



Git Branches



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Objectives



- ▶ Branches
- ▶ Merges
- ▶ Conflicts

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Recap- Git Workflow

Recap-What is Git?

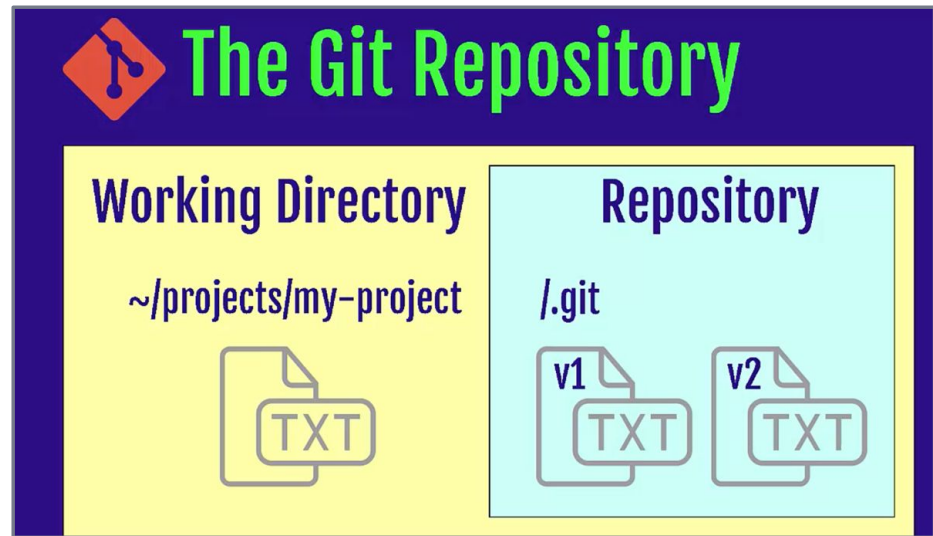


- **Git** is an **open source distributed version control system**
- **Tracks** and **records** changes to files over time (**versioning**)
- Can **retrieve** previous version of files at any time (**time travel**)
- Can be used **locally**, or **collaboratively** with others (**teamwork**)
- Contains 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"
```

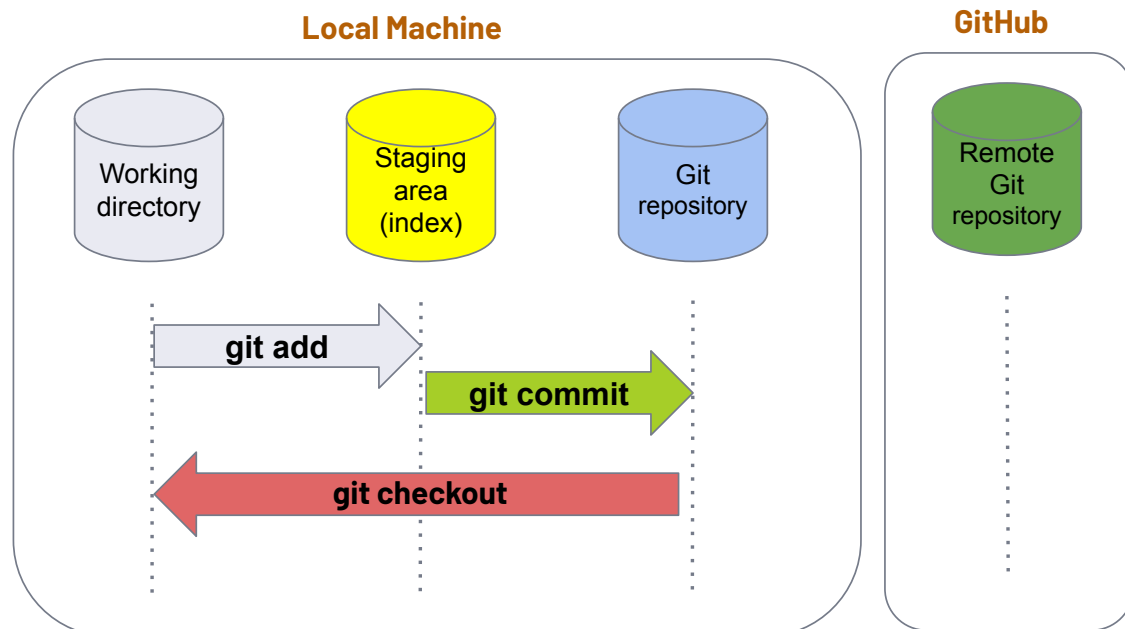
```
git config --global user.email "Your Name"
```

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

```
git config --list
```

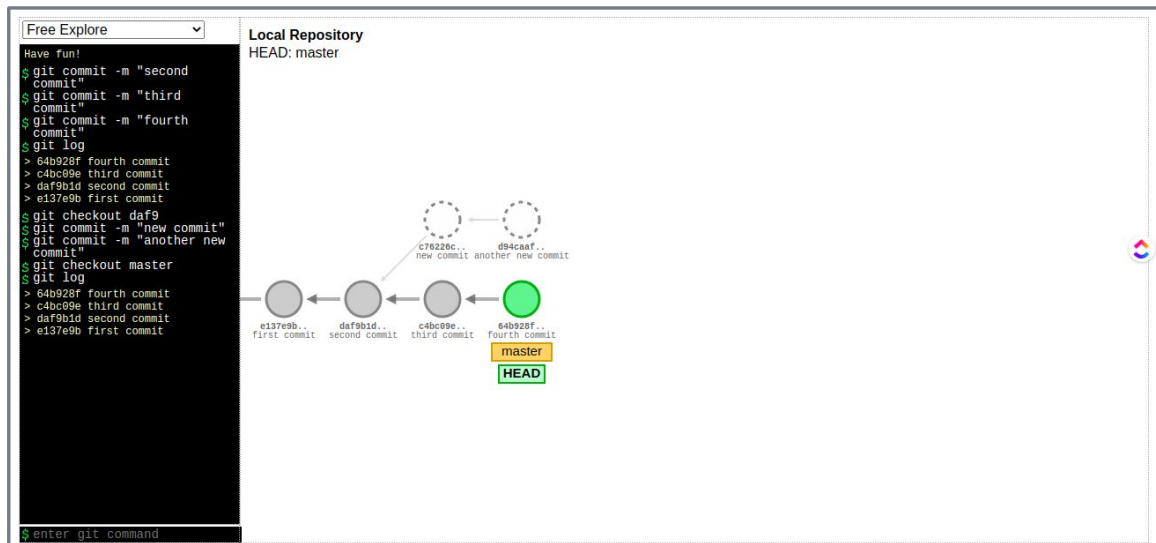
Recap-Basic Commands

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/>



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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
- Create a file named **file1.txt**
- Change the file
- Stage the file
- Commit the file to your repo
- Create a file named **file2.txt**
- Edit **file2.txt**
- Stage
- Delete the file **file1.txt**
- Rename **file2.txt** >> **file3.txt**

```
git init
```

```
touch file1.txt
```

```
vim file1.txt
```

```
git add .
```

```
git commit -m "message"
```

```
touch file2.txt
```

```
vim file2.txt
```

```
git add .
```

```
rm file1.txt
```

```
mv file2.txt file3.txt
```

Recap-Solutions Cntd.

- 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**

```
git add .
```

```
git rm --cached file3.txt
```

```
git add .
```

```
git commit -m "message"
```

```
git commit --amend
```

```
git log
```

```
git checkout "first commit ID"
```



Branch, Head

What comes to you your mind when you hear this?



Students, write your response!

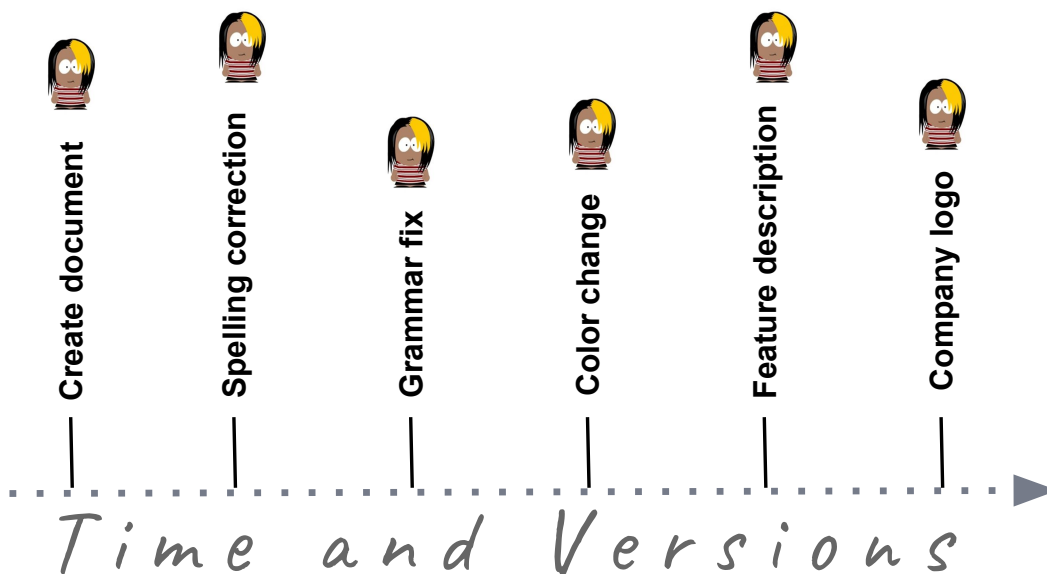
Pear Deck Interactive Slide
Do not remove this bar

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Git Branches



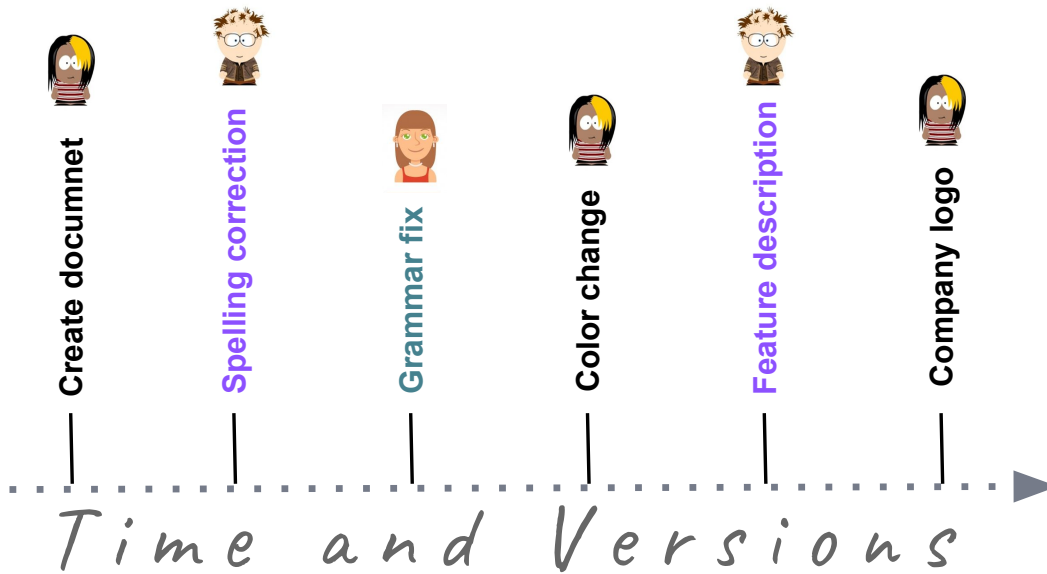
History Tracking





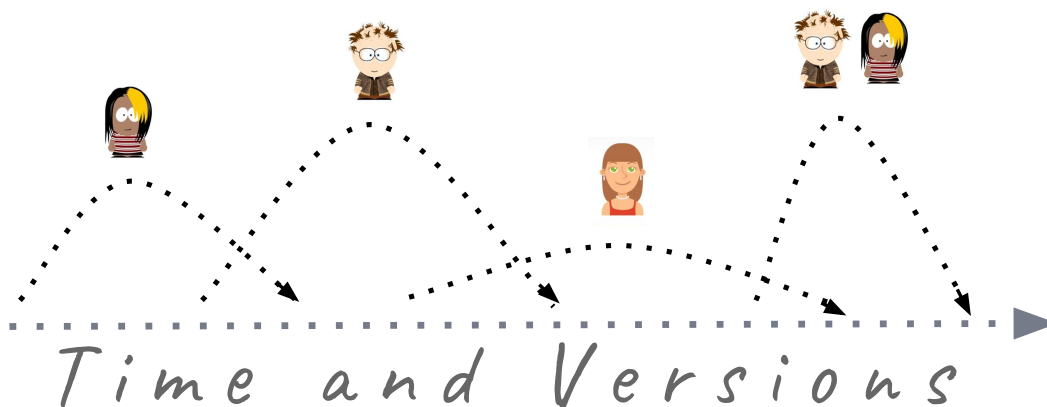
Git Branches

Collaborative History Tracking



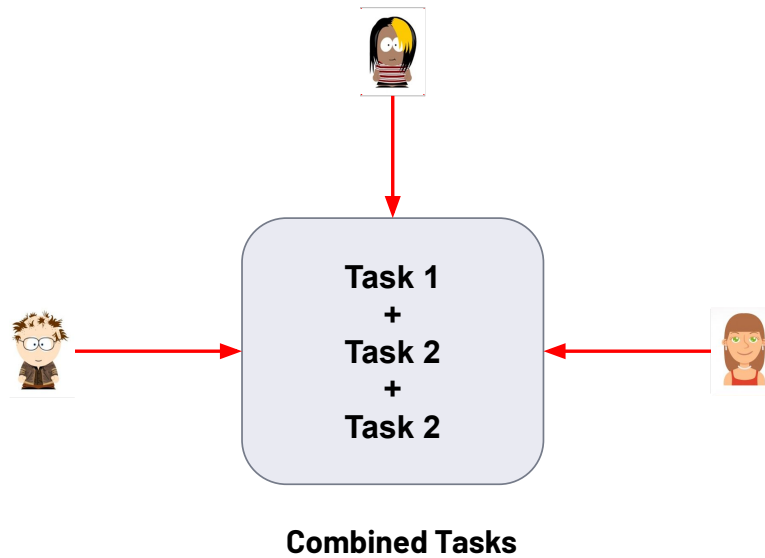
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Collaborative History Tracking

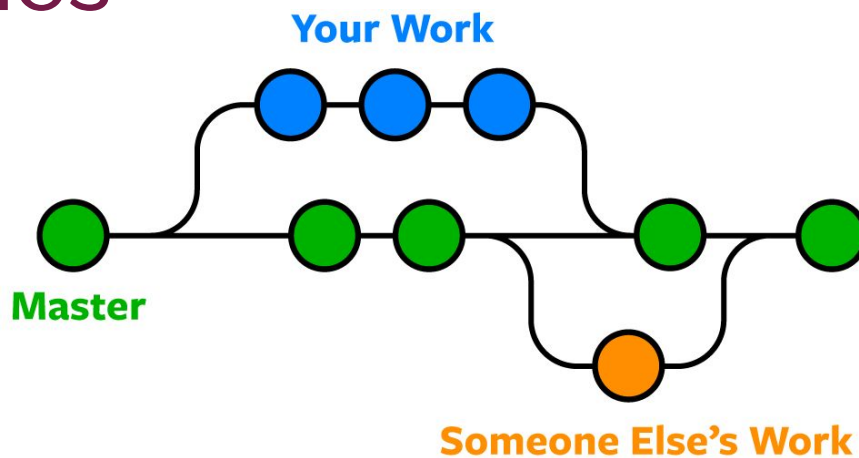


Git Branches

Collaboration



Branches



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

```
Eric's-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
```

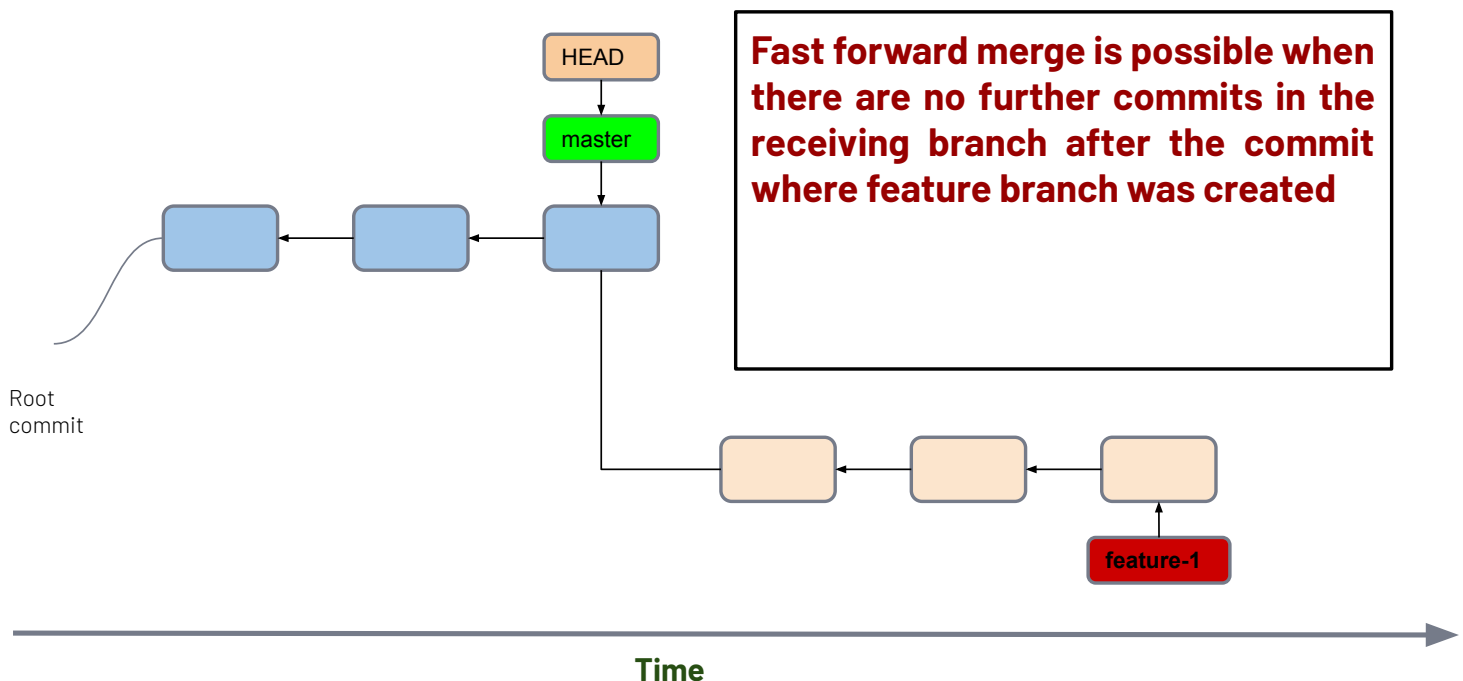
Deleting branches

→ delete a local branch

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

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

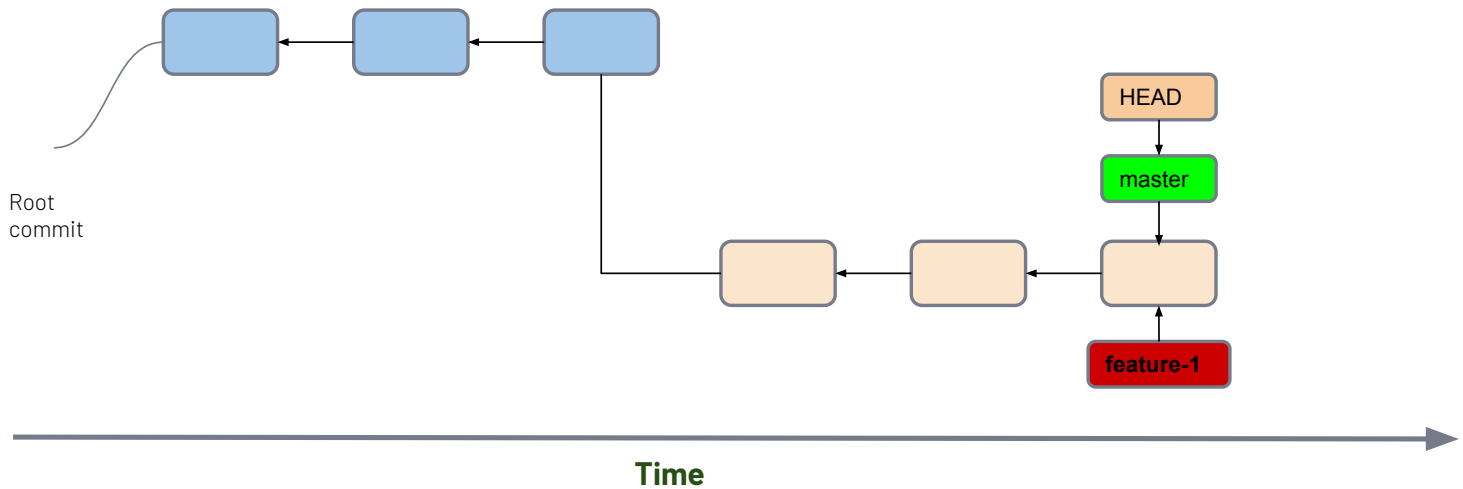
Fast forward merge



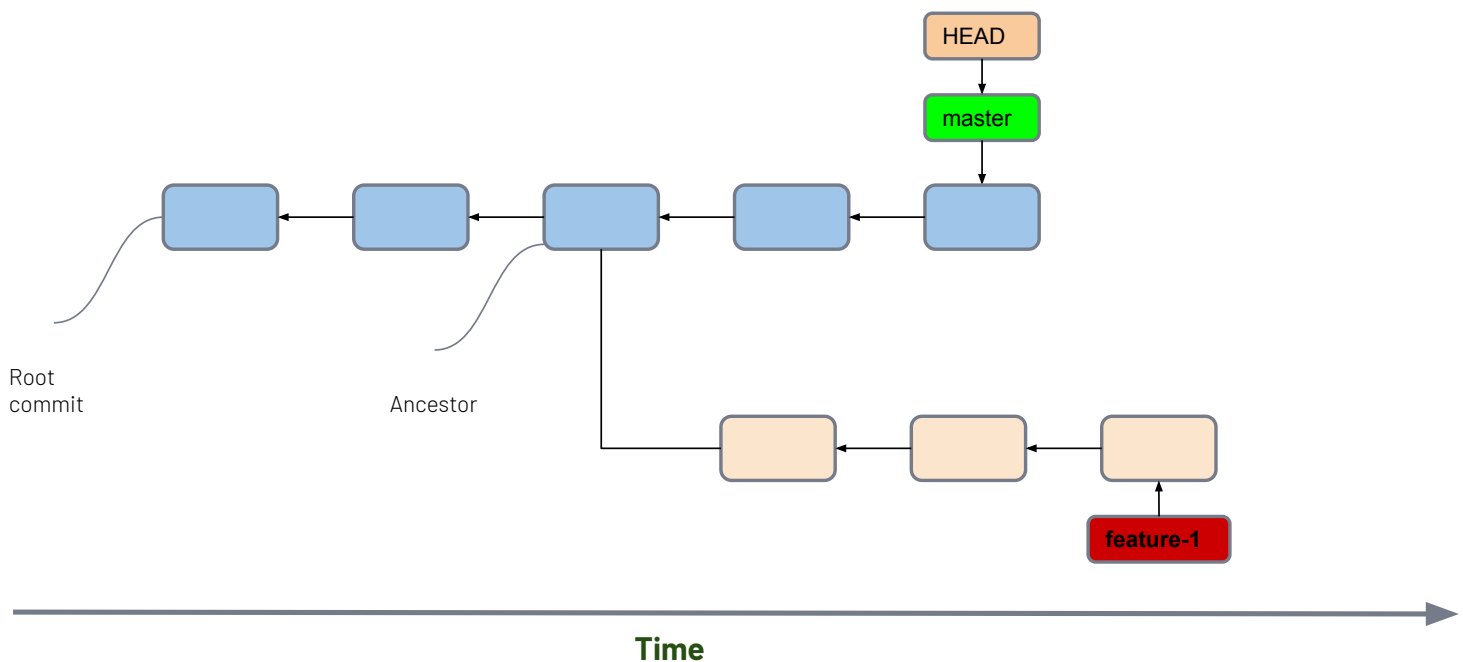


Fast forward merge

git merge <feature-branch>

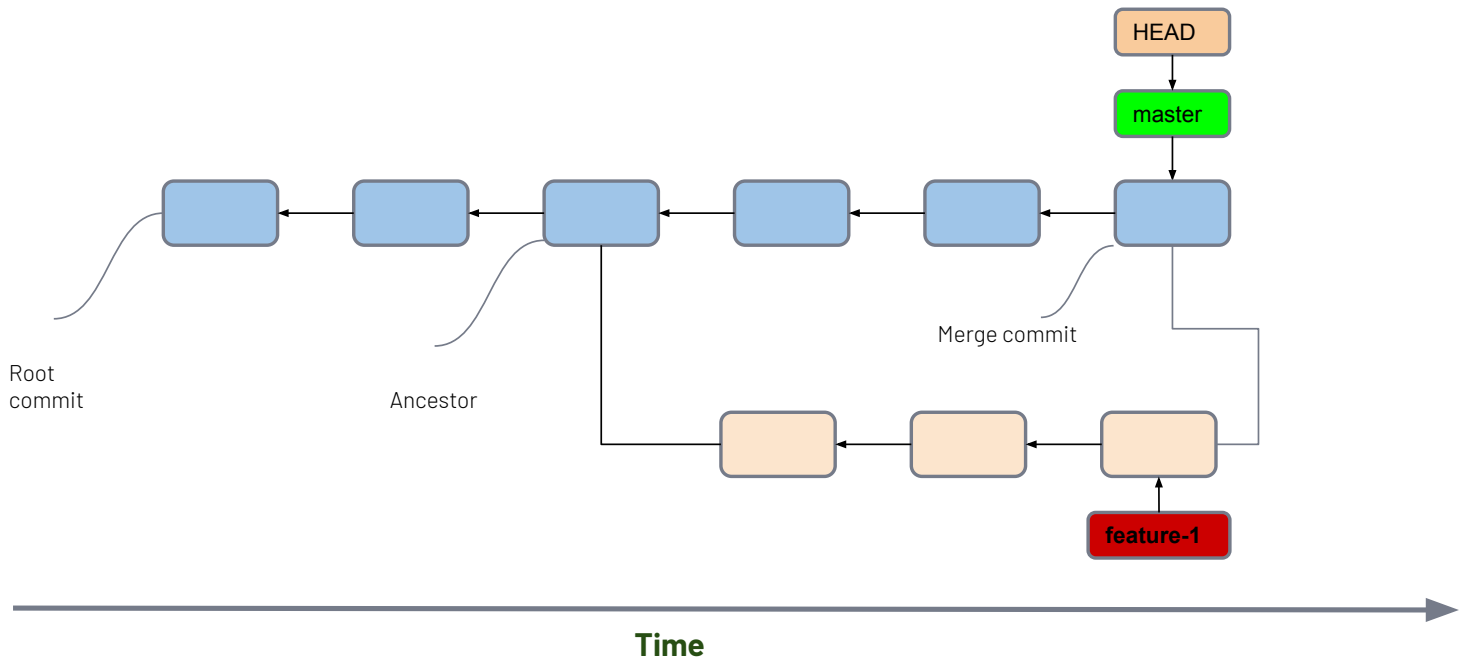


3-way merge

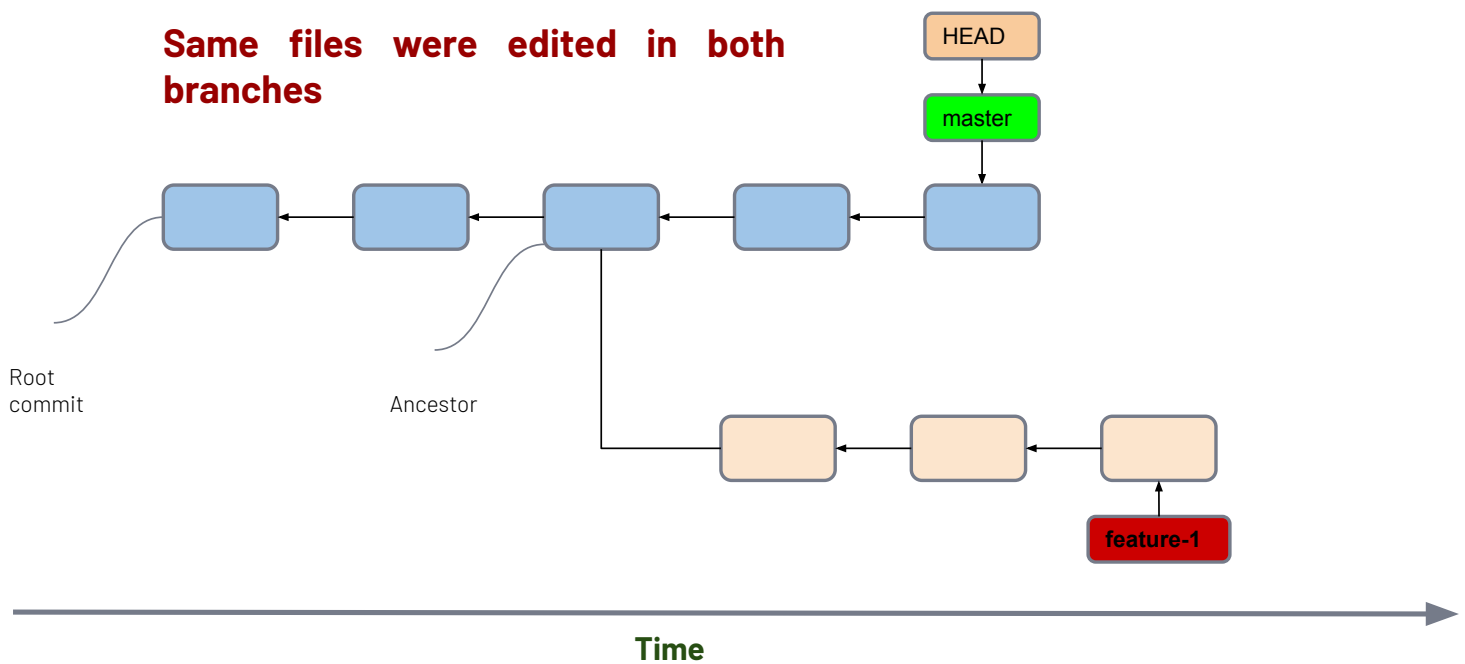




3-way merge

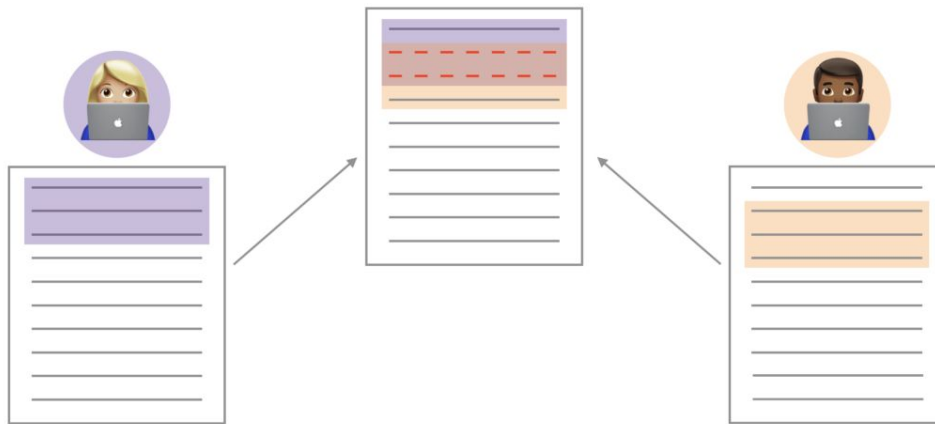


Merge Conflicts



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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