Explain the workflow of git with diagram?

GIT🡪 Git is a version control system that allows developers to track changes, collaborate and manage code changes. Gir workflow stages :

***Working directory***: Here the files are changed locally. Modifications are done locally only changes are unstaged. It is a starting point in workflow and it is essential for local development.

***Staging area:***  Changes are stored before commiting into local repository. In this staging area we can choose which files need to be commit.

Git add .

***Local repository:*** It stores all the commits before pushing them to remote repository. The complete history of our project is saved in this repository.

***Remote repository***: It is a cloud platform It allows multiple developers to collaborate by pushing and pulling changes .

Remote repository

Local Repository

Staging area

Working directory

Git add

Git commit

Git push

Git fetch

Git checkout

Git merge

2. what is git,how to stage a file with git add?

GIT is distributed version control system that helps developers to track chages in their code, collaborate with their teams. IT allows multiple developers to work on the same project remotely.

It is widely used in software development and supports both local and remote repositories for better collaboration. Git enables branching and merging . Here branching is an independent copy of the code, enabling multiple developers to work on different features, without affecting the main project.

Merging is used to integrate new features which is developed in several branches are integrated into main project. Here it helps developers to have clean codebase.

Staging is temporary storage where changes are stored before it is send to permanent repository. To keep track of changing files we use staging to keep modifications of files . Commad for stage in git is (git add ). First create a working directory and the add files to stage a specific file we use git add <filename> . IF we want to add whole folder use git add .once the file is staged we can verify it by using git status.

3. What is git, github, gitlab. Explain its differences.

|  |  |  |
| --- | --- | --- |
| GIT is a version control system | GITHUB is a cloud based repository | GITLAB is a integrated devops platform |
| Requires external tools for additional functionality | Wide range of integrations through GitHub Marketplace | Comprehensive integrations within its DevOps ecosystem, including third-party tools and services |
| It is best suitable for local version control | It is suitable for open source projects. | It is suitable for devops and CI/CD |
| Helps in collaboration and conflict resolution. | Provides a GUI for repositories | Provides advanced features like vulnerability and scaning. |
| It works offline with out internet | Stores and manages git repositories online | Provides issue tracking, code reviews , devops lifecyle management. |
| It allows multiple developers to work on a project with out interfering eachother. | It allows developers to store manage collaborate on repositiores. | IT offers a built-in devops tools for CI/CD, security and project management. |

4. How to create a tag. How can we push it?

Tag : tag in git is used to mark important commits in repository. It helps in version control by identifying stable points in the project. Tags need to be pushed manually.

Two types of tags are there :

Light weight tags: These are essentially bookmarks pointing to a commit and do not store any additional information before the commit.

Annotated tags: These are more robust. Annotated tags store extra information such as the tagger’s name, email, date, and message.

Creating a tag : git tag <tag\_name>

Creating annotated tag: git tag -a <tag\_name> -m "Tag message"

Pushing a tag: git push origin <tagname>

To push all tags : git push origin –tags

5.Explain the steps which are necessary to send a project from local repository to remote repository?

Here first we need to create a local repository

>> git init

Next create a remote repo in github

>> git remote add origin “repo link”

After that add files into local machine ushing

>> git add .

Check the status

>> git status

Commit the changes into file

>> git commit -m “Intial commit”

Push the local file into remote repo

>> git push -u origin main

Now check in github repo by refreshing it.

6. What is pull request explain its procedure?

Pull request takes place when developer ready to begin the process of merging new code changes with the main project repository. It allows developers to propose changesto a repository. It is used when working with feature branches and helps in code review before merging changes into the main branch.

7. what is fork, why is it necessary?

A fork is a copy of an existing repository in which the new owner disconnects the codebase from previous commiters.