Assignment – 1

# Task 1: Repository Creation and Basic Operations

## Step 1: Creating a Git Repository

To begin version control on a project, we create a new directory and initialize it as a Git repository. The steps are as follows:

mkdir folderName # Creates a new folder

cd folderName # Navigates into the folder

git init # Initializes a new Git repository

## Step 2: Adding and Committing a File

We will now create a file named README.md, add content to it, and make our first commit.

echo "# this is my README.md file" >> README.md # Creates the file and writes to it

git status # Shows untracked files

git add README.md # Stages the file for commit

git commit -m "Initial commit with README file" # Commits the file with a message

# Task 2: Remote Repositories

## Step 1: Adding a Remote Repository

To link the local repository to a GitHub repository, use the following command:

git remote add origin https://github.com/your-username/your-repo-name.git

* origin: Name given to the remote repository
* URL: Path to the GitHub repository

## Step 2: Pushing Changes to Remote

To upload local commits to the remote repository:

git push -u origin main

## Step 3: Cloning a Repository

To copy an existing repository from GitHub to your local system:

git clone https://github.com/username/repo-name.git

# Task 3: Fetching and Pulling Changes

## Step 1: Fetching Changes

Fetch retrieves changes from the remote repository without merging them:

git fetch origin

## Step 2: Pulling Changes

Pull fetches and merges the changes into the current branch:

git pull origin main

* git pull = git fetch + git merge

# Task 4: Branching

## Step 1: Creating and Switching Branches

git checkout -b feature-branch

* Creates and immediately switches to "feature-branch".

## Step 2: Switching Back to Main Branch

git switch main

* Modern alternative to "git checkout main".

## Step 3: Making Changes on Feature Branch

git switch feature-branch

echo "add feature.txt" > feature.txt

git add feature.txt

git commit -m "Adding feature file"

## Step 4: Checking Differences Between Branches

git diff main feature-branch

# Task 5: Resetting and Moving Back in History

## Step 1: Soft Reset to Previous Commit

git reset --soft <commit-hash>

* Moves to previous commit but keeps changes in working directory.

## Step 2: Hard Reset to Previous Commit

git reset --hard <commit-hash>

* Moves to previous commit and permanently deletes newer changes.

## Step 3: Checkout a Specific Commit

git checkout <commit-hash>

* Views the state of the project at a specific commit.

# Task 6: Creating Branches from Specific Commits

## Step 1: Create a Branch from a Specific Commit

git log

git branch new-branch-name <commit-hash>

git branch bugfix-branch 9f8e7d6

## Step 2: Create Branch from a Previous Commit in History

git log

git branch old-version abc1234

git switch old-version