

# The Git Parable

Johan Herland

<jherland@cisco.com>

# The Git Parable

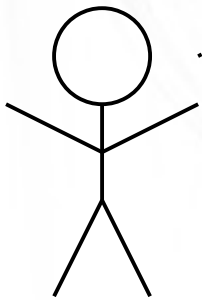
- Shamelessly stolen from Tom Preston-Werner  
<http://tom.preston-werner.com/2009/05/19/the-git-parable.html>
- I'm lazy...
- Also: Best introduction to Git I've found so far

# The Git Parable

- Git - simple & powerful

# The Git Parable

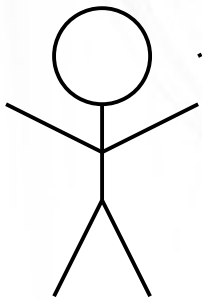
- Git - simple & powerful



```
git init  
git add ...  
git commit ...  
git branch ...  
git checkout ...  
git tag ...  
git diff ...  
git log ...  
git remote ...  
git fetch ...  
git pull ...  
git push ...  
...
```

# The Git Parable

- Git - simple & powerful

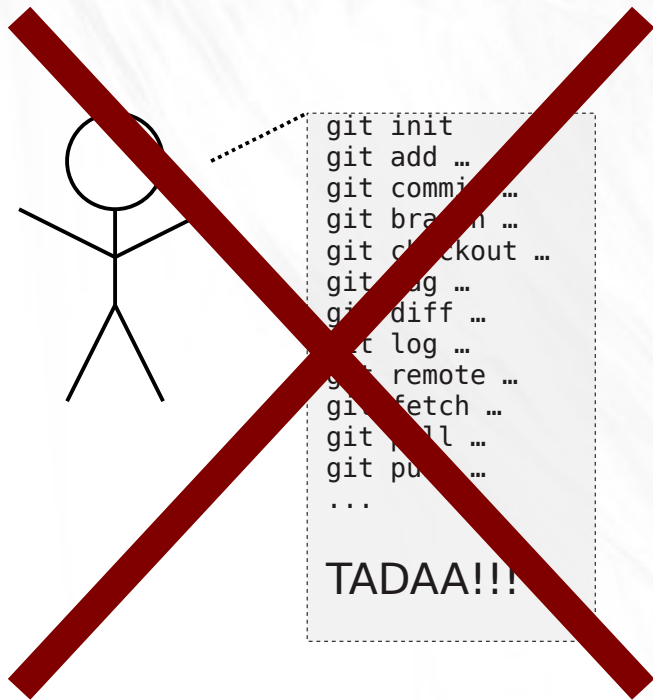


```
git init  
git add ...  
git commit ...  
git branch ...  
git checkout ...  
git tag ...  
git diff ...  
git log ...  
git remote ...  
git fetch ...  
git pull ...  
git push ...  
...
```

**TADAA!!!**

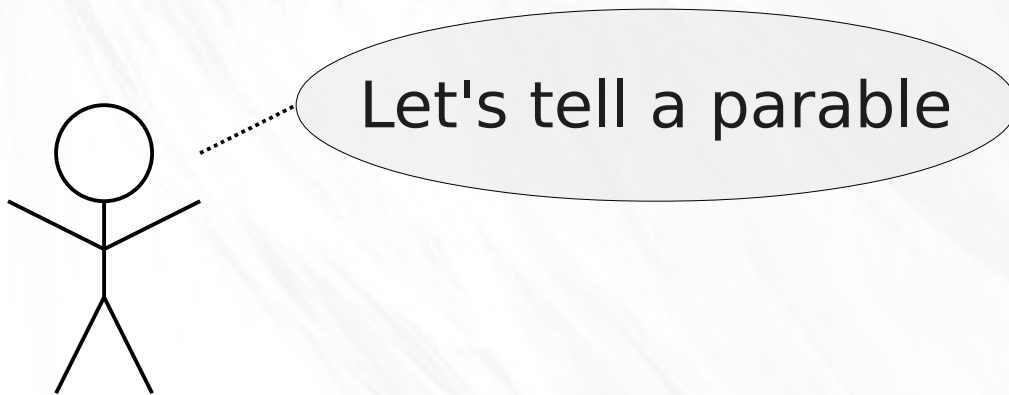
# The Git Parable

- Git - simple & powerful



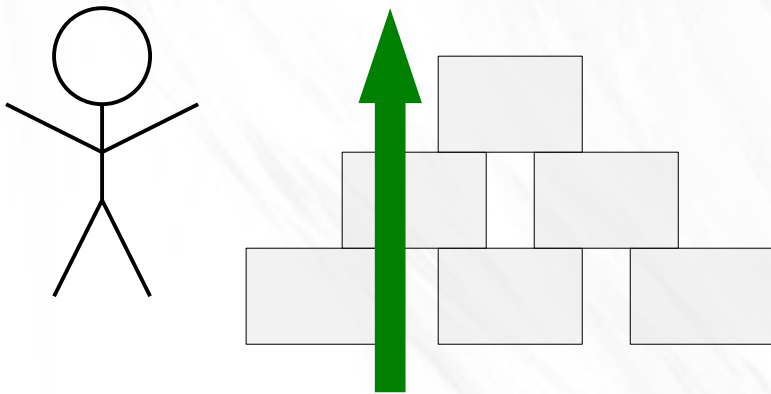
# The Git Parable

- Git - simple & powerful



# The Git Parable

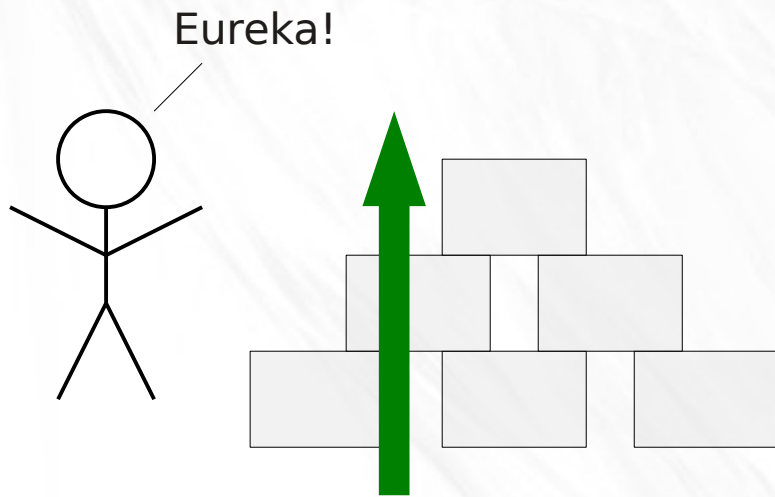
- Git - simple & powerful





# The Git Parable

- Git - simple & powerful



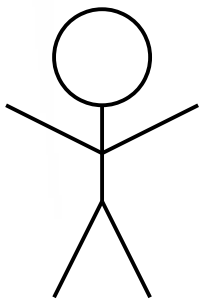
# The Parable

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



# The Parable

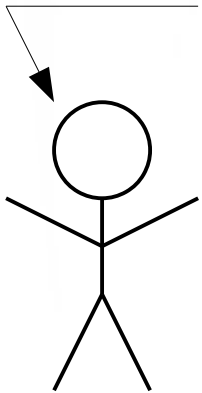
- Write a large software program



# The Parable

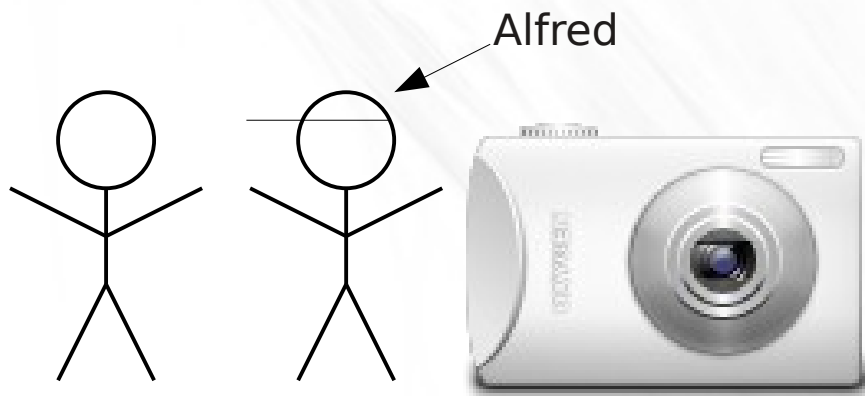
- Write a large software program
- Invent some method to keep track of versions
  - retrieve code that you changed/deleted

Responsible!



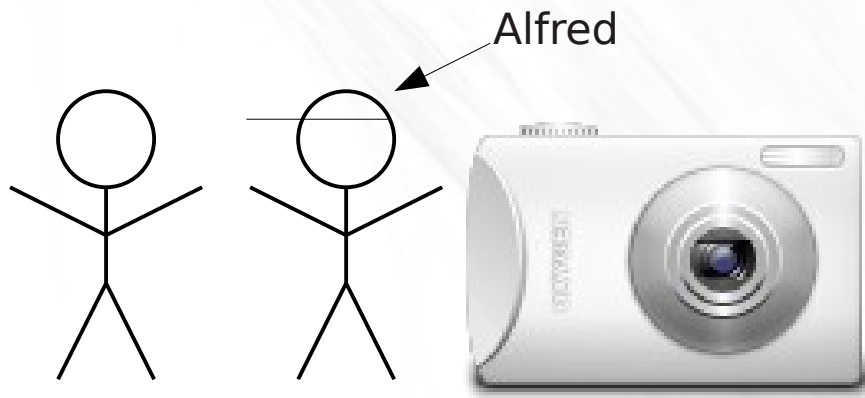
# Snapshots

- Alfred, the photographer



# Snapshots

- Alfred, the photographer





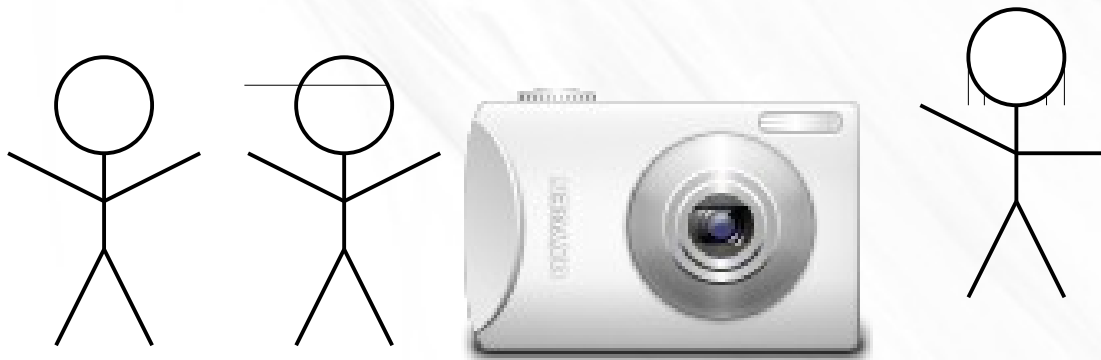
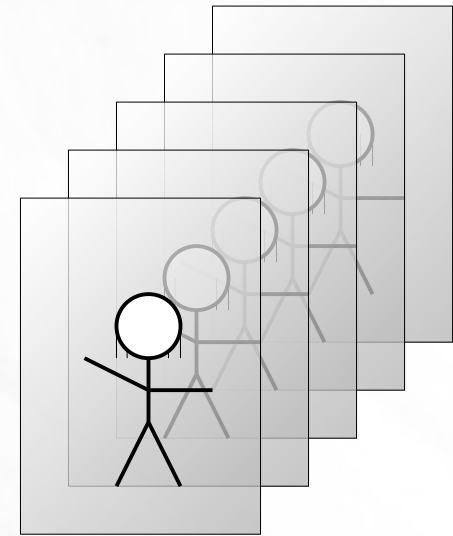
# Snapshots

- Alfred, the photographer
- Hazel and her daughter



# Snapshots

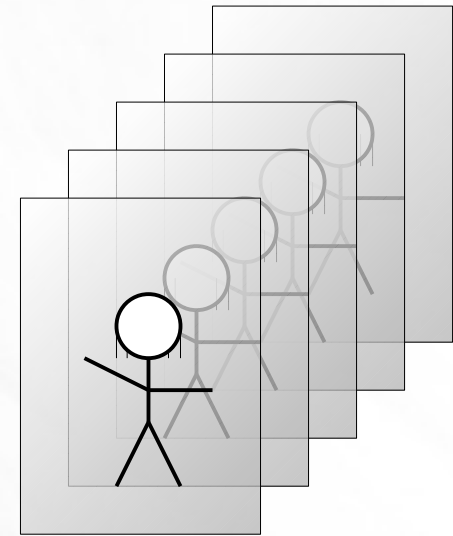
- Alfred, the photographer
- Hazel and her daughter
  - Remember what the daughter was like at each different stage





# Snapshots

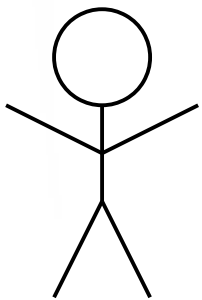
- Alfred, the photographer
- Hazel and her daughter
  - Remember what the daughter was like at each different stage



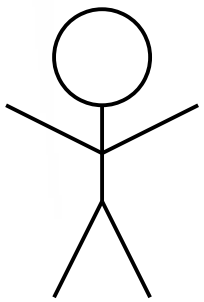
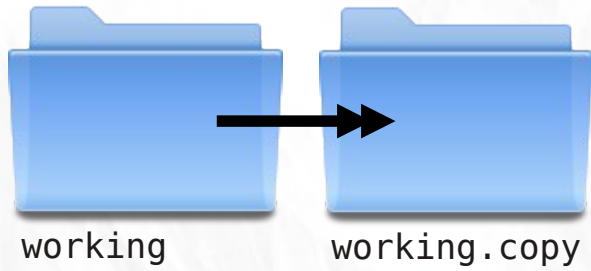
# Snapshots



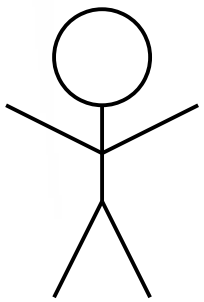
working



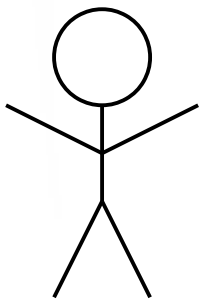
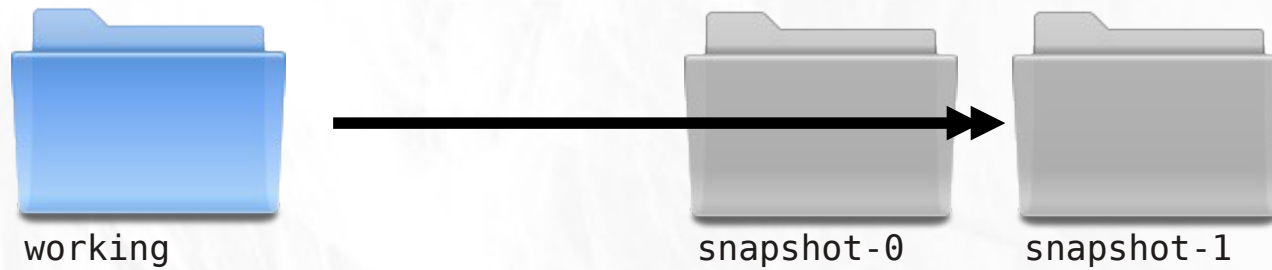
# Snapshots



# Snapshots



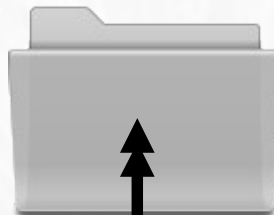
# Snapshots



# Snapshots



working



snapshot-0



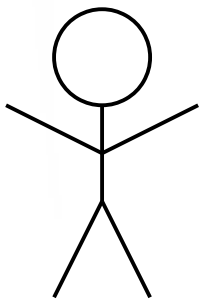
snapshot-1



message



message



2009-05-20 12:34:56

Initial version

2009-05-21 23:45:01

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

# Branches



working



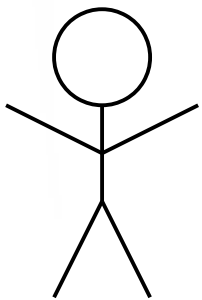
snapshot-0



snapshot-1



snapshot-99



# Branches



working



snapshot-0



snapshot-1

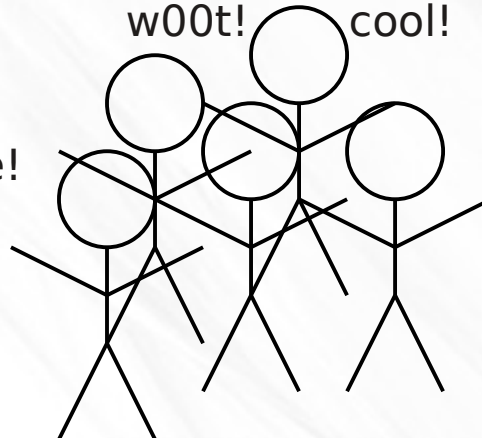
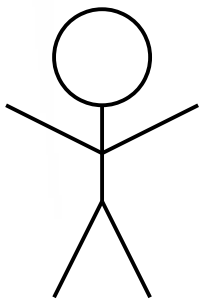


snapshot-99



w00t! cool!

nice!





# Branches



working



snapshot-0



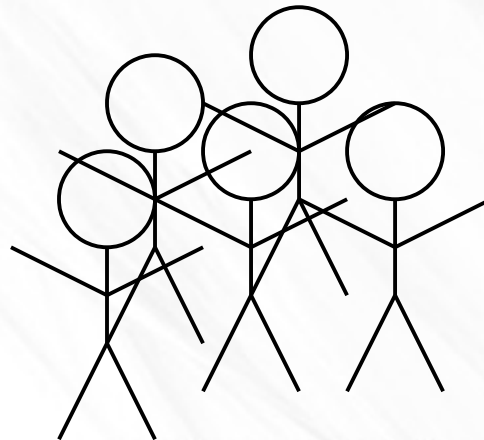
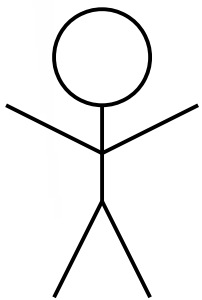
snapshot-1



snapshot-99



snapshot-109



# Branches



working



snapshot-0



snapshot-1

...



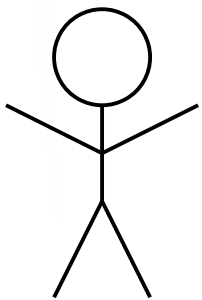
snapshot-99

...

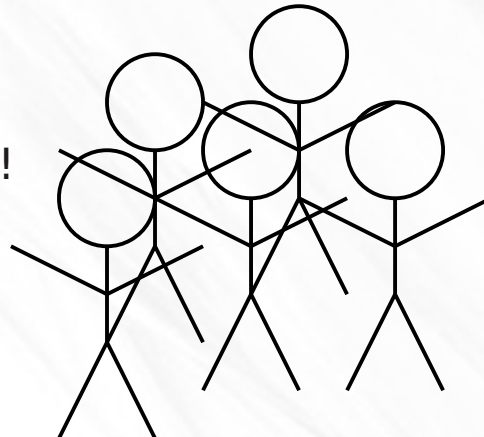


snapshot-109

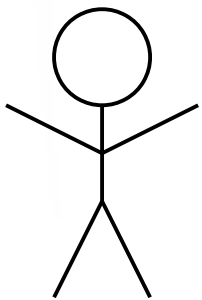
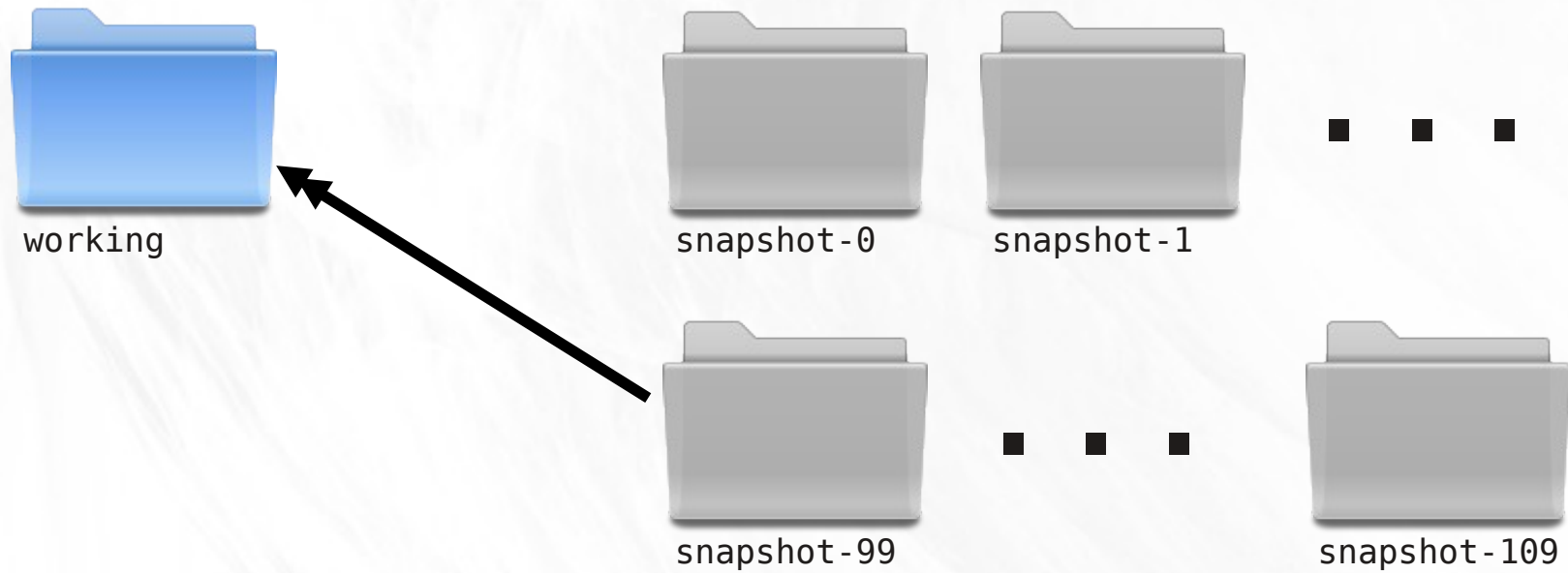
Does not work!



Boo!



# Branches



# Branches



working



snapshot-0



snapshot-1

...

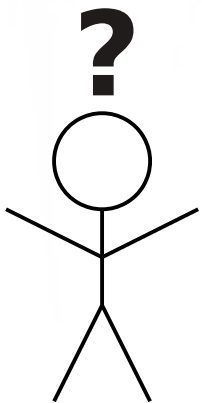


snapshot-99

...



snapshot-109

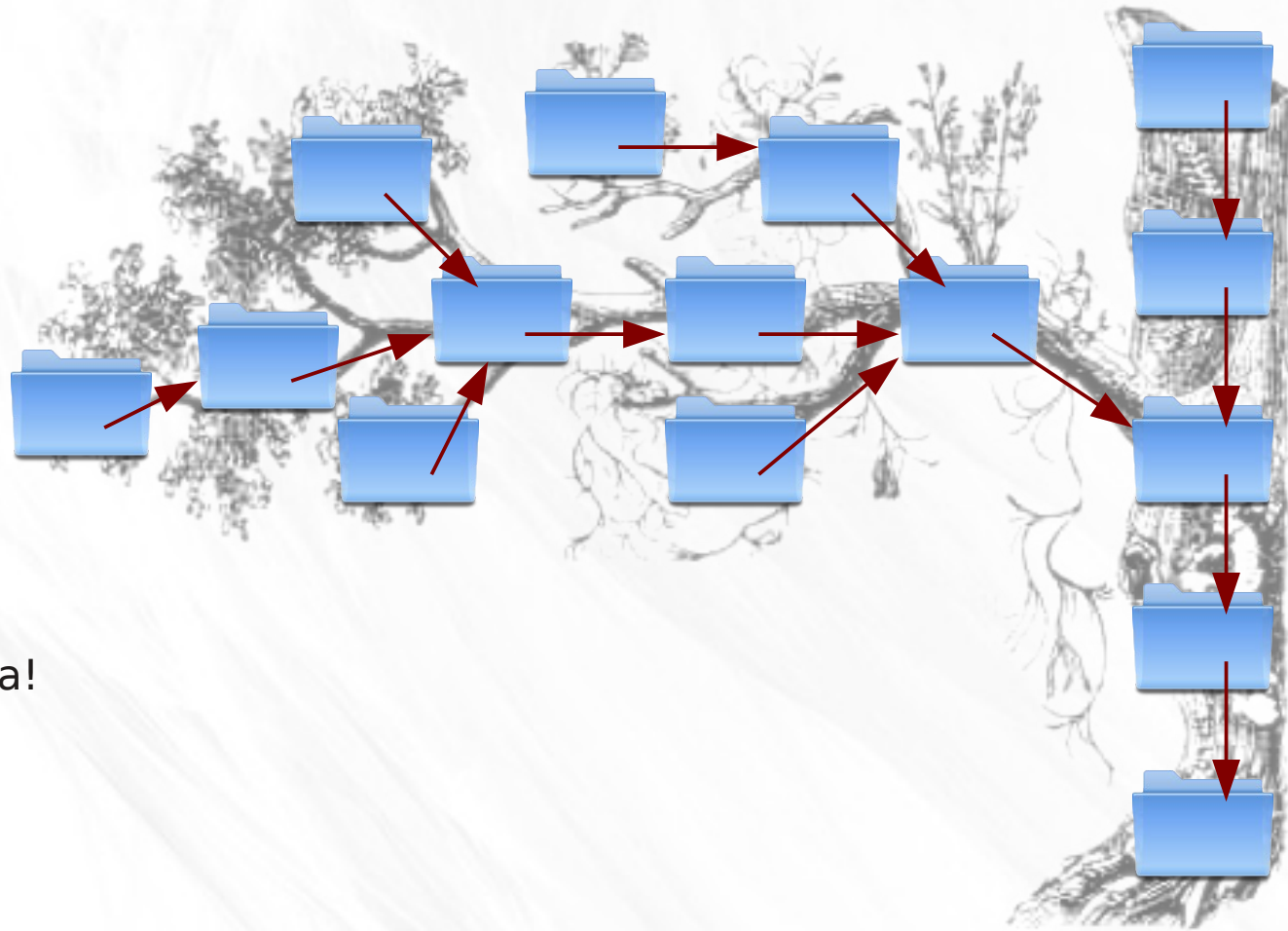


snapshot-110

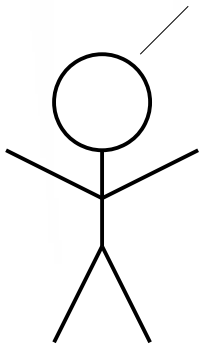
# Branches



# Branches

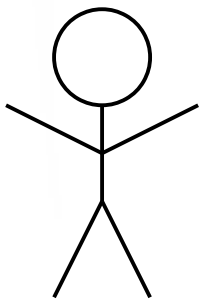
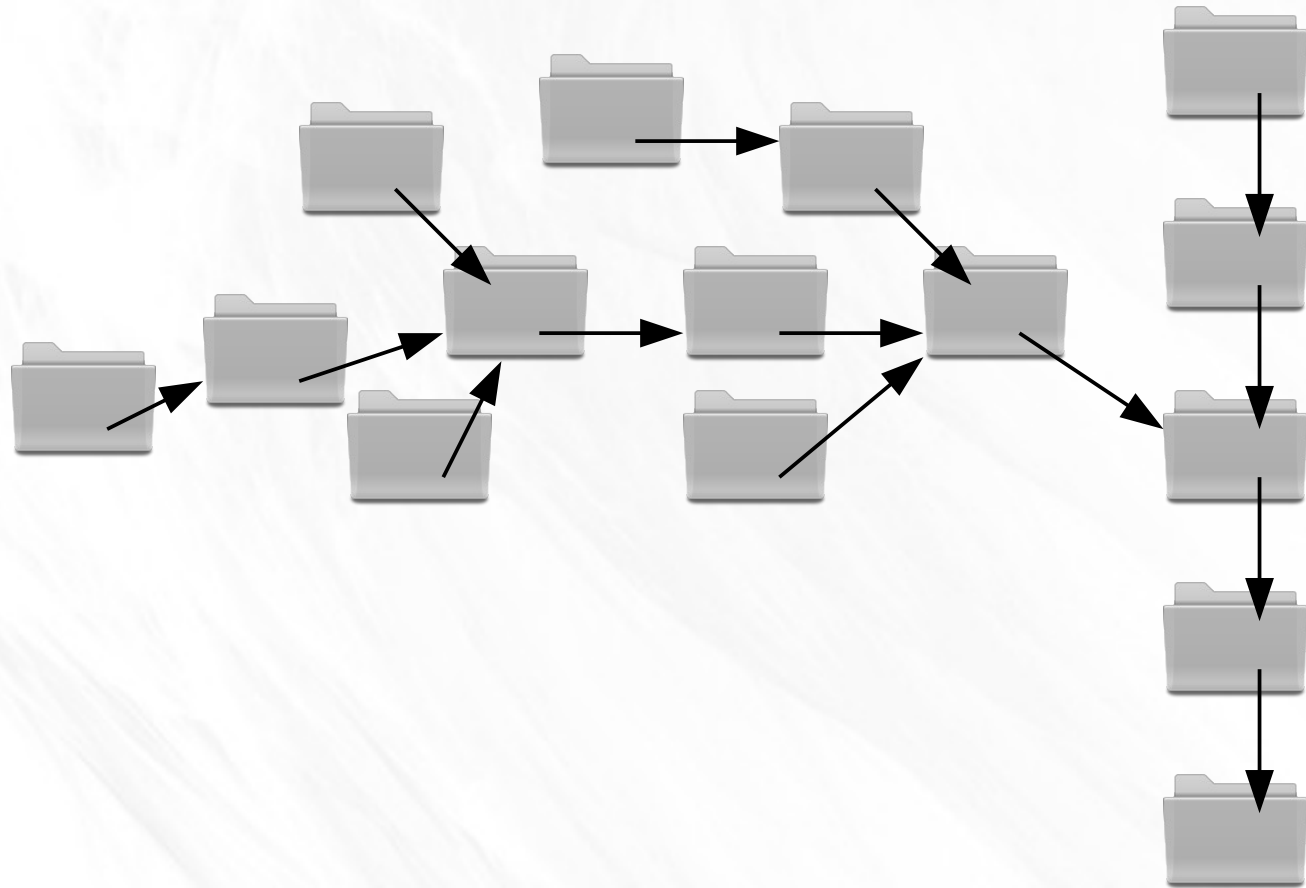


Eureka!

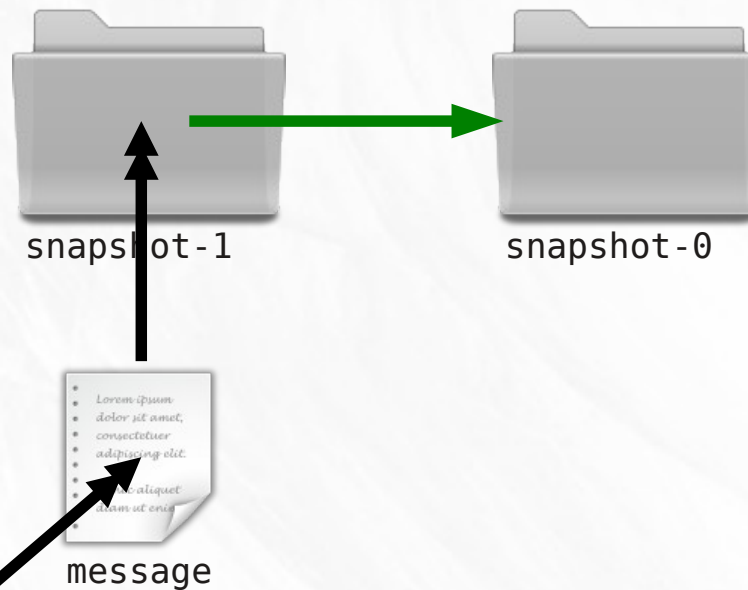




# Branches



# Branches

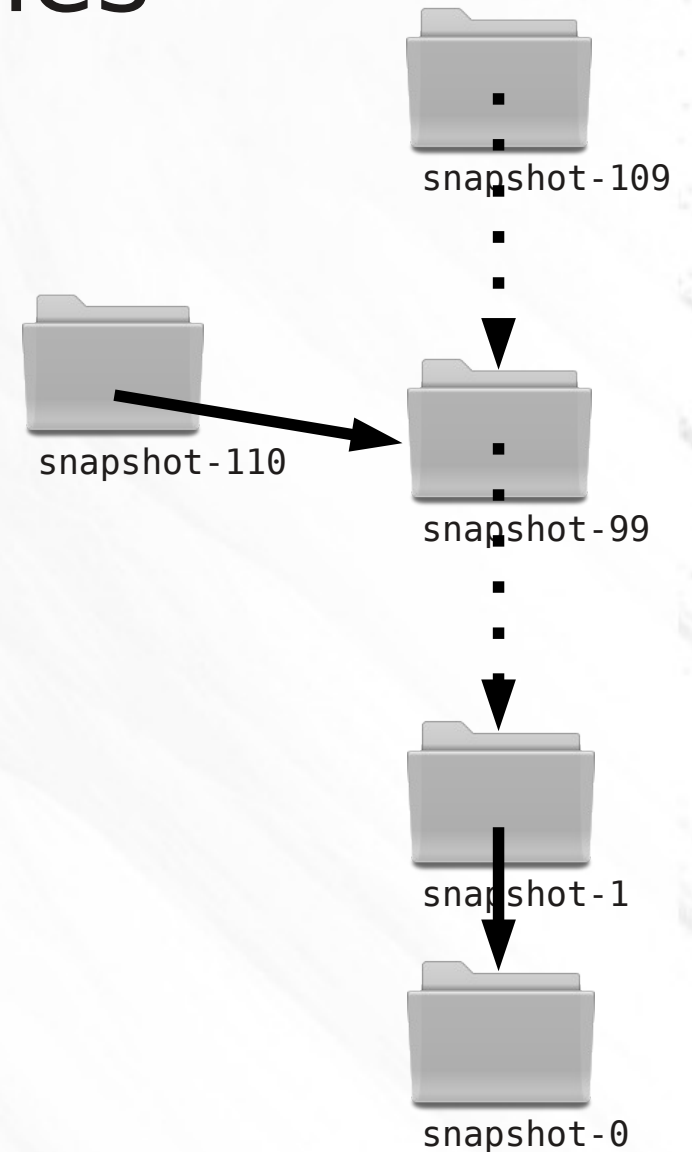
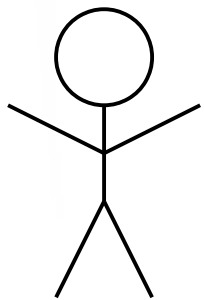


2009-05-21 23:45:01  
parent: snapshot-0

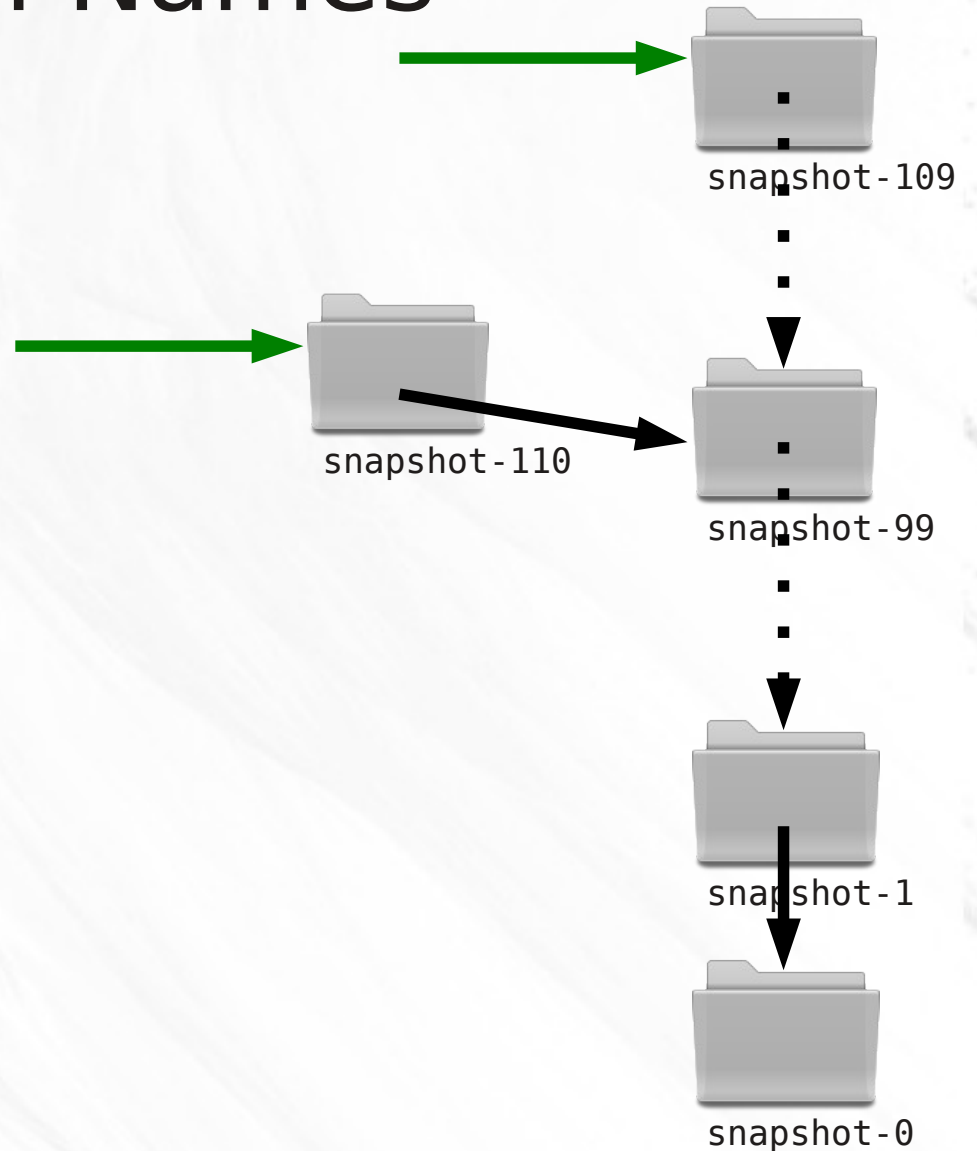
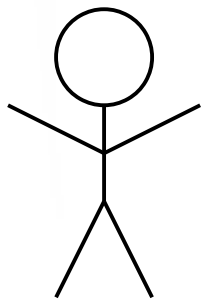
Introduced a new foo,  
and reset the bar to  
xyzyy.



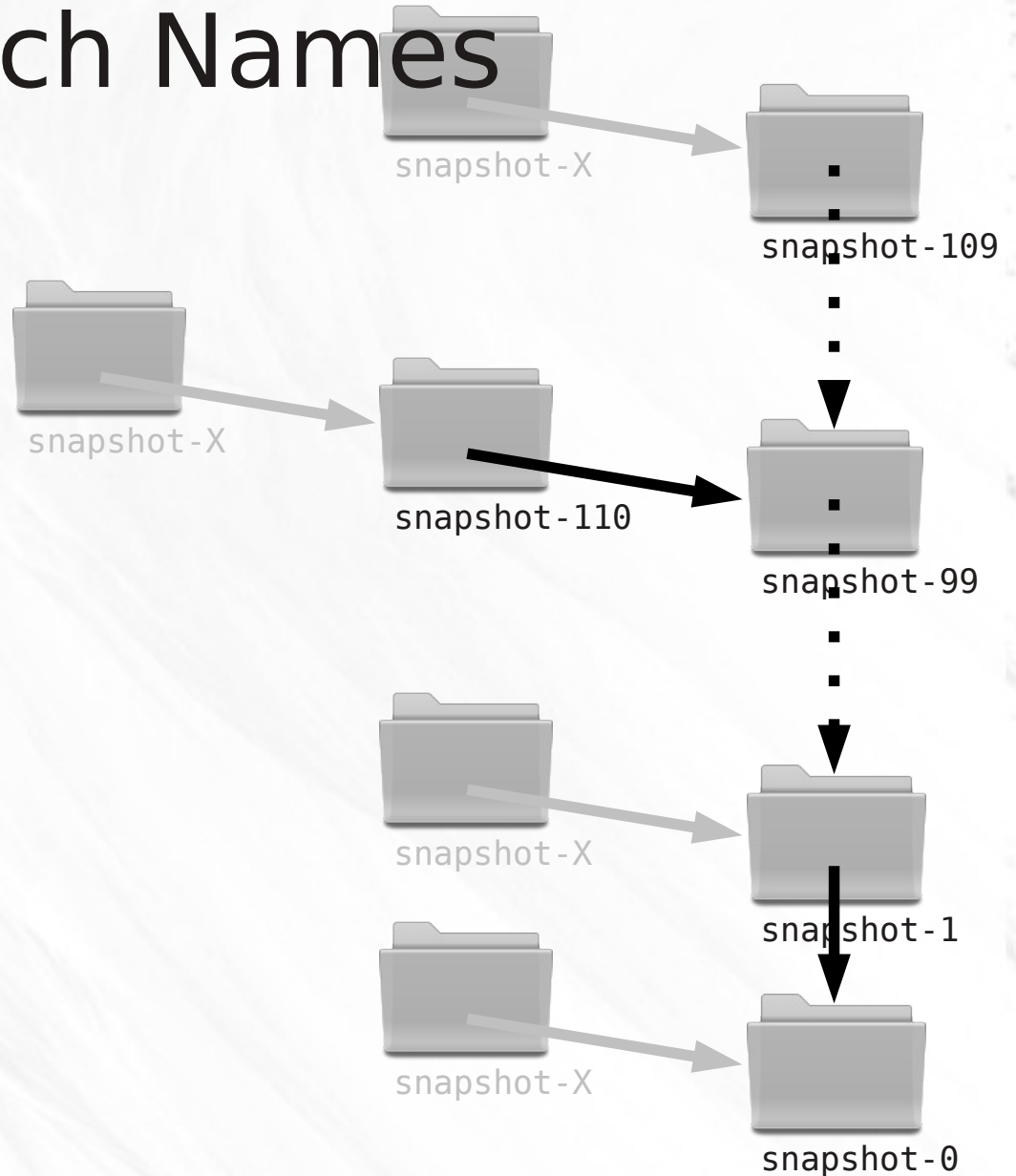
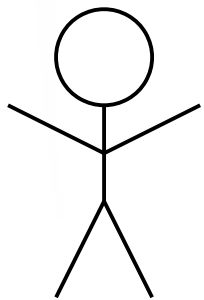
# Branch Names



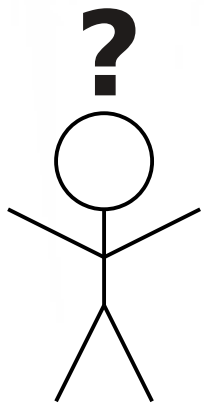
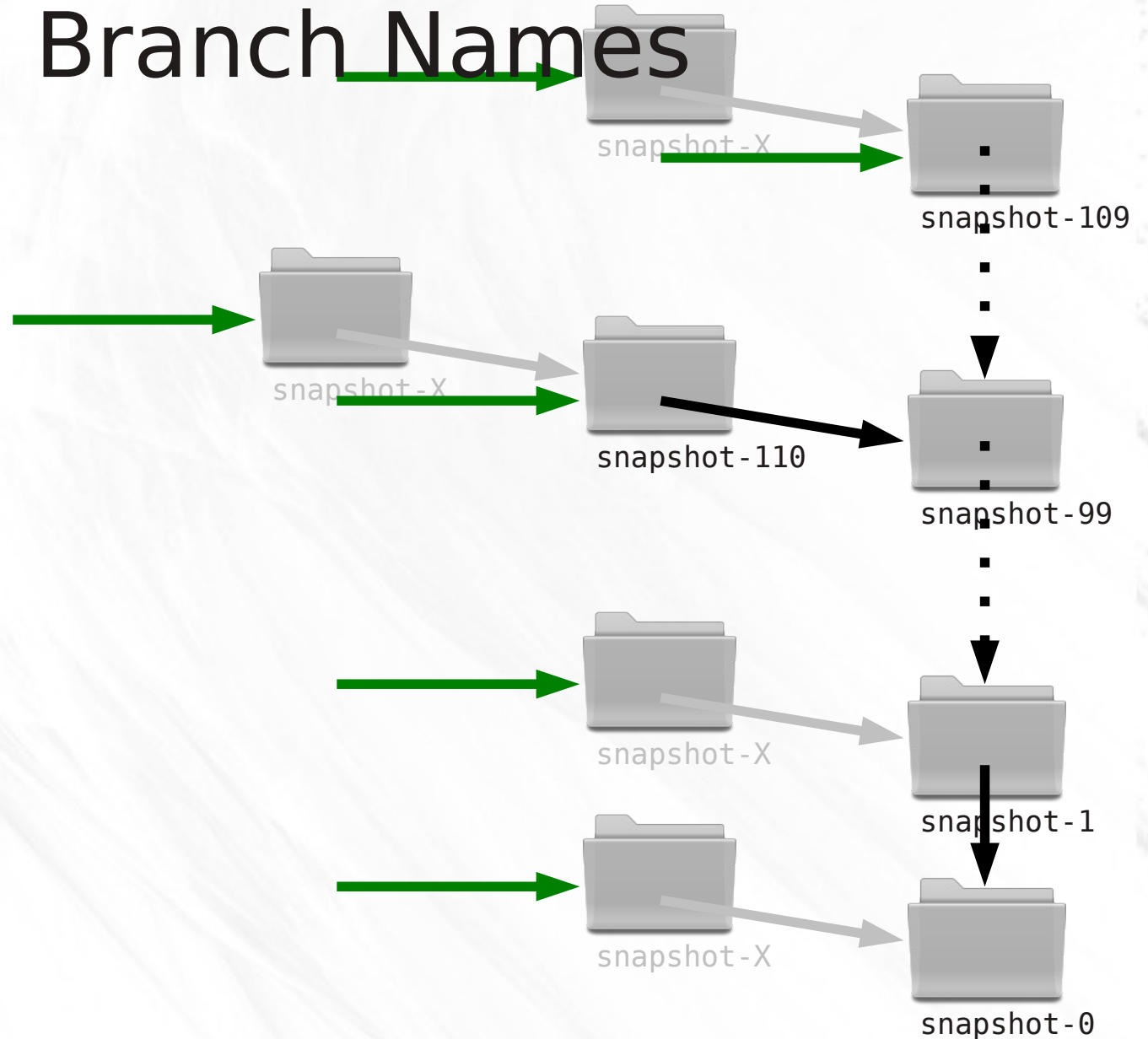
# Branch Names



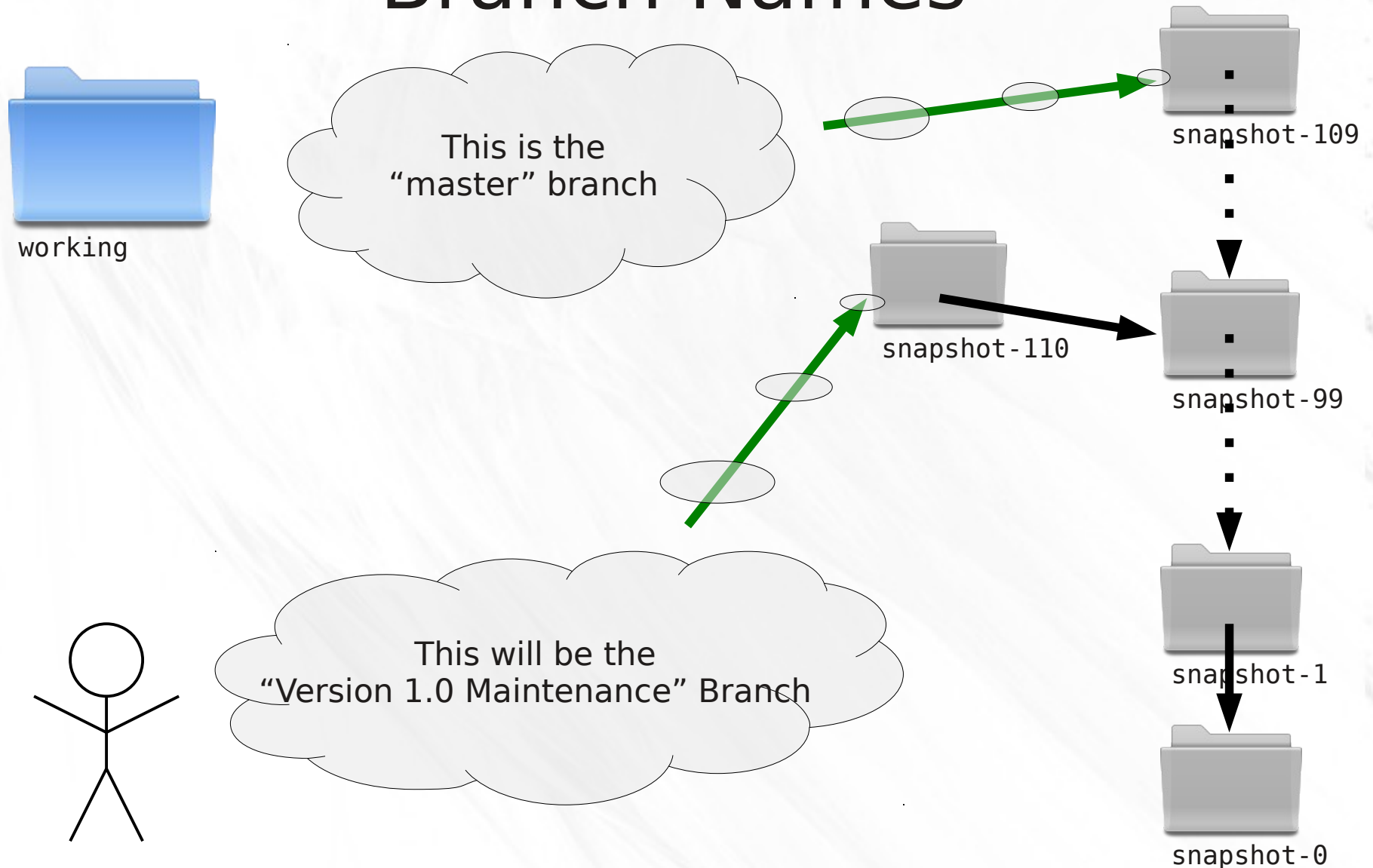
# Branch Names



# Branch Names



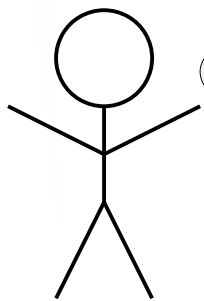
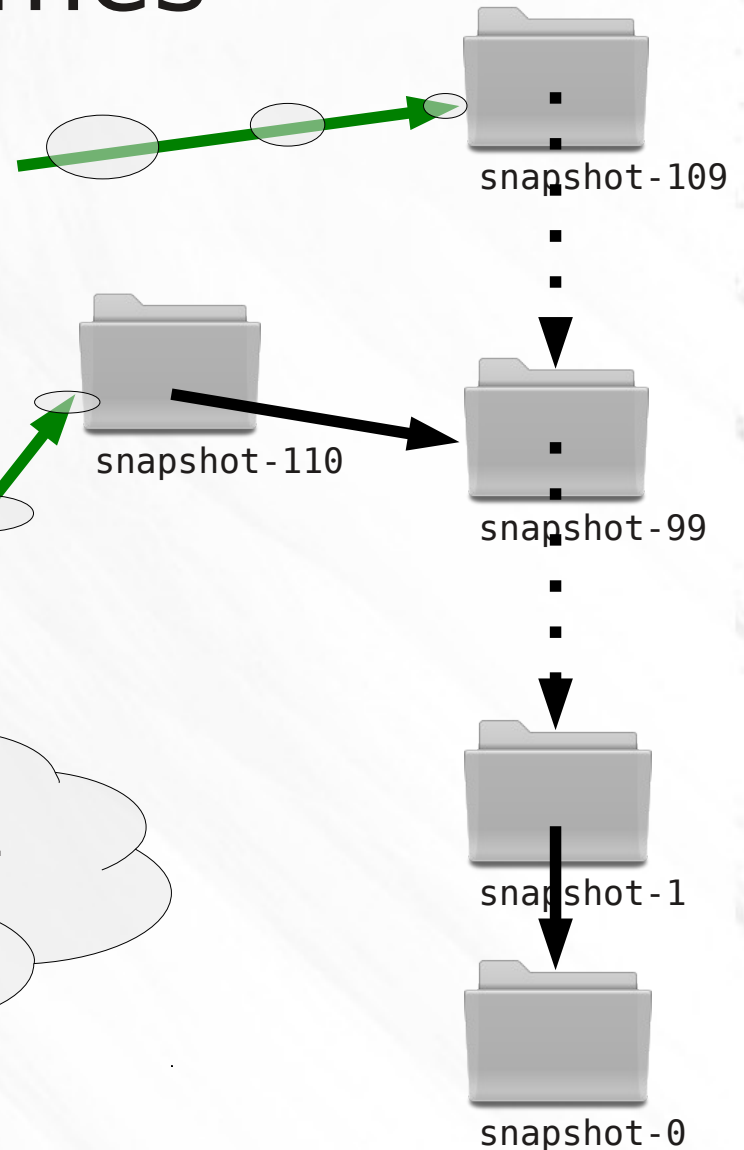
# Branch Names



# Branch Names

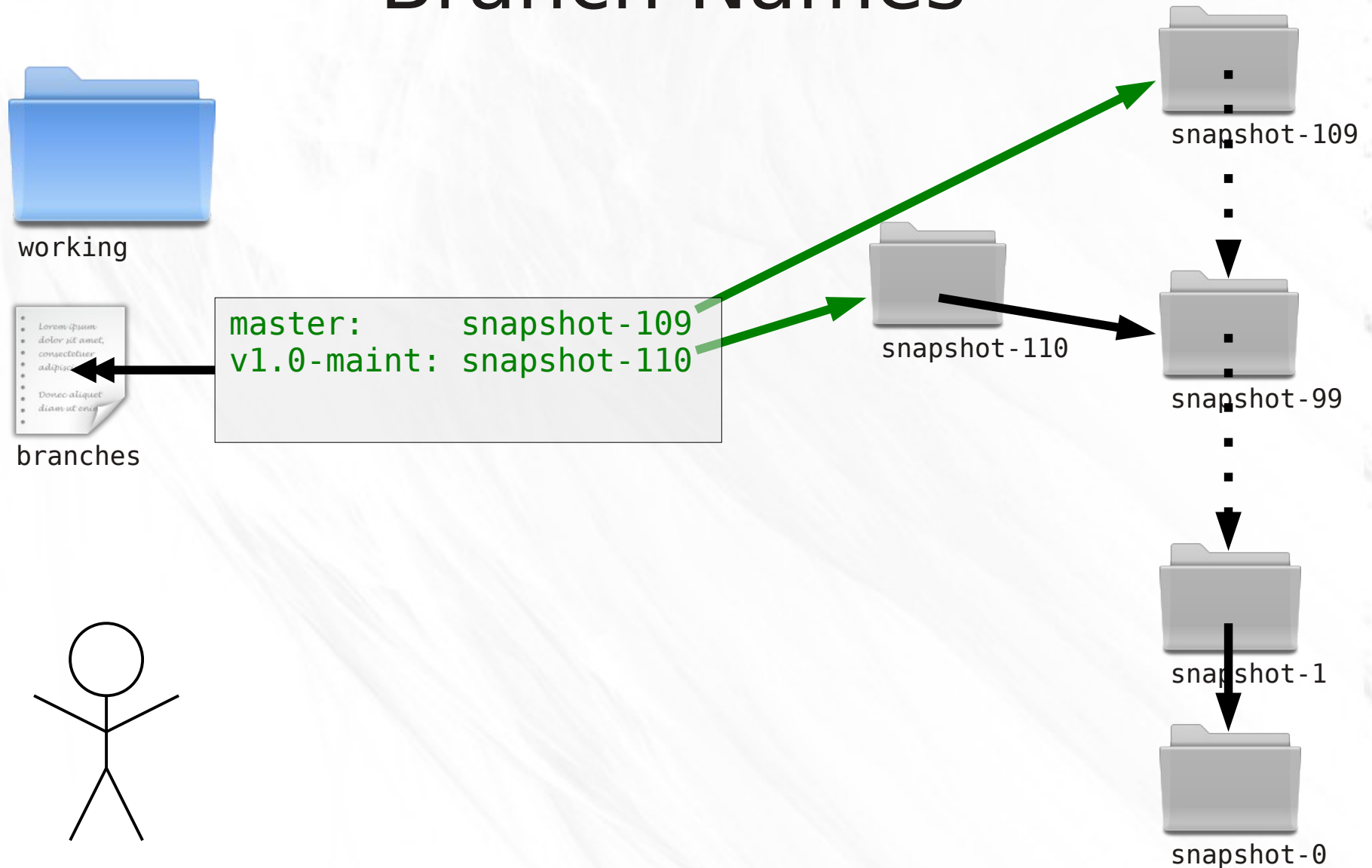


This is the  
“master” branch.  
It contains:  
snapshot-109  
(and its ancestors)



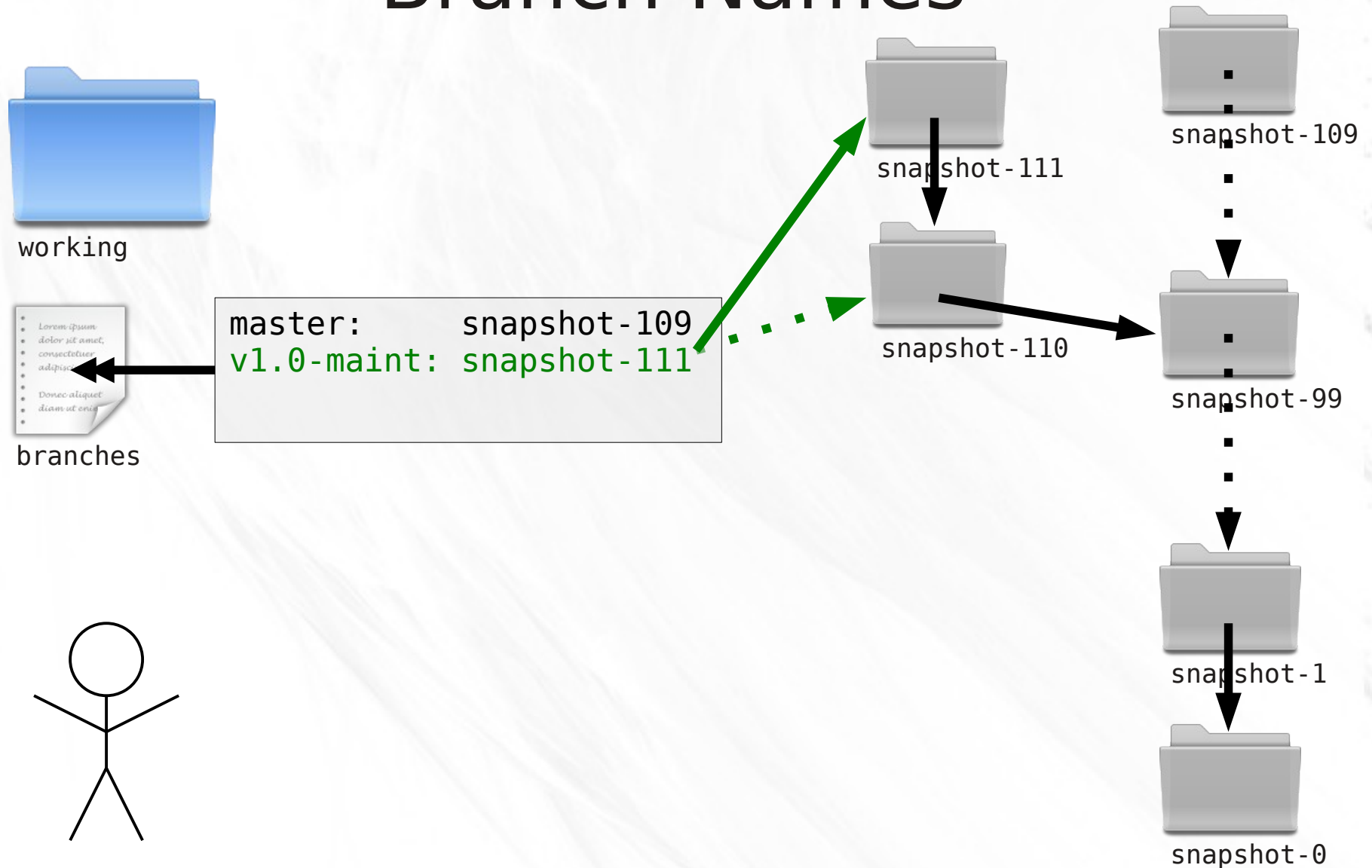
This is the  
“Version 1.0 Maintenance” Branch.  
It contains:  
snapshot-110  
(and its ancestors)

# Branch Names



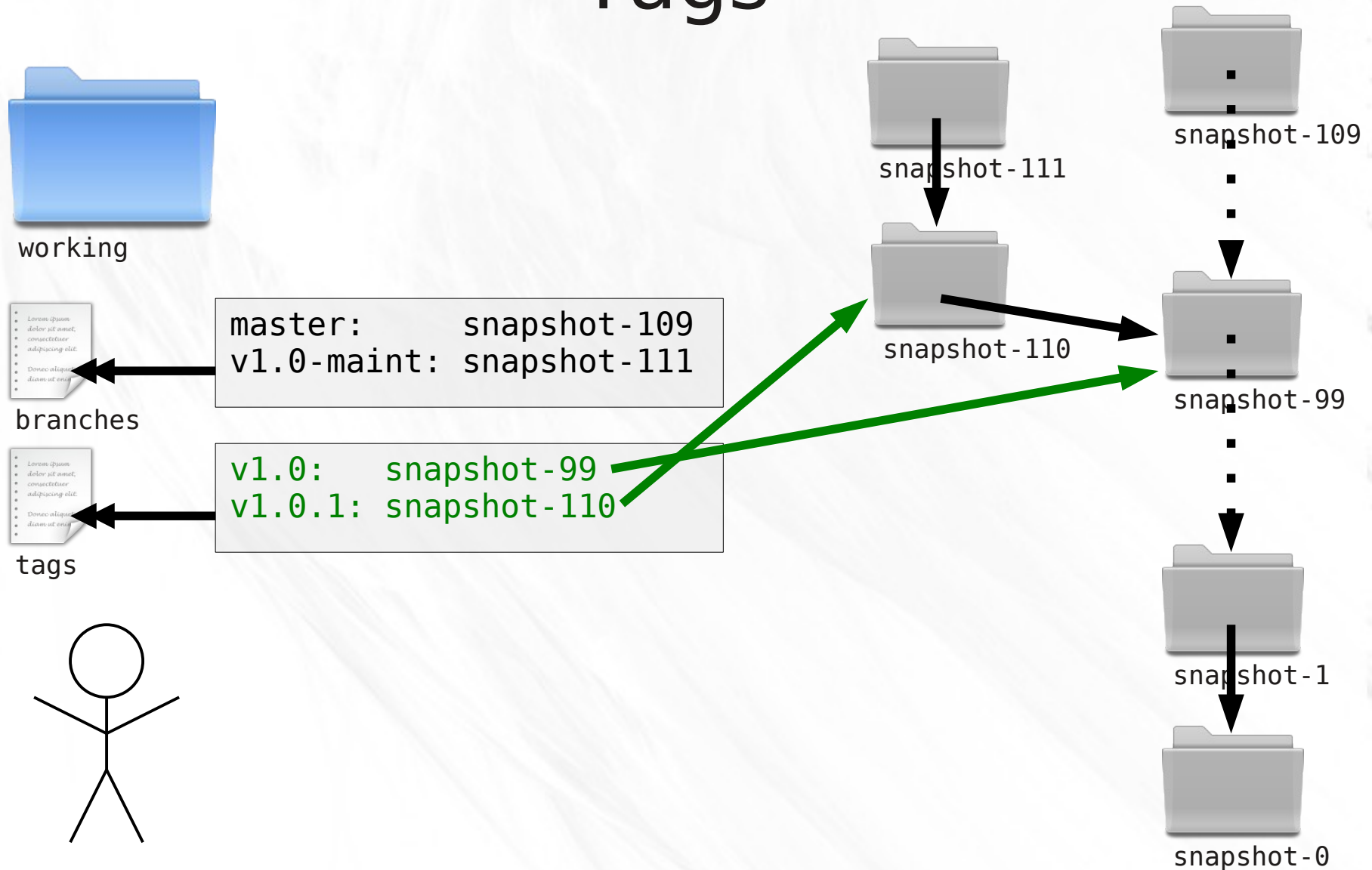


# Branch Names

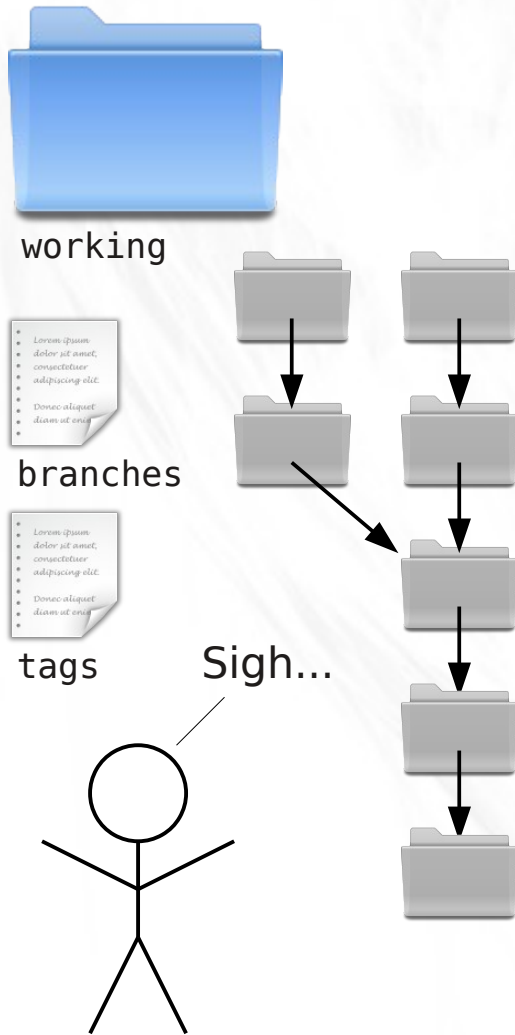




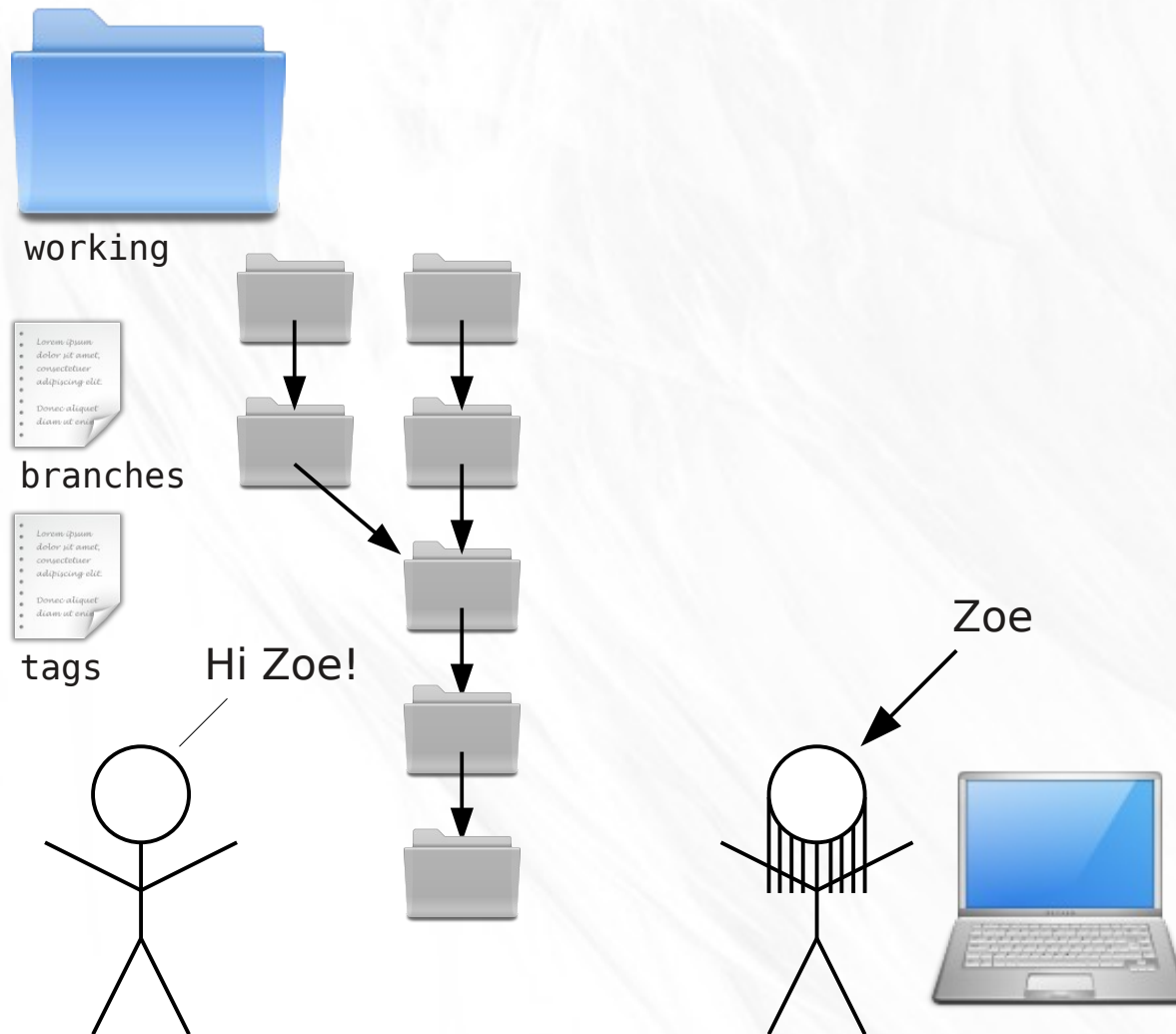
# Tags



# Distributed



# Distributed



# Distributed



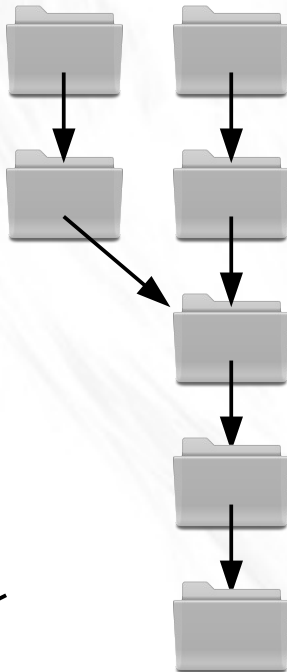
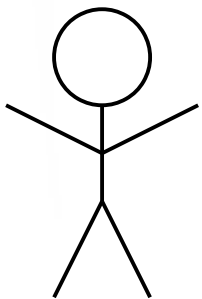
working



branches



tags



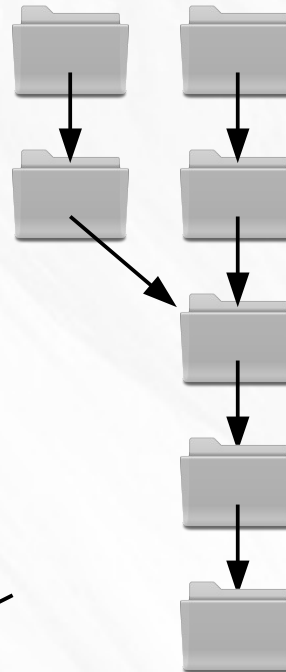
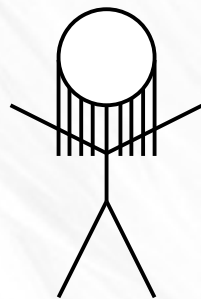
working



branches



tags



# Distributed



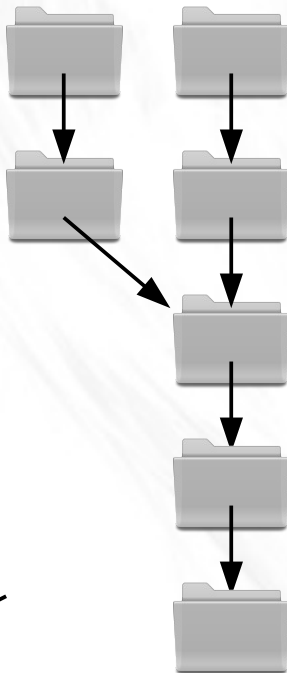
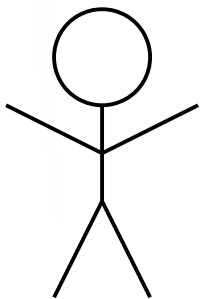
working



branches



tags



working

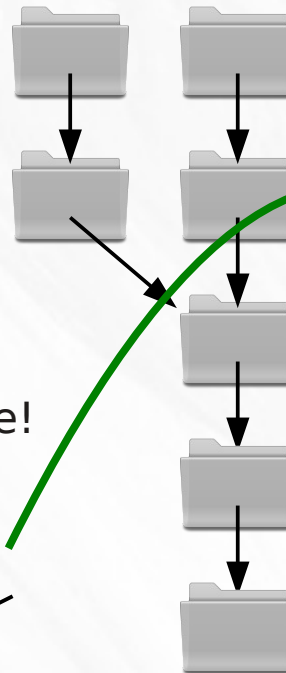
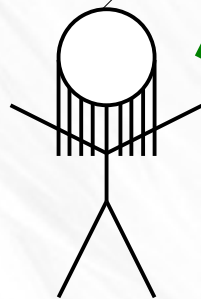


branches

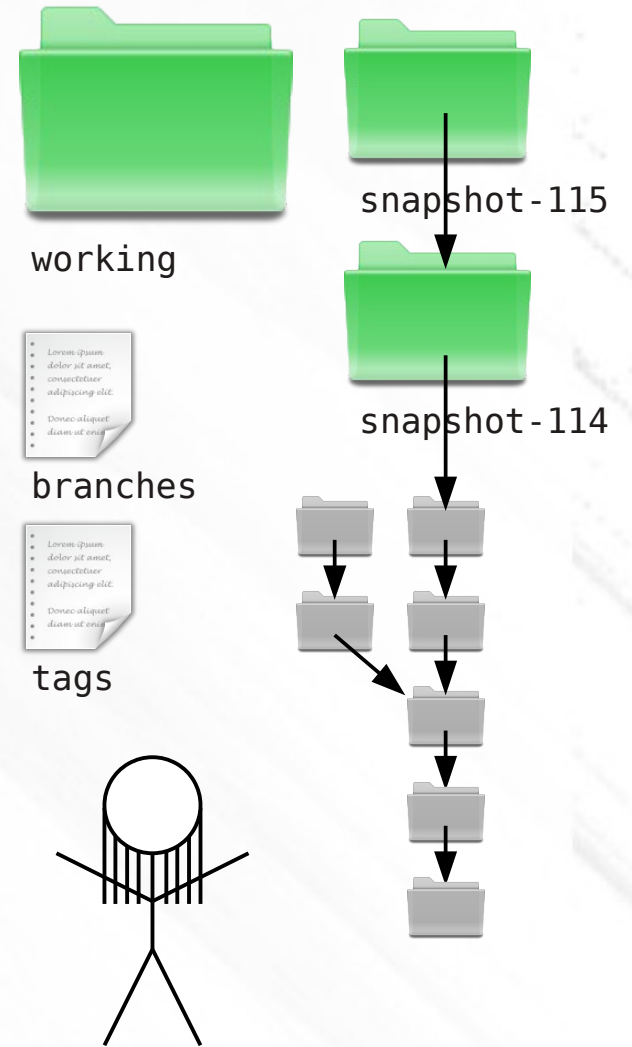
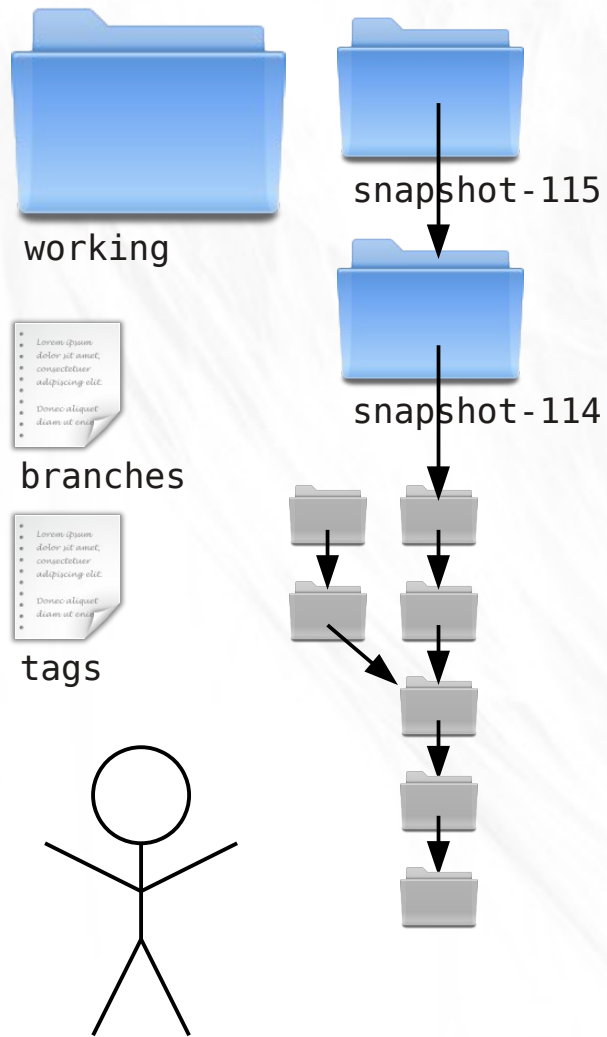


tags

Bye!



# Distributed



# Distributed



snapshot-114



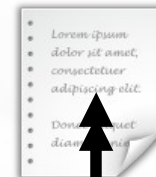
message

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

2009-05-21 23:45:01  
parent: snapshot-113  
author: Zoe <zoe@z.oe>

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



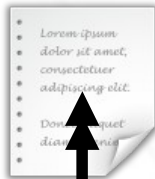
# Distributed



8ba3441b6b89cad23387ee875f2ae55069291f4b



**SHA1**



message

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

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



db9ecb5b5a6294a8733503ab57577db96ff2249e



**SHA1**

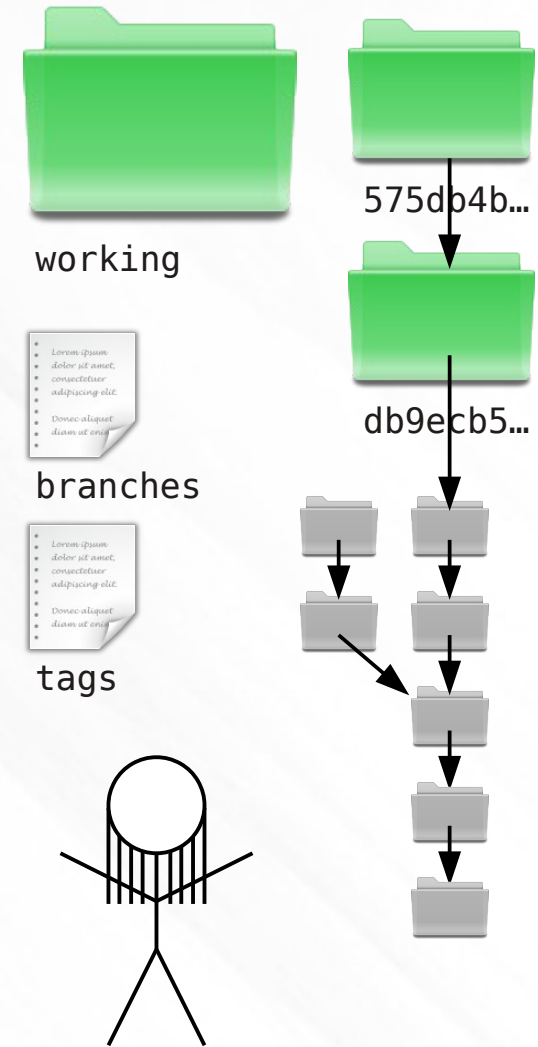
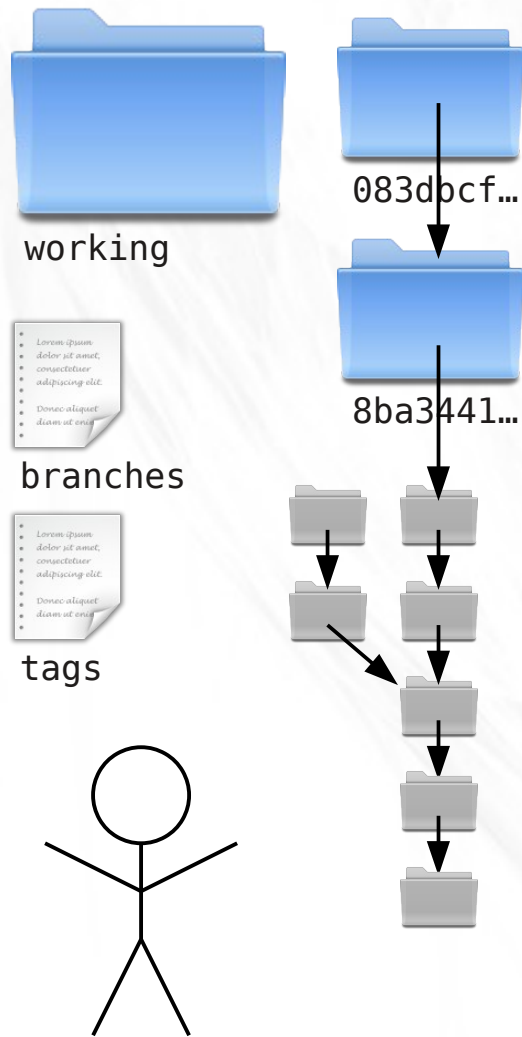


message

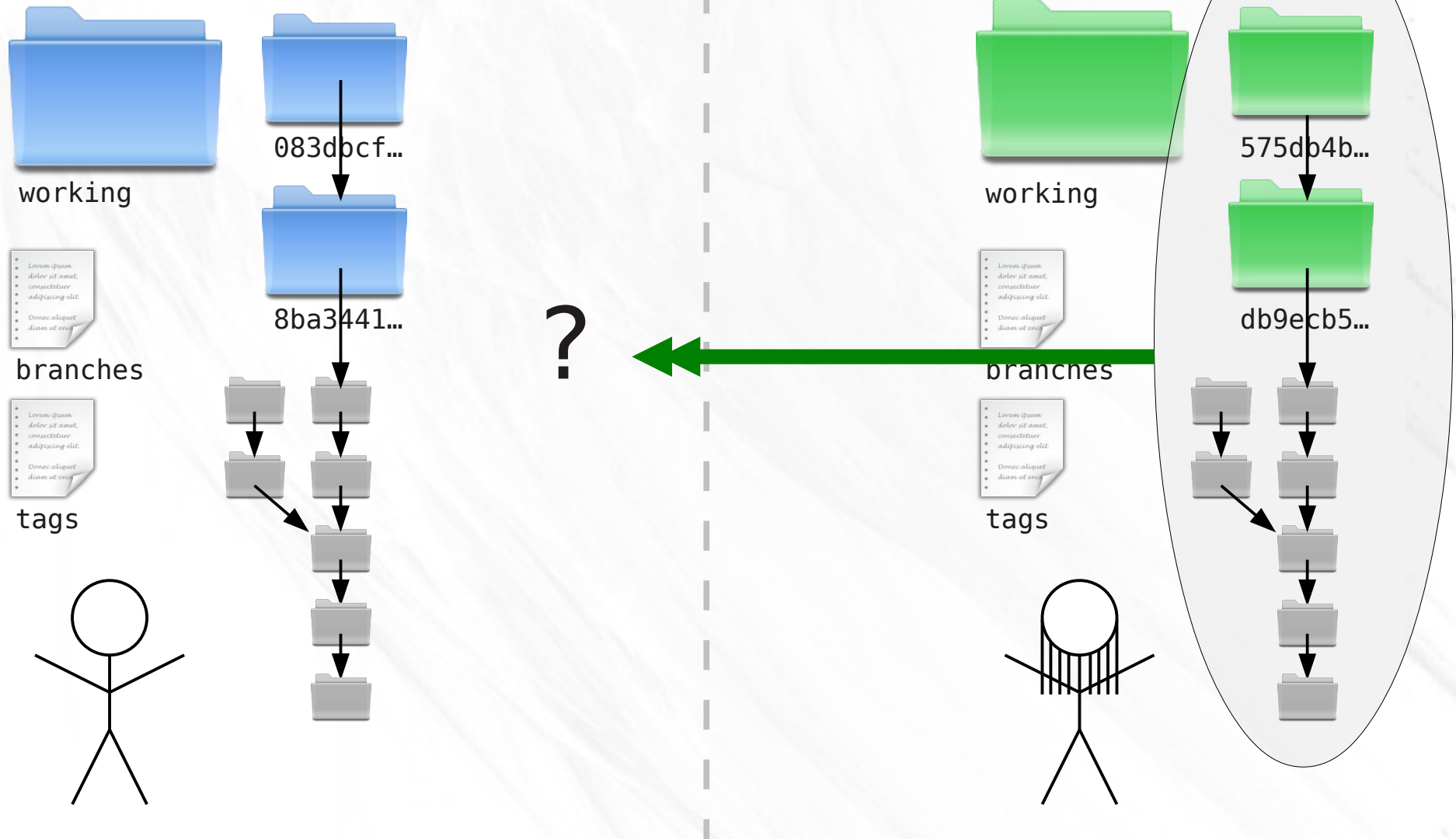
2009-05-21 23:45:01  
parent: snapshot-113  
author: Zoe <zoe@z.oe>

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

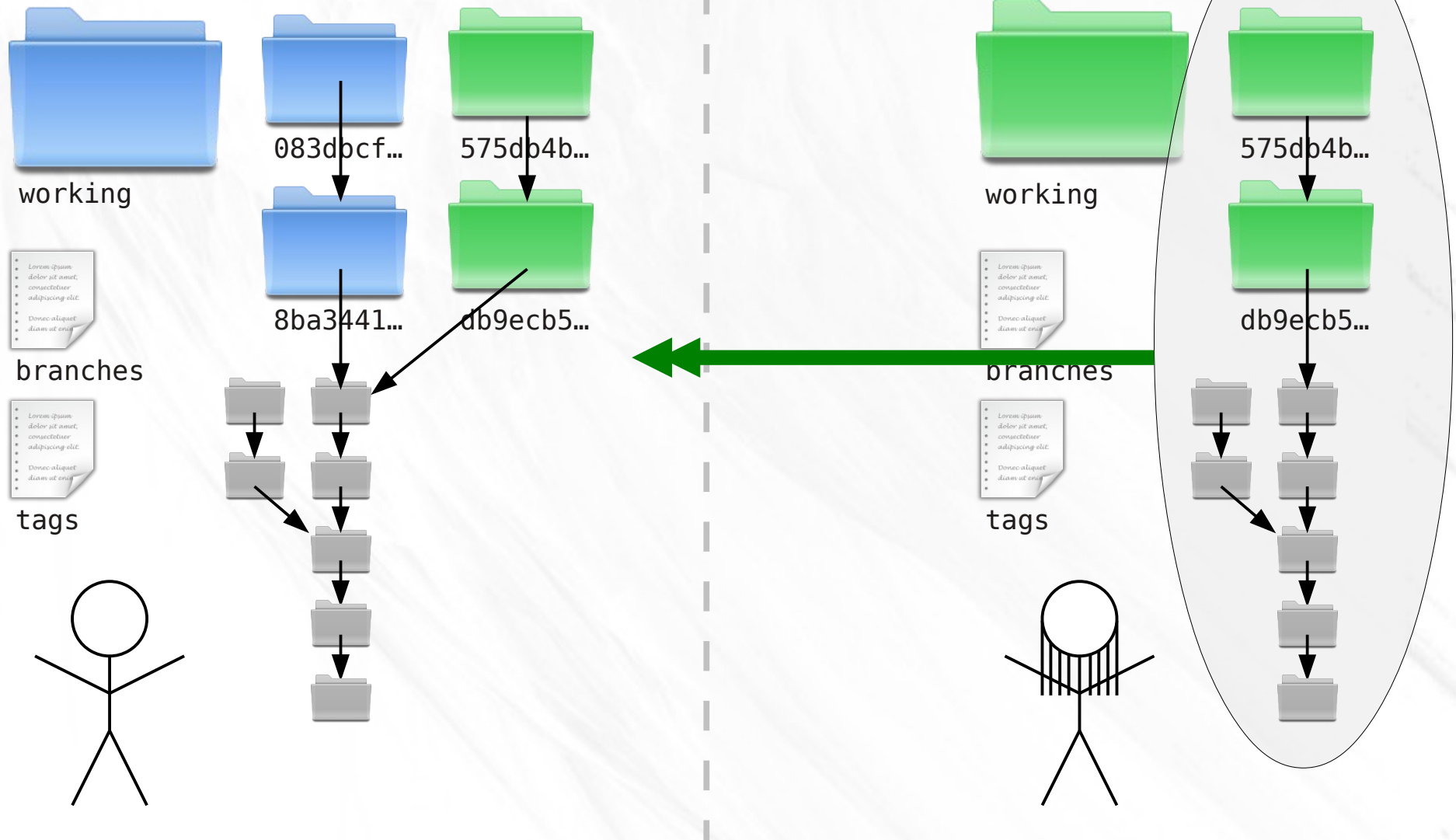
# Distributed



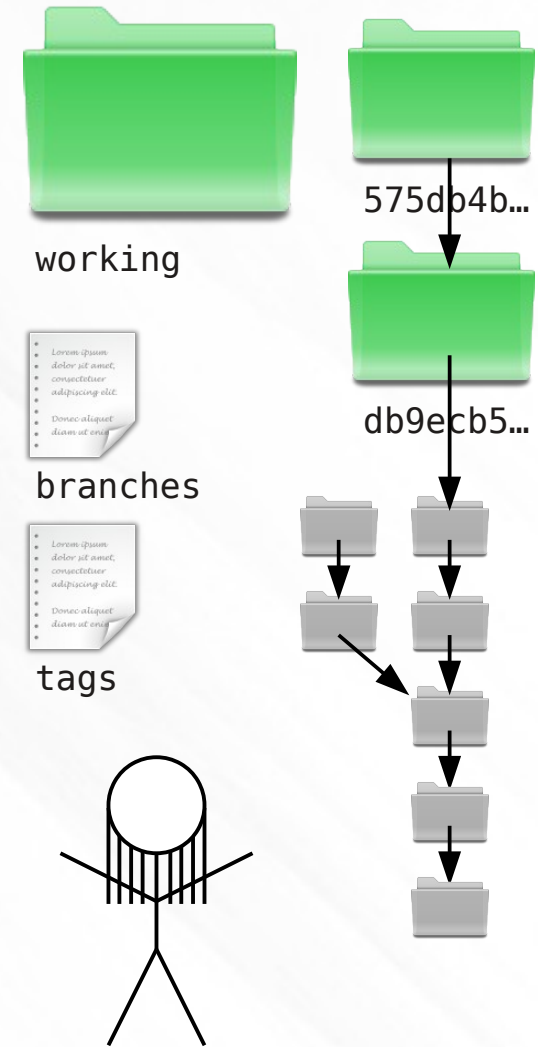
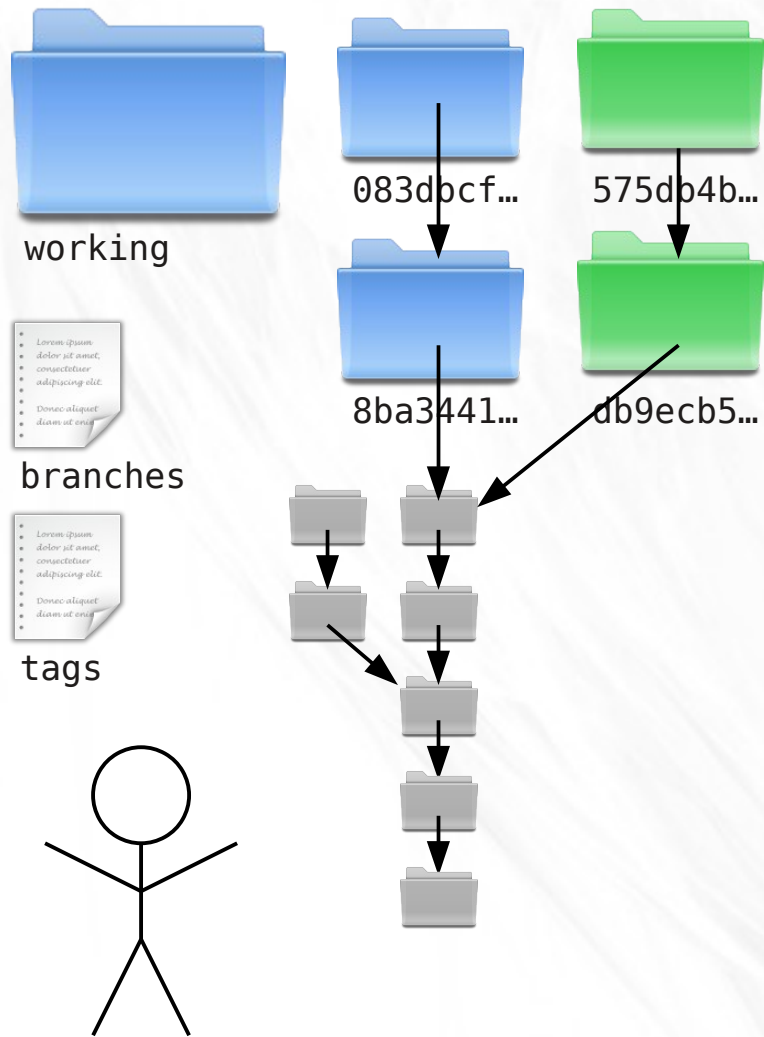
# Distributed



# Distributed



# Distributed



# Offline



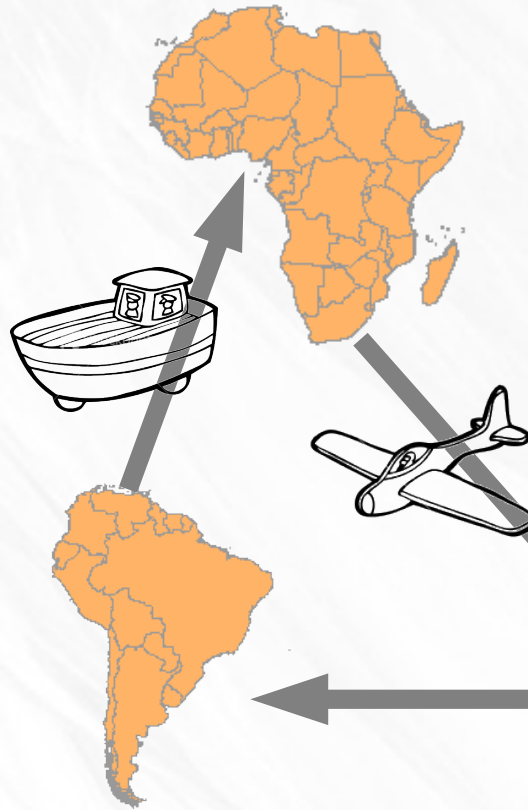
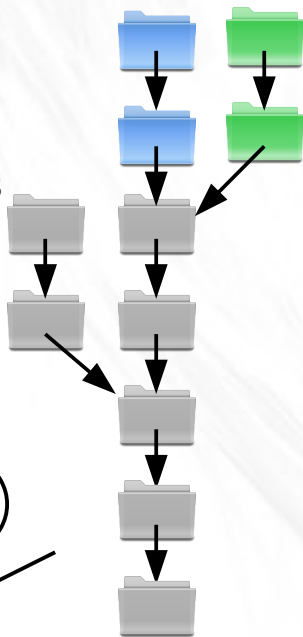
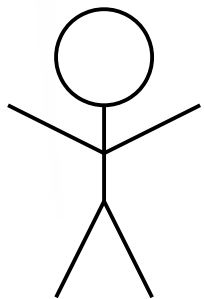
working



branches



tags



working



branches



tags

w00t!





# Offline



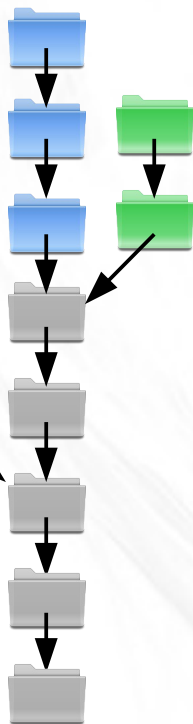
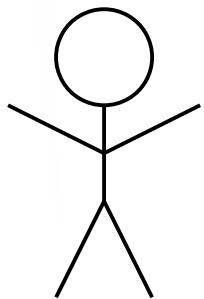
working



branches



tags



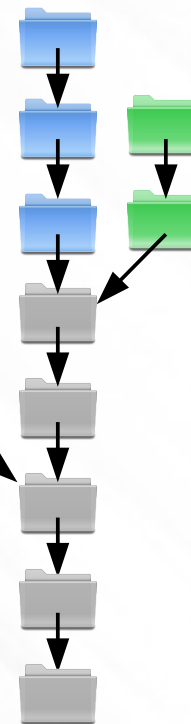
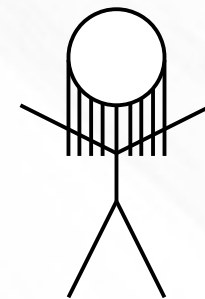
working



branches

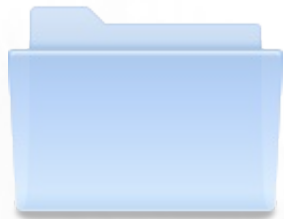


tags





# (simpler drawings)



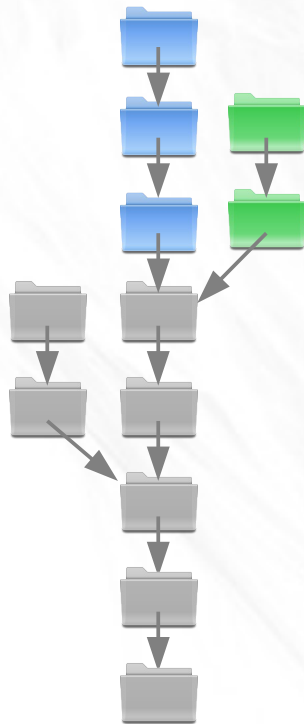
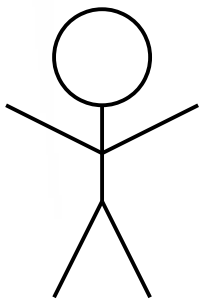
working



branches



tags



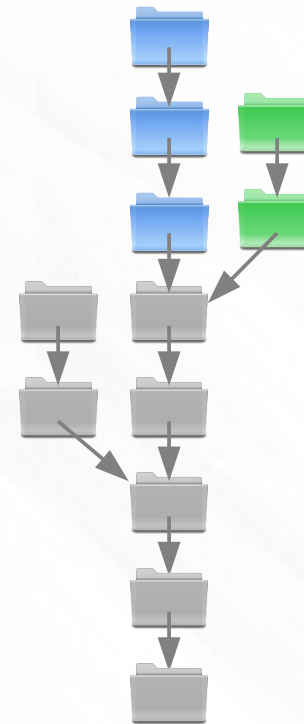
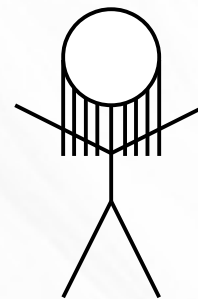
working



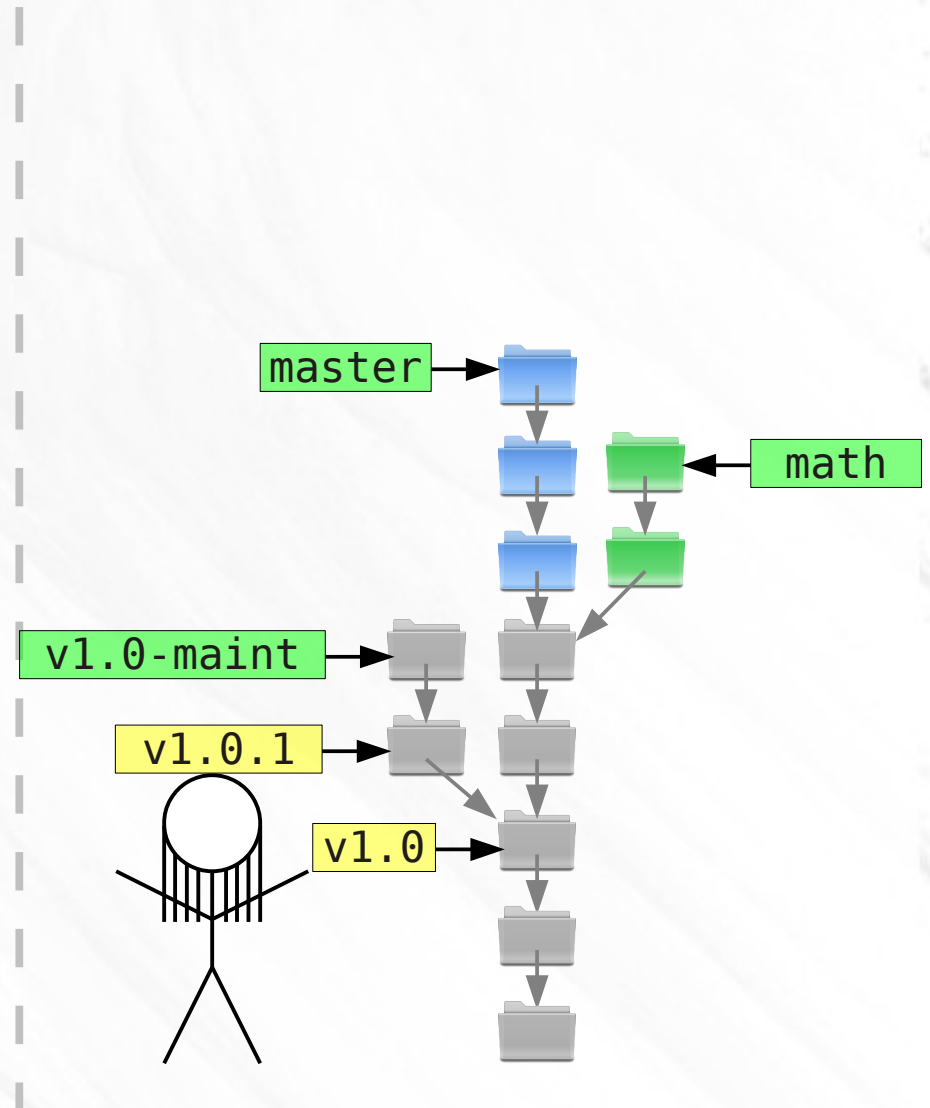
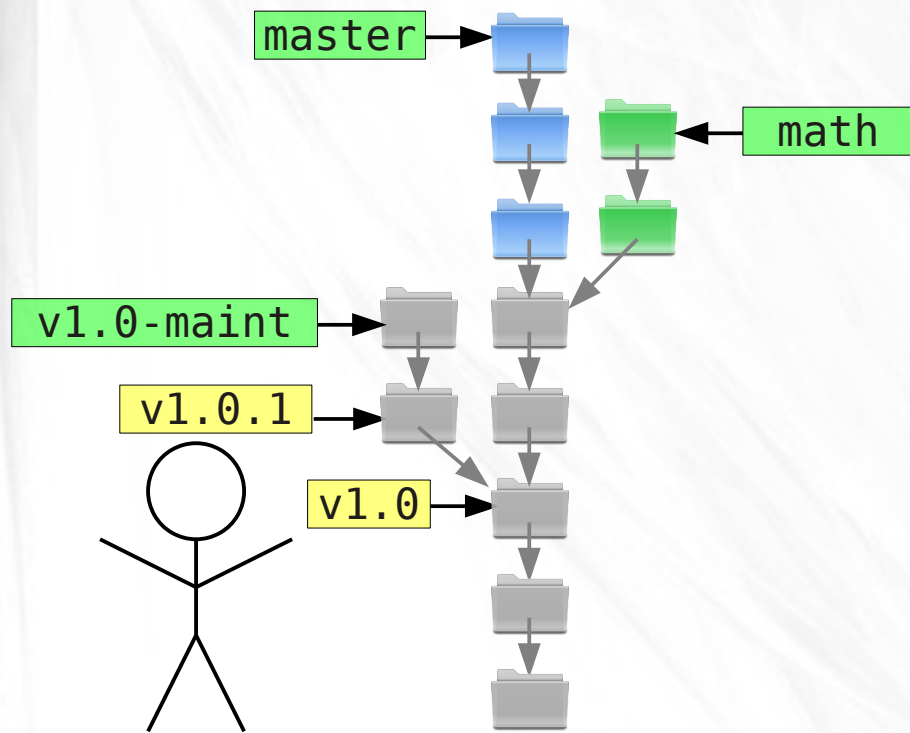
branches



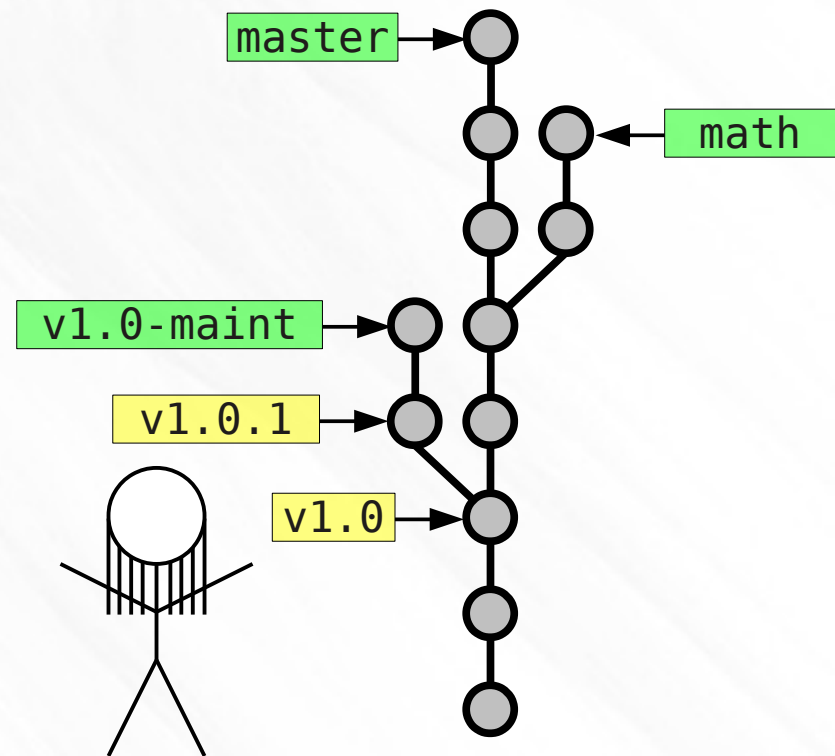
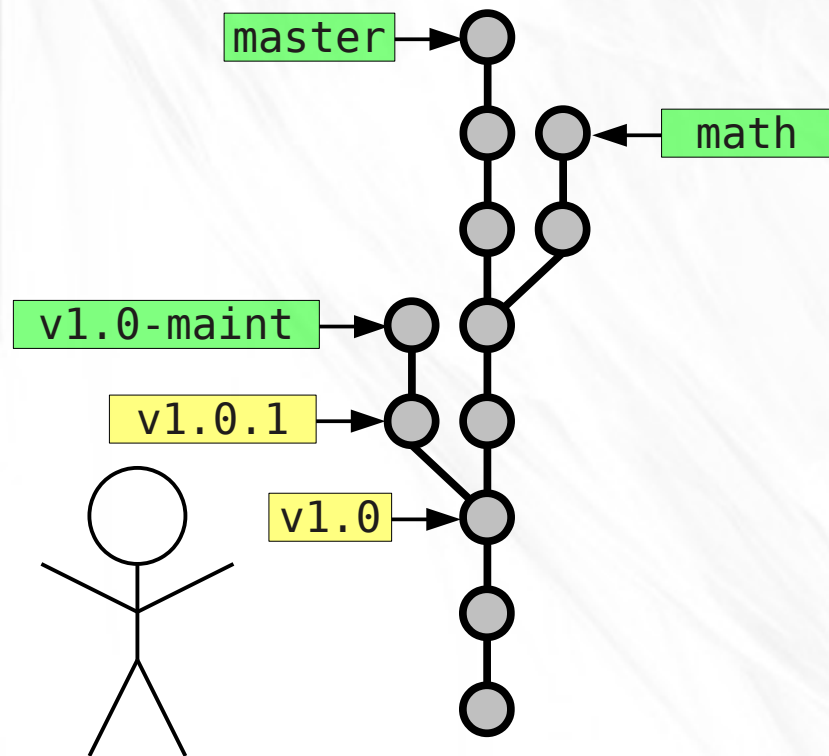
tags



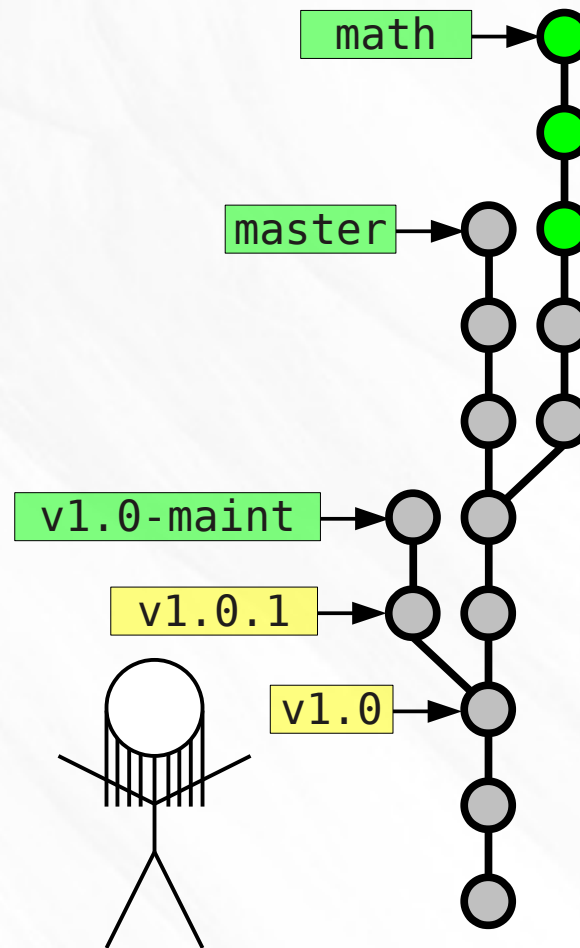
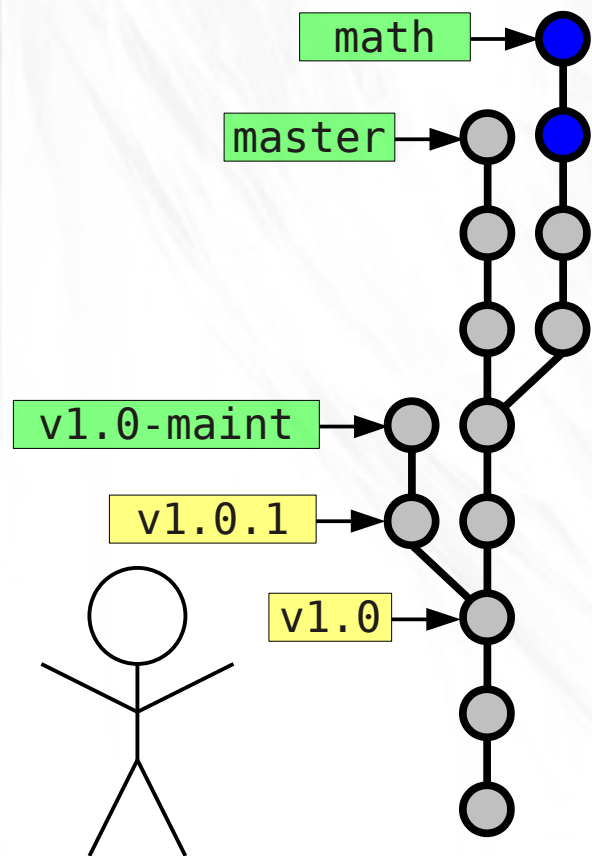
# (simpler drawings)



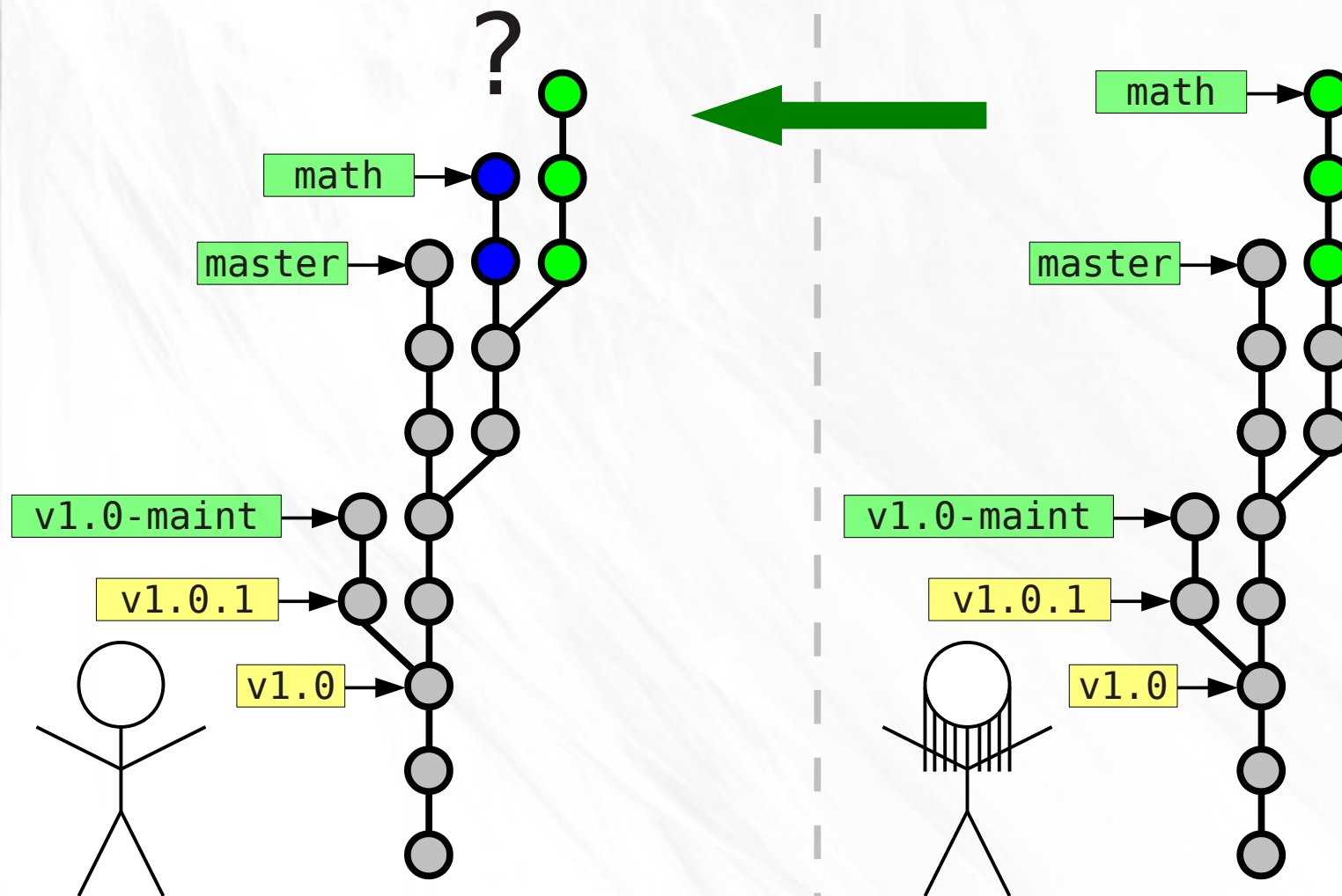
(simpler drawings)



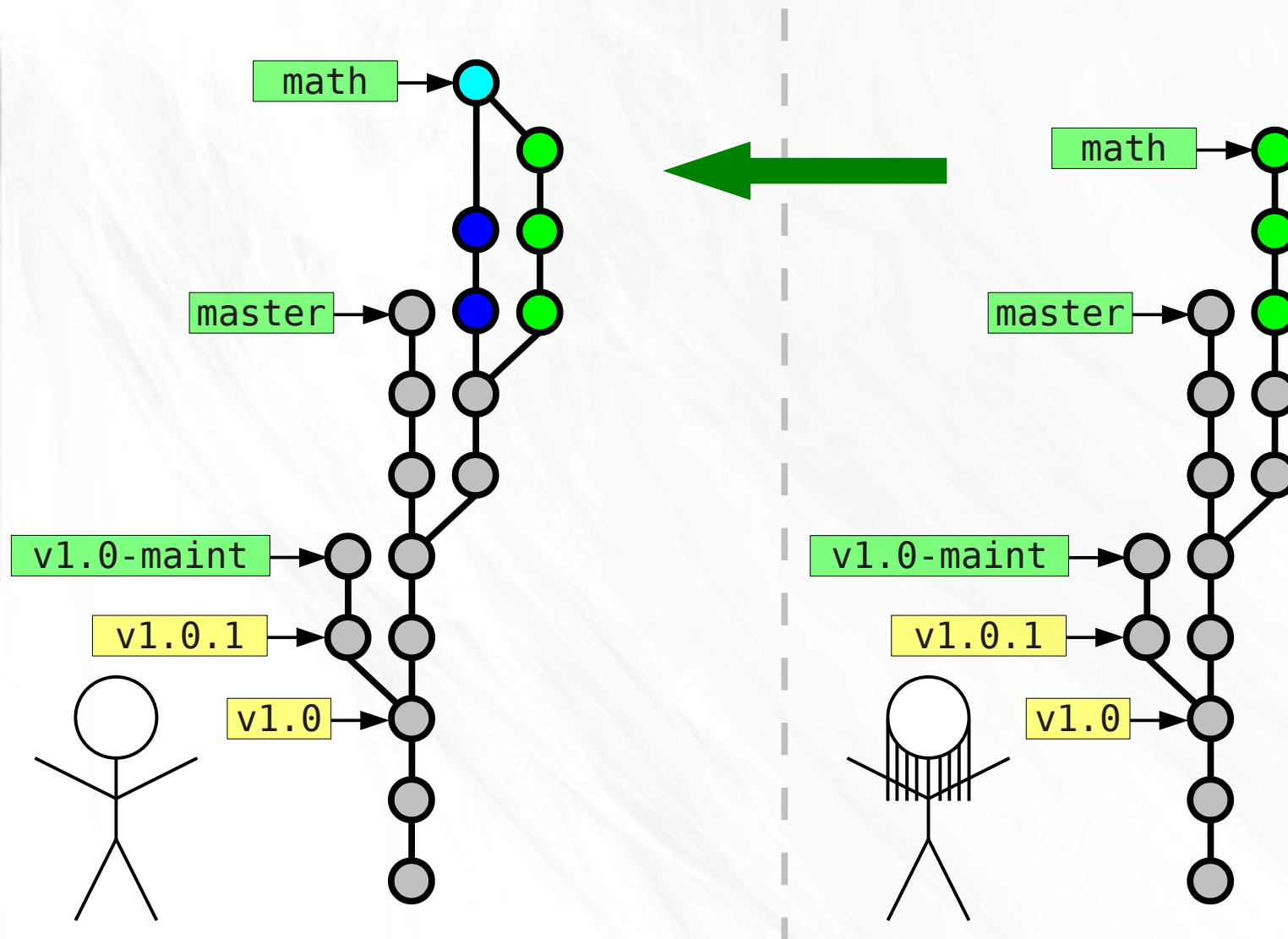
# Merges



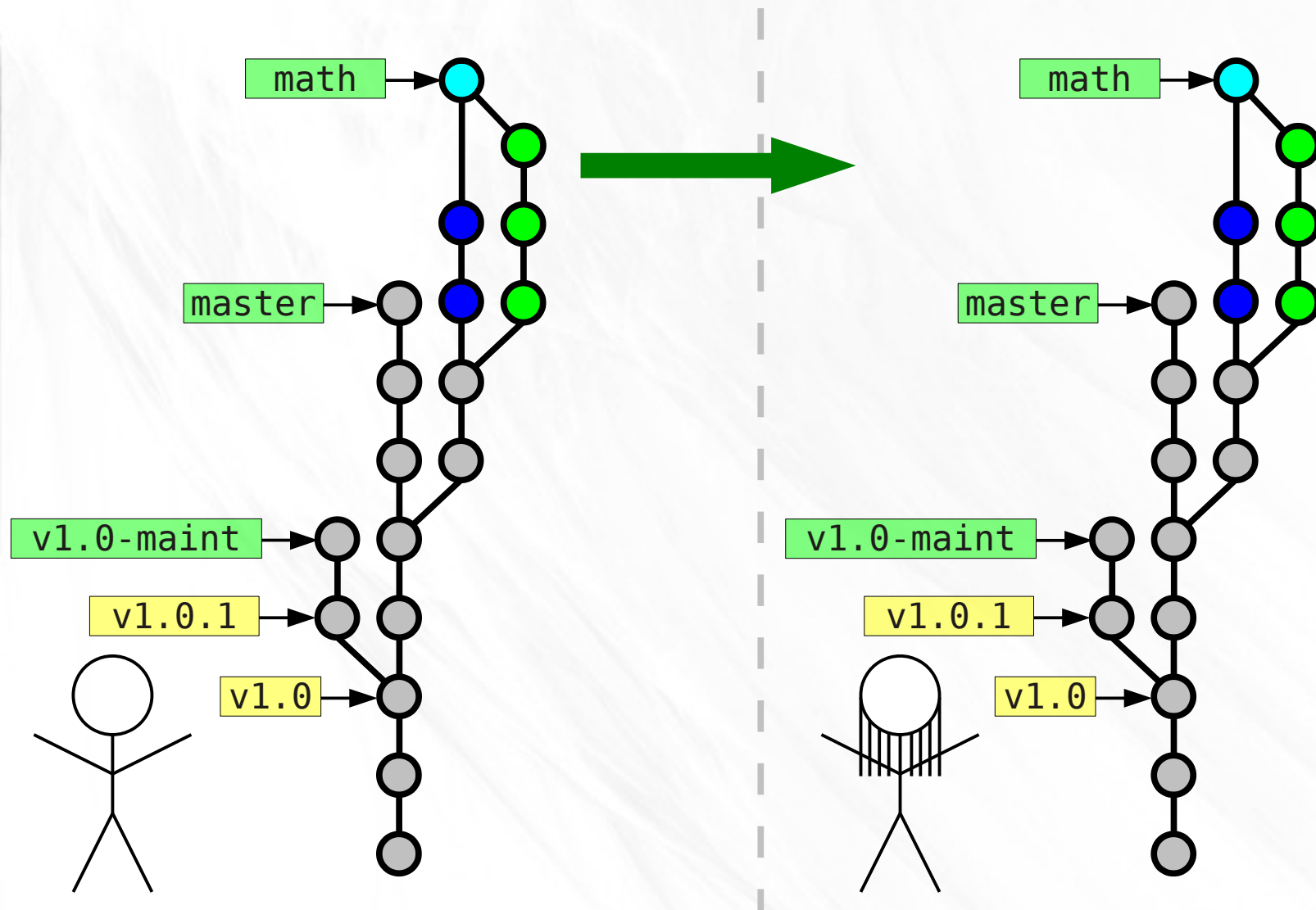
# Merges



# Merges

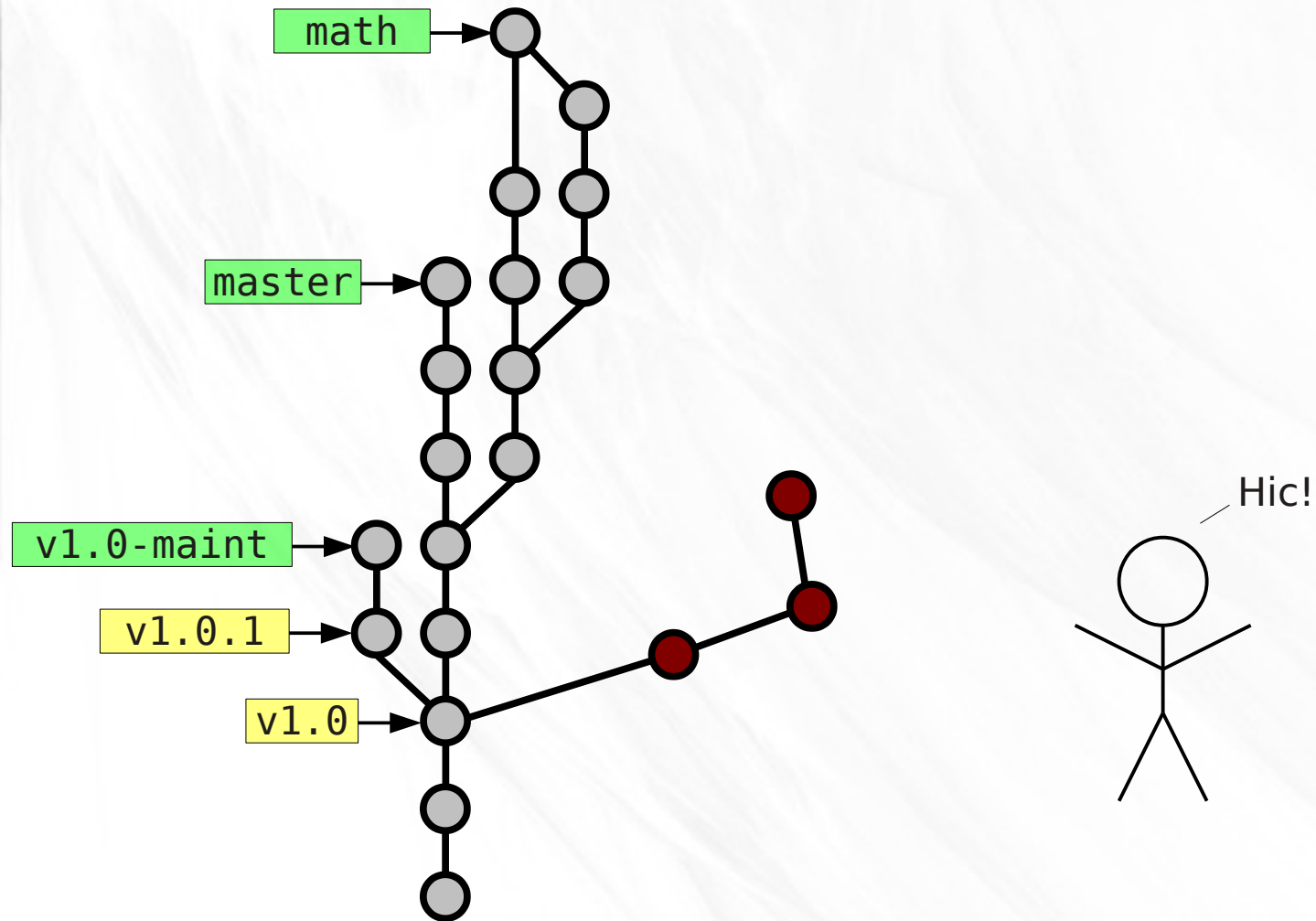


# Merges

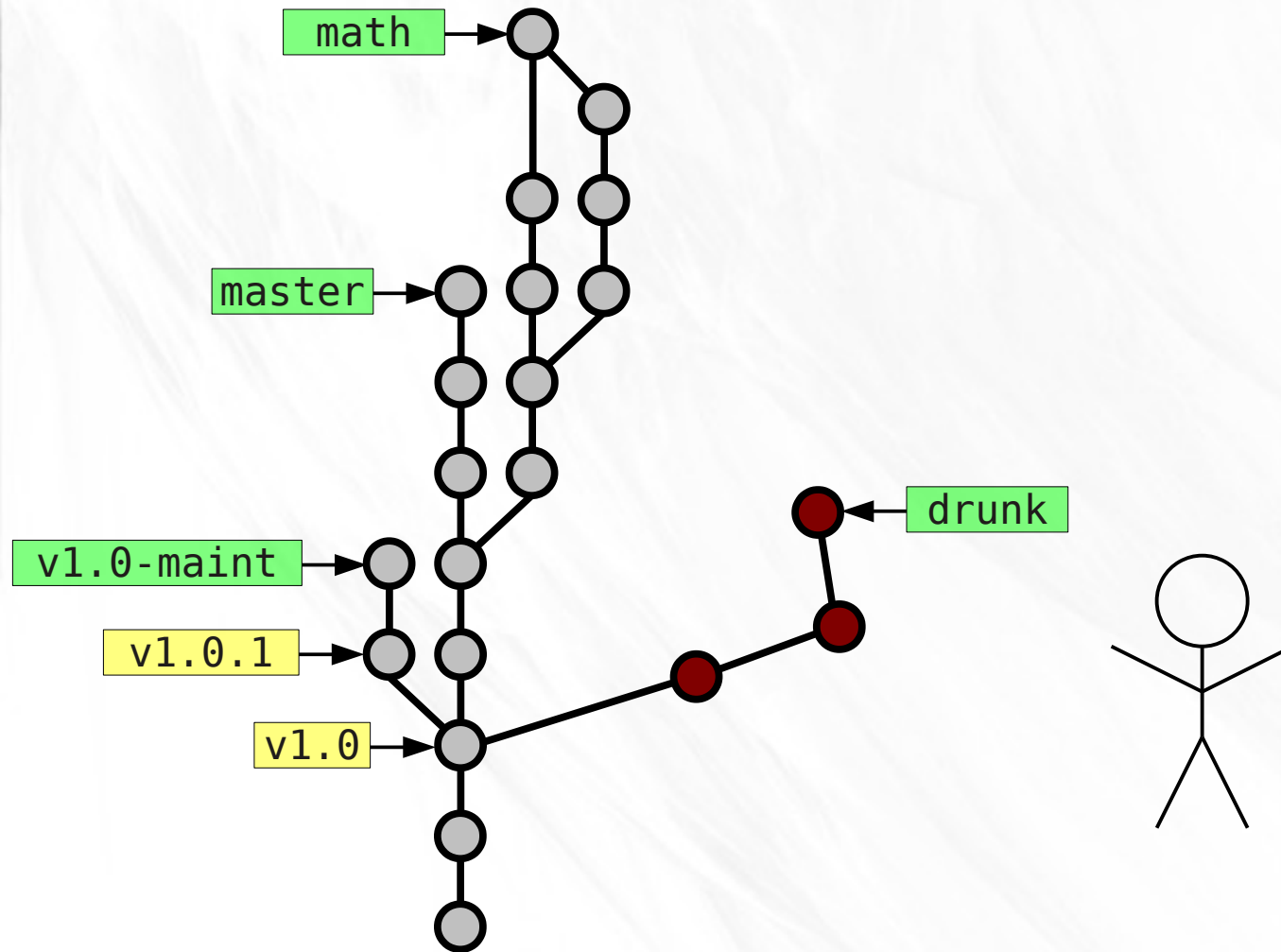




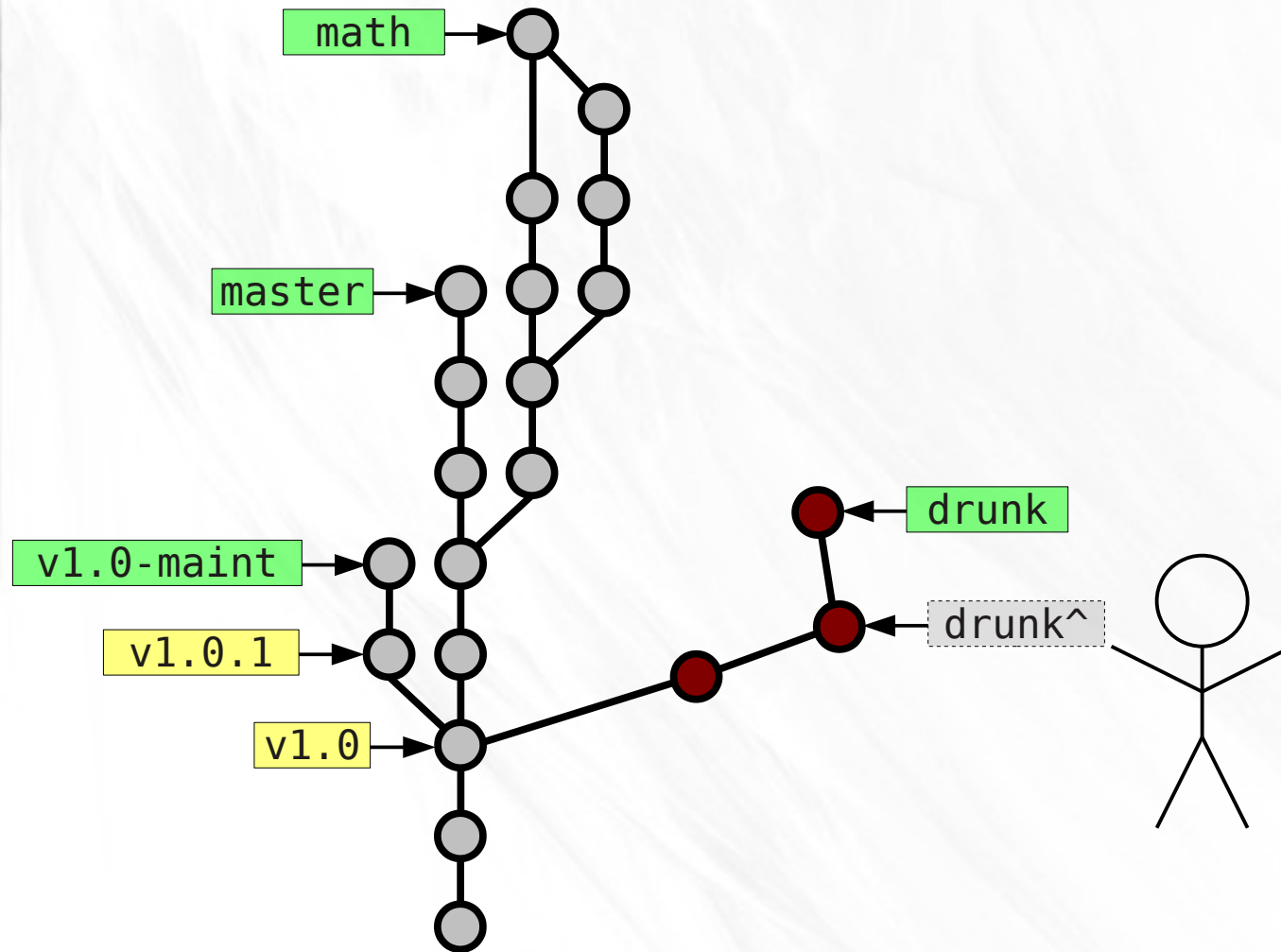
# Rewriting History



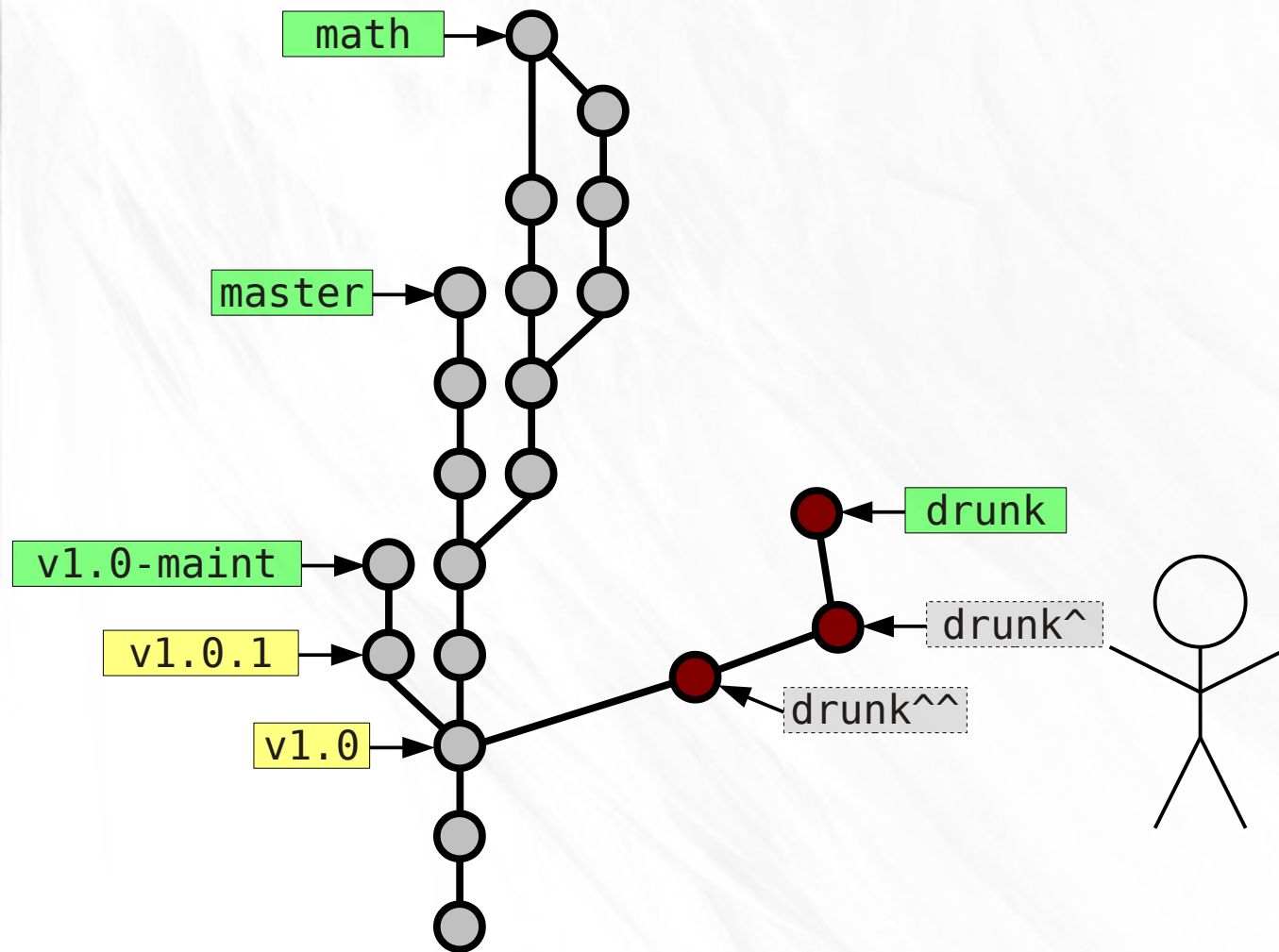
# Rewriting History



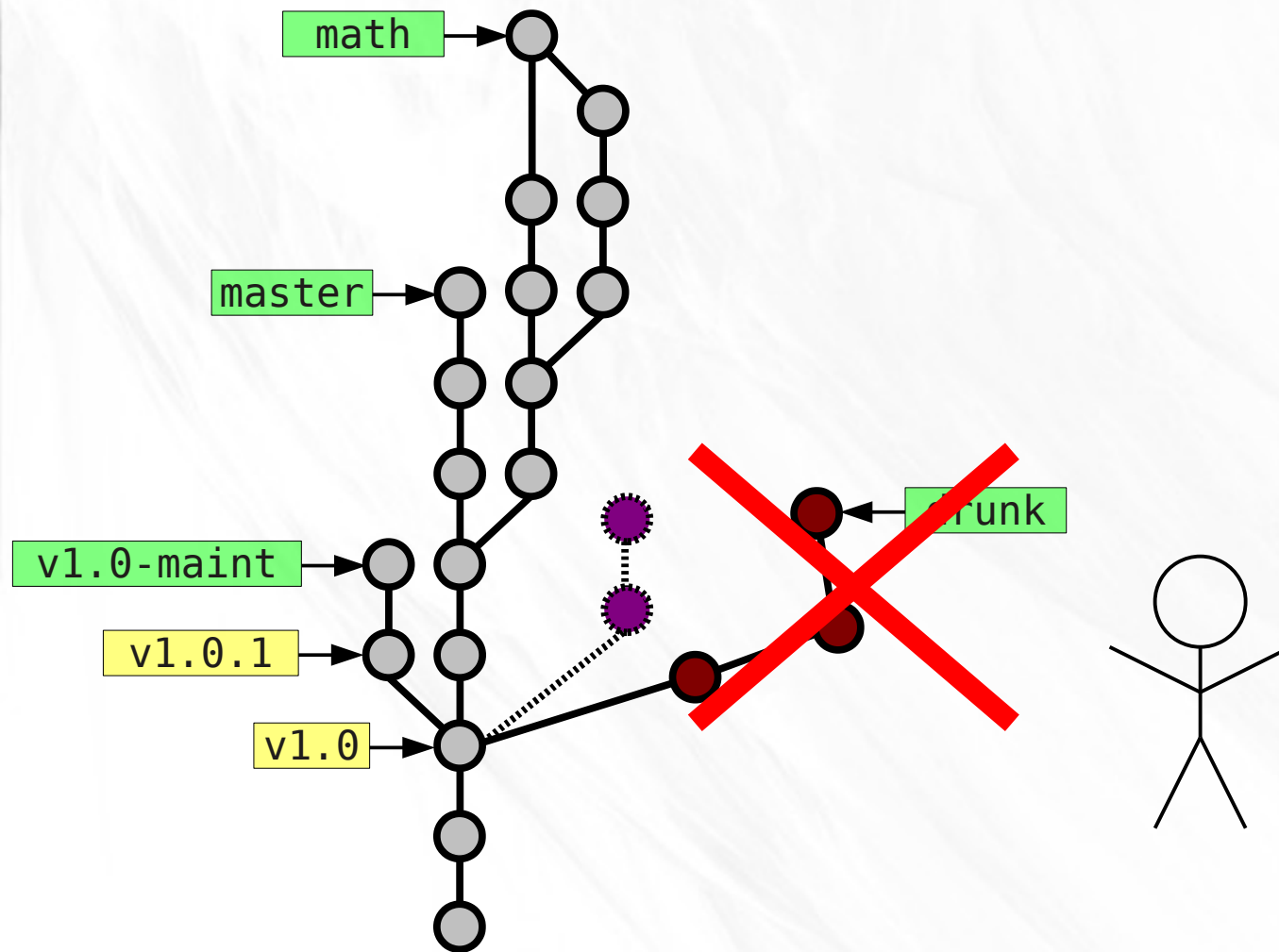
# Rewriting History



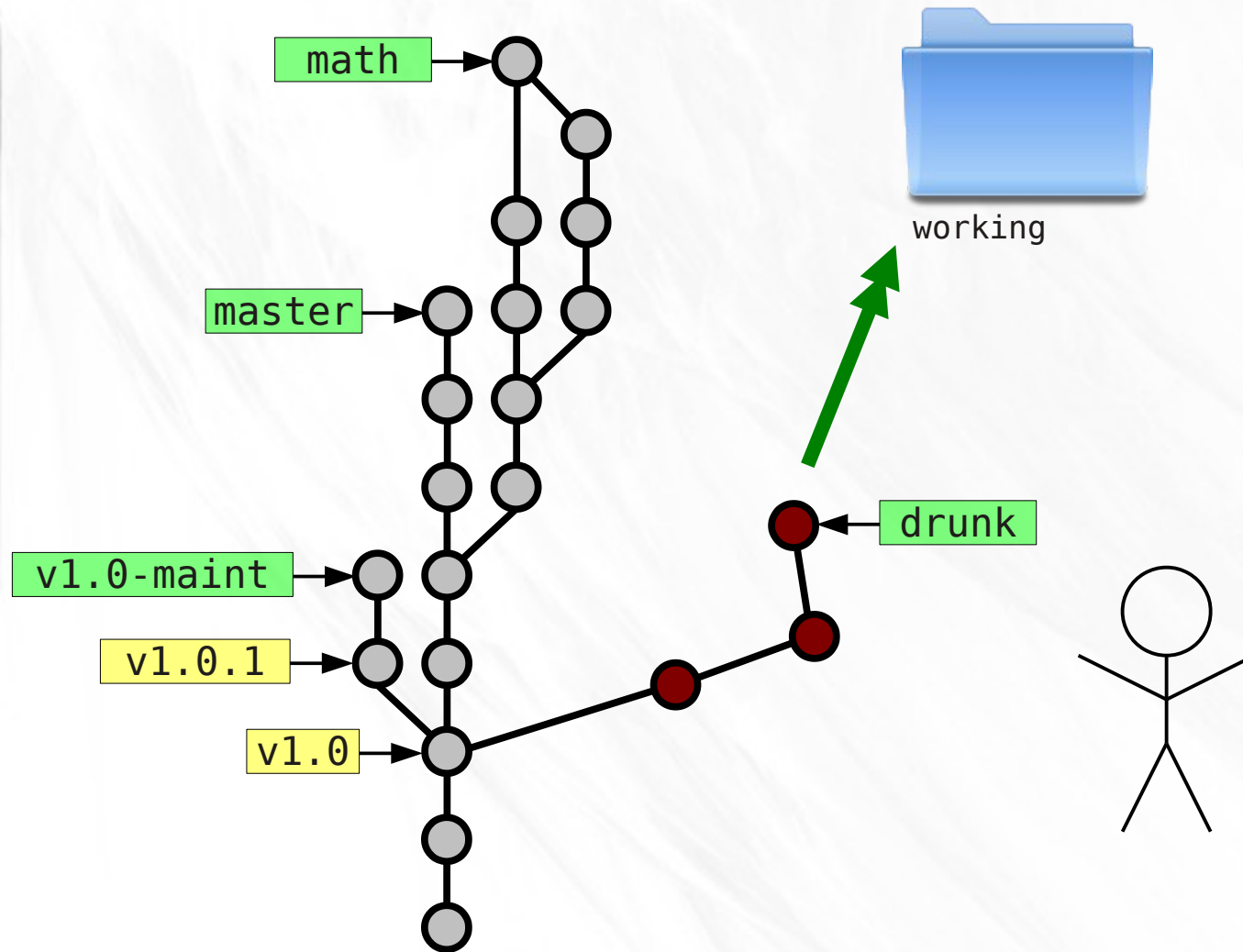
# Rewriting History



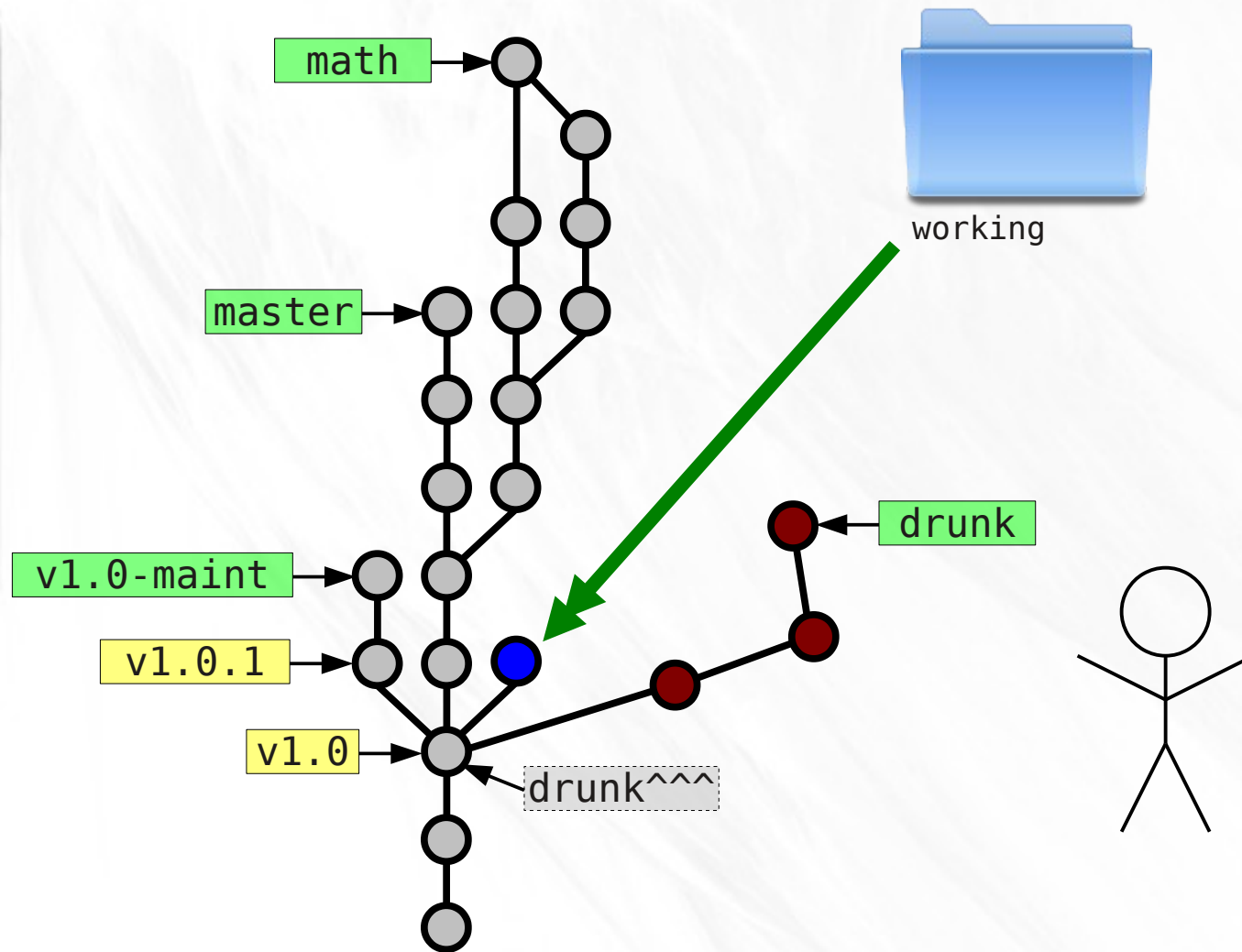
# Rewriting History



# Rewriting History

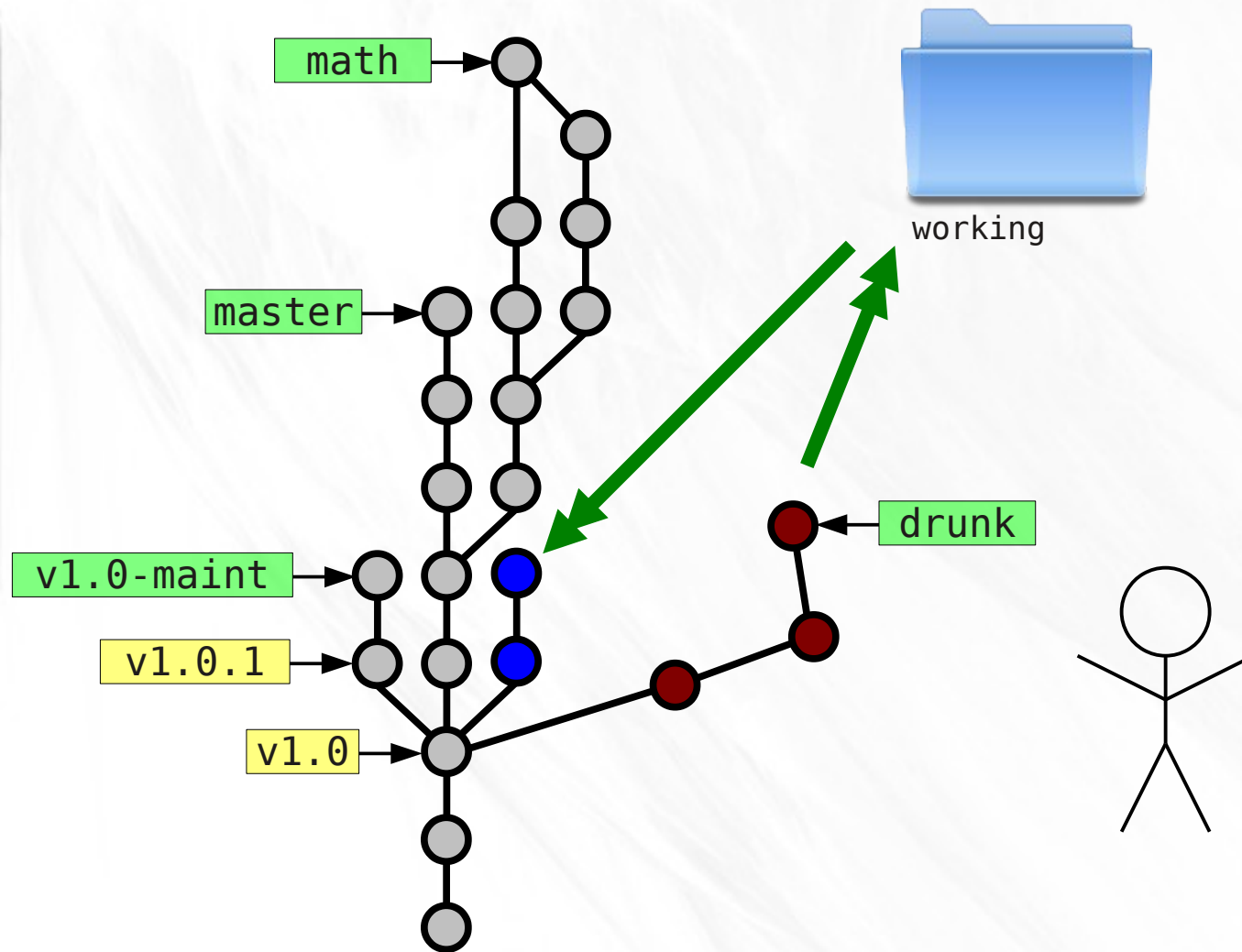


# Rewriting History

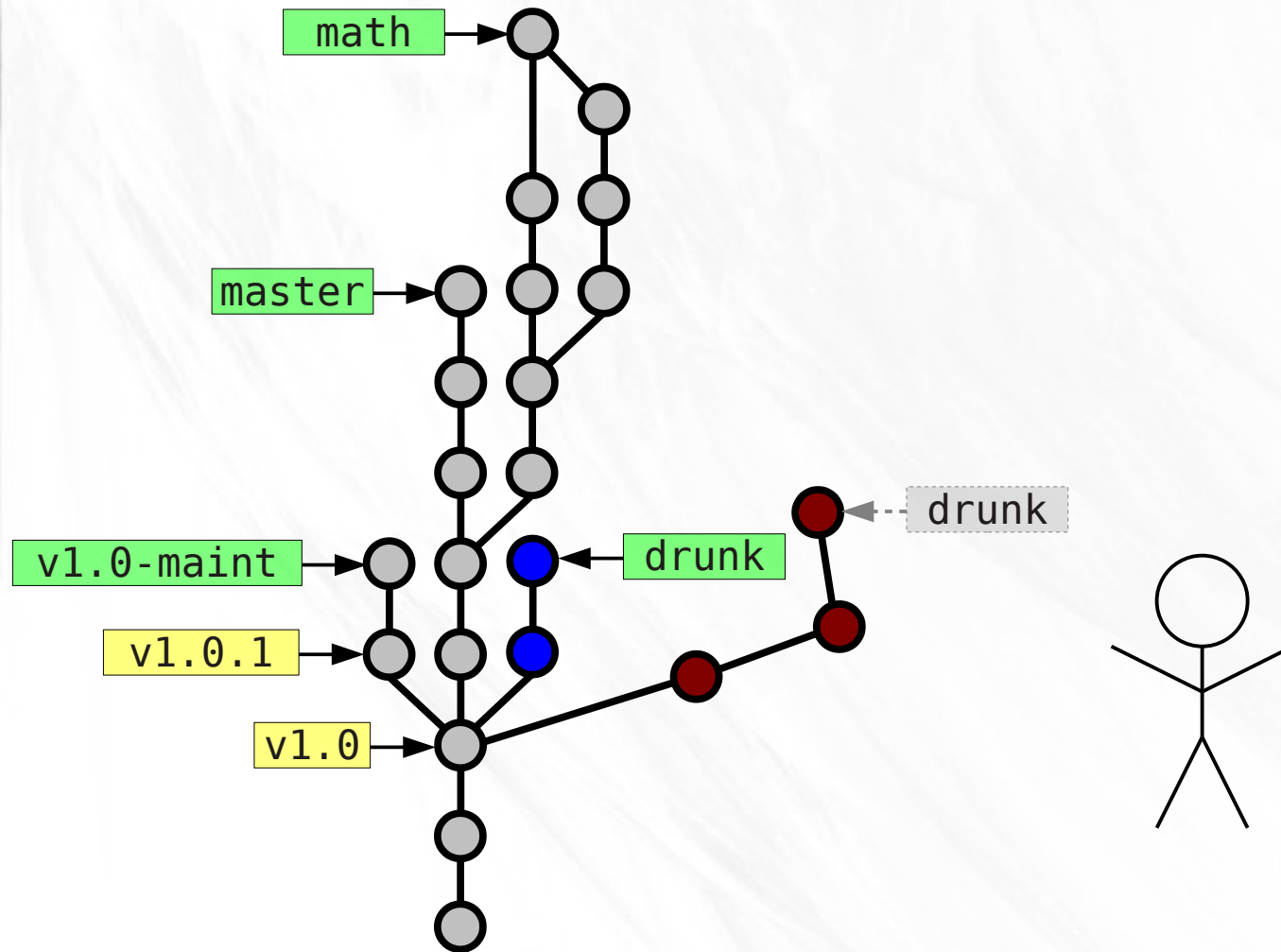




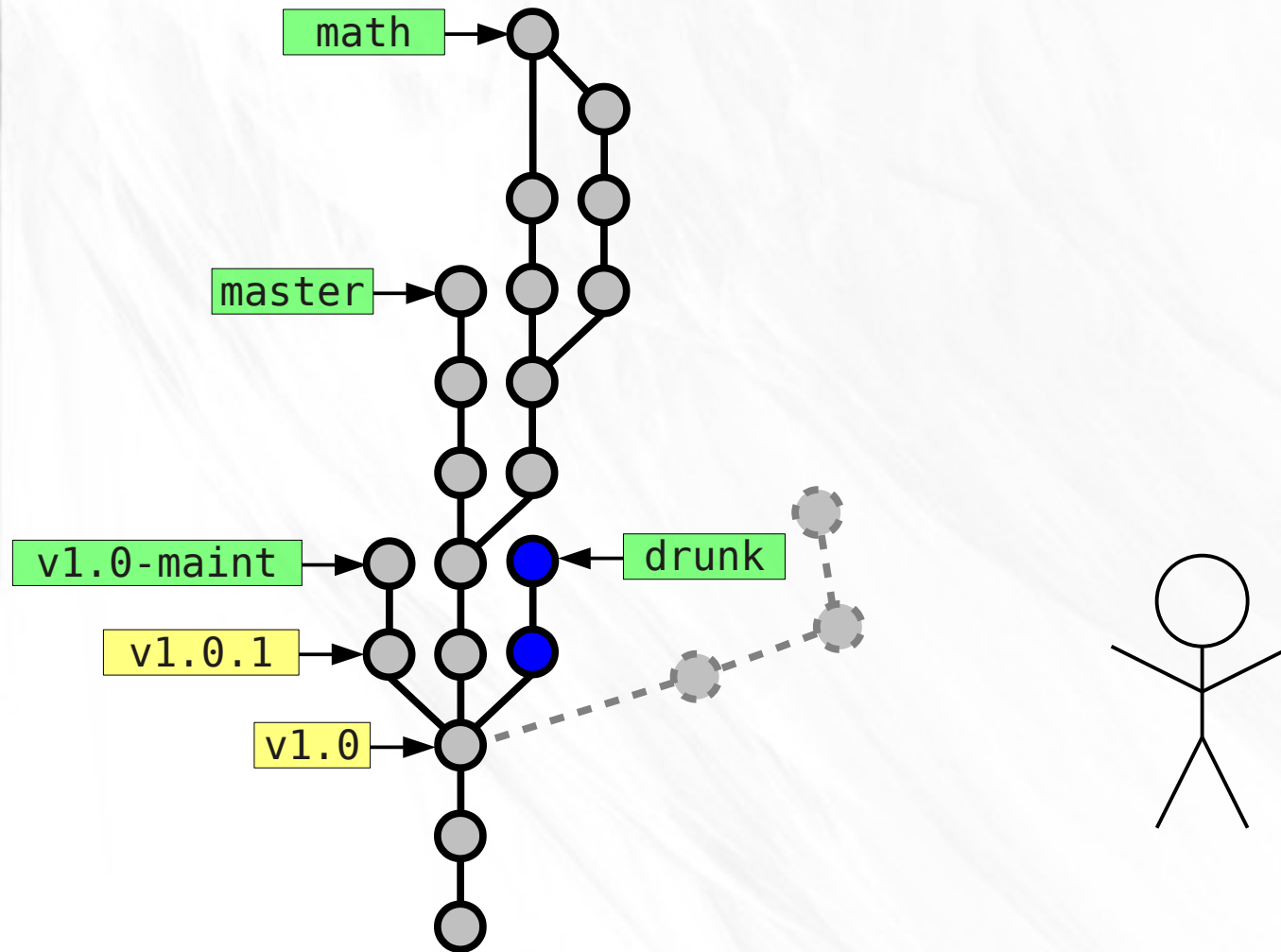
# Rewriting History



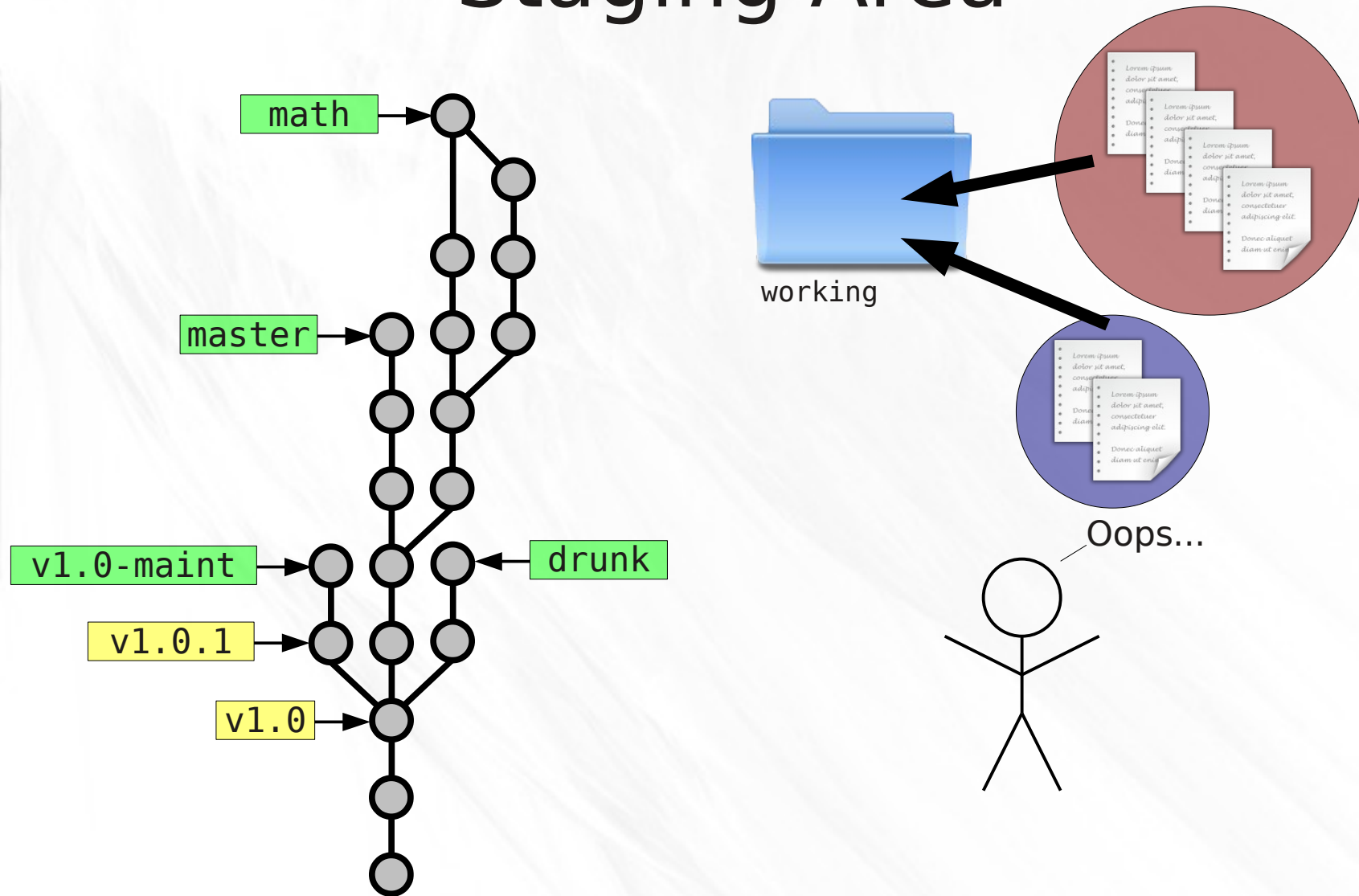
# Rewriting History



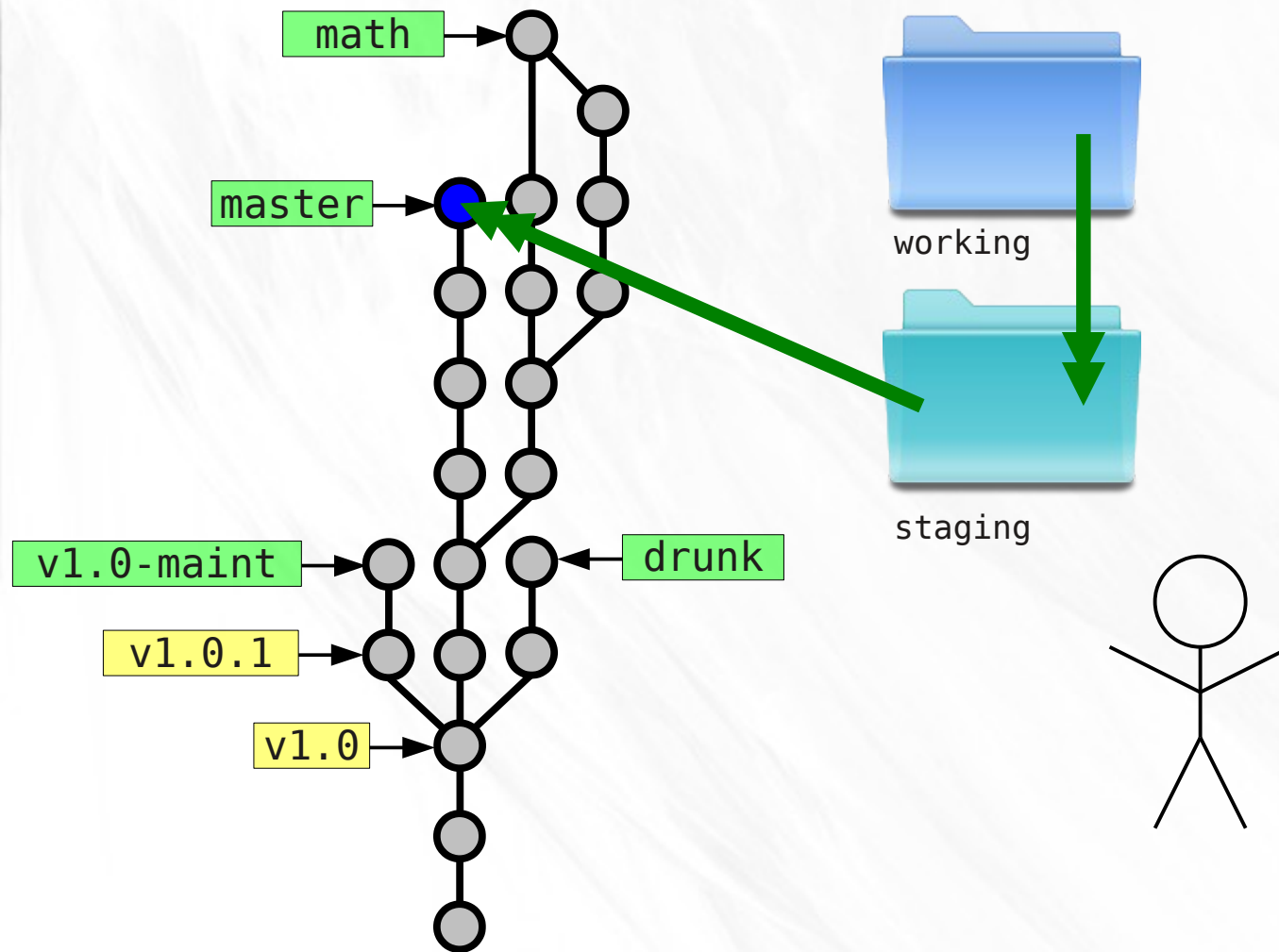
# Rewriting History



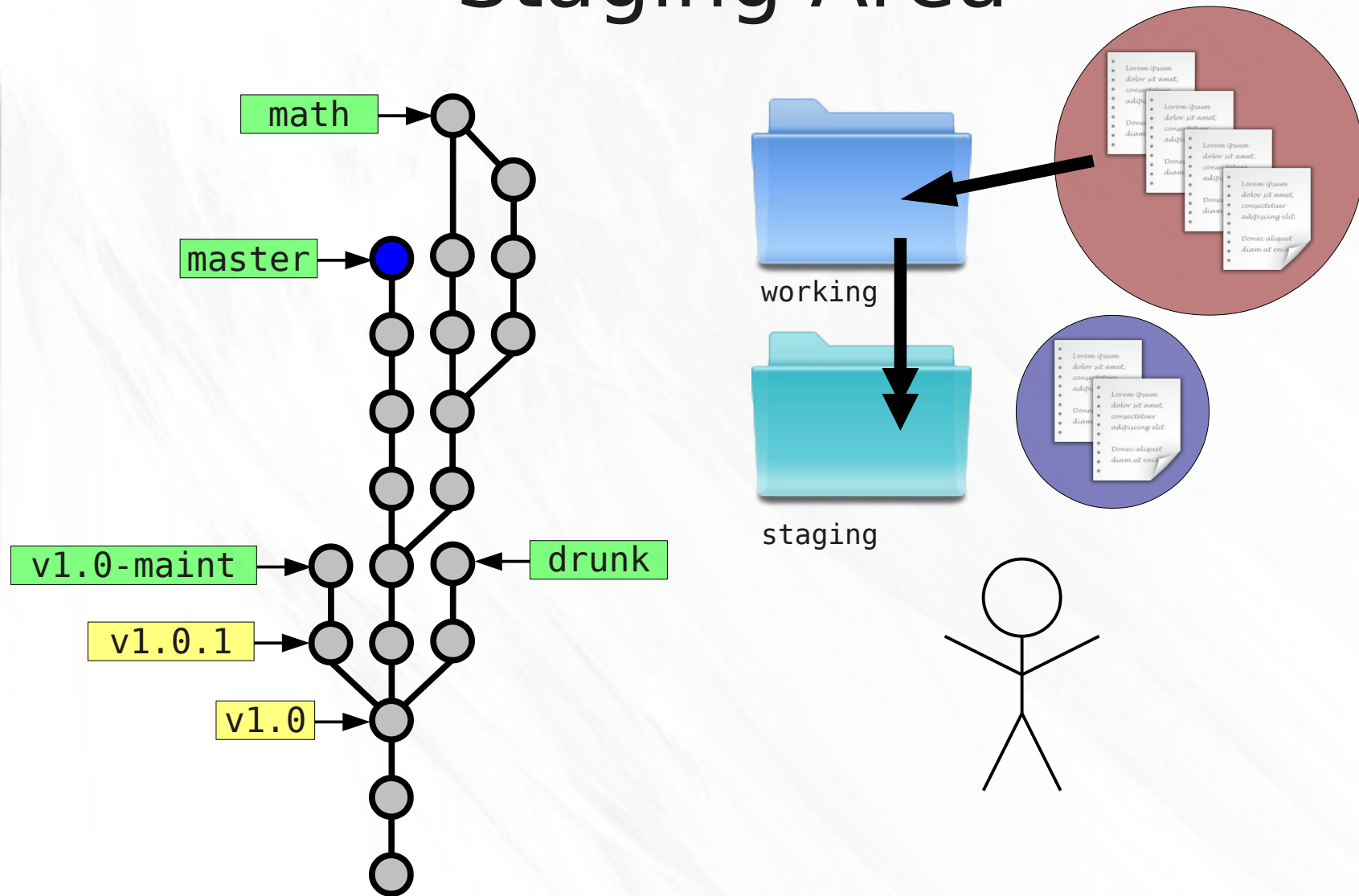
# Staging Area



# Staging Area

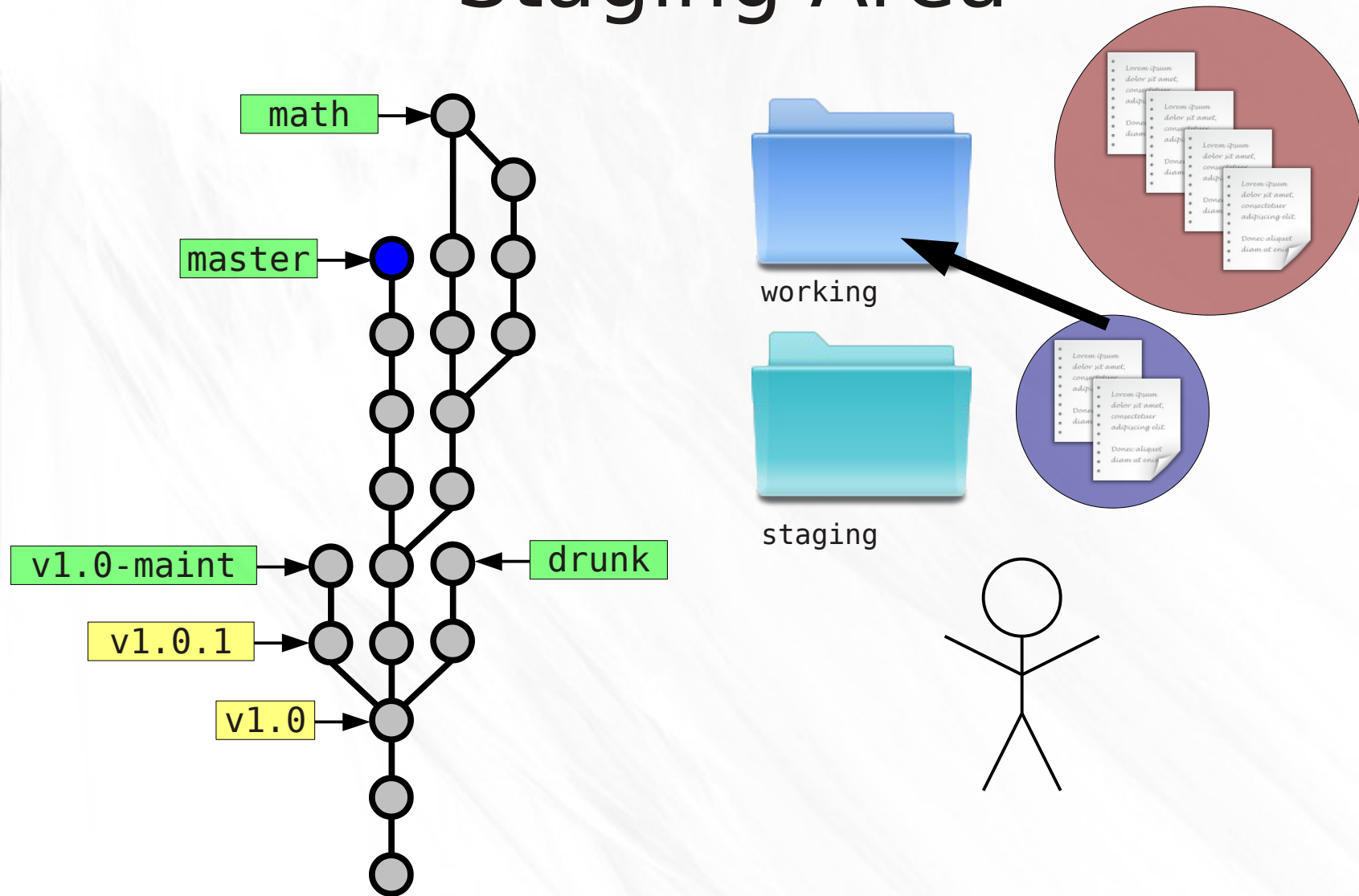


# Staging Area



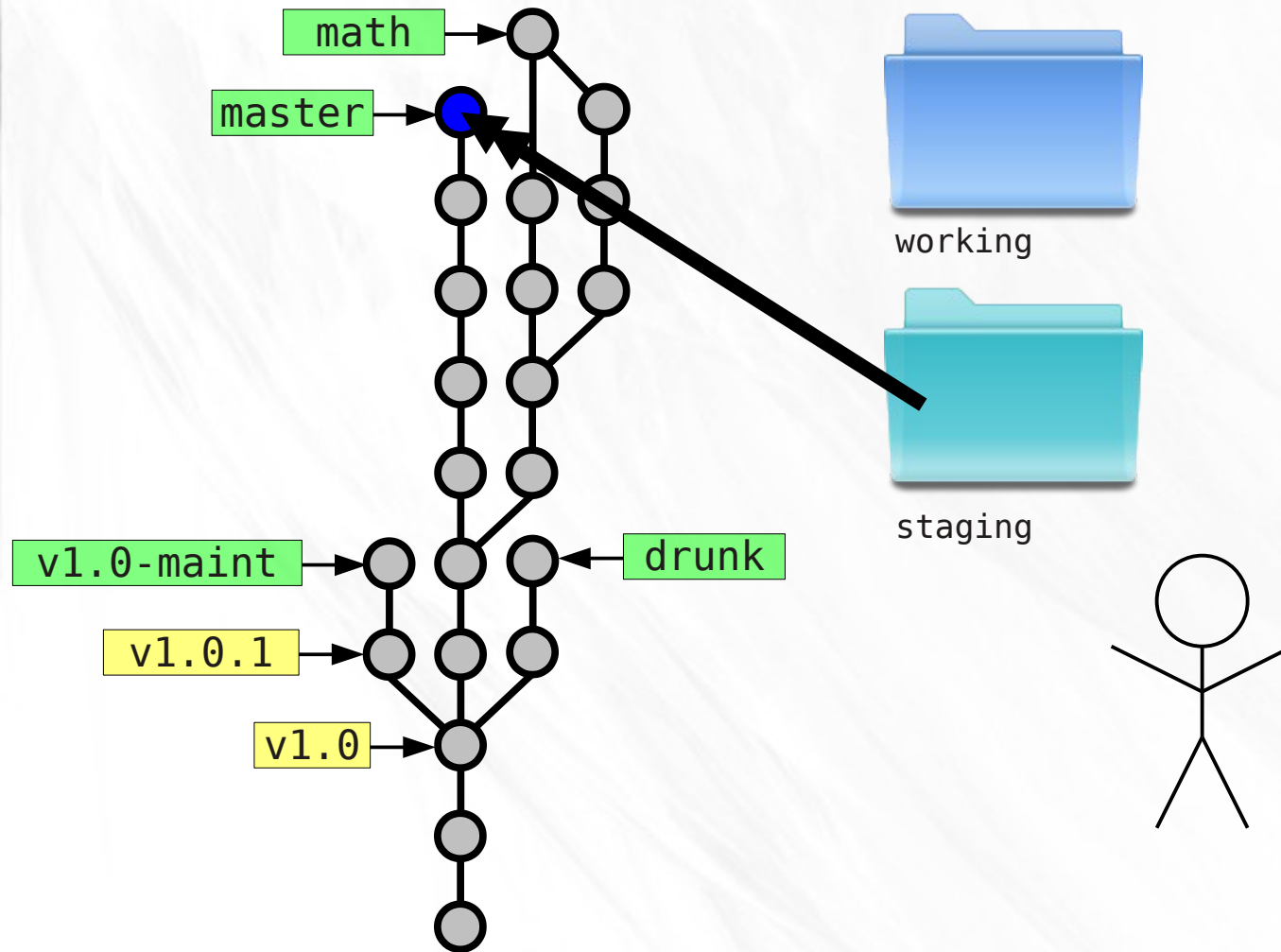


# Staging Area

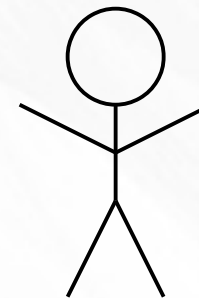
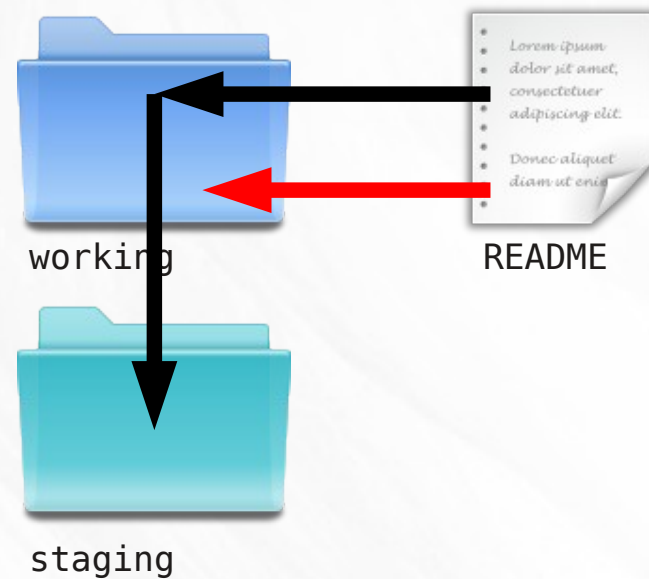
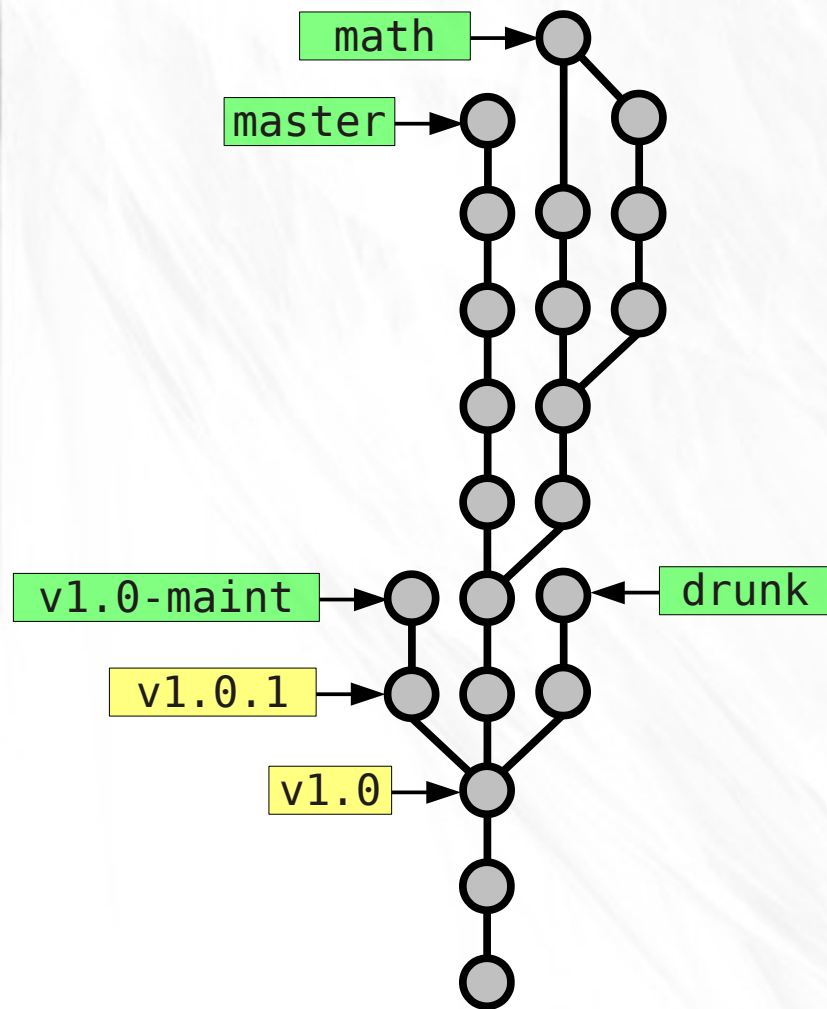




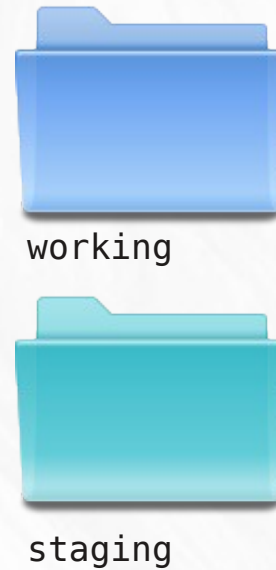
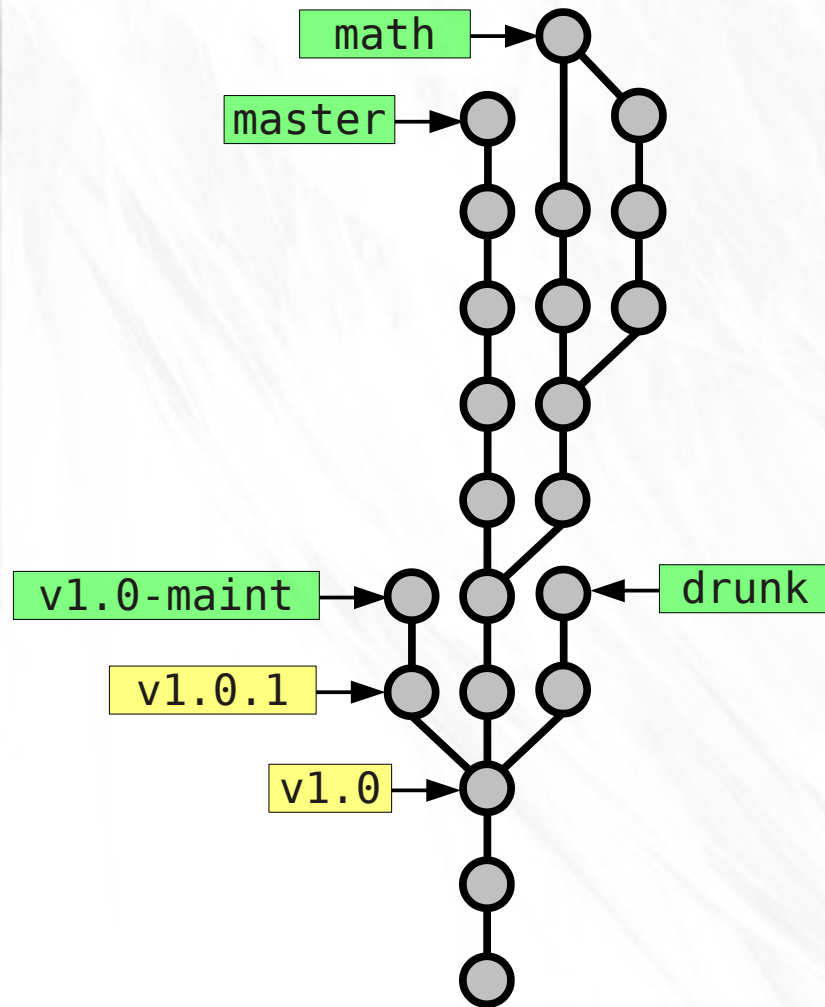
# Staging Area



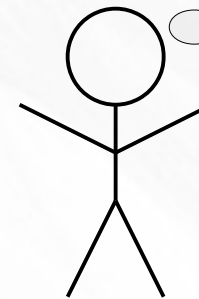
# Staging Area



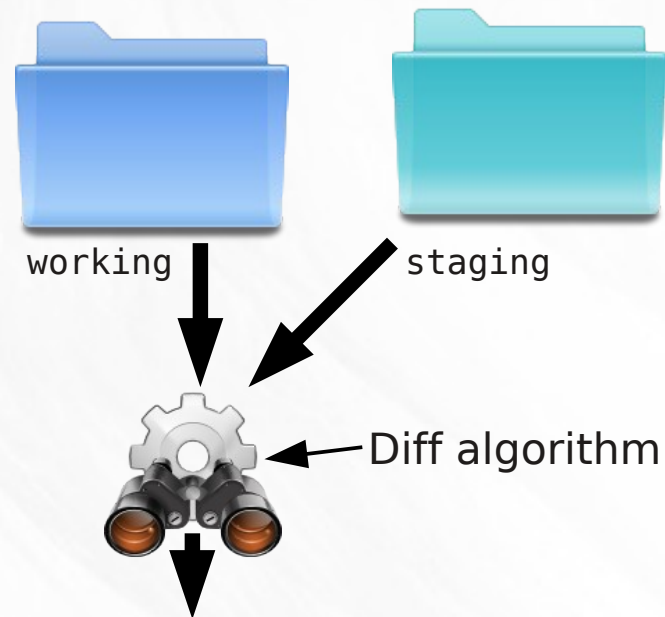
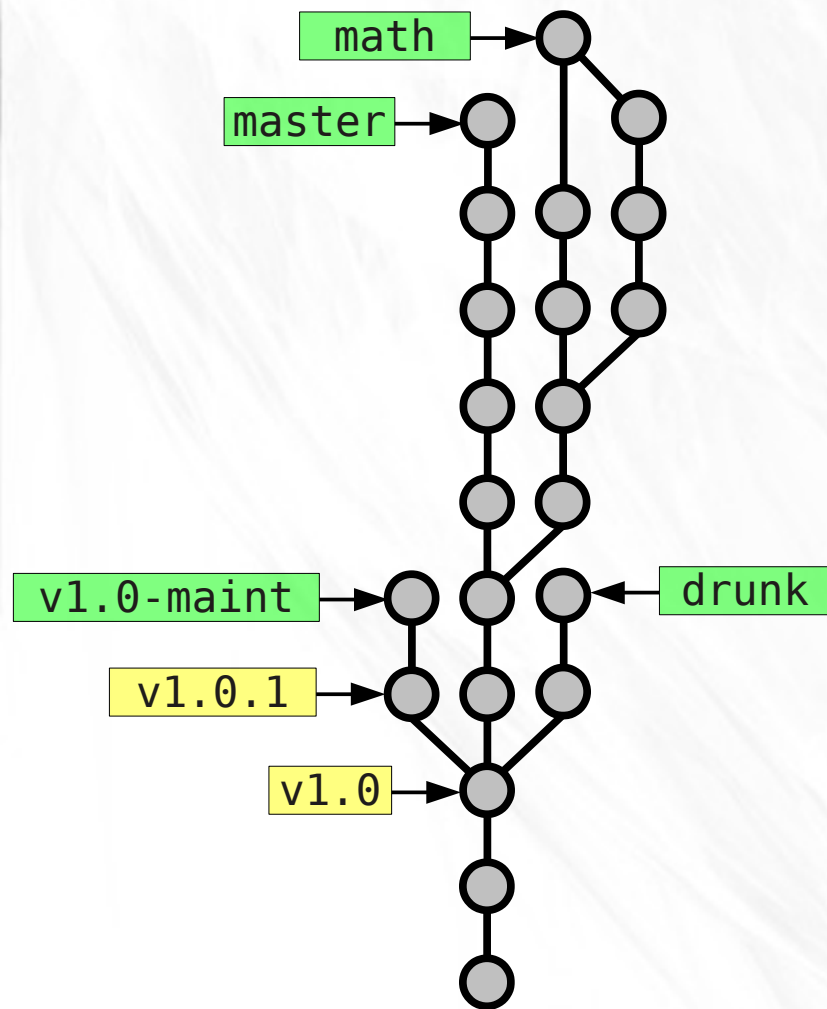
# Diffs



- What are the changes?
- working vs. staging
  - working vs. snapshot X
  - staging vs. snapshot X
  - snapshot X vs. snapshot Y

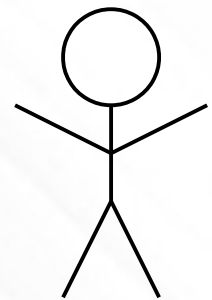


# Diffs

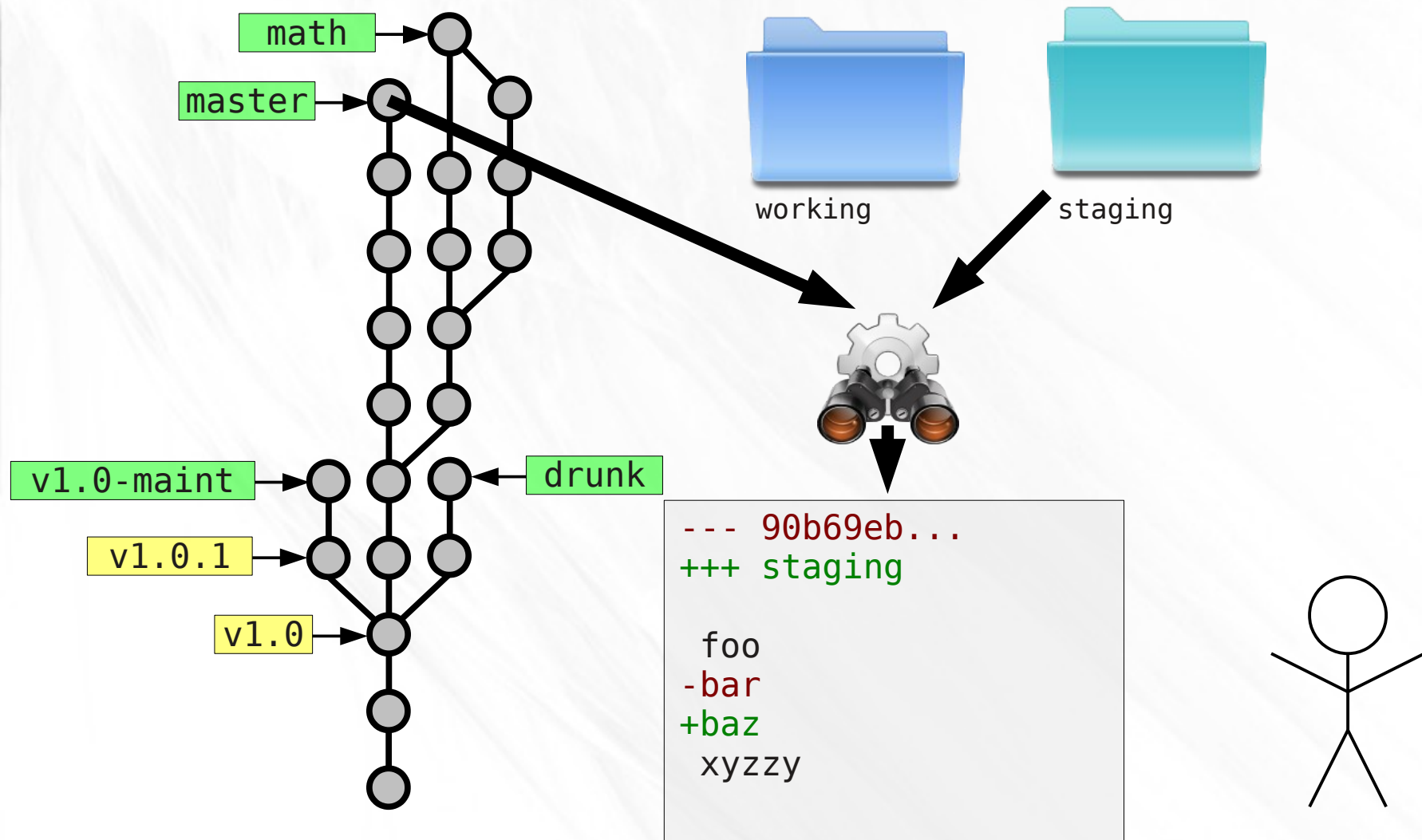


```
--- staging  
+++ working
```

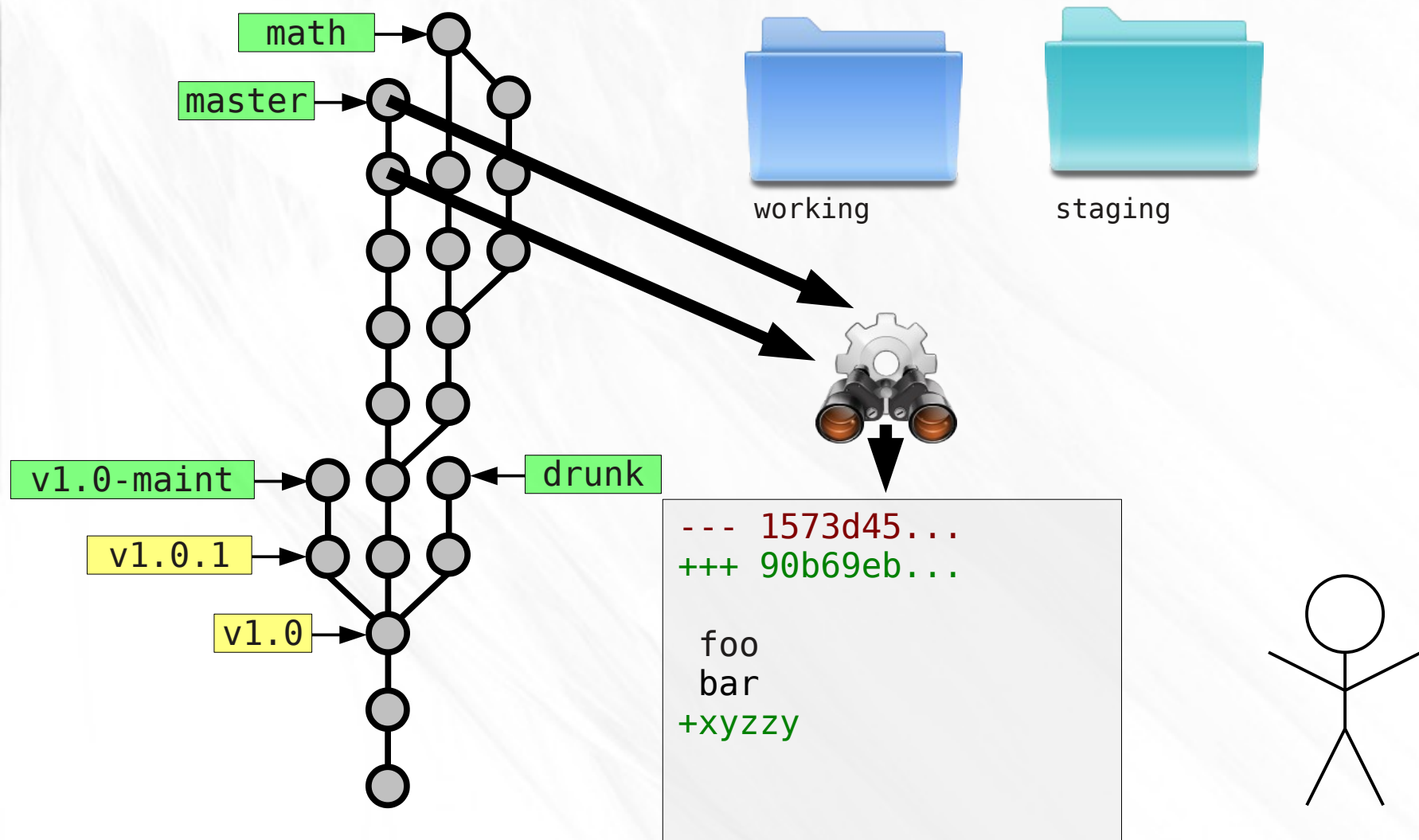
```
foo  
-baz  
+bazzle  
xyzy
```



# Diff

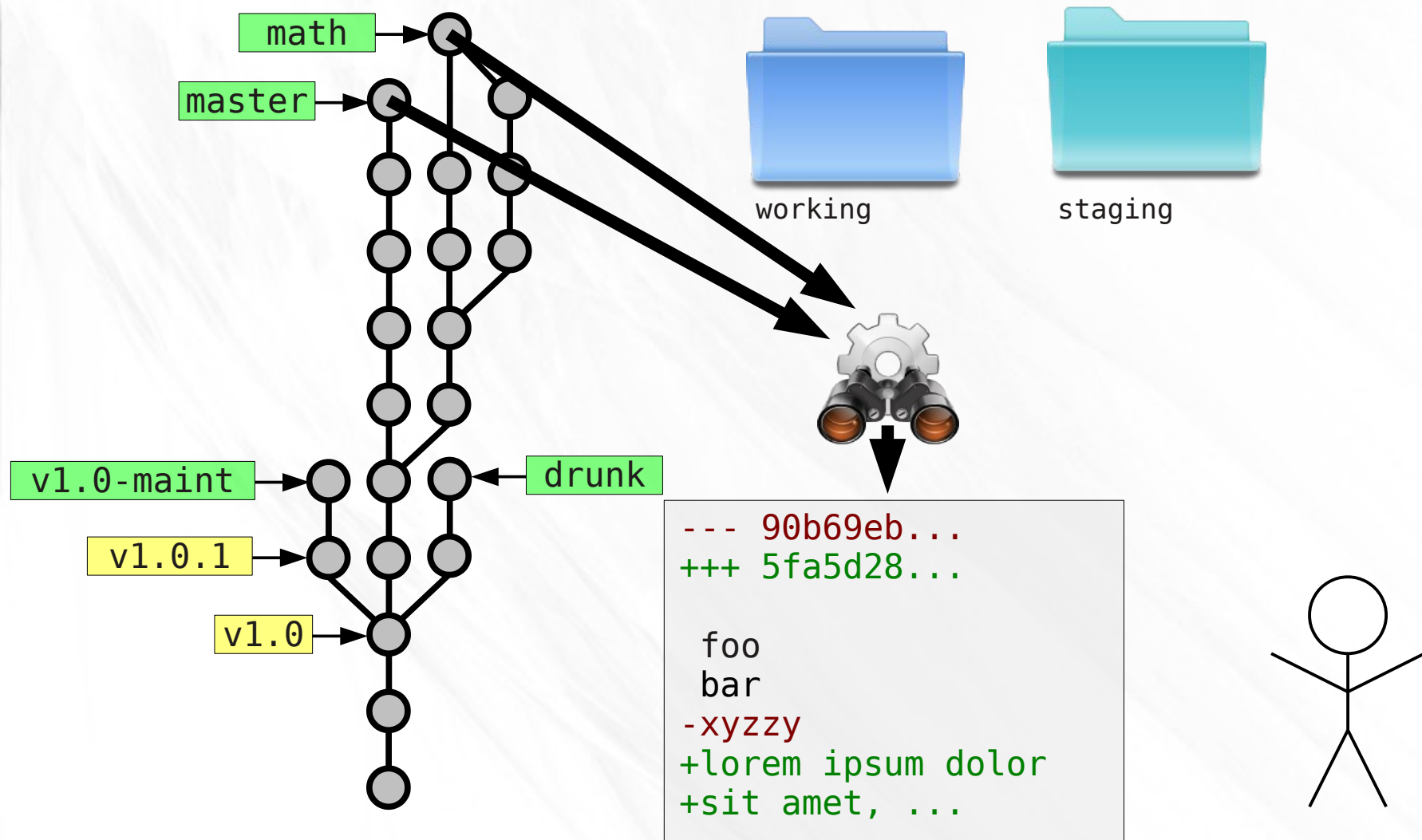


# Diffs



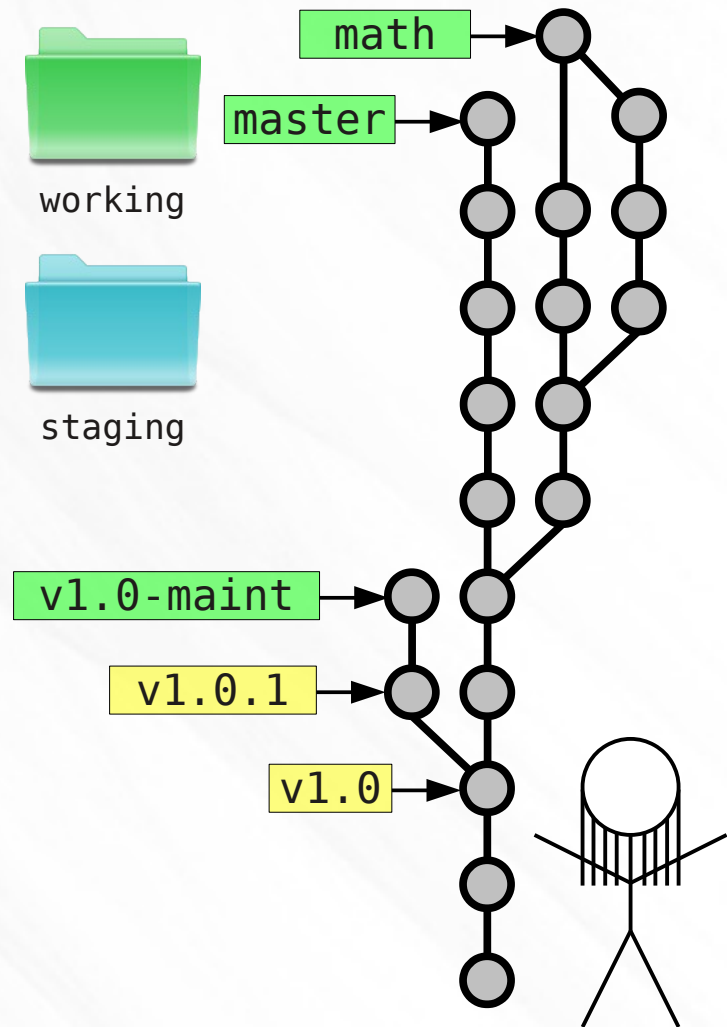
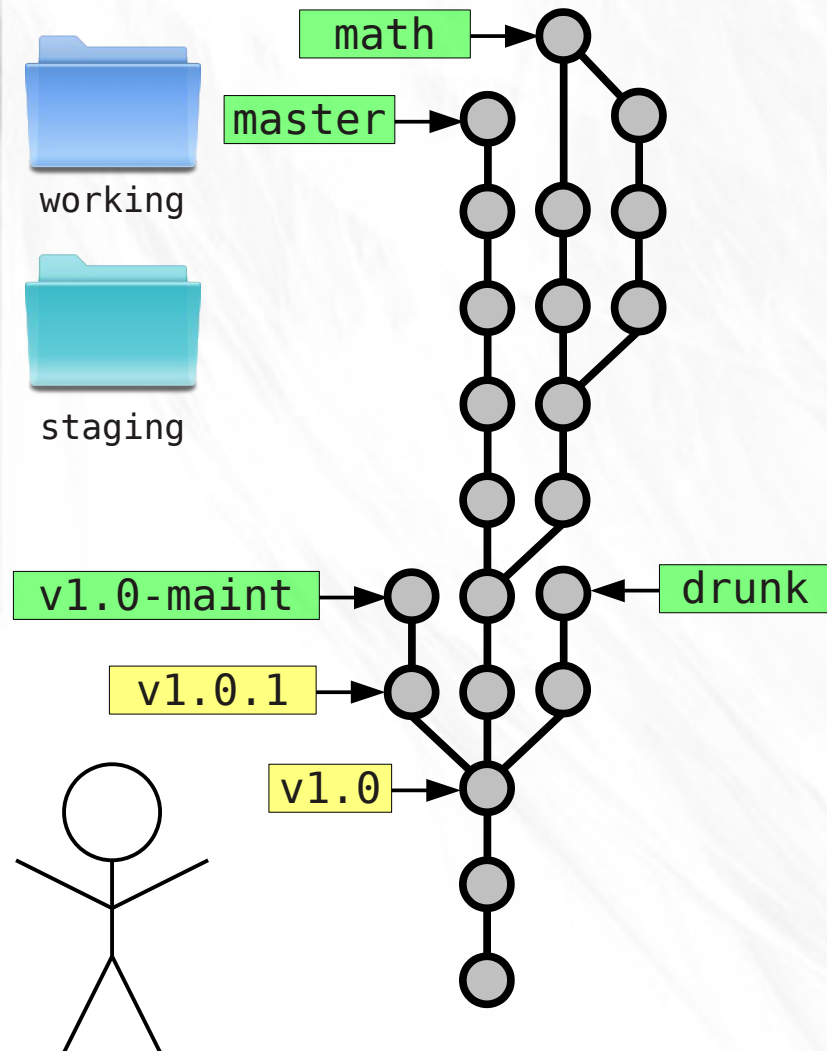


# Diffs

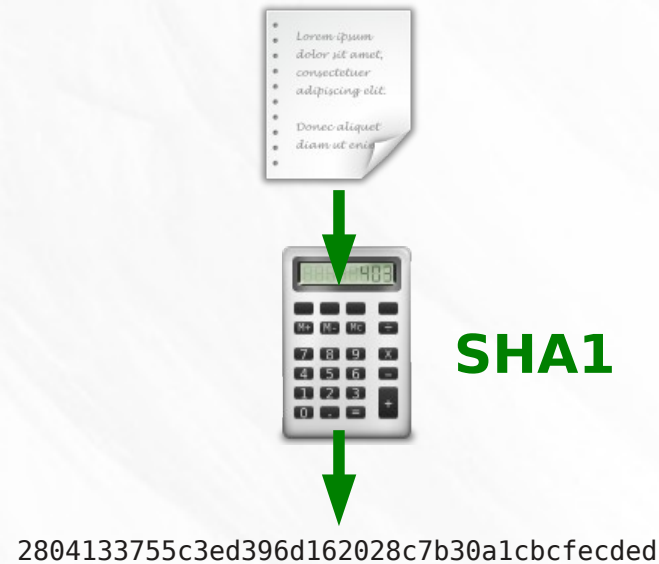
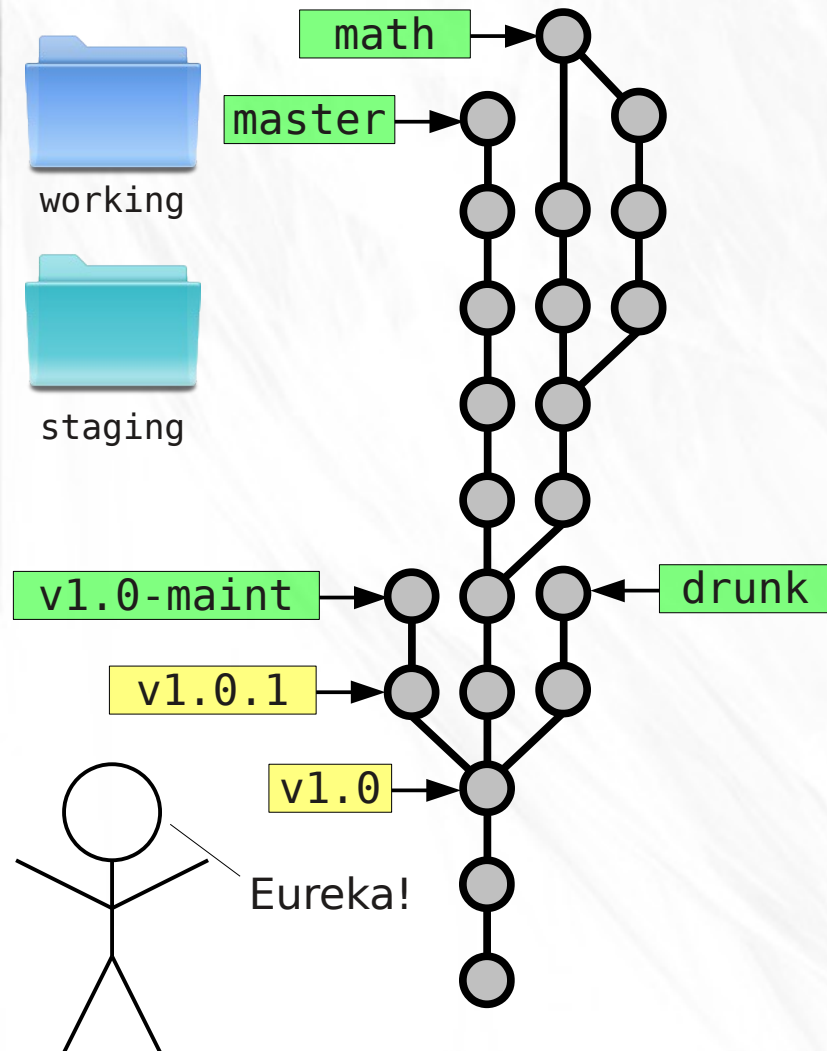




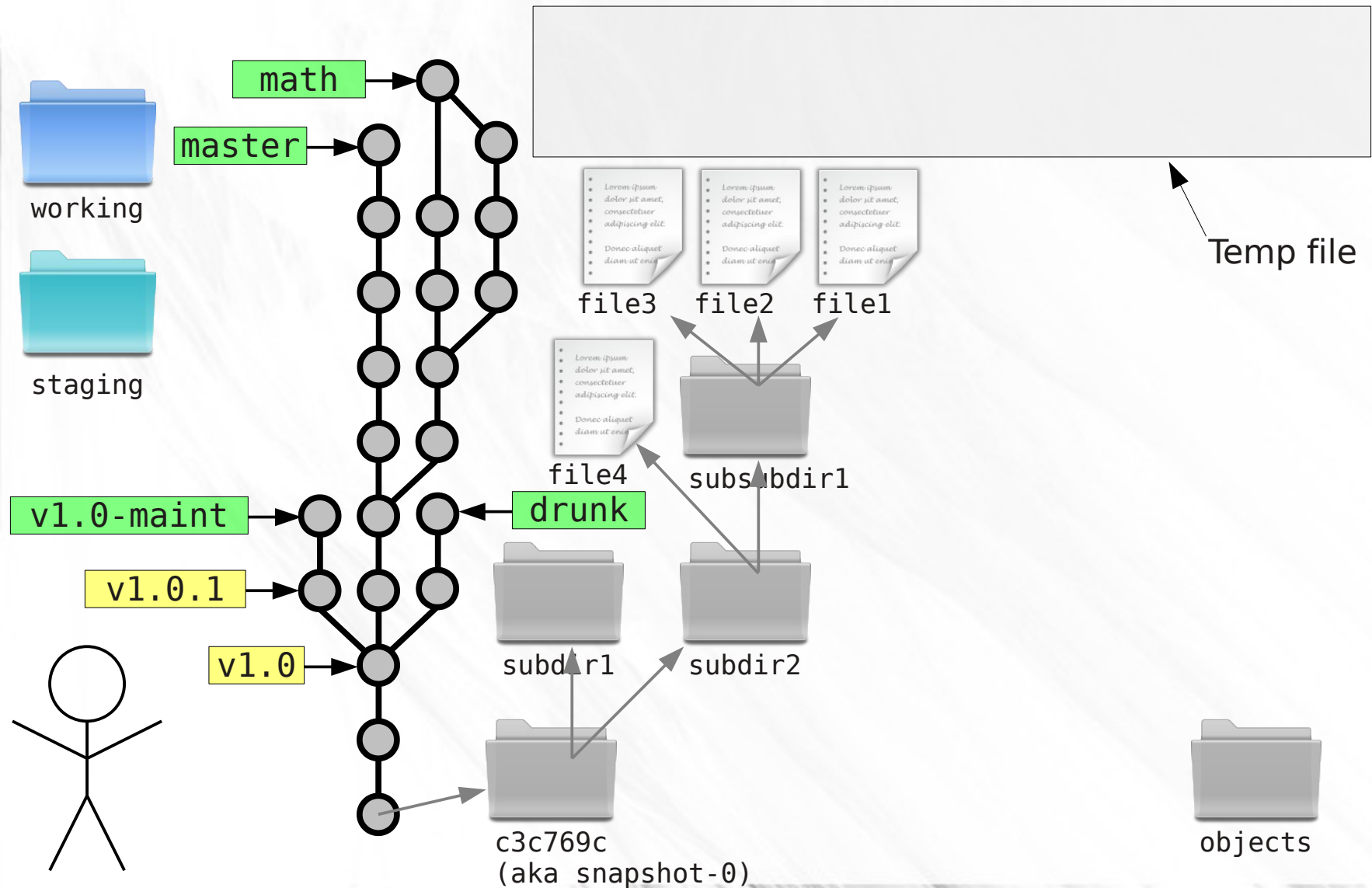
# Eliminating Duplication



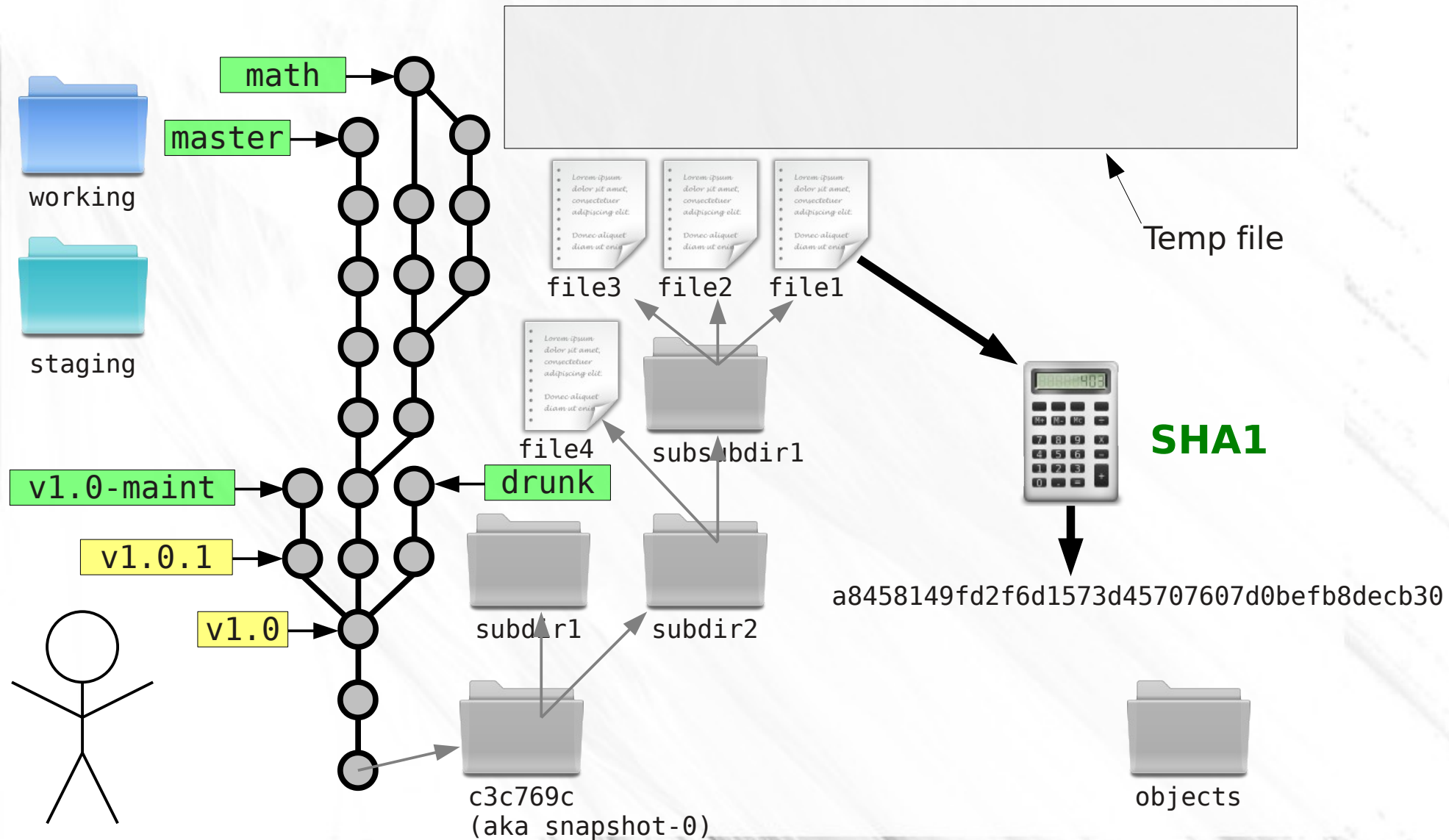
# Eliminating Duplication



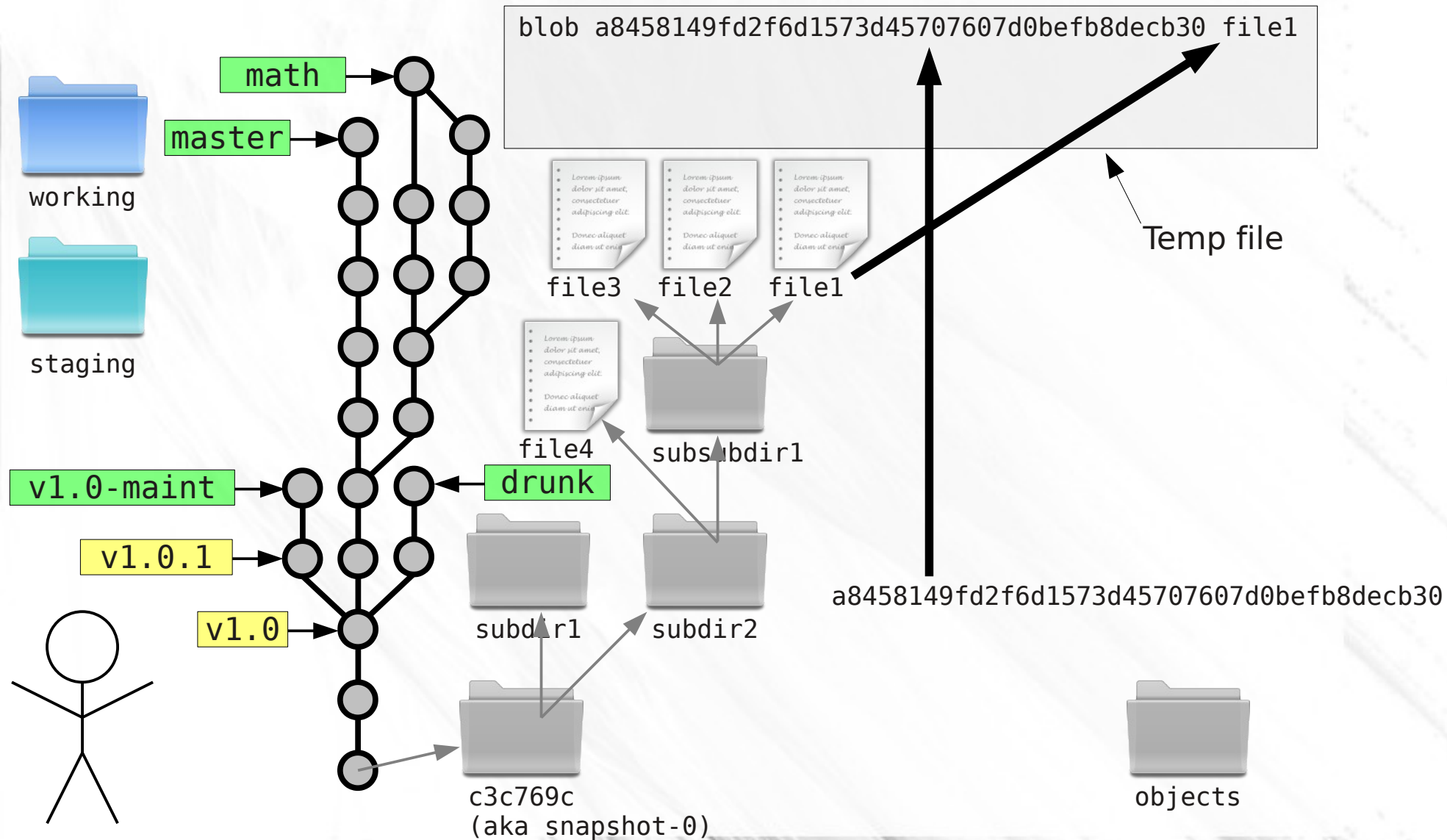
# Eliminating Duplication



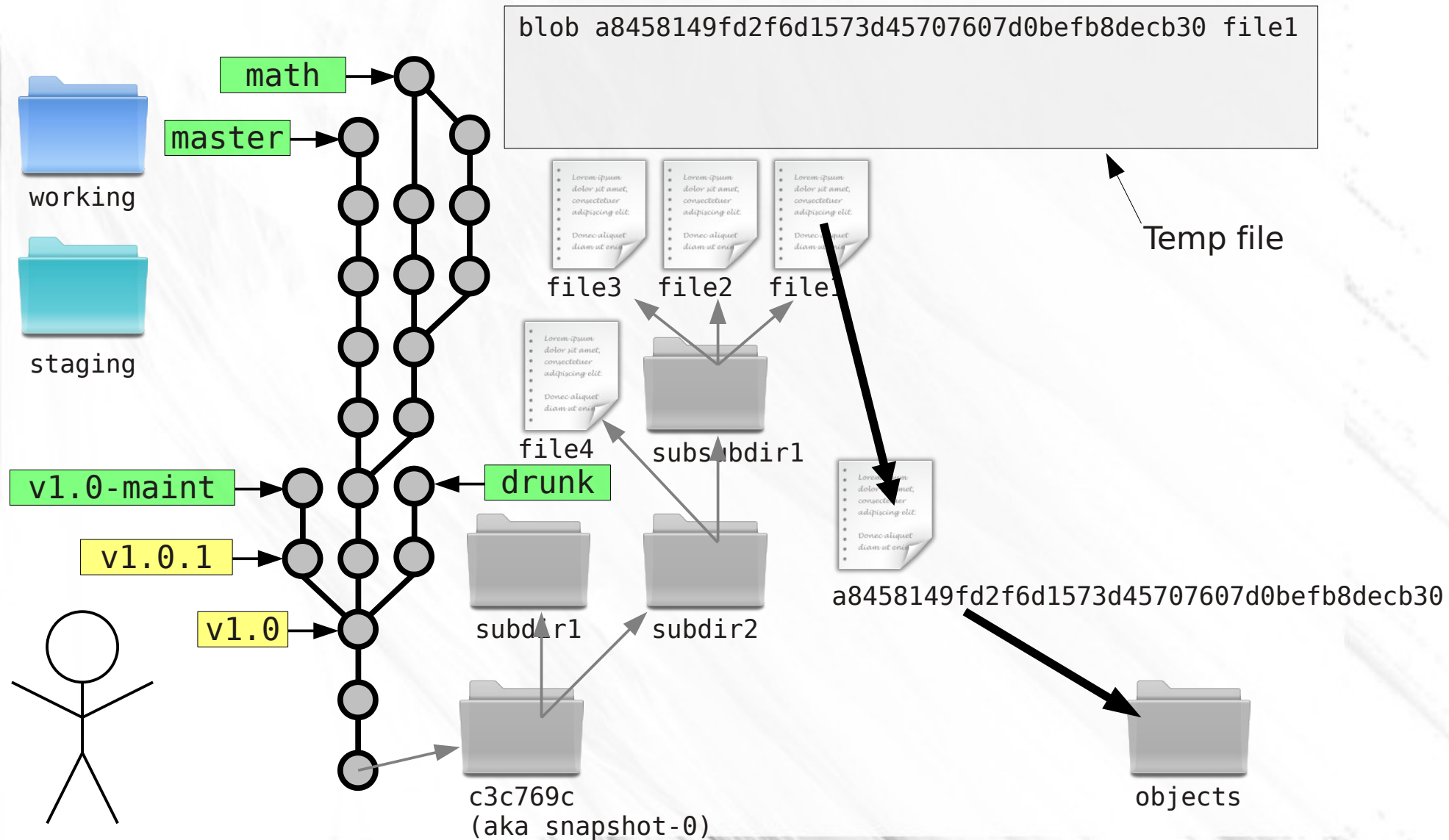
# Eliminating Duplication



# Eliminating Duplication

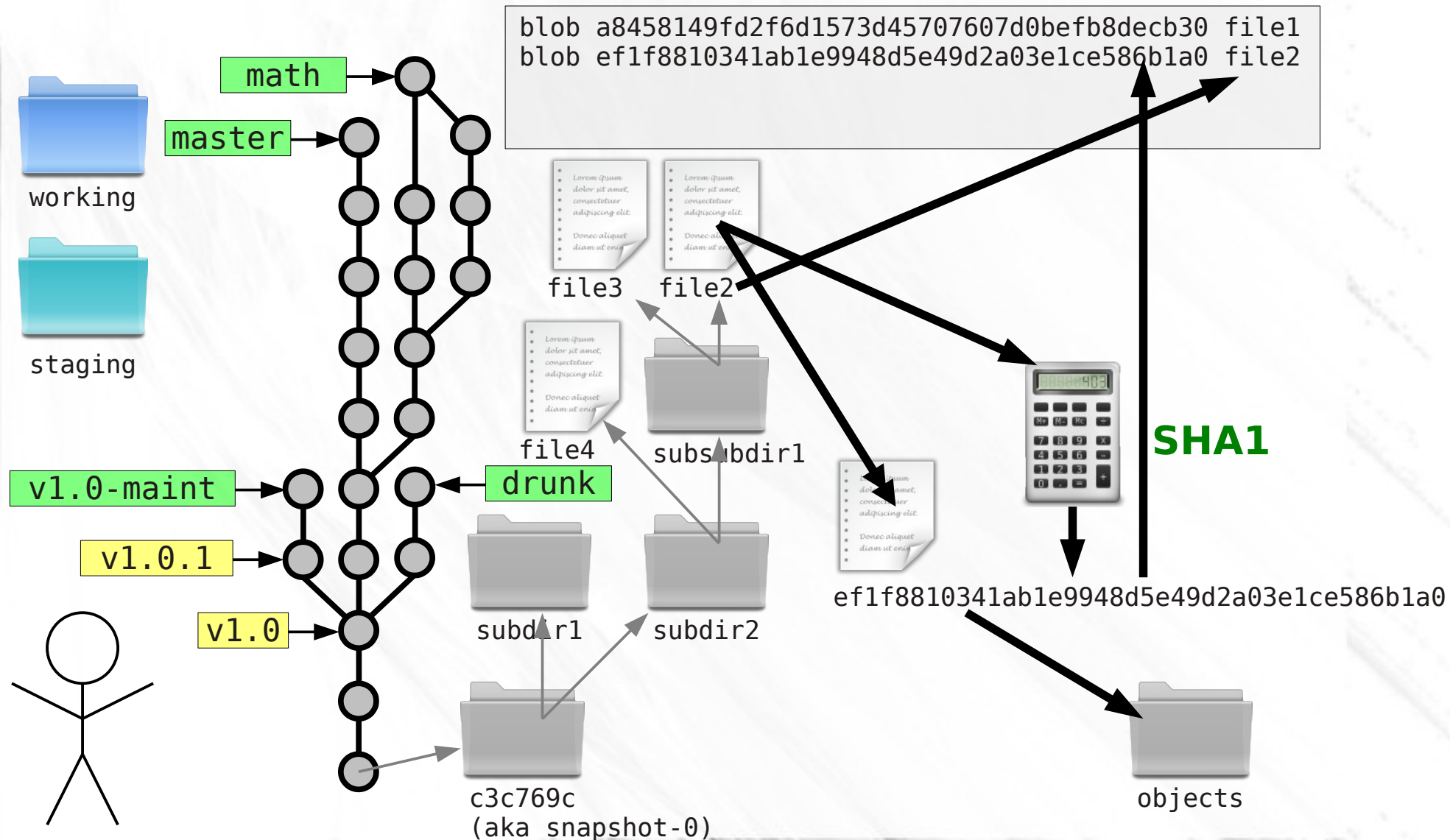


# Eliminating Duplication



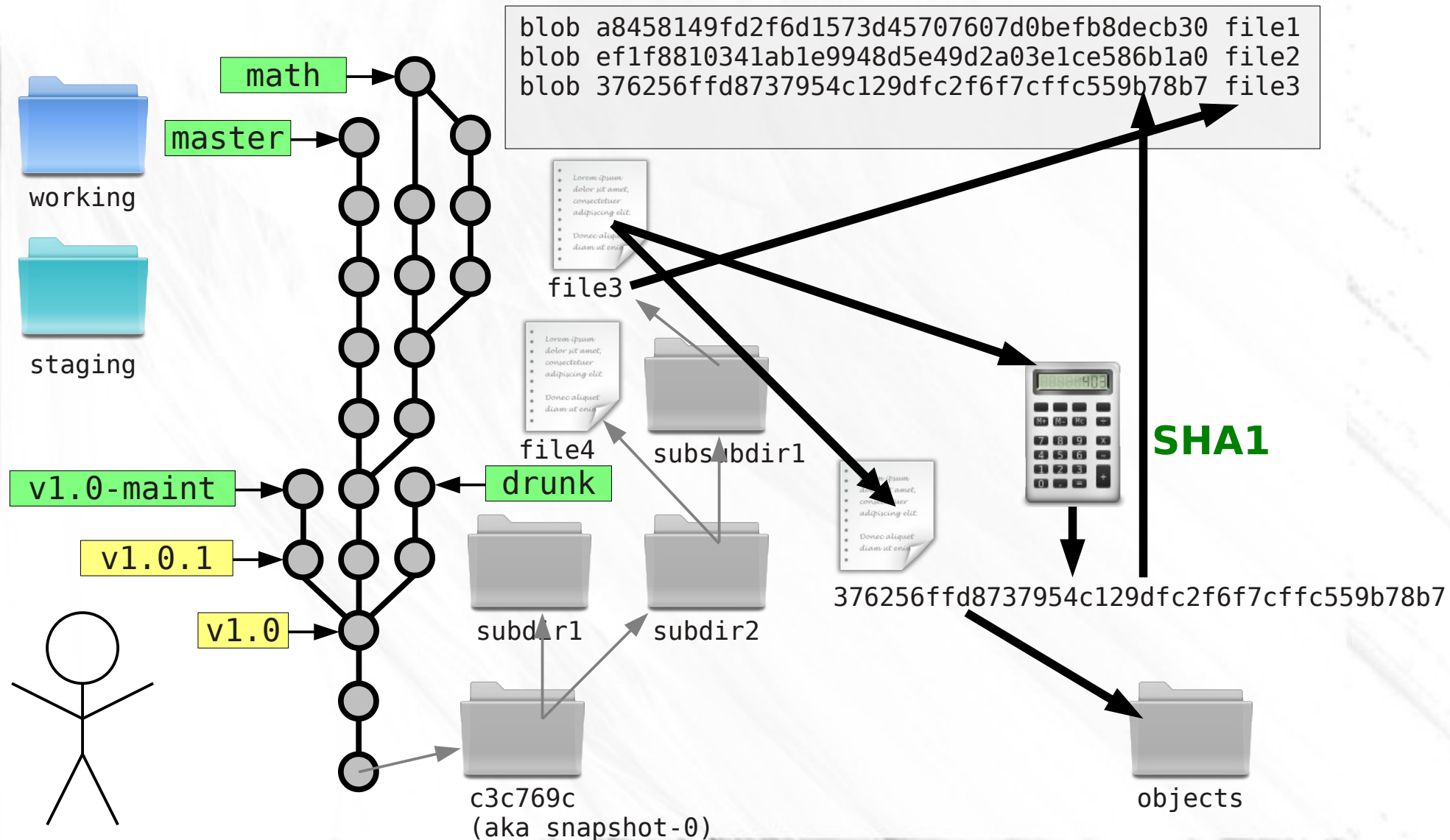


# Eliminating Duplication

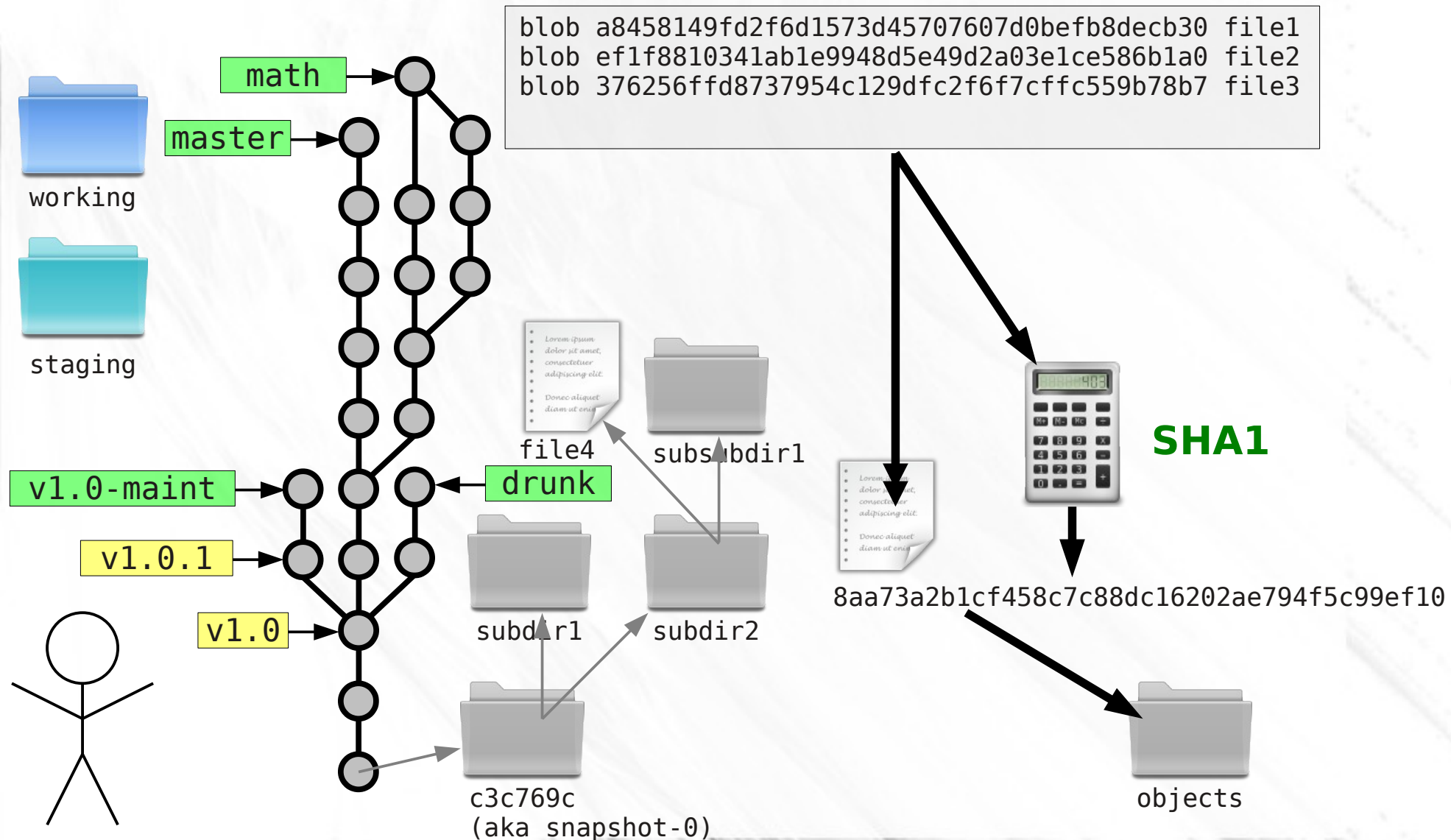




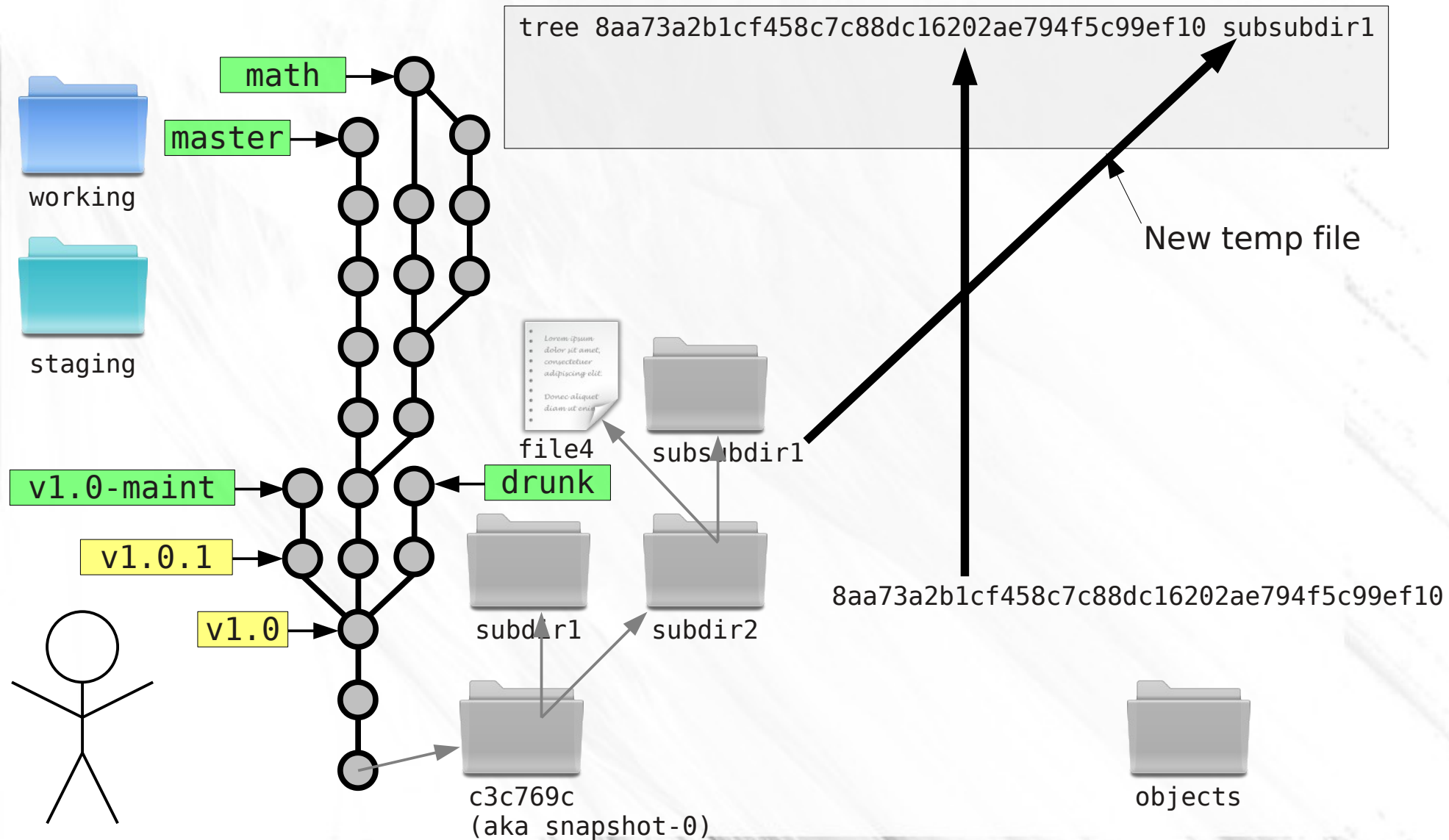
# Eliminating Duplication



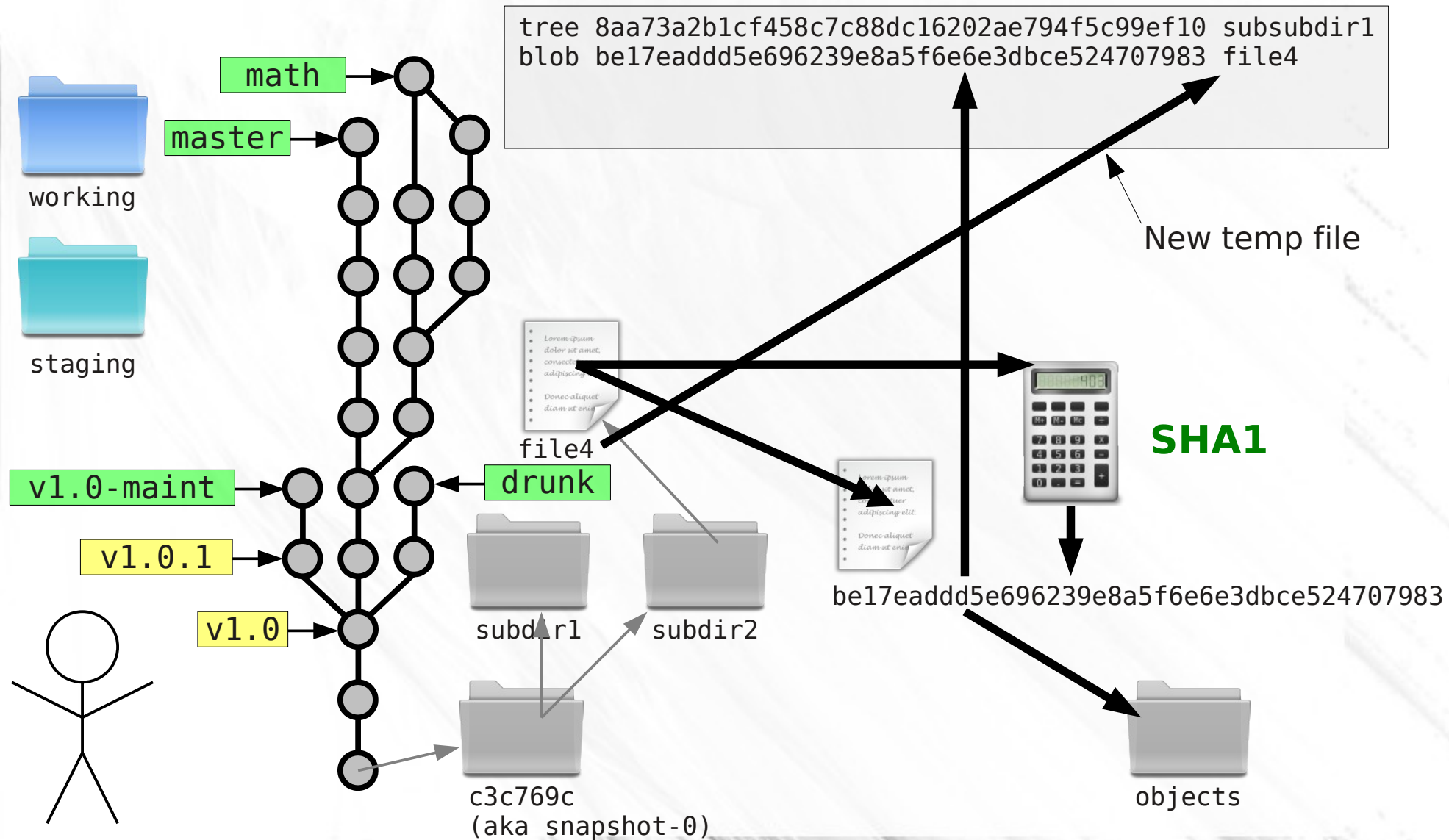
# Eliminating Duplication



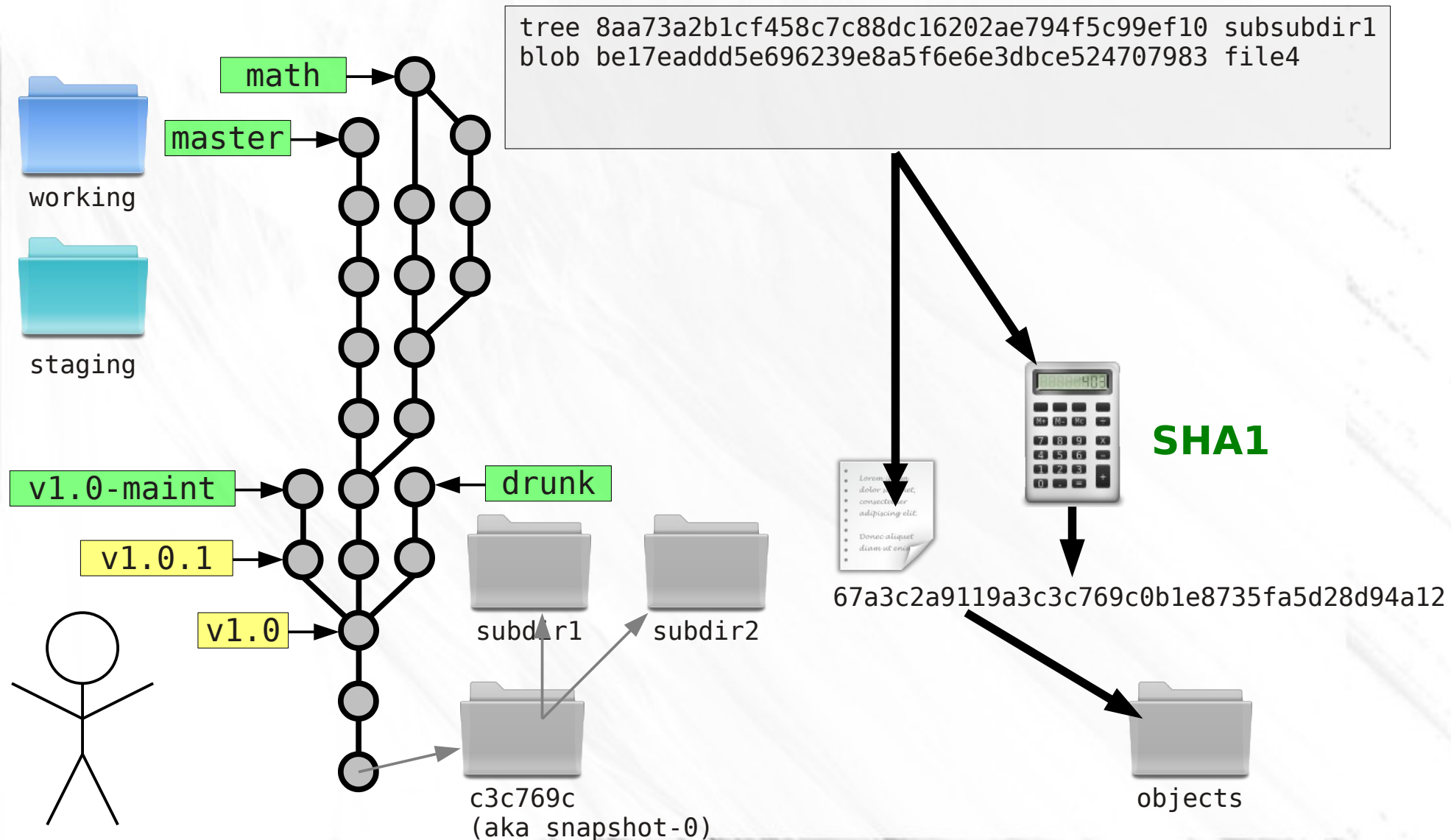
# Eliminating Duplication



# Eliminating Duplication

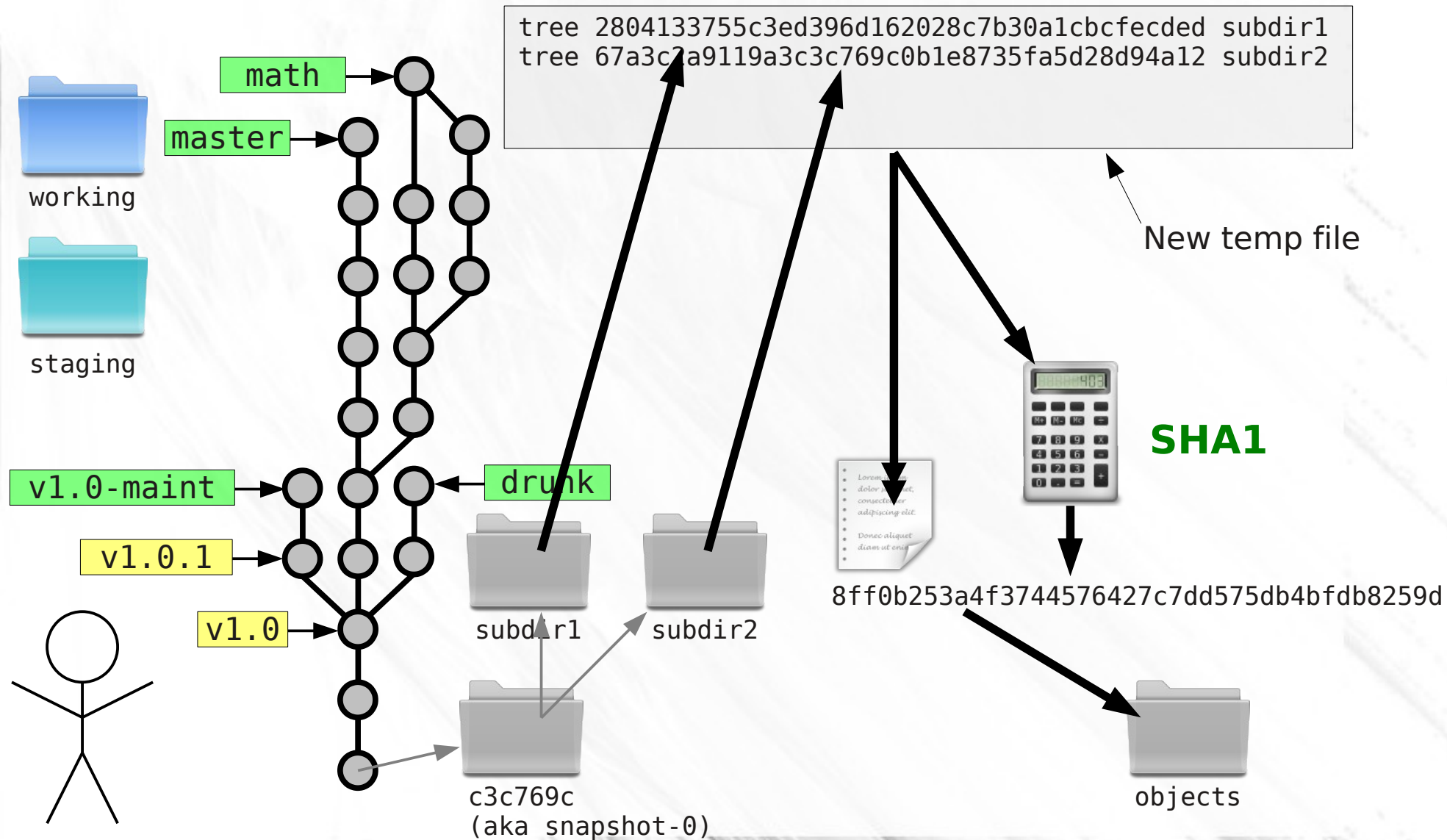


# Eliminating Duplication

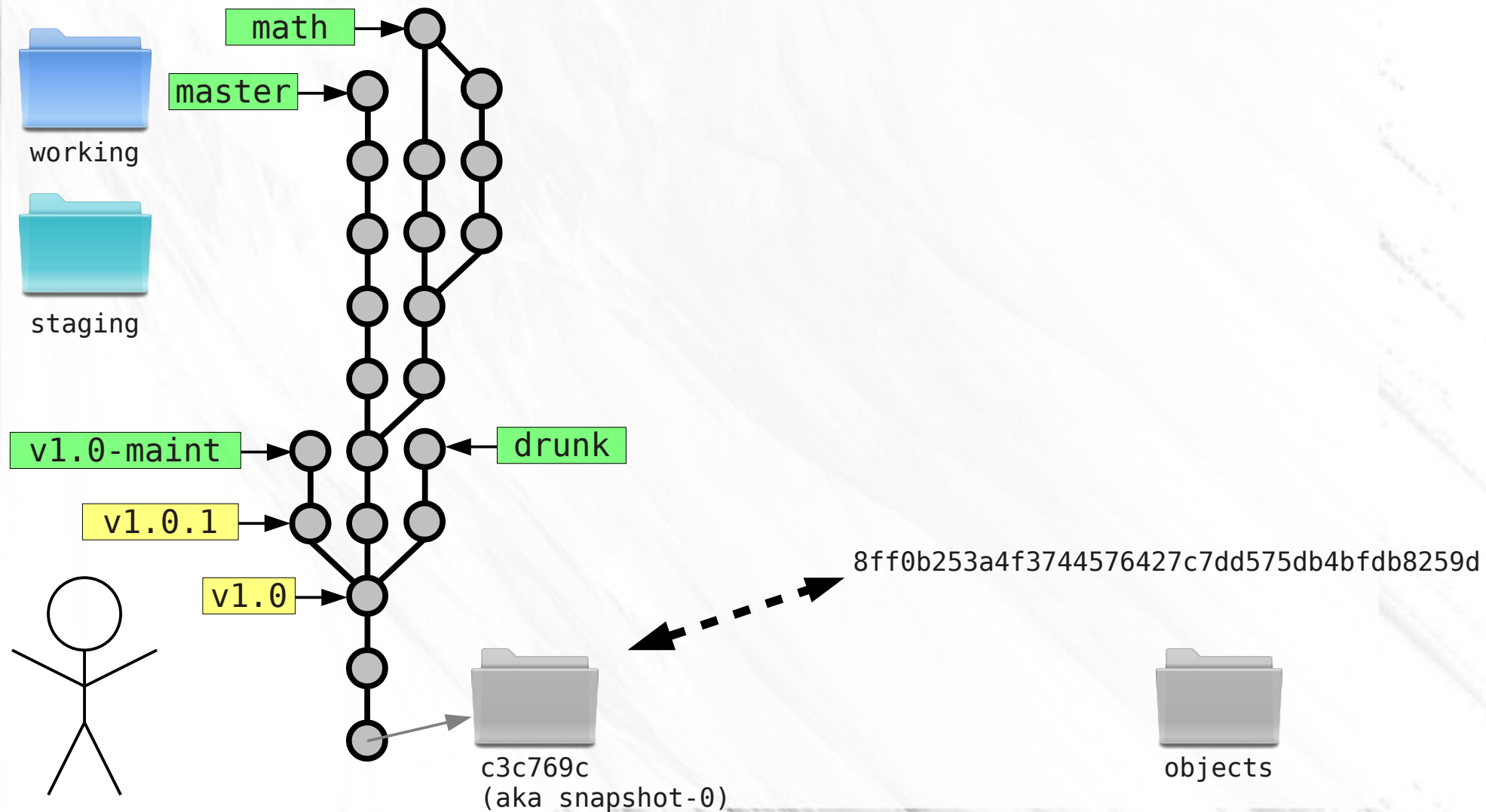




# Eliminating Duplication

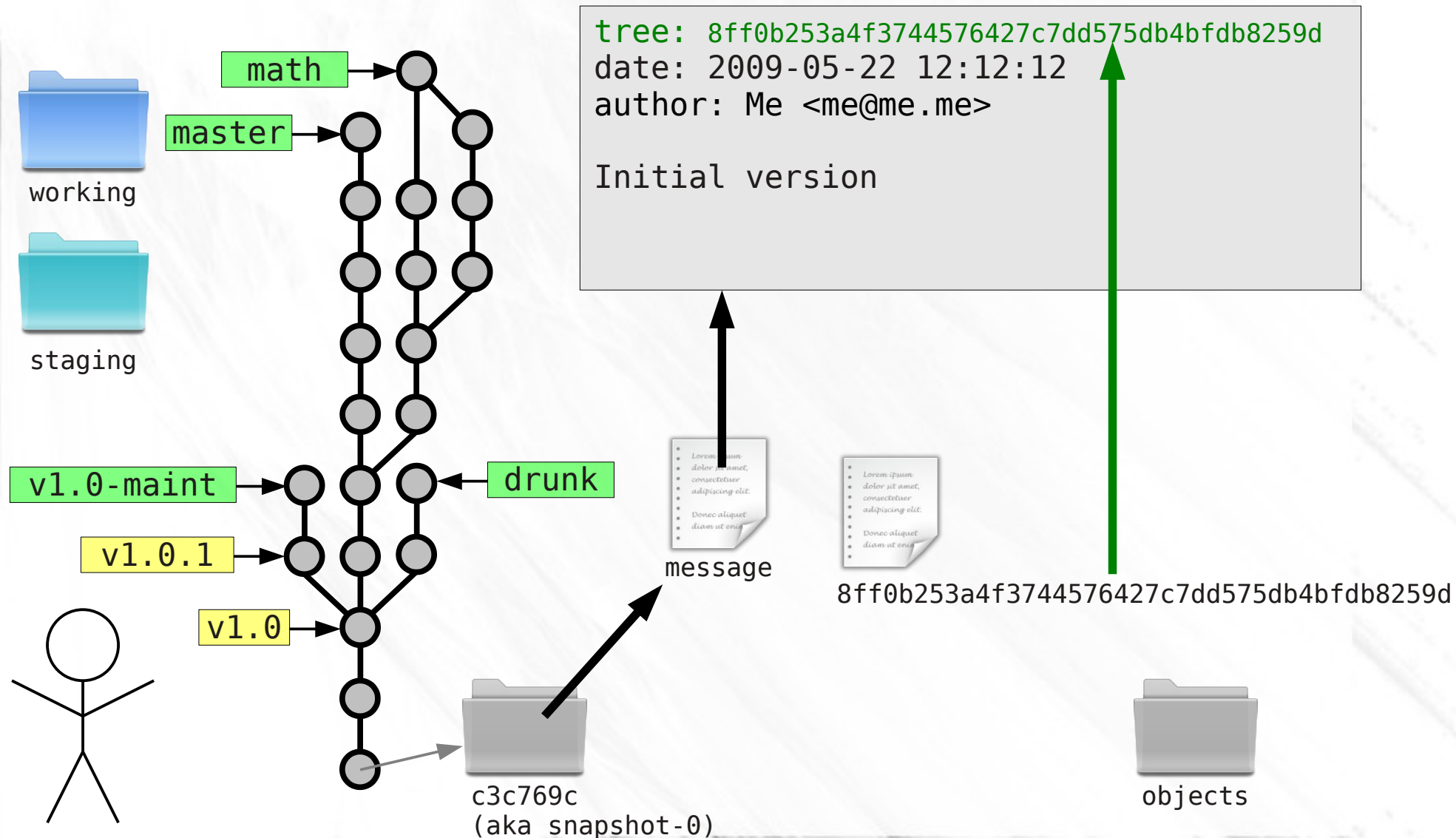


# Eliminating Duplication

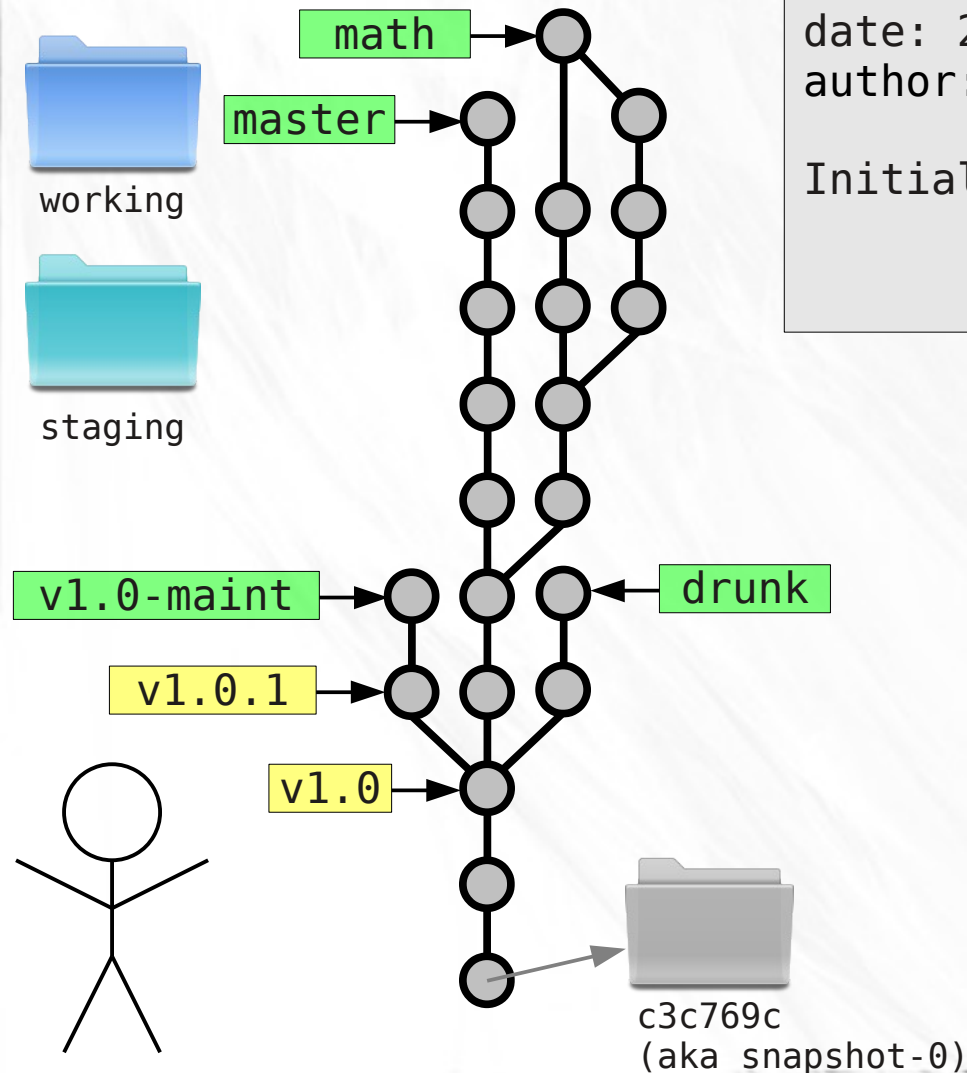




# Eliminating Duplication

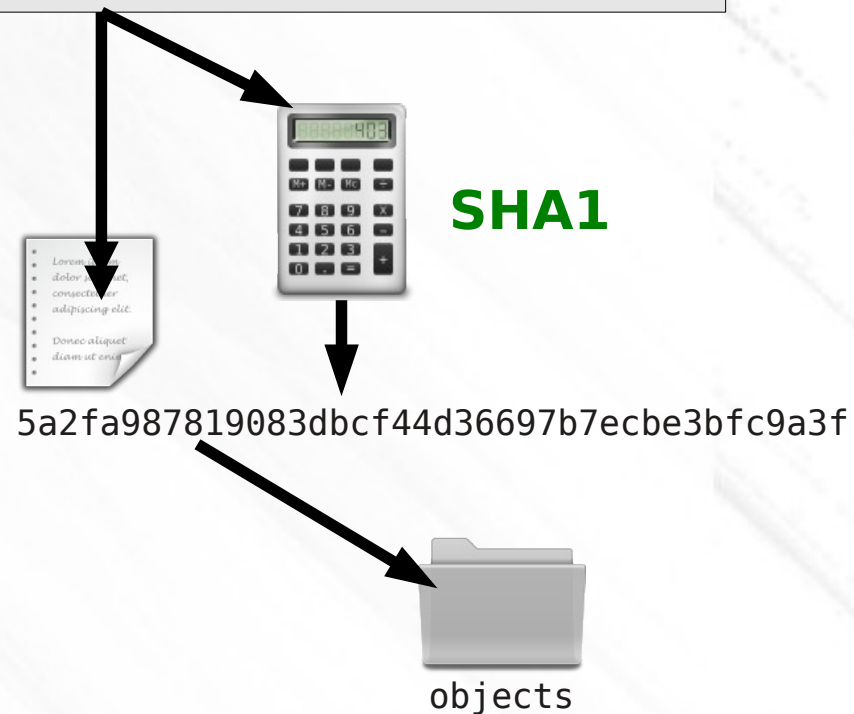


# Eliminating Duplication

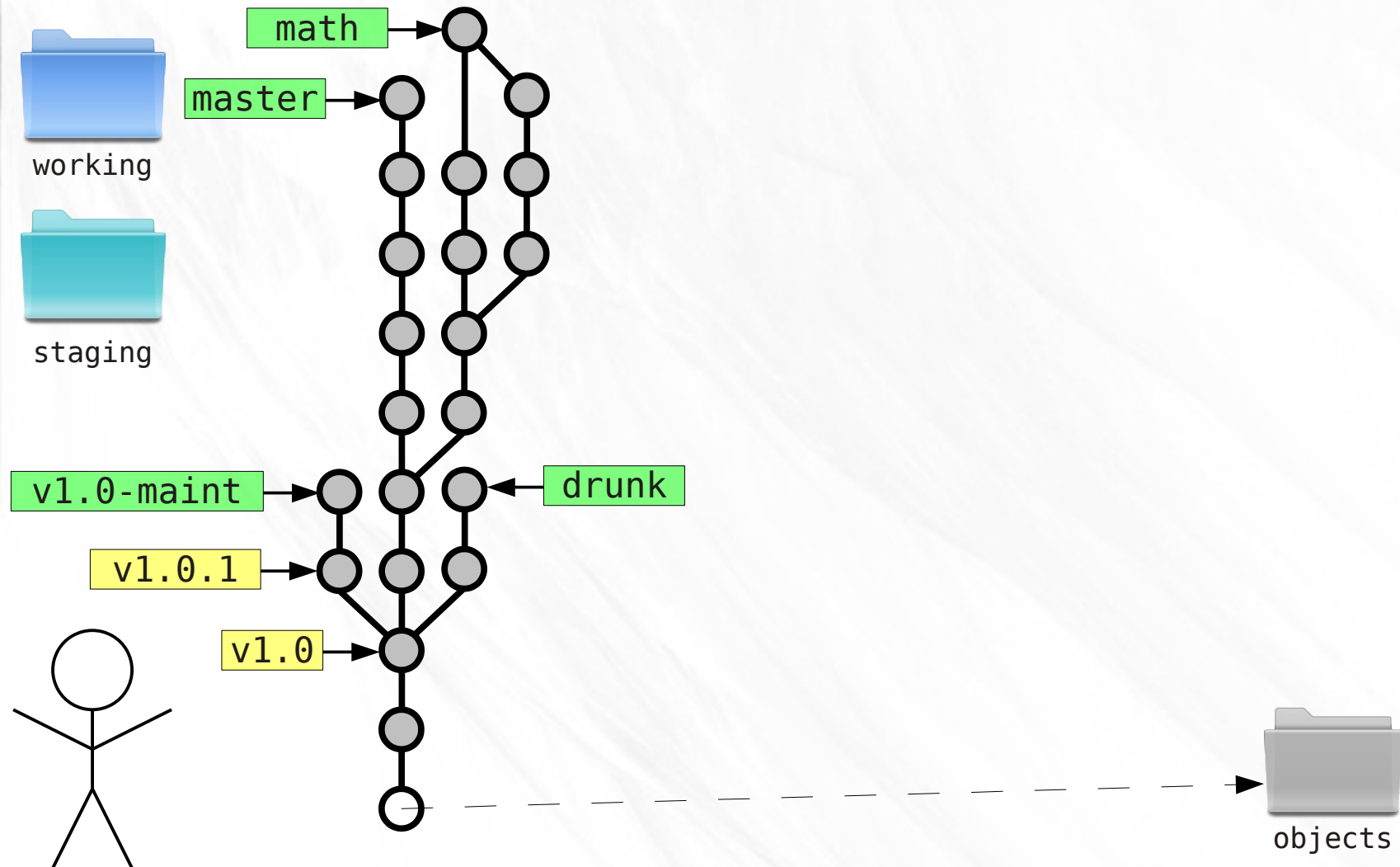


```
tree: 8ff0b253a4f3744576427c7dd575db4bfdb8259d
date: 2009-05-22 12:12:12
author: Me <me@me.me>
```

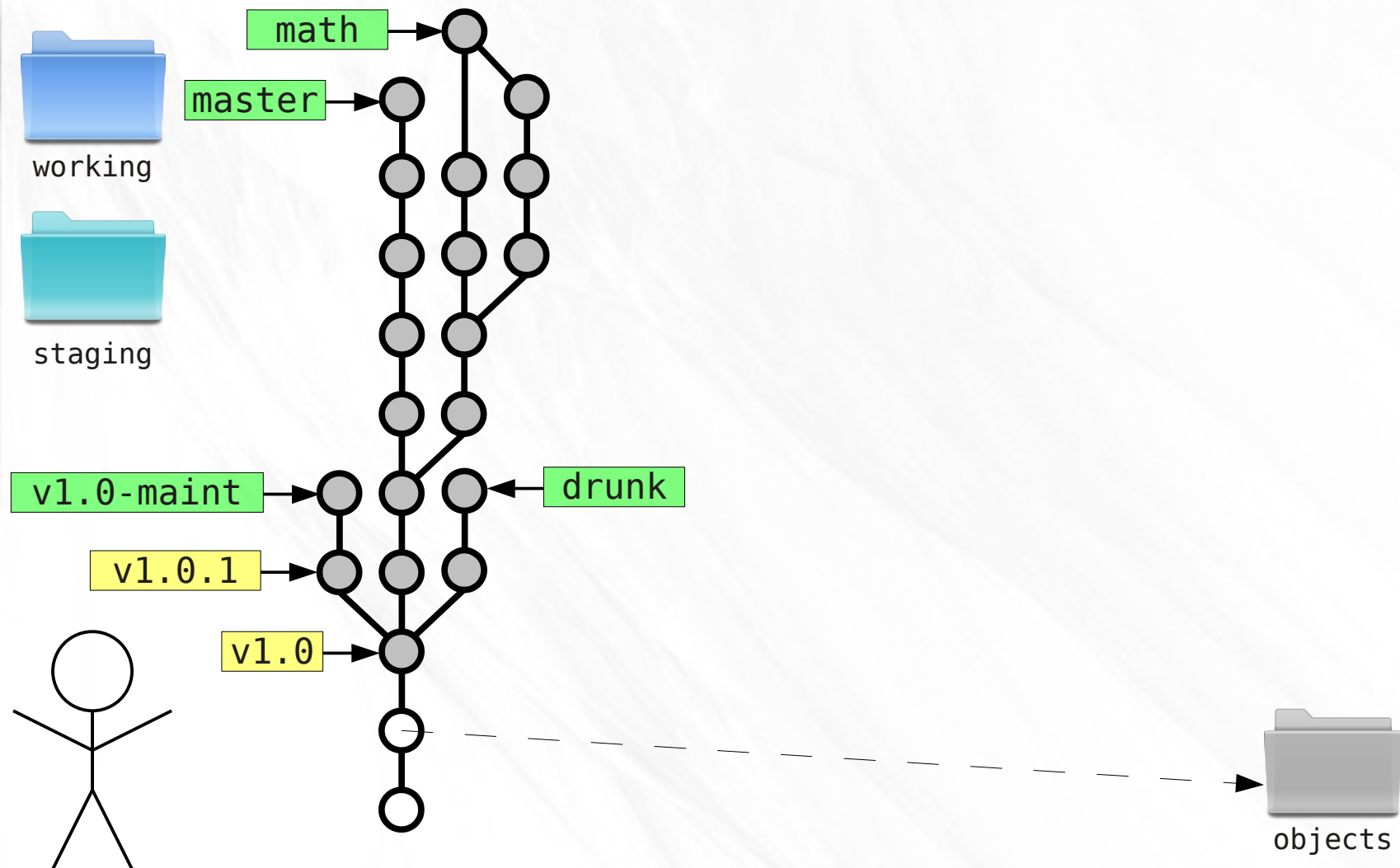
Initial version



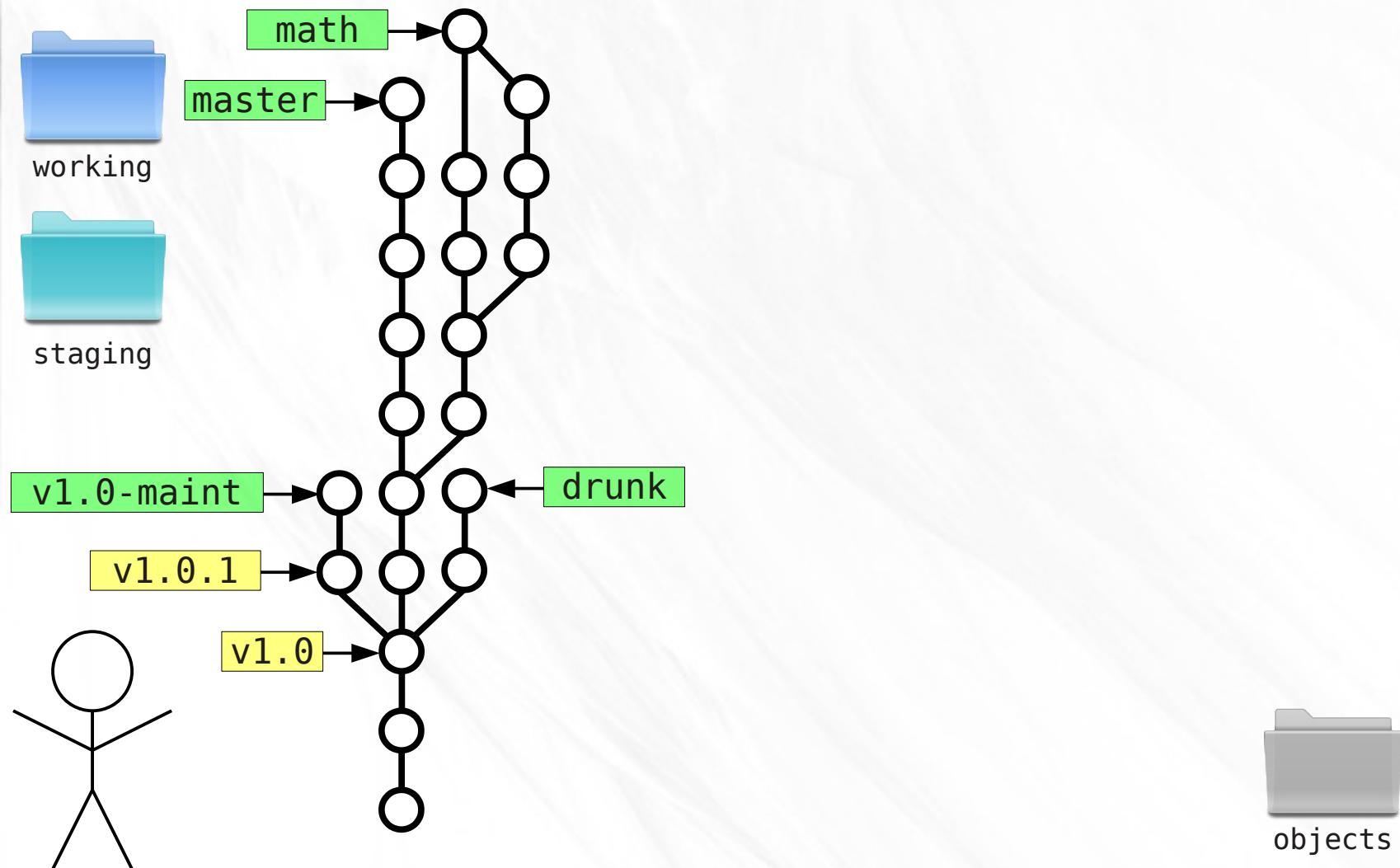
# Eliminating Duplication



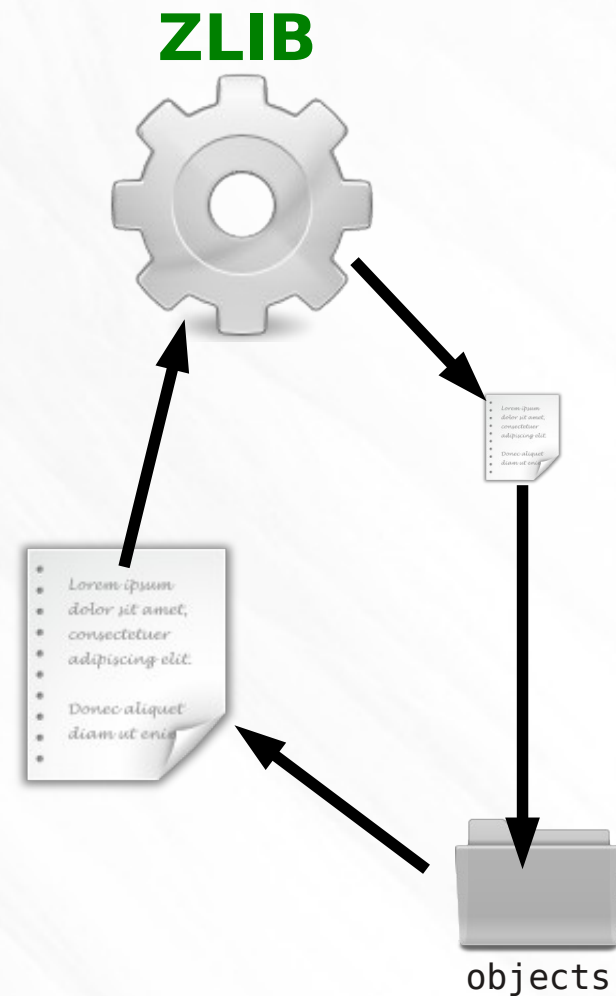
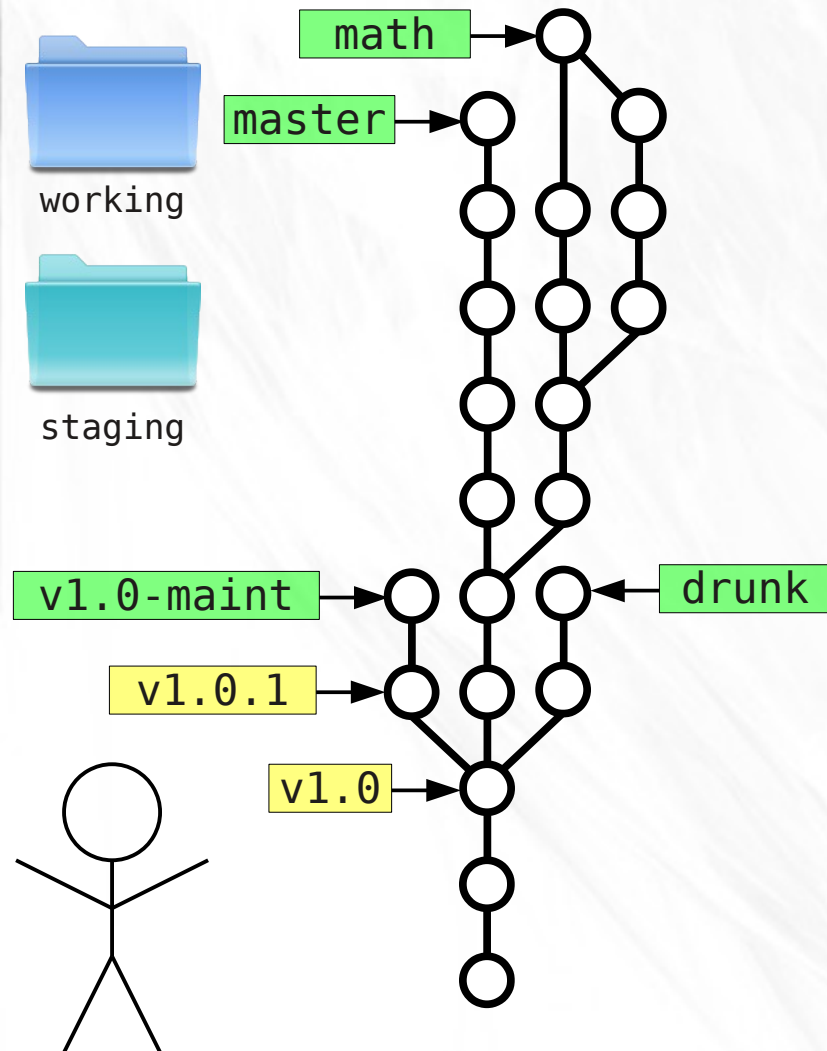
# Eliminating Duplication



# Eliminating Duplication

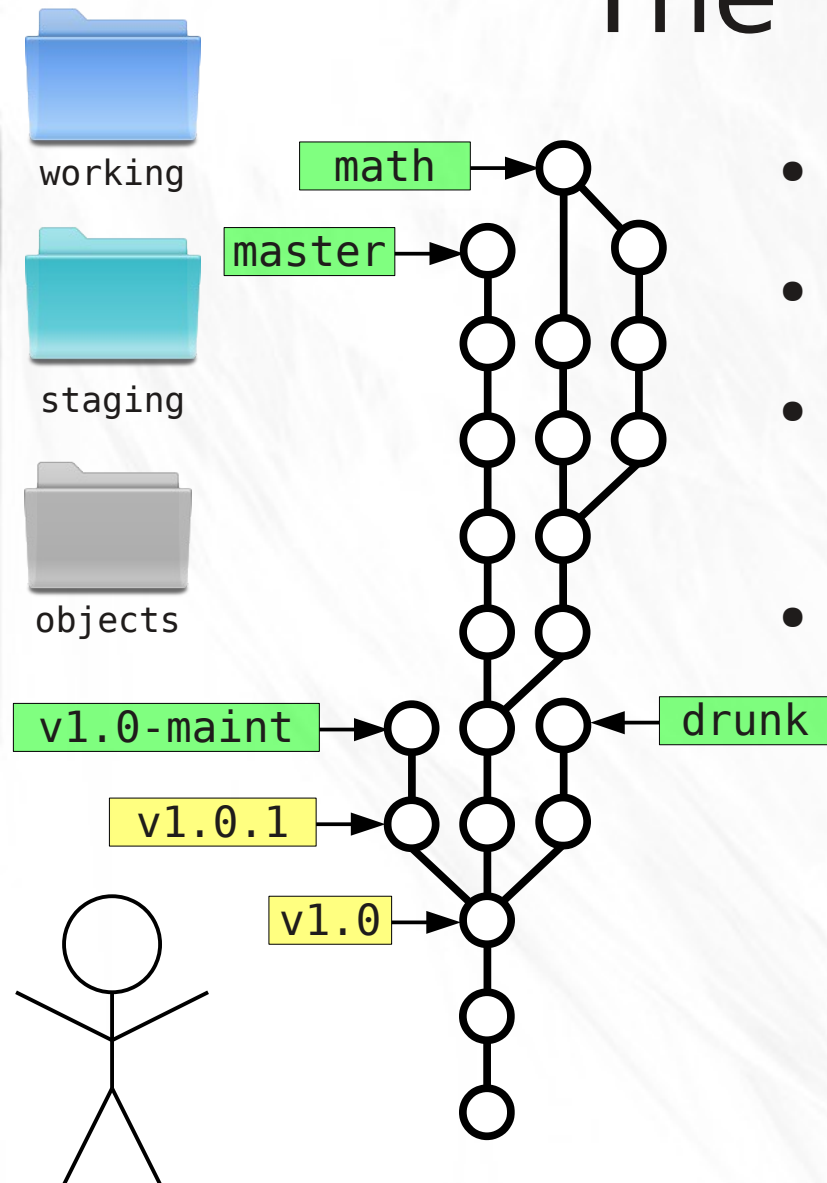


# Compressing Blobs





# The True Git



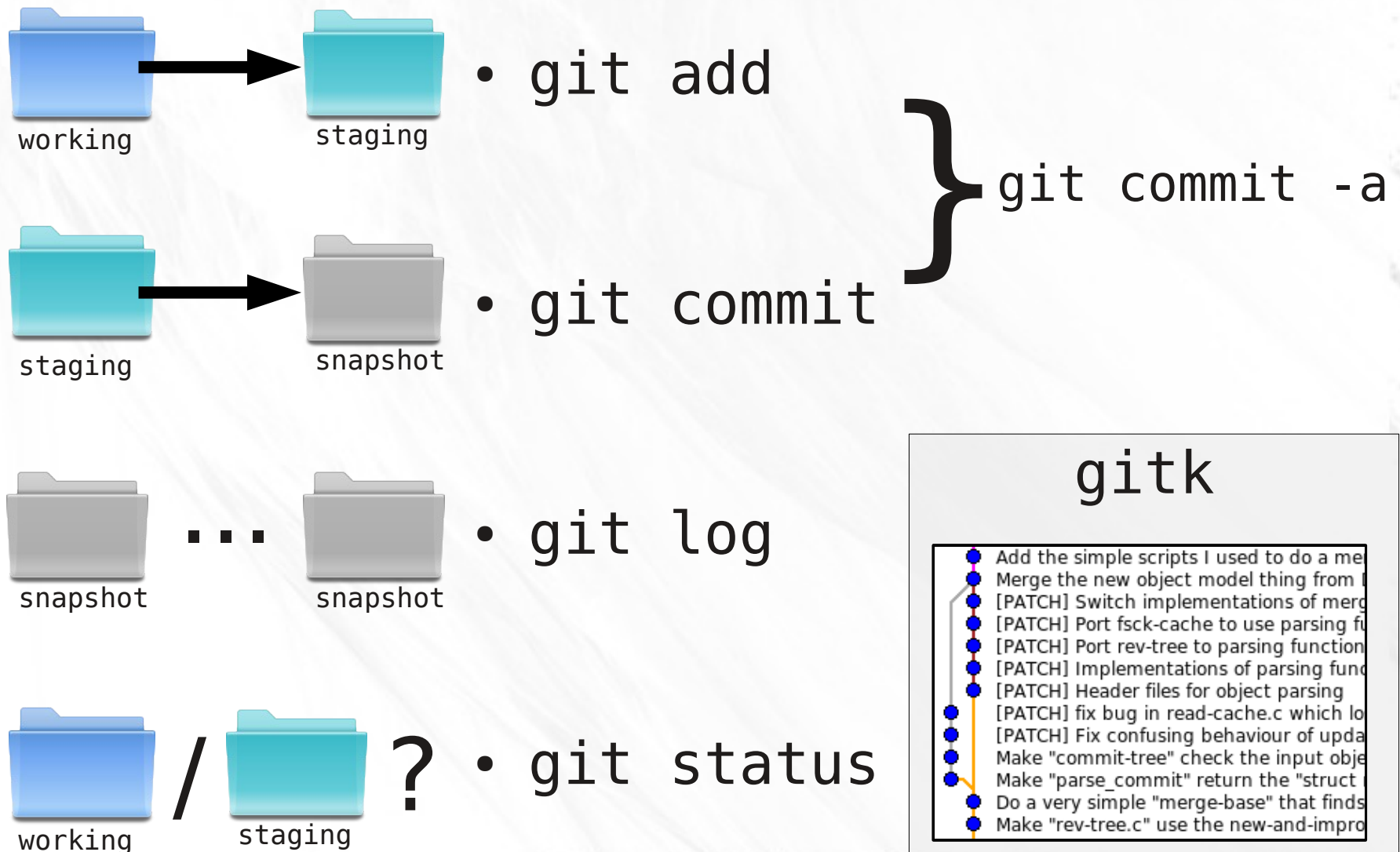
- TADAA!
- This is pretty much Git
- Nicer command line tools for all these operations
- Many, many other tools



# 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



## gitk

- Add the simple scripts I used to do a merge
- Merge the new object model thing from I
- [PATCH] Switch implementations of merge
- [PATCH] Port fsck-cache to use parsing fu
- [PATCH] Port rev-tree to parsing function
- [PATCH] Implementations of parsing func
- [PATCH] Header files for object parsing
- [PATCH] fix bug in read-cache.c which lo
- [PATCH] Fix confusing behaviour of upda
- Make "commit-tree" check the input obje
- Make "parse\_commit" return the "struct
- Do a very simple "merge-base" that finds
- Make "rev-tree.c" use the new-and-impro

# 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>`

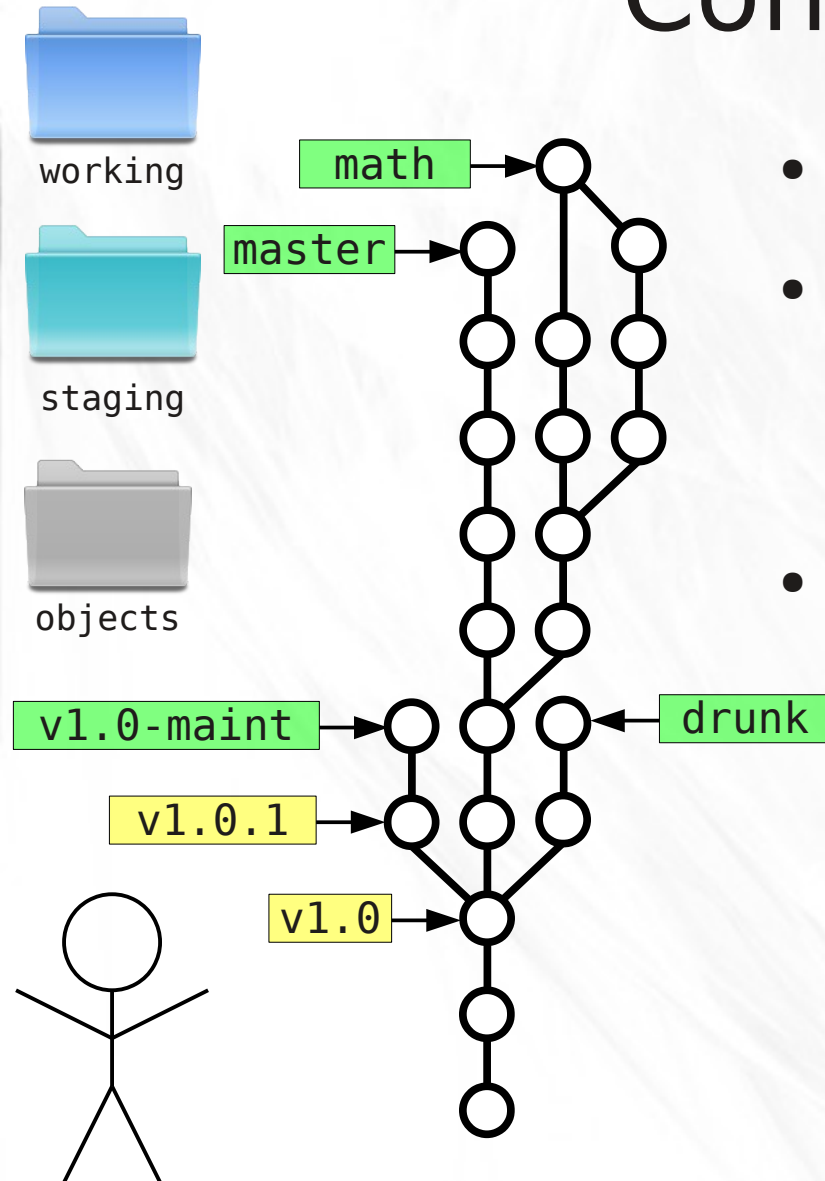
# Commands: Branches & Tags

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

# Commands: Fetching & Merging

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

# Conclusion



- Keep this parable in mind
- Git is simple and powerful

- One more thing:

`git reflog`



# Where to go next?

- @ Cisco:
  - [https://rdwiki.cisco.com/wiki/Git\\_Tutorial](https://rdwiki.cisco.com/wiki/Git_Tutorial)
    - Especially the “More resources” section
  - IRC: [#git](#) / Email: [gitadmin@cisco.com](mailto:gitadmin@cisco.com)
- In general:
  - Git homepage: <http://git-scm.com>
  - Pro Git: <http://git-scm.com/book>
  - Git Reference: <http://gitref.org>
  - GitHub: <http://github.com>
  - Gitorious: <http://gitorious.org>



# Questions?

- Thanks for your attention!
- This presentation is available at:  
[git@git.rd.tandberg.com:users/jherland/git\\_parable](https://git@git.rd.tandberg.com:users/jherland/git_parable)
- Reach me at [<jherland@cisco.com>](mailto:jherland@cisco.com)