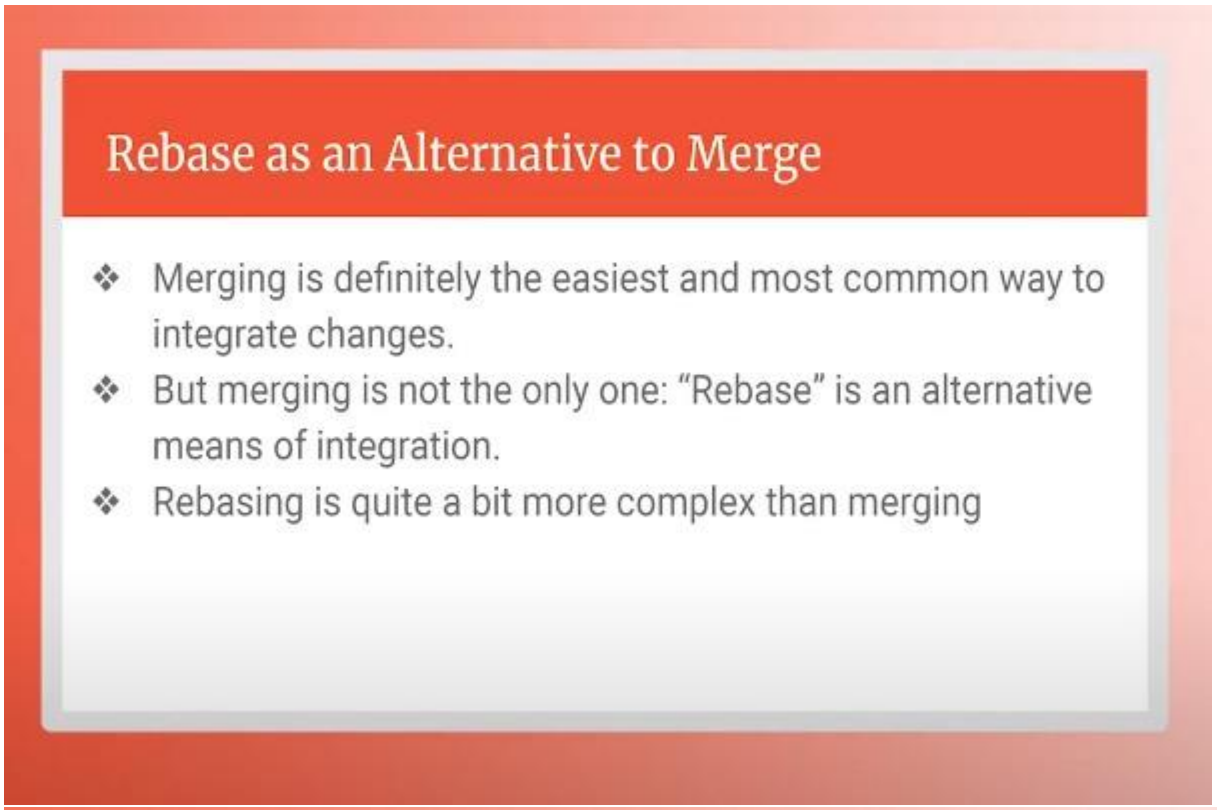
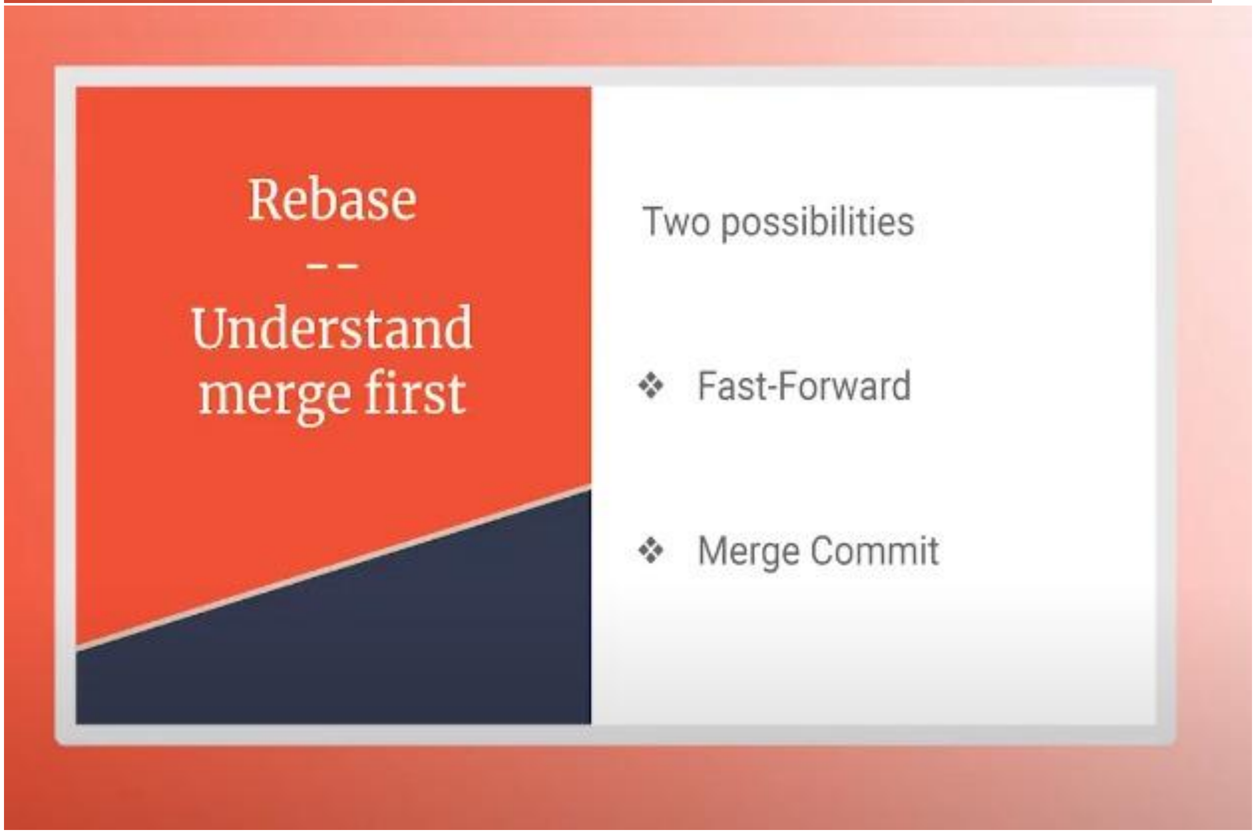


Rebase as an Alternative to Merge

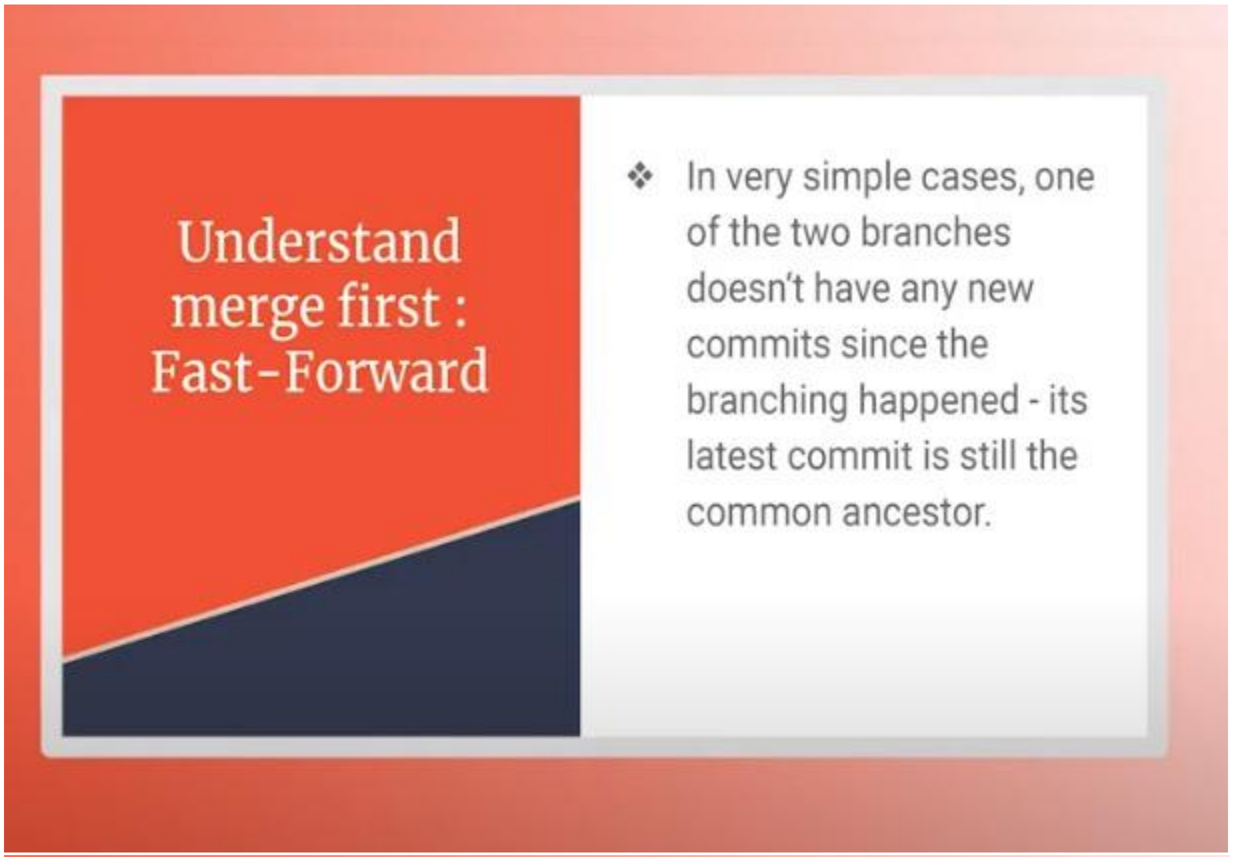
- ❖ Merging is definitely the easiest and most common way to integrate changes.
- ❖ But merging is not the only one: “Rebase” is an alternative means of integration.
- ❖ Rebasing is quite a bit more complex than merging



Rebase -- Understand merge first

Two possibilities

- ❖ Fast-Forward
- ❖ Merge Commit

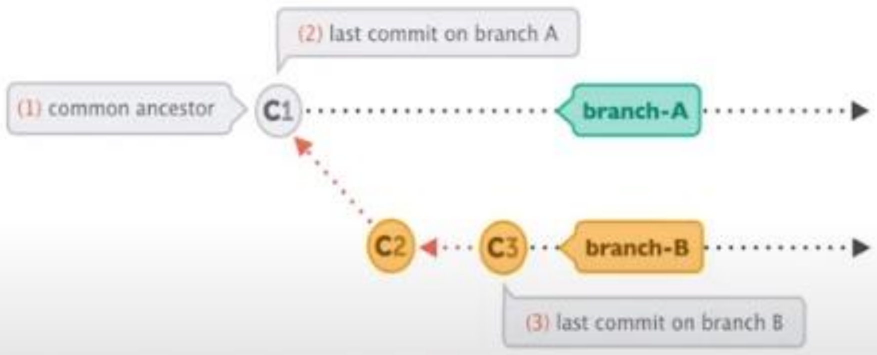


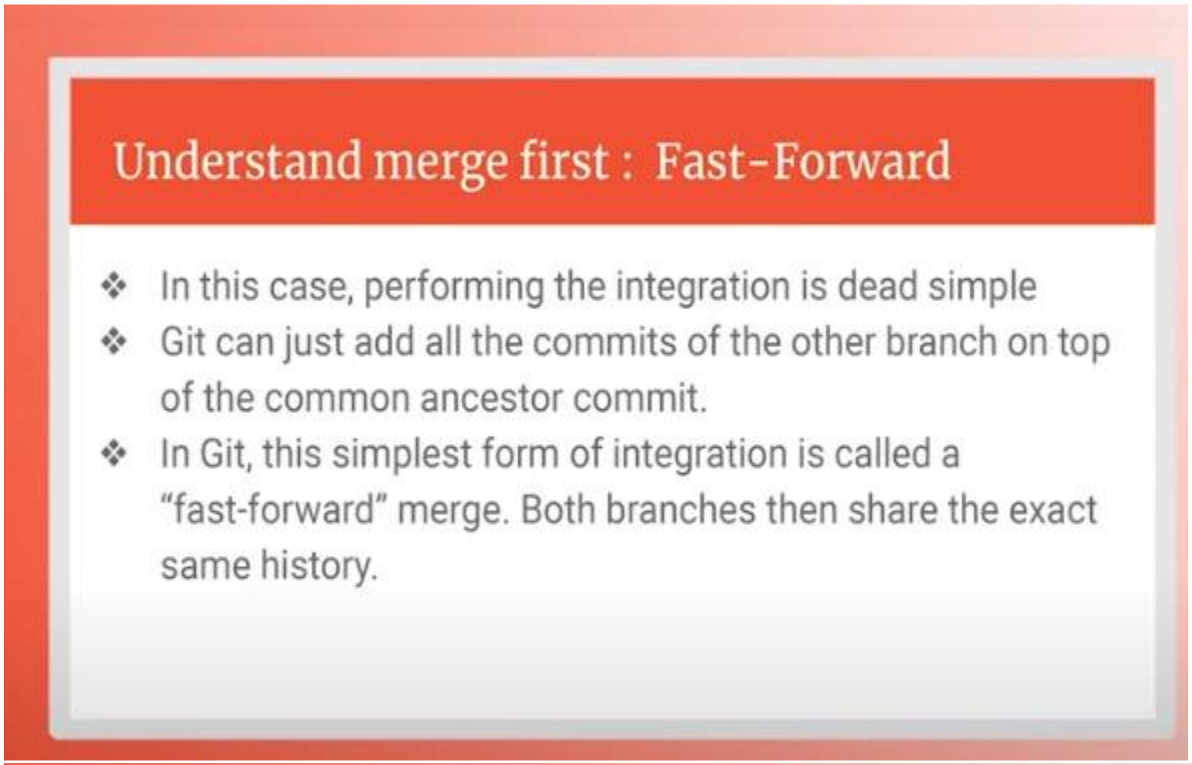
Understand merge first : Fast-Forward

❖ In very simple cases, one of the two branches doesn't have any new commits since the branching happened - its latest commit is still the common ancestor.

Understand merge first : Fast-Forward

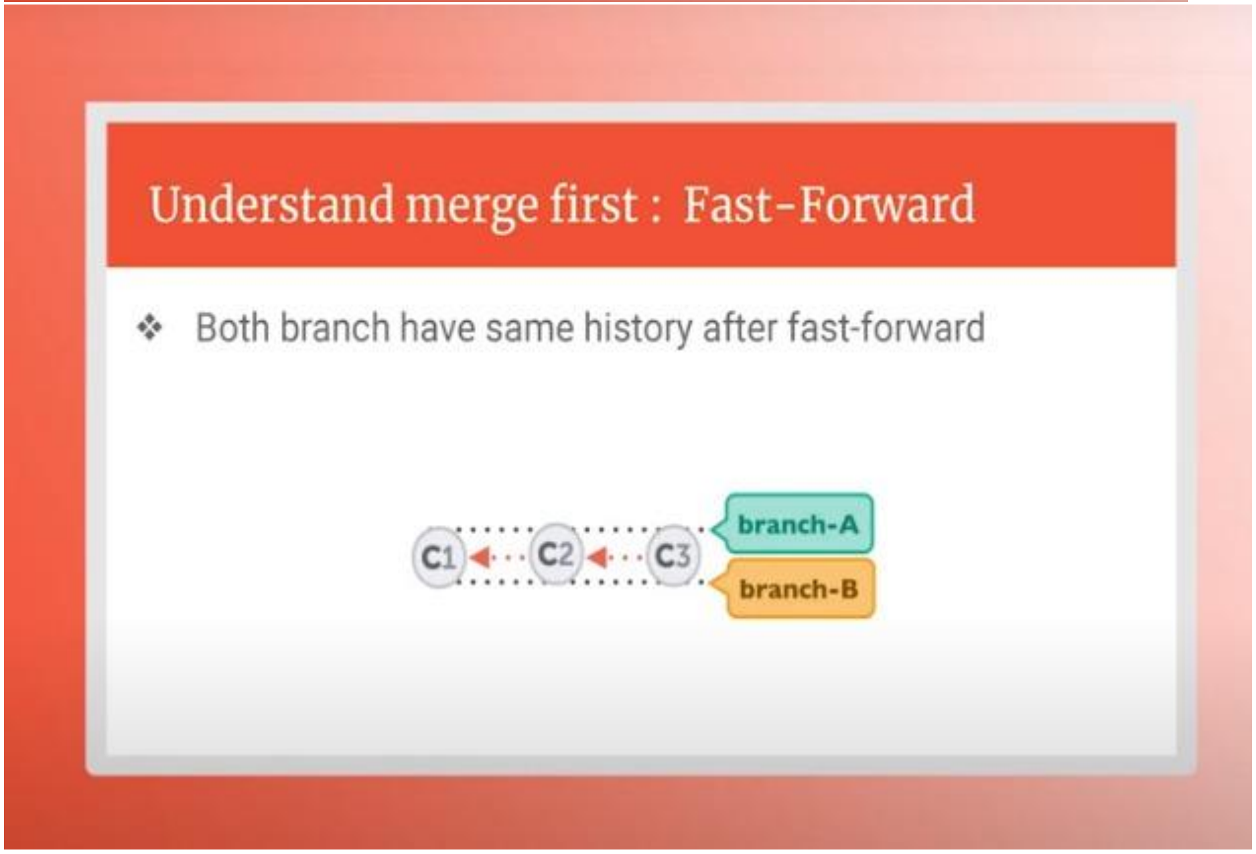
❖ Only one branch has new commits





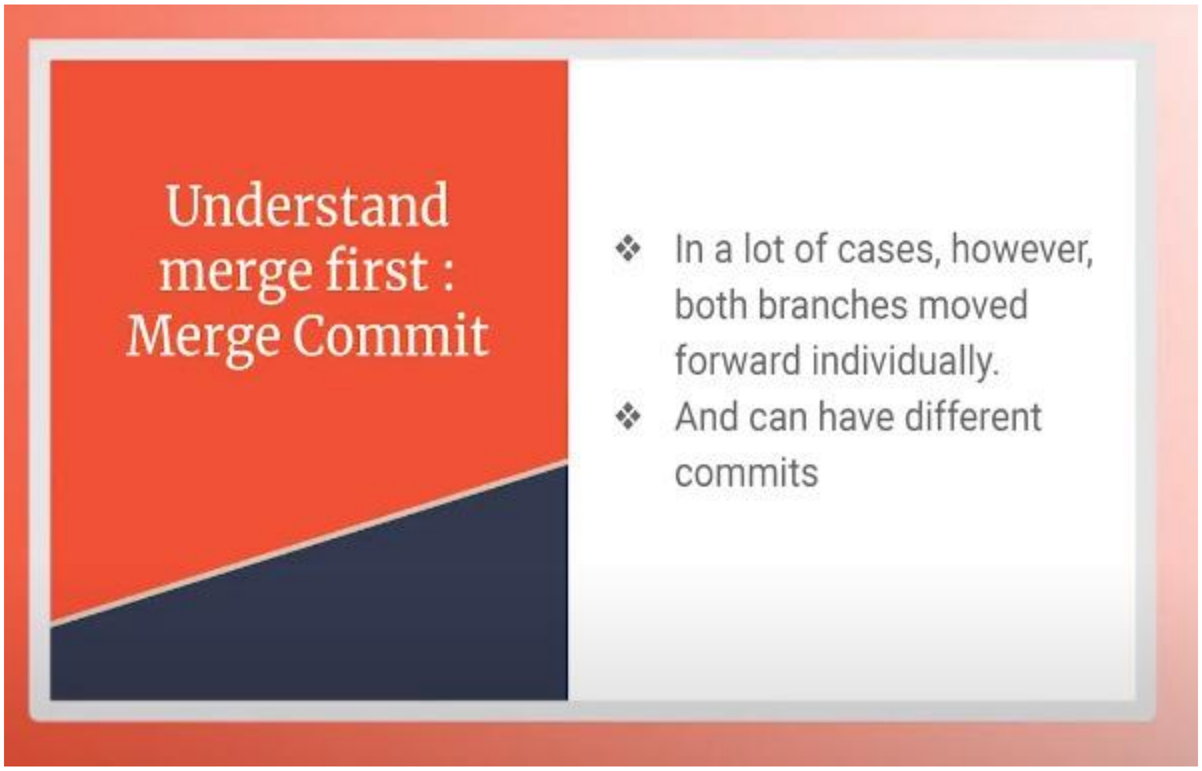
Understand merge first : Fast-Forward

- In this case, performing the integration is dead simple
- Git can just add all the commits of the other branch on top of the common ancestor commit.
- In Git, this simplest form of integration is called a "fast-forward" merge. Both branches then share the exact same history.



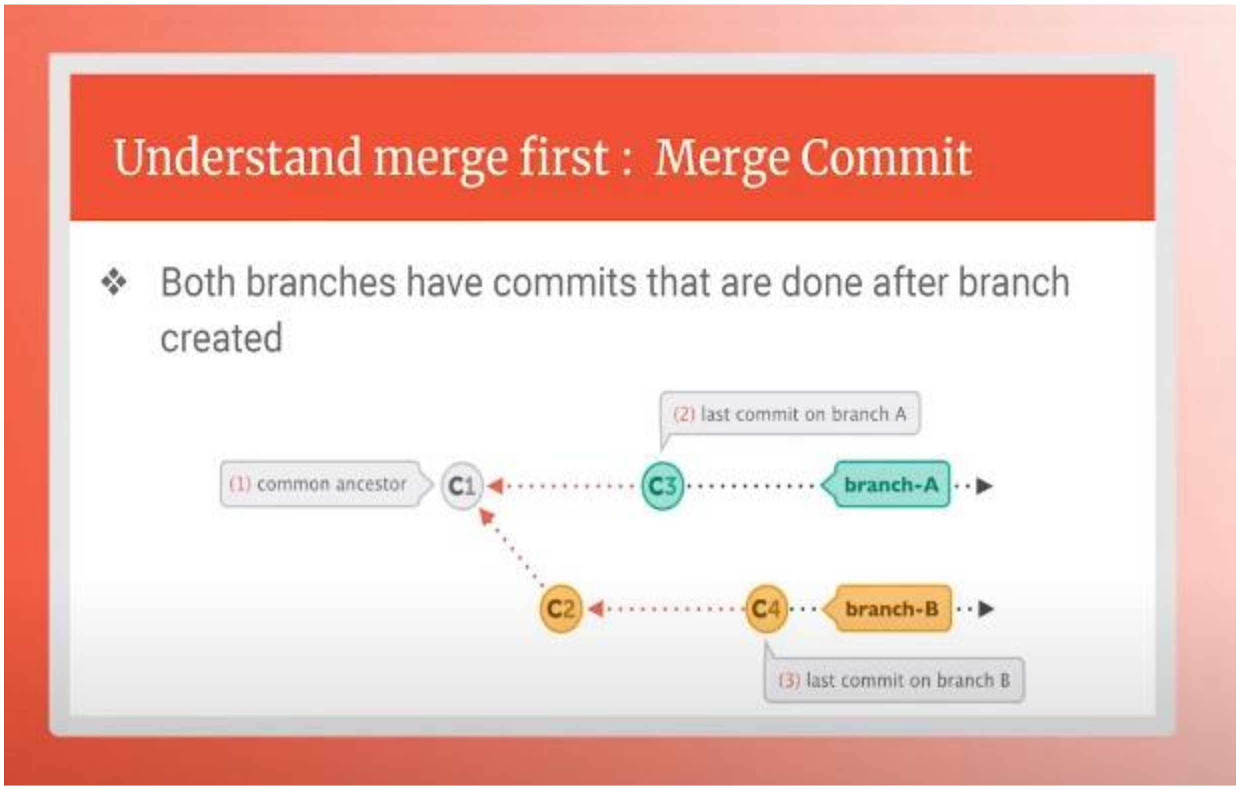
Understand merge first : Fast-Forward

- Both branch have same history after fast-forward



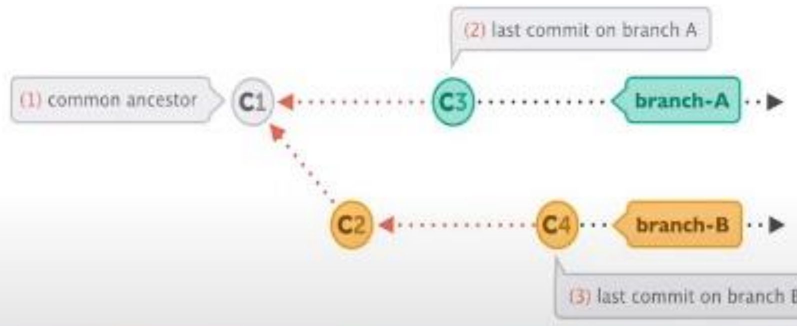
Understand merge first : Merge Commit

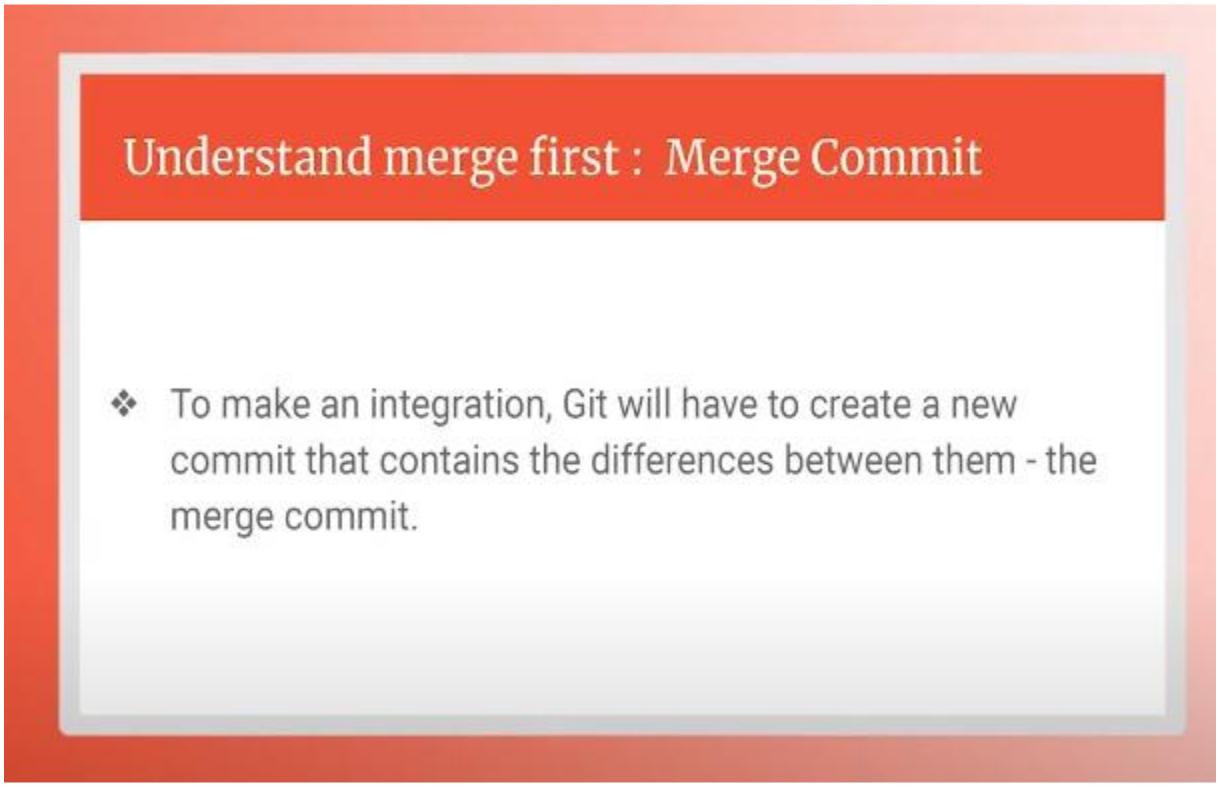
❖ In a lot of cases, however, both branches moved forward individually.
❖ And can have different commits



Understand merge first : Merge Commit

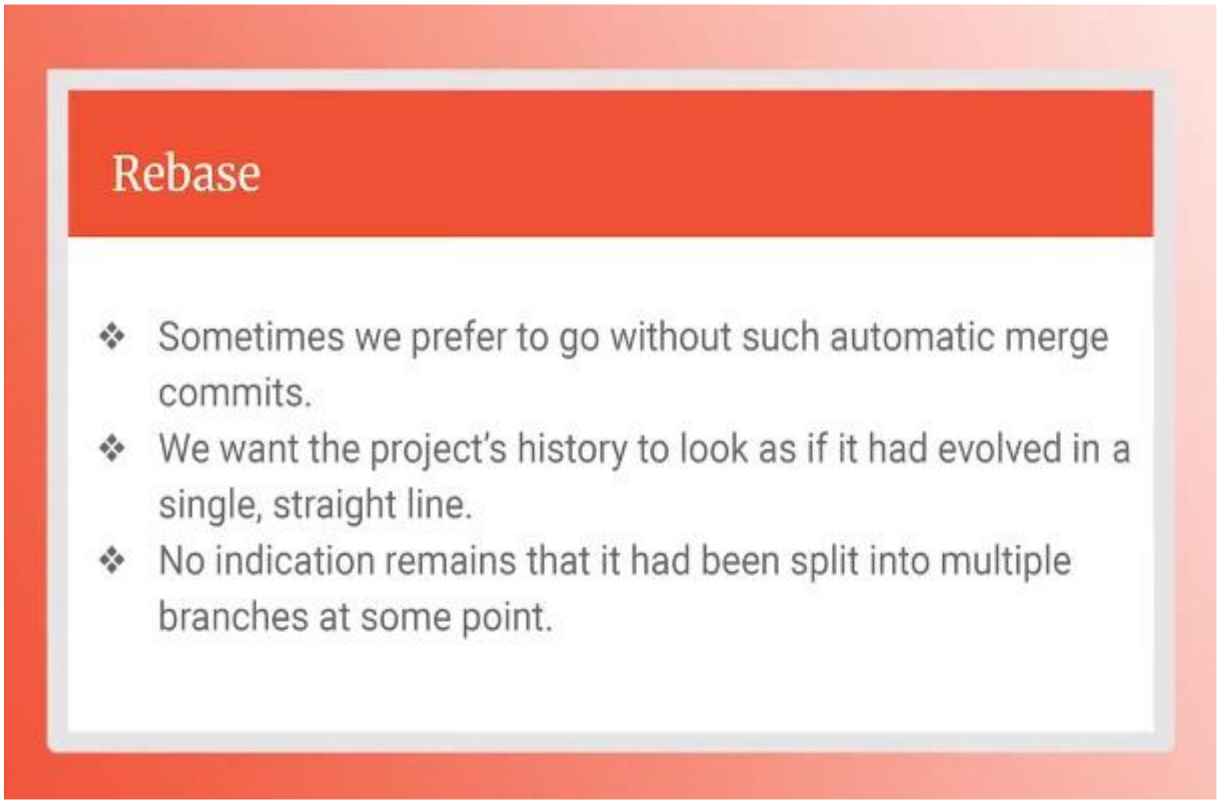
❖ Both branches have commits that are done after branch created





Understand merge first : Merge Commit

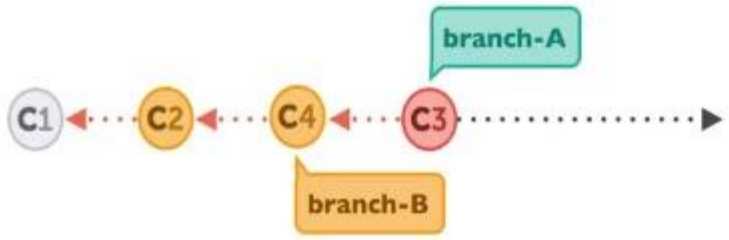
- To make an integration, Git will have to create a new commit that contains the differences between them - the merge commit.

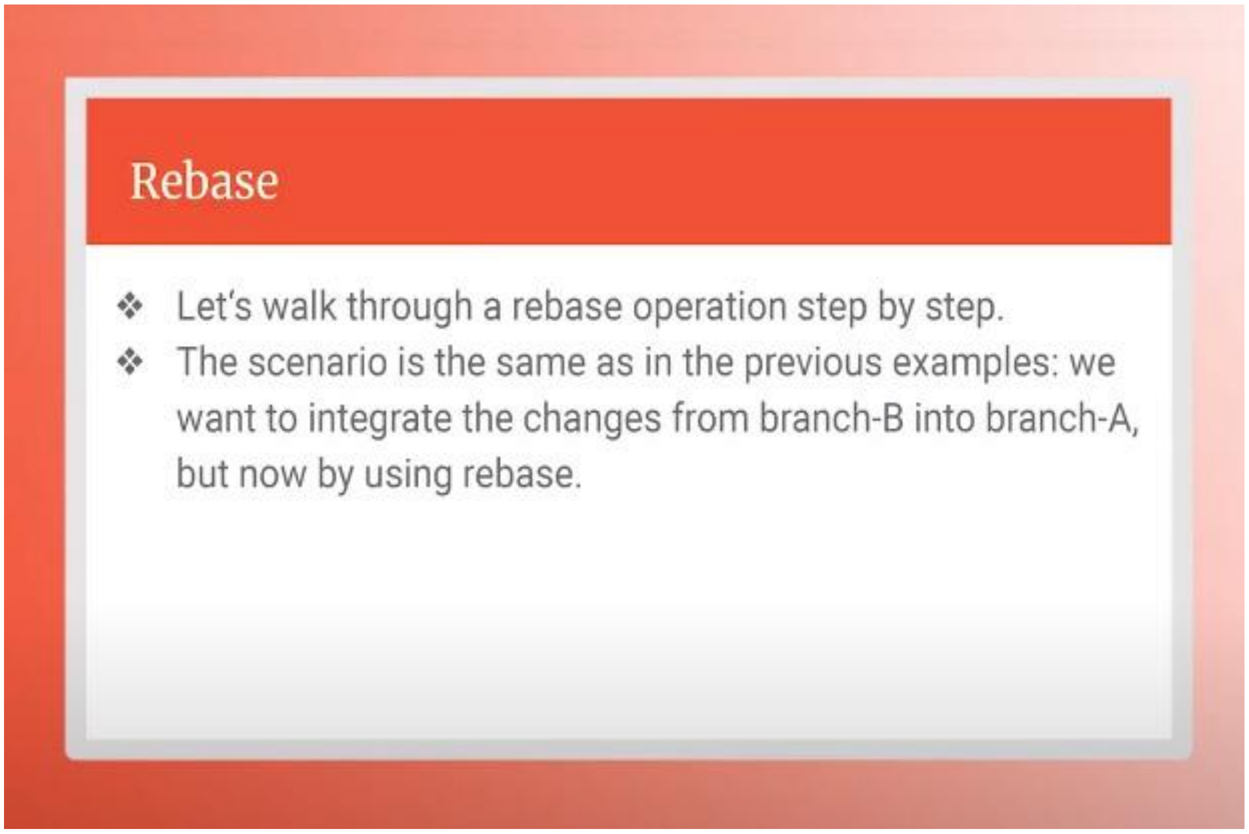


Rebase

- Sometimes we prefer to go without such automatic merge commits.
- We want the project's history to look as if it had evolved in a single, straight line.
- No indication remains that it had been split into multiple branches at some point.

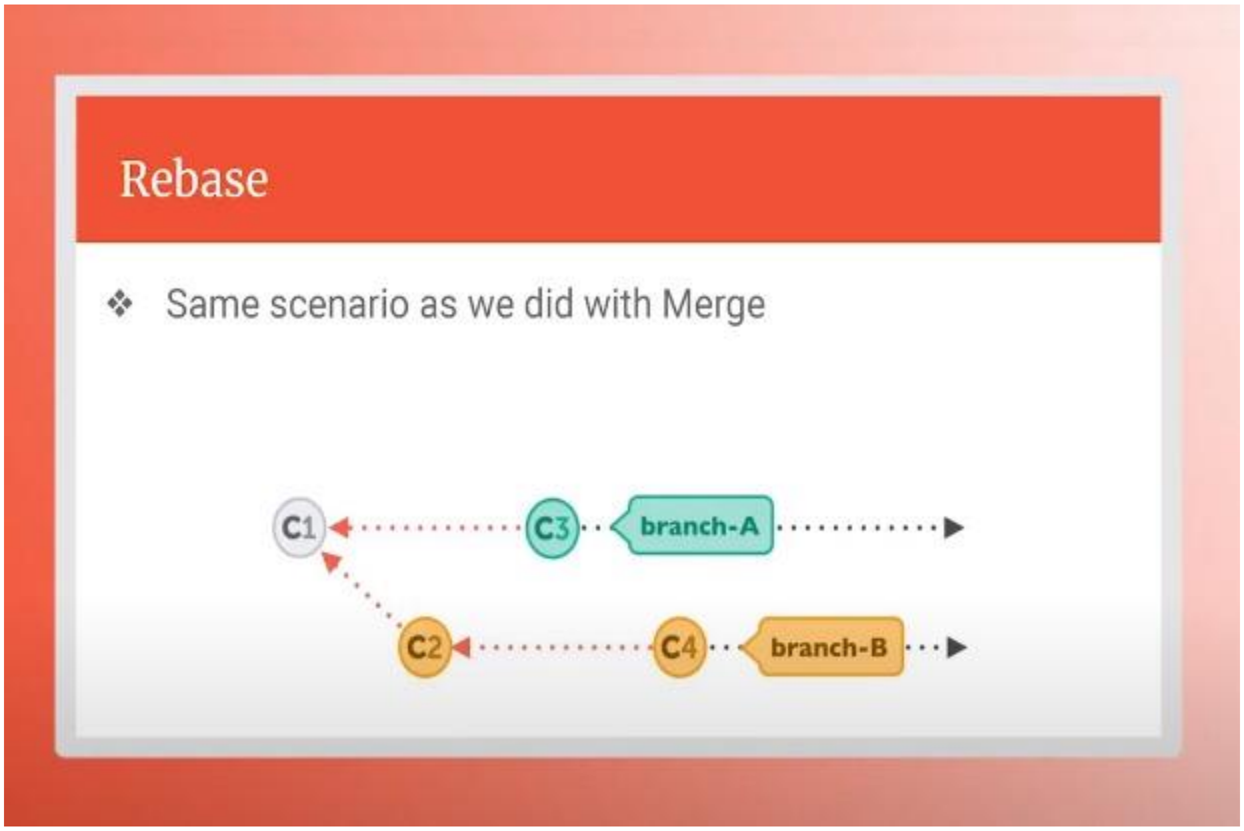
Rebase





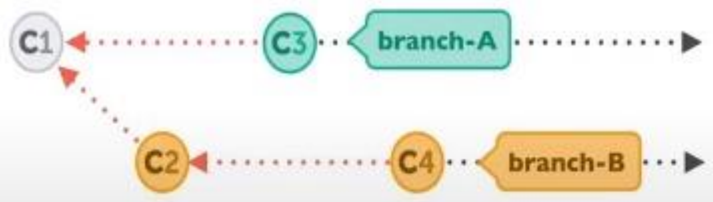
Rebase

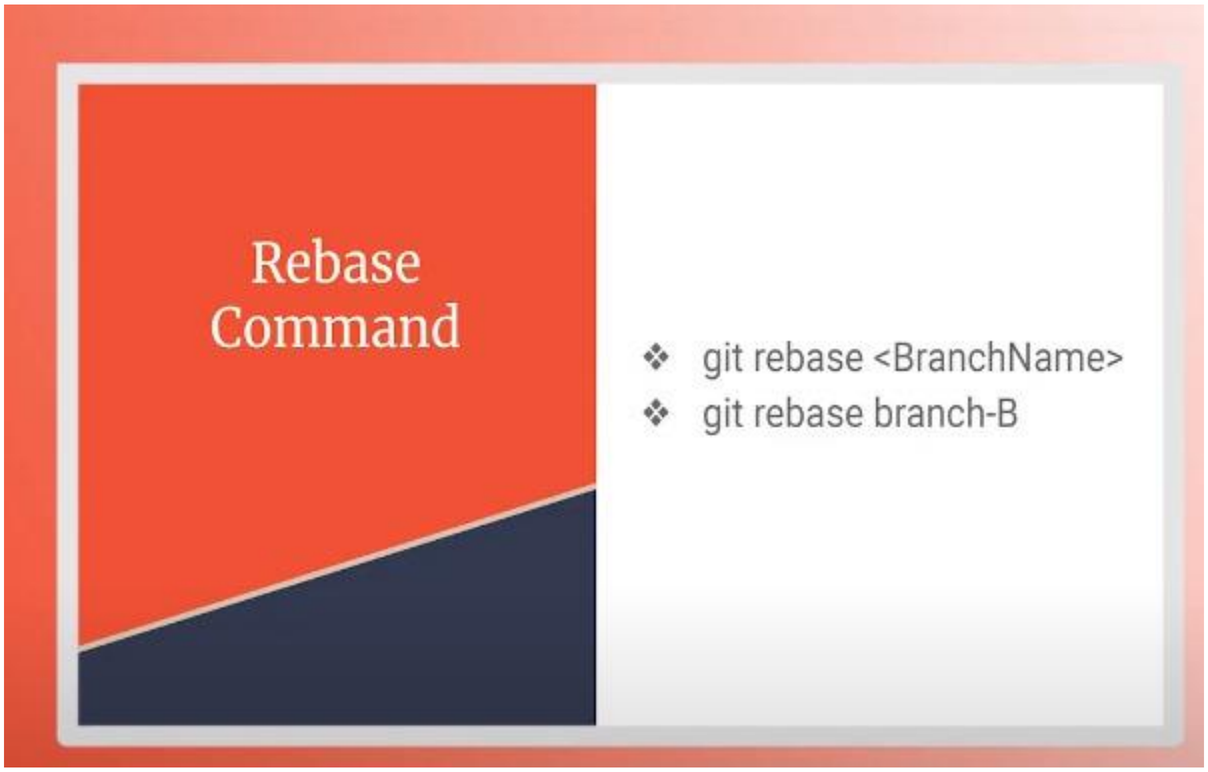
- ❖ Let's walk through a rebase operation step by step.
- ❖ The scenario is the same as in the previous examples: we want to integrate the changes from branch-B into branch-A, but now by using rebase.



Rebase

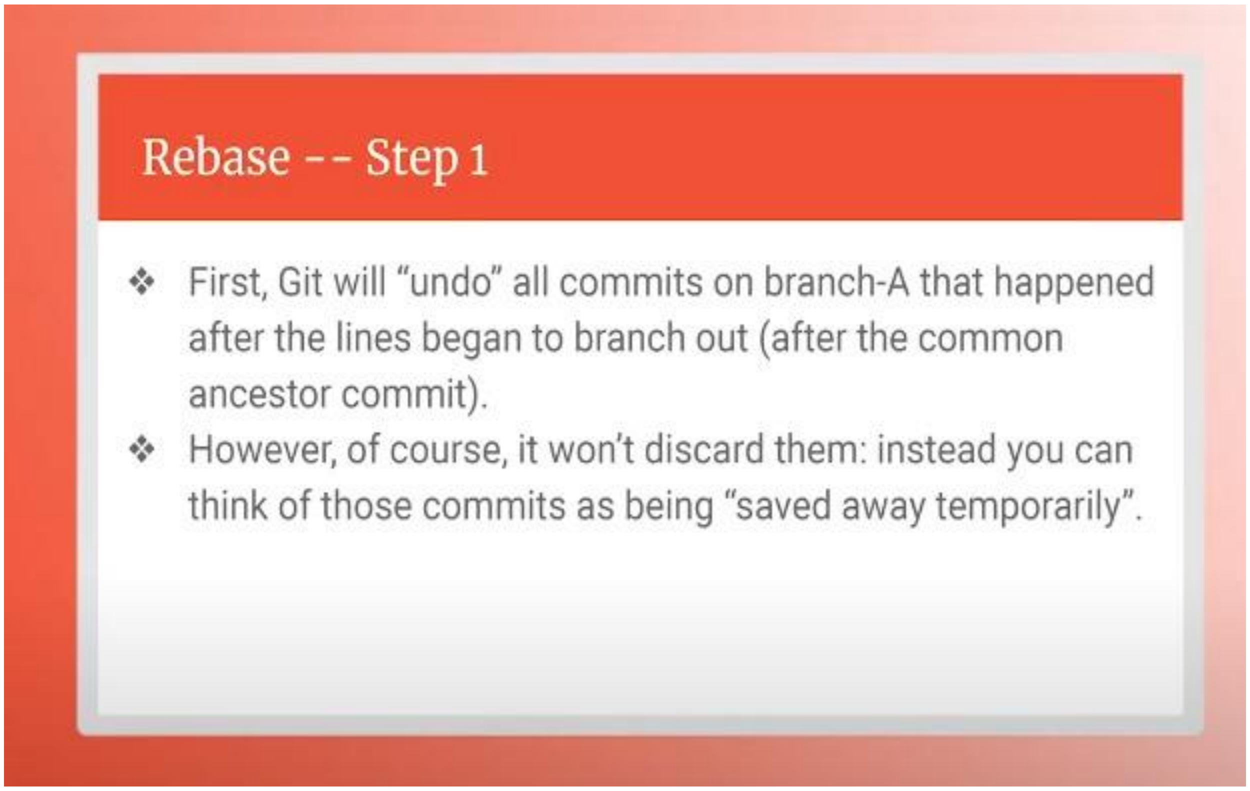
- Same scenario as we did with Merge





Rebase Command

- git rebase <BranchName>
- git rebase branch-B

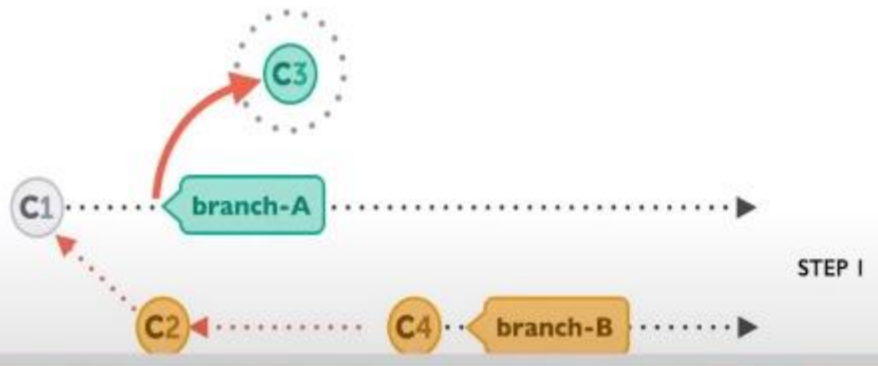


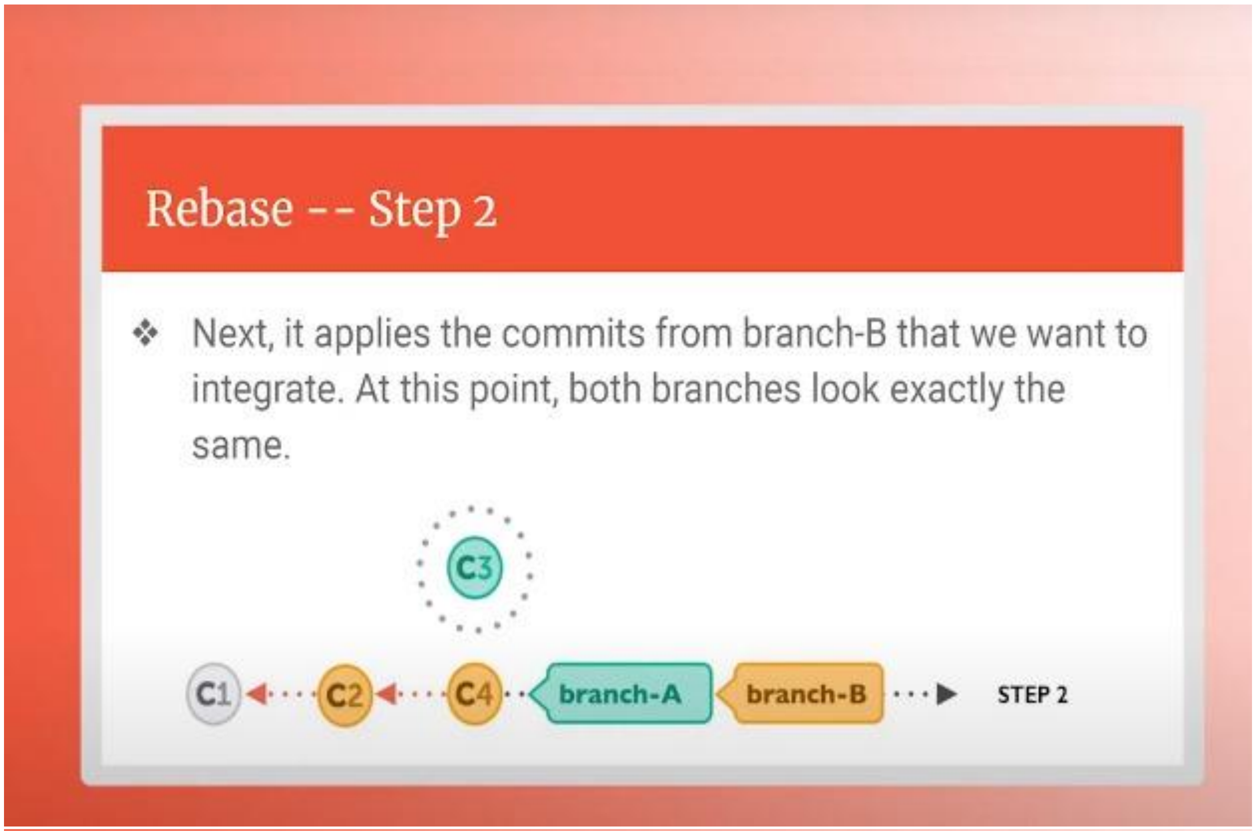
Rebase -- Step 1

- First, Git will “undo” all commits on branch-A that happened after the lines began to branch out (after the common ancestor commit).
- However, of course, it won’t discard them: instead you can think of those commits as being “saved away temporarily”.

Rebase -- Step 1

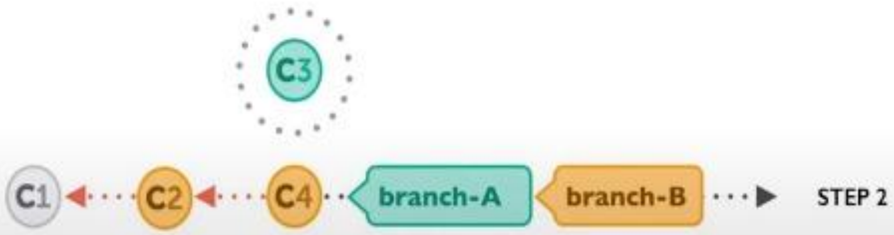
- Undo all commits on branch-A after common ancestor

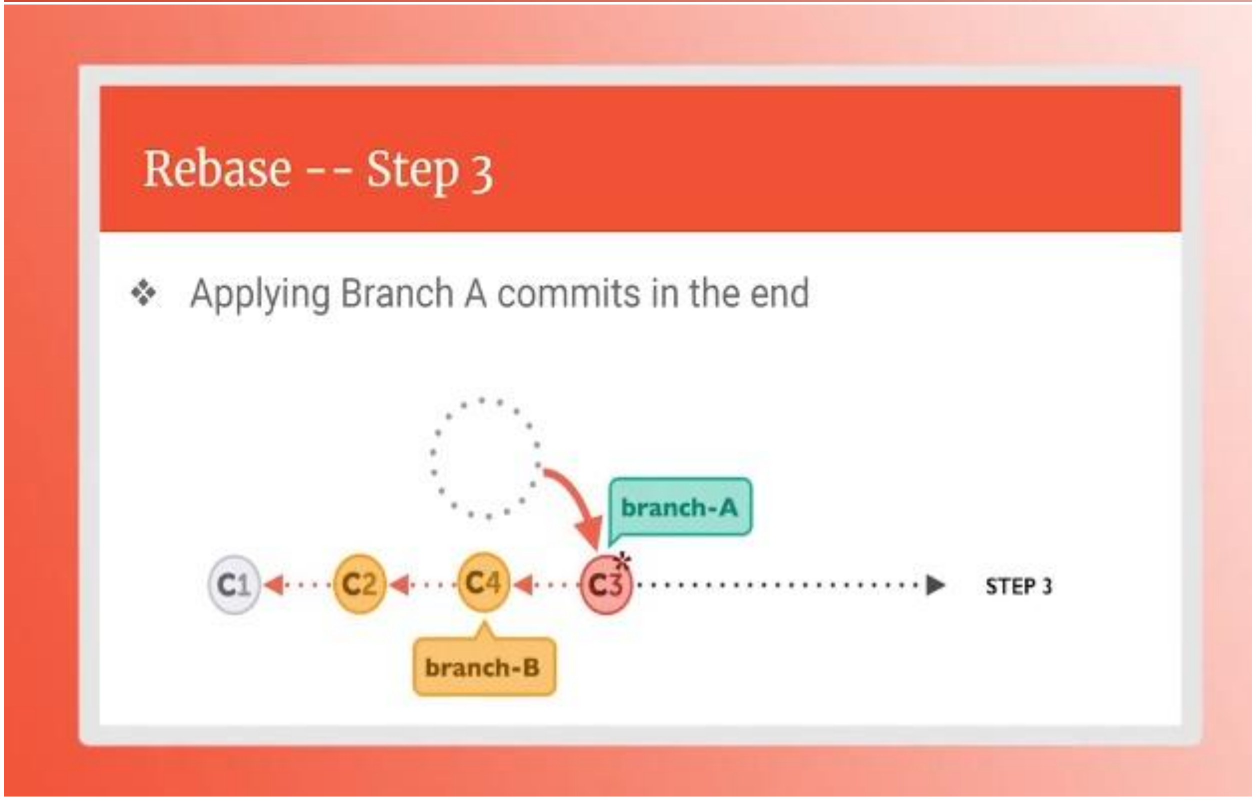




Rebase -- Step 2

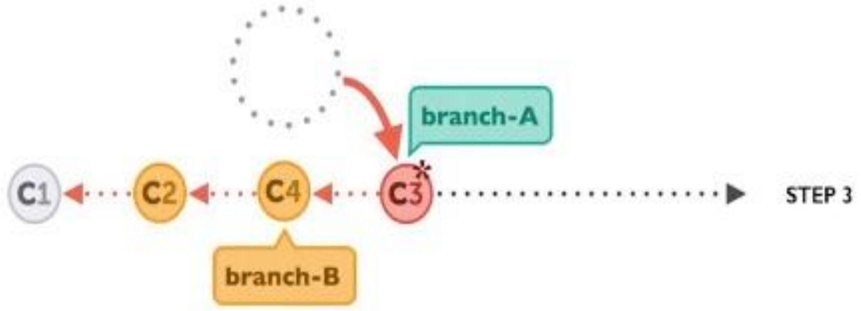
- Next, it applies the commits from branch-B that we want to integrate. At this point, both branches look exactly the same.

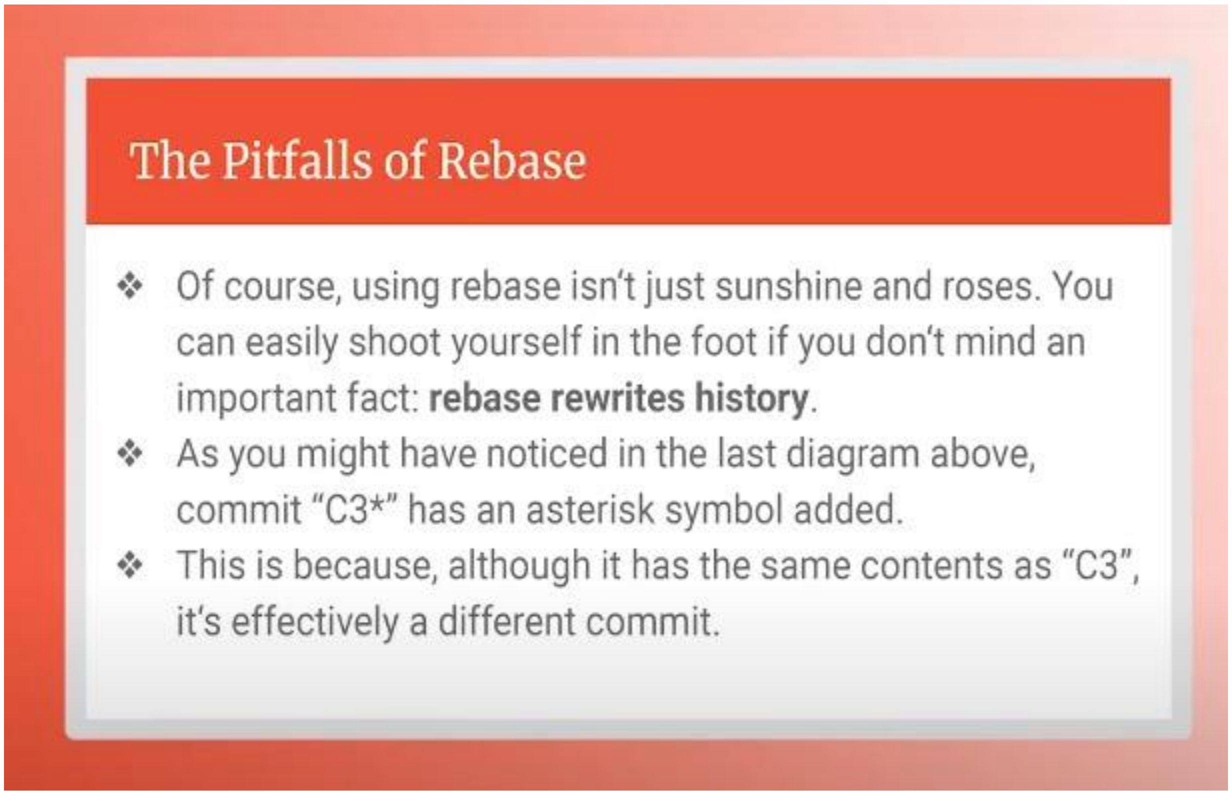




Rebase -- Step 3

- Applying Branch A commits in the end





The Pitfalls of Rebase

- Of course, using rebase isn't just sunshine and roses. You can easily shoot yourself in the foot if you don't mind an important fact: **rebase rewrites history**.
- As you might have noticed in the last diagram above, commit "C3*" has an asterisk symbol added.
- This is because, although it has the same contents as "C3", it's effectively a different commit.