Lab 14: Version Control with Git

Assignment Date: November 22nd, 2024

Deadline: .....

Class: BCA 7th Semester, New Summit College

Subject: Software Project Management **(SPM)**

Objective:

1. To understand the basic concepts and operations of version control systems using Git, including repository creation, branch management, file tracking, and version history.

Tasks:

Task 1: Install Git and Configure Git Environment

1. Install Git on your computer (if not already installed).
2. Configure user credentials using the following commands:
    - `git config --global user.name "Your Name"`
    - `git config --global user.email "youremail@example.com"`

Task 2: Create a Local Repository

1. Create a folder named `MyProject`.
2. Navigate to the folder in your terminal and initialize a Git repository:
    - `git init`

Task 3: Track and Commit Files

1. Create a sample file (e.g., `README.md`) with basic project details.
2. Add the file to the staging area:
    - `git add README.md`
3. Commit the changes with a meaningful message:
    - `git commit -m "Initial commit with project details"`

Task 4: Create and Manage Branches

1. Create a new branch for adding features:
    - `git branch feature-branch`
2. Switch to the new branch:
    - `git checkout feature-branch`
3. Make changes in the file (e.g., add additional details in `README.md`).
4. Commit the changes to the new branch.

Task 5: Merge Changes to Main Branch

1. Switch back to the `main` branch:
    - `git checkout main`
2. Merge the `feature-branch` changes into the `main` branch:
    - `git merge feature-branch`

Task 6: View Version History

1. Use the `git log` command to view the commit history.
2. Explore commit details, including hash, author, and commit message.

Task 7: Push Repository to a Remote Repository (Optional)

1. Create a remote repository on GitHub or GitLab.
2. Link the local repository to the remote repository:
    - `git remote add origin <repository-url>`
3. Push the local changes to the remote repository:
    - `git push -u origin main`

Report Format & Structure (Topics to include for submission):

- INDEX
- Theory
    a. Version Control
    b. Git & GitHub
    c. Key Elements of Git
        i. Dashboards
        ii. Repository
- Implementation:
    a. Git Installation & Configuration Process
    b. Initialization of Git
    c. Steps to Track and Commit Files
    d. Branch Creation, Management, and Merging
    e. Branch Management & Version History
- Conclusion

References:

1. https://drive.google.com/file/d/1KS0mKCRK9lSJKwRhfa99uBNwVvb10bMQ/view?usp=sharing
2. https://drive.google.com/file/d/1b7noTbxKmAHo4ZmxoxGZW8cjBw9rie1P/view?usp=sharing

Note:

The reference provided is for guiding purposes only. The final document/report required may be different from the reference. So prepare the Report according to the Report Format provided above.