

Git best practices

September 12, 2021

1 When in doubt, type `git status`

The `git status` command will tell you what the state of affairs is, e.g. if you have made changes since your last commit and which files have been changed.

2 Committing and pushing regularly

As you work on your homework, commit your changes every time you are about to take a break or switch to another task. For example, suppose you work for a couple hours and make some progress on HW1 Q1. You are about to break for lunch. Before doing so, commit and push your changes by typing the following commands in the Terminal:

```
git add --all                # stage changes for commit
git commit -m 'made some progress on HW1 Q1'  # commit your changes
git push                    # push change to Github
```

3 Pull regularly and commit before pulling

To stay up to date on the course materials, pull them regularly (e.g. daily) from the course Github repository by typing

```
git pull
```

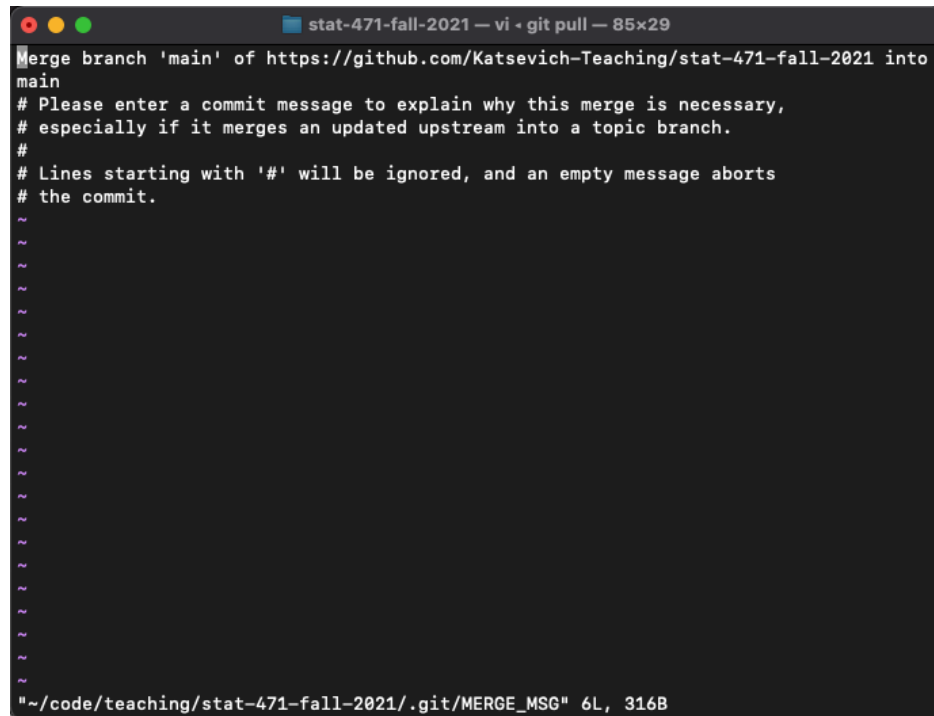
However, do not pull if you have made uncommitted changes. In this case, commit your changes as described above before pulling.

4 Merging changes

Sometimes, the teaching staff may make changes in the course Github repository to one or more files that you have also changed on your computer. In this case, a *merge* is required. There are two situations to be aware of: *automatic merge* and *merge conflict*.

4.1 Automatic merge

In most cases when merges are necessary, you and the teaching staff will have edited different lines of the same file. In this case, Git is smart enough to automatically merge these changes. You will see a screen like in Figure 1 pop up. This is Git opening up the Vim text editor and prompting you to write a little note about why this merge was necessary. However, since a default message is already present (Merge branch 'main' of <https://github.com/Katsevich-Teaching/stat-471-fall-2021.git>



```
stat-471-fall-2021 - vi - git pull - 85x29
Merge branch 'main' of https://github.com/Katsevich-Teaching/stat-471-fall-2021 into
main
# Please enter a commit message to explain why this merge is necessary,
# especially if it merges an updated upstream into a topic branch.
#
# Lines starting with '#' will be ignored, and an empty message aborts
# the commit.
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~/code/teaching/stat-471-fall-2021/.git/MERGE_MSG" 6L, 316B
```

Figure 1: A message from Git about a merge conflict.

into main), there is no need to do anything. We just want to exit the Vim editor by typing `:q` and then pressing `Enter`. If this does not work, press the `Esc` key prior to typing `:q`. Once you exit the Vim editor, you will see a message like the following in the Terminal:

```
Auto-merging homework/homework-1/HW1.Rmd
Merge made by the 'recursive' strategy.
 homework/homework-1/HW1.Rmd | 2 ++
1 file changed, 2 insertions(+)
```

This just says that an auto-merge was done and that you are all set.

4.2 Merge conflict

In rare cases, you and the teaching staff will make changes to the same line of code in the same file (to minimize the risk of this, avoiding changing the instructions or problem statements in the homework). In this case, you will have a merge conflict on your hands. You will be made aware of this by a message in the Terminal like the following:

```
Auto-merging homework/homework-1/HW1.Rmd
CONFLICT (content): Merge conflict in homework/homework-1/HW1.Rmd
Automatic merge failed; fix conflicts and then commit the result.
```

In this case, Git cannot automatically do the merge and you will need to do so manually. In order to do this, open the file(s) where the conflict occurred (you can get a list of all conflicted files by typing `git status`). You will see in the file some weird parts that look like Figure 2. The text between `<<<<<<<< HEAD` and `=====` is the version of the file that you created and the text

```

26 ▾ # Instructions {-}
27
28 ▾ ## Setup {-}
29
30 <<<<<<< HEAD|
31 Pull the most up-to-date version of this assignment from Github and set your working directory to
   `stat-471-fall-2021/` `homework/homework-1`. Consult the [getting started
   guide](https://github.com/Katsevich-Teaching/stat-471-fall-2021/blob/main/getting-started/getting-
   started.pdf) if you need to brush up on `R` or `Git`.
32 ▾ =====
33 Pull the very latest version of this assignment from Github and set your working directory to
   `stat-471-fall-2021/` `homework/homework-1`. Consult the [getting started
   guide](https://github.com/Katsevich-Teaching/stat-471-fall-2021/blob/main/getting-started/getting-
   started.pdf) if you need to brush up on `R` or `Git`.
34 >>>>>>> 4fb72eaf4454e2d4e7e5a276f88df02138ffd6d2
35

```

Figure 2: A file with a merge conflict.

between ===== and >>>>>>> 4fb72... is the version of the file the teaching staff created. Edit the file to obtain the version you'd like to keep, and then commit your changes as usual to signal that the merge is complete.

5 If there are still issues, post on Piazza or come to office hours

The teaching staff are here to help you, so let us know if you are having issues.