GITHUB-RESEARCH

Acquaintance with Git and Github

What is Git??
What is Github??

Git is a system that we utilize to track versions of files and also to help upload projects on different hosting services e.g Github

Github is a hosting service that we utilize to store codes,build projects and also to collaborate with other people to work on a project.

What is the difference between Git and Github.

Git	GIthub
This is a software	This is a service
Installed locally on a machine and works in a CLI	Cloud based meaning it requires the internet to operate and it has a graphical user interface
The repositories can be hosted locally or on a self hosted server	This provides cloud-based hosting for Git repositories

Advantages of using Git Locally

- It is Fast since activities are done locally without the requirement of internet connection.
- You can work offline and make or commit changes to the local repo
- You can manage multiple local branches meaning you can work on new features on the code without affecting the main codebase
- It is easy to go back to your previous versions of codebase if something is wrong or not how you wanted it to be

Advantages of using Github

- **It allows you to showcase your coding projects and skills to potential employers and the GEEK community at large.**
- **Makes it easy for a person to publish your projects and get feedback from external people.**
- **It gives a coder tools that will help them track their productivity and coding activity.**
- **It gives groups access to working together on the same codebase,edit and review other people's codes and combine the changes without a hassle.**
- **It serves as a container for teams to store ,manage and access their repositories and this minimizes data loss and versions of work clashing.**
- **It allows teams to assign tasks,track problems and manage their SDLC with the same platform.**

GIT BRANCHES

These are pointers that you create in the repo to work on features, bugs and also experiments on the initial code without affecting the main code and making changes to it.
Branches can be deleted and restored in a repository.

What are Branches used for and the benefits :

- **These are used to work on different features without affecting the main codebase**
- **They are used for fixing errors and bugs on a code ,testing the code that has been fixed before merging the fix into the main branch**
- **They enable multiple people to work on the same project concurrently**
- **The creating and merging of branches is fast**
- **The branches provide a clear way to track the development of different features and the alteration made**
- **The changes made in one branch do not affect the next branch.**

GIT COMMANDS

- **Git push- pushes committed changes from local to remote repo**
- **Git pull - pulls the changes from a remote to local repo**
- **Git add - used to add files to the staging area**
- **Git commit - commits changes made to the file from the staging area to the local repo**
- **Git branch- this is used to rename,create,list and delete branches**
- **Git merge- this is used to merge one or more branches into the current branch.**
- **Git status- this shows the status of the working directory and staging area**
- **Git init- it initializes a new repository**

Forking in Github

Forking means duplicating an existing repository on your github, and you can make changes to the code without affecting the original repository.

A pull request

This is a way to merge changes from your branches into your main code and it acts as a notification and a collaboration tool during integration

Protecting code’s stability

- **Use a well defined branching strategy with git,make sure all changes in the codes go through a thorough code review process.**
- **To make sure people do not override working features make sure that you establish a proper and clear Git branching strategy that will separate the working codes and the experimental codes and make sure each and everyone writes a unit test this will ensure that the codes function correctly**
- **Make sure that you enforce a code review process for all the pull requests as this will allow you to criticize the code before allowing the merge and utilize protected branches on your main branch in the Github.**

Alternatives for GITHUB

- **Gitlab- this is a git based platform with features for code hosting,collaboration and project management**
- **BItBucket- this is a git-based platform that focuses on code reviews and collaboration ,offering free plans and paid plans with unlimited private repositories and advanced security options**
- **GItea- this is a self-hosted server that offers a simple and familiar Git experience (you manage the server infrastructure)**

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