Introduction to Git

By
Vijaya Nandini M

Introduction to Git

- **Welcome!**
  - Our main goal here is to understand Git, GitHub, and code repositories.

Introduction to Git

- **Topics**
  - Understanding git and GitHub
  - Installing Git
  - Creating GitHub Profile
  - GitHub Tour
  - Creating and Cloning a git Repository
  - GitHub Desktop and Extensions
  - Exercise and Solution

Introduction to Git

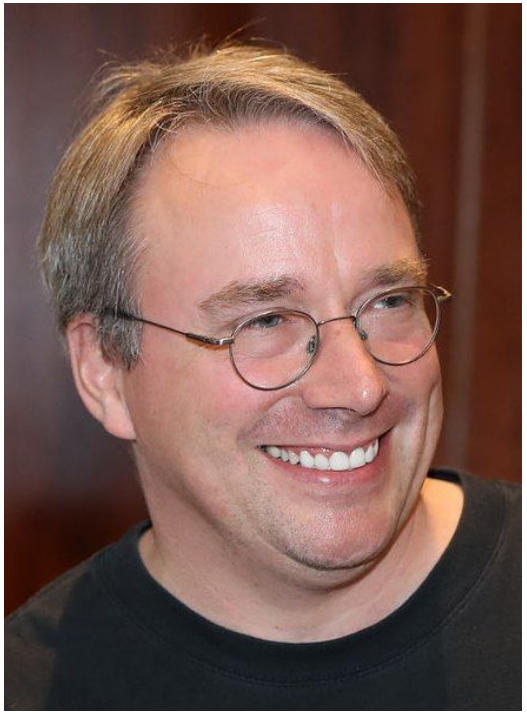
- Let’s cover a bit of history of Git and GitHub to fully understand the motivations behind the open source VCS software and the most popular company for using this VCS.

Introduction to Git

- Also just a quick note, you will see it stylized as **git** or **Git**.
- Git typically refers to the entire project, while git is the actual program used.

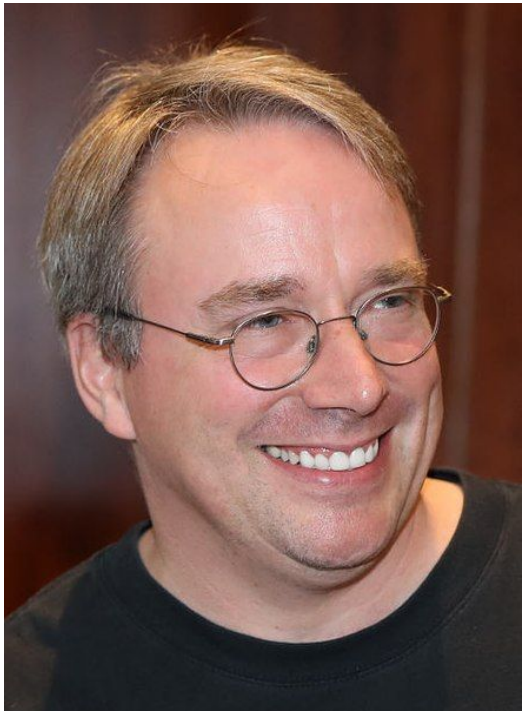
Introduction to Git

- Git was originally created by Linus Torvalds in 2005.
- Linus is famous for being the creator of the Linux kernel.
- Linus created Git after another VCS called BitKeeper became proprietary.



Introduction to Git

- Linus developed the basic foundation of git in just 3 days!
- If you want to view the source code, Git itself is hosted on GitHub:
  - **https://github.com/git/git**



Introduction to Git

- Meaning of “git”:

> - random three-letter combination that is pronounceable, and not actually used by any common UNIX command. The fact that it is a mispronunciation of "get" may or may not be relevant.
> - stupid. contemptible and despicable. simple. Take your pick from the dictionary of slang.
> - "global information tracker": you're in a good mood, and it actually works for you. Angels sing, and a light suddenly fills the room.
> - "goddamn idiotic truckload of sh*t": when it breaks

Introduction to Git

- Now let’s quickly discuss the brief history of GitHub the company!

GitHub

Introduction to Git

- GitHub was started in 2007 as an internet hosting service for software development and version control using Git.
- While GitHub has many free tier features, including hosting of repositories, their paid features revolve around the needs of corporations, such as multiple people working on a private code repository.

Introduction to Git

- GitHub was acquired by Microsoft in 2018 for USD $7.5 billion.
- Post acquisition there has been a deeper integration between GitHub and Microsoft products, including connecting to GitHub directly within VS Code, a code editor tool from Microsoft.

Introduction to Git

- Git is the open source software that actually manages the git commands as a VCS.
- We will call it at the command line with commands such as: **git push**
- GitHub is the online hosting provider, that can act as a machine connected to our local machine via the internet and host code in a repository for us.

Introduction to Git

- GitHub also provides many other features, especially graphical interfaces of many git features.
- For example you can easily merge issues or view commits on the GitHub website, rather using the command line locally.
- An online hosted repository also provides an ideal connection point between everyone working on the same project.

Introduction to Git

- All the features and git methods shown in this course will fall under the free tier of GitHub.
- You should also know that you can now perform the commands with the GitHub Desktop Tool (a GUI for git commands) and the VS Code with GitHub extensions.

Introduction to Git

- There are actually many, many GUIs that have been created for Git, you can find the official list here:
  - https://git-scm.com/downloads/guis
- We focus on how to use Git at the command line, since its still most commonly used that way.

Introduction to Git

- You should still learn the git commands to fully understand how to use git, but make sure you also take advantage of the easy to use tools and extensions for using Git (especially with GitHub).

Installing Git

Installing Git

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

Installing 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)`**

Installing 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**

Installing 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!

Installing Git

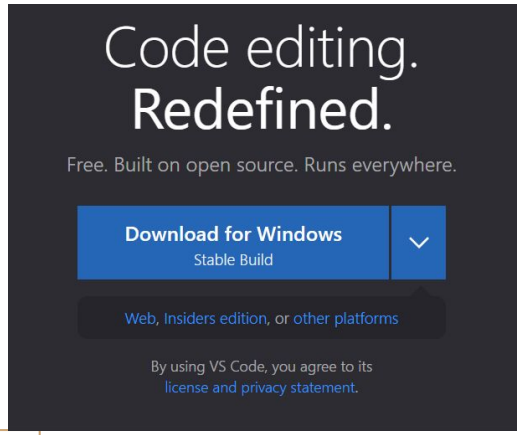
- **MacOS or Linux Users:**
  - Our suggested text editor for this course is VS Code:
    - **https://code.visualstudio.com/**
  - Its created by Microsoft and has direct integrations with GitHub and is one of the most popular text editors today.

Installing 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.

Installing Git

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



Installing Git

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

GitHub Profile Setup

GitHub Profile Setup

- Now that we've downloaded Git, let's create a GitHub profile and also download the GitHub Desktop Tool for a GUI.
- We'll also show you how to set-up the VS Code GitHub extension.

GitHub Profile Setup

- 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.
- Create an account at:
  - www.github.com

Configure Git

Configure Git

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

Configure 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.

Configure 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.

Configure 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”**

Configure Git

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

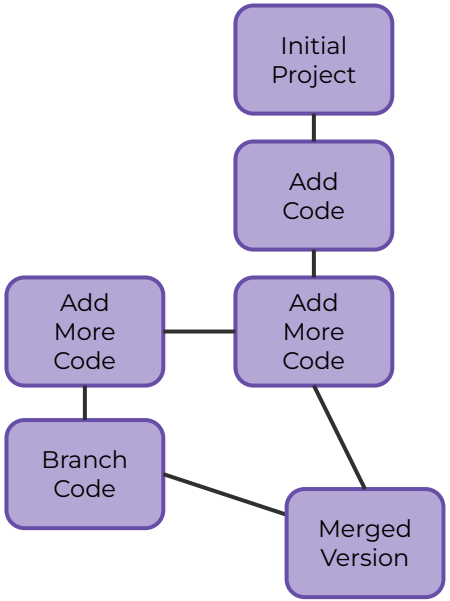
Creating Git Repository

Creating Git Repository

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

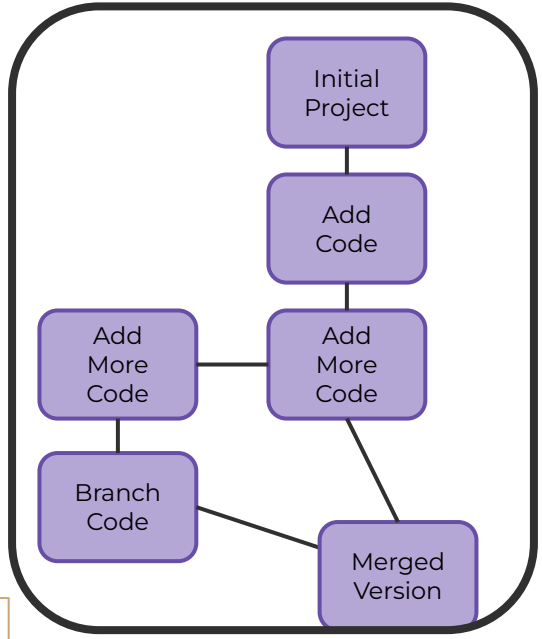
Creating Git Repository

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



Creating Git Repository

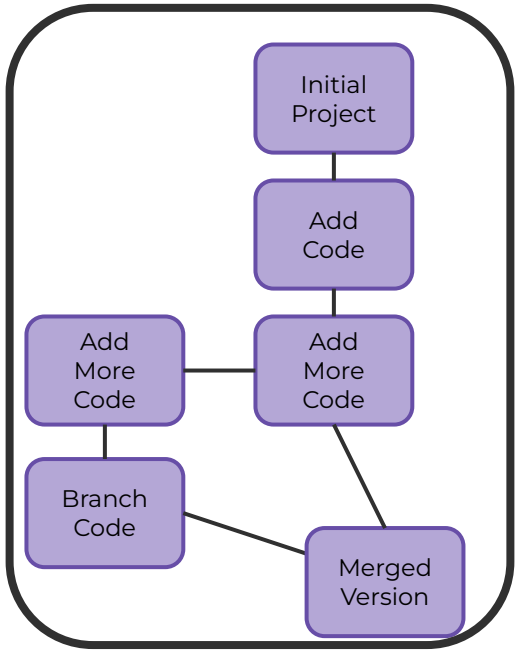
- The main place we track changes and manage our files that are using Git is called a **repository**.



Repository AKA "Repo"

Creating Git Repository

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



Repository AKA "Repo"

Creating Git Repository

- 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.

Creating Git Repository

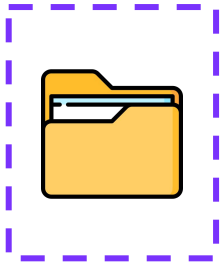
- How can we create a Git Repository?
  - Upon creating a repository with **git init** you will create a hidden .git file.
  - The .git file is a hidden file that manages the versioning of the files inside the Git repository.

Creating Git Repository

- 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.

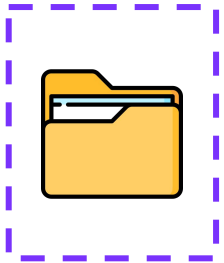
Creating Git Repository

- 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.



Creating Git Repository

- 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.

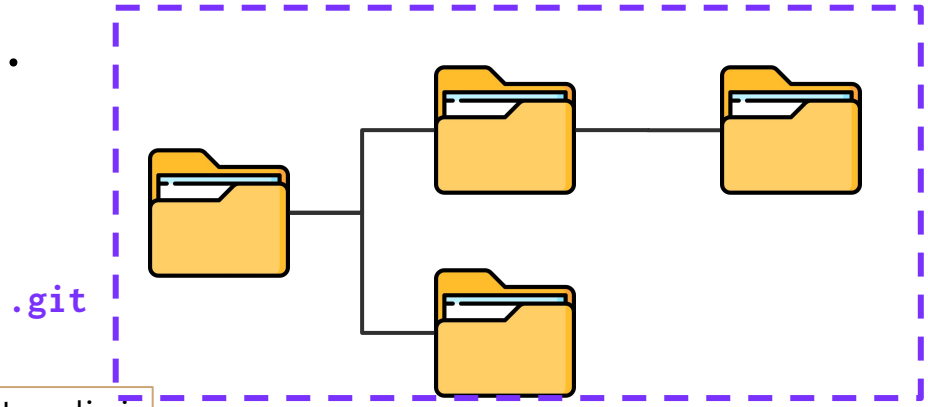


git init

.git

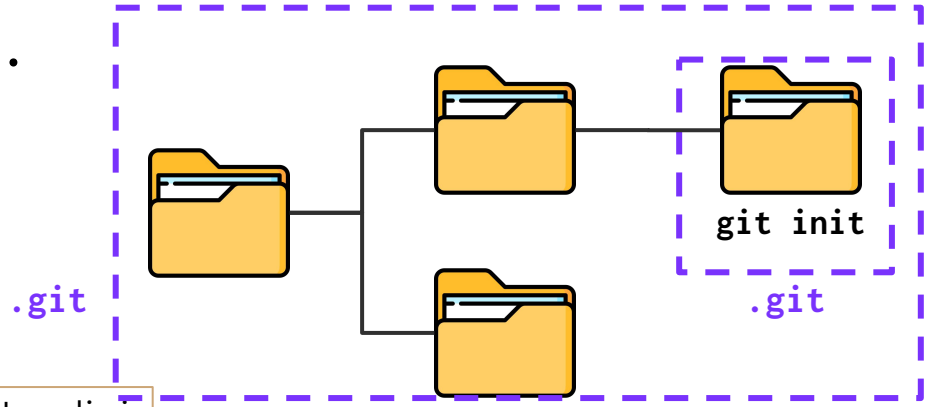
Creating Git Repository

- 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.



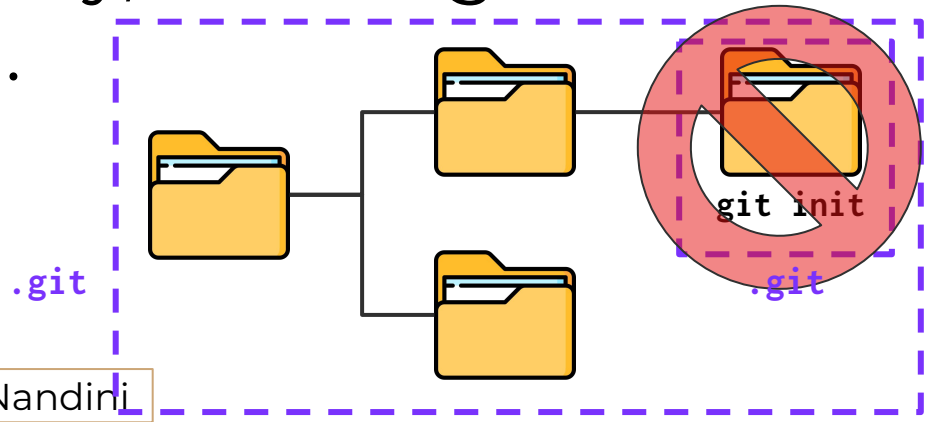
Creating Git Repository

- 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.



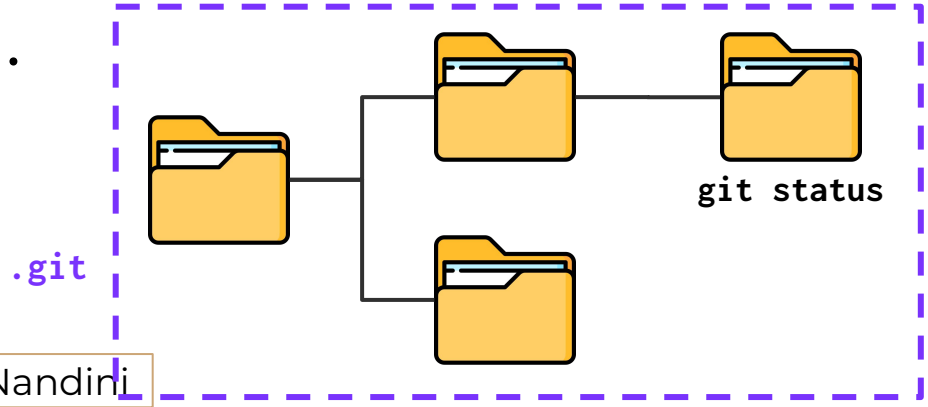
Creating Git Repository

- 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.



Creating Git Repository

- 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.



Creating Git Repository

- 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.

Summary and Exercise

Summary and Exercise

- Let’s review the main Git and GitHub related methods we now know:
  - **How to Create Repository**
    - Locally via Command Line
      - **git init**
    - Online via GitHub.com
    - Locally via GitHub Desktop Tool

Summary and Exercise

- Let’s review the main Git and GitHub related methods we now know:
  - **How to Clone a Repository**
    - Public Repo from GitHub to our local machine via the Command Line
      - **git clone**
    - Private Repo from GitHub to our local machine via GUI and Command Line

Summary and Exercise

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

Summary and Exercise

- **Exercise Solution:**
  - This basically mimics the operations we did, if you get stuck, review the previous slides.