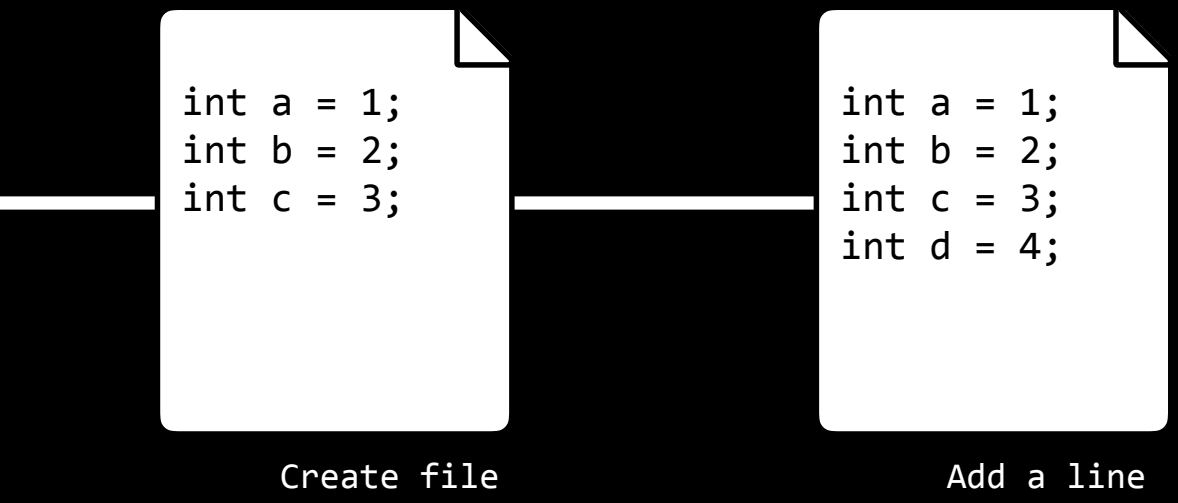
# What is Git?

Keep track of changes to code.

```
int a = 1;
int b = 2;
int c = 3;
```

Create file

Keep track of changes to code.



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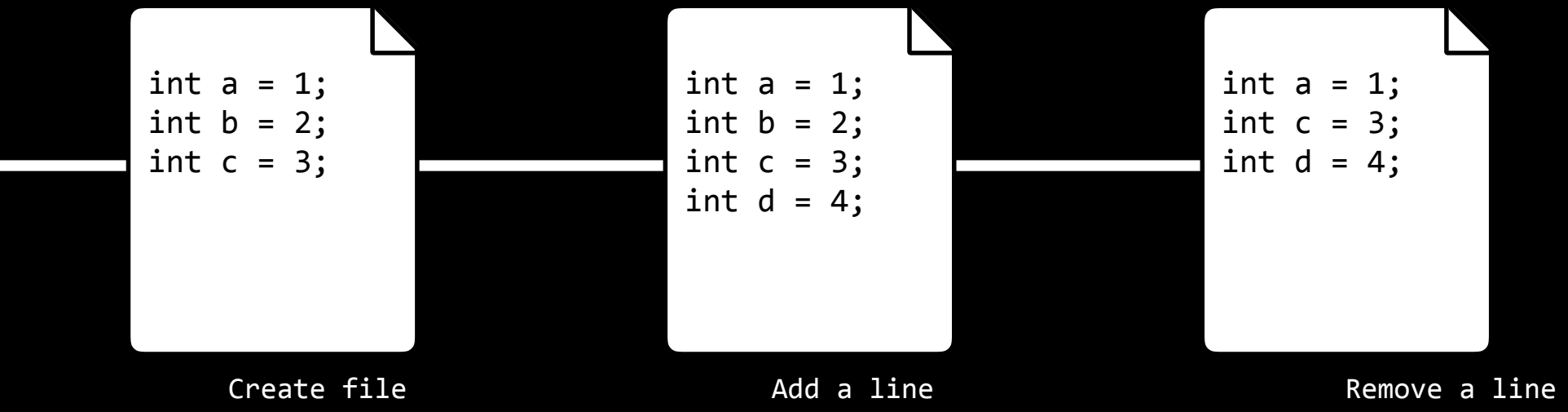
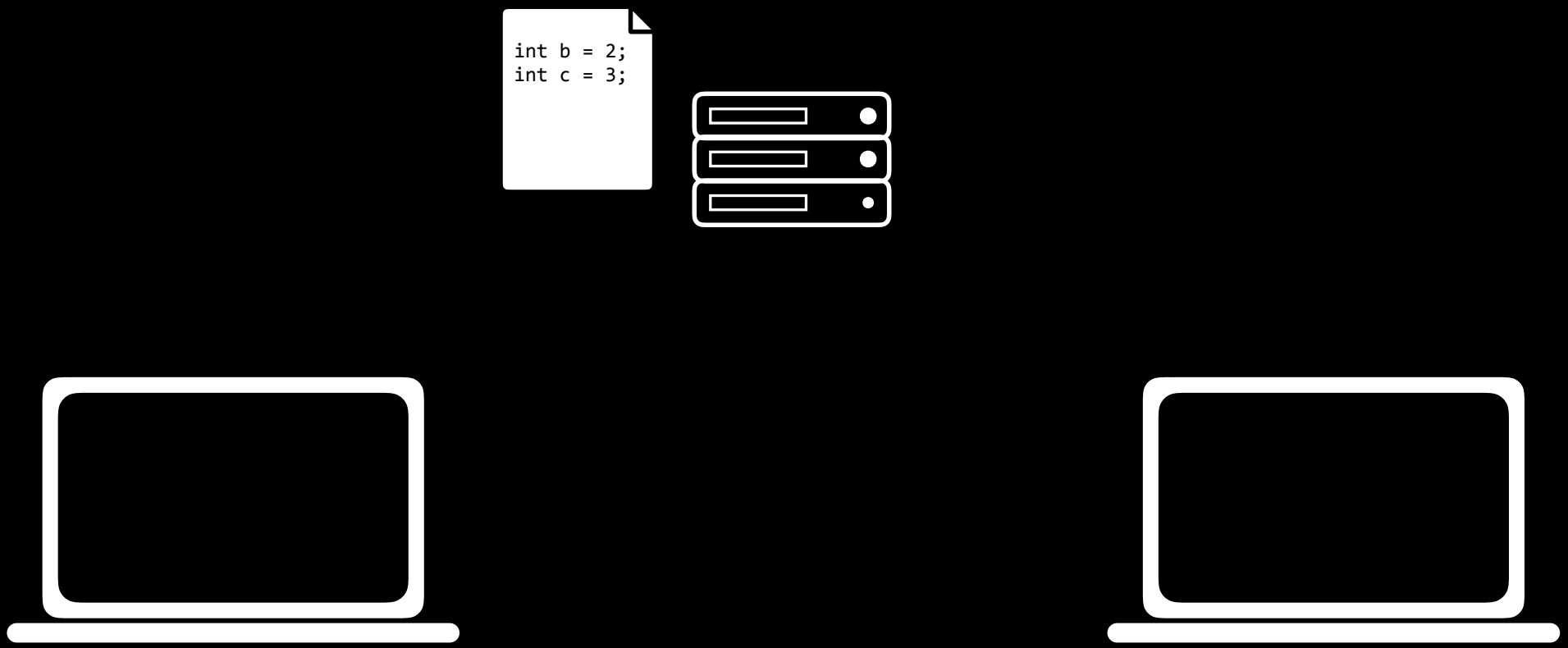


Synchronizes code between different people.



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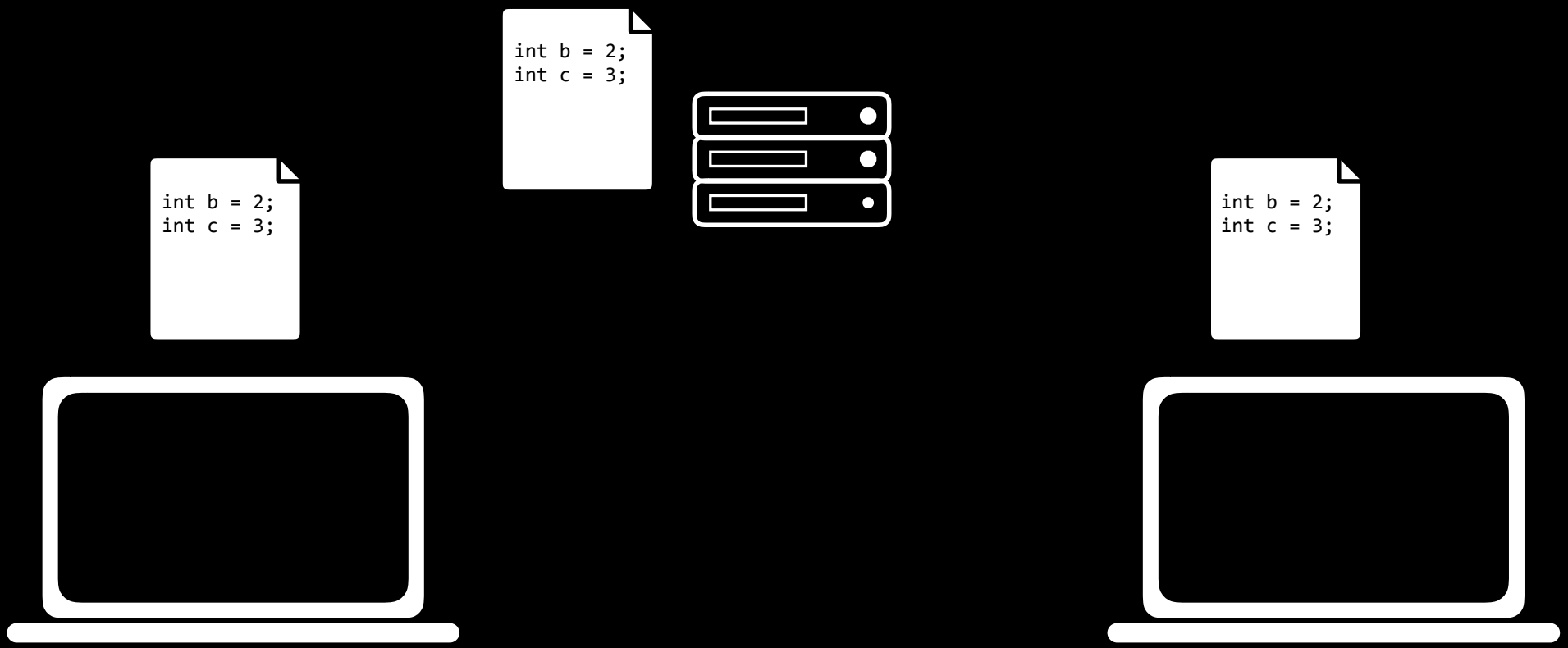

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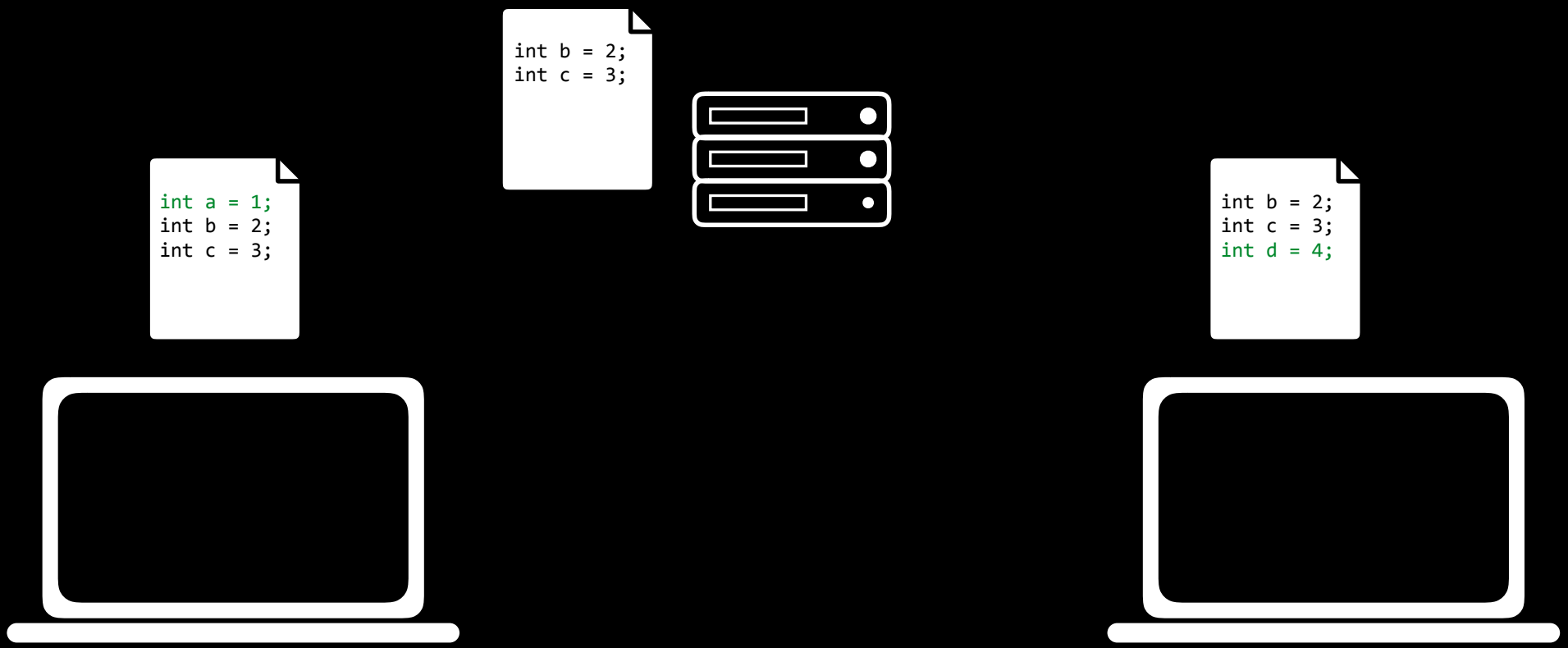

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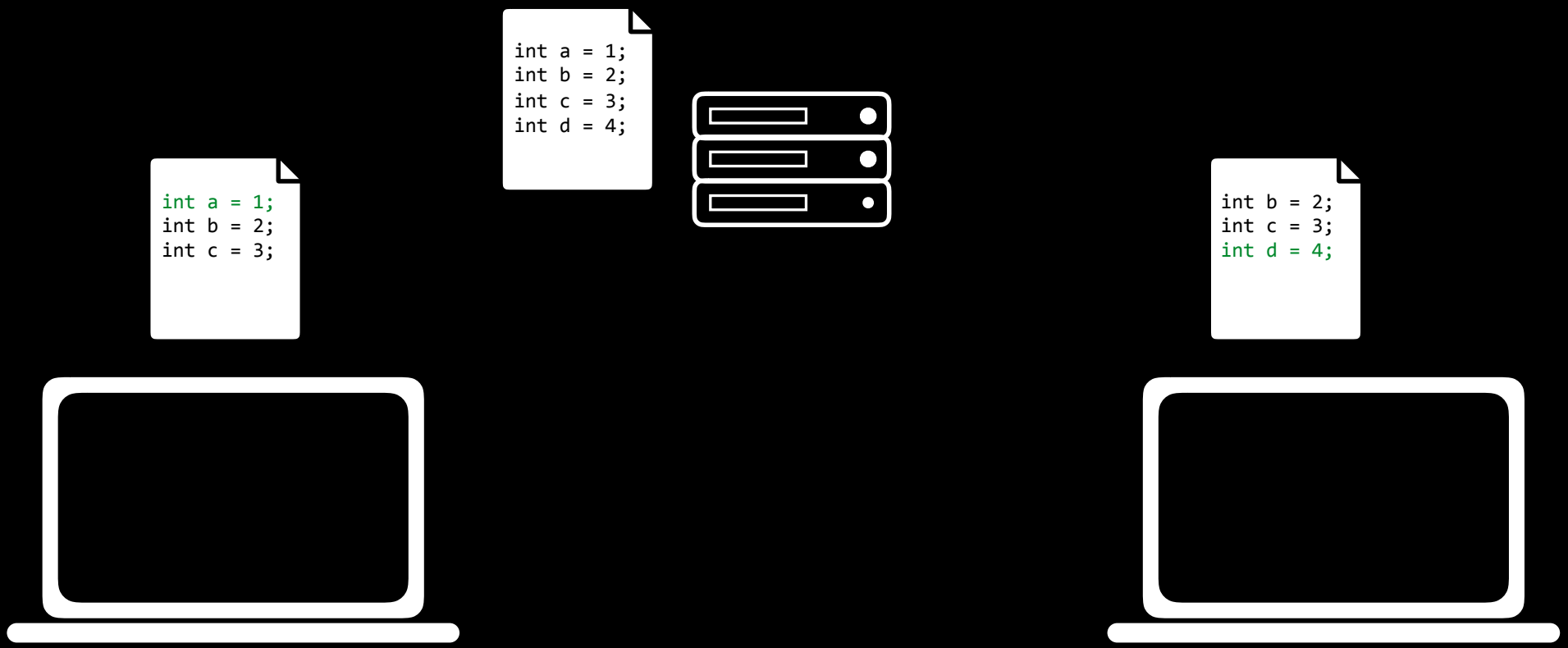

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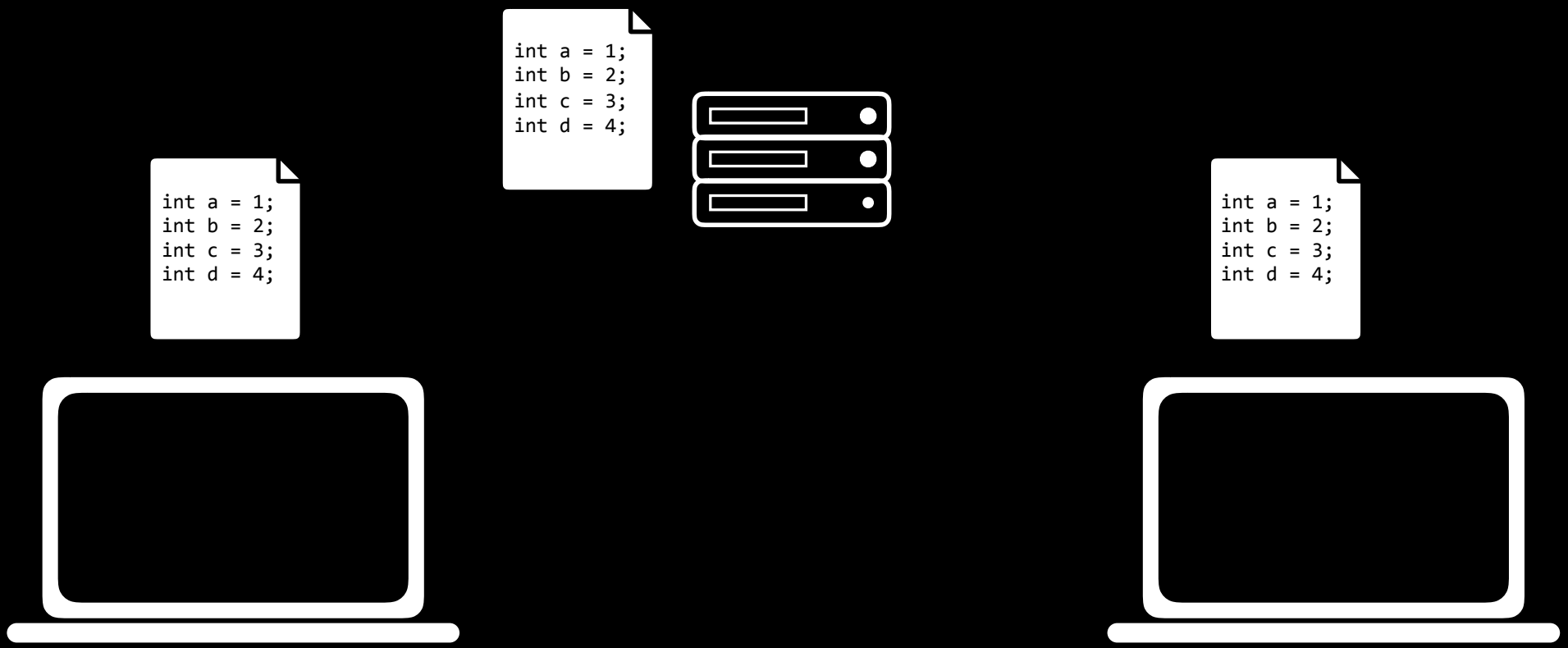

Test changes to code without losing the original.

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int a = 1;
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Revert back to old versions of code.

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```

Create file

```
int a = 1;
int b = 2;
int c = 3;
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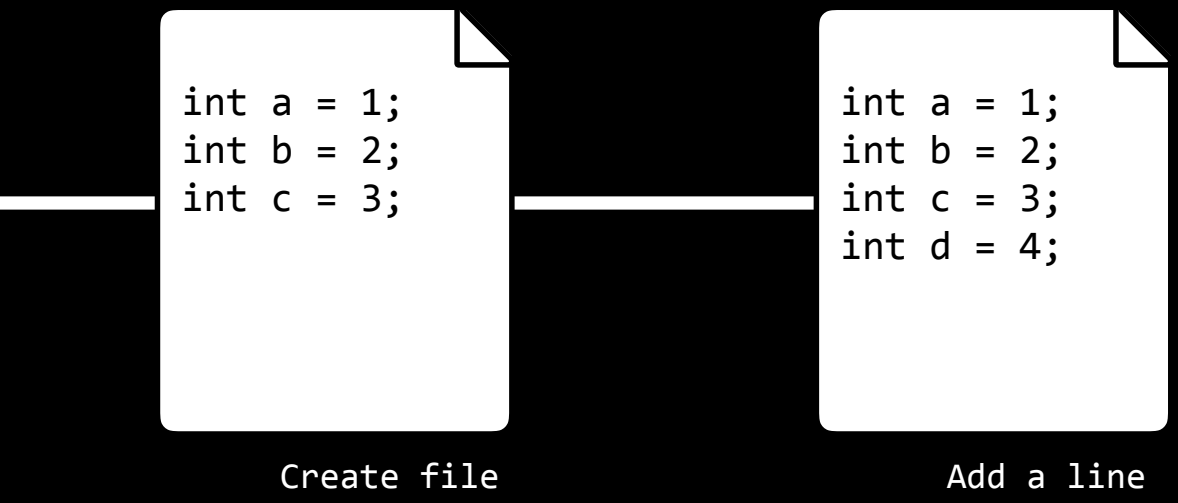
```

Add a line

```
int a = 1;
int c = 3;
int d = 4;
```

Remove a line

Revert back to old versions of code.



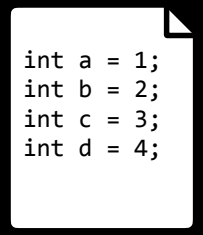
# What is Git?

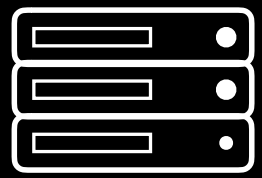
- Keeps track of changes to code.
- Synchronizes code between different people.
- Test changes to code without losing the original.
- Revert back to old versions of code.

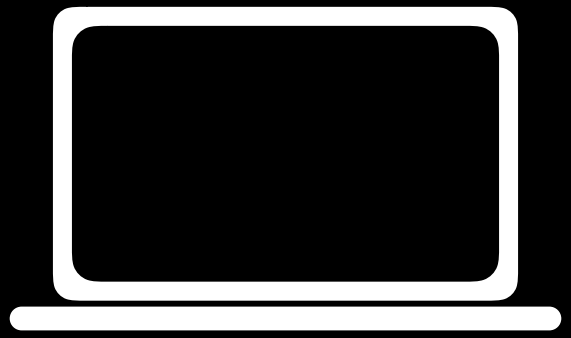
git clone

## `git clone <url>`

- makes a copy of a repository
- stores it on your computer
- a "fork" creates your own copy of someone else's repository





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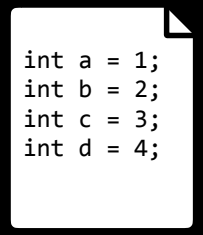


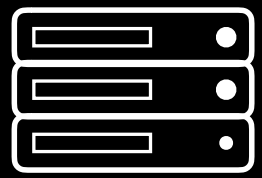

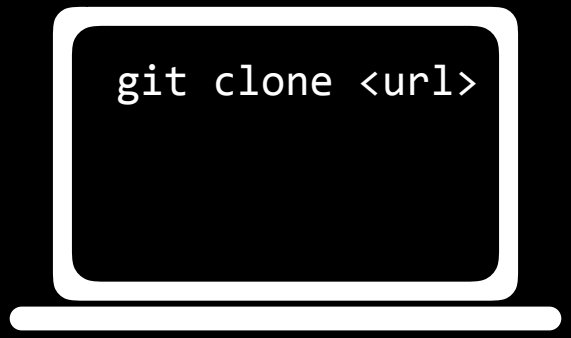

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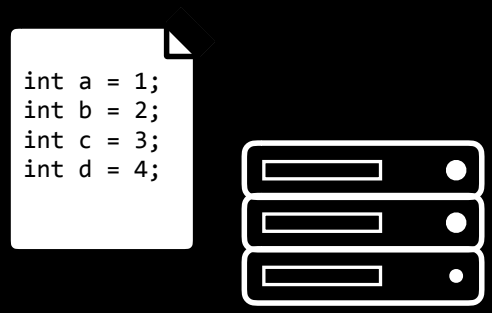
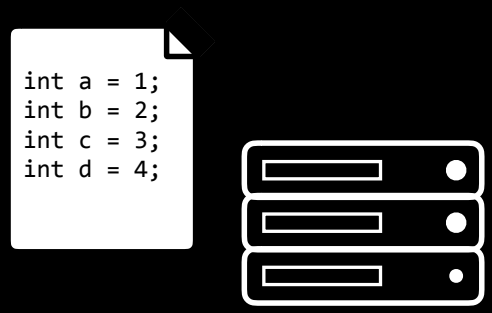
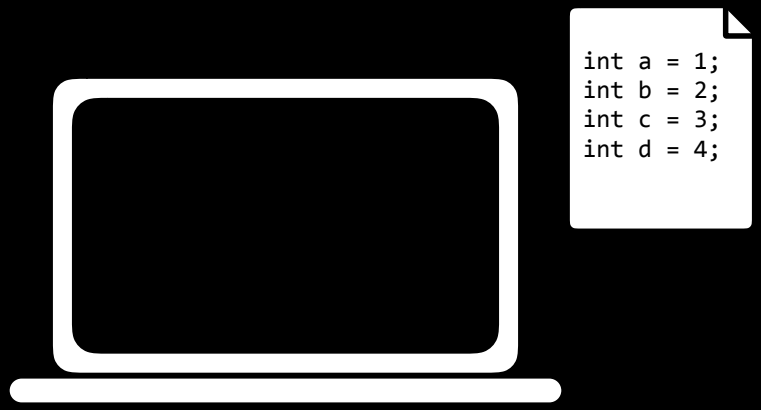



# git add

# `git add <filename>`

- adds a file to "staging area"
- tells `git` to include the file in the next revision to the repository
- `git add *` adds all changed files



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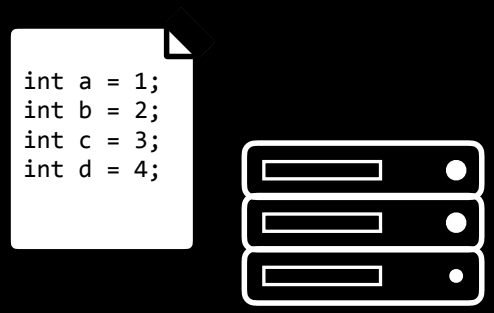


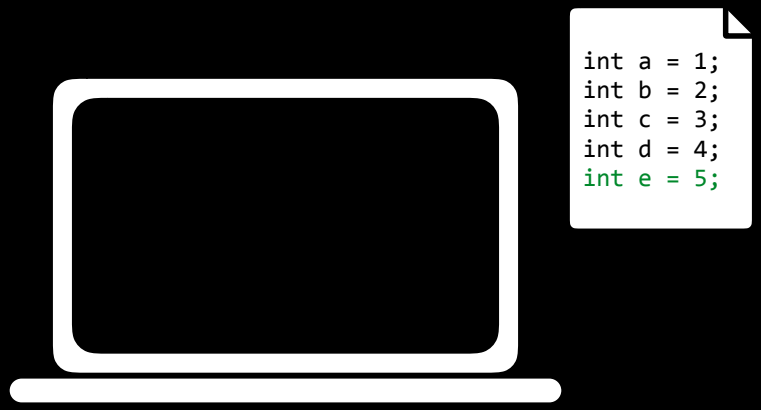

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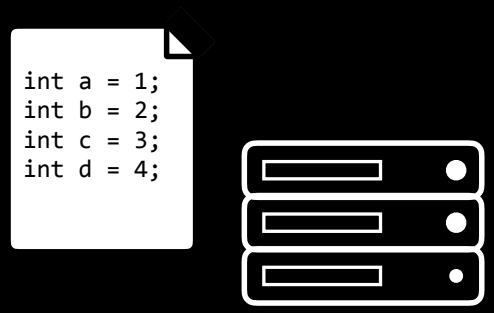


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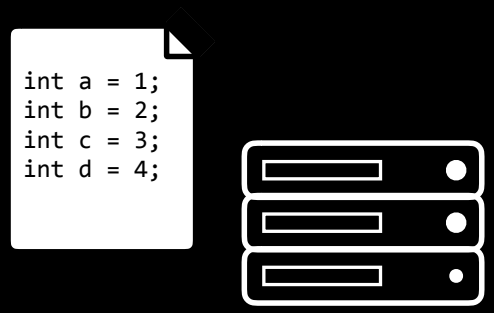




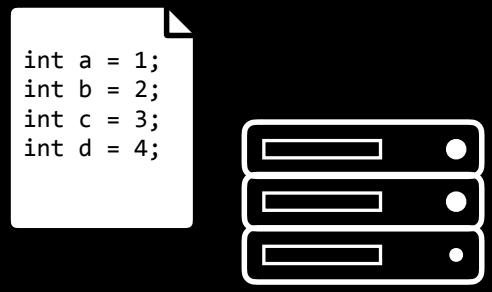
```
Changes to be committed:

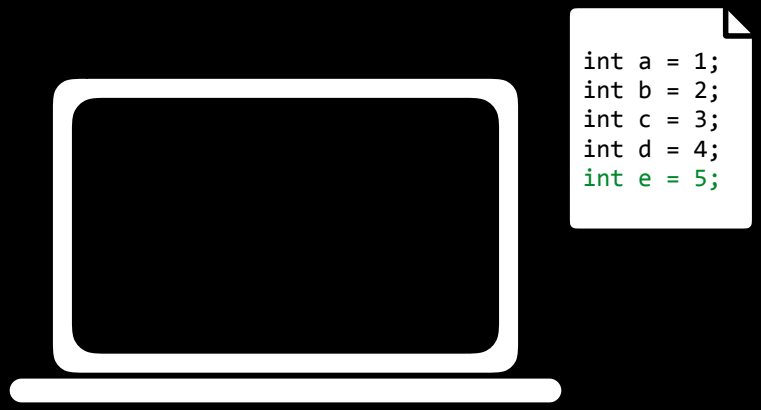
        modified: foo.c
```

git commit

## `git commit -m "message"`

- saves the changes to repository as a new revision (a "commit")
- records a message
- `git commit -am "message"` adds and commits in same step



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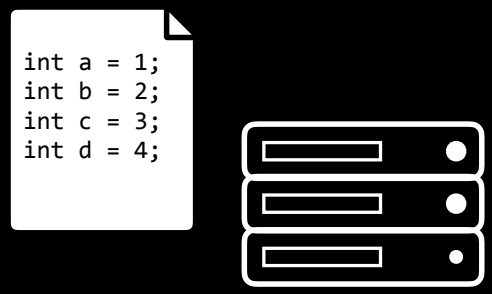


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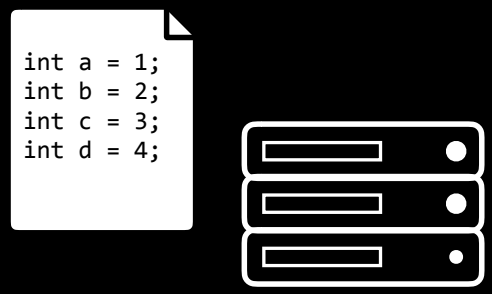
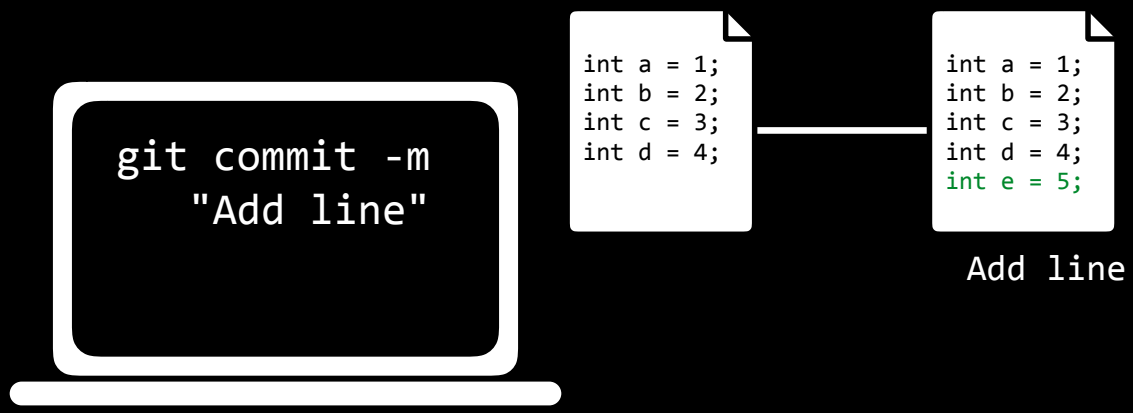
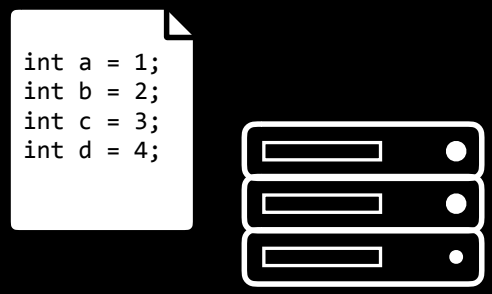


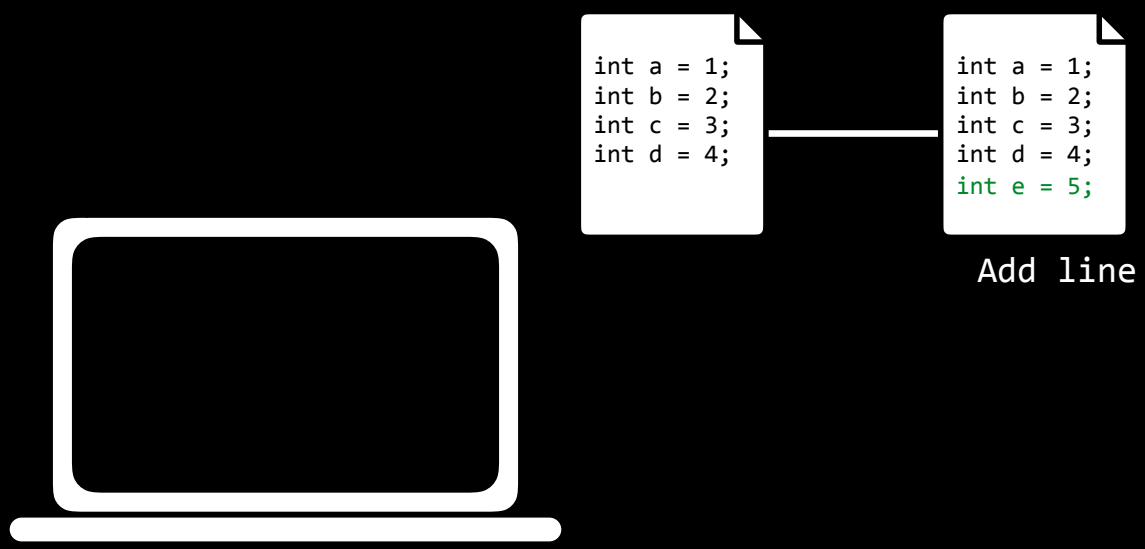



```
git status
```

# git status

- shows current status of repository



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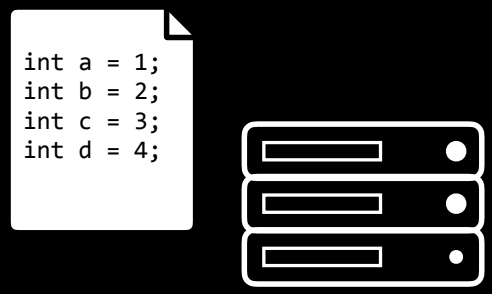


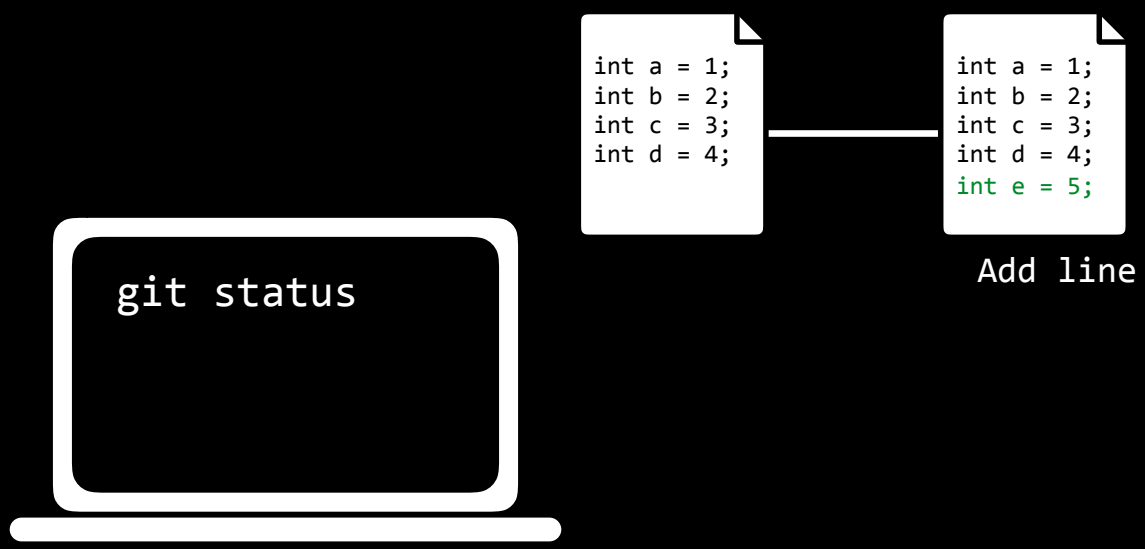

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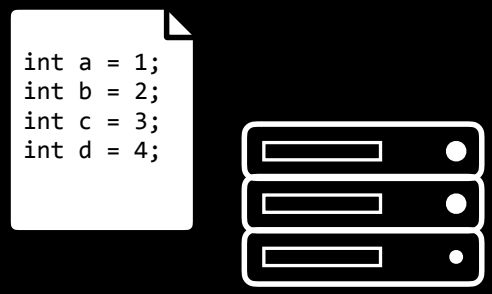
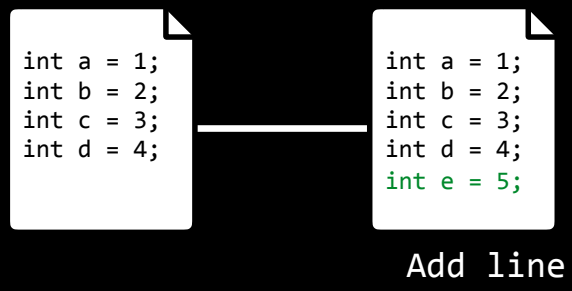


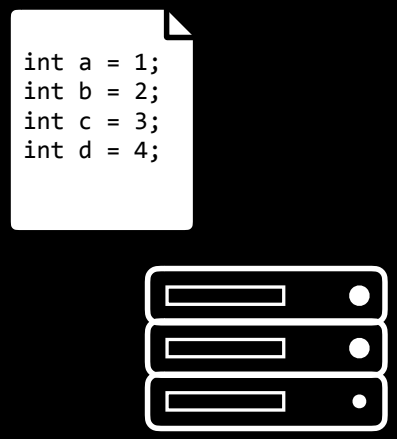


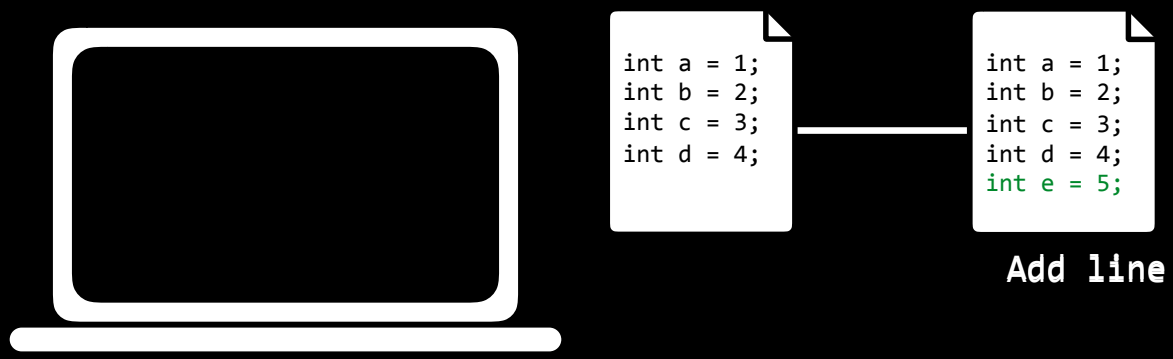
```
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)
```

```
git push
```

# `git push`

- sends committed changes to remote repository
- more explicitly, could write `git push origin master`



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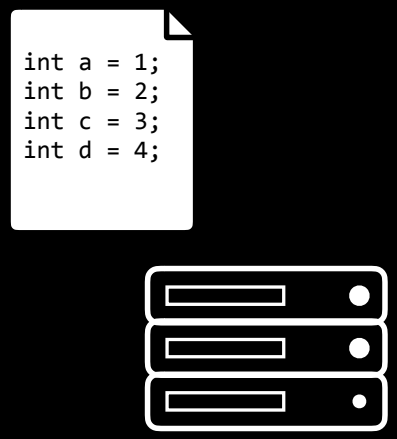


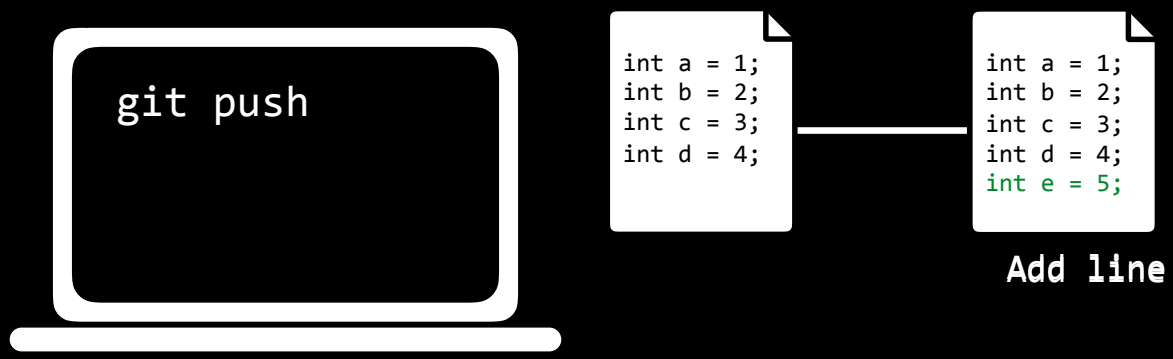

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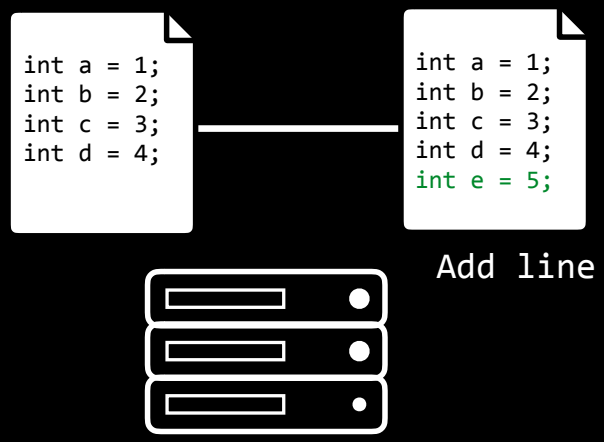
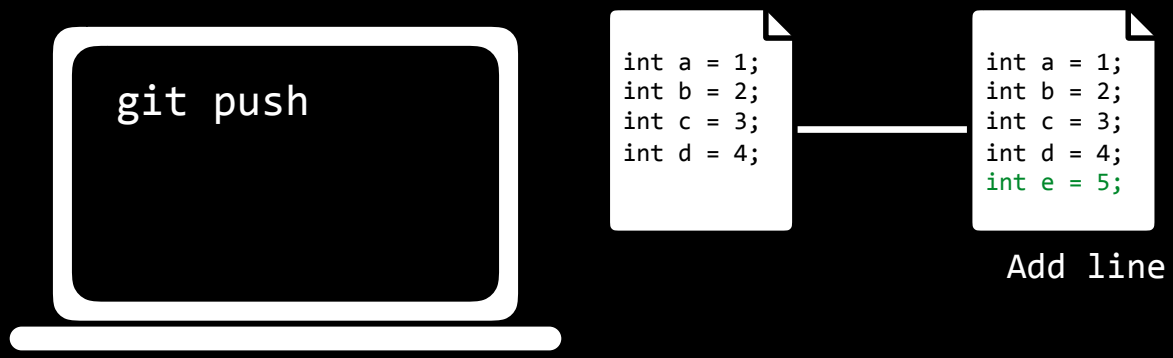
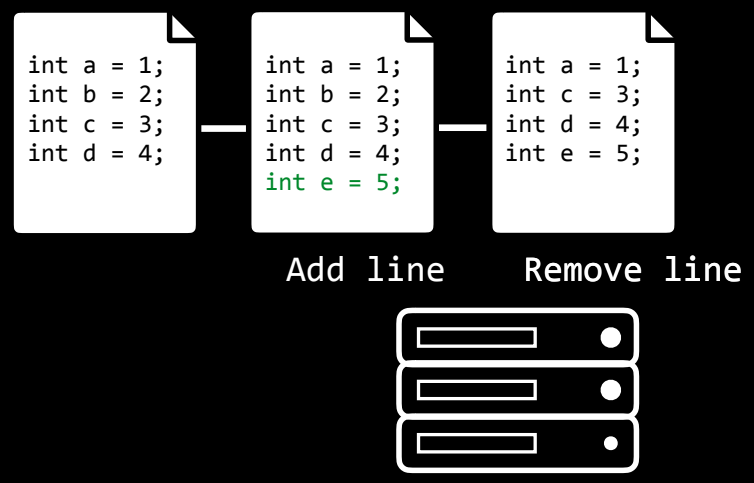


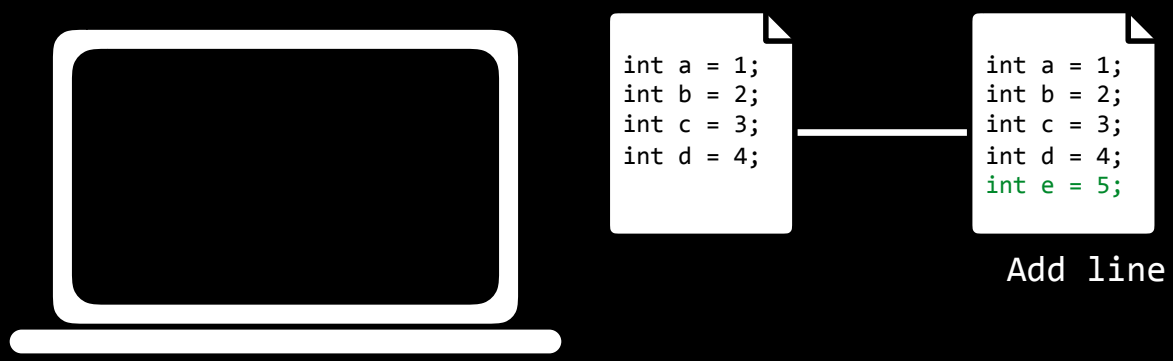



```
git pull
```

# `git pull`

- retrieves changes from remote repository



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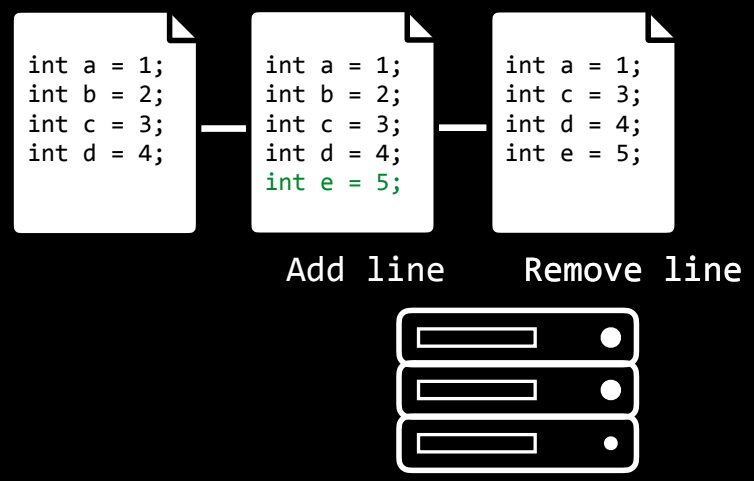


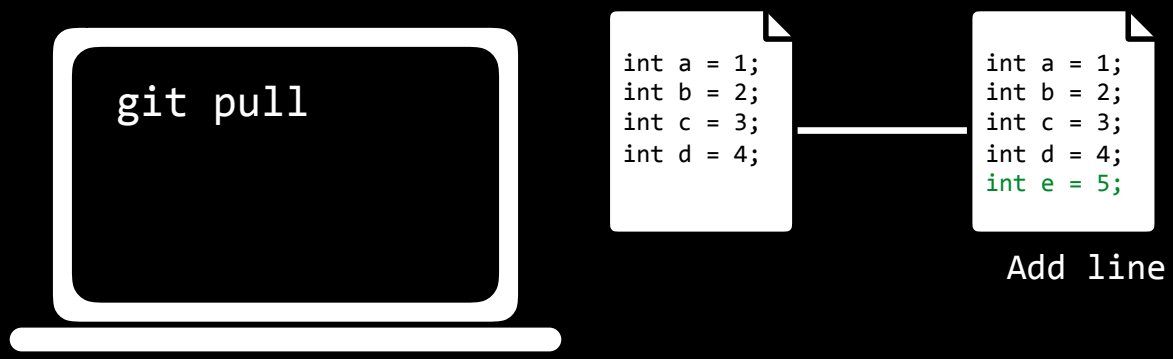

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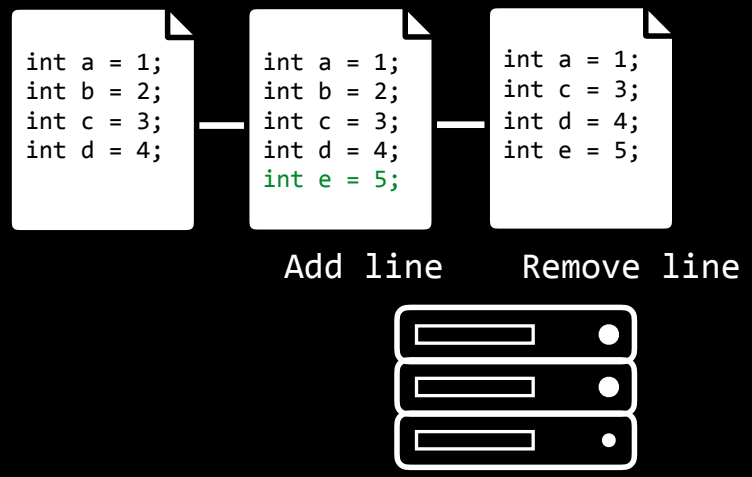
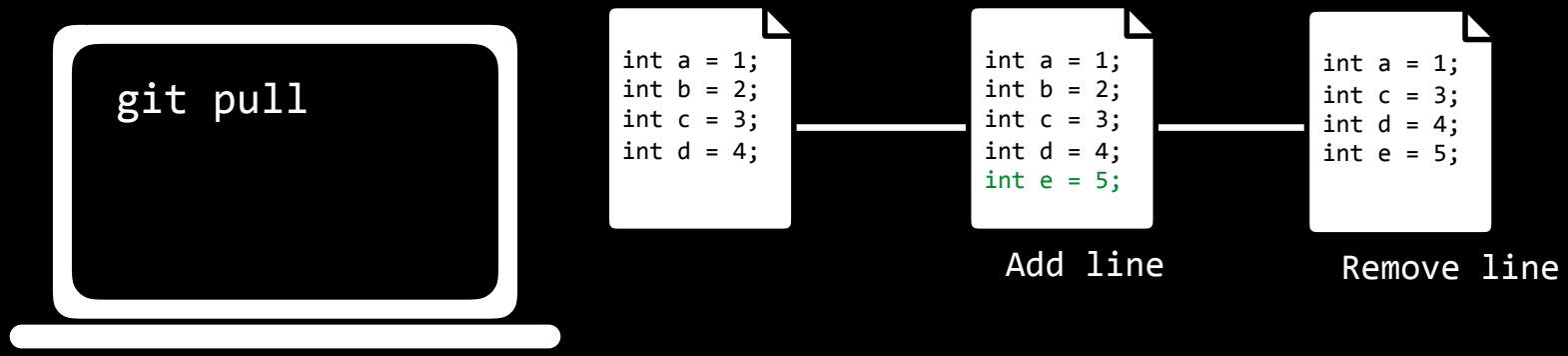
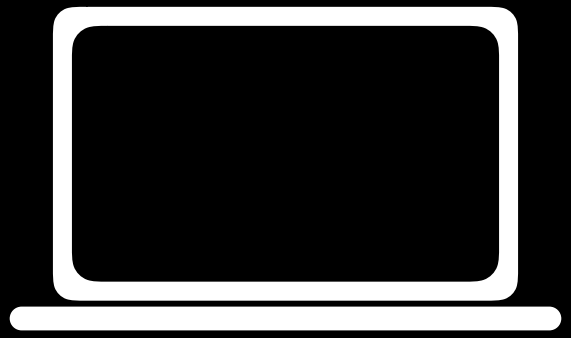


# Merge Conflicts

## Merge Conflicts

- when two different commits can't be automatically merged
- need to be resolved



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- when two different commits can't be automatically merged
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```
CONFLICT (content): Merge conflict in foo.c
Automatic merge failed; fix conflicts and then
commit the result.
```

# Merge Conflicts

- when two different commits can't be automatically merged
- need to be resolved

```
int a = 1;
<<<<<<< HEAD
int b = 2;
=======
int b = 0;
>>>>>>> 5468697320697320435335302e
int c = 3;
int d = 4;
int e = 5;
```

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>>>>>>> 546869732069732043533 5302e
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```

your changes

remote changes

conflicting commit

```
git pull
```

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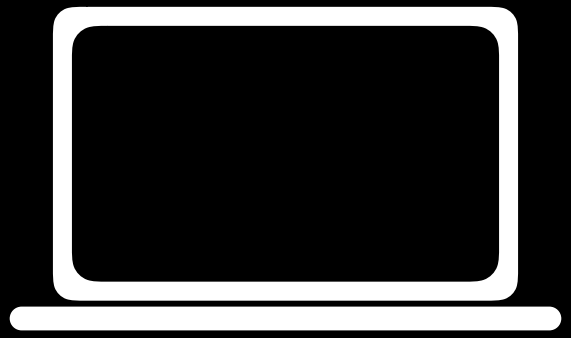
git log
```

## `git log`

- shows a history of commits and messages



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- shows a history of commits and messages


```
commit 5468697320697320435335302e
Author: Brian Yu <brianyu@college.harvard.edu>
Date:   Tue Oct 11 21:09:37 2016 -0400

    Remove a line

commit 4920746f6f6b20435335302e
Author: Brian Yu <brianyu@college.harvard.edu>
Date:   Tue Oct 11 21:05:28 2016 -0400

    Add a line
```

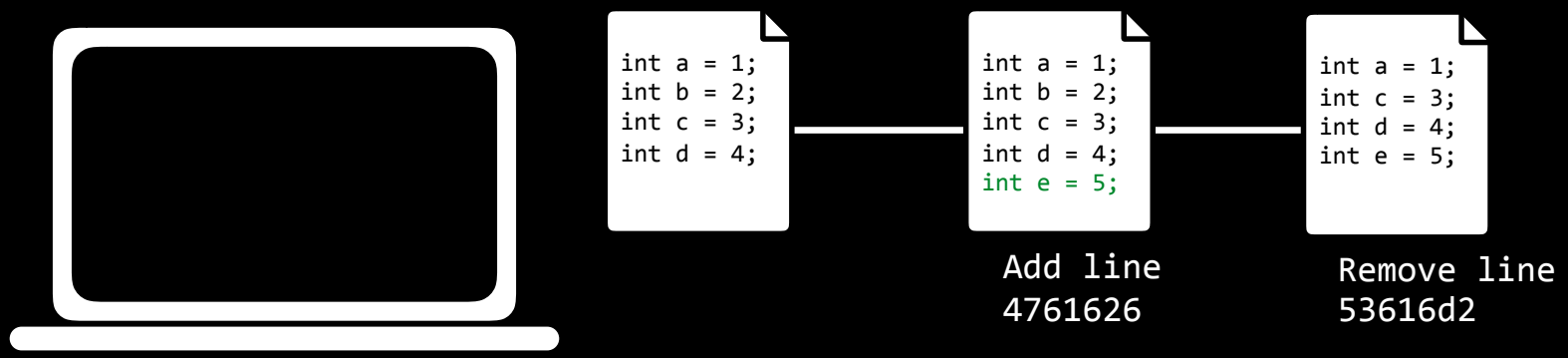
# git reset

# git reset

- `git reset --hard <commit>`

  reverts code back to a previous commit
- `git reset --hard origin/master`

  reverts code back to remote repository version



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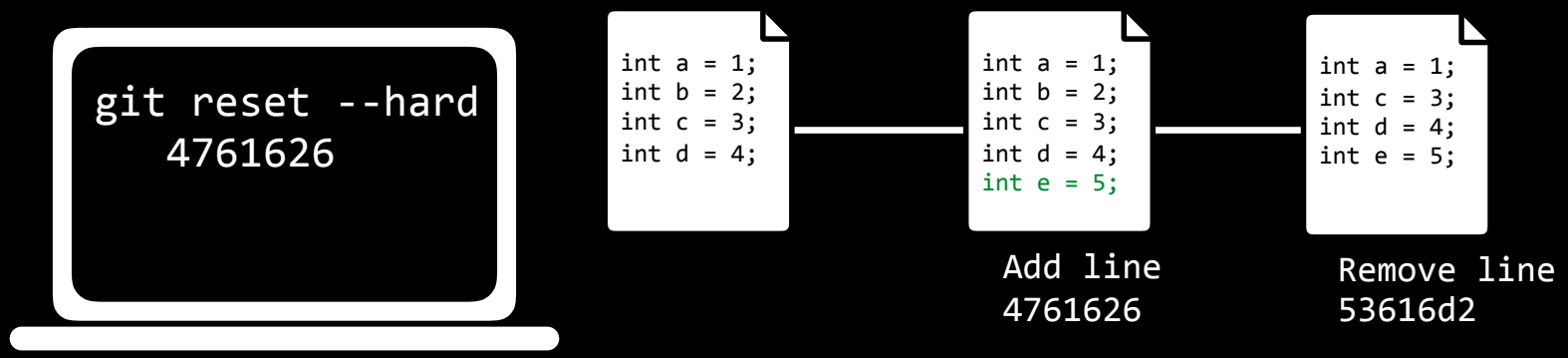
- `git reset --hard origin/master`

  reverts code back to remote repository version

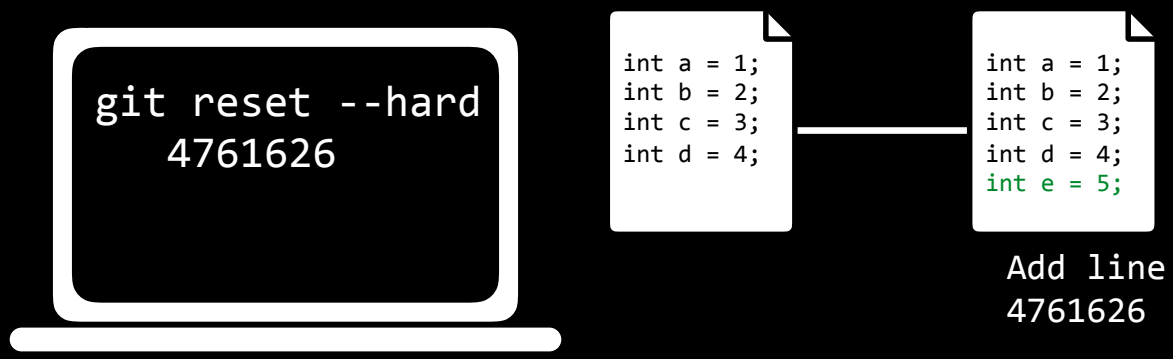


# git reset

- `git reset --hard <commit>`

  reverts code back to a previous commit
- `git reset --hard origin/master`

  reverts code back to remote repository version



# Branching

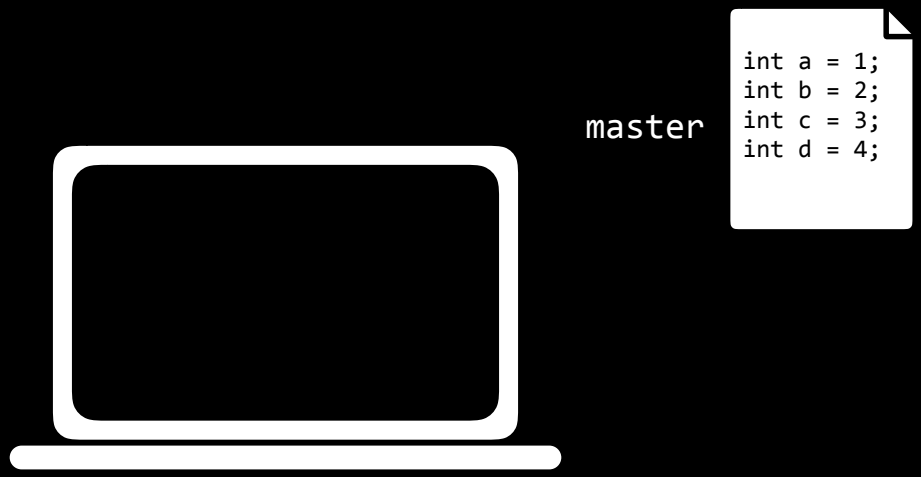
# Branching

- Branch is a version of the repository.
- Each branch has its own commit history and current version.

```
git branch
```

# `git branch`

- shows all branches of code
- create a branch with `git branch <branch_name>`
- switch to ("checkout") a new branch with `git checkout <branch_name>`



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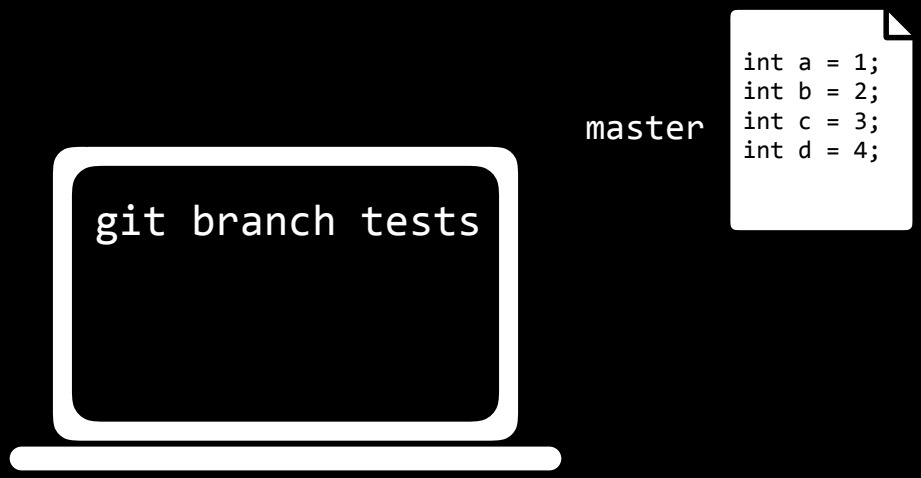

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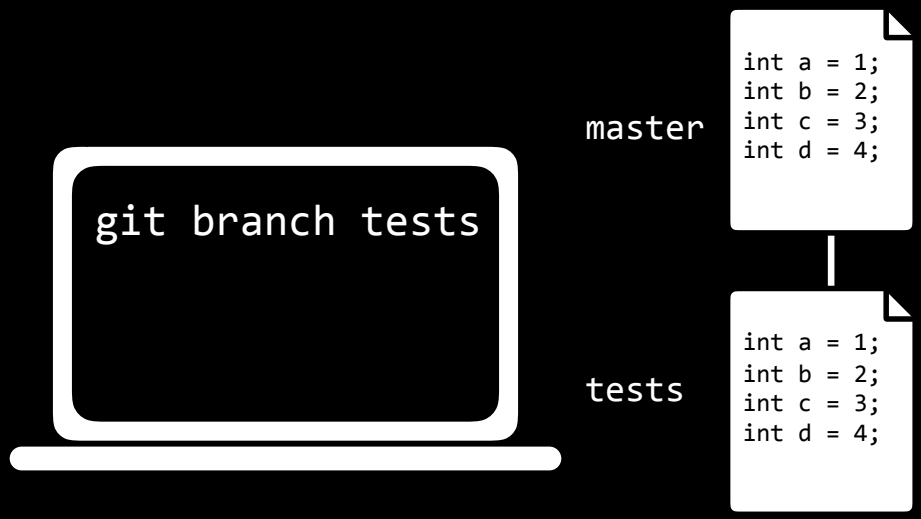
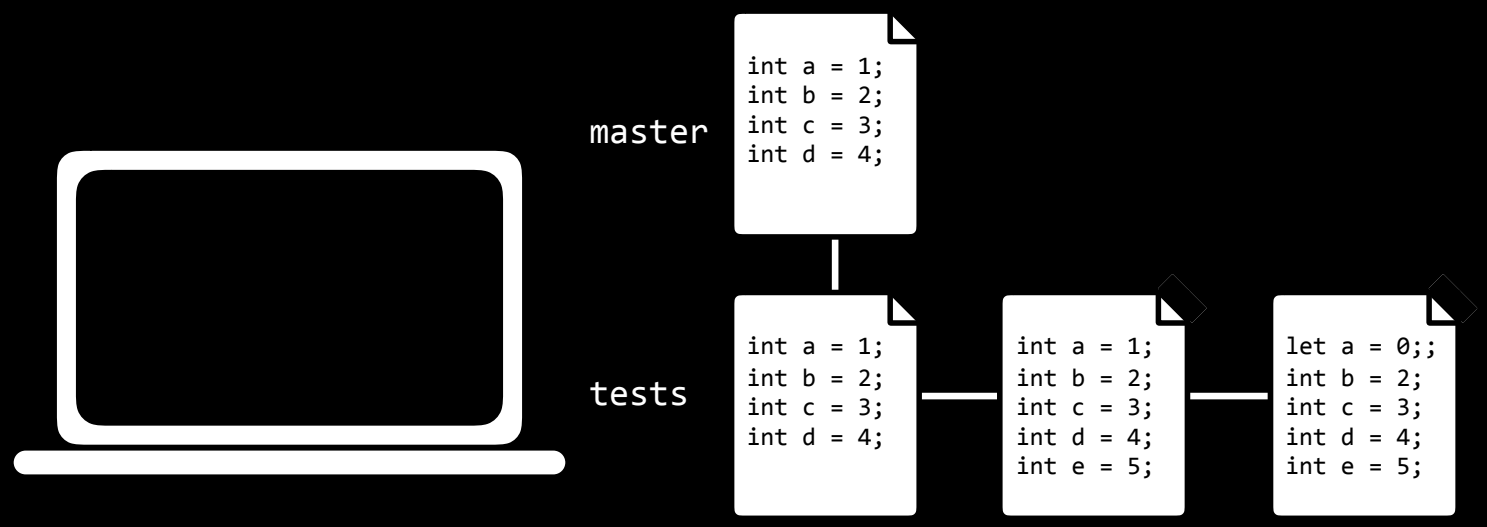


# git merge

# git merge

- `git merge <branch_name>` merges the branch `branch_name` with current branch



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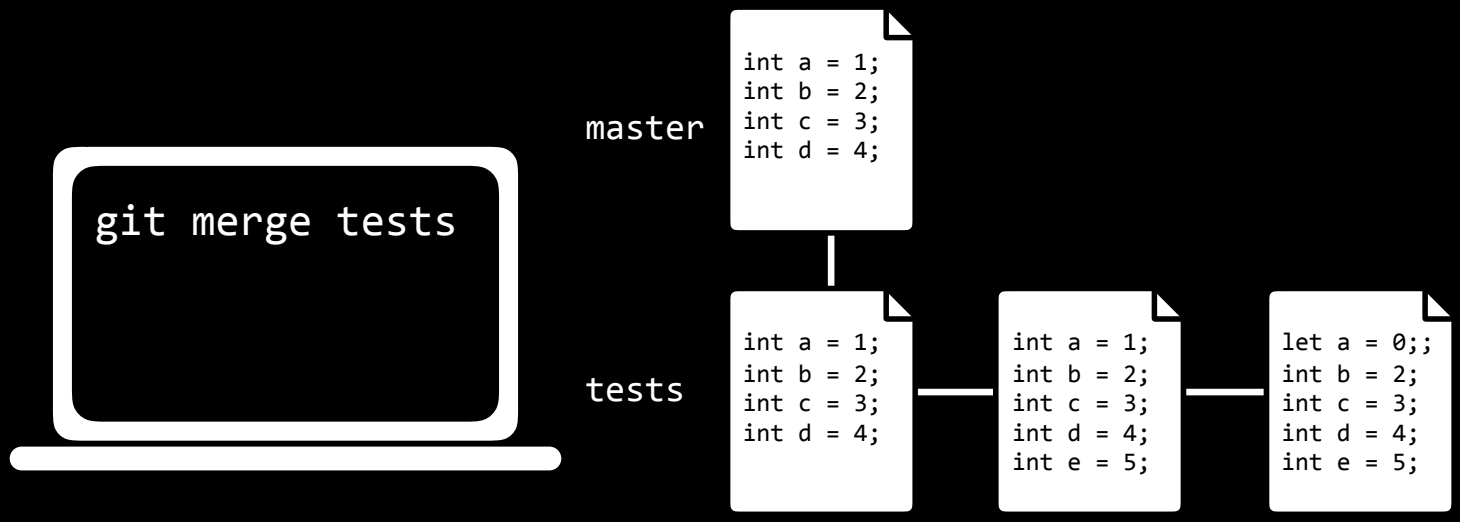

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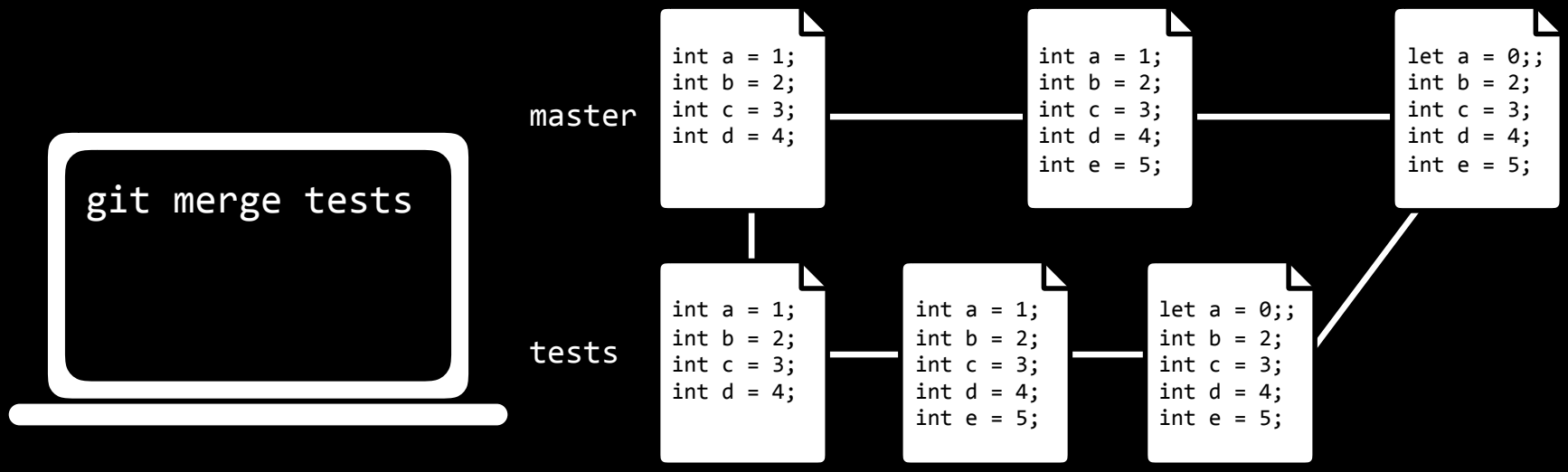

# Pull Requests

# Git

- Keeps track of changes to code.
- Synchronizes code between different people.
- Test changes to code without losing the original.
- Revert back to old versions of code.