GIT Assignment Questions

1. Setting Up Git:

- **Q1:** Install Git on your system and configure your name and email using the following commands:
  - `git config --global user.name "Your Name"`
  - `git config --global user.email "your.email@example.com"`
- **Q2:** How would you verify that Git has been installed and properly configured? Provide the command and the expected output.
- **Q3:** Initialize a new Git repository in an empty directory on your computer using `git init`.

2. Basic Git Operations:

- **Q4:** Create a new text file named `hello.txt` in your repository. Add some content to it. Then, stage the file for commit using the `git add` command.
- **Q5:** Commit the changes you made to the `hello.txt` file with a meaningful commit message. Provide the Git command to commit and the expected output.
- **Q6:** After committing your changes, use the `git status` command to check the state of your repository. Explain the output.
- **Q7:** How can you view the commit history of a repository? Use the `git log` command and describe what information it provides.

3. Branching and Merging:

- **Q8:** What is the purpose of branching in Git? How do branches help in software development?
- **Q9:** Create a new branch called `feature-branch` and switch to it using the appropriate Git command.
- **Q10:** Create a new file named `feature.txt` on your new branch and commit the changes. Then, switch back to the `main` branch.
- **Q11:** Merge the `feature-branch` into the `main` branch. What command would you use to merge the changes, and what happens if there are no conflicts?
- **Q12:** What is a merge conflict? Create a scenario where a merge conflict occurs and explain how you would resolve it.

4. Working with Remote Repositories:

- **Q13:** What is a remote repository in Git? How is it different from a local repository?
- **Q14:** Clone a remote repository from GitHub to your local machine using the `git clone` command. Provide the URL of a public repository to clone.
- **Q15:** After cloning the repository, make a small change (e.g., edit `README.md`), and commit the changes to your local repository.
- **Q16:** Push your local commits to the remote repository. What Git command is used to push changes to a remote repository? Explain how you would use it.
- **Q17:** Fetch the latest changes from the remote repository using the `git fetch` command. What is the difference between `git fetch` and `git pull`?

5. Undoing Changes in Git:

- **Q18:** After making several commits, you realize that a commit message needs to be changed. How can you edit the last commit message using Git?

Answers

1.
```
PS C:\Users\dell> git config --global user.name krishnagithub03
PS C:\Users\dell> git config --global user.email agrawalkrishna030@gmail.com
```

2.
```
PS C:\Users\dell> git --version
git version 2.37.3.windows.1
```

Expected output: git version a.b.c (version installed).

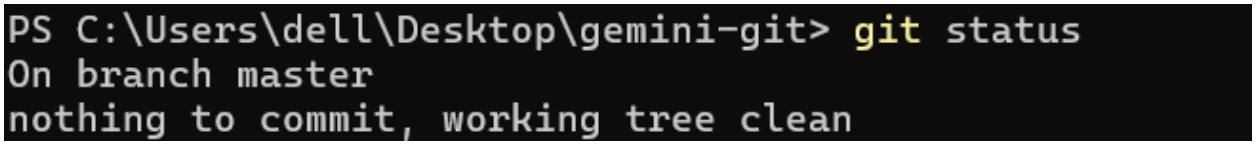
3.
```
PS C:\Users\dell\Desktop> mkdir gemini-git


    Directory: C:\Users\dell\Desktop


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d-----        03-01-2025     17:33                gemini-git


PS C:\Users\dell\Desktop> cd .\gemini-git\
PS C:\Users\dell\Desktop\gemini-git> git init
Initialized empty Git repository in C:/Users/dell/Desktop/gemini-git/.git/
```

4.
```
PS C:\Users\dell\Desktop\gemini-git> echo "Hello World" > hello.txt
PS C:\Users\dell\Desktop\gemini-git> ls


    Directory: C:\Users\dell\Desktop\gemini-git


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----        03-01-2025     17:35             28 hello.txt


PS C:\Users\dell\Desktop\gemini-git> git add .\hello.txt
```

5.
```
PS C:\Users\dell\Desktop\gemini-git> git commit -m "Add hello.txt with dummy content"
[master (root-commit) 10bd5bb] Add hello.txt with dummy content
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 hello.txt
```

Exptected Output : 1 file changed, 1 insertion, create mode 100644

hello.txt

6. 

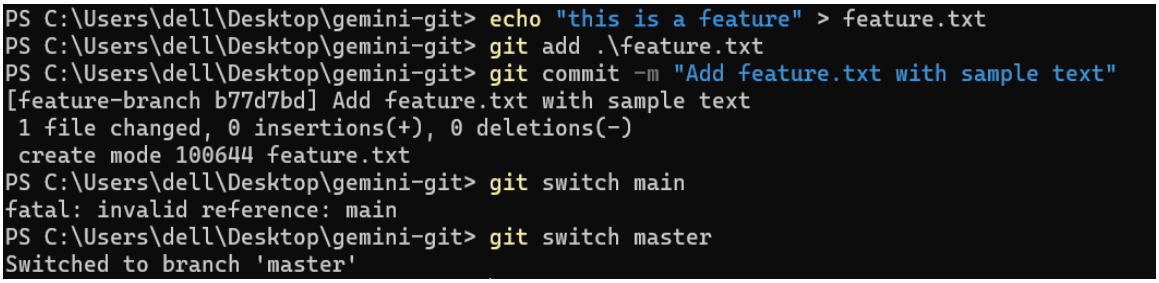
   This message means that on main branch of repo there are no uncommitted changes .

7. 

   git logs provides commit details: commit hash, author, date, and message.

8. Branching allows parallel development by isolating changes, making it easier to work on features without affecting the main codebase.

9. 

10. 

11.
```
PS C:\Users\dell\Desktop\gemini-git> git merge feature-branch
Updating 10bd5bb..b77d7bd
Fast-forward
 feature.txt | Bin 0 -> 40 bytes
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 feature.txt
```

If no conflicts, changes from feature-branch are integrated into master/main.

12. A merge conflict occurs when the same file is modified in different branches. To resolve:
Git marks the conflict in the file.Manually edit the file to resolve differences.Stage the resolved file: git add <filename>.,Complete the merge: git commit.

13. A remote repository is hosted on platforms like GitHub, enabling collaboration. A local repository exists on your machine.

14.
```
PS C:\Users\dell\Desktop\git-gemini> git clone https://github.com/krishnagithub03/temp_repo.git
Cloning into 'temp_repo'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
```

url : https://github.com/krishnagithub03/temp_repo.git

15.
```
PS C:\Users\dell\Desktop\git-gemini\temp_repo> echo "minor changes" >> README.md
PS C:\Users\dell\Desktop\git-gemini\temp_repo> git add .\README.md
PS C:\Users\dell\Desktop\git-gemini\temp_repo> git commit -m "Update README.md"
[main 2c00d58] Update README.md
 1 file changed, 0 insertions(+), 0 deletions(-)
PS C:\Users\dell\Desktop\git-gemini\temp_repo>
```

16.
```
PS C:\Users\dell\Desktop\git-gemini\temp_repo> git push origin main
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Writing objects: 100% (3/3), 296 bytes | 296.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/krishnagithub03/temp_repo.git
   ba11bf5..2c00d58  main -> main
```

Pushes local commits to the remote branch main.

17. Fetch vs Pull
    - git fetch: Downloads changes but doesn’t merge them.
    - git pull: Fetches and merges changes into the current branch.
18.

```
PS C:\Users\dell\Desktop\git-gemini\temp_repo> git commit --amend -m "Updated commit message"
[main 6c00133] Updated commit message
 Date: Fri Jan 3 18:10:55 2025 +0530
 1 file changed, 0 insertions(+), 0 deletions(-)
```