

Rebase after base

Learn how to master git
rebase

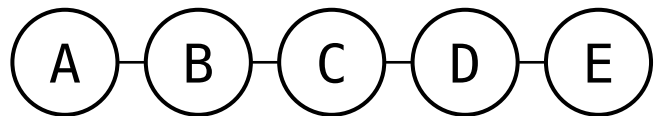
Hugo ARNAL



What is a rebase?

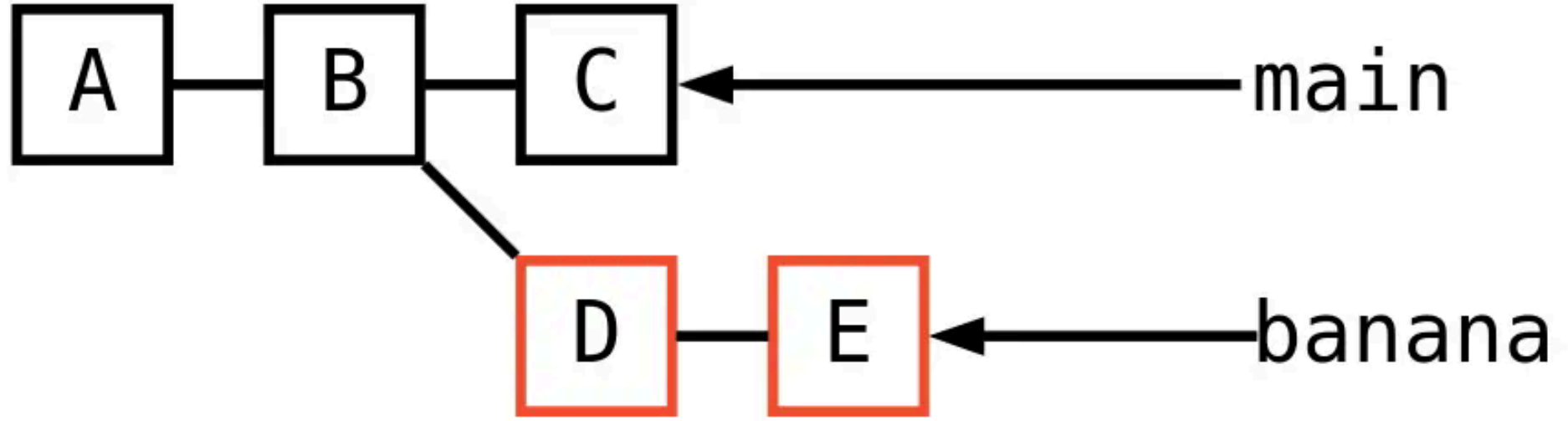


Commits

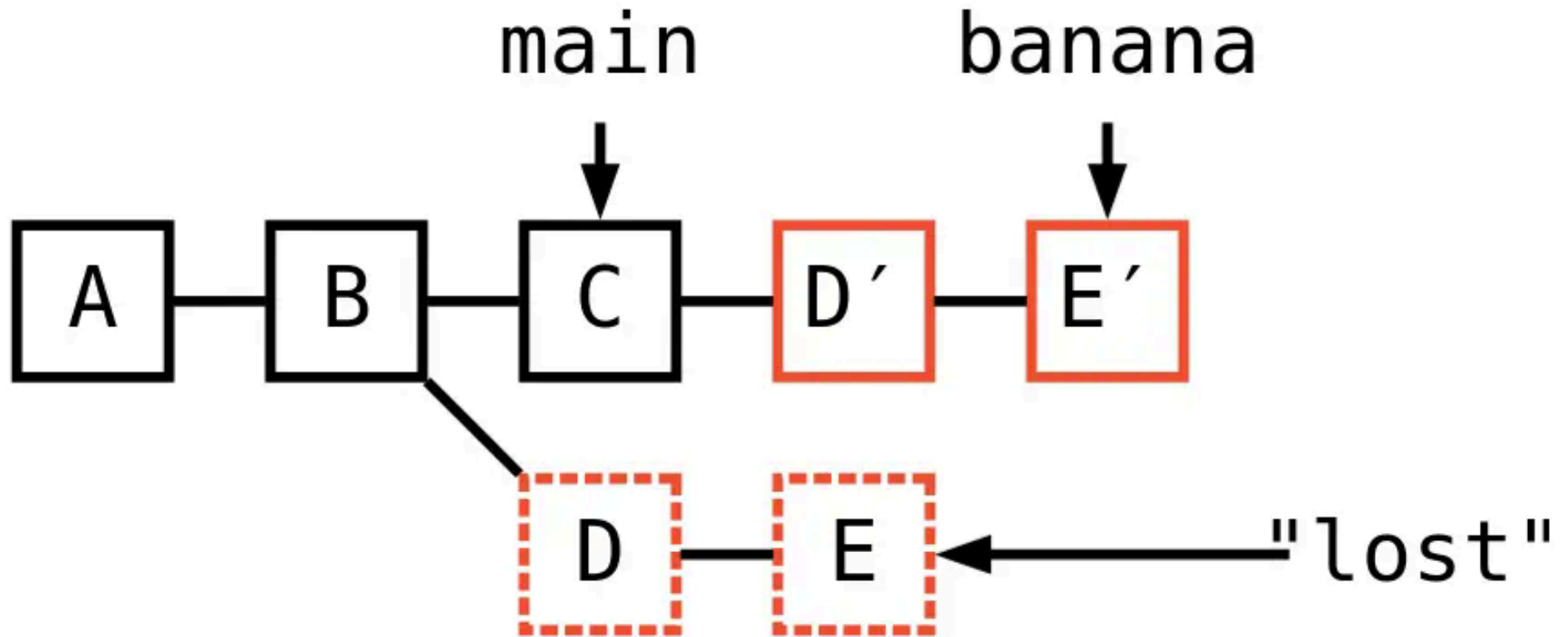


From left → right

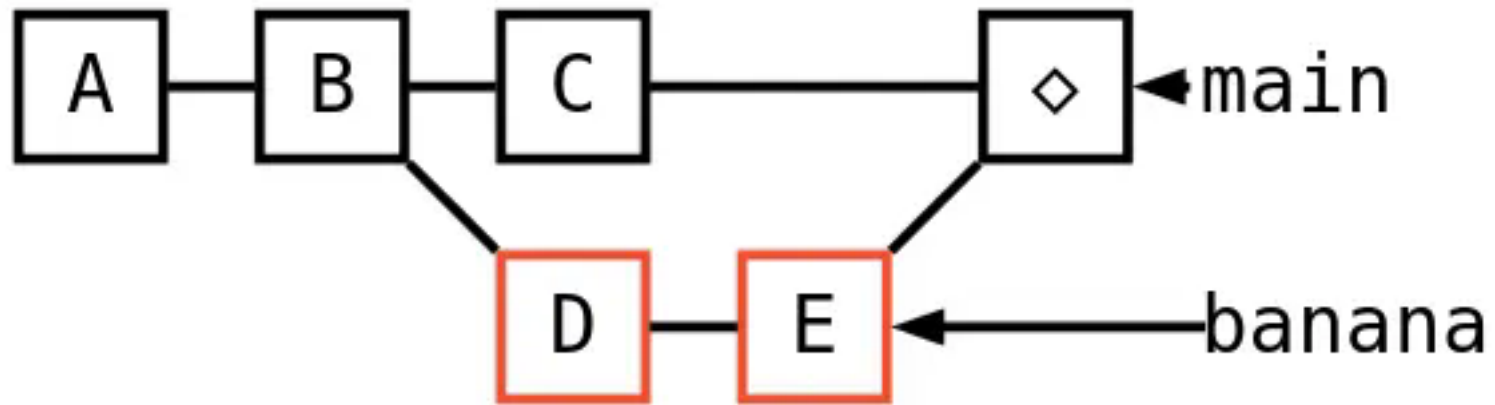
Branches



Rebase



Merging



Warning

Using `git rebase` will lead to use `git push --force`
which is EXTREMELY dangerous.

Full control with interactive mode

`git rebase -i main~50` (50 last commits since main)

```
git rebase -i main~15

1 pick f8f68b5 # Revert "fix: infinite component link loop w/tests"
2 pick 81766df # test: reintroduce infinite loop tests [skip ci]
3 pick 20fec53 # fix: infinite computation loop
4 pick ce8998b # test: advanced 4081 and
5 pick 15f8bb6 # test: advanced xor, not gates (4030, 4069)
6 pick 42d2aaf # [FIX] 4017
7 pick 05d32bb # test: advanced and, or, not gates
8 pick 2512a90 # test: updated 4017 johnson with new behavior
9 pick 3df77de # fix (4094): try storing into the right pins
10 pick 872b9f7 # ref: remove 'dynamic_cast' usage
11 pick 9f9c977 # fix: multiple linked components returns undefined
12 pick 7c4086c # [FIX] maybe the final 4514 fix
13 pick 83ebce0 # ref: remade the whole 4094 shift component
14 pick 0c0bd9c # docs: architecture
15 pick 8b61b6a # docs: README
16
17 # Rebase 1e28658..8b61b6a onto 1e28658 (15 commands)
18 #
19 # Commands:
20 # p, pick <commit> = use commit
21 # r, reword <commit> = use commit, but edit the commit message
22 # e, edit <commit> = use commit, but stop for amending
23 # s, squash <commit> = use commit, but meld into previous commit
24 # f, fixup [-C | -c] <commit> = like "squash" but keep only the previous
25 #   commit's log message, unless -C is used, in which case
26 #   keep only this commit's message; -c is same as -C but
27 #   opens the editor
28 # x, exec <command> = run command (the rest of the line) using shell
29 # b, break = stop here (continue rebase later with 'git rebase --continue')
30 # d, drop <commit> = remove commit
31 # l, label <label> = label current HEAD with a name
32 # t, reset <label> = reset HEAD to a label
33 # m, merge [-C <commit> | -c <commit>] <label> [# <oneline>]
34 #   create a merge commit using the original merge commit's
35 #   message (or the oneline, if no original merge commit was
36 #   specified); use -c <commit> to reword the commit message
37 # u, update-ref <ref> = track a placeholder for the <ref> to be updated
38 #   to this position in the new commits. The <ref> is
39 #   updated at the end of the rebase
40 #
41 # These lines can be re-ordered; they are executed from top to bottom.
42 #
43 # If you remove a line here THAT COMMIT WILL BE LOST.
44
~/code/y2/nanotekspice/.git/rebase-merge/git-rebase-todo" 46L, 2227B
```


Full control with interactive mode

- Step 1: do not `panic!()`
- Step 2: `git config --global core.editor vim`
- Step 3: let's analyse this

Full control with interactive mode

- Your commits are listed from oldest to newest
- By default, they're all in “pick” mode: essentially does not touch the commit.

```
git rebase -i main~15

1 pick f8f68b5 # Revert "fix: infinite component link loop w/tests"
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3 pick 20fee53 # fix: infinite computation loop
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33 # m, merge [-C <commit> | -c <commit>] <label> [# <oneline>]
34 #                        create a merge commit using the original merge commit's
35 #                        message (or the oneline, if no original merge commit was
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"/code/y2/nanotekspice/.git/rebase-merge/git-rebase-todo" 46L, 2227B
```

Full control with interactive mode

- Change the content of a commit by replacing “pick” with “edit”

```
hugo@chicago ~/code/y2/nanotekspice > git rebase -i main~15
Stopped at 81766df... # test: reintroduce infinite loop tests [skip ci]
You can amend the commit now, with

    git commit --amend

Once you are satisfied with your changes, run

    git rebase --continue
hugo@chicago ~/code/y2/nanotekspice > gst
interactive rebase in progress; onto 1e28658
Last commands done (2 commands done):
    pick f8f68b5 # Revert "fix: infinite component link loop w/tests"
    edit 81766df # test: reintroduce infinite loop tests [skip ci]
Next commands to do (13 remaining commands):
    pick 20fec53 # fix: infinite computation loop
    pick ce8998b # test: advanced 4081 and
    (use "git rebase --edit-todo" to view and edit)
You are currently editing a commit while rebasing branch 'main' on '1e28658'
    (use "git commit --amend" to amend the current commit)
    (use "git rebase --continue" once you are satisfied with your changes)

nothing to commit, working tree clean
hugo@chicago ~/code/y2/nanotekspice > █
```

```
hugo@chicago ~/code/y2/nanotekspice > gst
interactive rebase in progress; onto 1e28658
Last commands done (2 commands done):
    pick f8f68b5 # Revert "fix: infinite component link loop w/tests"
    edit 81766df # test: reintroduce infinite loop tests [skip ci]
Next commands to do (13 remaining commands):
    pick 20fec53 # fix: infinite computation loop
    pick ce8998b # test: advanced 4081 and
    (use "git rebase --edit-todo" to view and edit)
You are currently editing a commit while rebasing branch 'main' on '1e28658'.
    (use "git commit --amend" to amend the current commit)
    (use "git rebase --continue" once you are satisfied with your changes)

Changes not staged for commit:
    (use "git add <file>..." to update what will be committed)
    (use "git restore <file>..." to discard changes in working directory)
        modified:   Makefile

no changes added to commit (use "git add" and/or "git commit -a")
hugo@chicago ~/code/y2/nanotekspice > git add .
hugo@chicago ~/code/y2/nanotekspice > git commit --amend -m "modified commit"
[detached HEAD 3eb0e14] modified commit
Date: Mon Mar 2 13:13:31 2026 +0100
3 files changed, 9 insertions(+)
create mode 100644 tests/snes/files/other/simple_infinite_loop.nts
hugo@chicago ~/code/y2/nanotekspice > git rebase --continue
Successfully rebased and updated refs/heads/main.
```

Success!

```
commit 3eb0e14da2ec258754076d7112f204f1a3ff9c55
```

```
Author: Hugo ARNAL <hugo@hugoarnal.com>
```

```
Date: 2026-03-02 13:13:31 +0100
```

```
modified commit
```

```
commit f8f68b592518907f61d4bdcd30ed5076edc0b86e
```

```
Author: Hugo ARNAL <hugo@hugoarnal.com>
```

```
Date: 2026-03-02 13:03:52 +0100
```

```
Revert "fix: infinite component link loop w/tests"
```

```
This reverts commit 5874cfe0b4794e22a2ad2d91f2779b17d9237b95.
```

```
commit 1e28658a92f00254b12beae2784eaa1f9d52442d
```

```
Author: Hugo ARNAL <hugo@hugoarnal.com>
```

```
Date: 2026-03-03 11:08:17 +0100
```

```
test: updated 4514 decoder
```

Full control with interactive mode

- Squash commits to clean your history

```
git checkout -b squash
for c in H e l l o ' ' w o r l d; do
    echo "$c" >> squash.txt
    git add squash.txt
    git commit -m "Add '$c' to squash.txt"
done
```

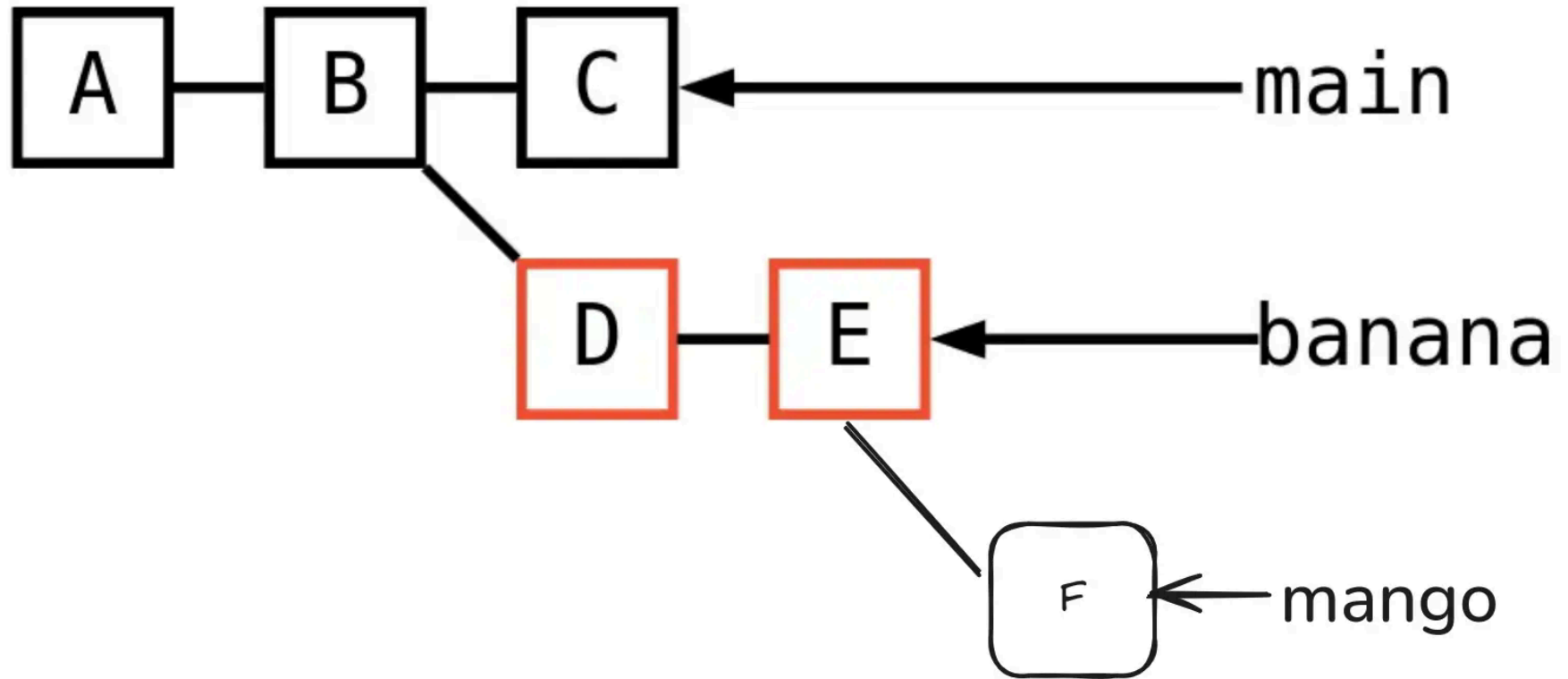
Source: git-rebase.io

- Replacing all picks (except the first one) with squash

```
pick 1e85199 Add 'H' to squash.txt
squash fff6631 Add 'e' to squash.txt
squash b354c74 Add 'l' to squash.txt
squash 04aaf74 Add 'l' to squash.txt
squash 9b0f720 Add 'o' to squash.txt
squash dc158cd Add ' ' to squash.txt
squash dfcf9d6 Add 'w' to squash.txt
squash 7a85f34 Add 'o' to squash.txt
squash c275c27 Add 'r' to squash.txt
squash a513fd1 Add 'l' to squash.txt
squash 6b608ae Add 'd' to squash.txt
```

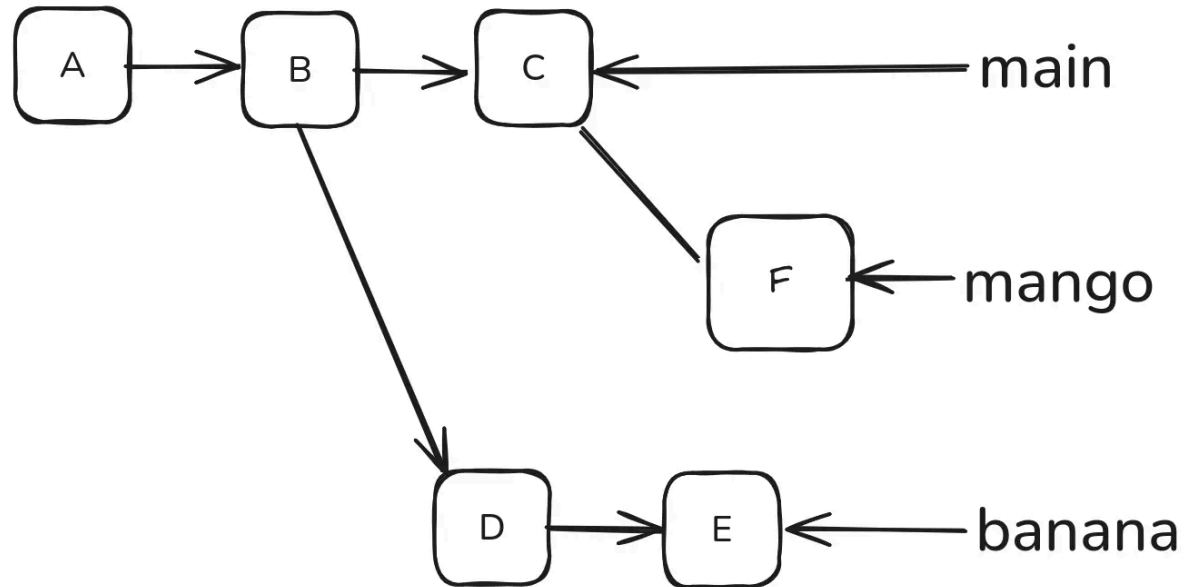
- This will create a singular commit with all the content from the other commits.

Rebasing to... rebase!



Rebasing to... rebase!

Let's say mango doesn't need to depend on banana to be merged in main.

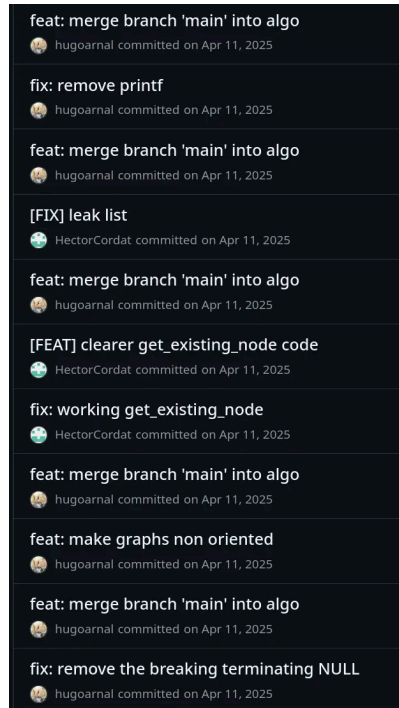


Bunch of other features

- Using `git rebase --autosquash`
- Splitting one commit into several
- Reordering commits
- Resolving conflicts

Why use git rebase?

- Cleaner git history (prevent merge commits)



Why use git rebase?

- More control over your git history

Editing and controlling the git history of your branch is usually essential when working on open source projects.

Why use git rebase?

- Features are clearer when getting reviewed

Question: as a PR reviewer, which one do you find clearer?

1.

- feat: new feature
- fix: feature
- ref: change how feature works
- imp: respect coding style
- Merge branch "main"
- fix: new changes with main branch
- feat: another important feature

2.

- feat: new feature
- feat: another important feature

When you should NOT use git rebase

- Two people working on the same branch

Pushing with `--force` might delete some work

An alternative to it is `git push --force-with-lease`
but retains dangerous

When you should NOT use git rebase

- Rewriting the history of an already pushed branch

I recommend to prevent this by setting rules on your branches (unfortunately can't be done on Epitech repos, except for mirrors).

In resume

- Use `git rebase` to maintain a clean history

Cleaner history makes code reviews easier in general.

- Do not use rebases when working with other people on the same branch (usually).

Because you will use `git push --force` which is ⚠
DANGEROUS ⚠

Going further?

git history landing in Git 2.54!

A safer way to just modify commit messages,
without rebasing.

[See an example](#)

Sources

Useful tutorials:

- <https://git-rebase.io>
- <https://learngitbranching.js.org>

- <https://git-scm.com/cheat-sheet.pdf>
- <https://jvns.ca/blog/2023/11/06/rebasing-what-can-go-wrong->
- <https://github.blog/open-source/git/highlights-from-git-2-54/>
- <https://git-scm.com/docs/git-history/2.54.0>
- <https://front-end.social/@stefan/116441339289854563>

Slides

<https://github.com/hugoarnal/talks>