Part D

D- Git version control

1- explain in detail the git version control system explaining why and when we use it and all the related terms

Git is a powerful version control system that helps developers track changes, collaborate on projects, and manage code efficiently. It allows multiple people to work on the same codebase by using branches, commits, and merges while keeping a complete history of modifications. Developers can push their updates to a remote repository, like GitHub, and pull the latest changes from teammates to stay in sync. Git prevents code conflicts, enables easy rollback to previous versions, and ensures a structured workflow for both small and large projects. Whether working solo or in a team, Git is an essential tool for maintaining organized and efficient software development.

2- mention all the cloud repositories that uses git version control and compare between them

| feature | GitHub | GitLab | AZure |
| --- | --- | --- | --- |
| Owner | Microsoft | Gitlab inc. | Microsoft |
| Best for | Open-source & collaboration | CI/CD & enterprise DevOps | Enterprises using Microsoft tools |
| Integration | GitHub Marketplace | DevOps tools | Azure, VS Code |
| Free private repos | yes | Yes | Yes |

3- state all the commands that you know with the explaining of each function of the

1.git config --global user.name "Mohammedali": Set global username.

2.git config --global user.email "mohammed@gmail.com": Set global email.

3.git init: Initialize a new repository.

4.git clone <url>: Clone a remote repository.

5.git add <file>: Stage a specific file.

6.git add .: Stage all changes.

7.git commit -m "message": Commit changes with a message.

8.git commit -am "message": Stage and commit modified files with a message.

9.git status: Check the status of files.

10.git diff: View changes between working directory and staged files.

11.git log --oneline: View commit history in a concise format.

12.git remote add <alias> <url>: Add a remote repository.

13.git remote remove <alias>: Remove a remote repository.

14.git remote: List remotes.

15.git push <alias>: Push local changes to remote.

16.git pull: Pull remote changes to local.