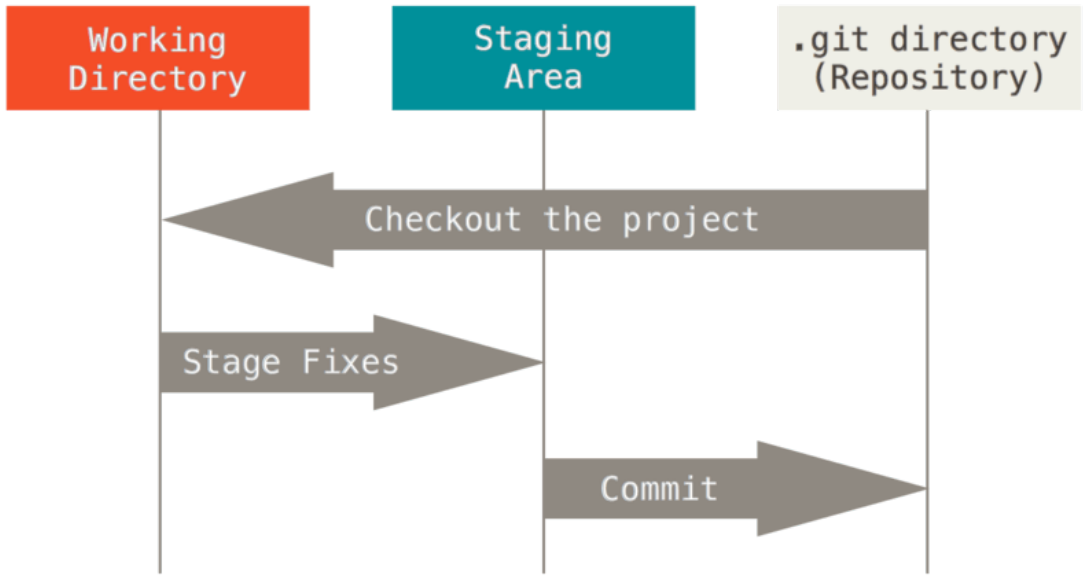
Git:



Local Git areas

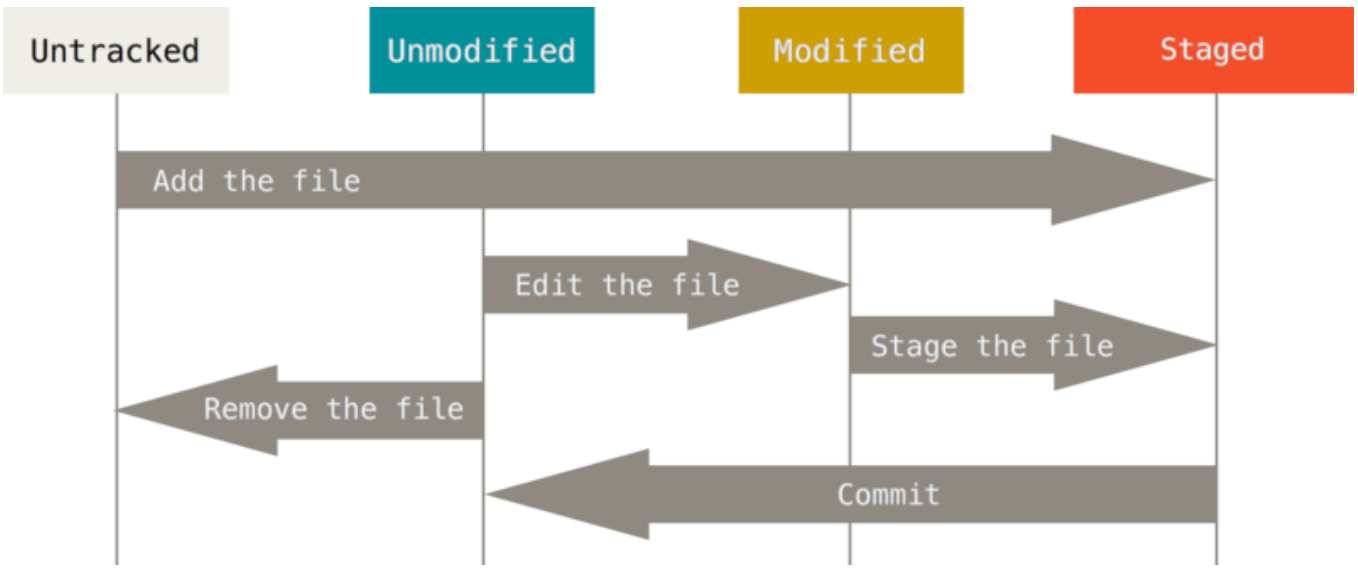
On your local machine files can be:

- in your local repo (committed)
- checked out and modified, but not yet committed (working copy)
- in-between, in a "staging" area
  - Staged files are ready to be committed
  - A commit saves a snapshot of all staged state



Basic Git life cycle

- modify files in your working tree
- stage files (selectively), adding snapshots of them to your staging area
  - also track files in your working directory
- commit, which takes staged files and stores that snapshot permanently to your Git directory



Using Git for lecture slides

- [optional] create a folder for this course and clone/create repos within that folder
- clone our lecture repo: `https://github.com/ualbany-csi402-s18/lectures`
  - just pull it each time to retrieve the new lectures!

Using Git for homework assignments

- on release date of homework
  - we send you a link
  - you follow link and push a button so that a private repo will be created for you for that specific homework
    - e.g., homework01-azerrima
- for doing your homework, you
  - clone the repo
  - create/edit assignment files
  - add changes
  - commit
  - push [as often as you want]
- at the deadline, we
  - clone your repo to our machine
  - grade it (as soon as possible)
  - push a version that contains feedback/grade

Exercise

- Retrieve repo from: `https://github.com/ualbany-csi402-s18/inclass125`
- In which snapshot *random.txt* contains random number 15139?
- Record the first 6 letter of SHA-1 hash code for the commit

- Submit it as your team answer on Socrative