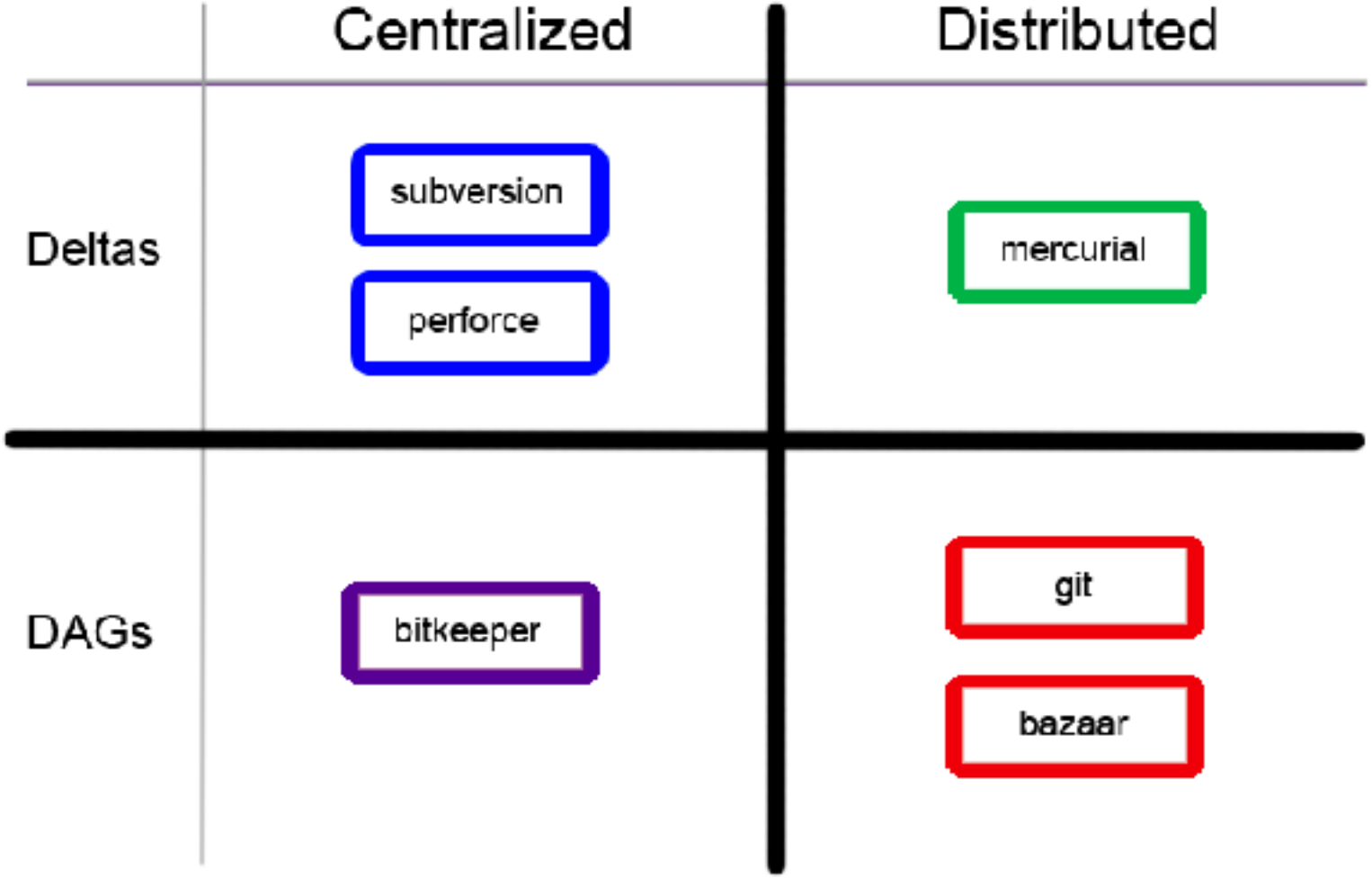
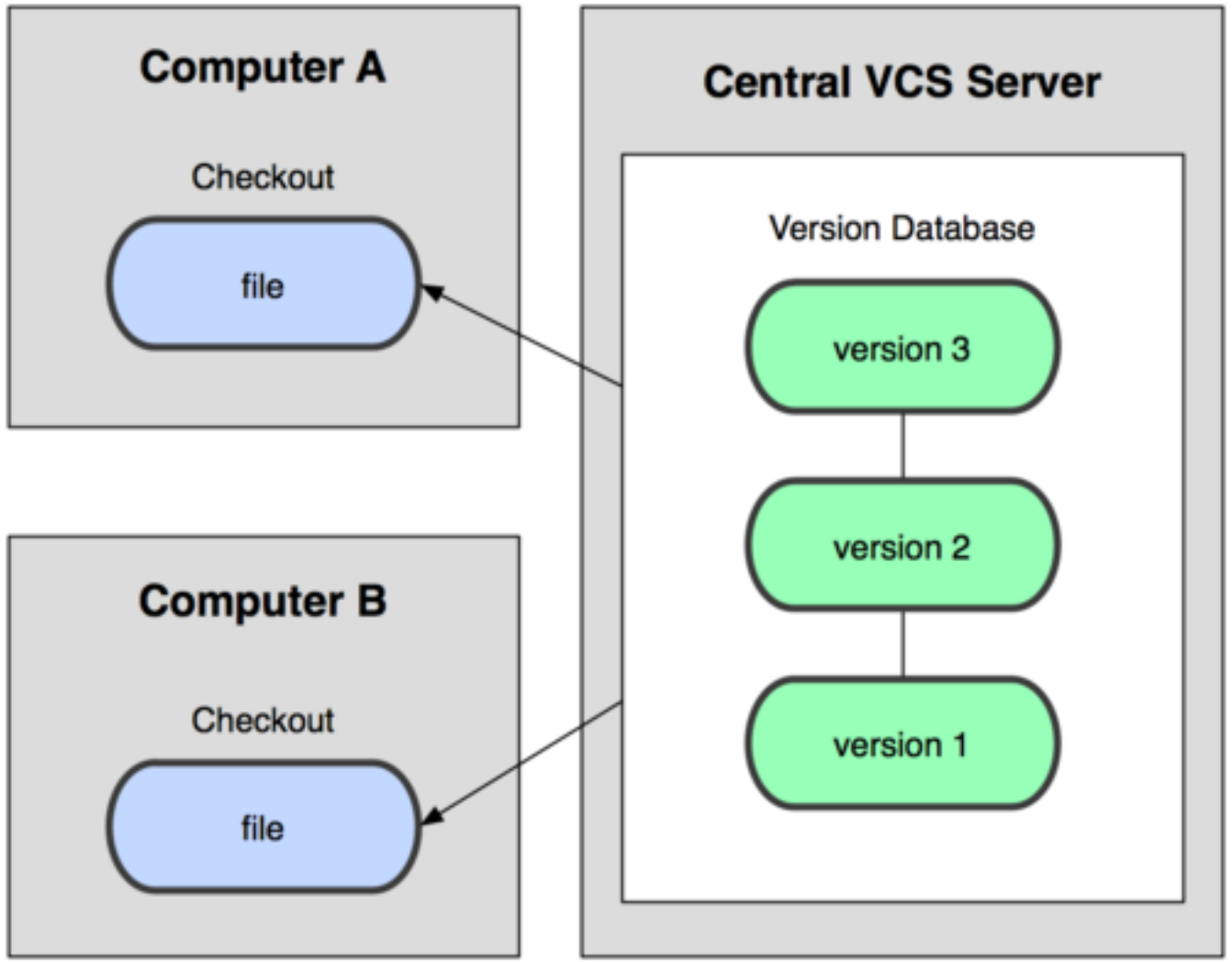
Distribute Source Code Management with Git Workshop

Intro Git

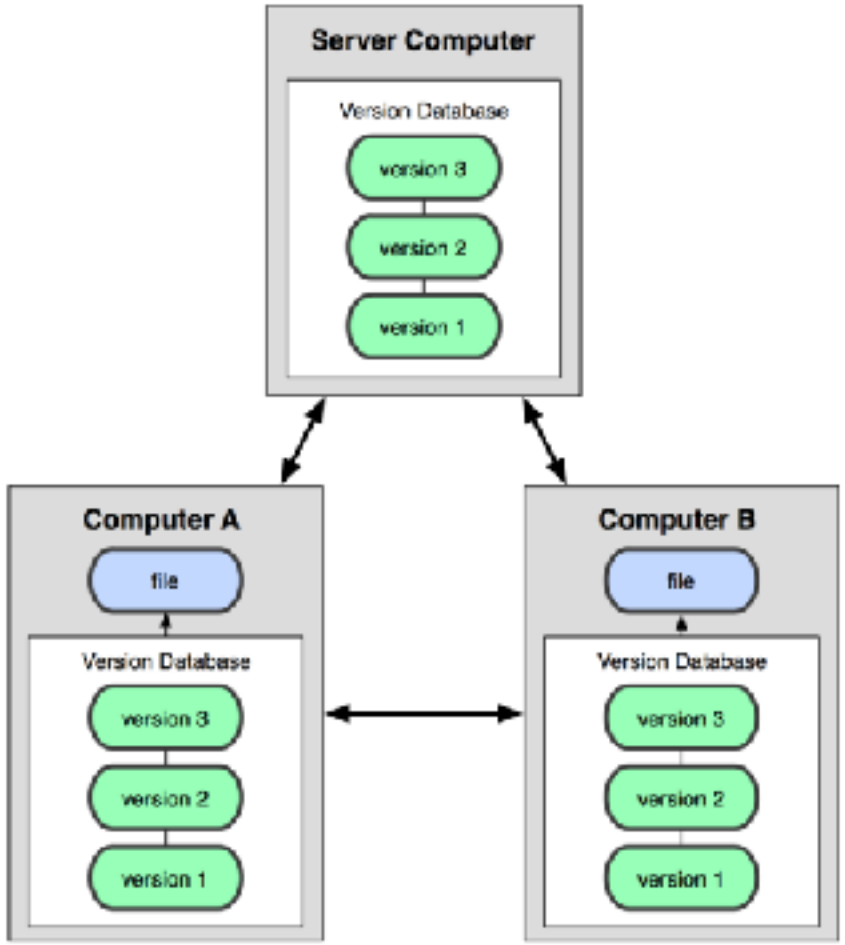
Version Control



Centralized Version Control



Distributed Version Control



เป้าหมายของการออกแบบ Git

Speed

Simple design

Support for many parallel branches

Fully distributed

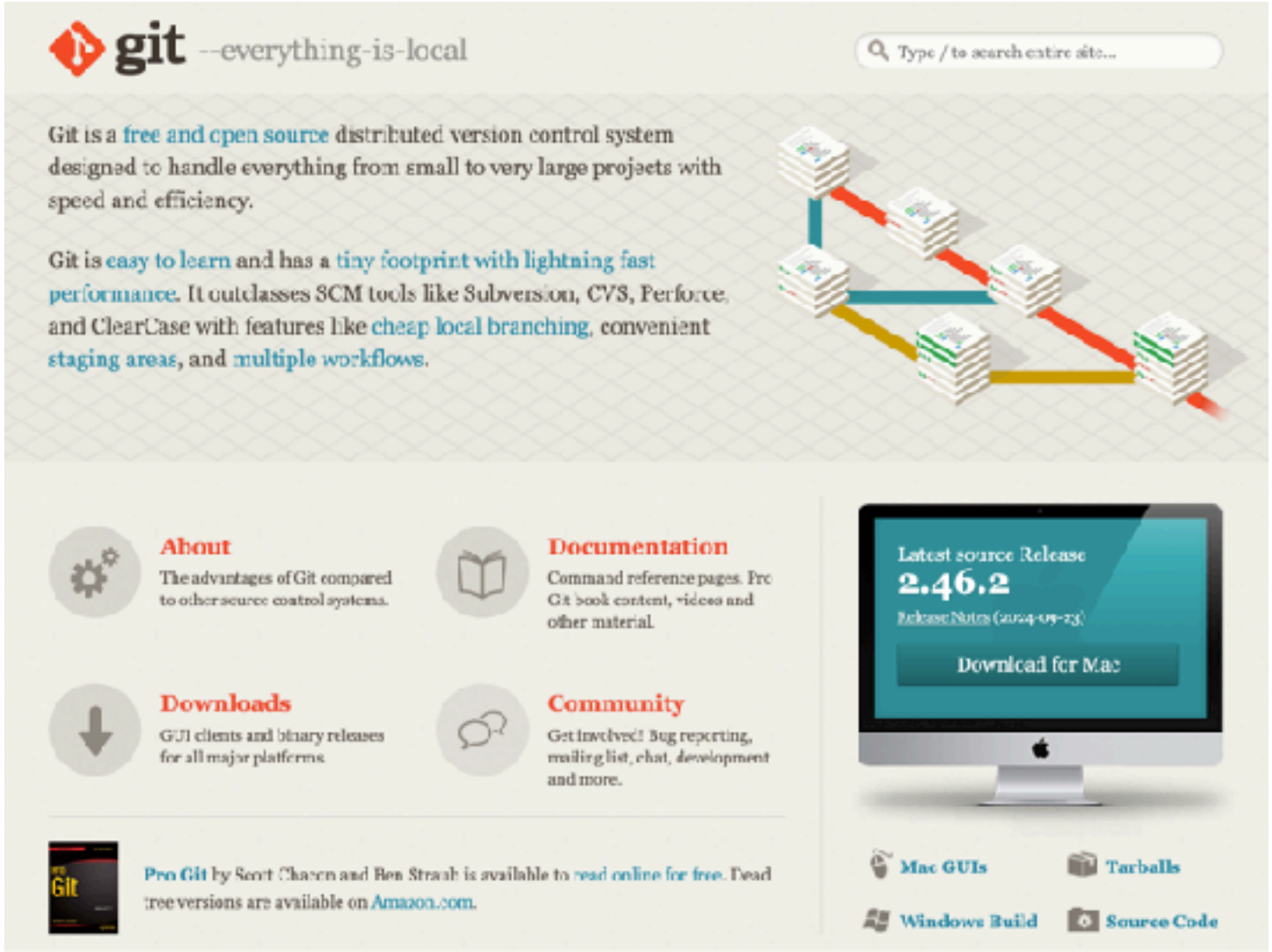
To handle large project like Linux kernel

Git Workflow

lorem ipsum dolor sit amet consectetuer adipiscing elit maecenas porttitor congue massa fusce posuere magna sed pulvinar ultricie purus

lean more

Install Git: http://git-scm.com/



Configuration Git on Local Machine

```
$git config --global user.name  “your name”
```

```
$git config --global user.email  “your email”
```

```
$git config -l
```

Create a repository

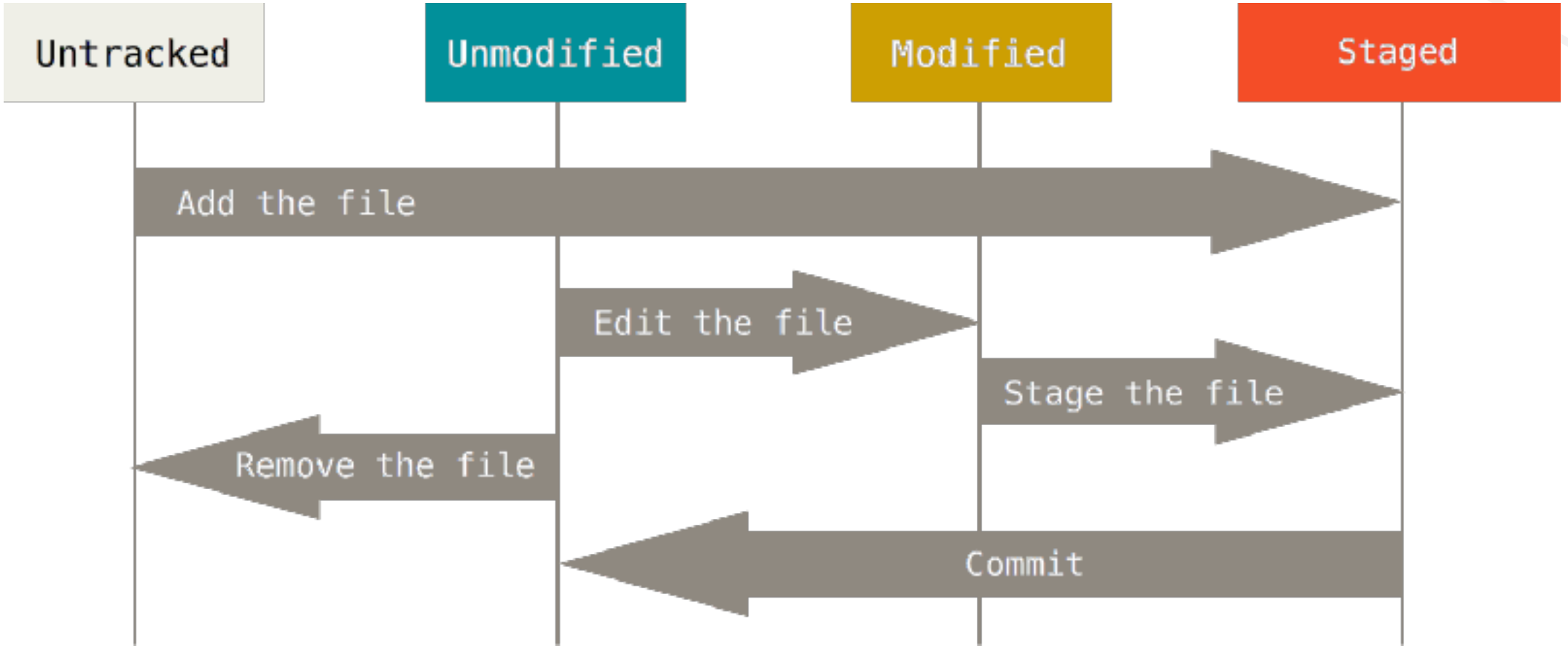
Windows	Select git bash	Mac or Linux	Open Terminal

$mkdir *git-workspace*

$cd *git-workspace*

$git **init**

Workflow



Create a file and check the status

$touch *README*

$git **status**

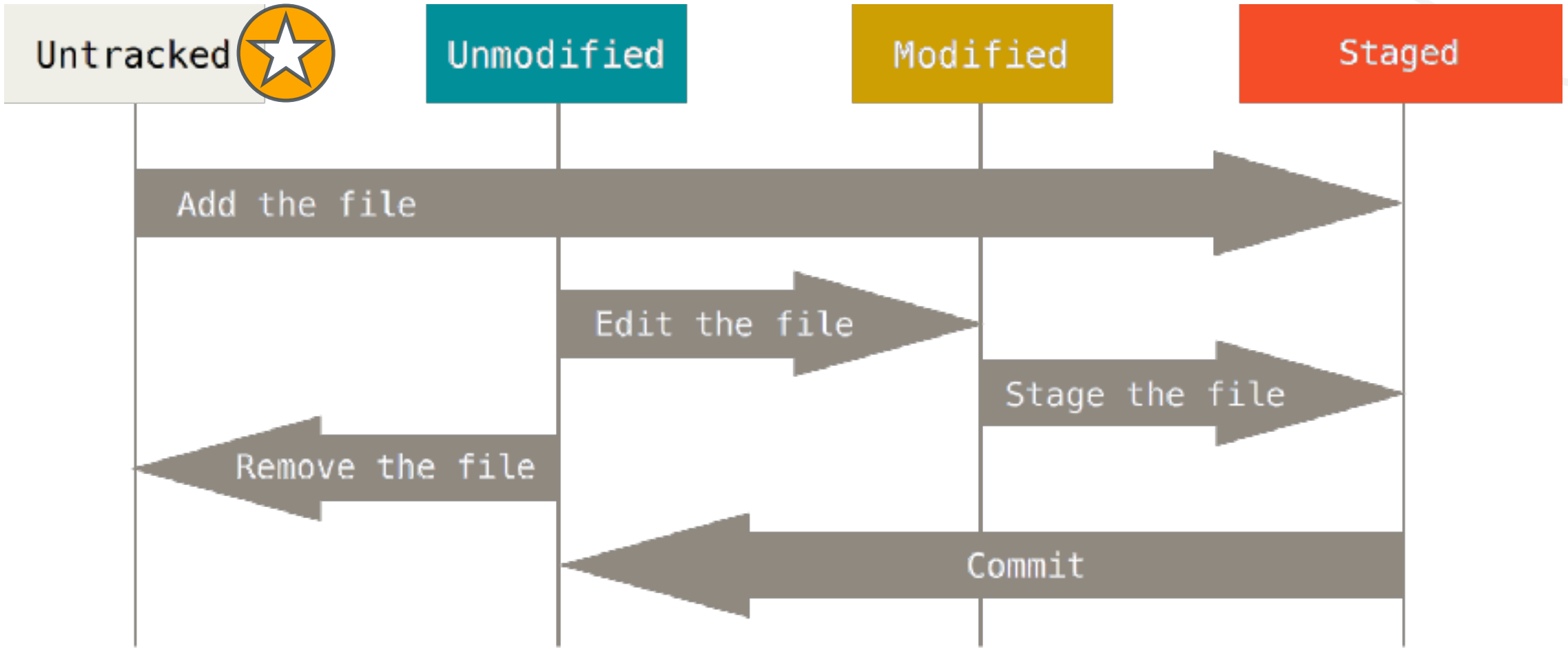
```
On branch main

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        README

nothing added to commit but untracked files present (use "git add" to track)
```

Untracked



Add the file and check the status

$git **add** *README*

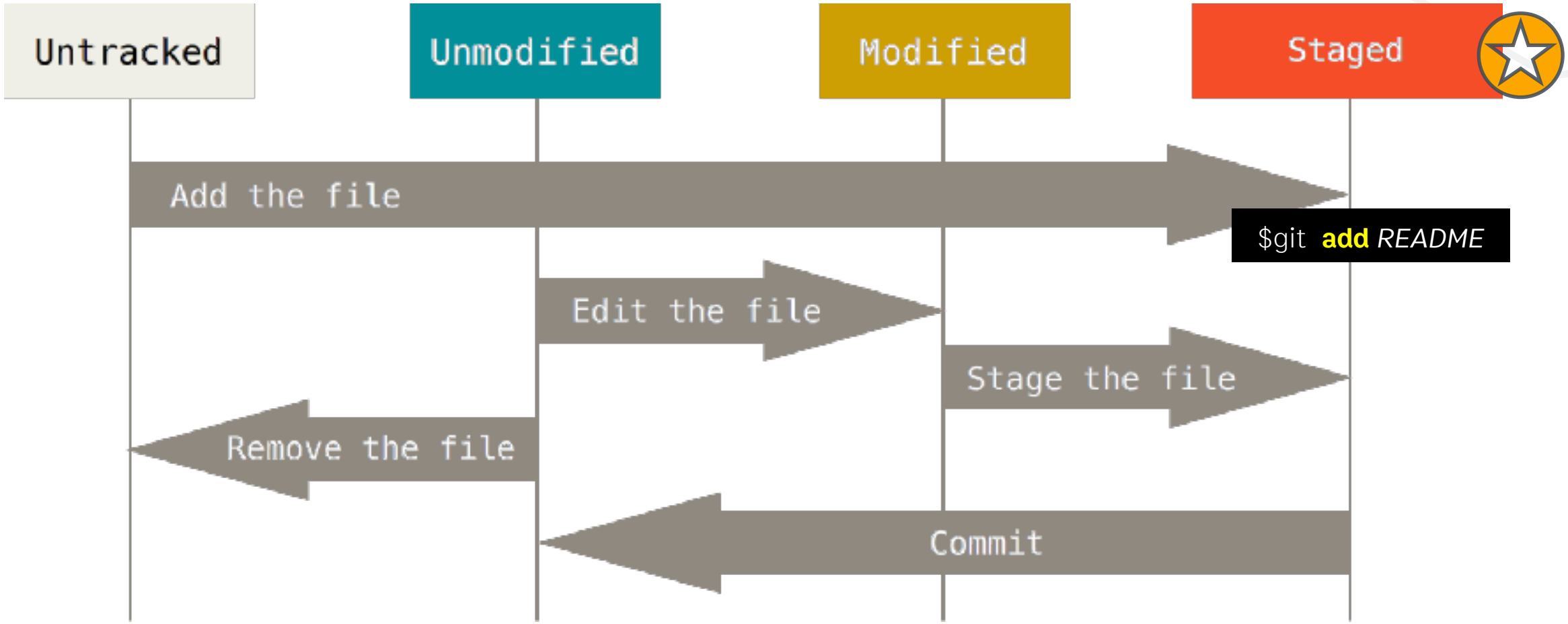
$git **status**

```
On branch main

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   README
```

Staged



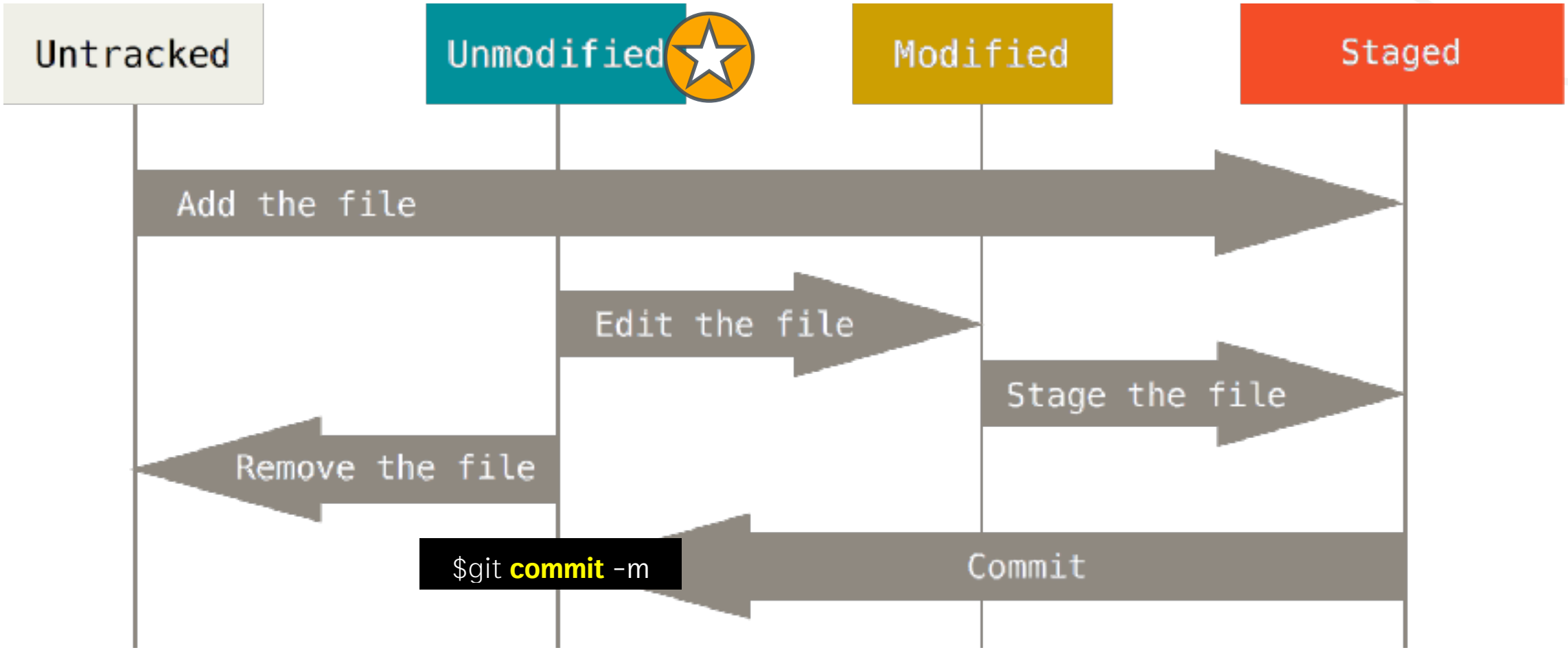
Commit your changes

$git **commit** -m “*Message for this change*”

$git **commit** -m “*Add README*”

```
[main (root-commit) 779b411] Add README
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 README
```

Unmodified



Check the status

$git **status**

```
On branch main
nothing to commit, working tree clean
```

View staged change

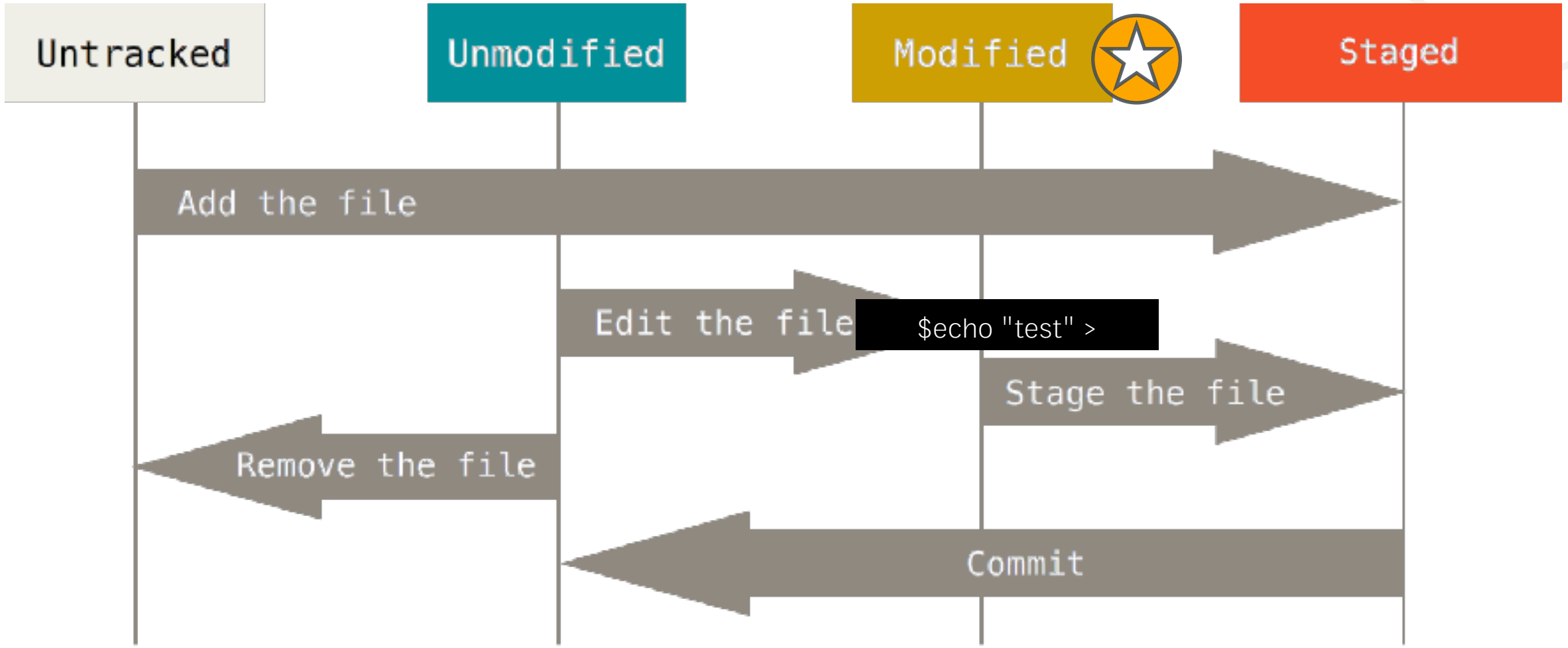
$echo “test” > README

$git **status**

```
On branch main
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:   README

no changes added to commit (use "git add" and/or "git commit -a")
```

Modified



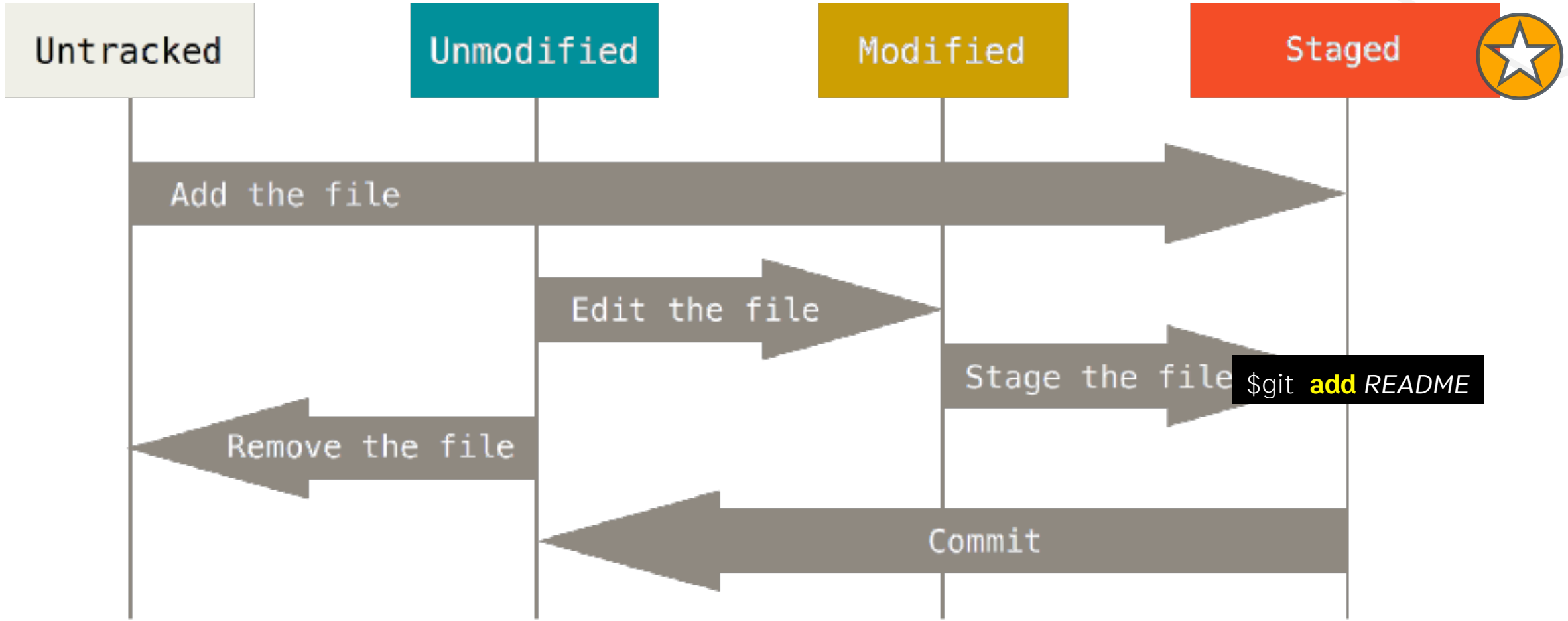
Add the file and check the status

$git **add** *README*

$git **status**

```
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   README
```

Staged



Commit your changes

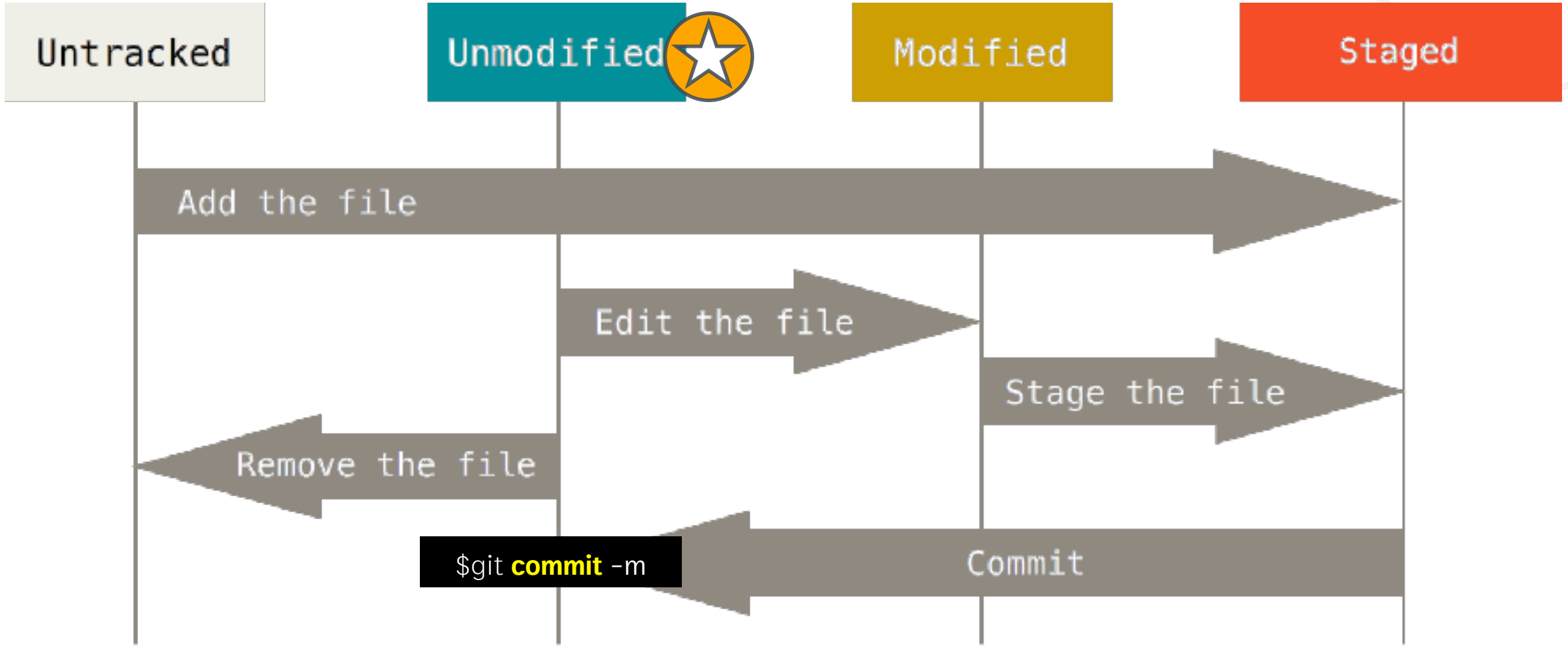
$git **commit** -m “Edit *README*”

```
[main 656bbdd] Edit README
 1 file changed, 1 insertion(+)
```

$git **status**

```
On branch main
nothing to commit, working tree clean
```

Unmodified



Ignore files and folders

```
$touch note
$mkdir tmp
$touch tmp/file
$git status
```

```
$touch .gitignore
$echo "note" > .gitignore
$echo "tmp/" >> .gitignore
```

Modified README

```
$echo "# hello" > README
```

```
$git add README
```

```
$git commit –m "Edit README content"
```

```
$git status
```

```
On branch main
nothing to commit, working tree clean
```

Git reset

```
$git reset <mode> <commit ID>
```

```
$git reset --soft <commit ID>
```

```
$git reset --mixed <commit ID>
```

```
$git reset --hard <commit ID>
```

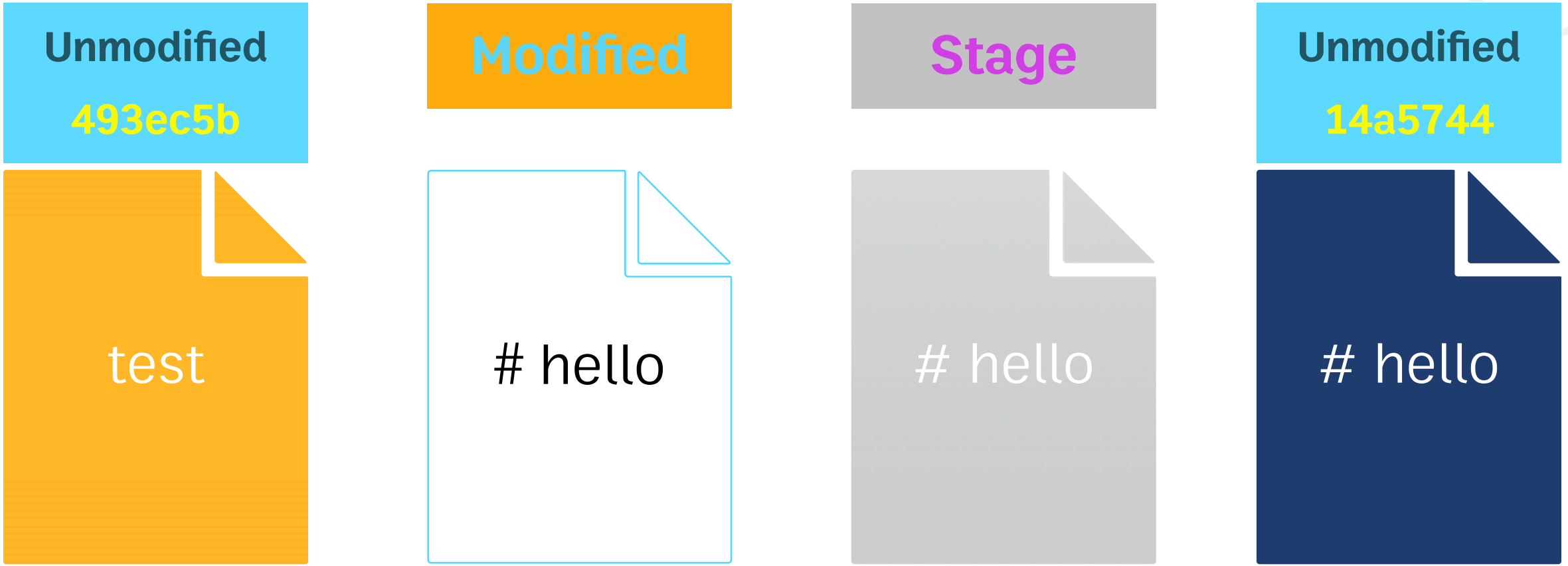
git log

```
$git log
```

```
$git log --oneline
```

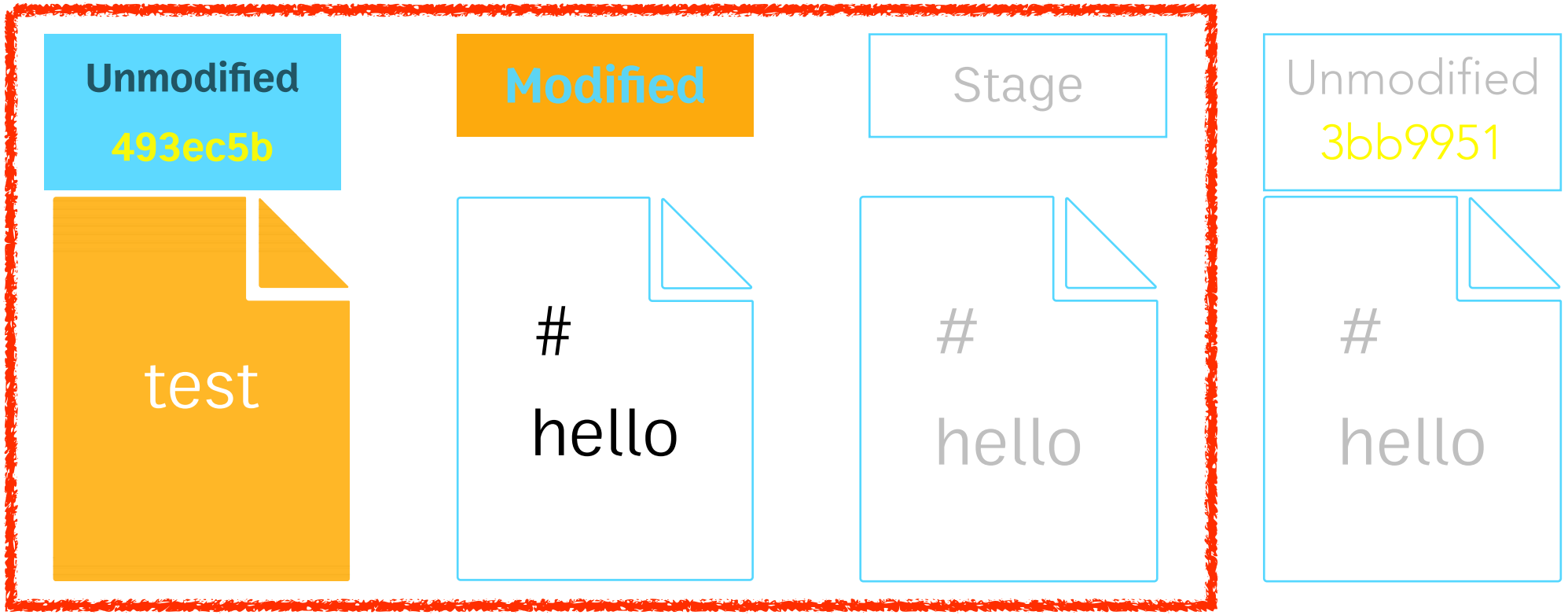
```
$git log --oneline --graph
```

Git reset



git reset --soft

$git **reset --soft 493ec5b**



git reset --mixed [default]

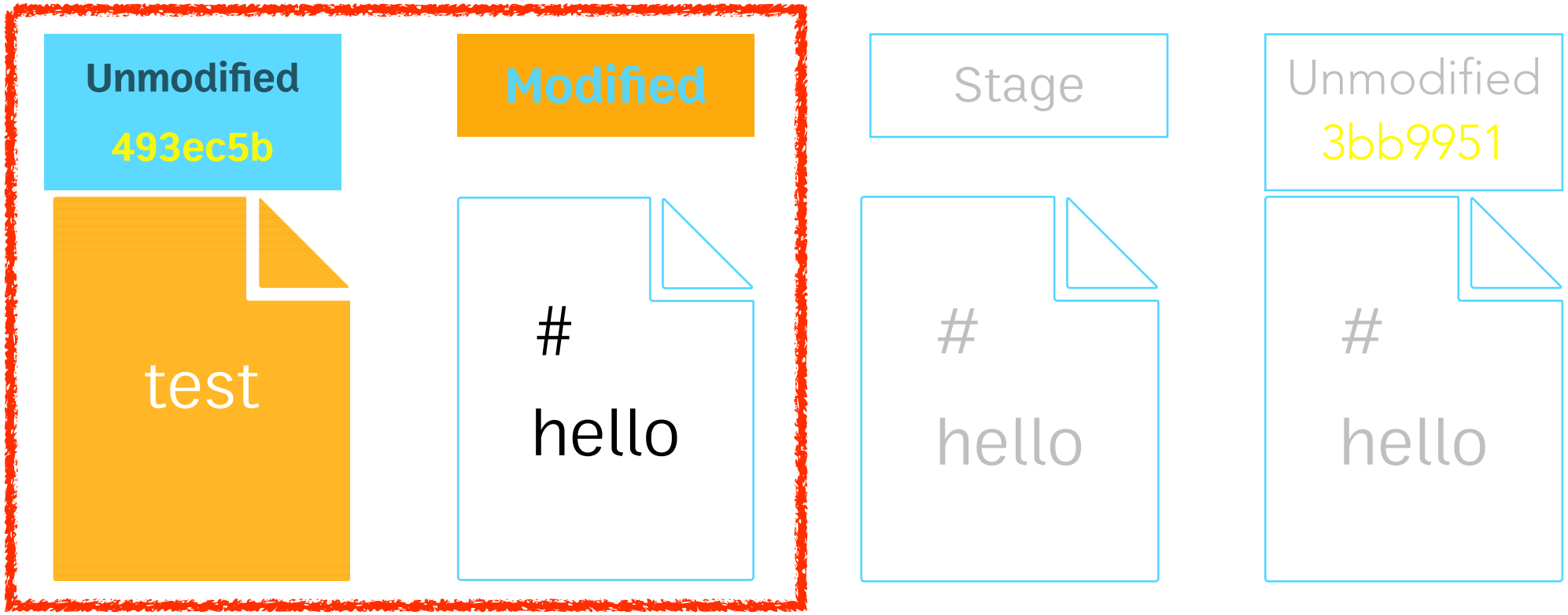
$git **reset 493ec5b**

$git **reset --mixed 493ec5b**

```
Unstaged changes after reset:
M       README
```

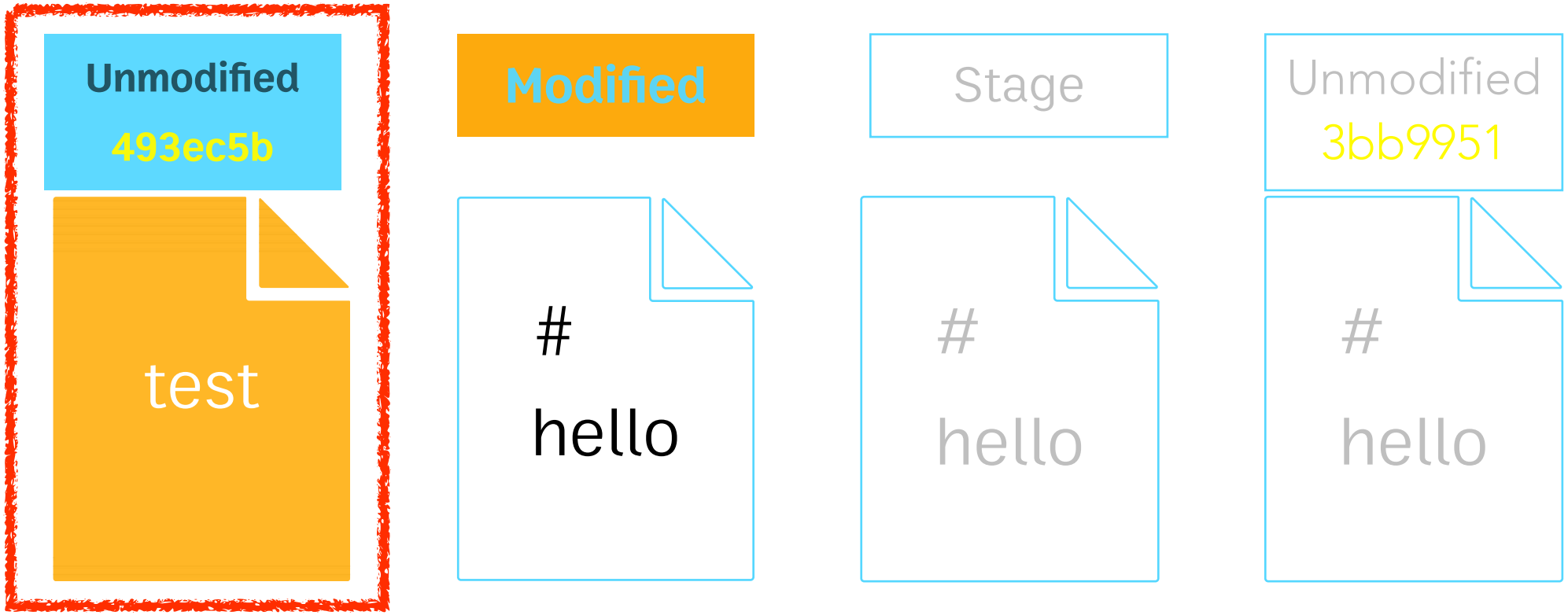
git reset --mixed [default]

$git **reset 493ec5b**



git reset --hard

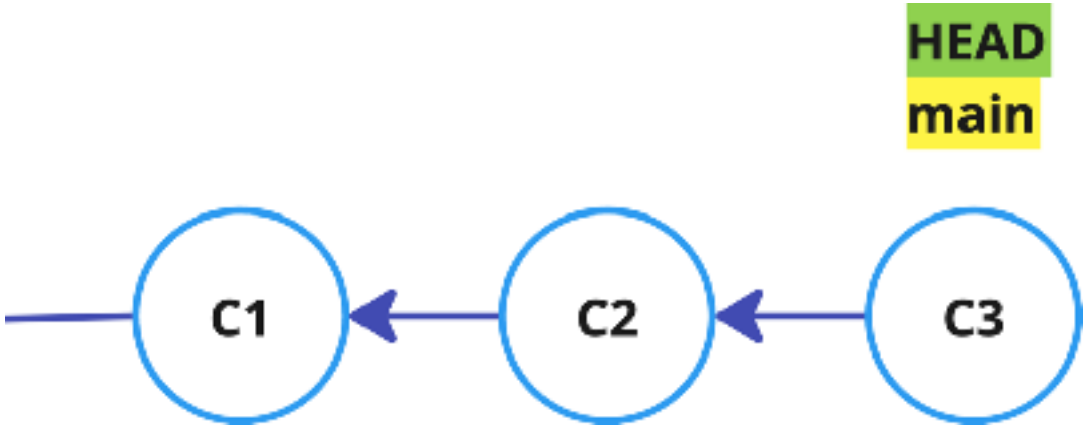
$git **reset --hard 493ec5b**



Git Branch

Current branch

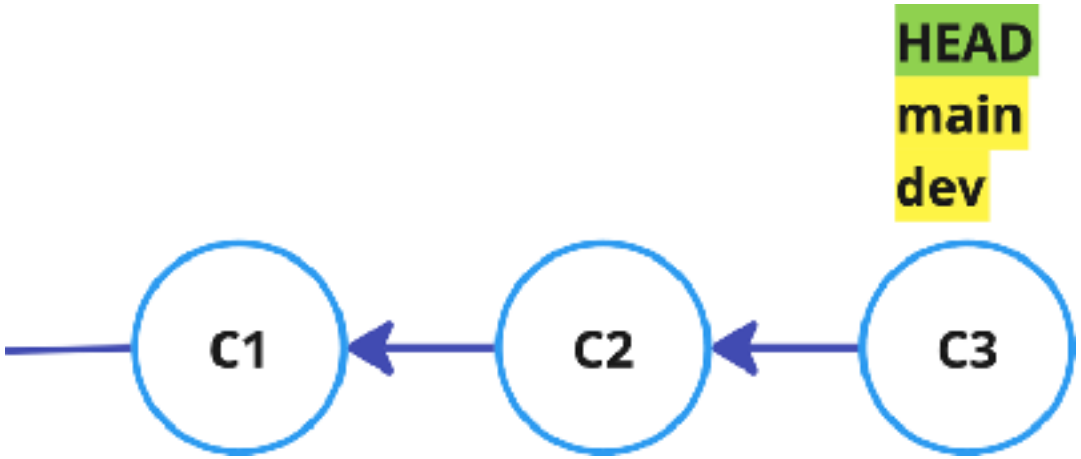
$git **branch**



Create new branch

```
$git branch <BRANCH NAME>
```

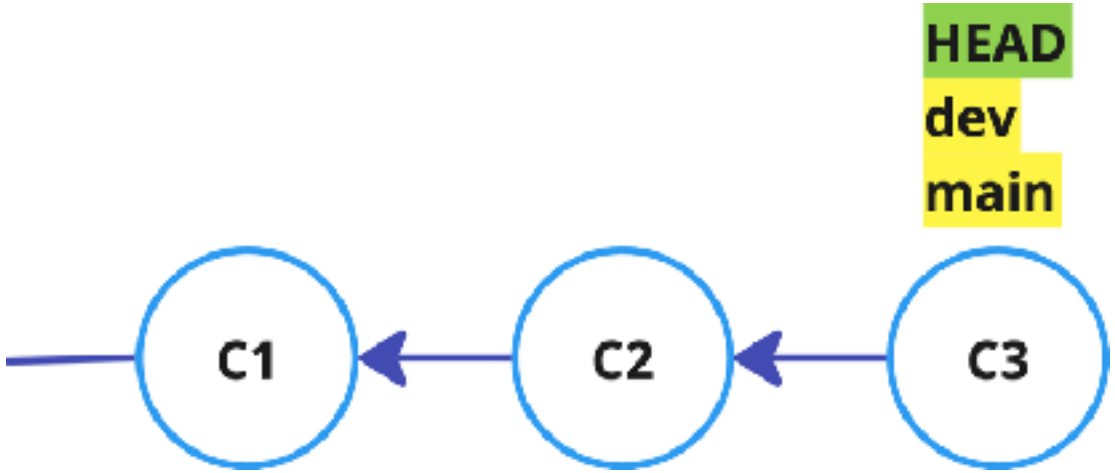
```
$git branch dev
```



Switch branch

```
$git switch <BRANCH NAME>
```

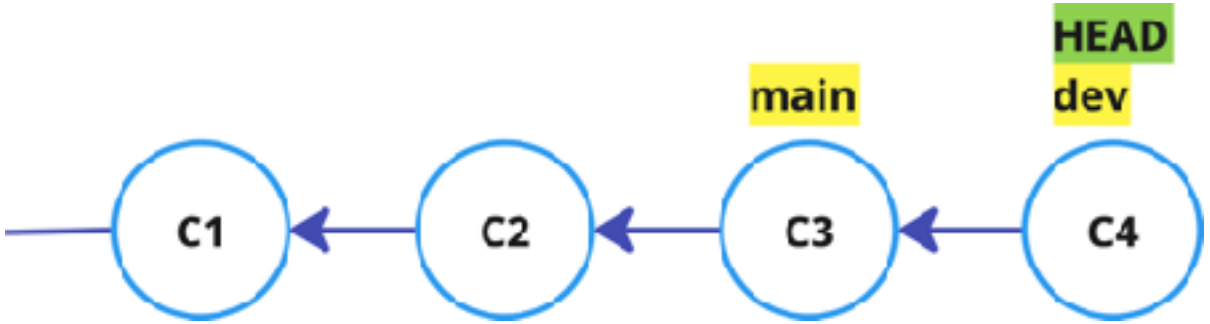
```
$git switch dev
```



Modified and commit on dev

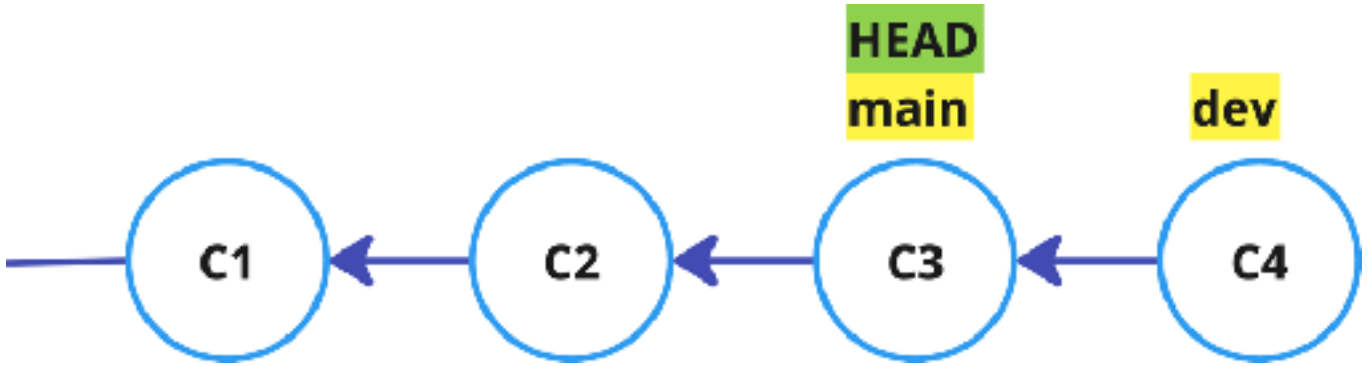
```
$echo “On branch dev” > README
```

```
$git commit -am “Add new content on branch dev”
```



Switch to master

```
$git switch main
```



Create and Switch branch

```
$git switch -c BRANCH NAME
```

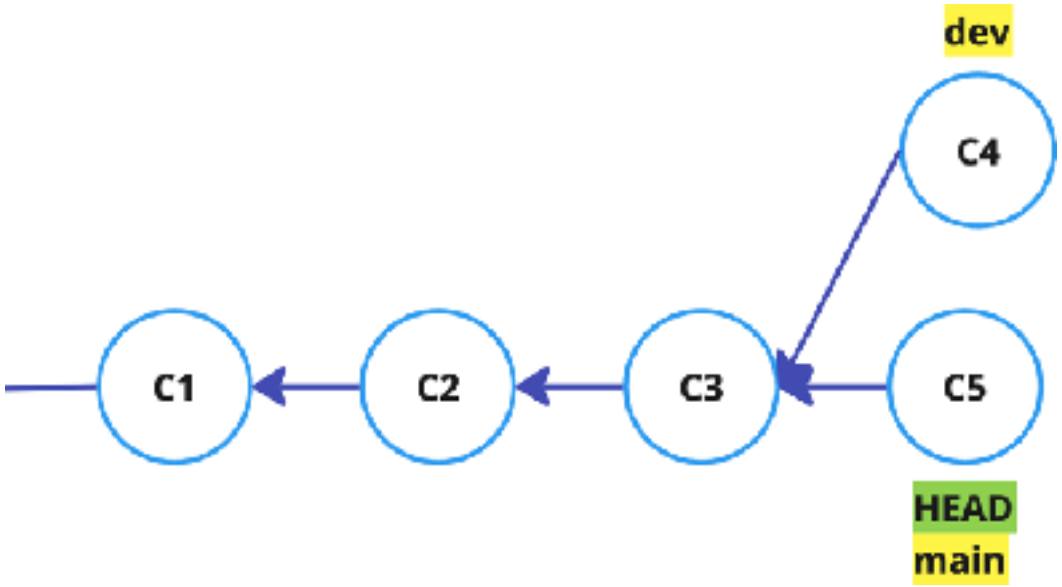
$git branch BRANCH NAME

$git switch BRANCH NAME

Modified and commit on main

```
$echo “On branch main” >> README
```

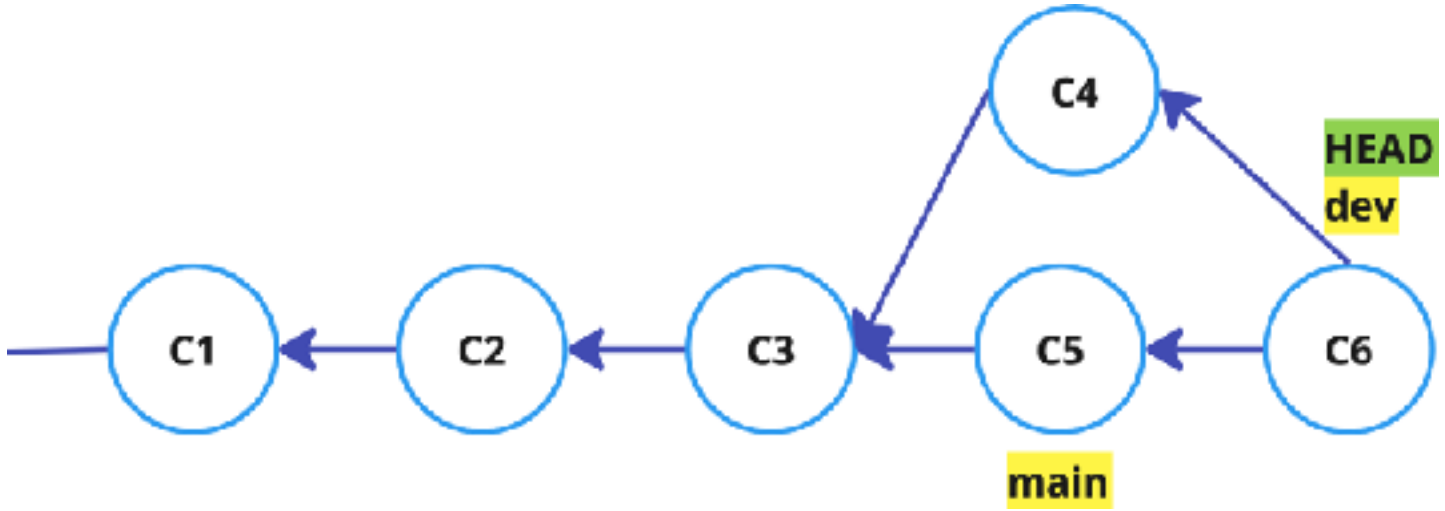
```
$git commit -am “Add new content on branch main”
```



Merge

$git **switch dev**

$git **merge main**



Conflict

$git **merge main**

```
Auto-merging README
CONFLICT (content): Merge conflict in README
Automatic merge failed; fix conflicts and then commit the result.
```

$git **status**

```
On branch dev
You have unmerged paths.
  (fix conflicts and run "git commit")
  (use "git merge --abort" to abort the merge)

Unmerged paths:
  (use "git add <file>..." to mark resolution)
        both modified:   README

no changes added to commit (use "git add" and/or "git commit -a")
```

Conflict

README

```
<<<<<<< HEAD
On branch dev
=======
# hello
On branch main
>>>>>>> main
```

Fix conflicts

git **status**

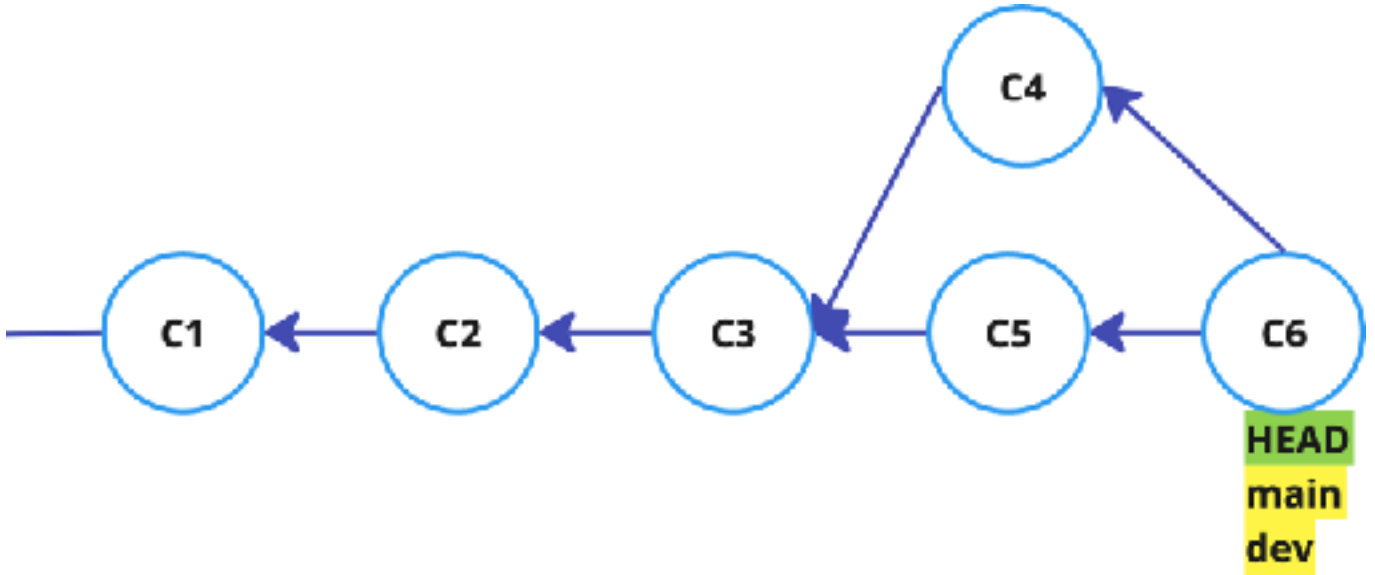
git **add README**

git **commit**

Merge

```
$git switch main
```

```
$git merge dev
```



Avoid Merge Conflict

Small change and commit

Early merge

Single Responsibility Principle

Communication is a Key

Mob programming

Rebase

Allows you to write history differently

Cleaner history

rebase -i (interactive)

Reset to before merge: dev, main

git **log --oneline --graph --all**

copy **dev commit ID(before merge)**

copy **main commit ID(before merge)**

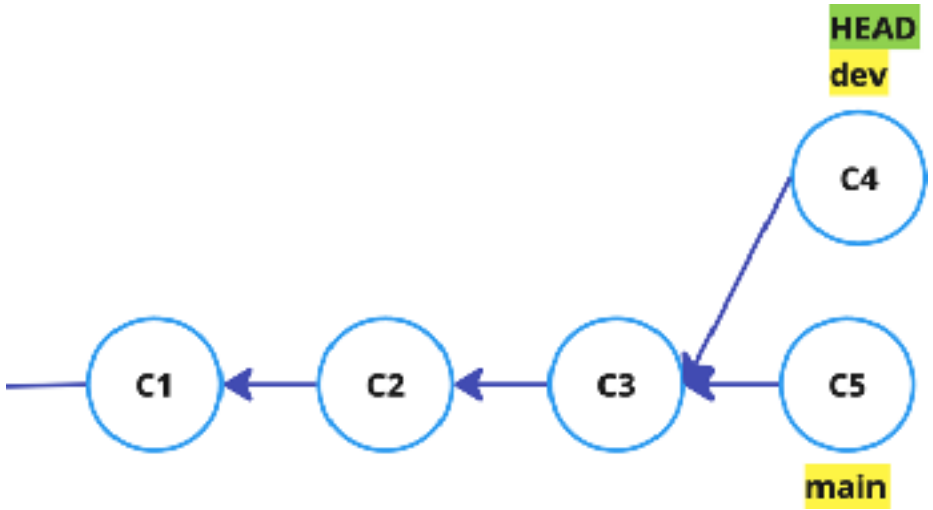
Reset to before merge: dev, main

```
git switch main
```

```
git reset --hard commit ID
```

```
git switch dev
```

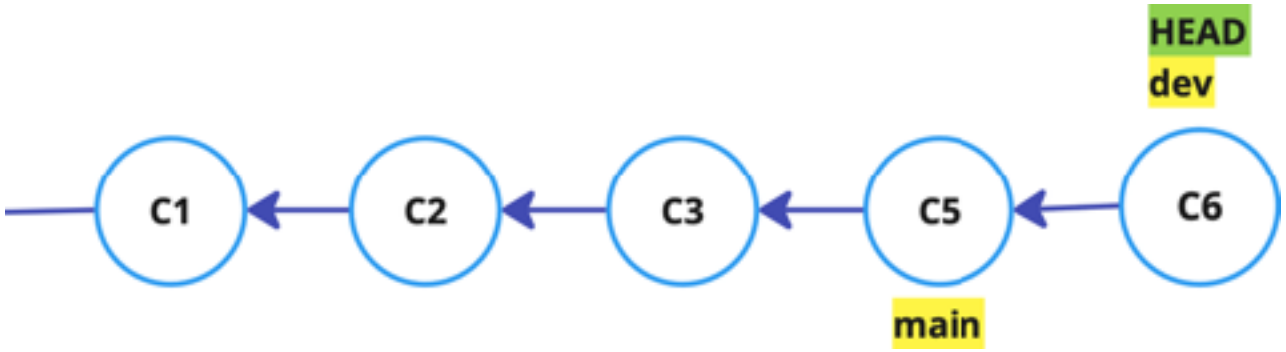
```
git reset --hard commit ID
```



Rebase

```
$git checkout dev
```

```
$git rebase main
```



data infographics

```
Auto-merging README
CONFLICT (content): Merge conflict in README
error: could not apply dffbb9f... Add new content on branch dev
hint: Resolve all conflicts manually, mark them as resolved with
hint: "git add/rm <conflicted_files>", then run "git rebase --continue".
hint: You can instead skip this commit: run "git rebase --skip".
hint: To abort and get back to the state before "git rebase", run "git rebase --abort".
hint: Disable this message with "git config advice.mergeConflict false"
Could not apply dffbb9f... Add new content on branch dev

<<<<<<< HEAD
# hello
On branch main
=======
On branch dev
>>>>>>> dffbb9f (Add new content on branch dev)

README: needs merge
You must edit all merge conflicts and then
mark them as resolved using git add
```

Tag

Show tags

git tag

Add new tag

git tag <tag_name>

git tag -a <tag_name> <commit_id>

git tag -am "Reason for tag" <tag_name> <commit_id>

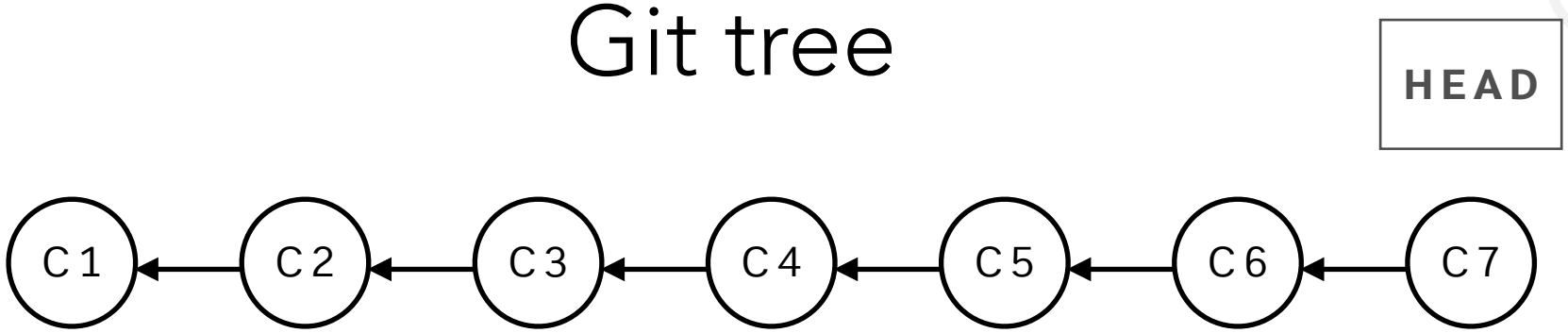
Remove tag

git tag -d <tag_to_remove>

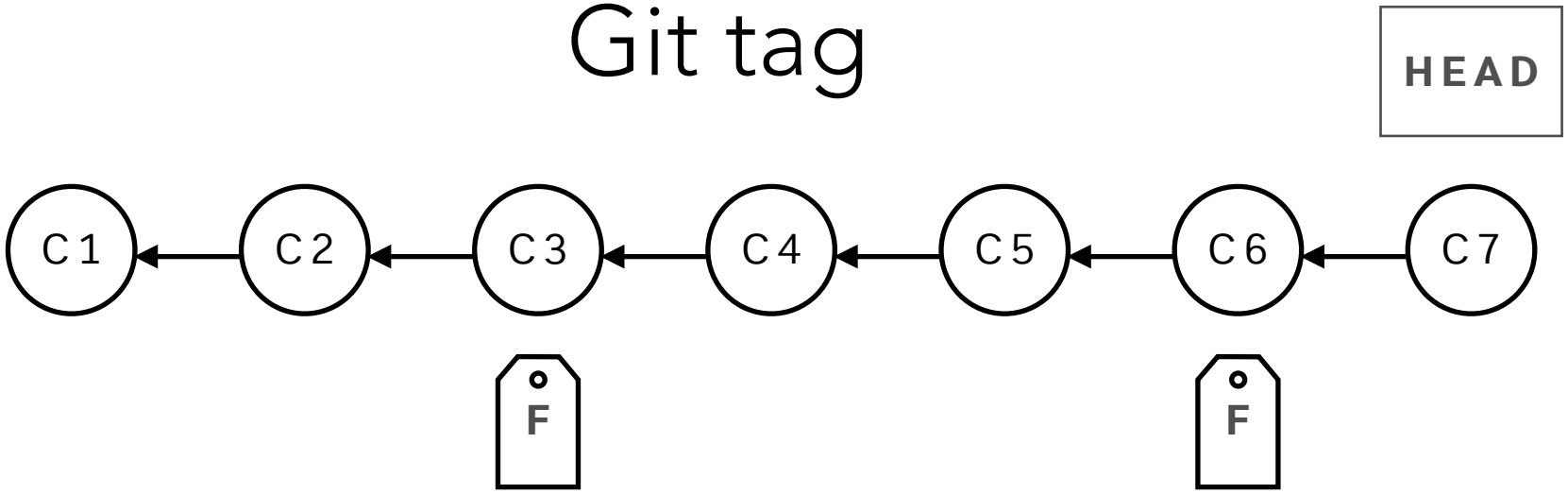
Remove all tag

git tag | xargs -n1 git tag -d

Git tree



Git tag



ETC,...

Commit message convention

- build: Build related changes (eg: npm related/ adding external dependencies)
- chore: A code change that external user won't see (eg: change to .gitignore file or .prettierrc file)
- feat: A new feature
- fix: A bug fix
- docs: Documentation related changes
- refactor: A code that neither fix bug nor adds a feature. (eg: You can use this when there is semantic changes like renaming a variable/ function name)
- perf: A code that improves performance
- style: A code that is related to styling
- test: Adding new test or making changes to existing test

https://dev.to/ishanmakadia/git-commit-message-convention-that-you-can-follow-1709

Git Stash

Show Stash

git stash list

Stash Uncommit

git stash

git stash -m <message>

Unstash

git stash pop

git stash pop -n stash@{<index>}

Be careful

Force Push

git push -f

Reset Remote Branch

git reset [--hard, --mixed, --soft] then git push

Pull Rebase(not frequency sync)

git pull --rebase

Remove all tag

git tag | xargs -n1 git tag -d

Remote Repository

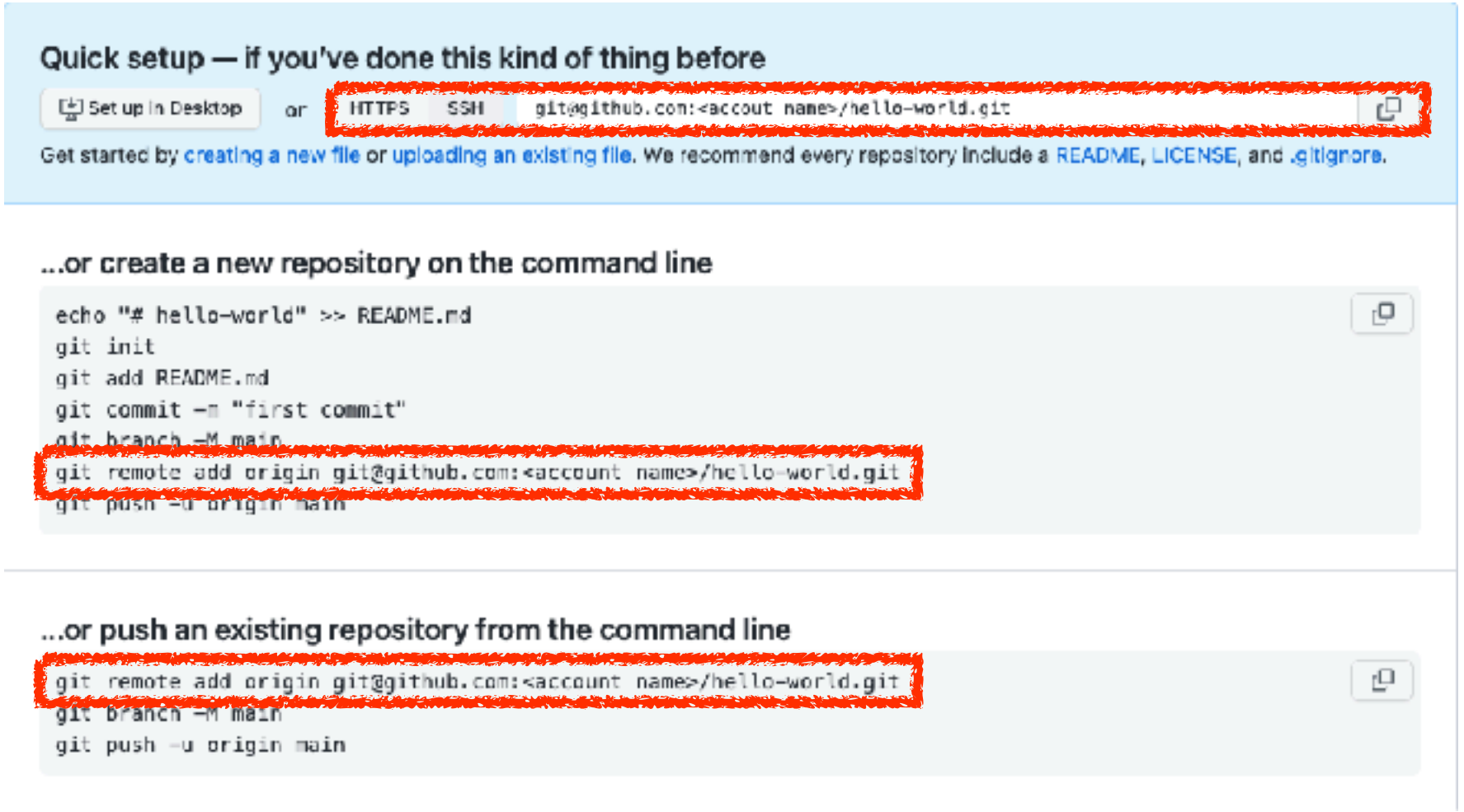
Working with remote repository

git clone

VS

git remote add

git remote

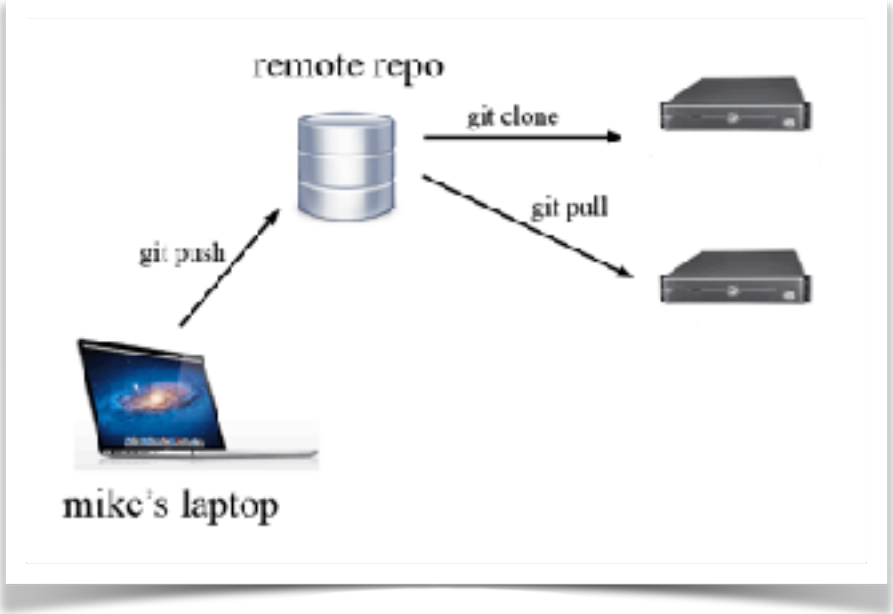


git clone

$git **clone** *git-url*

$git **clone** *git@github.com:<account name>/hello-world.git*

$git **clone** https://*github.com/<account name>/hello-world.git*



git push, git pull

Share code to remote

git push -u origin <branch-name>

git push

git push origin <branch-name>

Share local branch to remote

git push origin <branch-name>

Remove branch from remote

git push origin <:branch-name>

git push origin -d <branch-name>

Pull code from remote

git pull origin <branch-name>

git pull

Pull code from remote with rebase

git pull --rebase

Share tag

Share tags to remote

git push <remote_name> --tags

git push <remote_name> <tag_name>

Remove tag on remote

git push <remote_name> :<tag_to_remove>

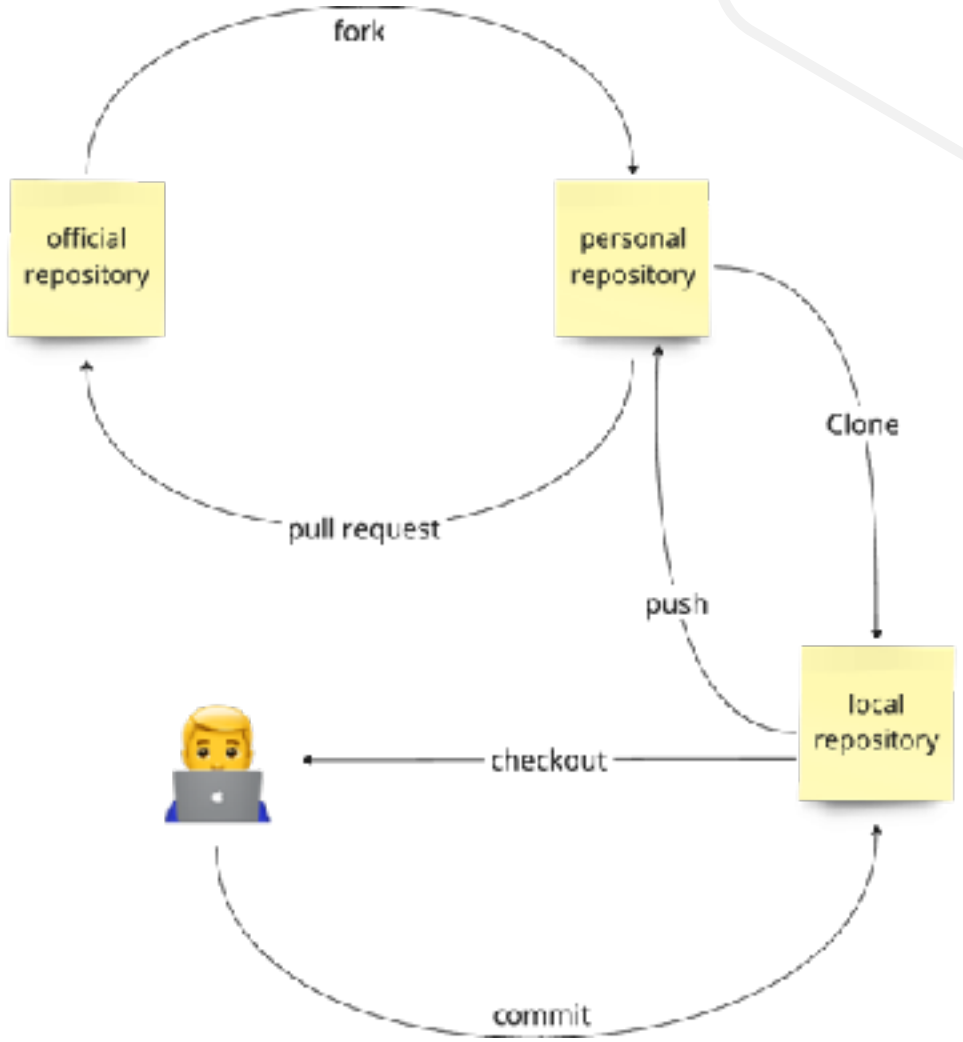
git push --delete <remote_name> <tag_to_remove>

Fetch tags from remote

git fetch --all --tags

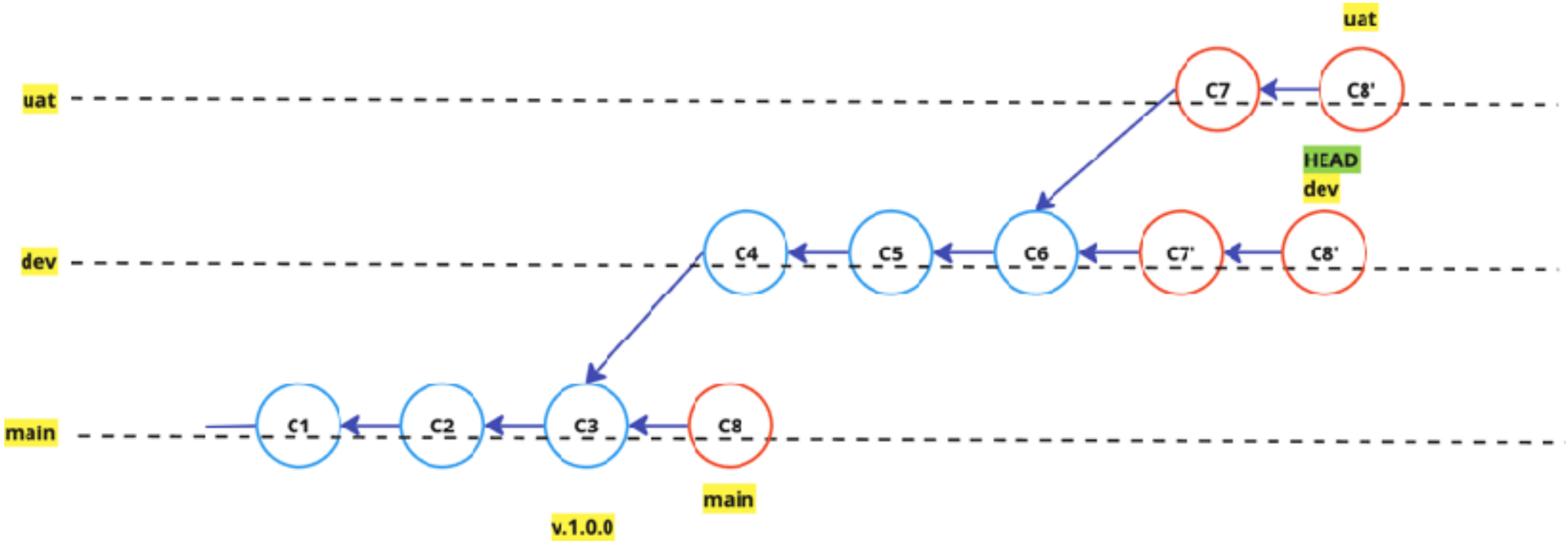
Pull Request

A **pull request** (**PR**), also known as a **merge request**, is a fundamental concept in software development, particularly when using version control systems like Git. It serves as a proposal to merge code changes from one branch into another, typically from a feature branch into the main branch of a project.

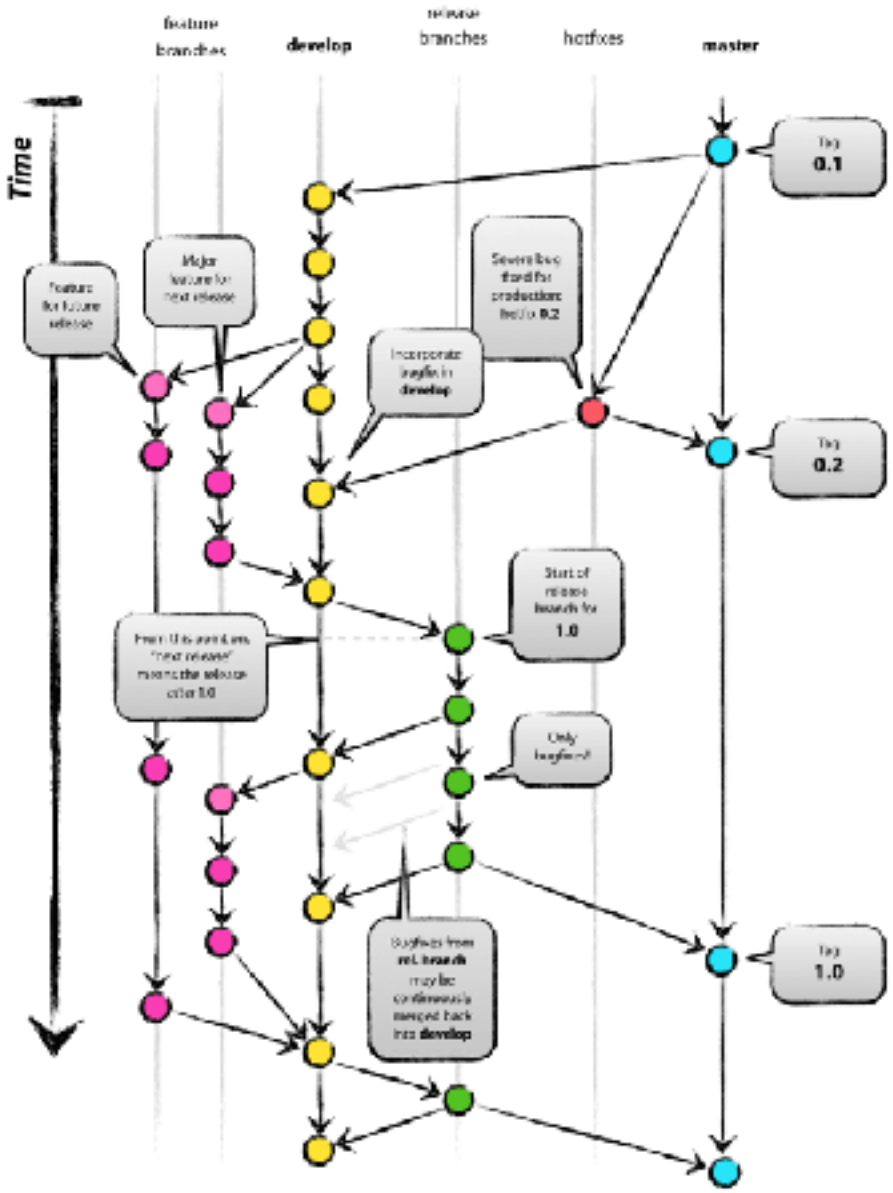


Branch Strategy

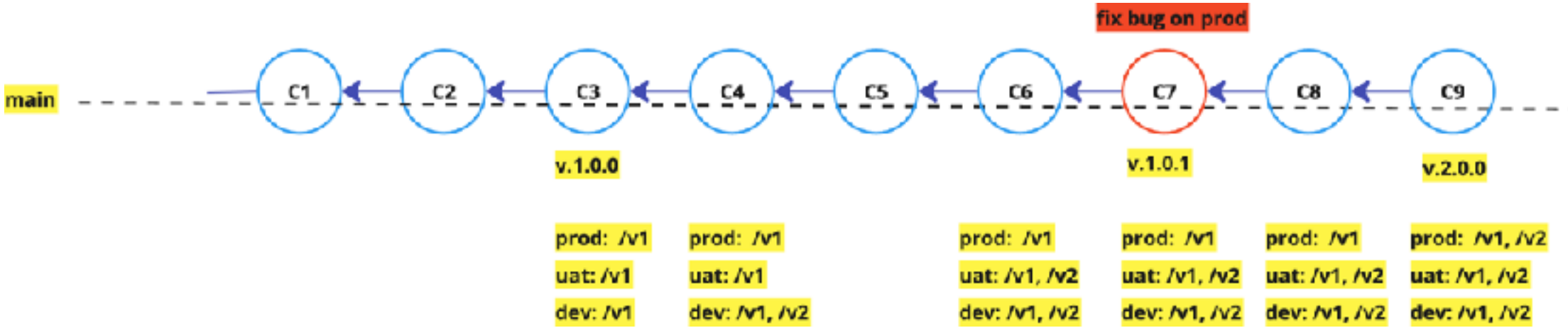
Branch by Environment



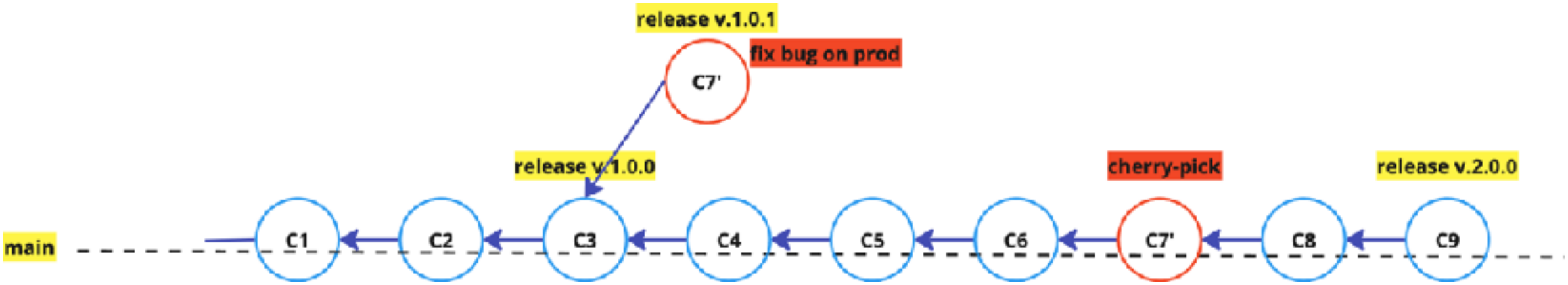
Git flow



Feature Flag



Branch for Release



thanks