Version Control Systems (aka VCSs)

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Outline

- Introduction
    - Why VCS?
- History
    - Which VCS?
- Let's try Git
- Conclusions

Introduction

- As the name suggests its a technology to control versions of an artefact
- Most probably code
- It's quite common for text project

Introduction

v1.0

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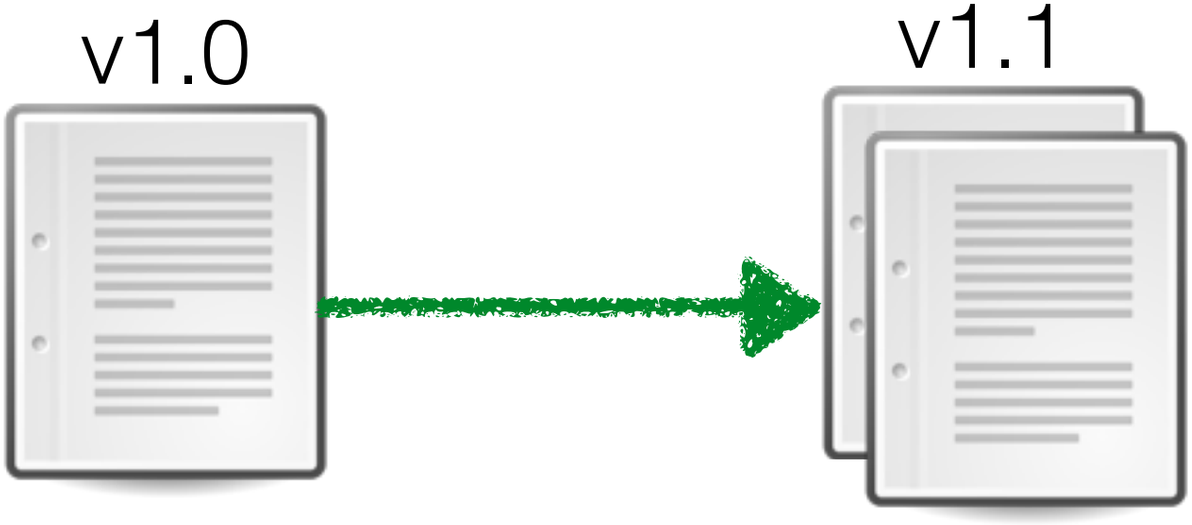

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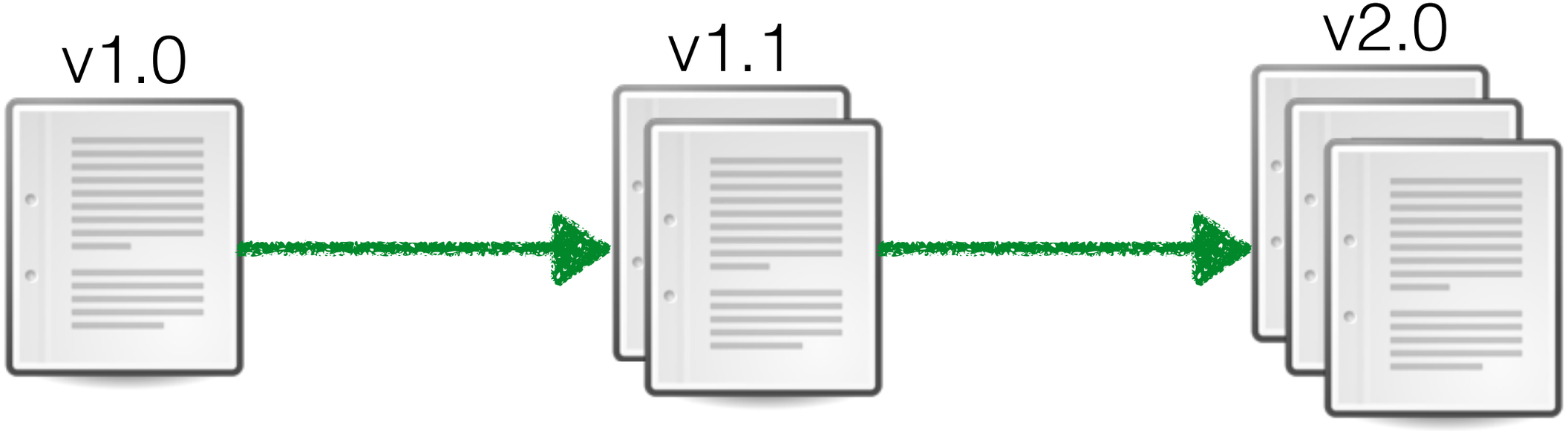

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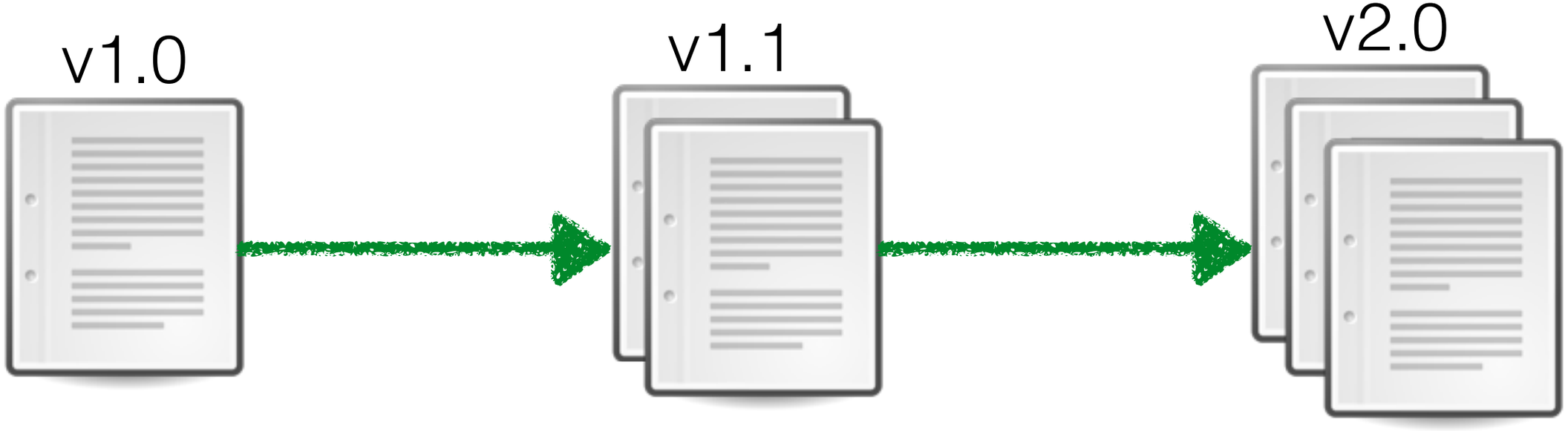

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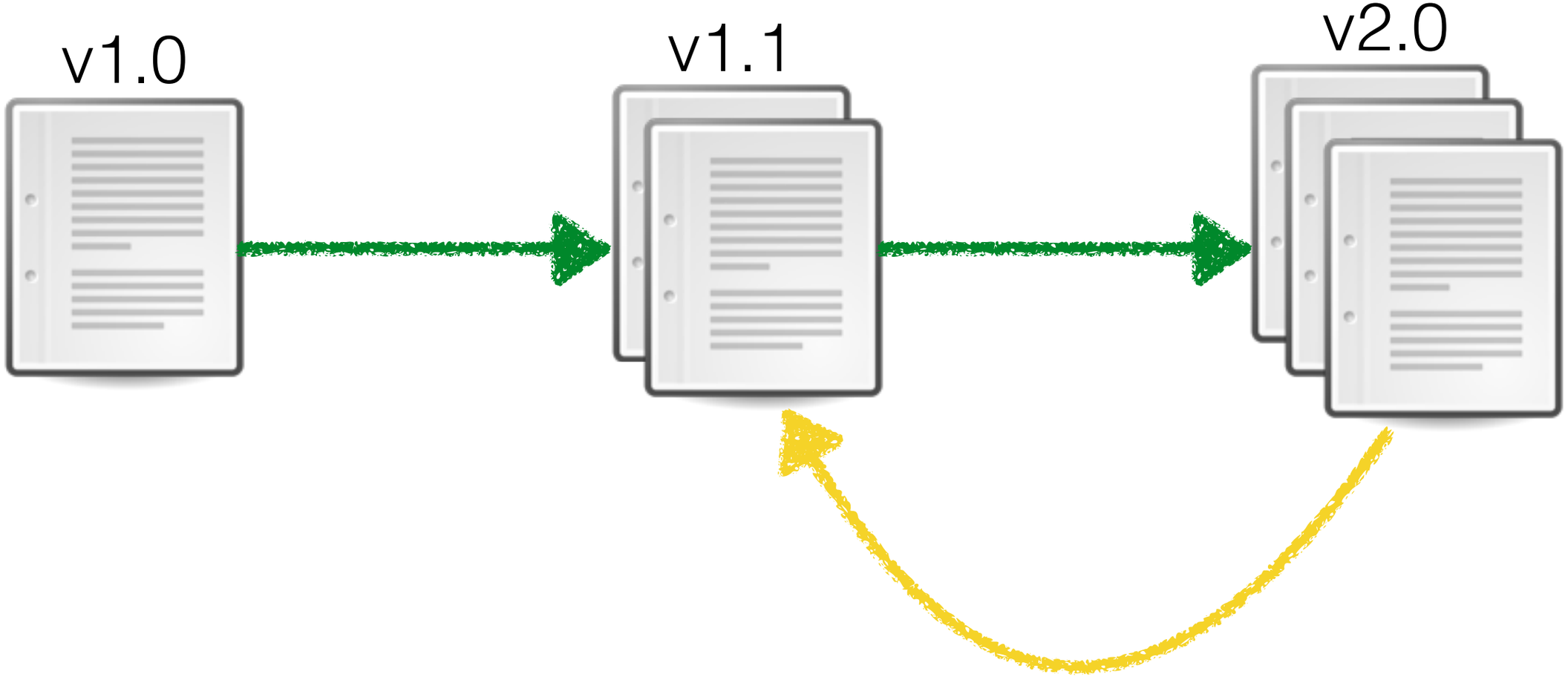

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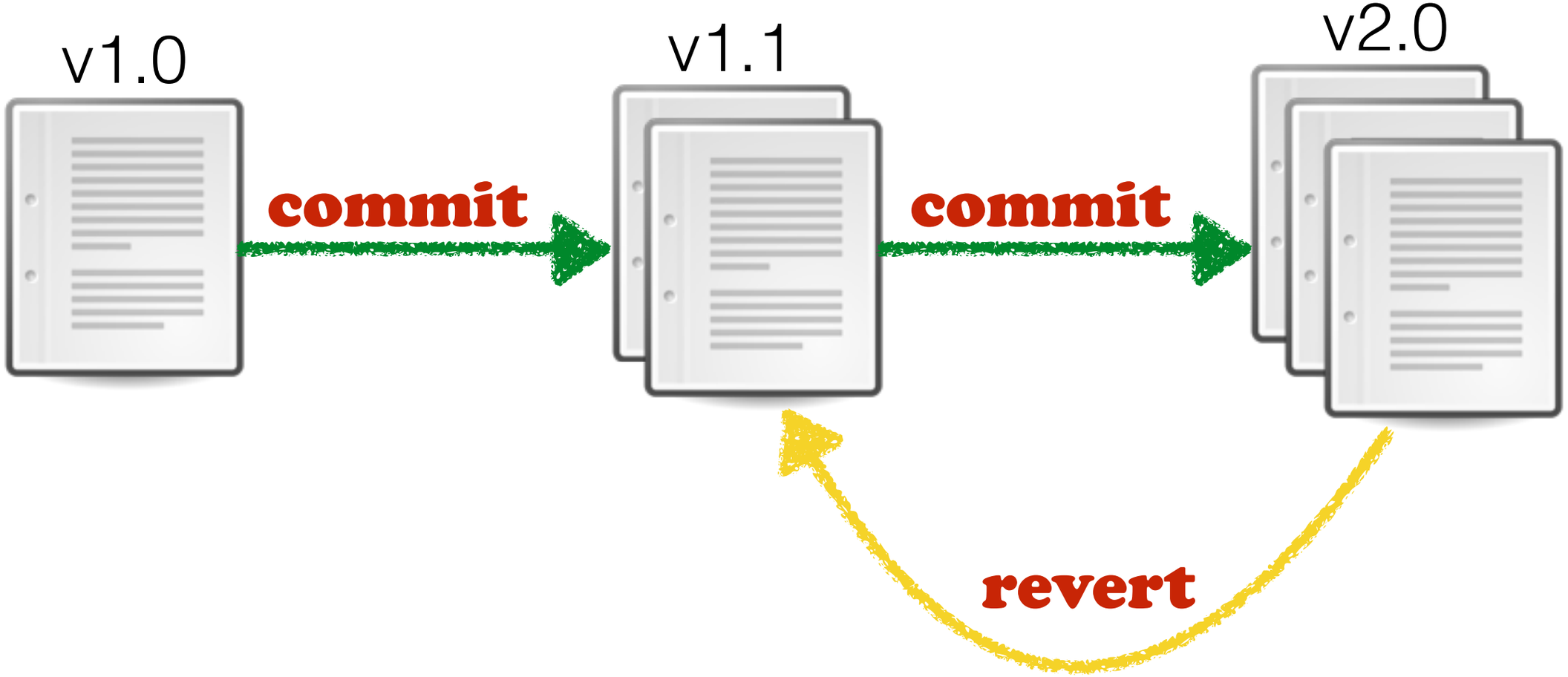

Why VCS?

- Control / Store different versions, historical data of your application / documents
- Bug fixes (find at which step the error happened)
- But VCSs have more uses:
  - Enables collaboration
  - Works as a backup

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  - project_v1.zip —> project_v2.zip

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- Post-its or cups

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Modern VCSs

- **Apache Subversion - SVN**
- Darcs
- **Git**
- Mercurial
- Bazaar
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Approaches

- Centralised
- Decentralised (or Distributed)

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Conflict : After a merge, changes performed at the same part cannot be resolved automatically.

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- Centralised:
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- Decentralised / Distributed:
  - Different copies, each copy is equally valid
  - Commits are happening to your local repository

SVN

- Apache Subversion
- Is a centralised VCS
- When a new version is commited, its id increments sequentially (e.g. 1, 2, 3, …)

SVN Example

SVN Example

Code

Repository 0

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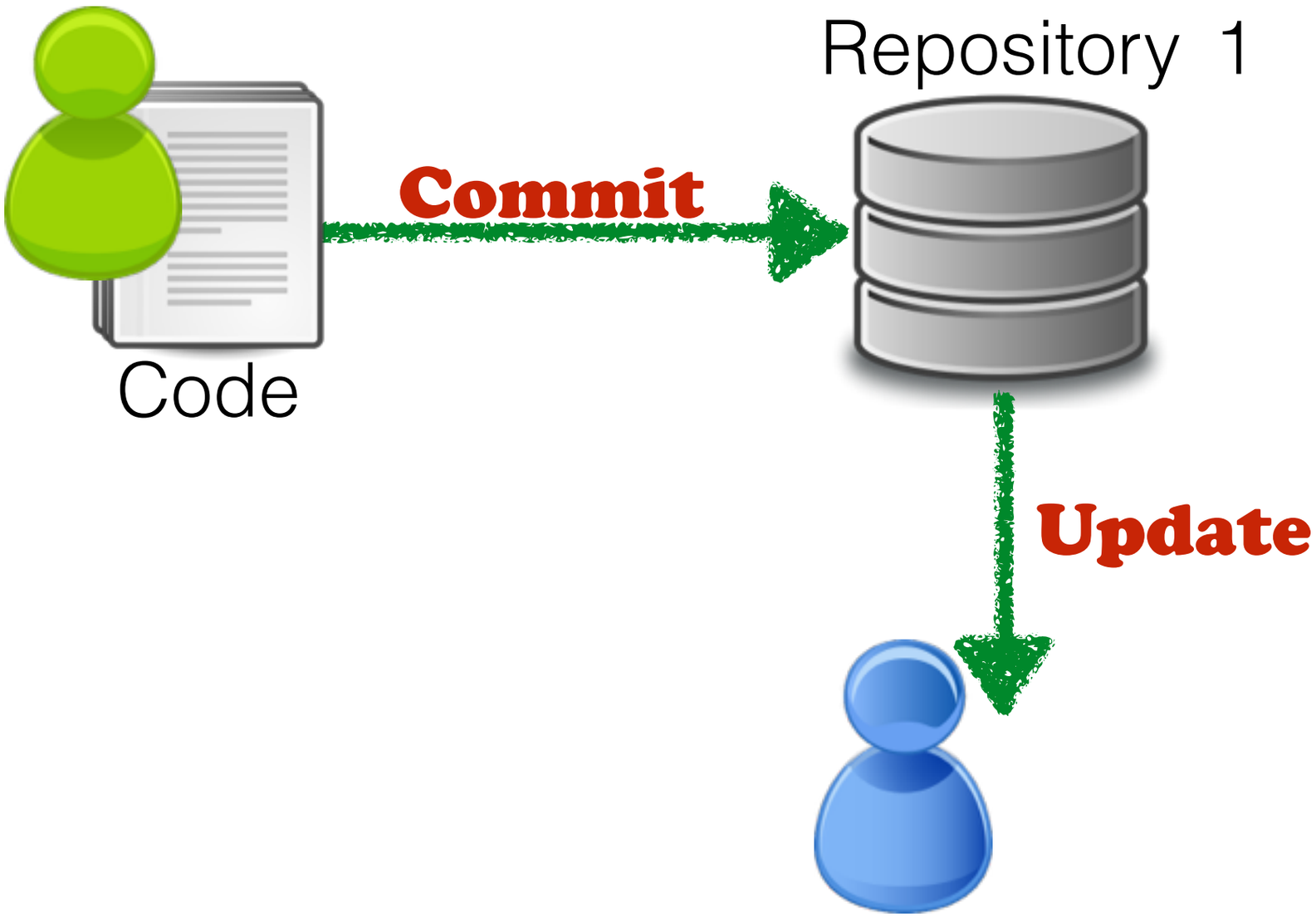

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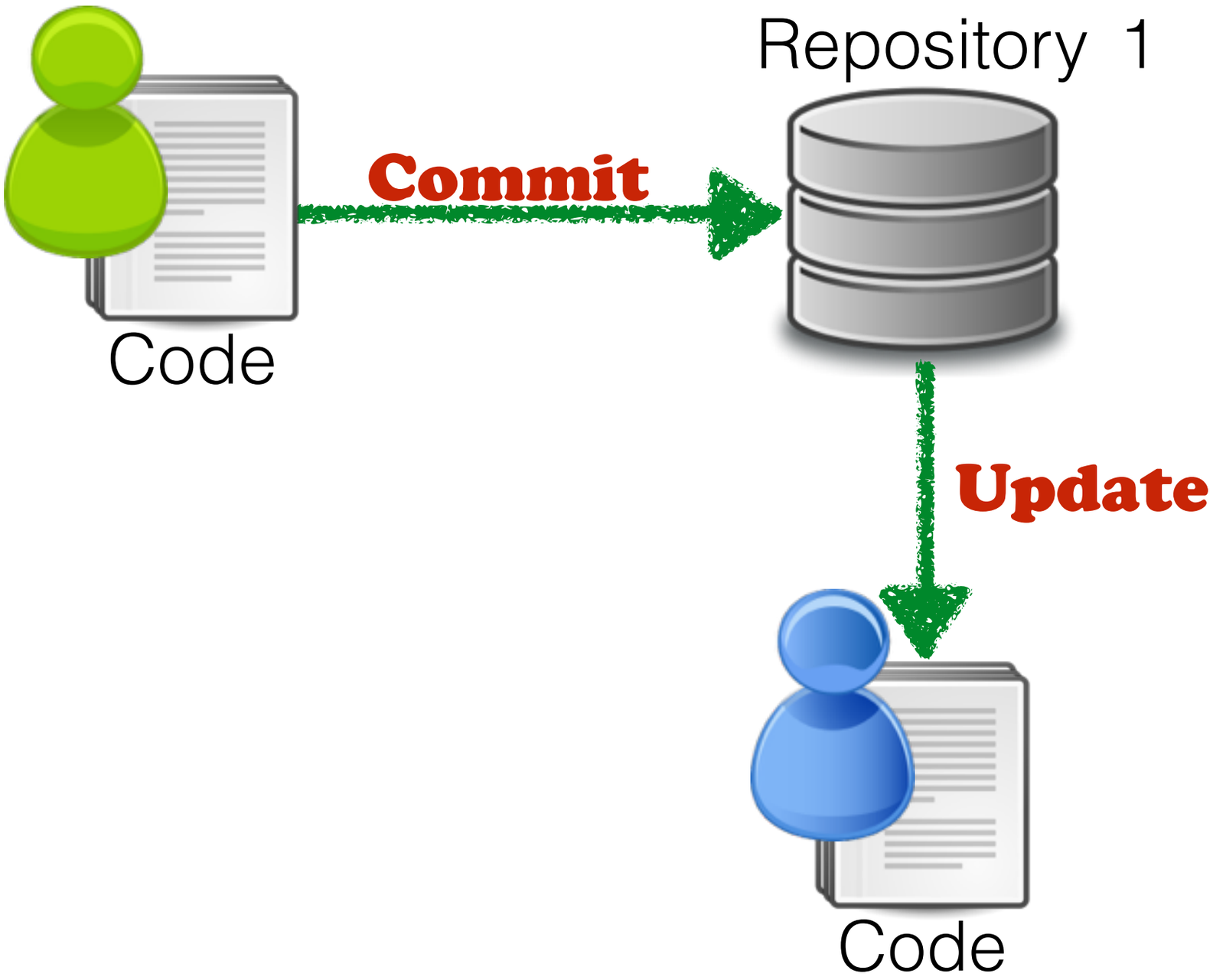

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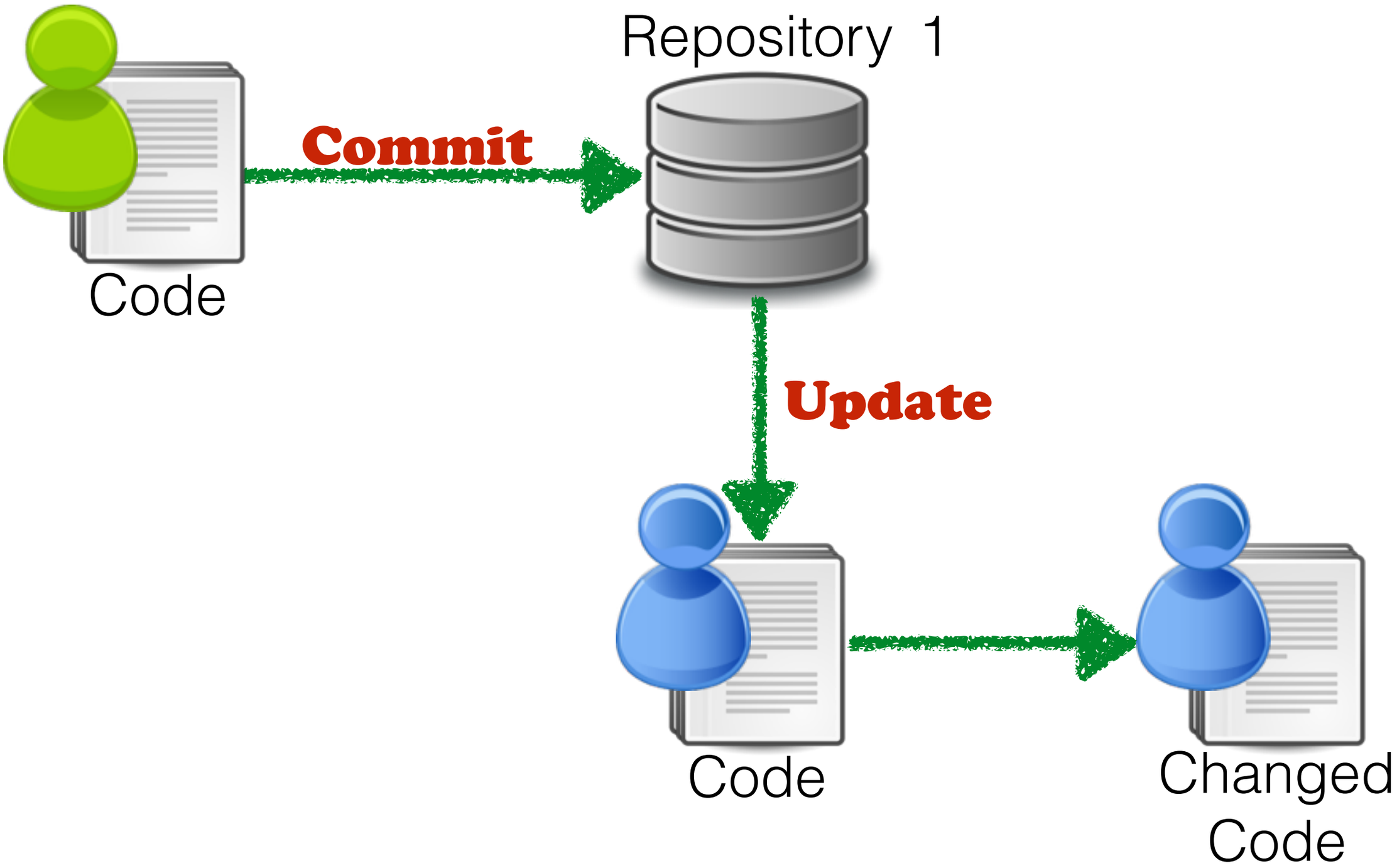

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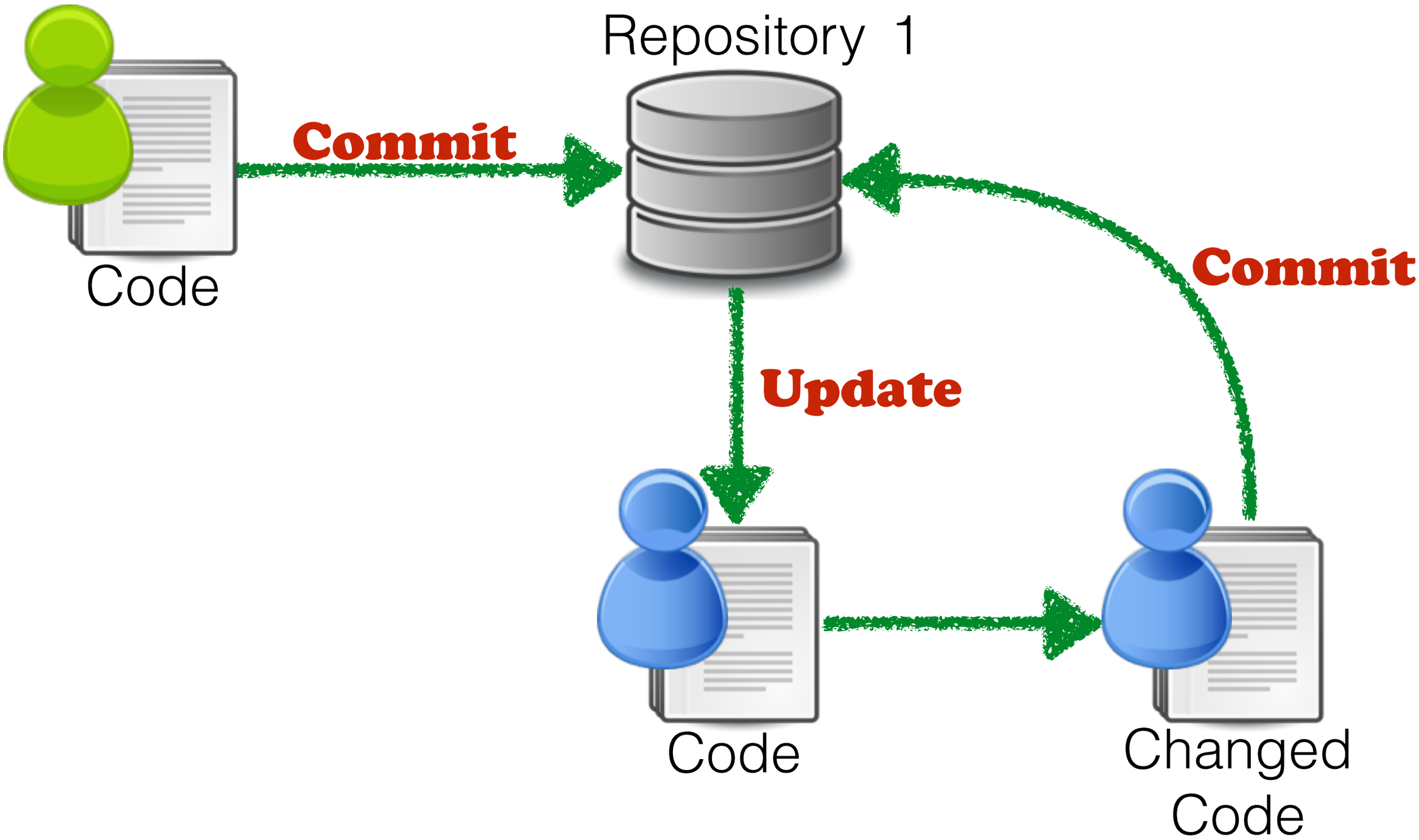

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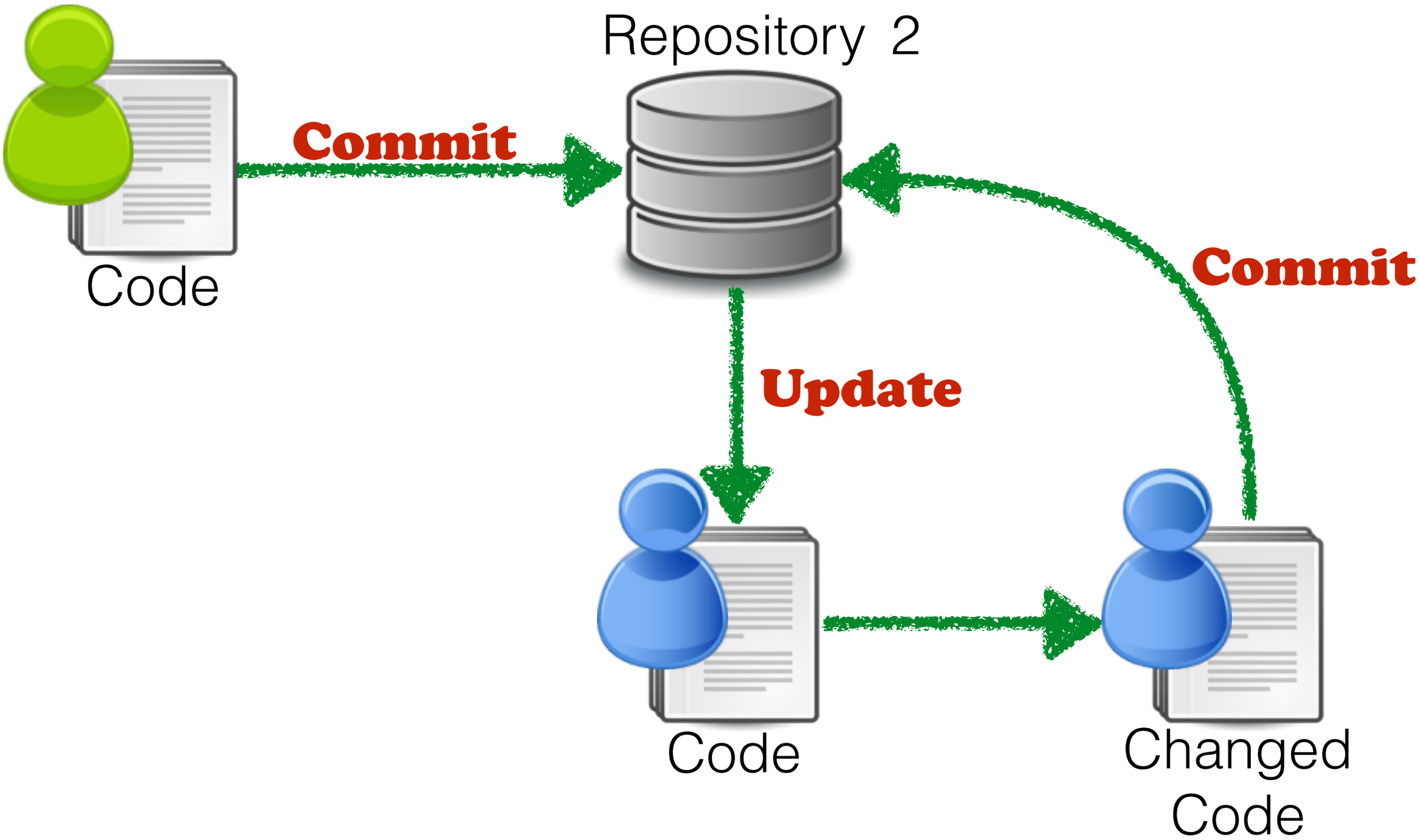

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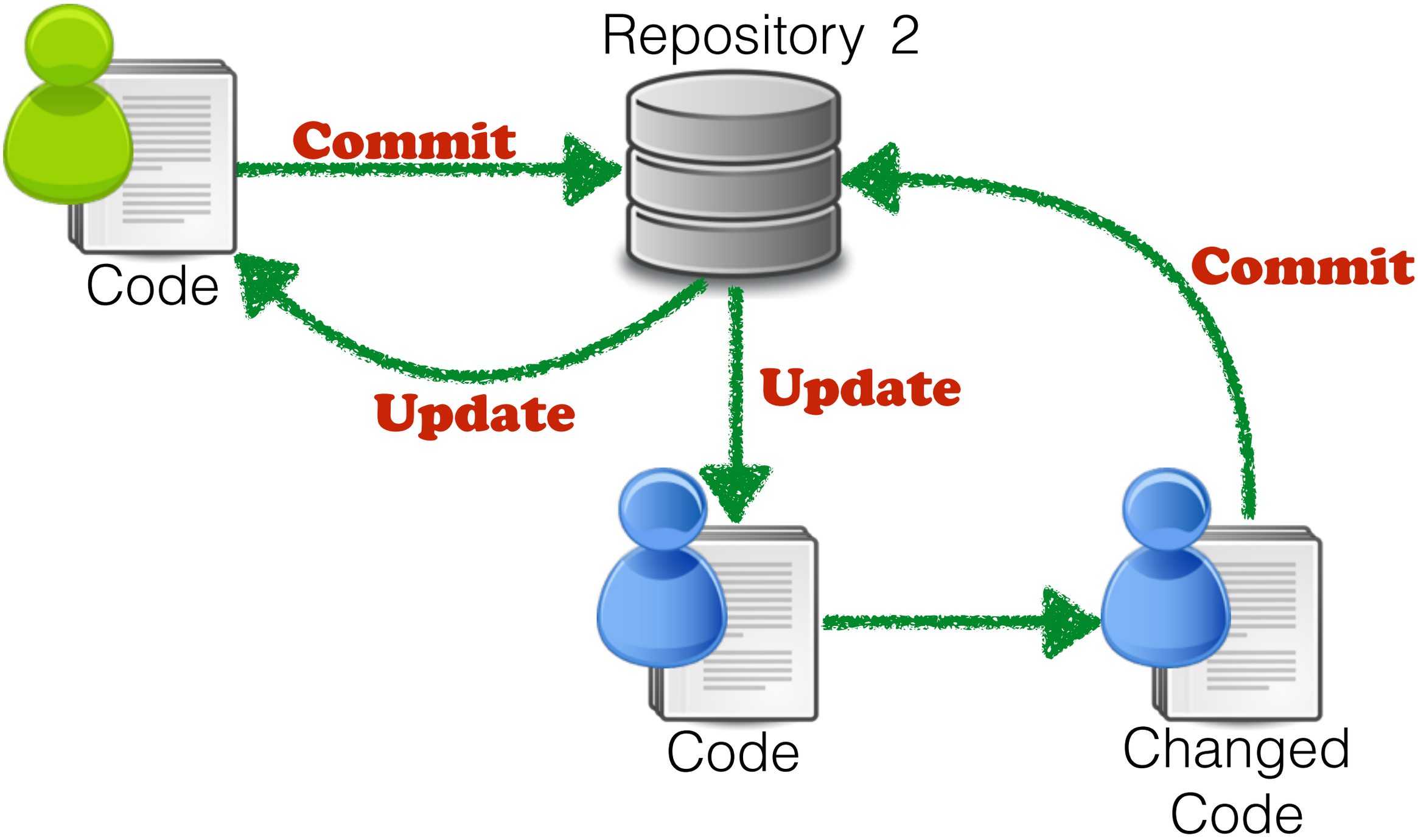
Repository 2
Commit
Code
Update
Update
Commit
Code
Changed Code

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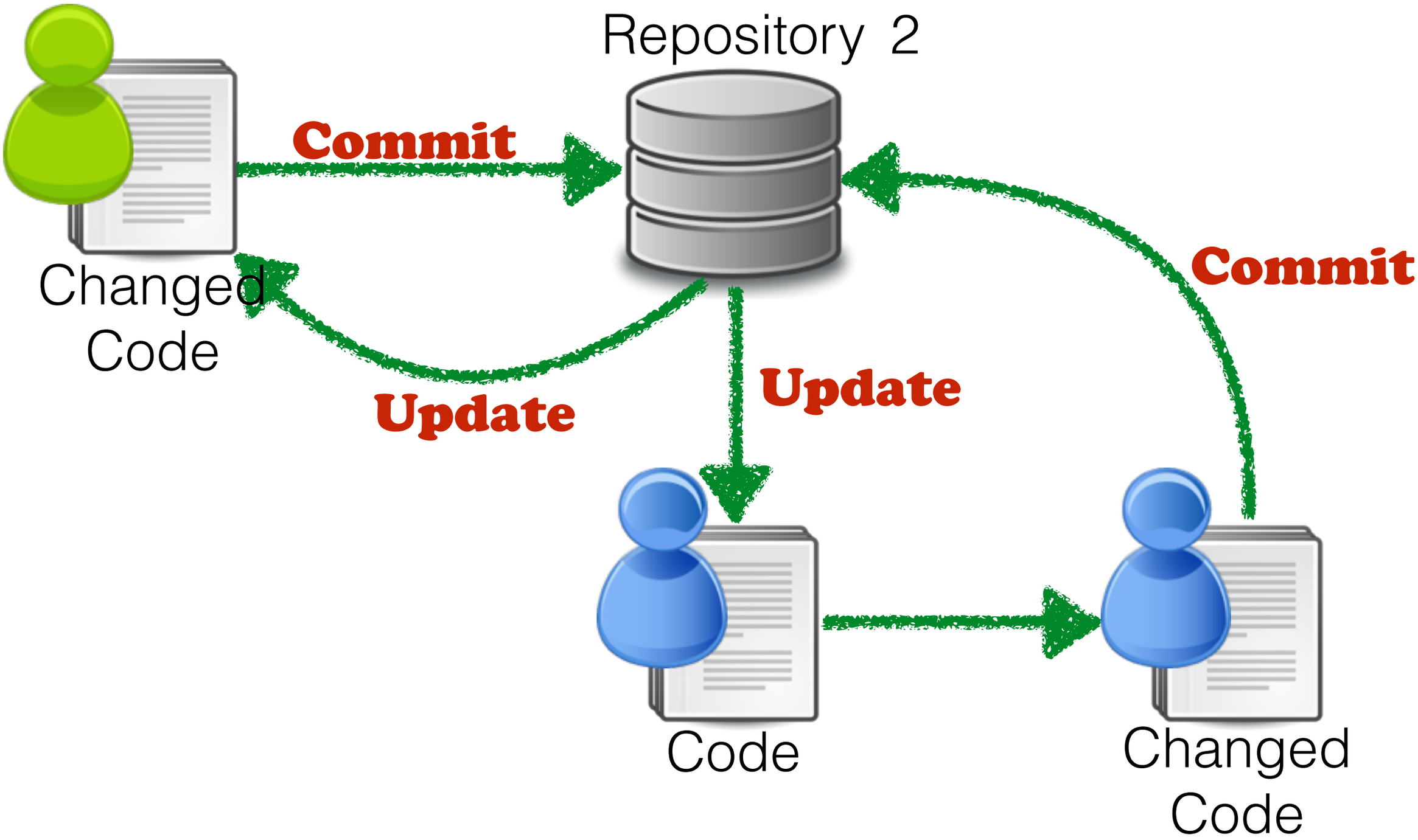
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SVN Software

- Windows:
  - **TortoiseSVN** - free
- Mac OS:
  - Versions - $
  - **SmartSVN** - free/$
- Linux:
  - RapidSVN - free
- Or Eclipse:
  - **Subversive** - free
  - Subclispe - free

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–Discourages branching

Git

- Is a decentralised (distributed) VCS
- 40 hexadecimal numbers for commit versions (e.g. f3abe64fc121b75f3f0566c73f2f1a4e8fffd68e)
    - Constructed based on author, commit message, previous version, …

Git Example

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Repository

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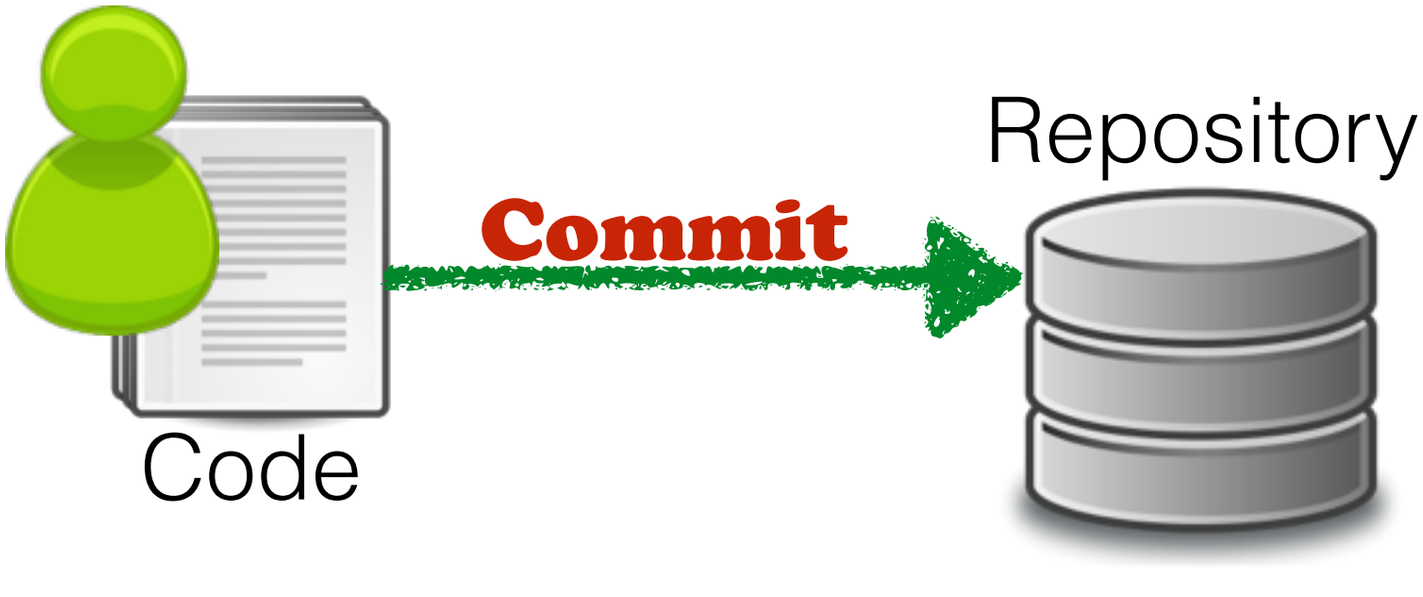

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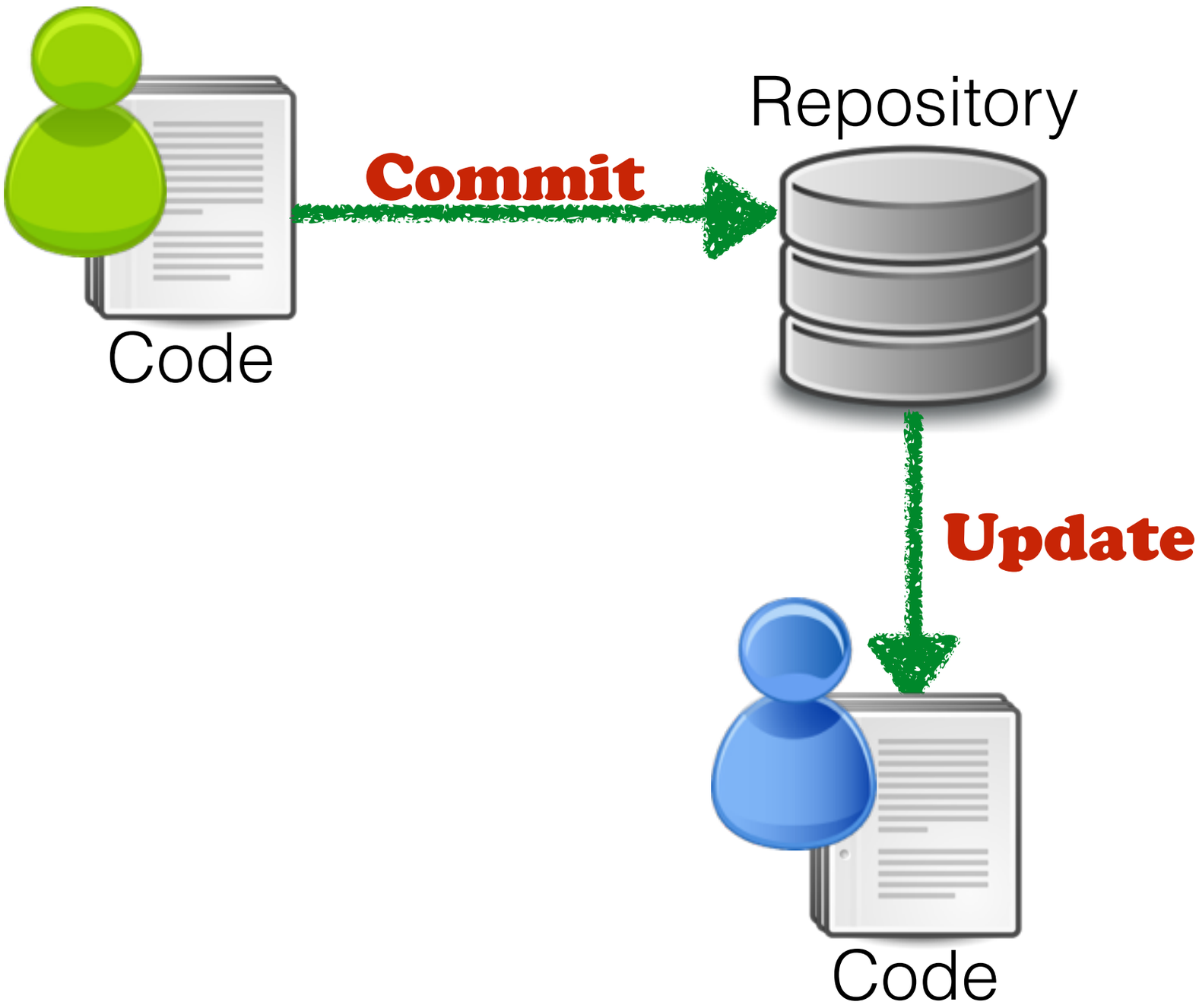

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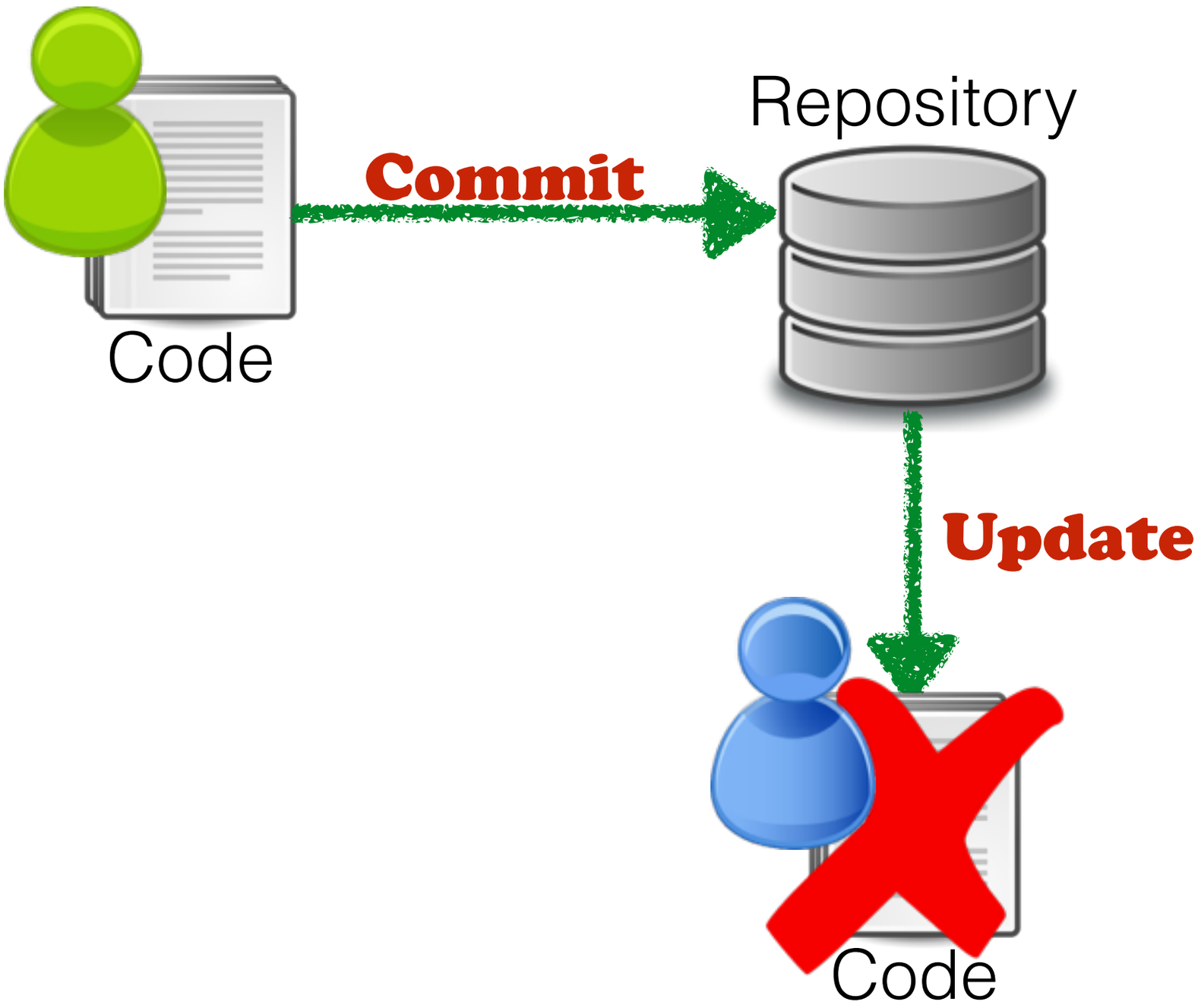

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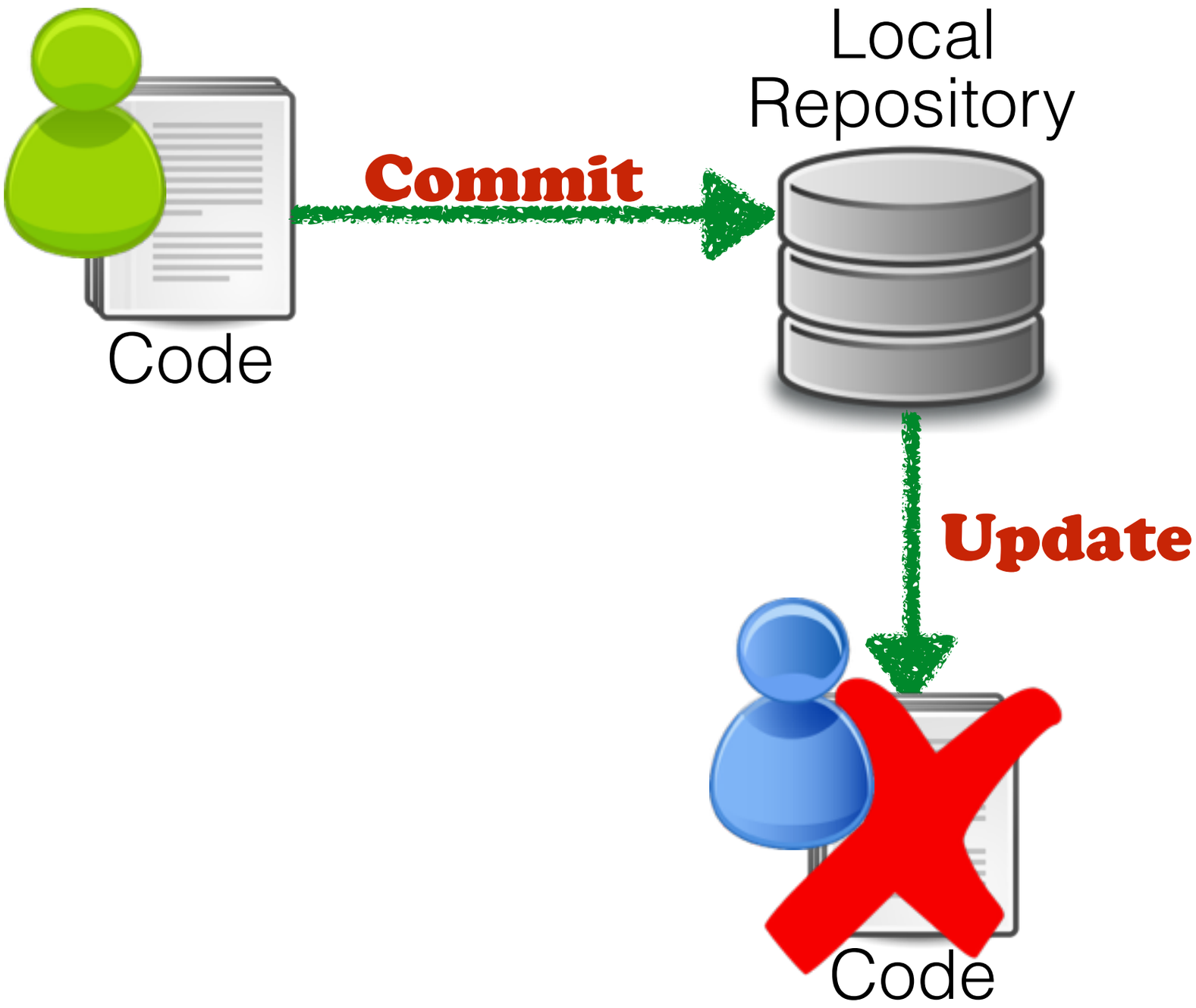

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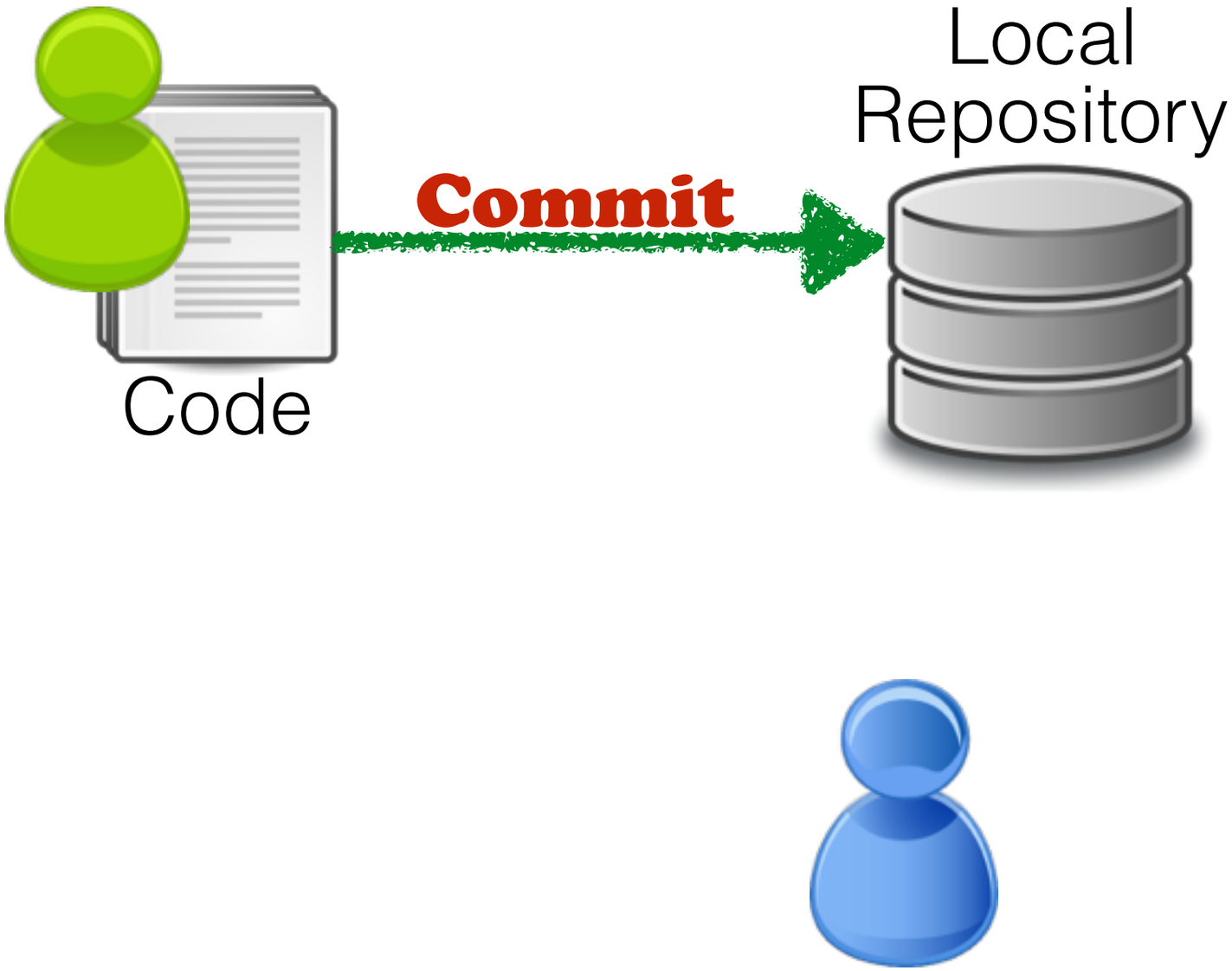

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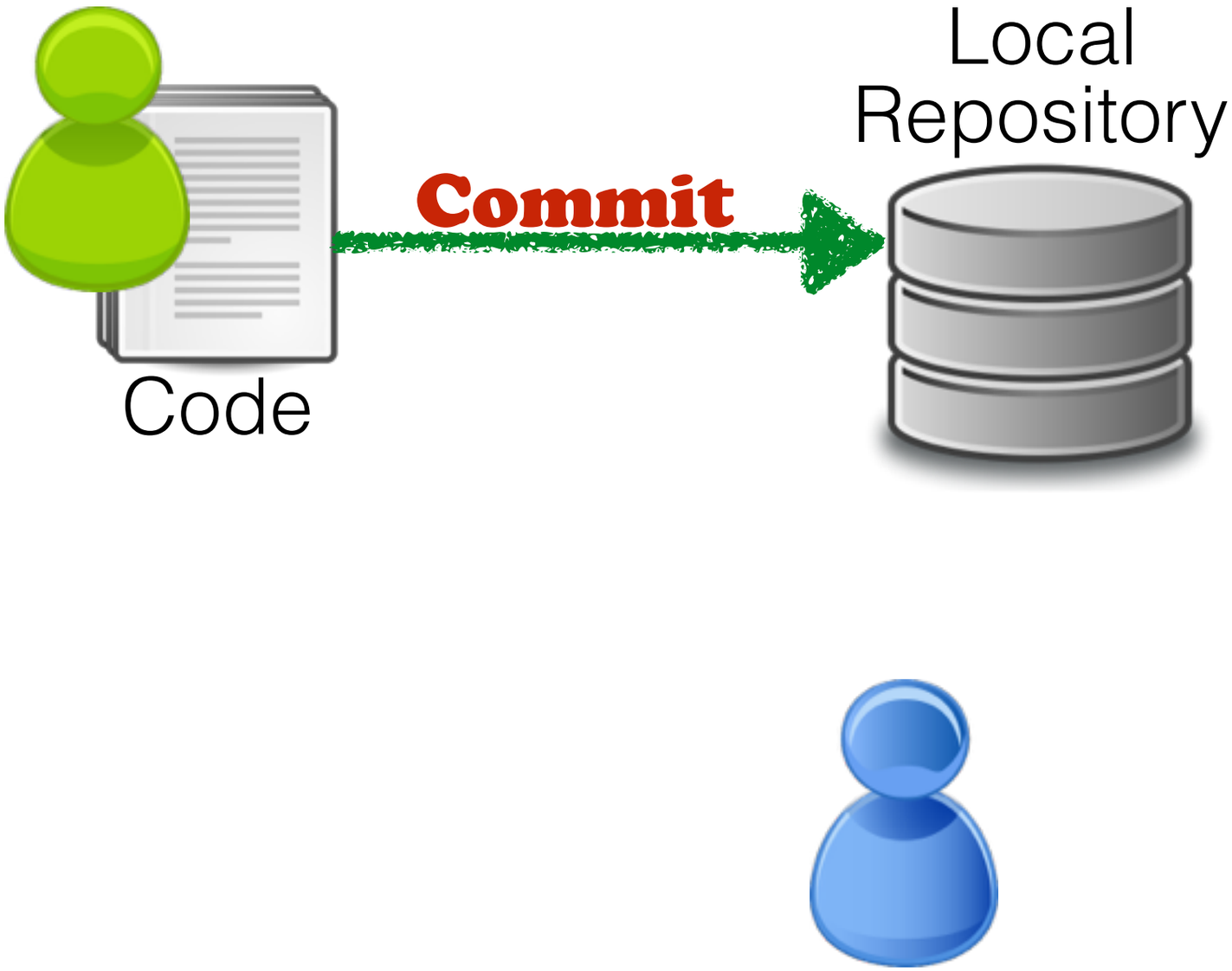

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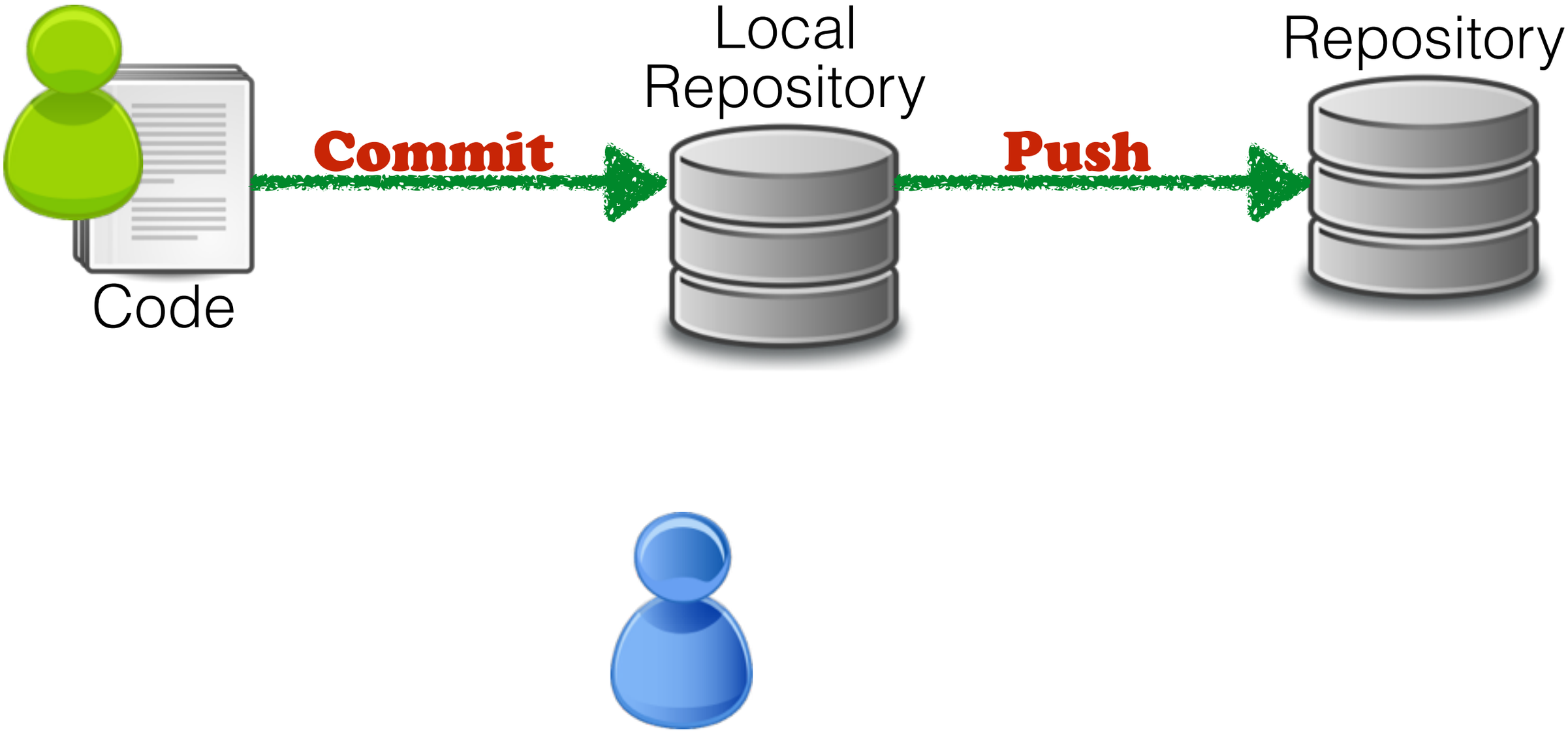

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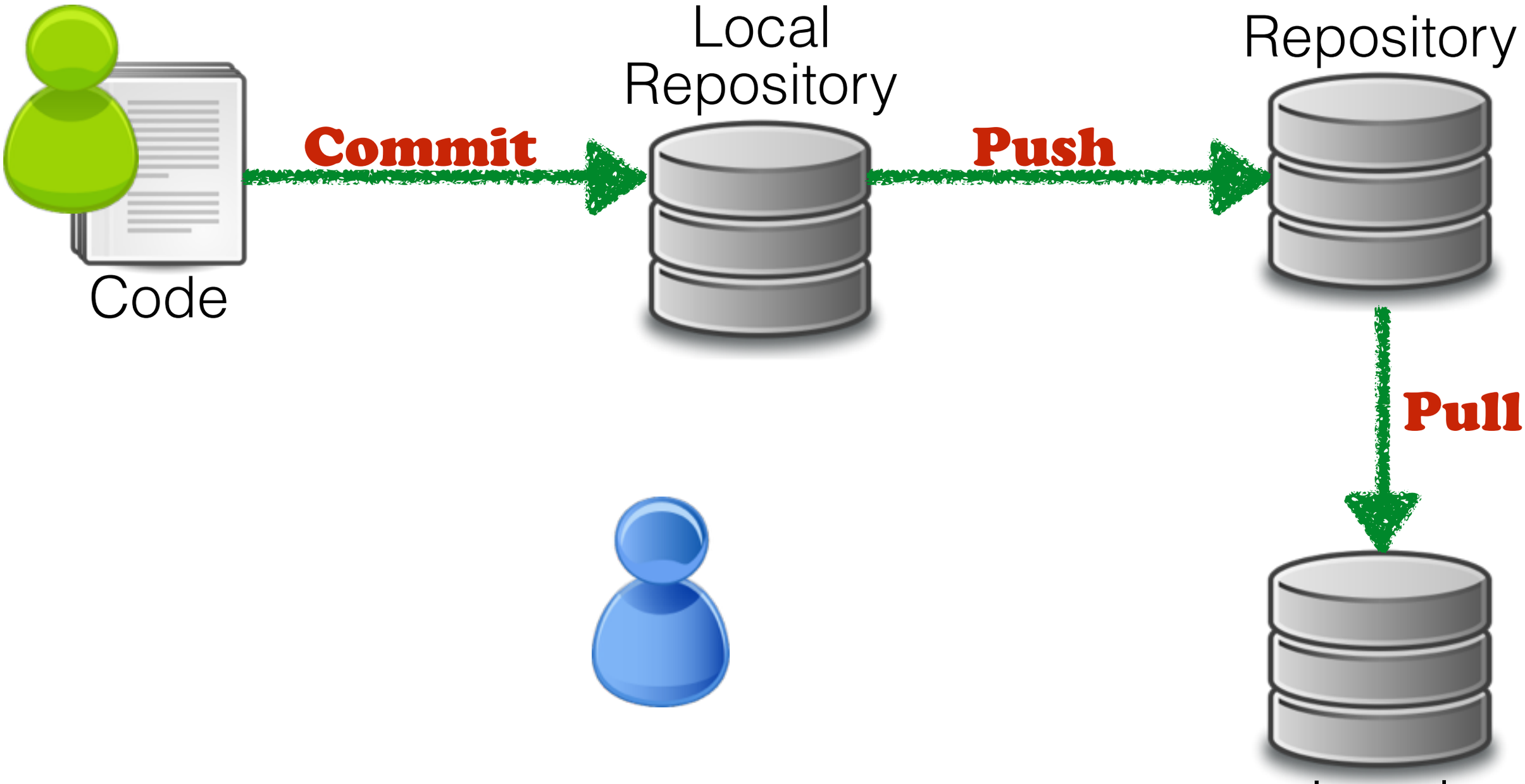
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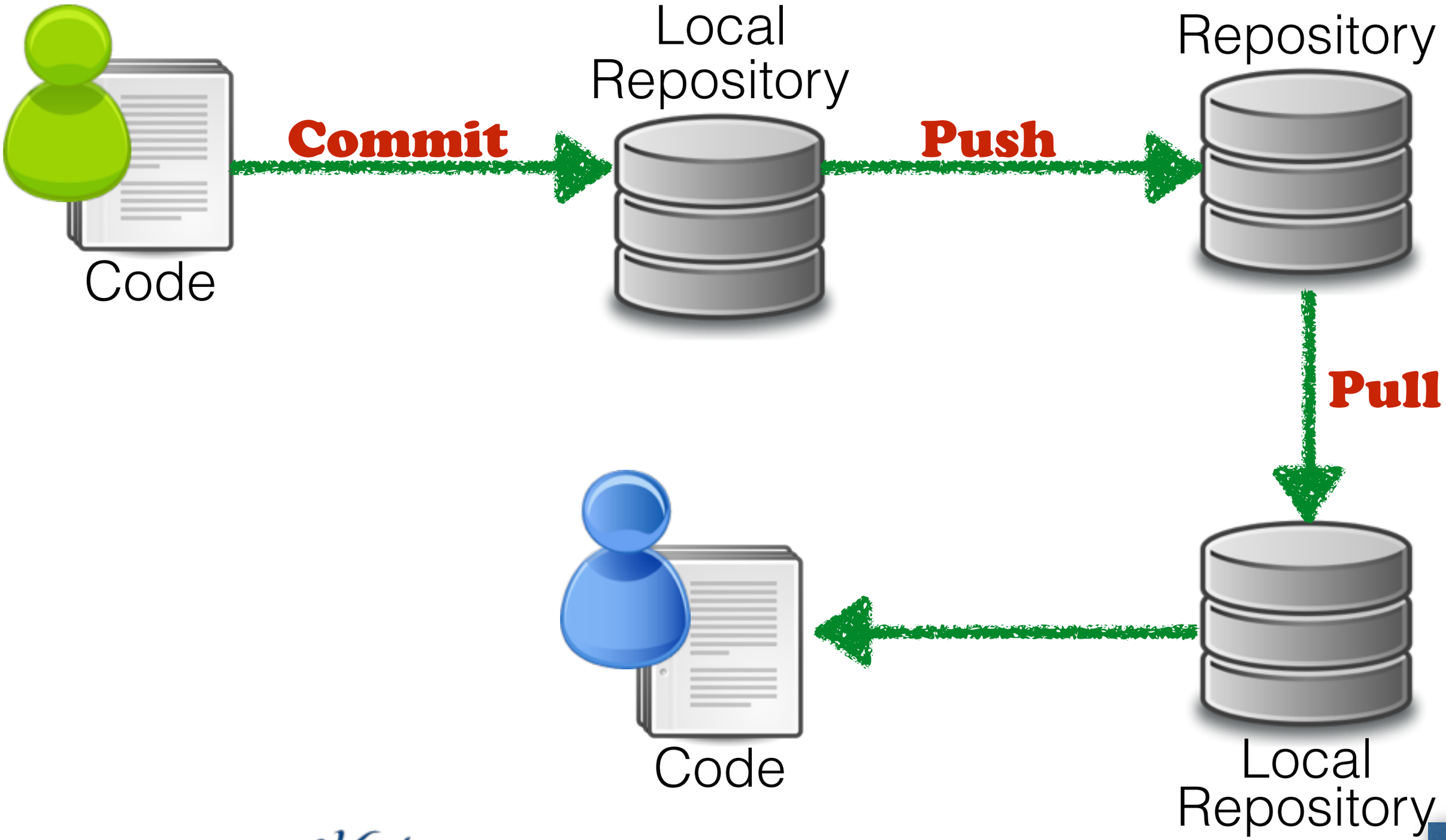
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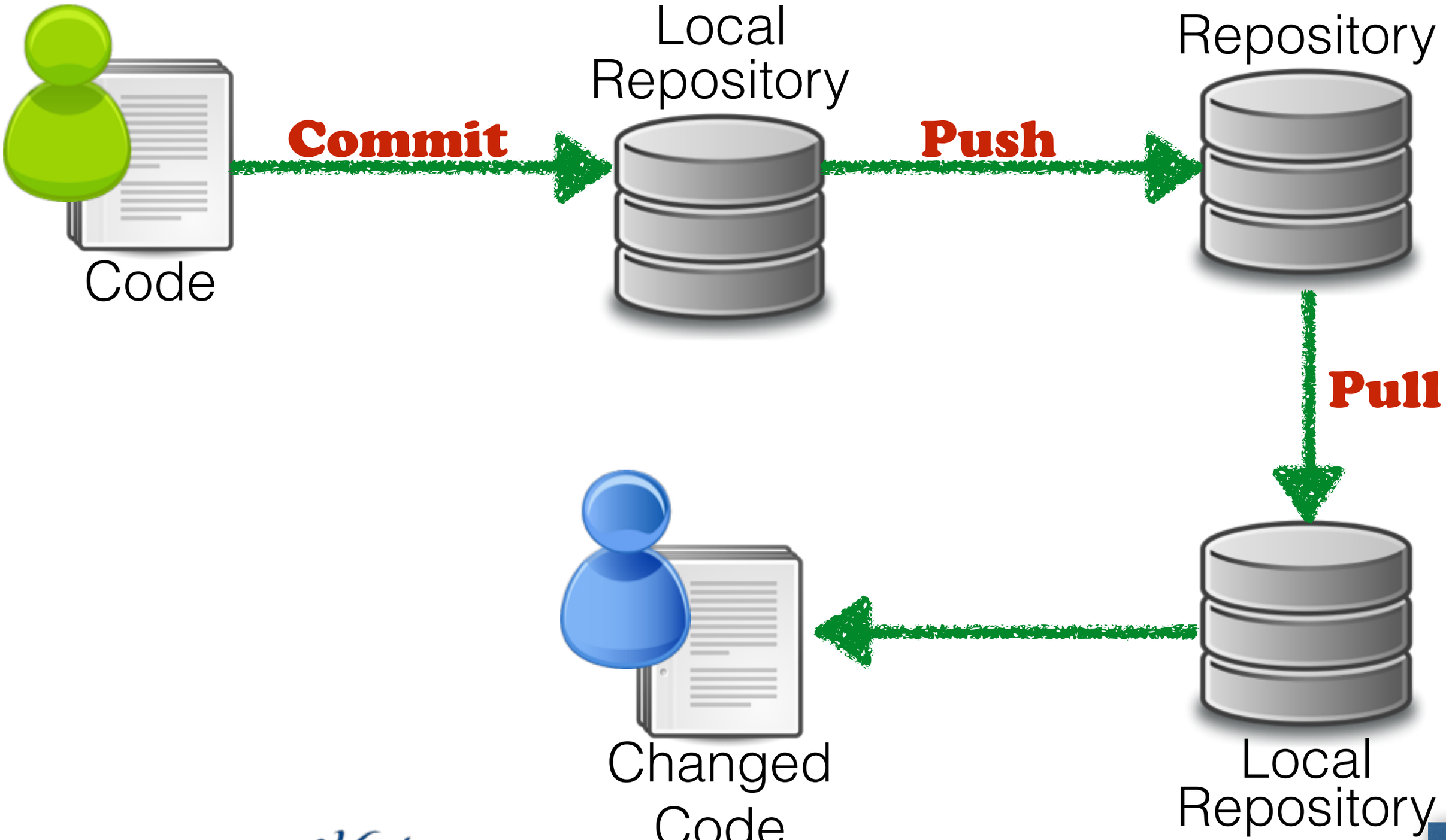
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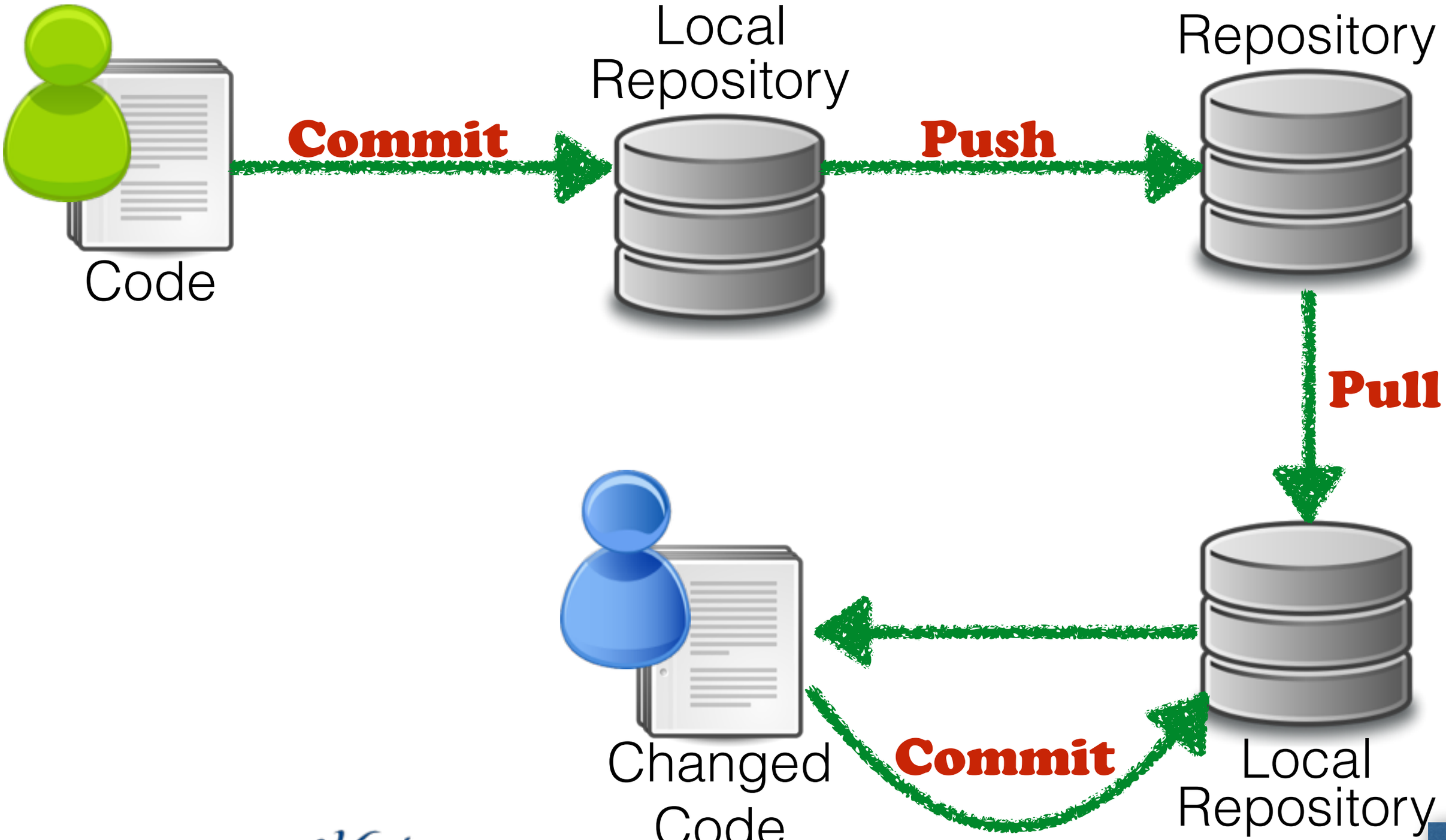
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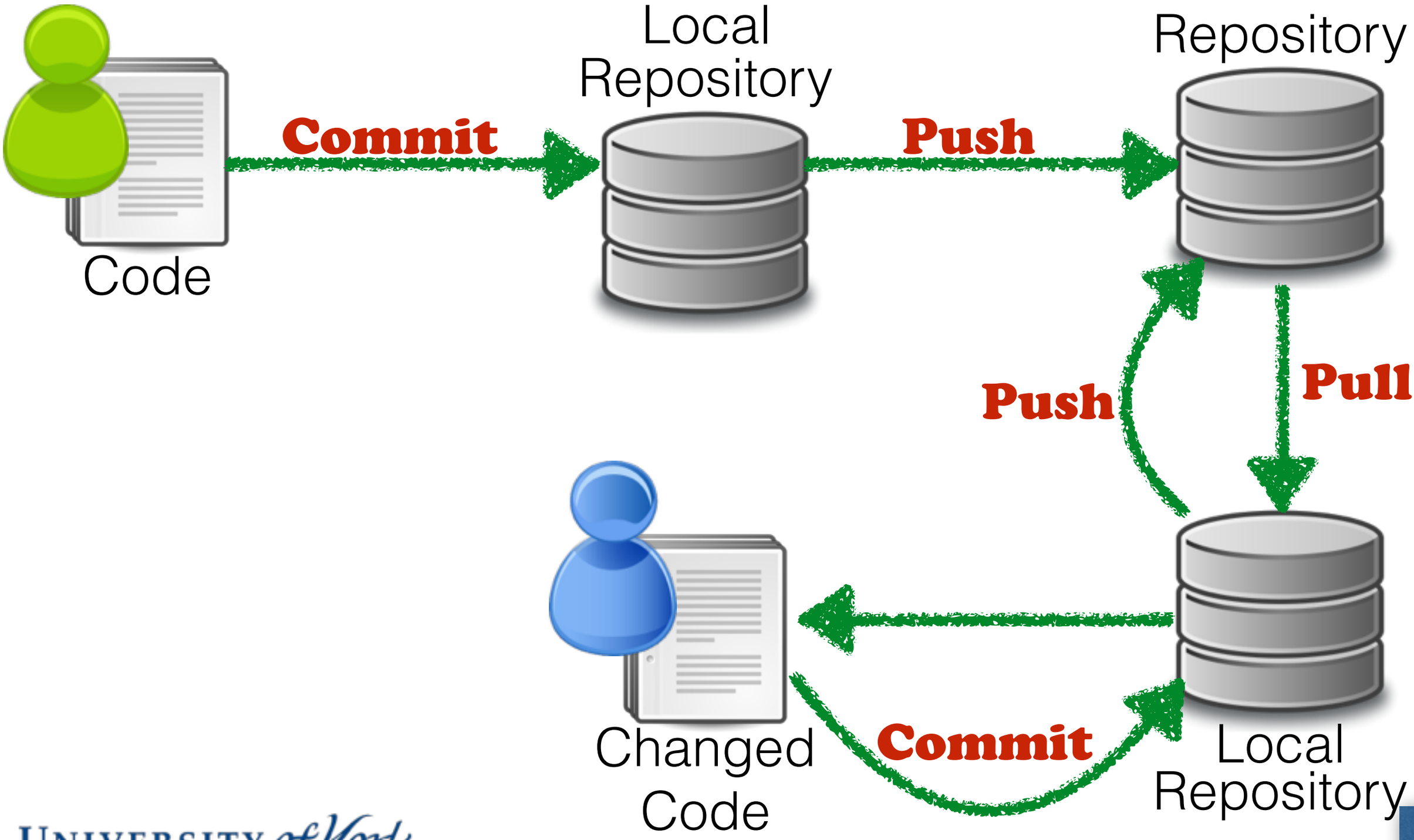
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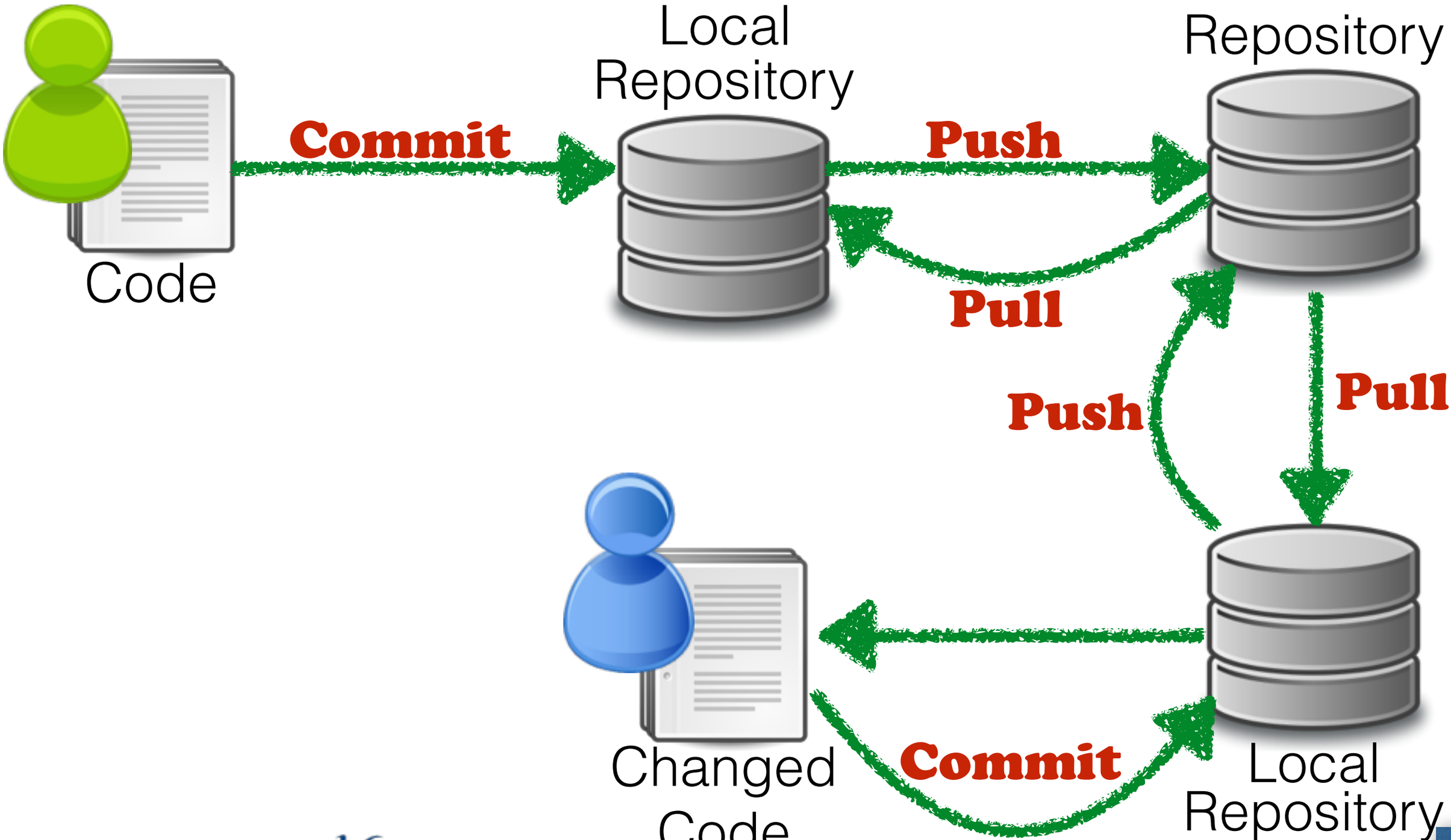
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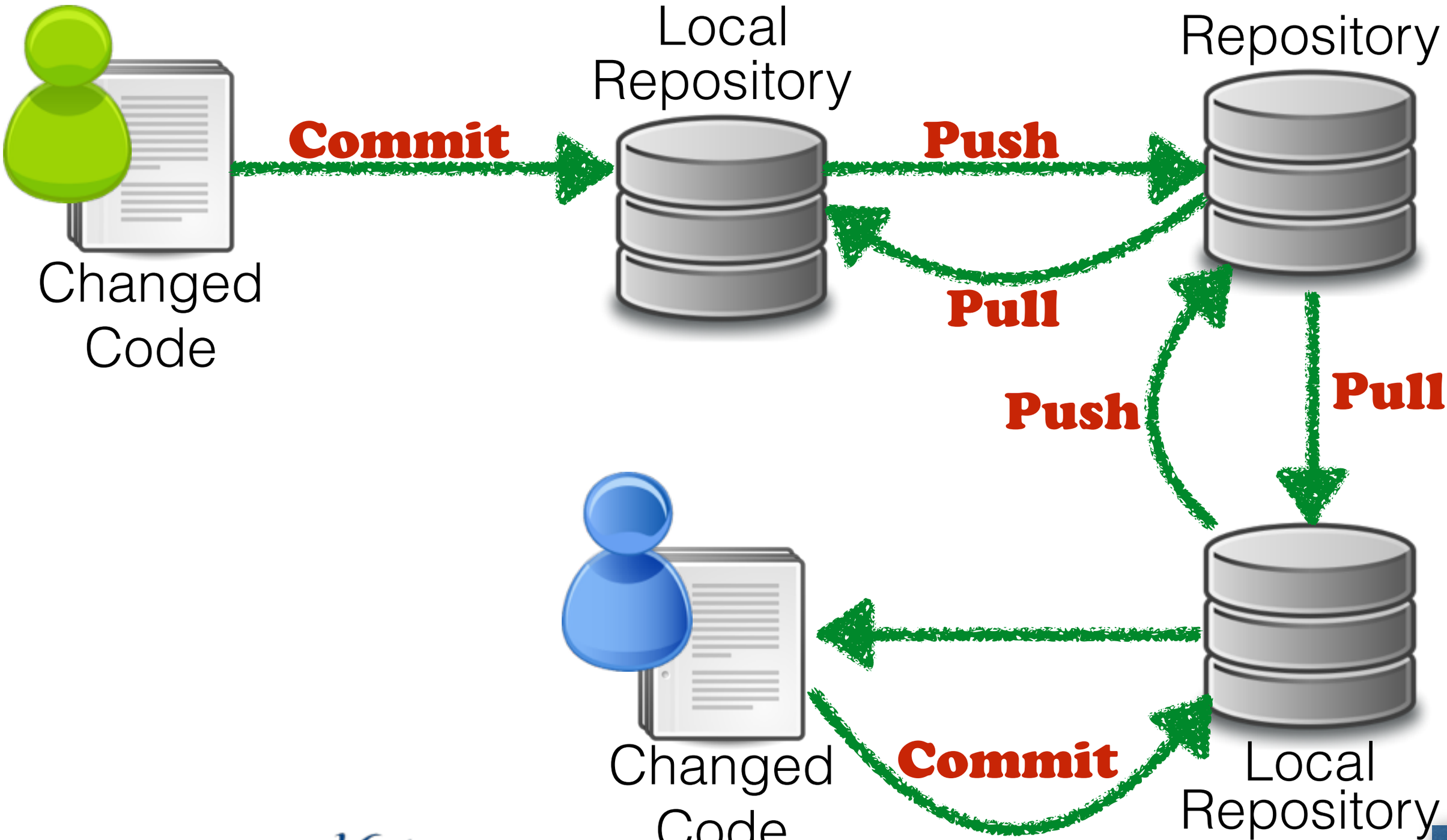
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- Mac OS:
  - **Terminal** - free
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- Linux:
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  - GitK - free
  - Terminal - free
- Or Eclipse:
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–Can be difficult

–Yes, more difficult than SVN (but after a while it is going to be your best friend in group projects)

Practical

- Let's try Git
- 1st part: single-user exercises that you will do on your machines
- 2nd part: collaboration, conflicts and some other features which I will demo on my computer
- 3rd part: setup a VCS for your team (optional)

Part 1

- Navigate to this practical's git repo: https://github.com/louismrose/VersionControlLecture

- Follow the instructions under Part 1

Part 2

- Collaboration through GUI (SourceTree). I will:
  - Create a repo on BitBucket
  - Clone it locally
  - Create files, stage them and commit
  - Invite a collaborator
  - Work together
  - Create and resolve conflicts
  - Branch and merge

Part 3 (optional)

- Having a VCS for your team project is not a requirement
- … however, I encourage you to do or at least give it a try
- If you are thinking of having one then spent the remaining time on:
  - Choosing which is the best for your needs
  - Experiment with different GUIs and choose which fits you best (or reject them all and use terminal)
  - If you pick Git, then create a repository online (Github or Bitbucket are good services)
  - Add the files you have so far created for your project
  - Try to collaborate
  - If conflicts appear don’t panic - try to resolve them