

Case Study 10: Comparative analysis of git and github

a) Differentiate b/w git and github in atleast 10 aspects. Include command level examples for better understanding

b) In what scenarios would you prefer using the git command-line interface over the github web interface and vice versa?

c) Discuss and compare git and github by referencing real-world applications or case studies where each is used effectively

Title of the Experiment:

Comparative Study of git & github in Version Control and Collaboration.

Aim:

To analyze & understand the difference git and github through commands and real world scenarios, highlighting their use in version control and team-collaboration.

Theory:

git is a DVCS used by developers to track and manage changes in source code during software development. git operates locally and is ideal for offline development.

github. it is cloud based platform that hosts git repositories. github enhances teamwork & transparency in open source. industry grade software projects.

Use cases:

- Git: Offline code versioning, working with branches, code recovery.
- Git Hub: Team collaboration, public repositories, showcasing participating portfolios.

Benefits

- Maintain full history of code changes
- Enables collaborative workflows
- Support open-source community development
- Reduces merge conflicts with branch based workflow

a] Differentiate b/w Git & Git Hub.

Aspect	Git	GitHub
Tool type	VCS: git init	Hosting platform for git repositories.
Repository creation	git init. Create local repo.	Create repo via GitHub web interface.
Cloning	git clone <url>	Provide URL to clone repository
Staging changes	git add filename	Not applicable.
Committing	git commit -m "msg"	Use commits via GitHub UI
Pushing	git push origin main	Sync with remote repo.
Pulling	git pull origin main	Uploads code to GitHub

Branching	git branch feature	Branch management via dropdown
Merging	git merge branch name	Done using pull requests.
History viewing	git log	Visual history on GitHub.

b]

b] Scenario for using Git CLI vs GitHub web interface.

Scenario.	Prefer Git CLI	Prefer GitHub web UI
Offline coding	Yes	No
Fast bulk commits	Yes	Not practical.
Reviewing code visually.	Not convenient	Yes
Learning Git commands	Yes	GUI hides underlying logic.
Managing CI/CD workflows	Requires external tools	GitHub Actions

c] Real-World Application of Git and GitHub

Git:

- local code tracking for individuals or offline environment
- Personal academic projects.
- Used in industries with security policies.

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GitHub :

- Collaboration in open source projects.
- Showing student portfolios and resumes.
- DevOps with GitHub Actions and CI/CD tools
- Organizing academic group projects via repositories

Conclusion:

This study, I gained a clear understanding of how Git manages versions locally while GitHub adds Collaboration, project management, and cloud hosting capabilities. This knowledge will help me contribute effectively to team projects & open source contributions.