# Git

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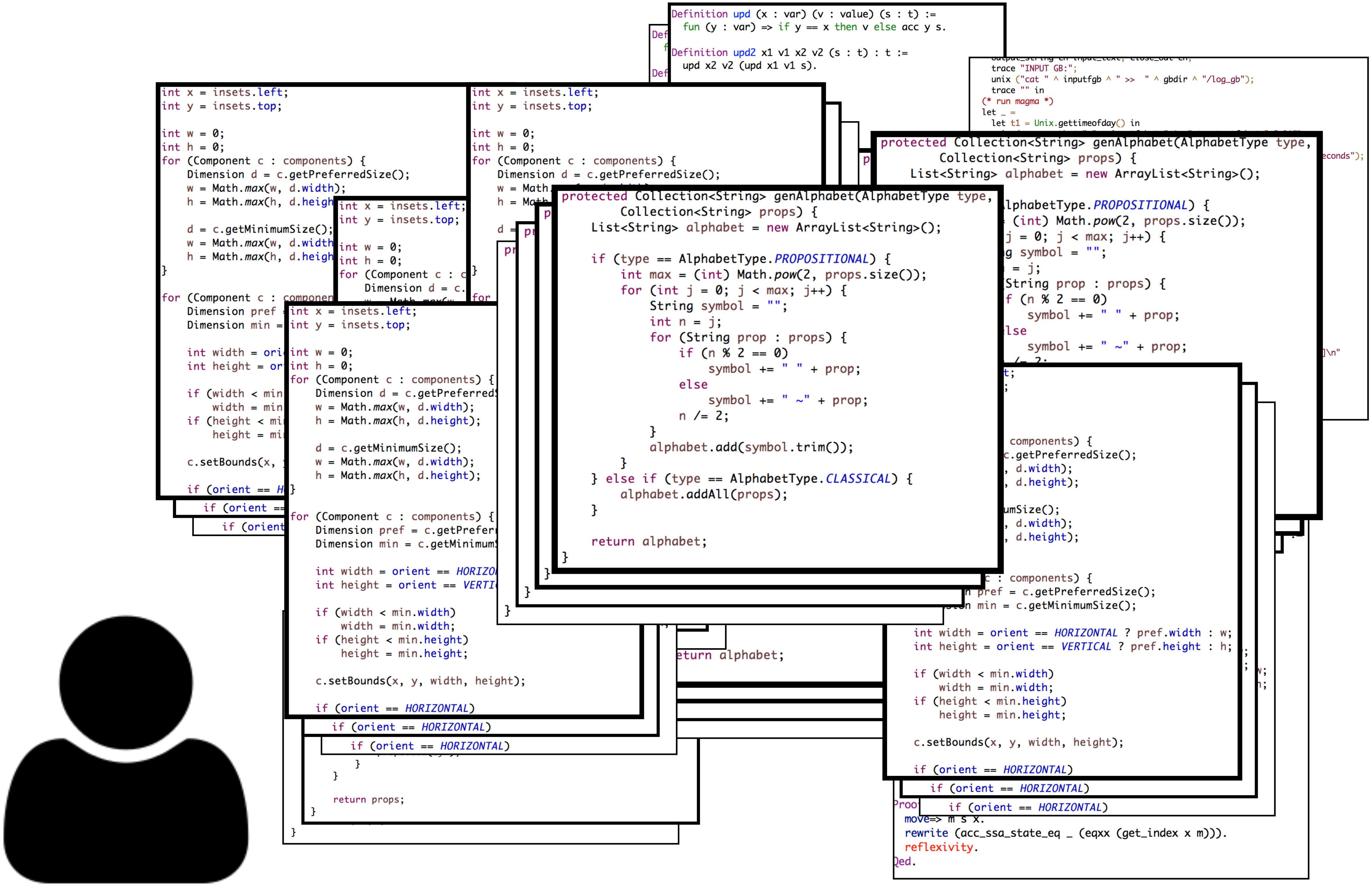
NARLabs

SDM 2022

# Productivity Tools for Developers

- Editors
- Debuggers
- Build automation tools
- Integrated development environment
- Modeling tools
- Source code analyzers / testing tools
- Version control tools ⟸ ***git***

# File Changes



```
Definition upd (x : var) (v : value) (s : t) :=
  fun (y : var) => if y == x then v else acc y s.

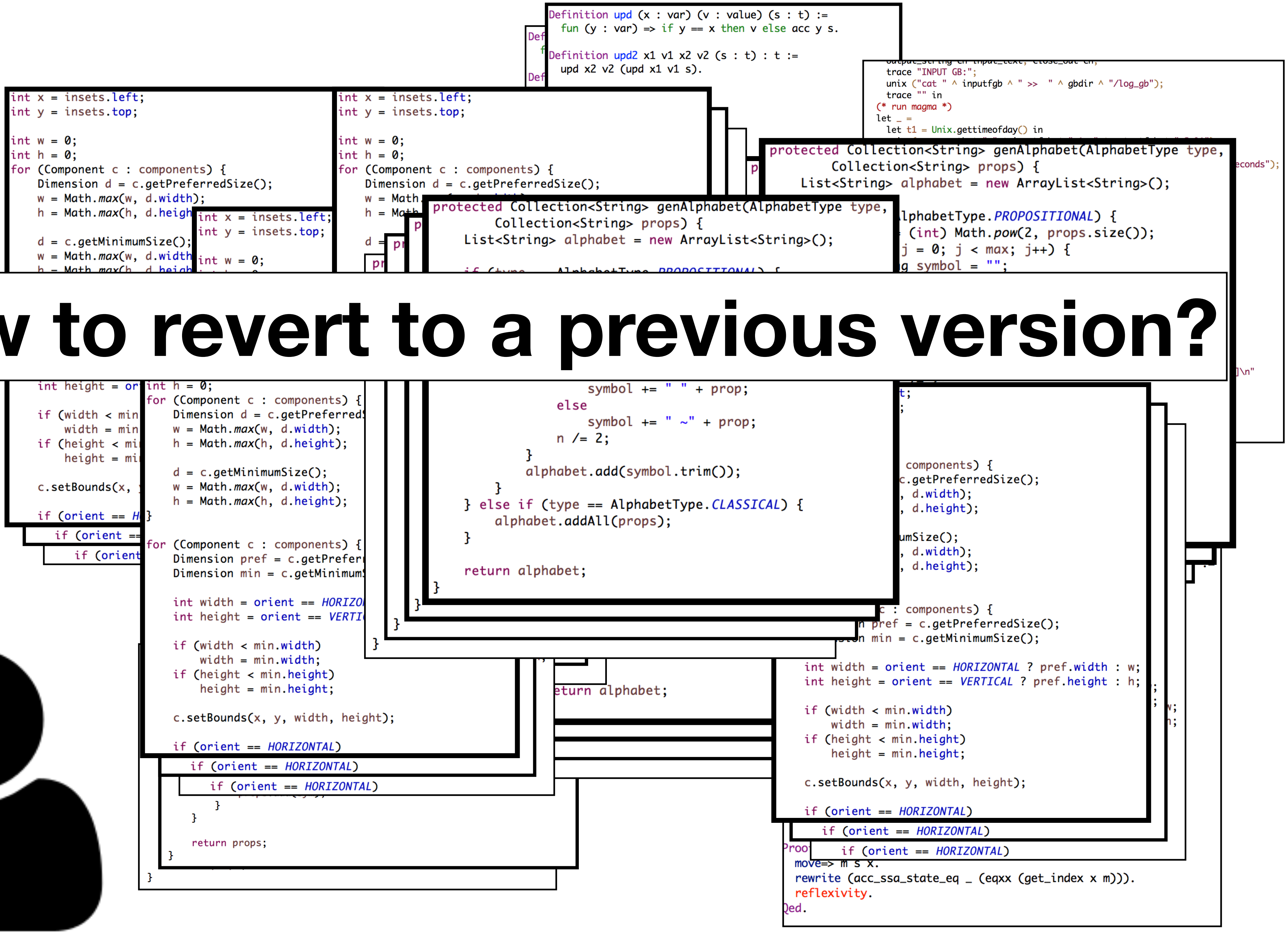
Definition upd2 x1 v1 x2 v2 (s : t) : t :=
  upd x2 v2 (upd x1 v1 s).
```

```
protected Collection<String> genAlphabet(AlphabetType type,
        Collection<String> props) {
    List<String> alphabet = new ArrayList<String>();

    if (type == AlphabetType.PROPOSITIONAL) {
        int max = (int) Math.pow(2, props.size());
        for (int j = 0; j < max; j++) {
            String symbol = "";
            int n = j;
            for (String prop : props) {
                if (n % 2 == 0)
                    symbol += " " + prop;
                else
                    symbol += " ~" + prop;
                n /= 2;
            }
            alphabet.add(symbol.trim());
        }
    } else if (type == AlphabetType.CLASSICAL) {
        alphabet.addAll(props);
    }

    return alphabet;
}
```

# File Changes



```
Definition upd (x : var) (v : value) (s : t) :=
  fun (y : var) => if y == x then v else acc y s.

Definition upd2 x1 v1 x2 v2 (s : t) : t :=
  upd x2 v2 (upd x1 v1 s).
```

```
int x = insets.left;
int y = insets.top;

int w = 0;
int h = 0;
for (Component c : components) {
    Dimension d = c.getPreferredSize();
    w = Math.max(w, d.width);
```

```
protected Collection<String> genAlphabet(AlphabetType type,
        Collection<String> props) {
    List<String> alphabet = new ArrayList<String>();
```

```
                symbol += " " + prop;
            else
                symbol += " ~" + prop;
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        }
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}

return alphabet;
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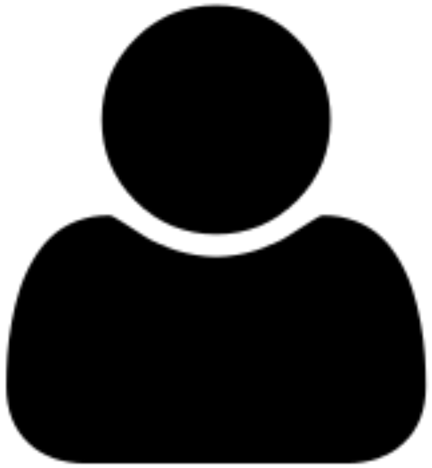
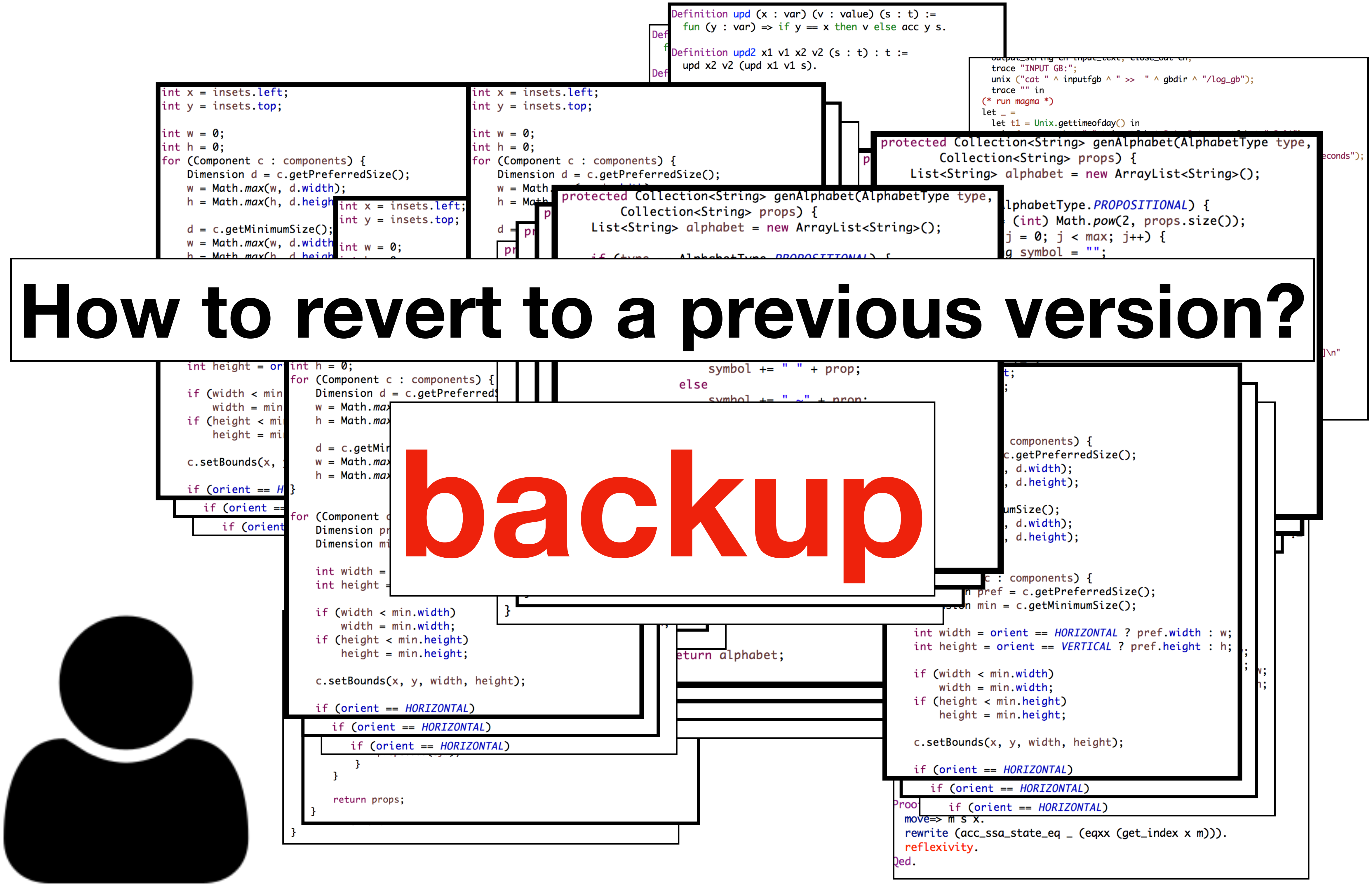
```

## How to revert to a previous version?



# File Changes



How to revert to a previous version?

backup

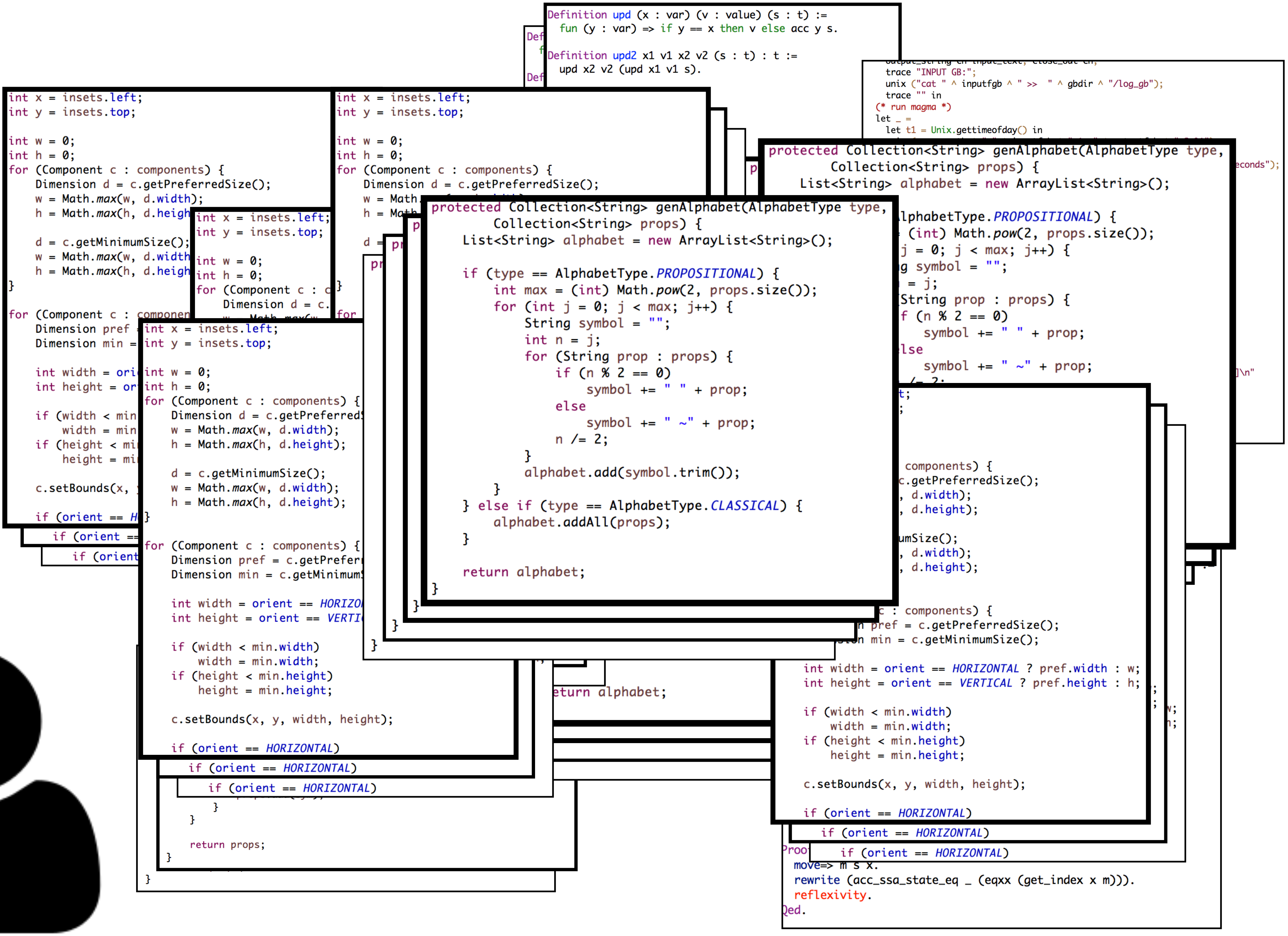
# Project Backup

2017/08/01

2017/08/05

2017/08/13

2017/08/27



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        for (int j = 0; j < max; j++) {
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            int n = j;
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                if (n % 2 == 0)
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                else
                    symbol += " ~" + prop;
                n /= 2;
            }
            alphabet.add(symbol.trim());
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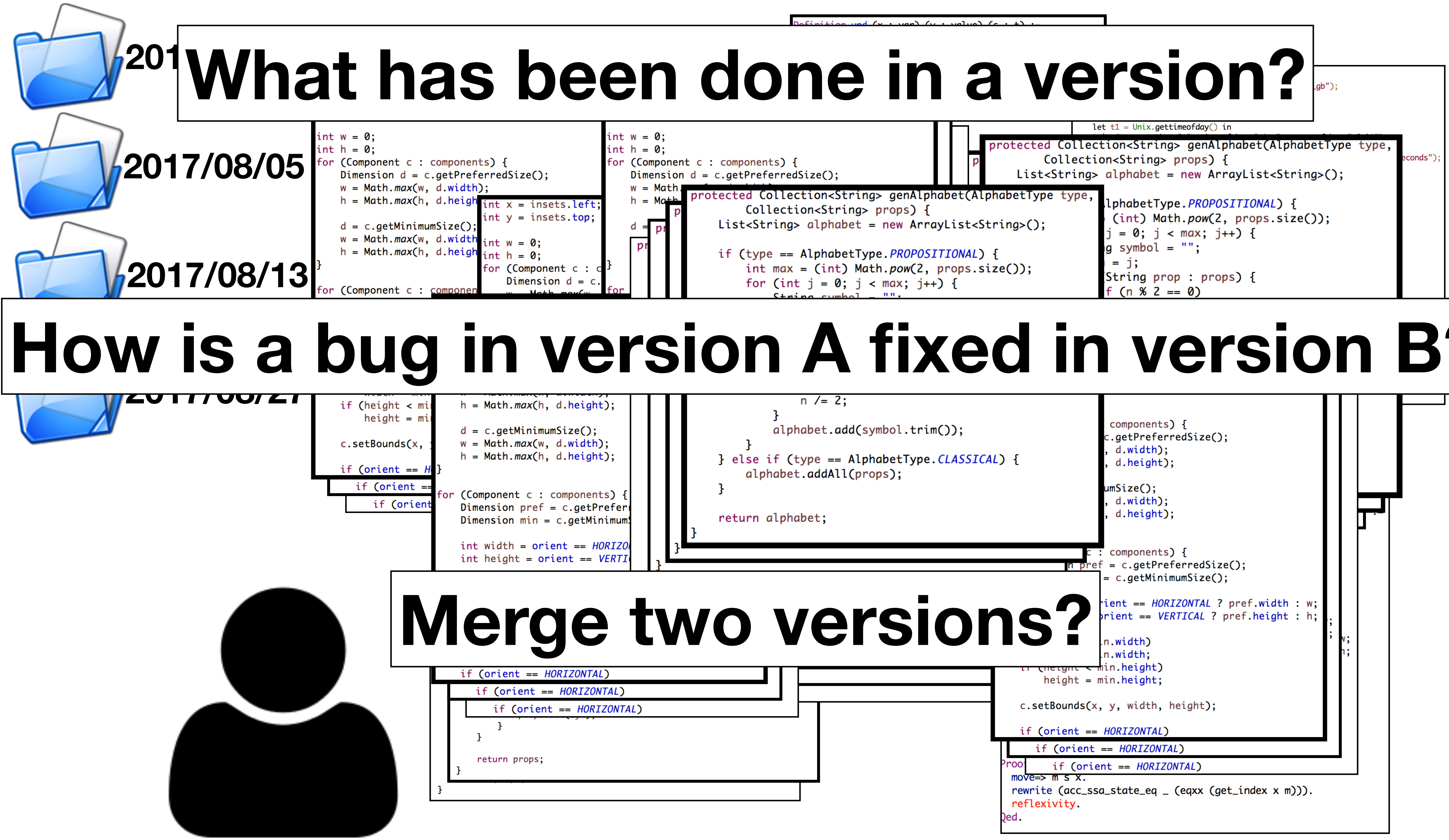
    } else if (type == AlphabetType.CLASSICAL) {
        alphabet.addAll(props);
    }

    return alphabet;
}
```

# Project Backup



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                n /= 2;
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            alphabet.add(symbol.trim());
        }
    } else if (type == AlphabetType.CLASSICAL) {
        alphabet.addAll(props);
    }

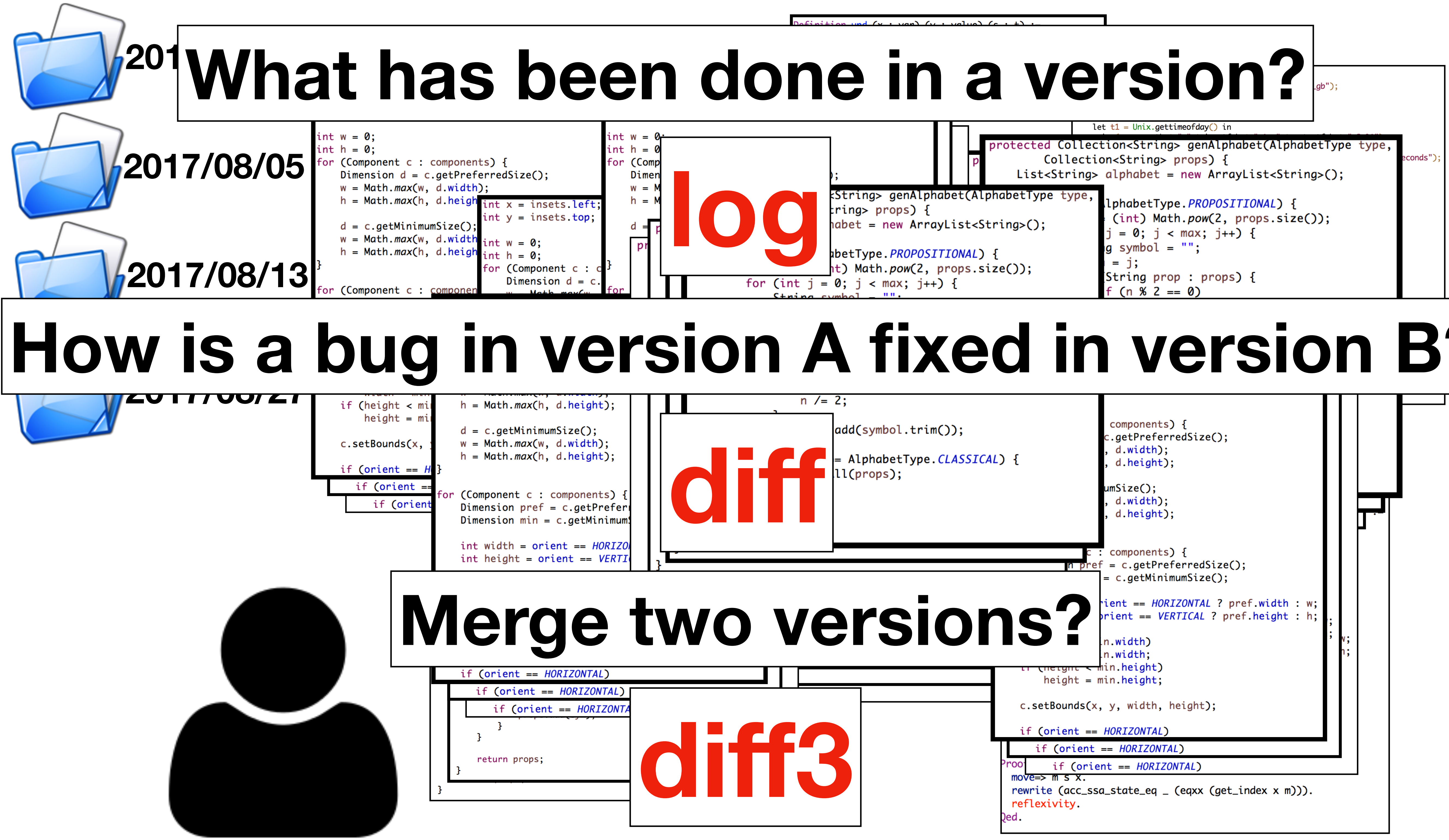
    return alphabet;
}
```

**What has been done in a version?**

**How is a bug in version A fixed in version B?**

**Merge two versions?**

# Project Backup


2017/08/05
2017/08/13

What has been done in a version?

log

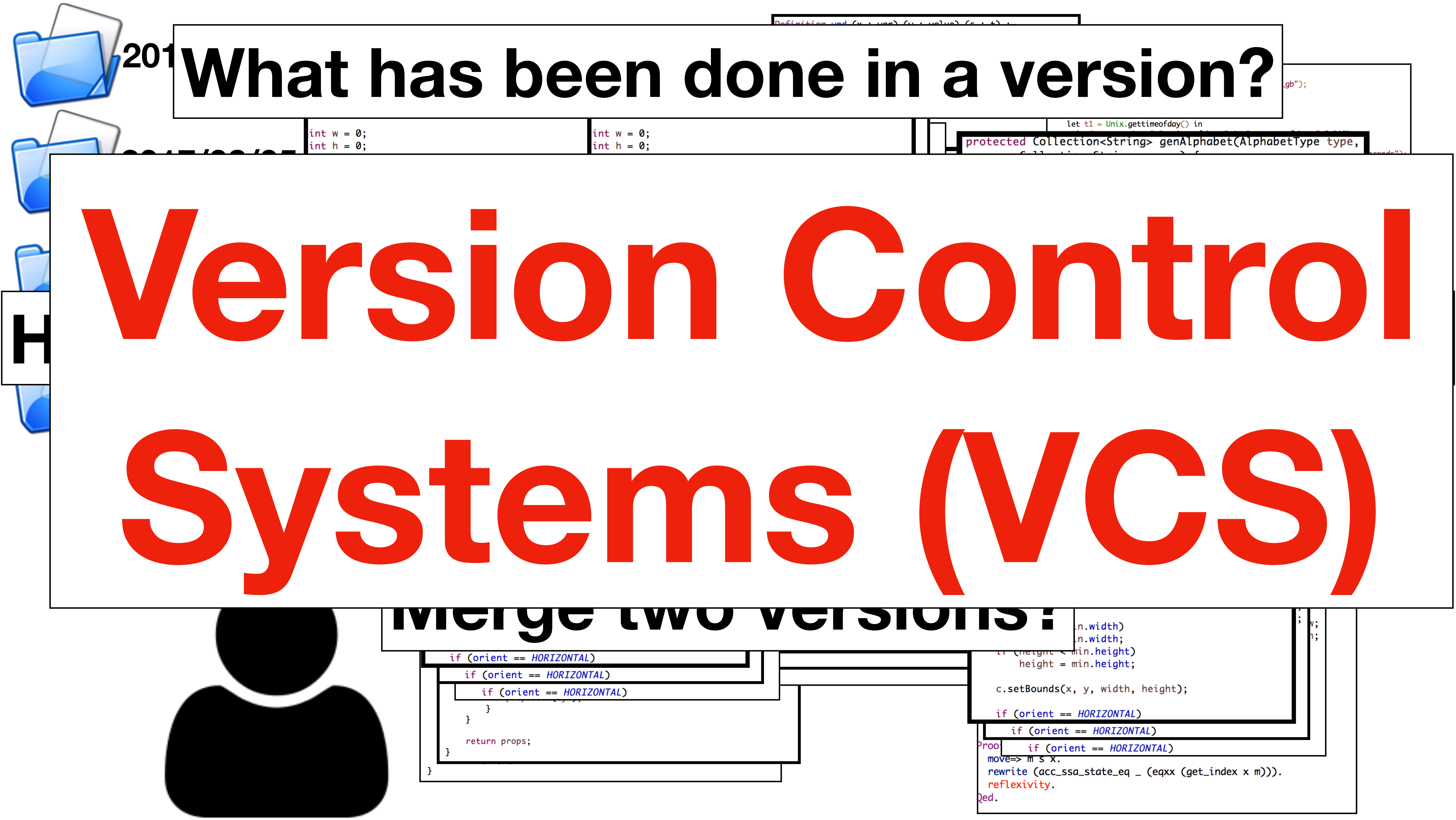
How is a bug in version A fixed in version B?

diff

Merge two versions?

diff3

# Project Backup


201
2017/03/05
H
int w = 0;
int h = 0;
let t1 = Unix.gettimeofday() in
protected Collection<String> genAlphabet(AlphabetType type,
if (orient == HORIZONTAL)
return props;
n.width)
n.width;
height = min.height;
c.setBounds(x, y, width, height);
move=> m s x.
rewrite (acc_ssa_state_eq _ (eqxx (get_index x m))).
reflexivity.
Qed.

**What has been done in a version?**

**Version Control Systems (VCS)**

**Merge two versions?**

# Version Control System

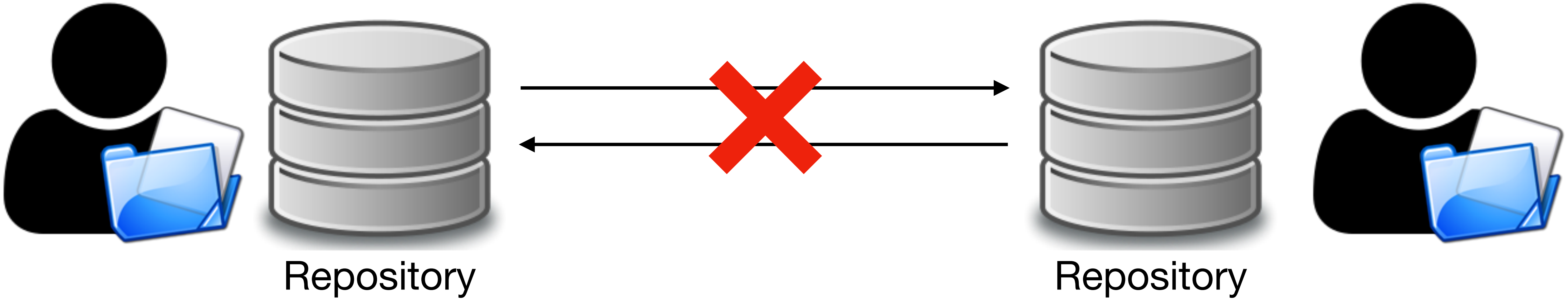
- The developer needs a system that can
  - store files in different versions with log messages,
  - compare files between different versions,
  - restore files from specific versions,
  - …

- All versions are stored in a ***repository***

- A version is checked out to a ***working area*** for editing

# Local Version Control

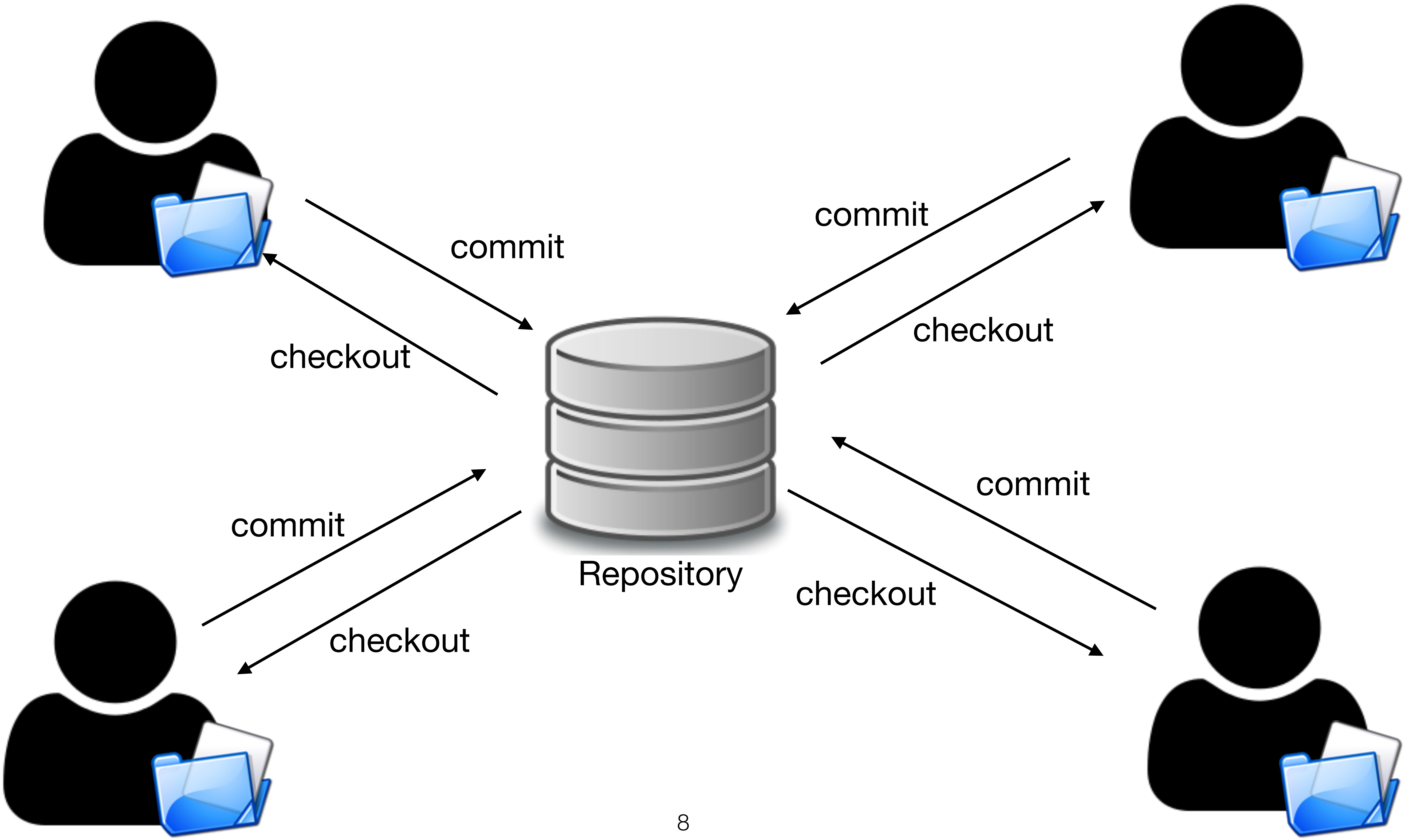
- SCCS (Source Code Control System, 1972)
- RCS (Revision Control System, 1982)


Repository
Repository

# Centralized Version Control

- CVS (Concurrent Versions System, 1990)
- SVN (Subversion, 2000)
- ClearCase
- Visual SourceSafe

# Multiple Developers



commit

checkout

commit

checkout

Repository

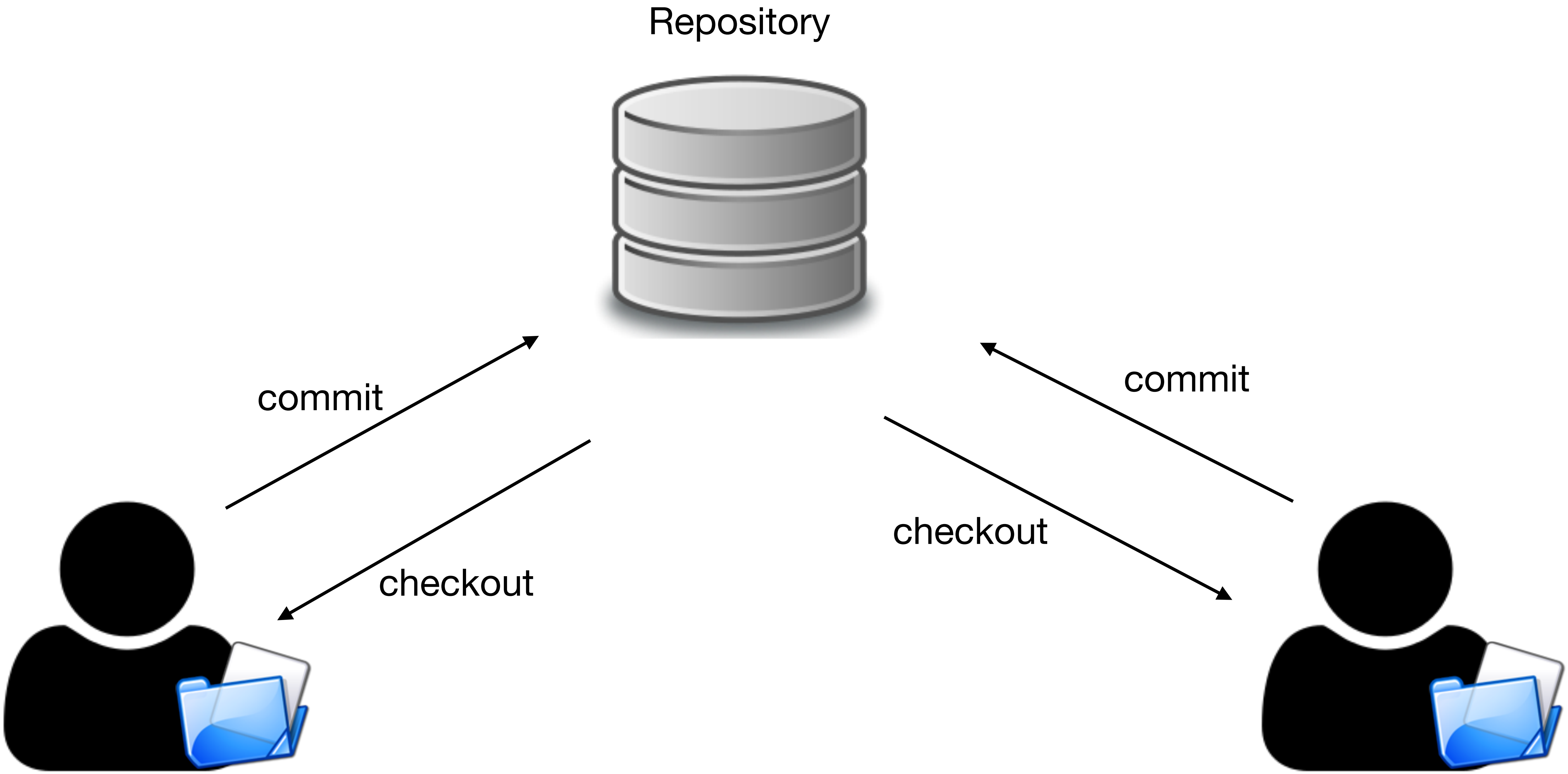
commit

checkout

commit

checkout

# Problems



Repository

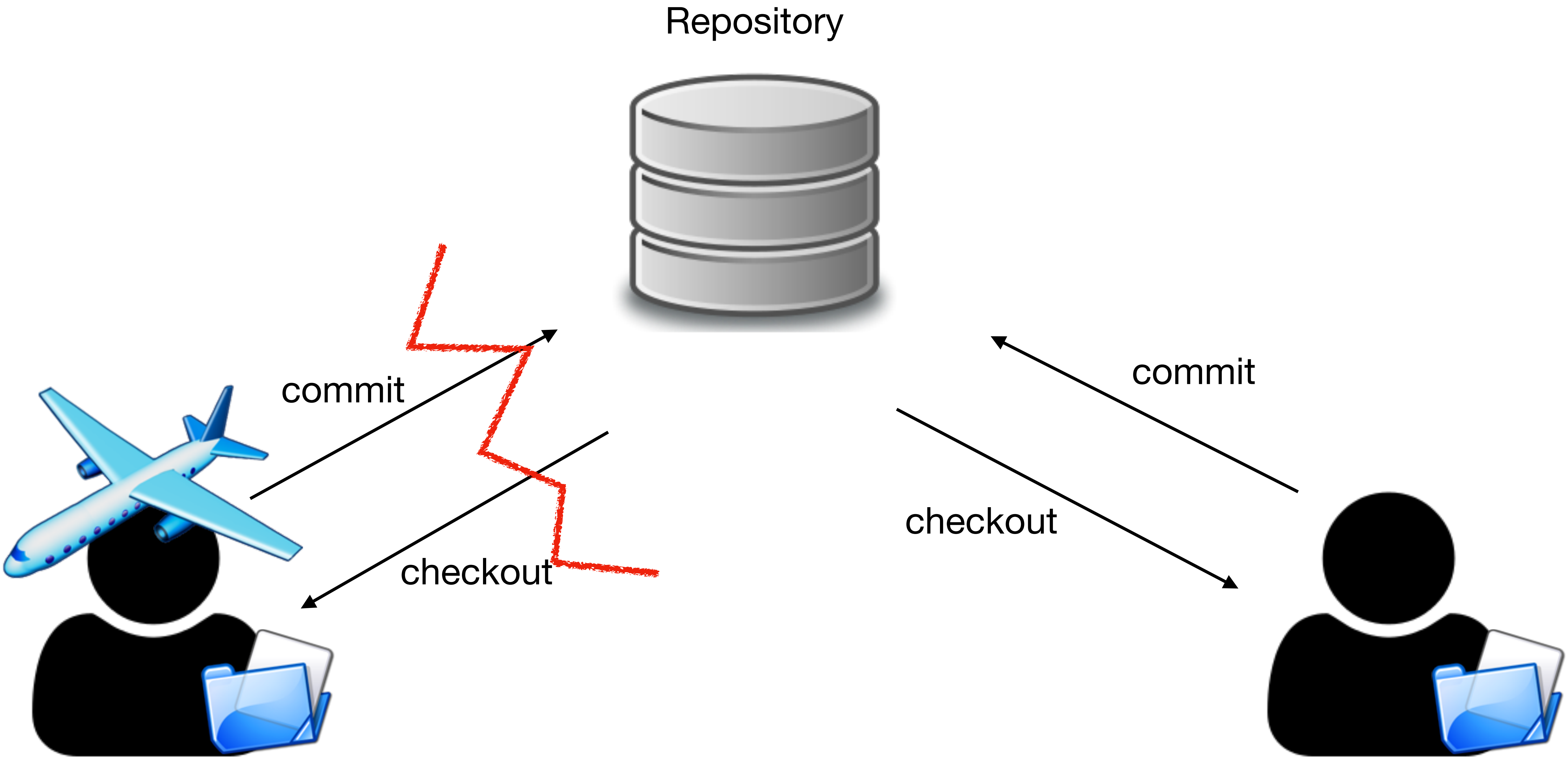
commit

checkout

commit

checkout

# Problems



Repository

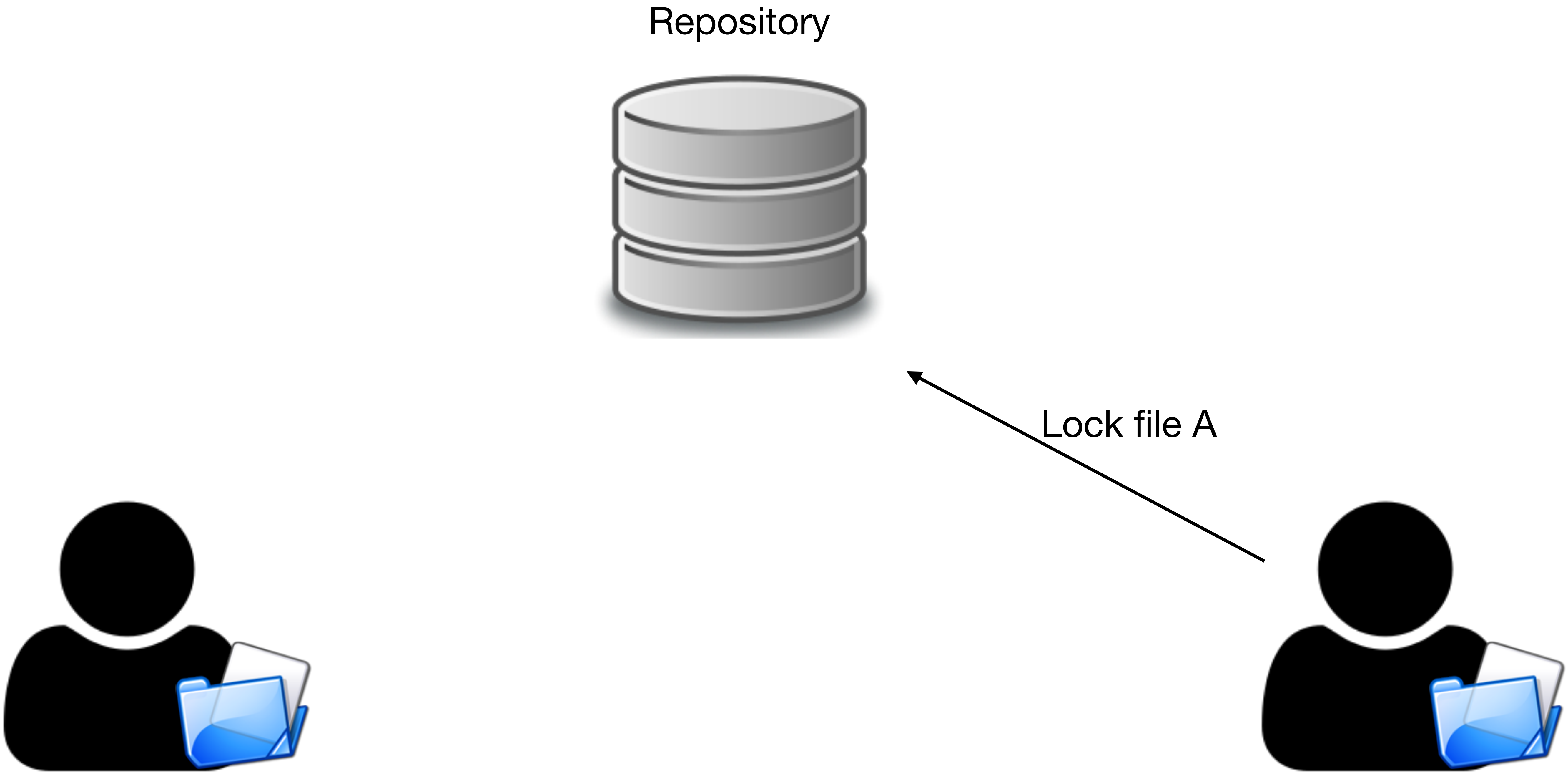
commit

checkout

commit

checkout

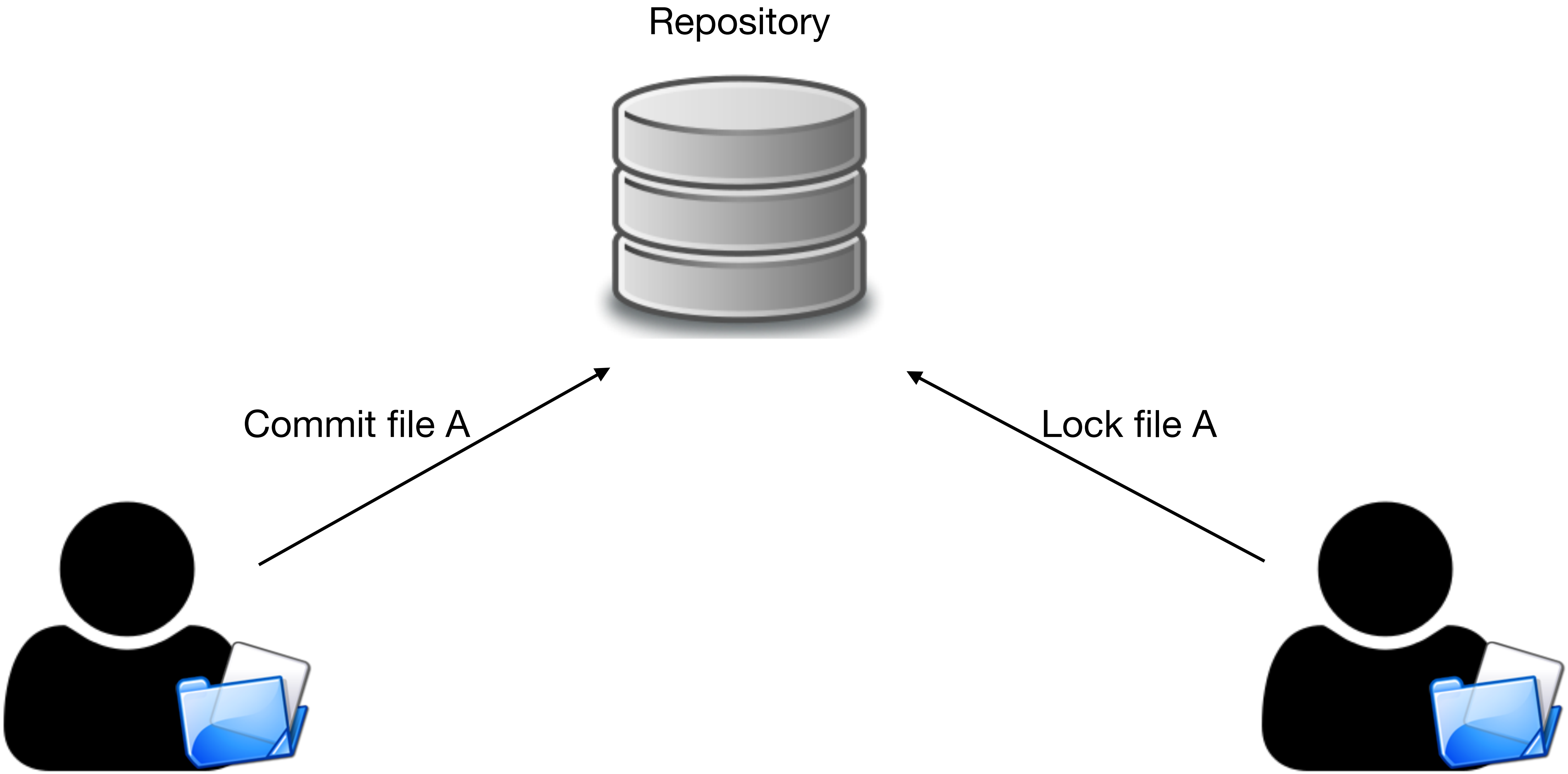
# Problems



Repository

Lock file A

# Problems

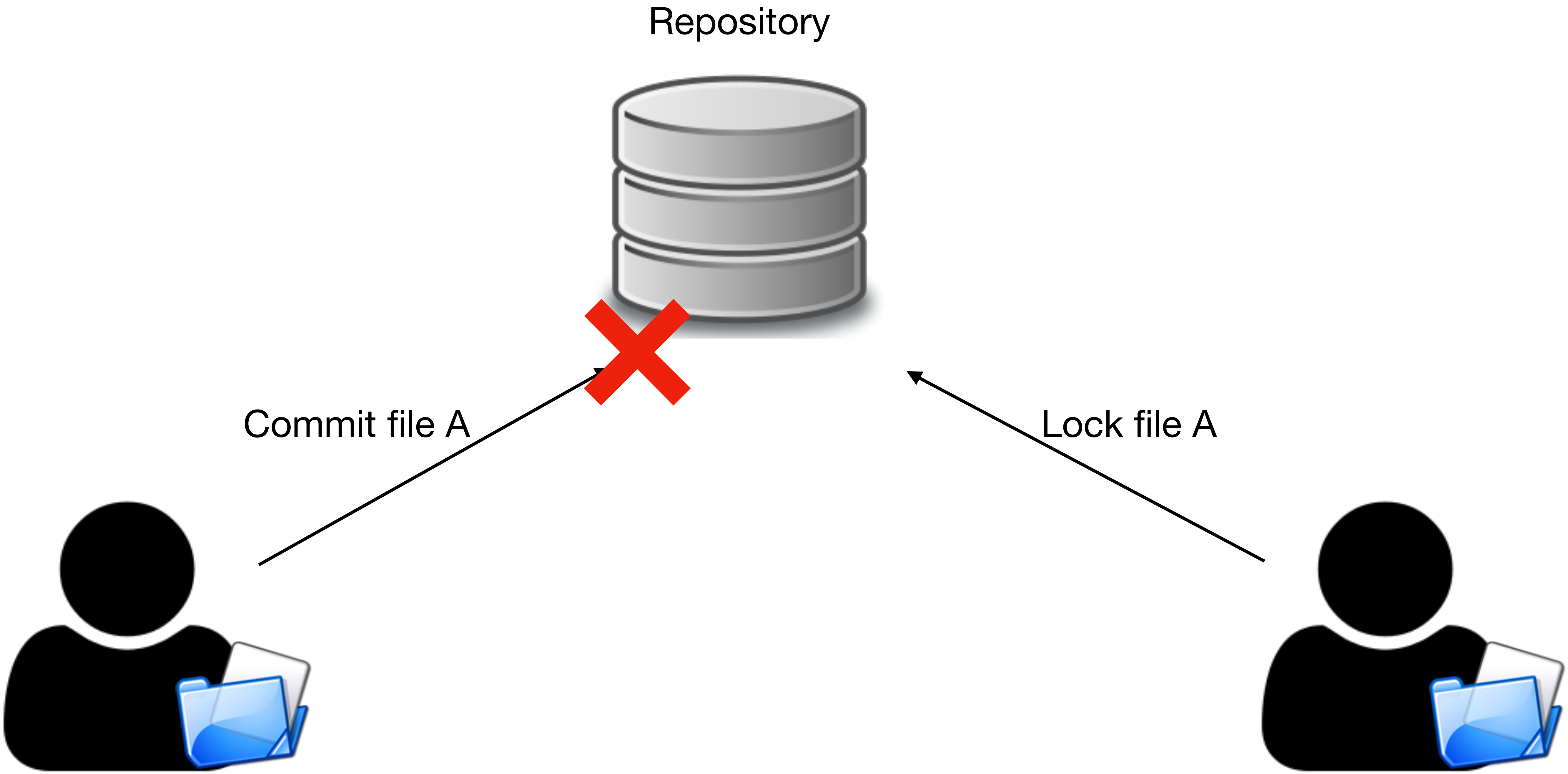


Repository

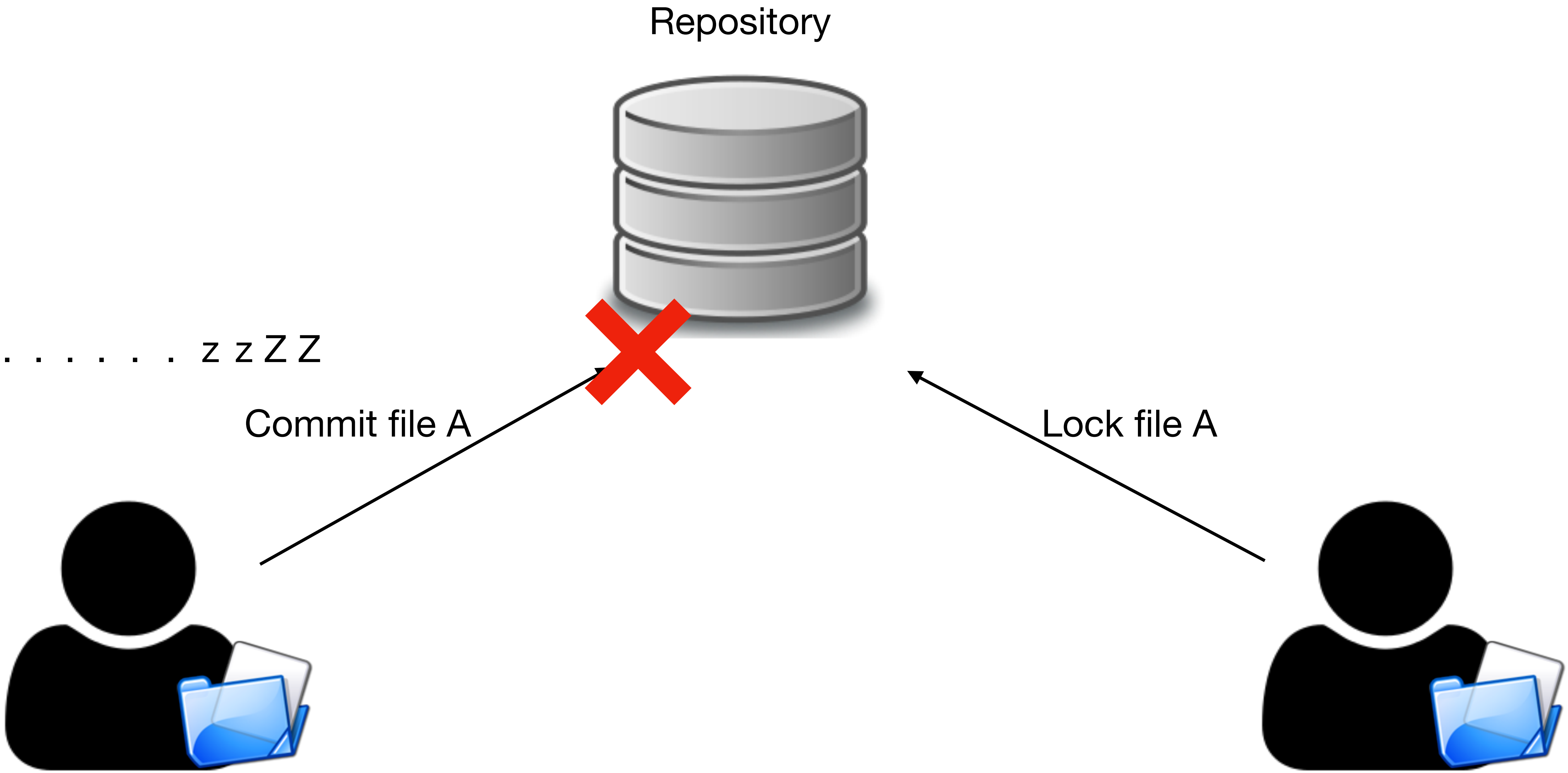
Commit file A

Lock file A

# Problems


Repository
Commit file A
Lock file A

# Problems



Repository

. . . . . . . z z Z Z

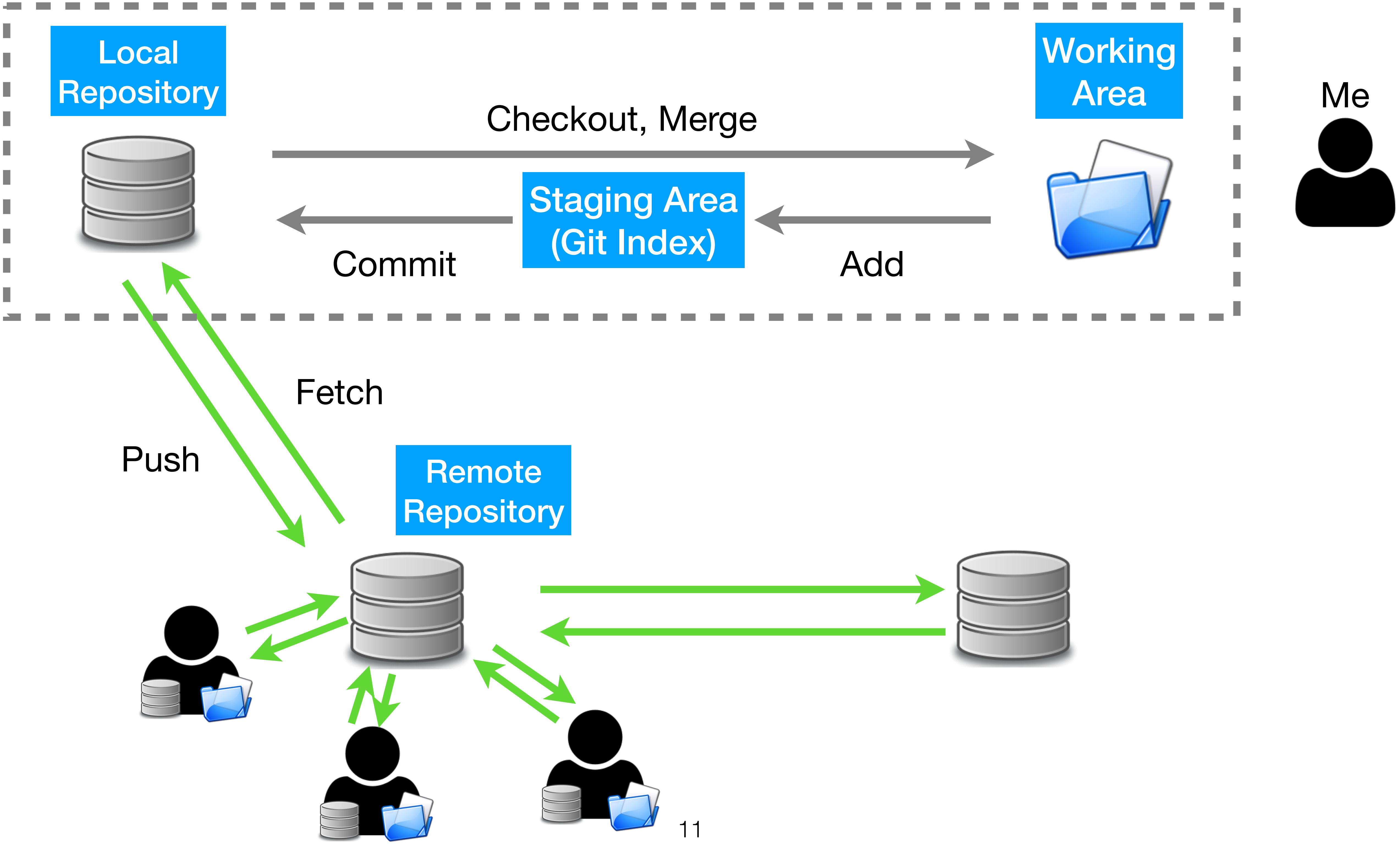
Commit file A

Lock file A

# Distributed Version Control

- BitKeeper
- Git (2005)
- Mercurial (2005)

# Distributed Approach (Git)



Local Repository

Working Area

Me

Checkout, Merge

Staging Area (Git Index)

Commit

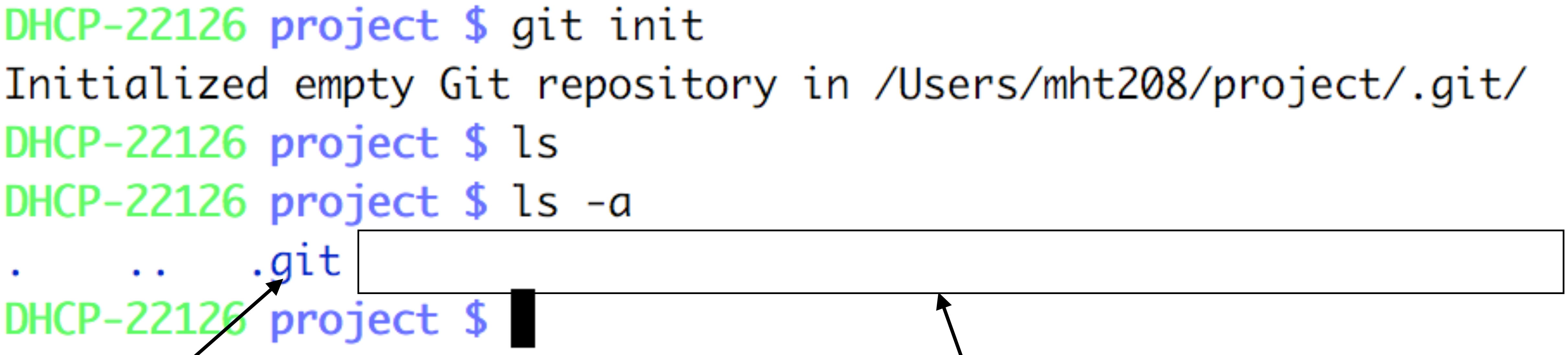
Add

Fetch

Push

Remote Repository

# Create a Repository

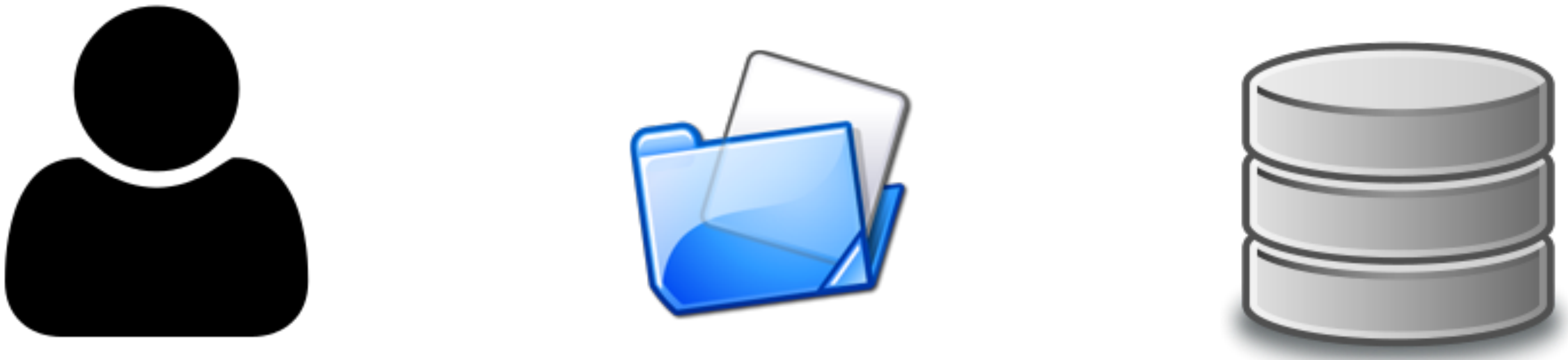


```
DHCP-22126 project $ git init
Initialized empty Git repository in /Users/mht208/project/.git/
DHCP-22126 project $ ls
DHCP-22126 project $ ls -a
.    ..    .git
DHCP-22126 project $ █
```

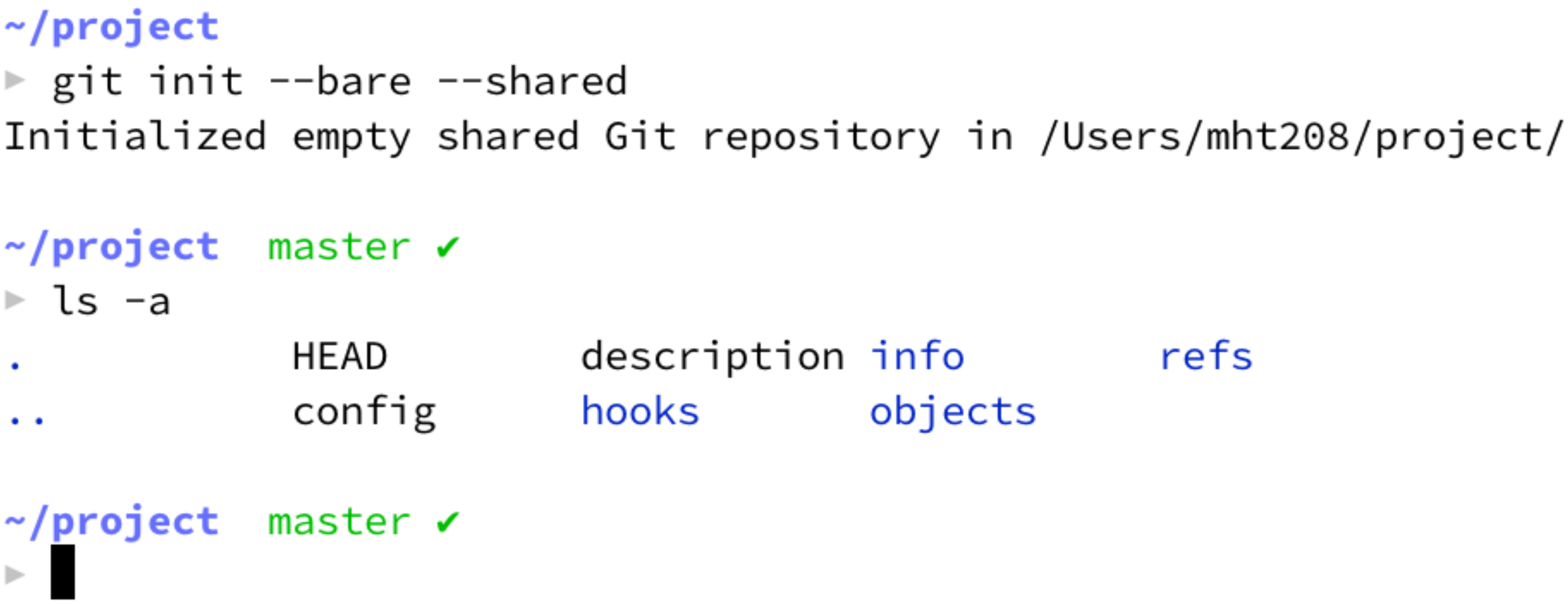
repository

working area (working tree)

Files in the “project” folder can be added to the repository



# Bare Repository



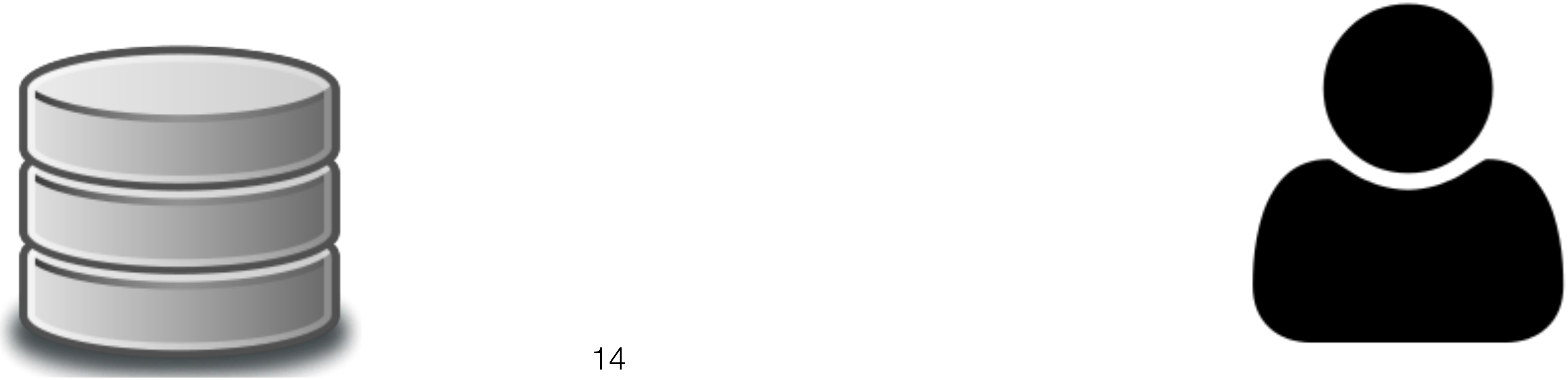
```
~/project
▶ git init --bare --shared
Initialized empty shared Git repository in /Users/mht208/project/

~/project  master ✔
▶ ls -a
.            HEAD         description info         refs
..           config       hooks       objects

~/project  master ✔
▶ █
```

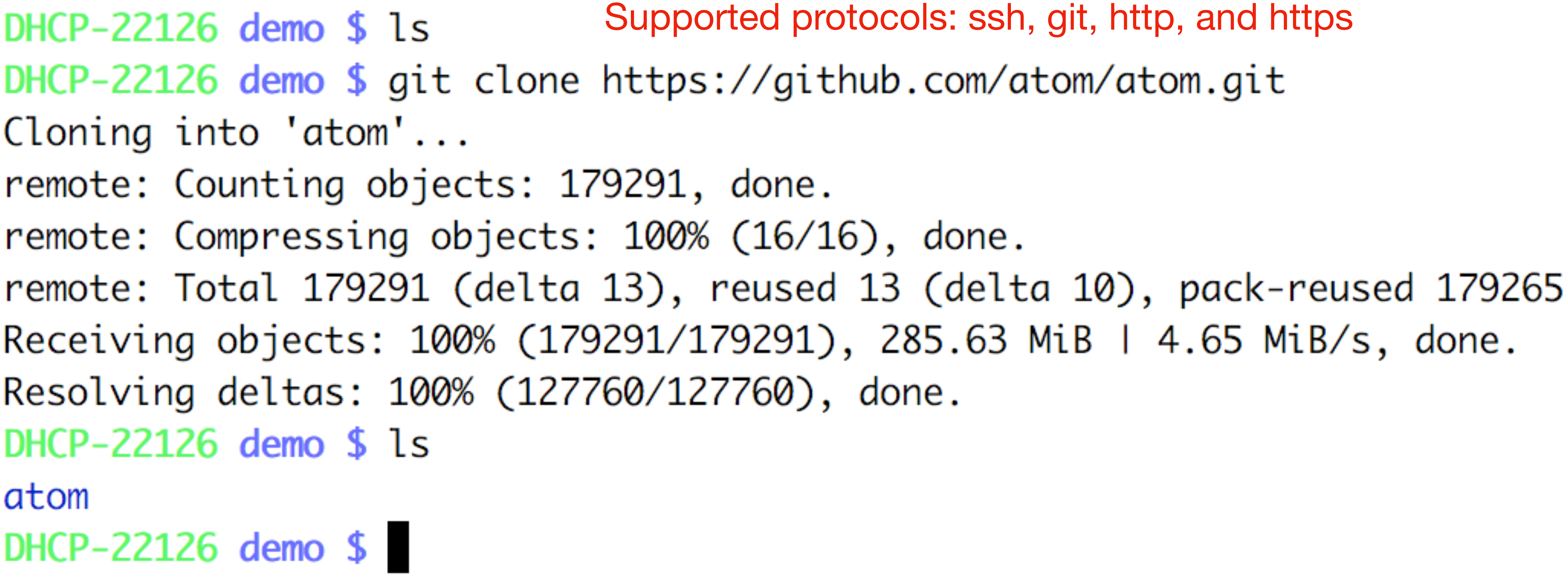
no working area in a bare repository

# Clone



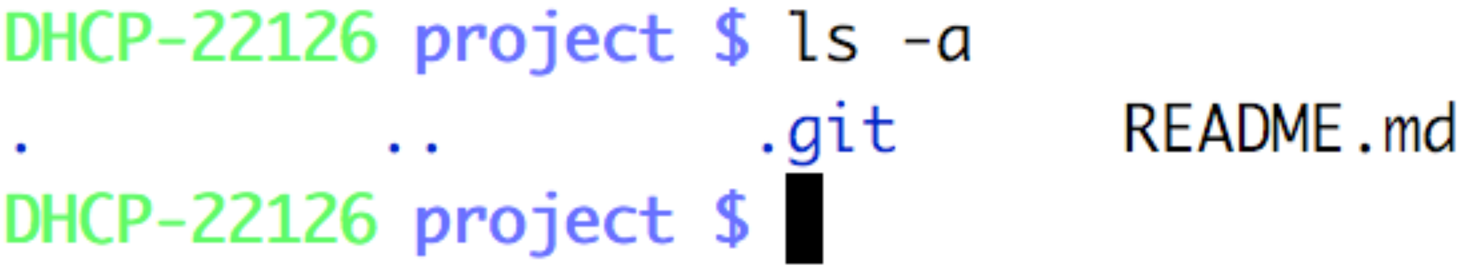
# Clone

Supported protocols: ssh, git, http, and https

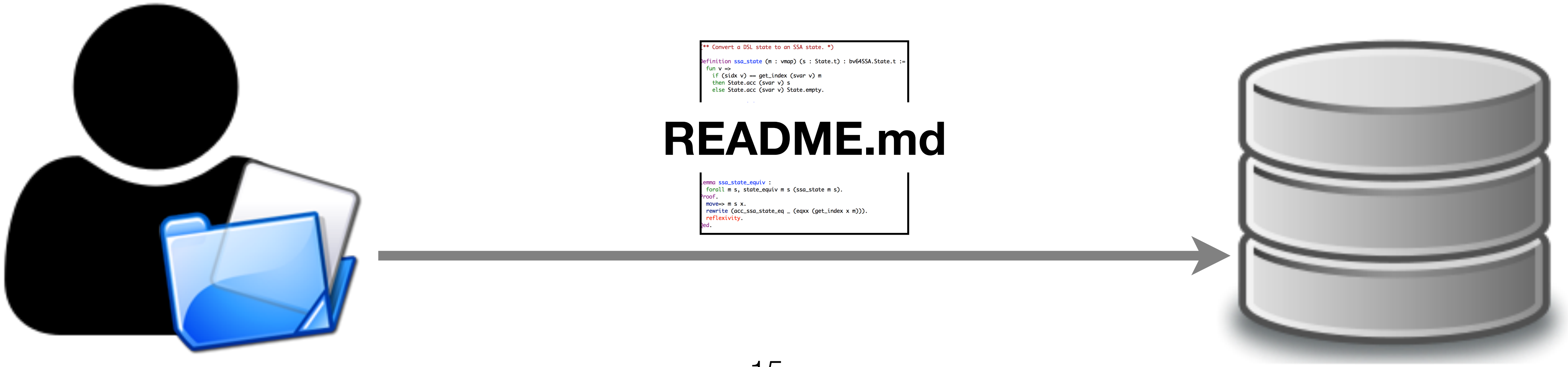


```
DHCP-22126 demo $ ls
DHCP-22126 demo $ git clone https://github.com/atom/atom.git
Cloning into 'atom'...
remote: Counting objects: 179291, done.
remote: Compressing objects: 100% (16/16), done.
remote: Total 179291 (delta 13), reused 13 (delta 10), pack-reused 179265
Receiving objects: 100% (179291/179291), 285.63 MiB | 4.65 MiB/s, done.
Resolving deltas: 100% (127760/127760), done.
DHCP-22126 demo $ ls
atom
DHCP-22126 demo $ 
```

# Add Commit



```
DHCP-22126 project $ ls -a
.               ..              .git            README.md
DHCP-22126 project $ █
```

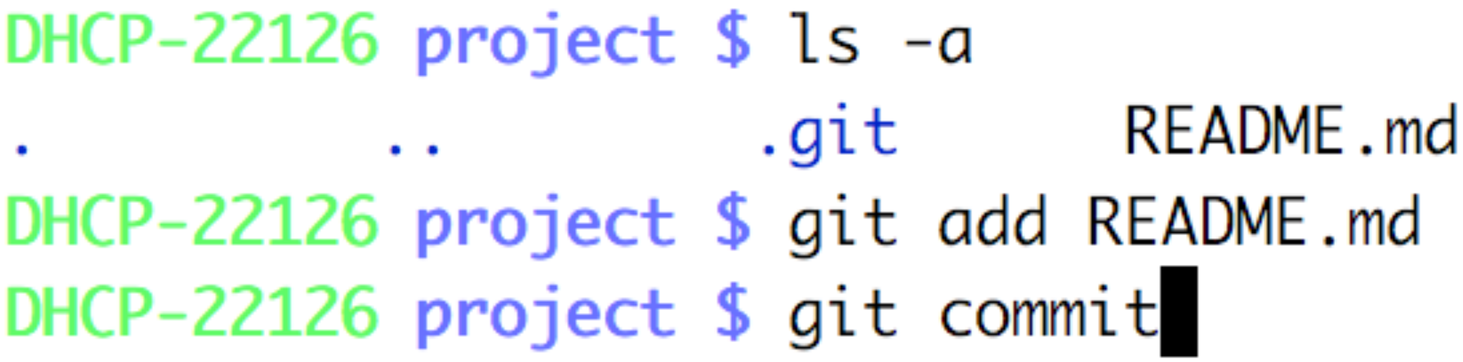


```
(** Convert a DSL state to an SSA state. *)

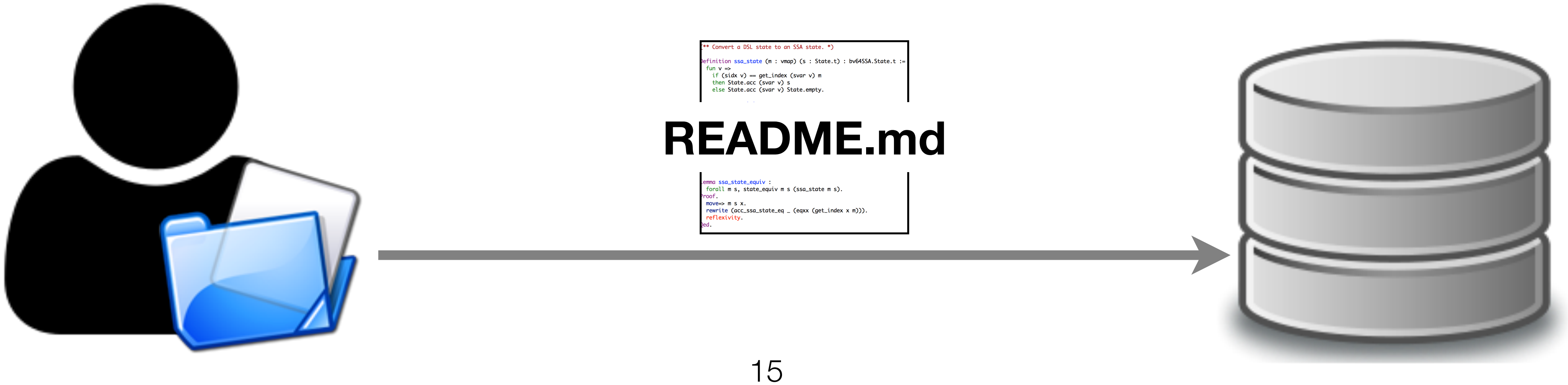
Definition ssa_state (m : vmap) (s : State.t) : bv64SSA.State.t :=
  fun v =>
    if (sidx v) == get_index (svar v) m
    then State.acc (svar v) s
    else State.acc (svar v) State.empty.
```

```
Lemma ssa_state_equiv :
  forall m s, state_equiv m s (ssa_state m s).
Proof.
  move=> m s x.
  rewrite (acc_ssa_state_eq _ (eqxx (get_index x m))).
  reflexivity.
Qed.
```

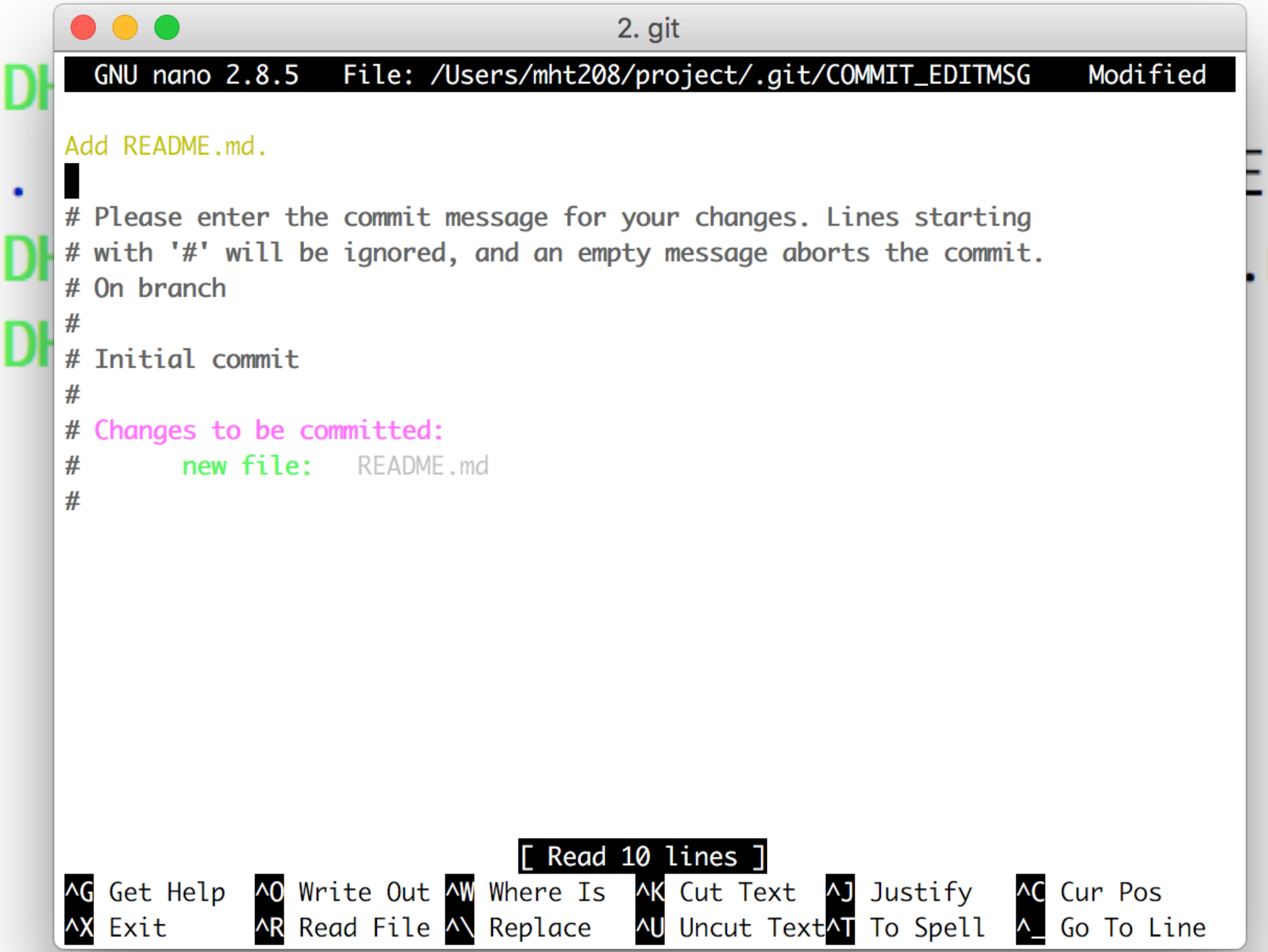
# Add Commit



```
DHCP-22126 project $ ls -a
.               ..              .git            README.md
DHCP-22126 project $ git add README.md
DHCP-22126 project $ git commit
```



# Add Commit



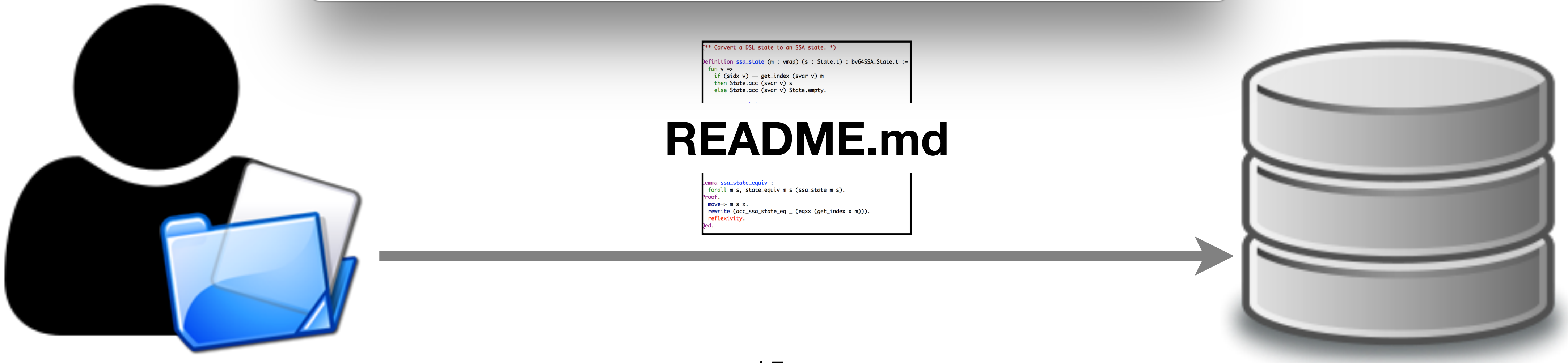
```
  GNU nano 2.8.5    File: /Users/mht208/project/.git/COMMIT_EDITMSG     Modified

Add README.md.

# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
# On branch
#
# Initial commit
#
# Changes to be committed:
#       new file:   README.md
#

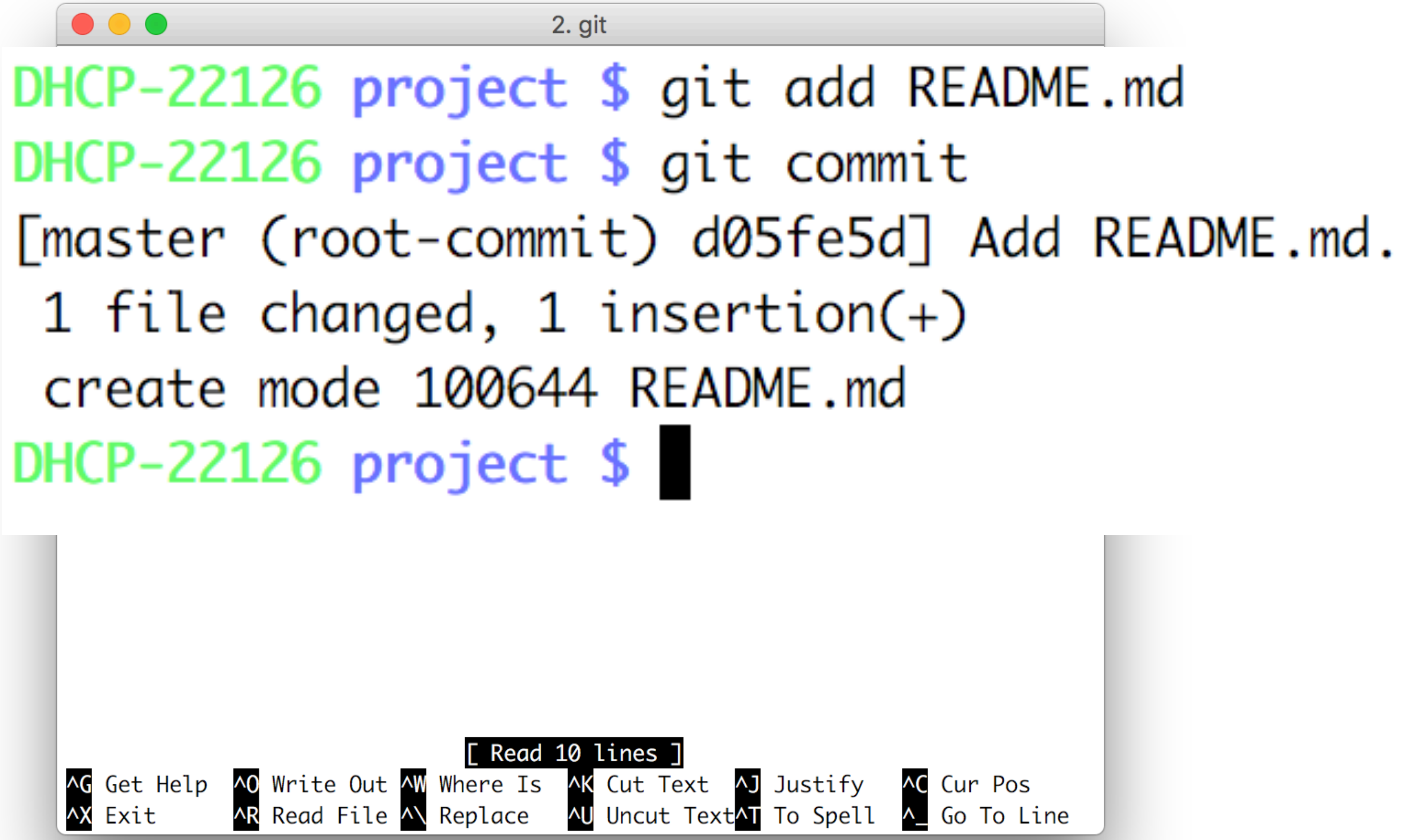



                              [ Read 10 lines ]
^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace   ^U Uncut Text^T To Spell  ^_ Go To Line
```



**README.md**

# Add Commit



```
DHCP-22126 project $ git add README.md
DHCP-22126 project $ git commit
[master (root-commit) d05fe5d] Add README.md.
 1 file changed, 1 insertion(+)
 create mode 100644 README.md
DHCP-22126 project $ 
```

```
                         [ Read 10 lines ]
^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace   ^U Uncut Text^T To Spell  ^_ Go To Line
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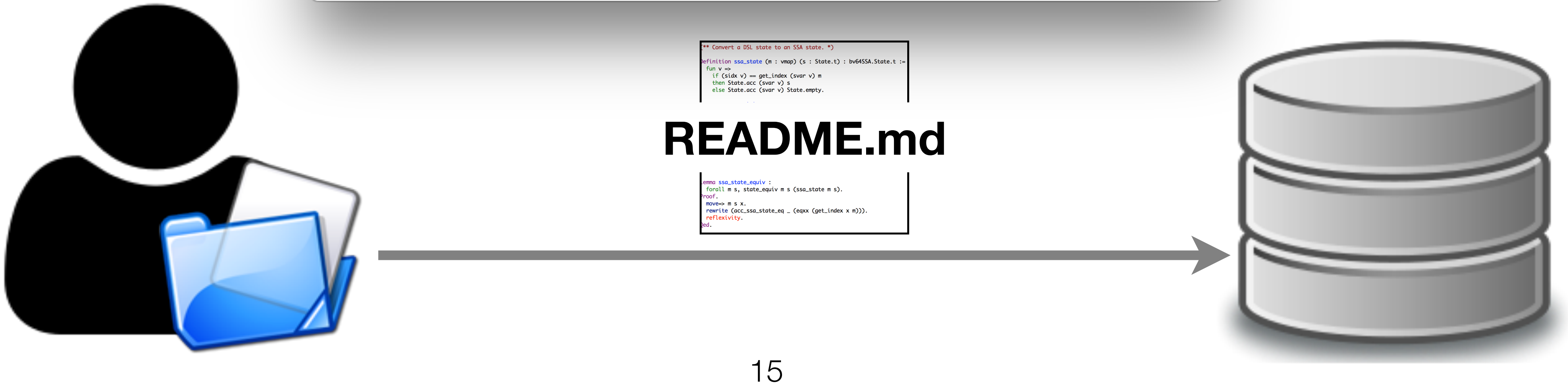
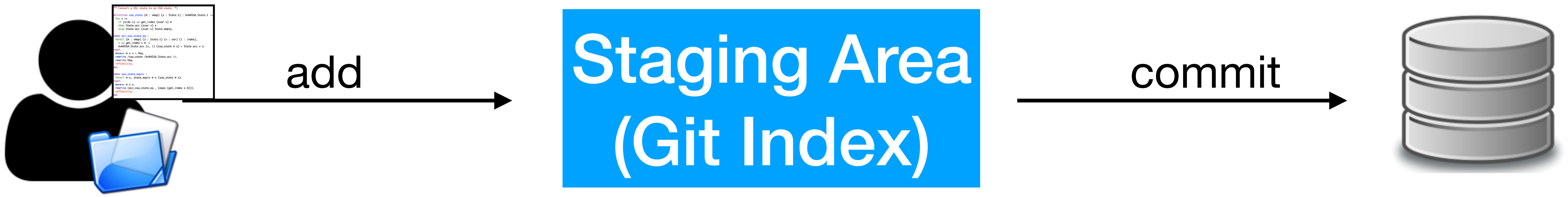


# Add VS Commit

- git add
  - Add files to the staging area
  - The files may be new or modified
- git commit
  - Add files in the staging area to the repository as a new version

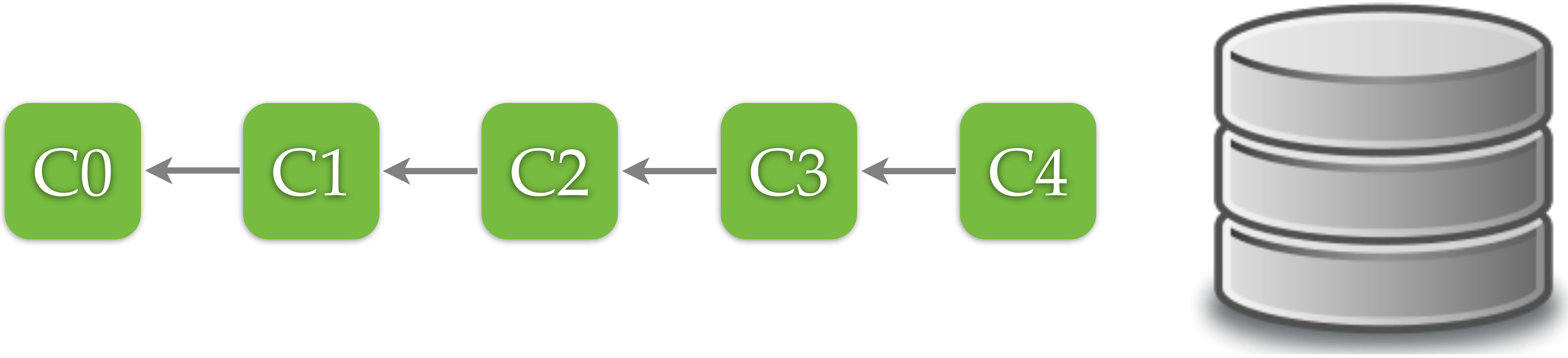


add

Staging Area (Git Index)

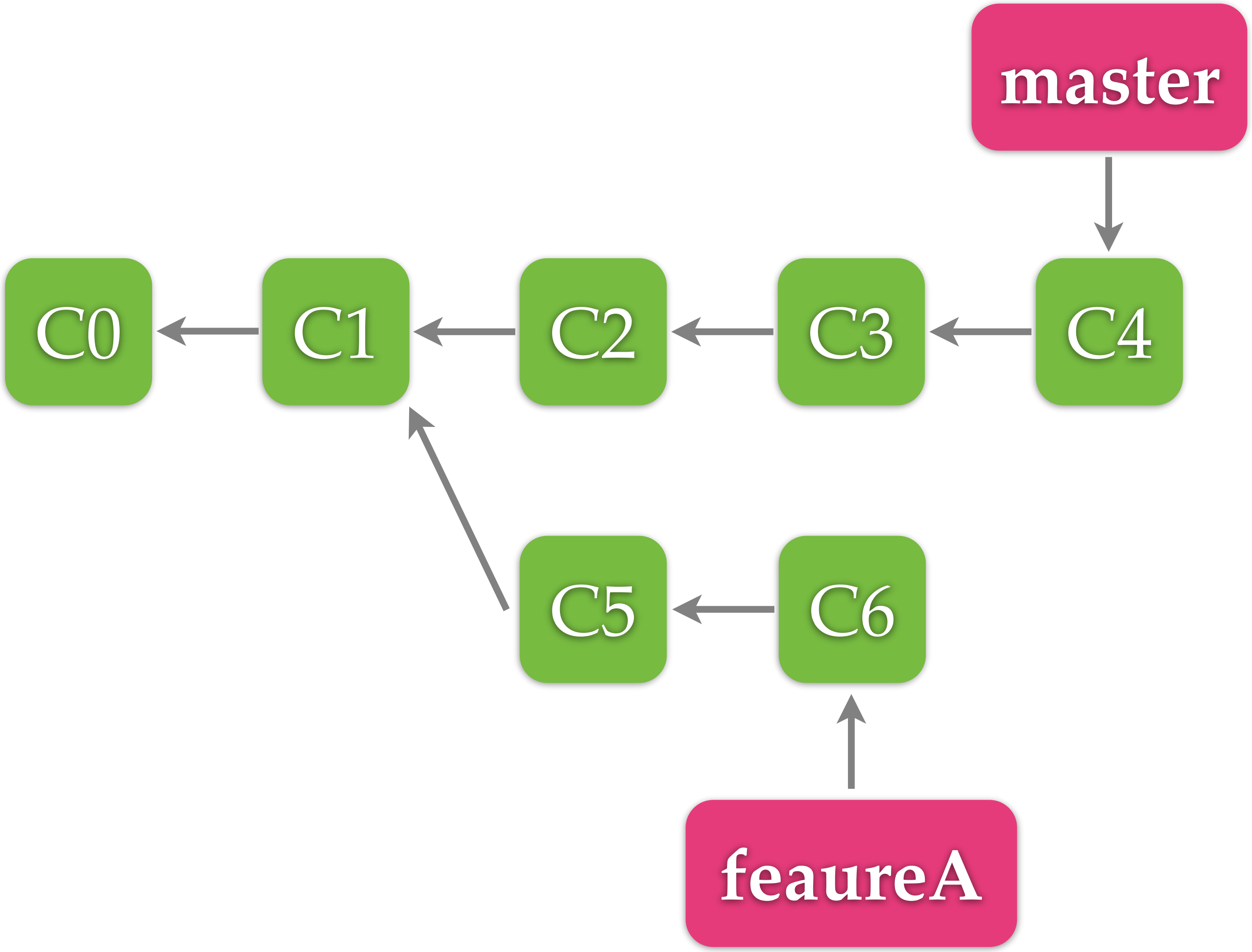
commit

# Add More Commits


C0
C1
C2
C3
C4

A commit has pointers back to its parents

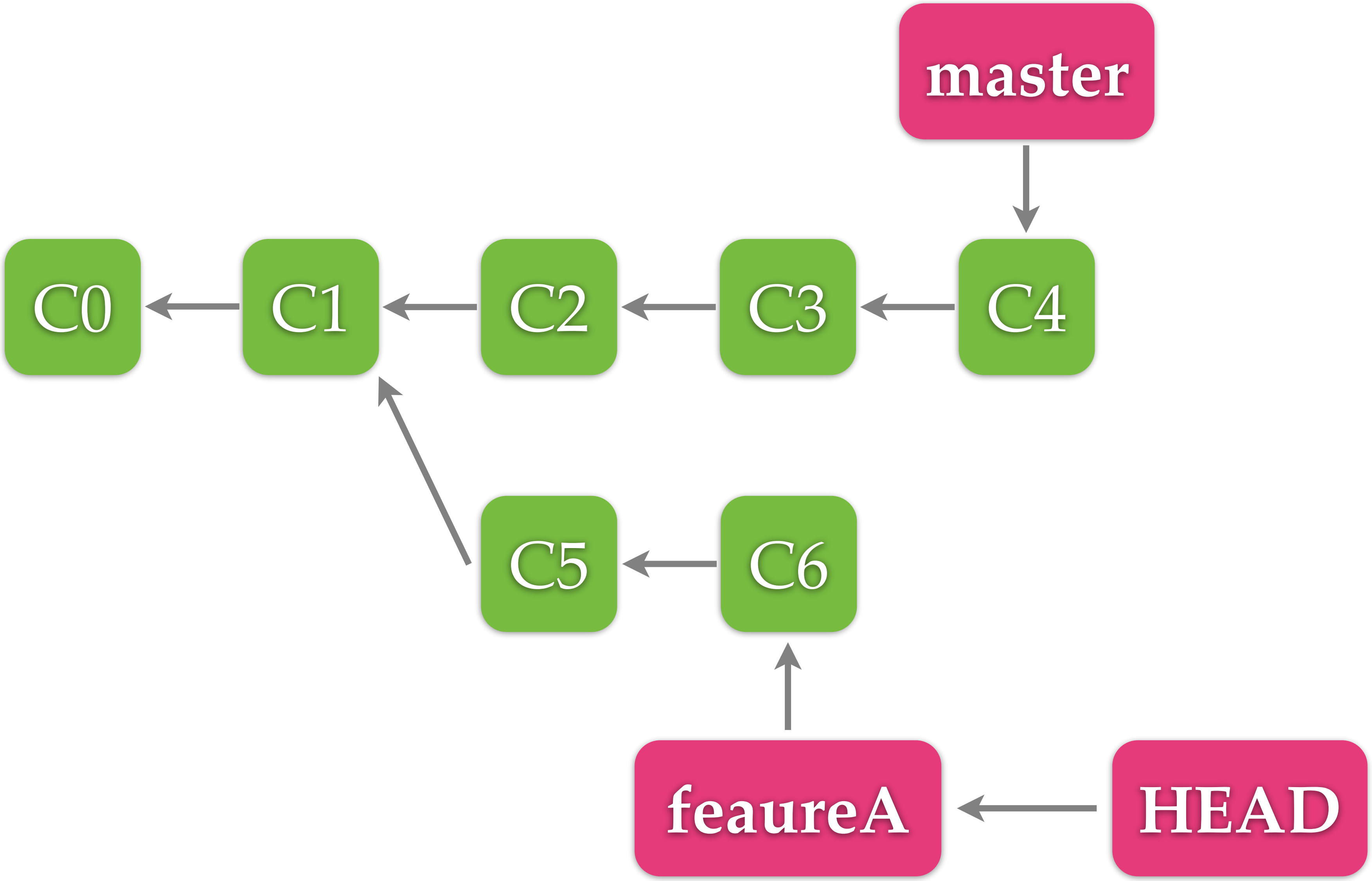
# Branches


master
C0
C1
C2
C3
C4
C5
C6
feaureA

A branch is used to track a line of development

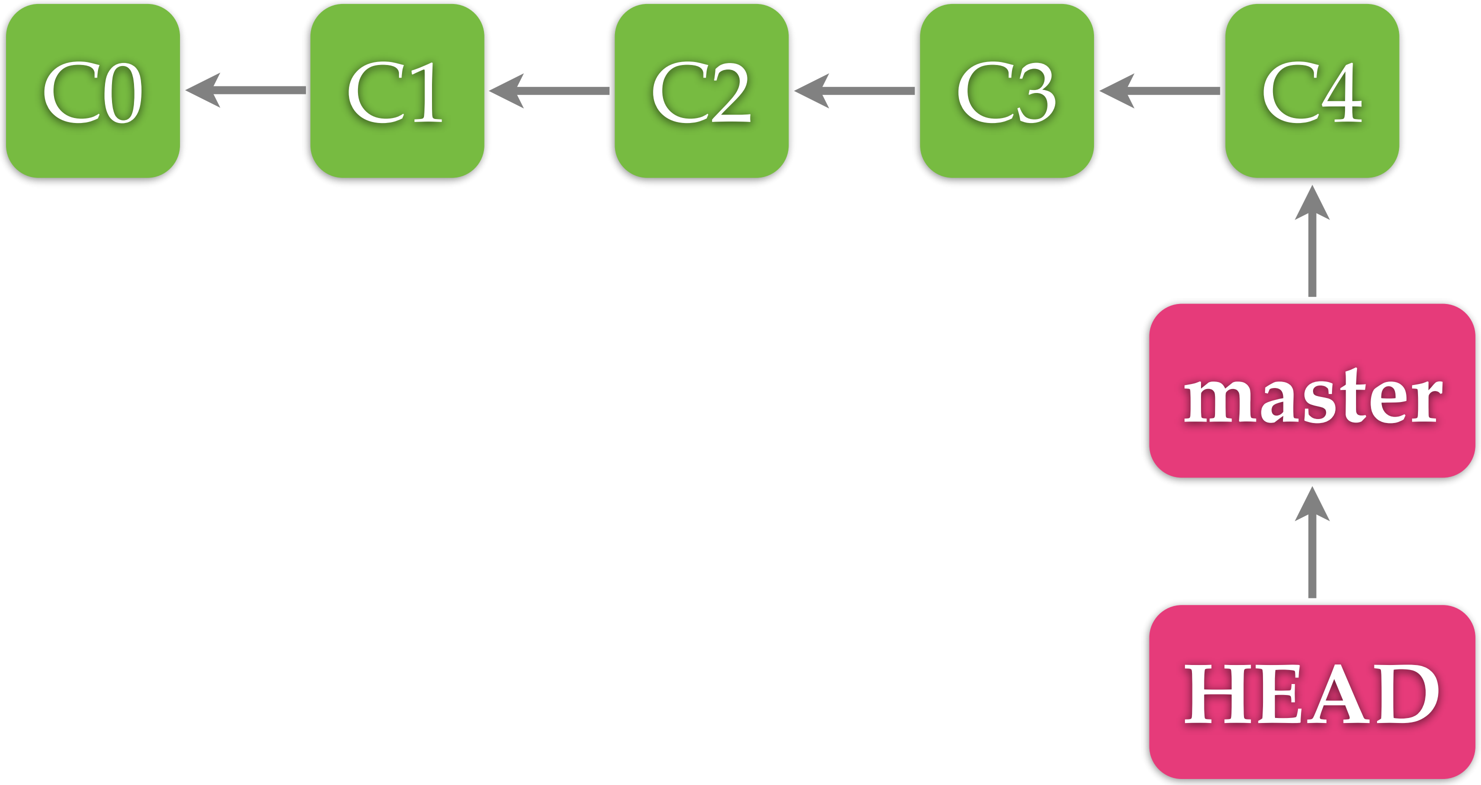
master is the default branch

# Head


master
C0
C1
C2
C3
C4
C5
C6
feaureA
HEAD

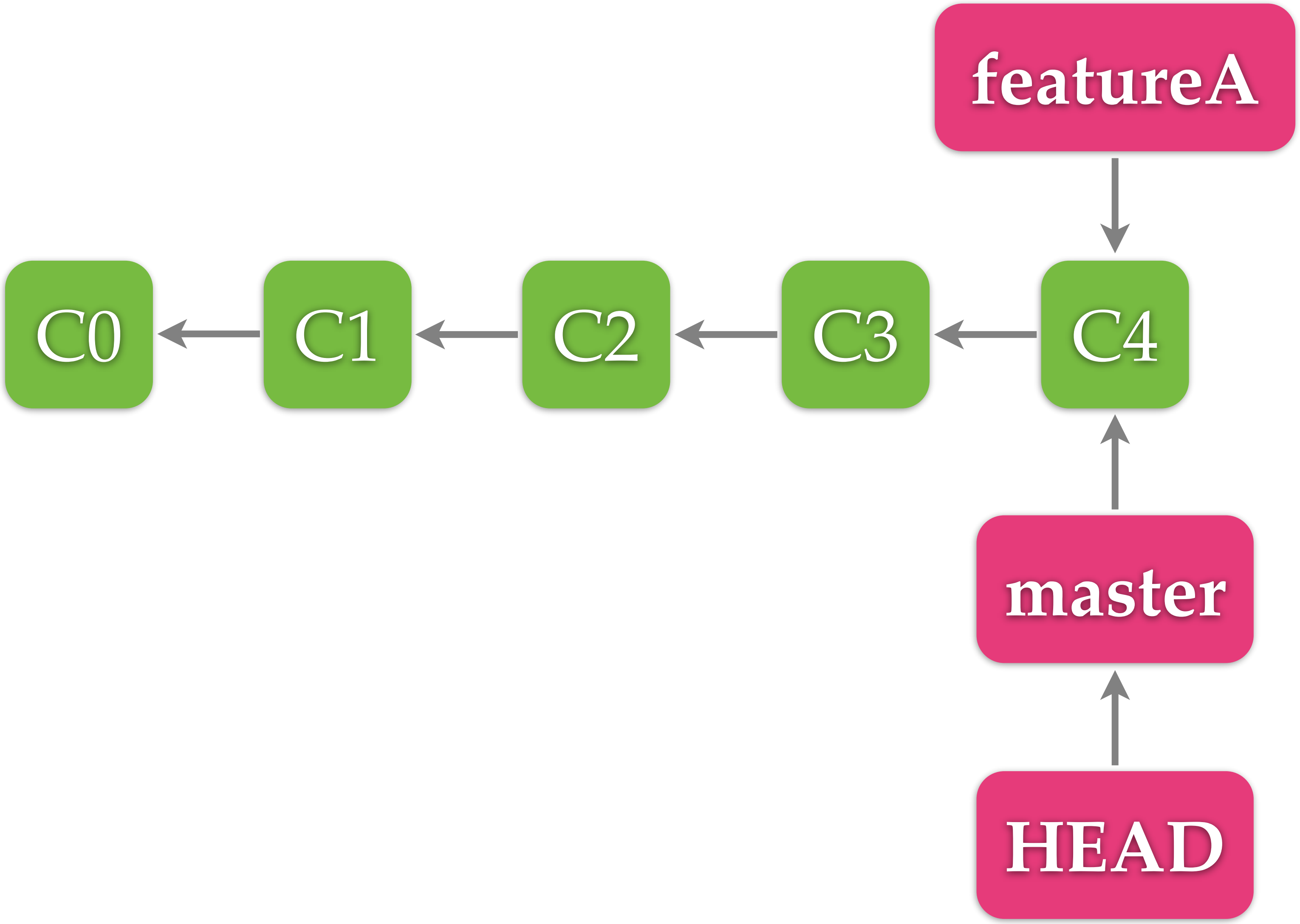
HEAD points to the branch or the commit of the working area

# Create Branches


C0
C1
C2
C3
C4
master
HEAD

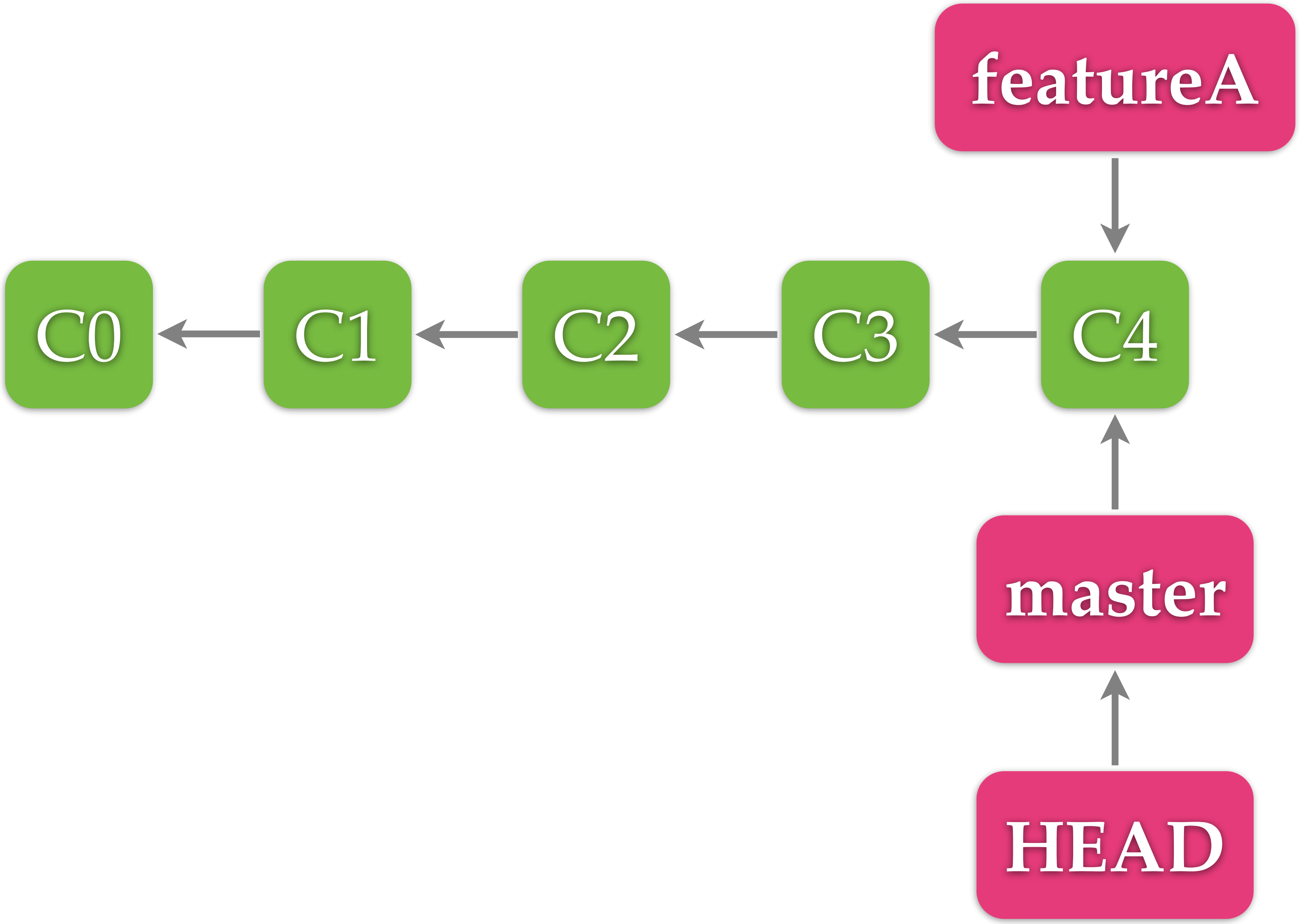
```
$ git branch featureA
```

# Create Branches


featureA
C0
C1
C2
C3
C4
master
HEAD

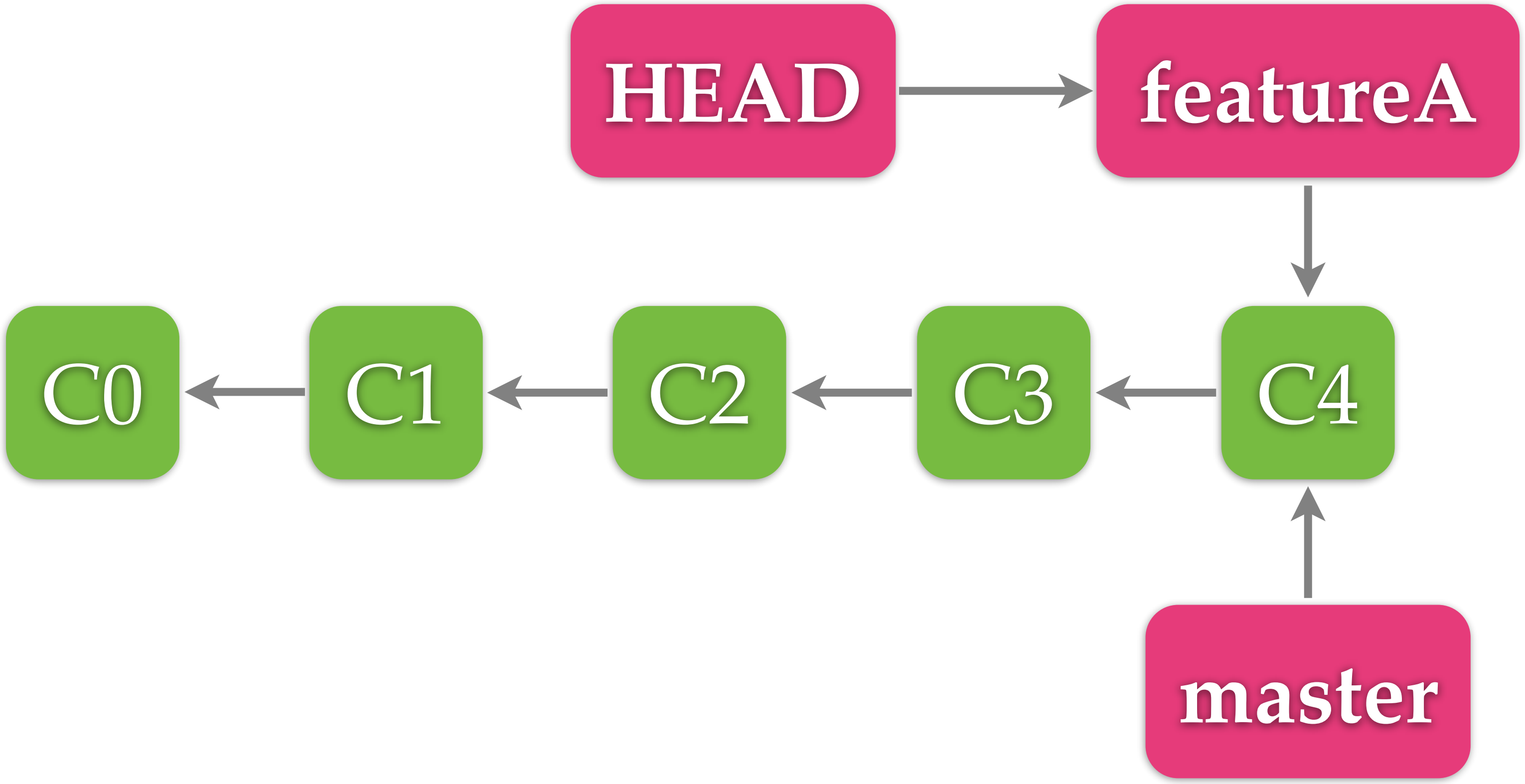
```
$ git branch featureA
```

# Switch Branches


featureA
C0
C1
C2
C3
C4
master
HEAD

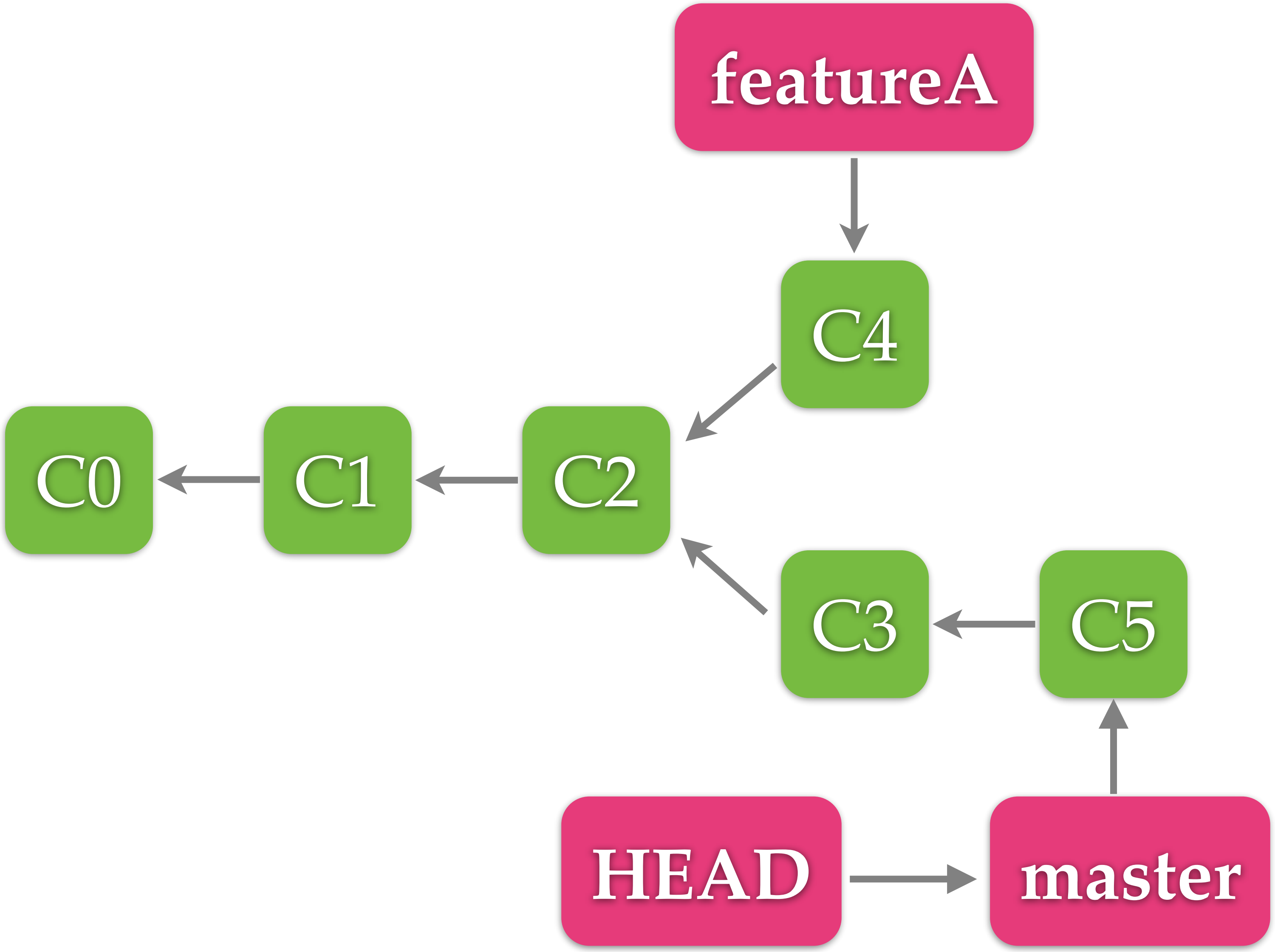
```
$ git checkout featureA
```

# Switch Branches


HEAD
featureA
C0
C1
C2
C3
C4
master

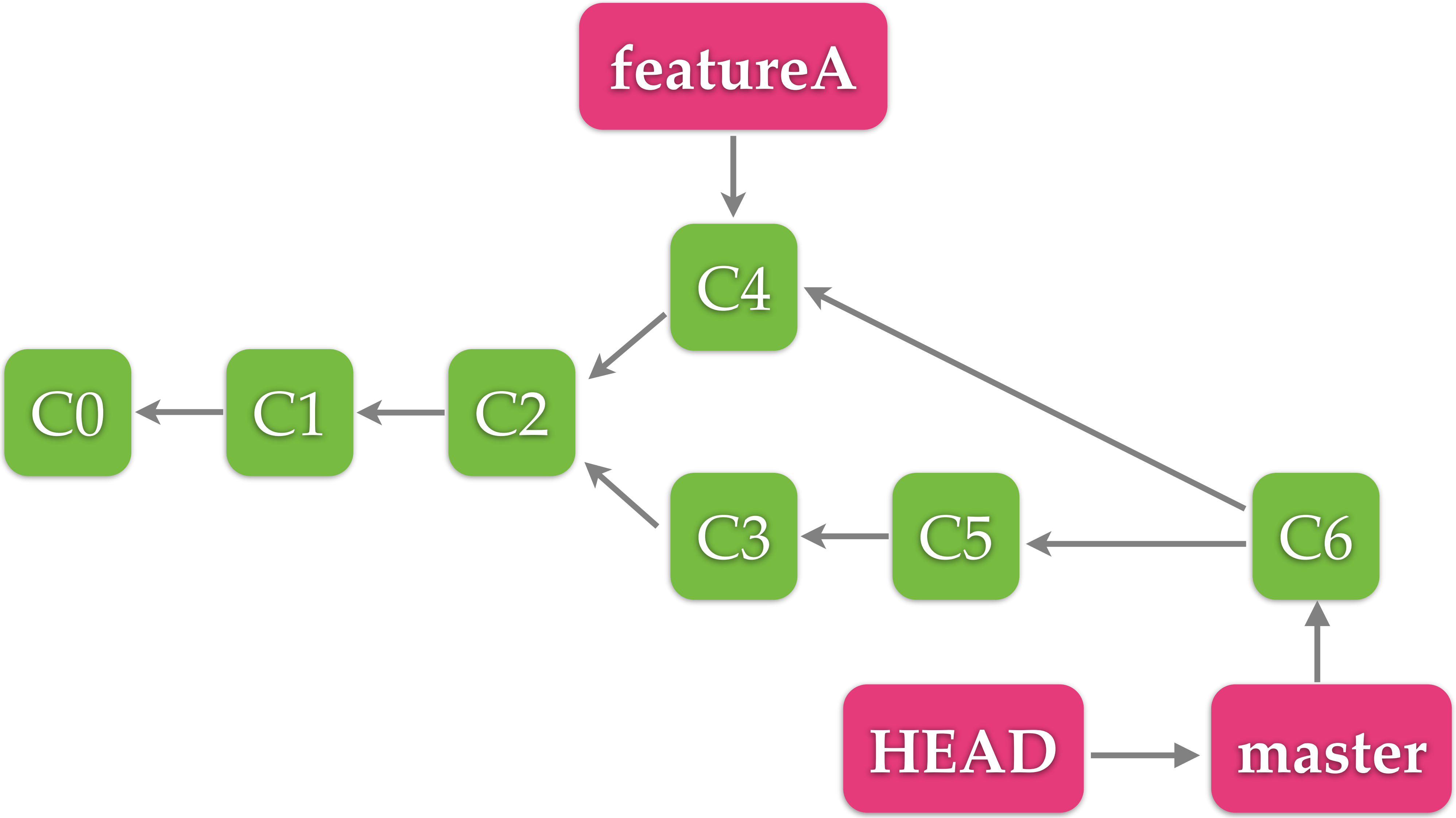
```
➔ $ git checkout featureA
```

# Merge


featureA
C4
C0
C1
C2
C3
C5
HEAD
master

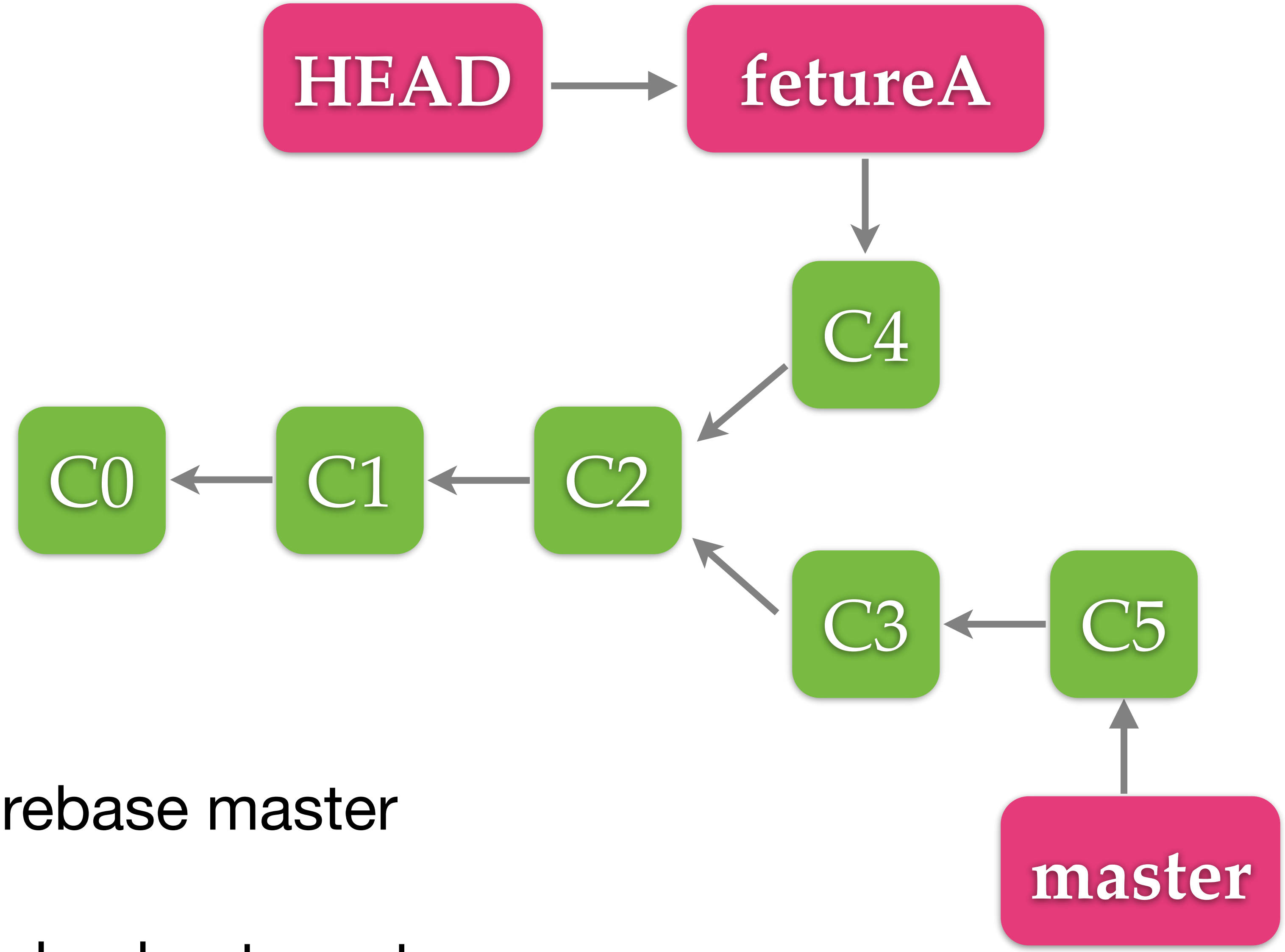
```
$ git merge featureA
```

# Merge


featureA
C4
C0
C1
C2
C3
C5
C6
HEAD
master

```
$ git merge featureA
```

# Rebase

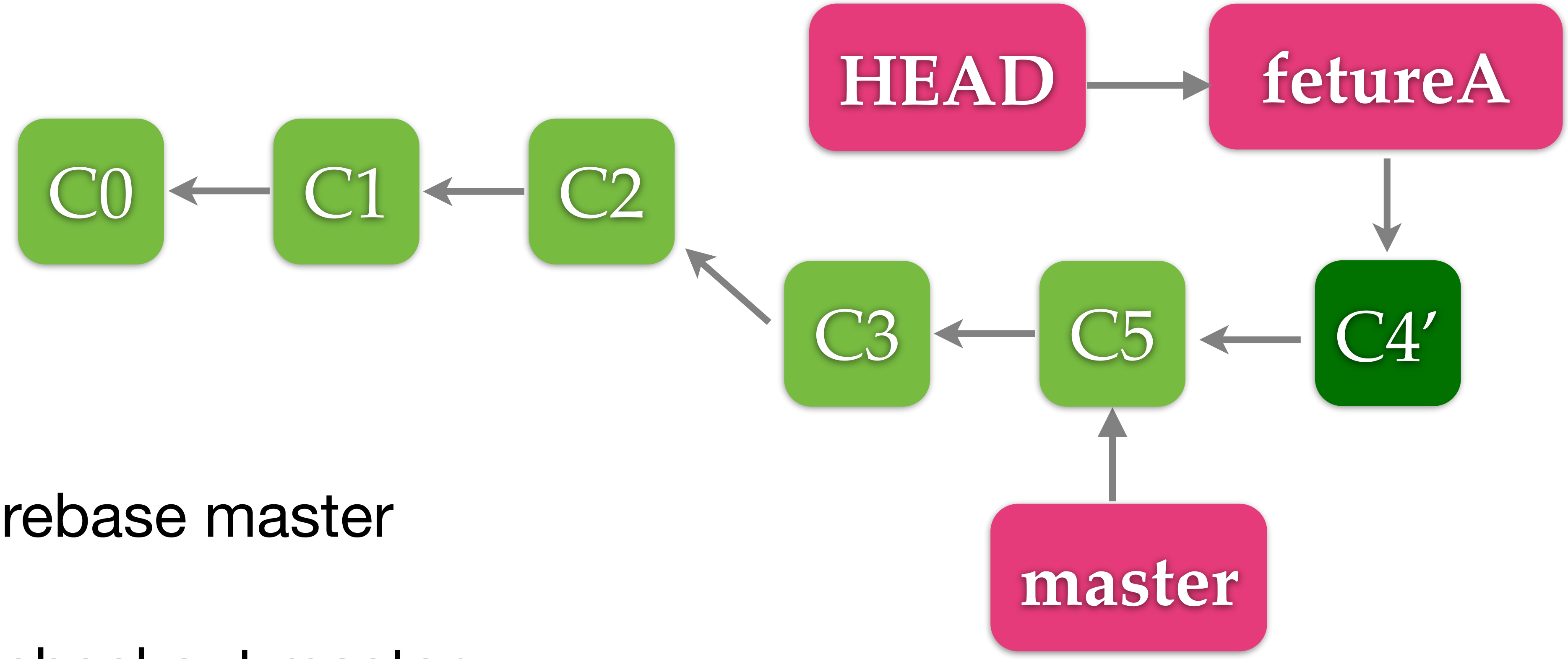

HEAD
fetureA
C4
C0
C1
C2
C3
C5
master

```
$ git rebase master

$ git checkout master

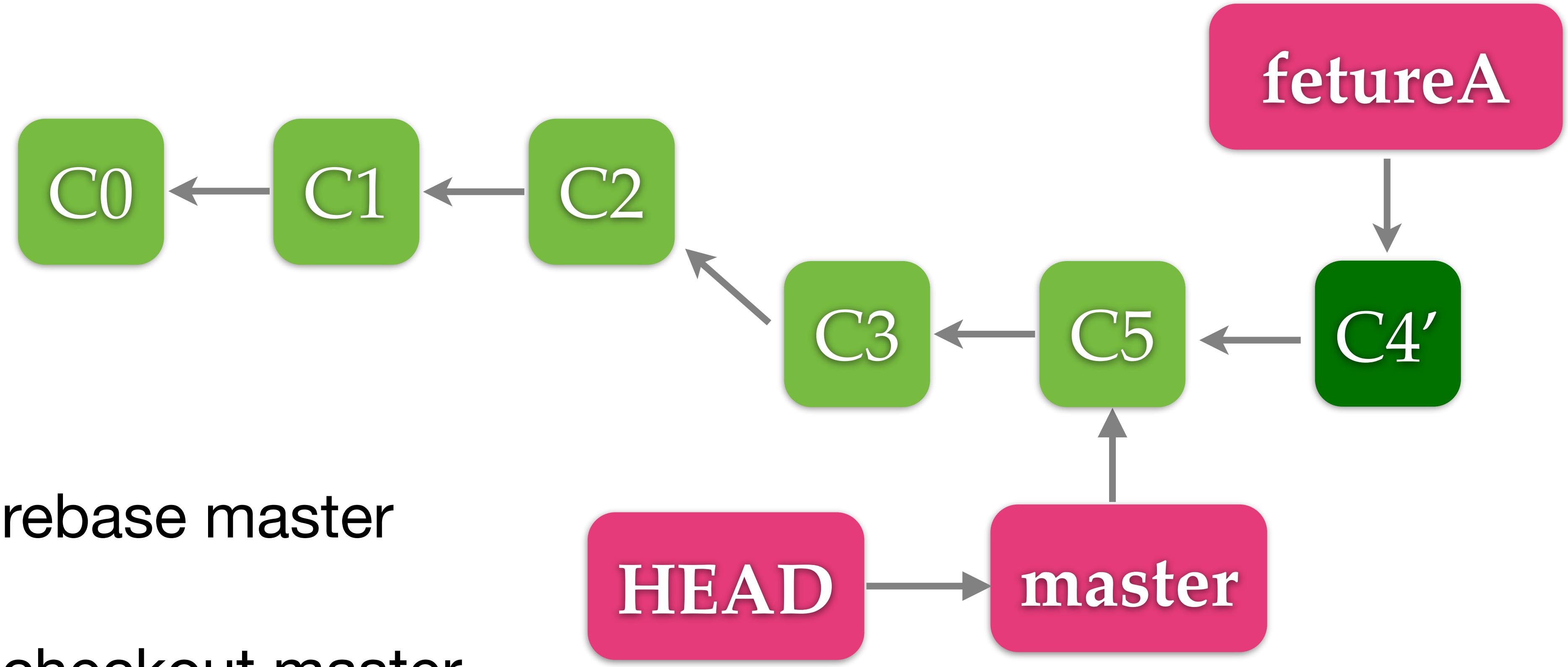
$ git rebase featureA
```

# Rebase


HEAD
futureA
C0
C1
C2
C3
C5
C4′
master

- ➜ $ git rebase master
- $ git checkout master
- $ git rebase featureA

# Rebase

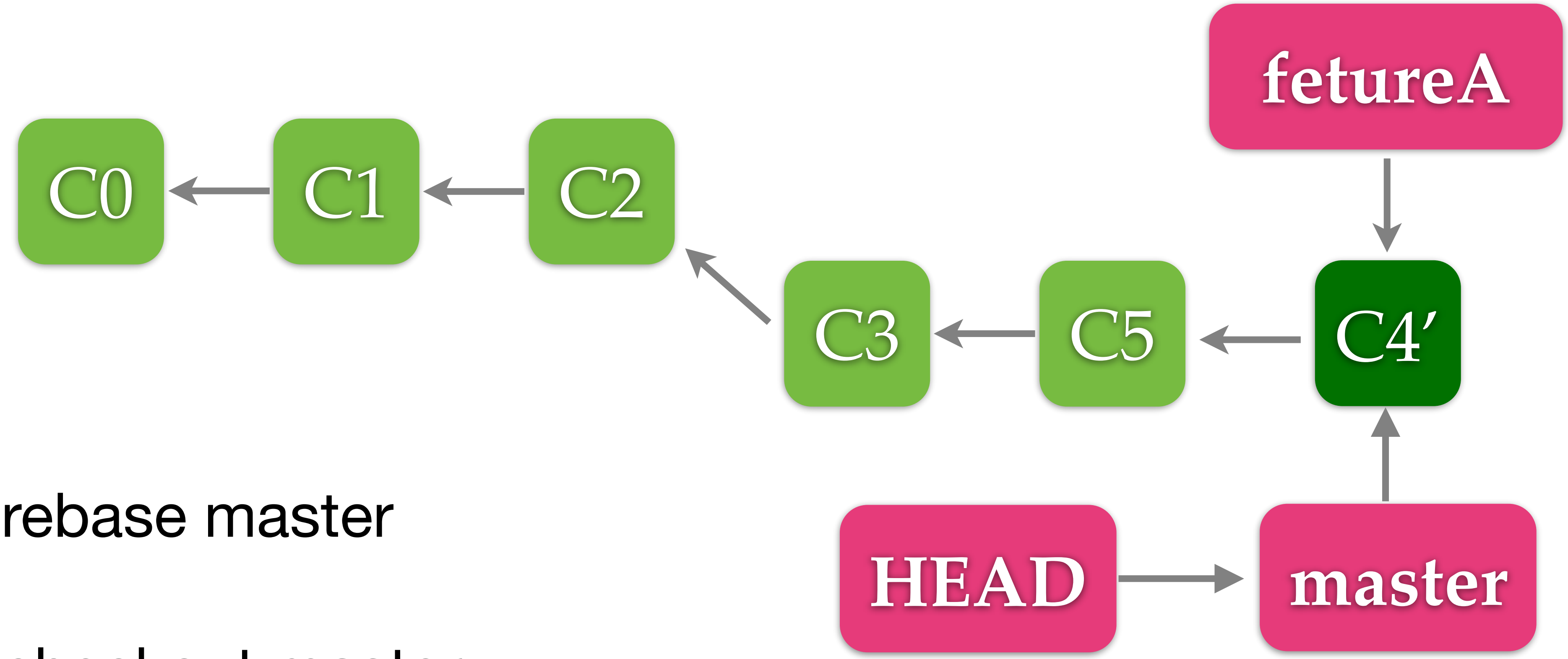

fetureA
C0
C1
C2
C3
C5
C4′
HEAD
master

```
$ git rebase master
```

➜
```
$ git checkout master
```

```
$ git rebase featureA
```

# Rebase


fetureA

C0 C1 C2

C3 C5 C4′

HEAD master

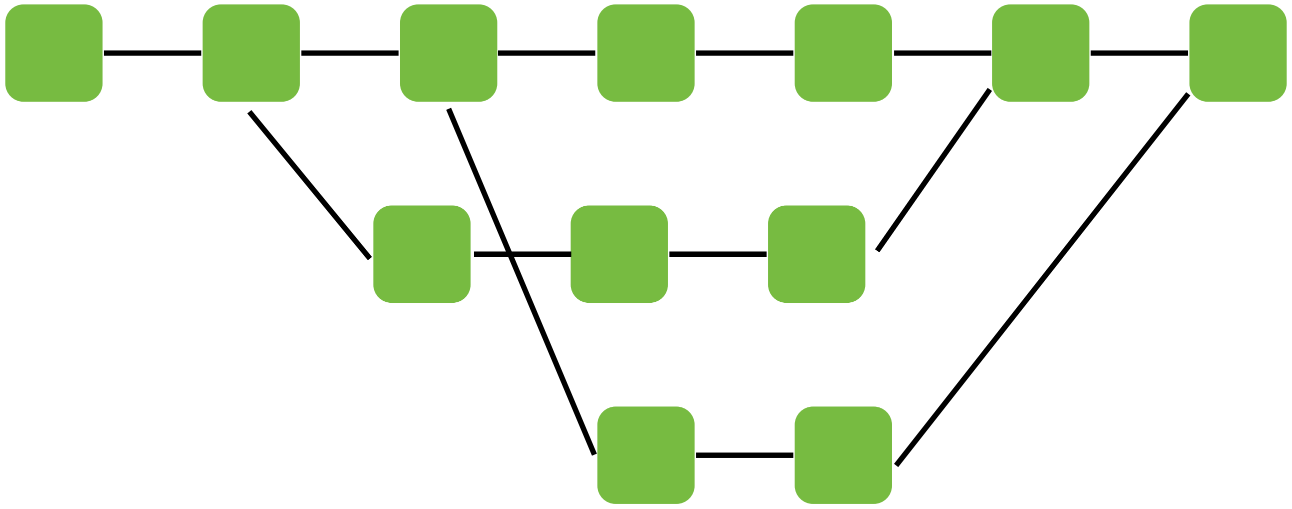
**Fast Forward**

```
$ git rebase master

$ git checkout master

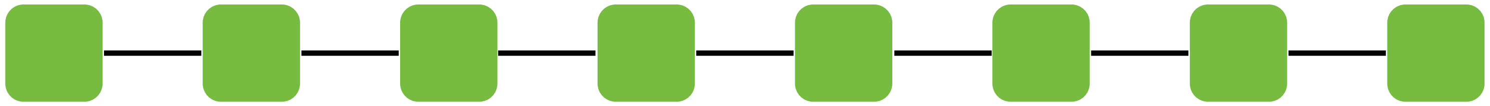
$ git rebase featureA
```

# Merge VS Rebase

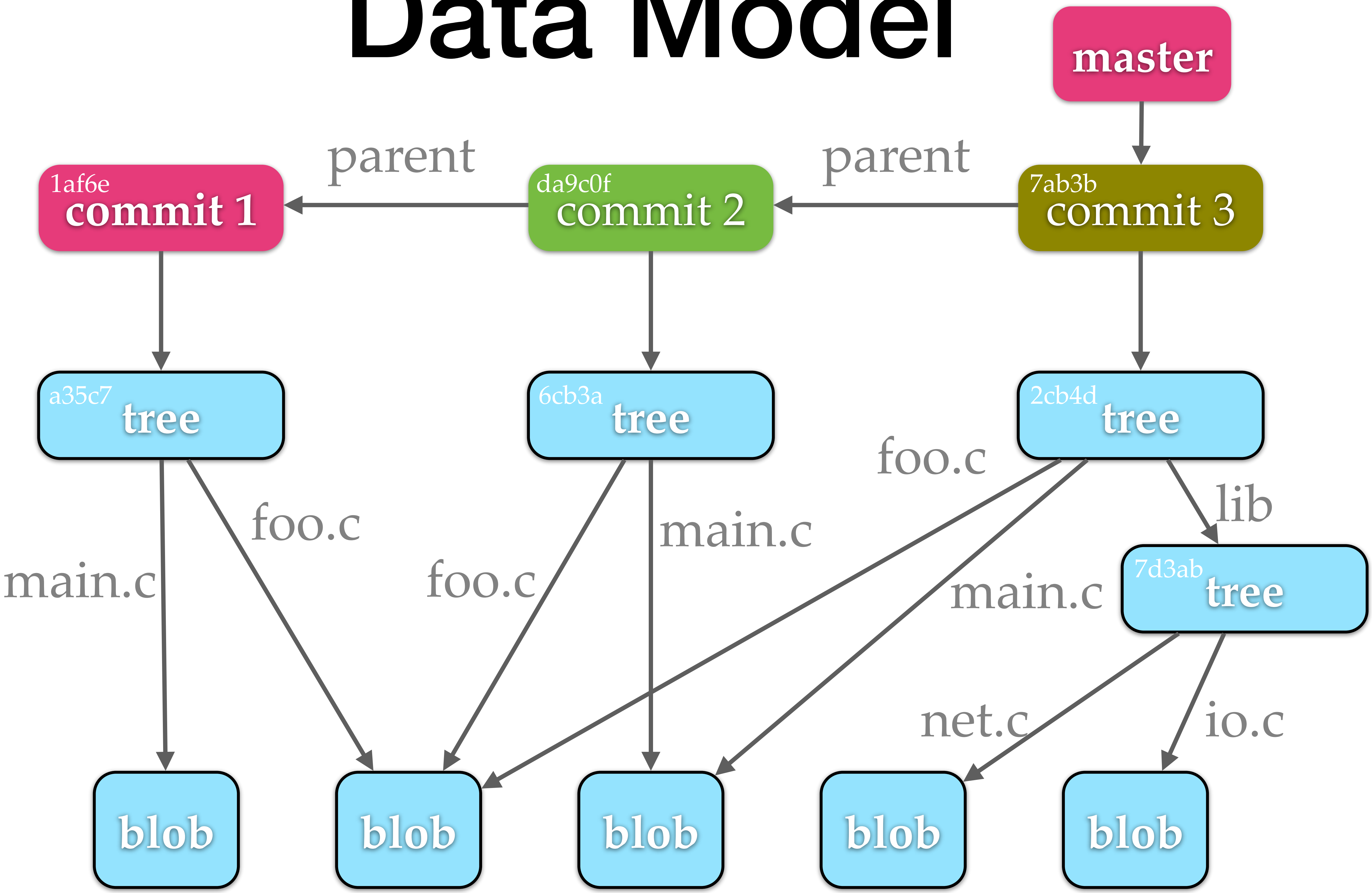


Merge

Rebase



# Data Model

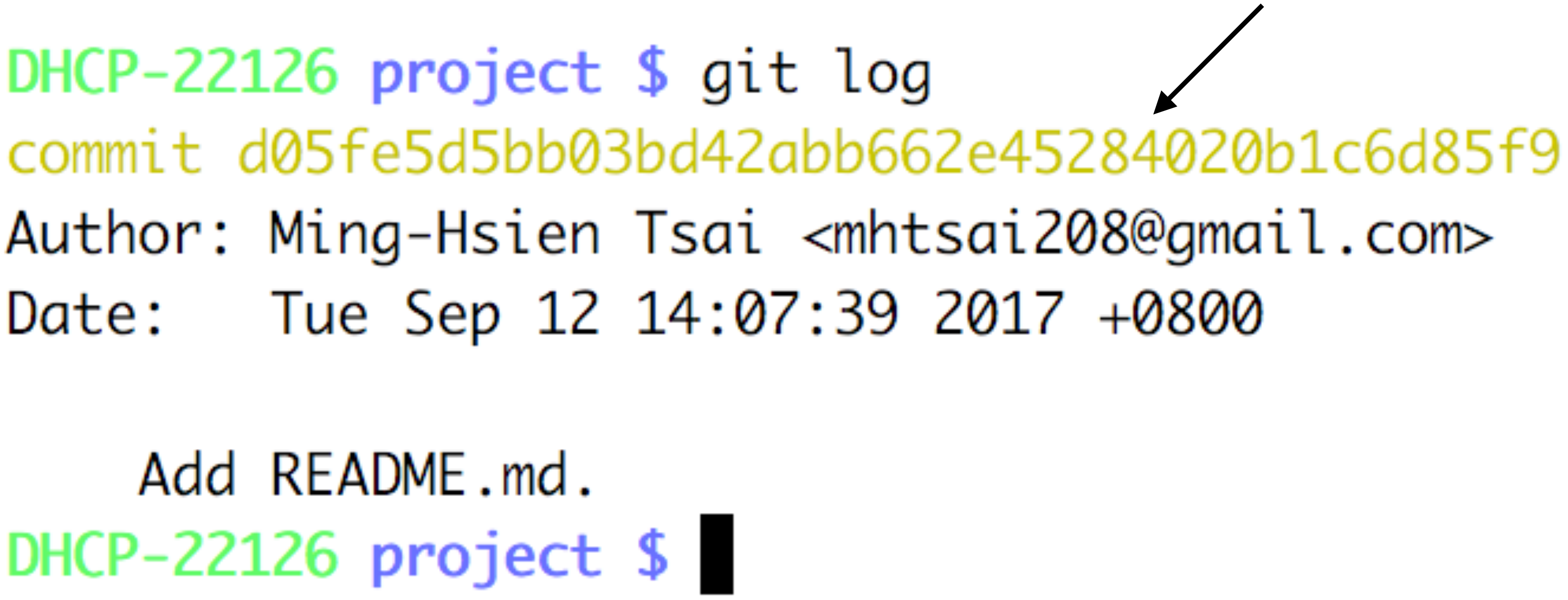

master
1af6e
commit 1
parent
da9c0f
commit 2
parent
7ab3b
commit 3
a35c7
tree
6cb3a
tree
2cb4d
tree
foo.c
lib
main.c
foo.c
foo.c
main.c
main.c
7d3ab
tree
net.c
io.c
blob
blob
blob
blob
blob

Data compressed by ZLIB

SHA1 hash of data as file name

# History

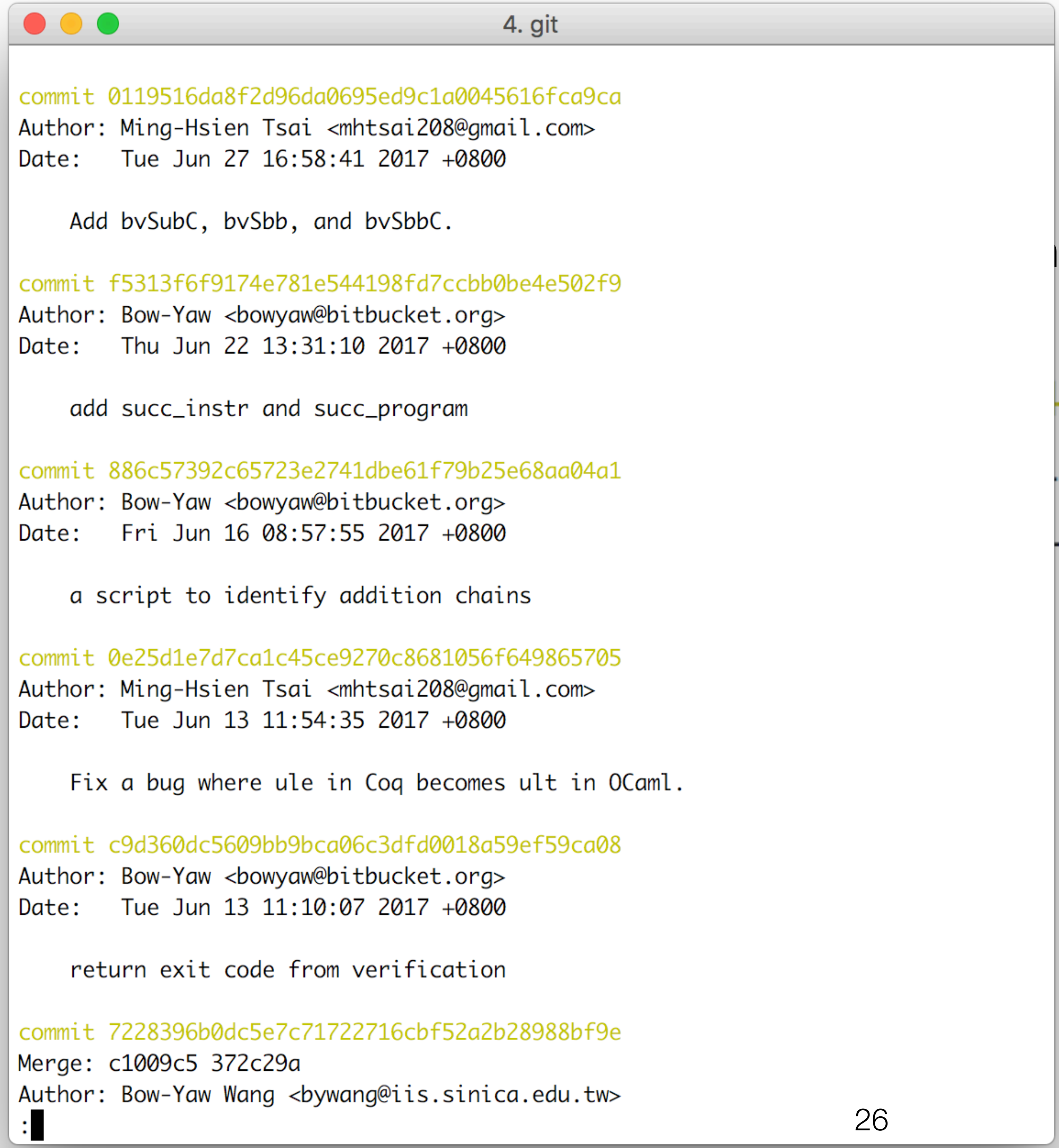
this is the ID of the version



```
DHCP-22126 project $ git log
commit d05fe5d5bb03bd42abb662e45284020b1c6d85f9
Author: Ming-Hsien Tsai <mhtsai208@gmail.com>
Date:   Tue Sep 12 14:07:39 2017 +0800

    Add README.md.
DHCP-22126 project $ 
```

# History



```
commit 0119516da8f2d96da0695ed9c1a0045616fca9ca
Author: Ming-Hsien Tsai <mhtsai208@gmail.com>
Date:   Tue Jun 27 16:58:41 2017 +0800

    Add bvSubC, bvSbb, and bvSbbC.

commit f5313f6f9174e781e544198fd7ccbb0be4e502f9
Author: Bow-Yaw <bowyaw@bitbucket.org>
Date:   Thu Jun 22 13:31:10 2017 +0800

    add succ_instr and succ_program

commit 886c57392c65723e2741dbe61f79b25e68aa04a1
Author: Bow-Yaw <bowyaw@bitbucket.org>
Date:   Fri Jun 16 08:57:55 2017 +0800

    a script to identify addition chains

commit 0e25d1e7d7ca1c45ce9270c8681056f649865705
Author: Ming-Hsien Tsai <mhtsai208@gmail.com>
Date:   Tue Jun 13 11:54:35 2017 +0800

    Fix a bug where ule in Coq becomes ult in OCaml.

commit c9d360dc5609bb9bca06c3dfd0018a59ef59ca08
Author: Bow-Yaw <bowyaw@bitbucket.org>
Date:   Tue Jun 13 11:10:07 2017 +0800

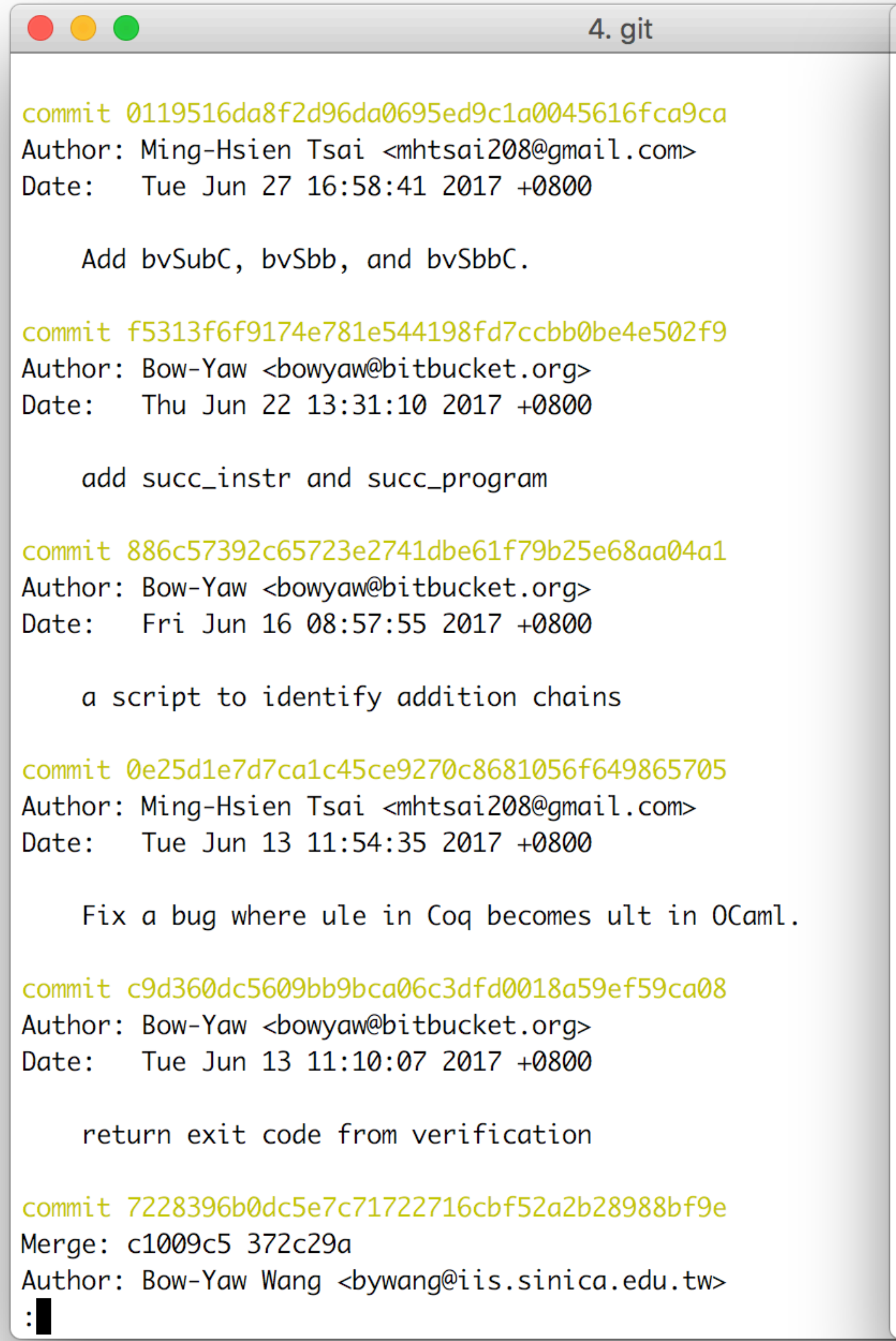
    return exit code from verification

commit 7228396b0dc5e7c71722716cbf52a2b28988bf9e
Merge: c1009c5 372c29a
Author: Bow-Yaw Wang <bywang@iis.sinica.edu.tw>
:
```

**is is the ID of the version**

```
5284020b1c6d85f9
208@gmail.com>
7 +0800
```

# History



```
commit 0119516da8f2d96da0695ed9c1a0045616fca9ca
Author: Ming-Hsien Tsai <mhtsai208@gmail.com>
Date:   Tue Jun 27 16:58:41 2017 +0800

    Add bvSubC, bvSbb, and bvSbbC.

commit f5313f6f9174e781e544198fd7ccbb0be4e502f9
Author: Bow-Yaw <bowyaw@bitbucket.org>
Date:   Thu Jun 22 13:31:10 2017 +0800

    add succ_instr and succ_program

commit 886c57392c65723e2741dbe61f79b25e68aa04a1
Author: Bow-Yaw <bowyaw@bitbucket.org>
Date:   Fri Jun 16 08:57:55 2017 +0800

    a script to identify addition chains

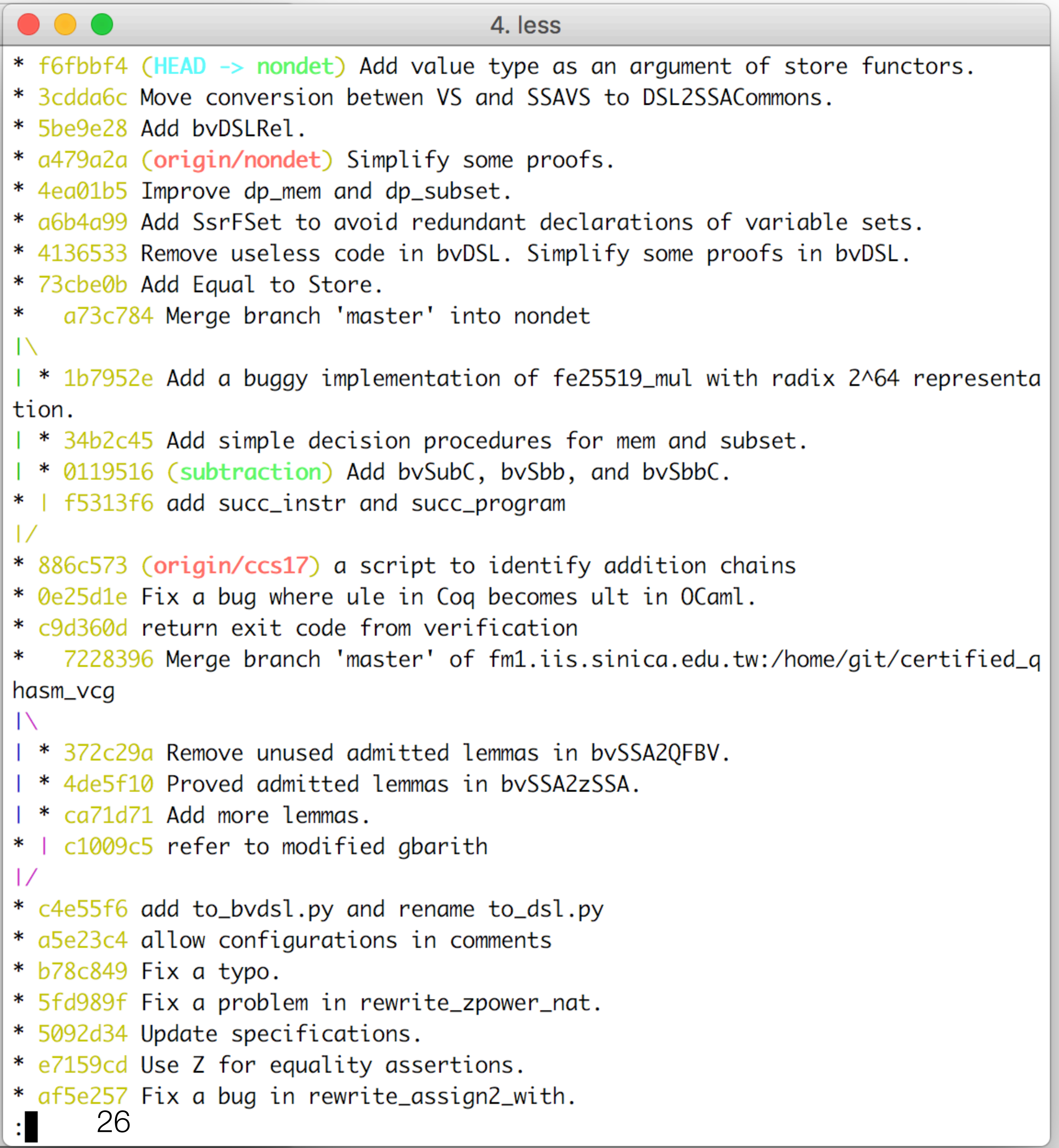
commit 0e25d1e7d7ca1c45ce9270c8681056f649865705
Author: Ming-Hsien Tsai <mhtsai208@gmail.com>
Date:   Tue Jun 13 11:54:35 2017 +0800

    Fix a bug where ule in Coq becomes ult in OCaml.

commit c9d360dc5609bb9bca06c3dfd0018a59ef59ca08
Author: Bow-Yaw <bowyaw@bitbucket.org>
Date:   Tue Jun 13 11:10:07 2017 +0800

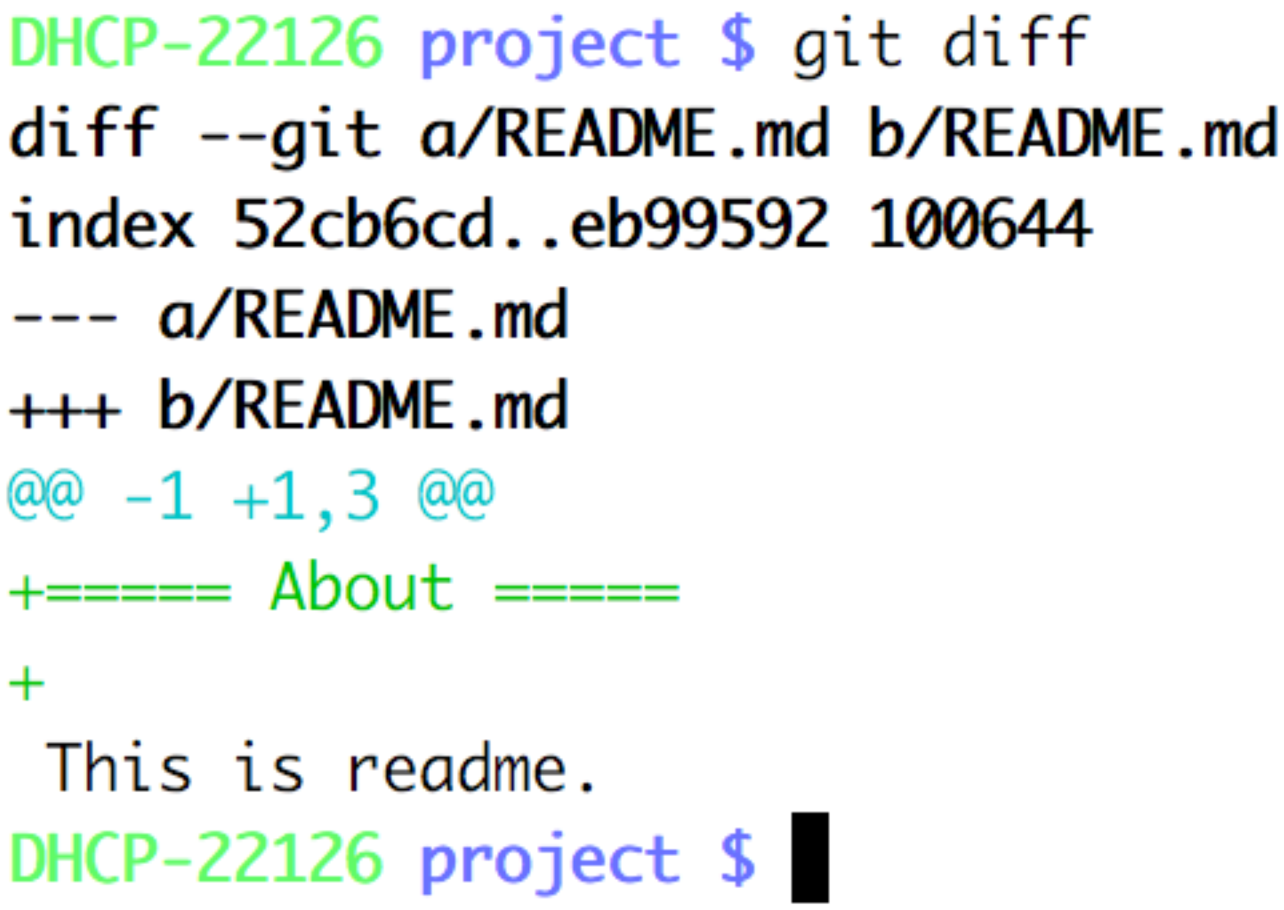
    return exit code from verification

commit 7228396b0dc5e7c71722716cbf52a2b28988bf9e
Merge: c1009c5 372c29a
Author: Bow-Yaw Wang <bywang@iis.sinica.edu.tw>
:
```



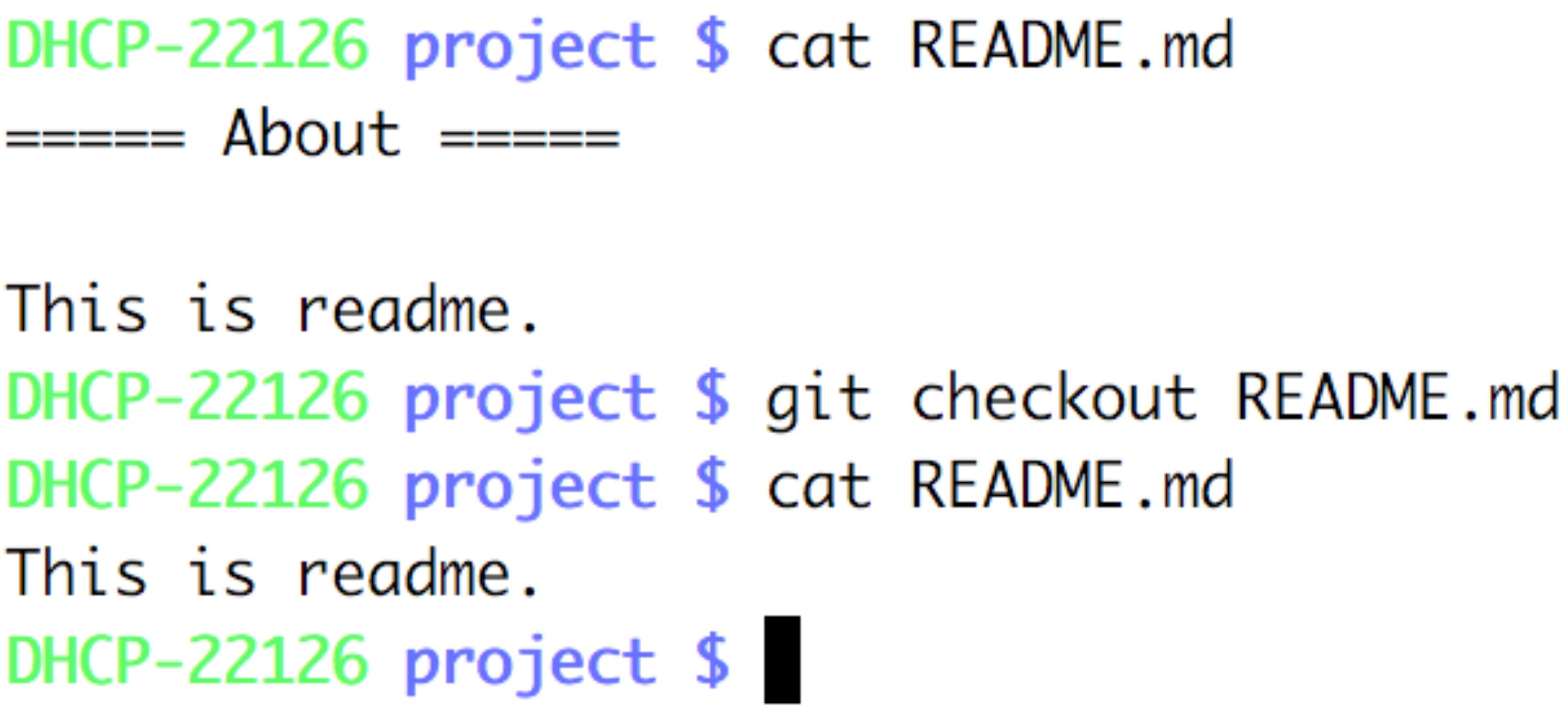
```
* f6fbbf4 (HEAD -> nondet) Add value type as an argument of store functors.
* 3cdda6c Move conversion betwen VS and SSAVS to DSL2SSACommons.
* 5be9e28 Add bvDSLRel.
* a479a2a (origin/nondet) Simplify some proofs.
* 4ea01b5 Improve dp_mem and dp_subset.
* a6b4a99 Add SsrFSet to avoid redundant declarations of variable sets.
* 4136533 Remove useless code in bvDSL. Simplify some proofs in bvDSL.
* 73cbe0b Add Equal to Store.
*   a73c784 Merge branch 'master' into nondet
|\
| * 1b7952e Add a buggy implementation of fe25519_mul with radix 2^64 representa
tion.
| * 34b2c45 Add simple decision procedures for mem and subset.
| * 0119516 (subtraction) Add bvSubC, bvSbb, and bvSbbC.
* | f5313f6 add succ_instr and succ_program
|/
* 886c573 (origin/ccs17) a script to identify addition chains
* 0e25d1e Fix a bug where ule in Coq becomes ult in OCaml.
* c9d360d return exit code from verification
*   7228396 Merge branch 'master' of fm1.iis.sinica.edu.tw:/home/git/certified_q
hasm_vcg
|\
| * 372c29a Remove unused admitted lemmas in bvSSA2QFBV.
| * 4de5f10 Proved admitted lemmas in bvSSA2zSSA.
| * ca71d71 Add more lemmas.
* | c1009c5 refer to modified gbarith
|/
* c4e55f6 add to_bvdsl.py and rename to_dsl.py
* a5e23c4 allow configurations in comments
* b78c849 Fix a typo.
* 5fd989f Fix a problem in rewrite_zpower_nat.
* 5092d34 Update specifications.
* e7159cd Use Z for equality assertions.
* af5e257 Fix a bug in rewrite_assign2_with.
:
```

# File Difference



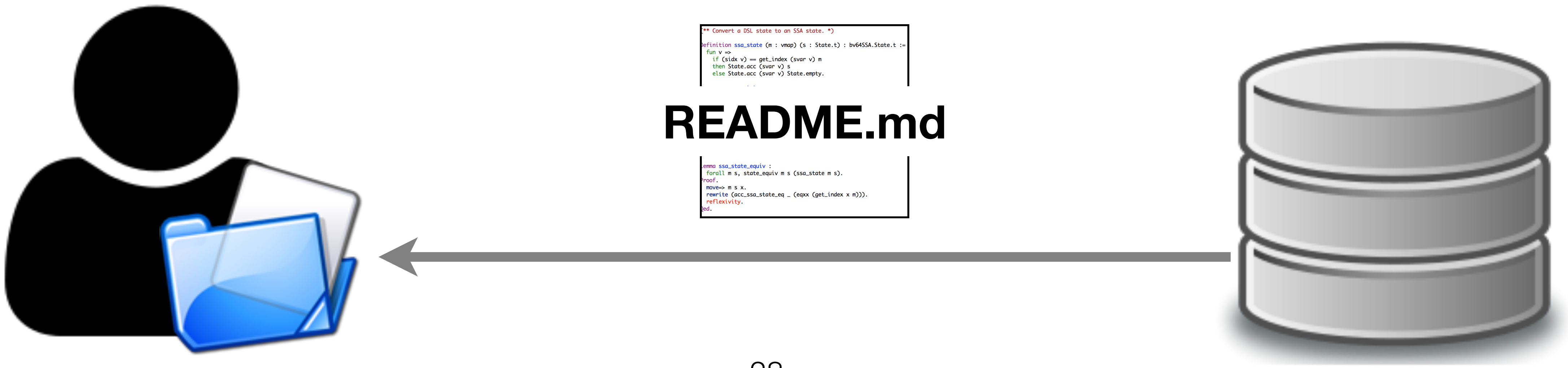
```
DHCP-22126 project $ git diff
diff --git a/README.md b/README.md
index 52cb6cd..eb99592 100644
--- a/README.md
+++ b/README.md
@@ -1 +1,3 @@
+===== About =====
+
 This is readme.
DHCP-22126 project $ █
```

# File Restore (Checkout)

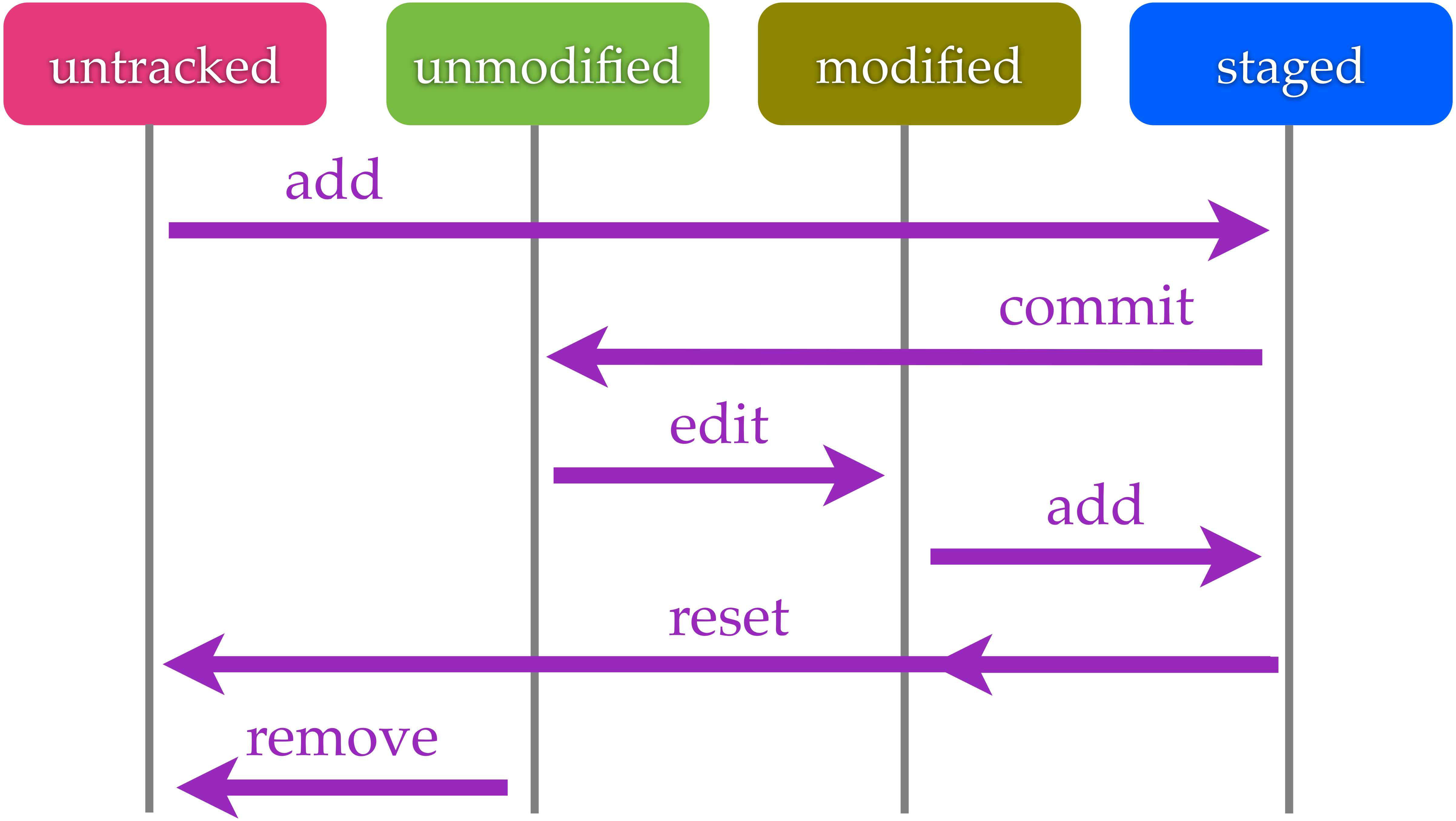


```
DHCP-22126 project $ cat README.md
===== About =====

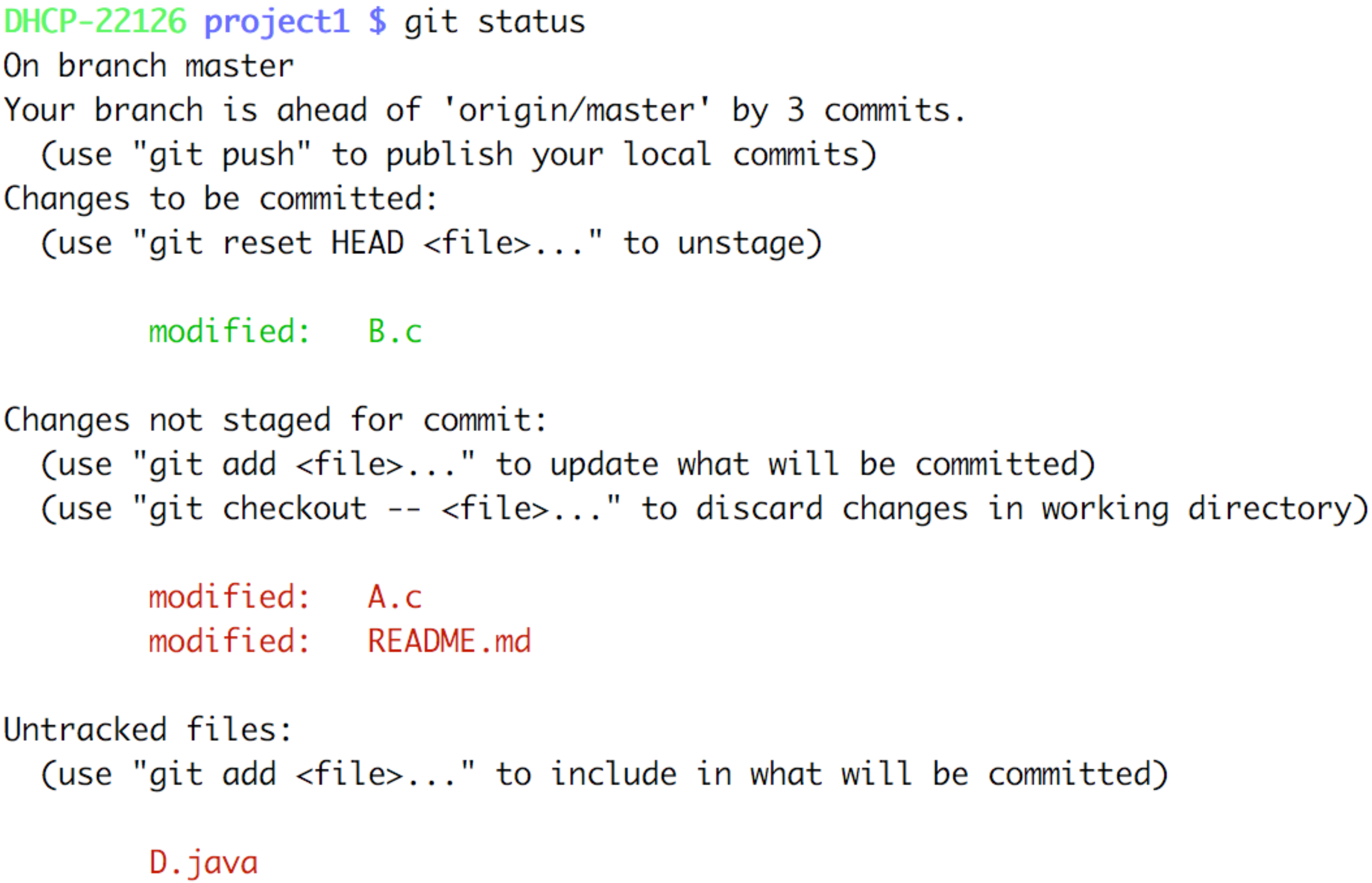
This is readme.
DHCP-22126 project $ git checkout README.md
DHCP-22126 project $ cat README.md
This is readme.
DHCP-22126 project $ █
```



# File Status


untracked
unmodified
modified
staged
add
commit
edit
add
reset
remove

# File Status



```
DHCP-22126 project1 $ git status
On branch master
Your branch is ahead of 'origin/master' by 3 commits.
  (use "git push" to publish your local commits)
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   B.c

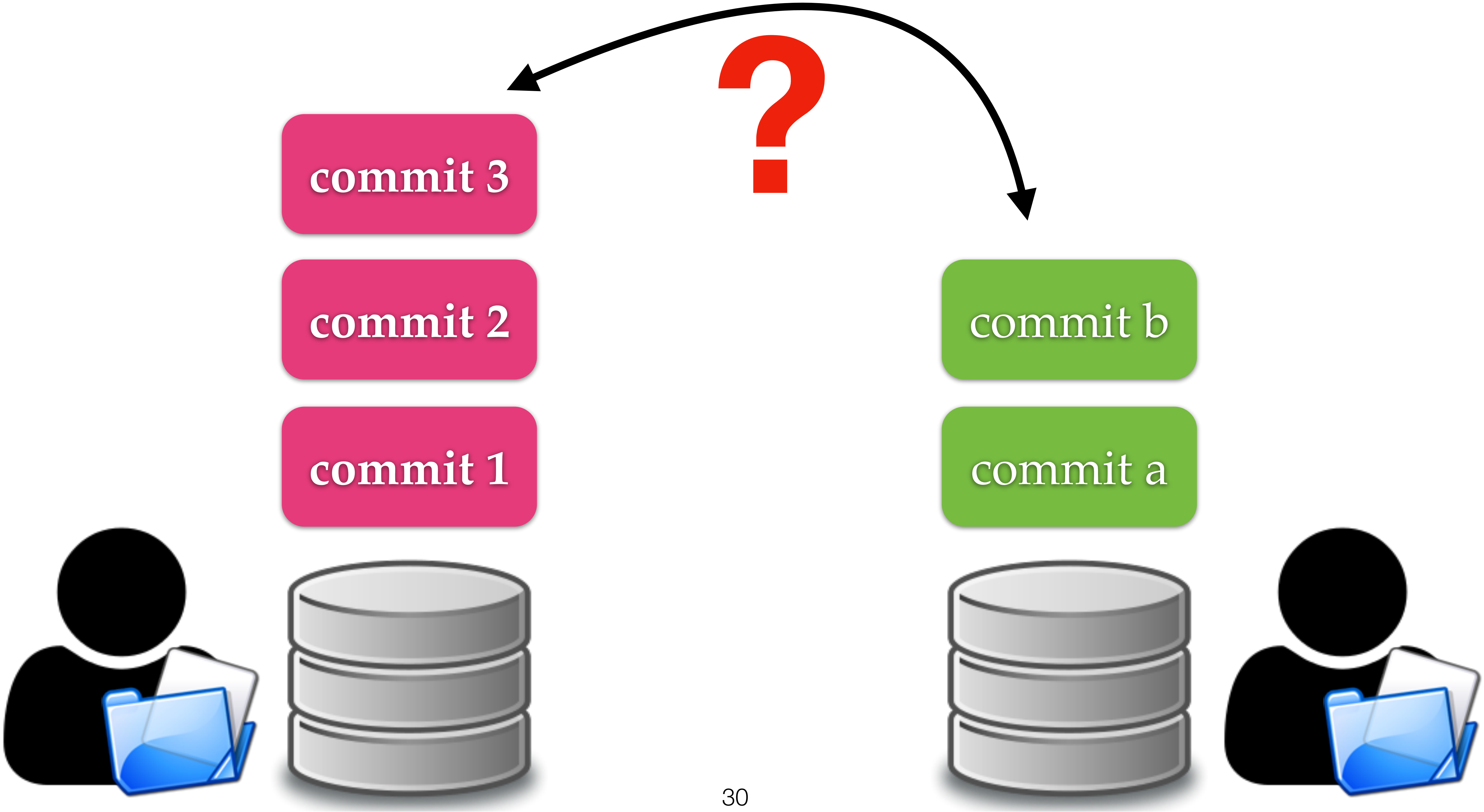
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   A.c
        modified:   README.md

Untracked files:
  (use "git add <file>..." to include in what will be committed)

        D.java
```

# Synchronization



commit 3

commit 2

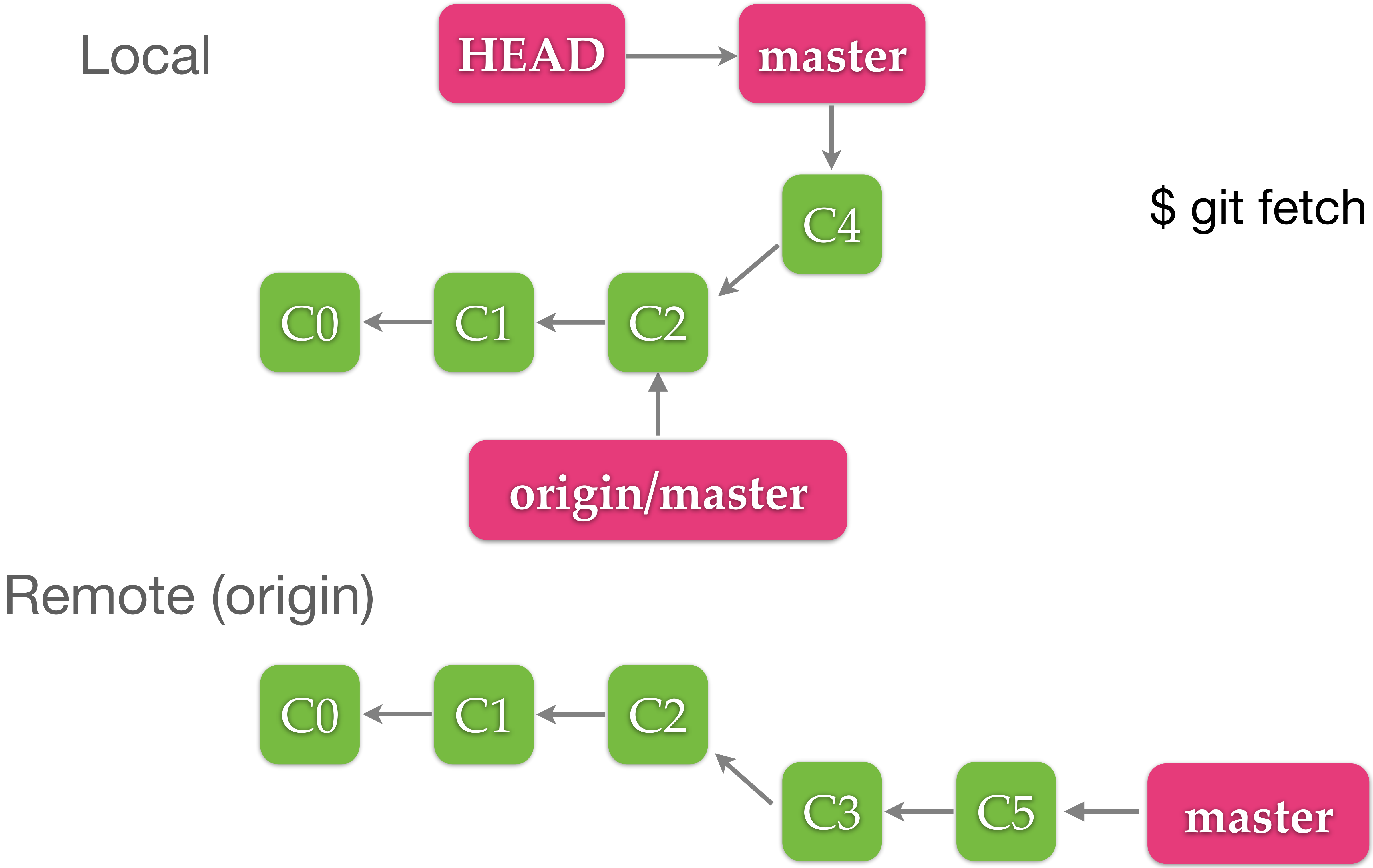
commit 1

commit b

commit a

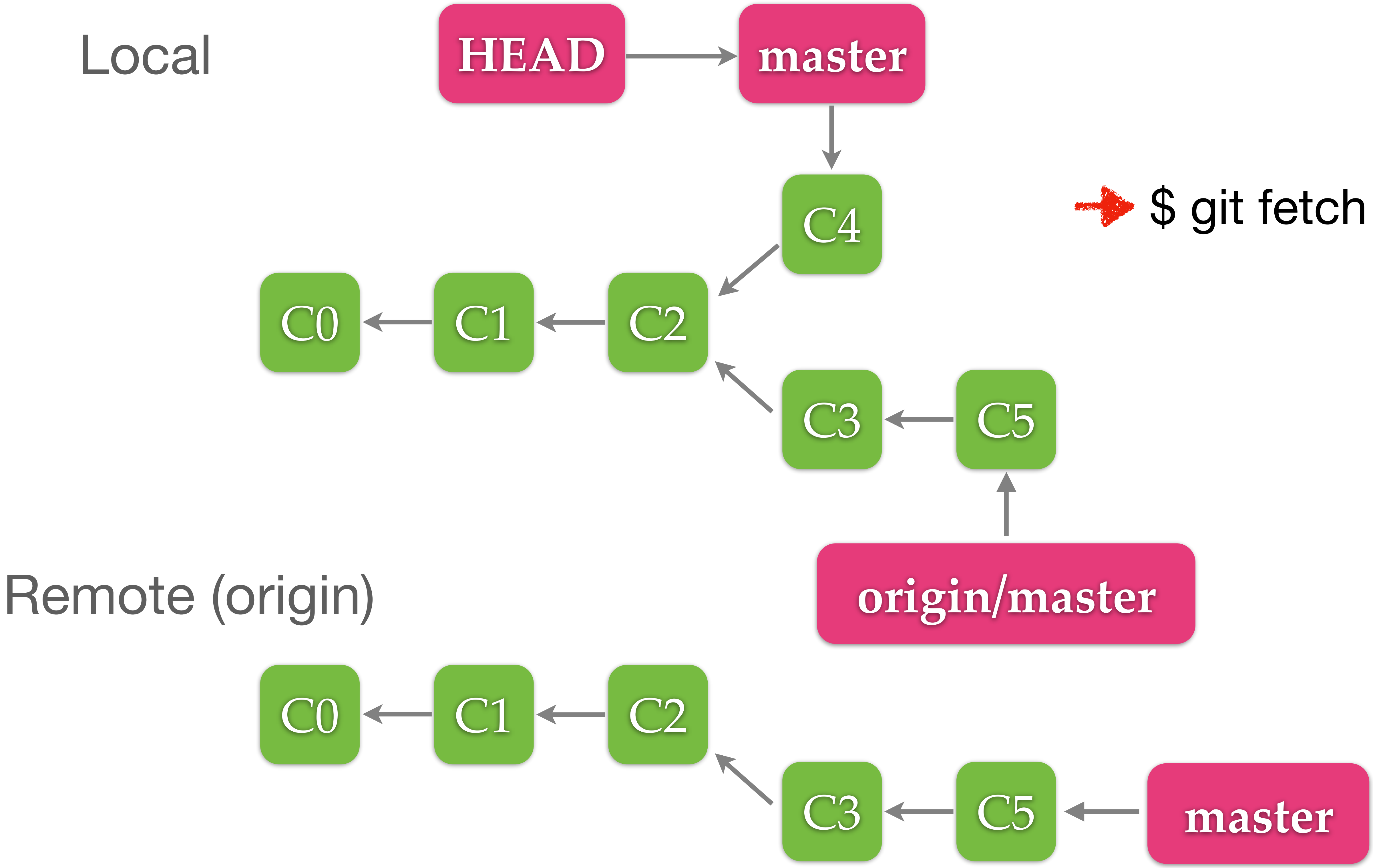
?

# Fetch


Local
HEAD
master
C4
C0
C1
C2
origin/master
Remote (origin)
C0
C1
C2
C3
C5
master

```
$ git fetch
```

# Fetch



Local

HEAD

master

C4

C0

C1

C2

C3

C5

origin/master

Remote (origin)

C0

C1

C2

C3

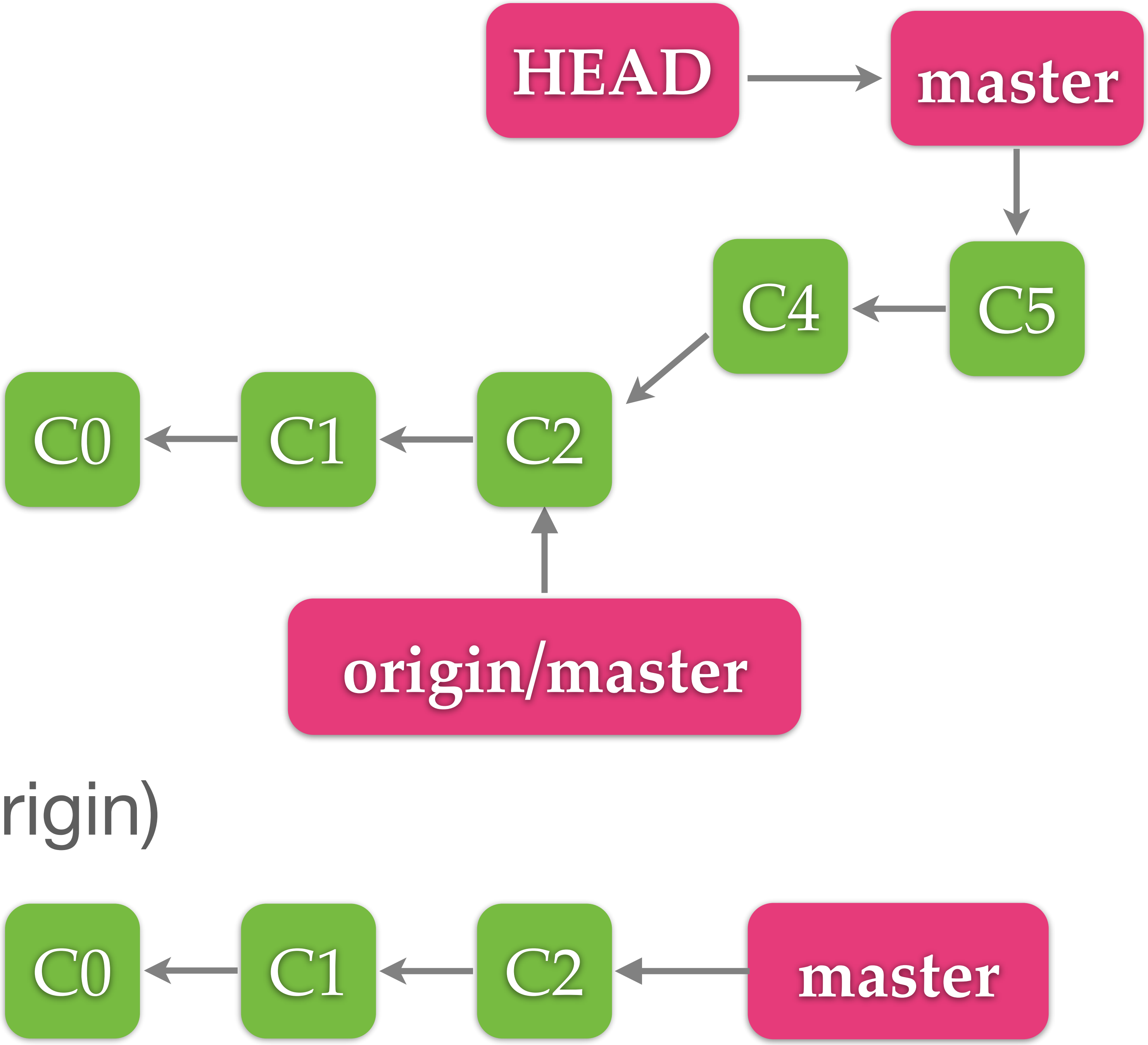
C5

master

```
$ git fetch
```

# Push

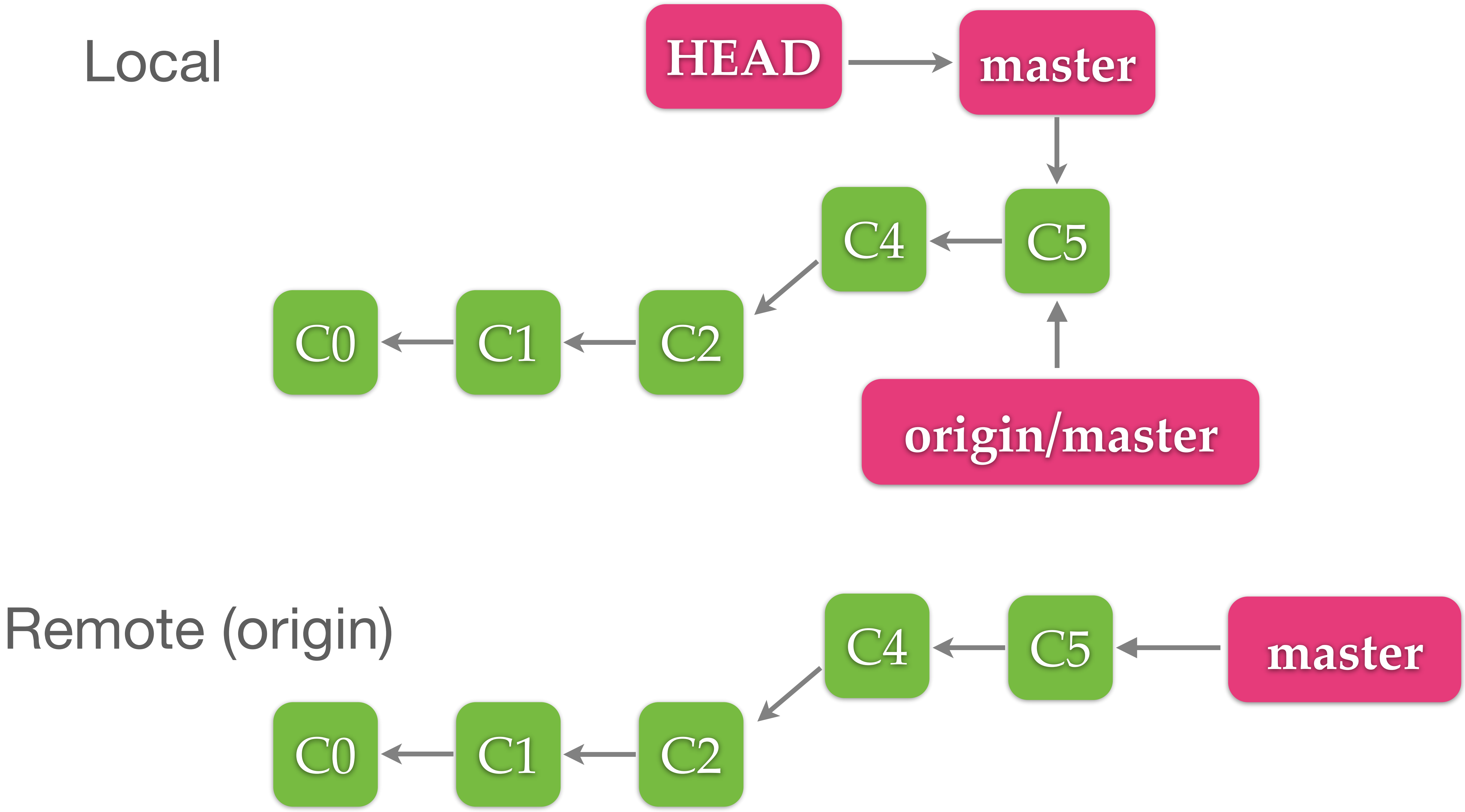
Local


HEAD
master
C4
C5
C0
C1
C2
origin/master
C0
C1
C2
master

Remote (origin)

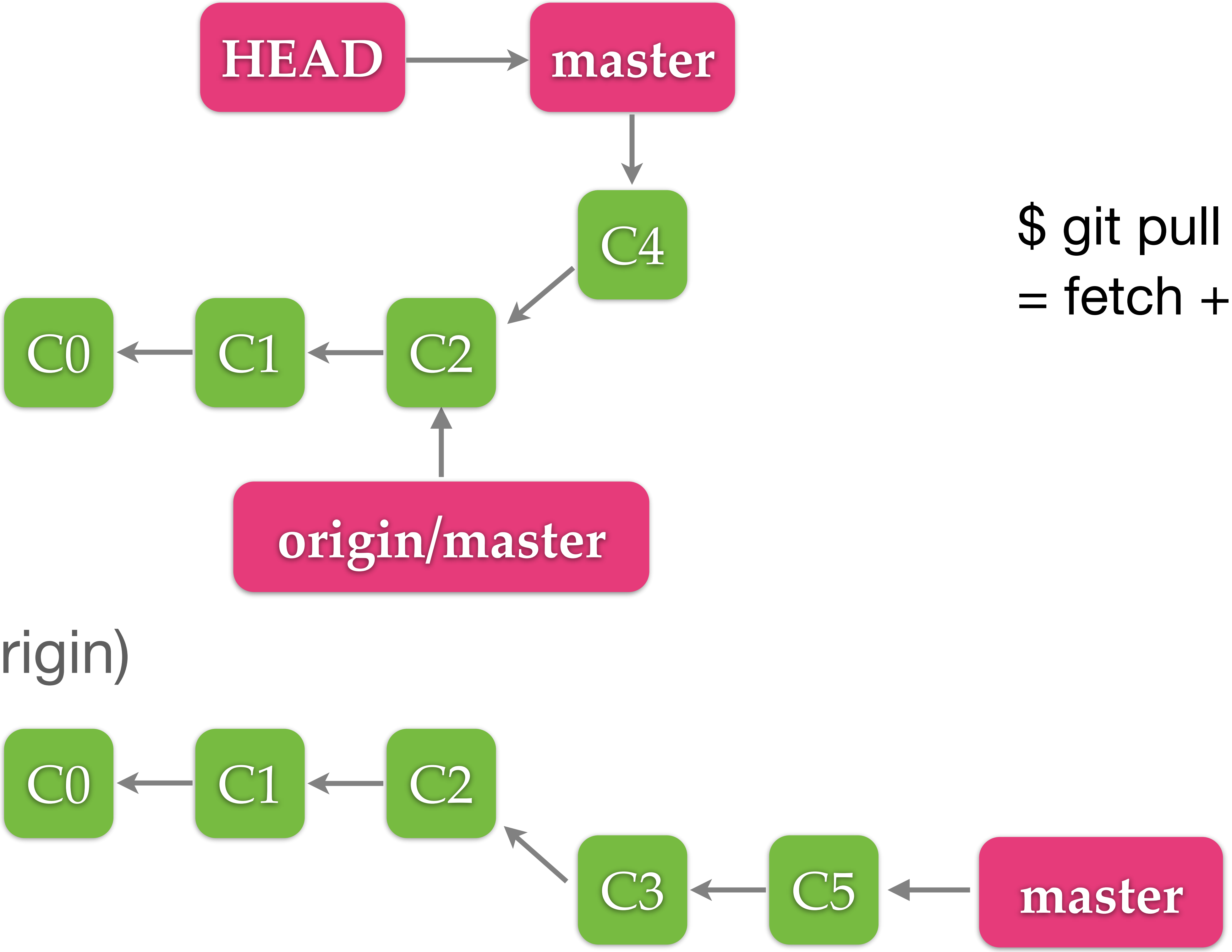
$ git push origin master

# Push


Local
HEAD
master
C4
C5
C0
C1
C2
origin/master
Remote (origin)
C4
C5
master
C0
C1
C2

```
$ git push origin master
```

# Pull



Local

HEAD

master

C4

C0

C1

C2

origin/master

Remote (origin)

C0

C1

C2

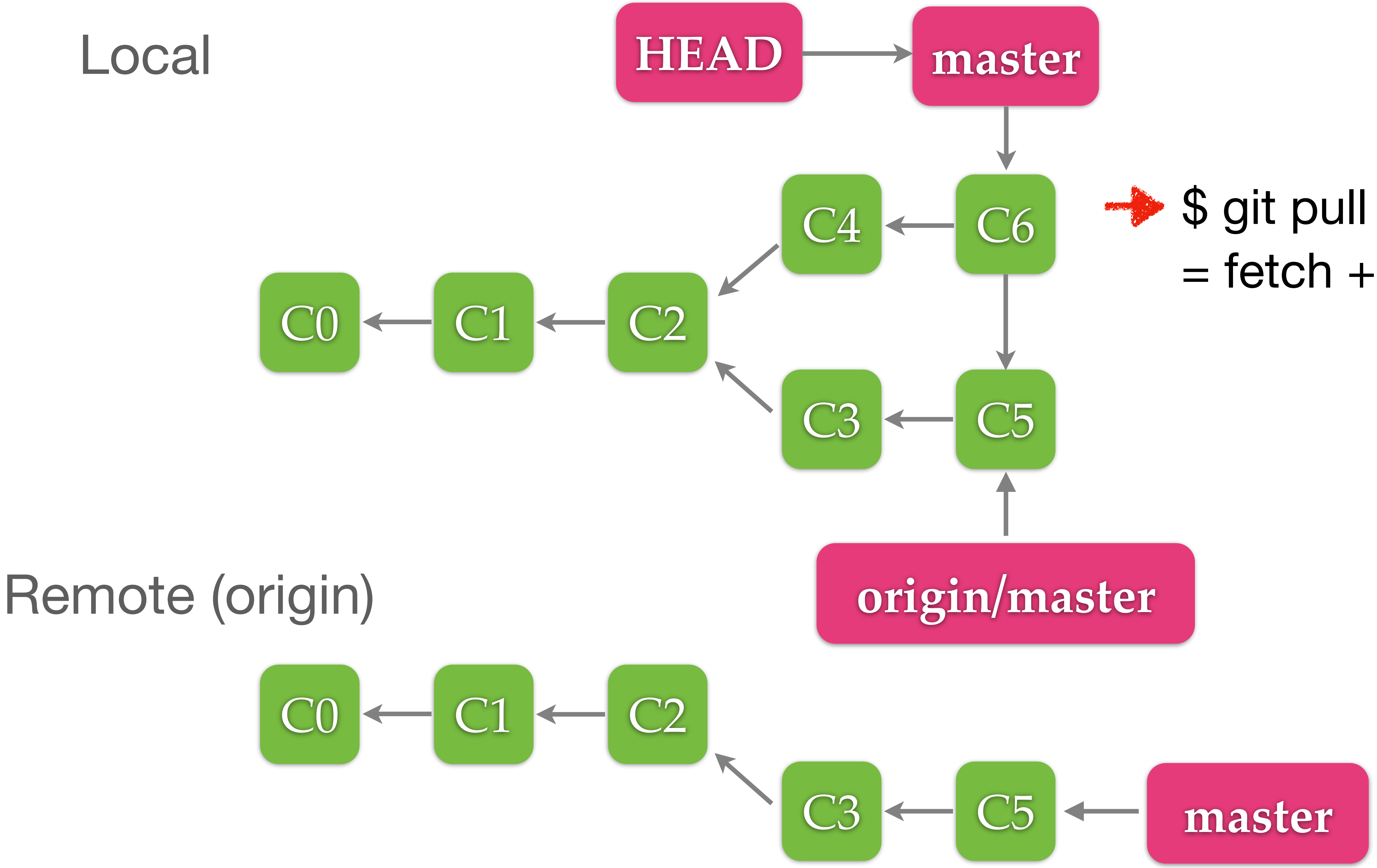
C3

C5

master

```
$ git pull
= fetch + merge
```

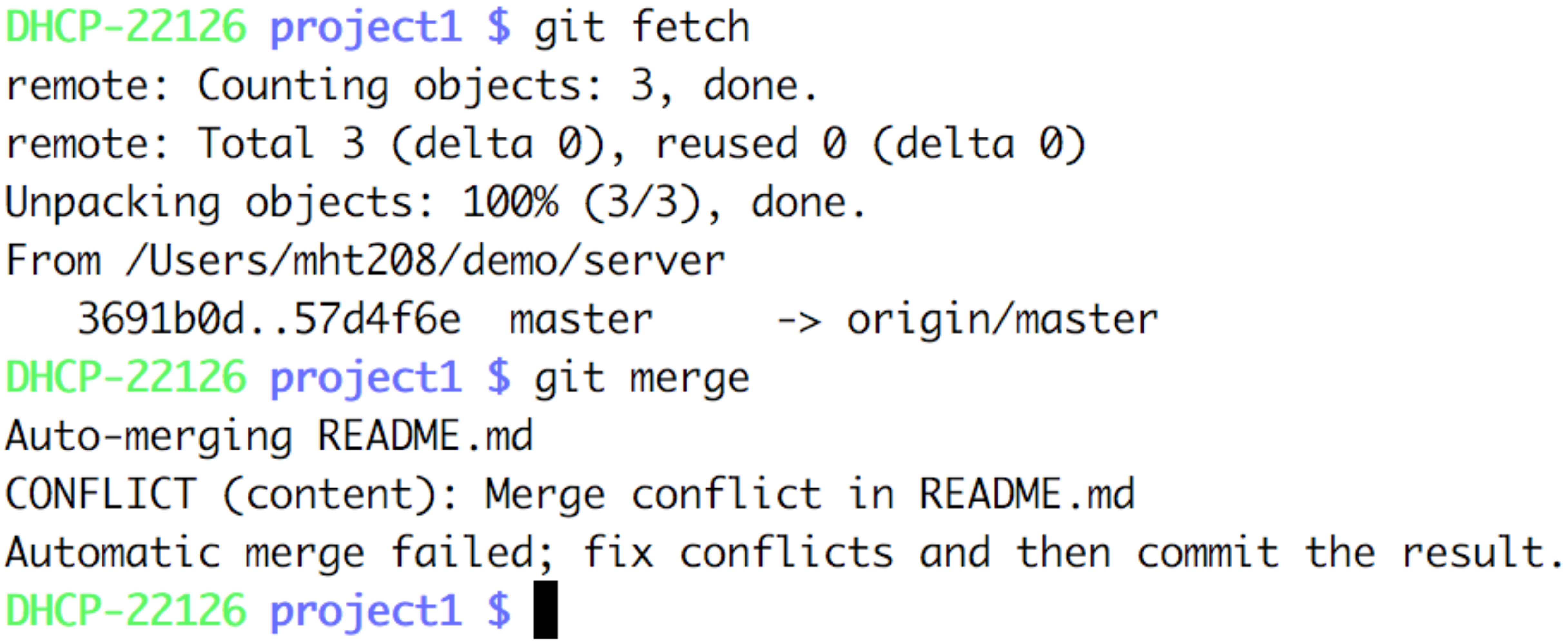
# Pull


Local
HEAD
master
C4
C6
C0
C1
C2
C3
C5
origin/master
Remote (origin)
C0
C1
C2
C3
C5
master

```
$ git pull
```

= fetch + merge

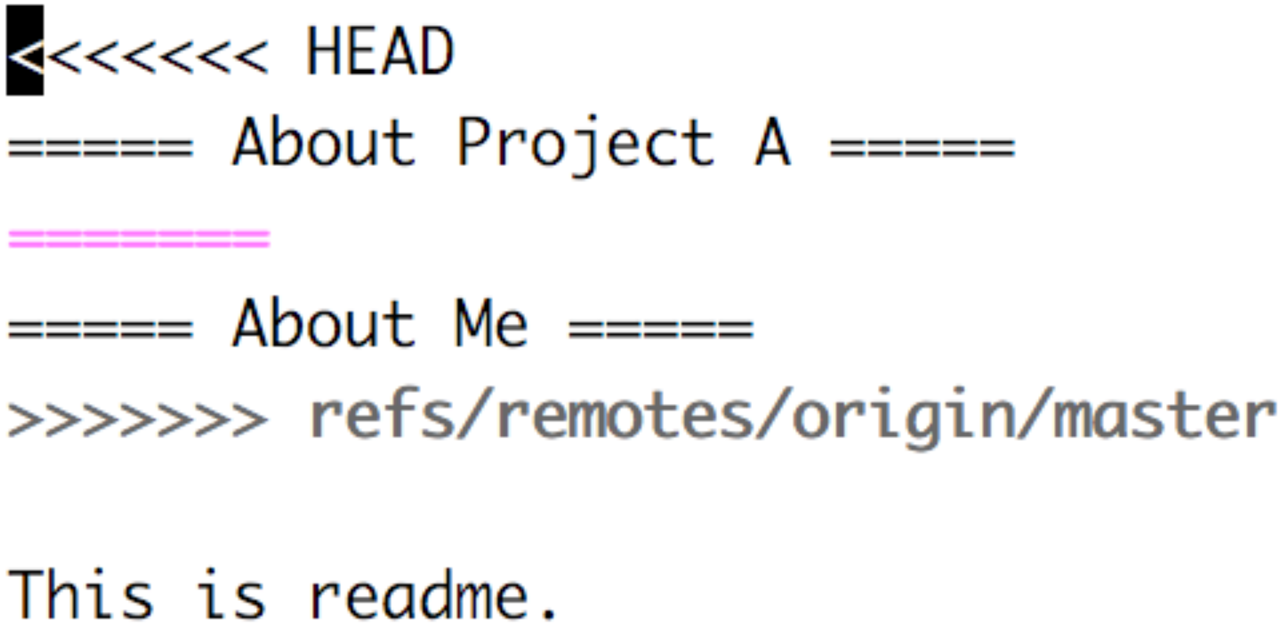
# Resolve Conflicts



```
DHCP-22126 project1 $ git fetch
remote: Counting objects: 3, done.
remote: Total 3 (delta 0), reused 0 (delta 0)
Unpacking objects: 100% (3/3), done.
From /Users/mht208/demo/server
   3691b0d..57d4f6e  master     -> origin/master
DHCP-22126 project1 $ git merge
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
Automatic merge failed; fix conflicts and then commit the result.
DHCP-22126 project1 $ █
```

# Resolve Conflicts

1. Edit files with conflicts

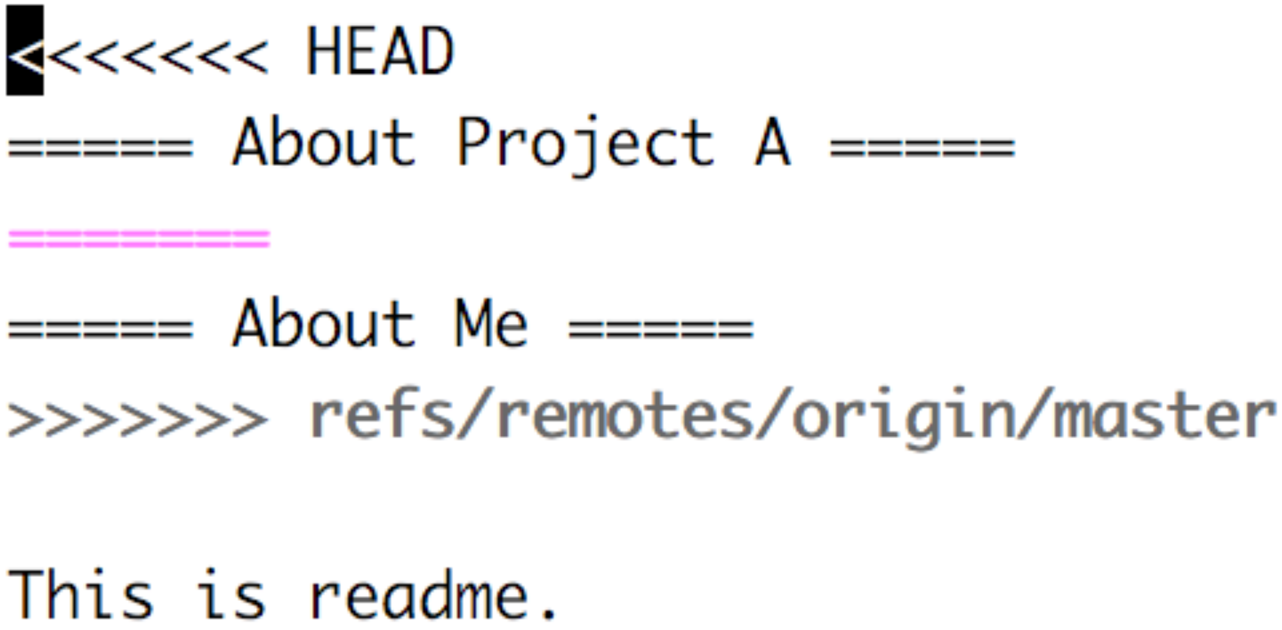


```
<<<<<<< HEAD
===== About Project A =====
=======
===== About Me =====
>>>>>>> refs/remotes/origin/master

This is readme.
```

# Resolve Conflicts

1. Edit files with conflicts
2. git add

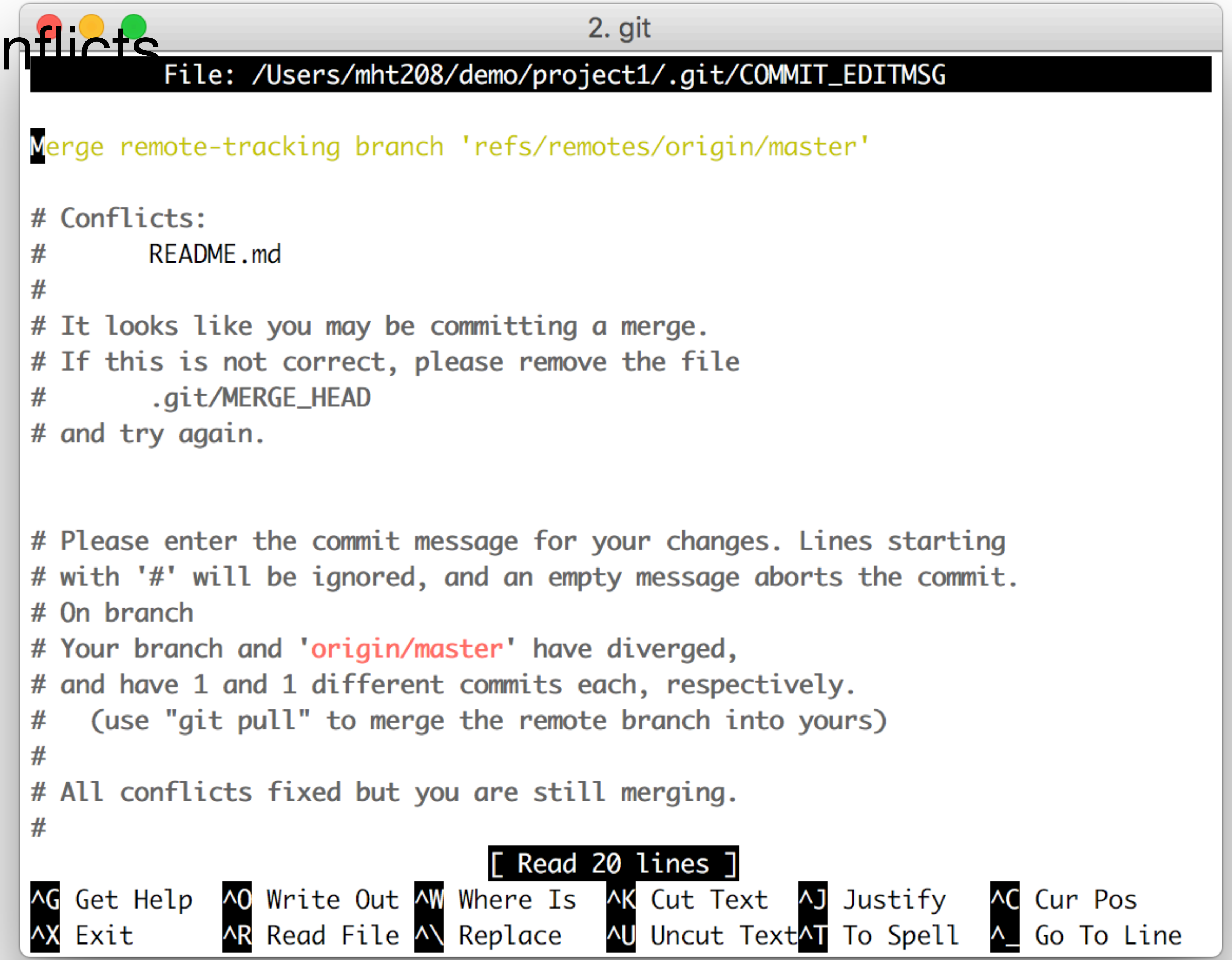


```
<<<<<<< HEAD
===== About Project A =====
=======
===== About Me =====
>>>>>>> refs/remotes/origin/master

This is readme.
```

# Resolve Conflicts

1. Edit files with conflicts
2. git add
3. git commit



```
            File: /Users/mht208/demo/project1/.git/COMMIT_EDITMSG

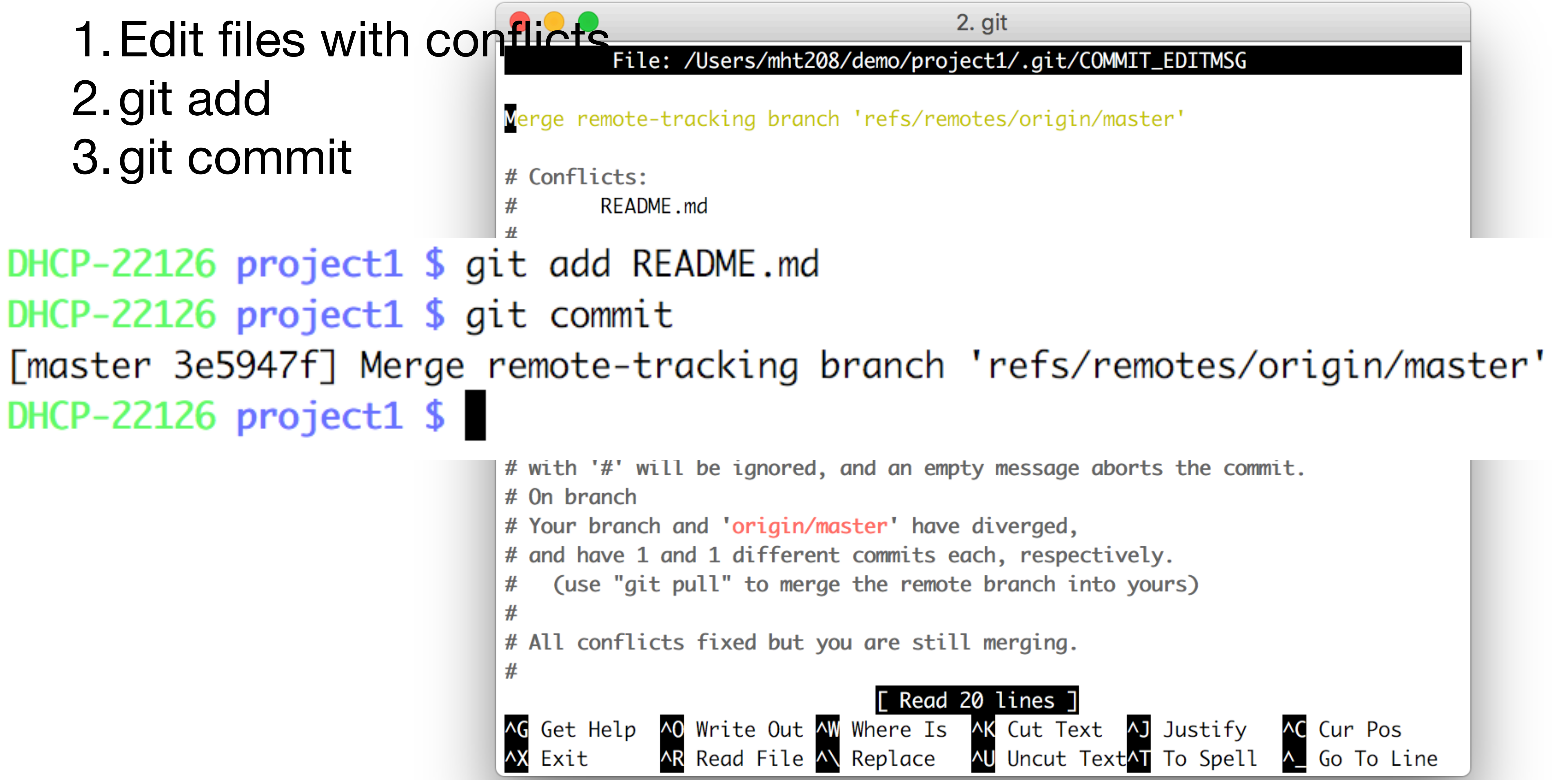
Merge remote-tracking branch 'refs/remotes/origin/master'

# Conflicts:
#       README.md
#
# It looks like you may be committing a merge.
# If this is not correct, please remove the file
#       .git/MERGE_HEAD
# and try again.


# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
# On branch
# Your branch and 'origin/master' have diverged,
# and have 1 and 1 different commits each, respectively.
#   (use "git pull" to merge the remote branch into yours)
#
# All conflicts fixed but you are still merging.
#
                            [ Read 20 lines ]
^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace   ^U Uncut Text^T To Spell  ^_ Go To Line
```

# Resolve Conflicts

1. Edit files with conflicts
2. git add
3. git commit



```
File: /Users/mht208/demo/project1/.git/COMMIT_EDITMSG

Merge remote-tracking branch 'refs/remotes/origin/master'

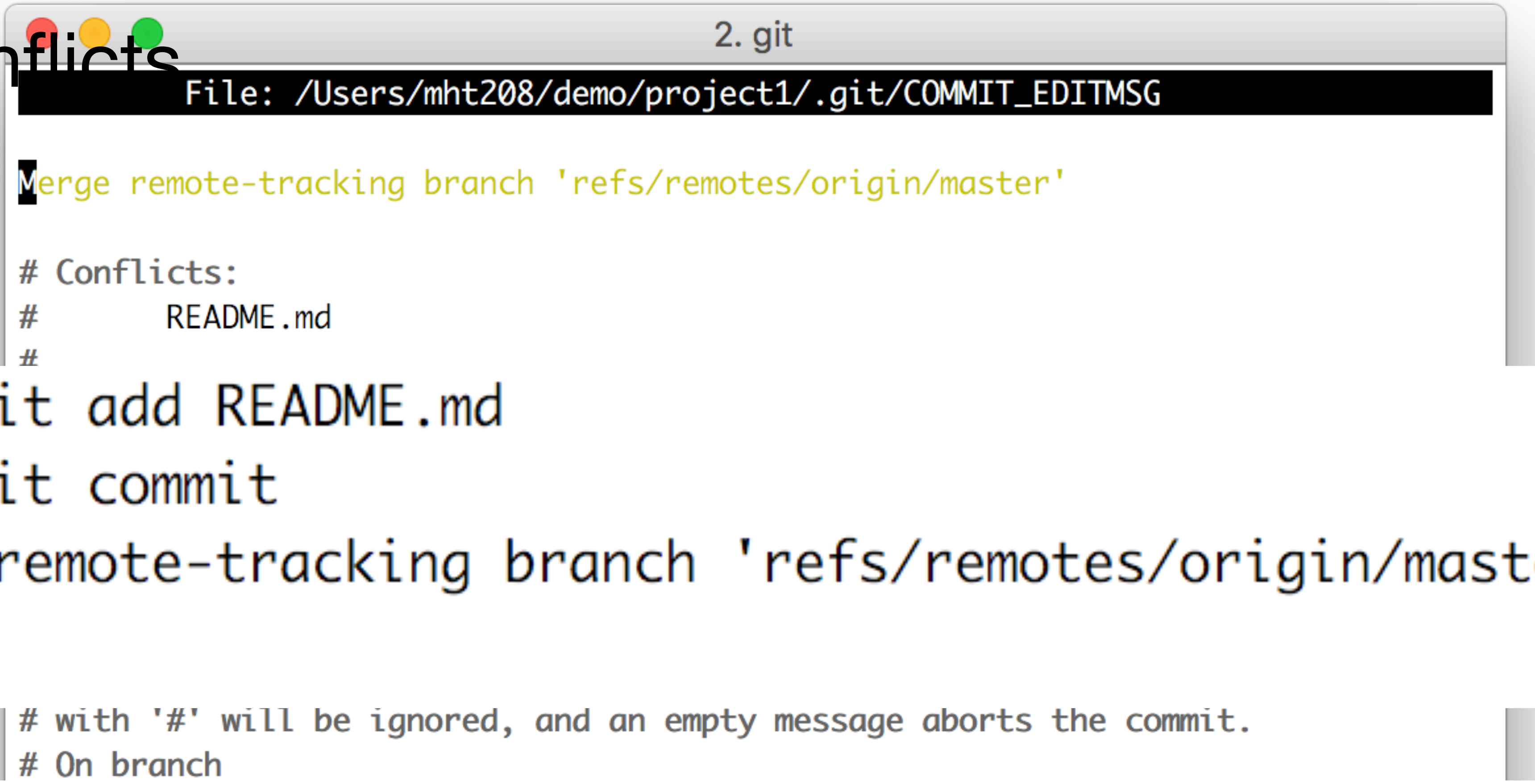
# Conflicts:
#       README.md
#
```

```
DHCP-22126 project1 $ git add README.md
DHCP-22126 project1 $ git commit
[master 3e5947f] Merge remote-tracking branch 'refs/remotes/origin/master'
DHCP-22126 project1 $ 
```

```
# with '#' will be ignored, and an empty message aborts the commit.
# On branch
# Your branch and 'origin/master' have diverged,
# and have 1 and 1 different commits each, respectively.
#   (use "git pull" to merge the remote branch into yours)
#
# All conflicts fixed but you are still merging.
#
                              [ Read 20 lines ]
^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace   ^U Uncut Text^T To Spell  ^_ Go To Line
```

# Resolve Conflicts

1. Edit files with conflicts
2. git add
3. git commit



```
  File: /Users/mht208/demo/project1/.git/COMMIT_EDITMSG

Merge remote-tracking branch 'refs/remotes/origin/master'

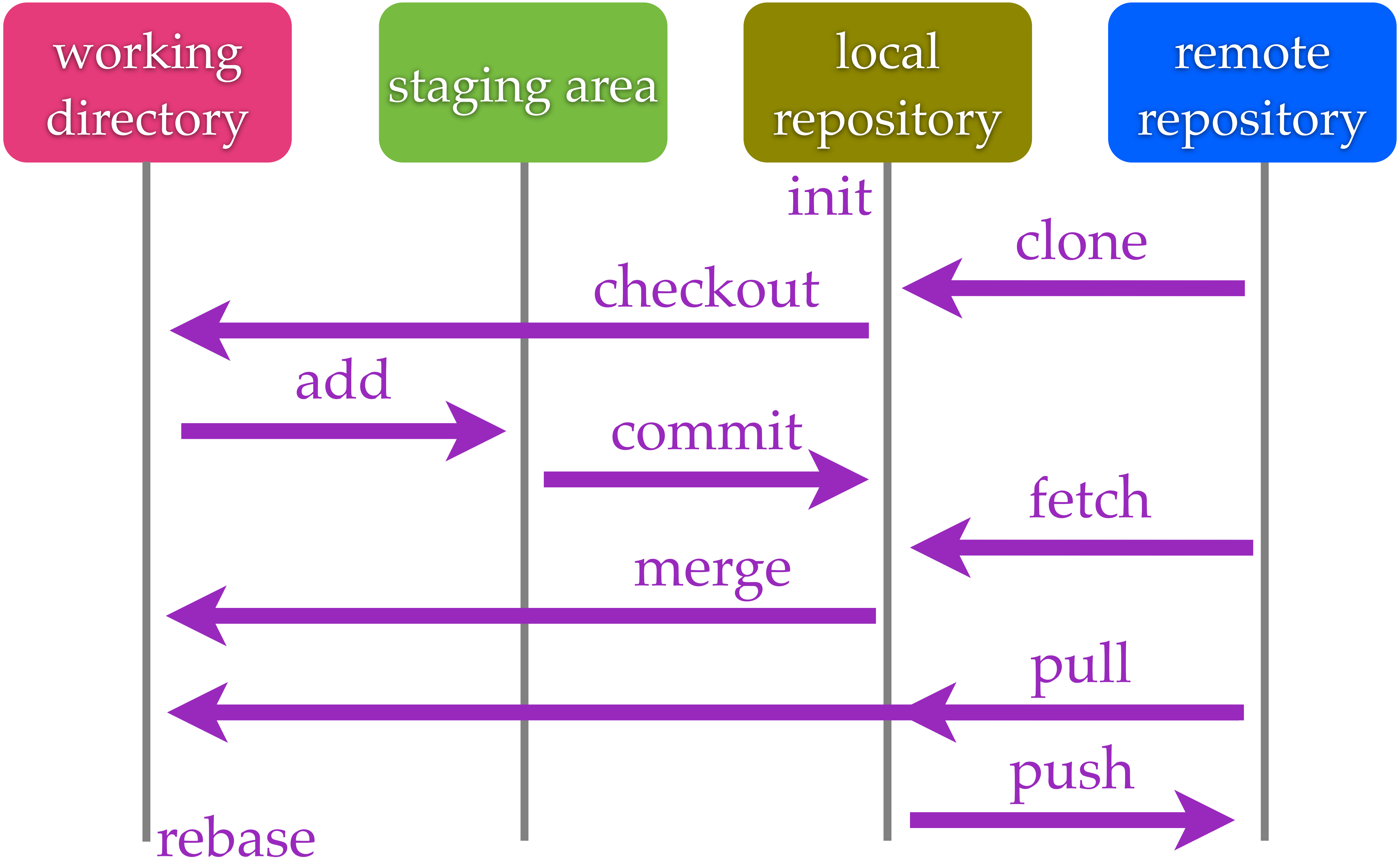
# Conflicts:
#       README.md
#
```

```
# with '#' will be ignored, and an empty message aborts the commit.
# On branch
```

```
DHCP-22126 project1 $ git add README.md
DHCP-22126 project1 $ git commit
[master 3e5947f] Merge remote-tracking branch 'refs/remotes/origin/master'
DHCP-22126 project1 $ 
```

```
*   3e5947f (HEAD -> master) Merge remote-tracking branch 'refs/remotes/origin/m
aster'
|\
| * 57d4f6e (origin/master) Modify README.md.
* | 22804d8 Modify README.md.
|/
* 3691b0d Add README.md.
```

# Summary



working directory

staging area

local repository

remote repository

init

clone

checkout

add

commit

fetch

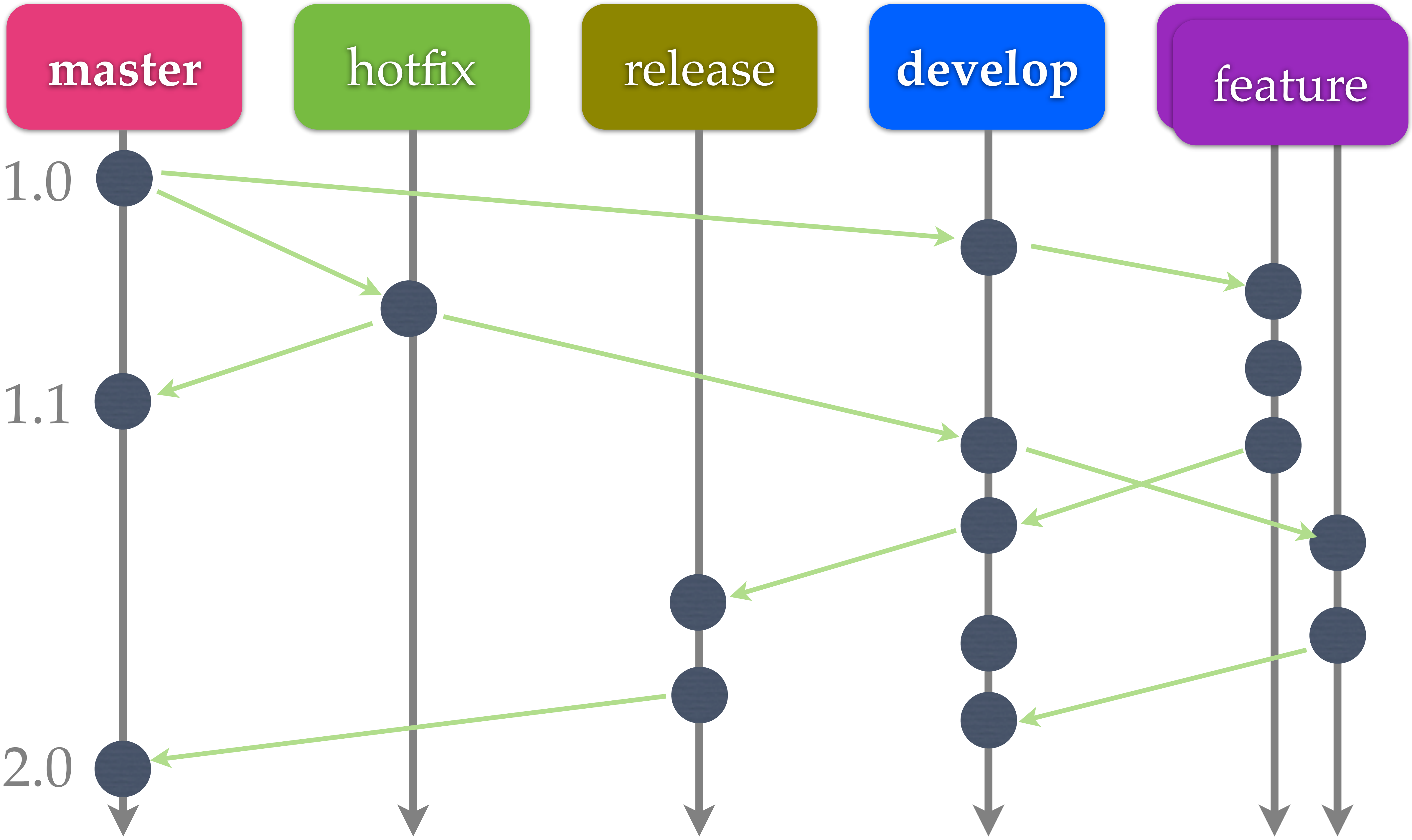
merge

pull

push

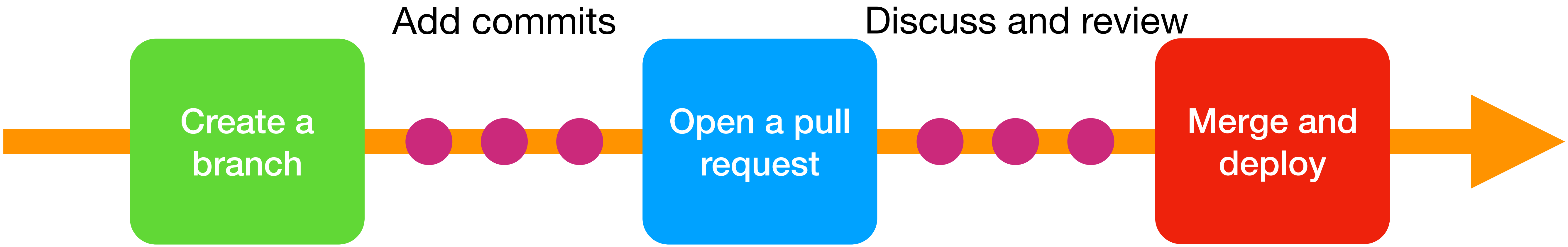
rebase

# Git Flow


master
hotfix
release
develop
feature
1.0
1.1
2.0

http://nvie.com/posts/a-successful-git-branching-model/

# GitHub Flow



Add commits

Discuss and review

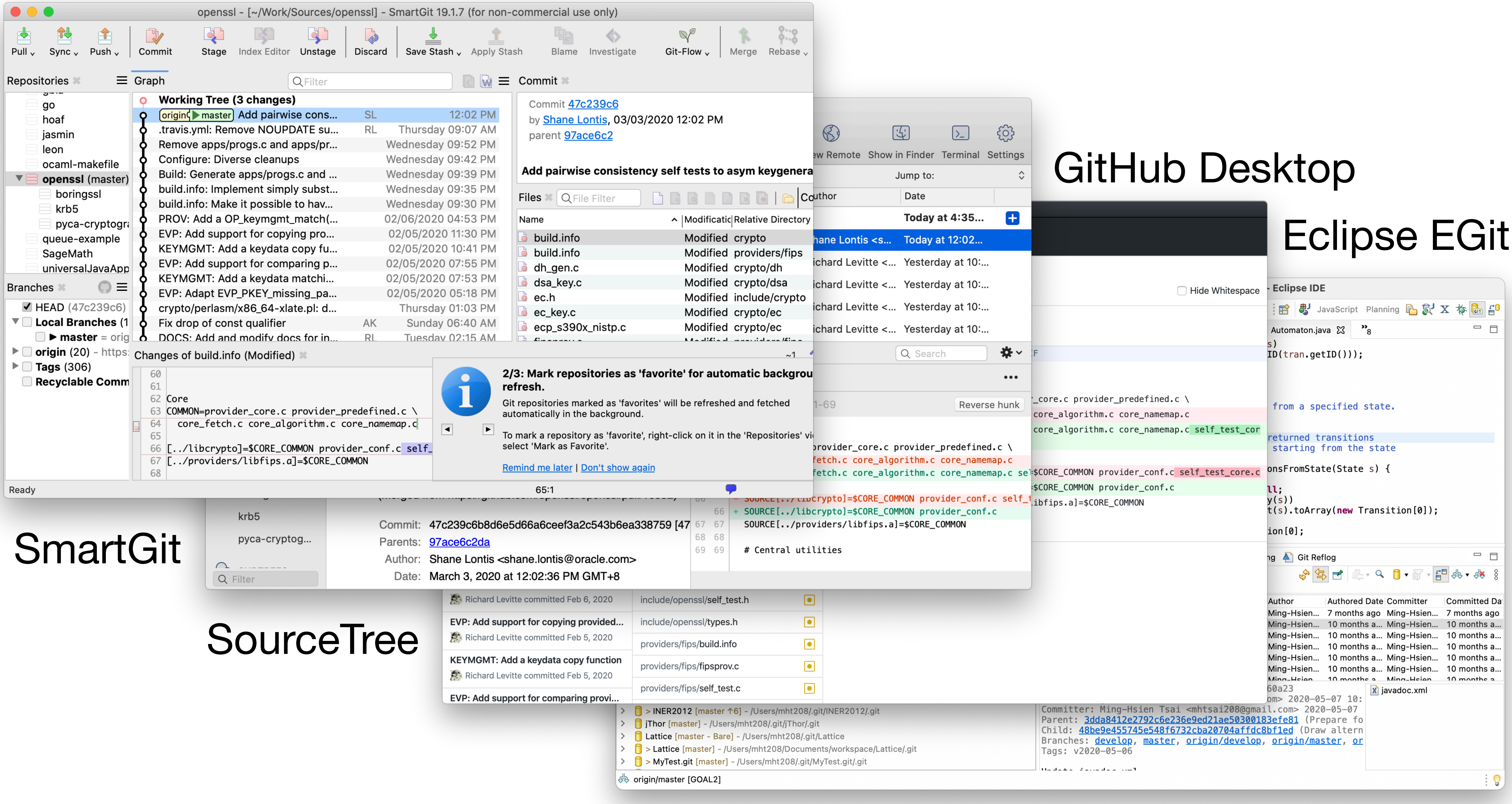
Create a branch

Open a pull request

Merge and deploy

https://docs.github.com/en/get-started/quickstart/github-flow

# GUI Clients



go
hoaf
jasmin
leon
ocaml-makefile
openssl (master)
boringssl
krb5
pyca-cryptogr
queue-example
SageMath
universalJavaApp

☑ HEAD (47c239c6)
☐ **Local Branches** (1
☐ ▶ **master** = orig
☐ **origin** (20) - https:
☐ **Tags** (306)
☐ **Recyclable Comm**

| | | |
|---|---|---|
| **Working Tree (3 changes)** | | |
| origin ▶ master Add pairwise cons... | SL | 12:02 PM |
| .travis.yml: Remove NOUPDATE su... | RL | Thursday 09:07 AM |
| Remove apps/progs.c and apps/pr... | | Wednesday 09:52 PM |
| Configure: Diverse cleanups | | Wednesday 09:42 PM |
| Build: Generate apps/progs.c and ... | | Wednesday 09:39 PM |
| build.info: Implement simply subst... | | Wednesday 09:35 PM |
| build.info: Make it possible to hav... | | Wednesday 09:30 PM |
| PROV: Add a OP_keymgmt_match(... | | 02/06/2020 04:53 PM |
| EVP: Add support for copying pro... | | 02/05/2020 11:30 PM |
| KEYMGMT: Add a keydata copy fu... | | 02/05/2020 10:41 PM |
| EVP: Add support for comparing p... | | 02/05/2020 07:55 PM |
| KEYMGMT: Add a keydata matchi... | | 02/05/2020 07:53 PM |
| EVP: Adapt EVP_PKEY_missing_pa... | | 02/05/2020 05:18 PM |
| crypto/perlasm/x86_64-xlate.pl: d... | | Thursday 01:03 PM |
| Fix drop of const qualifier | AK | Sunday 06:40 AM |
| DOCS: Add and modify docs for in... | RL | Tuesday 02:15 AM |

Commit 47c239c6
by Shane Lontis, 03/03/2020 12:02 PM
parent 97ace6c2

**Add pairwise consistency self tests to asym keygenera**

| Name | Modification | Relative Directory |
|---|---|---|
| build.info | Modified | crypto |
| build.info | Modified | providers/fips |
| dh_gen.c | Modified | crypto/dh |
| dsa_key.c | Modified | crypto/dsa |
| ec.h | Modified | include/crypto |
| ec_key.c | Modified | crypto/ec |
| ecp_s390x_nistp.c | Modified | crypto/ec |

Changes of build.info (Modified)

```
Core
COMMON=provider_core.c provider_predefined.c \
  core_fetch.c core_algorithm.c core_namemap.c

[../libcrypto]=$CORE_COMMON provider_conf.c self_
[../providers/libfips.a]=$CORE_COMMON
```

**2/3: Mark repositories as 'favorite' for automatic backgrou refresh.**

Git repositories marked as 'favorites' will be refreshed and fetched automatically in the background.

To mark a repository as 'favorite', right-click on it in the 'Repositories' vi select 'Mark as Favorite'.

Remind me later | Don't show again

| Author | Date |
|---|---|
| | Today at 4:35... |
| hane Lontis <s... | Today at 12:02... |
| ichard Levitte <... | Yesterday at 10:... |
| ichard Levitte <... | Yesterday at 10:... |
| ichard Levitte <... | Yesterday at 10:... |
| ichard Levitte <... | Yesterday at 10:... |

```
provider_core.c provider_predefined.c \
fetch.c core_algorithm.c core_namemap.c
fetch.c core_algorithm.c core_namemap.c se
SOURCE[../libcrypto]=$CORE_COMMON provider_conf.c self_
+ SOURCE[../libcrypto]=$CORE_COMMON provider_conf.c
SOURCE[../providers/libfips.a]=$CORE_COMMON

# Central utilities
```

krb5
pyca-cryptog...

Commit: 47c239c6b8d6e5d66a6ceef3a2c543b6ea338759 [47
Parents: 97ace6c2da
Author: Shane Lontis <shane.lontis@oracle.com>
Date: March 3, 2020 at 12:02:36 PM GMT+8

Richard Levitte committed Feb 6, 2020
EVP: Add support for copying provided...
Richard Levitte committed Feb 5, 2020
KEYMGMT: Add a keydata copy function
Richard Levitte committed Feb 5, 2020
EVP: Add support for comparing provi...

include/openssl/self_test.h
include/openssl/types.h
providers/fips/build.info
providers/fips/fipsprov.c
providers/fips/self_test.c

```
_core.c provider_predefined.c \
core_algorithm.c core_namemap.c
core_algorithm.c core_namemap.c self_test_cor
$CORE_COMMON provider_conf.c self_test_core.c
$CORE_COMMON provider_conf.c
ibfips.a]=$CORE_COMMON
```

```
s)
ID(tran.getID()));

 from a specified state.

 returned transitions
 starting from the state
onsFromState(State s) {
ll;
y(s))
t(s).toArray(new Transition[0]);
ion[0];
```

| Author | Authored Date | Committer | Committed Da |
|---|---|---|---|
| Ming-Hsien... | 7 months ago | Ming-Hsien... | 7 months ago |
| Ming-Hsien... | 10 months a... | Ming-Hsien... | 10 months a... |
| Ming-Hsien... | 10 months a... | Ming-Hsien... | 10 months a... |
| Ming-Hsien... | 10 months a... | Ming-Hsien... | 10 months a... |
| Ming-Hsien... | 10 months a... | Ming-Hsien... | 10 months a... |
| Ming-Hsien... | 10 months a... | Ming-Hsien... | 10 months a... |

> INER2012 [master ↑6] - /Users/mht208/.git/INER2012/.git
jThor [master] - /Users/mht208/.git/jThor/.git
Lattice [master - Bare] - /Users/mht208/.git/Lattice
> Lattice [master] - /Users/mht208/Documents/workspace/Lattice/.git
> MyTest.git [master] - /Users/mht208/.git/MyTest.git/.git
origin/master [GOAL2]

```
Committer: Ming-Hsien Tsai <mhtsai208@gmail.com> 2020-05-07
Parent: 3dda8412e2792c6e236e9ed21ae50300183efe81 (Prepare fo
Child: 48be9e455745e548f6732cba20704affdc8bf1ed (Draw altern
Branches: develop, master, origin/develop, origin/master, or
Tags: v2020-05-06
```

GitHub Desktop

Eclipse EGit

SmartGit

SourceTree

# References

- http://git-scm.com/book
- http://git-scm.com/docs