Version Control with Git

Koen Leuveld

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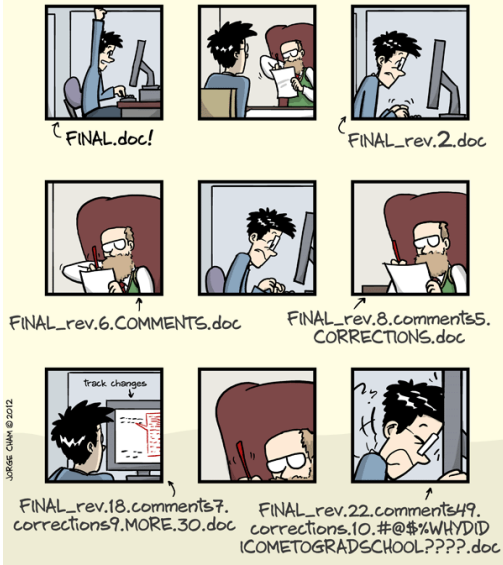
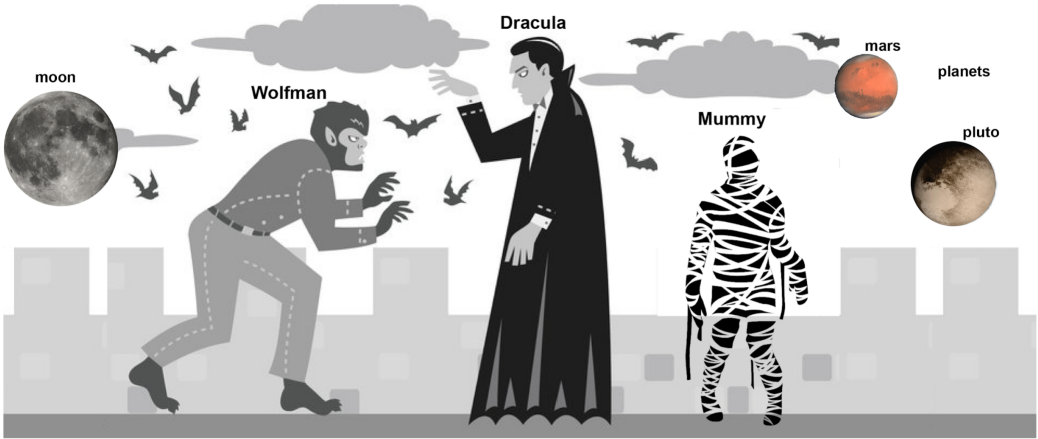
Program

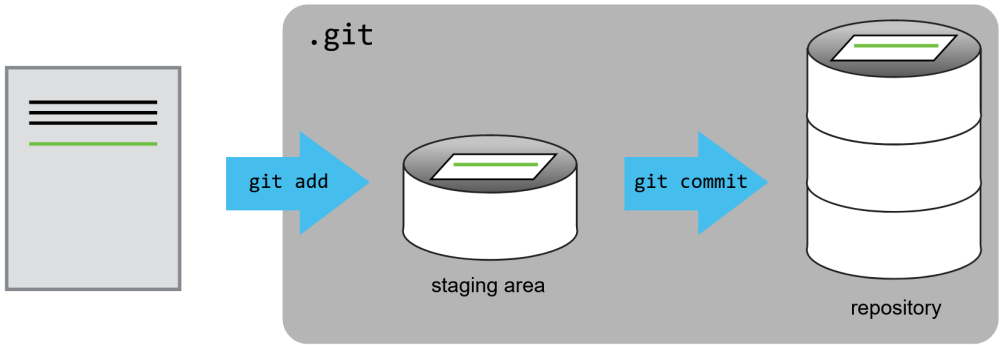
Time	Activity
09:30	Intro and Recap
09:45	Exploring history
10:10	Ignoring Things
10:15	GitHub
10:30	Coffee Break
10:45	Collaborating
11:10	Conflicts
11:25	Branches
12:00	Lunch Break
13:00	Git in practice
13:30	Reflection
14:00	WEEKEND

"FINAL".doc


FINAL.doc!
FINAL_rev.2.doc
FINAL_rev.6.COMMENTS.doc
FINAL_rev.8.comments5.
CORRECTIONS.doc
Track changes
FINAL_rev.18.comments7.
corrections9.MORE.30.doc
FINAL_rev.22.comments49.
corrections.10.#@$%WHYDID
ICOMETOGRADSCHOOL????.doc
JORGE CHAM © 2012

Universal Missions




.git
git add
staging area
git commit
repository

Basic Git commands

```
$ git <command> <options>
```

E.g.

- `git add myfile.txt`

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- `git add myfile.txt`
- `git status`
- `git commit -m "add myfile"`

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E.g.

- `git add myfile.txt`
- `git status`
- `git commit -m "add myfile"`
- `git log`

Episode 5: Recovering Older Versions of a File

Which commands below will let you recover the last committed version of the Python script called data_cruncher.py?

1. `$ git checkout HEAD`
2. `$ git checkout HEAD data_cruncher.py`
3. `$ git checkout HEAD~1 data_cruncher.py`
4. `$ git checkout <unique ID of last commit> data_cruncher.py`

Episode 5: Reverting a Commit

Below are the right steps and explanations for Jennifer to use `git revert`[1], what is the missing command?

1. `________ # Look at the git history of the project to find the commit ID`
2. Copy the ID (the first few characters of the ID, e.g. 0b1d055).
3. `git revert [commit ID]`
4. Type in the new commit message.
5. Save and close

[1]The command `git revert` is different from git checkout [commit ID] because git checkout returns the files not yet committed within the local repository to a previous state, whereas git revert reverses changes committed to the local and project repositories.

Episode 5: Understanding Workflow and History

What is the output of the last command in:

```
$ cd planets
$ echo "Venus is beautiful and full of love" > venus.txt
$ git add venus.txt
$ echo "Venus is too hot to be suitable as a base" >> venus.txt
$ git commit -m "Comment on Venus as an unsuitable base"
$ git checkout HEAD venus.txt
$ cat venus.txt
```

Episode 5: Understanding Workflow and History

What is the output of the last command in:

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$ cd planets
$ echo "Venus is beautiful and full of love" > venus.txt
$ git add venus.txt
$ echo "Venus is too hot to be suitable as a base" >> venus.txt
$ git commit -m "Comment on Venus as an unsuitable base"
$ git checkout HEAD venus.txt
$ cat venus.txt
```

Answer: `Venus is beautiful and full of love`

Episode 6: Ignoring Nested Files

Given a directory structure that looks like:

```
results/data
results/plots
```

How would you ignore only `results/plots` and not `results/data`?

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Episode 6: Including specific files

How would you ignore all `.dat` files in your root directory except for `final.dat`?

Hint: Find out what ! (the exclamation point operator) does

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```
*.dat           # ignore all data files
!final.dat      # except final.data
```

Episode 6: Ignoring Nested Files: Variation

Given a directory structure that looks similar to the earlier Nested Files exercise, but with a slightly different directory structure:

```
results/data
results/images
results/plots
results/analysis
```

How would you ignore all of the contents in the results folder, but not results/data?

Hint: think a bit about how you created an exception with the ! operator before.

Episode 6: Ignoring Nested Files: Variation

Given a directory structure that looks similar to the earlier Nested Files exercise, but with a slightly different directory structure:

```
results/data
results/images
results/plots
results/analysis
```

How would you ignore all of the contents in the results folder, but not results/data?

Hint: think a bit about how you created an exception with the ! operator before.

```
results/*               # ignore everything in results folder
!results/data/          # do not ignore results/data/ contents
```

Episode 9: A Typical Worksession

Put the following actions in order, and give the commands needed to achieve the action:

- Make changes by appending the number 100 to a text file numbers.txt
- Update remote repository to match the local repository
- Celebrate your success with some fancy beverage(s)
- Update local repository to match the remote repository
- Stage changes to be committed
- Commit changes to the local repository

Episode 9: A Typical Worksession

order	action	command
1		
2		
3		
4		
5		
6	Celebrate!	AFK

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order	action	command
1	Update local	git pull origin main
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1	Update local	git pull origin main
2	Make changes	echo 100 >>numbers.txt
3	Stage changes	git add numbers.txt
4	Commit changes	git commit -m "Add 100 to numbers.txt"
5	Update remote	git push origin main
6	Celebrate!	AFK

Open Science

- Git and GitHub are great for transparency: every one can see the work you have done.
- But: it may not be the best for scientific archiving. (Is your repo guaranteed to be accessible for 10 years?)
- Use the OSF to archive github repos, and get a DOI

Git in Practice

- I am a big fan!
- It declutters your hard drive (and head) by removing the need to keep track of versions
- GitHub can be linked to OSF and Zenodo
- No need to use command line

Example repos

https://github.com/utrechtuniversity/dataprivacyhandbook

https://github.com/kleuveld/rerc_selfcheck_overview

https://github.com/tpronk/splithalfr (website)

Reflection

- What do like about git?
- What don't you like about git?
- Do you think you will be using git? What for?