Software Engineering at MPRI
Advanced tutorial on git, and its extensions

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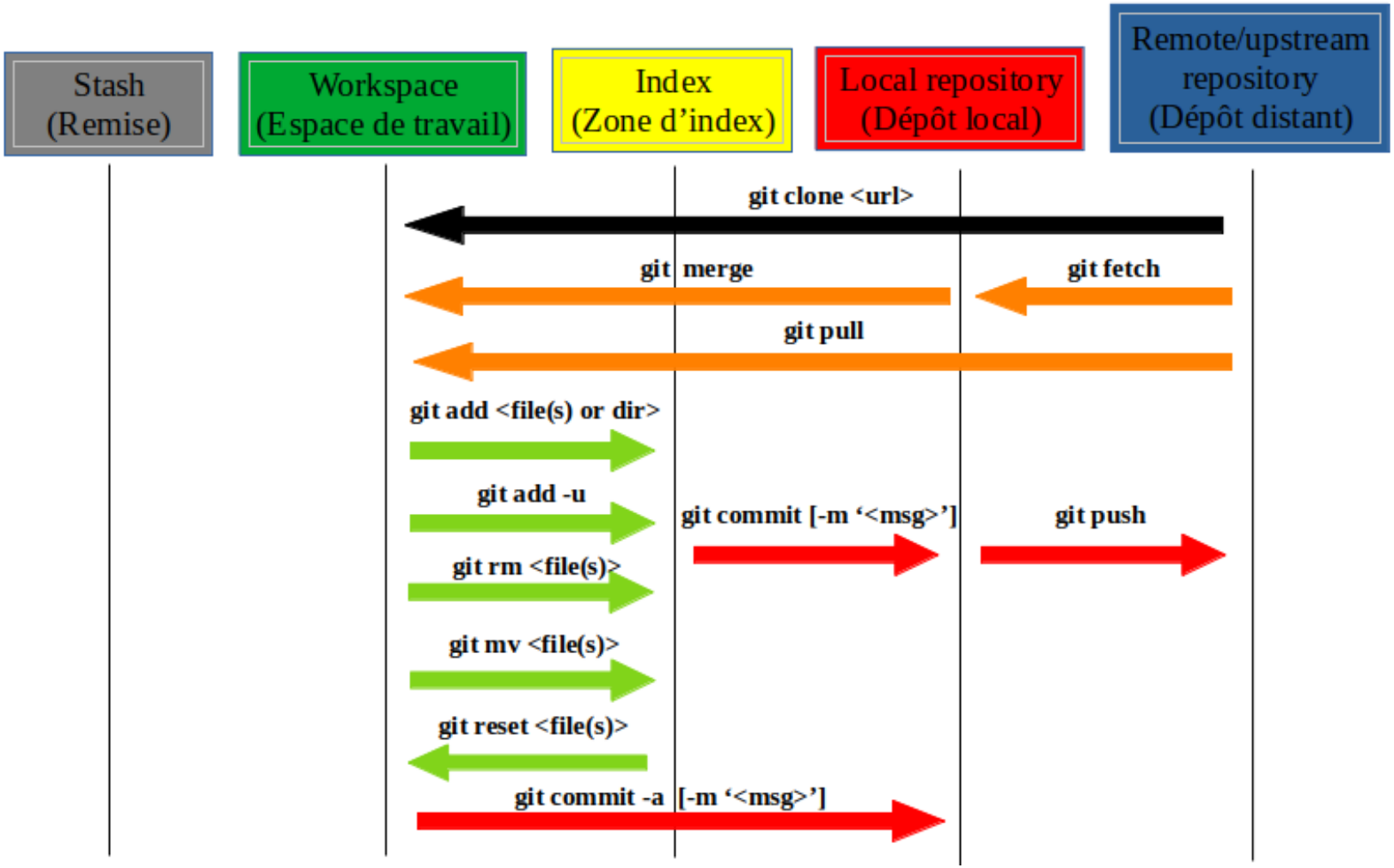
December 6, 2020

Remember


Stash
(Remise)
Workspace
(Espace de travail)
Index
(Zone d'index)
Local repository
(Dépôt local)
Remote/upstream
repository
(Dépôt distant)
git clone <url>
git merge
git fetch
git pull
git add <file(s) or dir>
git add -u
git commit [-m '<msg>']
git push
git rm <file(s)>
git mv <file(s)>
git reset <file(s)>
git commit -a [-m '<msg>']

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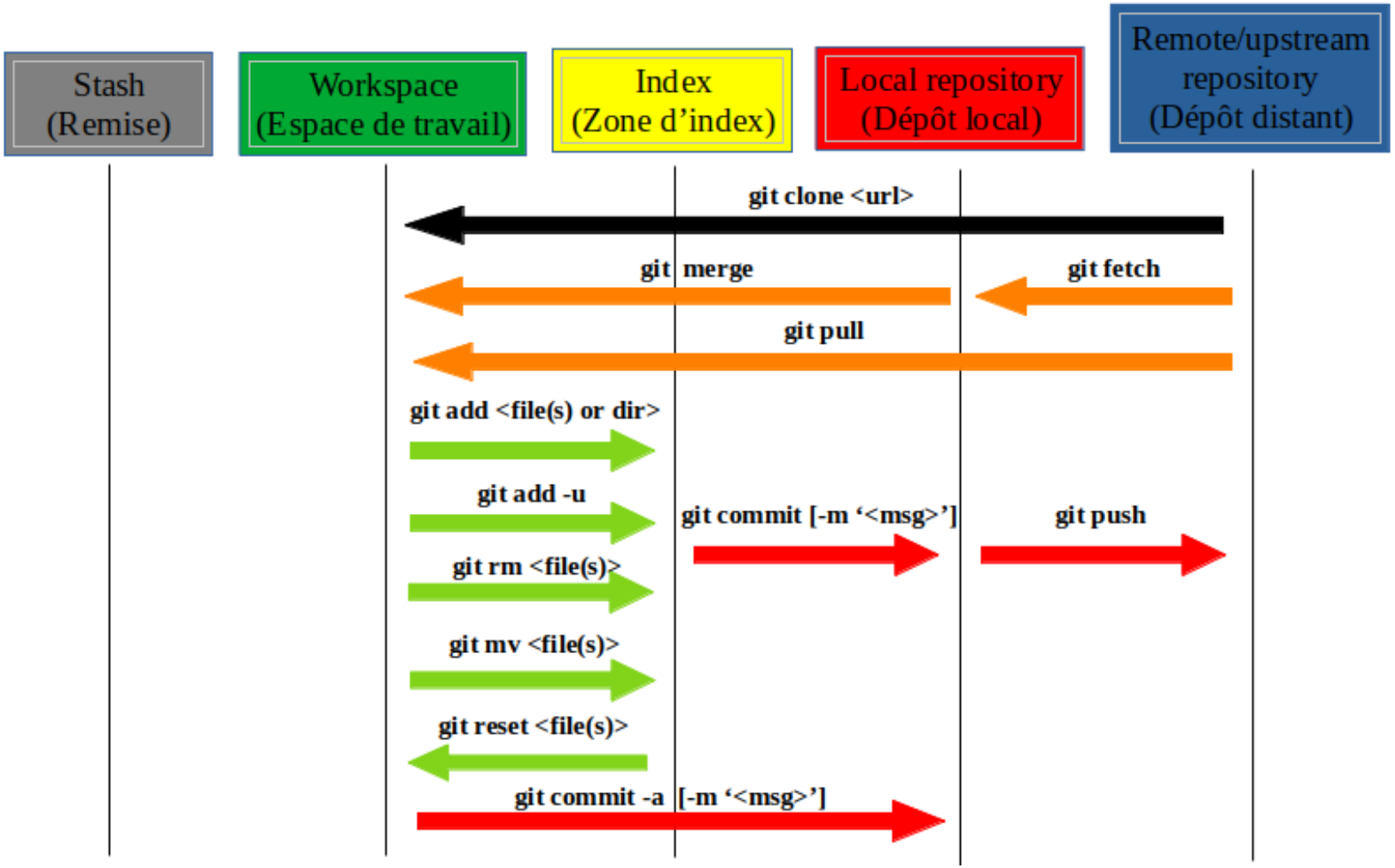

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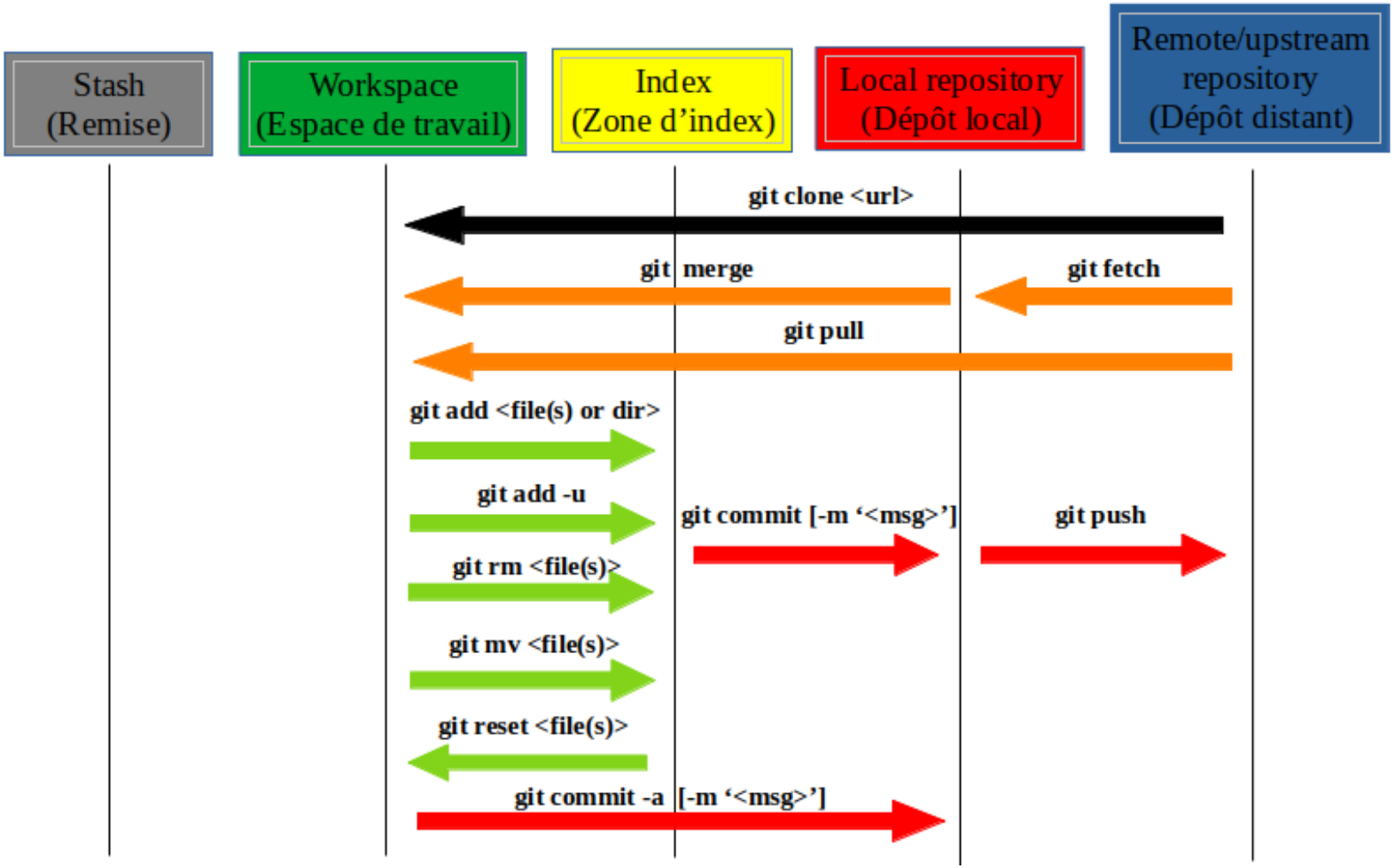

- too easier...
- ... because sometimes we have some difficult problems!

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  Switch between your 2 only branches.

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- Don't forget the manual: `man git <...>`

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- Don't forget the manual: `man git <...>`
- Don't forget the bible: `https://git-scm.com/book/en/v2`

Sommaire

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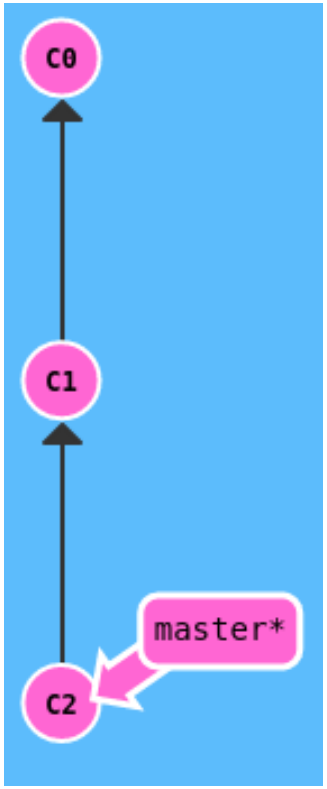
`HEAD` is a special pointer to the branch we are currently working on.

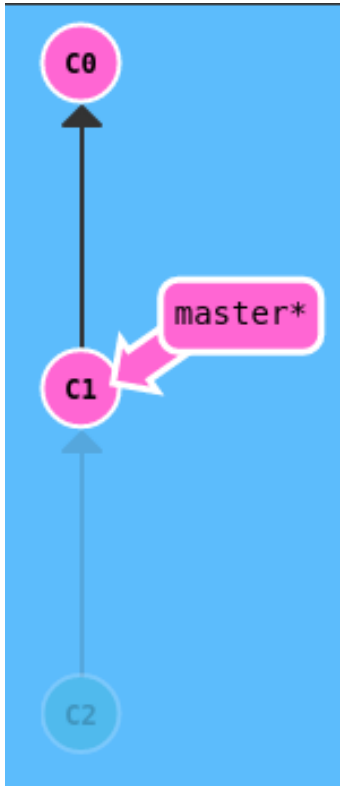
- `HEAD`: the current branch
- `HEAD^`: the parent of HEAD
- `HEAD~4` : the great-great grandparent of HEAD
- `git branch -f master HEAD~3`: move (forced) the master three-parent branch behind HEAD.

Sommaire

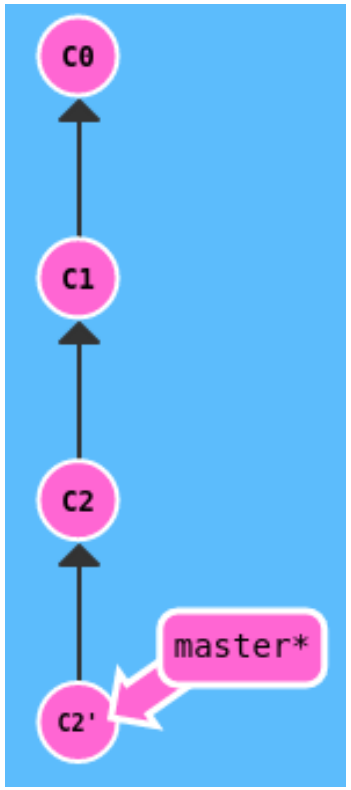
git reset VS git revert



Initial situation



git reset HEAD~1
(rewriting history)



git revert HEAD

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$ git reset <commit>

Revert changes by moving a branch reference backwards in time to an older commit.

In this sense you can think of it as "rewriting history;" git reset will move a branch backwards as if the commit had never been made in the first place.

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Clear staging area, rewrite working tree from specified commit.

WARNING: You must be aware that everything you have coded since the last commit or the last pull will be lost!

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`$ git revert <commit>`

While resetting works great for local branches on your own machine, its method of "rewriting history" doesn't work for remote branches that others are using.

In order to reverse changes and share those reversed changes with others, we need to use git revert.

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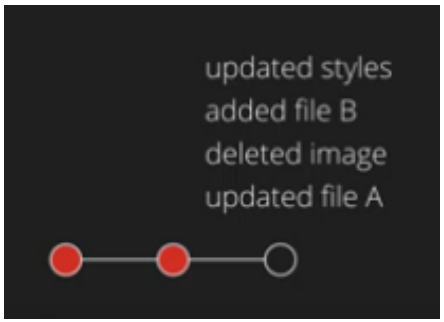

The wonderful world of `git stash`

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Save modified and staged changes.

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`$ git stash show <stash-index>` (Ex. `git stash show 0`)
Show changes.

`$ git stash show -p <stash-index>`
Show changes in full tree-view.

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`$ git stash clear`
Remove all the stash entries.

Sommaire

Git merge

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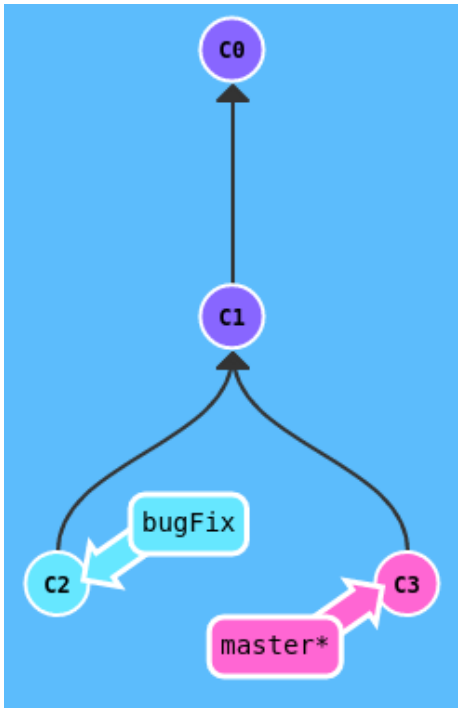
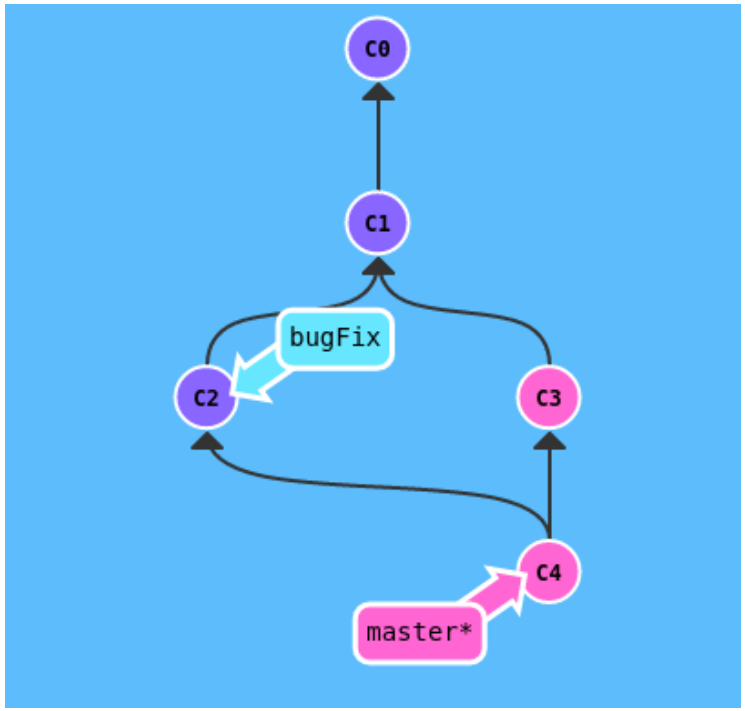
Merge the modifications of a given branch into the current branch (HEAD).



→ `git merge bugFix` →



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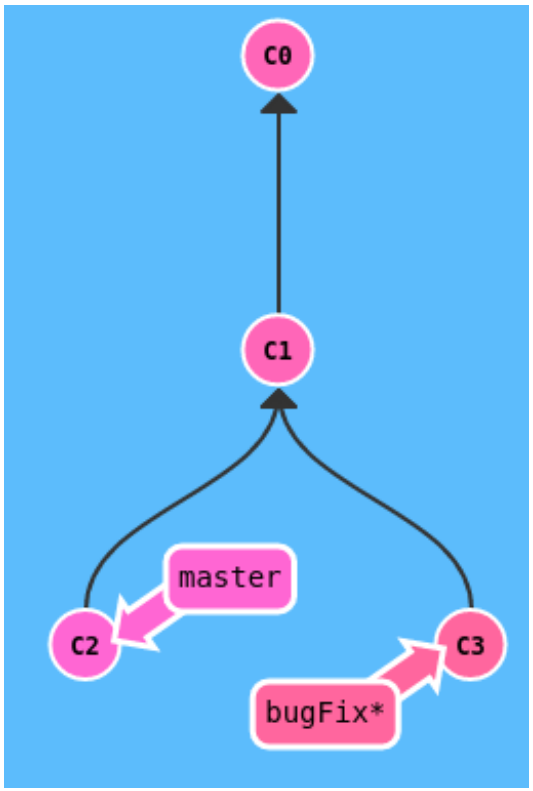
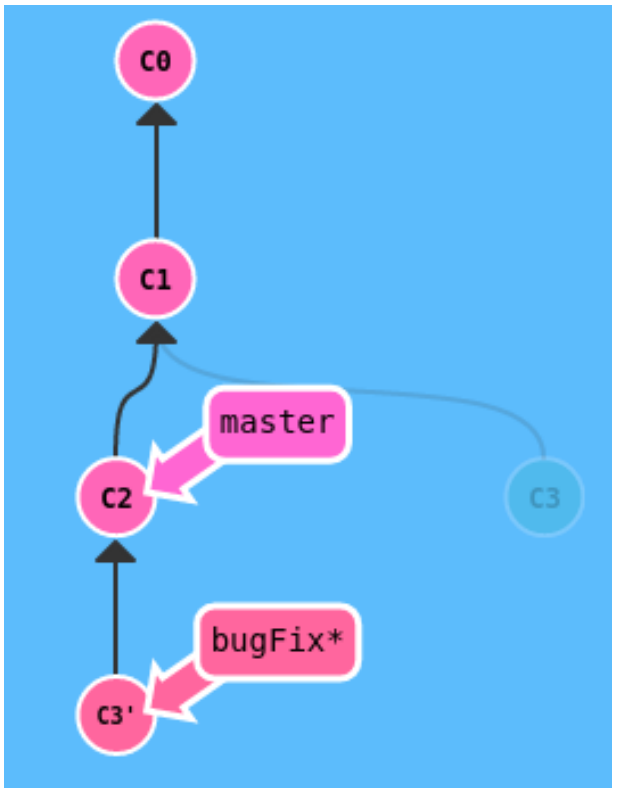


→ `git rebase master` →



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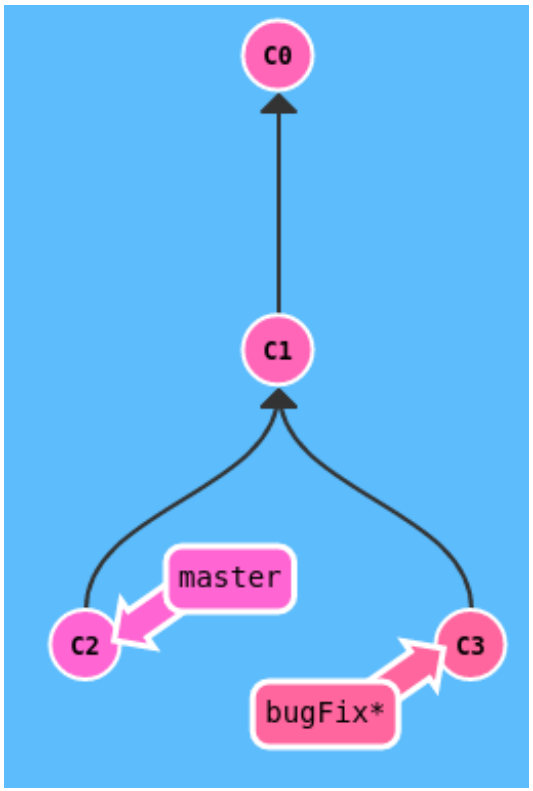

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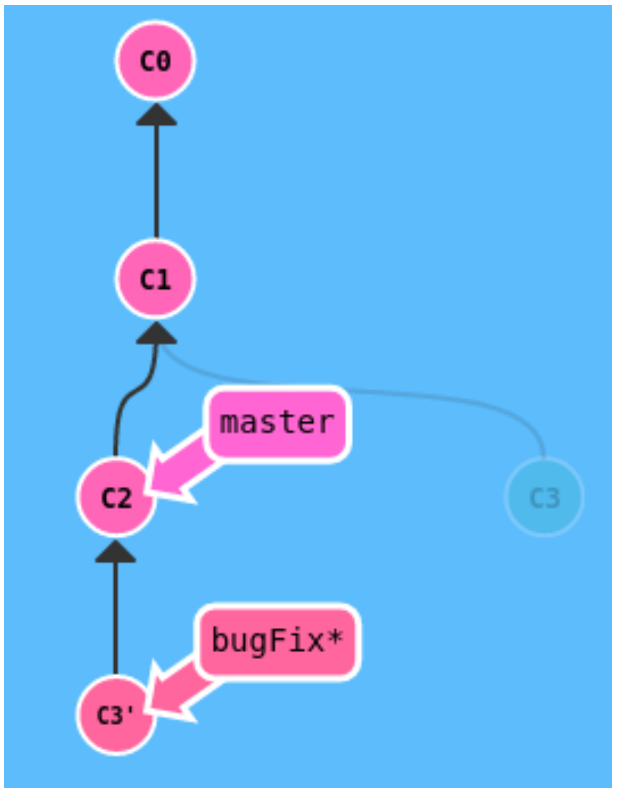

While this sounds confusing, the advantage of rebasing is that it can be used to make a nice linear sequence of commits.

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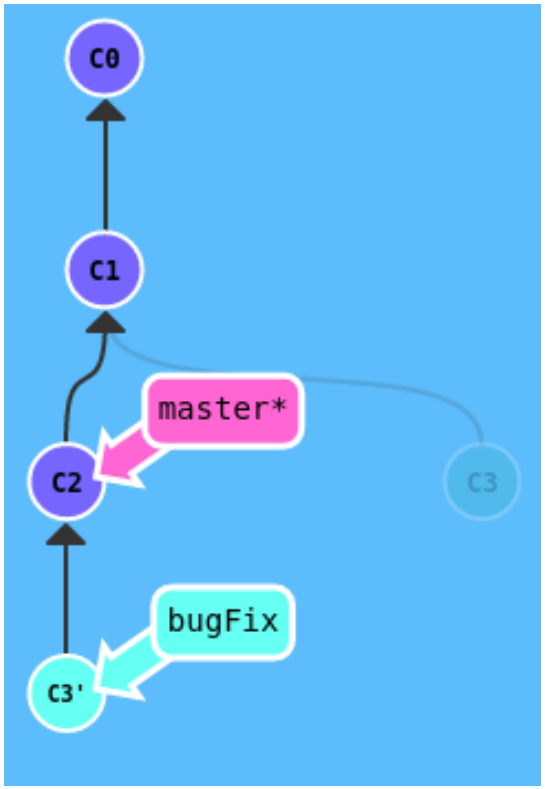

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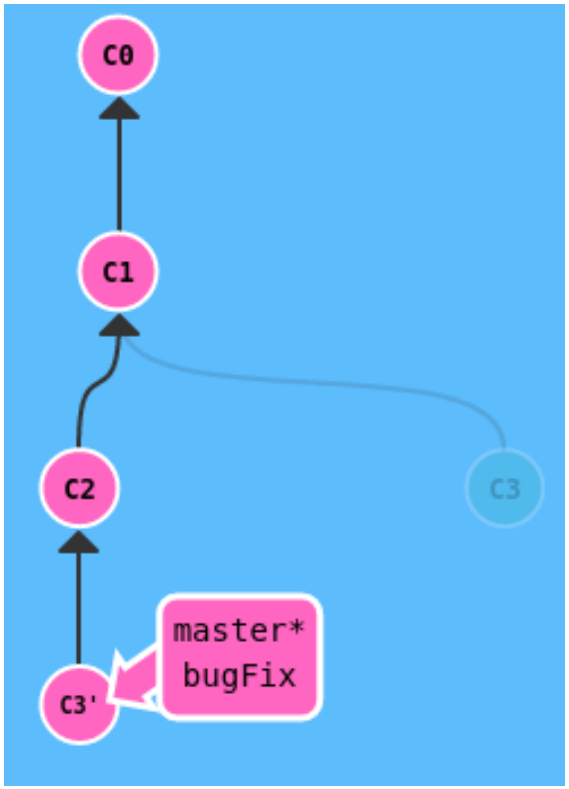

Like `git merge`, no new commit because the branch `master` is an ancestor of the branch `bugFix`.
Note: The commit C3 already exists.

See the difference

- `git pull`
  = `git fetch; git merge origin/my-branch`
- Rebase from a branch: `git rebase <branch-name>`
- In case of conflicts, do after each conflict: `git rebase --continue`
- `git pull --rebase`
  = `git fetch; git rebase origin/my-branch`

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- `git status` returns files that could not be merged (listed as "unmerged")
- To mark conflicts in a resolved `<file>` file, `git add <file>` must be done.

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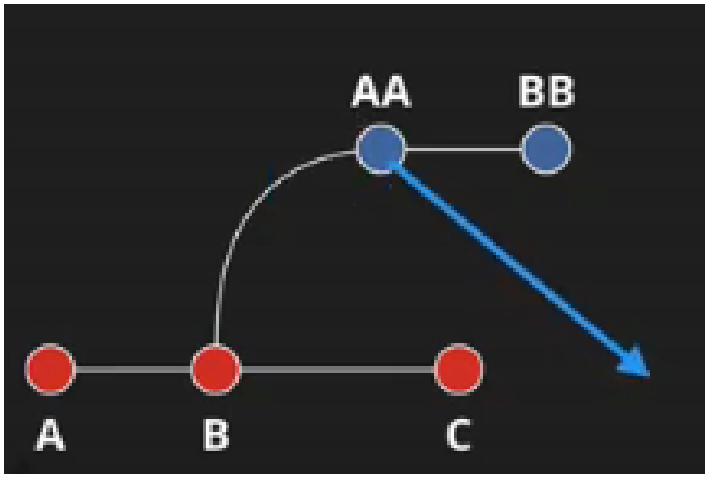
git cherry-pick

It's a very straightforward way of saying that you would like to copy a series of commits below your current location (HEAD).



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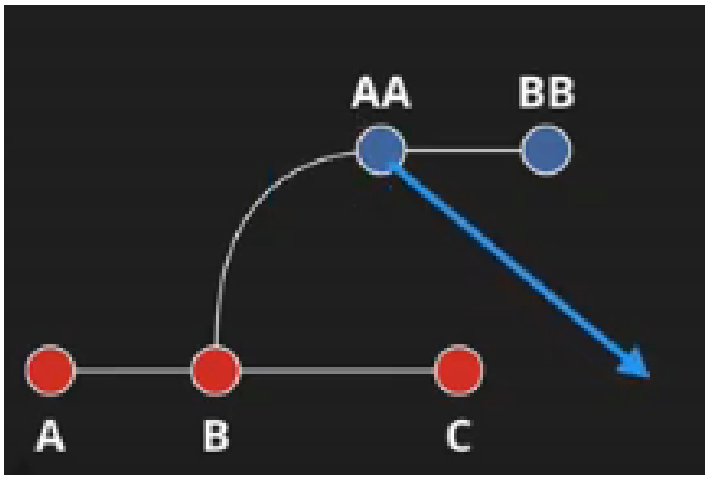

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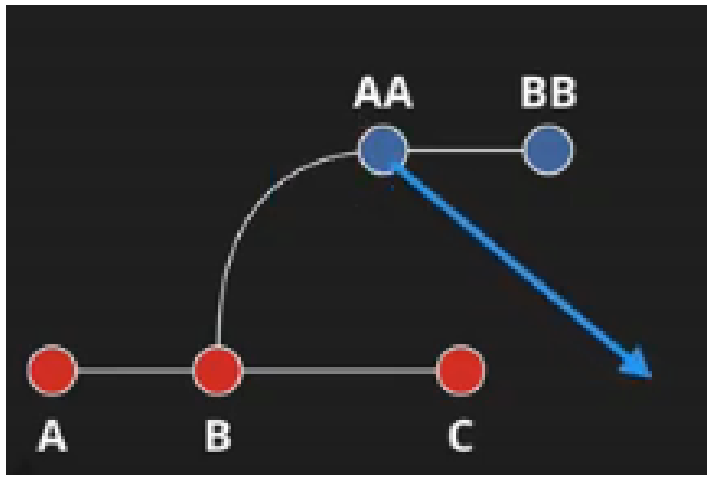

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`$ git cherry-pick <SHA> or <commit-ID> -n`
Don't create a new commit. So you need to do `git commit` after.

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Note : Each time you used `git bisect good/bad`, the current commit is changed, thanks to a dichotomic process.

Exercise

Find and fix the bug that is somewhere here:
`https://github.com/amelieled/GL_bisect_GL_MPRI.git`