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Versioning with Git

Teacher

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We will learn Git basics

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Plan:

- What is versioning
- Git introduction
- Lab: practicing Git

What is Versioning?

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Also known as:

- Version Control or Version Control System (VCS)
- Source Control Management (SCM)

What is Versioning?

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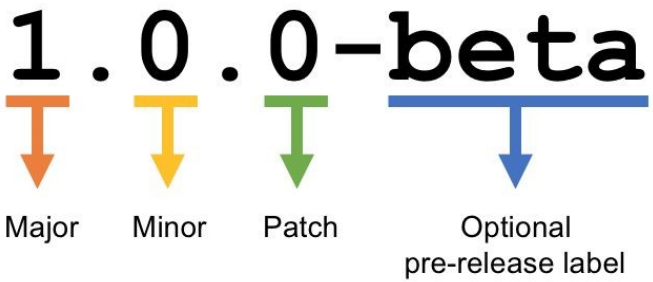
It is the practice of tracking and managing changes to software code.

SCM (or VCS) - tools that help you keep track of your code with a complete history of changes.

What do they manage?

- Code (or any **text-based** documents)
- Project versions:
  - Global project version (**`tags:1.2.4-beta`**)
  - Each modification is a «version»
- Change requests

Semantic Versioning (tag names)



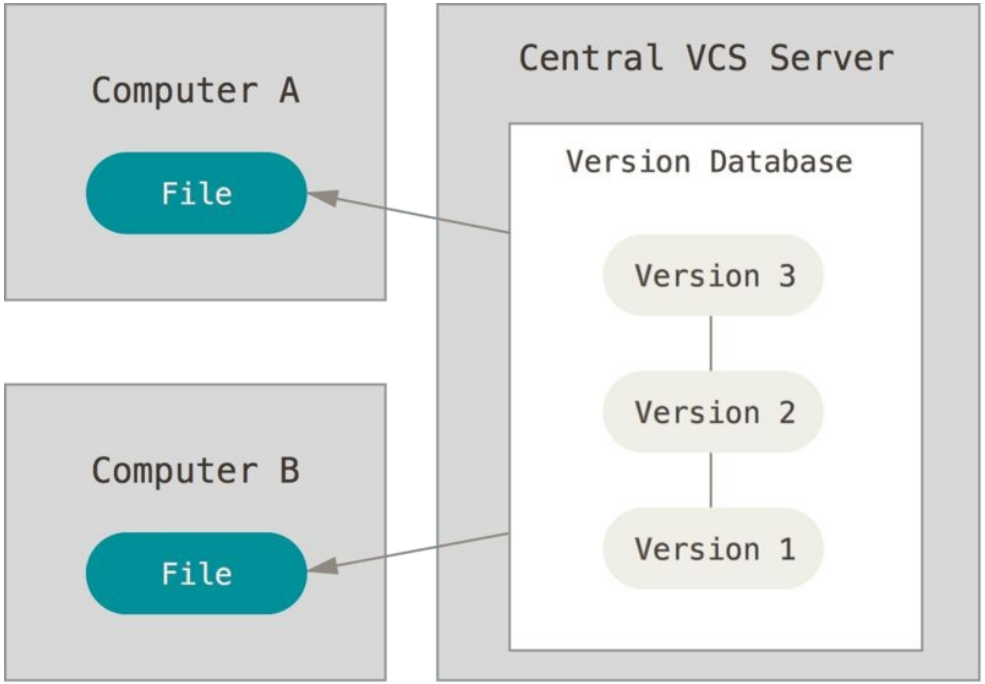
- **MAJOR** - when incompatible API changes
- **MINOR** - when new functionality
- **PATCH** - when bug fixes
- **LABEL** - optional, for pre-releases

What types of VCS?

- Centralized
- Decentralized

Centralized VCS

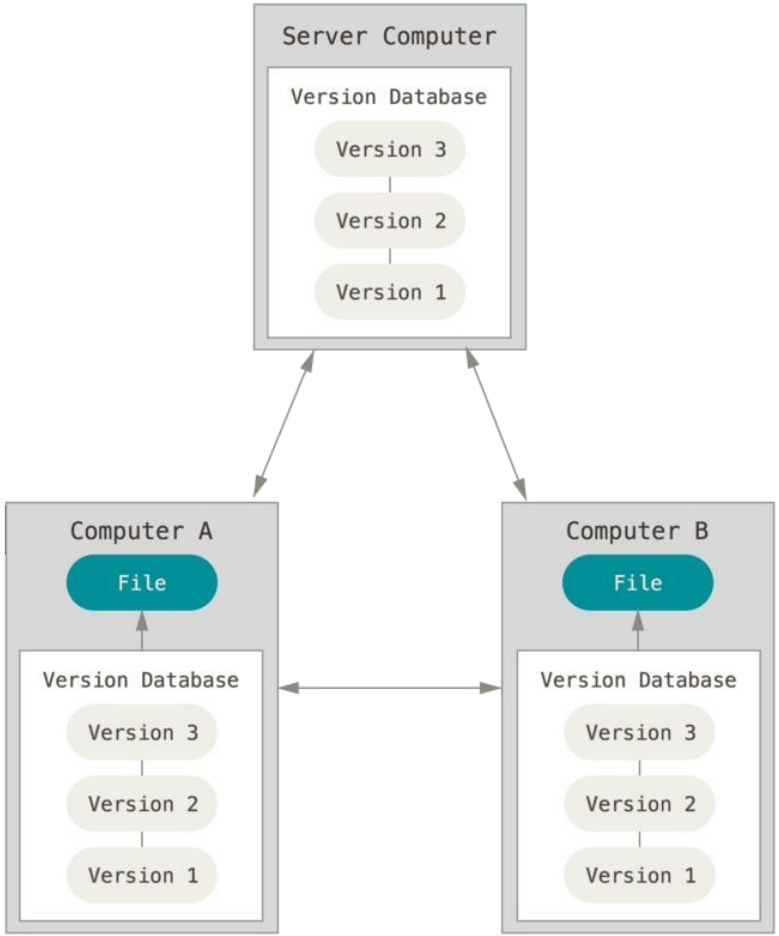
- Needs network
- Single Point of Failure



Decentralized VCS

+ Local work is possible

- Workflow is more comp



Why learning Git?

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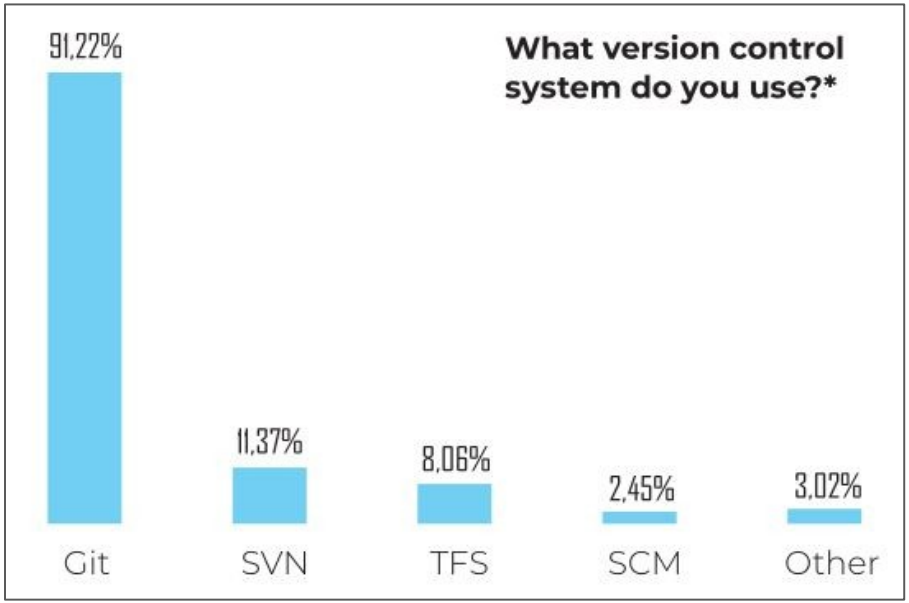
- Alternative to **SVN** (Subversion, created in 2000)



From *State of software development in 2019*, **codingsans.com**

What is Git?

- **The most popular VCS**
- **Decentralized**
- **Open Source and free**
- Created in **2005** by Linus Torvalds

Git repository

- **Is a set of versioned files**

  With entire history of changes

- **Copied to a local folder**

  “.git” folder at the root of a project

- **The users choose the files to version**

Common scenario

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1. Checking out remote changes

   `git clone` or `git pull`

2. Editing a file

   eg: add a new function “attack()” to the “player.js” file

3. Adding a file to “staging area” for the next commit

   `git add player.js`

Common scenario

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4. Commit the modification to the local repository:

```
git commit -m “Add player attack”
```

5. Send local modifications to the **remote** repository

```
git push
```

6. Resolution of any conflicts:

   Code modification + commit

Conflict resolution

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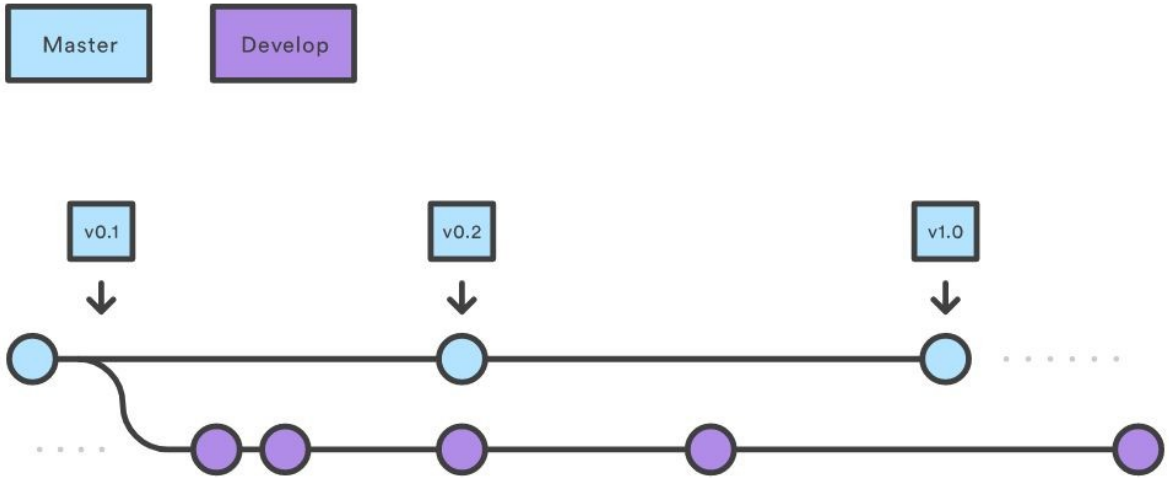
Conflicts - are modifications made on the same line

Must be resolved manually:

- edit files with a resolver tool (or text editor)
- commit the files
- push to the **remote branch**

Branches

- 1 branch = 1 separate versioning space
  → isolation of changes



Managing a git repository

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- Git commands:
  - `pull`, `push`, `merge` ...
  - through a graphical interface: GitHub Desktop, Fork GitKraken...
- Git remote repositories:
  - on GitHub, GitLab, self-hosted...

Git ignore

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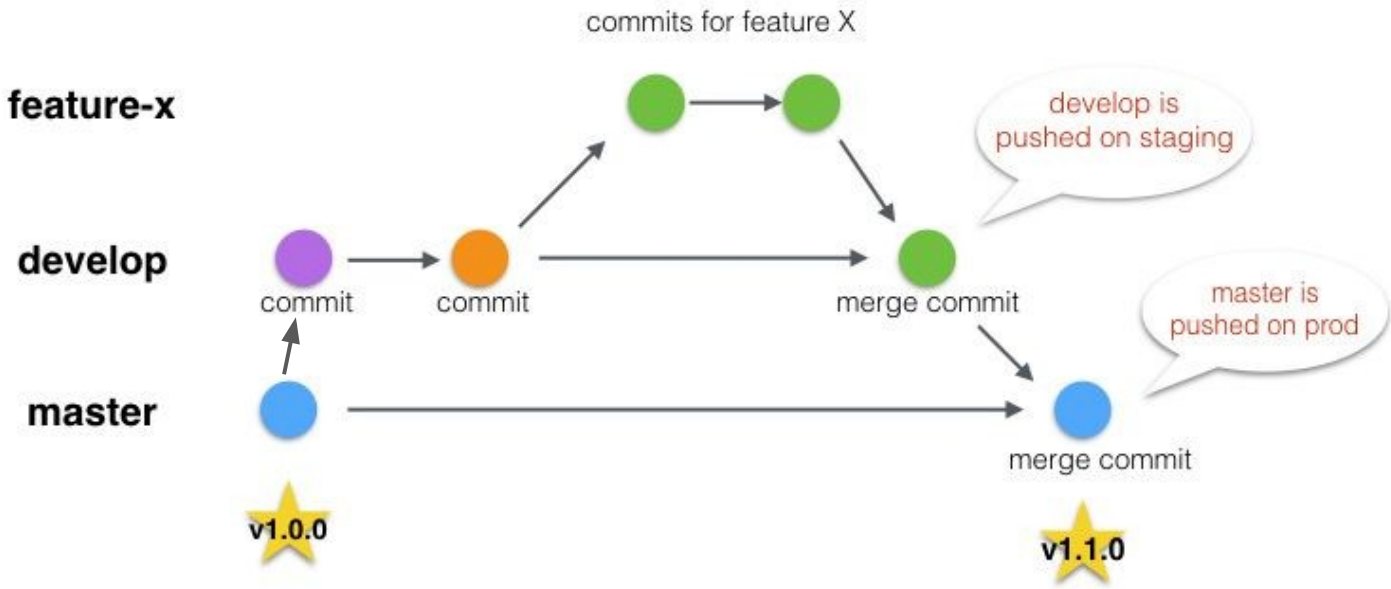
- The “.gitignore” file contains the files to ignore
- Works with wildcards
  - `.*` : ignore all files starting with a “.”
- Useful for ignoring files specific to your environment:
  - codeblocks or VScode files
  - “node_modules” folder in Node.js

Git Flow

Typical organization of versioning:



Where can you use Git?

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- Software development
- Writing (books, articles, theses)
- Whatever requires tracking the history…

Go further

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1. Learn the difference between **merge and rebase**:

   https://dzone.com/articles/merging-vs-rebasing

2. Learn **Conventional Commits** - a specification for writing commit messages:

https://www.conventionalcommits.org/en/v1.0.0-beta.2/