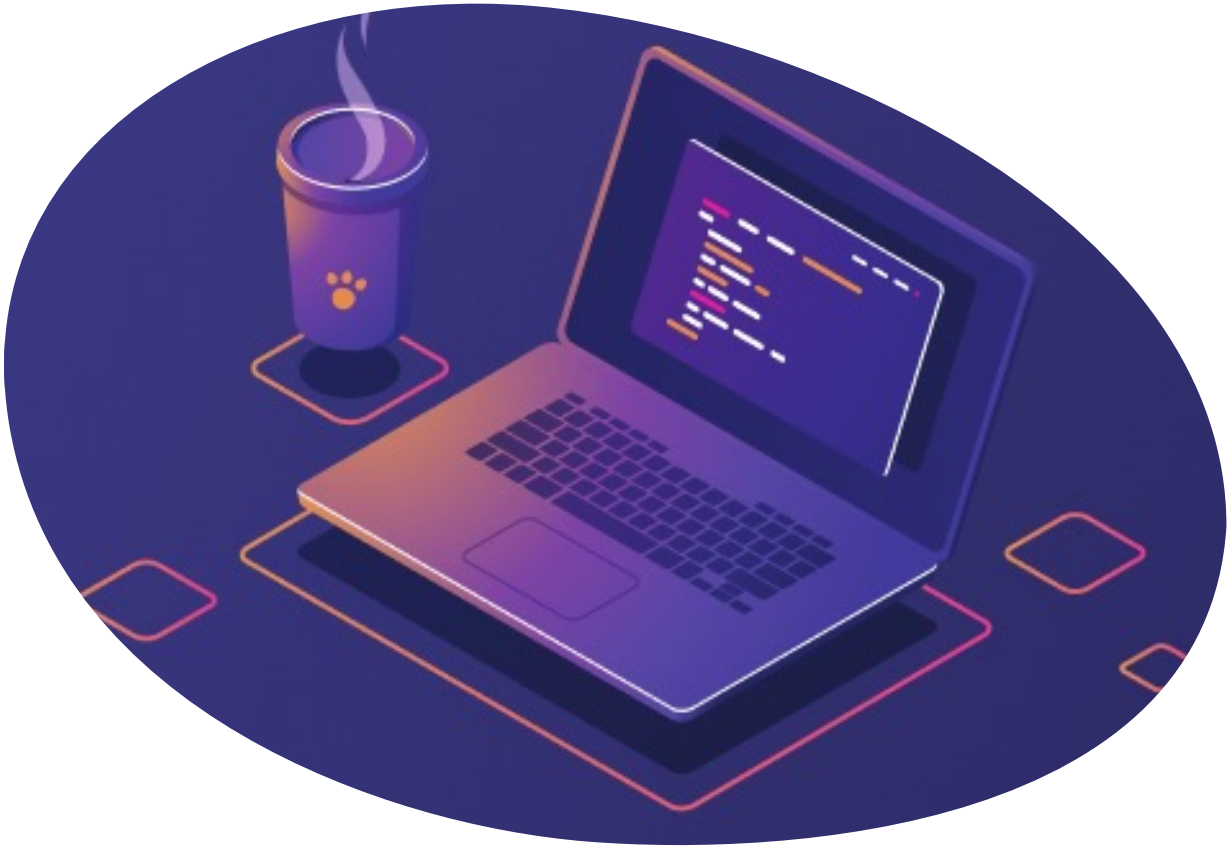

Document

Group

Week1 : SOFTWARE DEVELOPMENT TOOLS AND ENVIRONMENTS

แผนการสอน	
สัปดาห์ที่	หัวข้อ
1	Git and GitHub Configure Git Creating and Cloning Repositories Private Repositories and Token Lab week 1
2	Understanding Git Usage and Workflow Add and Commit Git Log Git Remote and Git Push Fetch and Pull Lab week 2
3	Understanding Branches Understanding HEAD Git Branch Commands Delete and Rename Branches Merging Branches - Theory and Concepts Merging Branches in Practice Git Diff Lab week 3
4	Git with Going back and Undoing Changes -Git Checkout and Detached HEAD -Git Restore, Git Reset, Git Revert Undoing Changes - Exercise and Solution
5	Docker Docker Overview Basic Docker Commands Docker Run Docker Images Environment Variables Command vs Entrypoint Labs - Docker Images Labs - Environment Variables Labs - Command vs Entrypoint
6	Docker Compose Docker Registry Lab: Docker Registry Labs: Docker Compose
7	Docker Engine Docker Storage Docker Networking Labs - Docker Storage Labs - Docker Networking
8	Docker Swarm Docker Service Docker Stacks CI/CD - Docker Integration Lab

5	Docker Docker Overview Basic Docker Commands Docker Run Docker Images Environment Variables Command vs Entrypoint Labs - Docker Images Labs - Environment Variables Labs - Command vs Entrypoint
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7	Docker Engine Docker Storage Docker Networking Labs - Docker Storage Labs - Docker Networking
8	Docker Swarm Docker Service Docker Stacks CI/CD - Docker Integration Lab
9	Kubernates 1 Container Orchestration Kubernetes Architecture PODs
10	Kubernates 2 Basics of Networking in Kubernetes ReplicaSets and Deployments
11	Micro service
12	Jenkins
13	Mini Project Pitching
14	Mini Project Pitching
15	Mini Project Pitching
16	Mini Project Pitching

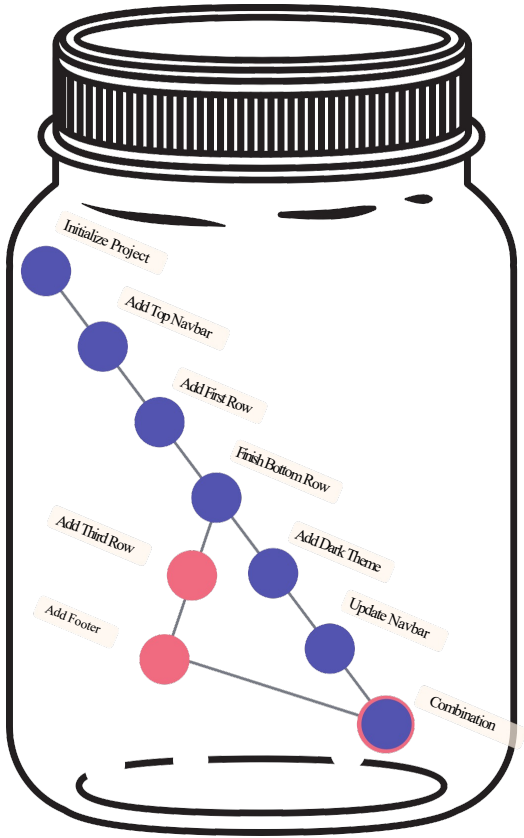
กลางภาค	30
ปลายภาค	30
LAB	20
Mini project	20

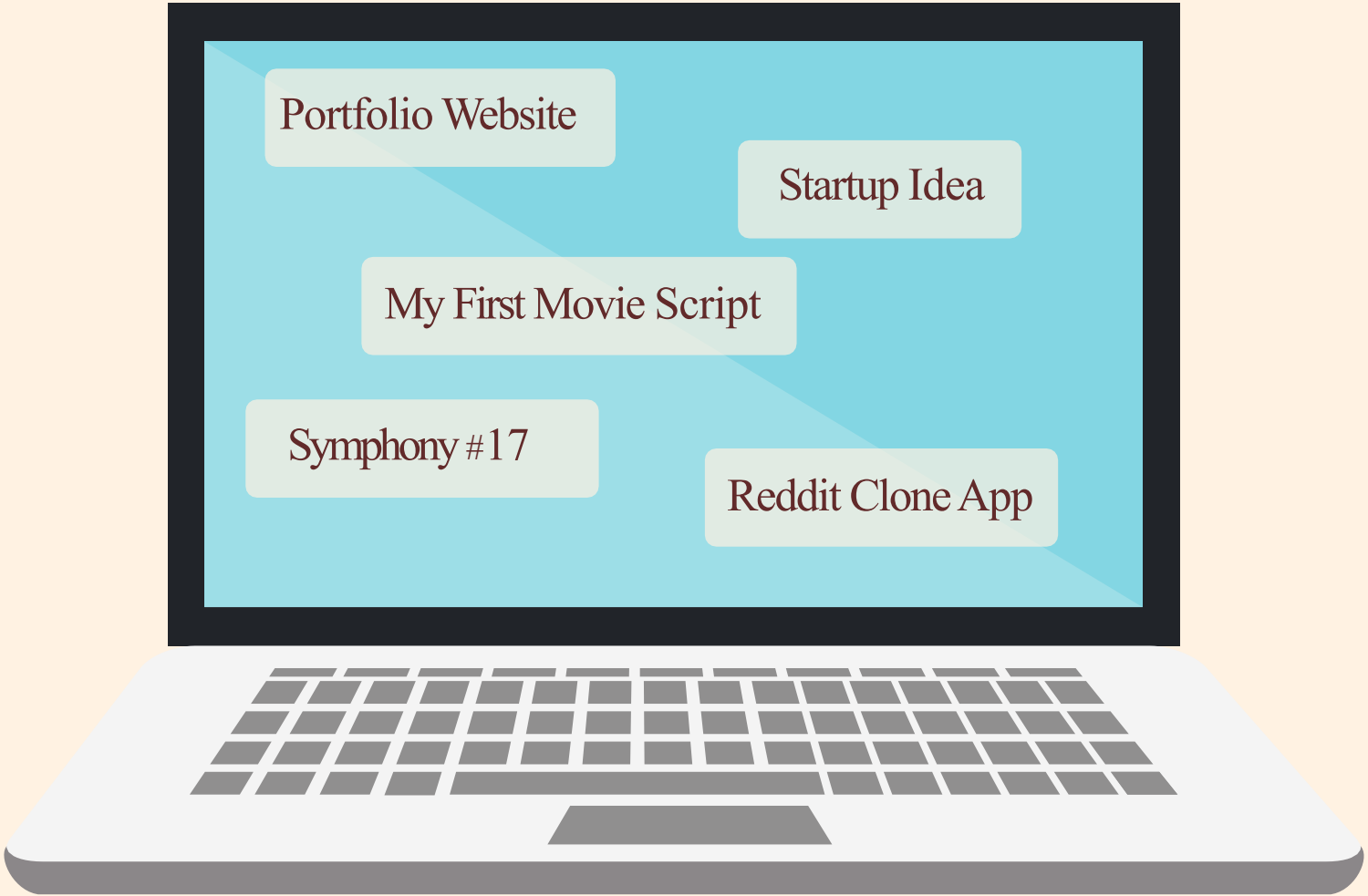
- Git was developed in 2005 by **Linus Torvalds**
- Git is **Version control system** is a system that records changes to a file or set file over time so that you. can restore specific version later
- Git is a **Distributed Version Control System**

Repository

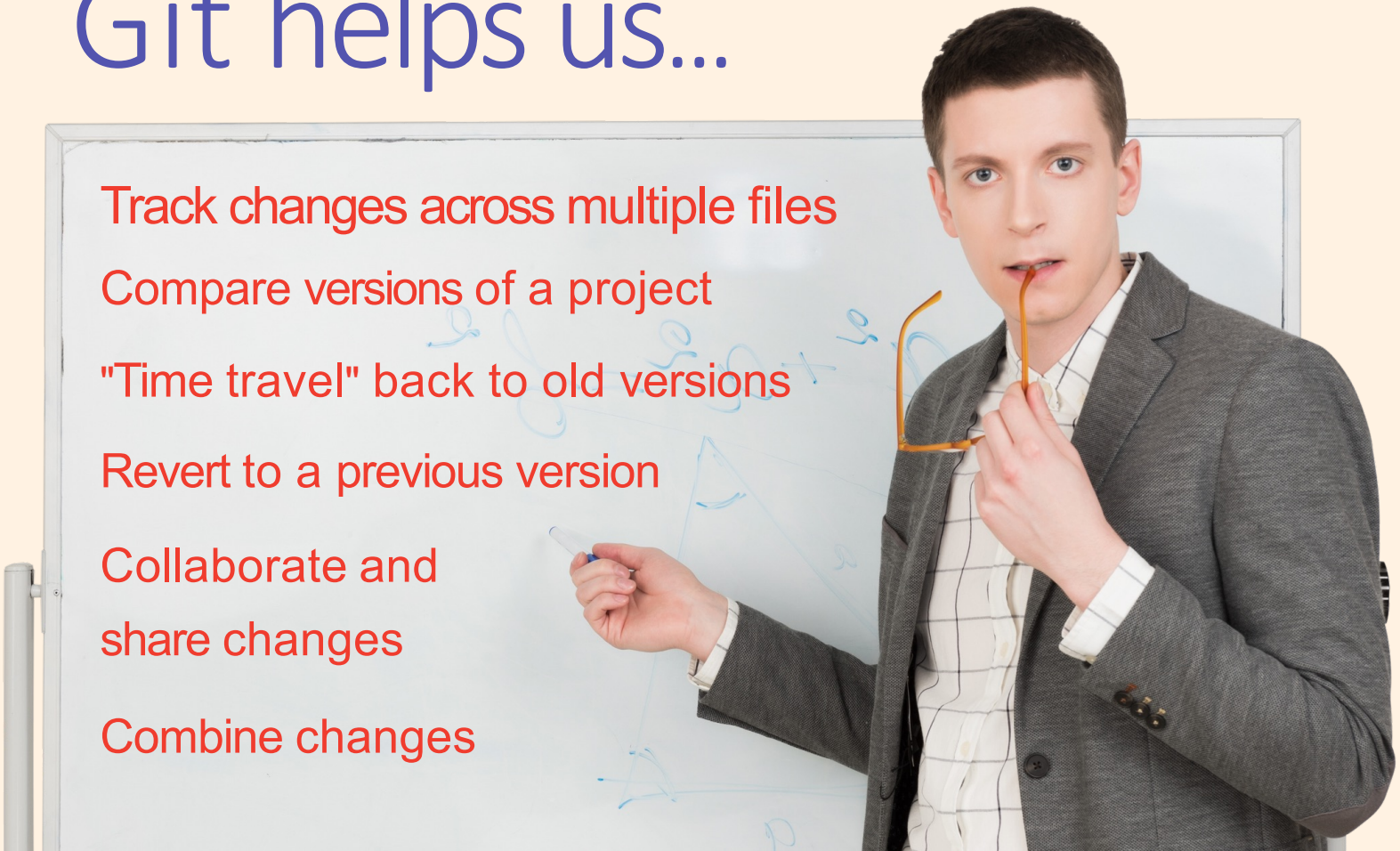
A Git "Repo" is a workspace which tracks and manages files within a folder.

Anytime we want to use Git with a project, app, etc we need to create a new git repository. We can have as many repos on our machine as needed, all with separate histories and contents




Portfolio Website
Startup Idea
My First Movie Script
Symphony #17
Reddit Clone App

Git helps us...



Track changes across multiple files

Compare versions of a project

"Time travel" back to old versions

Revert to a previous version

Collaborate and
share changes

Combine changes

Git – What and Why

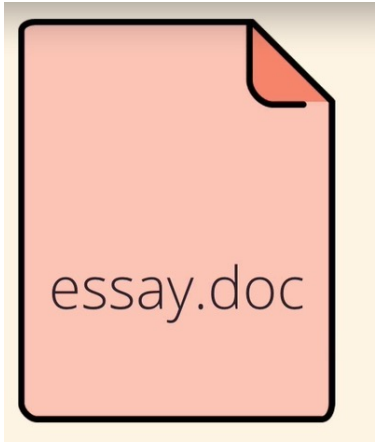
Oh boy, I sure do love playing my video games!

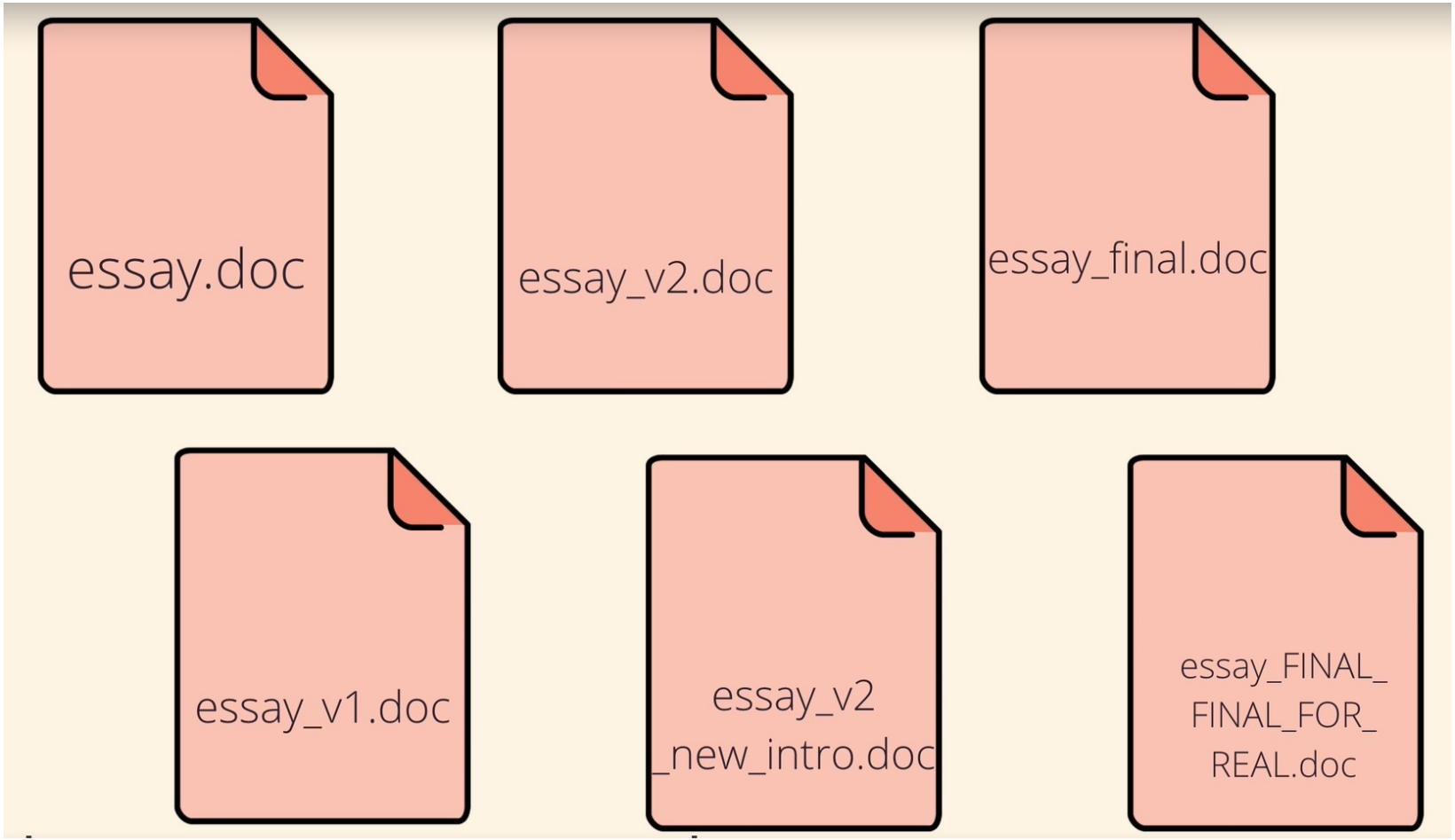
I'm going to save my game now in case I die soon!

Oh jeez, this is going to be a difficult fight!

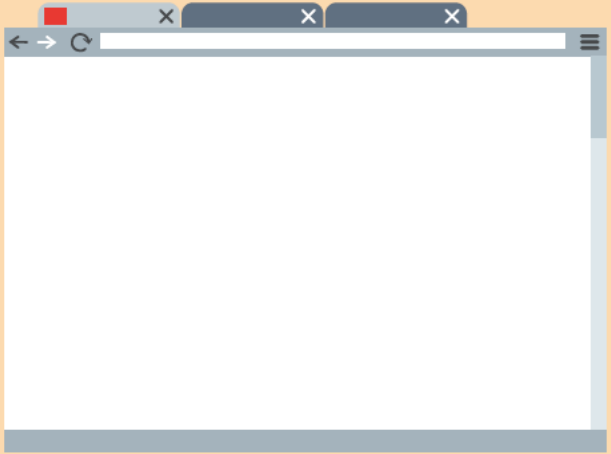
ughhhhh I died!

Thank heavens I saved my game! I can just revert!


essay.doc

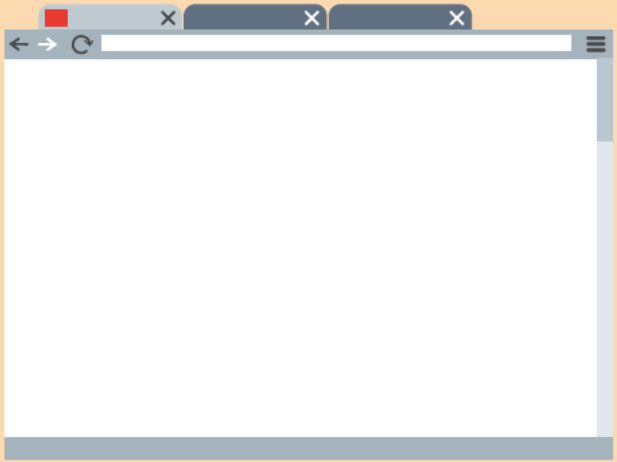

essay.doc
essay_v2.doc
essay_final.doc
essay_v1.doc
essay_v2
_new_intro.doc
essay_FINAL_
FINAL_FOR_
REAL.doc

I Start A New Project!



Add A Checkpoint

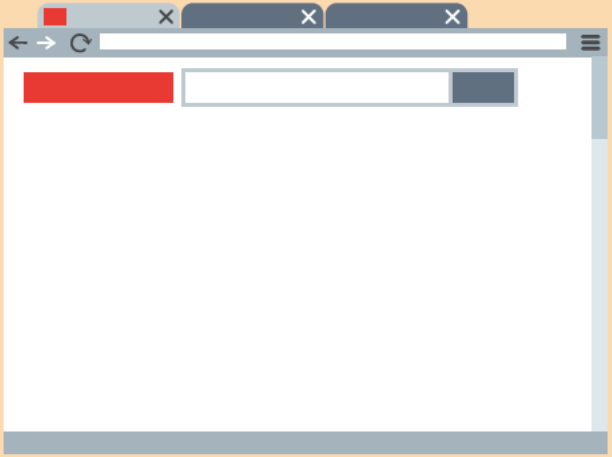
Initialize Project



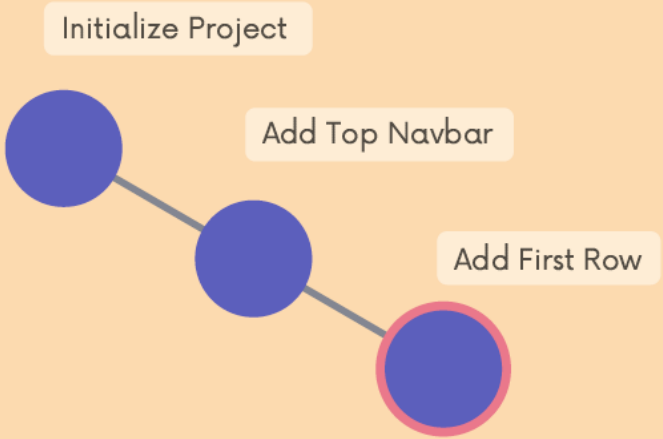
Add A Checkpoint

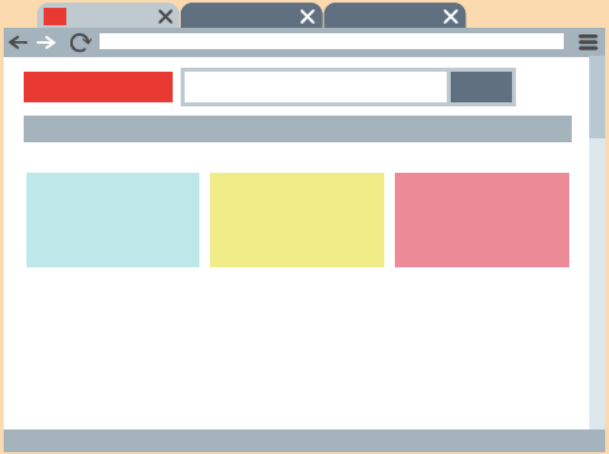
Initialize Project

Add Top Navbar

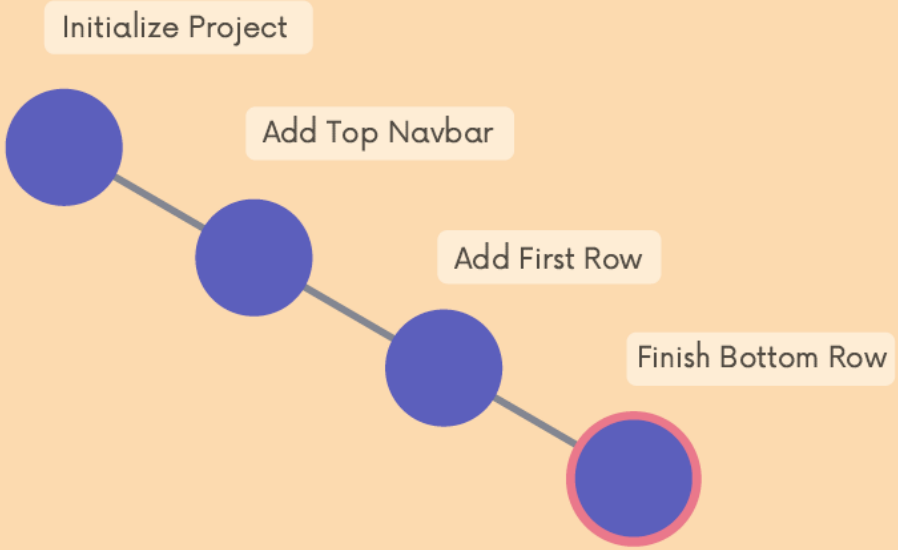


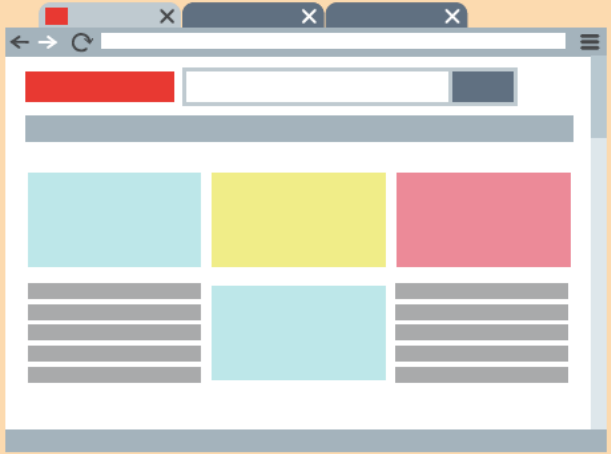
Add A Checkpoint



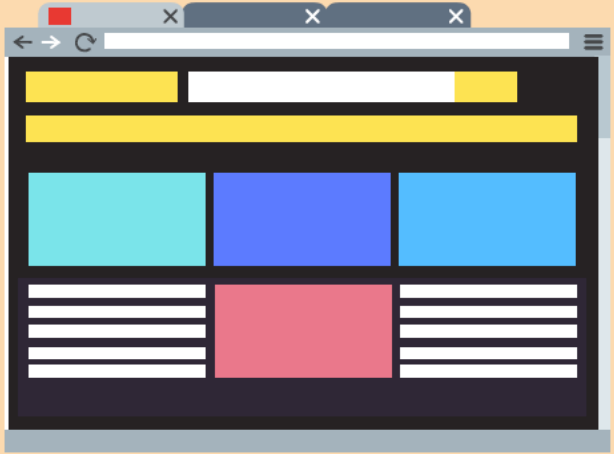


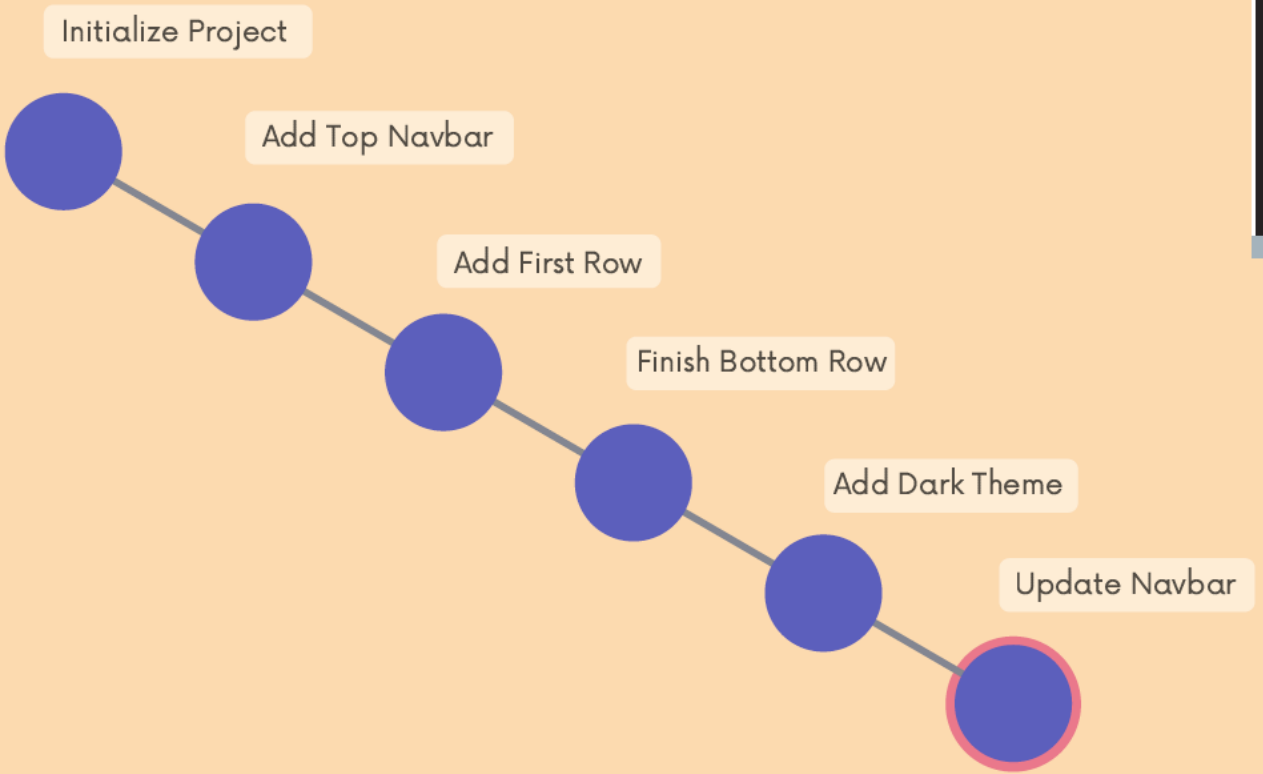
Add A Checkpoint





Add A Checkpoint

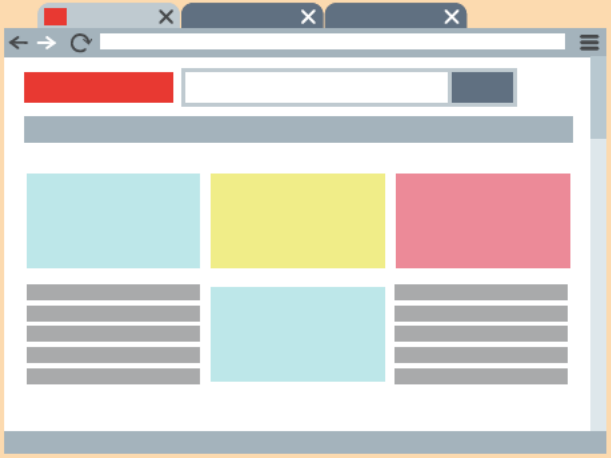


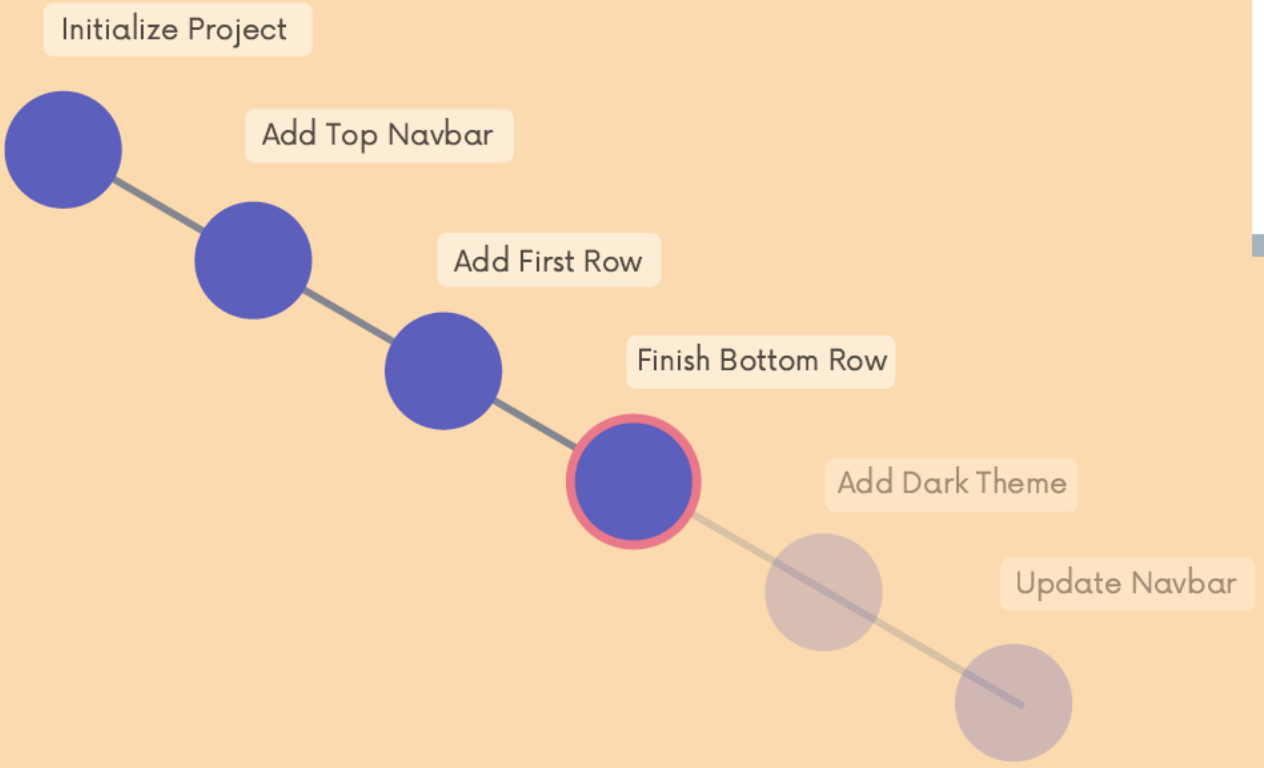


ANGRY BOSS SAYS...

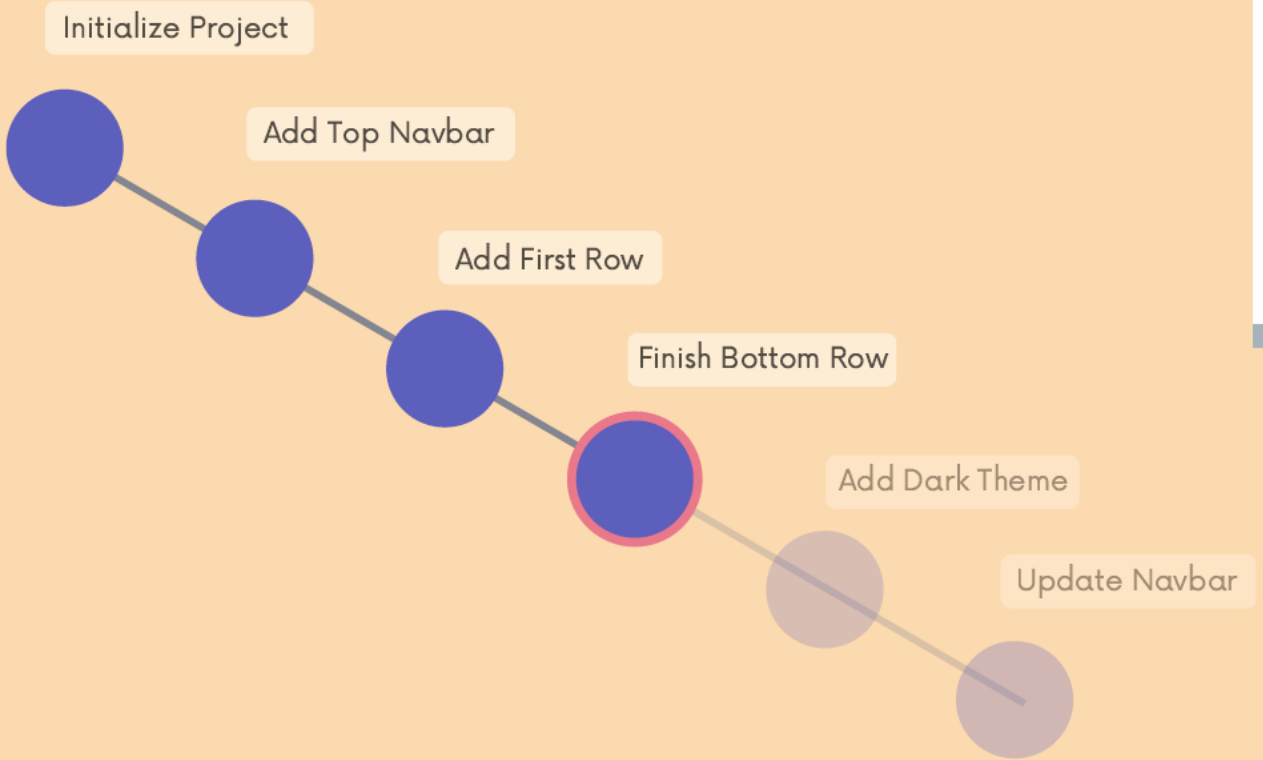
THE COLORS ARE BAD!

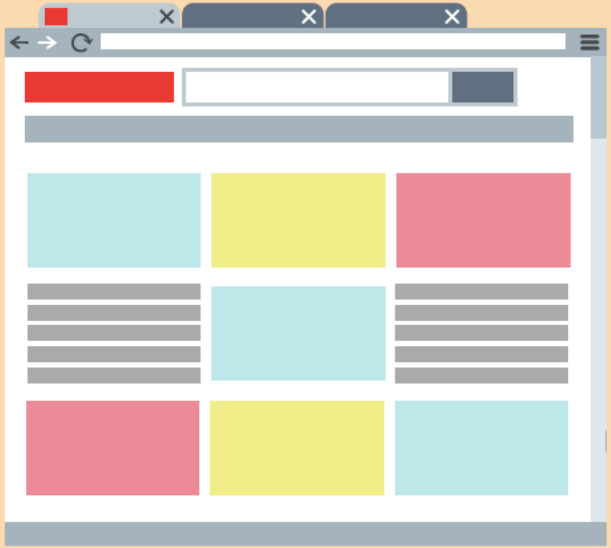
I can go back to prior checkpoints I made!





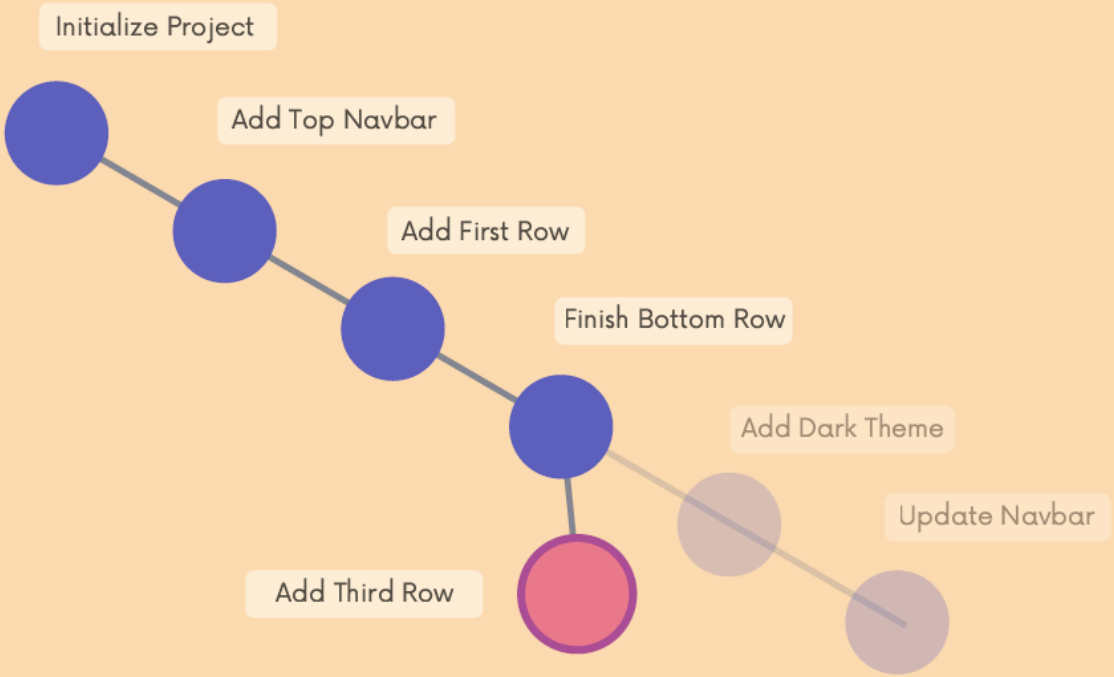
I can even start more work off of an old checkpoint

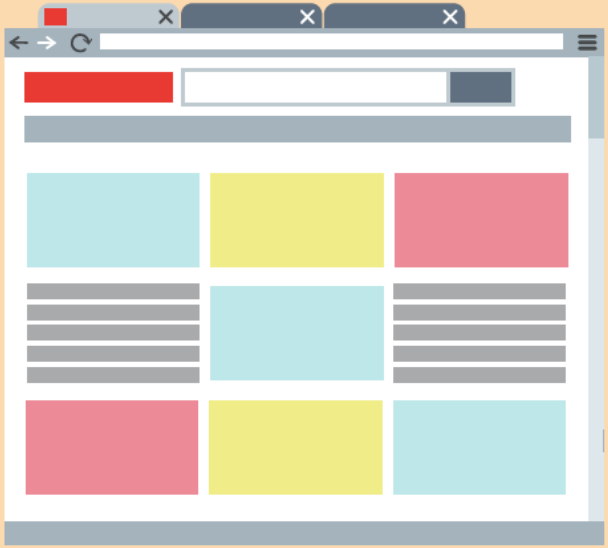




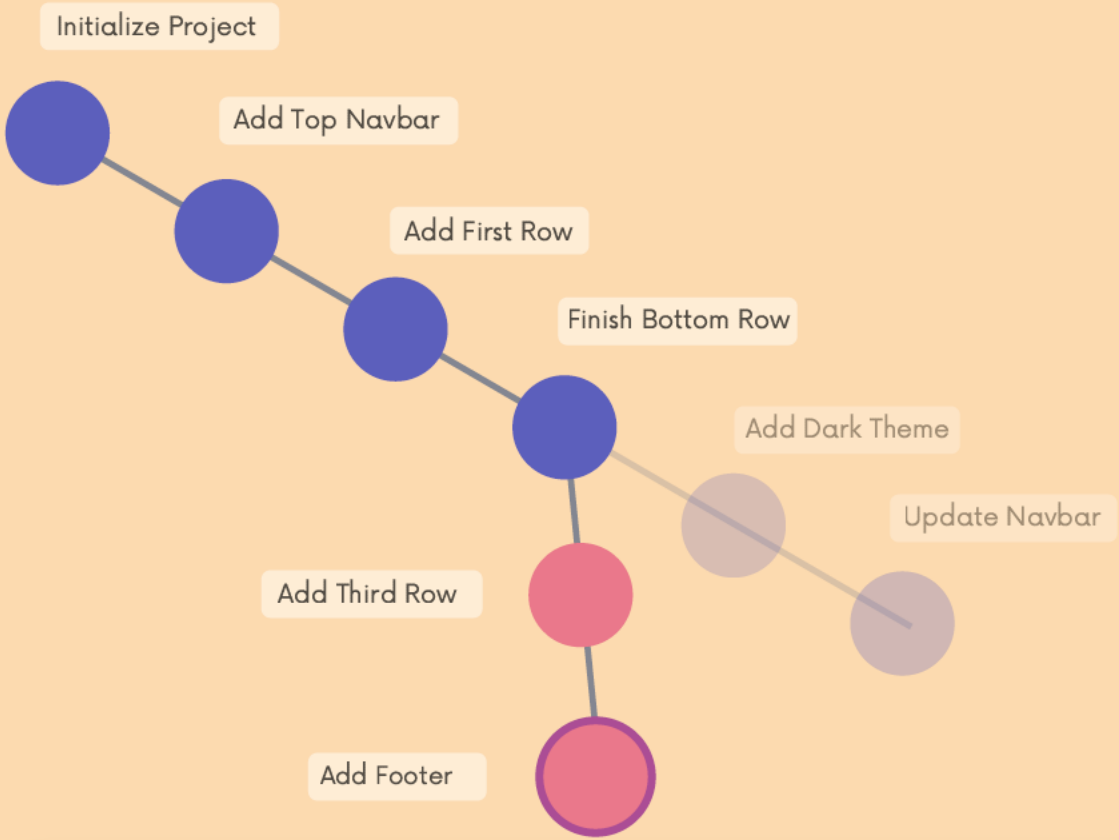
I add more content!

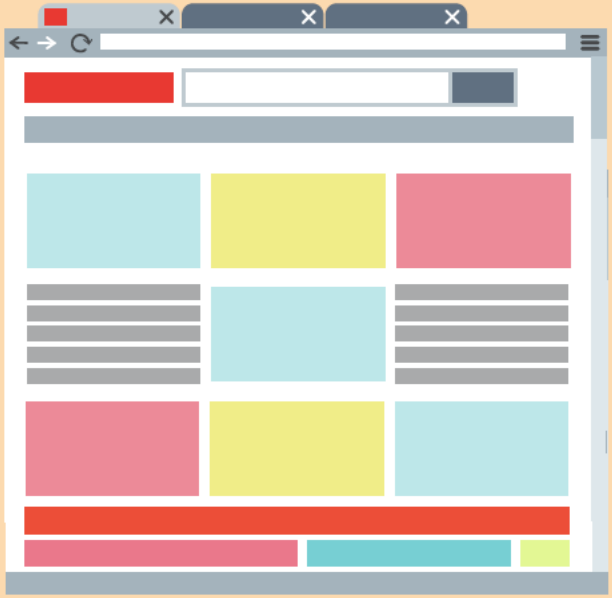
I add a new checkpoint!



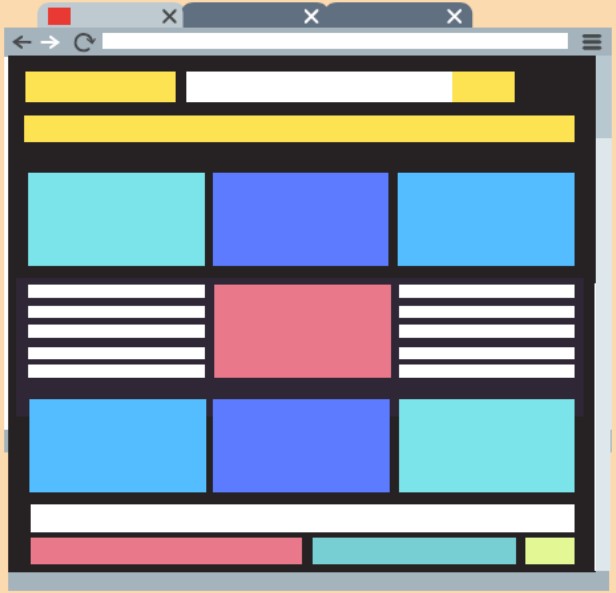


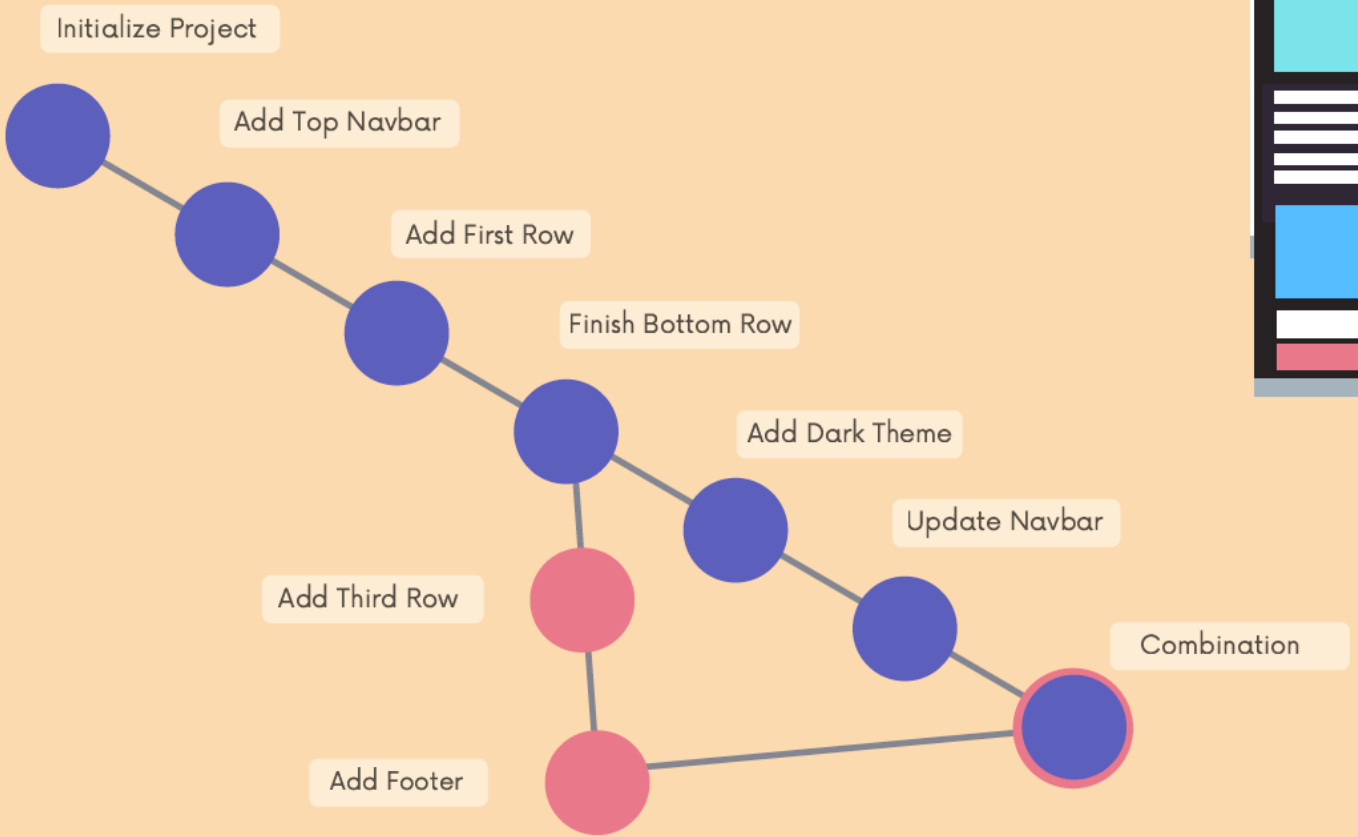
Another checkpoint!





And I can even combine checkpoints!





Before Version Control System

Before Version Control System

Before Version Control System

Version 1.0

running code version 1.0

Before Version Control System

Version 1.0

I have a great idea, send me your code

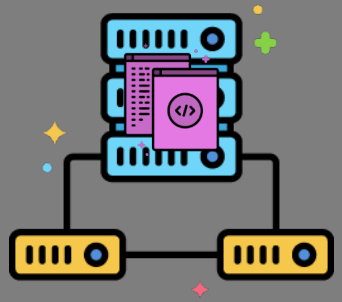
Version 2.0

running code version 1.0

Before Version Control System

Version 1.0

Version 2.0



running code version 2.0

Before Version Control System

Version 1.0

Version 2.0

running code version 2.0

Before Version Control System

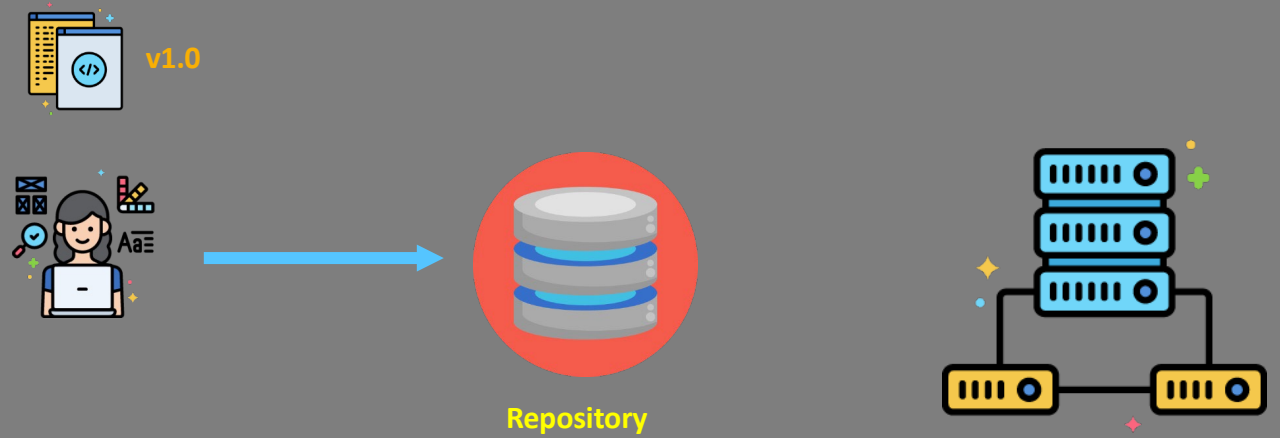
Version 1.0

Version 2.0

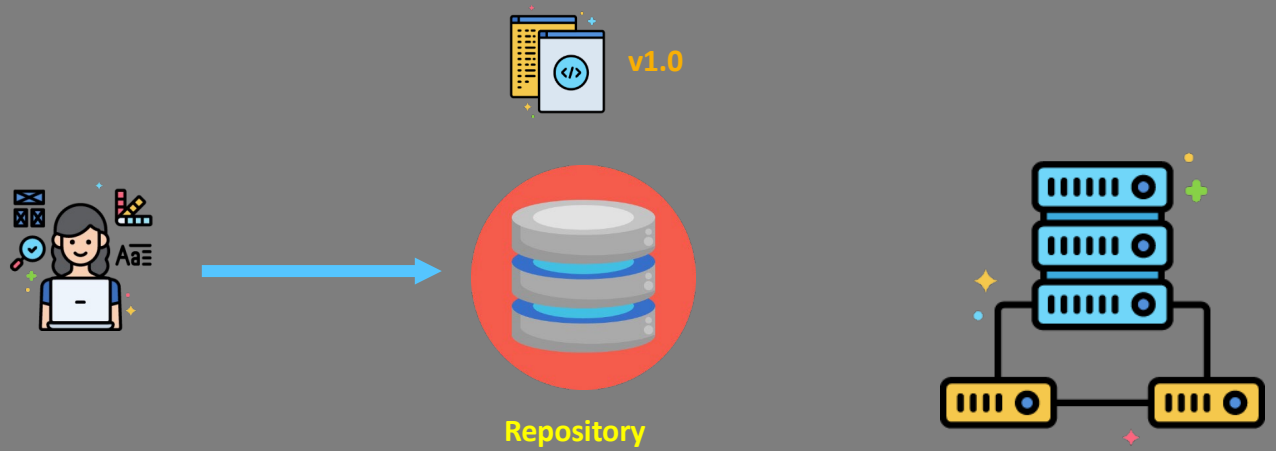
running code version 2.0

- Rollback is time consuming
- No audit tracking
- Not scalable for large teams

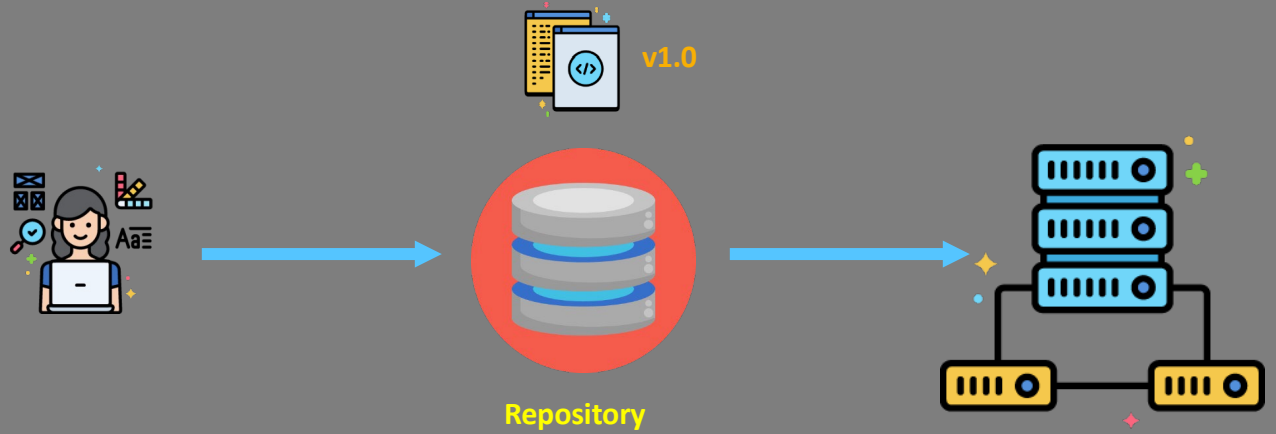
Version Control System



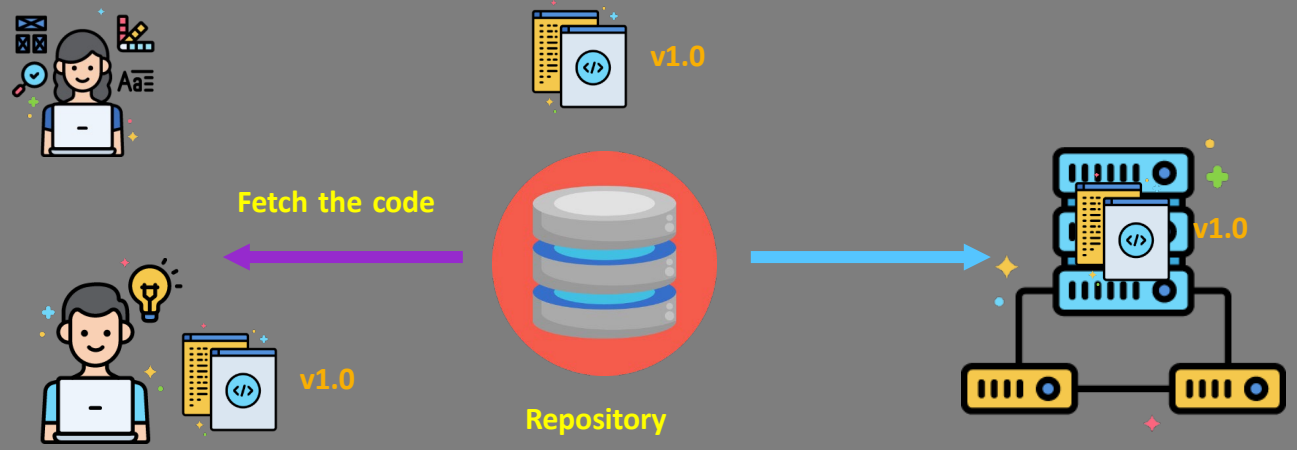
Version Control System



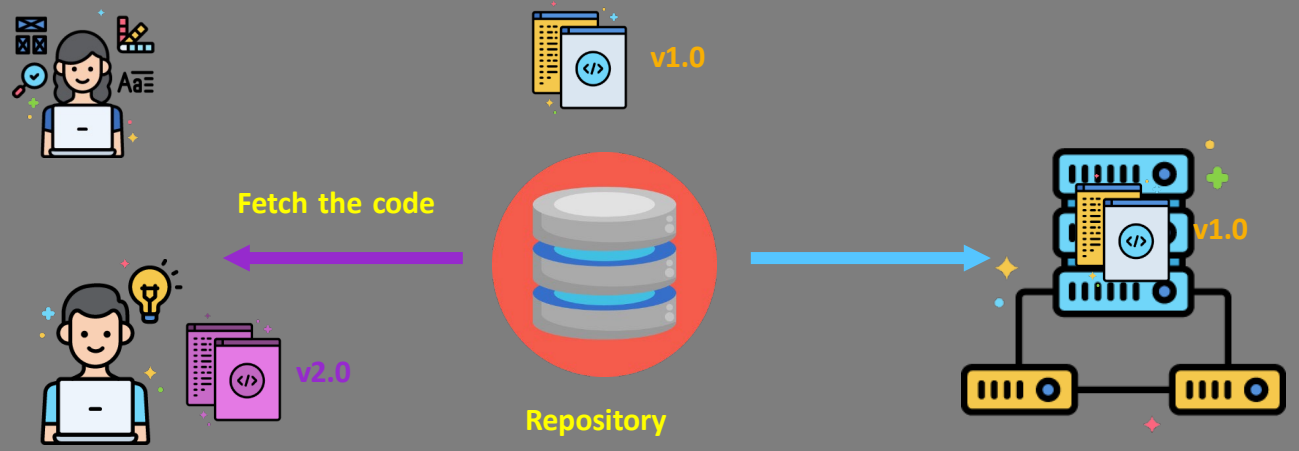
Version Control System



Version Control System



Version Control System



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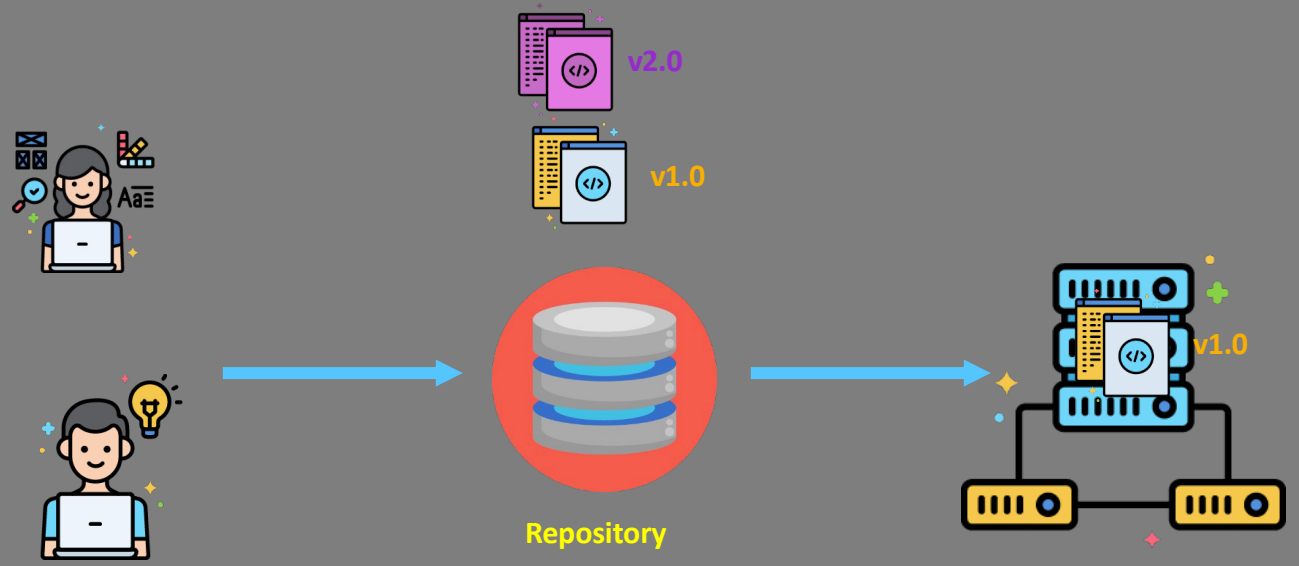

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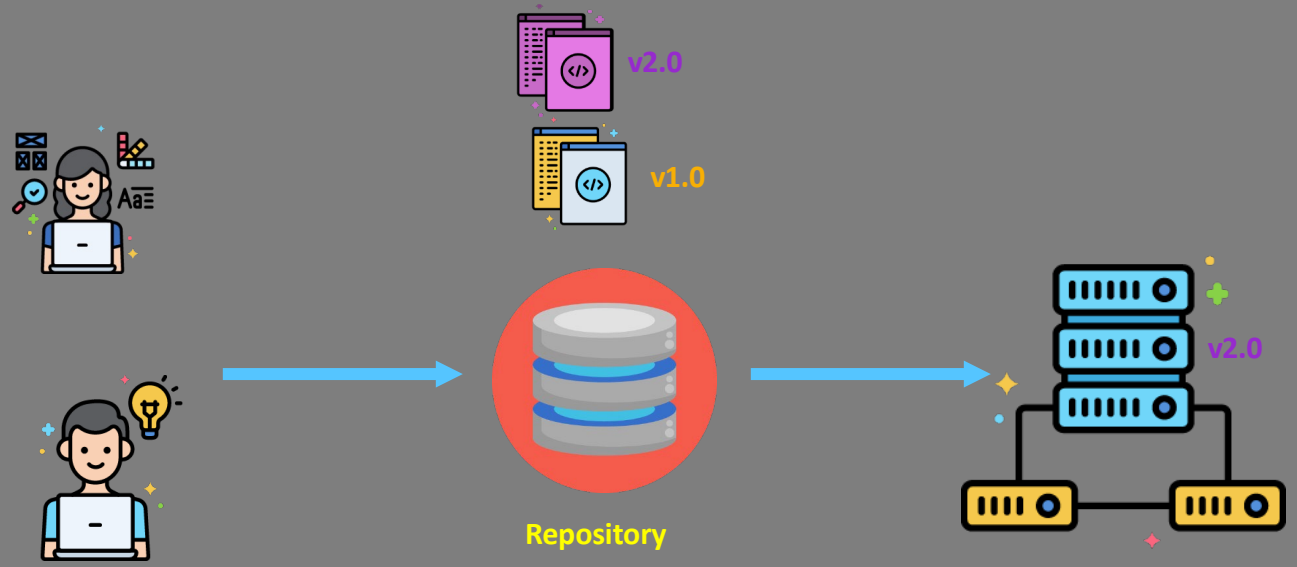

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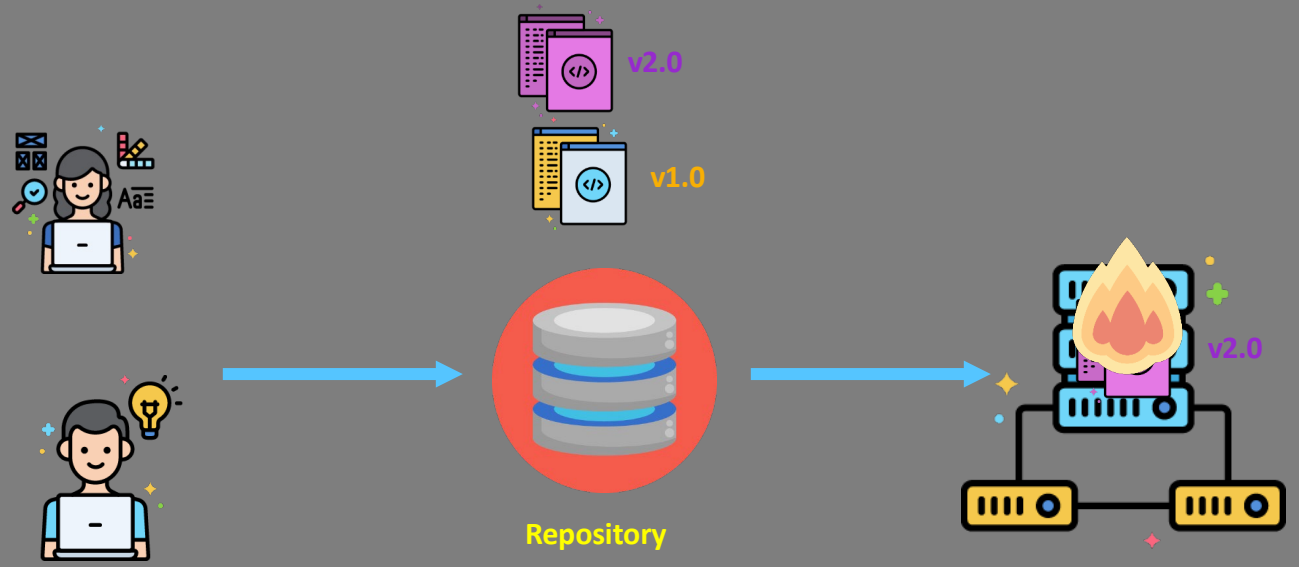
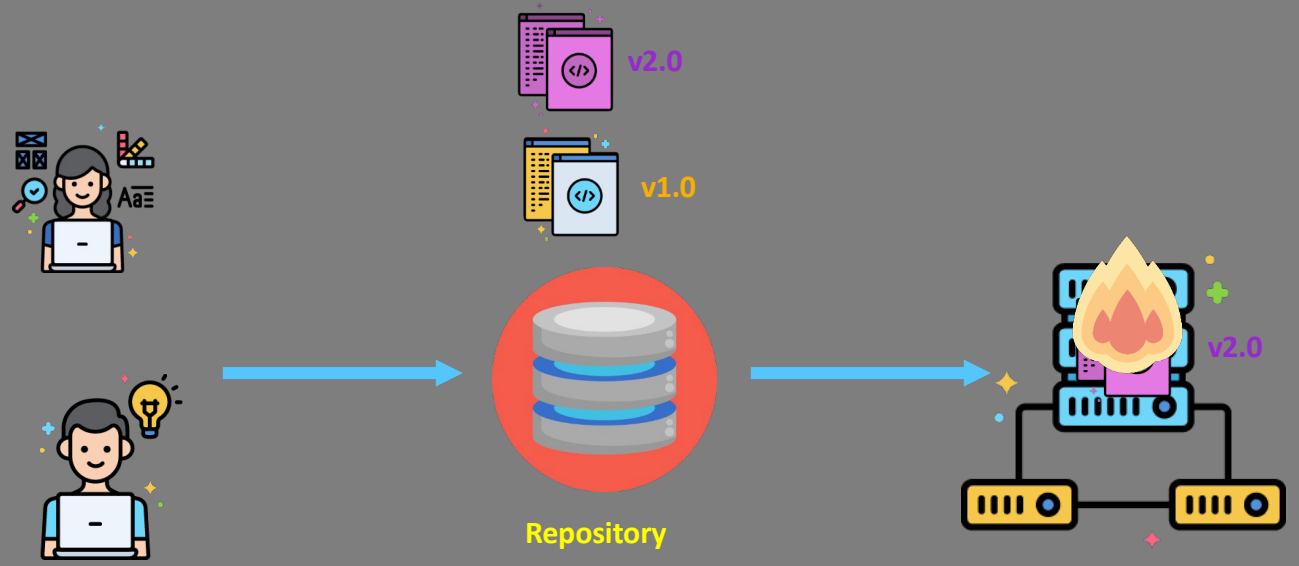
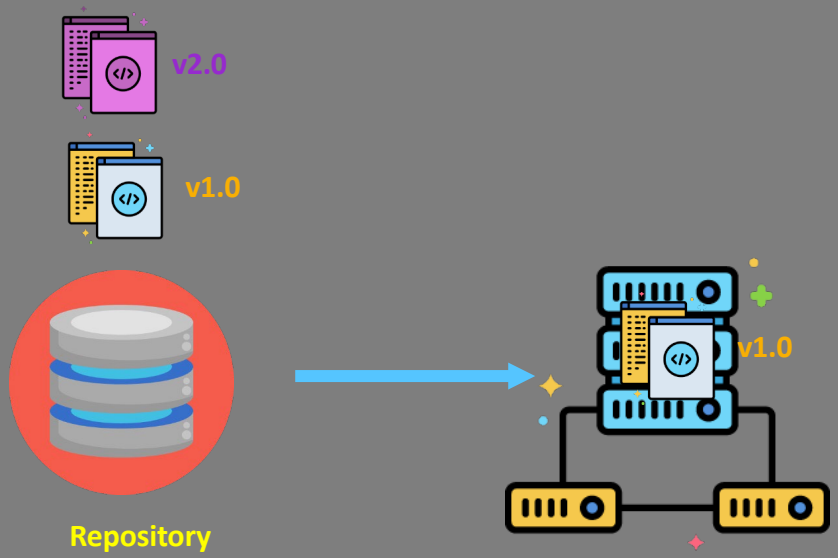


Version Control System



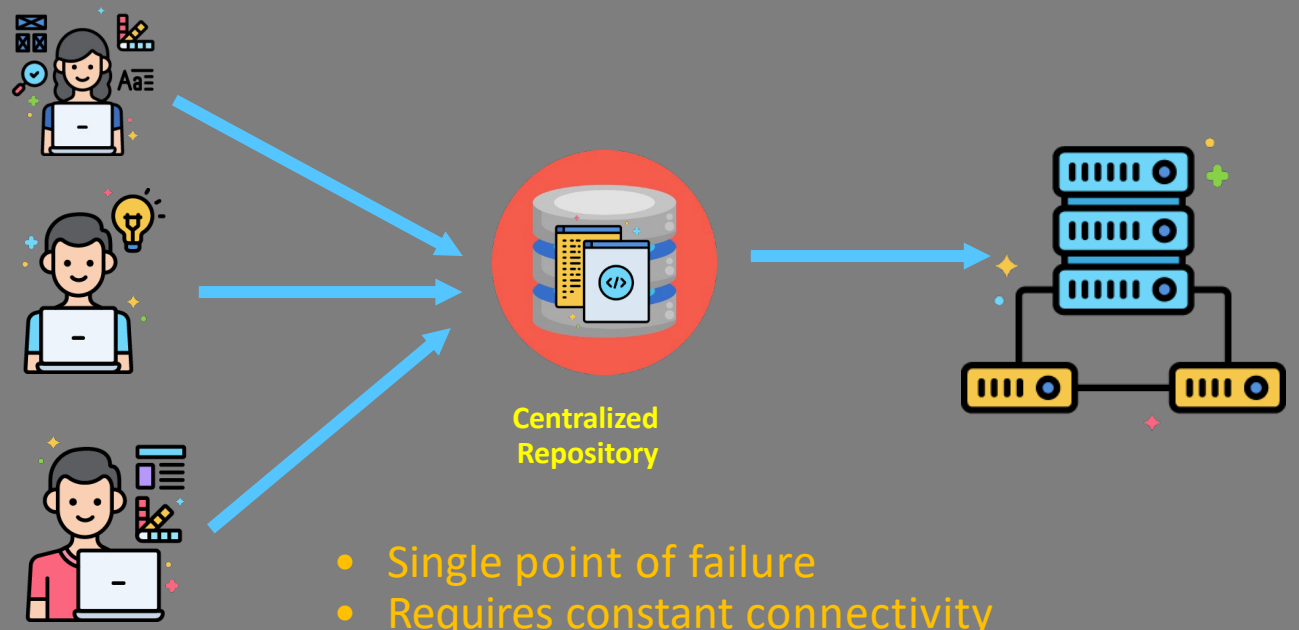
Version Control System - Git



Why Git?

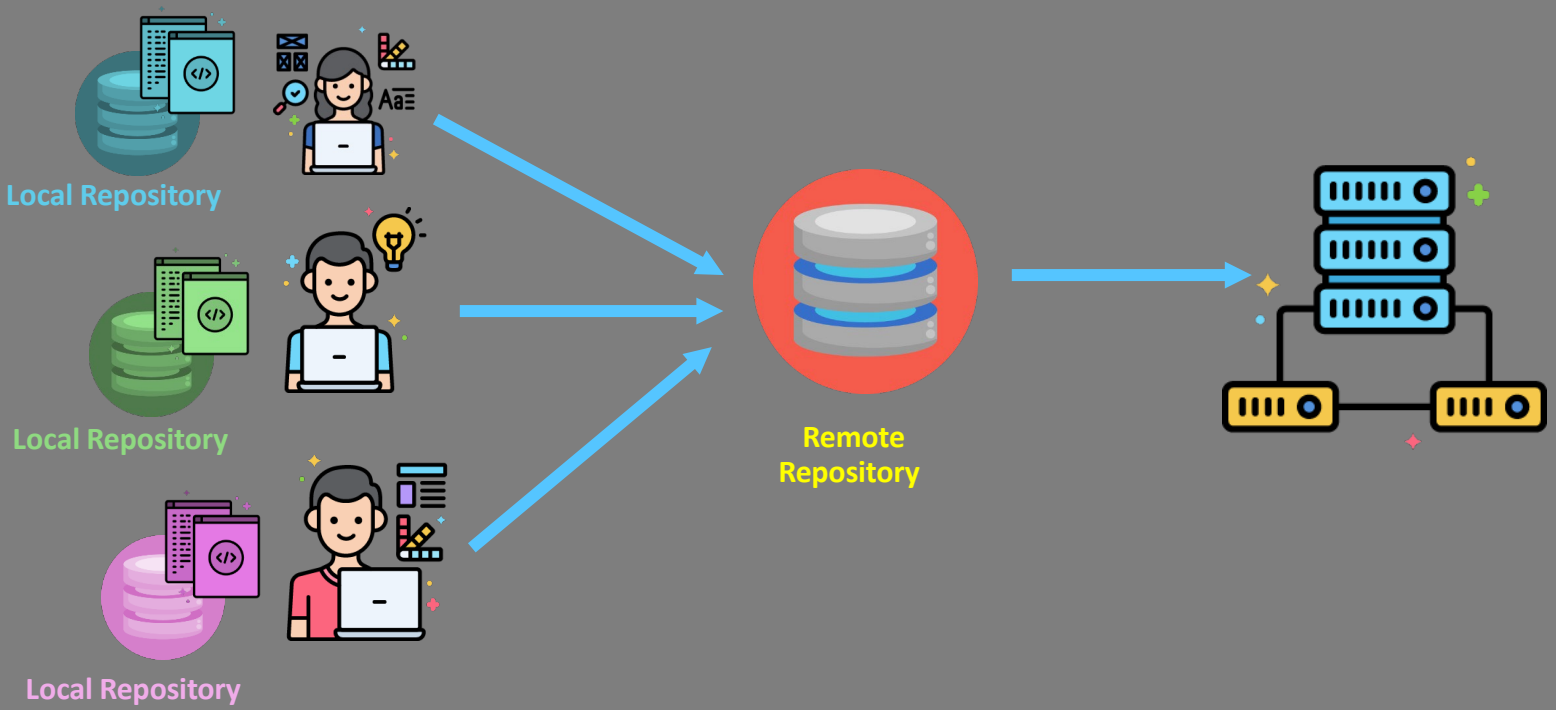
- Distributed

Centralized Version Control System

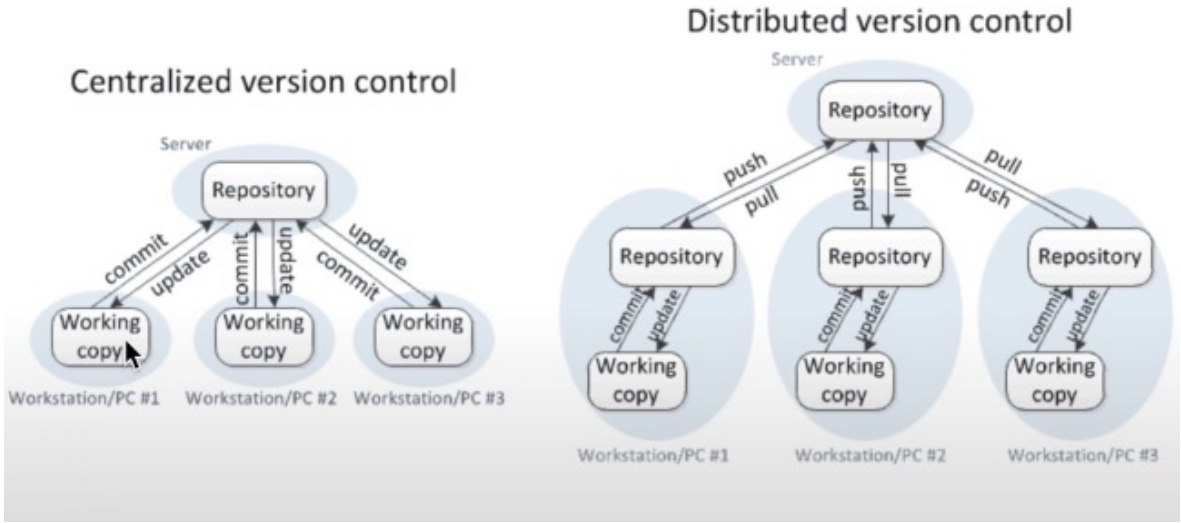


- Single point of failure
- Requires constant connectivity
- E.G – Subversion, Endevor

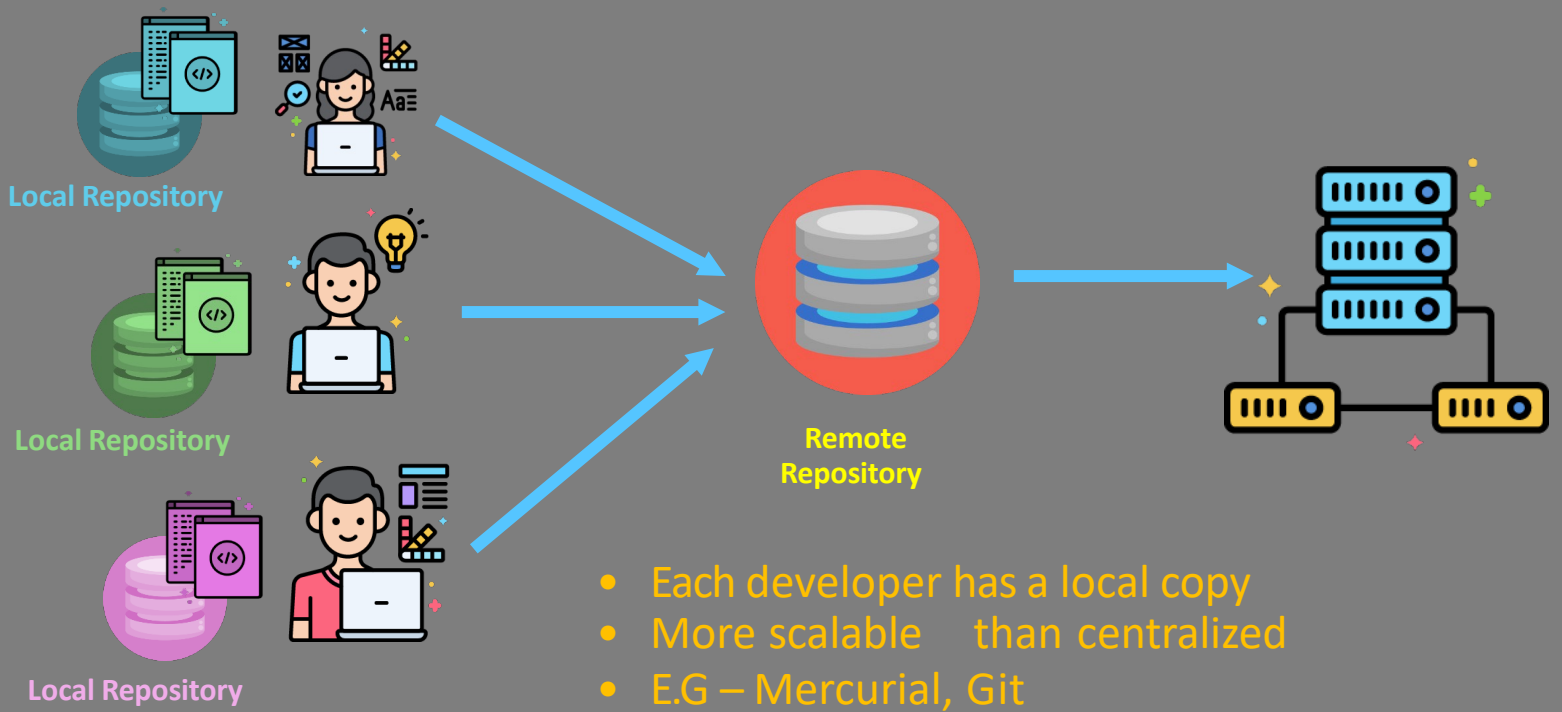
Distributed Version Control System



Centralized vs Distributed
Version Control

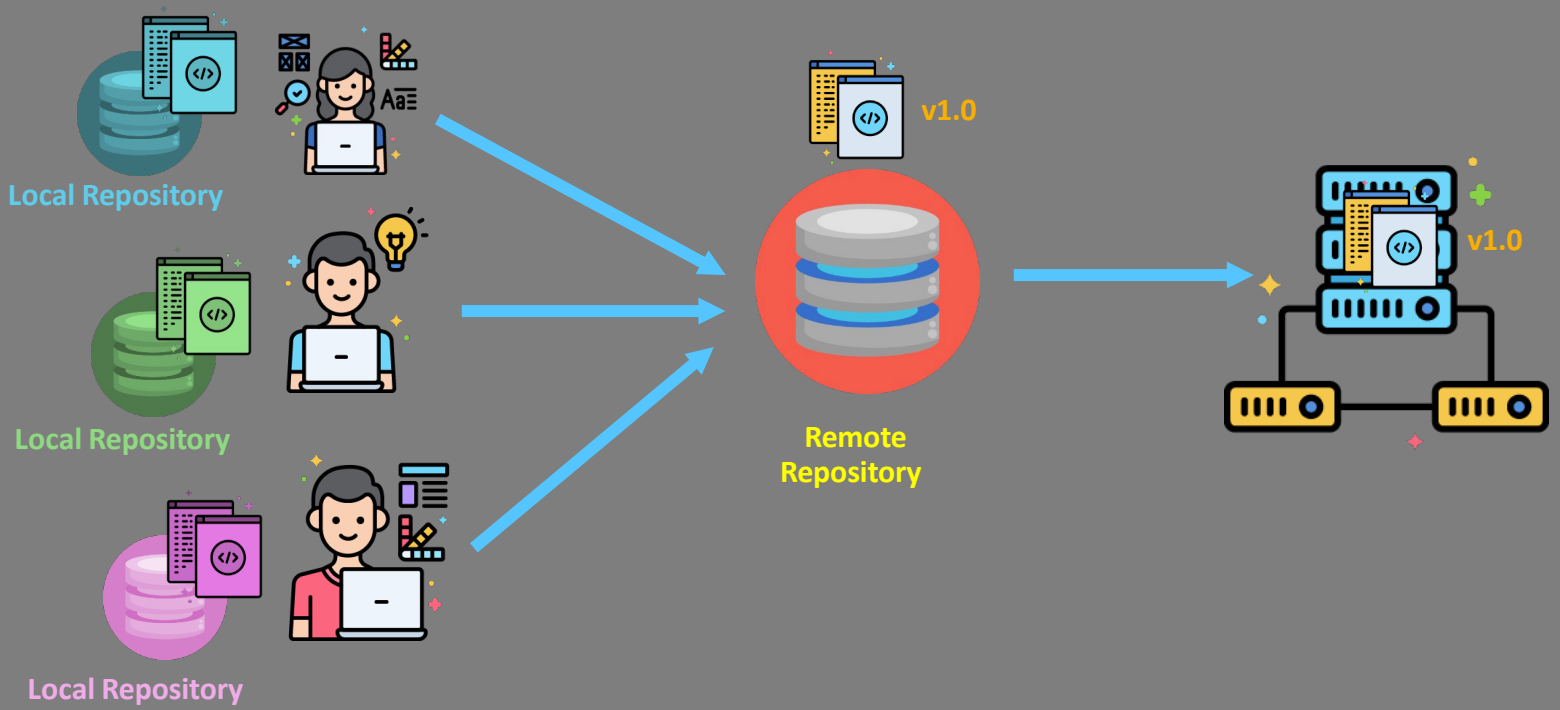


Distributed Version Control System



- Each developer has a local copy
- More scalable than centralized
- E.G – Mercurial, Git

Distributed Version Control System



Version Control System

Why Git?

- Distributed
- Performant
- Detailed audit tracking
- Open source
  - Free!
  - Implemented with Kubernetes GitOps, integration with Jenkins and other DevOps tools
  - GitHub, GitLab, Code Commit are all based on Git

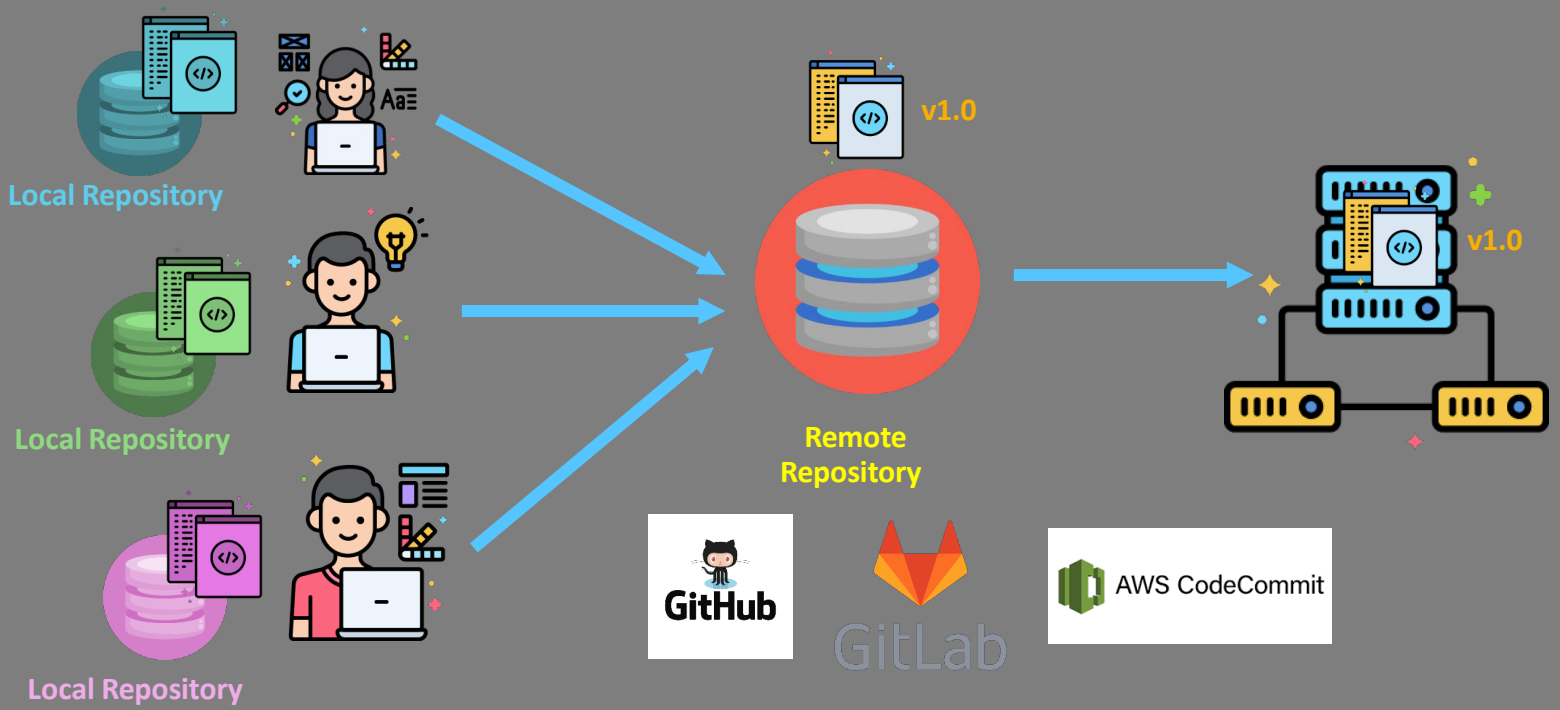
Git vs GitHub

Git Vs. GitHub

- Version Control System
- Installed locally on the system
- Created in 2005, by Linus Torvalds
- Open source, and used in multiple cloud repository services

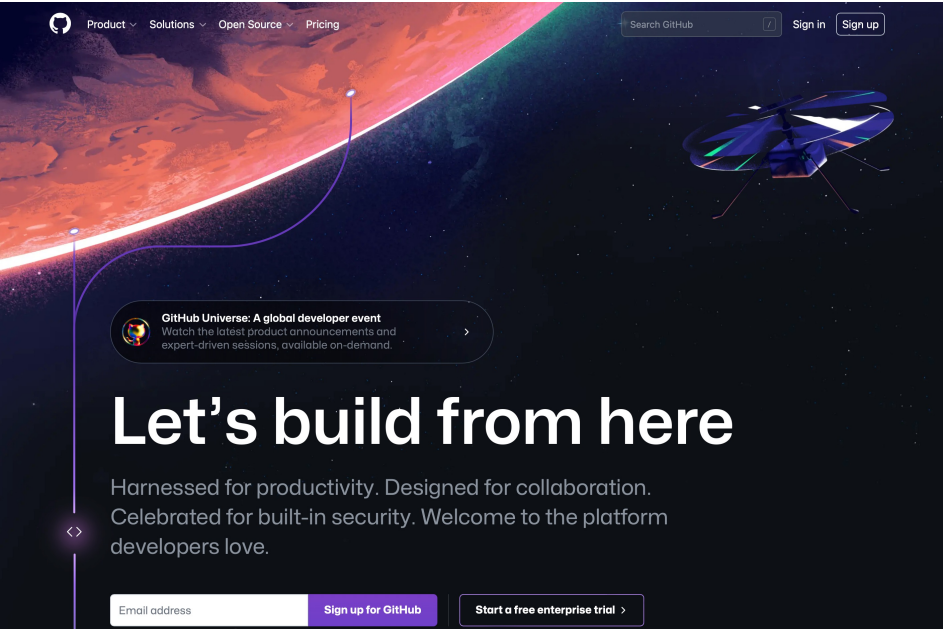
- Git repository hosting services with other features
- Runs on the cloud
- Created in 2008, currently owned by Microsoft
- Not open source, have free and paid tiers

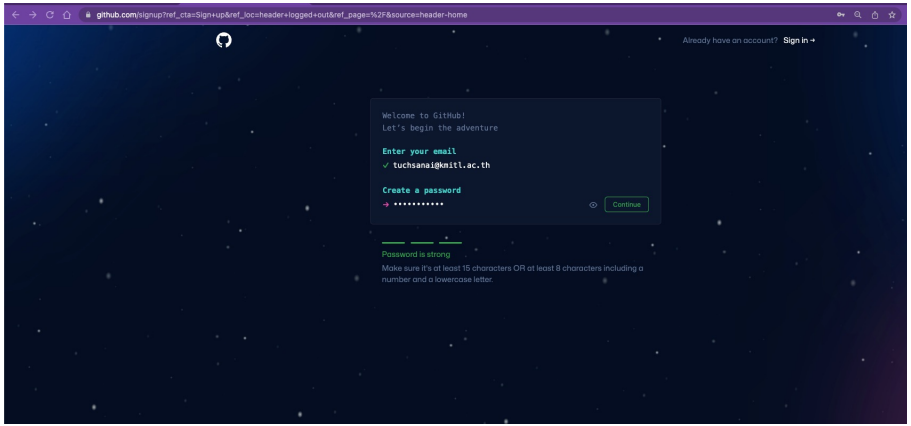
Distributed Version Control System



Week 1 - Starting with Git

Sign Up : https://github.com





https://github.com

Installing Git

Week 1 - Starting with Git

- Let’s install git on to your computer!
  - The installation process will be slightly different depending on your Operating System.

Week 1 - Starting with Git

- **MacOS or Linux Users:**
  - Congrats! You already have Git installed on your machine since it comes pre-installed as part of your OS.
  - To confirm this, open up a terminal and type:
    - `git --version`
    - `>> git version 2.25.1 (Apple Git-128)`

Week 1 - Starting with Git

- **MacOS or Linux Users:**
  - If you wish to update or re-install git, you can do this by simply selecting the MacOS or Linux links on the official git website:
    - **https://git-scm.com/downloads**

Week 1 - Starting with Git

- **MacOS or Linux Users:**
  - Now we'll be editing text files for this course, which means we need a text editor.
  - If you're in this course, we'll assume you've used a text editor before, and often people have very strong opinions on a preferred text editor!

Week 1 - Starting with Git

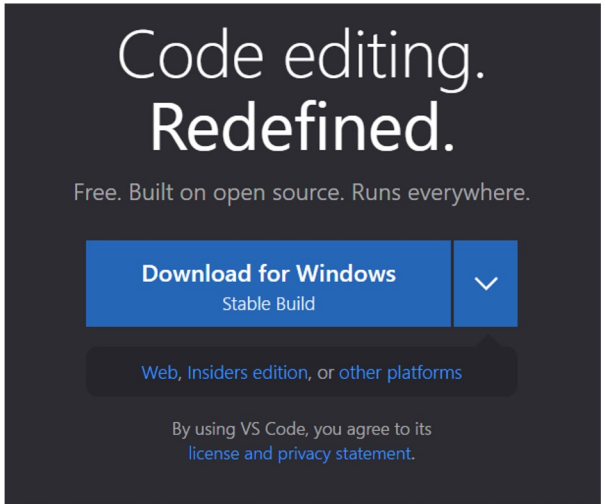
- **MacOS or Linux Users:**
  - Our suggested text editor for this course is VS Code:
    - **https://code.visualstudio.com/**
  - Its created by Microsoft and has direct integrations with GitHub and is one of the most popular text editors today.
  - You can follow along with any text editor you prefer however.

Week 1 - Starting with Git

- **Windows Users:**
  - Our *HIGHLY recommend* text editor for this course is VS Code:
    - **https://code.visualstudio.com/**
  - Why *HIGHLY* recommended?
    - Windows + VS Code + GitHub
    - Upon installing git you will be asked to select a default editor, you'll need VS Code installed to select it as default.

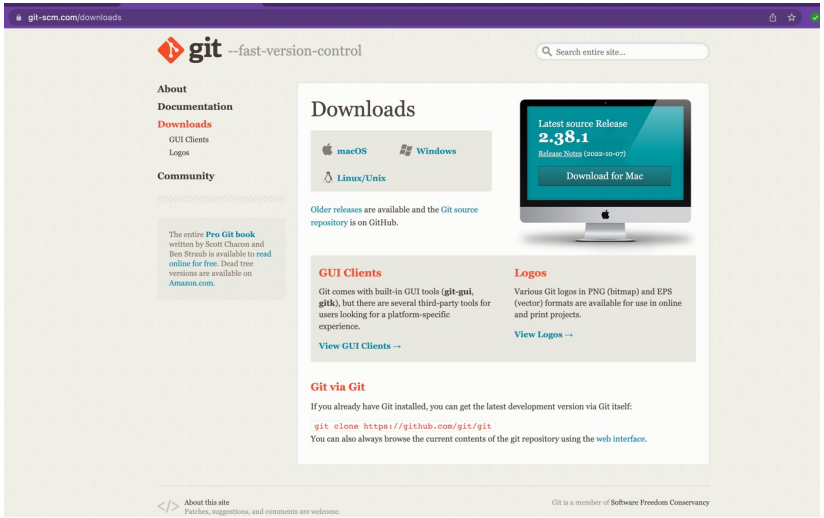
Week 1 - Starting with Git

- **Windows Users:**
  - Go to:
    - **https://code.visualstudio.com/**
  - Download with Default Settings:



Week 1 - Starting with Git

- **Windows Users:**
  - Next we'll download git, go to:
    - **https://git-scm.com/**



DAY 1
Configure Git

Week 1 - Starting with Git

- So far we've:
  - Installed Git
  - Created a GitHub Account Profile
  - Installed GitHub Desktop and VS Code
- What left for Day 1:
  - Configure Git Locally
  - Create a Repository
  - Explore VS Code Integrations
  - Exercise and Solution

Week 1 - Starting with Git

- Take careful note of the user name and email address you register with at GitHub, ideally it will be the same username and email you configure git with locally.
- We can technically use any username/email we want, but your history of “commits” (changes to code) will be saved in the public log of changes in the repository.

Week 1 - Starting with Git

- In this lecture we will set-up a name and email address on our local installation of Git.
- If you only ever used Git locally by yourself then this username and email would just be stored on your local historical logs.
- However if you end up working with others and using GitHub, this information will be useful to identify who did what.

Week 1 - Starting with Git

- You can check the current configuration with the commands:
  - **git config user.name**
  - **git config user.email**
- The configuration commands will be:
  - **git config --global user.name “user”**
  - **git config --global user.email “email”**
- If switch with another github account
  - **git config --global user.name “user”**
  - **git config --global user.email “email”**
  - **git config --global credential.username “user”**

Show global Git configuration?

```
git config --list  or   git config -l
```

or look at your ~/.gitconfig file. The local configuration will be in your repository's .git/config file.

```
git config --list --show-origin
```

Week 1 - Starting with Git

- Let’s head over to our command line interface to set-up our Git configuration:
  - Git Bash
  - Terminal
  - Command Prompt

Week 1 - Starting with Git

DAY 1
Creating a Git Repository

Day 1 - Starting with Git

- The main place we track changes and manage our files that are using Git is called a **repository**.

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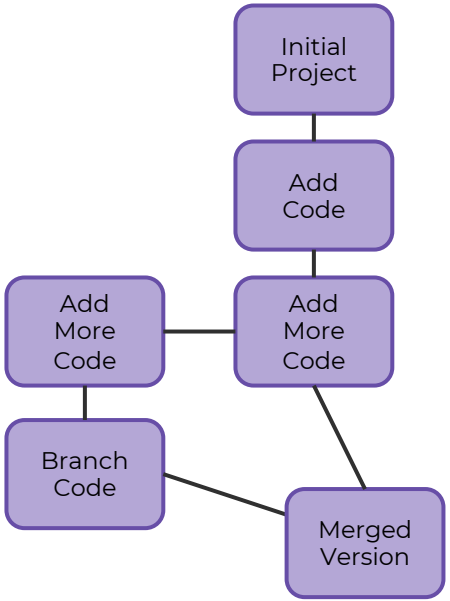

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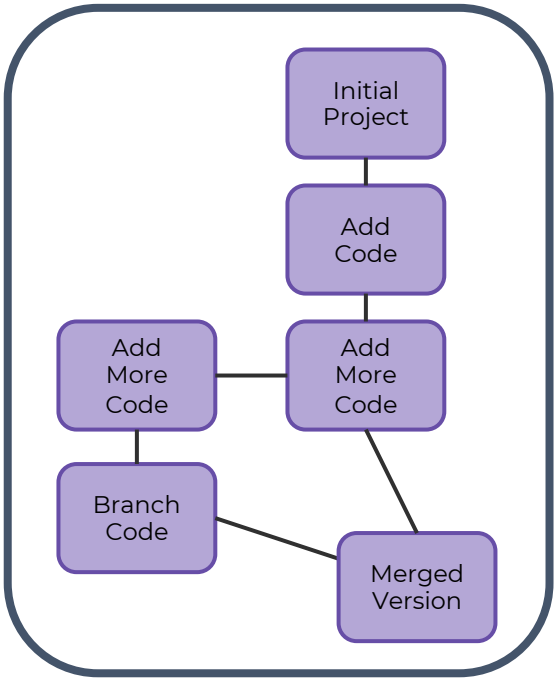
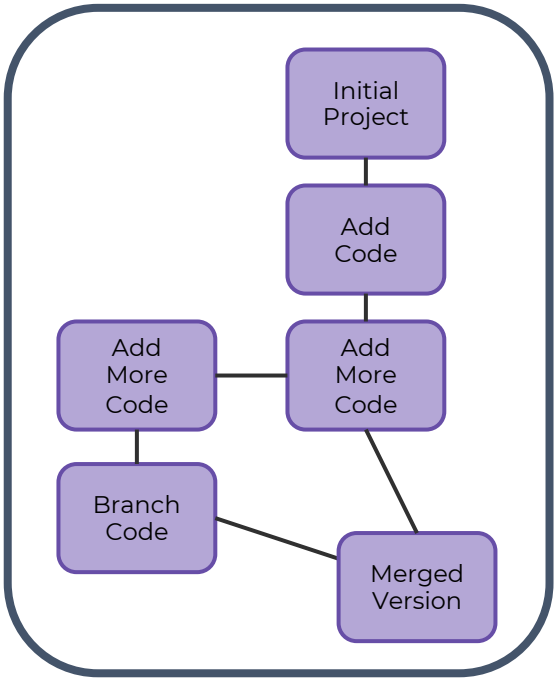


Repository
AKA “Repo”

Day 1 - Starting with Git

- Let's explore a public repository:
  - **https://github.com/tensorflow/tensorflow**



Repository AKA "Repo"

Day 1 - Starting with Git

- How can we create a Git Repository?
  - **git init**
    - This command initializes a Git Repository on your local machine.
    - You only need to run this command once per project.
  - **git status**
    - This command will report back the status of your Git repository.

Day 1 - Starting with Git

- How can we create a Git Repository?
  - Upon creating a repository with **git init** you will create a hidden .git file.
  - The .git file is a hidden file that manages the versioning of the files inside the Git repository.

Day 1 - Starting with Git

- Git inside a Folder/Directory:
  - Upon creating a Git Repository, all the folders/directories inside the top level Git Repository will also be part of that Repository, meaning all the changes are tracked.

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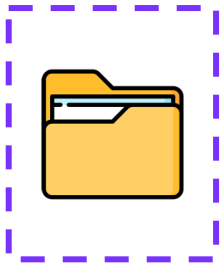

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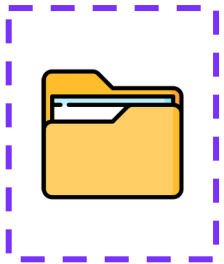

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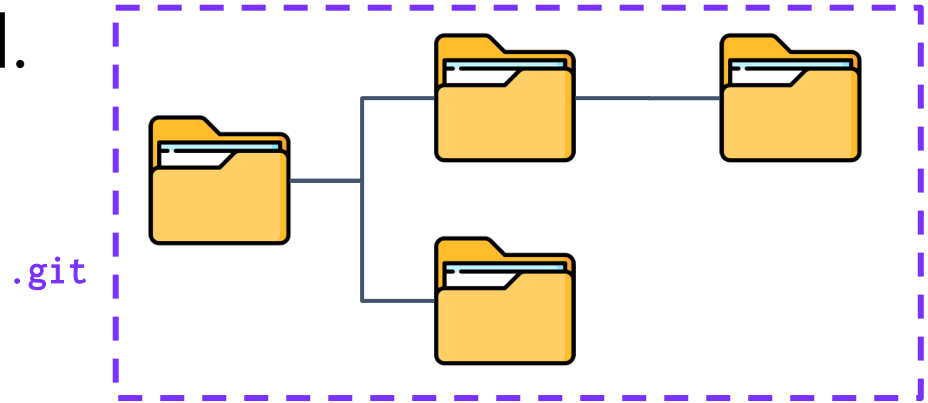

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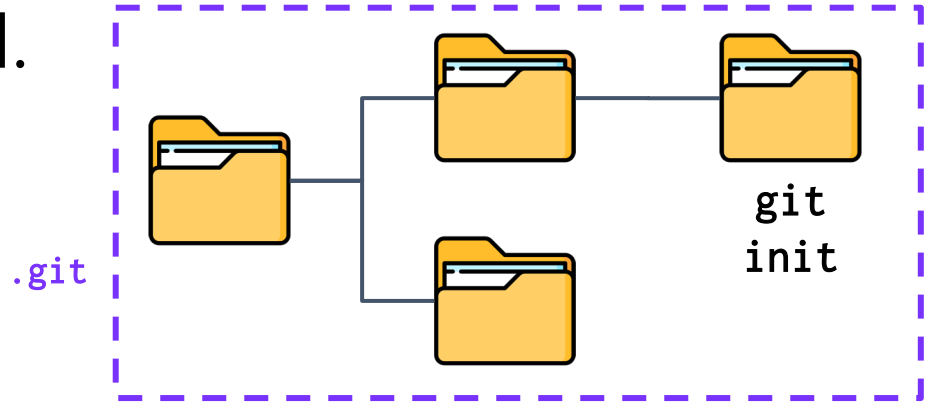

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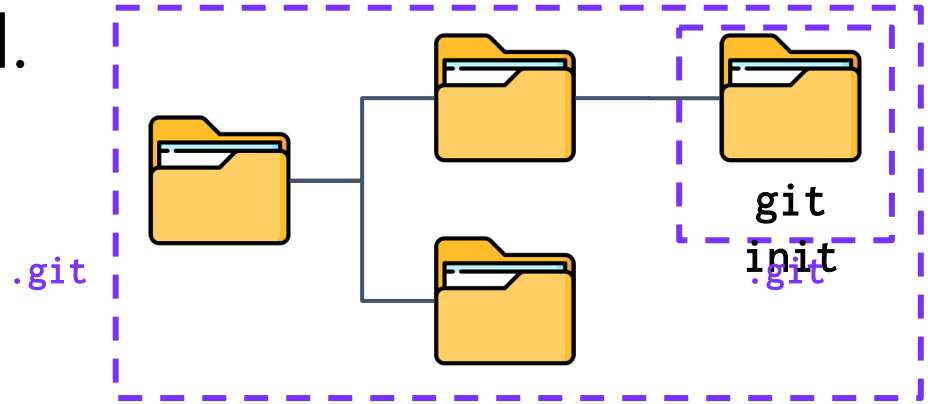

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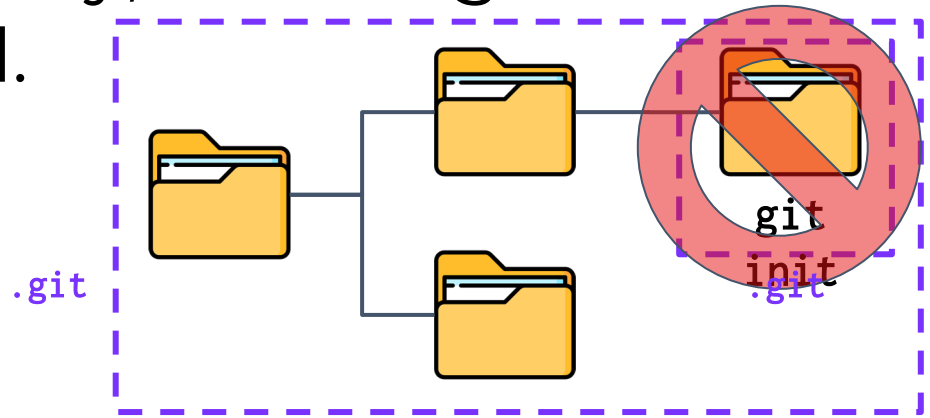

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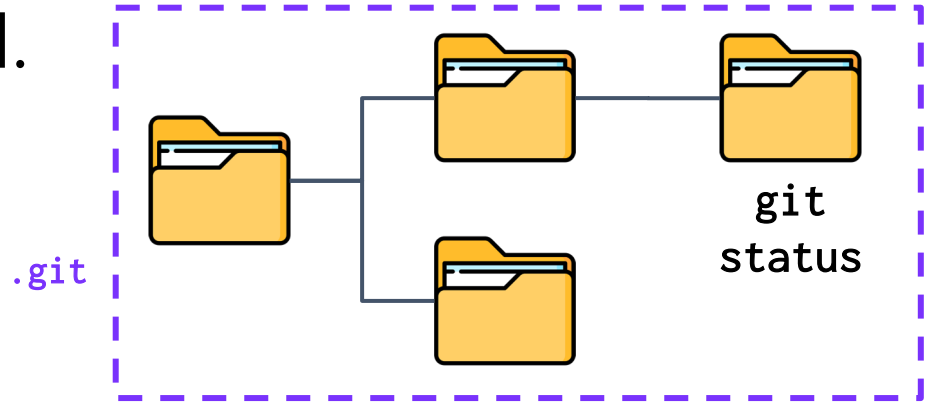

Ignoring Files

We can tell Git which files and directories to ignore in a given repository, using a .gitignore file. This is useful for files you know you NEVER want to commit, including:

- Secrets, API keys, credentials, etc. Operating
- System files (.DS_Store on Mac) Log files
- Dependencies & packages

.gitignore

Create a file called .gitignore in the root of a repository. Inside the file, we can write patterns to tell Git which files & folders to ignore:

- .DS_Store will ignore files named .DS_Store
- folderName/ will ignore an entire directory
- *.log will ignore any files with the .log extension

https://www.toptal.com/developers/gitignore

Day 1 - Starting with Git

- How can we create a Git Repository?
  - We can also use the Graphical Interface with GitHub Desktop or we can even create a new repository online at **www.github.com**.
  - Then we can **git clone** this repository to our local machine.

Day 1 - Starting with Git

- Let’s create our first local Git repository at the command line.
- Then we’ll create a repository on GitHub and use **git clone** to clone it to our local computer.
  - We’ll need to set-up some tokens in order to clone private repositories.

DAY 1
Private Repositories and Tokens

Day 1 - Starting with Git

- We discovered we can easily clone other public repositories with the **git clone** command and then the HTTPS URL for the public repository.
- Now let’s explore how to deal with private repositories we wish to clone.

Day 1 - Starting with Git

- Option 1: Command Line:
  - Create Personal Access Tokens (PAT) on Github.com
  - When using the **git clone** command, reference the PAT.
- Option 2: GitHub Desktop Tool GUI:
  - Open the Github Desktop Tool
  - Login with GitHub Username and PW
  - Clone Repo via GUI

Day 1 - Starting with Git

- Clone Syntax with PAT:

git clone https://token@github.com/account/repo.git

- Previously we used:

git clone https://github.com/account/repo.git

DAY 1
Summary and Exercise

Day 1 - Starting with Git

- **Exercise Tasks:**
  - Create a new Private Repository on GitHub.
  - Initialize your repository with README, license and gitignore.
  - Clone your Repository using the Command Line and a PAT.