

Git Tutorial

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Octocat logos © 2013 - 2017 GitHub, Inc.



Overview

- version control
- basic git (command line)
- exercises!

Ask whenever confused



Show of hands

- 1. If you use Google Drive, Dropbox, or Box
- 2. If you use any backup software/method for your personal computer

2020-01-28

Version Control

• **Issue**: Files with long, complicated history. Want to keep different versions:

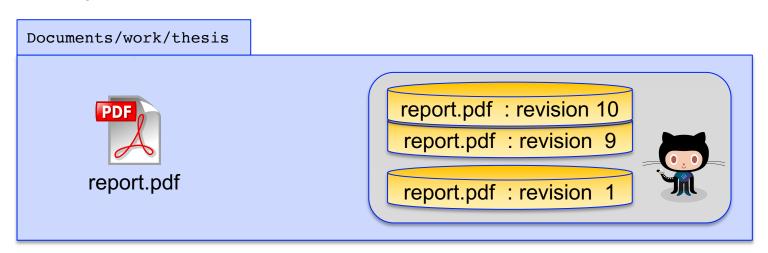
```
Report_v3_comments_2018_01_05.docx experiment pipeline 10 2017 11 05.sh
```

- Compound issue: Other people work on them too
- Programs like git (version control systems) keep track of changes made by different people



Git Concepts

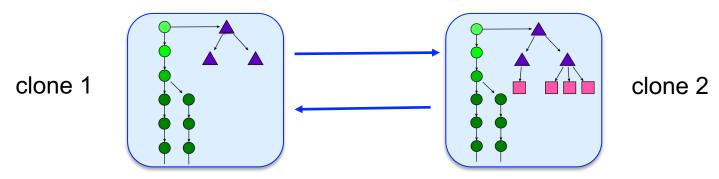
- a git project is called a repository or repo = directory with history
- a repo contains a collection of snapshots (called *revisions*) of the directory:





Git Concepts

revisions are connected in branches, reflecting file evolution

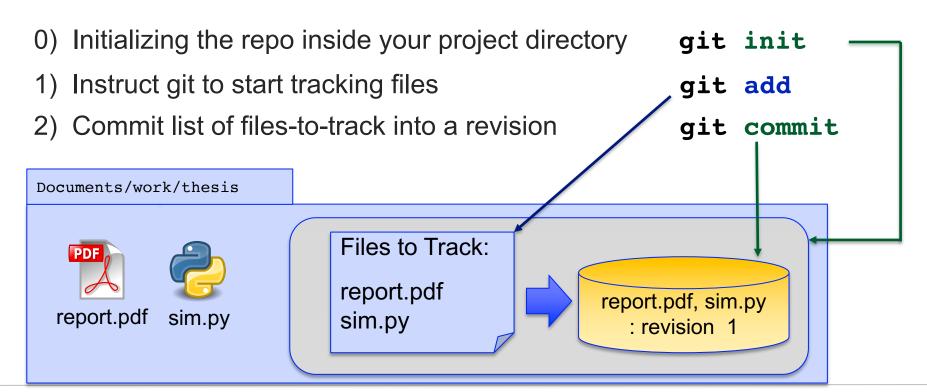


Original image © Bunyk / Wikimedia Commons / CC-BY-SA-4.0

- repos are decentralized
 - Each clone contains everything (all revisions + history)
 - Changes can be passed between clones



Creating a Repo and Recording Changes



Exercise 1

• 10-15 minutes

• Go to https://mpbio-bbt015.github.io/

If you need to, read "How to connect to remote accounts"

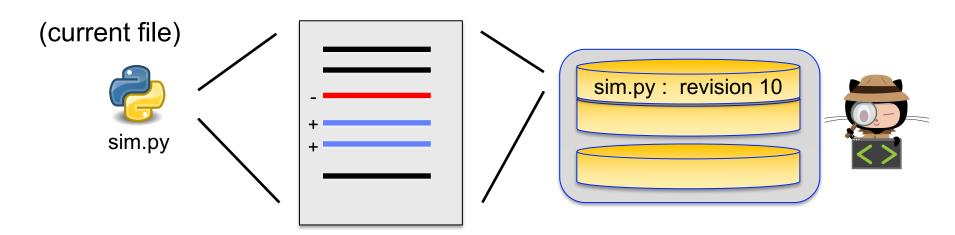
Notes are good-to-know info only



Making and Committing Changes

- Git reports what changed since latest revision: git status
- Differences can be inspected:

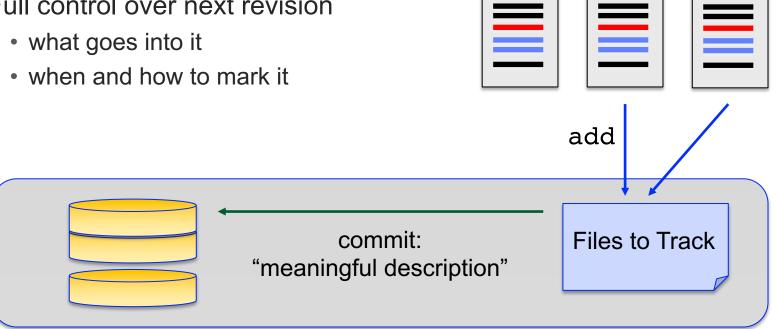
git diff





Making and Committing Changes

Full control over next revision

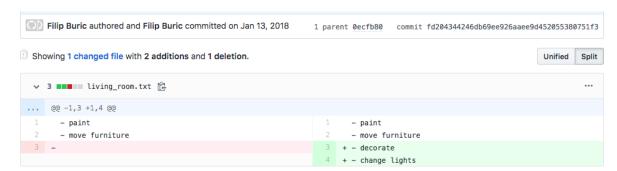




Viewing Differences

- Web (GitHub) or GitHub Desktop (= graphical frontends to the git program)
 - Easier to use
 - Limited functionality

- Command line:
 - More cumbersome
 - Far more flexible
 - Always available



```
buric@C17LQHT [15:39] : apartment_2018 $ git diff fd2043~ fd2043 living_room.txt
diff --git a/living_room.txt b/living_room.txt
index 6b76c07..6efbd9d 100644
--- a/living_room.txt
+++ b/living_room.txt
ee -1,3 +1,4 ee
- paint
- move furniture
-
+- decorate
+- change lights
```



Git is meant for text files

- Tool for tracking source code (= text / "low level")
- Can track any type of file BUT can't see diffs (without extra plugins)

report.md

Markdown: text, readable by any program

```
40
41 * ## Number of peptides per protein identifications
42
43
44 * ```{r}
45    percolator_concat_hi_conf %>%
46    dplyr::rename(protein_id = `protein id`) %>%
47    dplyr::group_by(protein_id) %>% |
48    dplyr::distinct(`sequence`) %>%
49    mutate(n_pep = n()) %>% ungroup() %>%
50
51    ggplot(aes(x = n_pep)) +
52    geom_histogram(binwidth = 1) + xlim(0, 20) +
53    xlab('peptides / proteins')
54    ```
```

(only need to track this)

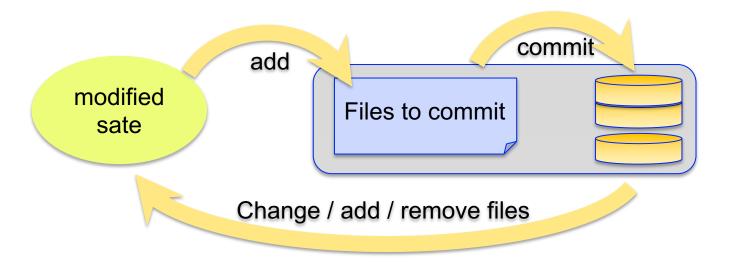
report.pdf

PDF: "binary" format, encodes graphics, needs dedicated decoder (Adobe, etc)

```
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ãYKKwqqK8WQQsQ0KQQsKË0 • qœ<0x9d><0x9d>####""&b <<0x8d>Îxü{<0x</p>
4# 0x16 KBC-ÅÅ=iå5SÈl 0x00-0x00-0x00-0x08-0x18-0x8d-2±150.30.43-x3bzweepÝÜĒĒÌ
```



Typical Work Loop





Pop Quiz! (yaaay...)

• Go to socrative.com > Student Login

Room number: BBT045



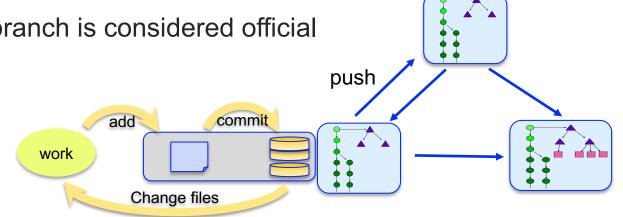
Exercise 2

• 15 minutes



Collaborating

Convention:
 one repo and one branch is considered official

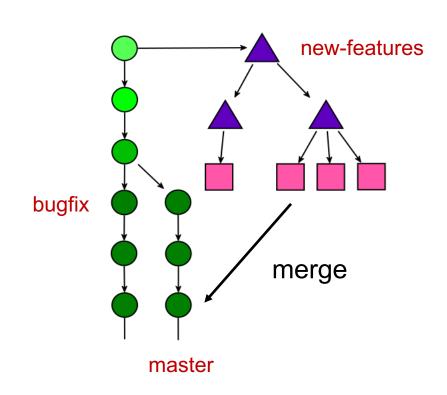


- Collaborators:
 - clone from this repo
 - work
 - push their contributions to it



Collaborating

- Work usually done on branches:
 - maintain separation of interest (e.g. "development" vs "bug fixing")
 - isolate changes
 (e.g. "experimental" branch)





Some real examples

Using GitHub to

- inspect files
- change file



Wrap-up

- Do use git to track your work even if working alone
- Don't be afraid to break things! Almost always possible to recover.
- Complex tool but daily routine involves only a handful of commands



Thank you!

