Git Branches

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WAY TO REINVENT YOURSELF

Objectives

- Branches
- Merges
- Conflicts

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1 Recap- Git Workflow

Recap-What is Git?

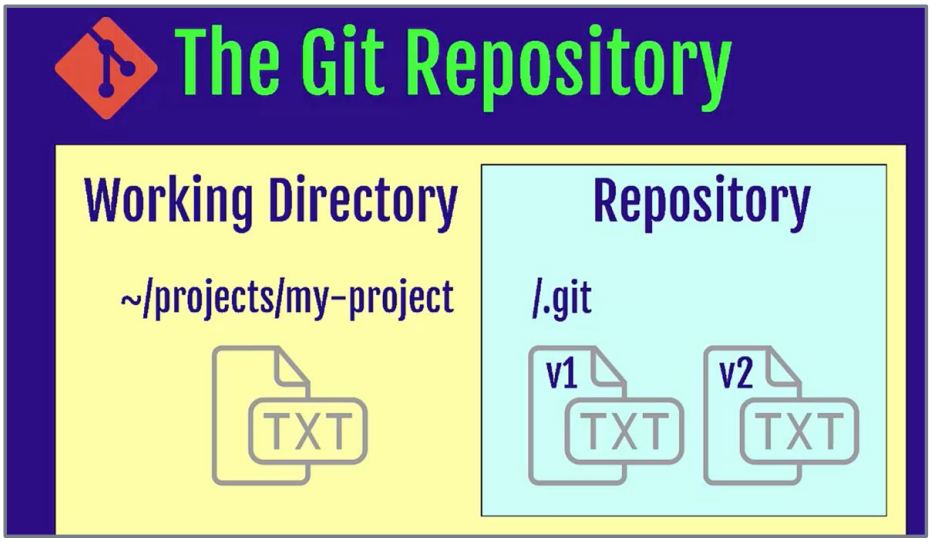
- **Git** is an **open source distributed version control system**
- **Tracks** and **records** changes to files over time (**versioning**)
- Can **retrieve** previous version of files at any time (**time travel**)
- Can be used **locally**, or **collaboratively** with others (**teamwork**)
- Contains extra information such as **date**, **author**, and **a message explaining the change**
- **Compare** and **Blame**
  - What changed
  - When it changed
  - Why it changed
  - Who changed it

Recap-Git Repository

What is a repository

- A directory or storage space where your projects can live.

- Local Repository
- Remote Repository (Central Repository)



Recap-Workflow-Git's "three trees"

Working Directory

Where you work.Create new files, edit files delete files etc.

Staging Area (Index)

Before taking a snapshot, you're taking the files to a stage. Ready files to be committed.

Repository (Commit Tree)

Committed snapshots of your project will be stored here with a full version history.

Recap-Git Config

- Git needs your identity to mark/label changes / editor

```
git config --global user.name "Your Name"
```

```
git config --global user.email "Your Name"
```

```
git config --global core.editor "vim"
```

```
git config --list
```


Recap-Basic Commands

git help

git init

git status

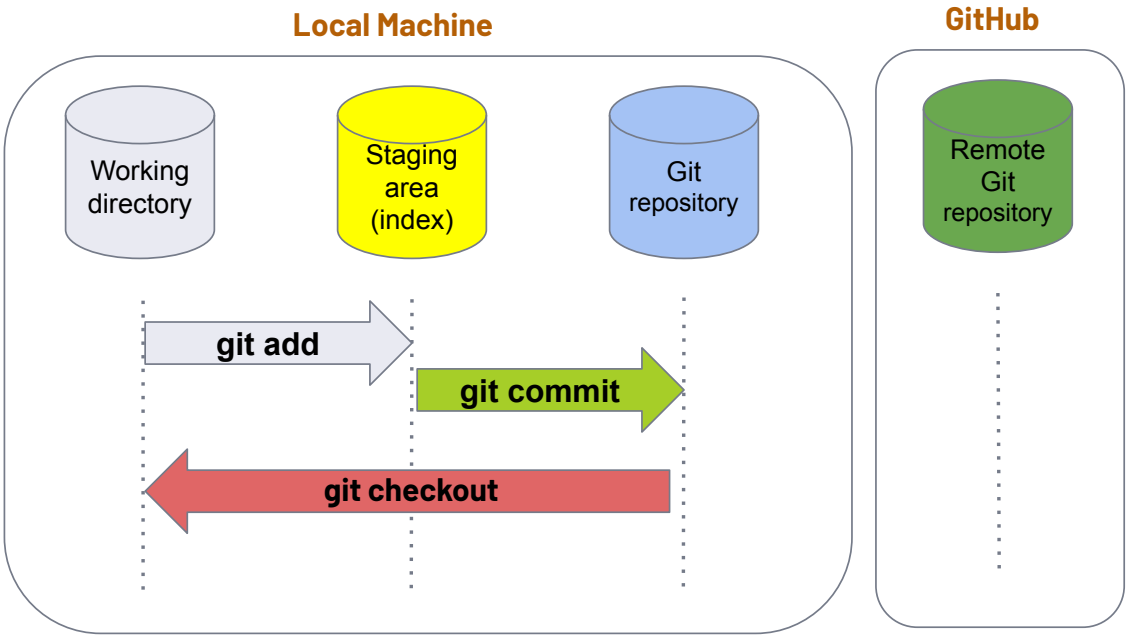
git add .

git rm --cached

git commit -m "abc"

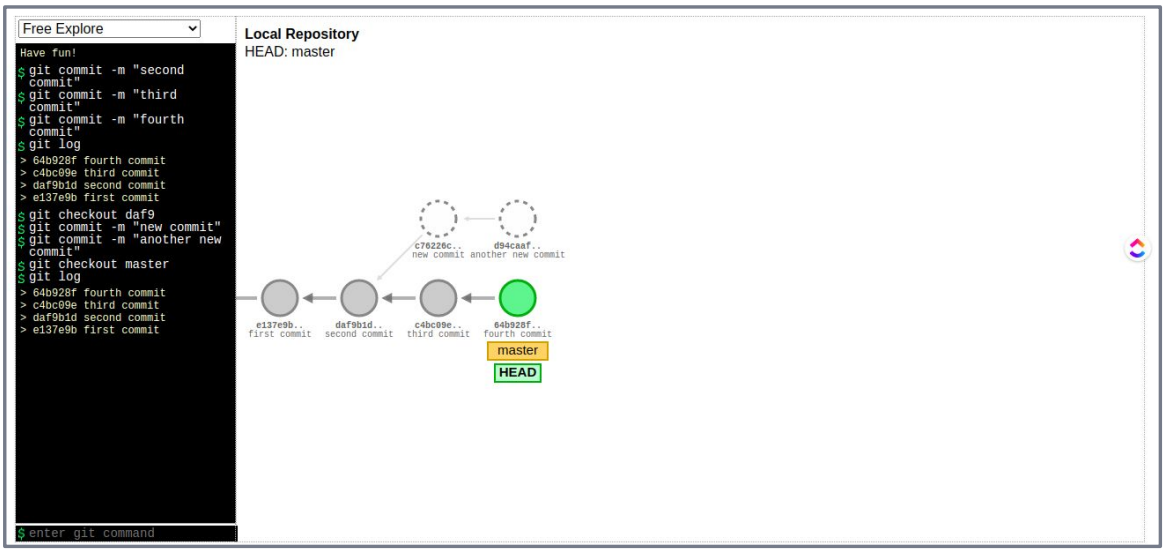
git log

git checkout commitID



Recap-Timetravel

https://git-school.github.io/visualizing-git/



Recap-Tasks

Task-1

- Create a new repo under **my-second-project** folder
- Create a file named **file1.txt**
- Change the file
- Stage the file
- Commit the file to your repo

Task-2

- Create a file named **file2.txt**
- Edit **file2.txt**
- Stage
- Delete the file **file1.txt**
- Rename **file2.txt** >> **file3.txt**
- Stage **file3.txt**
- Unstage **file3.txt**
- Stage **file3.txt** again
- Commit the file to your repo
- Change the message of the commit
- Switch back to your first commit in Task-1

Recap-Solutions

Create a new repo under **my-second-project** folder	`git init`
Create a file named **file1.txt**	`touch file1.txt`
Change the file	`vim file1.txt`
Stage the file	`git add .`
Commit the file to your repo	`git commit -m "message"`
Create a file named **file2.txt**	`touch file2.txt`
Edit **file2.txt**	`vim file2.txt`
Stage	`git add .`
Delete the file **file1.txt**	`rm file1.txt`
Rename **file2.txt** >> **file3.txt**	`mv file2.txt file3.txt`

Recap-Solutions Cntd.

Stage **file3.txt**	`git add .`
Unstage **file3.txt**	`git rm --cached file3.txt`
Stage **file3.txt** again	`git add .`
Commit the file to your repo	`git commit -m "message"`
Change the message of the commit	`git commit --amend`
Switch back to your first commit in **Task-1**	`git log`
	`git checkout "first commit ID"`

Git

Branch, Head

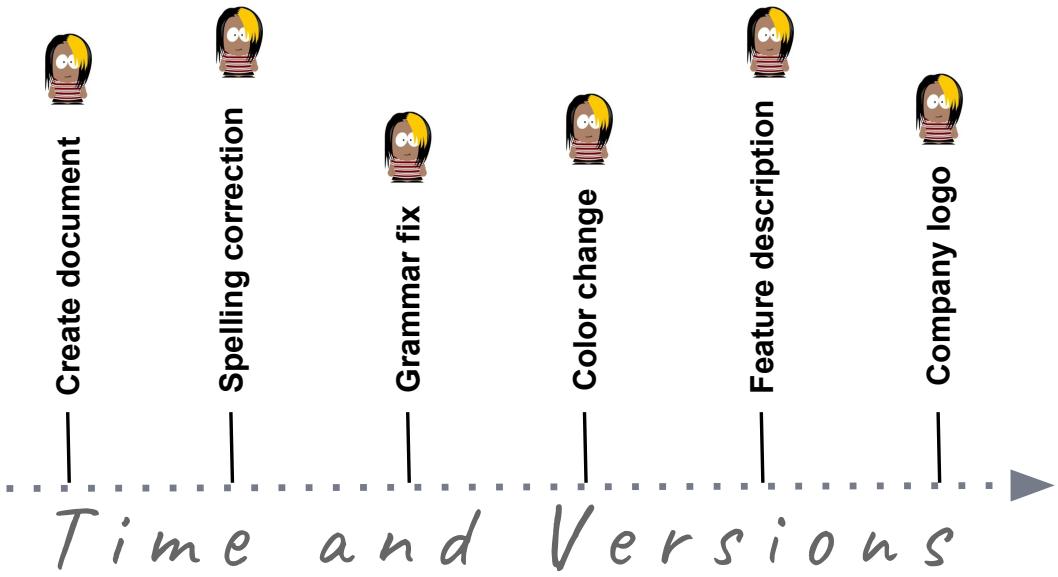
What comes to you your mind when you hear this?

Students, write your response!

Pear Deck Interactive Slide
Do not remove this bar

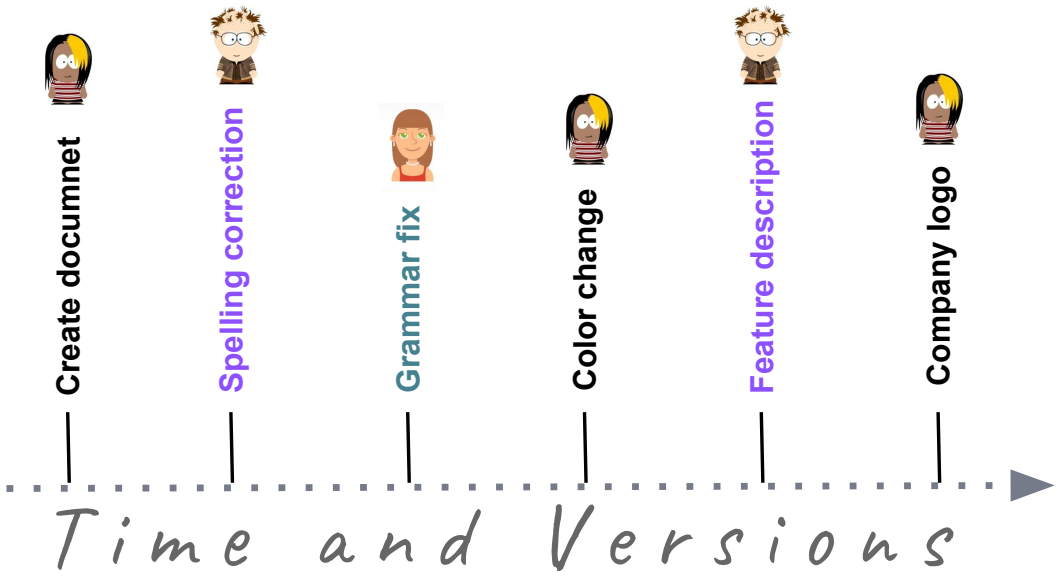
Git Branches

History Tracking



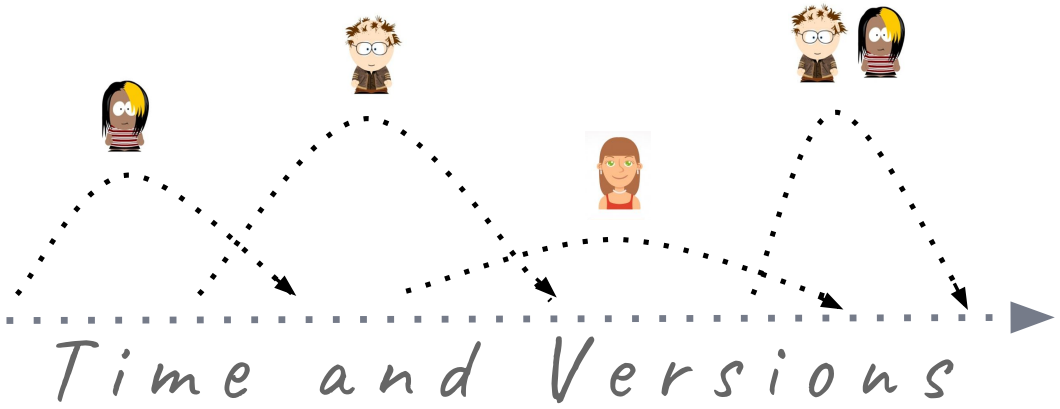
Git Branches

Collaborative History Tracking



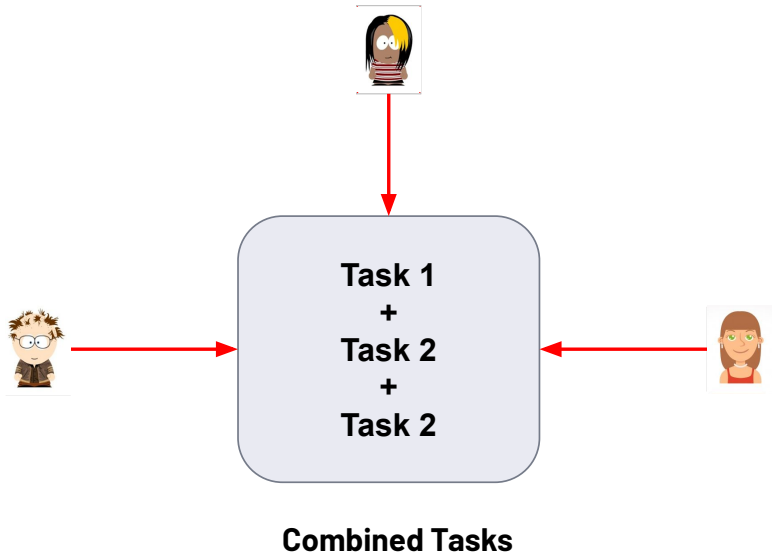
Git Branches

Collaborative History Tracking

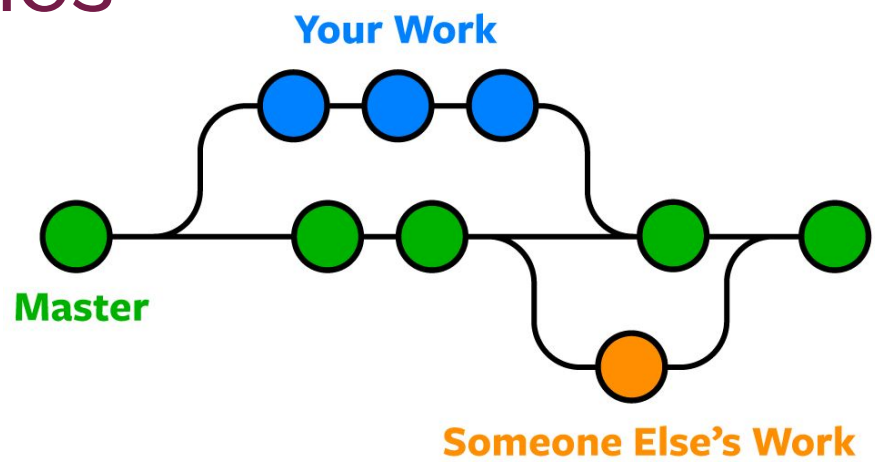


Git Branches

Collaboration



Branches



- Production of the project lives on master/main branch
- Branches are reference to a commit

```
Erics-Mac:project eric$ git branch
* master
```

Branches

- to see local branches

```
git branch
```

- to see remote branches

```
git branch -r
```

- to see all branches

```
git branch -a
```


Creating/switching branches

- create a new branch

```
git branch Branch name
```

- switch to a branch

```
git checkout Branch name
```

- create a new branch and switch to that branch

```
git checkout -b Branch name
```

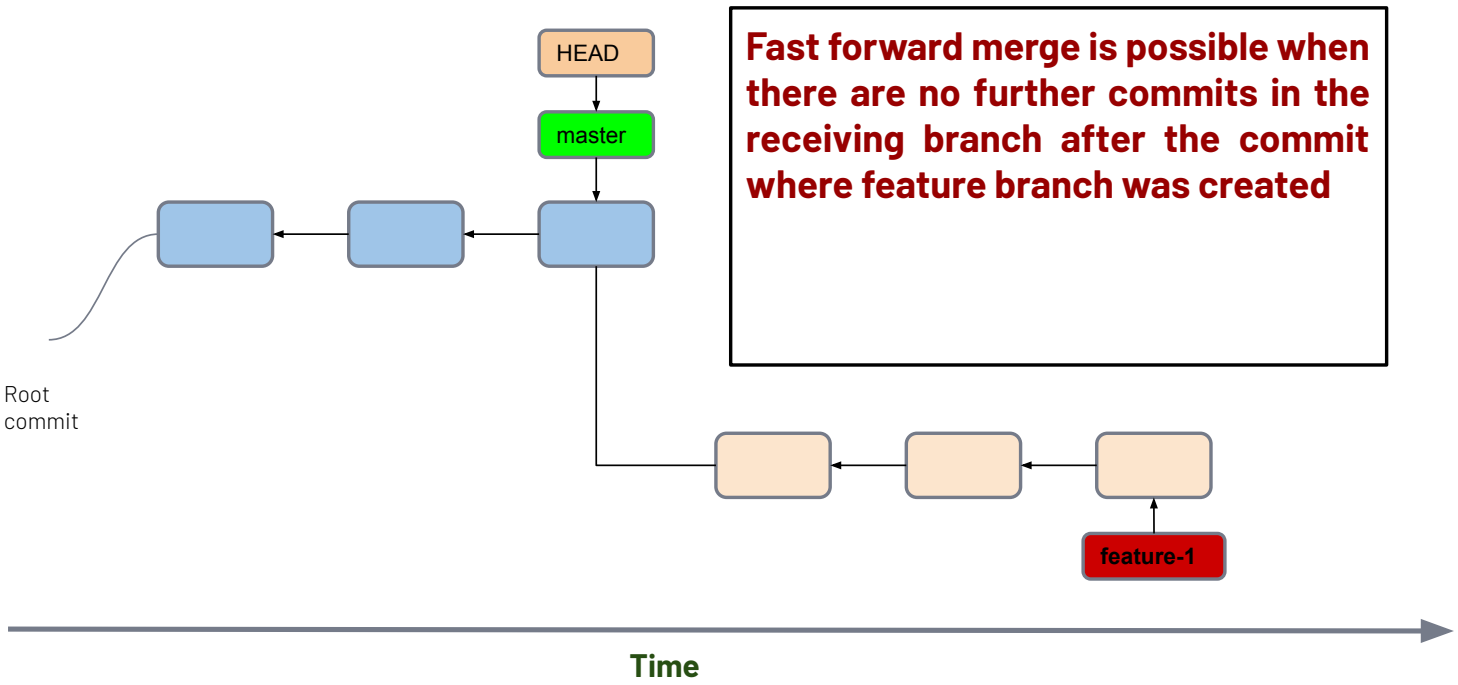
Deleting branches

➔ delete a local branch

```
git branch -d Branch name
```

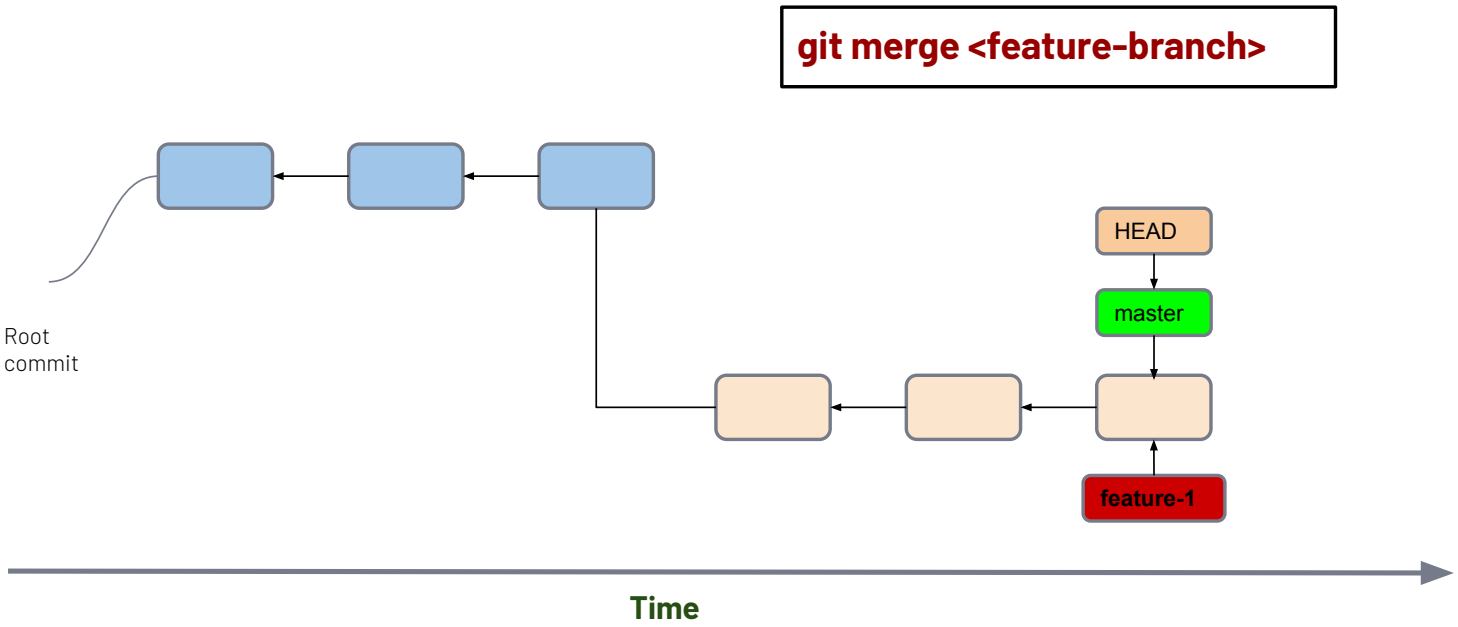
```
git branch -D Branch name
```


Fast forward merge

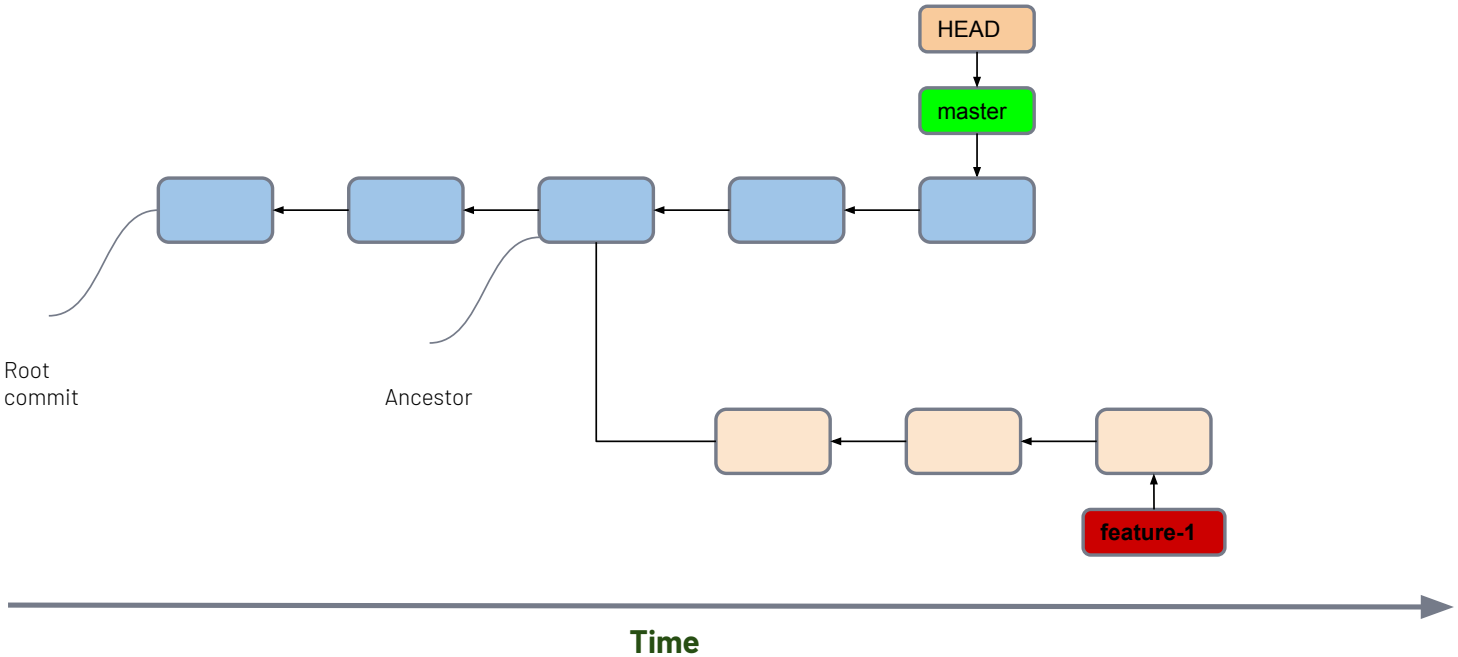


Fast forward merge is possible when there are no further commits in the receiving branch after the commit where feature branch was created

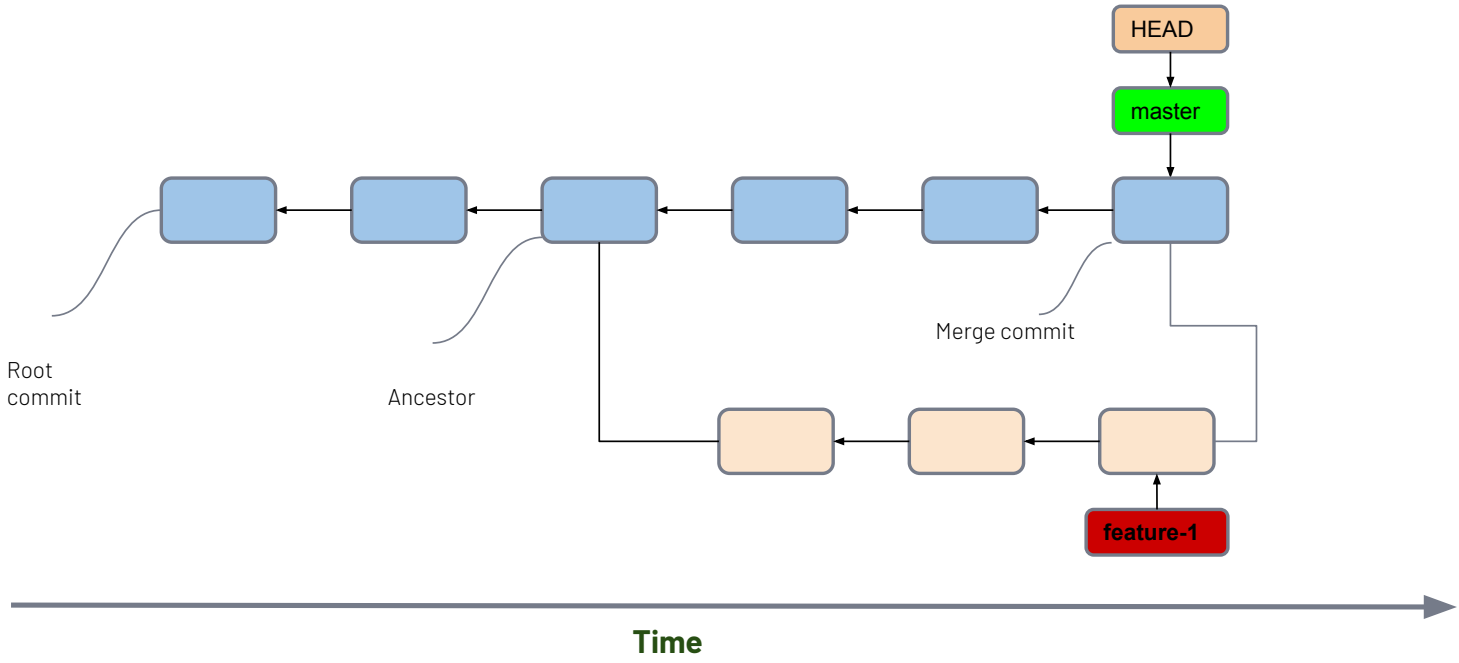
Fast forward merge



3-way merge

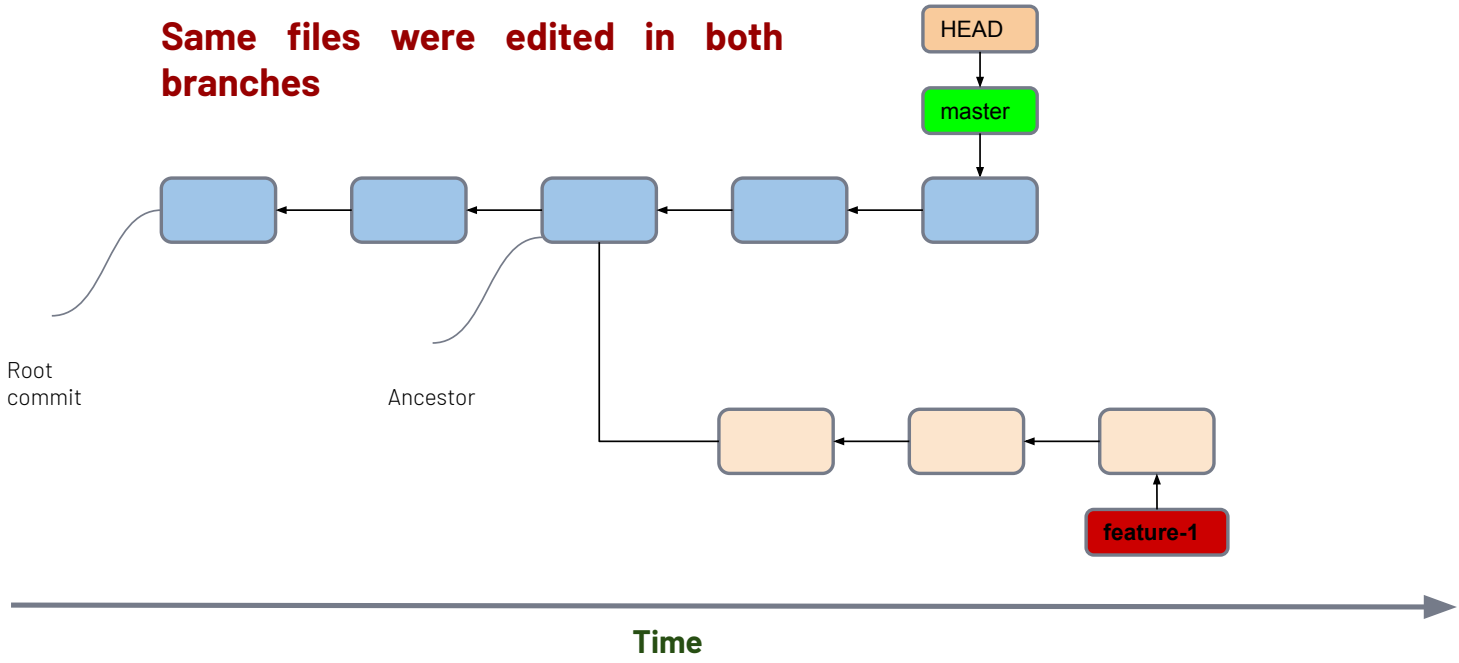


3-way merge



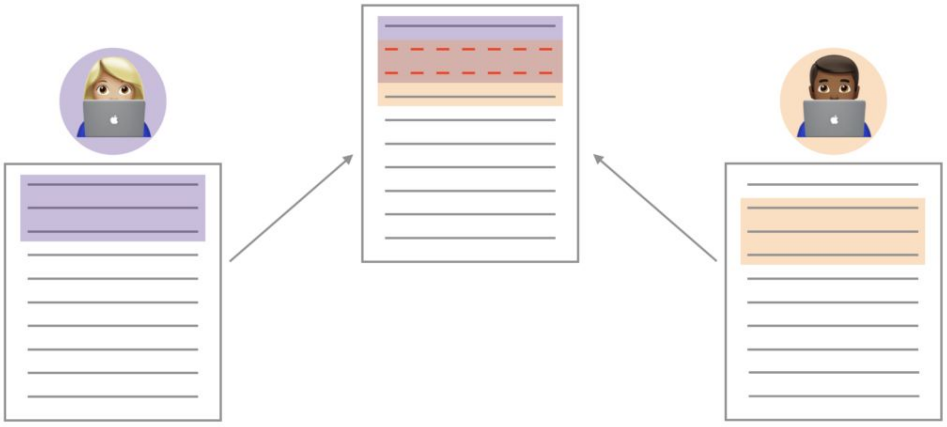
Merge Conflicts

Same files were edited in both branches



Github - Merge Conflict

- **Merge conflicts** happen when you merge branches that have competing commits, and Git needs your help to decide which changes to incorporate in the final merge.



THANKS!

Any questions?

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