



# **Chapter 05**

## **GIT Advanced**

**Open Source SW Development**  
**CSE22300**

# Reset

# The Three Tress

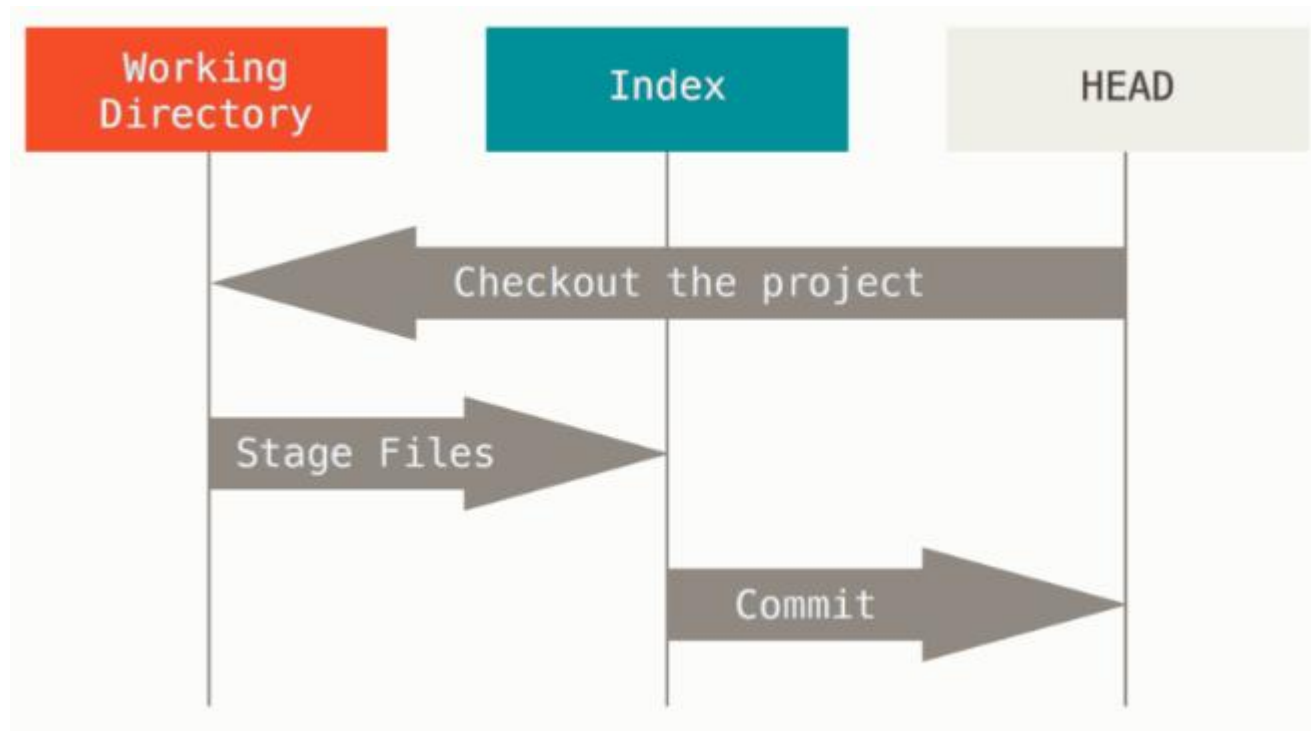
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- **Tree**
  - **Collection of files, not specifically the data structure**

Tree	Role
HEAD	Last commit snapshot, next parent
Index	Proposed next commit snapshot, Staging area
Working Directory	Working Tree, Sandbox, Actual files and directories

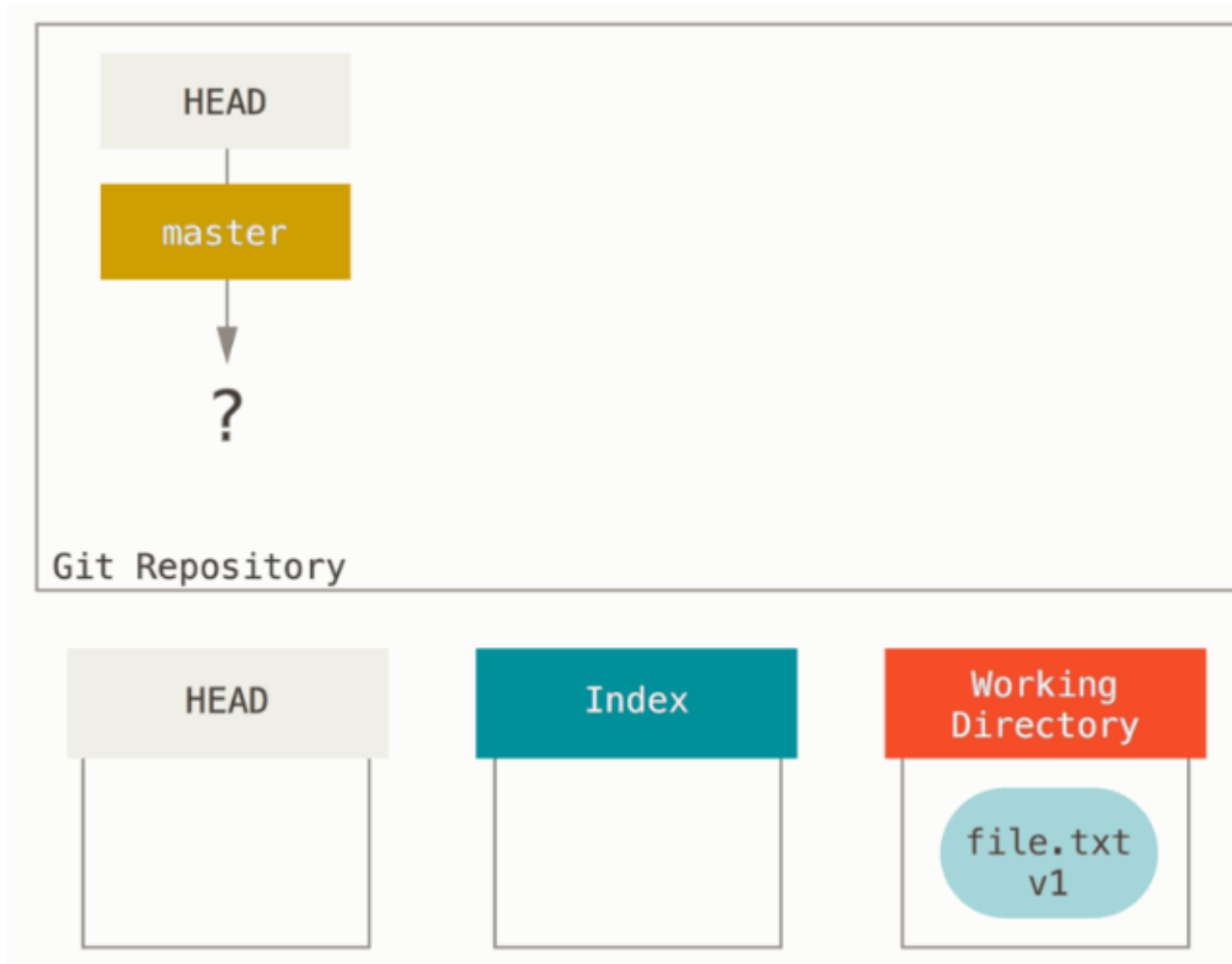
# The Workflows

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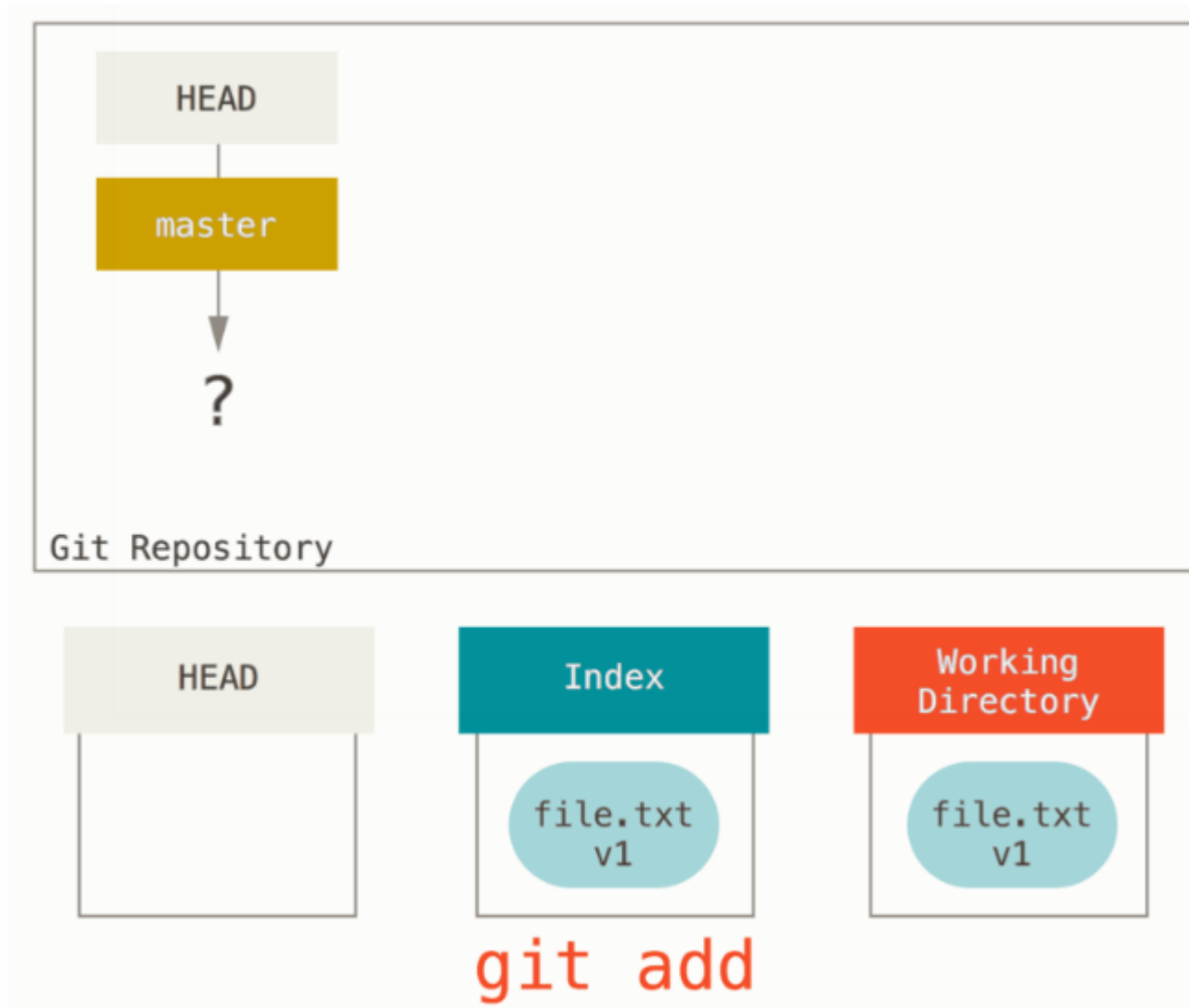


# git init

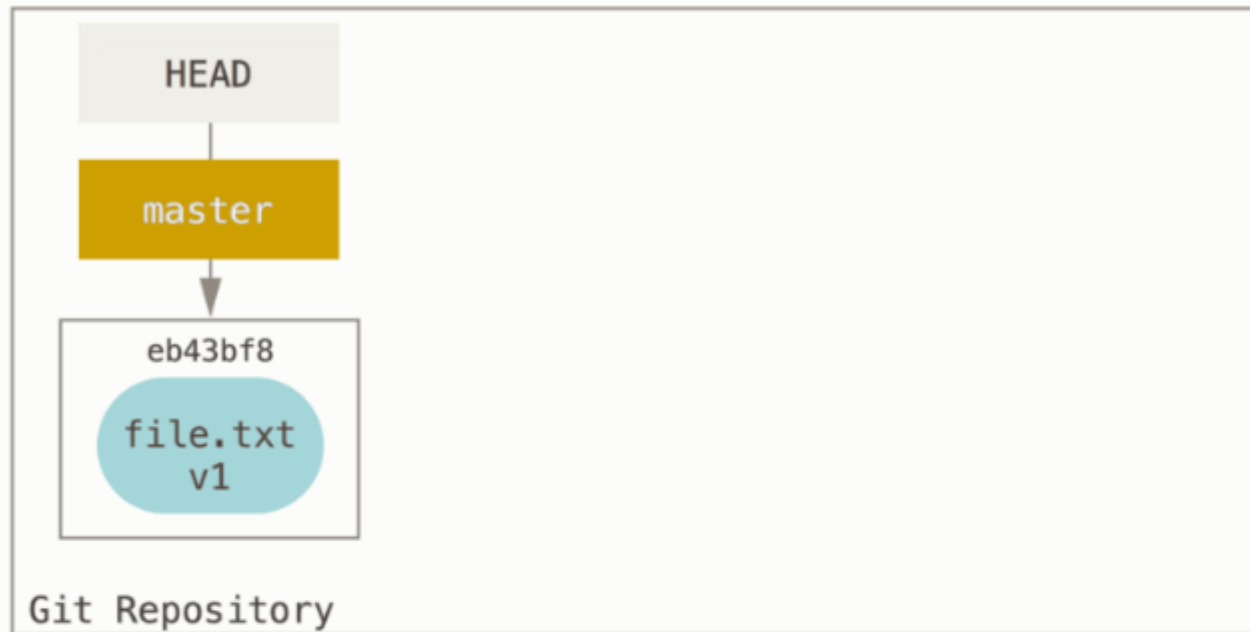
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# git add

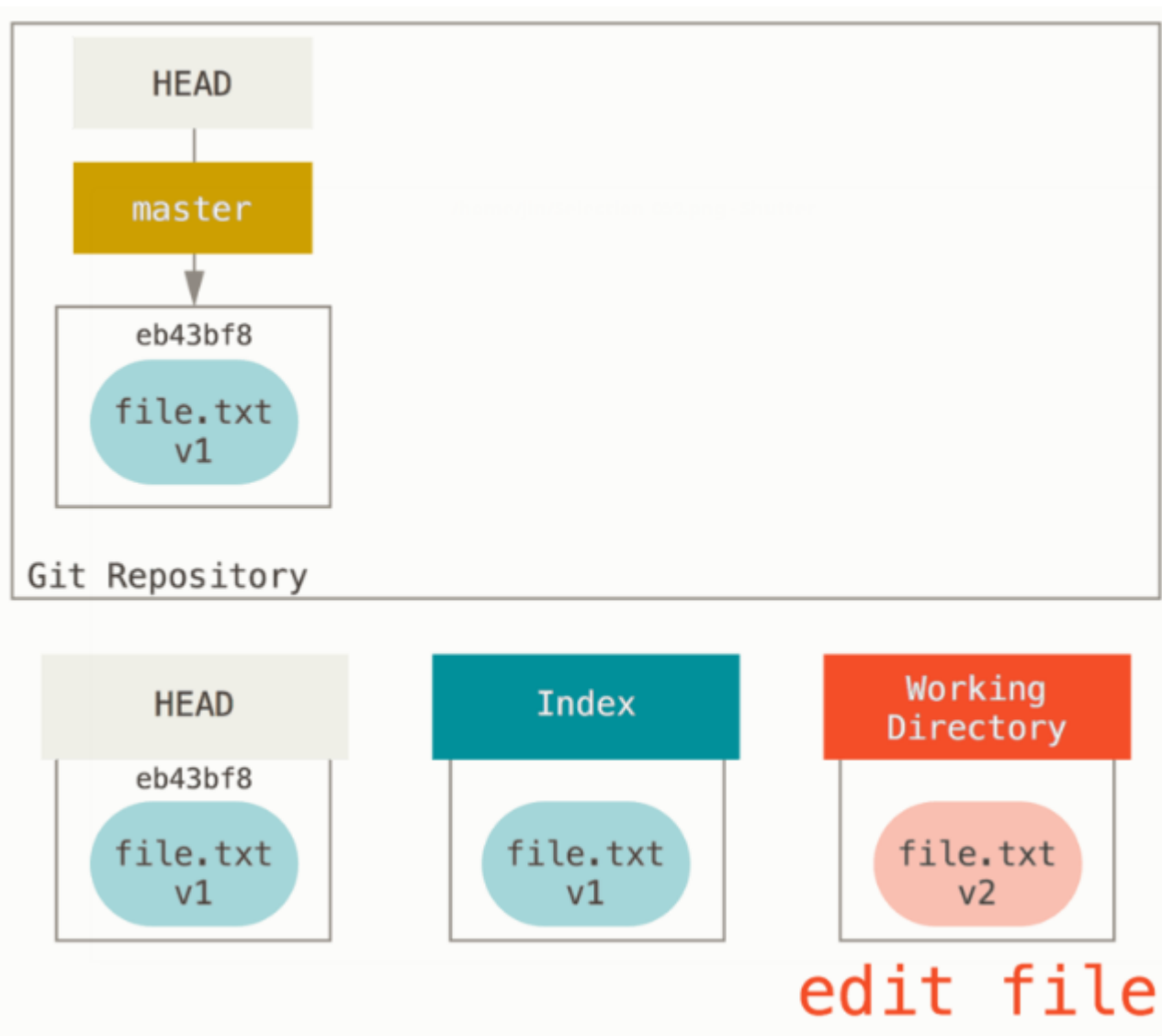


# git commit



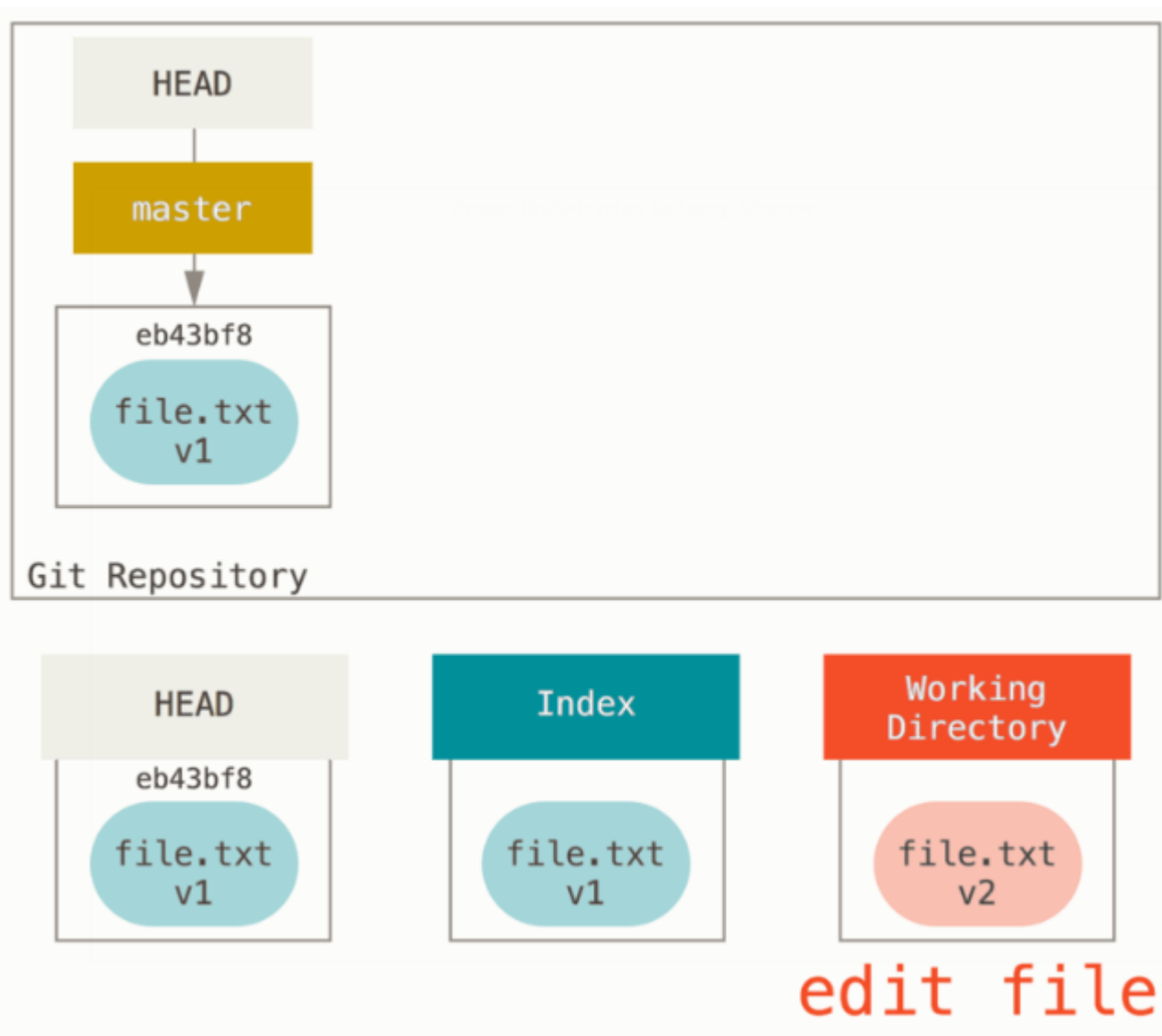
git commit

# edit file

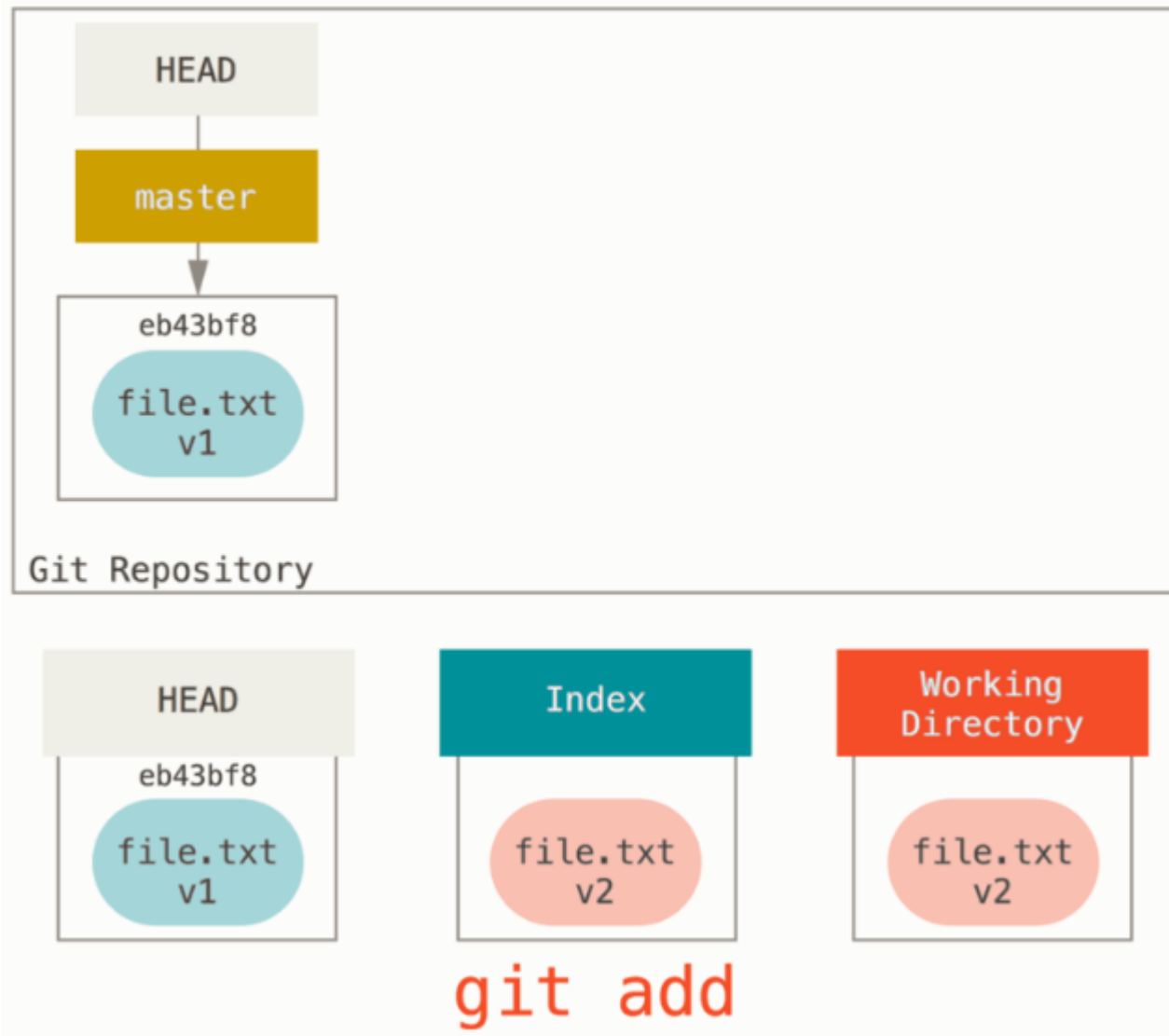




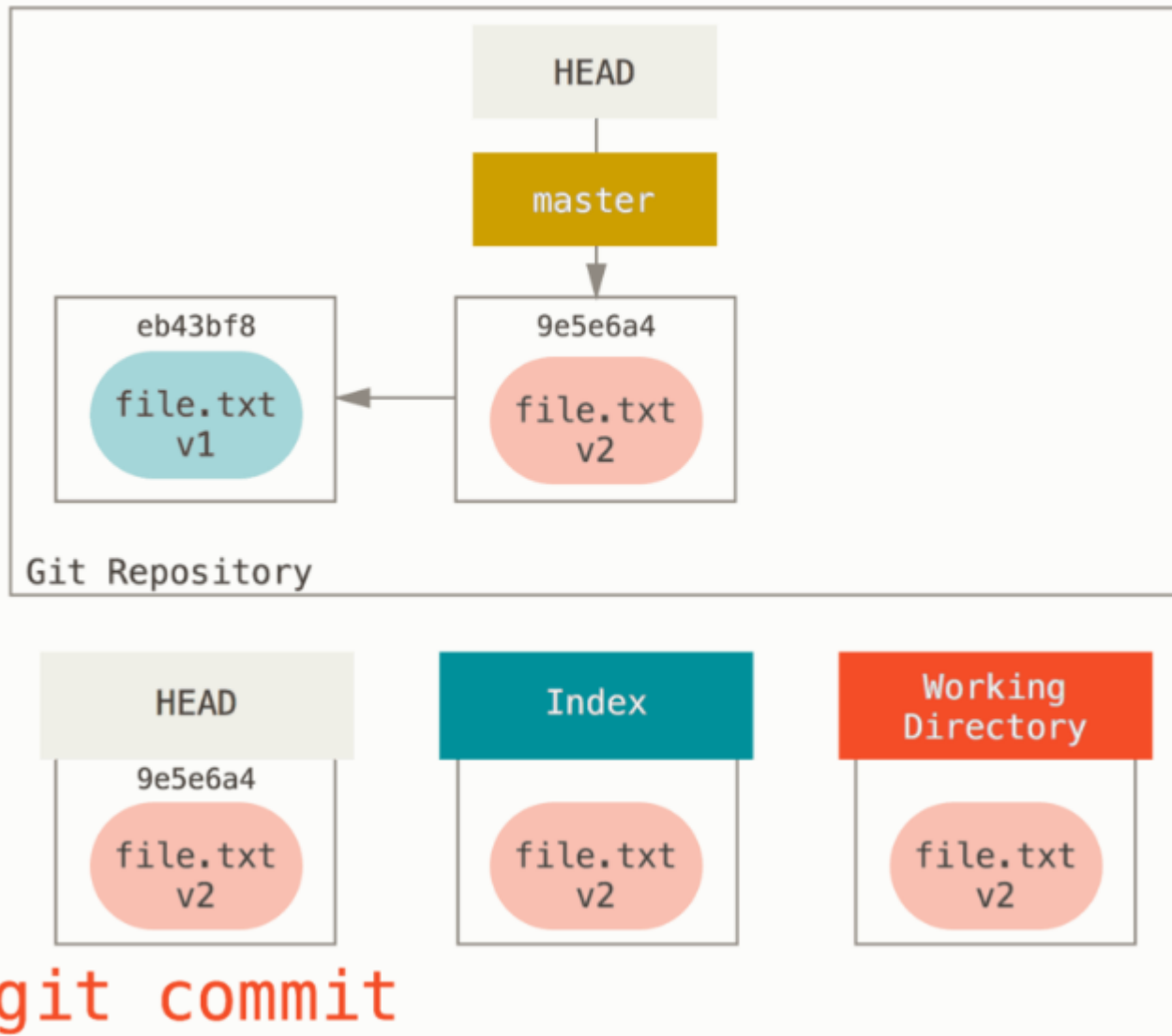
# edit file



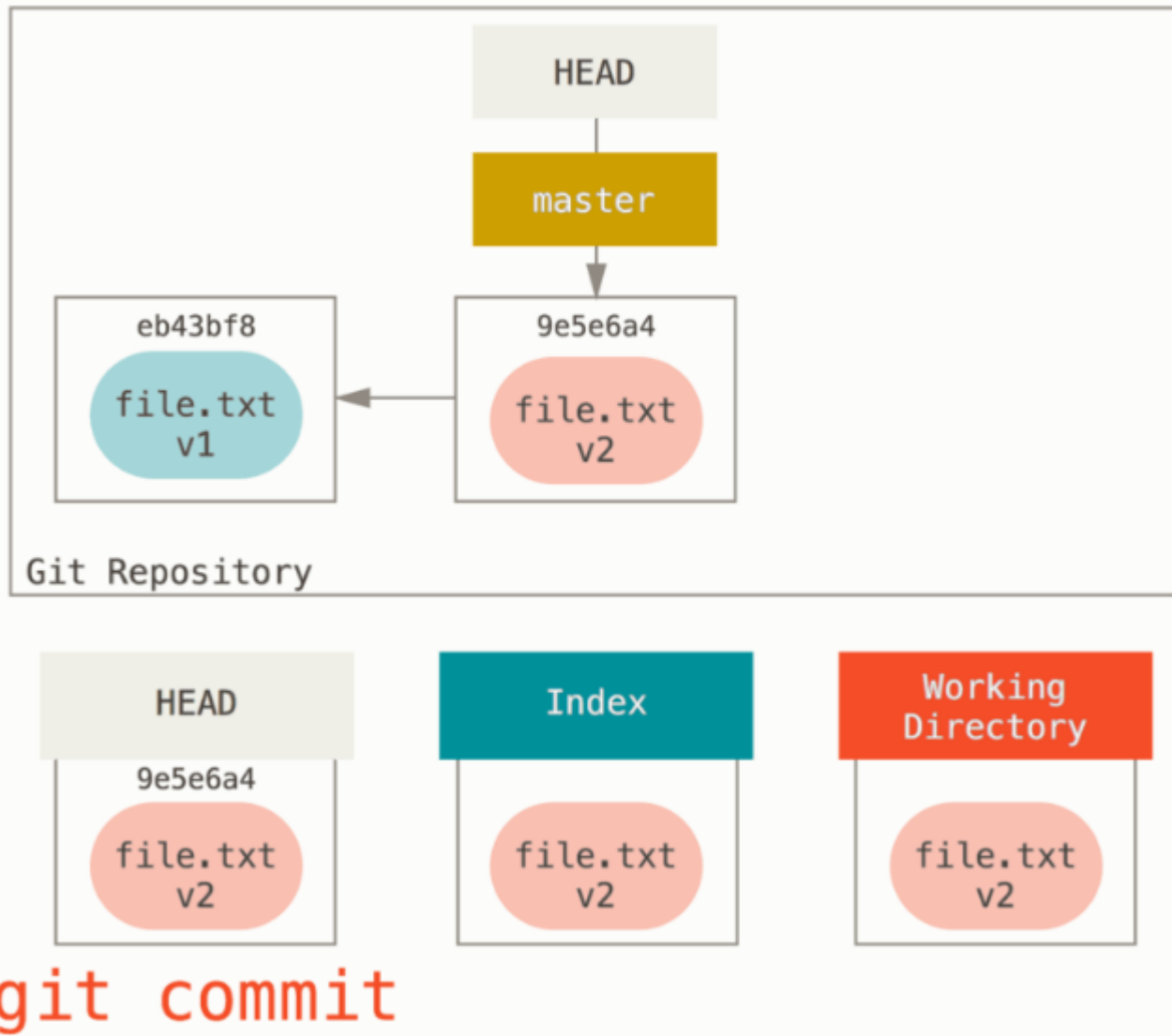
# git add edited file



# git add edited file



# git add edited file

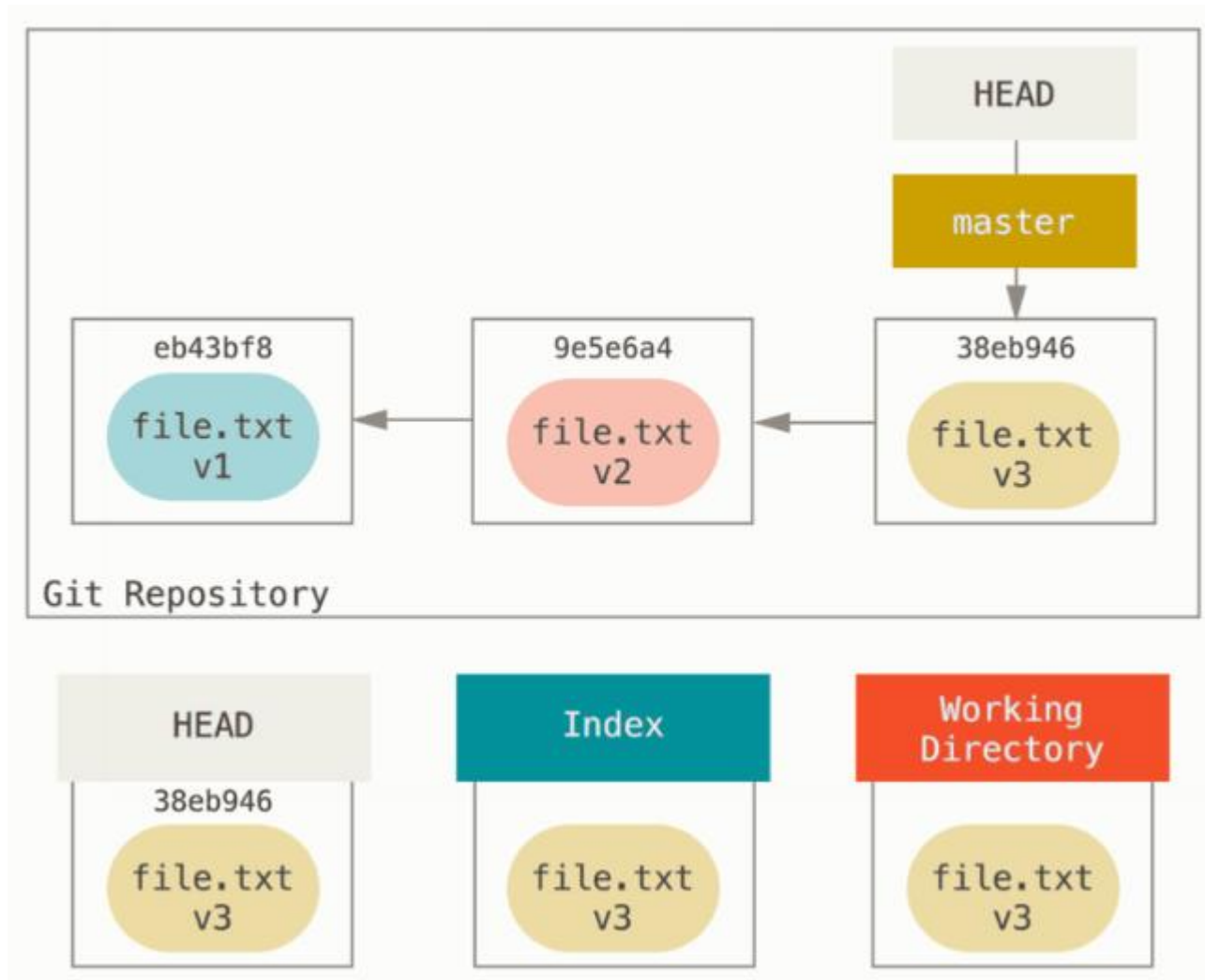


# Reset

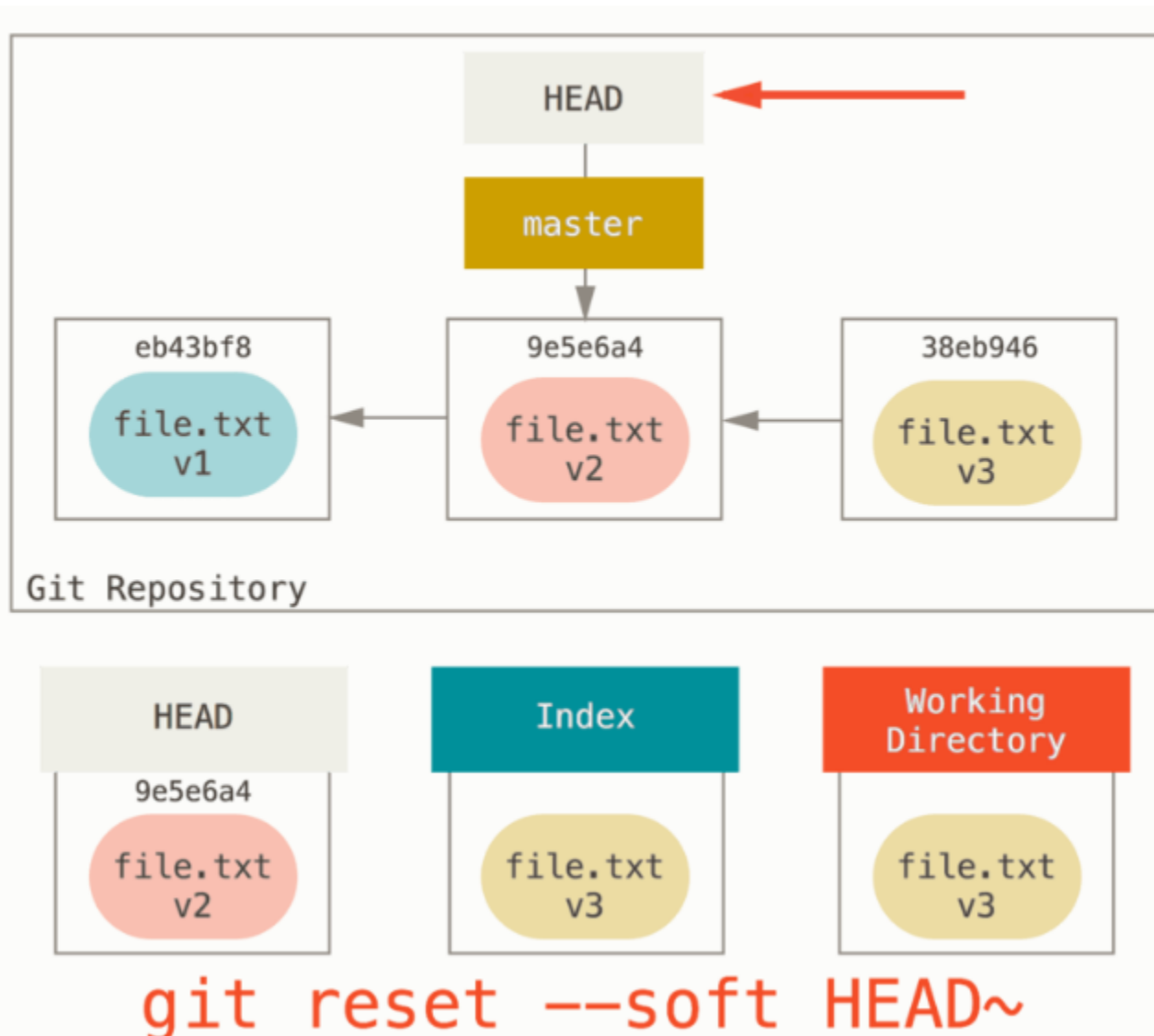
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- **Three steps**
  - **Move the branch HEAD points to (stop here if –soft)**
  - **Move the index look like HEAD (stop here unless –hard)**
  - **Move the Working Directory look like the index**

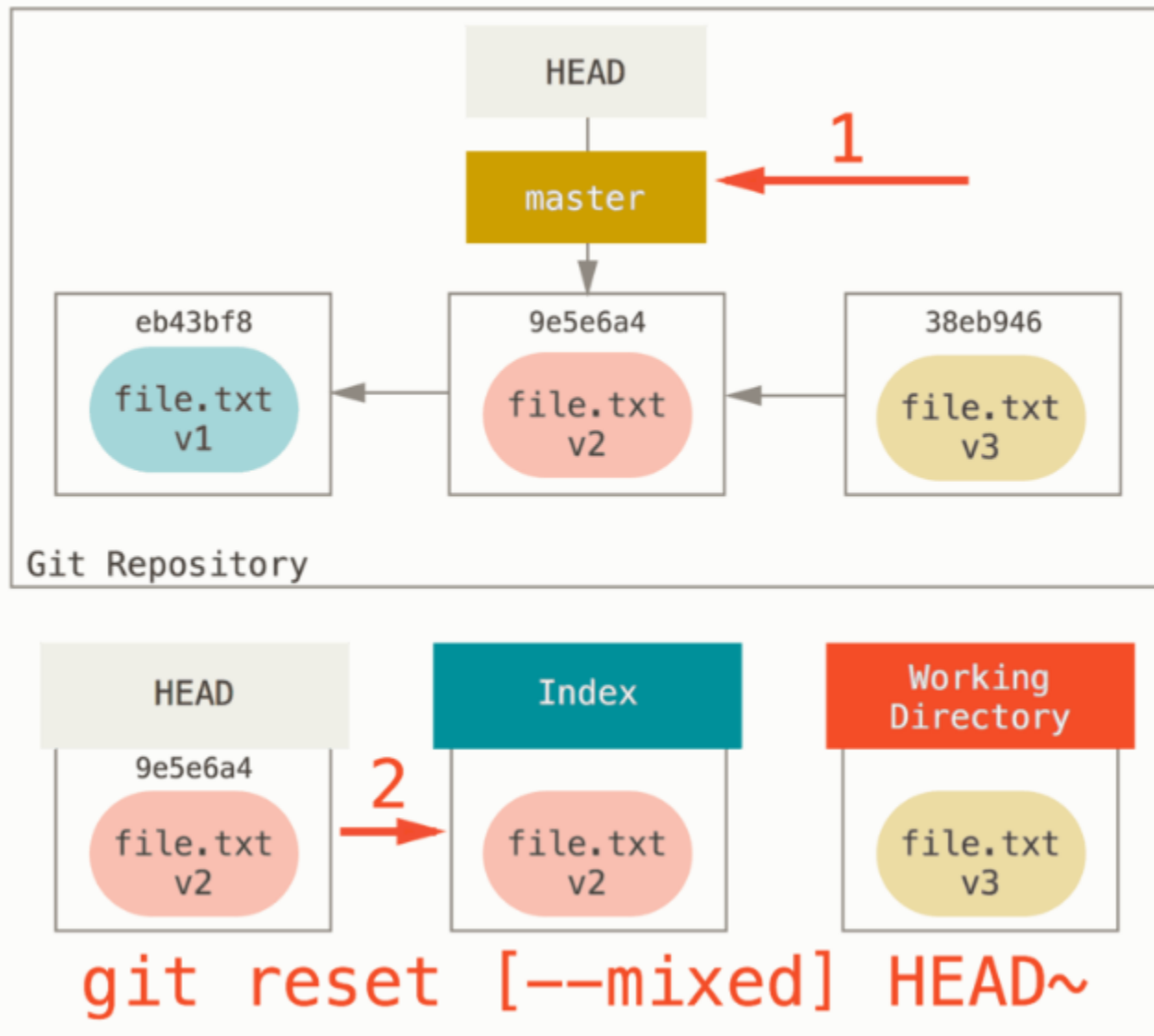
# Reset



# Reset

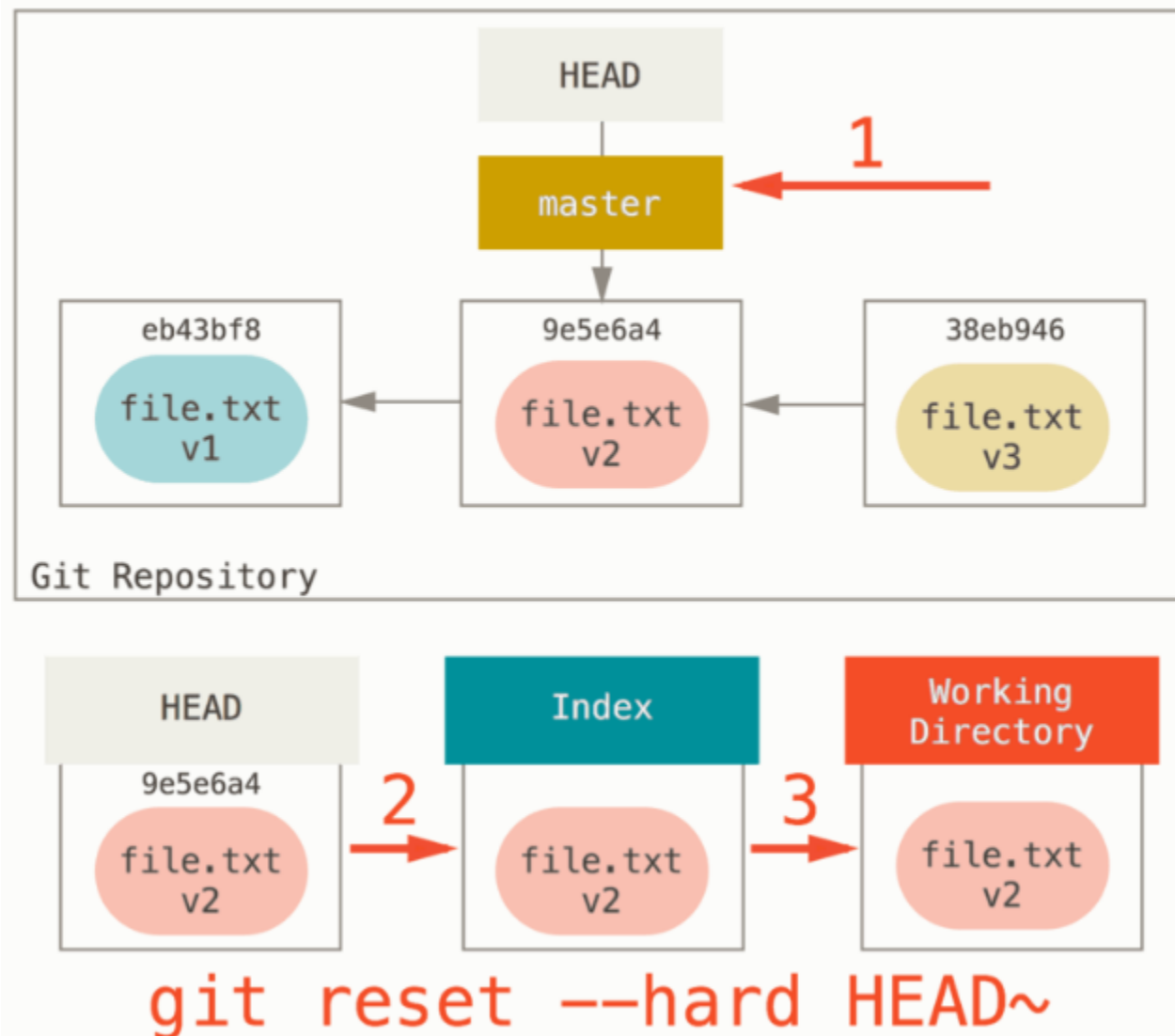


# Reset





# Reset

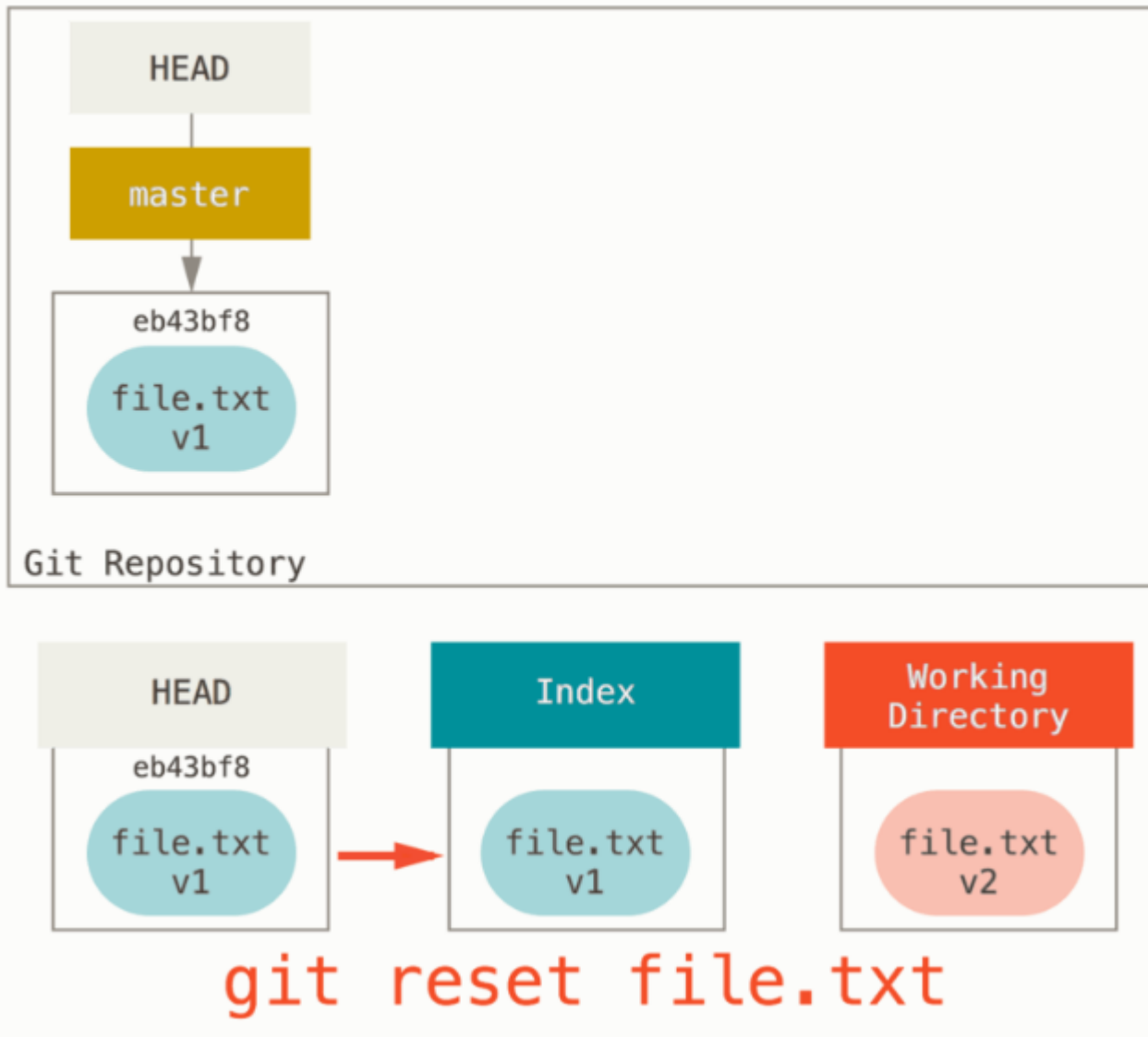


# Reset with Path

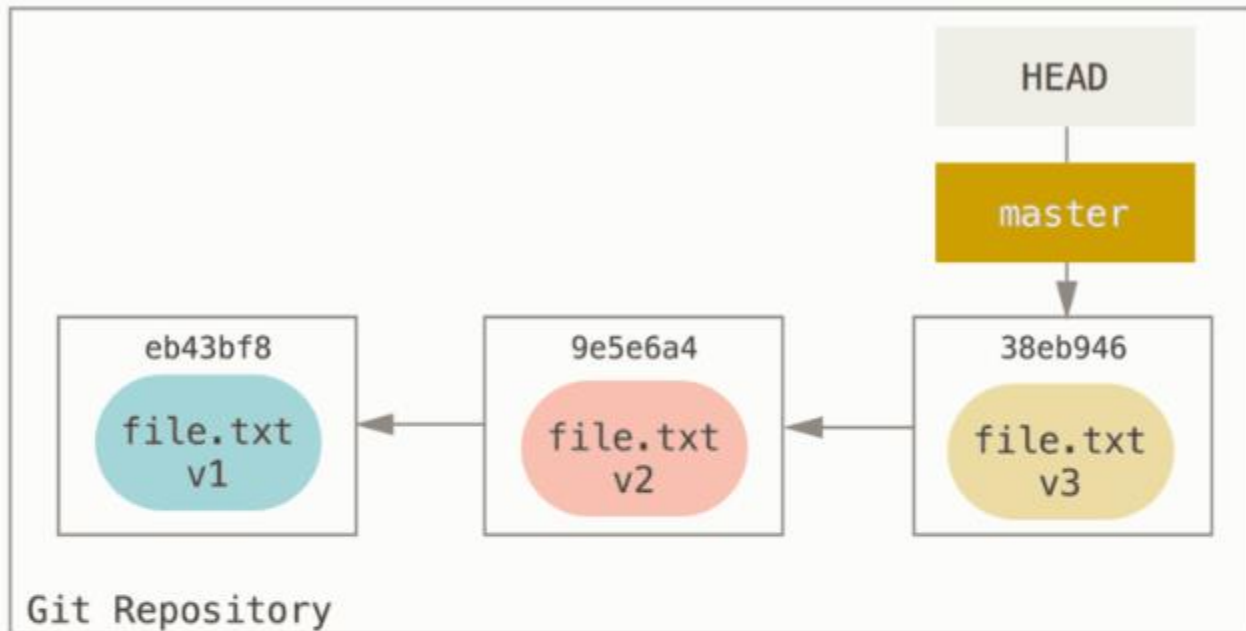
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- **git reset file.txt**
  - opposites of git add
  - Move the branch **HEAD** points to (skipped)
  - Make the index look like **HEAD** (stop here)

# Reset with Path

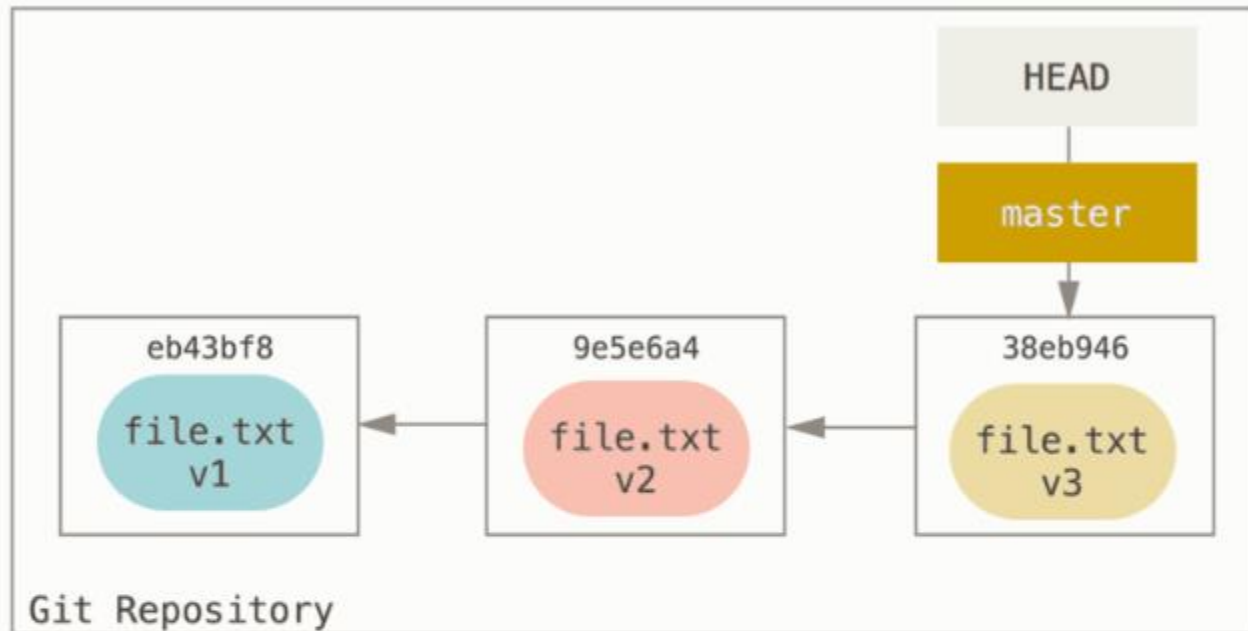


# Reset with Path



`git reset eb43 -- file.txt`

# Reset with Path

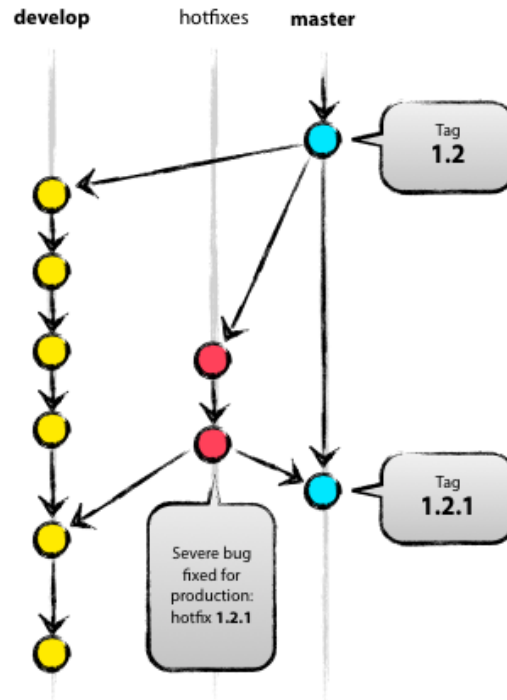


`git reset eb43 -- file.txt`

# Advance Features

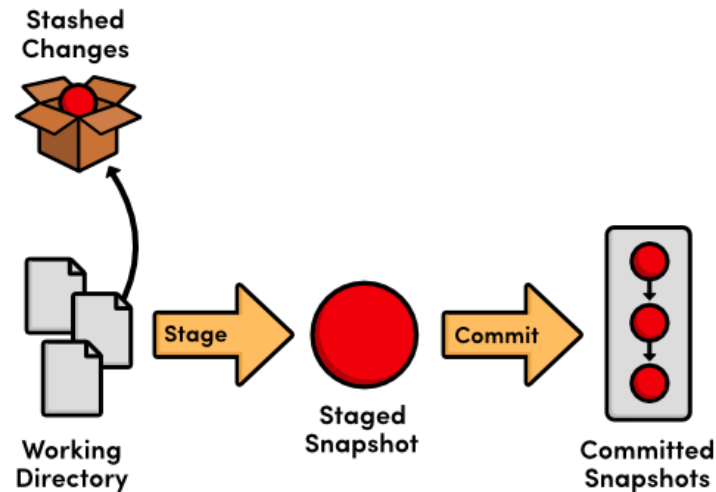
# Tags

- Adds a symbolic name
  - `git tag <tag name> <commit name>`
- A tag cannot be changed. However, it can be moved (See the advanced session for instructions)



# Stash

- There can be multiple stashes, each with a name.
  - `git stash list`
- You can apply a stash other than the last one.
  - `git stash apply <stash name>`
- Applying a stash does not delete it.
  - `git stash drop <stash name>`

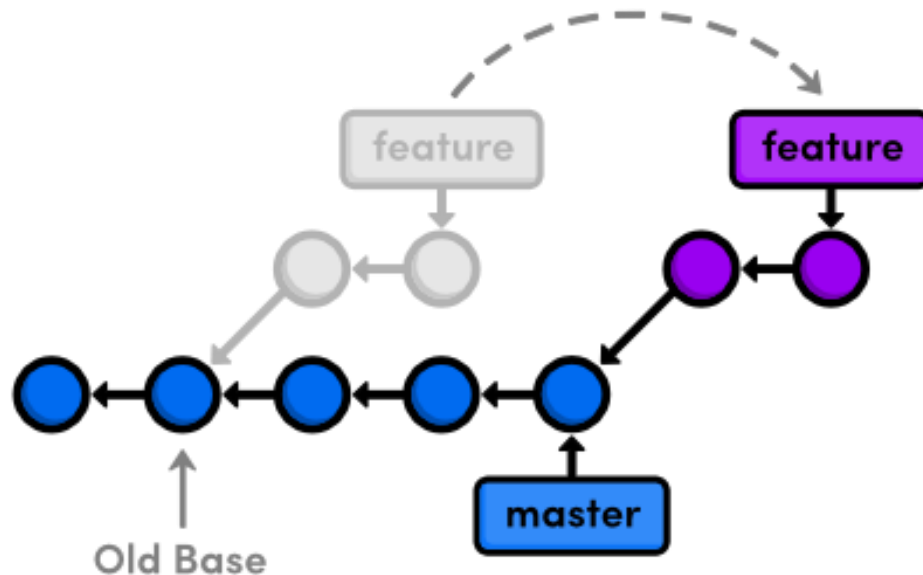




# Git Rebase

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- The main topic of this part
- **git rebase** allows you to rewrite your history.
  - It alters the repository so that the commits you can see before and after its usage are different.
  - It can change, merge, split, add, remove, modify commits



# Git Rebase

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- **IT IS A DANGEROUS COMMAND!**
  - If you change history, you will break merges for **EVERYONE** that has already ‘pulled’ your branch.
  - git tries to protect you from it
  - If it detects that pushing will probably cause it, it tries to stop you.
  - You will have to use a different syntax to go ahead anyway.
  - However, you should not rely on this

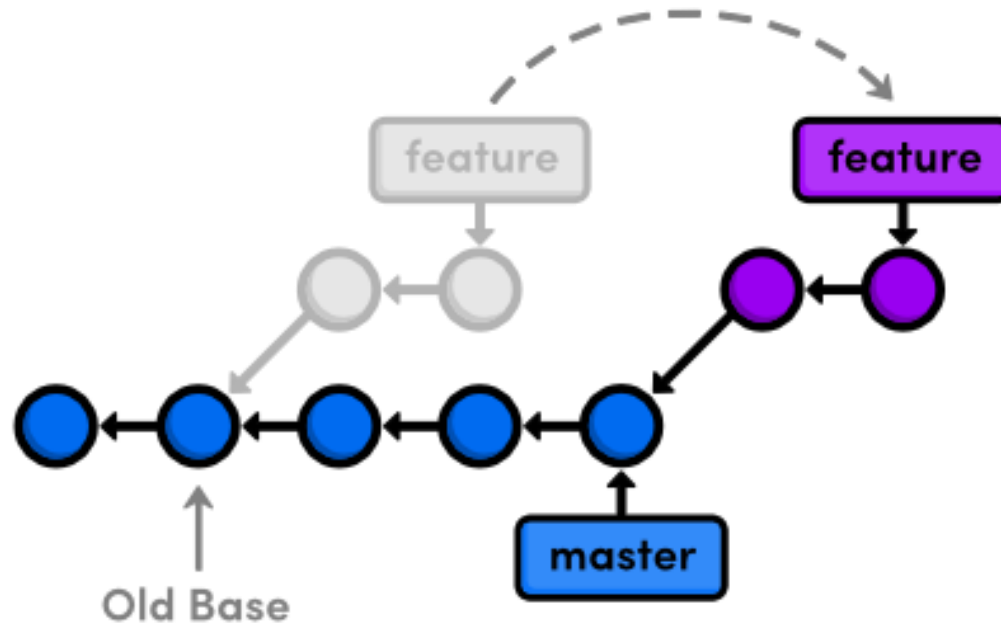
# Git Rebase

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- **No commit should EVER be rebased if it is already public.**
  - If you have already “pushed” it, or
  - If you have “pulled” or “fetched” it, or
  - These include commits inherited from branches created from “pushed” or “pulled” ones.
- **No commit should be rebase if:**
  - You have merged it on a different branch
- **A suggestion:**
  - Only use it on private branches you have not merged anywhere.

# Git Rebase

- **Two main usages:**
  - Batch
  - Interactive



# Git Rebase – Batch Usage

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- Takes a branch, and modify it to make it look like the branch never existed
- Example:
  - A-B-C-D            master
  - \-E-F-G        topic
- Becomes:
  - A-B-C-D-E'-F'-G'   master
- From 'topic' branch: 'git rebase master'

# Git Rebase – Batch Usage

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- **Git rebase does an actual merge**
- **Merges may have conflict. You have three choices**
- **Solve the conflicts:**
  - **git add the resolutions**
  - **git rebase –continue**
- **Skip this commit**
  - **git rebase –skip**
- **Abort the rebase**
  - **git rebase --abort**

# Git Rebase – Interactive

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- **git rebase -i <commit>**
  - **<commit>** should be the commit **BEFORE** the first one you wish to alter.
  - Will open your **\$EDITOR** with the following buffer:

# Git Rebase – Interactive

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```
pick d6a7c25 Added README file.  
pick dce0696 changed README file.  
pick 8e5ba04 Makefile  
pick b42cffd rgheguie  
pick 2306a37 new line.
```

```
# Rebase 68bcfea..2306a37 onto 68bcfea
```

```
#
```

```
# Commands:
```

```
# p, pick = use commit
```

```
# r, reword = use commit, but edit the commit message
```

```
# e, edit = use commit, but stop for amending
```

```
# s, squash = use commit, but meld into previous commit
```

```
# f, fixup = like "squash", but discard this commit's log message
```

```
#
```

```
# If you remove a line here THAT COMMIT WILL BE LOST.
```

```
# However, if you remove everything, the rebase will be aborted.
```

```
#
```



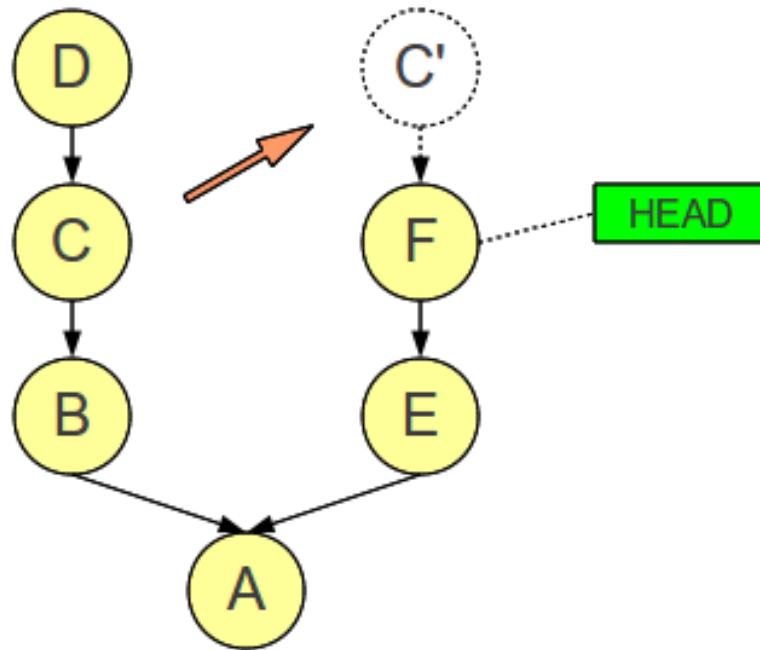
# Git Rebase – Interactive

---

- If you do nothing, or remove all the lines, nothing happens
- **squash** – This commit gets deleted, but its contents are added to the previous commit. Commit messages are merged.
- **fixup** – Like squash, but the commit message gets lost
- **reword** – change the commit message
- **edit** – stop there to allow modifying the commit

# Git Cherry Pick

- The ability to get a specific commit from a branch and merge **\*only that commit\*** on a different branch.
  - Also known as: “backport fix for bug ##### to an older branch.”
  - This is a merge operation. Conflicts may occur and will have to be resolved normally



# Git Cherry Pick

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- **git cherry-pick <commit>**
  - Will merge commit <commit> on the current branch.
- **If you are merging from a public branch, add “-x”, i.e.:**
  - **git cherry-pick -x <commit>**
  - **Reason:** Will add a note to the commit message specifying the source of the cherry-pick