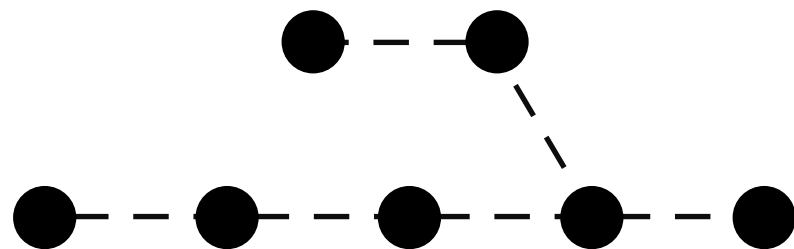# Git workshop

What is git ? (for a biologist)

a versioning system =
a set of tools to track changes
    * in a directory...
    * or across computers...

a command-line tool (but has interfaces)
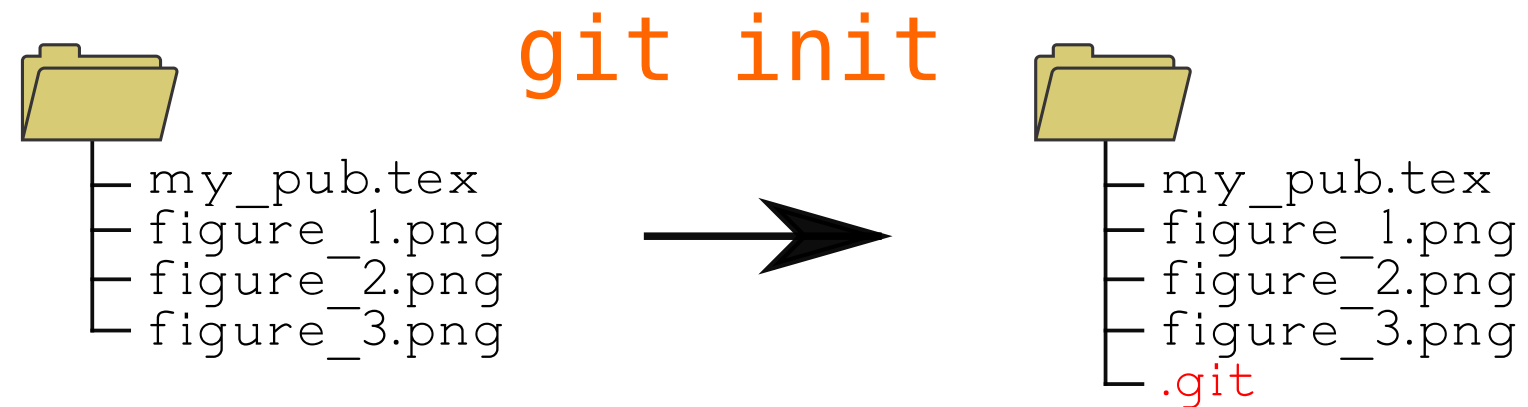
Why use git ?

to keep track of work on a project

to work with collaborators

git essentials
(you don't need to know everything !)

- a repository = a tracked folder

git init

```
└─ my_pub.tex
└─ figure_1.png
└─ figure_2.png
└─ figure_3.png
```

→

```
└─ my_pub.tex
└─ figure_1.png
└─ figure_2.png
└─ figure_3.png
└─ .git
```

- git status

git essentials

(you don't need to know everything !)

- a commit = a set of changes
    = a set of addition/deletion/modifs of files

git add ...

```
my_pub.tex
figure_1.png
figure_2.png
figure_3.png
.git
```

git add . (add all files in the current directory)

git add my_pub.tex figure_1.png figure_2.png figure_3.png (add specific files)
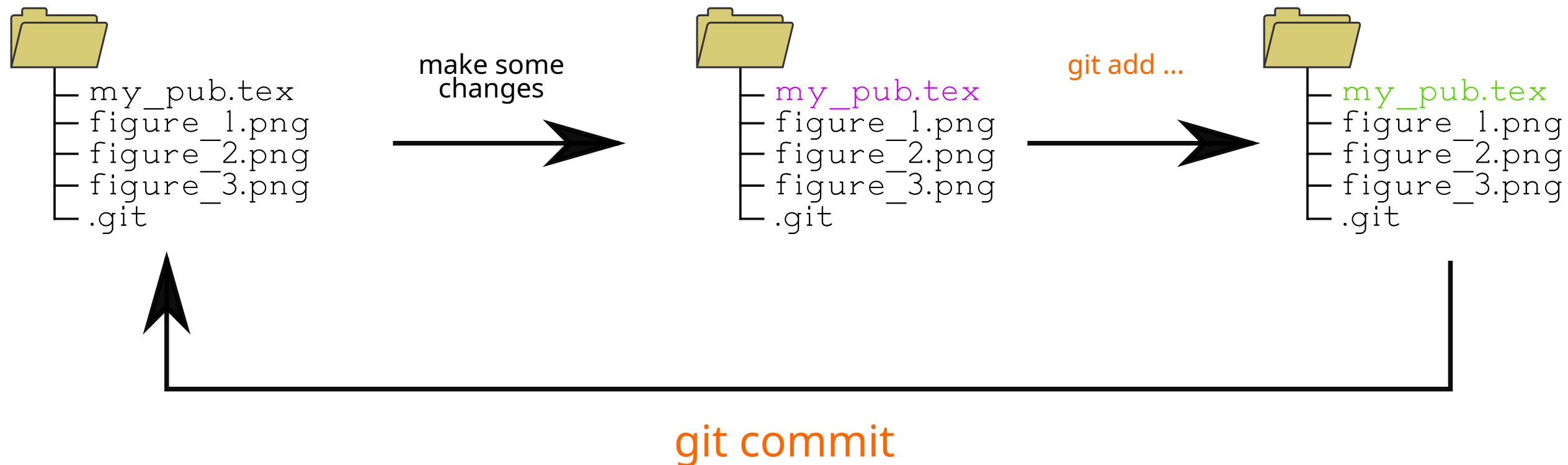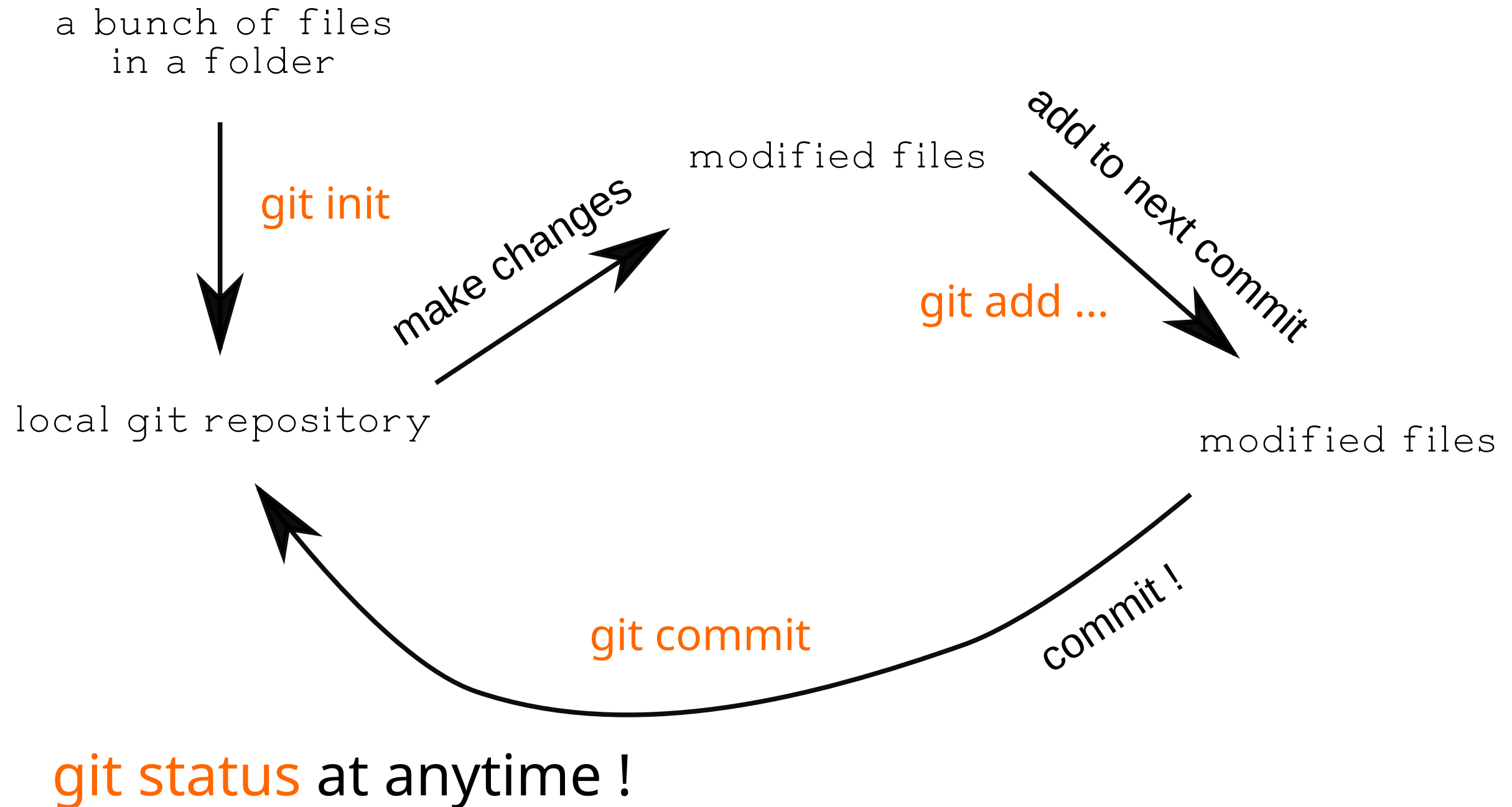
(then git status !)

(then git commit !)

git essentials

(you don't need to know everything !)

- a commit = a set of changes
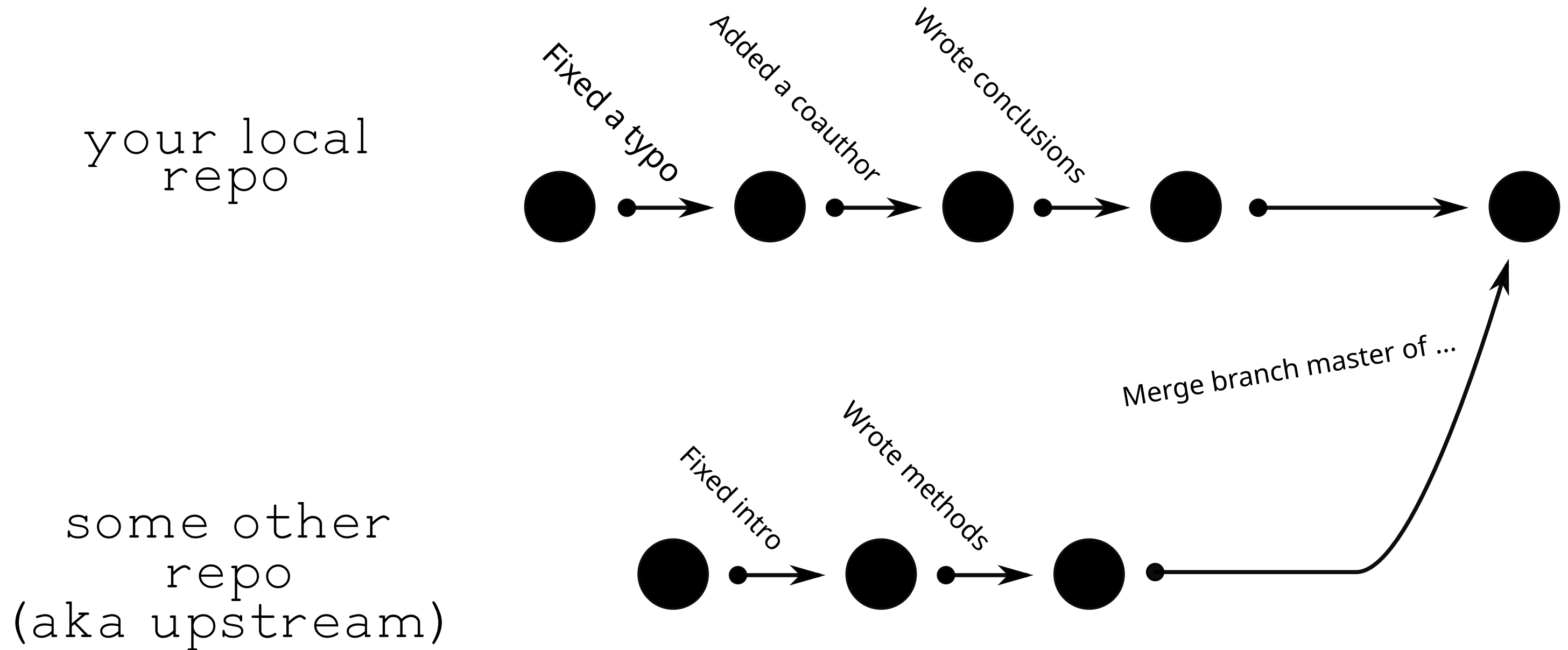 = a set of addition/deletion/modifs of files

my_pub.tex
figure_1.png
figure_2.png
figure_3.png
.git

make some
changes

my_pub.tex
figure_1.png
figure_2.png
figure_3.png
.git

git add ...

my_pub.tex
figure_1.png
figure_2.png
figure_3.png
.git

git commit

git status at anytime !

tracking changes locally

a bunch of files
in a folder

git init

modified files

add to next commit

make changes

git add ...

local git repository

modified files

git commit

commit !

git status at anytime !

tracking changes across repos

your local
repo

Fixed a typo

Added a coauthor

Wrote conclusions

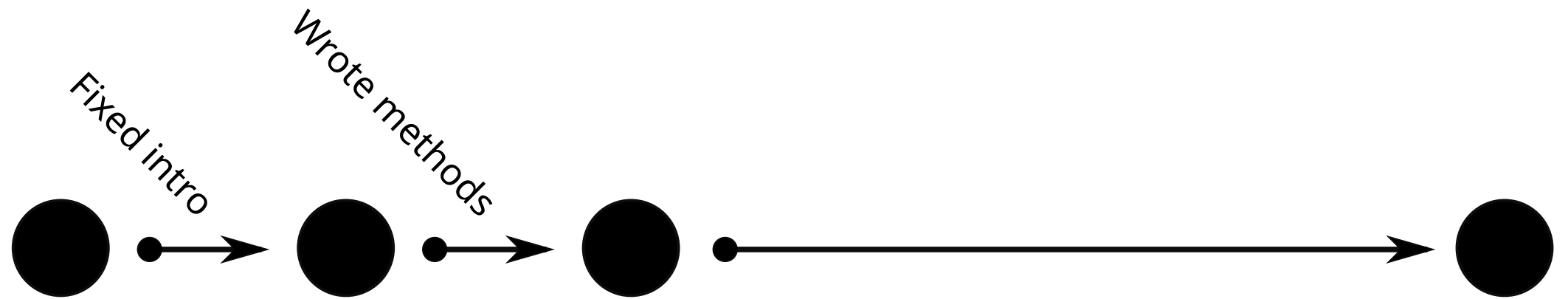Merge branch master of ...

some other
repo
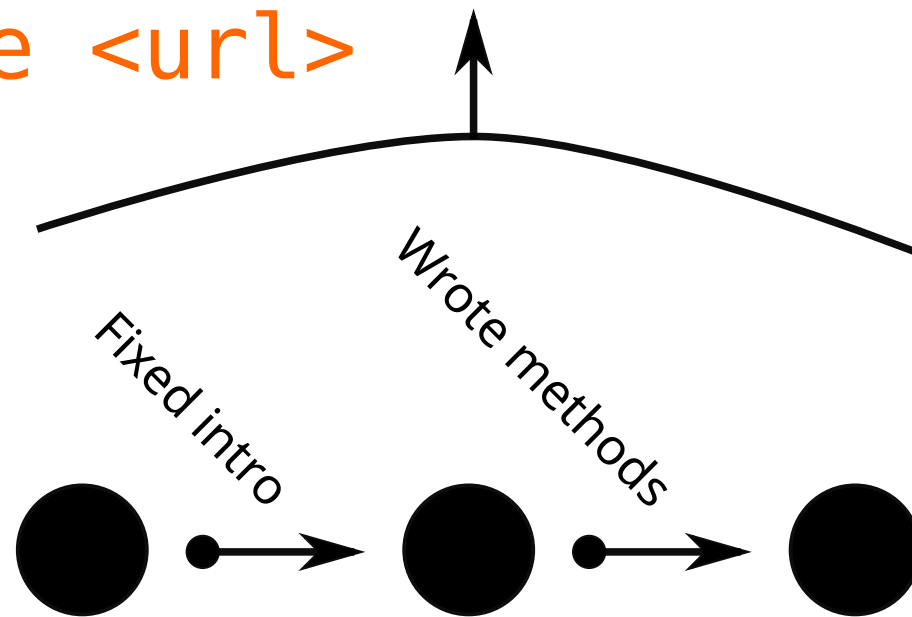(aka upstream)

Fixed intro

Wrote methods

tracking changes across repos

your local
repo

some other
repo
(aka upstream)

tracking changes across repos

your local repo

Fixed intro

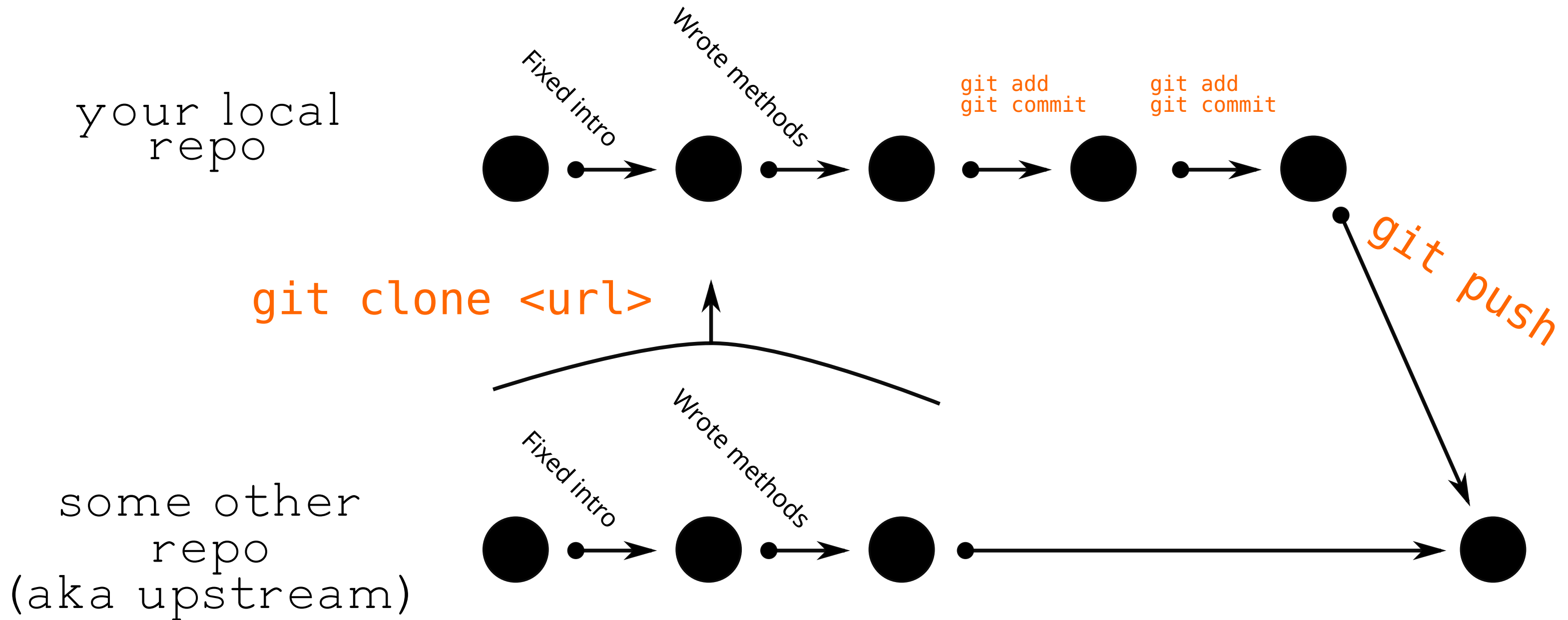Wrote methods
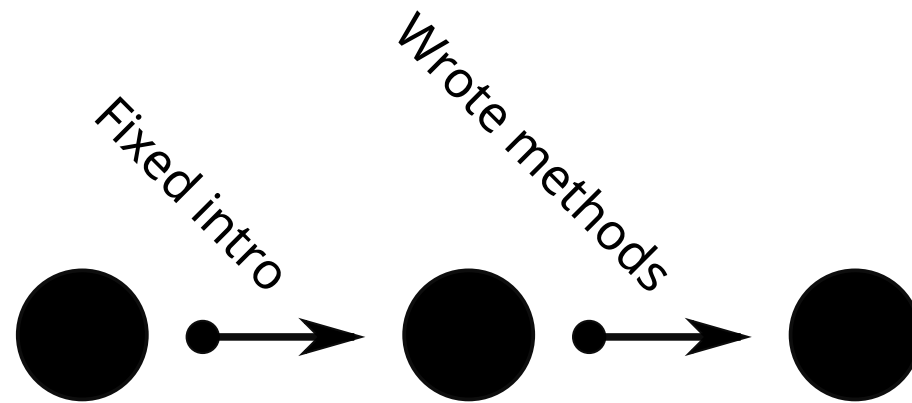
git clone <url>

some other repo
(aka upstream)

Fixed intro

Wrote methods

tracking changes across repos

your local repo

Fixed intro

Wrote methods

git add
git commit

git add
git commit

git clone <url>

git push

some other repo
(aka upstream)

Fixed intro

Wrote methods

tracking changes across repos

your local repo

Fixed intro

Wrote methods

git add
git commit

git add
git commit

```
> git push
To https://git.overleaf.com/15553729tjgtktzgtfwd
 ! [rejected]        master -> master (fetch first)
error: failed to push some refs to 'https://git.overleaf.com/15553729tjgtktzgtfwd'
hint: Updates were rejected because the remote contains work that you do
hint: not have locally. This is usually caused by another repository pushing
hint: to the same ref. You may want to first integrate the remote changes
hint: (e.g., 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
```

git push

some other repo
(aka upstream)

Fixed intro

Wrote methods

tracking changes across repos

your local
repo

Fixed intro

Wrote methods

git add
git commit

git add
git commit

git pull

git push

some other
repo
(aka upstream)

Fixed intro

Wrote methods

tracking changes across repos

your local repo

Fixed intro   Wrote methods   git add   git add
                              git commit   git commit

git pull   git push

some other repo
(aka upstream)

Fixed intro   Wrote methods

tracking changes across repos

your local repo

Fixed intro   Wrote methods   git add git commit   git add git commit

From https://git.overleaf.com/15553729tjgtktzgtfwd
   caefe81..599757b master   -> origin/master
Auto-merging main.tex
CONFLICT (content): Merge conflict in main.tex
Automatic merge failed; fix conflicts and then commit the result.

git pull

some other repo (aka upstream)

Fixed intro   Wrote methods
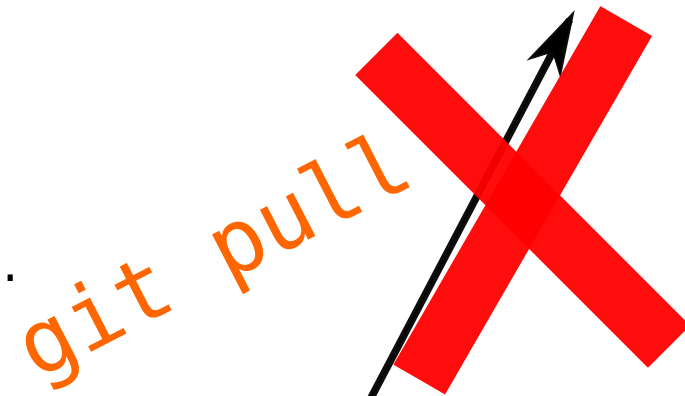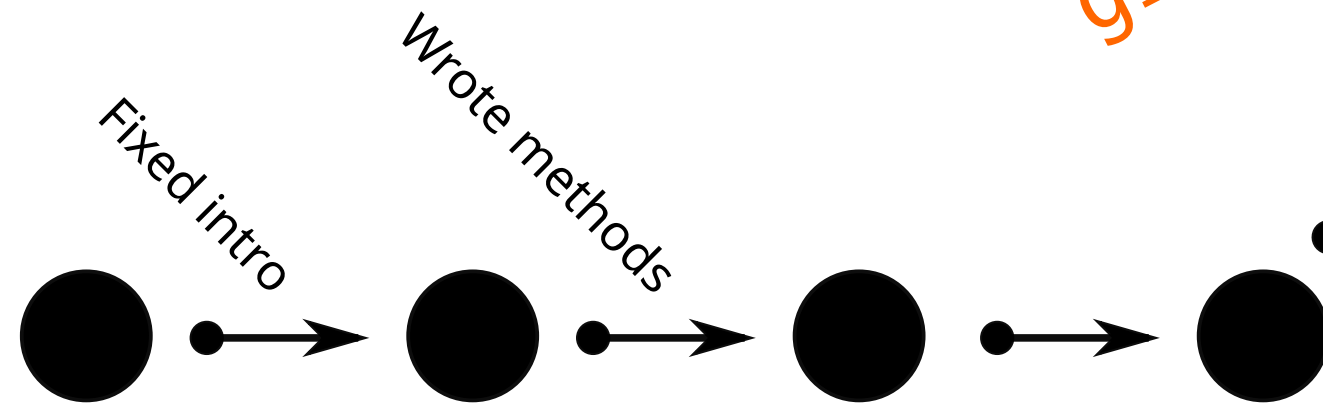
tracking changes across repos

```
[...]
<<<<<<< HEAD
% Add the actual text below
=======
% Add the actual text below (use your imagination)
>>>>>>> 599757bbe3dd97df3ee210c8da56322cc531f119
[...]
```
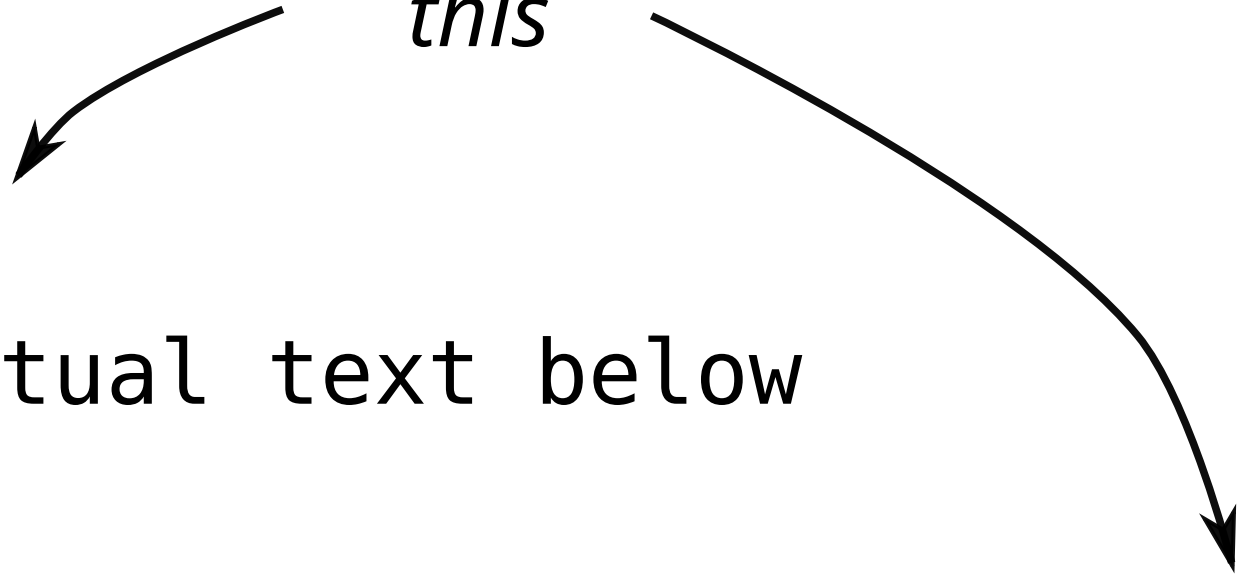
What you have
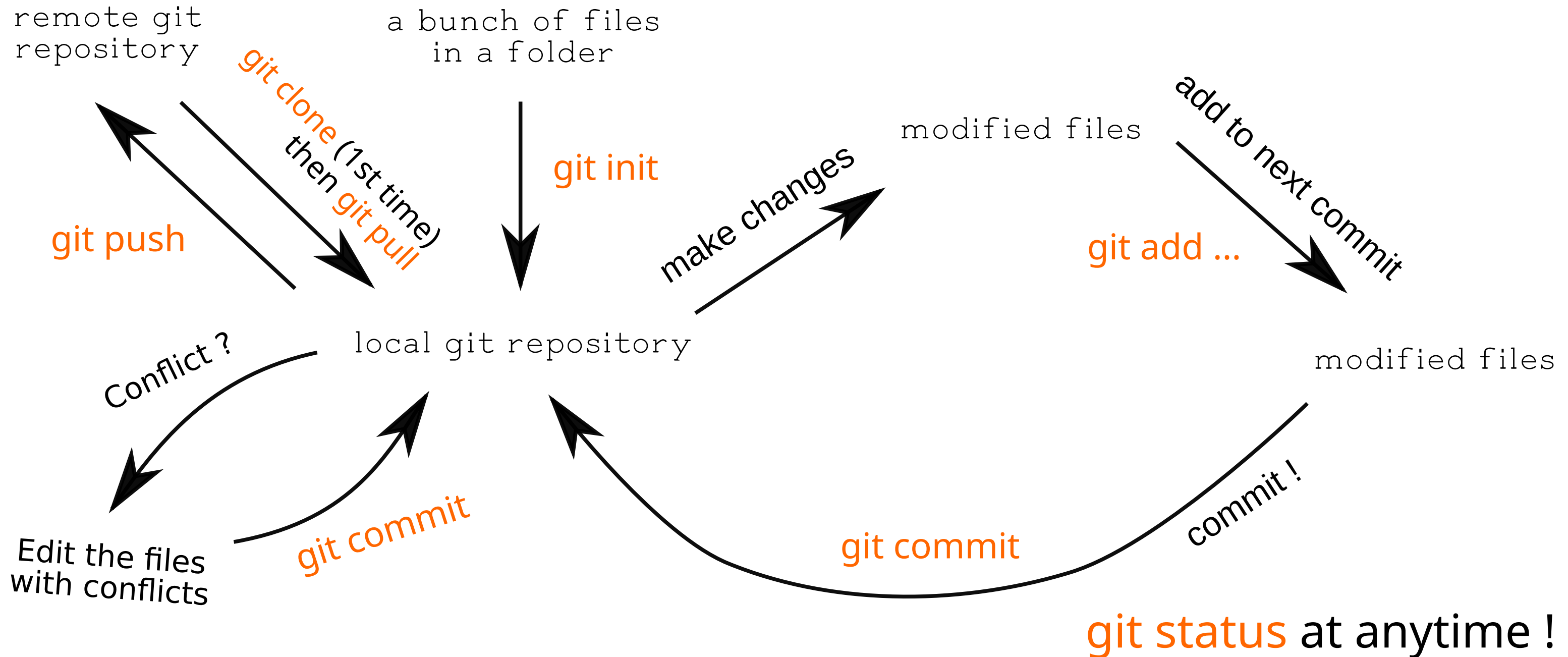
What they have

tracking changes across repos

remove this

[...]

<<<<<<< HEAD

% Add the actual text below

=======

% Add the actual text below (use your imagination)
>>>>>>> 599757bbe3dd97df3ee210c8da56322cc531f119

[...]

then `git commit`!

tracking changes everywhere

remote git
repository

a bunch of files
in a folder

git clone (1st time)
then *git pull*

git init

make changes

modified files

add to next commit

git push

git add ...

local git repository

modified files

Conflict ?

git commit

git commit

commit !

Edit the files
with conflicts

git status at anytime !

Graphical interfaces

git instaweb (view only, all)

Rstudio (all)

gitg (linux)

github client (all ?)

...