Intro to Git
Part I
IB 516 Analytical Workflows

Outline

What is a version control system?

- Records changes in a set of files over time so that you can recall specific versions later.
- Allows 'time travel' back and forth from any previous time in your project development.
- Allows 'peaceful coexistence and exchange of info between 'parallel universes' of a project'
- Allows stable and efficient collaborations (with others and with your past self) that produce reproducible work.

In practice

- Avoid appending version/date to filenames.
- Compare changes over time.
- Revert the entire project back to a previous state.
- View or revert selected files back to a previous state.
- See who last modified something that might be causing a problem, who introduced the bug and when, and more.
- If you screw things up or lose files, you can easily recover.
- You get all this for very little effort / overhead (aside from startup costs for learning).

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https://git-scm.com/book/en/v2/Getting-Started-About-Version-Control

Visualizing a version controlled project through time

[master] 6c6faa5 My first commit - John Doe

[develop] 3e89ec8 Develop a feature - part 1 - John Doe

[develop] e188fa9 Develop a feature - part 2 - John Doe

[master] 665003d Fast bugfix - John Fixer

[myfeature] eaf618c New cool feature - John Feature

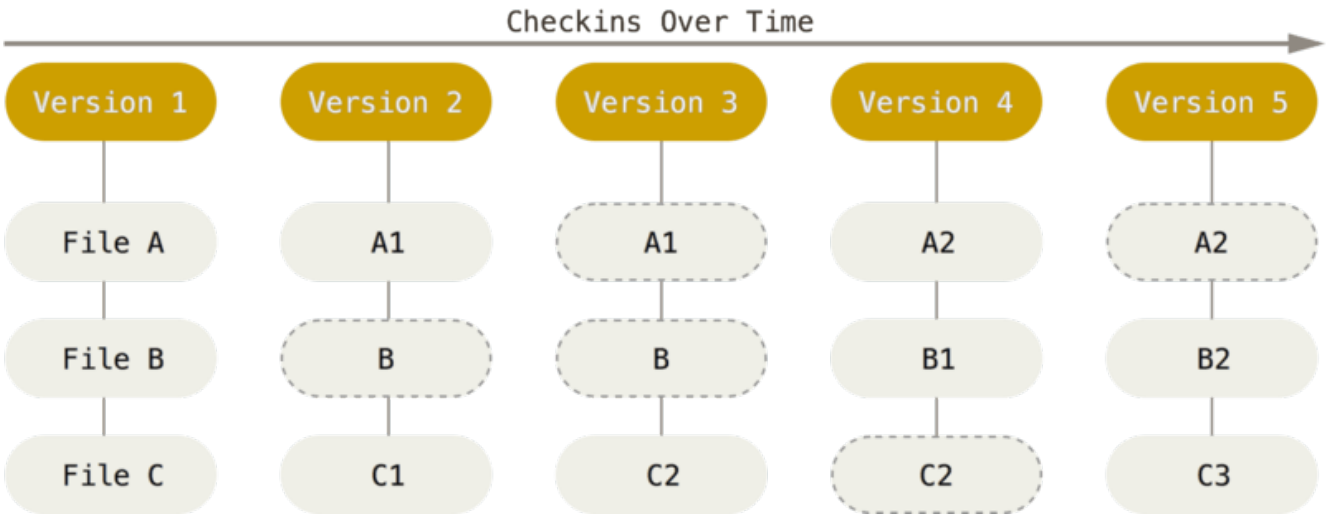
[master] 8f1e0e7 Merge branch `develop` into `master` - John Doe

[master] 6a3dacc Merge branch `myfeature` into `master` - John Doe

[master] abcdef0 Release of version 0.1 - John Releaser

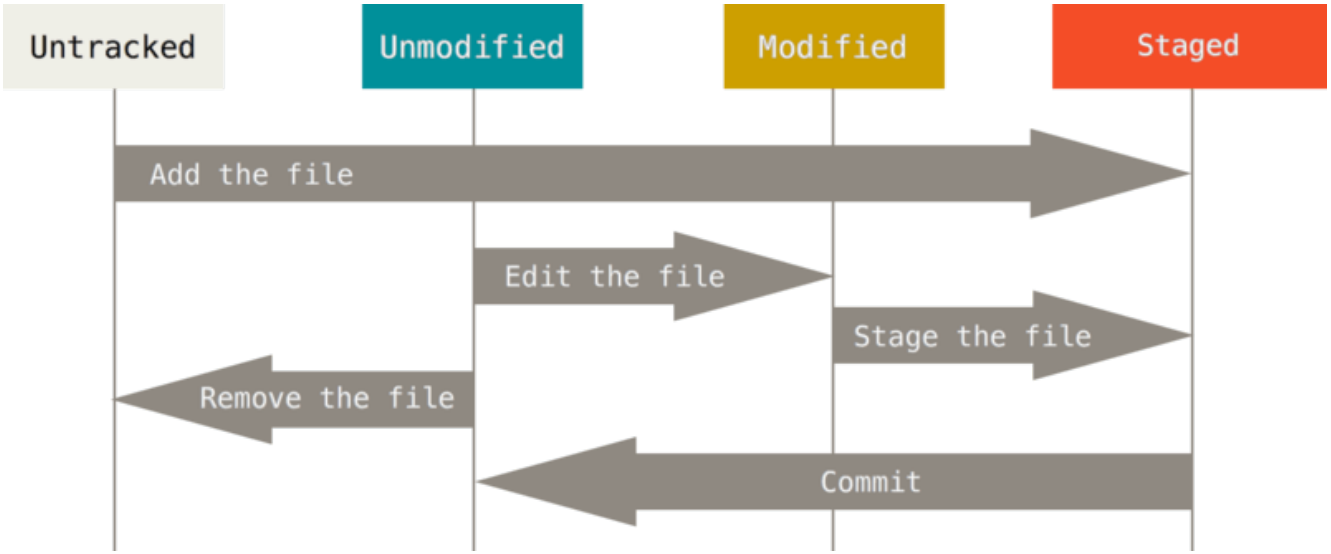
https://stackoverflow.com/a/24107223

Version control in Git: How Git stores data



http://git-scm.com/book/en/v2/Getting-Started-What-is-Git

A file's lifecyle



*We haven't talked about *staging* which is an intermediate step between modifying a file and committing it. Git allows you to choose which modified files will be *staged* (i.e. flagged for inclusion) as part of the next commit. Typically we will want to commit all modifications. Github Desktop automatically stages all modifications, so we don't need to think too much about staging at the moment.

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Git jargon

repository – staging – commit

local – remote

pull – fetch – push

master (main) – branch (feature branch) – merge

origin – clone – fork

Commit messages

- Use the 'imperative mood.'
- Complete the sentence:
  "If this commit is adopted , it will..."
- Capitalize the first word.
- Do not use a period.

https://chris.beams.io/posts/git-commit/