Lecture Notes

Version control and project environments

ECP 8506 - Clinical Trial Simulations

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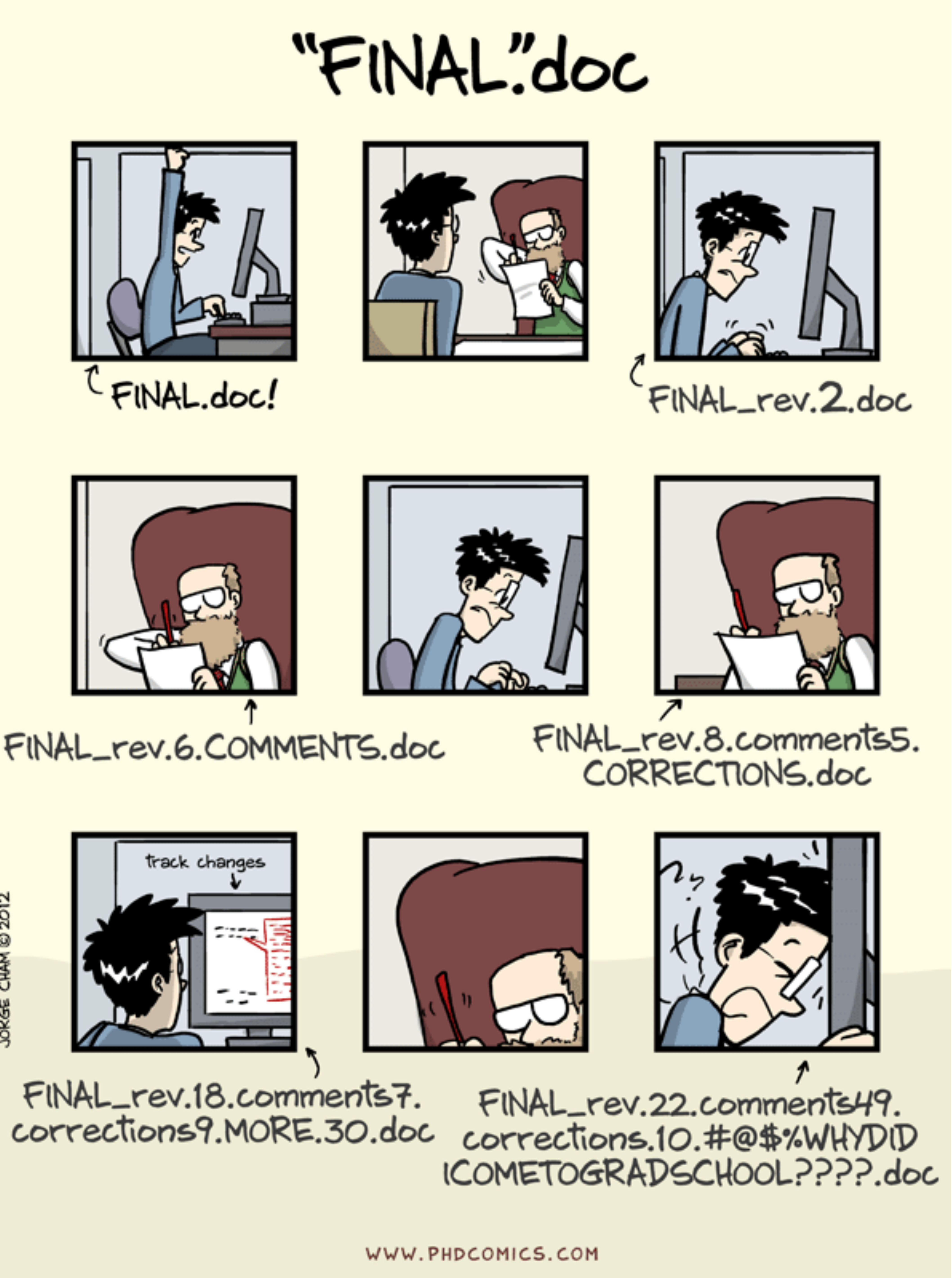


How do you record the history of your projects?

What is version control and why should we care?

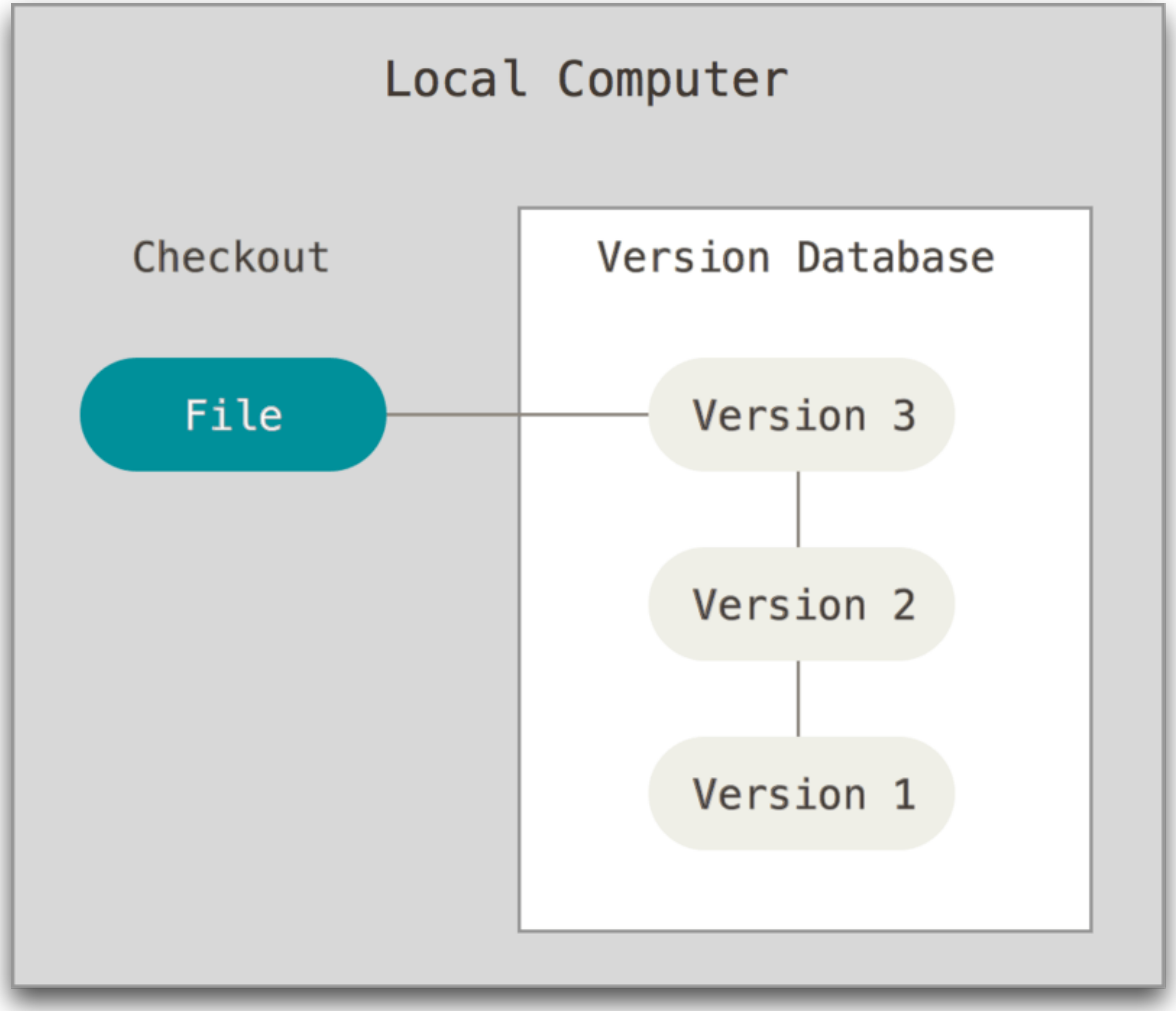
Version control is a system that records ***changes*** to a file or set of files over time so that you can recall specific versions later.

Version control systems start with a base version of the document and then save just the changes you made at each step of the way.

One can review project history to find out:

- *Which* changes were made?
- *Who* made the changes?
- *When* were the changes made?
- *Why* were changes needed?

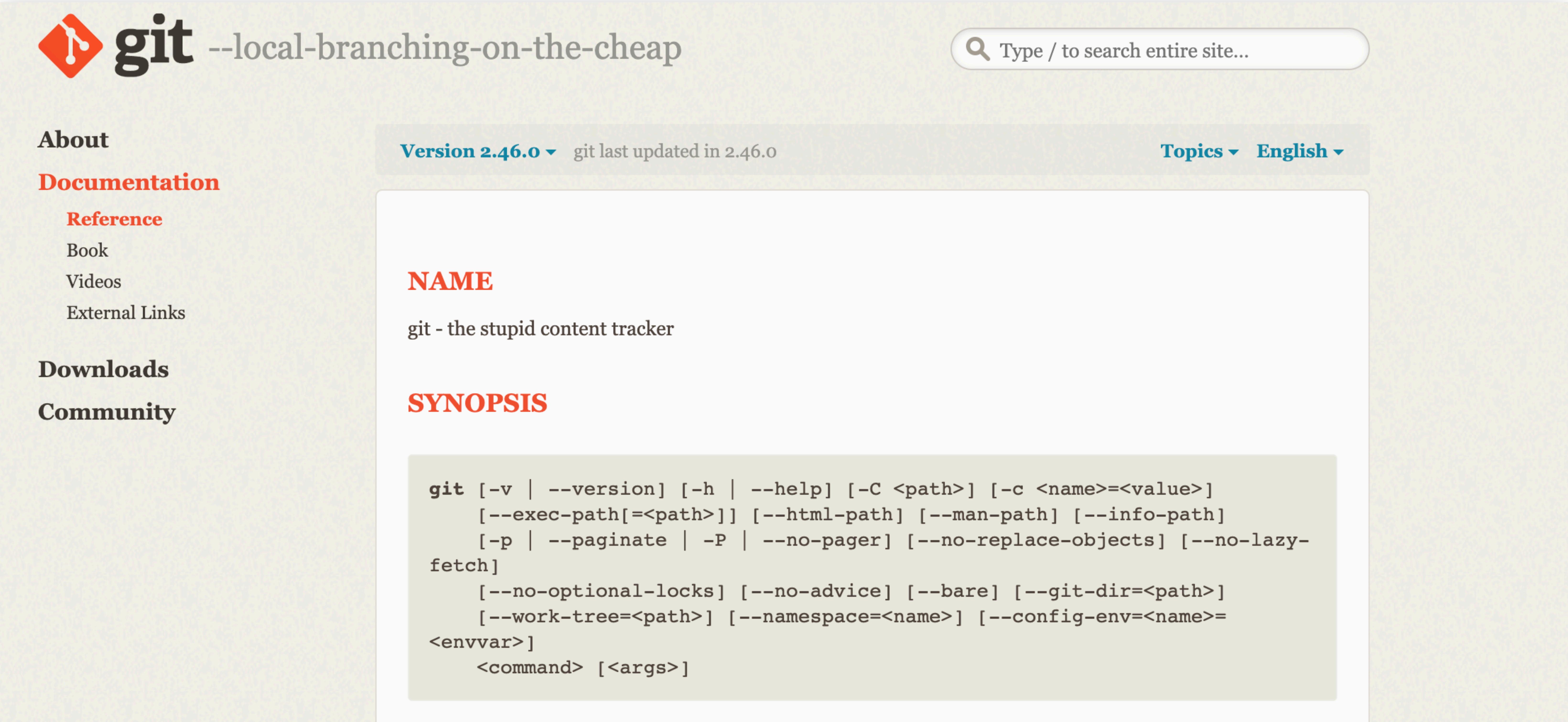
Different types of version control system out there and we will focus on **Git** utility



Source: https://git-scm.com/book/en/v2/Getting-Started-About-Version-Control

Git version control system

The most common version control system.



NAME

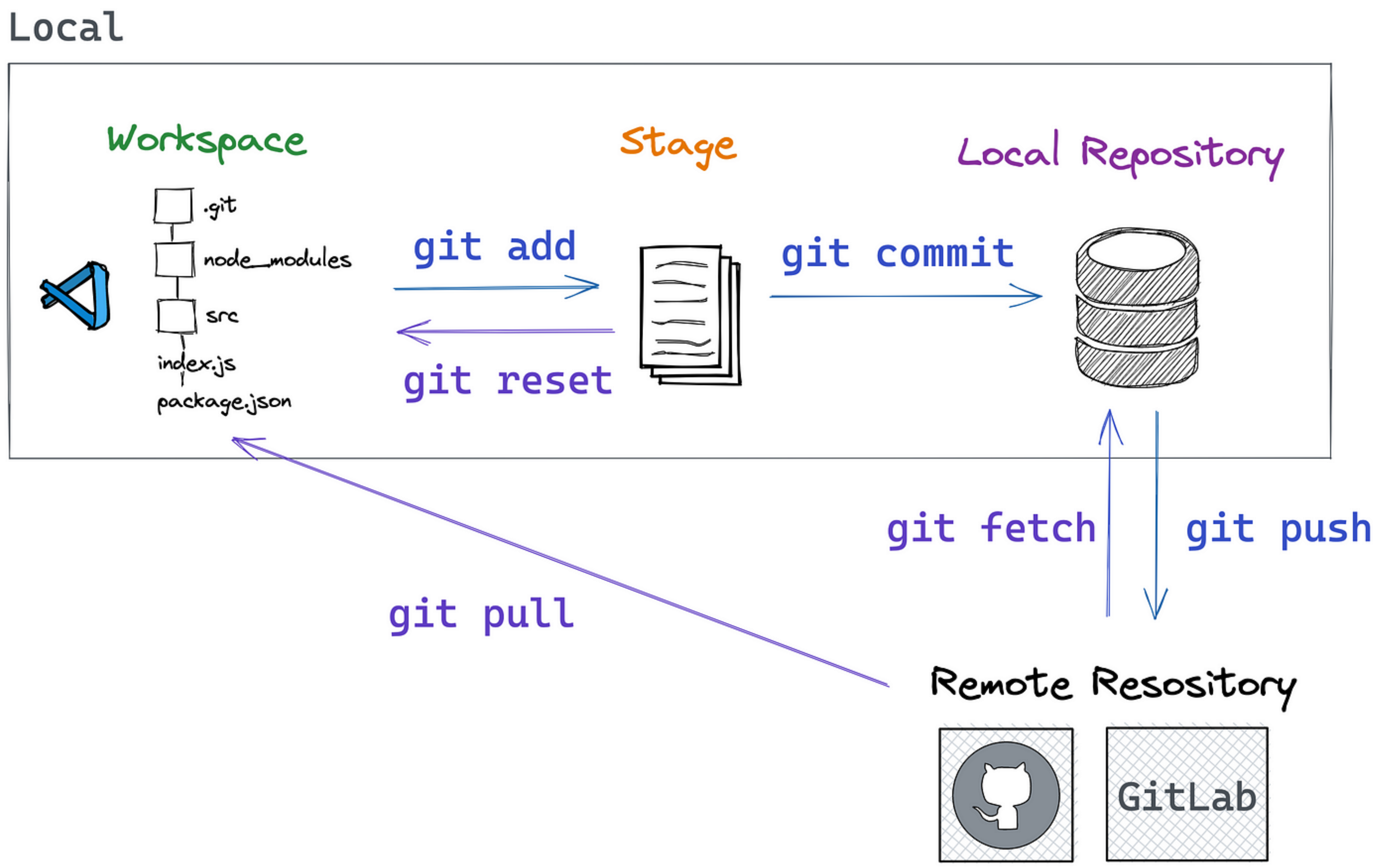
git - the stupid content tracker

SYNOPSIS

```
git [-v | --version] [-h | --help] [-C <path>] [-c <name>=<value>]
    [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
    [-p | --paginate | -P | --no-pager] [--no-replace-objects] [--no-lazy-
fetch]
    [--no-optional-locks] [--no-advice] [--bare] [--git-dir=<path>]
    [--work-tree=<path>] [--namespace=<name>] [--config-env=<name>=
<envvar>]
    <command> [<args>]
```

Git Repository

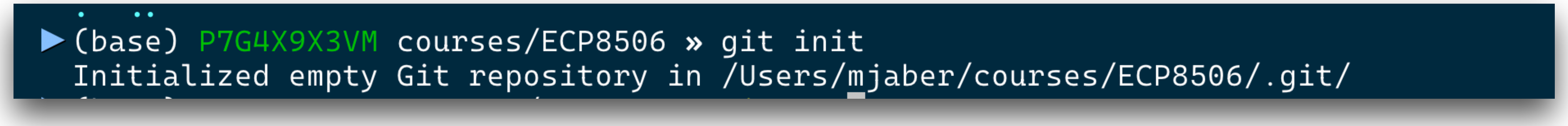
A Git repository is the .git/ folder inside a project. This repository tracks all changes made to files in your project, building a history over time. Meaning, if you delete the .git/ folder, then you delete your project's history.



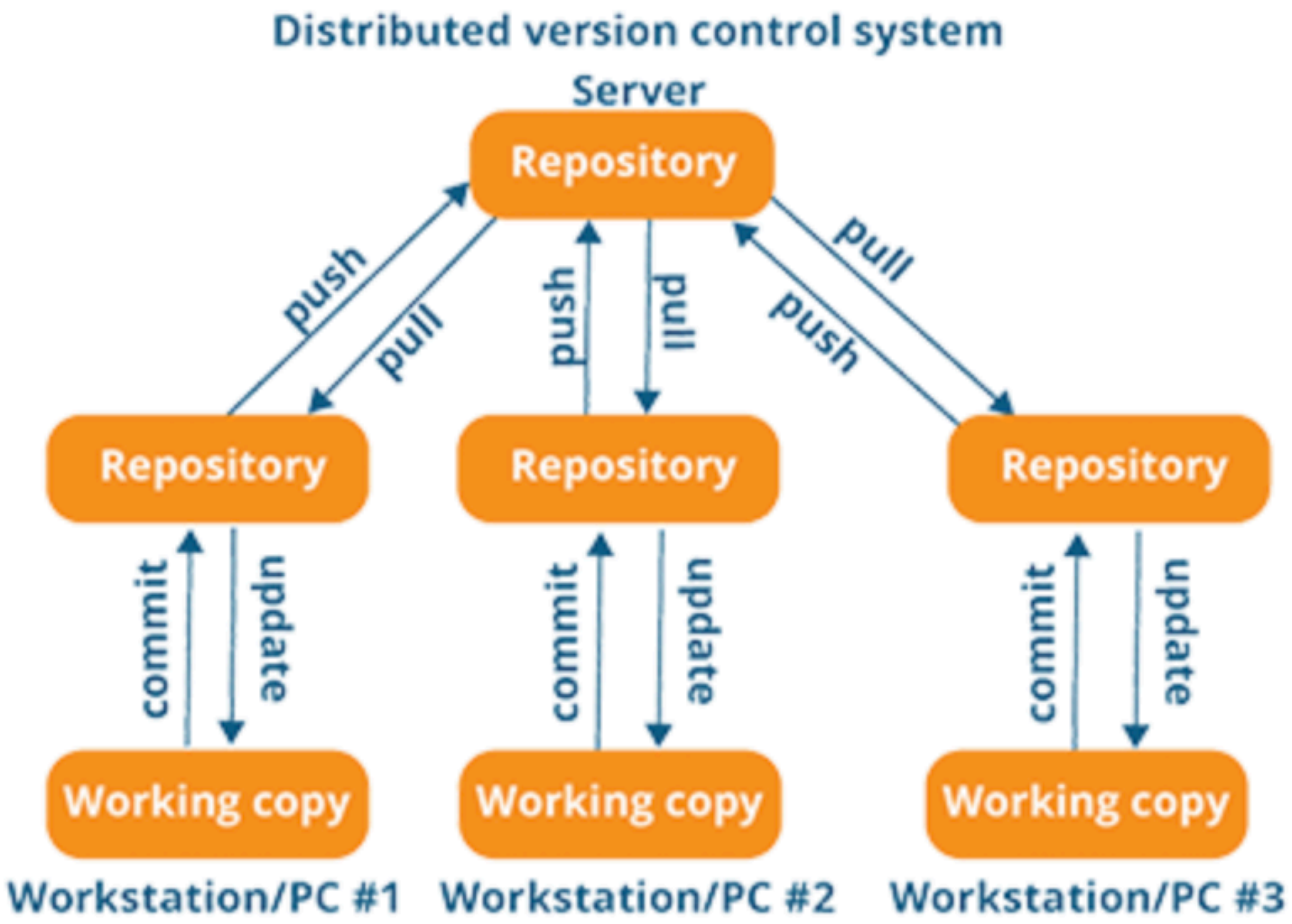
Source path

To initialize a repository (a.k.a repo) in your local device:

> git init



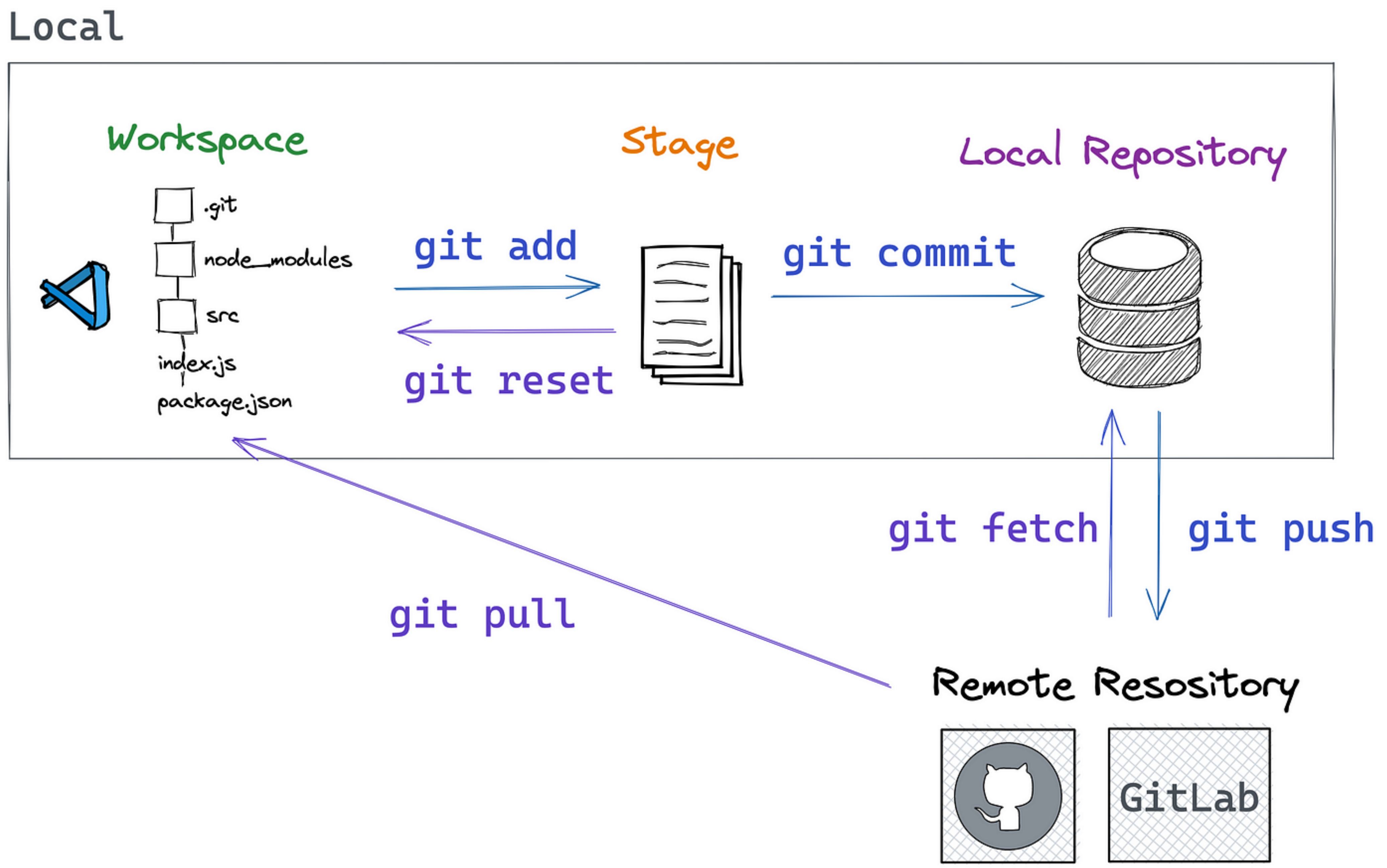
```
▶ (base) P7G4X9X3VM courses/ECP8506 » git init
  Initialized empty Git repository in /Users/mjaber/courses/ECP8506/.git/
```


Distributed version control system
Server
Repository
push
pull
push
pull
pull
push
Repository
Repository
Repository
commit
update
commit
update
commit
update
Working copy
Working copy
Working copy
Workstation/PC #1
Workstation/PC #2
Workstation/PC #3

GitHub and others

Git Workflow

- Initializing a repository: git init
- Adding files to staging area: git add
- Creating a commit: git commit -m "Commit message"
- Checking status: git status
- Viewing commit history: git log



Connect Git/GitHub on MSI through RStudio

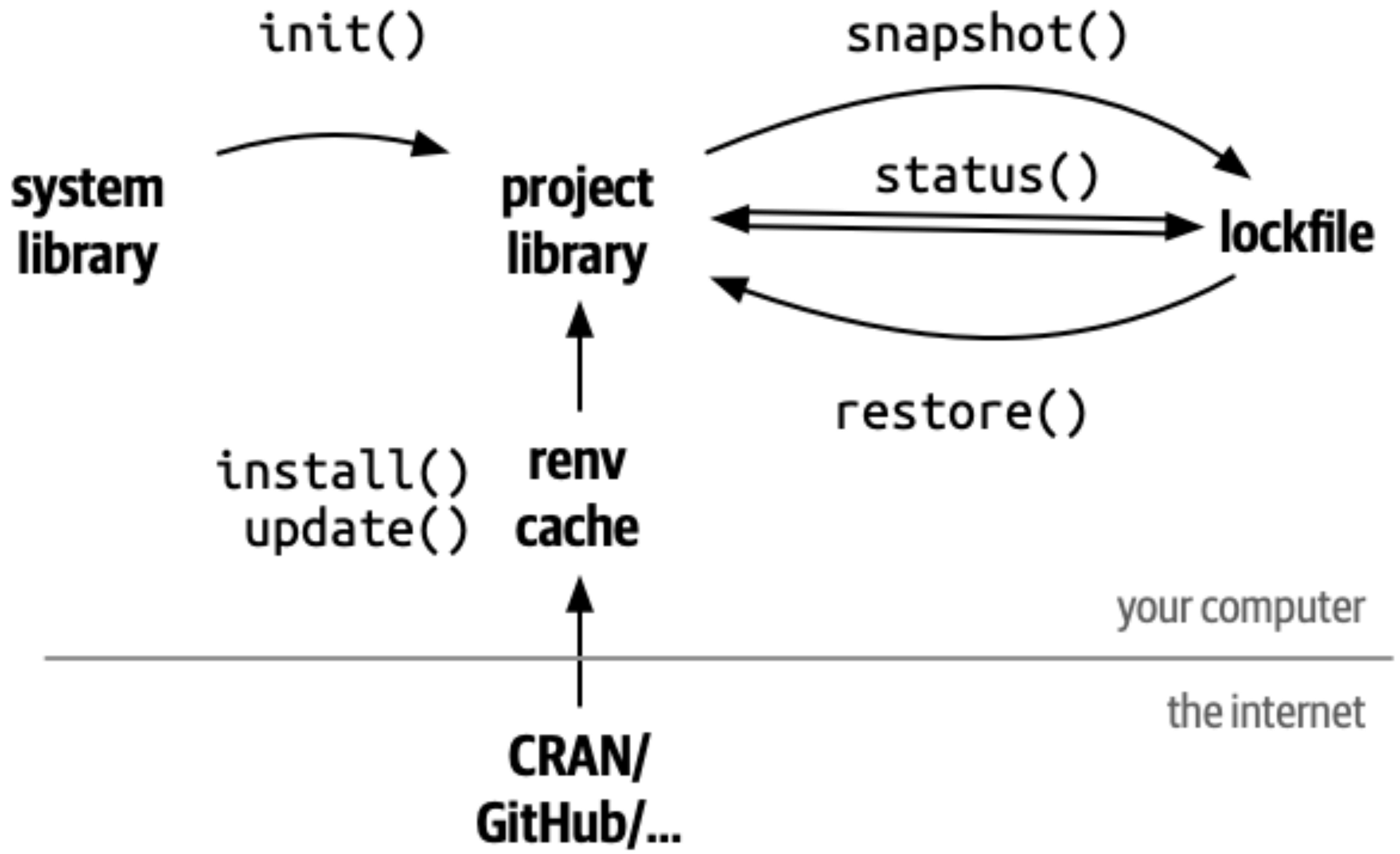
```
usethis::create_github_token(description=…)

gitcreds::creds_set()
```

https://usethis.r-lib.org/index.html

https://gitcreds.r-lib.org/index.html

Reproducible environments using renv



“renv is an R package help create snapshots of your R projects”

https://rstudio.github.io/renv/

https://rstudio.github.io/renv/articles/renv.html

Common `renv` commands

```
renv::init()

renv::install()

renv::snapshot()

renv::restore()
```