Git Report

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***Abstract*—Git is an open source, distributed Version Control System. It is popular for being extremely lightweight and scalable and is the industry standard for distributed software development.**

Keywords—Git, GitHub, Version control, SCM

I. INSTALLING GIT LOCALLY

Git can be installed locally by downloading the installer from git-scm.com. Follow the standard installation procedure. Open git-bash to configure local user. The commands are:

git config –global user.name <name>

git config –global user.email <email>

A. Making a repository

Navigate to local repository. In the terminal, execute

git init

This command makes a .git file in the project folder.

B. Committing to the repository

Saving changes in Git require two steps: first, changes are staged, and then they are committed.

1) The staging area is a middlestep where changes are prepared before being committed. Changes added to the staging area are committed.

git add file_name.txt

2) A commit takes the staged changes and saves them as a new snapshot in the project's history.

git commit -m "changes"

git status can be used to know the current status of the staging area and edited files.

C. Branching

Bramches allow to make an alternate chain of development, allowing features to be built without altering the main codebase.

git branch new-feature

git checkout new-feature

D. Merging branches.

To merge a branch to the main codebase, do

git checkout main

git merge new-feature

Merging a branch integrates the changes in the feature branch into the main codebase.

E. Remote repositories.

To connect the remote repository to the local main.

git remote add origin <URL_of_the_remote_project>

To push changes from current repository to remote codebase,

git push origin main

F. Merge conflict.

A merge conflict occurs when there are multiple changes on the same line in a git repository from multiple sources and git cannot automattically decide which changes to keep.

It prompts the user to manually resolve the conflict to keep the correct changes in the code. The changed file is then staged and committed.

git add fixed
git commit -m "message"

G. Reversing changes.

Commited changes can be reversed with 'git reverse' and 'git rebase'.
git revert <commit> creates a new commit that undoes the changes made in the mentioned commmit.
'git reset <commit> removes commits relative to the head and restores a previous version of repository

H. Git rebase.

'git rebase' is used to make the git commit history more linear by combining commits into the main branch. It is different from branching because it removes the trace of the earlier branch that was made.
'git rebase main'

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