जय श्री राम

Git & Github

Qw. Why we need Git?

→ In nun we work on project we are not able to track Project (which user what changes do) and Collabration not exist.

Git is here Change the all game, Git track the Code (which line of Code change by user and when that change happened).

→ So Git only track the Code

→ To Collabration in Project we need a Centralized server (a Single Source of truth) so the that Dever is GitHub.

GitHub like many server exist and where you also install git and use that.

You also install Git is local machine.

→ Linux Kernel and the version Central System Git were Created by — Linus Torvolds

→ Problem (before GIt)

- linux Kernel = very large Project
- many developer working together
- Code changes tracking too difficult

→ Solution

- linus Created new version Cntrl System
- System name is GIt.

→ Initially git was ~~for~~ used to only
track my Code (user prospective)

|| vcs (version Cntrl System) — GIt
|| vcs Remote — Remote — GItHub, GItLab, GItRe

How GIt Works

ⓐ Let's Create a file hello.Js

hello.Js

Const fname = 'Piyush';

Const lname = 'Garg';

ⓑ We remove this both line of Cd, from hello.Js

hello.Js

- We can track this record in database
  (mongodb, Postgres, Sql) and also track this
  record in [.txt] file.

Changes.txt

+ Const fname = 'Piyush';
+ Const lname = 'Garg';
- Const fname = 'Piyush';
- Const lname = 'Garg';

- what user do we manage in Changes.txt

* Git follows these same trick

① git init
   → Initialized empty Git repository in

* ls -a (hidden dir. file Shown)

② git add <filename>

③ git commit -m "maine aaj ye kiya"

chai code tracker   git

ccct init   . chaicode   git init   . gitl

ccct yaad-krlo   git add <filename>

ccct sve-farlo   . chaicode   git commit -m " maine
                                        aaj ye kiya"

→ git log → the command show history

Hello.txt

Hii, my name is Piyush Garg

```
>
    git add Hello.txt
    git Commit -m " i added my name"

    git log
    Commit   054 _ _ _ _ .    (HEAD -> main)
    Author :  Piyush Garg < Piyushgarg.dev@gmail.com
    Date :  Sat Dec  27    22:07:47   2025   + 530

        i added my name


    git status
    on branch main
    changes not stages for Commit

        modified: hello.txt

    git diff
    - Hii, My name is Piyush Garg
    + Hii, my name is Piyush Garg
    + Hii, My name is Aniruch
```

git add hello.txt
      ↳ this Command means, this Changes an
        ready for Commit

git Commit -m "added Changes by Aniruddh"

git diff 054d43 ab9b022bdc
      ↳ This Command show you differerce b/w two
        Commit

feature.txt
_____

Time machine Created

   ◻
     git add feature.txt

     git Commit -m "time machine Create"
           ↓
        4b90 - - - -

feature.txt
_____

Time machin Create 4

   By found 🐟

   ◻
     git add feature.txt

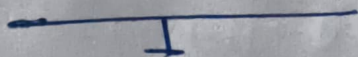   git Commit -m "bug found"
         ↓
        9c403 - - - - -

Okay Do Bug has Been found after
the Code Commit.

So I need to undo this Code

▷
git revert < hash >

git revert 9c403 ———————

due to this Command Bug undo
But new Commit happened and
HEAD has been Changed

↓

de64256 (HEAD -> master) Revert "bug found"

9c403 -- Bug found

Note :- Revert Command is Create
new Commit and undo and
never delete history

| git reset --hard < hash > |

↓
this Command delete all history
after that Commit (hash).

□

git log --oneline

7d73308 (HEAD → main) Revert "added Bug"
d84af58 added Bug
2b9b022 this is a new featur
8747657 added changes by anirudh
054d32 g added my nam

git reset --hard d84af58

git log --oneline
d84af58 (HEAD → main) added Bug
2b9b022 this is new featur
8747657 added changes by Anirudh
054d42 g added my name

.git

> cd .git
> ls
COMMIT_EDITING   FETCH_HEAD   index   objects
    config   HEAD   info   ORIG_HEAD
description   hooks   logs   refs

Cat HEAD

ref : refo | head | main

cd refo

ls

heads tags

cd heads

ls

main

. Cat main

2b9b022 ----.

* git log

. GIT Ko agar head pta logana hai

```
.git | HEAD = main
.git | refs | heads | main = HEAD Gmmit
                                    ‾
                                    ↑
```

when i got HEAD Gmmit

then i go easily Back (undo)

Easily

> cd objects

```
05    52    87       98      Pack
23    5d    93       d8      fd
2 b   60    94       f3      into
```

‾‾‾‾‾‾‾‾‾‾‾‾‾
↑

directory all are two Character name

> git Cat-file -p 2b

    9b022bd cc29e1667ca cc9455 - - -

    tree 940d8bddd1078899ccea - - -

    Parent 87f765d939 - - - -.

    author Piyush Garg <piyushgarg.dev@gmail.com>

    Commiter Piyush Garg <piyushgarg.dev@gmail.com>

Note :- 1st Commit of Parent is nothing / null

Q git Commit -am " message"

    → git Commit everything in the working directory

③ git add.
    → Stage all changed file for the next Commit

④ .git/HEAD wally Gutei
    → A reference of the current Branch

⑤ what kind of information is stored in .git/Gutia
    → Repository-opecific Configuration(remote, branches, settings)