



Course Overview

By
Vijaya Nandini M





Version Control Overview

- Before we jump into the world of **git** and **GitHub**, let's have an optional overview of **version control**.



Version Control Overview

- **Version Control**

- When working with digital files, whether is a .docx Word file or a programming .py Python file, you probably don't finish all your work at once.
- In this case, the software you use to manage and track changes in these files is your **version control**.



Version Control Overview

- **Version Control**

- You could create your own version control system, such as using multiple files:
 - `My_Paper.docx`



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 - My_Paper.docx
 - My_Paper_v2.docx



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 - My_Paper.docx
 - My_Paper_v2.docx
 - My_Paper_Final.docx



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- You could create your own version control system, such as using multiple files:
 - My_Paper.docx
 - My_Paper_v2.docx
 - My_Paper_Final.docx
 - My_Paper_Actual_Final.docx

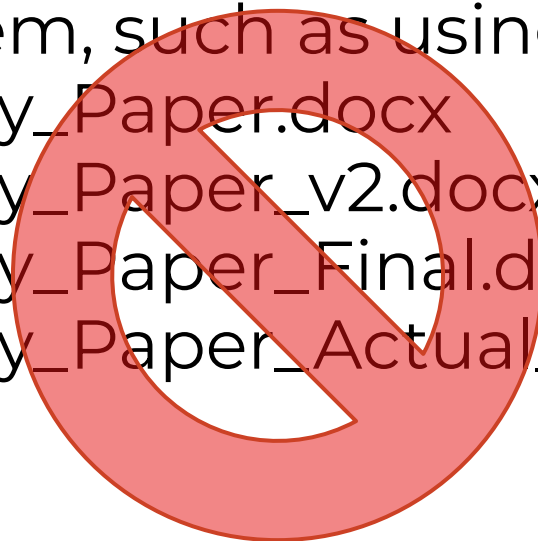


Version Control Overview

- **Version Control**

- You could create your own version control system, such as using multiple files:

- My_Paper.docx
- My_Paper_v2.docx
- My_Paper_Final.docx
- My_Paper_Actual_Final.docx





Version Control Overview

- **Version Control**

- Alternatively, you could decide just to keep updating the same file over and over again.
- But what happens if you want to go back to a historical version, perhaps because of a bug in your newest version?
- What if you want to work with others on the same code?



Version Control Overview

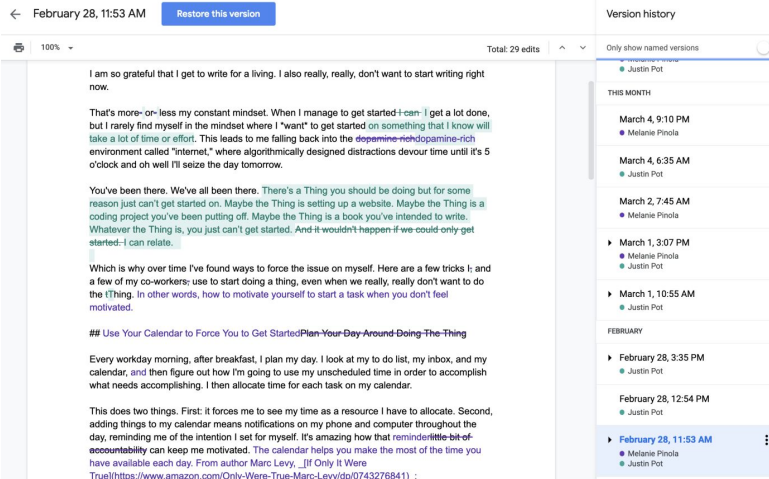
- **Version Control**
 - Clearly we need a more robust system that can allow us to work on the same file, yet retain information about previous versions.
 - A **version control system (VCS)** allows us to track changes, undo changes, compare versions, work with others, and more!



Version Control Overview

- **Version Control**

- Version control is starting to become more common in consumer tools:





Version Control Overview

- **Version Control**

- Git itself is one example of a **VCS**, and while there are others (subversion, mercurial, etc...), **git** is by far the most popular VCS in the world.
- Fortunately for us **git** is free and open-source and we can download it to our own computer.



Version Control Overview

- **Version Control**

- *What is GitHub? (or GitLab?)*
 - You can use git completely free locally, and use it to track changes on your local files on your own computer.
 - However if you want to host your code on the internet, its typically easier to use a hosting service like GitHub.



Version Control Overview

- **Version Control**

- *What is GitHub? (or GitLab?)*
 - GitHub (owned by Microsoft) integrates easily with git and allows you to have versions of your code “live” on the internet for you and others to access, update, and change from any machine.



Version Control Overview

- **Version Control**

- *GitHub vs. git*

- GitHub is **not** the same thing as “git”.

- Git:

- Open source VCS software.

- GitHub:

- Company that operates a service for hosting files on the internet that are managed using git.



Version Control Overview

- **Version Control**

- Let's briefly visualize how .git would work on a simple file.
- Keep in mind, we'll do a much deeper dive into all of this.



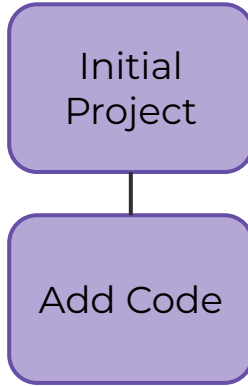
Version Control Overview

Initial
Project





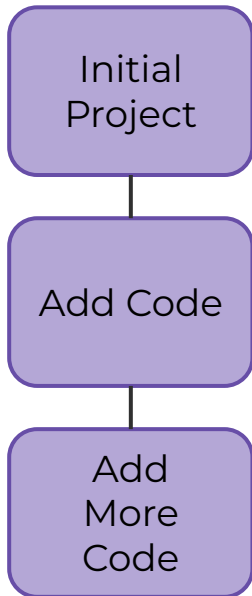
Version Control Overview



Add Code



Version Control Overview

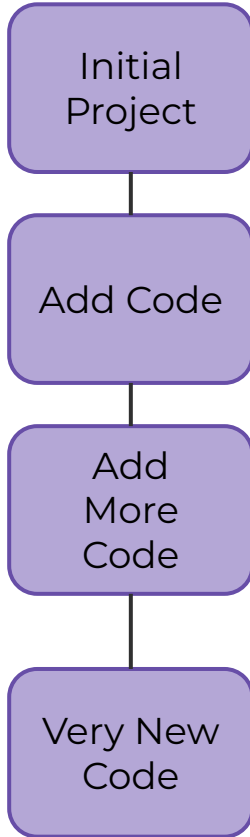


Add Code

More Code



Version Control Overview



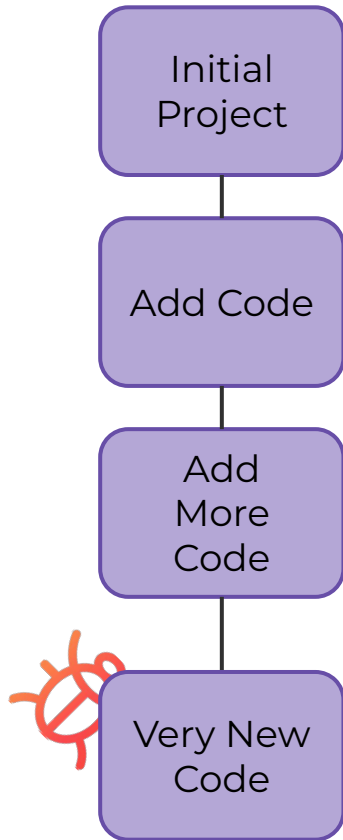
Add Code

More Code

Very New Code



Version Control Overview



Add Code

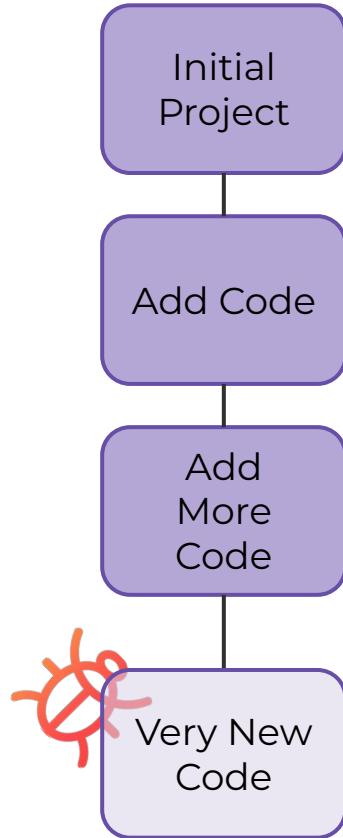
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Very New Code






Version Control Overview



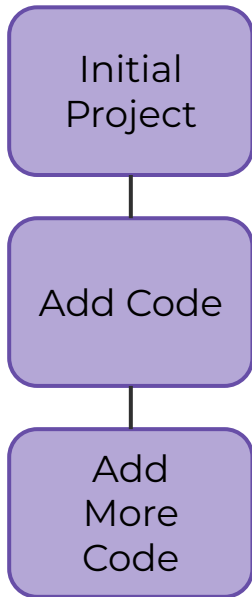
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Very New Code 



Version Control Overview

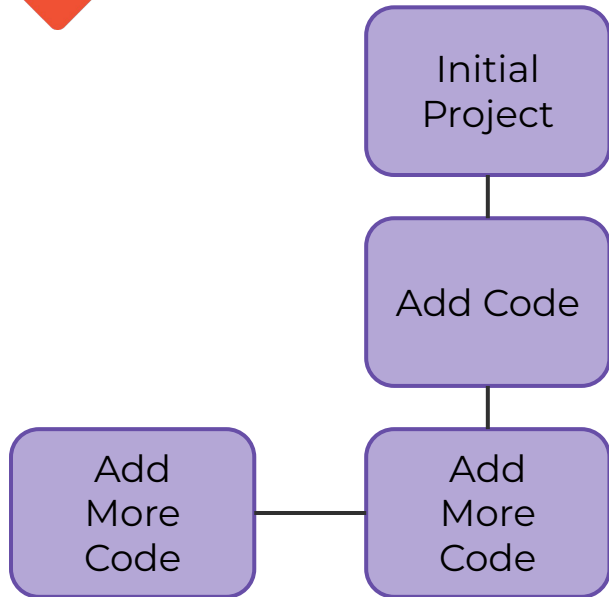


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Version Control Overview



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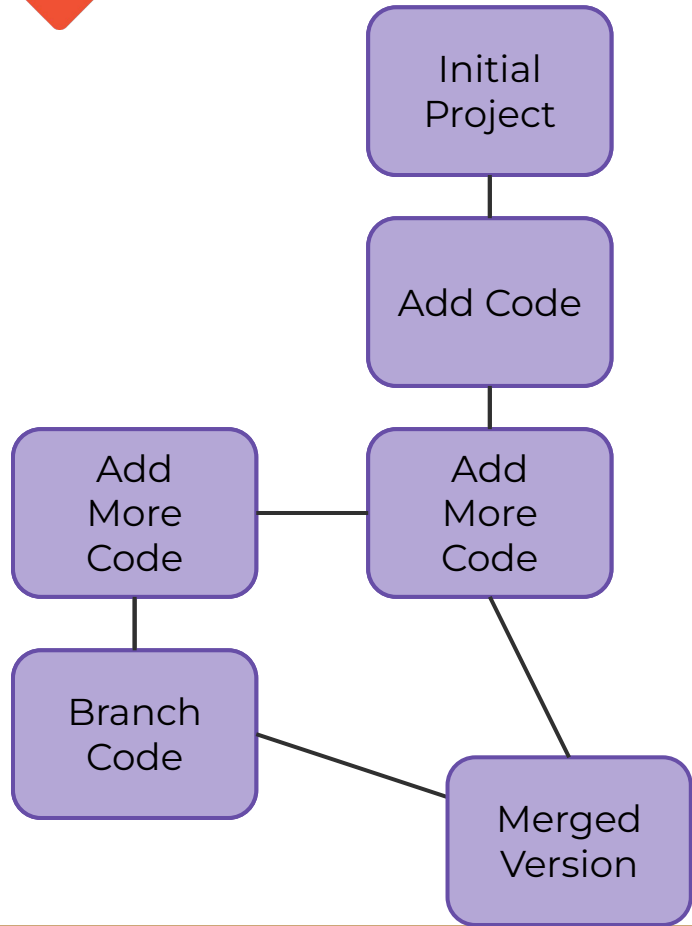
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More Code



Version Control Overview



Add Code

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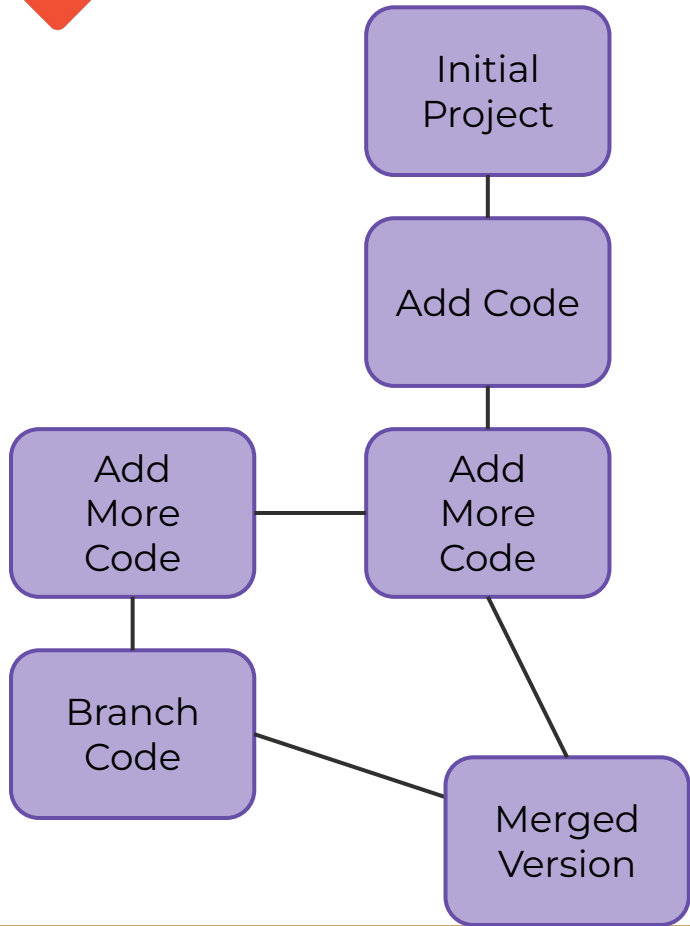
Branch Code

Add Code

More Code



Version Control Overview



Add Code

More Code

Branch Code

Add Code

More Code

Branch Code



Version Control Overview

- **Version Control**

- A VCS such as git allows you to add “save points” to your work, create changes, update existing code, undo changes, create branches for others to work on, and merge work together.