

# Collaborating with Git & Github

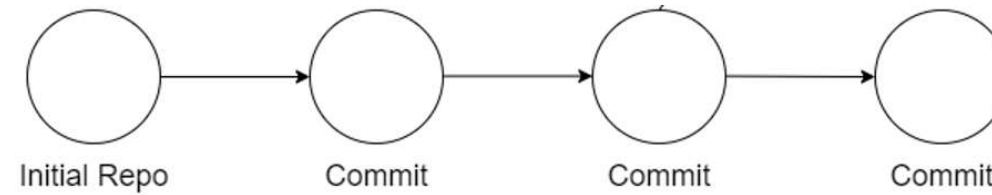
Justin Post

# Recap

- **Git** is a version control software
  - Associated with a folder (repo)
  - Tracks changes to files
- **Github** is an online hosting service for Git-based projects
- Workflow:
  - Pull down most recent files (`git pull`) or do initial download (`git clone`)
  - Add files you want to keep changes to (`git add`)
  - Commit to the changes (`git commit`)
  - Push the changes to the remote repo (`git push`)

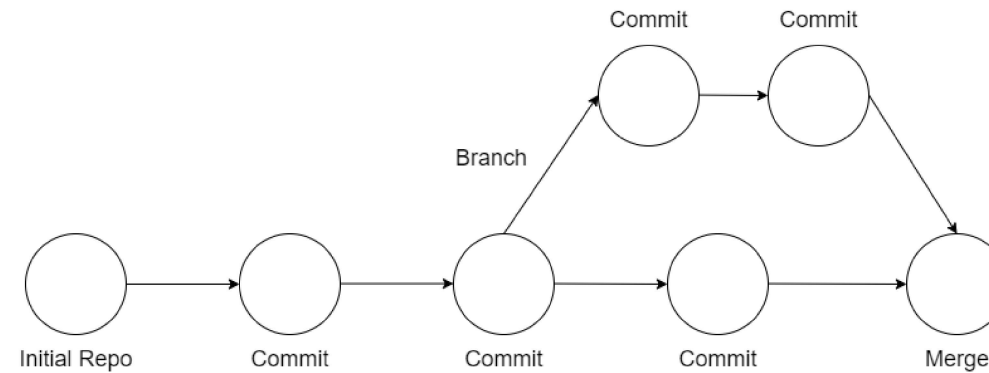
# Collaboration Idea

- Everyone can work on the same **branch** and just take turns working



# Working on Branches

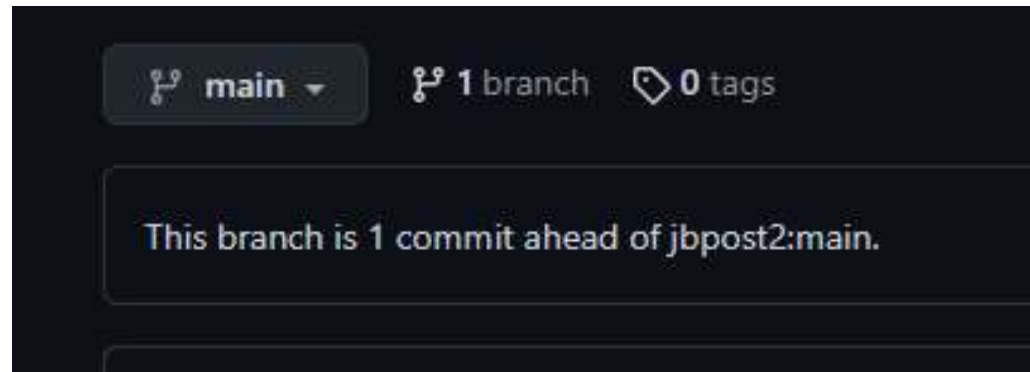
- Alternatively, you can have separate **branches** of the repo



- Work on a branch is similar to working on the main branch
- Can merge when happy!

# Forking

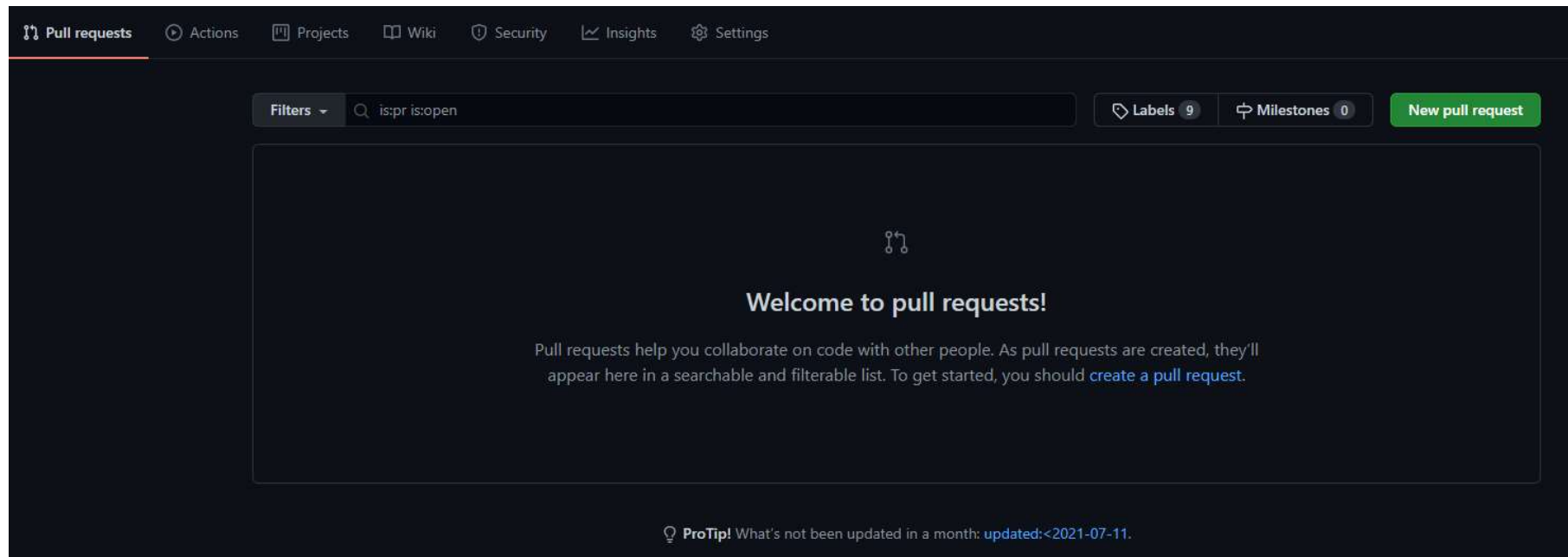
- People often `fork` the repo
- This creates a copy of the repo on your account
- You can then work as normal
- If you do a commit on your branch, you may notice something like this



# Merging Branches

Suppose you like your commit and you think the original owner will too!

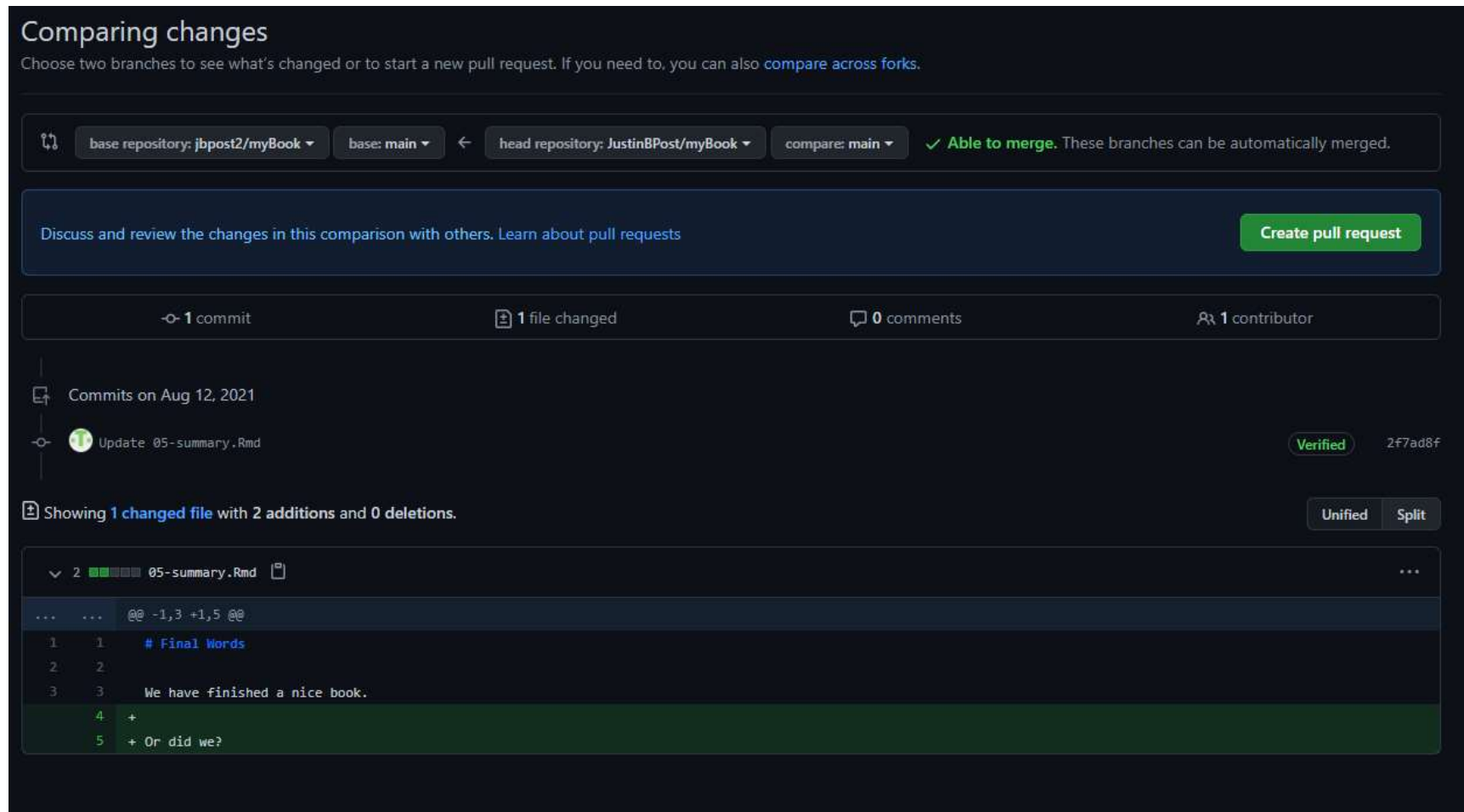
- You can do a **pull** request



# Merging Branches

Suppose you like your commit and you think the original owner will too!

- You can do a **pull** request



The screenshot shows the GitHub 'Comparing changes' interface. At the top, it says 'Comparing changes' and provides instructions: 'Choose two branches to see what's changed or to start a new pull request. If you need to, you can also [compare across forks](#).' Below this, there are dropdown menus for 'base repository: jbpost2/myBook', 'base: main', 'head repository: JustinBPost/myBook', and 'compare: main'. A green checkmark indicates 'Able to merge. These branches can be automatically merged.' A blue box contains the text 'Discuss and review the changes in this comparison with others. [Learn about pull requests](#)' and a green 'Create pull request' button. Below this, a summary bar shows '1 commit', '1 file changed', '0 comments', and '1 contributor'. The 'Commits on Aug 12, 2021' section shows a commit 'Update: 05-summary.Rmd' with a 'Verified' badge and hash '2f7ad8f'. Below this, it says 'Showing 1 changed file with 2 additions and 0 deletions.' and has 'Unified' and 'Split' tabs. The file '05-summary.Rmd' is shown with a diff view. The diff shows two additions: '# Final Words' and 'We have finished a nice book.' followed by two more additions: '+ Or did we?'.

Comparing changes

Choose two branches to see what's changed or to start a new pull request. If you need to, you can also [compare across forks](#).

base repository: jbpost2/myBook base: main head repository: JustinBPost/myBook compare: main ✓ Able to merge. These branches can be automatically merged.

Discuss and review the changes in this comparison with others. [Learn about pull requests](#) [Create pull request](#)

1 commit 1 file changed 0 comments 1 contributor

Commits on Aug 12, 2021

Update: 05-summary.Rmd Verified 2f7ad8f

Showing 1 changed file with 2 additions and 0 deletions. Unified Split

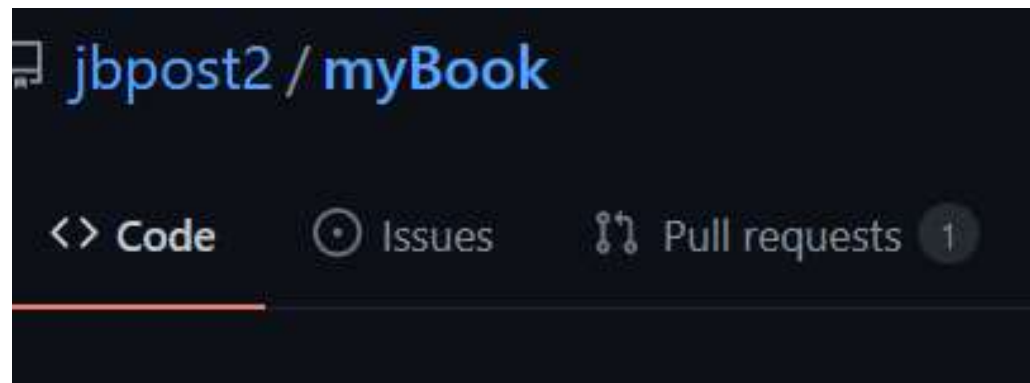
2 05-summary.Rmd

```
... @@ -1,3 +1,5 @@
1 1 # Final Words
2 2
3 3 We have finished a nice book.
4 +
5 + Or did we?
```

# Merging Branches

If you are lucky, there won't be any merge conflicts.

- Allows the owner of the original repo to accept the pull request without needing to modify things
- The owner will get a notification that a pull request has been made





# Merging Branches

Owner can then investigate the request and choose whether or not to accept it or they can ask for more details

# Dealing with conflicts

- Sometimes changes requested conflict with changes already made

The screenshot shows the GitHub 'Comparing changes' interface. At the top, it says 'Comparing changes' and 'Choose two branches to see what's changed or to start a new pull request. If you need to, you can also [compare across forks](#).' Below this, there are dropdown menus for 'base repository: jbpost2/myBook', 'base: main', 'head repository: JustinBPost/myBook', and 'compare: main'. A red error message states: 'X Can't automatically merge. Don't worry, you can still create the pull request.' Below the error message, there is a text box with the text 'Discuss and review the changes in this comparison with others. [Learn about pull requests](#)' and a green button labeled 'Create pull request'. Below this, there is a summary bar showing '1 commit', '1 file changed', '0 comments', and '1 contributor'. Below the summary bar, there is a section for 'Commits on Aug 12, 2021' showing a commit 'Update 02-literature.Rmd' with a green 'Verified' badge and the hash '366353a'. Below the commit, there is a section for 'Showing 1 changed file with 1 addition and 0 deletions.' with buttons for 'Unified' and 'Split'. Below this, there is a diff view for the file '02-literature.Rmd'. The diff shows a comparison between two versions of the file. The first version (base) has three lines: '# Literature', 'Yes I like this line.', and 'Here is a review of existing methods.' The second version (head) has the same three lines plus a fourth line: '+ This line is better than yours, approve this change.' The fourth line is highlighted in green.

Comparing changes

Choose two branches to see what's changed or to start a new pull request. If you need to, you can also [compare across forks](#).

base repository: jbpost2/myBook base: main head repository: JustinBPost/myBook compare: main

X Can't automatically merge. Don't worry, you can still create the pull request.

Discuss and review the changes in this comparison with others. [Learn about pull requests](#) [Create pull request](#)

1 commit 1 file changed 0 comments 1 contributor

Commits on Aug 12, 2021

Update 02-literature.Rmd [Verified](#) 366353a

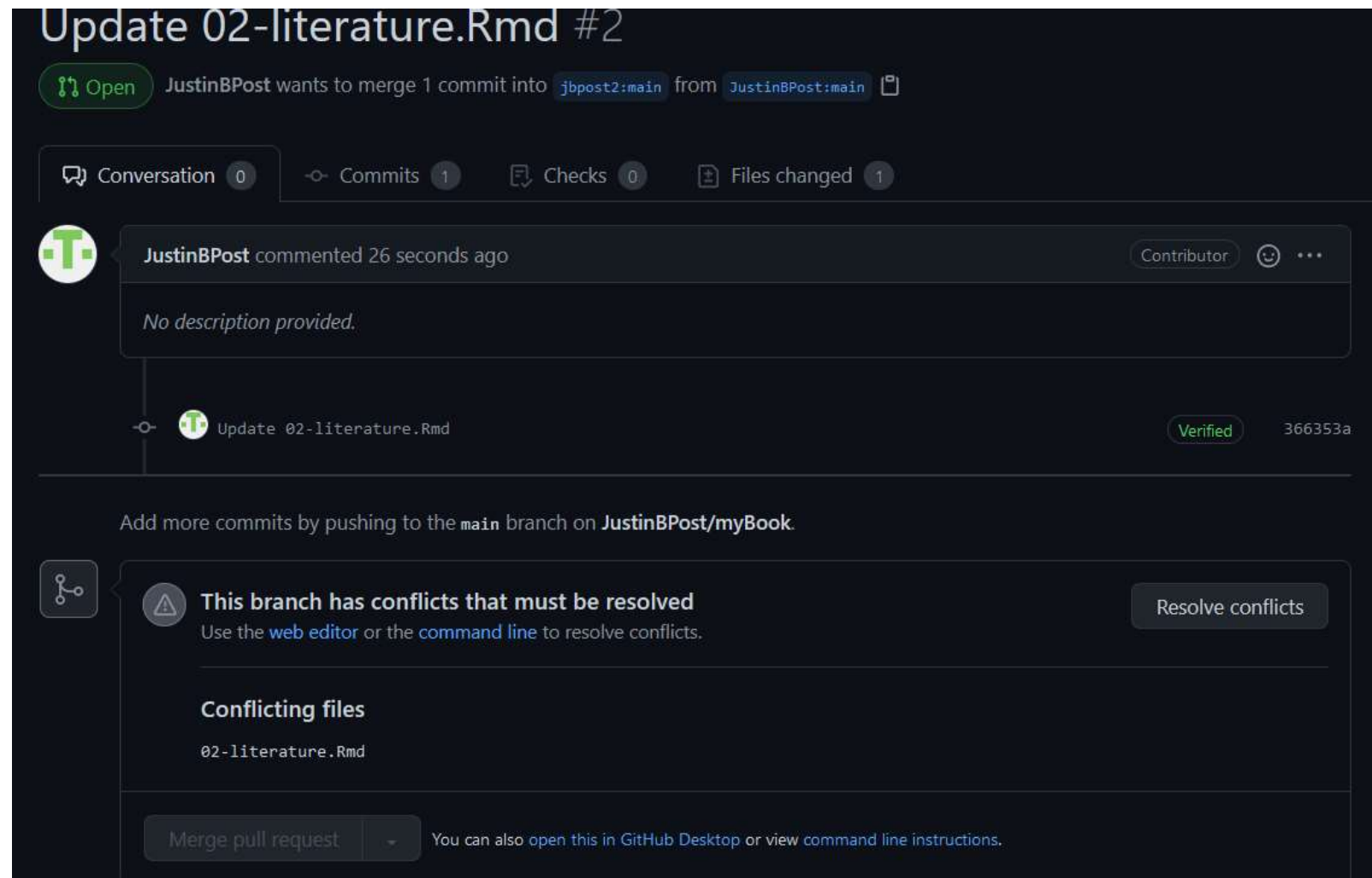
Showing 1 changed file with 1 addition and 0 deletions. [Unified](#) [Split](#)

1 02-literature.Rmd

```
... @@ -1,3 +1,4 @@
1 1 # Literature
2 2 Yes I like this line.
3 3 Here is a review of existing methods.
4 + This line is better than yours, approve this change.
```

# Dealing with conflicts


Owner sees a notification about conflicts that must be resolved



# Dealing with conflicts

They can view the issues and pick which to include or to include both with a modification

<<<<<< is a conflict marker



The screenshot shows a code editor window titled "Update 02-literature.Rmd #2". Below the title, it says "Resolving conflicts between Justin8Post:main and jbpost2:main and committing changes → Justin8Post:main". On the left, a sidebar shows "1 conflicting file" and a file named "02-literature.Rmd". The main editor area shows the content of "02-literature.Rmd" with line numbers 1 through 9. The content is as follows:

```
1 # Literature
2 Yes I like this line.
3 Here is a review of existing methods.
4 <<<<<< main
5 This line is better than yours, approve this change.
6 |=====
7 This line isn't so good.
8 >>>>>> main
9
```

A red bracket on the left side of the editor highlights lines 4 through 8, indicating the conflict region.

- Figure out what to do and delete the <<< == >>> lines