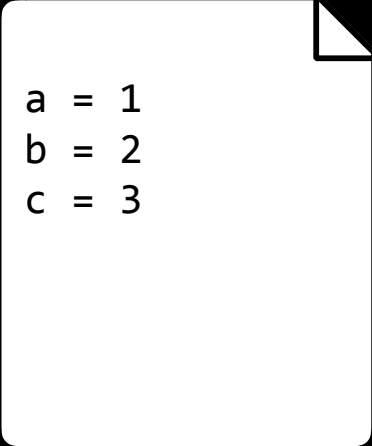


Version Control

git

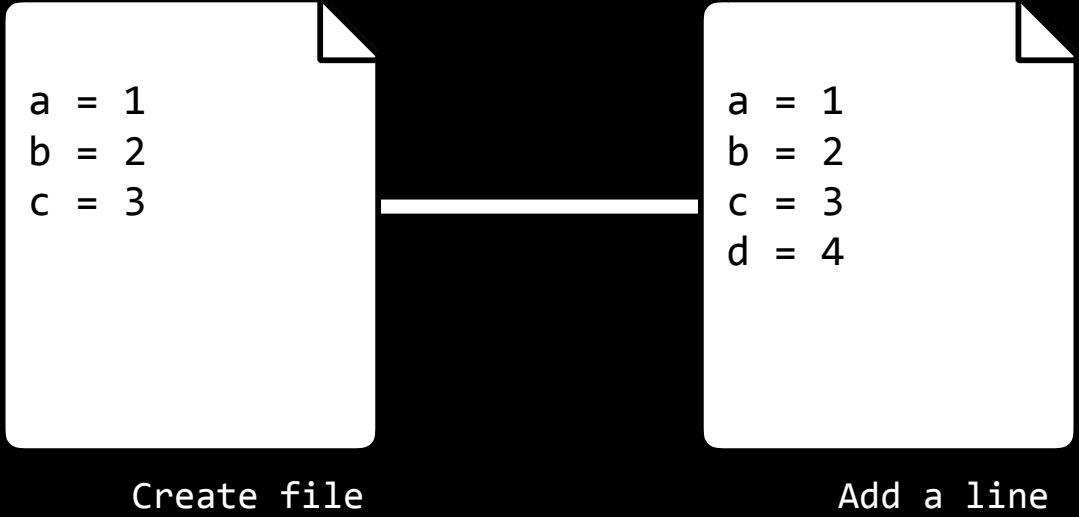
Keep track of changes to code.



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

Create file

Keep track of changes to code.



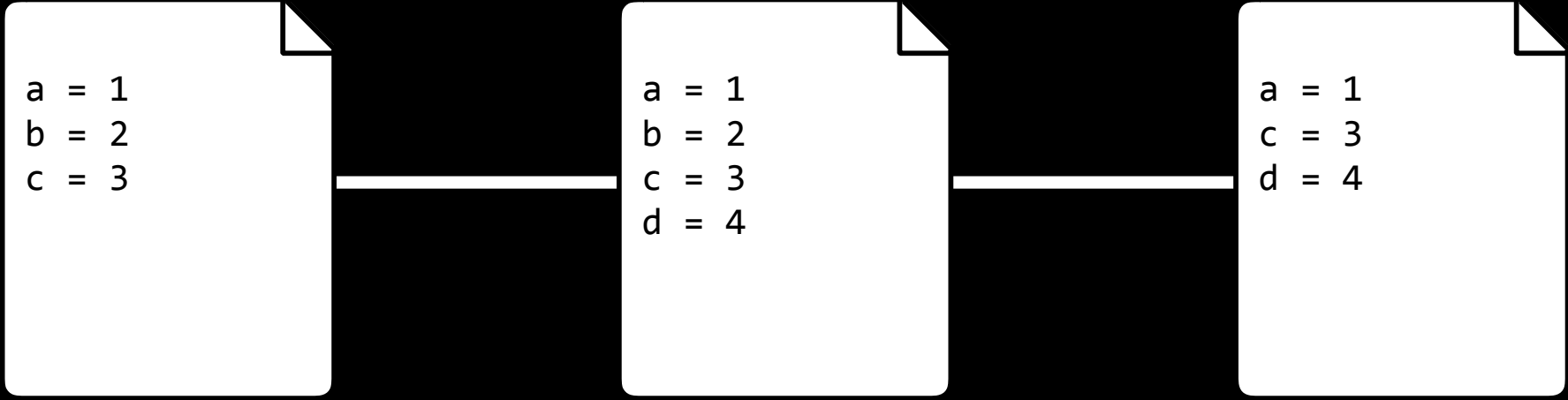
```
a = 1  
b = 2  
c = 3
```

Create file

```
a = 1  
b = 2  
c = 3  
d = 4
```

Add a line

Keep track of changes to code.



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

Create file

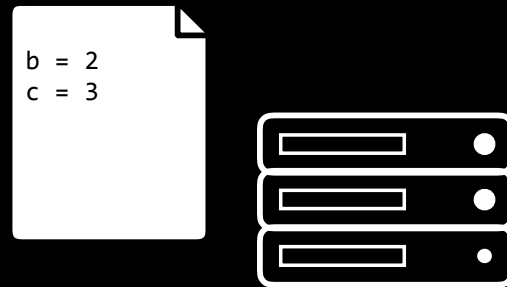
```
a = 1  
b = 2  
c = 3  
d = 4
```

Add a line

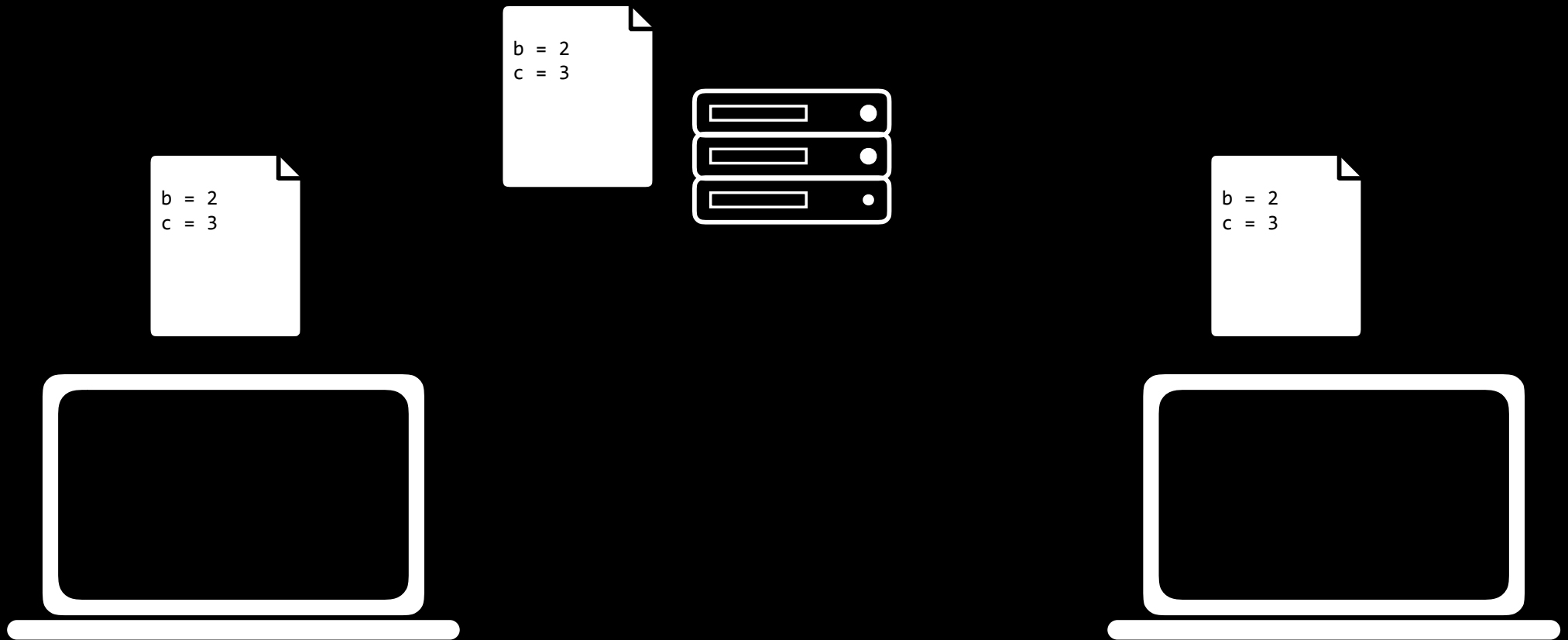
```
a = 1  
c = 3  
d = 4
```

Remove a line

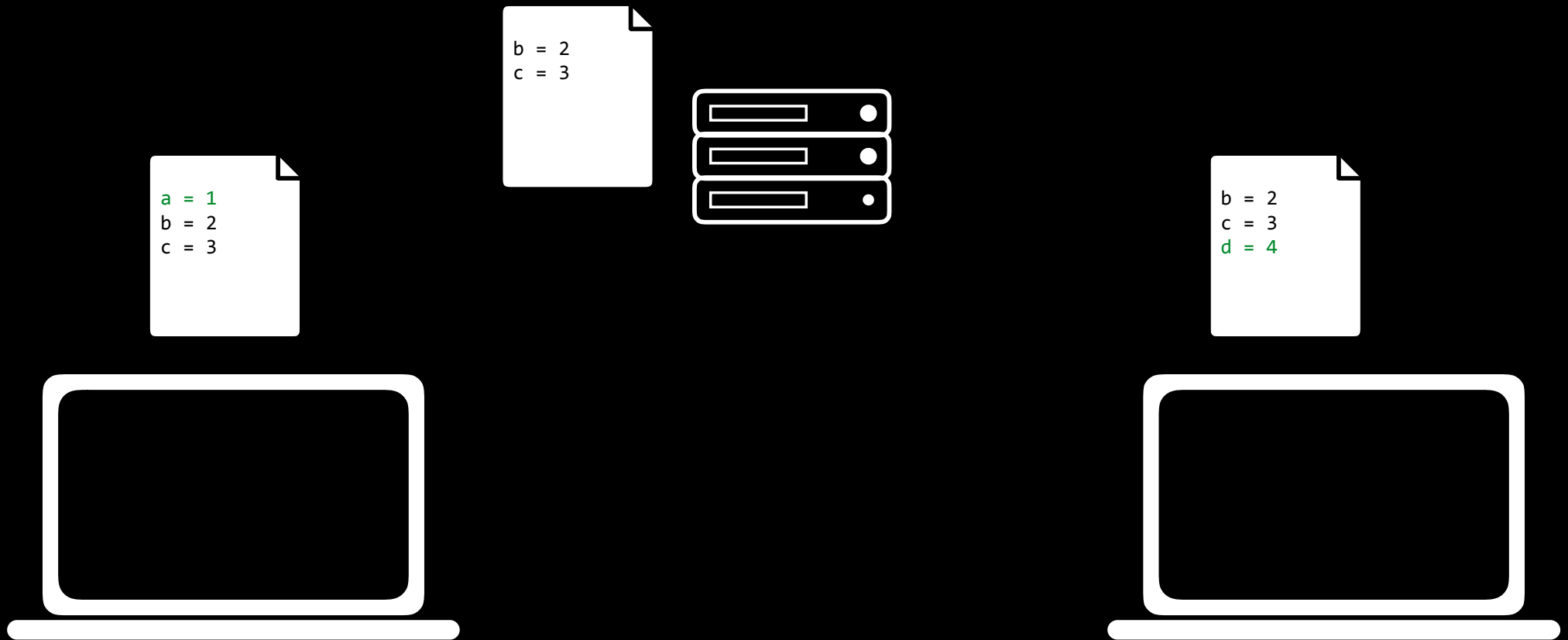
Synchronizes code between different people.



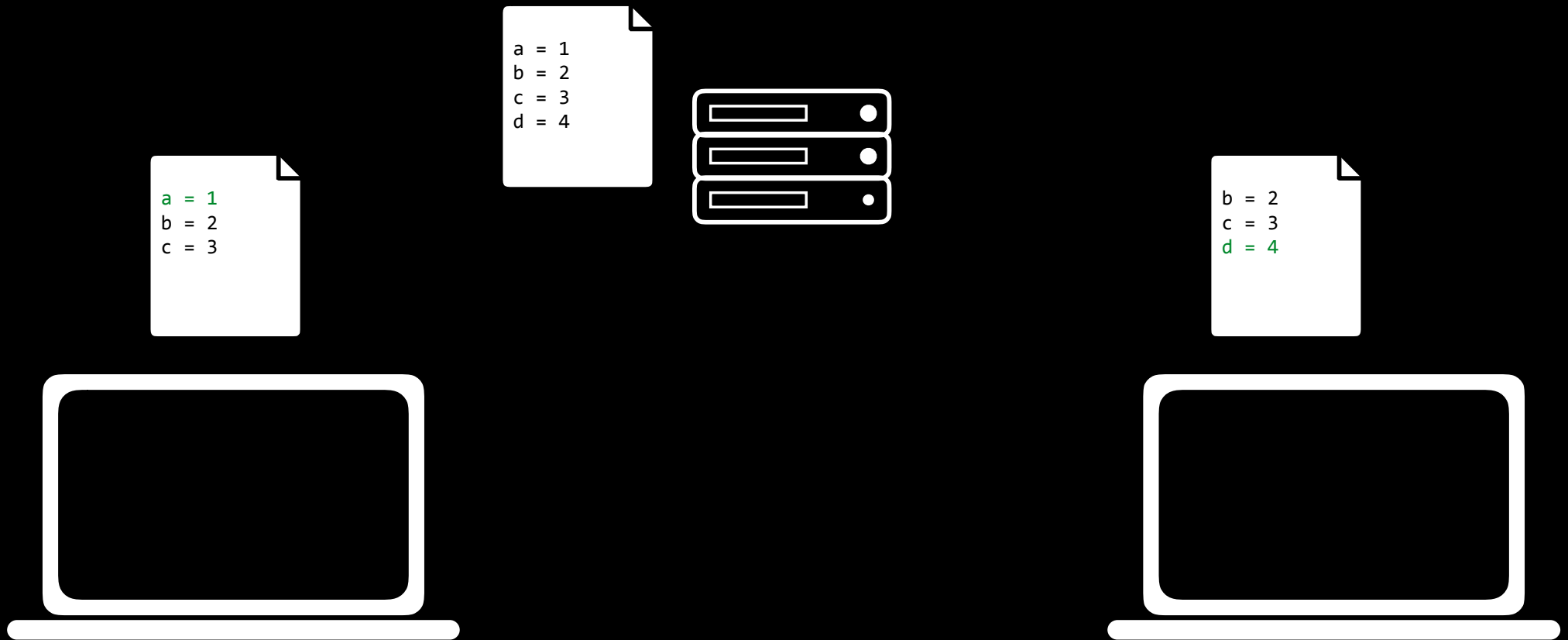
Synchronizes code between different people.



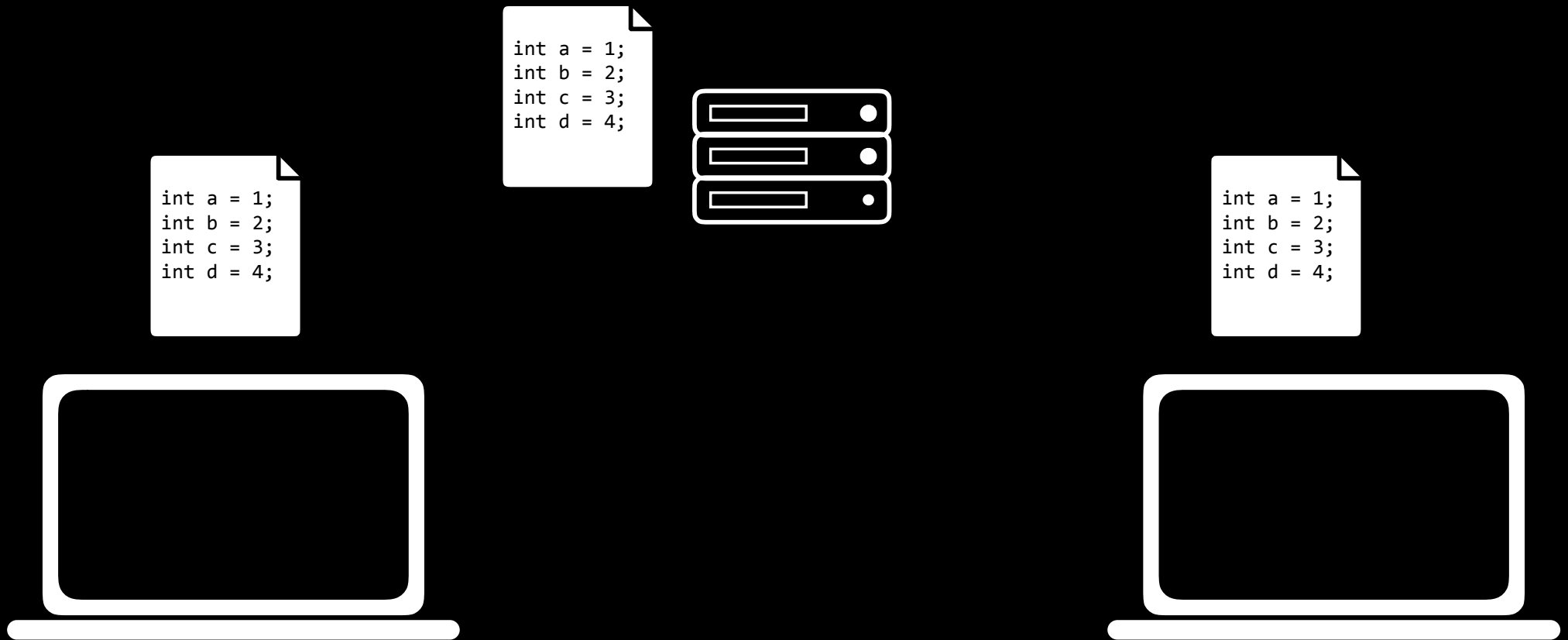
Synchronizes code between different people.



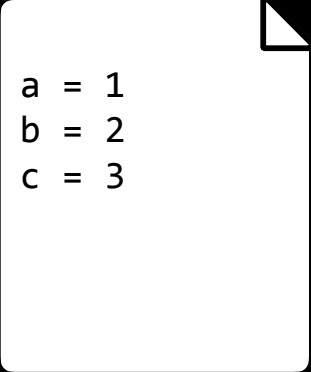
Synchronizes code between different people.



Synchronizes code between different people.

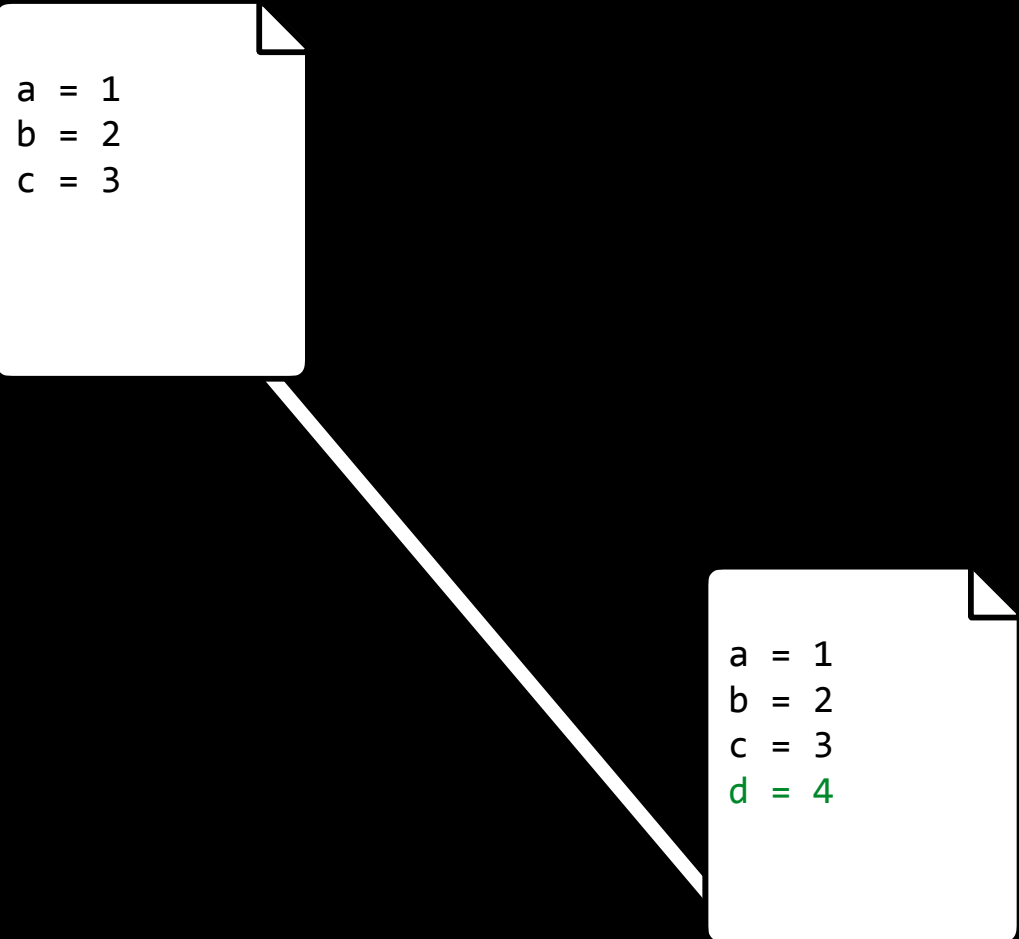


Test changes to code without losing the original.



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

Test changes to code without losing the original.



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

The diagram illustrates a branching strategy for testing code. A horizontal line on the left represents the main branch. A diagonal line branches off from the original code file to a new test file, representing a branch or commit used for testing changes without affecting the original code.

```
a = 1  
b = 2  
c = 3  
d = 4
```

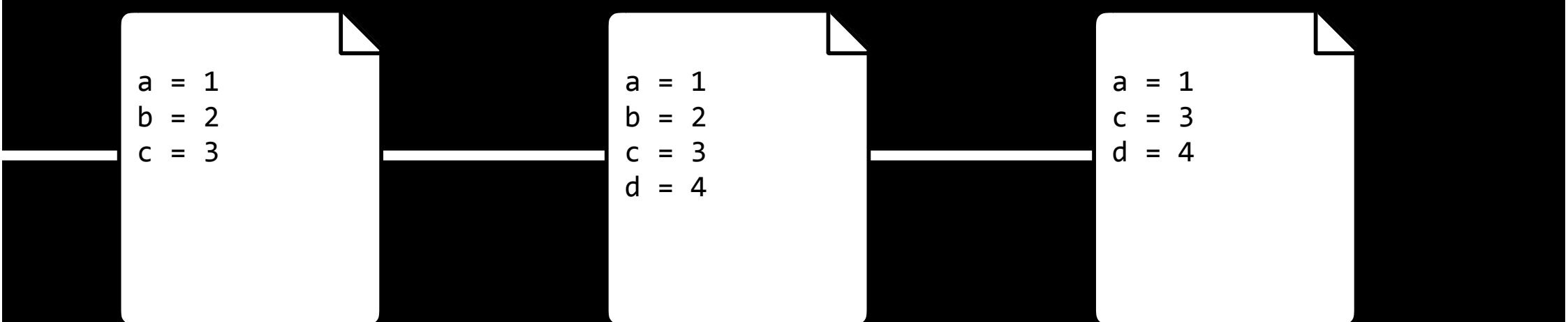
Test changes to code without losing the original.

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

```
a = 1  
b = 2  
c = 3  
d = 4
```

```
a = 1  
b = 2  
c = 3  
d = 4
```

Revert back to old versions of code.



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

Create file

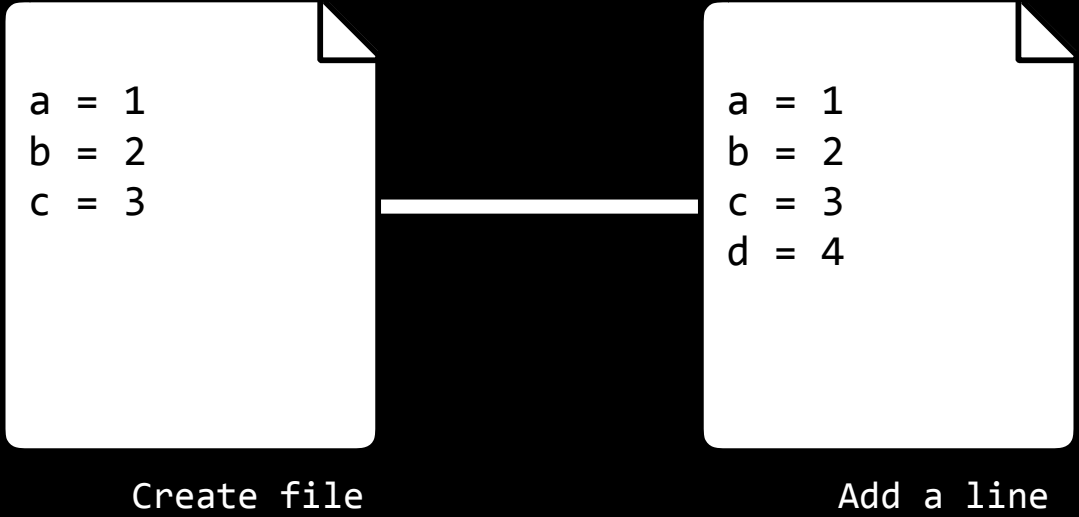
```
a = 1  
b = 2  
c = 3  
d = 4
```

Add a line

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

Remove a line

Revert back to old versions of code.



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

Create file

```
a = 1  
b = 2  
c = 3  
d = 4
```

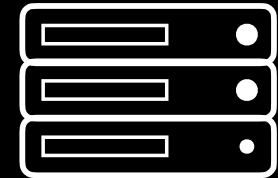
Add a line

GitHub

git clone

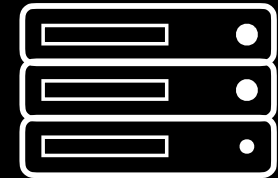
```
git clone <url>
```

```
a = 1  
b = 2  
c = 3  
d = 4
```



```
git clone <url>
```

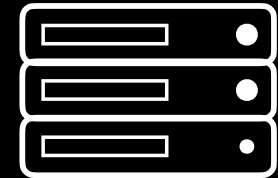
```
a = 1  
b = 2  
c = 3  
d = 4
```



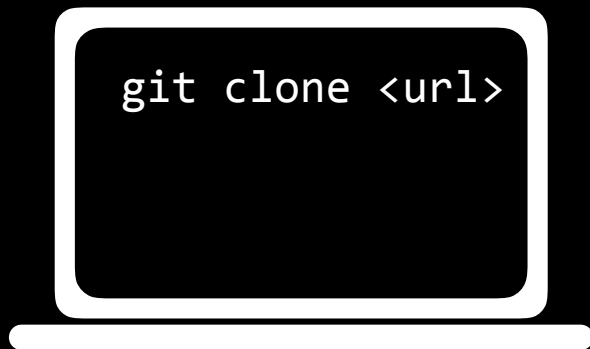
```
git clone <url>
```

```
git clone <url>
```

```
a = 1  
b = 2  
c = 3  
d = 4
```



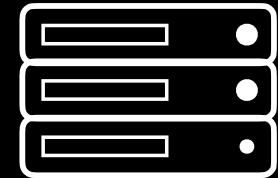
```
a = 1  
b = 2  
c = 3  
d = 4
```



```
git add
```

```
git add <filename>
```

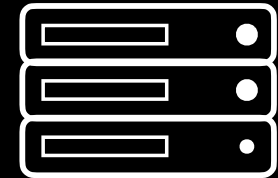
```
a = 1  
b = 2  
c = 3  
d = 4
```



```
a = 1  
b = 2  
c = 3  
d = 4
```

```
git add <filename>
```

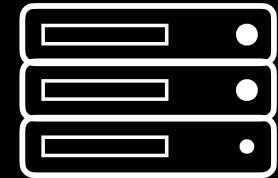
```
a = 1  
b = 2  
c = 3  
d = 4
```



```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

```
git add <filename>
```

```
a = 1  
b = 2  
c = 3  
d = 4
```



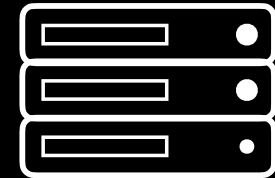
```
git add foo.py
```

```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```



```
git add <filename>
```

```
a = 1  
b = 2  
c = 3  
d = 4
```



```
git add foo.py
```

```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

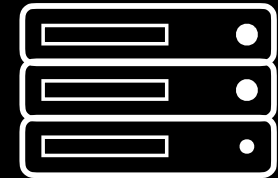
Changes to be committed:

modified: foo.py

```
git commit
```

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

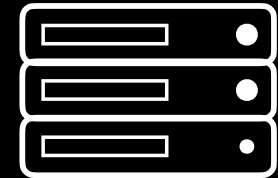
```
a = 1  
b = 2  
c = 3  
d = 4
```



```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

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

```
a = 1  
b = 2  
c = 3  
d = 4
```

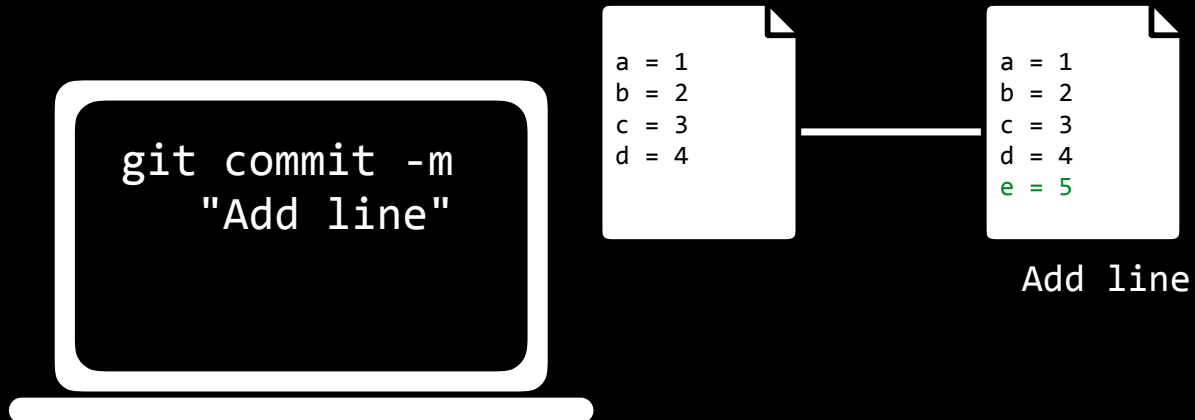
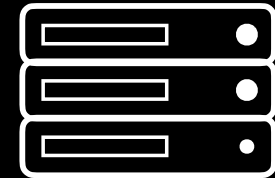


```
git commit -m  
"Add line"
```

```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

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

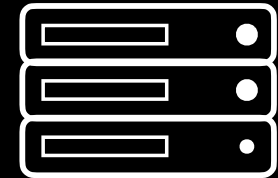
```
a = 1  
b = 2  
c = 3  
d = 4
```



```
git status
```

git status

```
a = 1  
b = 2  
c = 3  
d = 4
```



```
a = 1  
b = 2  
c = 3  
d = 4
```

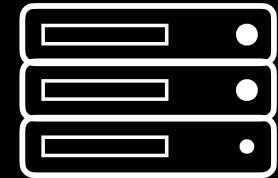
```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

Add line



git status

```
a = 1  
b = 2  
c = 3  
d = 4
```



```
a = 1  
b = 2  
c = 3  
d = 4
```

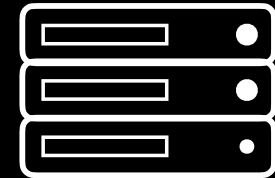
```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

Add line

git status

git status

```
a = 1  
b = 2  
c = 3  
d = 4
```



```
a = 1  
b = 2  
c = 3  
d = 4
```

```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

Add line

A laptop icon with a thick white border. The screen area is a rounded rectangle containing the text 'git status'.

git status

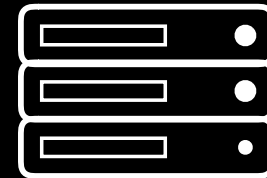
On branch master

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

```
git push
```

git push

```
a = 1  
b = 2  
c = 3  
d = 4
```



```
a = 1  
b = 2  
c = 3  
d = 4
```

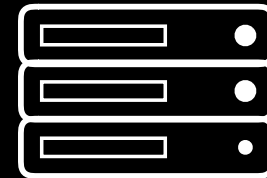


```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

Add line

git push

```
a = 1  
b = 2  
c = 3  
d = 4
```



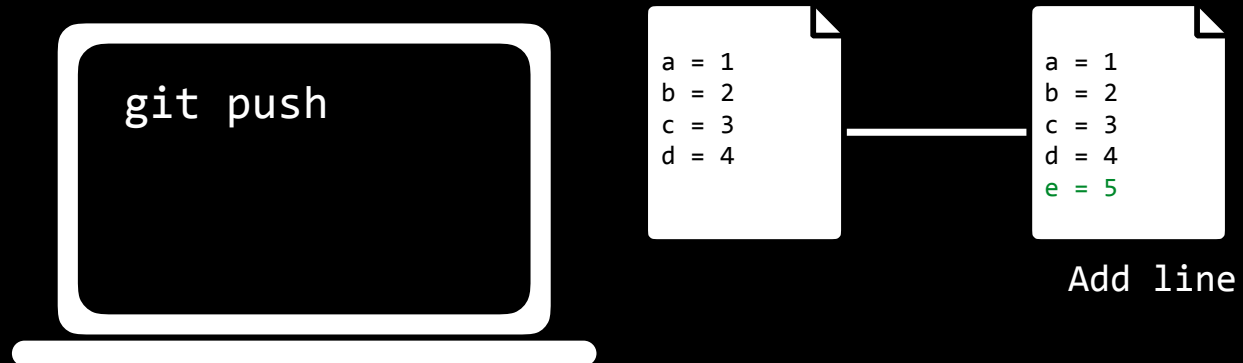
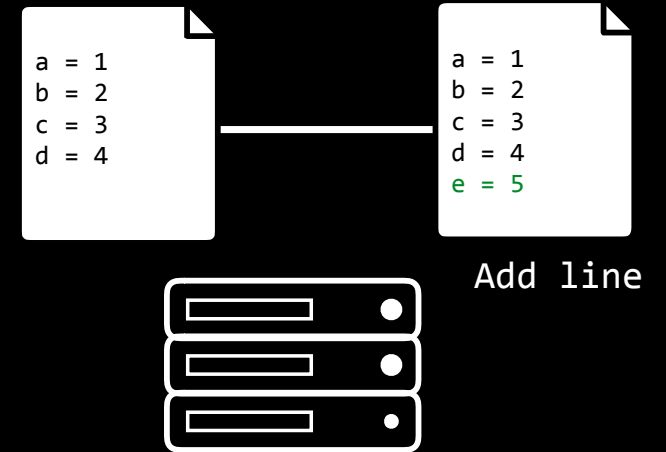
```
a = 1  
b = 2  
c = 3  
d = 4
```



```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

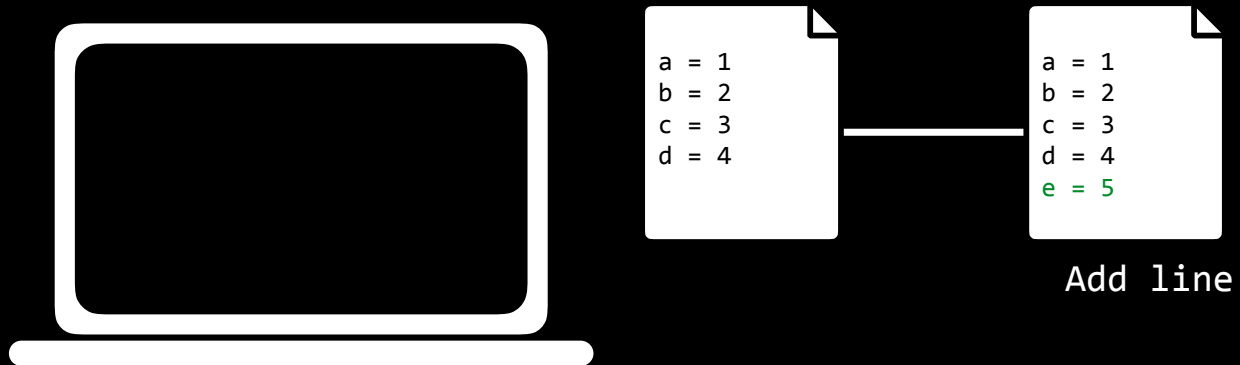
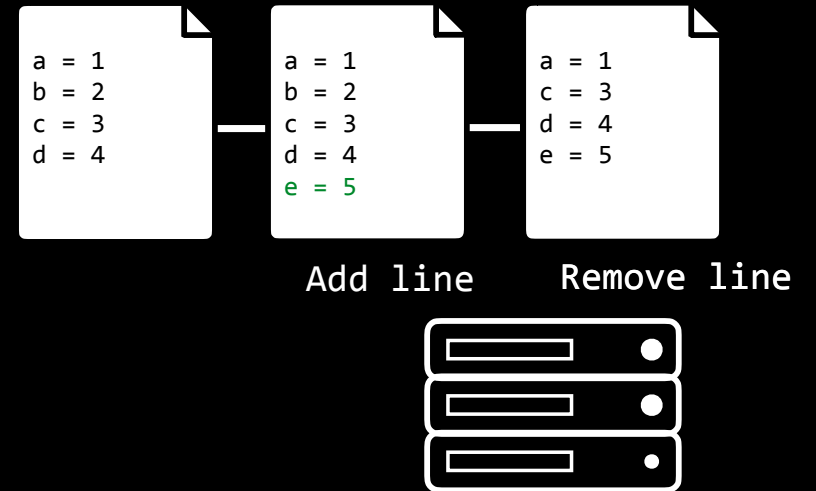
Add line

git push

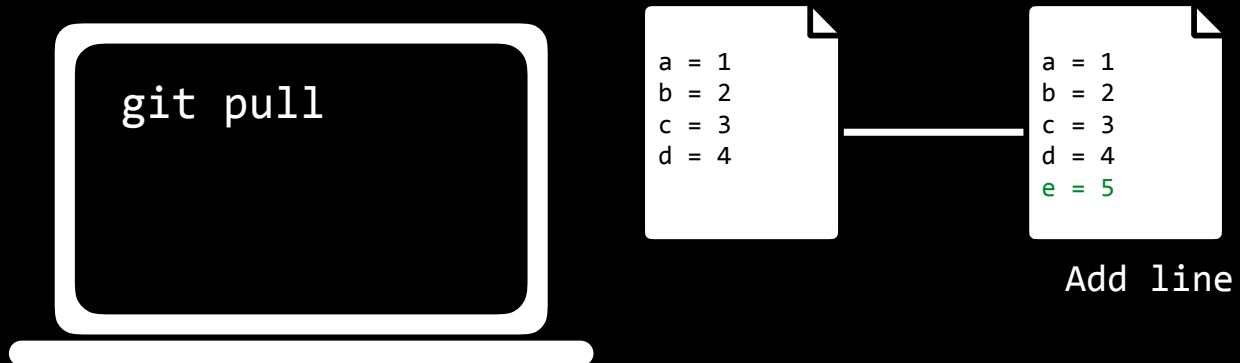
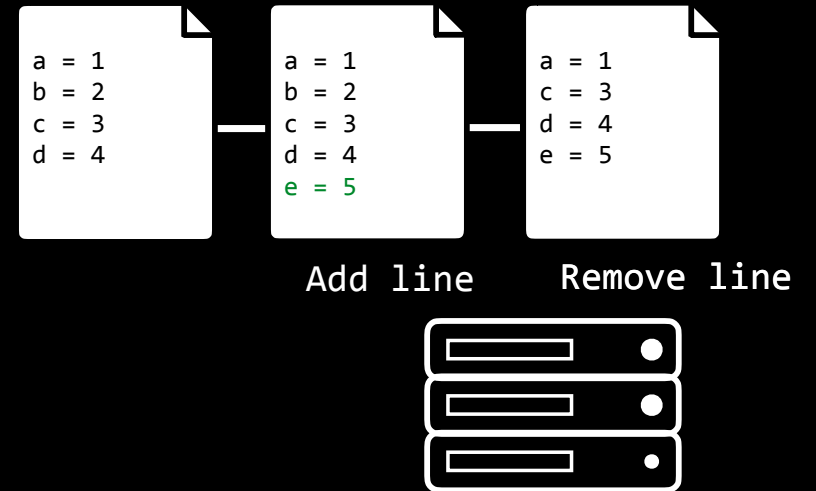


```
git pull
```

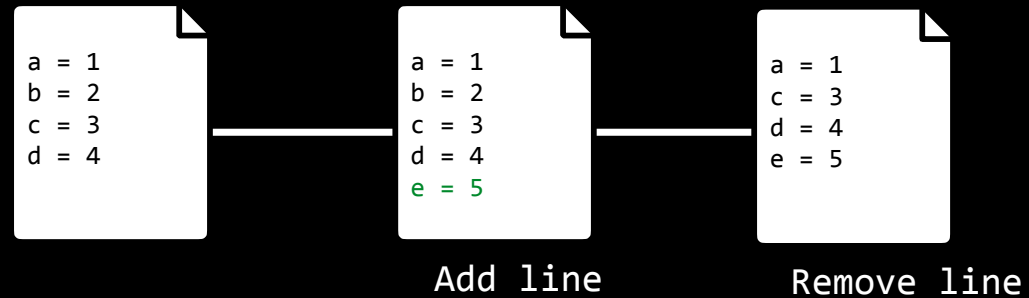
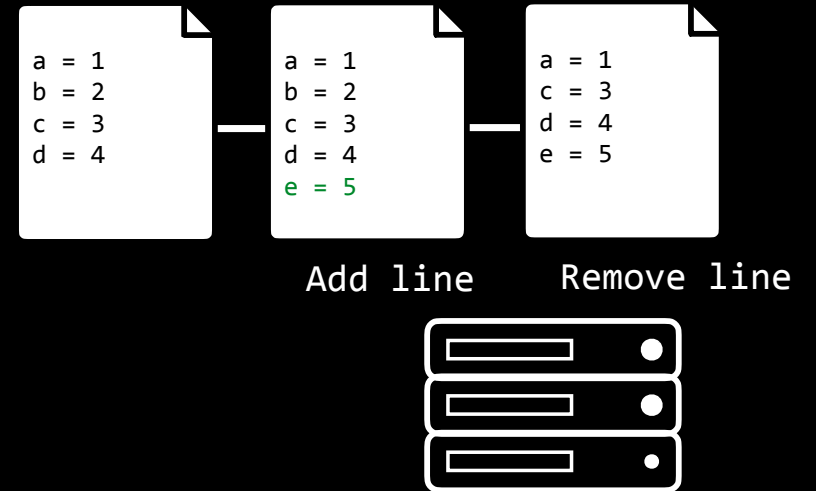
git pull



git pull



git pull




Merge Conflicts

Merge Conflicts




Merge Conflicts



```
git pull
```


Merge Conflicts



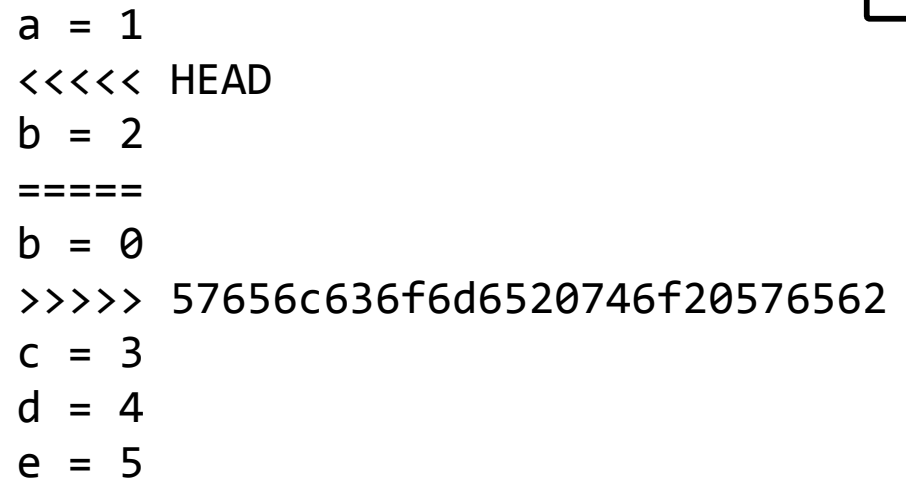
```
git pull
```

```
CONFLICT (content): Merge conflict in foo.py  
Automatic merge failed; fix conflicts and then  
commit the result.
```

Merge Conflicts




```
git pull
```



```
a = 1
<<<<< HEAD
b = 2
=====
b = 0
>>>>> 57656c636f6d6520746f20576562
c = 3
d = 4
e = 5
```

Merge Conflicts




```
git pull
```

your
changes


remote
changes

```
a = 1
<<<<< HEAD
{ b = 2
  =====
{ b = 0
  >>>>> 57656c636f6d6520746f20576562
c = 3
d = 4
e = 5
```

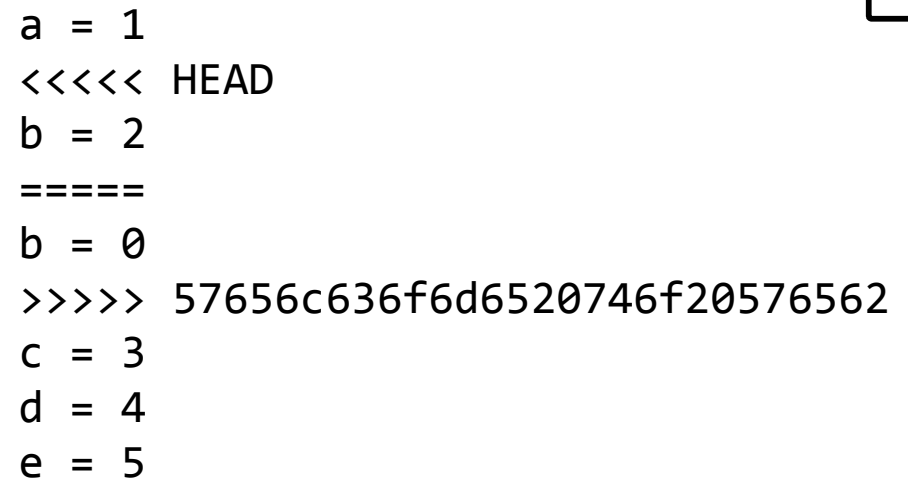
conflicting commit



Merge Conflicts




```
git pull
```



```
a = 1
<<<<< HEAD
b = 2
=====
b = 0
>>>>> 57656c636f6d6520746f20576562
c = 3
d = 4
e = 5
```


Merge Conflicts



```
git pull
```

```
a = 1
```


```
b = 2
```

```
c = 3
```

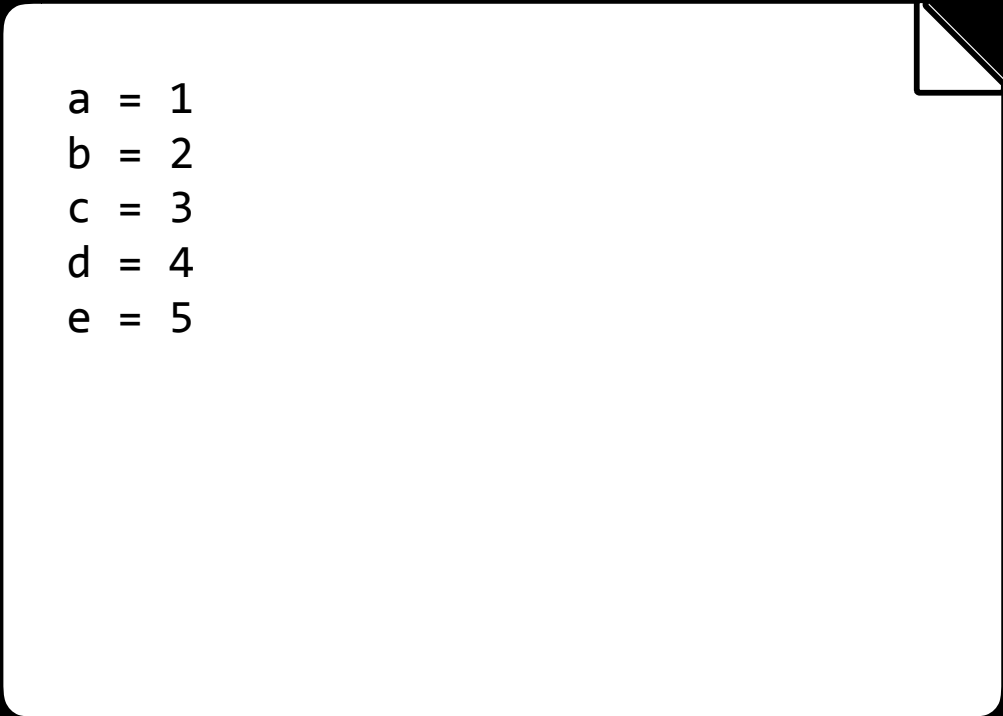
```
d = 4
```

```
e = 5
```

Merge Conflicts



```
git pull
```




```
a = 1  
b = 2  
c = 3  
d = 4  
e = 5
```

```
git log
```

```
git log
```



```
git log
```



```
git log
```

git log

```
commit 436f6d6d6974204d73672048657265
Author: Brian Yu <brian@cs.harvard.edu>
Date:   Mon Jan 22 14:06:28 2018 -0400
```

Remove a line

```
commit 57656c636f6d6520746f20576562
Author: Brian Yu <brian@cs.harvard.edu>
Date:   Mon Jan 22 14:05:28 2018 -0400
```

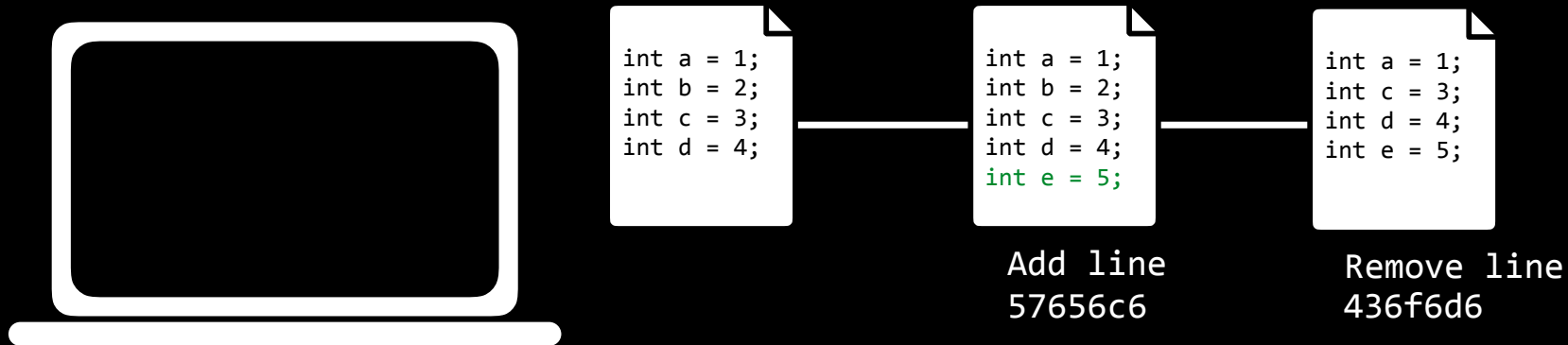
Add a line



```
git reset
```

git reset

- `git reset --hard <commit>`
- `git reset --hard origin/master`



git reset

- `git reset --hard <commit>`
- `git reset --hard origin/master`



```
git reset --hard  
57656c6
```

```
int a = 1;  
int b = 2;  
int c = 3;  
int d = 4;
```

```
int a = 1;  
int b = 2;  
int c = 3;  
int d = 4;  
int e = 5;
```

Add line
57656c6

```
int a = 1;  
int c = 3;  
int d = 4;  
int e = 5;
```

Remove line
436f6d6

git reset

- `git reset --hard <commit>`
- `git reset --hard origin/master`



```
git reset --hard  
57656c6
```

```
int a = 1;  
int b = 2;  
int c = 3;  
int d = 4;
```

```
int a = 1;  
int b = 2;  
int c = 3;  
int d = 4;  
int e = 5;
```

Add line
57656c6