Lab 01

Introduction to Version Control with Git and GitHub

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

The key topics **discussed** in this lab, including the fundamentals of Git and GitHub, setting up Git on Windows, basic Git commands, and the steps to publish code to GitHub. It conveys the focus on version control and collaboration, which are essential concepts in software engineering.

Git 

Version control system is a tool that helps to track changes in code.
Git is a Version Control System.

- Popular
- Free & Open Source
- Fast & Scalable

Git is mainly used for two things.

- To track the history of changes
- To collaborate (work in a team)

GitHub 

Website that allows programmers to store and manage their code using Git.
https://github.com

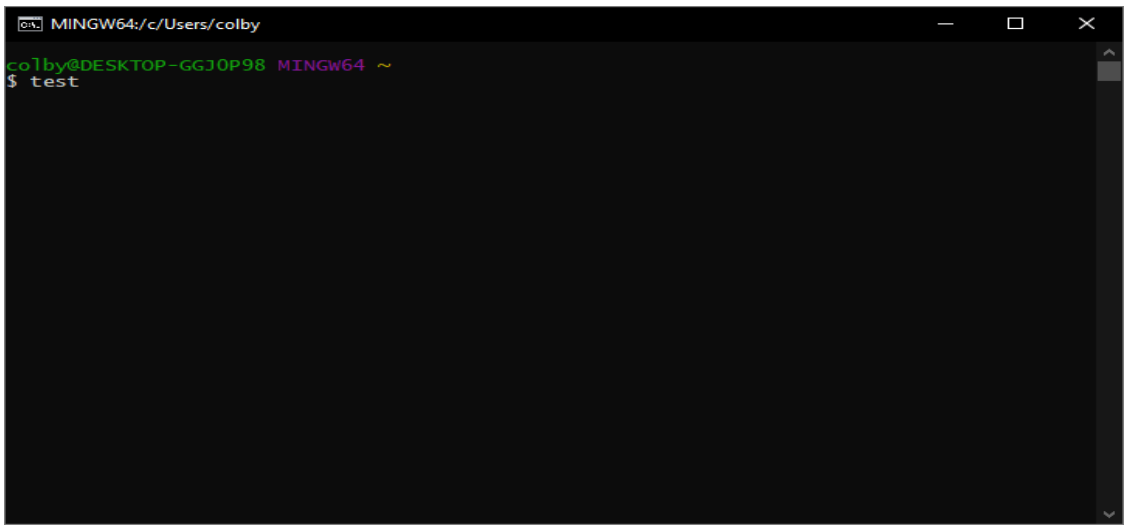
Setting Up Git on Windows

Follow these steps to set up Git on your Windows machine:

1. Download Git for Windows from the official website: https://git-scm.com/download/win

2. Run the installer and follow the installation instructions.

3. Open a command prompt or Git Bash and configure your name and email:



```
$ git config --global user.name "Your Name"
$ git config --global user.email "youremail@example.com"
```

Basic Git Commands

Here are some essential Git commands:

- **git init**: Initialize a new Git repository.
- **git clone**: Clone a repository from GitHub.
- **git add**: Stage changes for commit.
- **git commit**: Commit changes to the repository.
- **git pull**: Fetch and merge changes from a remote repository.
- **git push**: Push changes to a remote repository on GitHub.

Learn More

For a comprehensive guide on Git and GitHub, please check out our detailed tutorial in the Git Cheat Sheet file in this repository.

Steps of method 01 to Publish to GitHub

Step 1: Create a GitHub Repository

- Go to the GitHub website (https://github.com) and log in to your GitHub account.
- Click the "+" icon in the top-right corner and select "New repository."
- Fill in the repository name, description, and other settings.
- Choose the repository visibility (public or private).
- Optionally, initialize the repository with a README file or add a .gitignore file and a license.
- Click the "Create repository" button.

Step 2: Method 02 Install Git

If you haven't already installed Git on your computer, download and install it from the official website (https://git-scm.com/).

Step 3: Open Your Project in Visual Studio Code

- Open Visual Studio Code.
- Use the "File" menu to open your project folder.

Step 4: Initialize a Git Repository

- Open the integrated terminal in Visual Studio Code by pressing `Ctrl +` (backtick) or selecting `Terminal > New Terminal` from the menu.
- Navigate to your project directory using the terminal.
- Run the following command to initialize a Git repository in your project folder:

```
$ git init
```

Step 5: Add and Commit Your Code

- In Visual Studio Code, make changes to your project files as needed.
- Use the integrated terminal to add your changes to the staging area. Replace <file(s)> with the file(s) you want to stage or use '.' to stage all changes:

```
$ git add fileName
```

for all files

```
$ git add .
```

Commit your changes with a descriptive commit message:

```
$ git commit -m "Your commit message here"
```

Step 7: Push Your Code to GitHub

Push your local code to GitHub by running the following command:

```
$ git push origin main
```

1. **Task 1**: **Explain** the fundamentals of Git and GitHub. Read the provided material about Git and GitHub and answer the following questions:
    a. What is Git, and why is it used in software development?
    b. List three key features of Git.
    c. Explain the main purpose of GitHub.

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

Marks	1	2	3	4
Knowledge	Student could not demonstrate knowledge about the given topic	Some concepts are demonstrated but clearly students lack deep understanding	Most of the knowledge is correct, some further understanding and improvements are required	Demonstrated knowledge about topic well with deep understanding of concepts.

2. **Task 2**: **Discuss** and Learn how to install Git on a Windows machine and configure it.
    a. Task: Follow the steps outlined in the material to install Git on your Windows computer. Use the provided link to download Git for Windows.
    b. Task: After installation, open a command prompt or Git Bash and configure your name and email as instructed in the material.

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

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3. **Task 3**: **Identify** essential Git commands. Read and understand the basic Git commands listed in the material.
    a. Task: Practice using Git commands on your local machine. Initialize a new Git repository, add a file, make changes, stage changes, commit changes, and view the Git history.

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

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4. **Task 4**: **Describe** how you can Create a GitHub repository for your project.
    a. Task: Follow the step-by-step instructions from the material to create your GitHub repository. Provide a name, description, and choose the repository's visibility (public or private).
    b. Task: Optionally, initialize the repository with a README file. Explore the repository settings on GitHub.

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

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5. **Task 5**: **Discuss** how you can Publish your project to GitHub.
    a. Task: Open your project in Visual Studio Code (VS Code) if you have one. If not, create a simple project or use any existing code.
    b. Task: Initialize a Git repository in your project directory using VS Code's integrated terminal. Then, make changes to your project, stage those changes, and commit them with a meaningful message.
    c. Task: Push your local code to the GitHub repository you created in Lab Task 4. Use the provided Git command in the material to perform the push operation.

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			improvements are required	understanding of concepts.

Lab Report: Must be submitted in next lab. Followings are the rubrics for lab report.

Marks	1	2	3	4
Lab Report	The lab report does not follow the guidelines for formatting.	Presents some sections of the lab in the correct order. Three or more sections are not in the correct order; missing heading or title;	Presents most sections of the lab in the correct order, one or two sections may not be in the correct order; heading or title missing or not complete;	Presents all the sections of the lab in the correct order with correct formatting: includes correct heading, section headings and title of lab;