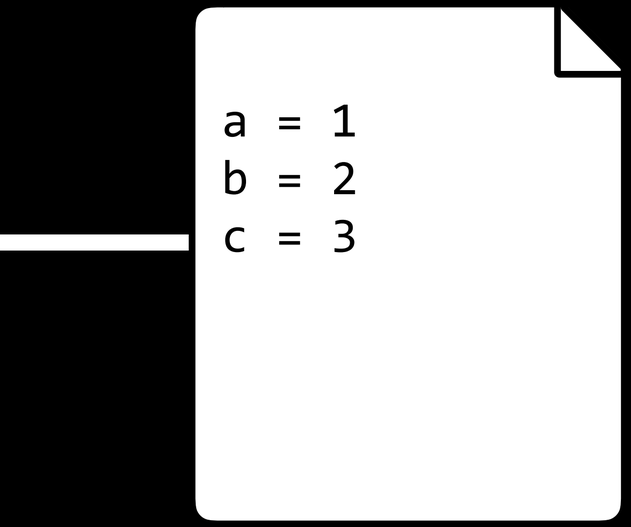
CS50 Beyond

Agenda

- Git
  - Repositories
  - Commits
  - Branches and Merges
  - GitHub
- Sass

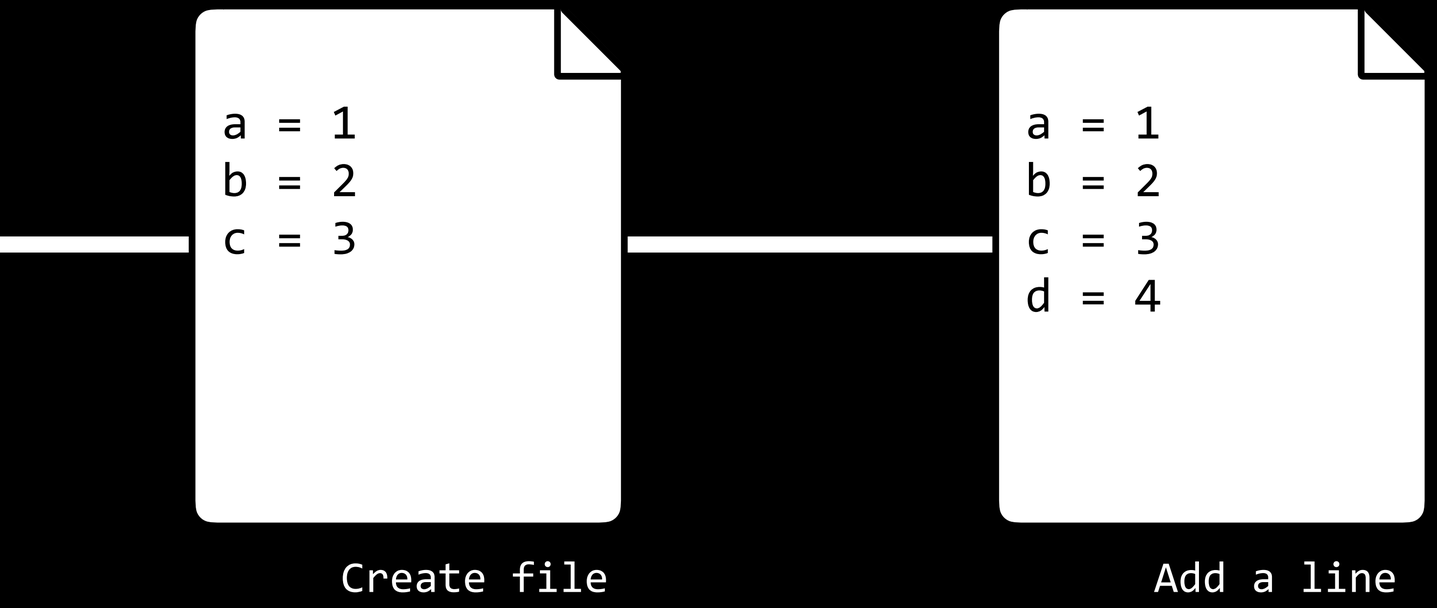
Git

Keep track of changes to code.

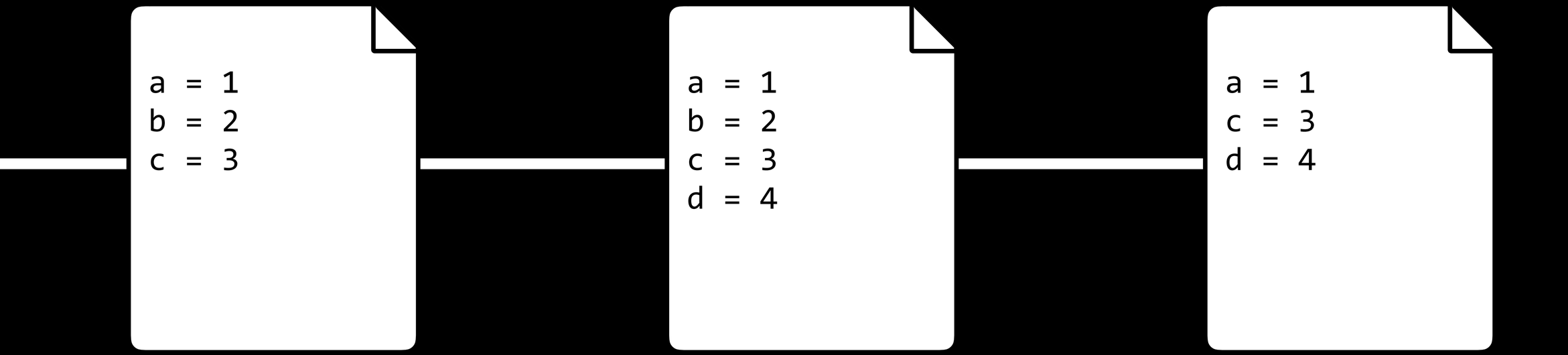


Create file

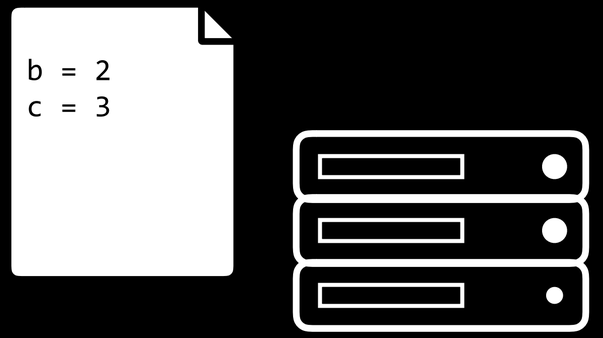
Keep track of changes to code.

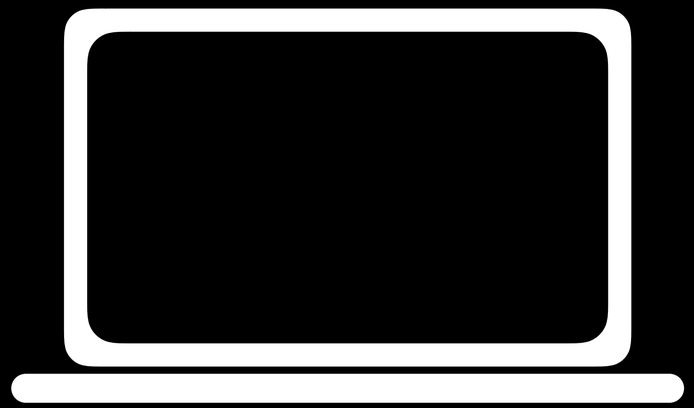


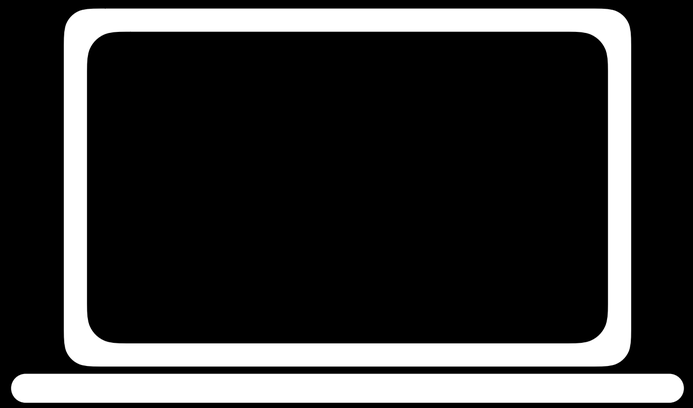
Keep track of changes to code.



Synchronizes code between different people.







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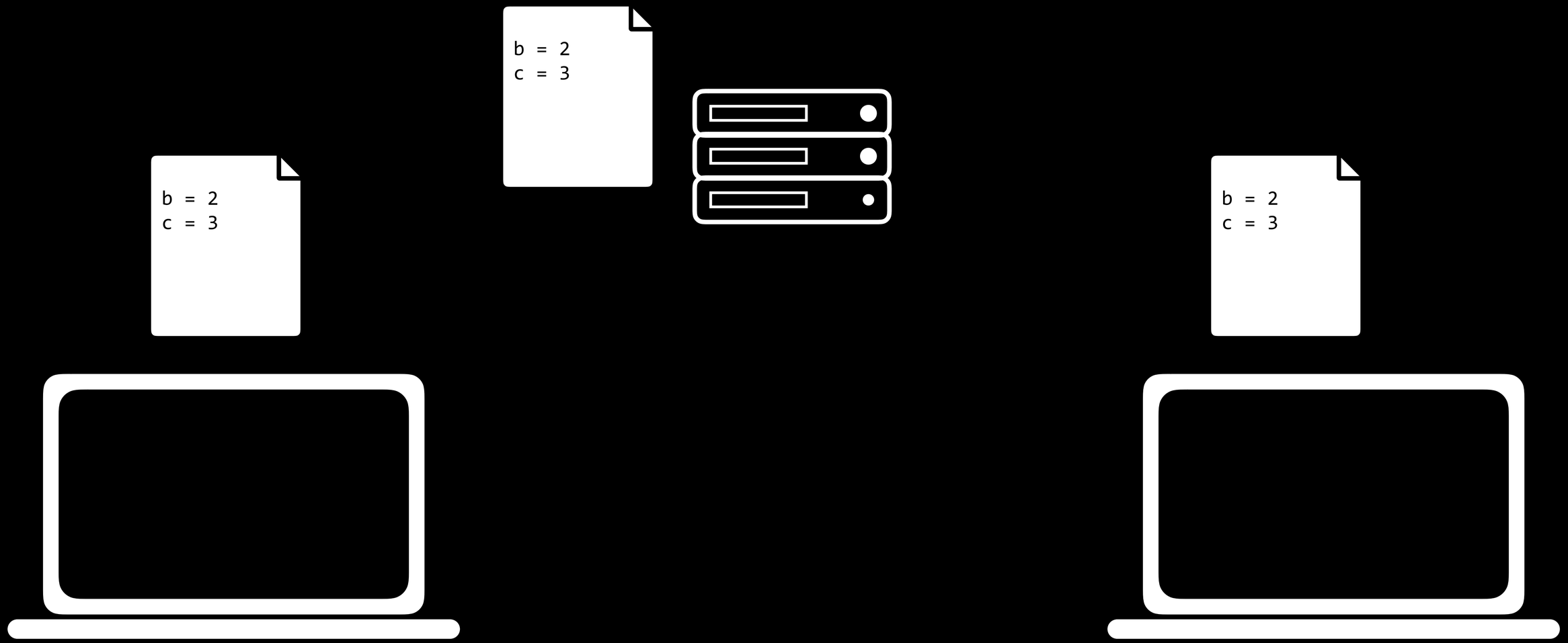

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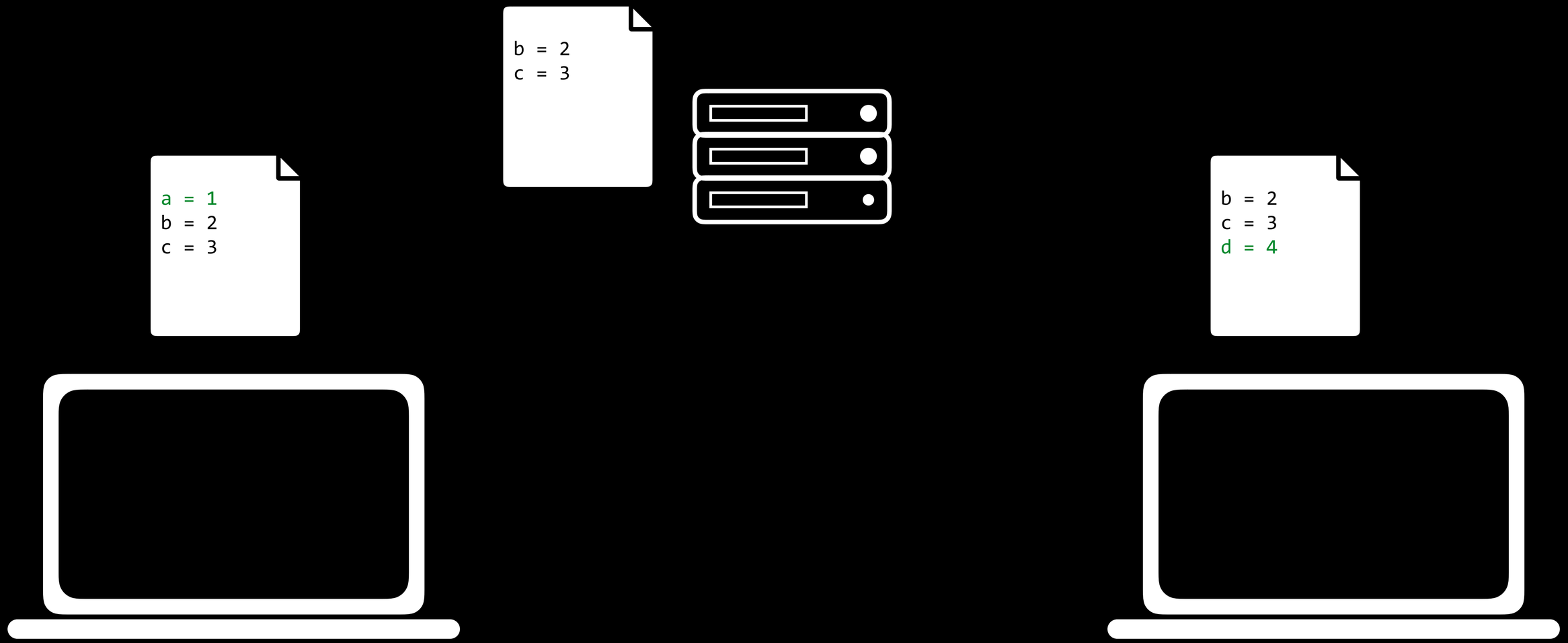

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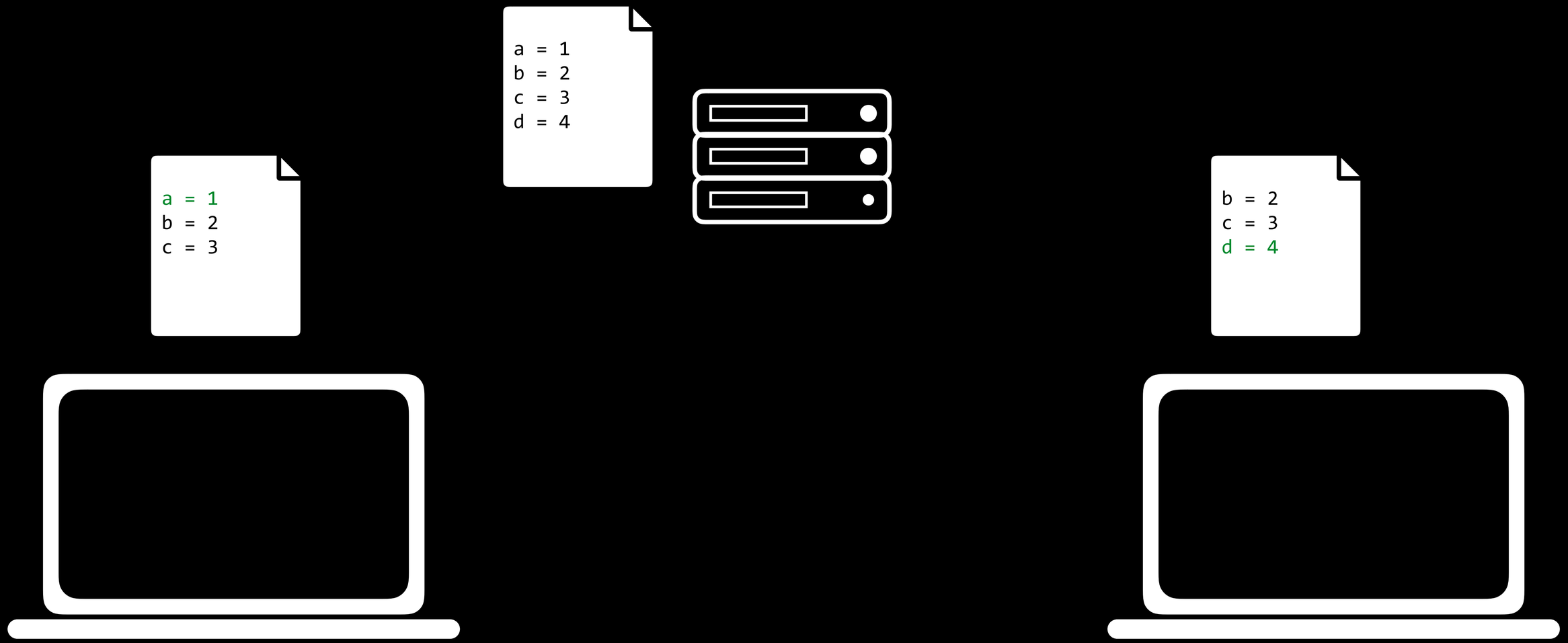
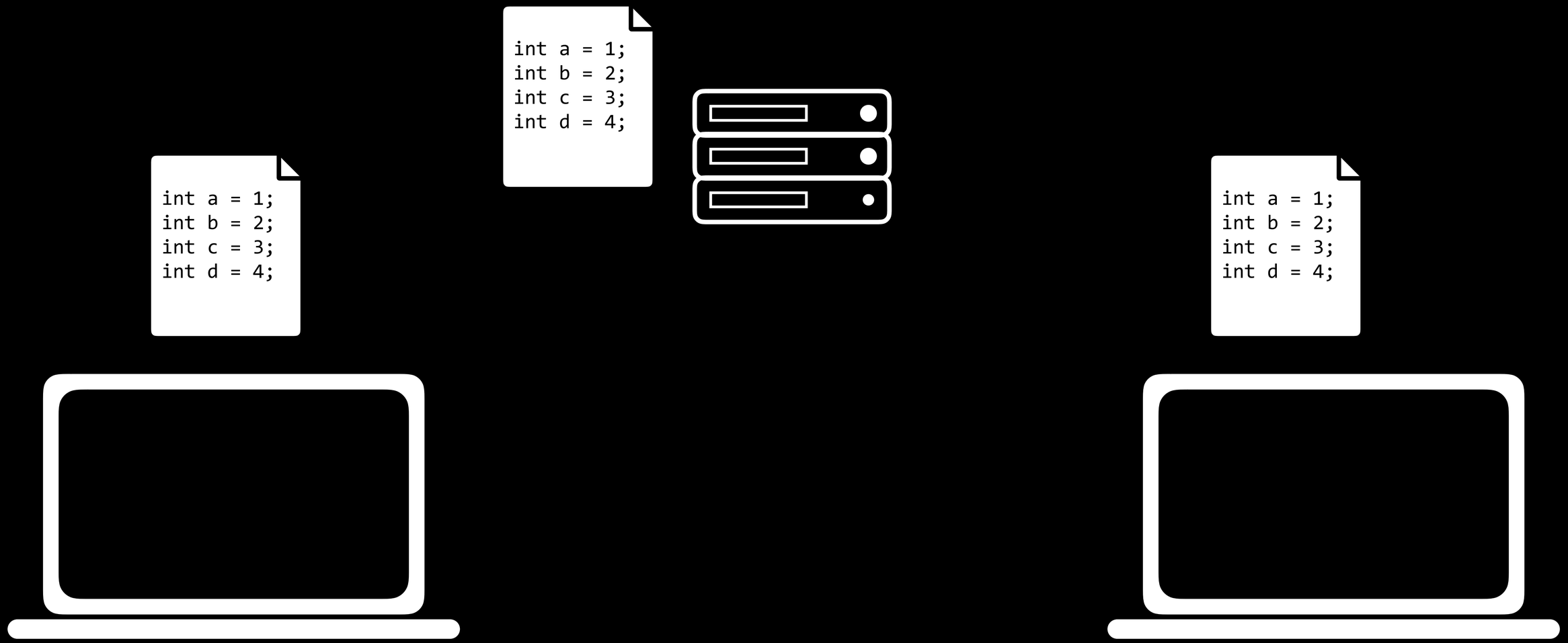
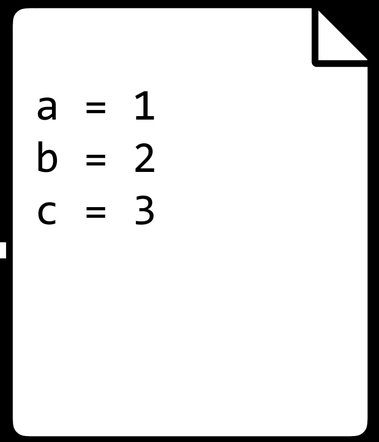


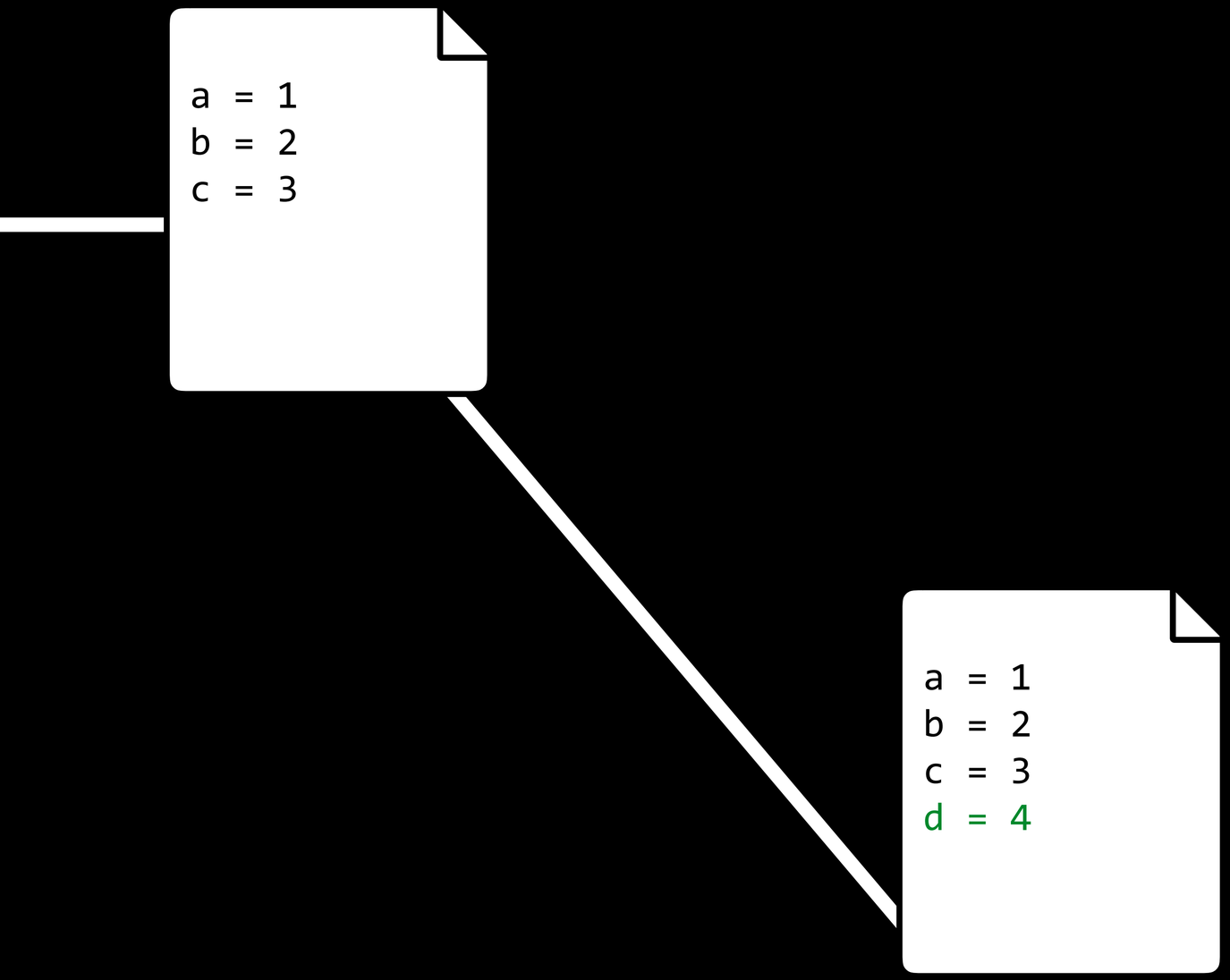
Synchronizes code between different people.



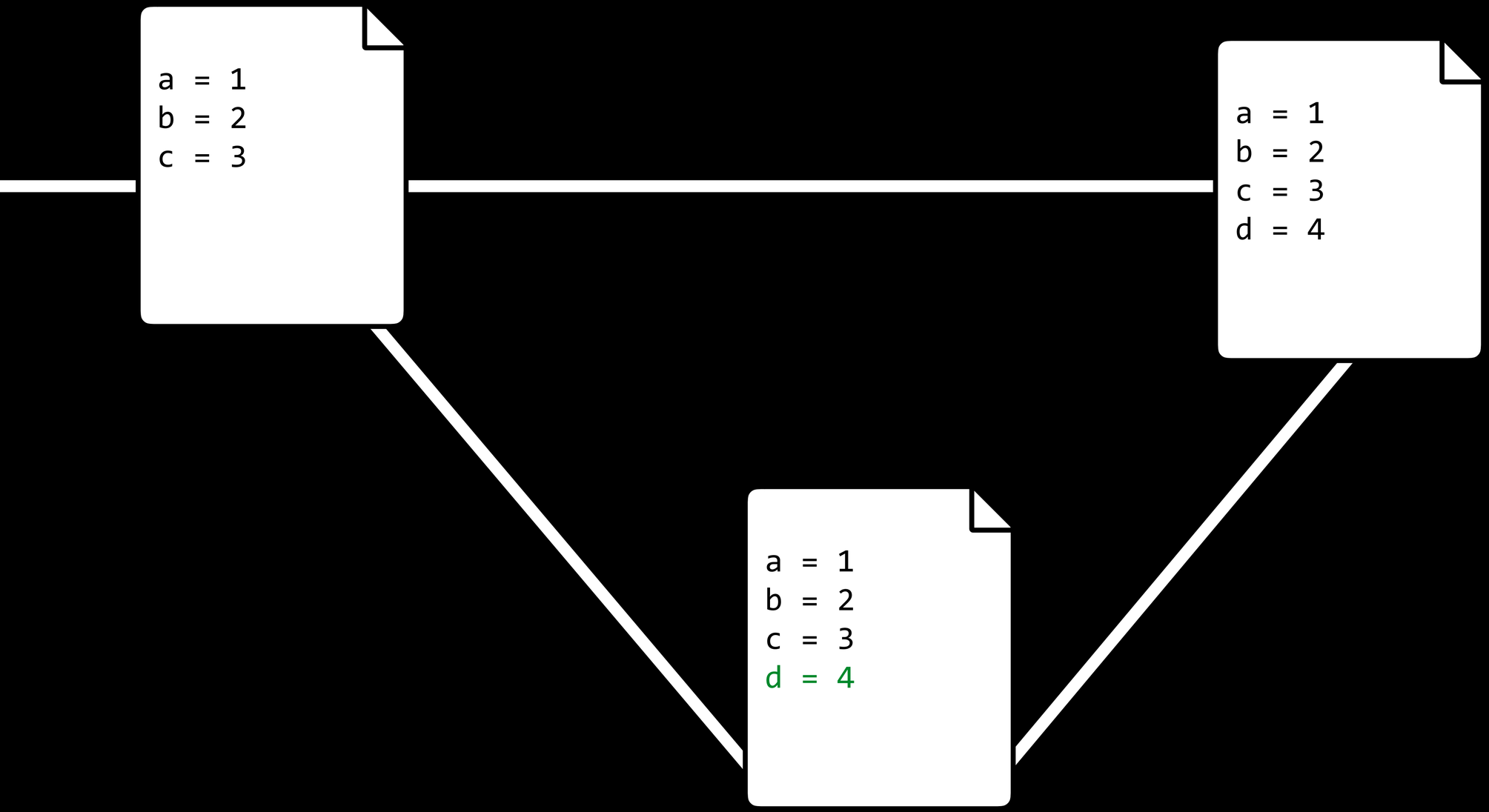
Test changes to code without losing the original.



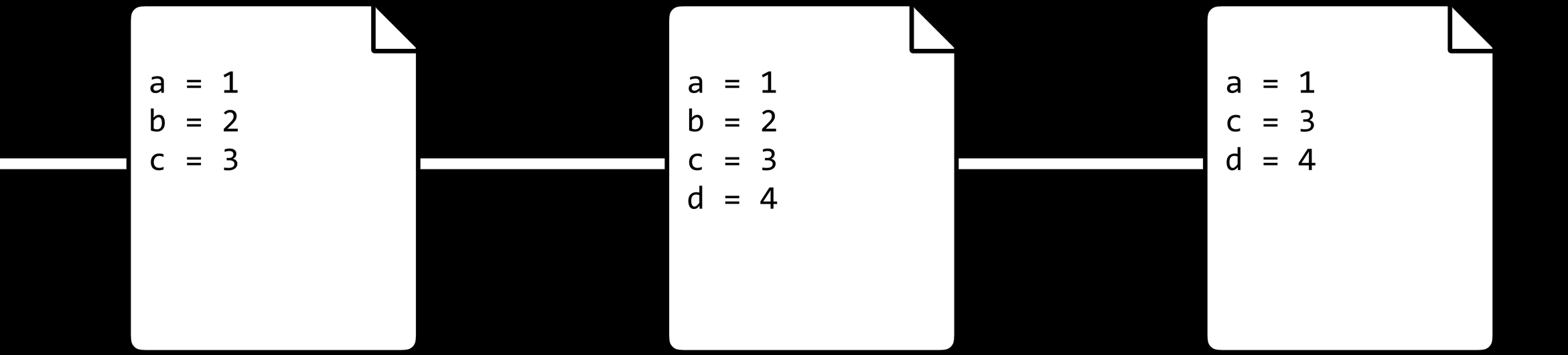
Test changes to code without losing the original.



Test changes to code without losing the original.



Revert back to old versions of code.



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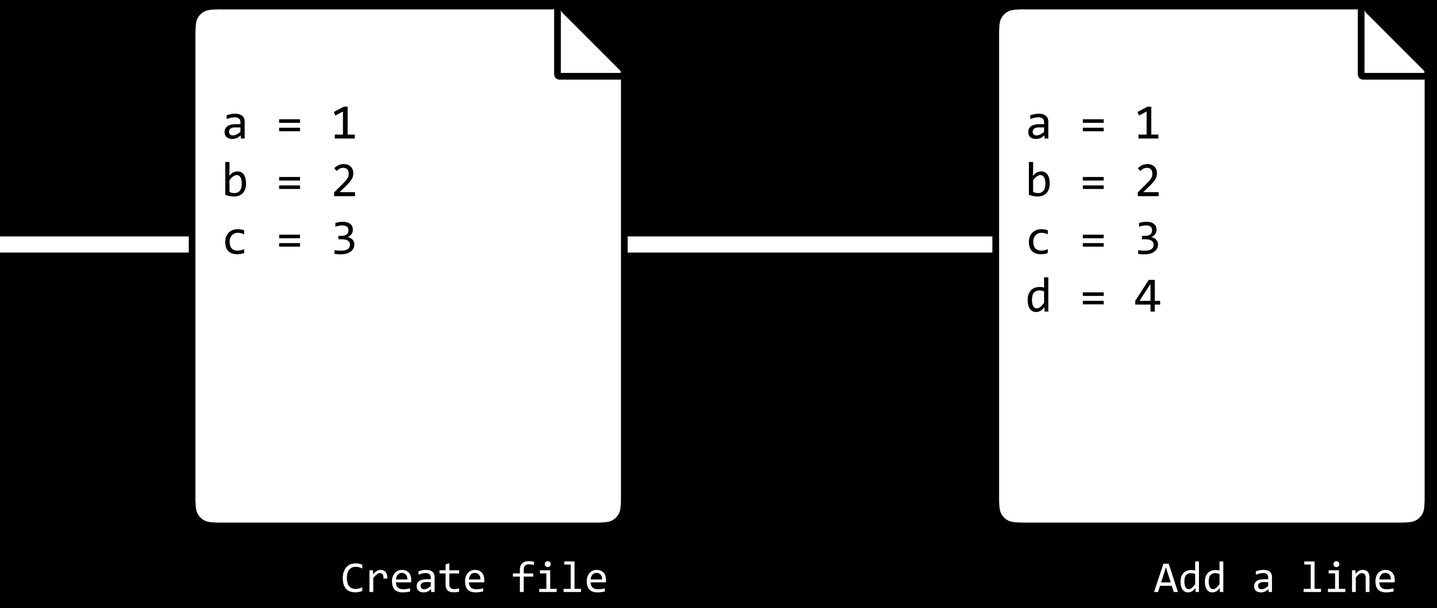
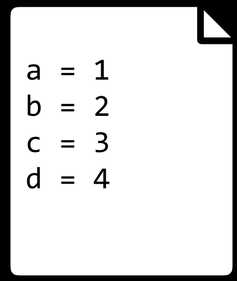
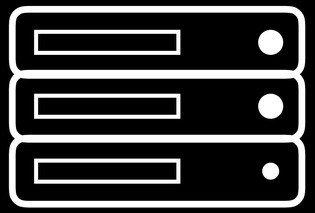


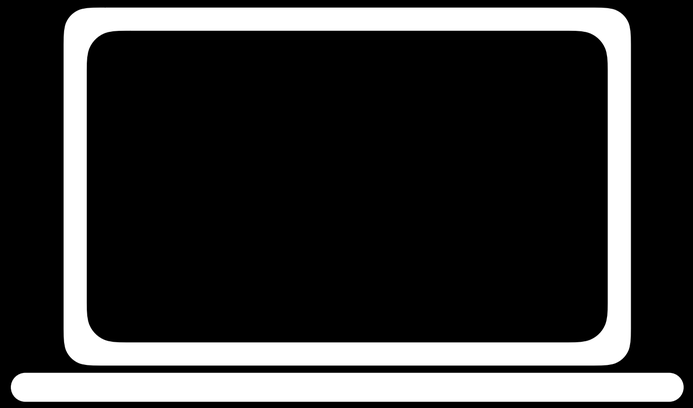
GitHub

git clone

git clone <url>







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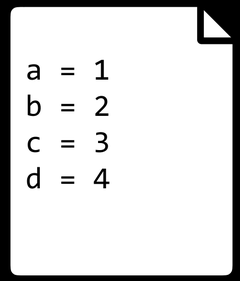

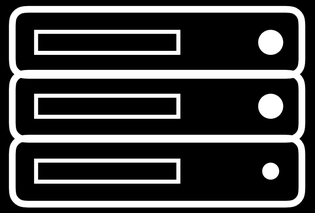

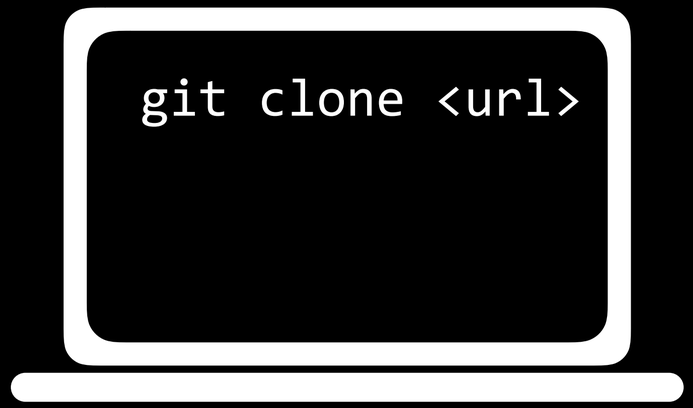

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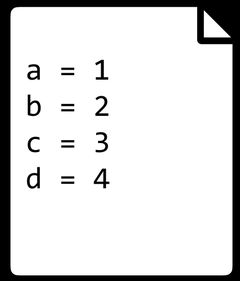

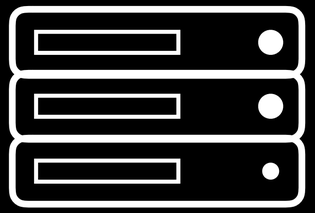

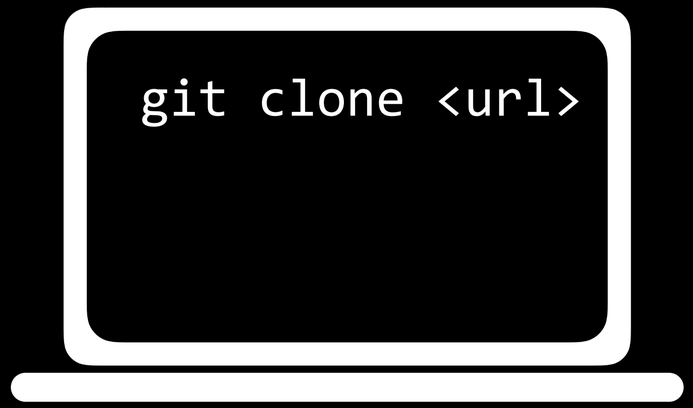

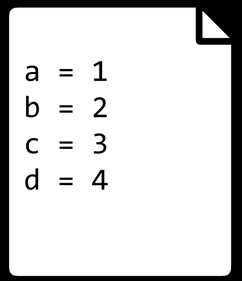

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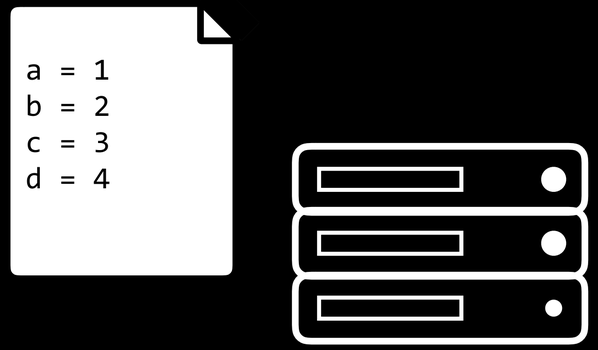
git add <filename>



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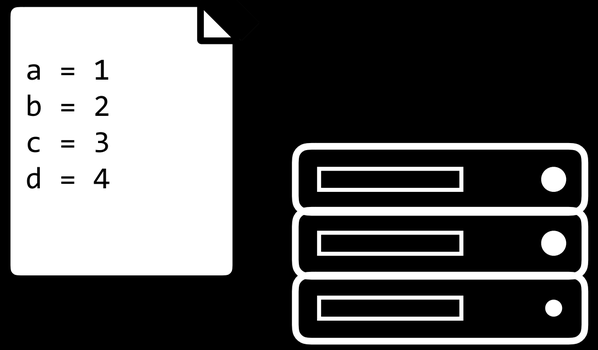

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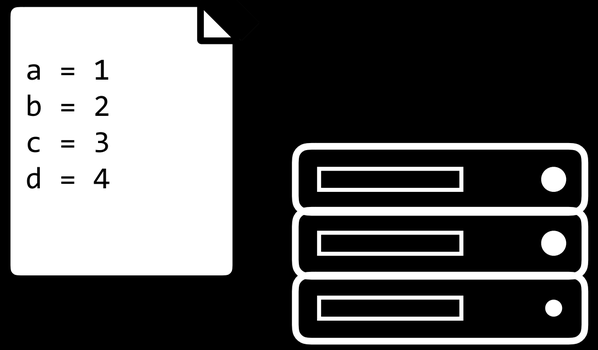

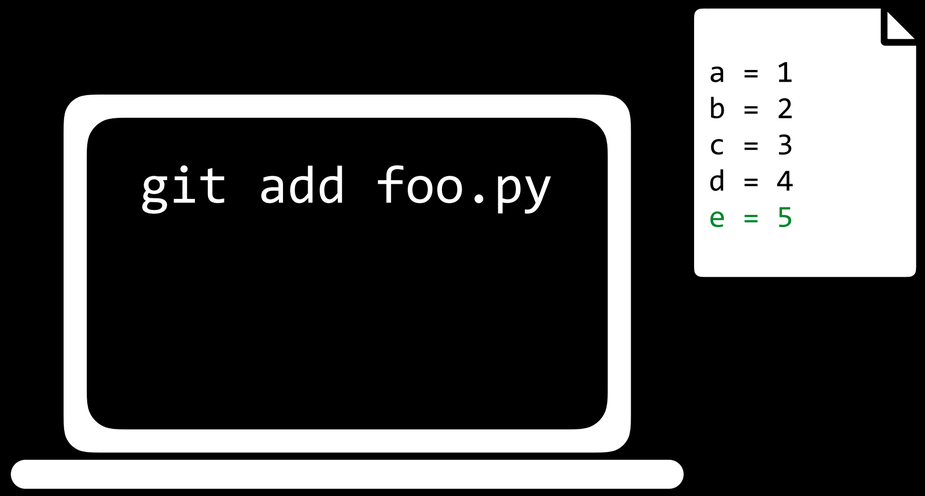

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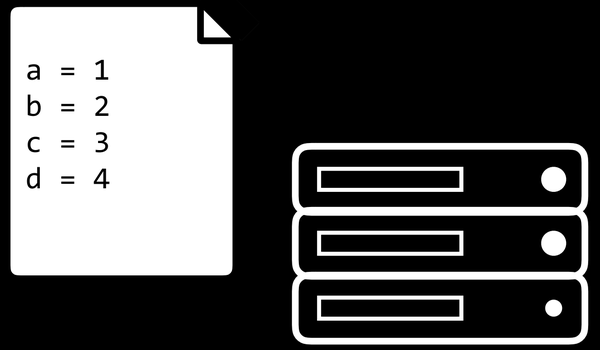
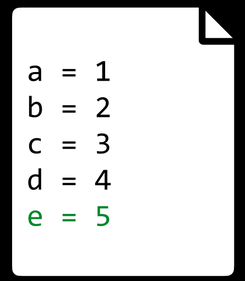


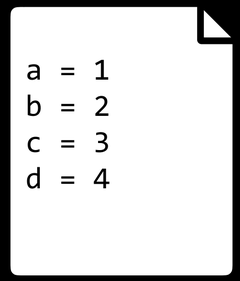


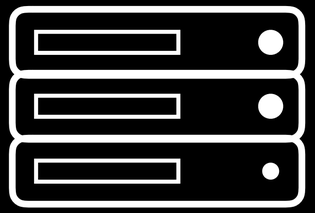
Changes to be committed:

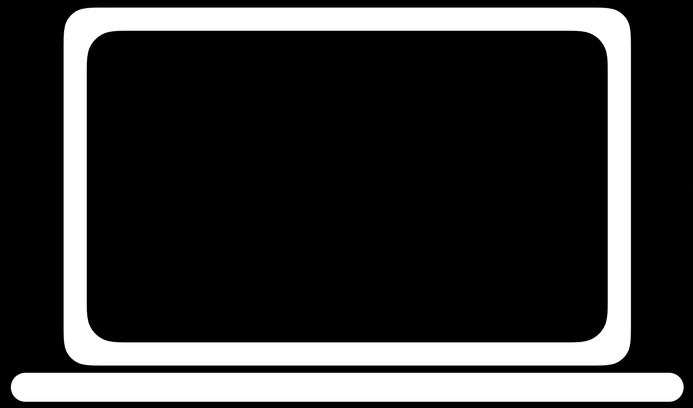
modified: foo.py

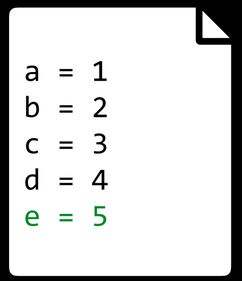
git commit

git commit -m "message"

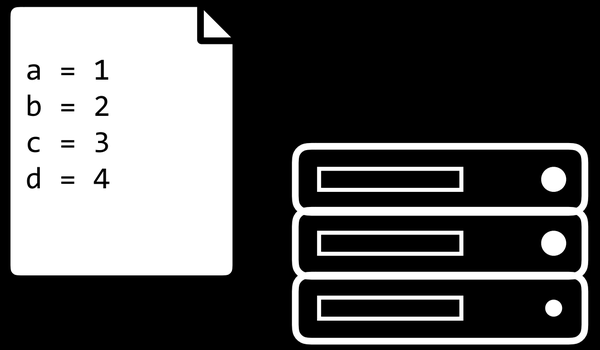




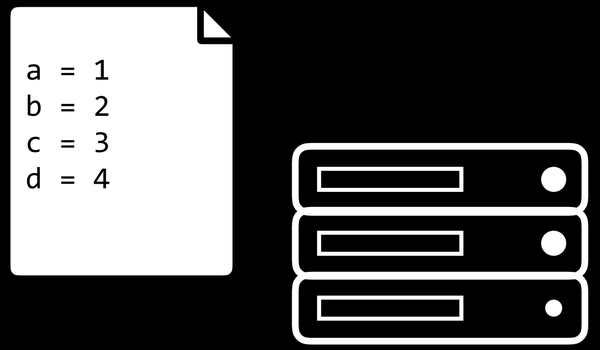


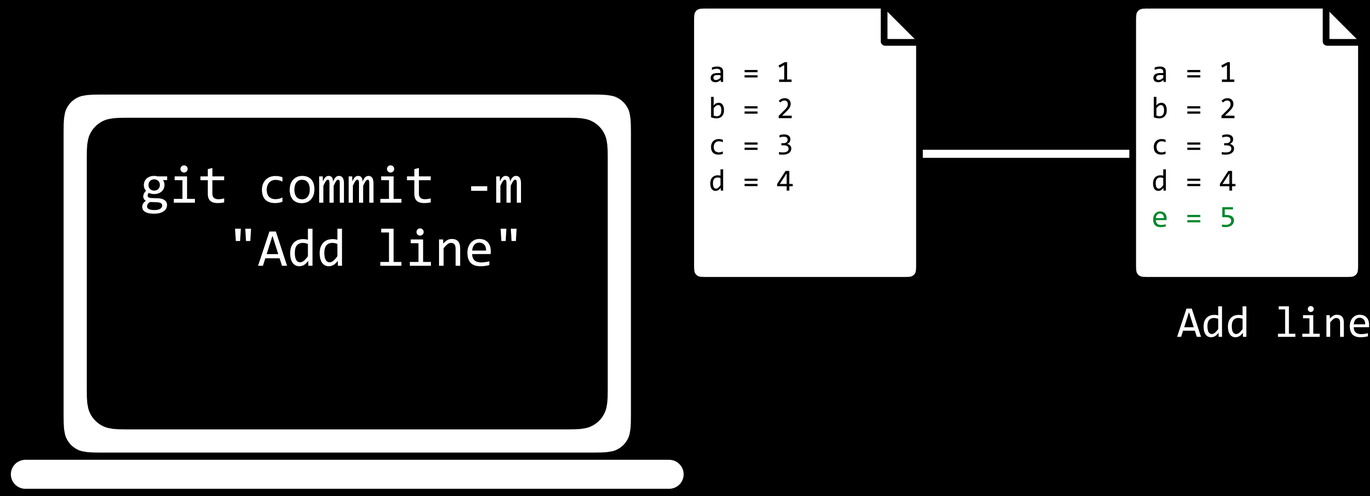


git commit -m "message"



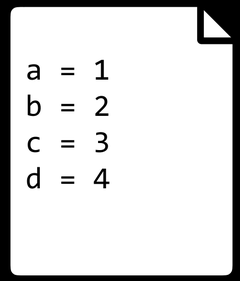
git commit -m "message"

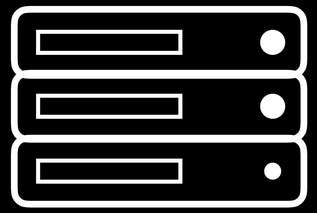


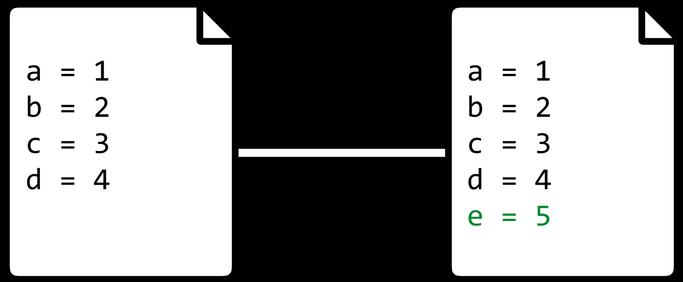


git status

git status







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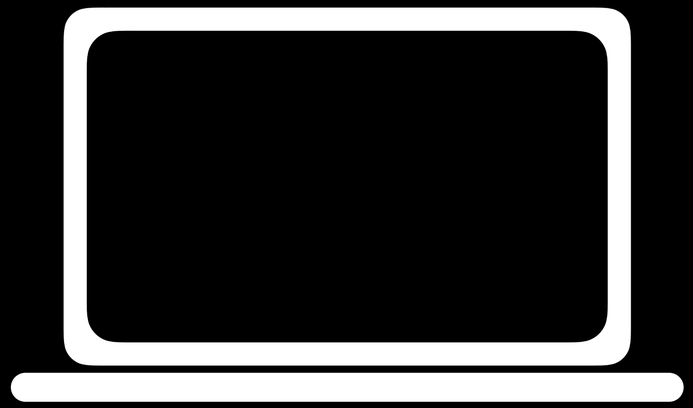

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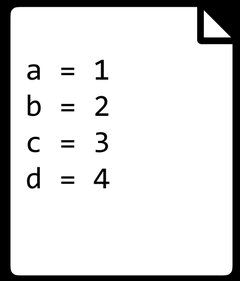
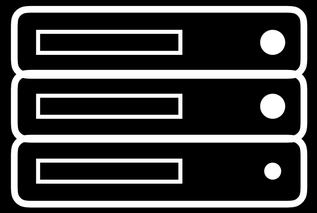
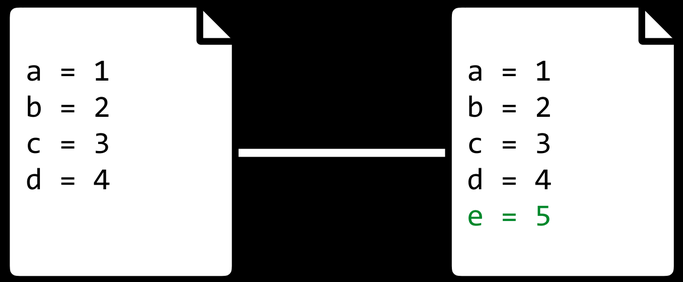
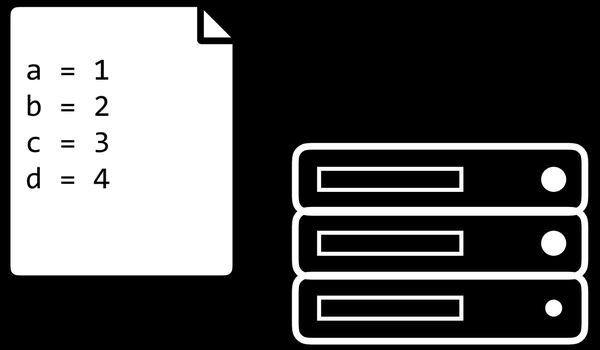
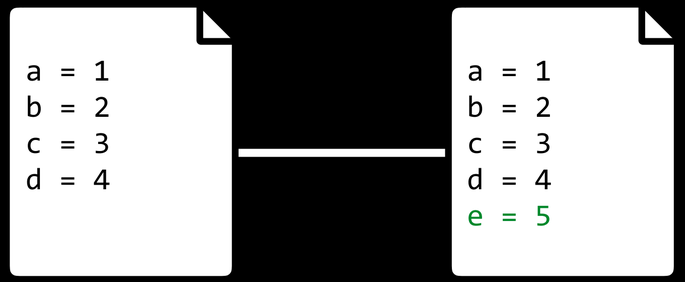






git status



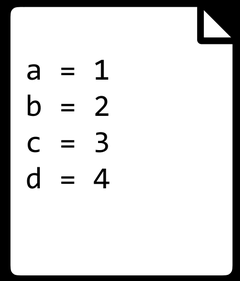


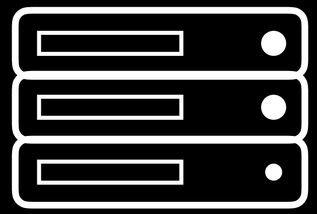
Add line

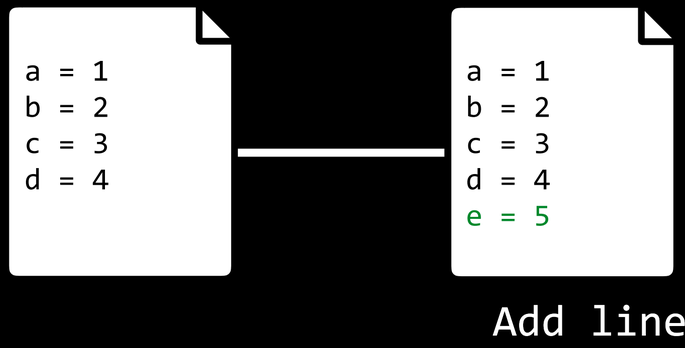

```
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)
```

```
git push
```

git push







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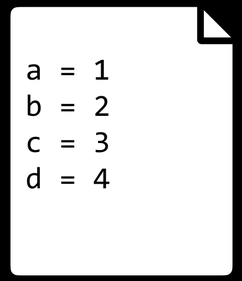
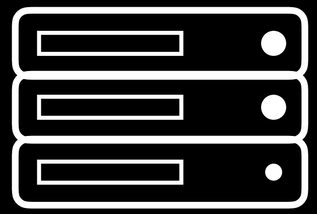
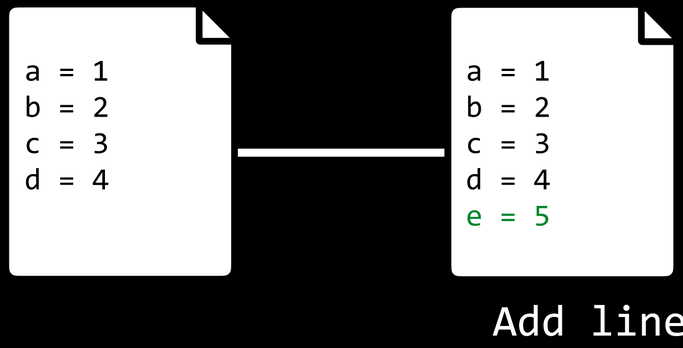
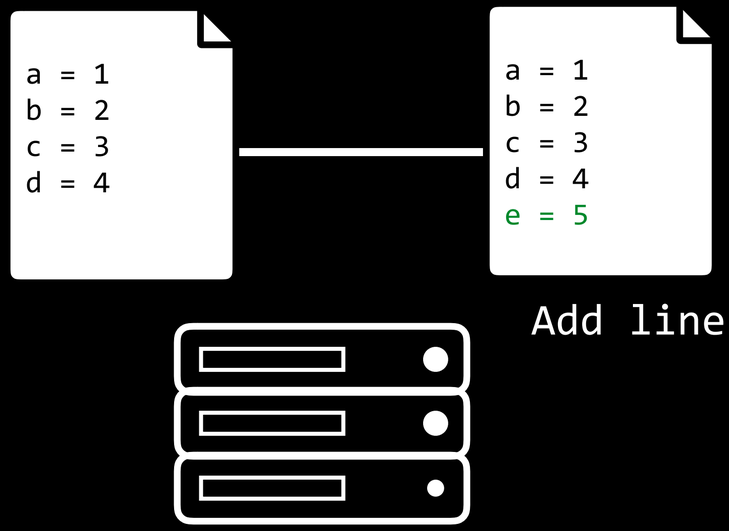






git push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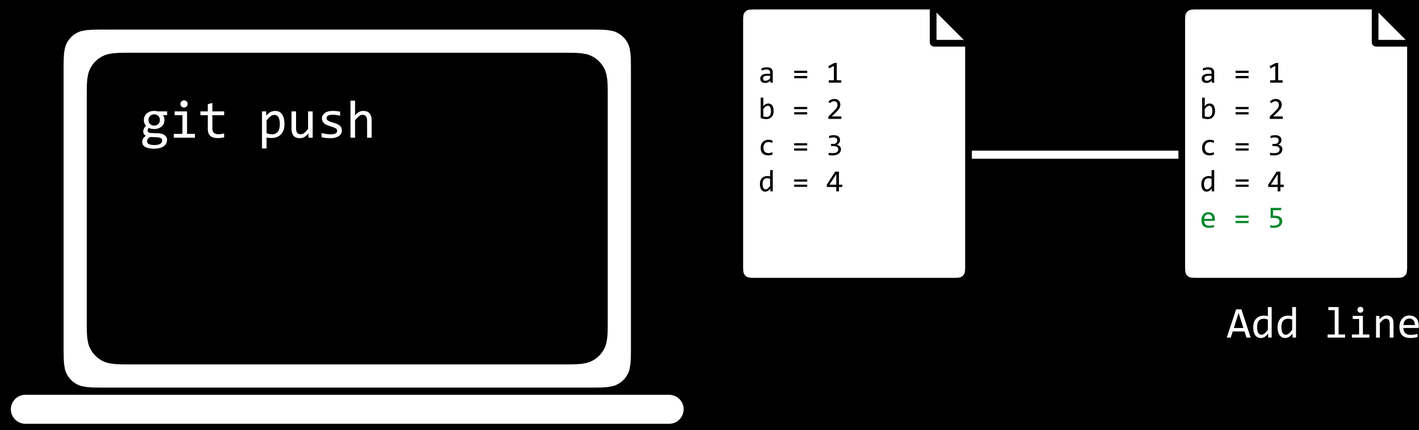
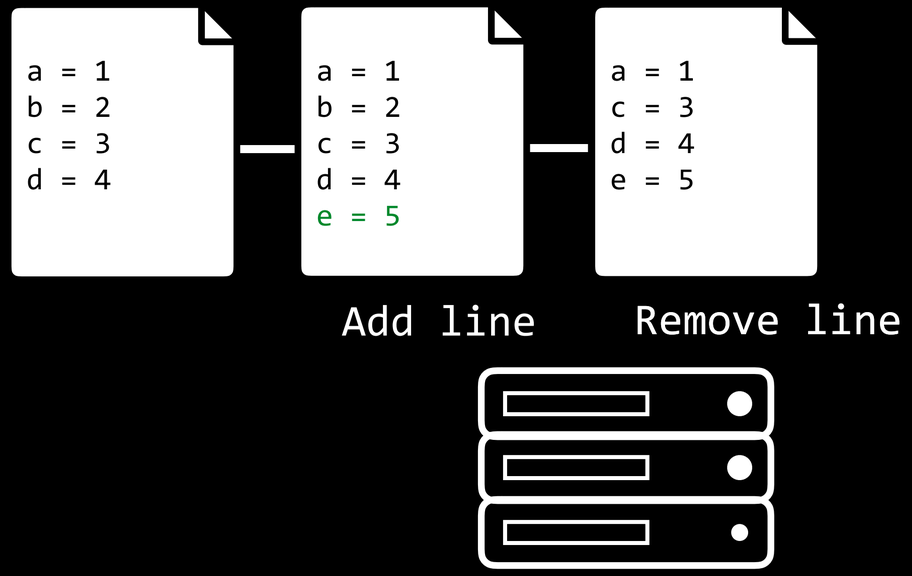
b = 2
c = 3
d = 4
a = 1
b = 2
c = 3
d = 4
e = 5
Add line


git push
a = 1
b = 2
c = 3
d = 4
a = 1
b = 2
c = 3
d = 4
e = 5
Add line

```
git pull
```

git pull


a = 1
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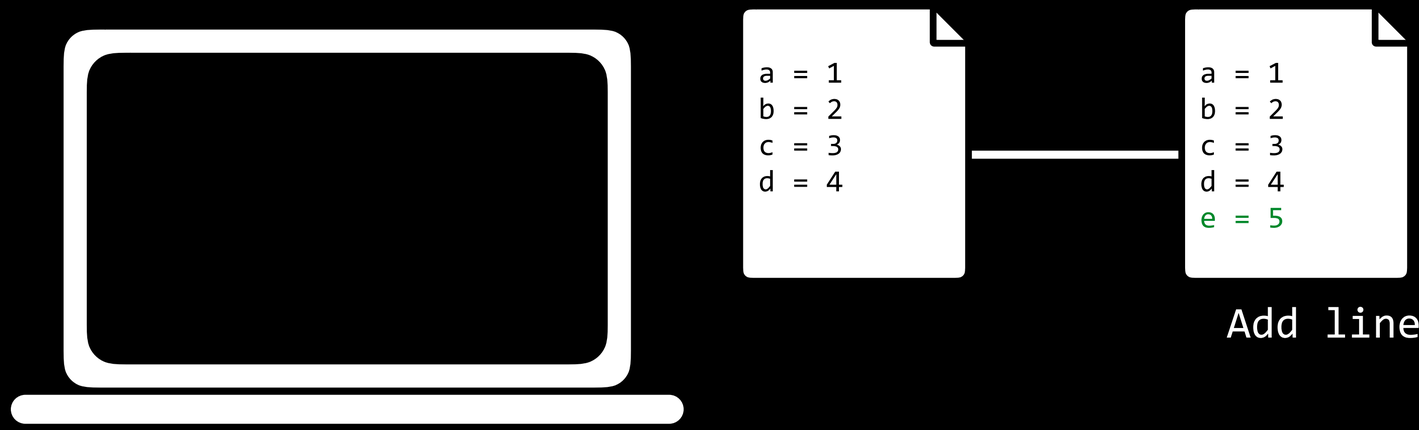
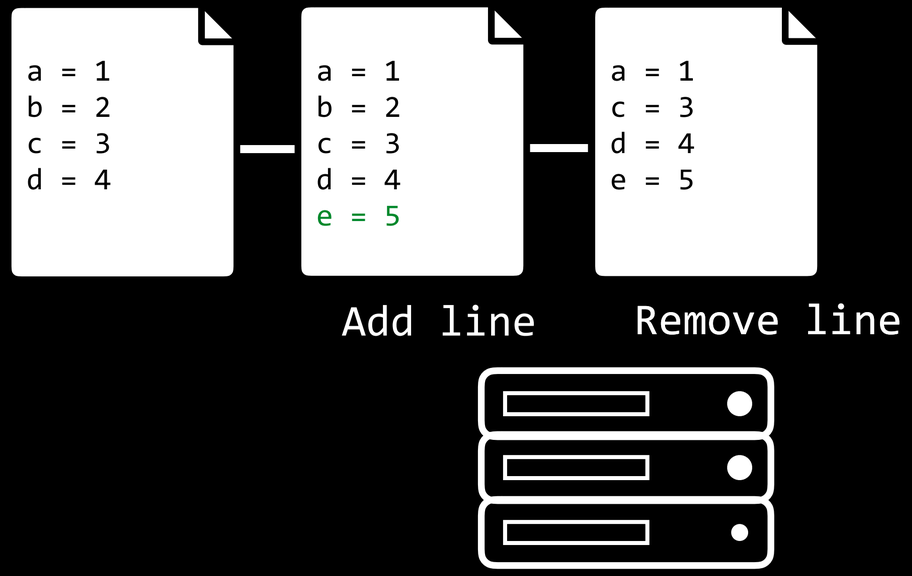
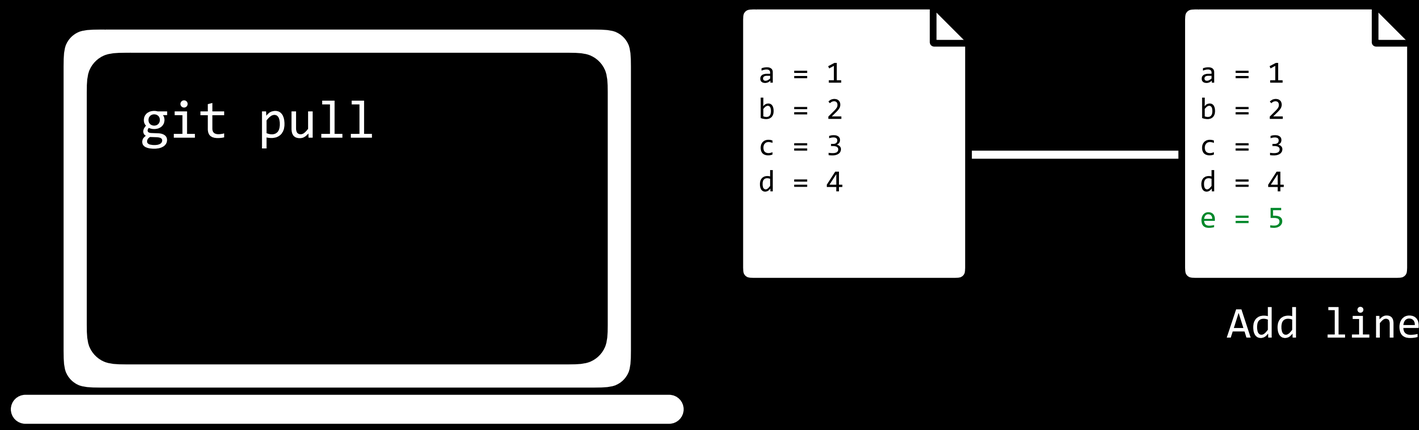
c = 3
d = 4
a = 1
b = 2
c = 3
d = 4
e = 5
a = 1
c = 3
d = 4
e = 5
Add line
Remove line

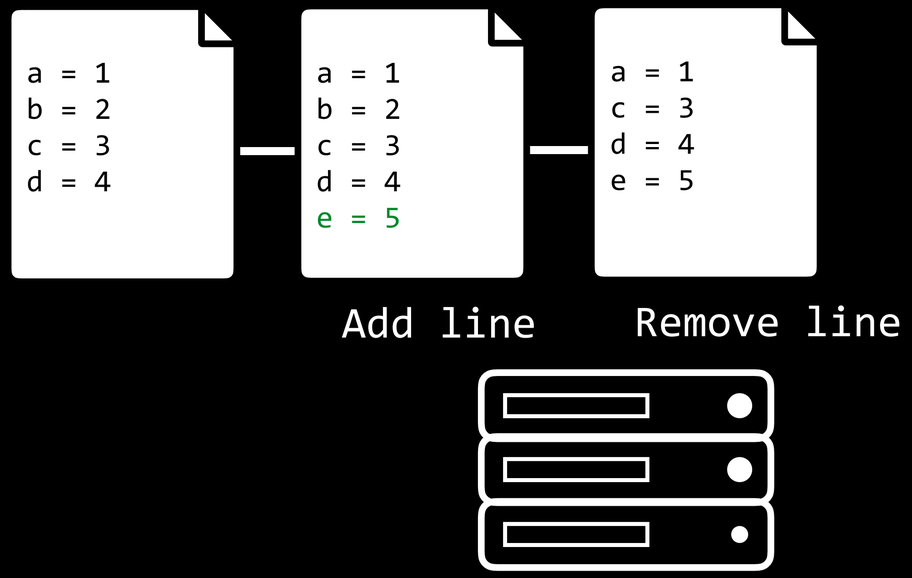

a = 1
b = 2
c = 3
d = 4
a = 1
b = 2
c = 3
d = 4
e = 5
Add line

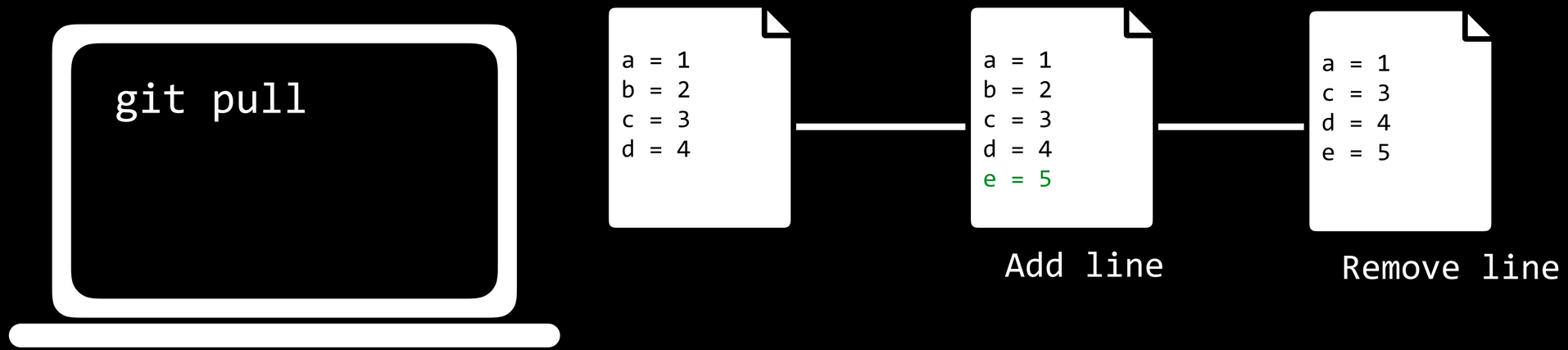
git pull


a = 1
b = 2
c = 3
d = 4
a = 1
b = 2
c = 3
d = 4
e = 5
a = 1
c = 3
d = 4
e = 5
Add line
Remove line


git pull
a = 1
b = 2
c = 3
d = 4
a = 1
b = 2
c = 3
d = 4
e = 5
Add line

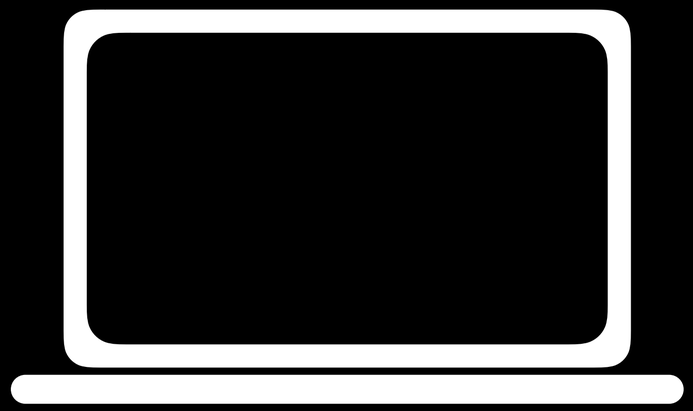
git pull


a = 1
b = 2
c = 3
d = 4
a = 1
b = 2
c = 3
d = 4
e = 5
a = 1
c = 3
d = 4
e = 5
Add line
Remove line


git pull
a = 1
b = 2
c = 3
d = 4
a = 1
b = 2
c = 3
d = 4
e = 5
a = 1
c = 3
d = 4
e = 5
Add line
Remove line

Merge Conflicts

Merge Conflicts



Merge Conflicts

Merge Conflicts


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

Merge Conflicts


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

Merge Conflicts

your changes

remote changes

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

conflicting commit

Merge Conflicts


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

Merge Conflicts

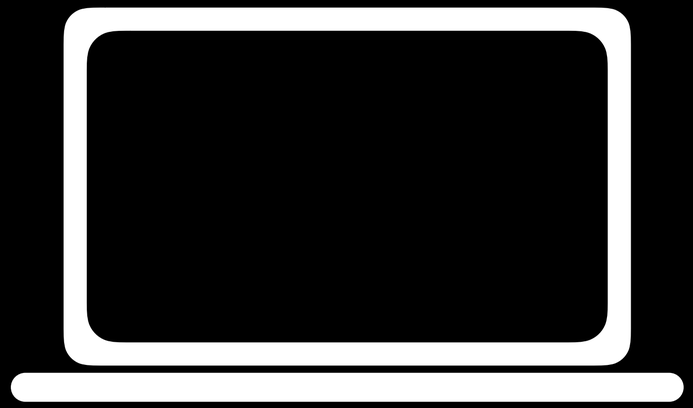

```
a = 1

b = 2



c = 3
d = 4
e = 5
```

Merge Conflicts


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

git log

```
git log
```



git log

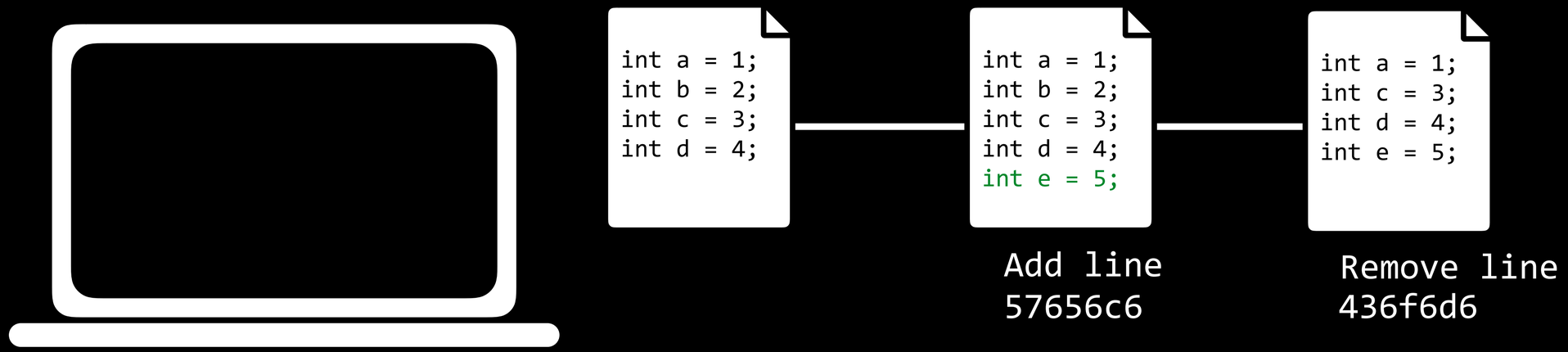
git log


```
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

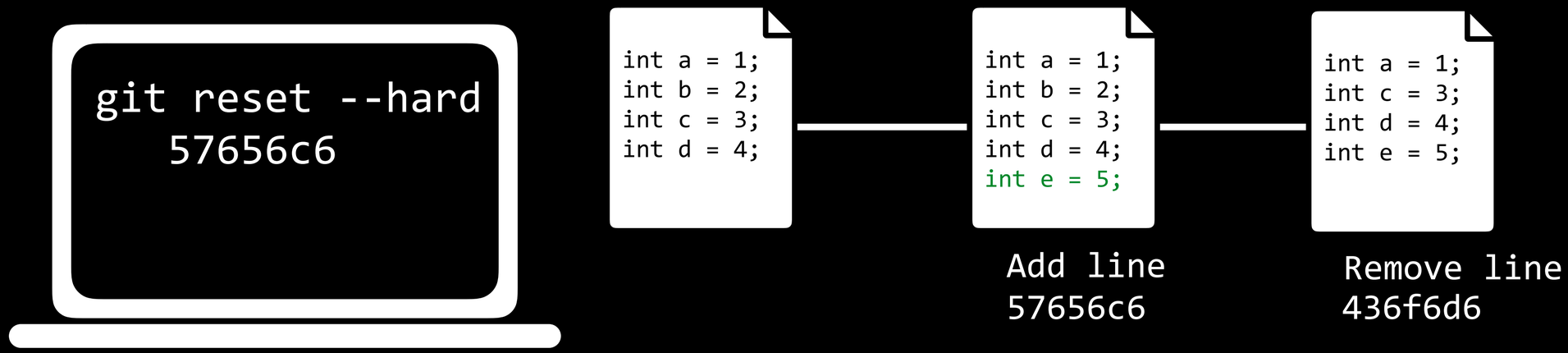
git reset

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



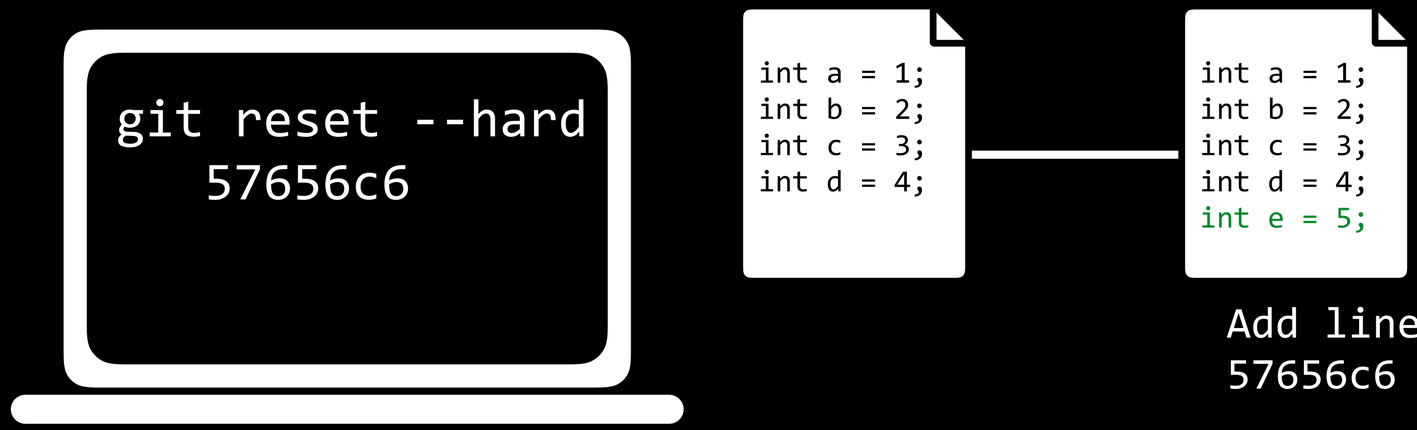
git reset

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



git reset

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

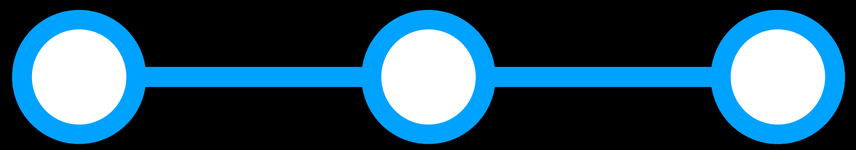


Making Changes

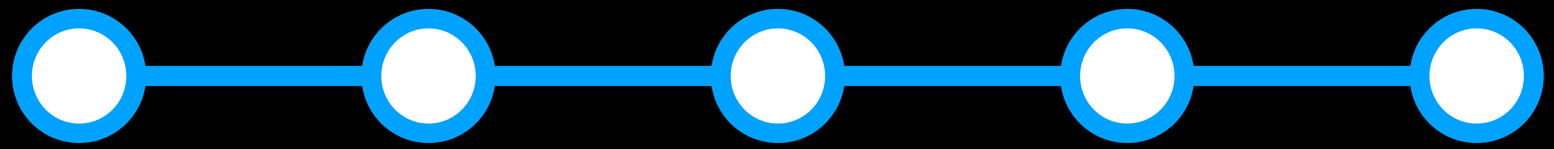
first
commit

first commit

changes


first
commit
changes
more
changes


first commit
changes
more changes
start new feature

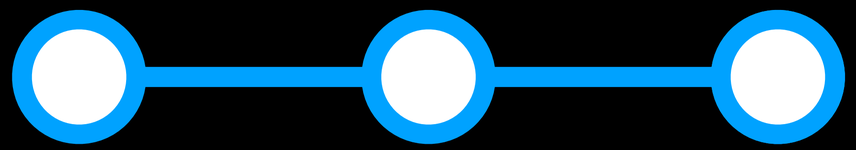

first commit
changes
more changes
start new feature
keep working on new feature

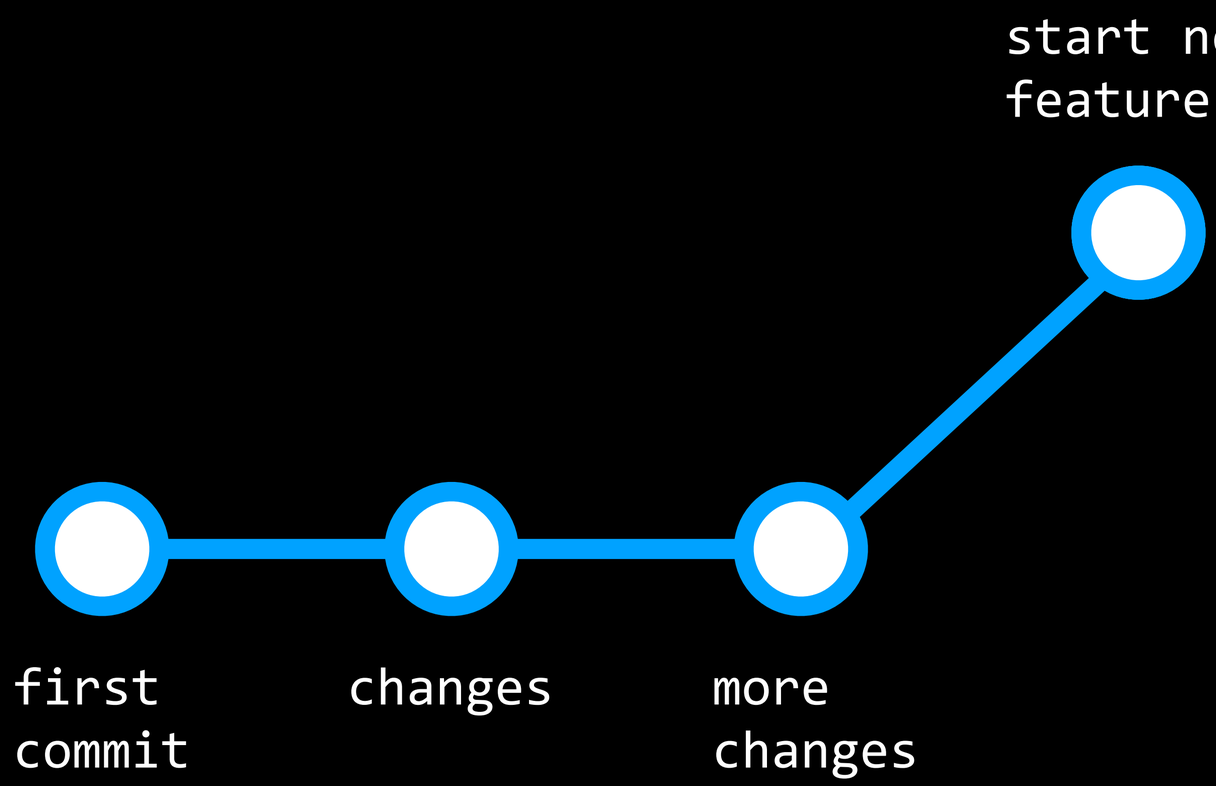
Branching

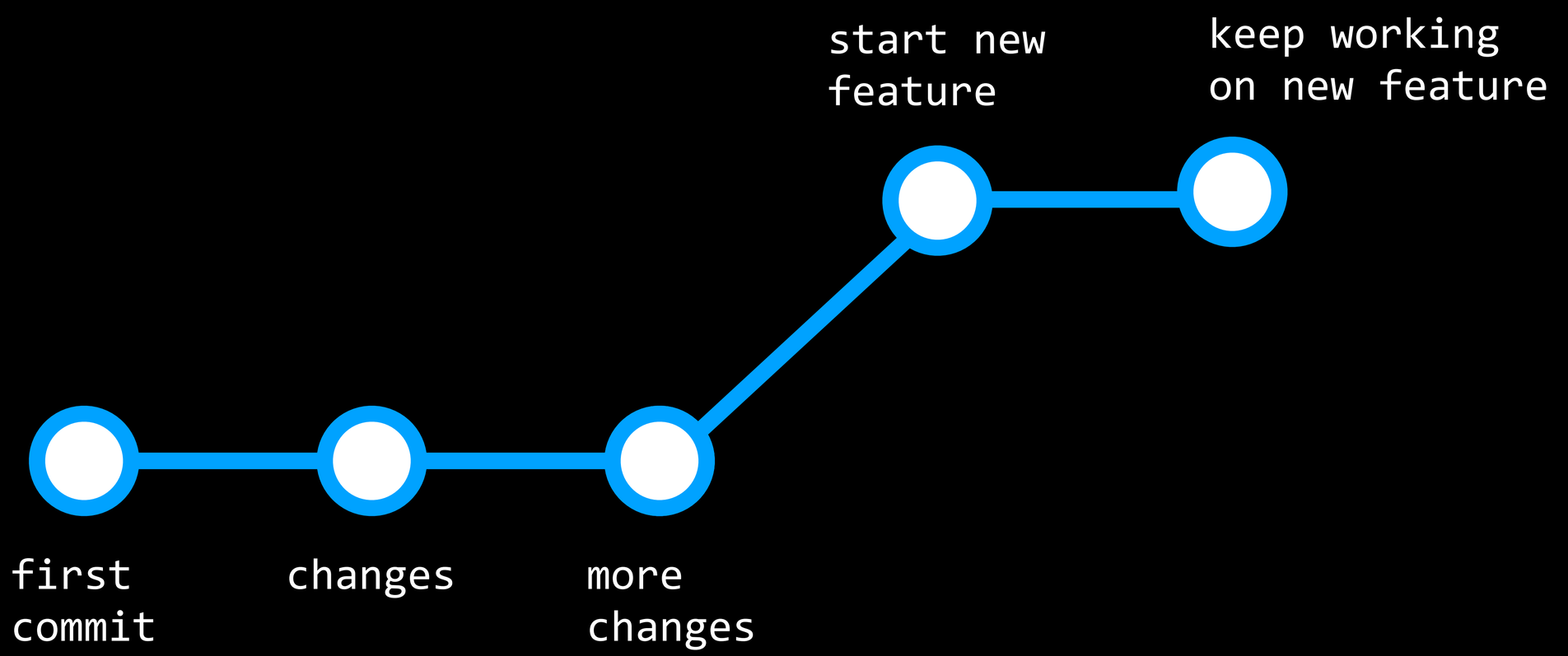
first
commit

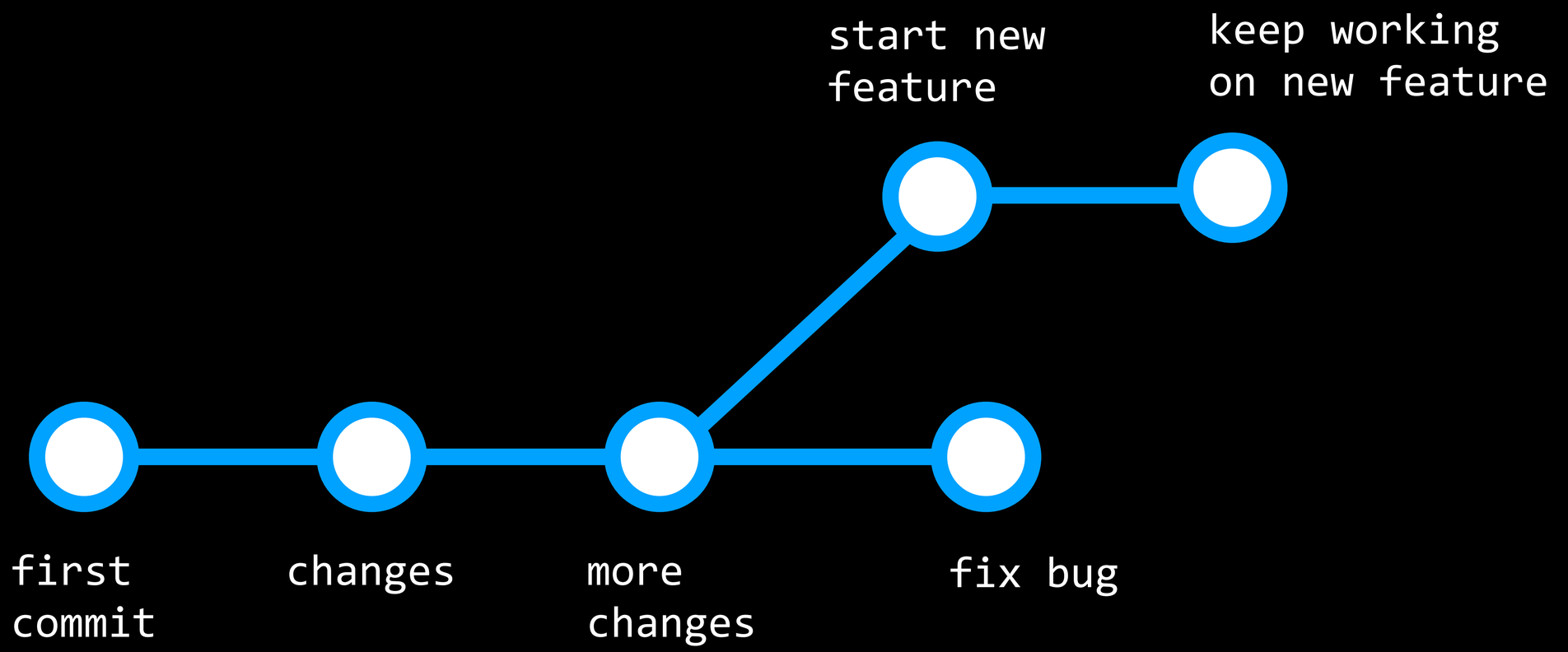
first commit

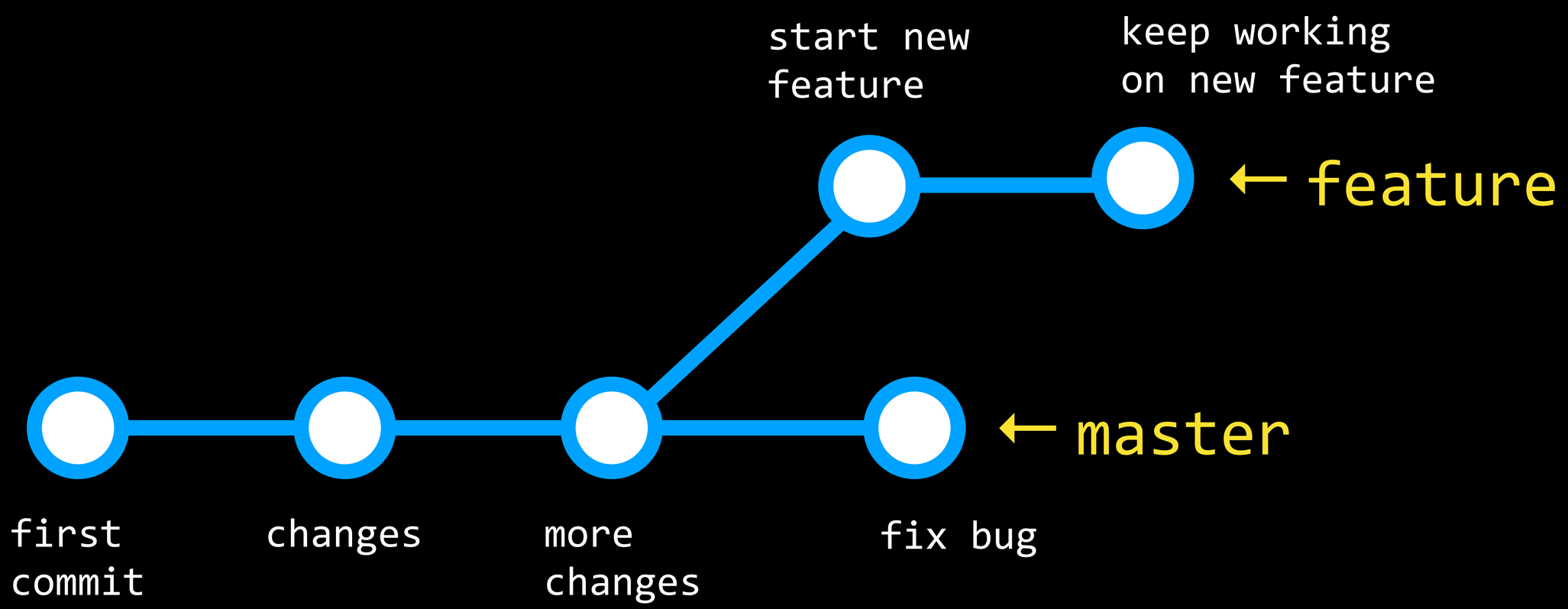
changes

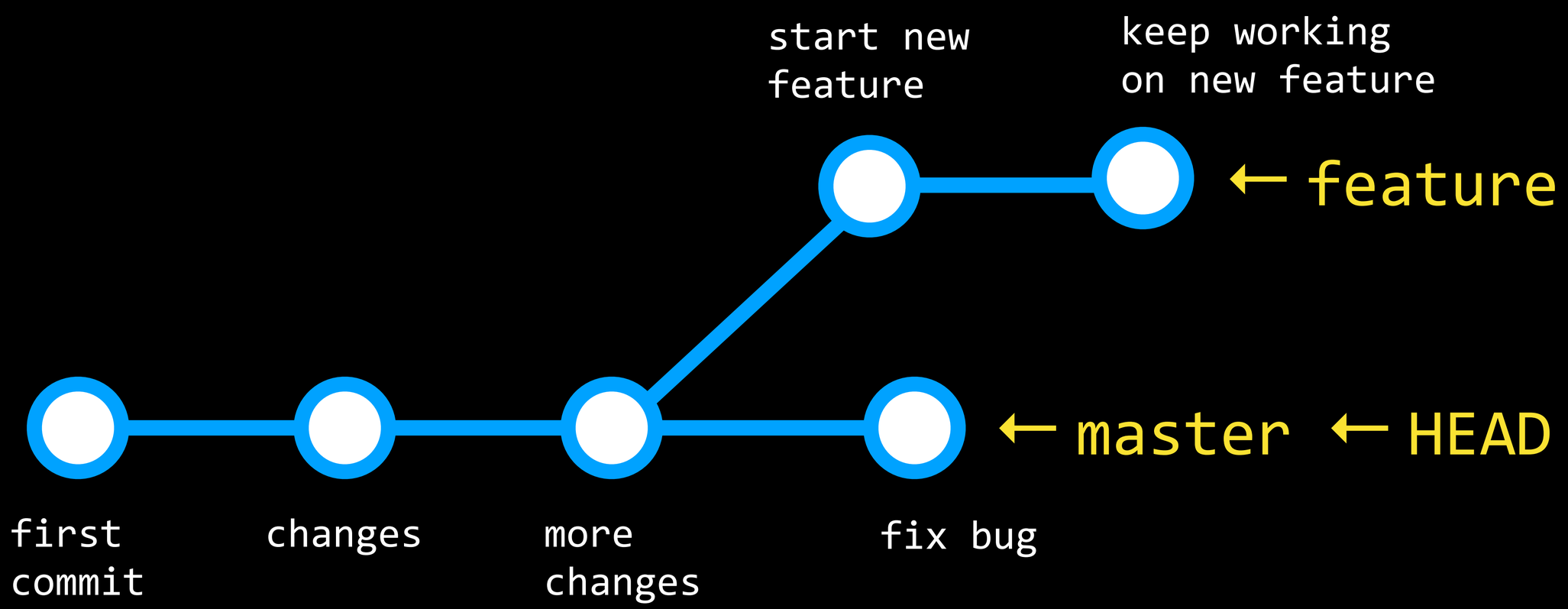

first
commit
changes
more
changes

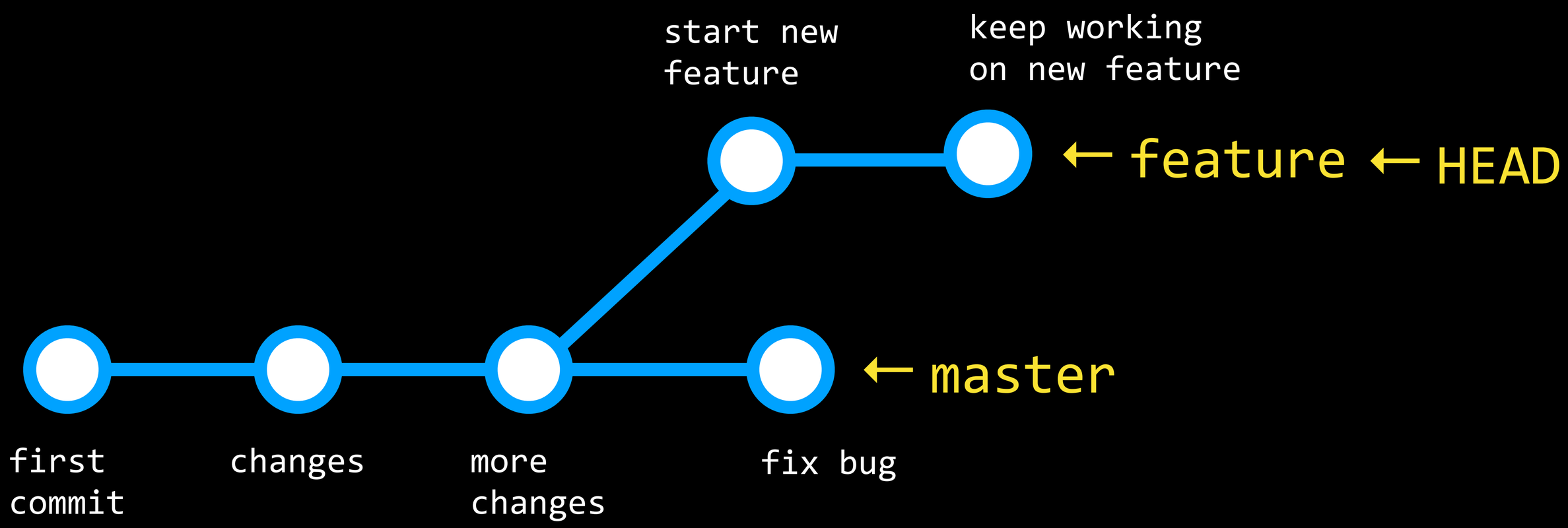

start new
feature
first
commit
changes
more
changes

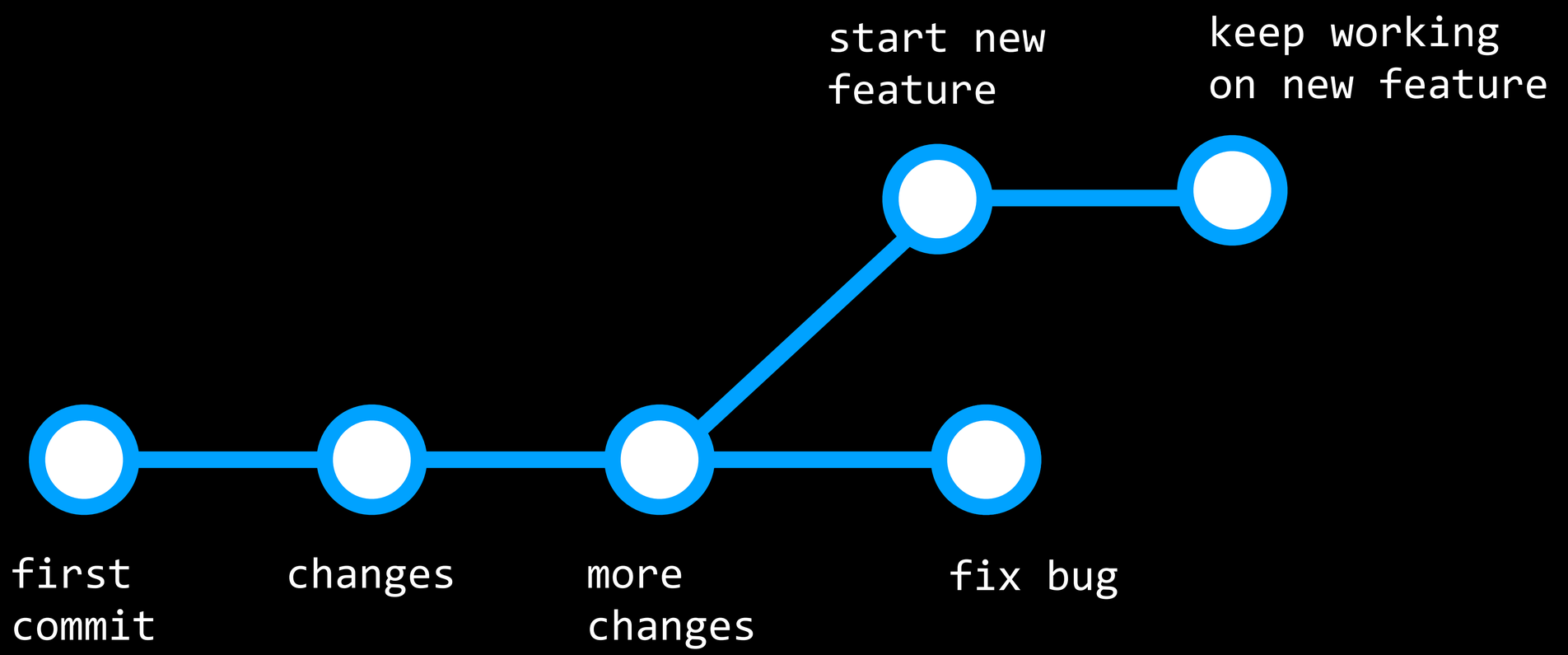

start new
feature
keep working
on new feature
first
commit
changes
more
changes

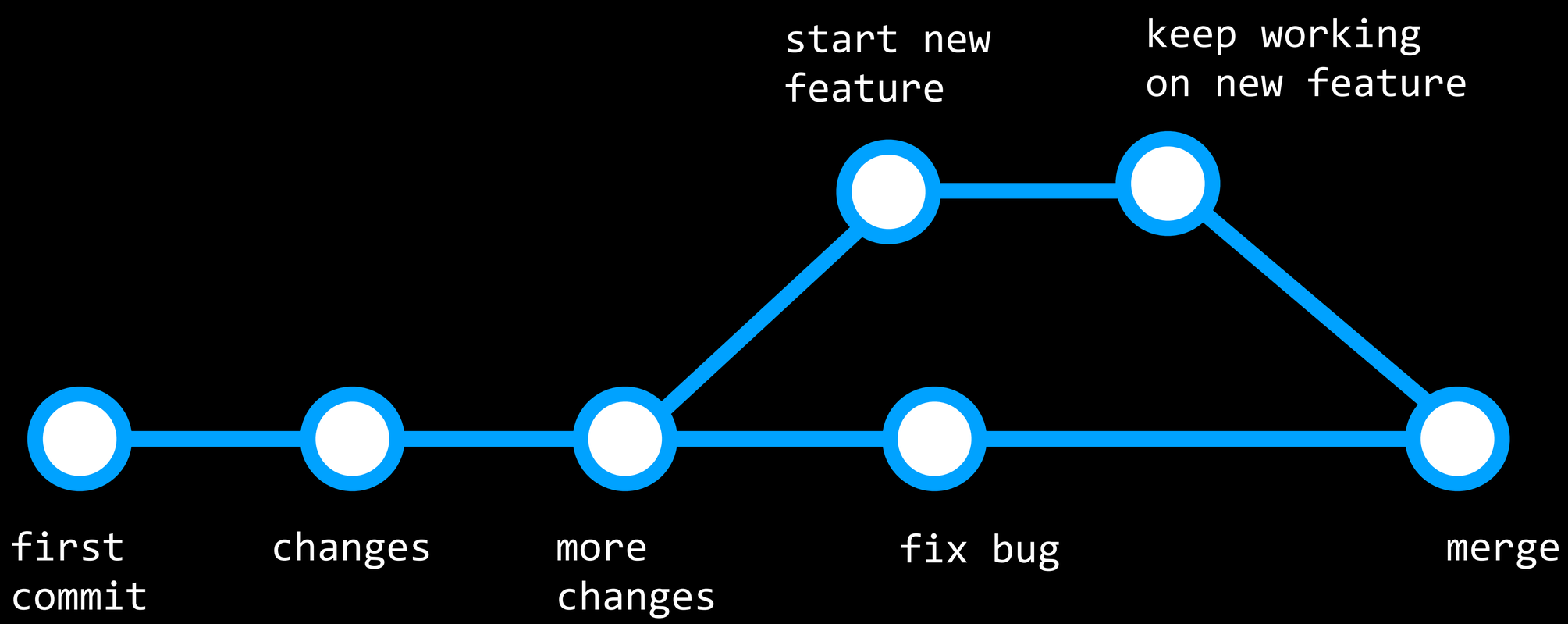

start new
feature
keep working
on new feature
first
commit
changes
more
changes
fix bug


start new feature
keep working on new feature
feature
master
first commit
changes
more changes
fix bug


start new feature
keep working on new feature
feature
master
HEAD
first commit
changes
more changes
fix bug


start new feature
keep working on new feature
← feature ← HEAD
← master
first commit
changes
more changes
fix bug


start new
feature
keep working
on new feature
first
commit
changes
more
changes
fix bug

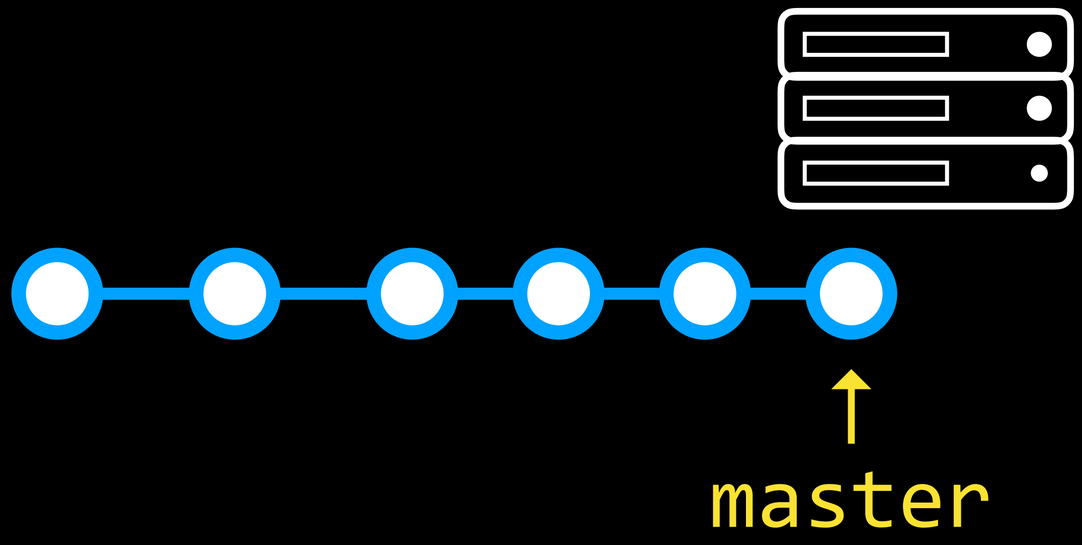

start new
feature
keep working
on new feature
first
commit
changes
more
changes
fix bug
merge

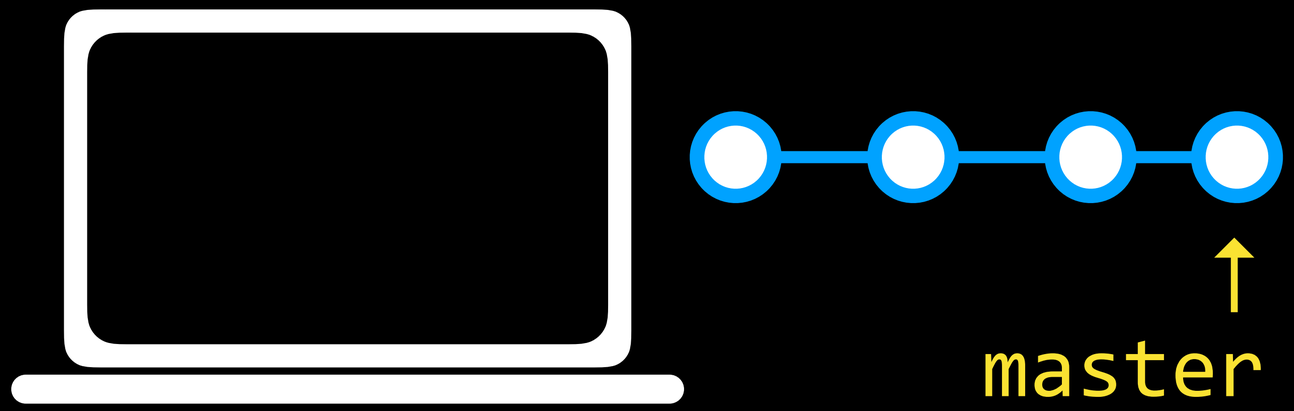
Branching

- `git branch`
- `git checkout`
- `git merge`

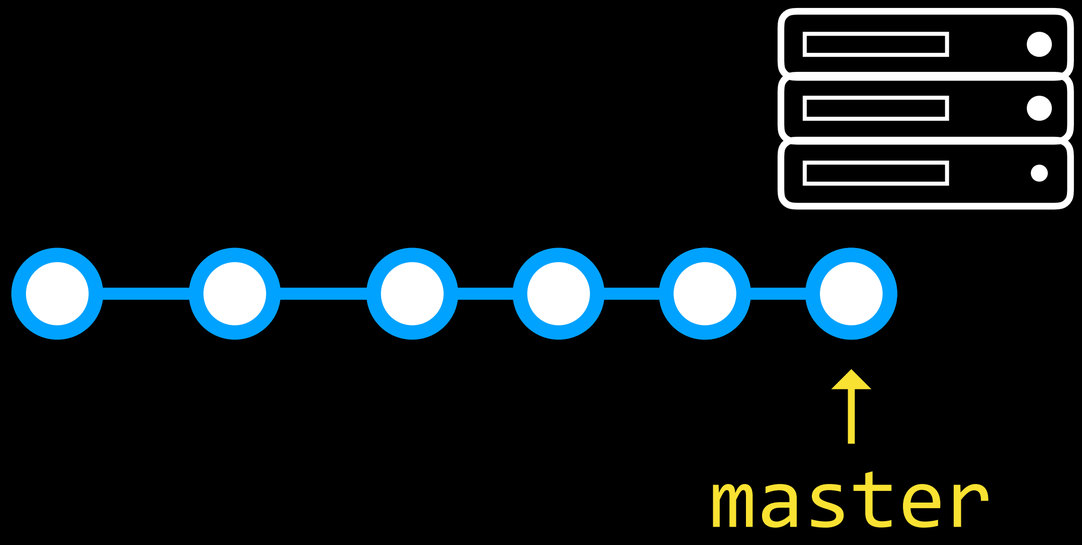
Remotes

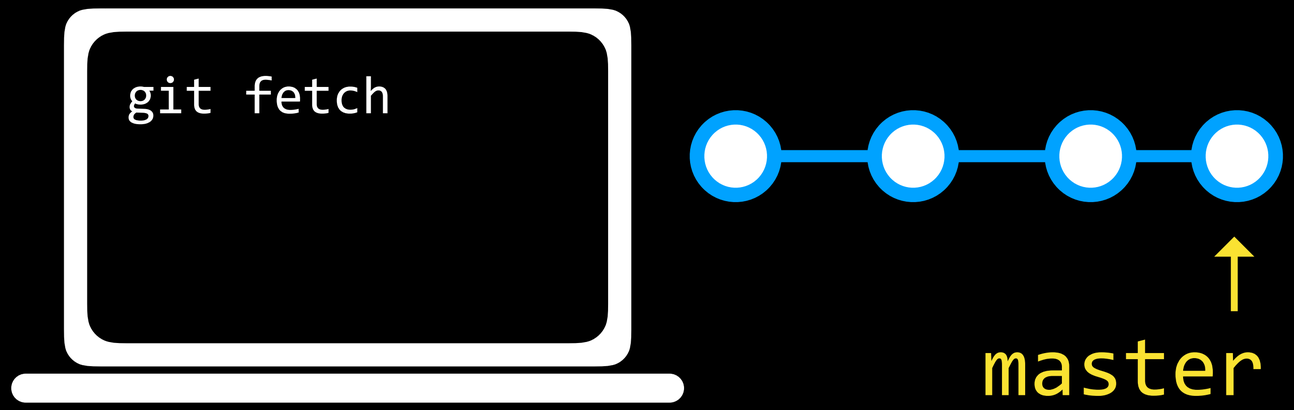
Remotes



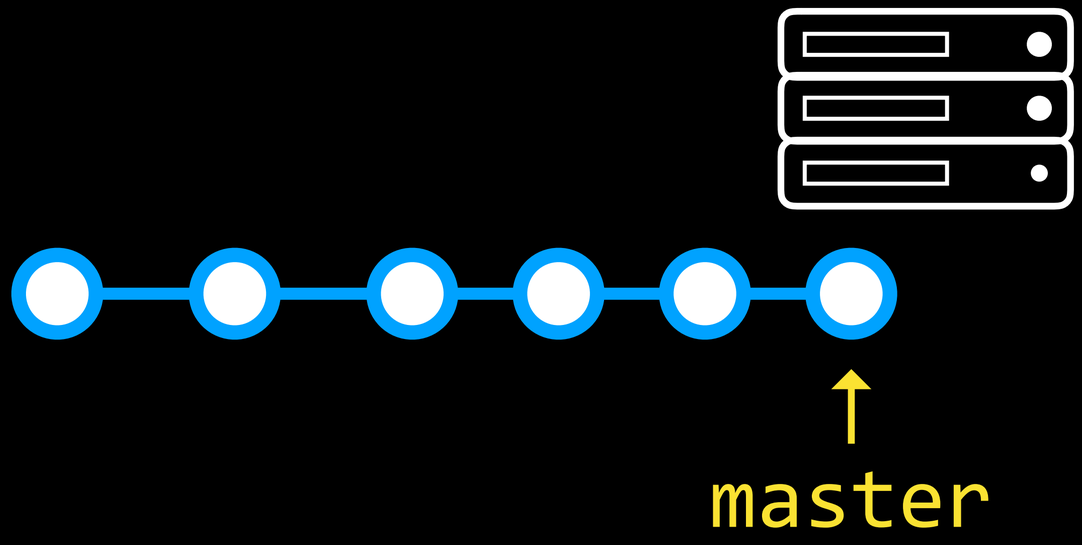


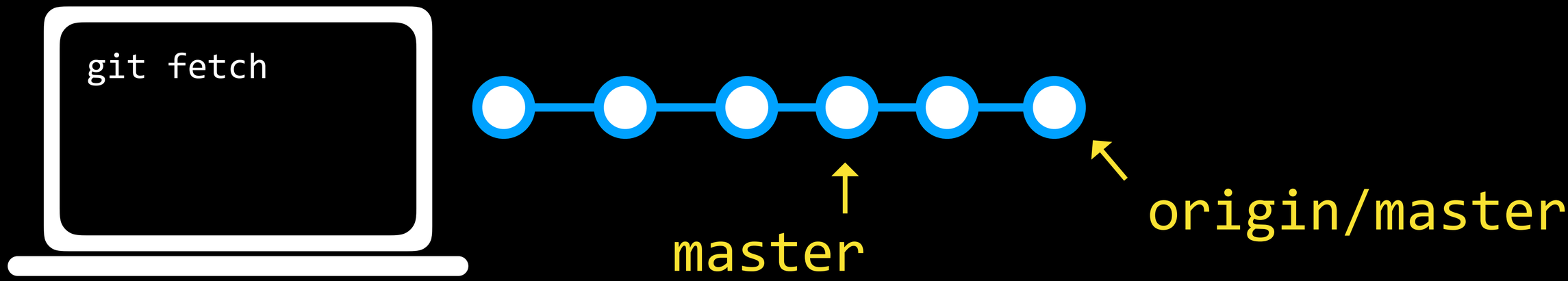
Remotes



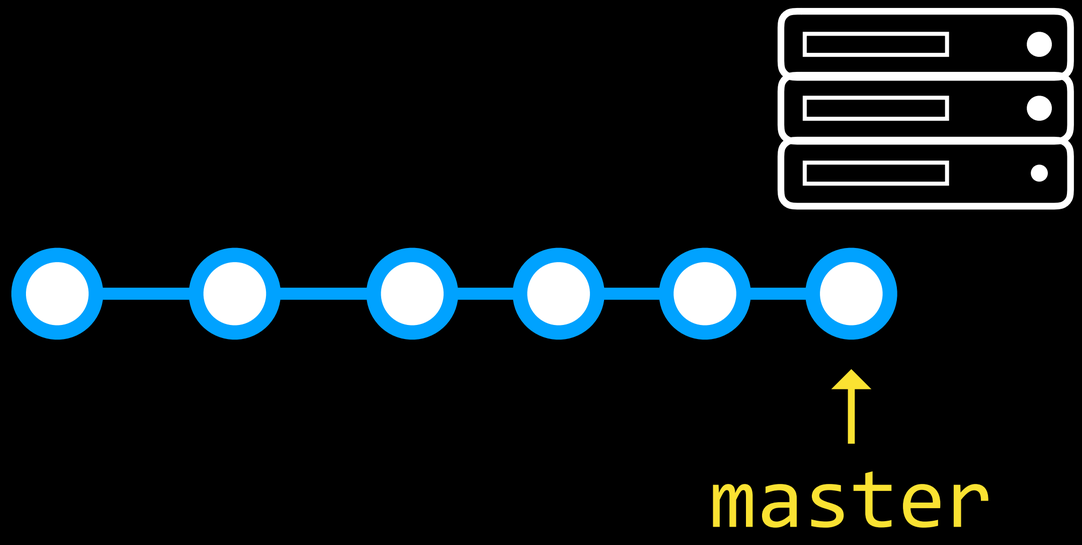


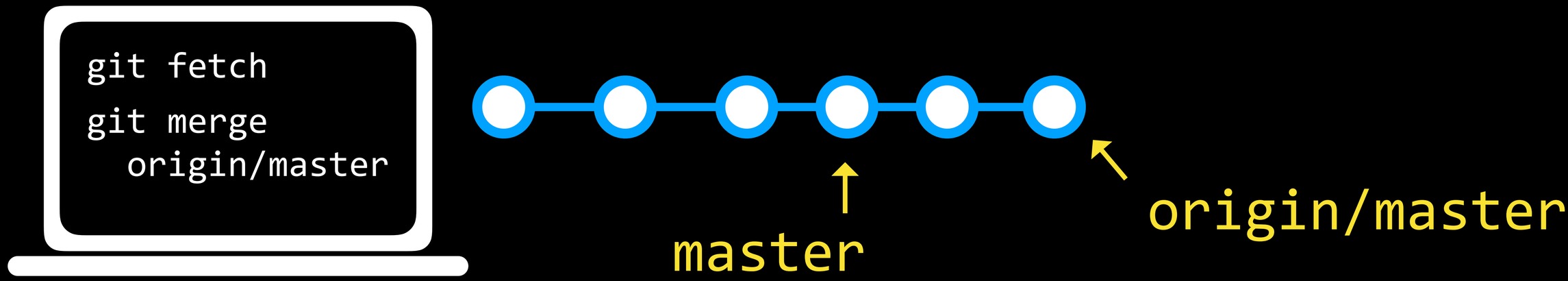
Remotes



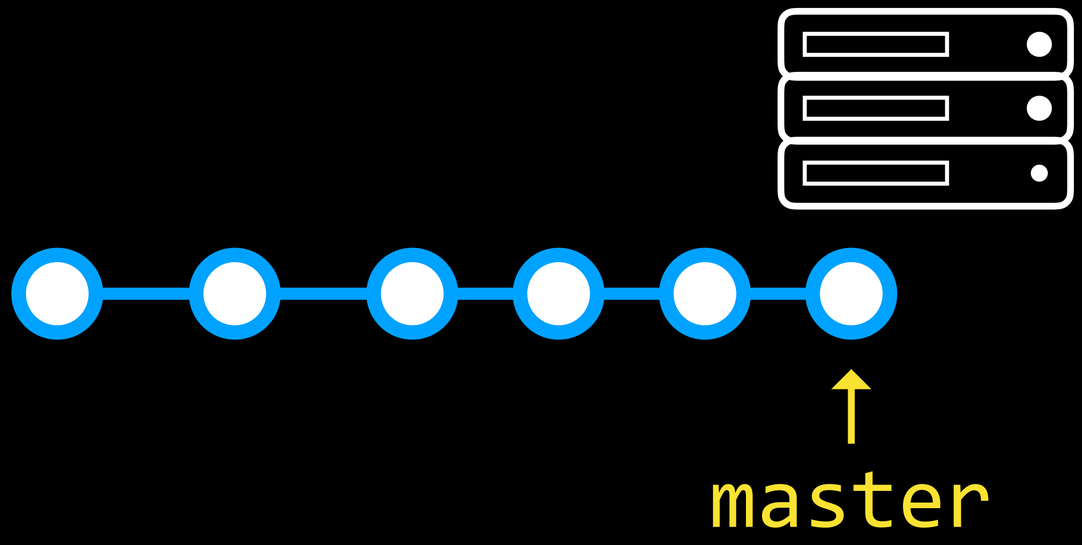


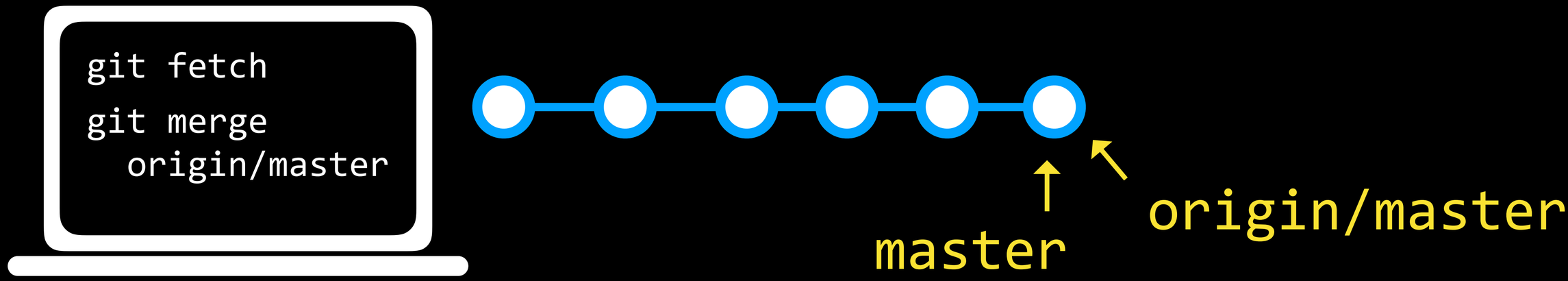
Remotes


master

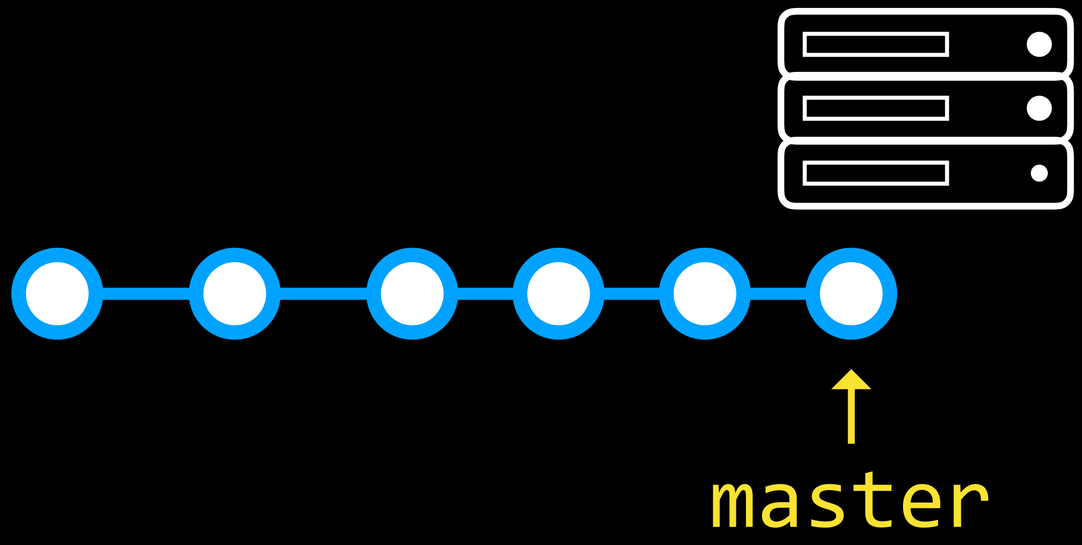

git fetch
git merge
origin/master
master
origin/master

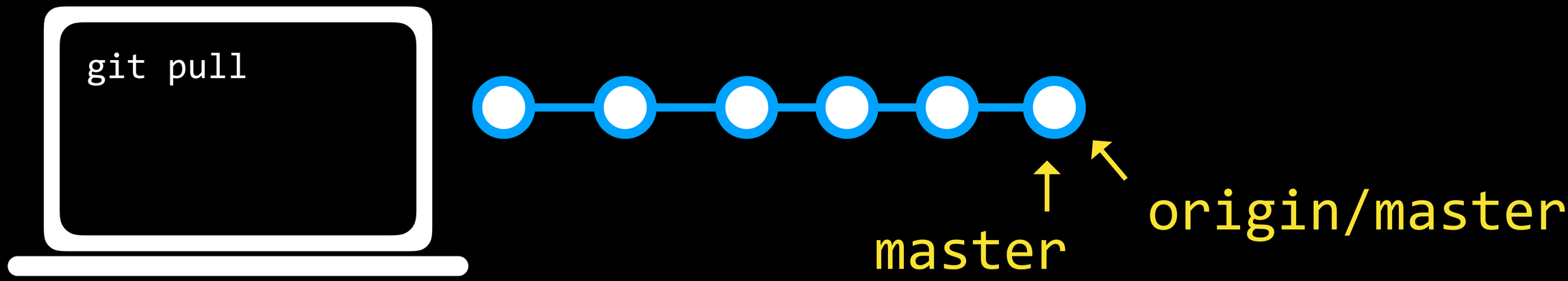
Remotes


master


git fetch
git merge
origin/master
master
origin/master

Remotes





GitHub

- Issues
- Forks
- Pull Requests

Sass

Sass Features

- Variables
- Nesting
- Inheritance
- ...

Variables

CSS

```
color: blue;
```

Sass

```
$foo: blue;

color: $foo;
```

Nesting

CSS

```
div {
  font-size: 18px;
}
div p {
  color: blue;
}
div ul {
  color: green;
}
```

Sass

```
div {
  font-size: 18px;
  p {
    color: blue;
  }
  ul {
    color: green;
  }
}
```

Afternoon Project

- Install Sass and add it to your HTML page(s).
- Push your HTML page(s) to GitHub.
- Find a partner, add each other as collaborators. Clone each others' repos. Make a change, and push it to a different branch. Make a pull request!

CS50 Beyond