



The Git Parable

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The Git Parable

- Shamelessly stolen from Tom Preston-Werner
 - <http://tom.preston-werner.com/2009/05/19/the-git-parable.html>
- I'm lazy...
- Also: Best introduction to Git I've found so far

- Fair warning:
 - Google Docs supports animated slide transitions
 - I made these slide *very* late in the evening...

Git – simple & powerful

`git init`

`git tag ...`

`git push ...`

`git pull ...`

`git commit ...`

`git remote ...`

`git branch ...`

`git diff ...`

`git checkout ...`

`git add ...`

`git log ...`

`git fetch ...`

Git simple & powerful

git init

git push ...

TADAA!

git remote ...

git diff ...

git checkout ...

add ...

git fetch ...

gi

JAZZ HANDS!






I DON'T DO...

JAZZ HANDS



parable

/ˈpærəb(ə)l/ 

noun

noun: **parable**; plural noun: **parables**

a simple story used to illustrate a moral or spiritual lesson, as told by Jesus in the Gospels.

"the parable of the blind men and the elephant"

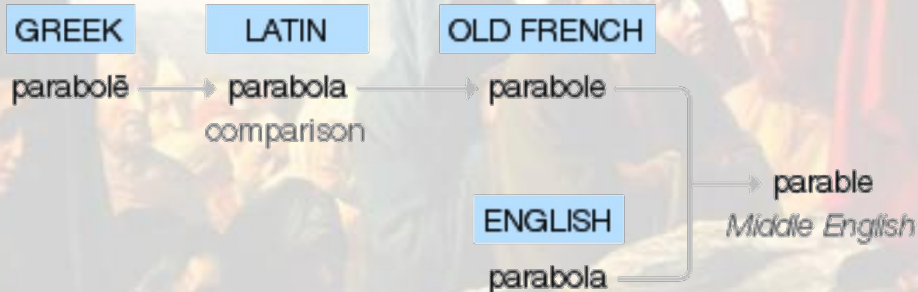
synonyms: allegory, moral story, moral tale, fable, lesson, exemplum; More

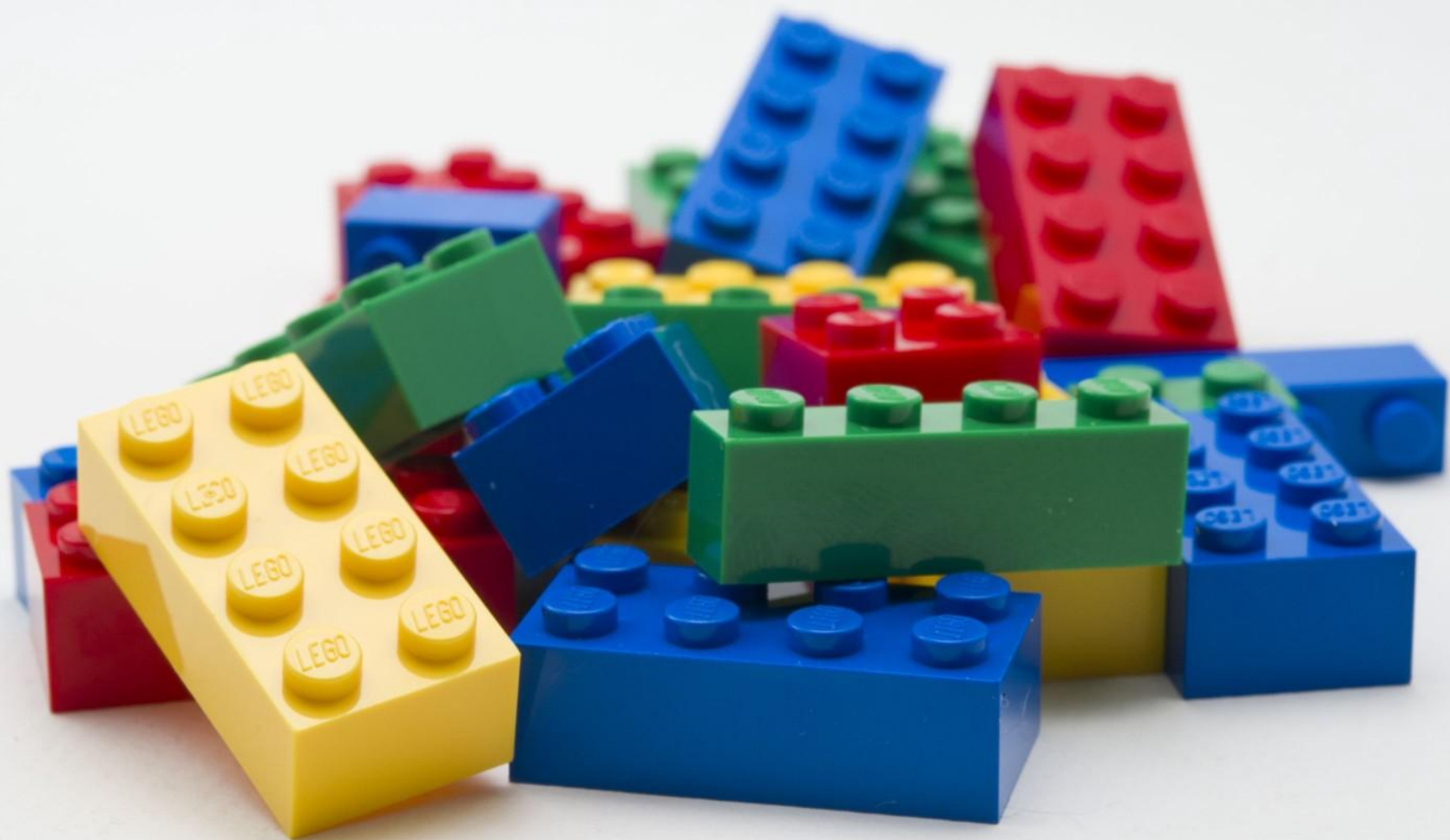
Haggadah;

rare apologue

"the parable of the prodigal son"

Origin







The Parable

- A simple computer
 - A text editor
 - A few filesystem commands



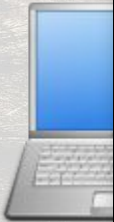
The Parable

- Write a large software program



The Parable

- Write a large software program
- Invent some method to keep track of versions
 - retrieve code that you changed/deleted



Snapshots

- Alfred, the photographer



Snapshots

- Alfred, the photographer



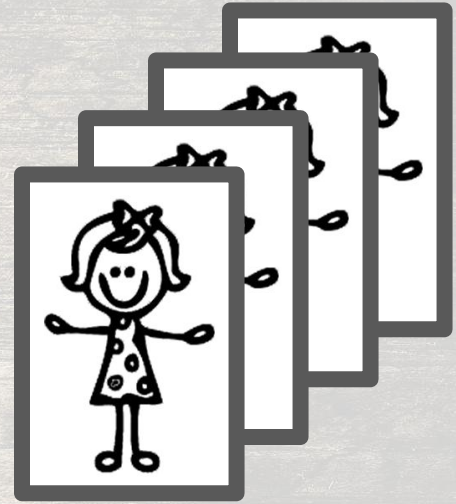
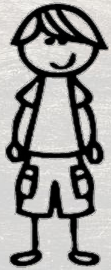
Snapshots

- Alfred, the photographer
- Hazel and her daughter



Snapshots

- Alfred, the photographer
- Hazel and her daughter
 - Remember what the daughter was like at each different stage



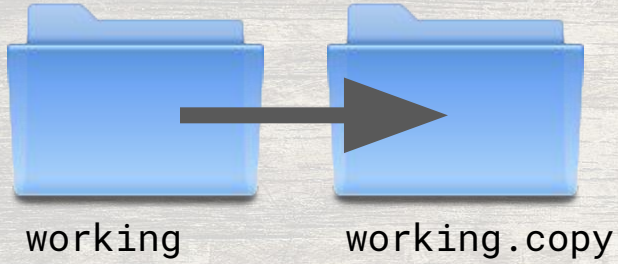
Snapshots



working



Snapshots



Snapshots



working



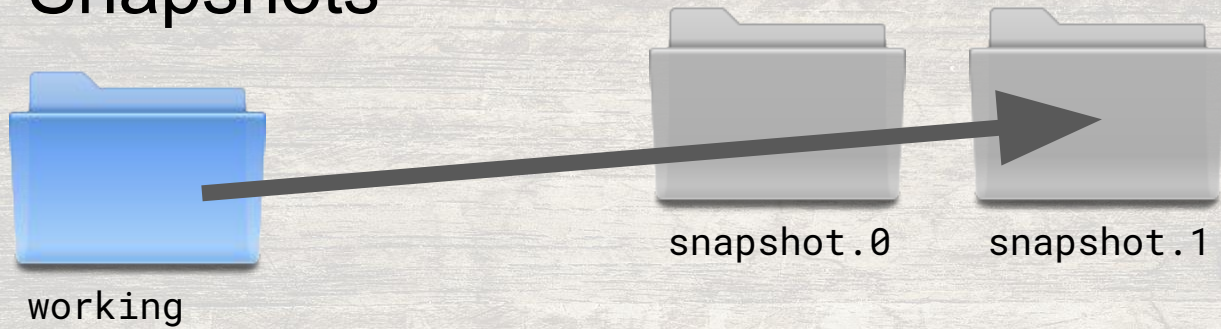
working.copy



snapshot.0



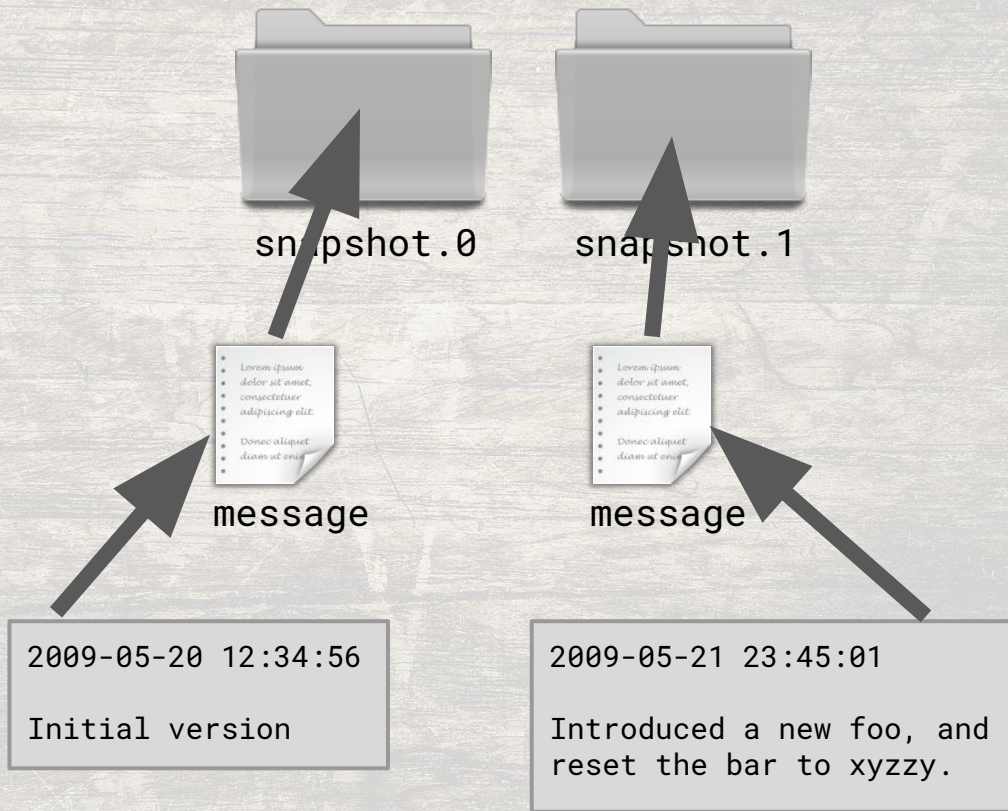
Snapshots



Snapshots



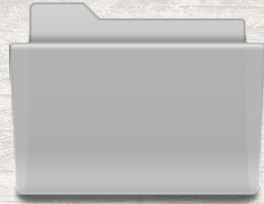
working



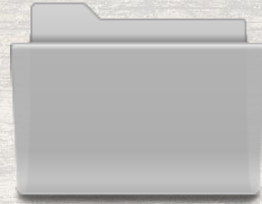
Branches



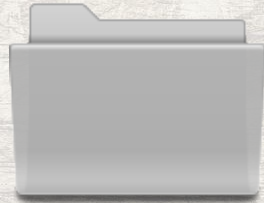
working



snapshot.0



snapshot.1



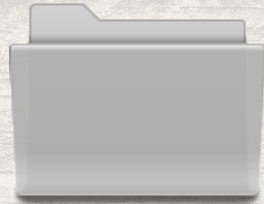
snapshot.99



Branches



working



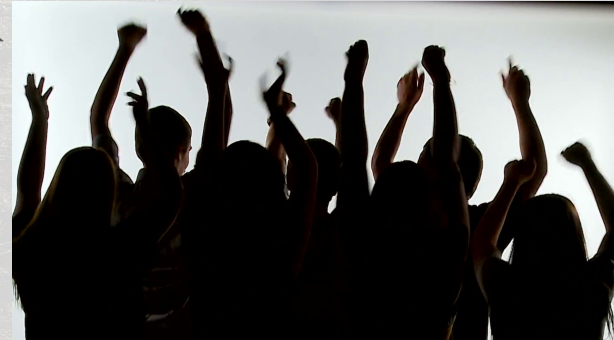
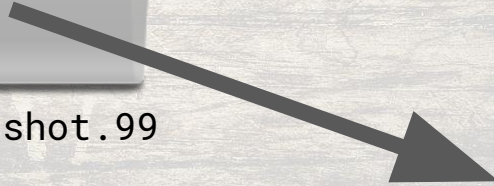
snapshot.0



snapshot.1



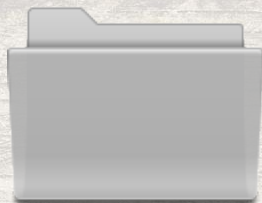
snapshot.99



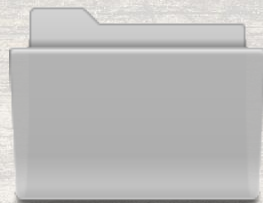
Branches



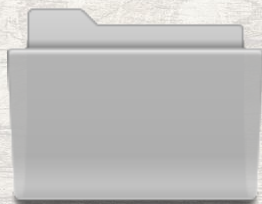
working



snapshot.0



snapshot.1



snapshot.99



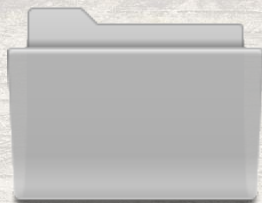
snapshot.109



Branches



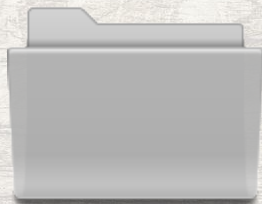
working



snapshot.0



snapshot.1



snapshot.99



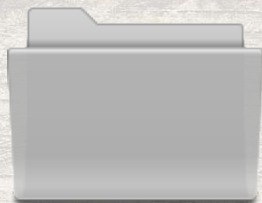
snapshot.109



Branches



working



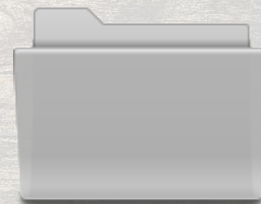
snapshot.0



snapshot.1



snapshot.99



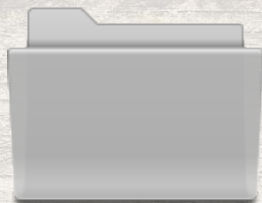
snapshot.109



Branches



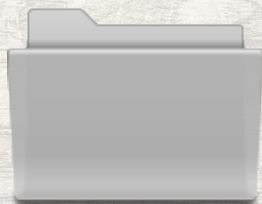
working



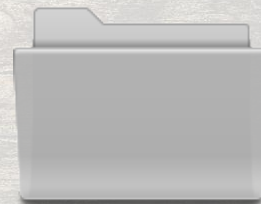
snapshot.0



snapshot.1



snapshot.99



snapshot.109

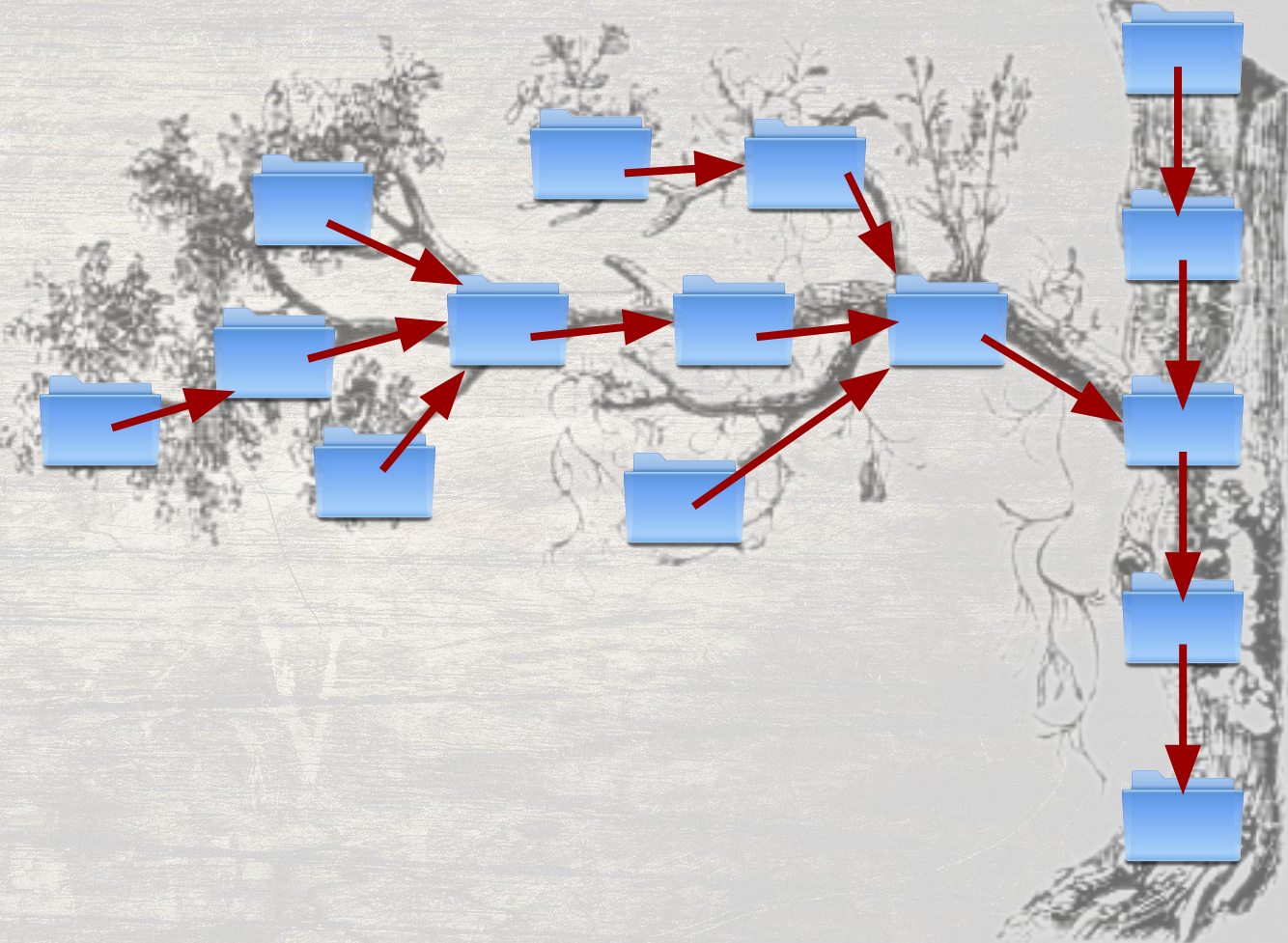
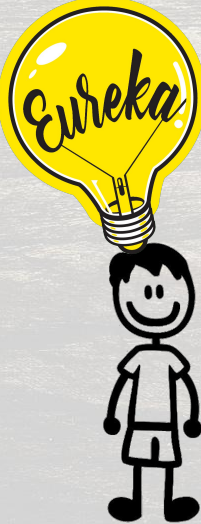


snapshot.110

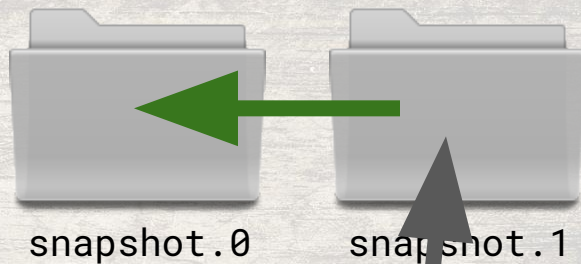
Branches



Branches



Branches



message



2009-05-21 23:45:01

parent: snapshot.0

Introduced a new foo, and
reset the bar to xyzzy.

Branch Names



working



snapshot.110



snapshot.109



snapshot.99



snapshot.1



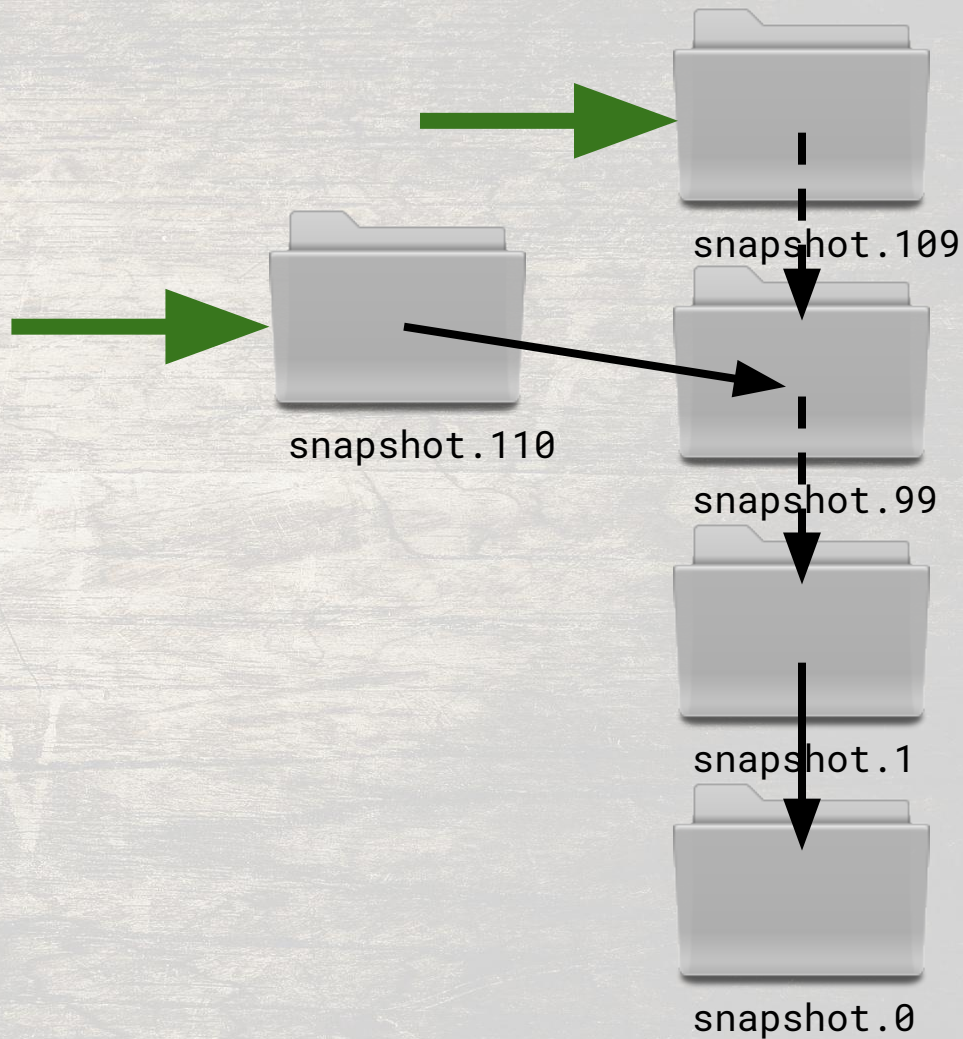
snapshot.0



Branch Names



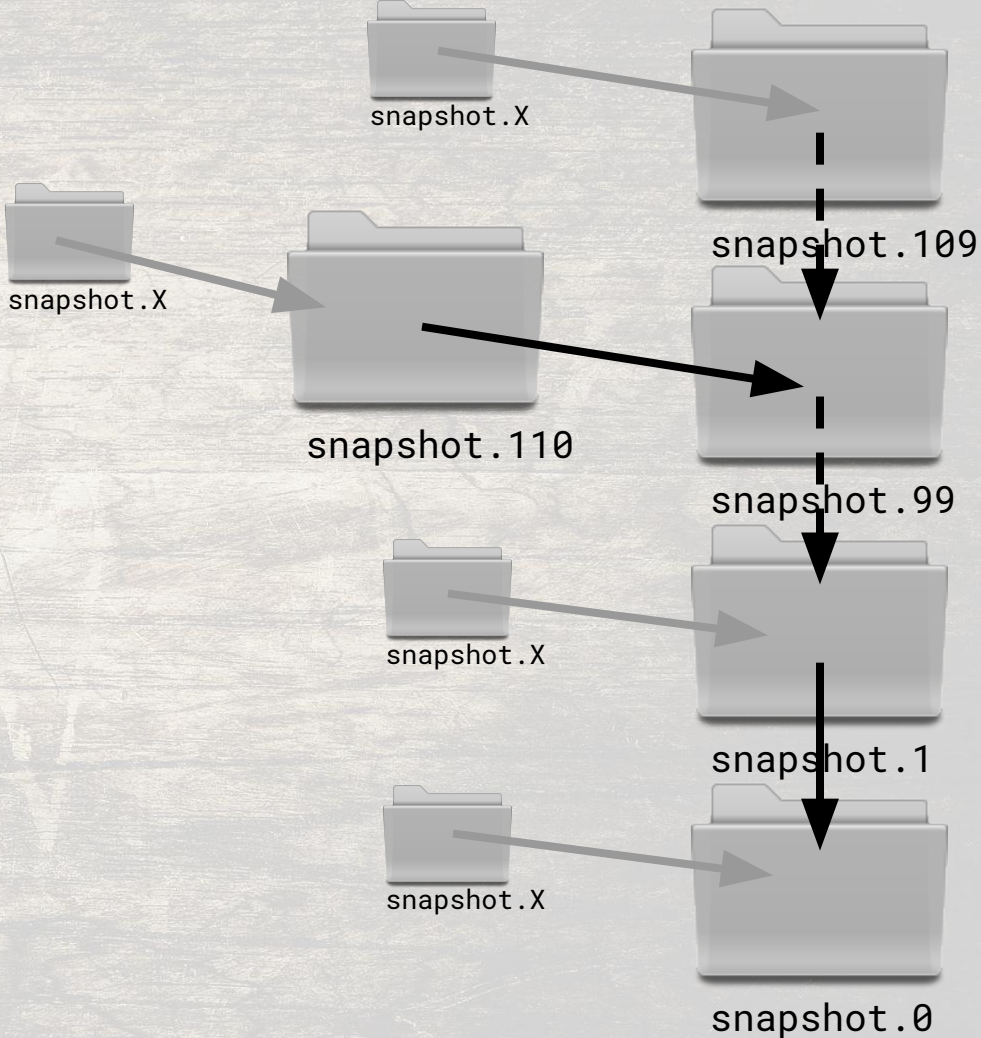
working



Branch Names



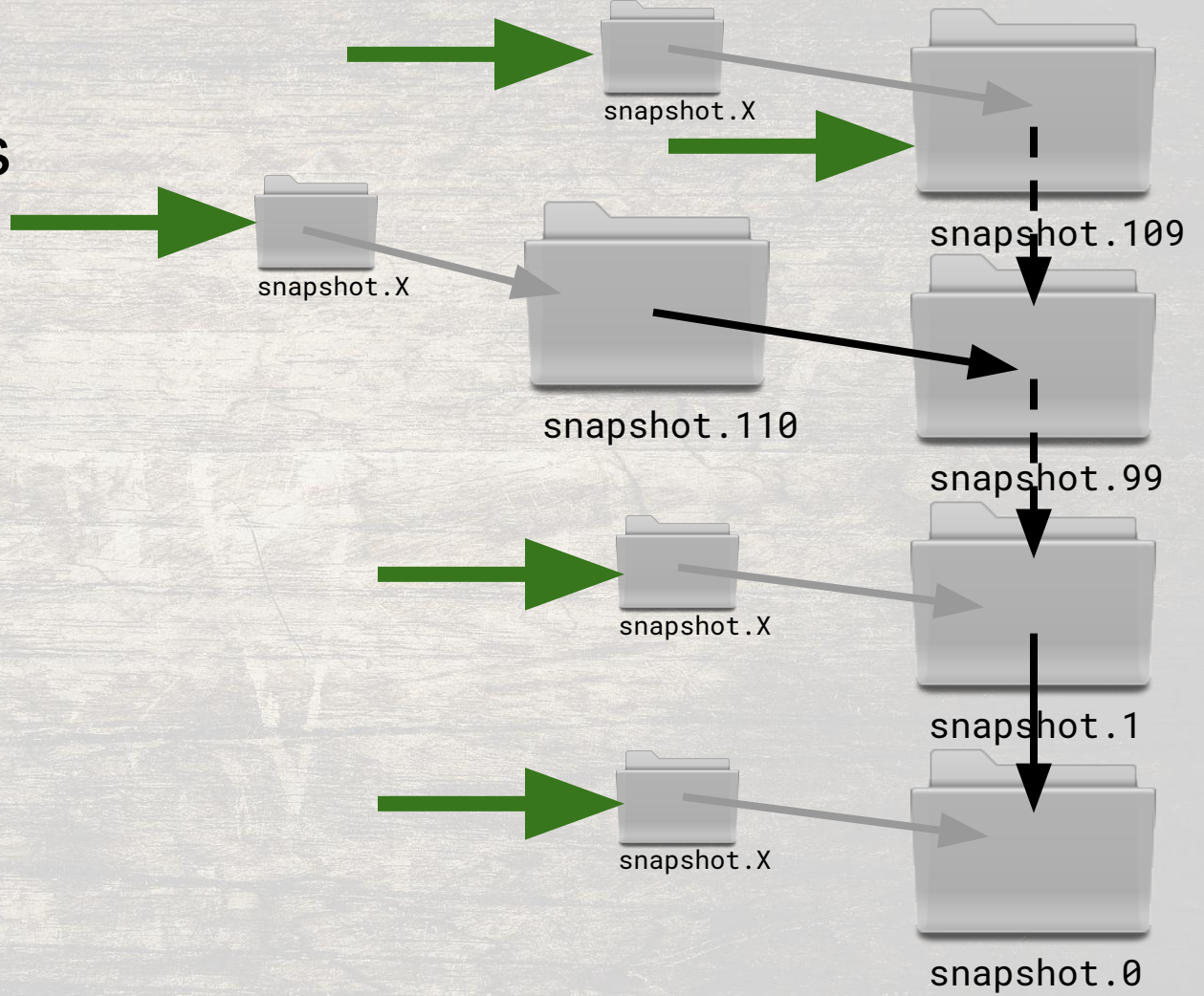
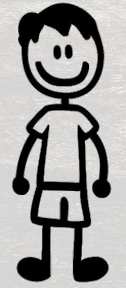
working



Branch Names



working



Branch Names



working



This is the "master" branch

This will be the "Version 1.0 Maintenance" branch

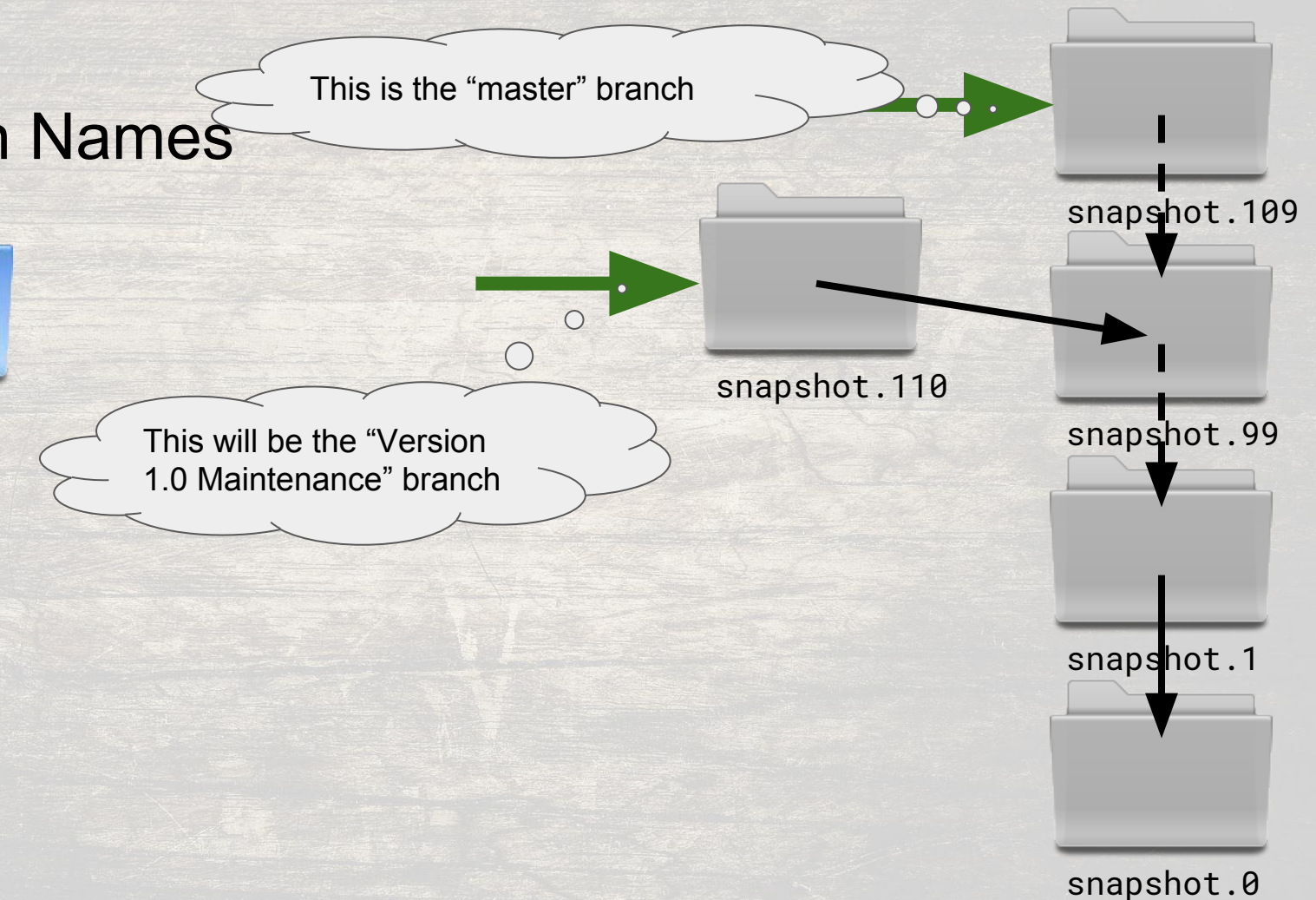
snapshot.110

snapshot.109

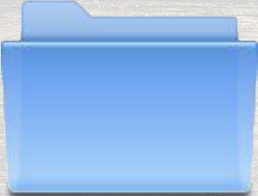
snapshot.99

snapshot.1

snapshot.0



Branch Names

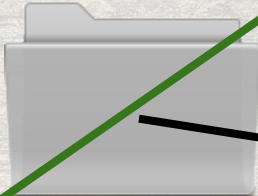


working

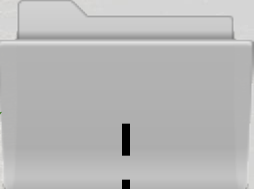


branches

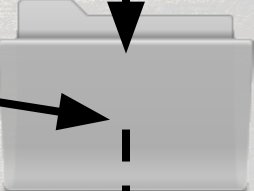
```
master:    snapshot-109  
v1.0-maint: snapshot-110
```



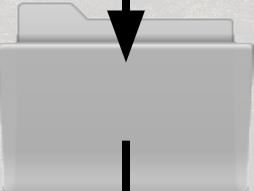
snapshot.110



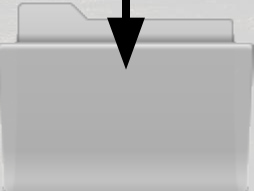
snapshot.109



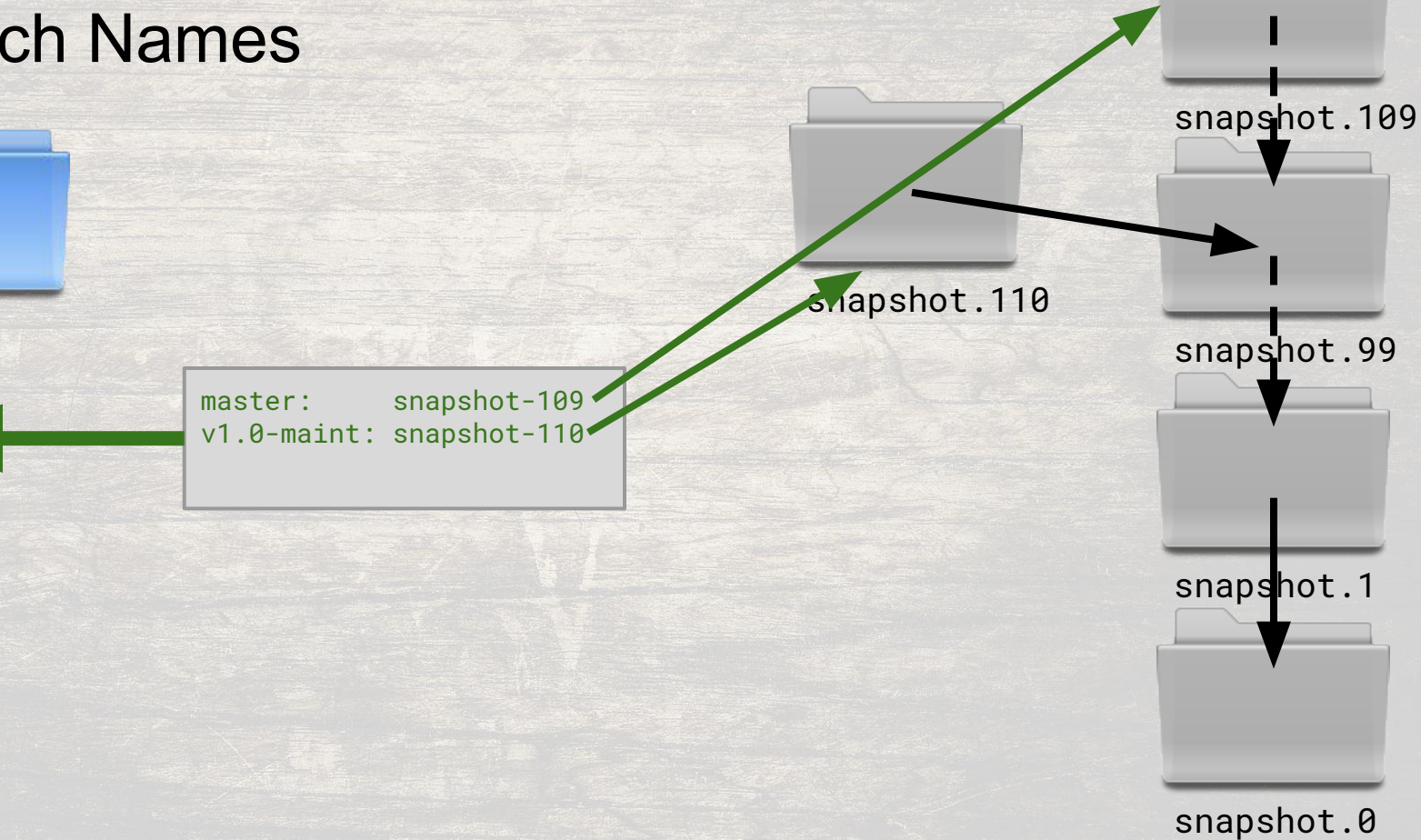
snapshot.99



snapshot.1



snapshot.0



Branch Names



working



branches



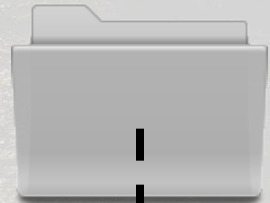
```
master:    snapshot-109
v1.0-maint: snapshot-111
```



snapshot.111



snapshot.110



snapshot.109



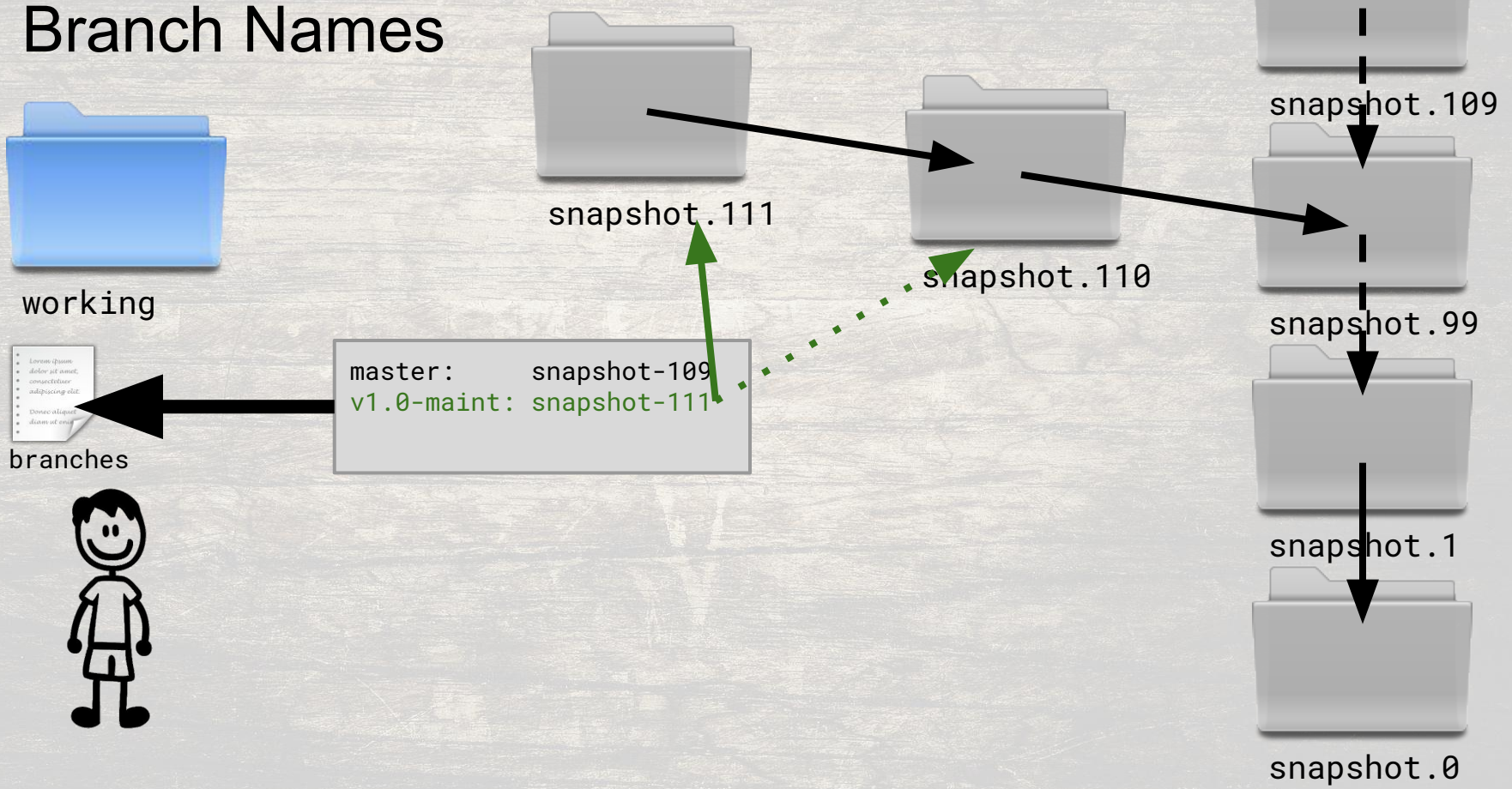
snapshot.99



snapshot.1



snapshot.0



Tags



working



branches

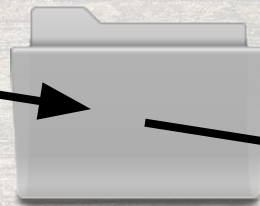


tags

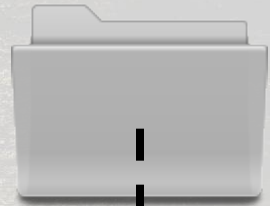
v1.0: snapshot-99
V1.0.1: snapshot-110



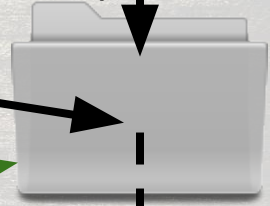
snapshot.111



snapshot.110



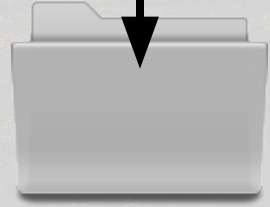
snapshot.109



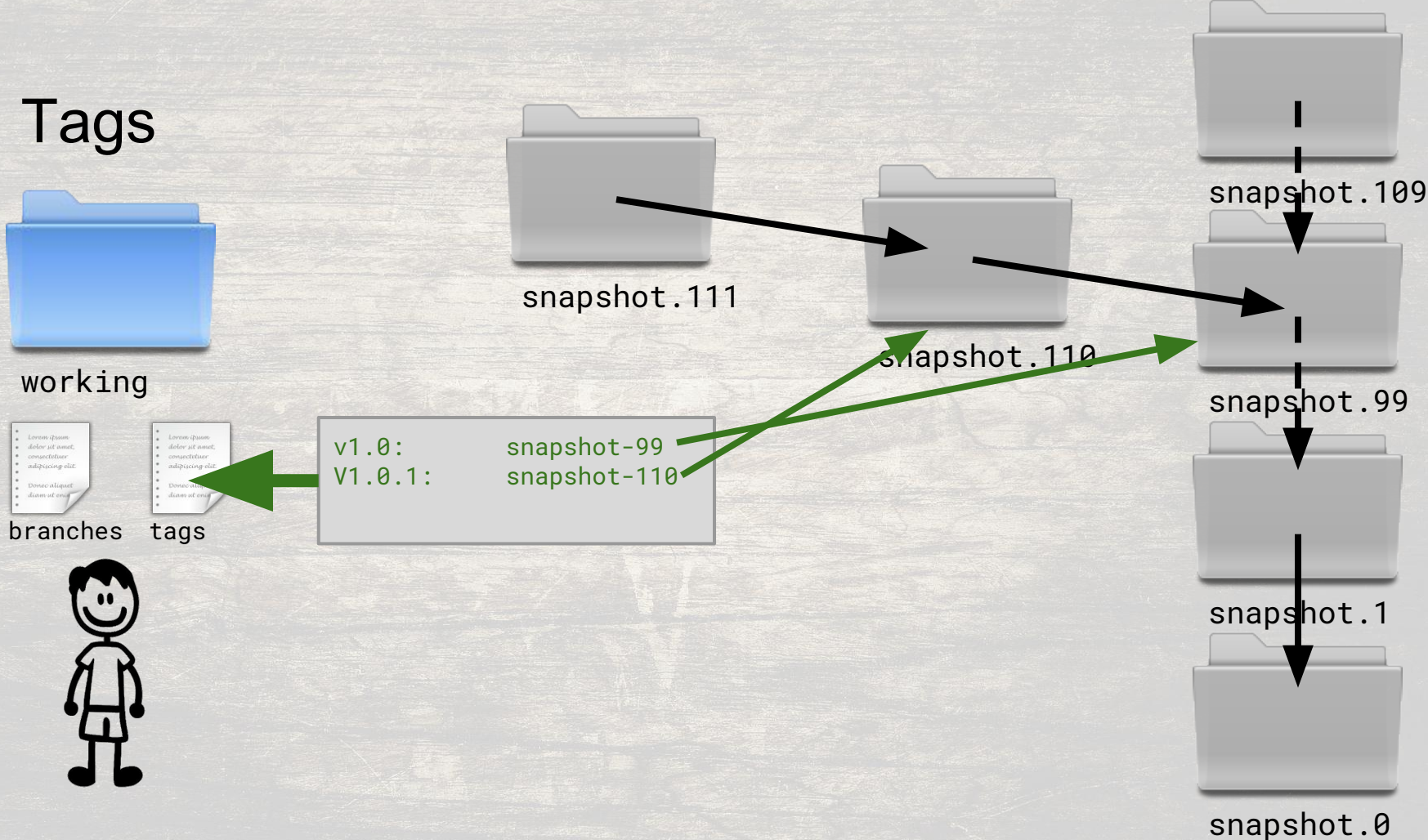
snapshot.99



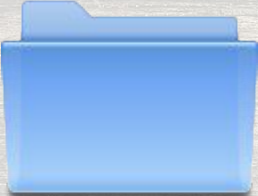
snapshot.1



snapshot.0



Distributed



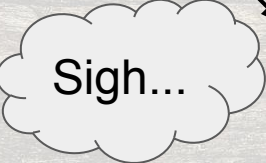
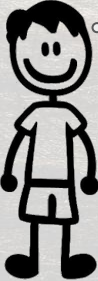
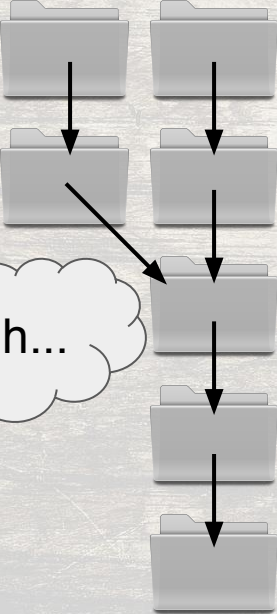
working



branches



tags



Sigh...

Distributed



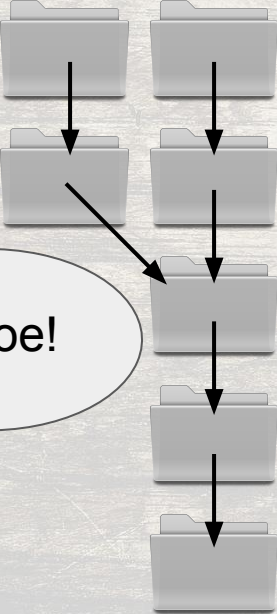
working



branches



tags



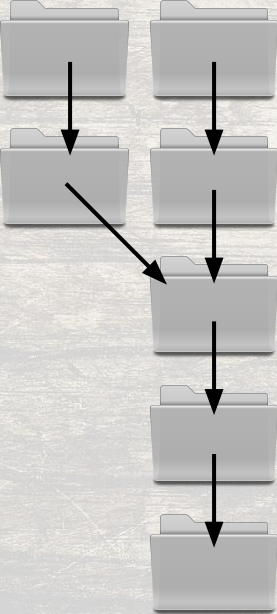
Distributed



working



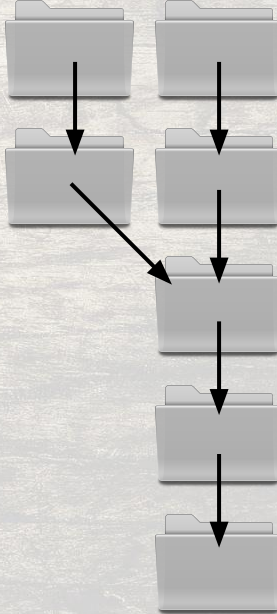
branches tags



working



branches tags



Distributed



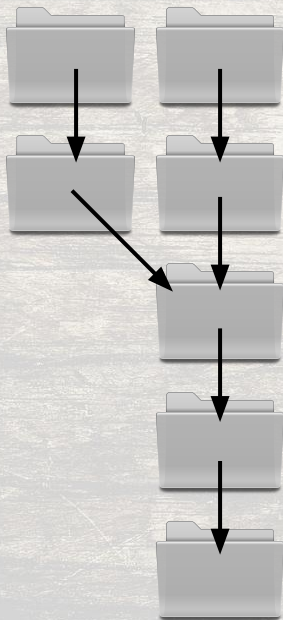
working



branches



tags



working



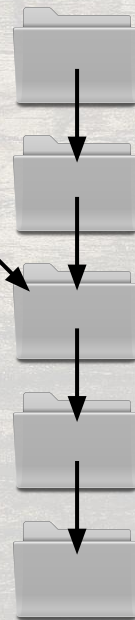
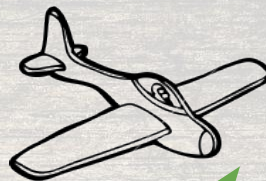
branches



tags



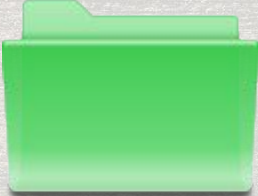
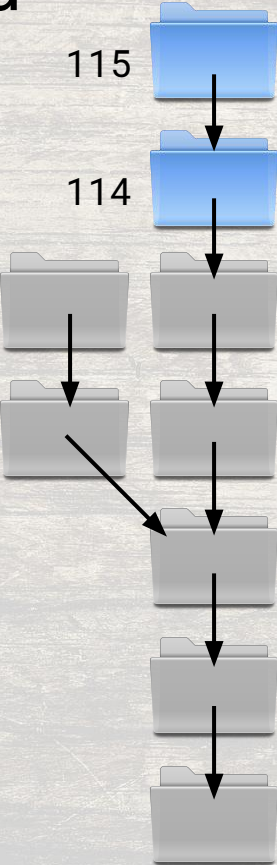
Bye!



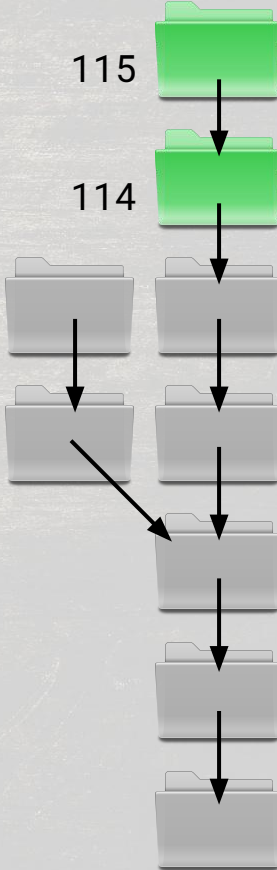
Distributed



working



working



Distributed



snapshot.114



message

2009-05-22 12:12:12
parent: snapshot.113
author: Me <me@me.me>

Blarfle, a cool new feature;
extends the existing blorg.



snapshot.114



message

2009-05-23 23:22:21
parent: snapshot.113
author: Zoe <zoe@z.oe>

Frotzed the blarglefoo
and the garglezoot.

Distributed



8ba3441b6b89cad23387ee875f2e55069291f4b



message



SHA-1

2009-05-22 12:12:12
parent: snapshot.113
author: Me <me@me.me>

Blarfle, a cool new feature;
extends the existing blorg.



db9ecb5b5a6294a8733503ab57577db96ff2249e



message

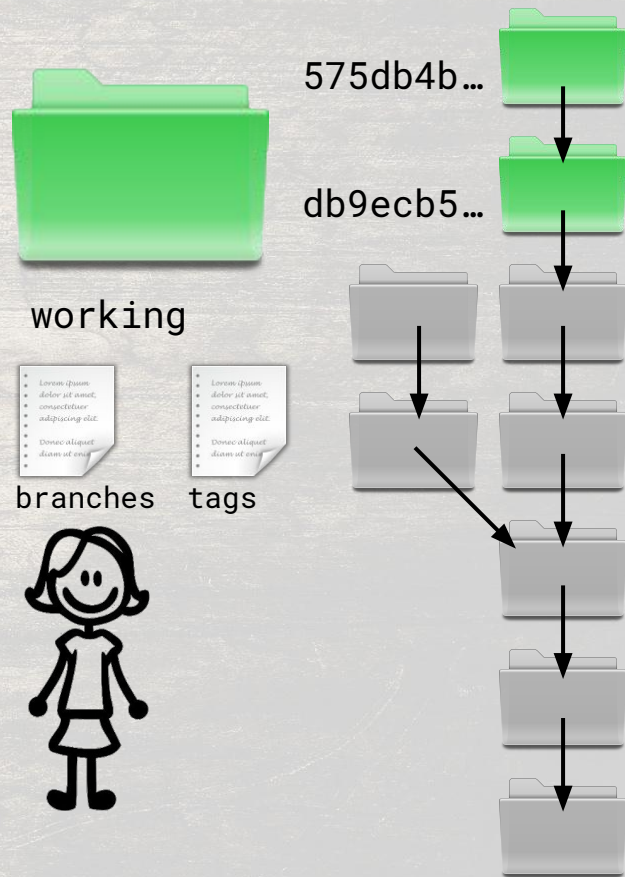
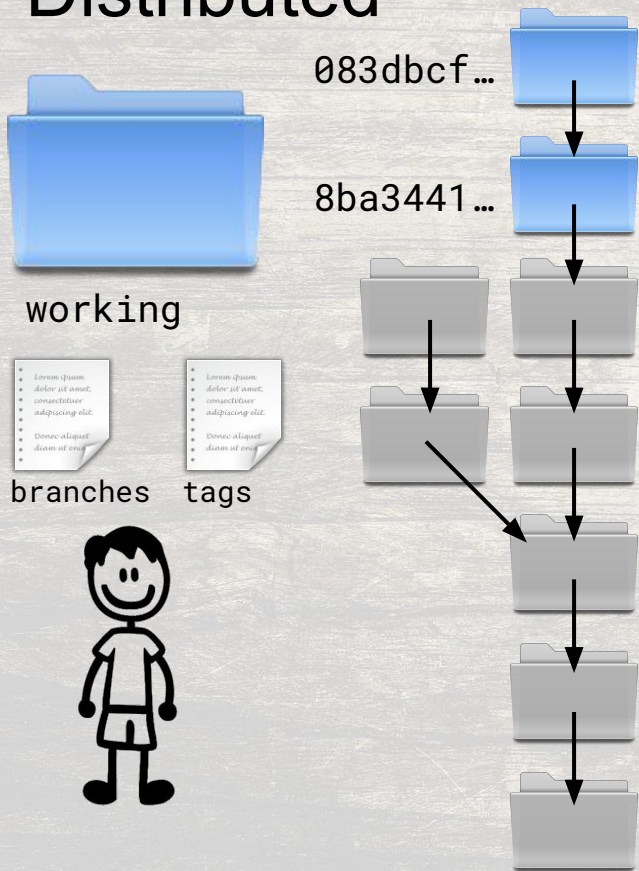


SHA-1

2009-05-23 23:22:21
parent: snapshot.113
author: Zoe <zoe@z.oe>

Frotzed the blarglefoo
and the garglezoot.

Distributed



Distributed



working



branches



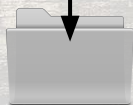
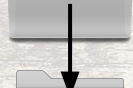
tags



083dbcf...



8ba3441...



?



working



branches



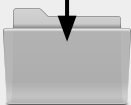
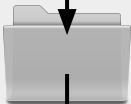
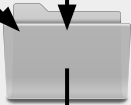
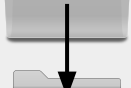
tags



575db4b...



db9ecb5...



Distributed



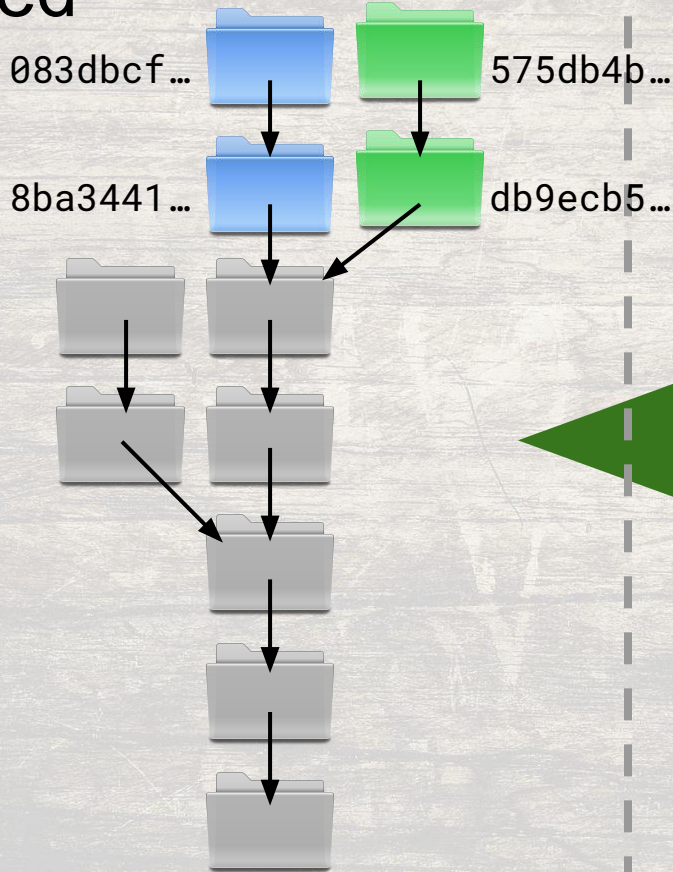
working



branches



tags



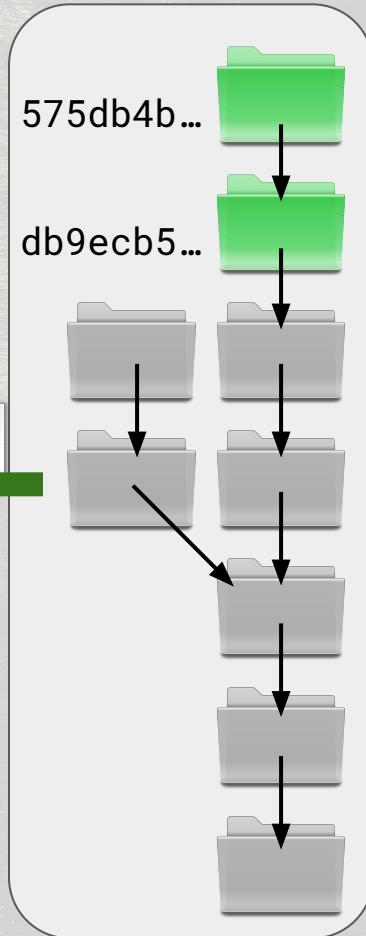
working



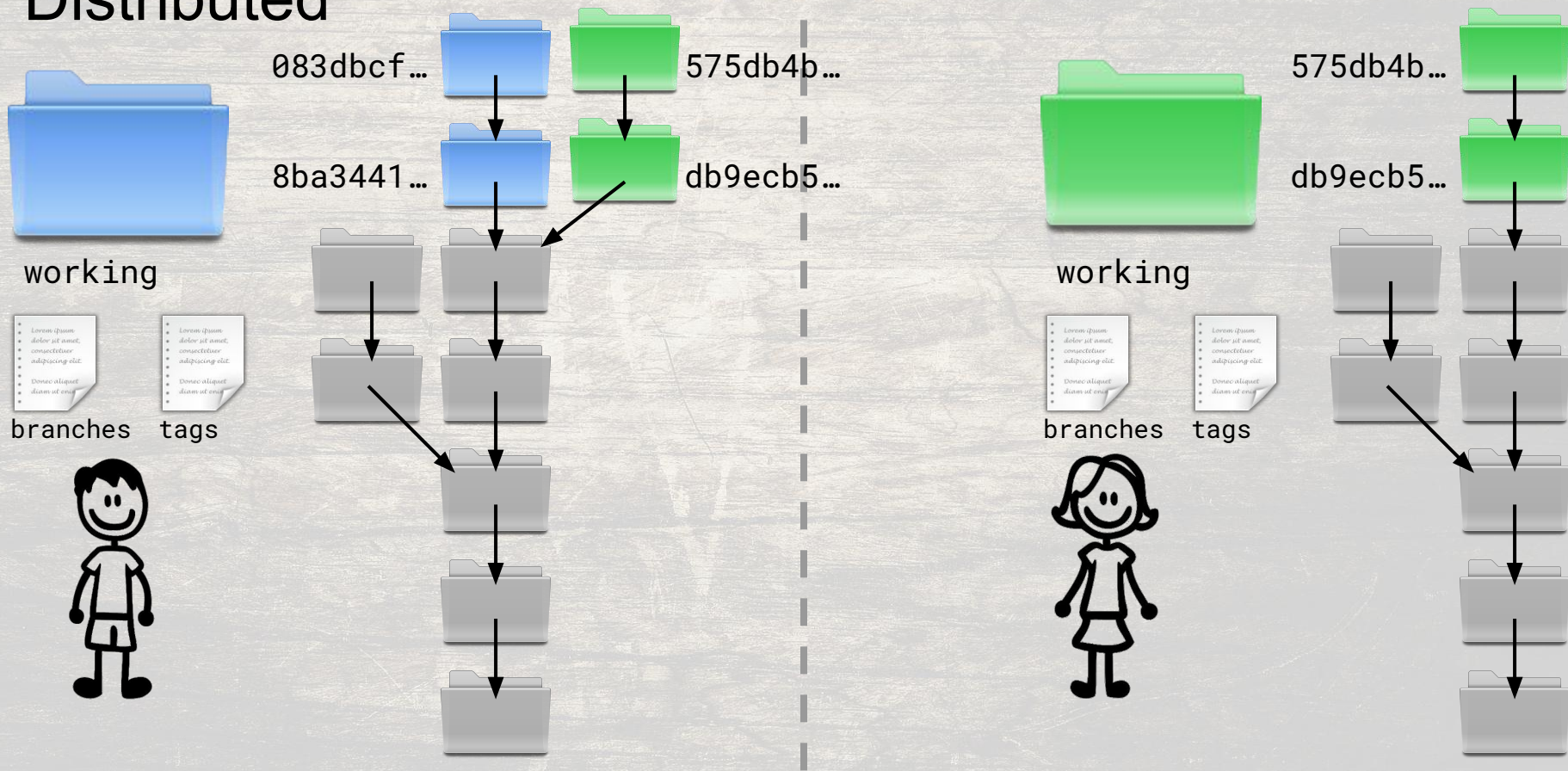
branches



tags



Distributed



Offline



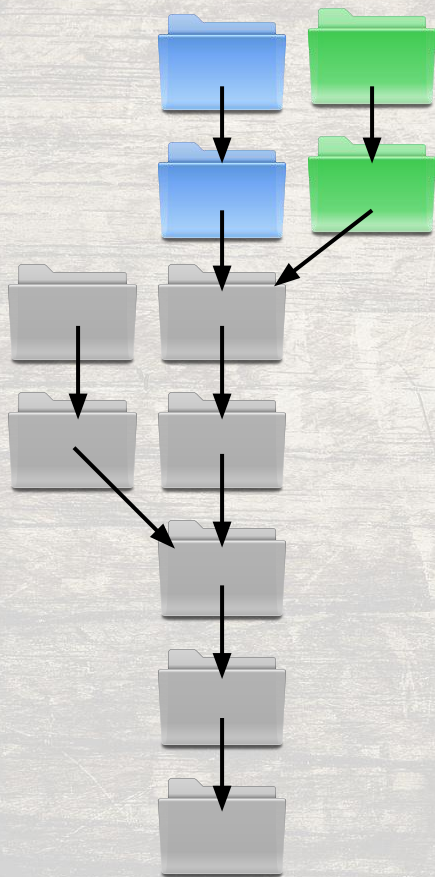
working



branches



tags



working



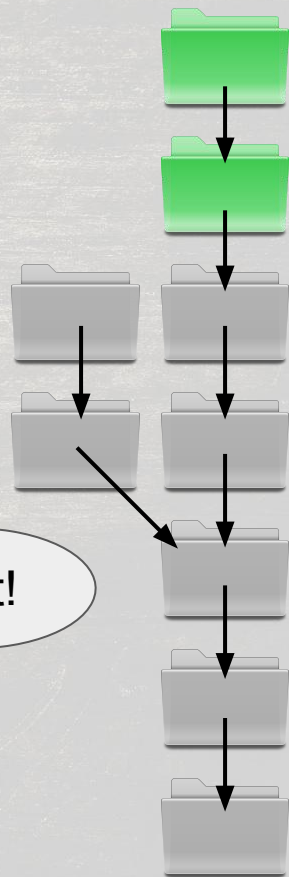
branches



tags



w00t!



Offline



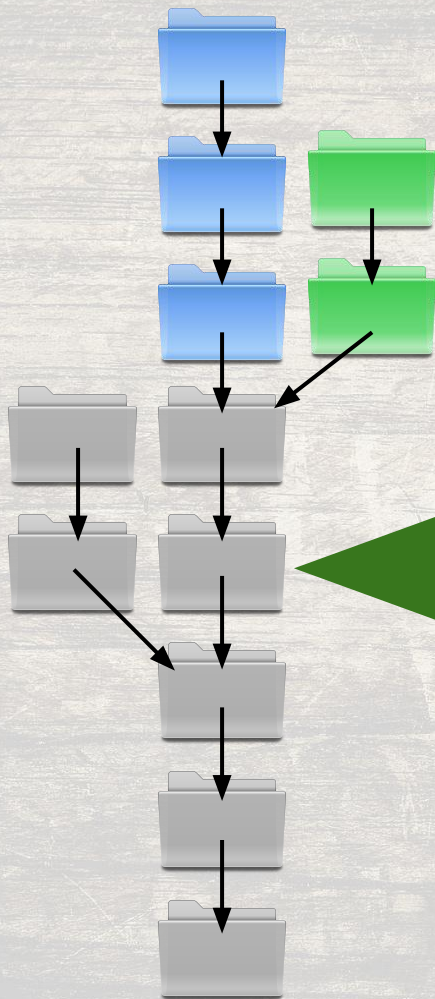
working



branches



tags



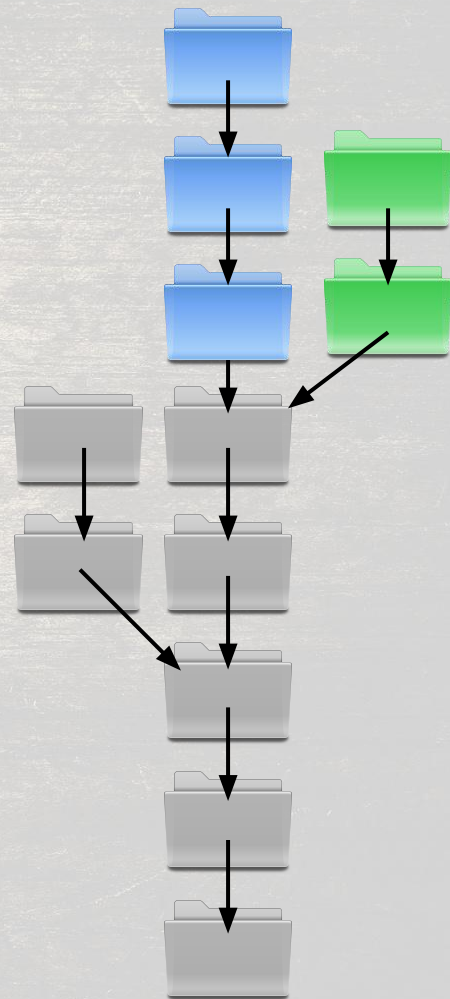
working



branches



tags



Simplify



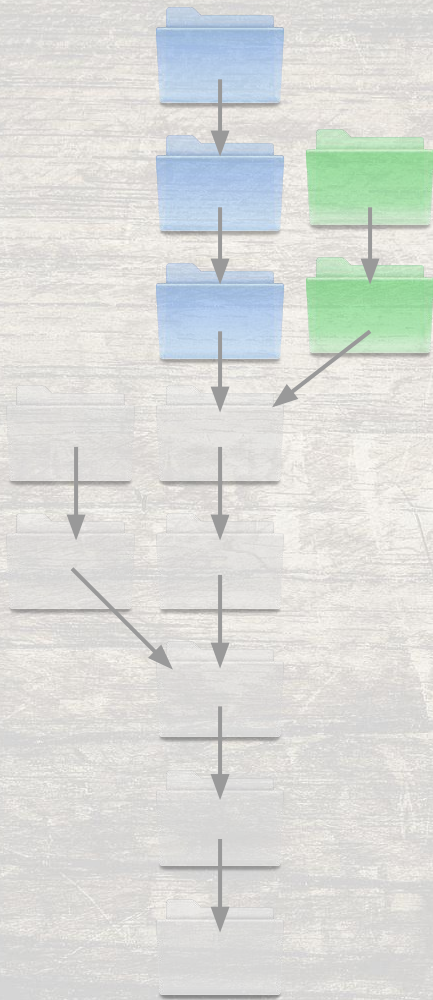
working



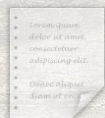
branches



tags



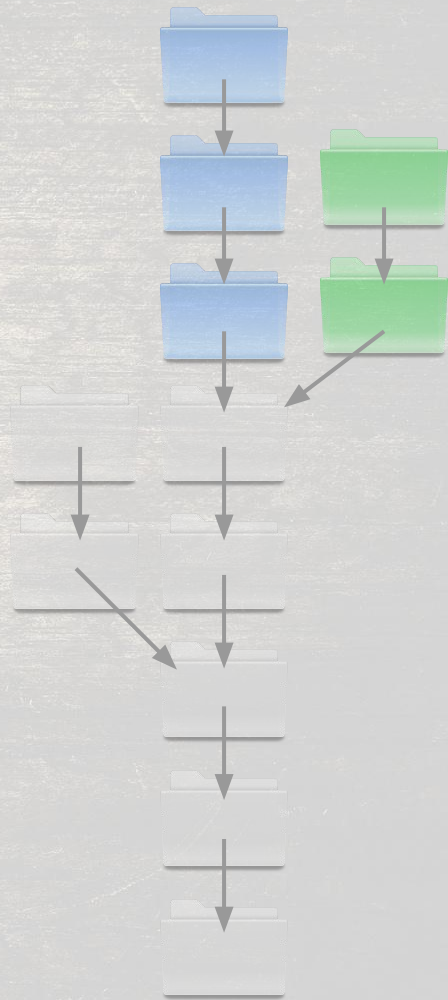
working



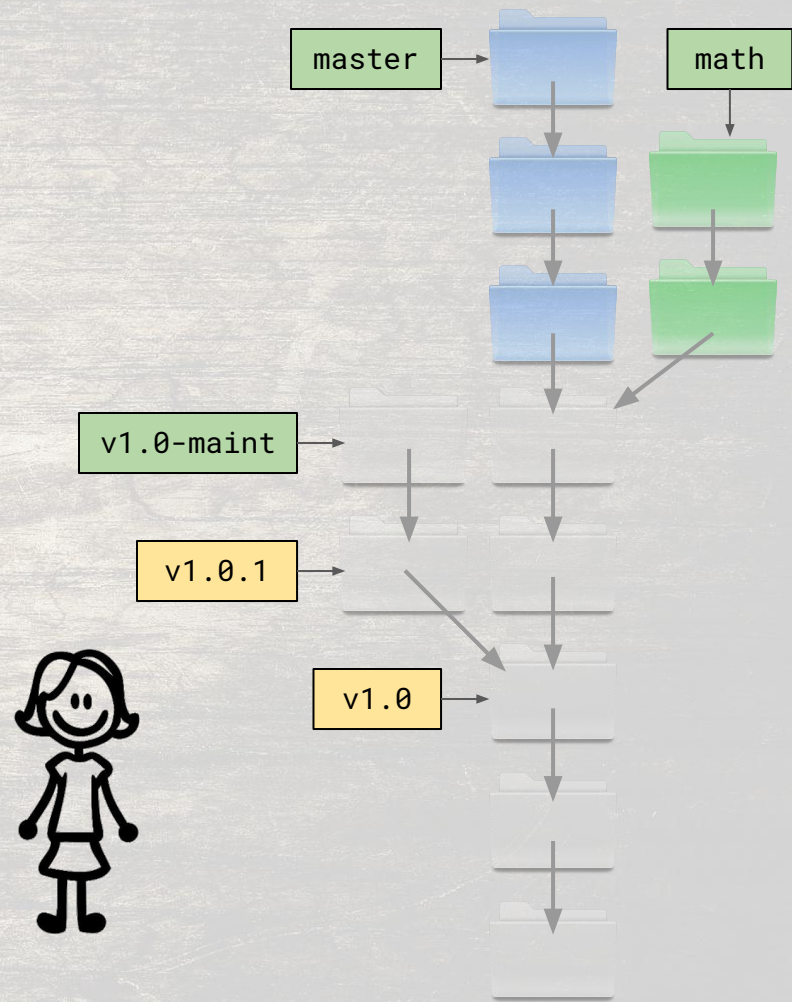
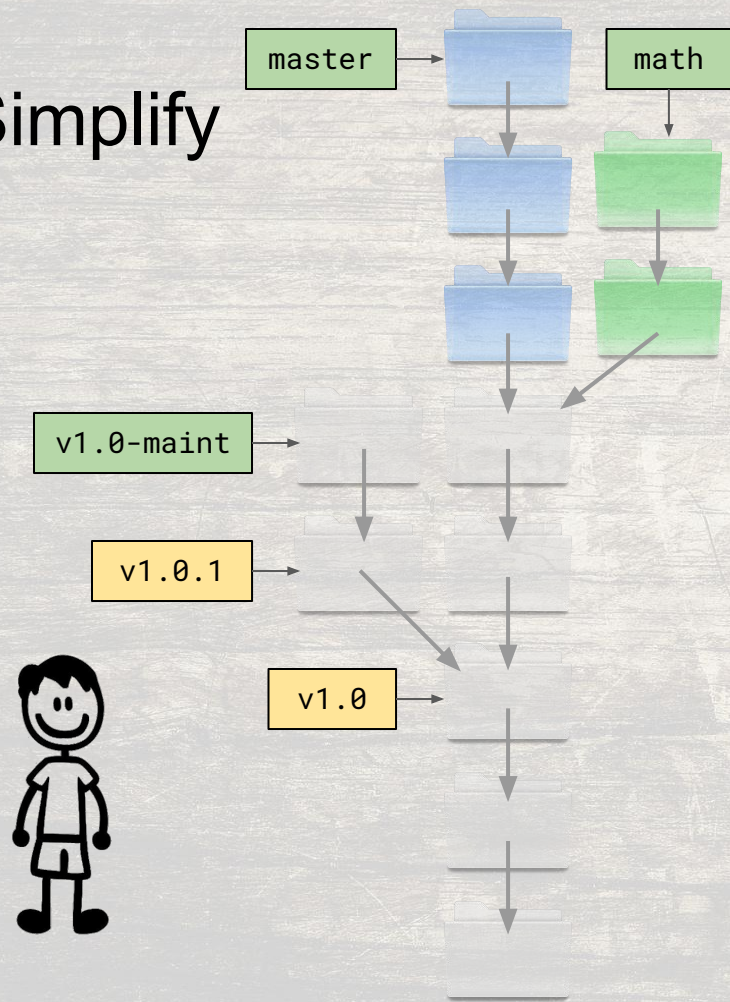
branches



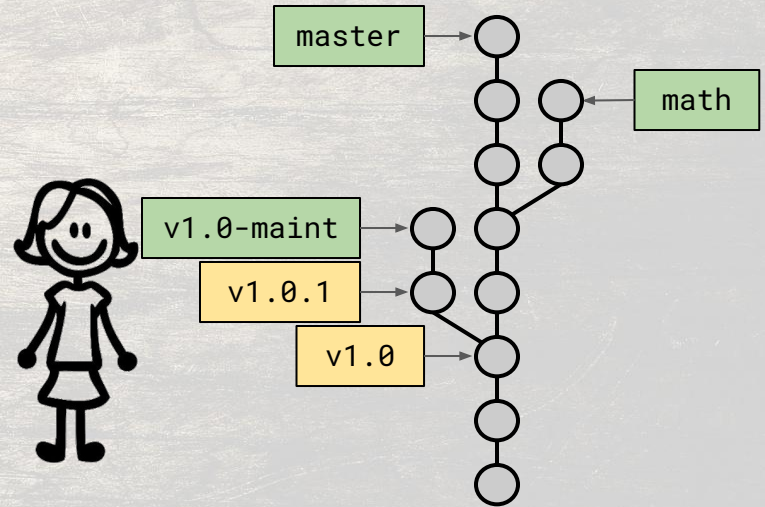
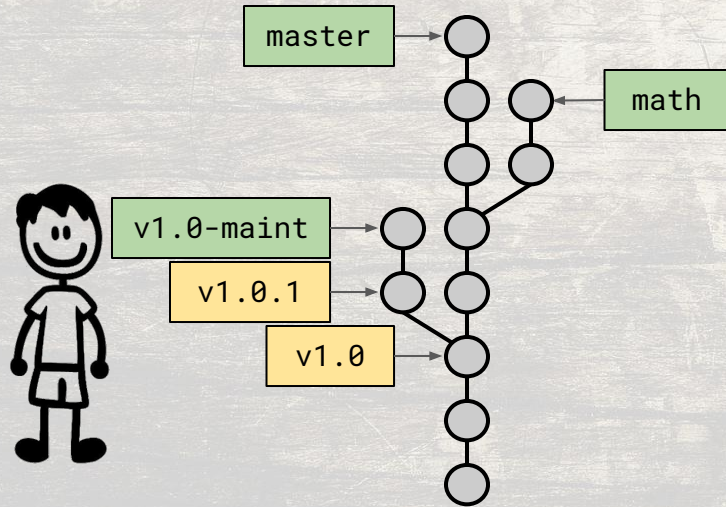
tags



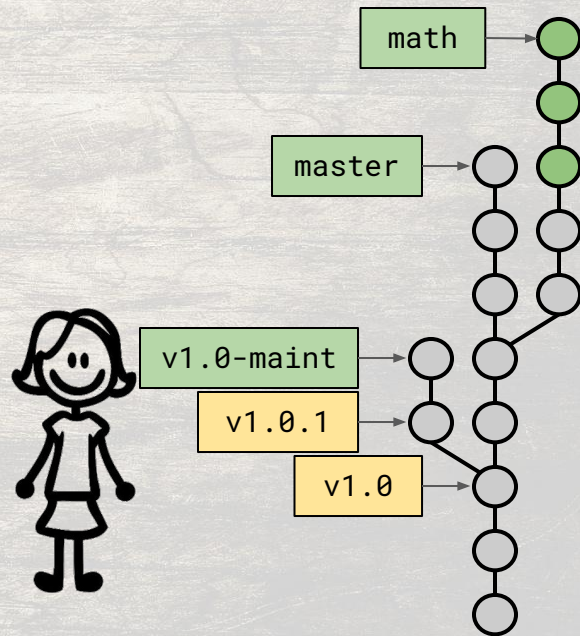
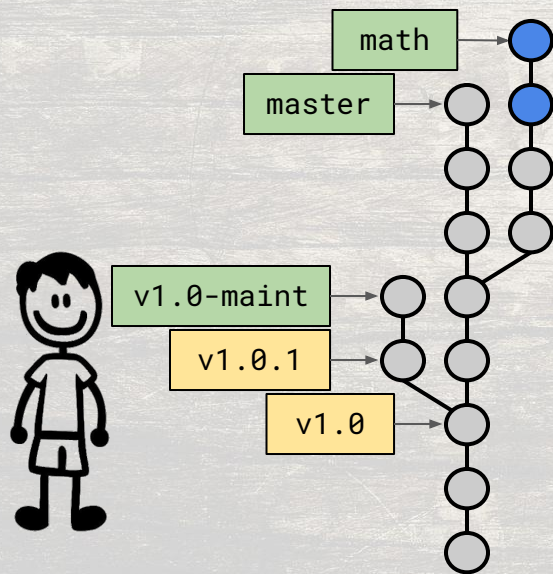
Simplify



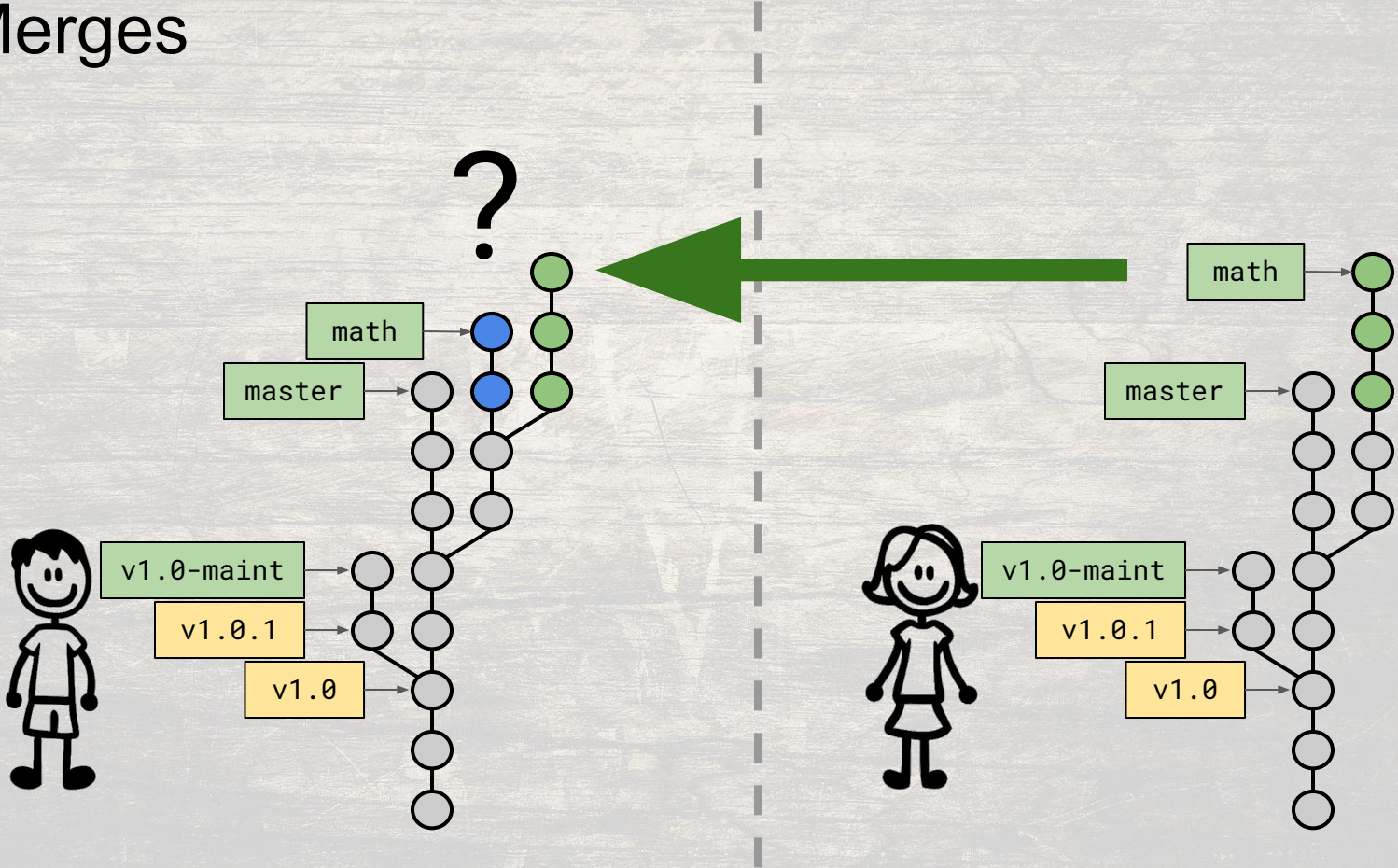
Simplify



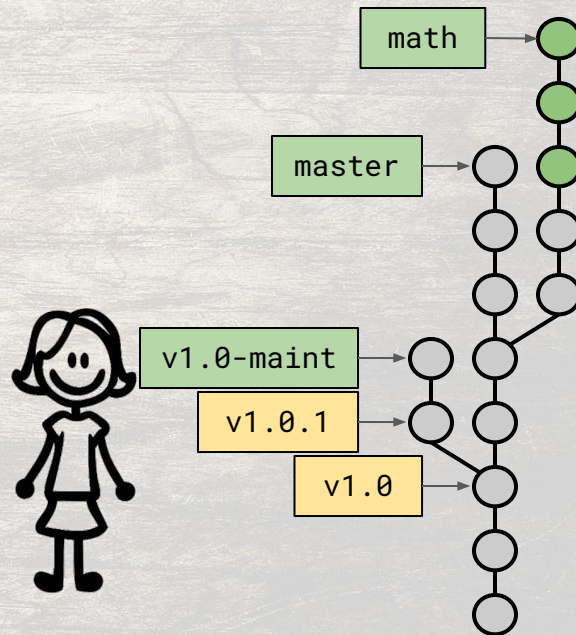
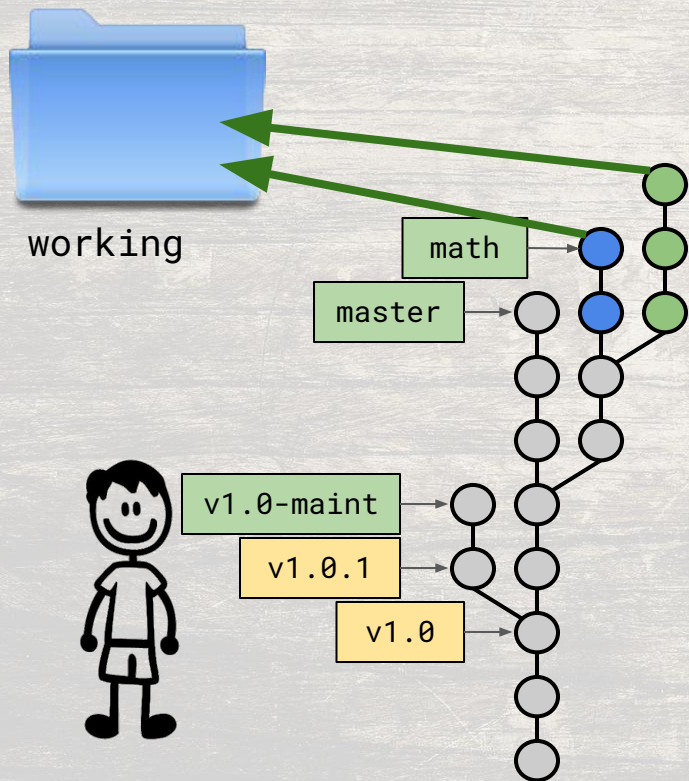
Merges



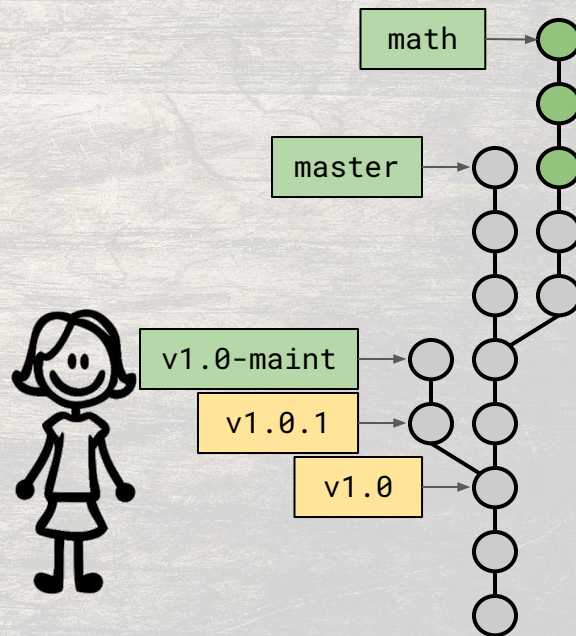
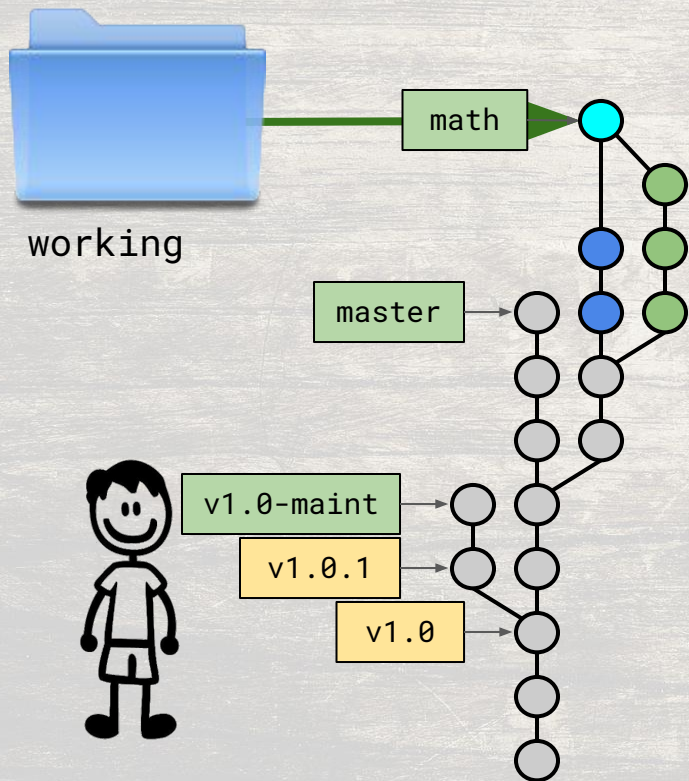
Merges



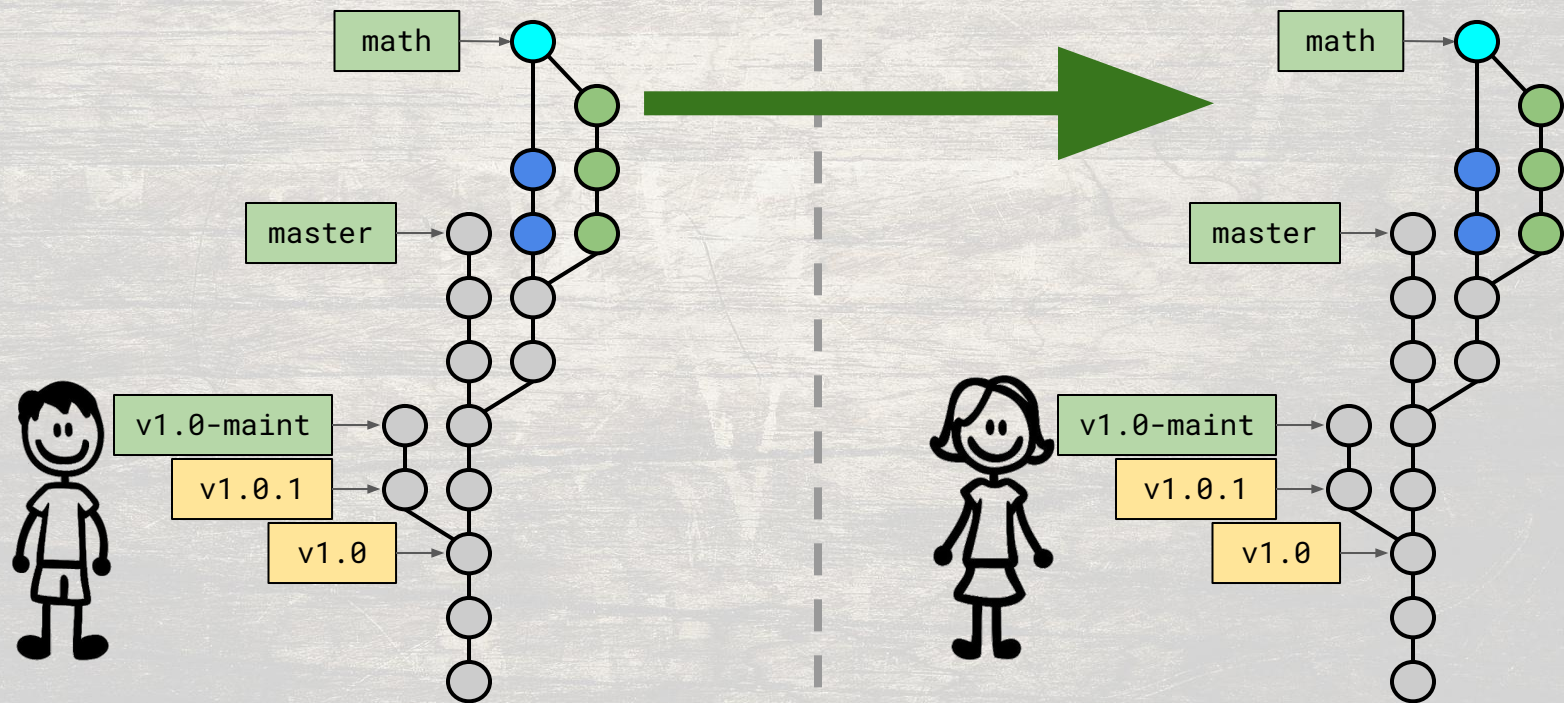
Merges



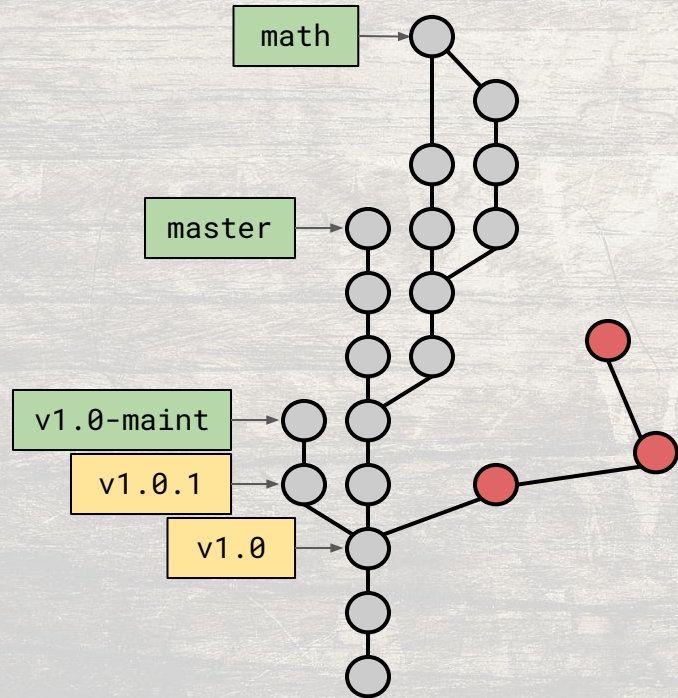
Merges



Merges



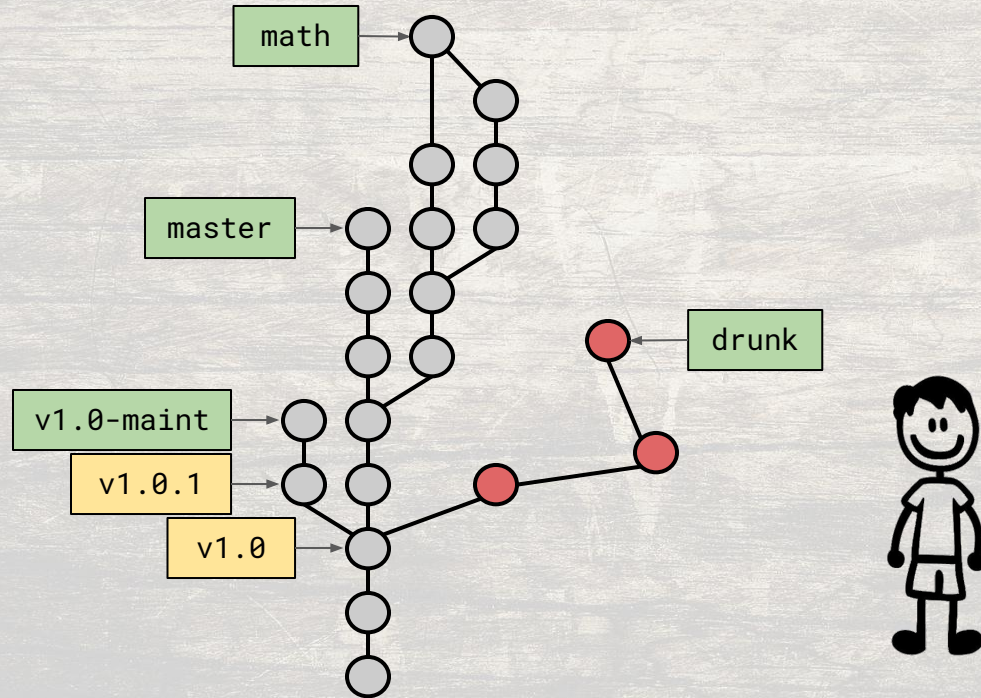
Rewriting History



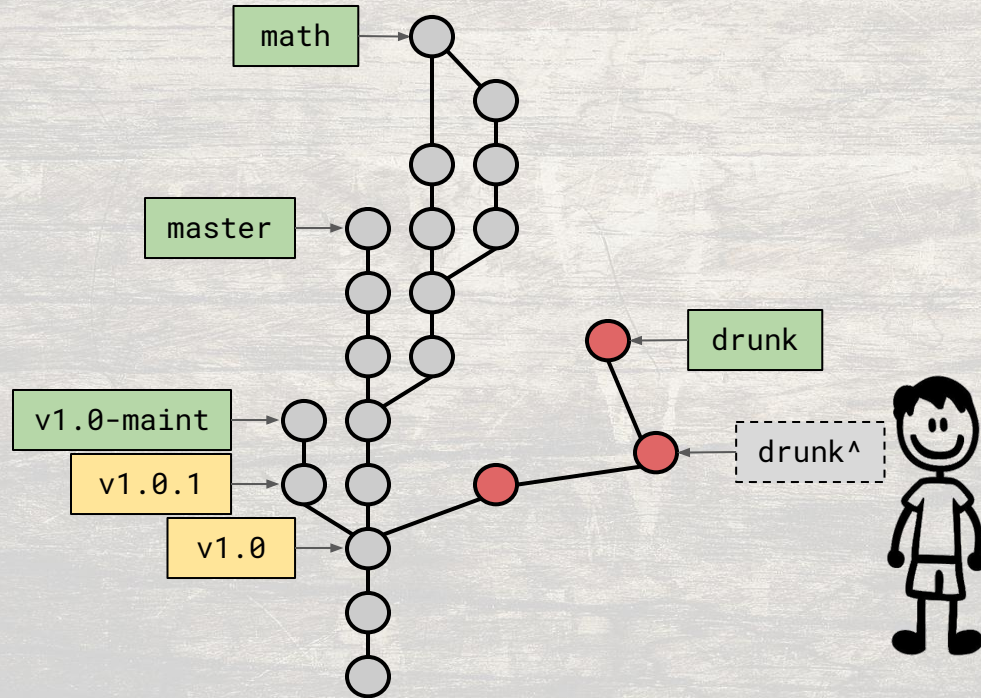
hic!



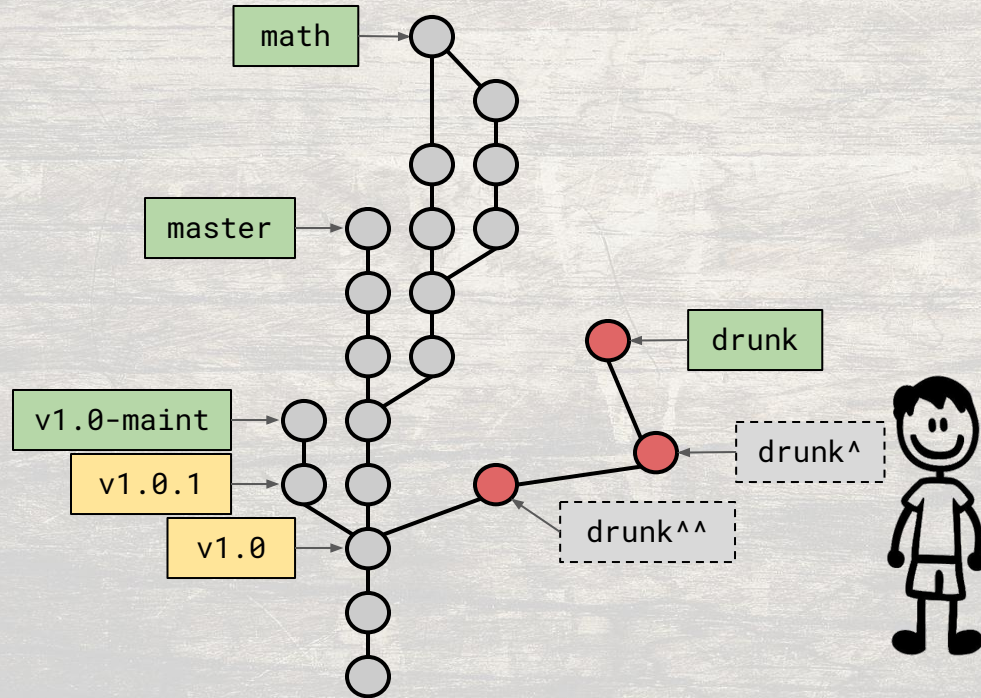
Rewriting History



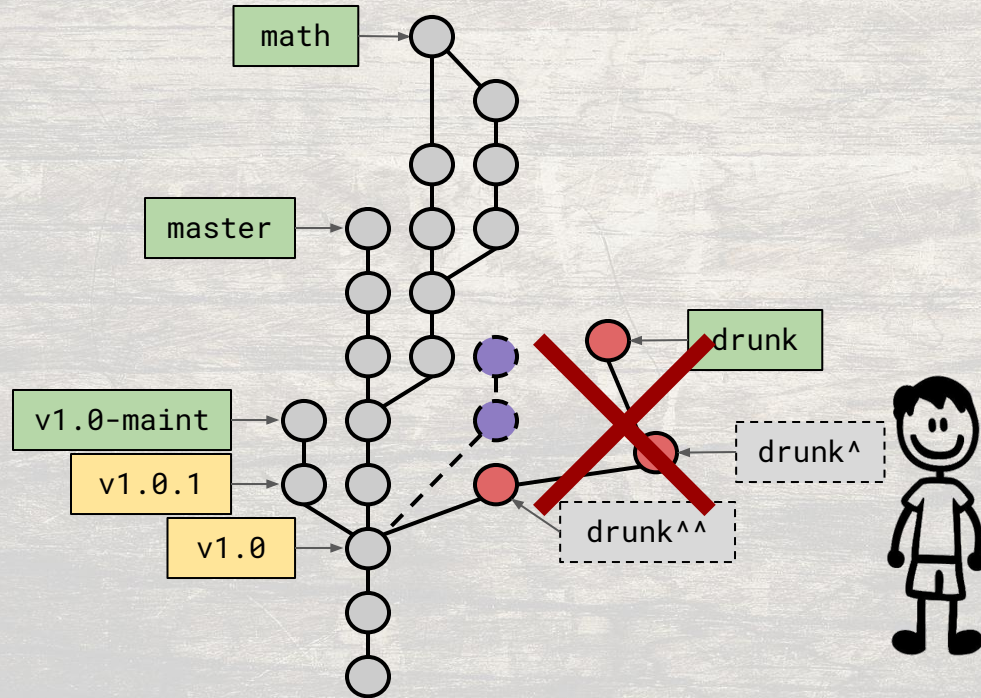
Rewriting History



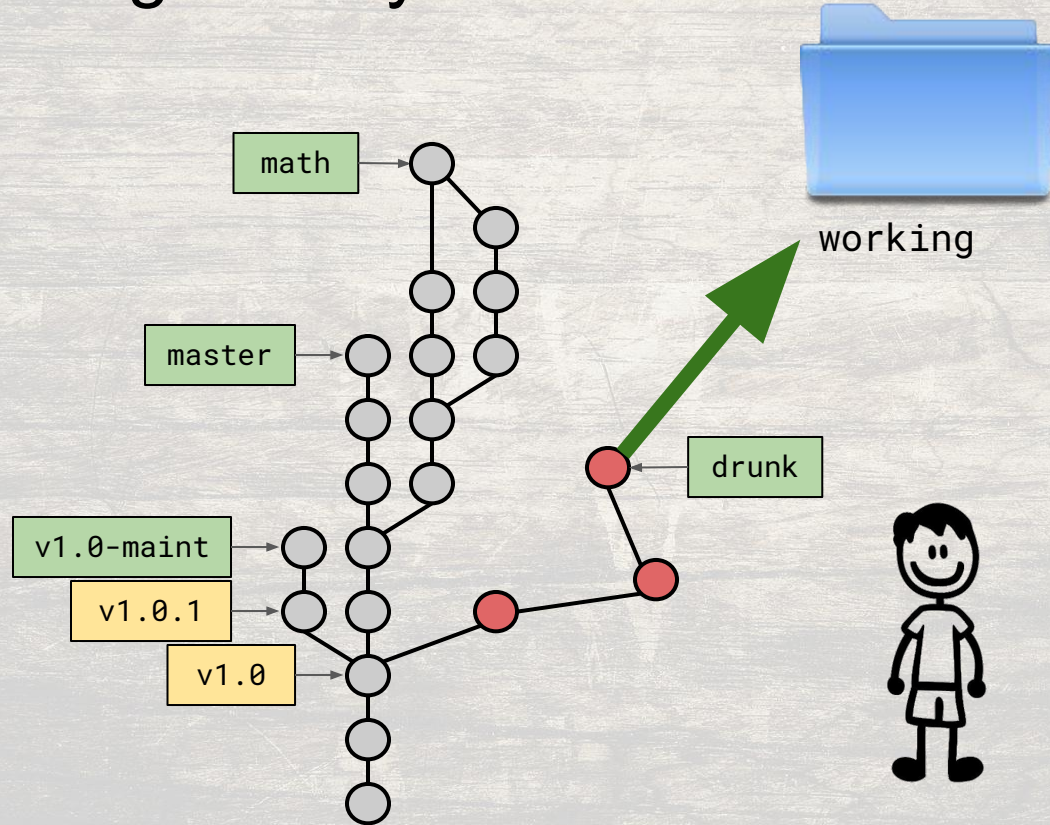
Rewriting History



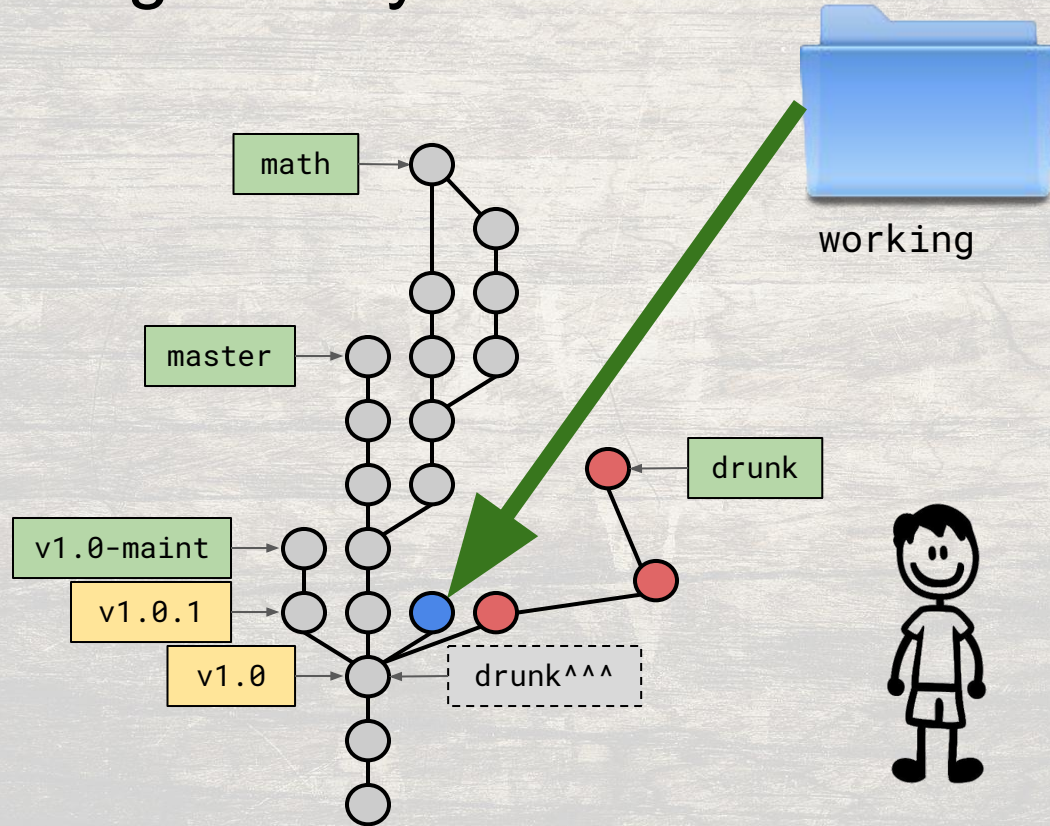
Rewriting History



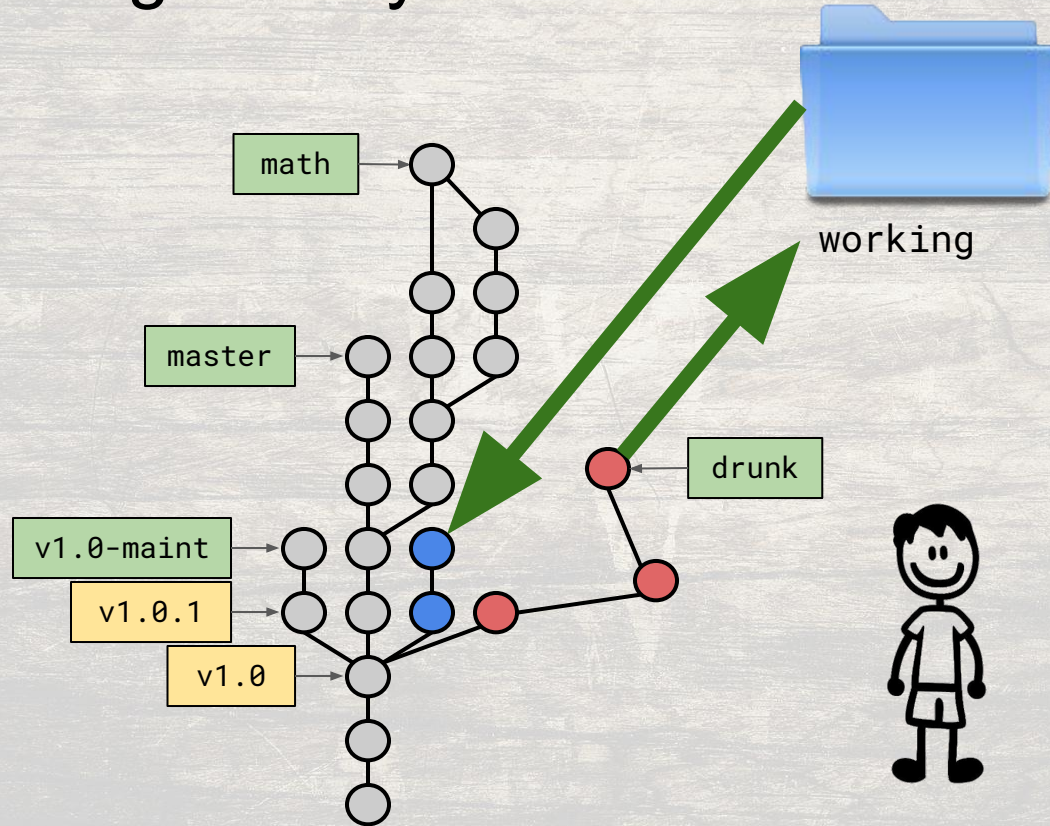
Rewriting History



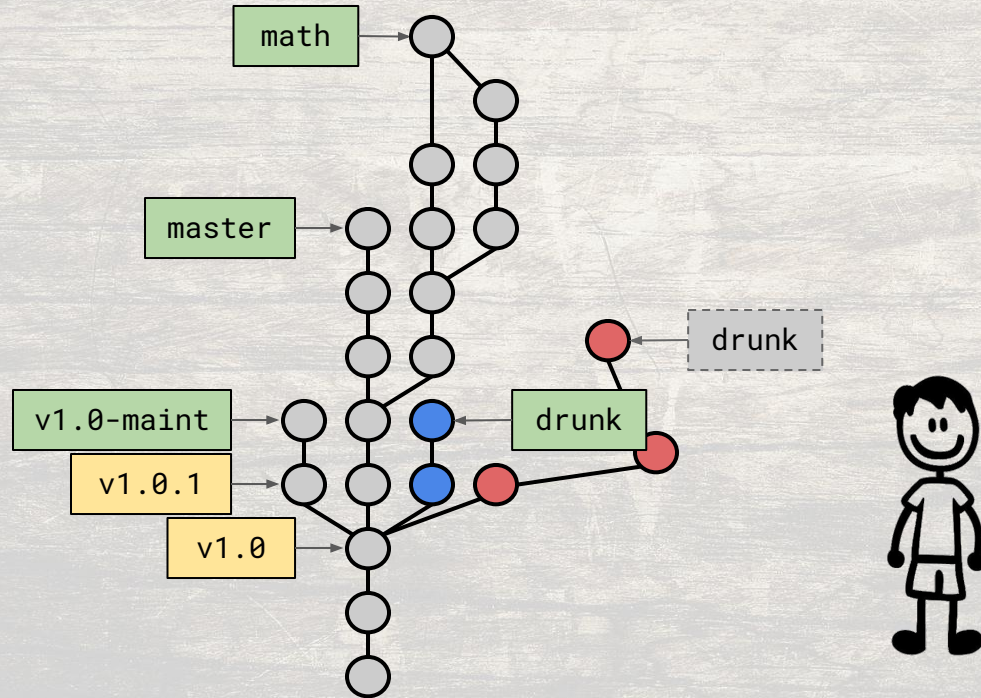
Rewriting History



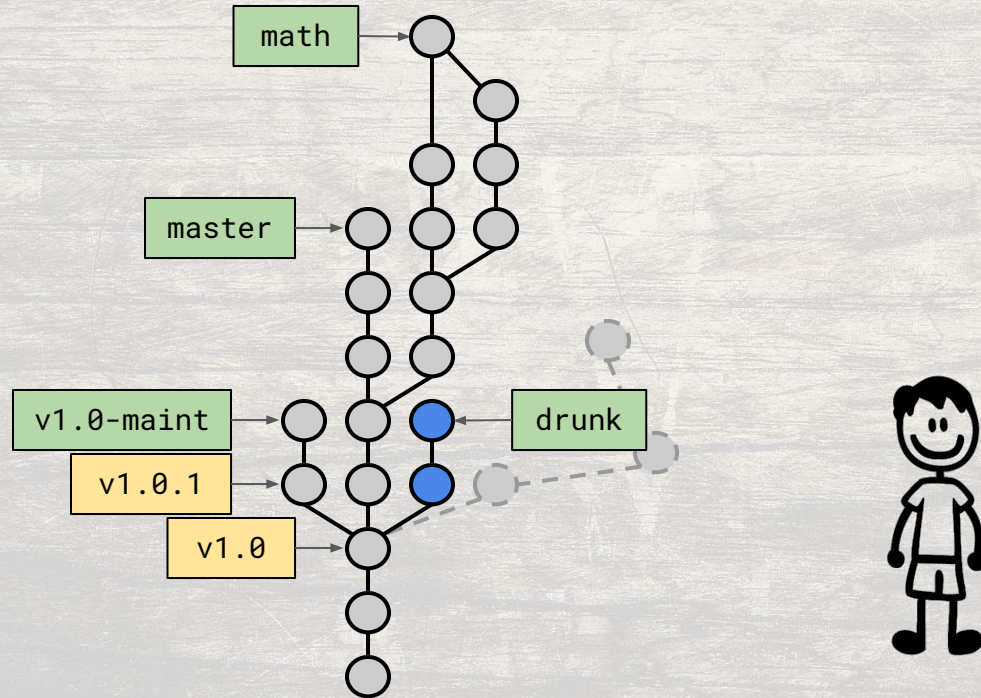
Rewriting History



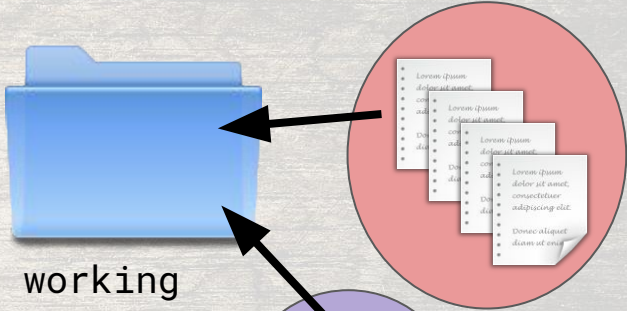
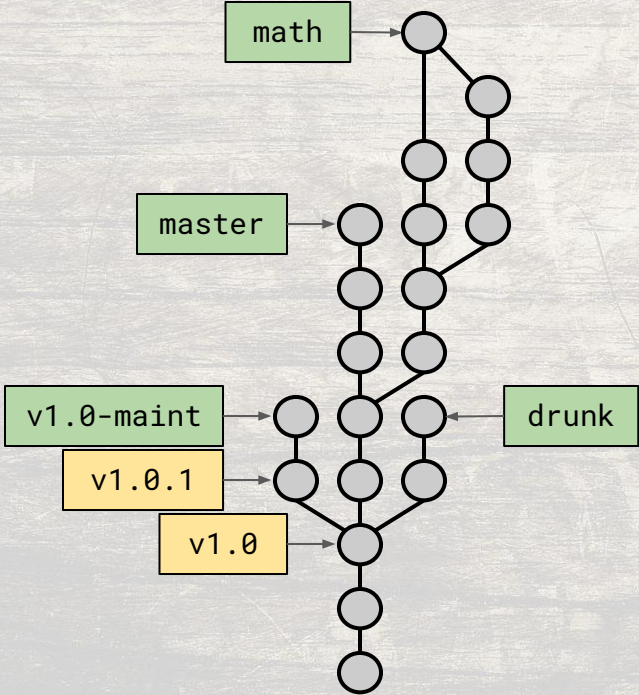
Rewriting History



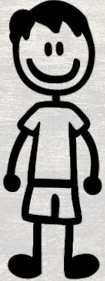
Rewriting History



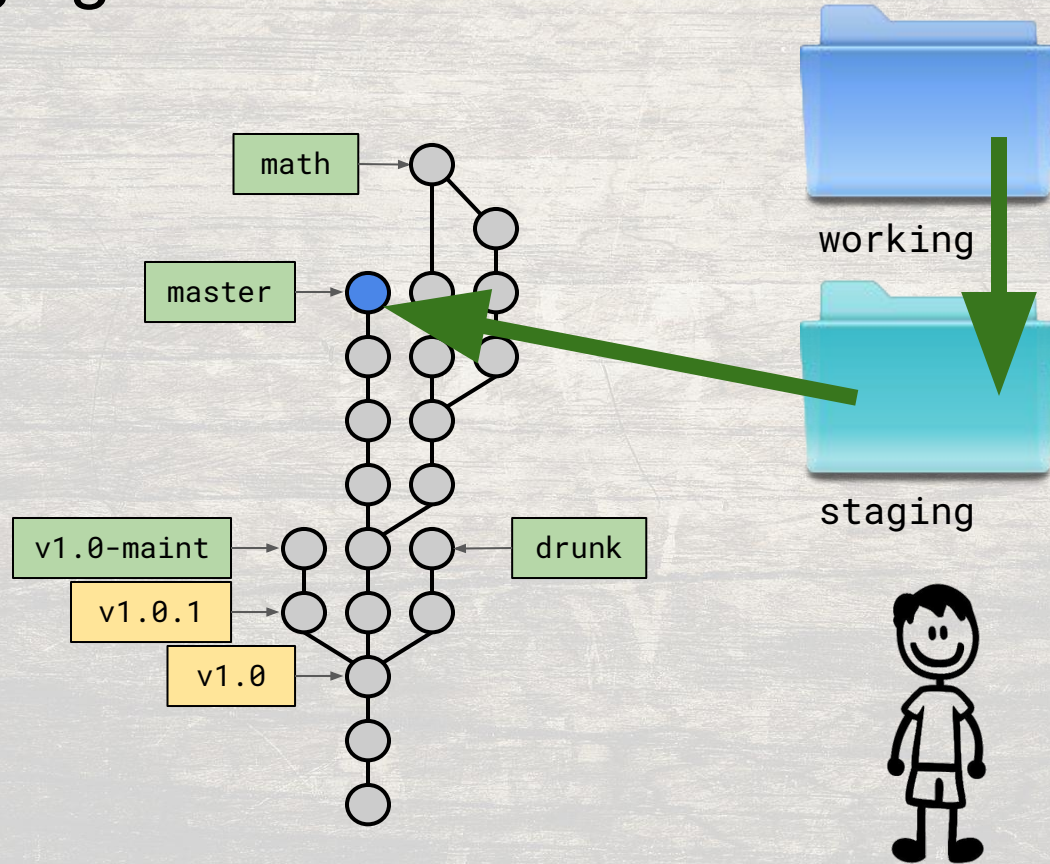
Staging Area



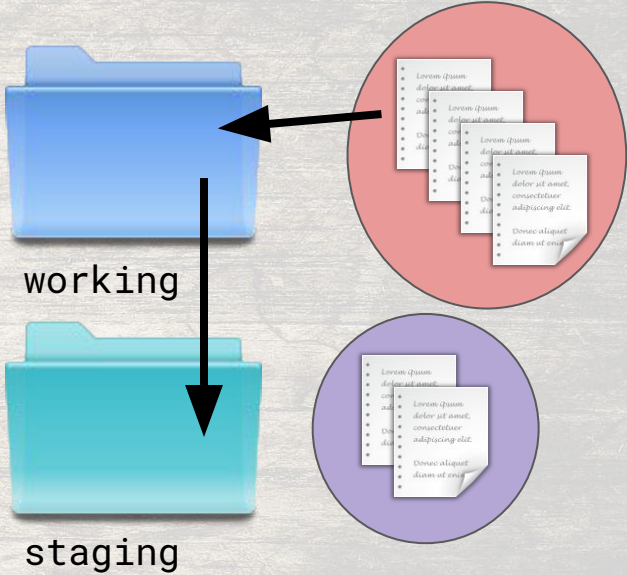
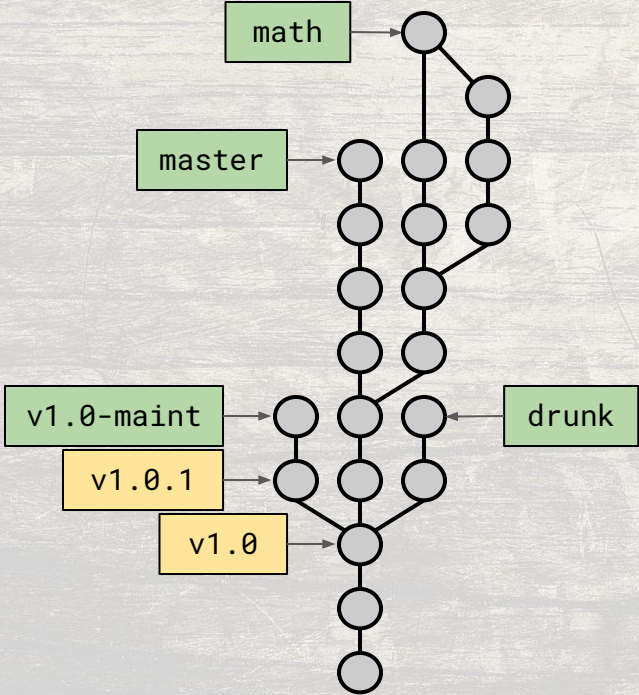
Oops...



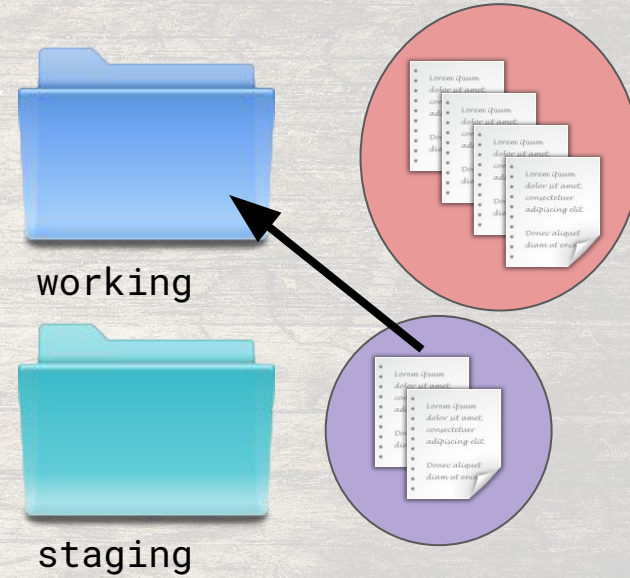
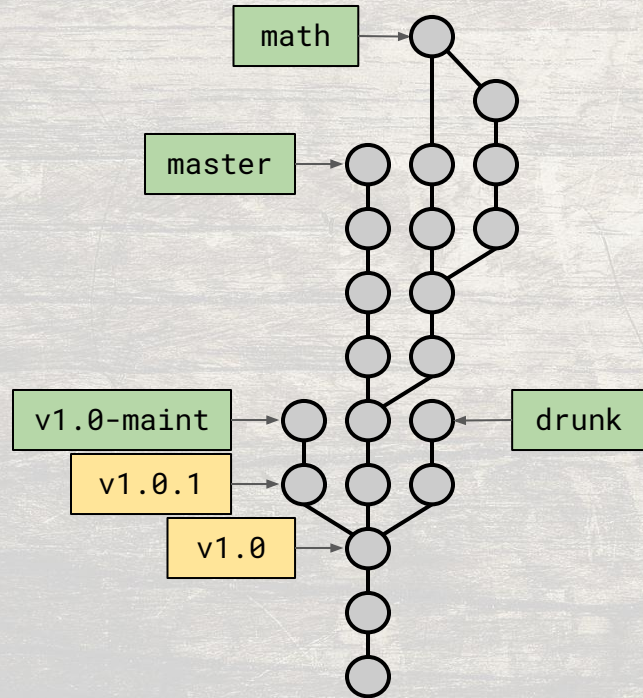
Staging Area



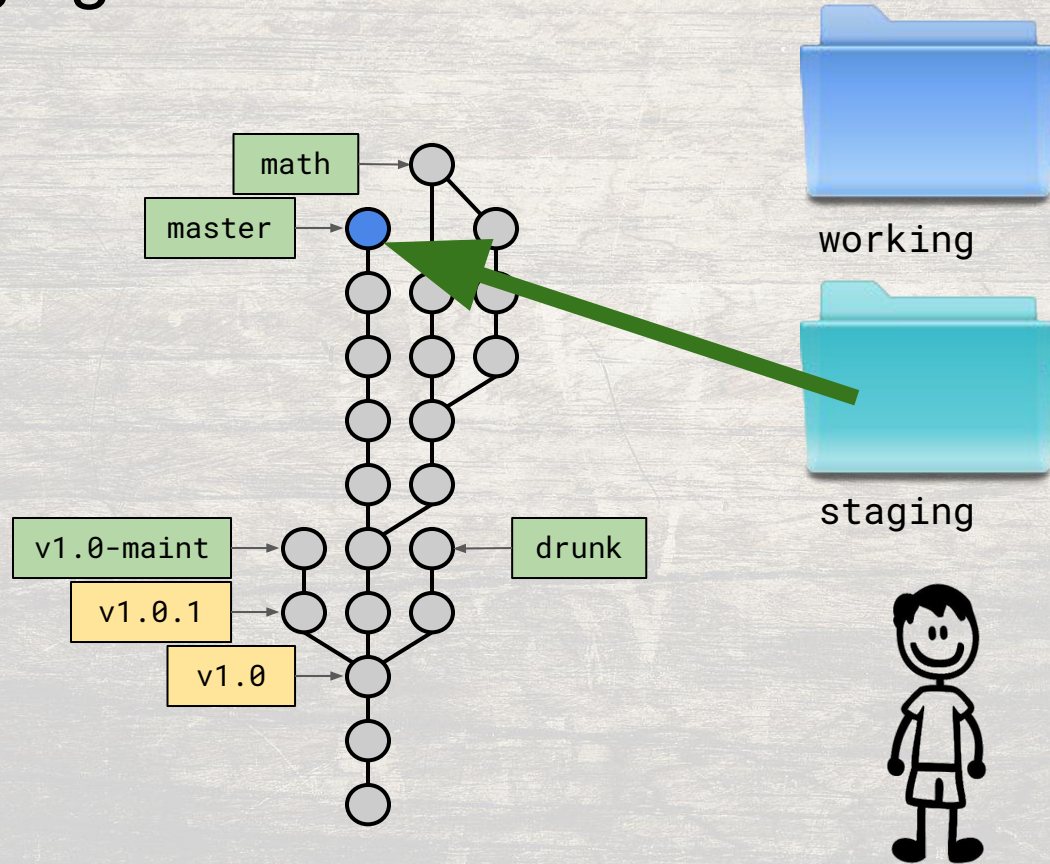
Staging Area



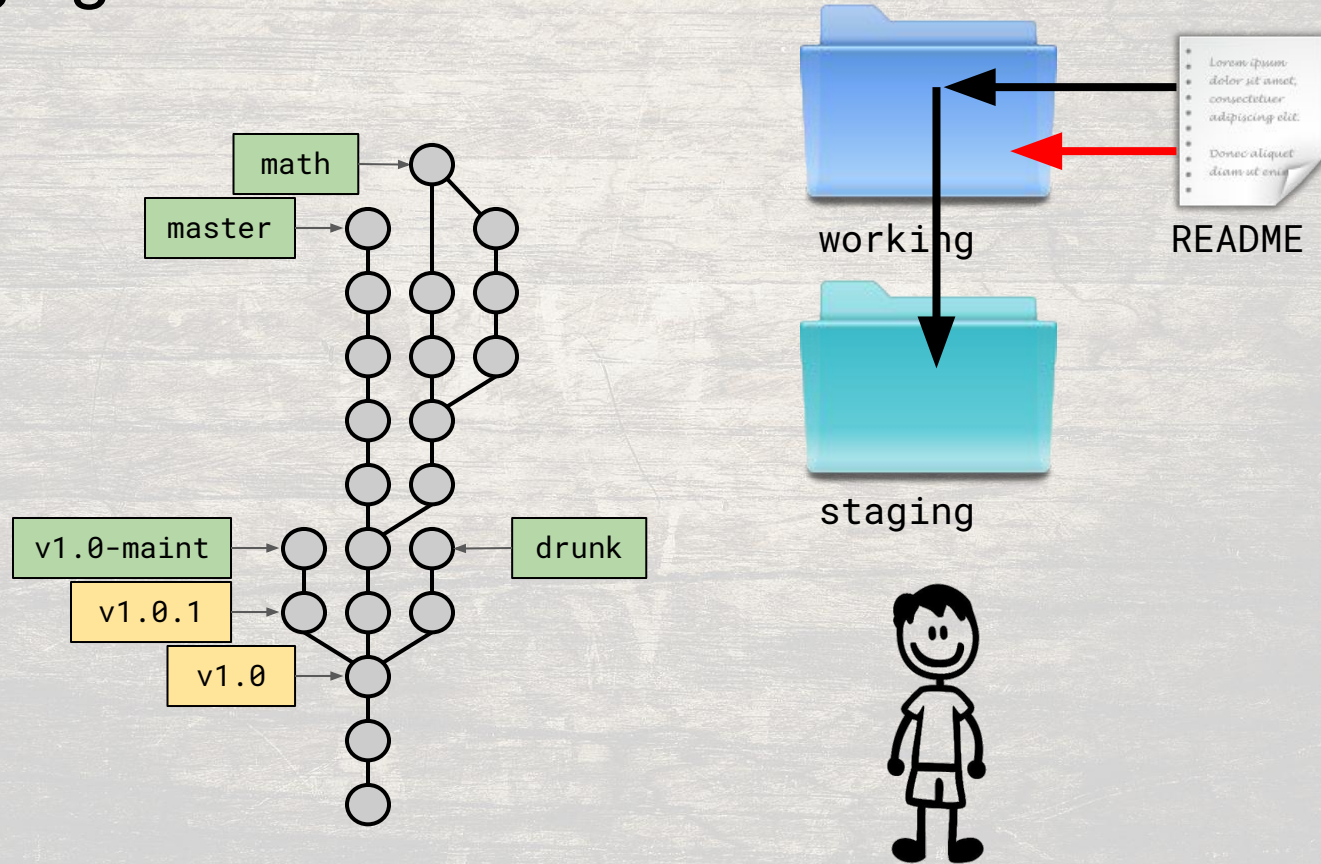
Staging Area



Staging Area



Staging Area



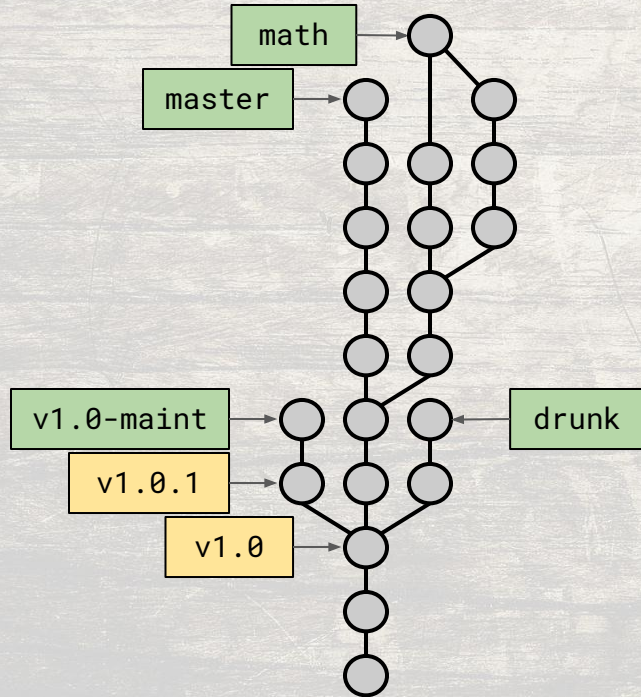
Diffs



working



staging

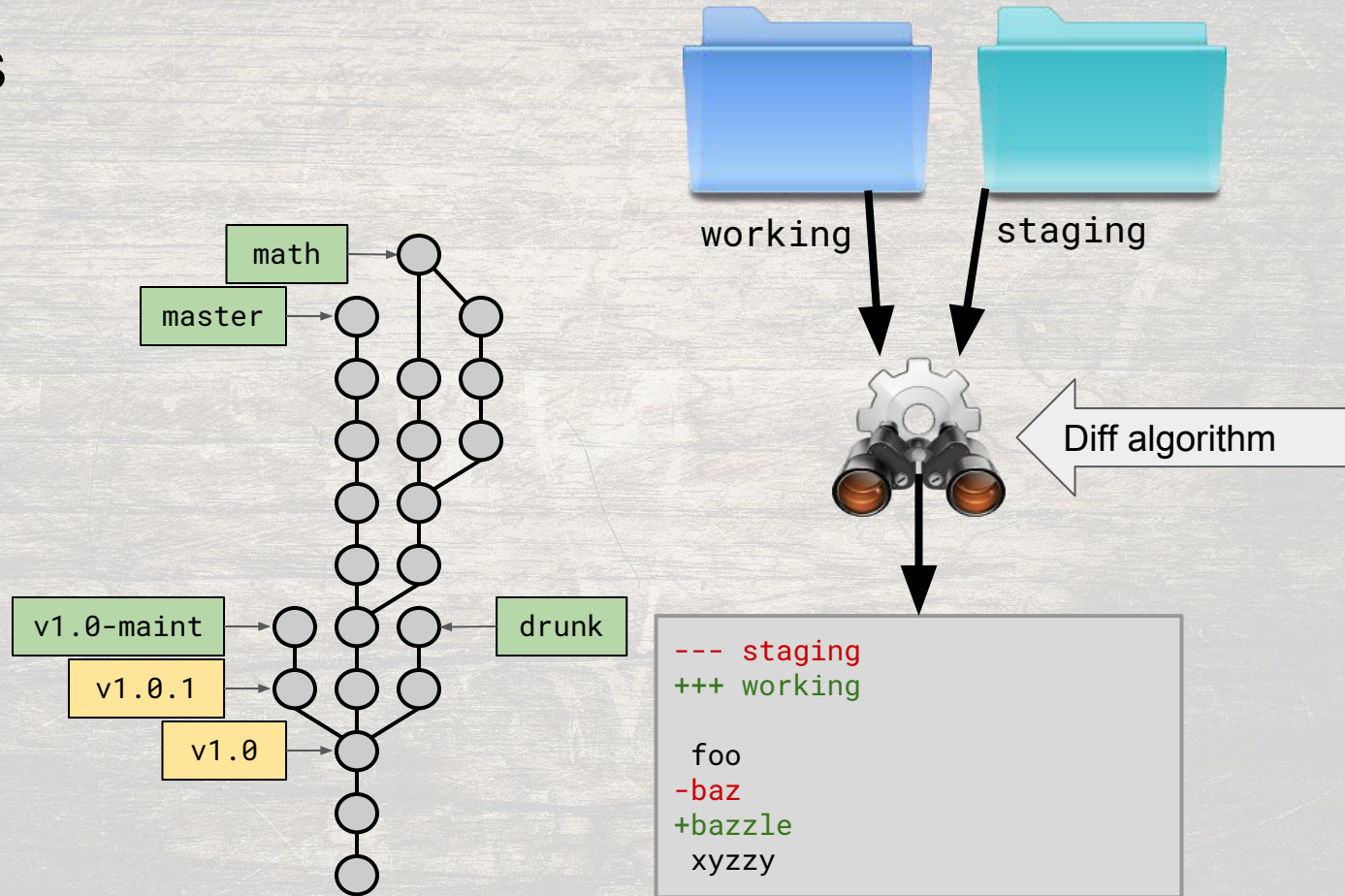


What are the changes?

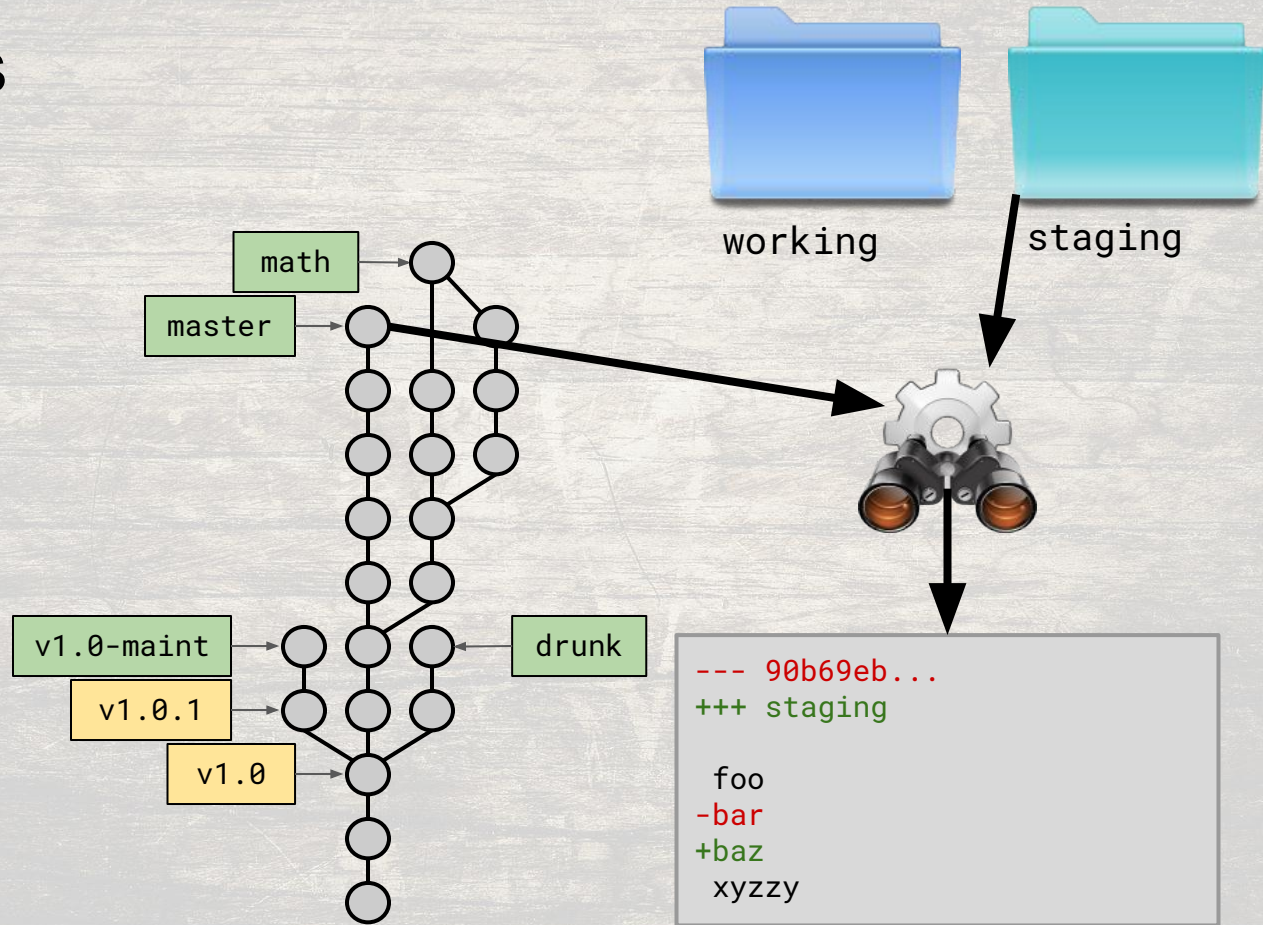
- working vs. staging?
- working vs. snapshot X?
- staging vs. snapshot X?
- snapshot X vs. snapshot Y?



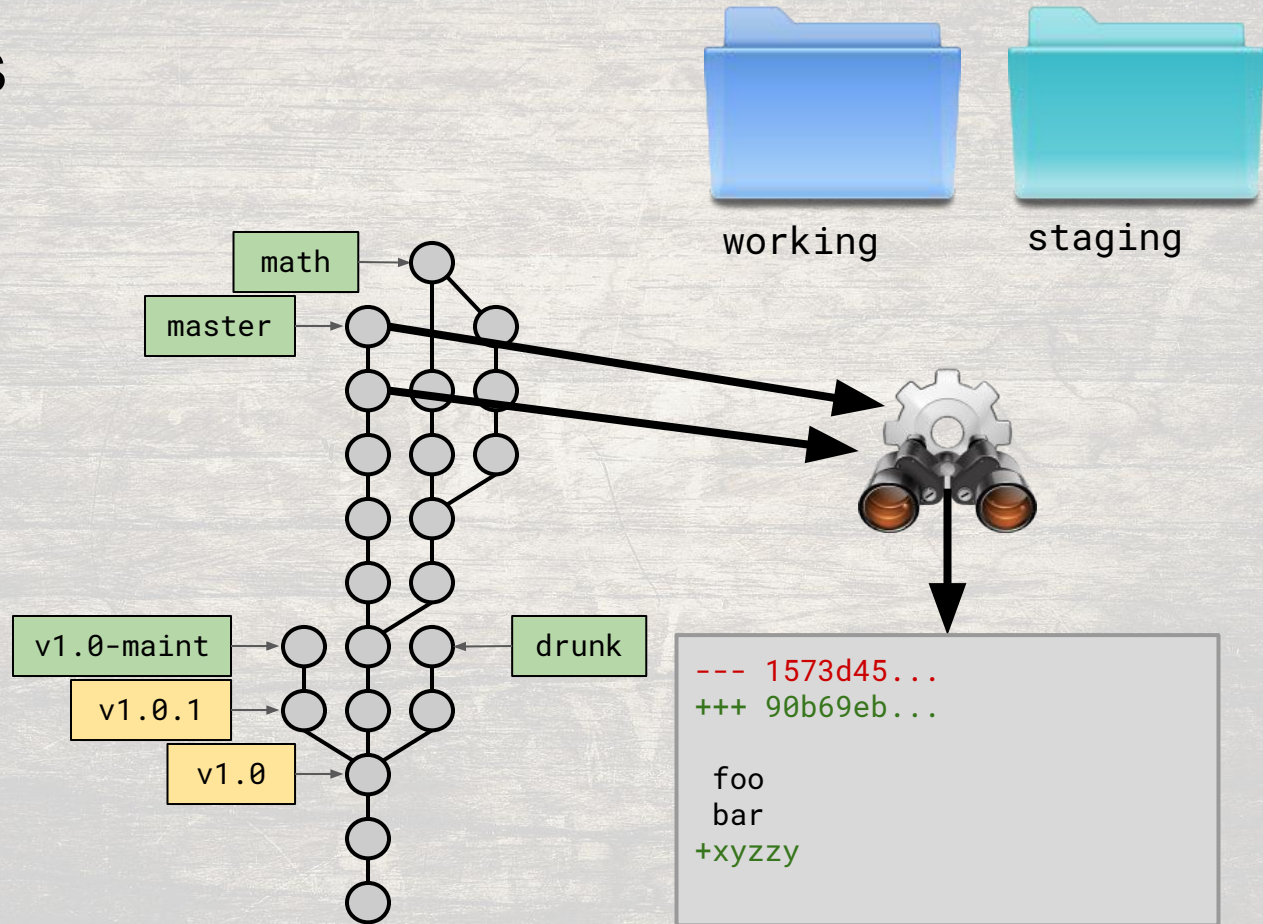
Diffs



Diffs



Diffs

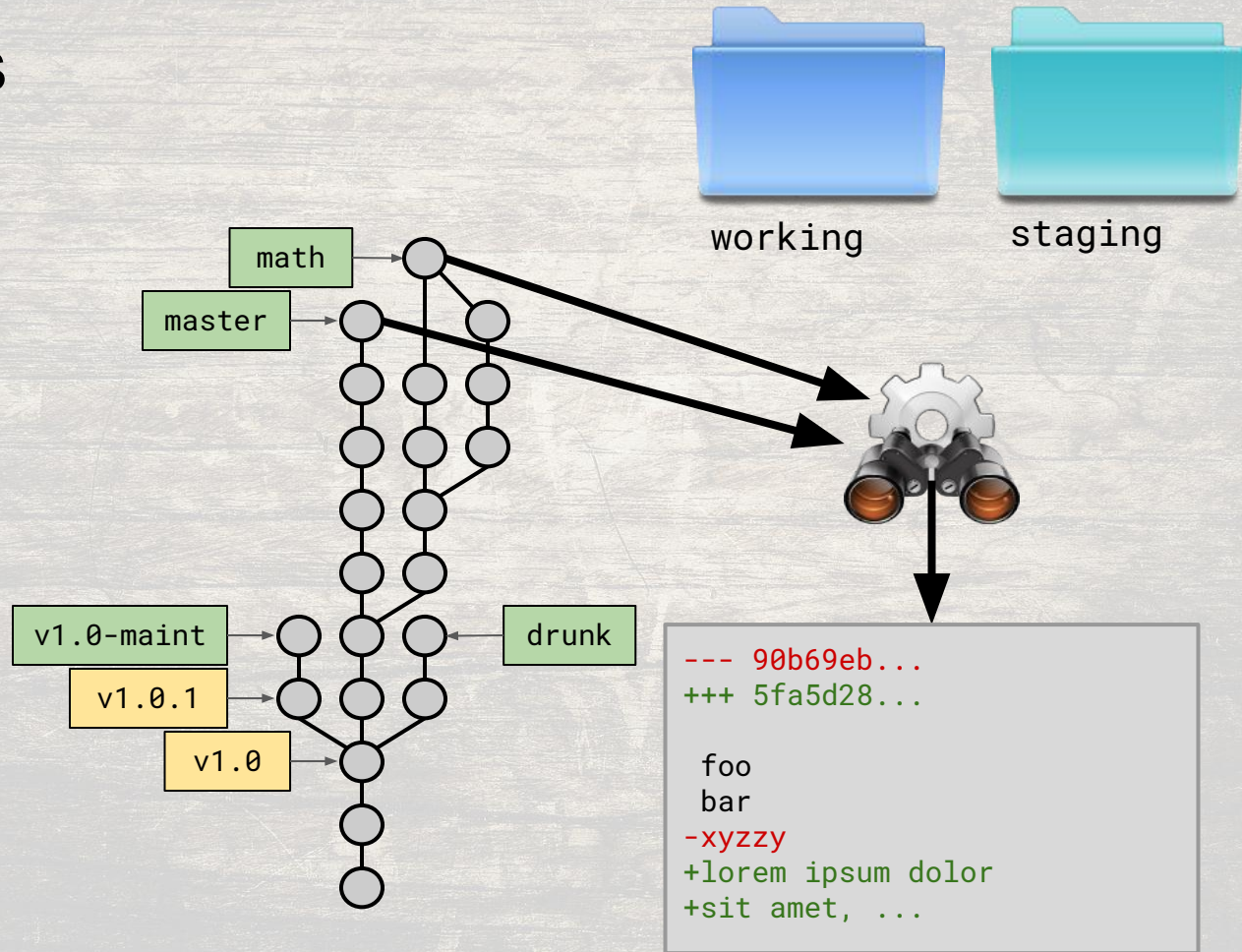


working

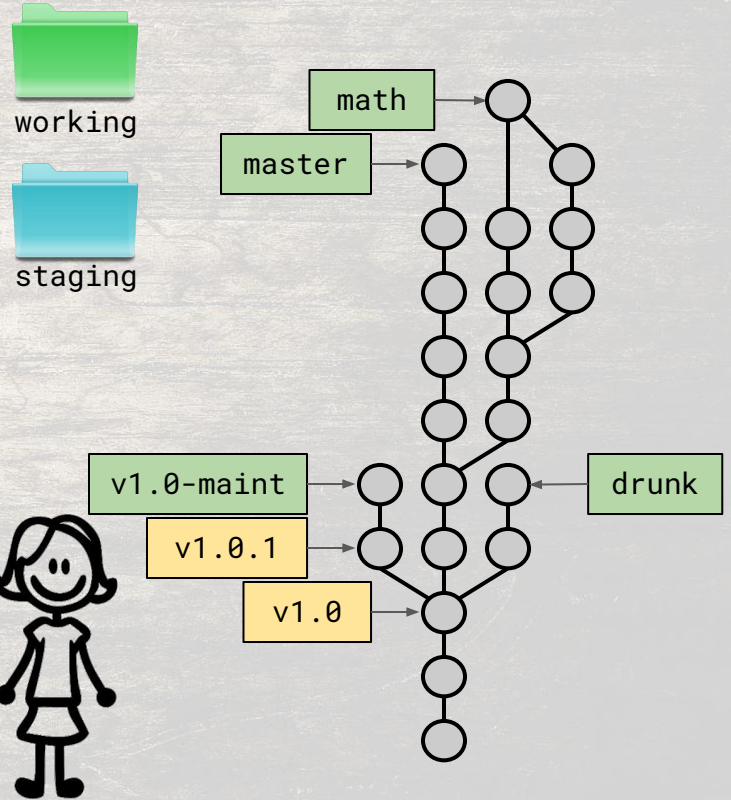
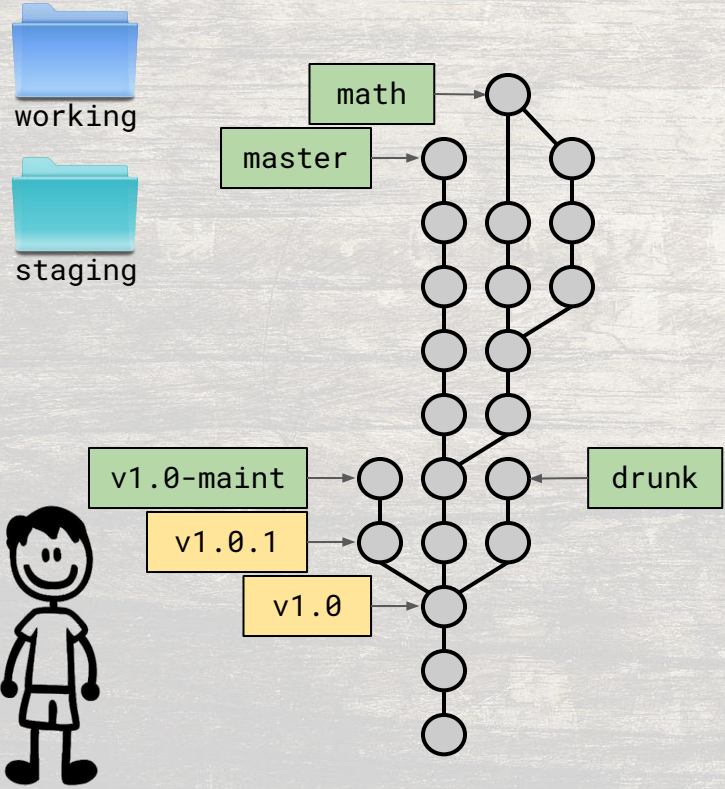
staging



Diffs



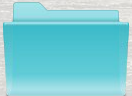
Eliminating Duplication



Eliminating Duplication



working



staging



v1.0-maint

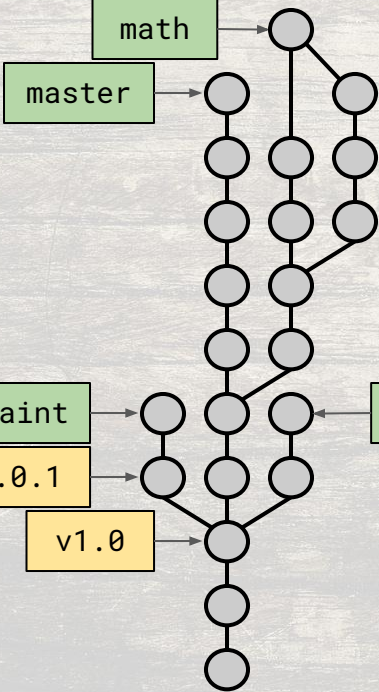
v1.0.1

v1.0

math

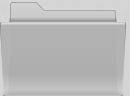
master

drunk



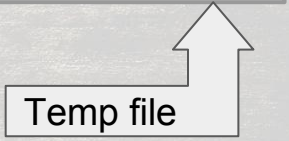
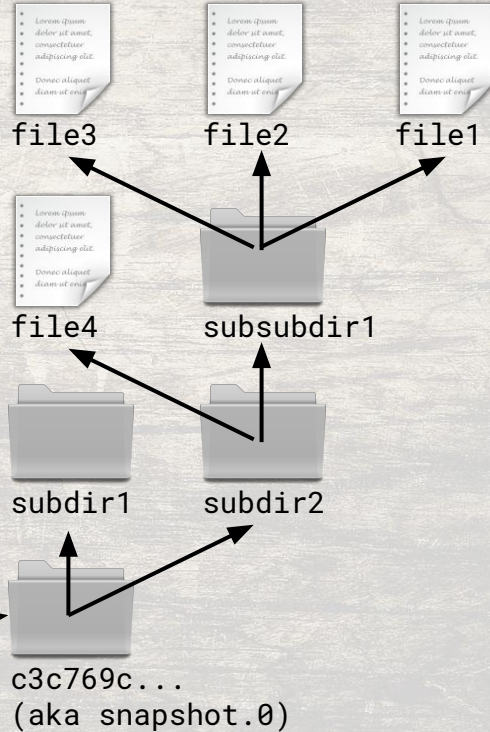
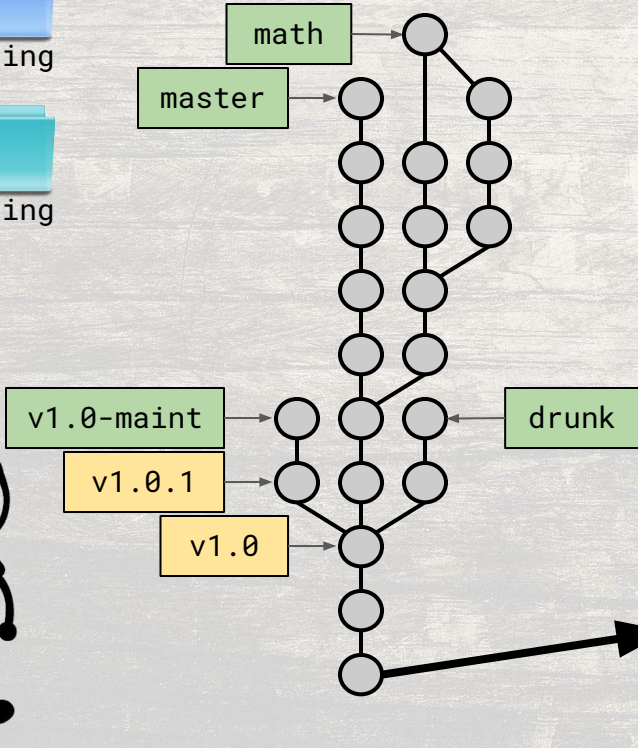
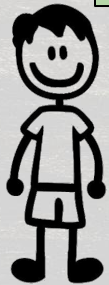
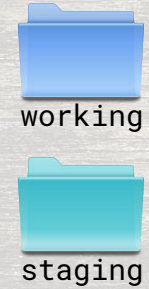
SHA-1

2804133755c3ed396d162028c7b30a1cbcfcdded

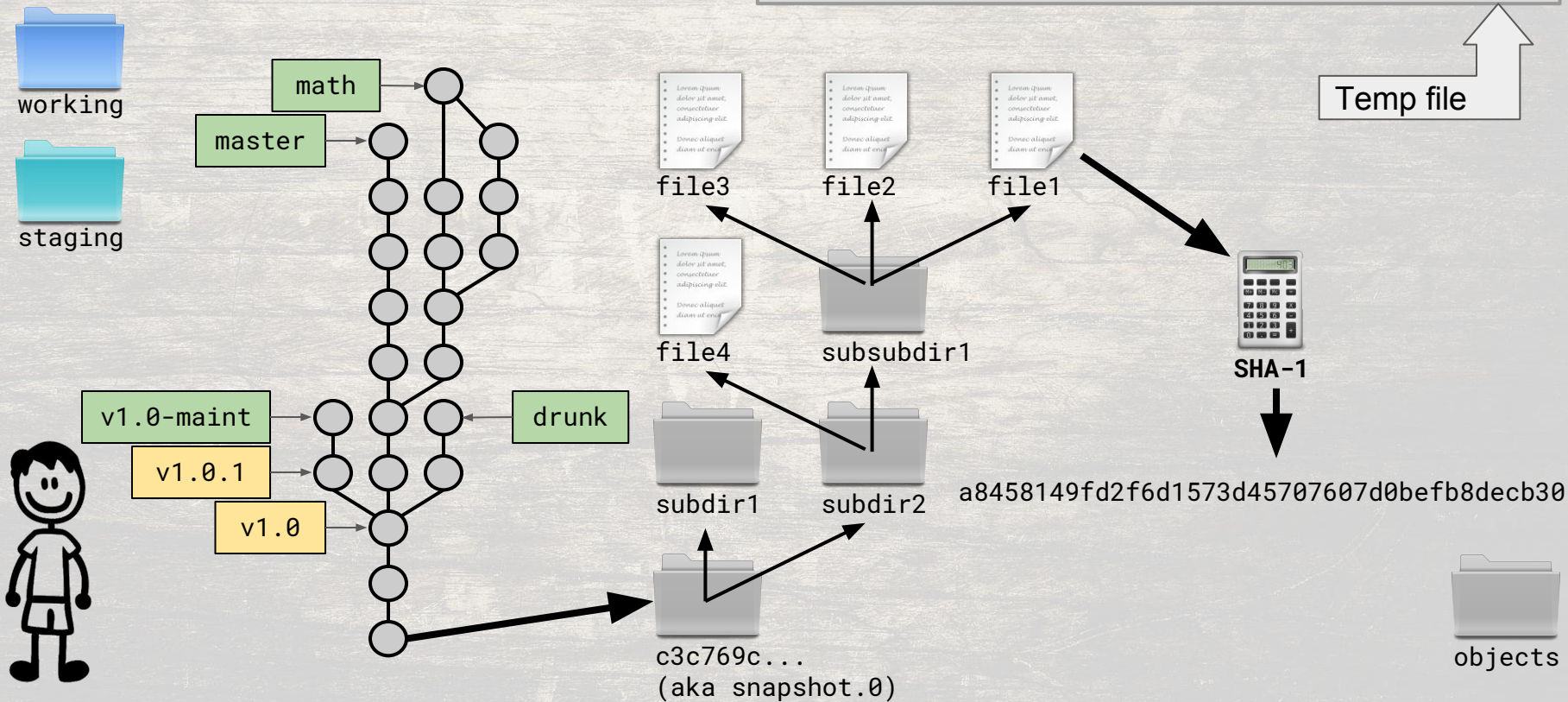


objects

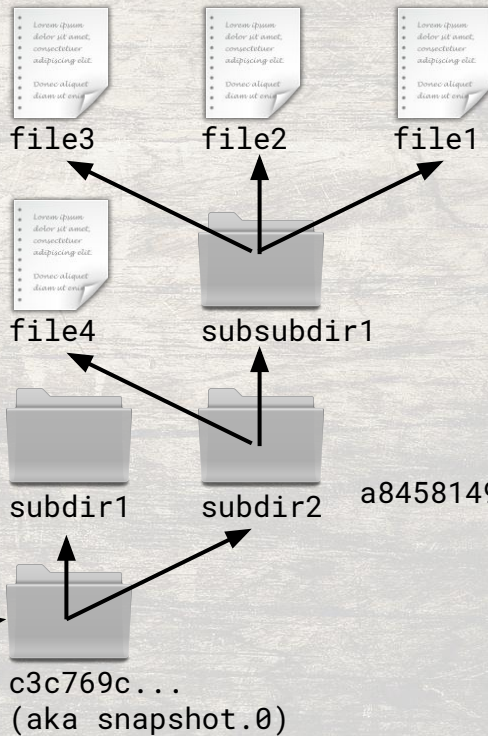
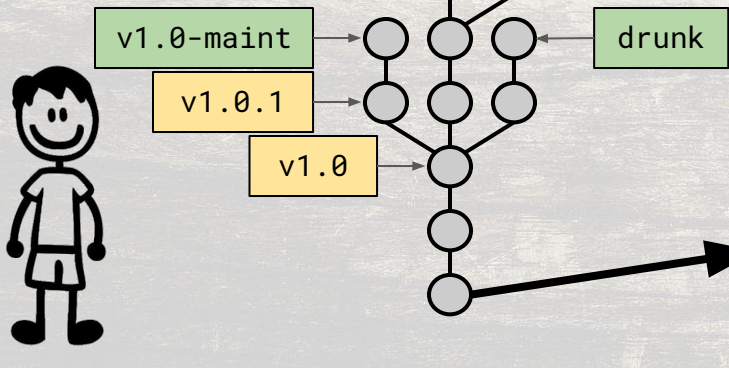
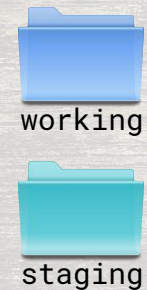
Eliminating Duplication



Eliminating Duplication



Eliminating Duplication



blob a8458149fd2f6d1573d45707607d0befb8decb30 file1

Temp file

a8458149fd2f6d1573d45707607d0befb8decb30



blob a8458149fd2f6d1573d45707607d0befb8decb30 file1

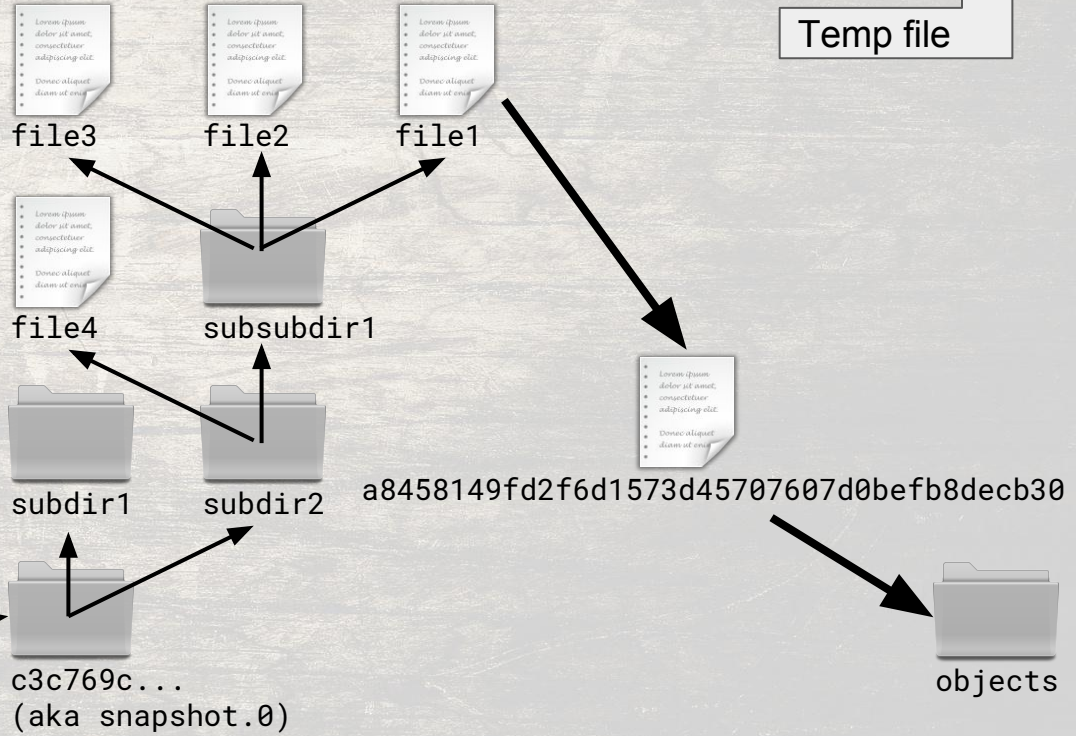
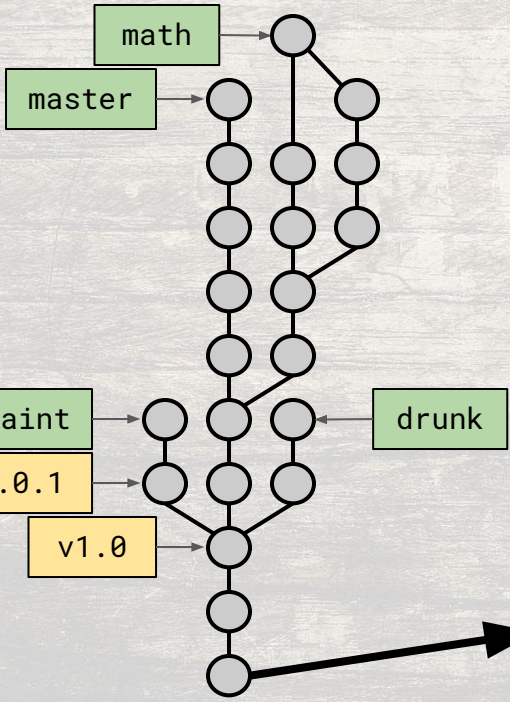
Eliminating Duplication



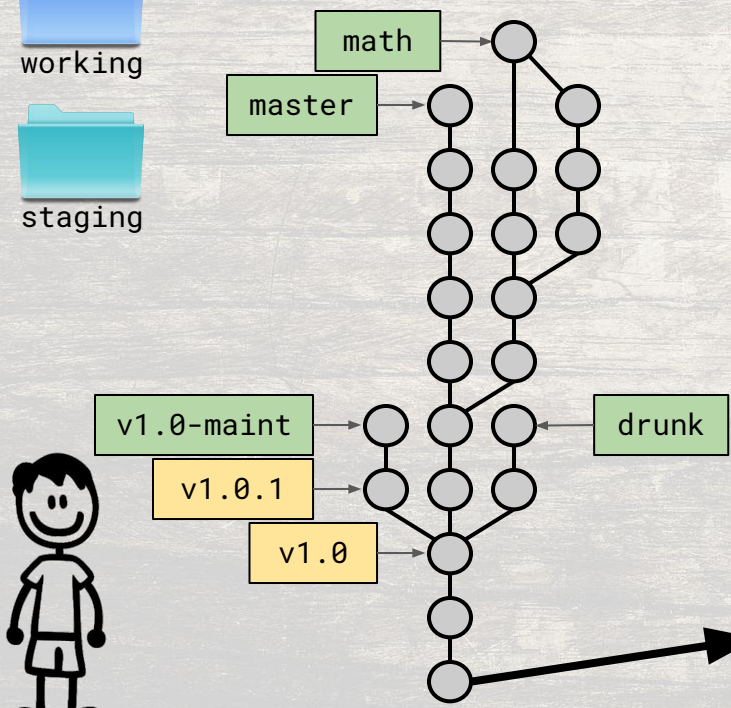
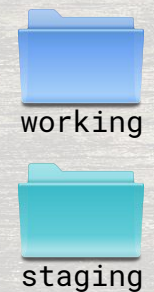
working



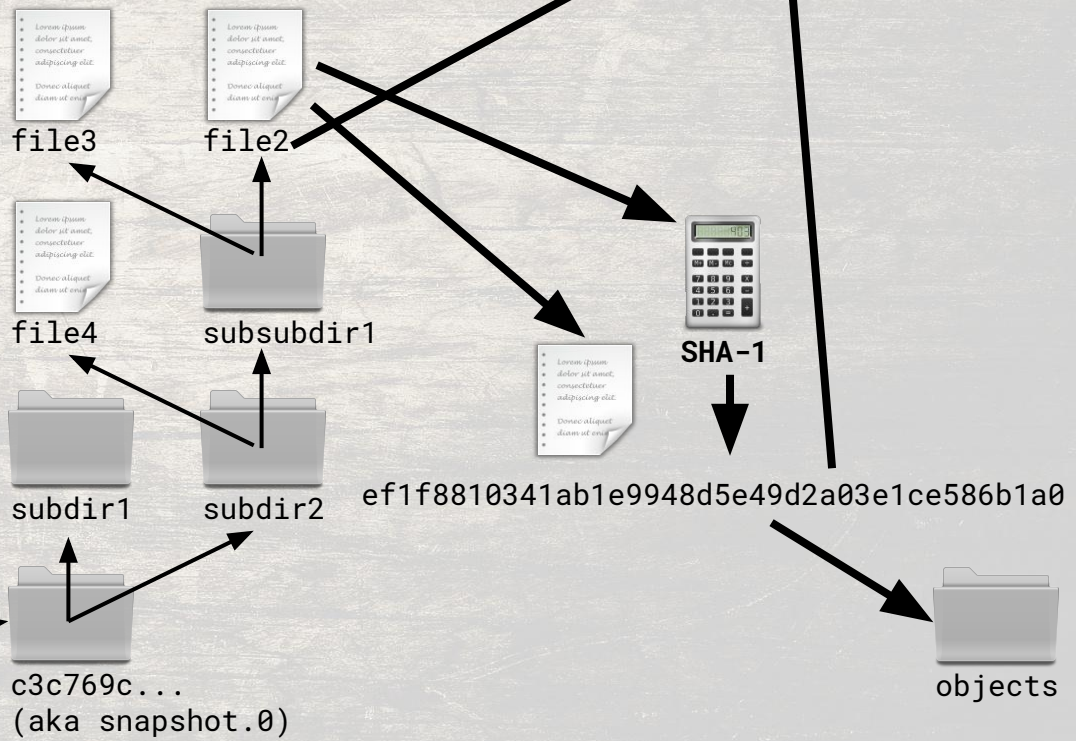
staging



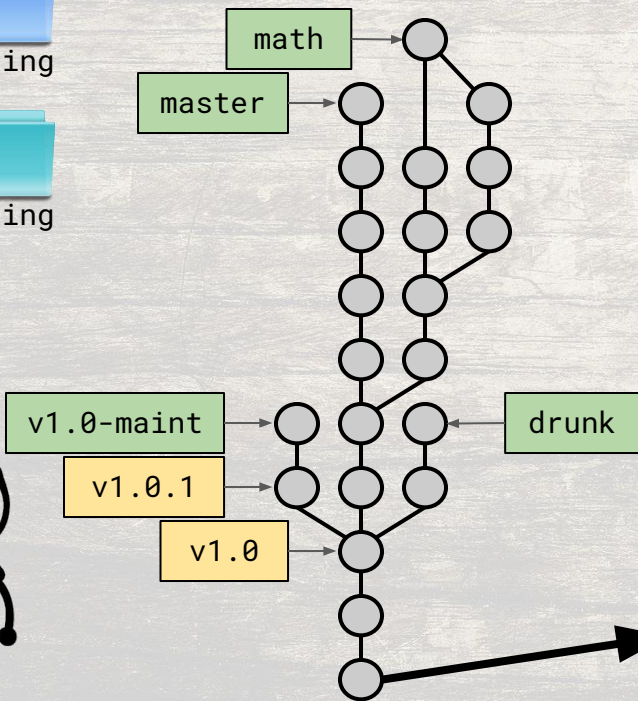
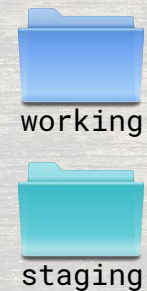
Eliminating Duplication



```
blob a8458149fd2f6d1573d45707607d0befb8decb30 file1  
blob ef1f8810341ab1e9948d5e49d2a03e1ce586b1a0 file2
```



Eliminating Duplication



file3



file4



subsubdir1



subdir1



subdir2



c3c769c...
(aka snapshot.0)

```
blob a8458149fd2f6d1573d45707607d0befb8decb30 file1
blob ef1f8810341ab1e9948d5e49d2a03e1ce586b1a0 file2
blob 376256ffd8737954c129dfc2f6f7cffc559b78b7 file3
```

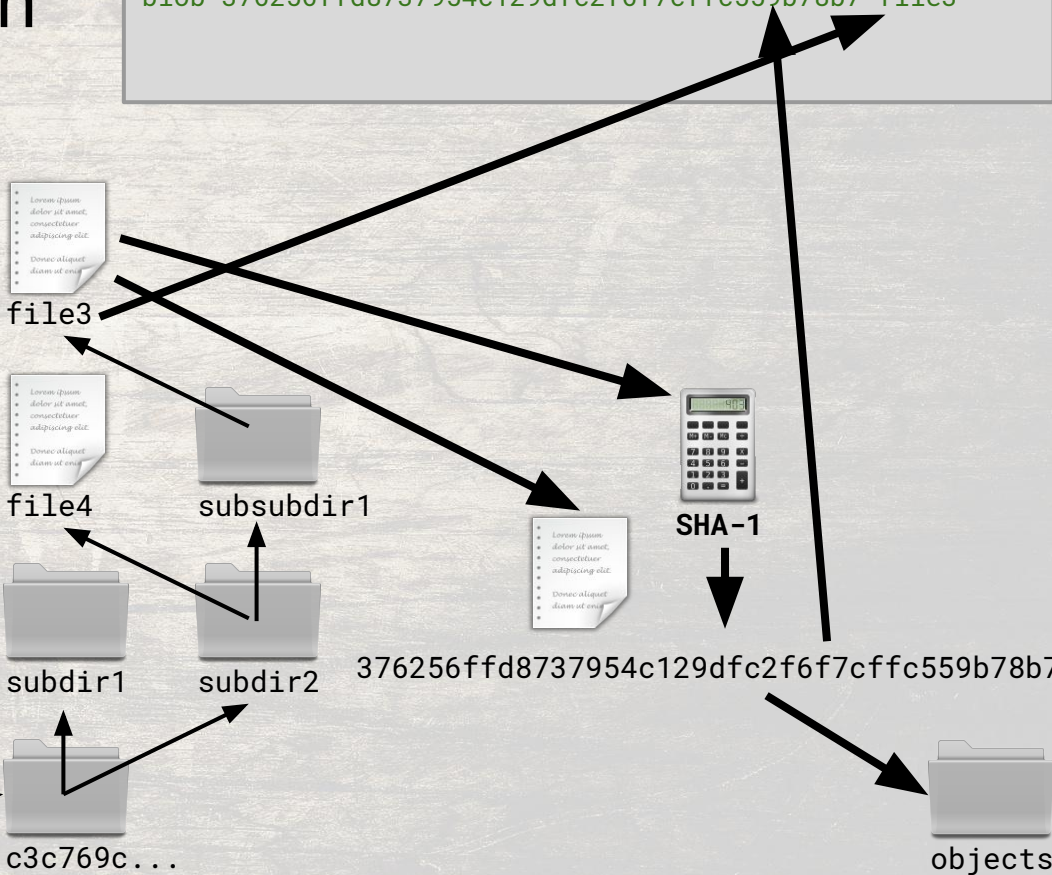


SHA-1

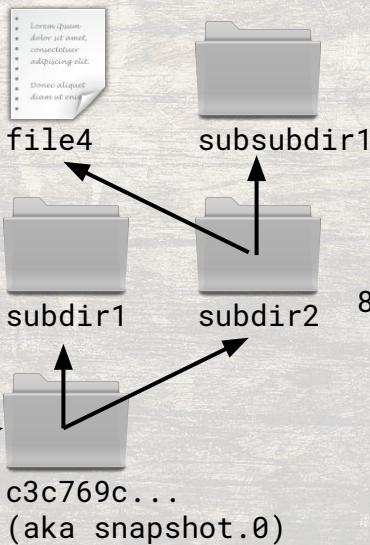
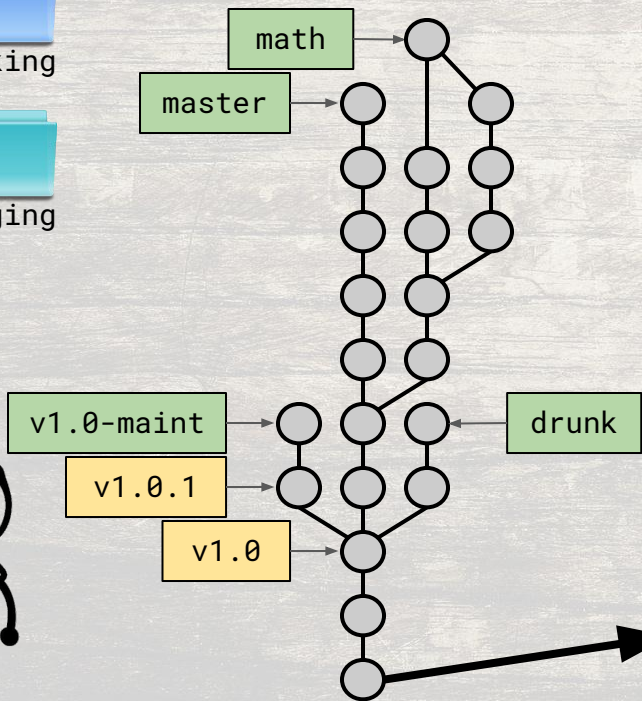
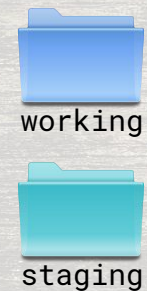
376256ffd8737954c129dfc2f6f7cffc559b78b7



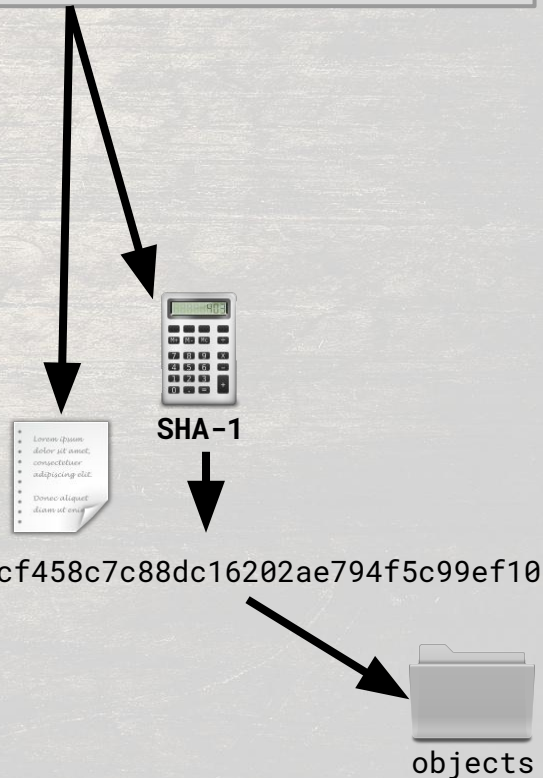
objects



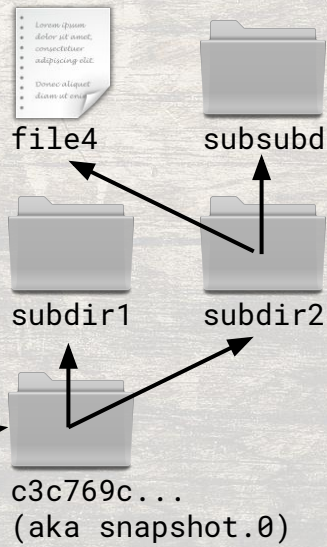
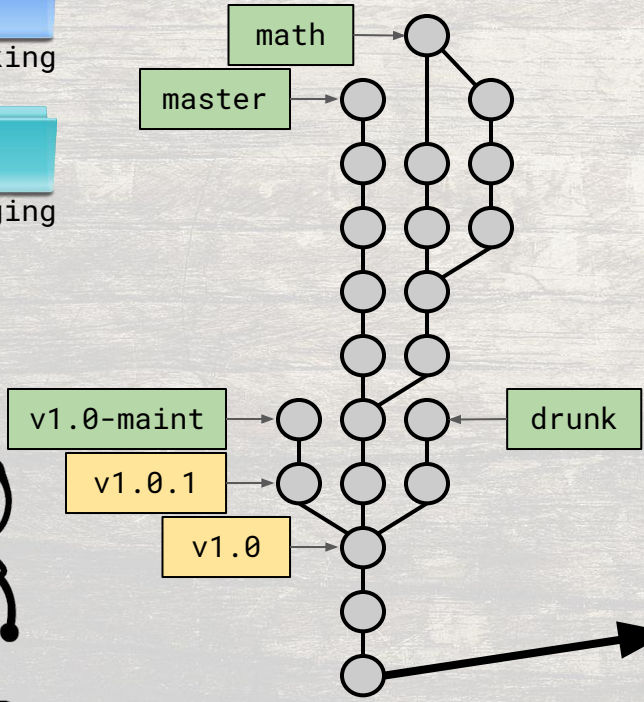
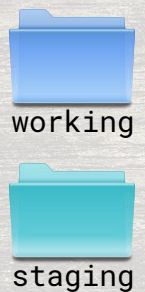
Eliminating Duplication



```
blob a8458149fd2f6d1573d45707607d0befb8decb30 file1  
blob ef1f8810341ab1e9948d5e49d2a03e1ce586b1a0 file2  
blob 376256ffd8737954c129dfc2f6f7cffc559b78b7 file3
```



Eliminating Duplication



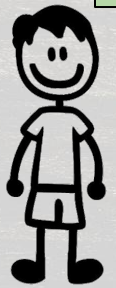
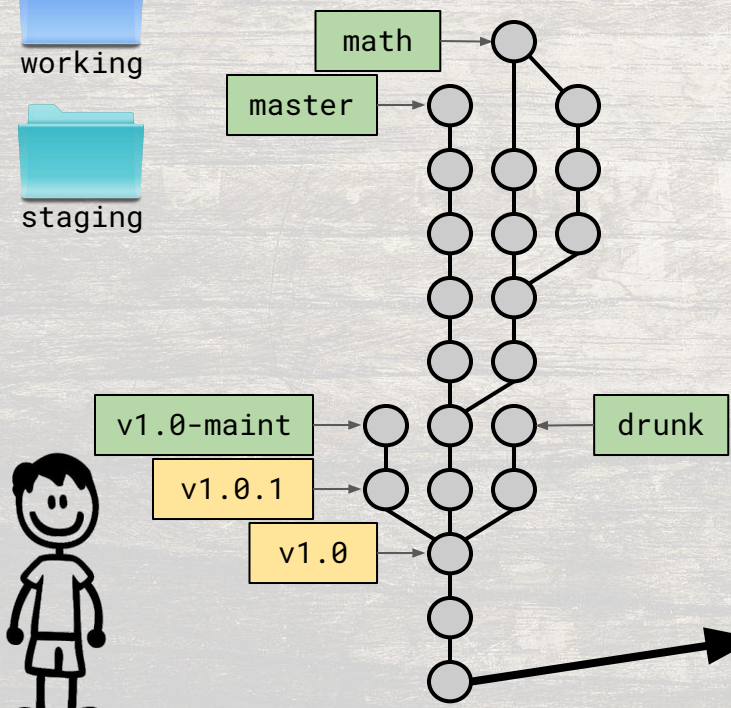
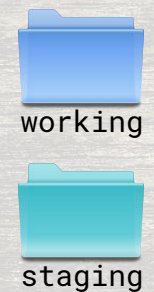
```
tree 8aa73a2b1cf458c7c88dc16202ae794f5c99ef10 subsudir1
```

New temp file

8aa73a2b1cf458c7c88dc16202ae794f5c99ef10



Eliminating Duplication



```
tree 8aa73a2b1cf458c7c88dc16202ae794f5c99ef10 subsubdir1  
blob be17eadd5e696239e8a5f6e6e3dbce524707983 file4
```



file4



subdir1



subdir2

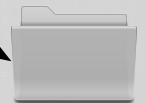


SHA-1

be17eadd5e696239e8a5f6e6e3dbce524707983



c3c769c...
(aka snapshot.0)

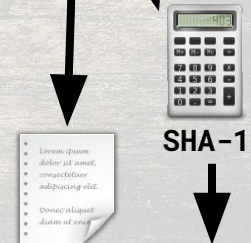
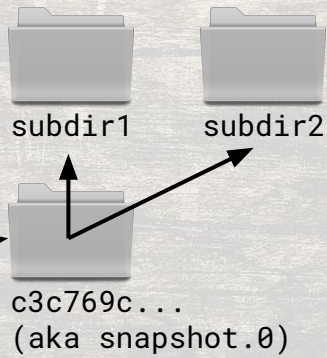
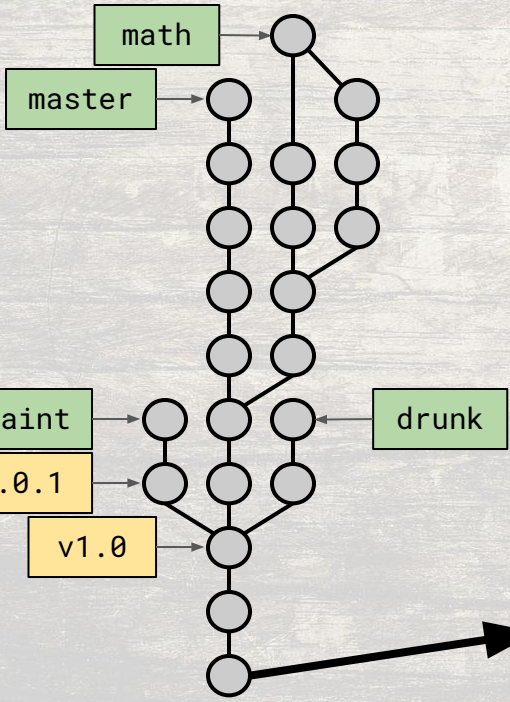
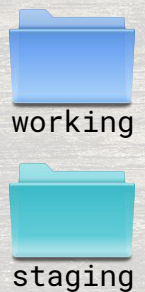


objects



Eliminating Duplication

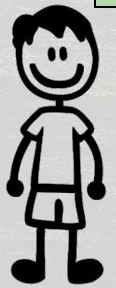
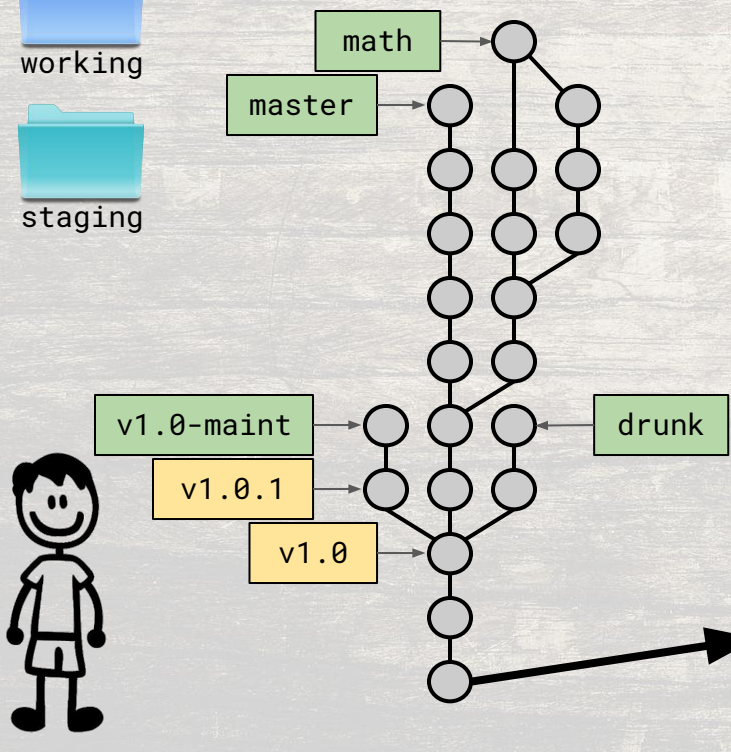
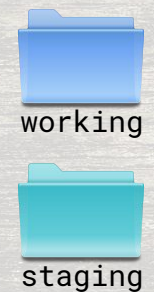
```
tree 8aa73a2b1cf458c7c88dc16202ae794f5c99ef10 subsubdir1
blob be17eadd5e696239e8a5f6e6e3dbce524707983 file4
```



67a3c2a9119a3c3c769c0b1e8735fa5d28d94a12



Eliminating Duplication



```
tree 2804133755c3ed396d162028c7b30a1cbcfcedd subdir1
tree 67a3c2a9110a3c3c769c0b1e8735fa5d28d94a12 subdir2
```

New temp file



SHA-1



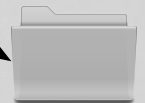
8ff0b253a4f3744576427c7dd575db4bfdb8259d



subdir1

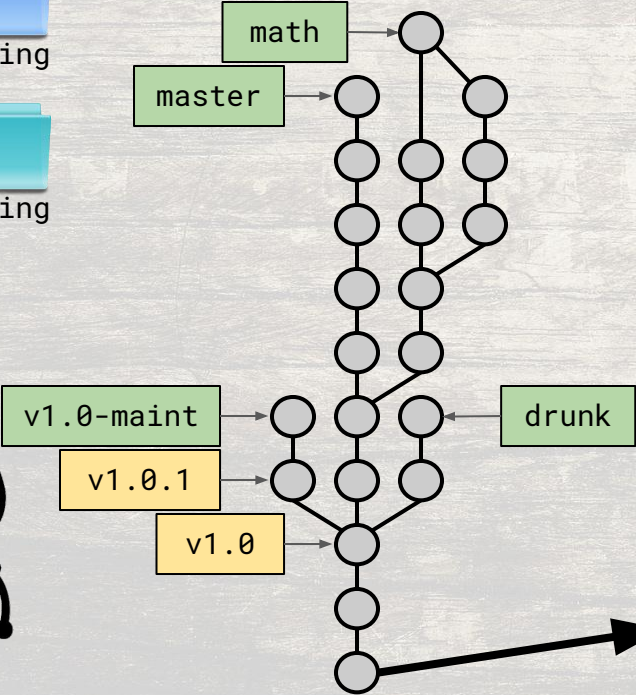
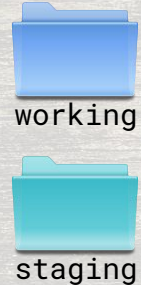
subdir2

c3c769c...
(aka snapshot.0)

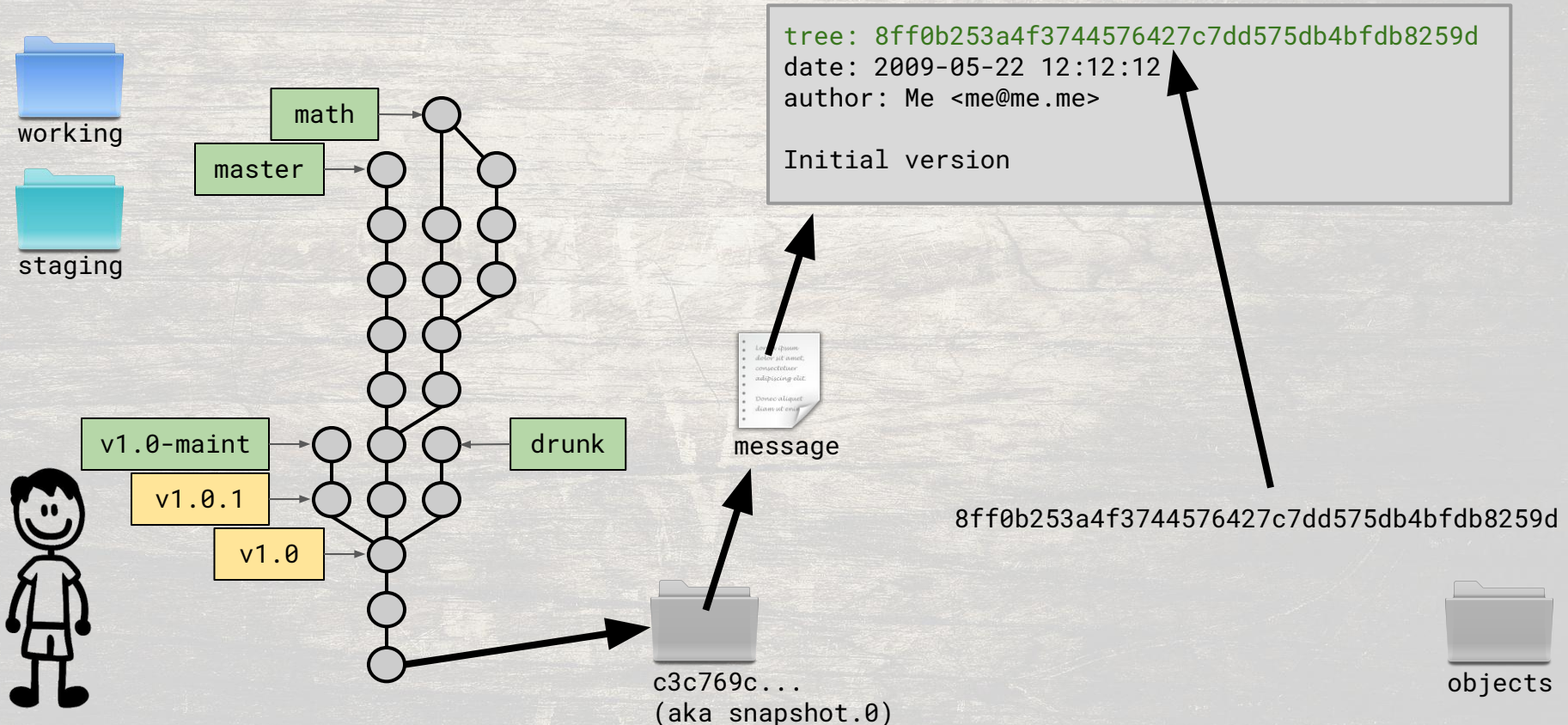


objects

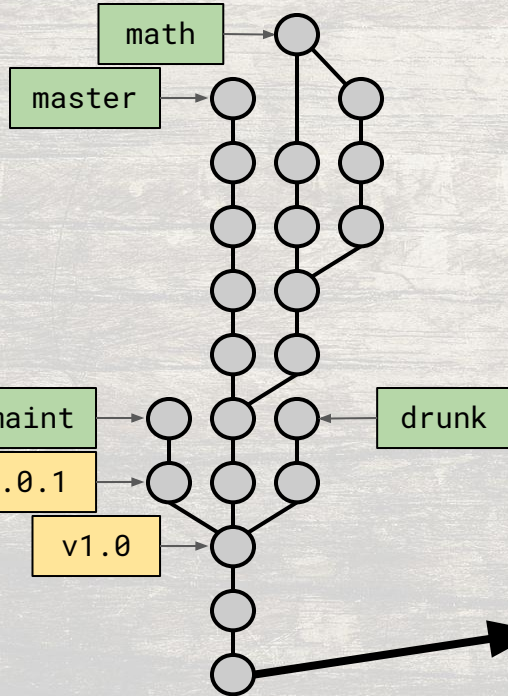
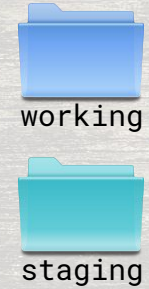
Eliminating Duplication



Eliminating Duplication



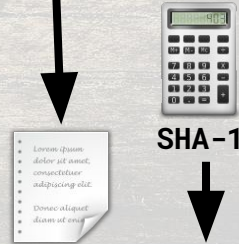
Eliminating Duplication



c3c769c...
(aka snapshot.0)

```
tree: 8ff0b253a4f3744576427c7dd575db4bfdb8259d
date: 2009-05-22 12:12:12
author: Me <me@me.me>
```

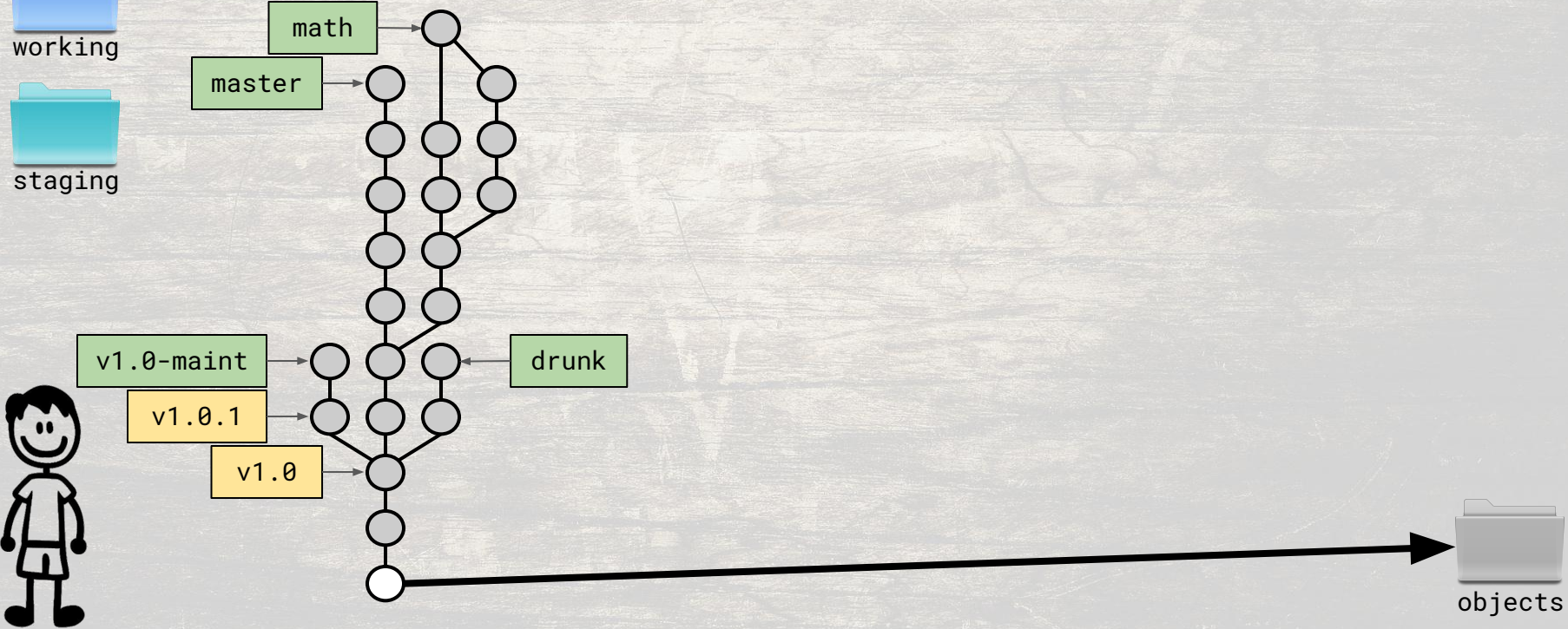
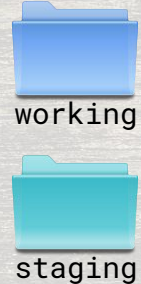
Initial version



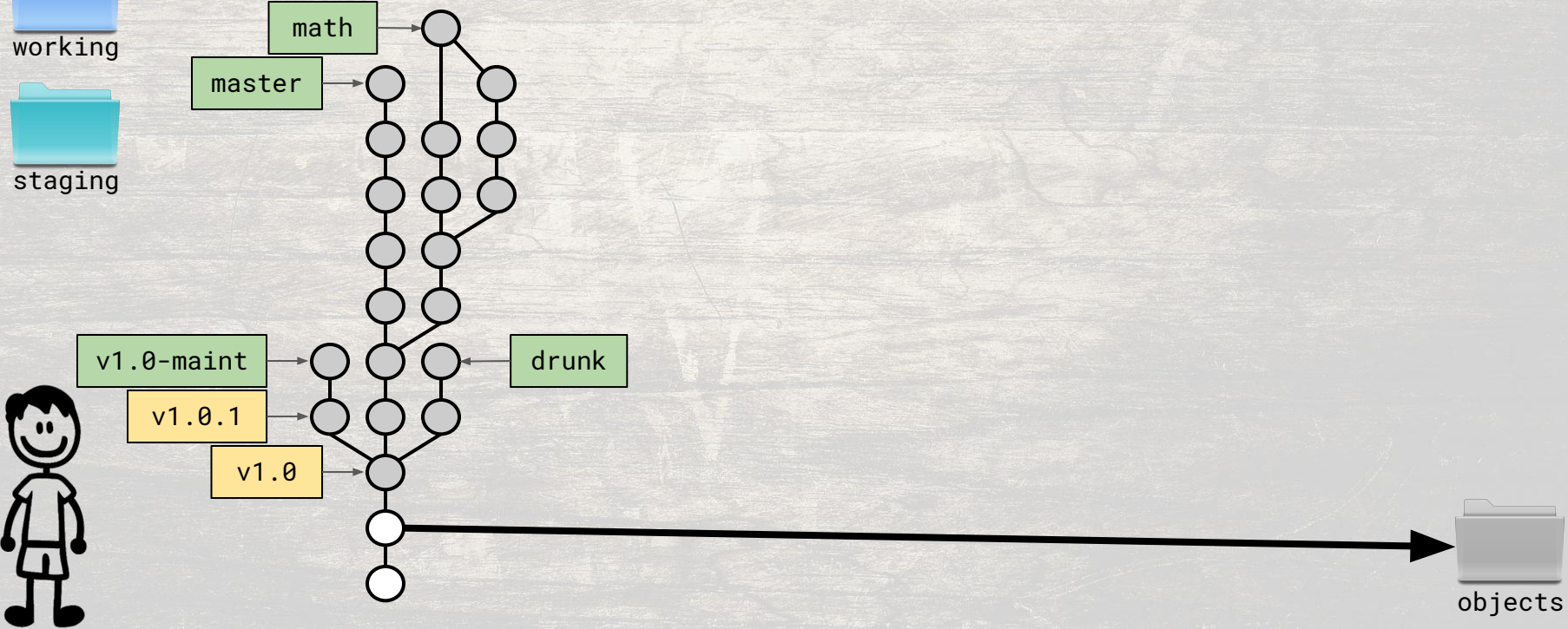
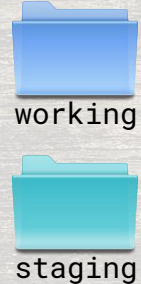
5a2fa987819083dbcf44d36697b7ecbe3bfc9a3f



Eliminating Duplication



Eliminating Duplication



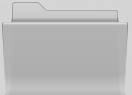
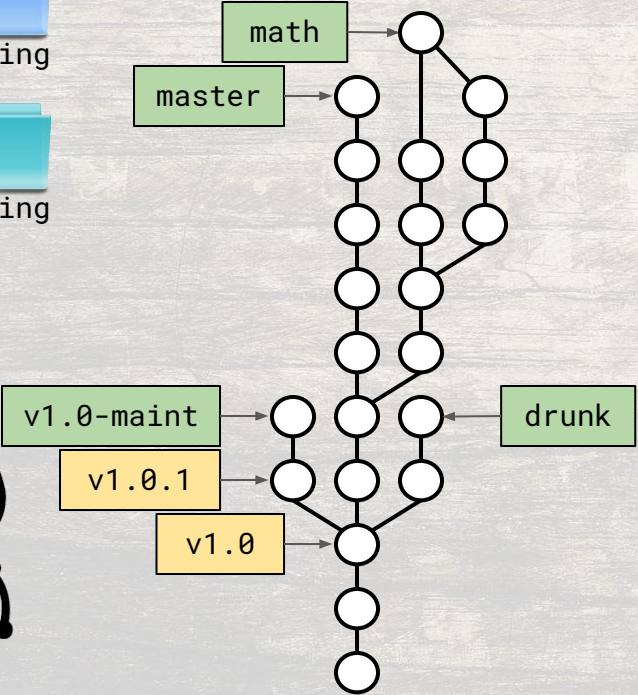
Eliminating Duplication



working

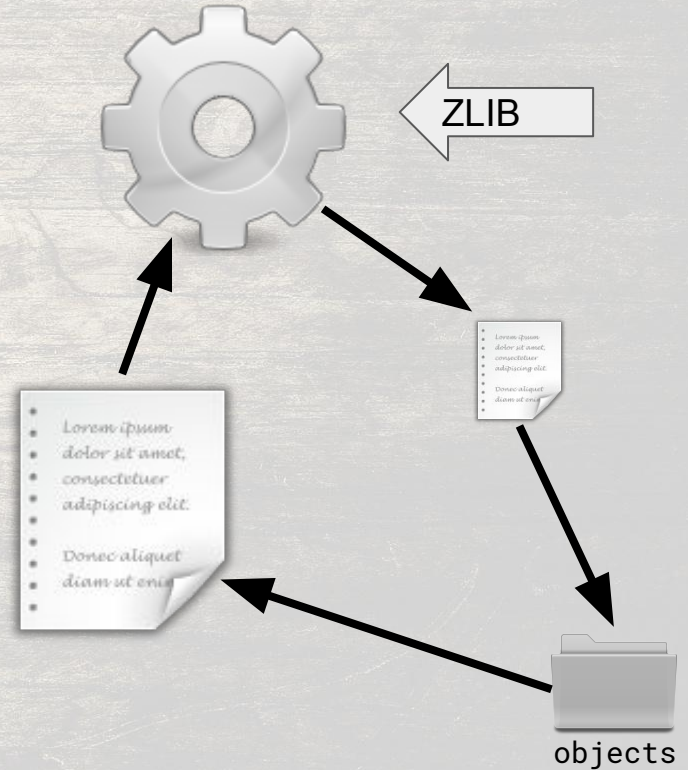
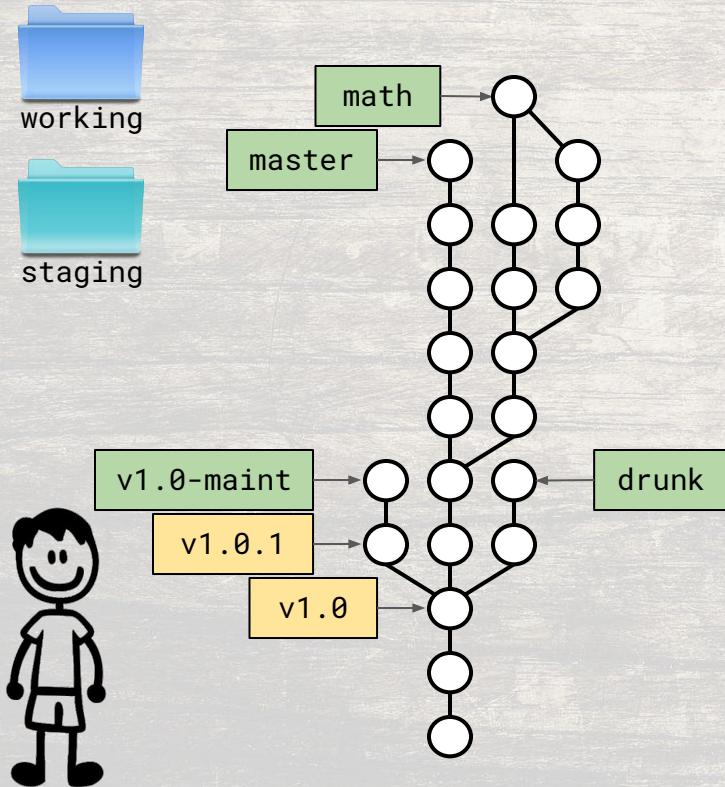


staging

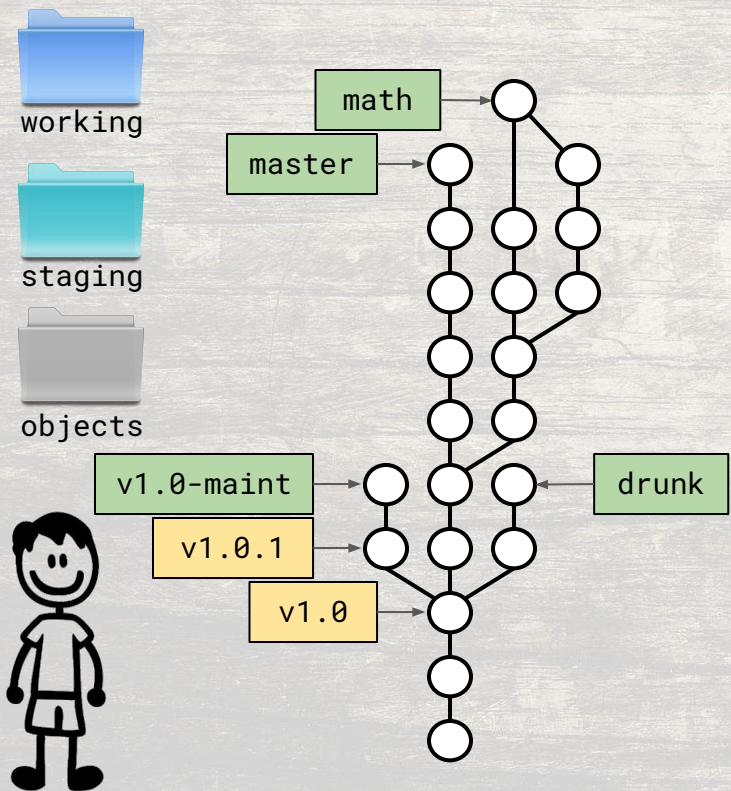


objects

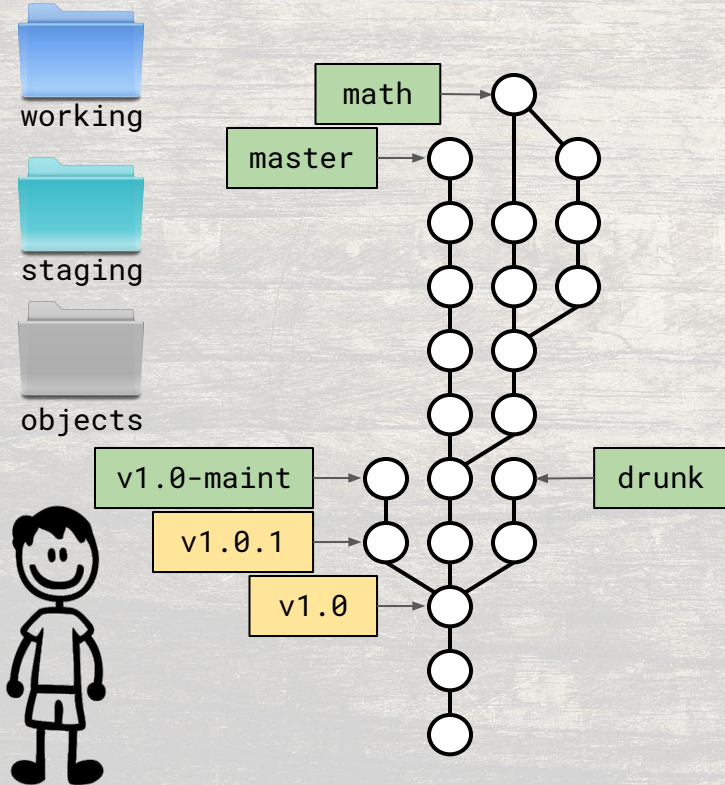
Compressing Blobs



The True Git



The True Git



- This is pretty much Git
- Nicer command line tools for all these operations
- Many, many other tools

Commands: Getting Started

- First, tell Git who you are:
 - `git config --global user.name "My Name"`
 - `git config --global user.email "my@email.address"`
- Get help:
 - `git <command> -h`
 - `git help <command>`
- Start a new Git repository:
 - `git init`

Commands: Making snapshots



git add



git commit

git commit -a



git log



git status

gitk

- Add the simple scripts I used to do a merge with conli
- Merge the new object model thing from Daniel Barkal
- [PATCH] Switch implementations of merge-base, port
- [PATCH] Port fsck-cache to use parsing functions
- [PATCH] Port rev-tree to parsing functions
- [PATCH] Implementations of parsing functions
- [PATCH] Header files for object parsing
- [PATCH] fix bug in read-cache.c which loses files when
- [PATCH] Fix confusing behaviour of update-cache --re
- Make "commit-tree" check the input objects more car
- Make "parse_commit" return the "struct revision" for t
- Do a very simple "merge-base" that finds the most re
- Make "rev-tree.c" use the new-and-improved "mark_re

Commands: Diffing



working

VS.



staging

`git diff`



staging

VS.



snapshot

`git diff --staged`



working

VS.



snapshot

`git diff HEAD`



snapshot

VS.



snapshot

`git diff <from> <to>`

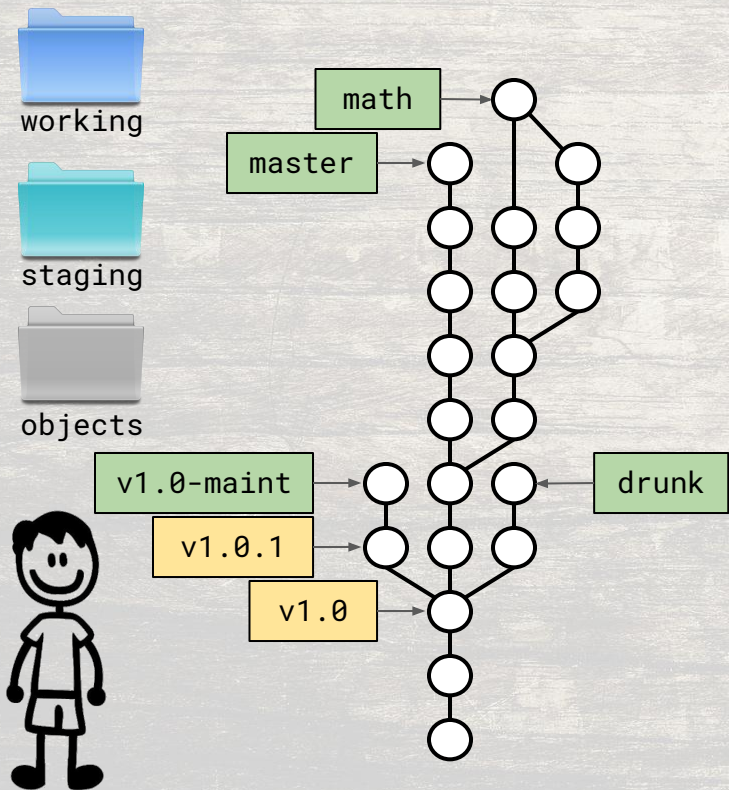
Commands: Branches & Tags

- `git branch`
 - `git branch <branch>`
 - `git checkout <branch>`
 - `git tag -l`
 - `git tag <tag>`
- } `git checkout -b <branch>`

Commands: Fetching & Merging

- `git remote add <name> <URL>`
 - `git fetch <name>`
 - `git merge <name>/<branch>`
- } `git pull`

Summary



- Keep this parable in mind

- Git is simple and powerful

- One more thing:

`git reflog`

Where to go next?

- Git homepage: <http://git-scm.com>
- Pro Git: <http://git-scm.com/book>
- GitHub: <http://github.com>
- Learn Git Branching: <https://learngitbranching.js.org>
- Git Ready: <http://gitready.com>

Thanks!

Questions?

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<johan@herland.net>

