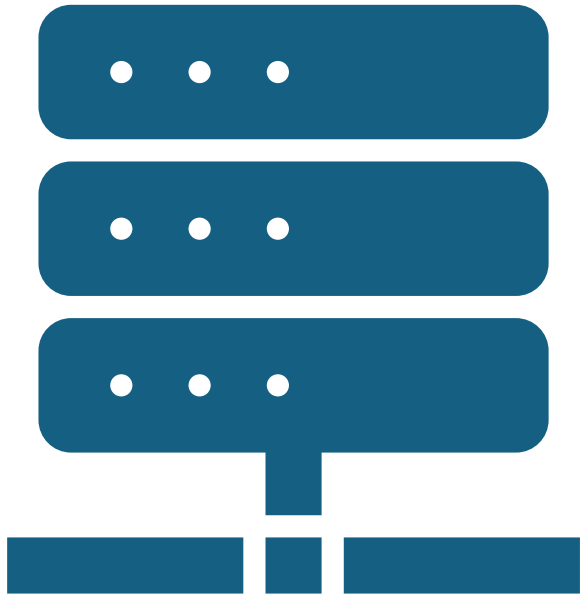
Introduction

- **Git**: A distributed version control system.
- **GitHub**: A platform to host and collaborate on Git repositories.
- 🔑 *Main goal*: Manage code efficiently and work in teams seamlessly.



Git History

- 2005 – Git is Created by **Linus Torvalds**
- At the time, the **Linux kernel project** was using a proprietary version control system called **BitKeeper**.
- Design goals:
- Distributed
- Fast
- Secure
- Reliable branching and merging

Github History

- 2008 – GitHub Launches
- Founded by **Tom Preston-Werner**, **Chris Wanstrath**, **PJ Hyett**, and **Scott Chacon**.
- Public launch: **April 10, 2008**
- Purpose:
- Make Git easier to use
- Provide hosting for Git repositories
- Enable **collaboration, issue tracking, and code review**

Git != GitHub

GIT

version Control System is a tools that helps to track changes in code

Git is a Version Control System. It is:

popular

free & Open Source

fast and Scalable

Primarily 2 use of Git

1) TRACK THE HISTORY

2) COLLABORATE

GitHub

- Website that allows developers to store and manage their code using git.
- https://github.com

- Provides tools for:
  - Code review
  - Issue tracking
  - Pull Requests (PRs)
  - Collaboration
  - Project management

Git vs GitHub

Feature	Git	GitHub
Type	Version Control Tool	Cloud Hosting Platform
Works Locally	✅	❌ (Needs Internet)
Collaboration	Limited (local only)	Full (PRs, Issues, Comments)
Interface	Command Line	Web-based GUI

GitHub Account

. CREATE A NEW REPOSITORY

. MAKE OUR FIRST COMMIT

Create a New Repository

GitHub, Inc. [US] | https://github.com/new

Search or jump to... / Pull requests Issues Marketplace Explore

Create a new repository

A repository contains all the files for your project, including the revision history.

Owner: SiliconOrchid / Repository name: HelloWorld

Great repository names are short and memorable. Need inspiration? How about solid-succotash.

Description (optional)

My first Git Repository

- Public
  Anyone can see this repository. You choose who can commit.
- Private
  You choose who can see and commit to this repository.

- [x] Initialize this repository with a README
  This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

Add .gitignore: Python | Add a license: None

Create repository

Setting up Git

VISUAL STUDIO CODE

GIT --VERSION

Configuring Git

```
git config --global user.name "my name"
```

```
git config --global user.email "someone@gmail.com"
```

```
git config --list
```

```
C:\Users\saura>git config --list
diff.astextplain.textconv=astextplain
filter.lfs.clean=git-lfs clean -- %f
filter.lfs.smudge=git-lfs smudge -- %f
filter.lfs.process=git-lfs filter-process
filter.lfs.required=true
http.sslbackend=openssl
http.sslcainfo=C:/Program Files/Git/mingw64/ssl/certs/ca-bundle.crt
core.autocrlf=true
core.fscache=true
core.symlinks=false
pull.rebase=false
credential.helper=manager
credential.https://dev.azure.com.usehttppath=true
init.defaultbranch=master
user.email=sauravacharya236@gmail.com
user.name=SauravAcharya23
core.longpaths=true
```

Clone & Status

```
saura@TUFGAMMER MINGW64 ~/OneDrive/Desktop
$ git clone https://github.com/SauravAcharya23/demo.git
Cloning into 'demo'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.

saura@TUFGAMMER MINGW64 ~/OneDrive/Desktop
$
```

Clone - Cloning a repository on our local machine

- git clone <-some link->

status - displays the state of code

- git status

```
PS C:\Users\saura\OneDrive\Desktop\demo> git status
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean
PS C:\Users\saura\OneDrive\Desktop\demo>
```

- Untracked
  - new files that git doesn't yet track
- Modified
  - changed
- Staged
  - file is ready to be committed
- Unmodified
  - unchanged

```
Untracked files:
  (use "git add <file>..." to include in what will be committed)

        about.txt.txt
        index.txt.txt
```

```
Changes to be committed:
  (use "git rm --cached <file>..." to unstage)

        new file:   about.txt.txt
        new file:   index.txt.txt
```

Add and Commit

add- adds new or changed files in your working directory to the Git staging area.

git add <-file name->

git add .

commit - It is the record of change

git commit -m "some message"

```
HOME@LAPTOP-MSQ6RBU0 MINGW64 /g/git-tutorial (master)
$ git add index.txt
```

```
HOME@LAPTOP-MSQ6RBU0 MINGW64 /g/git-tutorial (master)
$ git commit -m "first commit"
[master (root-commit) 93b8b09] first commit
 2 files changed, 2 insertions(+)
 create mode 100644 about.txt.txt
 create mode 100644 index.txt.txt
```

Push Command

Push

- upload local repo content to remote repo

- git push origin main

```
HOME@LAPTOP-MSQ6RBUO MINGW64 /g/git-tutorial (master)
$ git push origin master
To github.com:thesparkler/git-tutorials.git
 ! [rejected]        master -> master (non-fast-forward)
error: failed to push some refs to 'git@github.com:thesparkler/git-tutorials.git'
hint: Updates were rejected because the tip of your current branch is behind
hint: its remote counterpart. Integrate the remote changes (e.g.
hint: 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
```

Init Command

```
PS C:\Users\saura\OneDrive\Desktop\demo> get-ChildItem -Hidden


    Directory: C:\Users\saura\OneDrive\Desktop\demo


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d--h--         6/28/2025   1:11 PM                .git


PS C:\Users\saura\OneDrive\Desktop\demo>
```

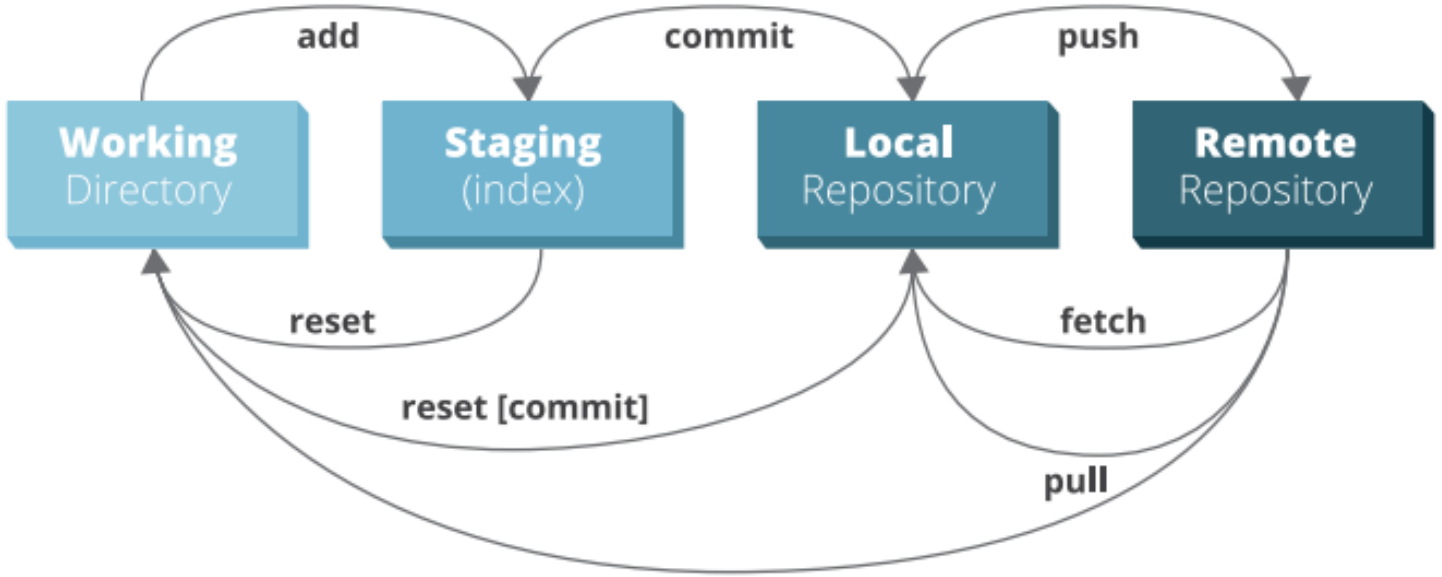
```
PS C:\Users\saura\OneDrive\Desktop\demo> git branch
* main
PS C:\Users\saura\OneDrive\Desktop\demo>
```

```
HOME@LAPTOP-MSQ6RBUO MINGW64 /g/git-tutorial
$ git init
Initialized empty Git repository in G:/git-tutorial/.git/
```

- init - used to create a new git repo
- git init
- git remote add origin <-link->
  - This command adds a new remote repository named "origin" to your local Git configuration.
- git remote -v (to verify remote)
  - This command lists all configured remote repositories and their URLs.
  - The -v flag stands for "verbose" and shows both fetch and push URLs.
- git branch (to check branch)
  - This command lists all local branches in your repository.
- git branch -M main (to rename branch)
  - This command renames the current branch to "main".
  - -M is a combination of --move --force, which forces the rename even if "main" already exists.
- git push origin main
  - This command pushes your local "main" branch to the remote repository named "origin".

WorkFlow

- Clone Repository
- Create Branch
- Make Changes
- Add & Commit
- Push to GitHub
- Create Pull Request
- Review & Merge



Git Branches

Branch Commands

git branch (to check branch)	• Lists all local branches in your Git repository.
git branch -M main (to rename branch)	• Renames the current branch to main (or another specified name).
git checkout <-branch name-> (to navigate)	• Switches to an existing branch.
git checkout -b <-new branch name-> (to create new branch)	• Creates a new branch and switches to it immediately. • -b glag Create a new branch before checking it out.
git branch -d <-branch name-> (to delete branch)	• Deletes a local branch (only if it has been merged).

Alternate Branch Commands

git branch <-newbranch name->

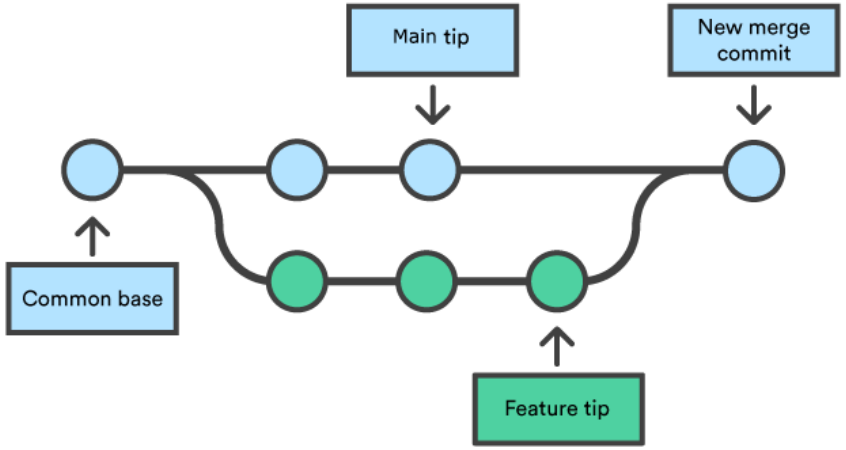
- Create new branch that you have specified

git checkout <-branchname->

- Switches to an existing branch.

```
HOME@LAPTOP-MSQ6RBUO MINGW64 /g/git-tutorial (master)
$ git checkout newsBranch
error: pathspec 'newsBranch' did not match any file(s) known to git.
```

Merging Code




```
kendumez@
→  minikube-demo git:(main) ✗ git diff README.md
diff --git a/README.md b/README.md
index fb65379..6fc463a 100644
--- a/README.md
+++ b/README.md
@@ -1,3 +1,8 @@
+# Changelog
+
+3.21.24: Updated golang image
+
+
 # Getting started with minikube
```

Way 1

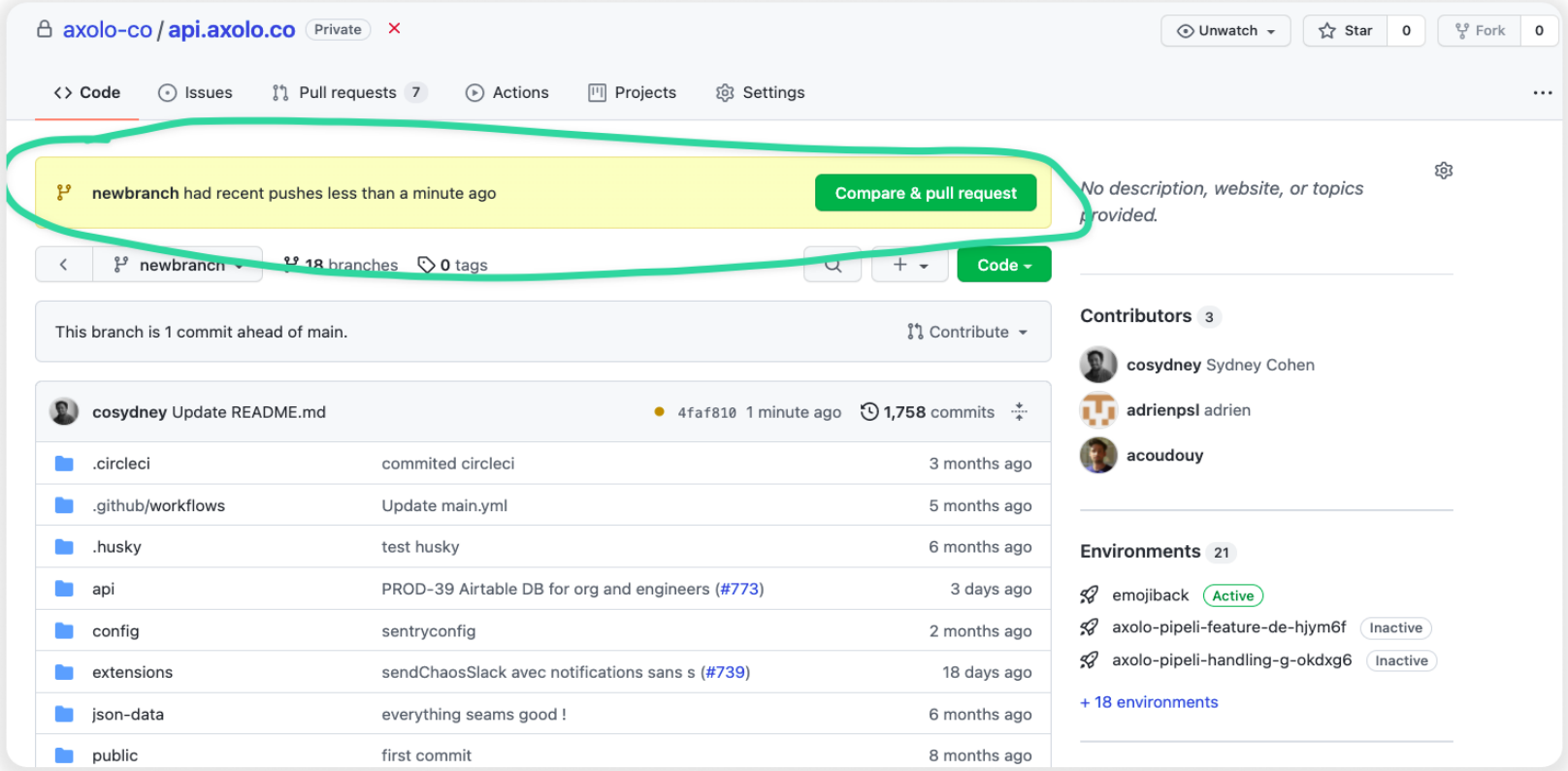
- git diff <-branch name-> (to compare commits, branches, files & more)
- git merge <-branch name-> (to merge 2 branches)

Way 2

- Create a PR (Pull Request)

Pull Request

- It lets you tell others about changes you've pushed to a branch in a repository on GitHub.



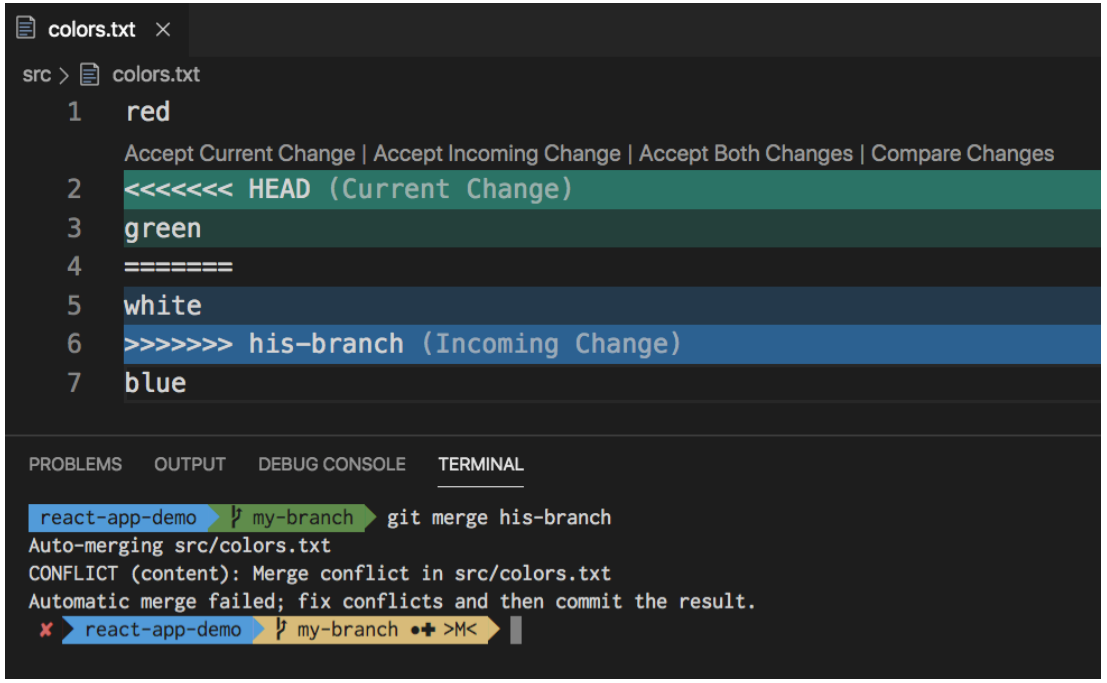
Pull Command

git pull origin main

- used to fetch and download content from a remote repo and immediately update the local repo to match that content.

```
HOME@LAPTOP-MSQ6RBU0 MINGW64 /g/git-tutorial (master)
$ git pull origin master
From github.com:thesparkler/git-tutorials
 * branch            master     -> FETCH_HEAD
Merge made by the 'recursive' strategy.
 portfolio.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 portfolio.txt
```

Resolving Merge conflicts



- An event that takes place when Git is unable to automatically resolve differences in code between two commits.

Fork

A fork is a repository that shares code and visibility settings with the original "upstream" repository.

Fork is a rough copy.