

Experiment 1

Objective: Overview of Git and GitHub, Setting Up GitHub Account, Initializing a GitHub Repository and pushing a README File.

Software Used/ Tools Required: Git, GitHub Account, Visual Studio Code.

Theory overview:

1. Git: Version Control System

- **Definition:** Git is a distributed version control system (VCS) used to track changes in source code during software development.
- **Purpose:** It allows multiple developers to work on a project simultaneously, keeping track of every change.
- **Key Features:**
 - **Commits:** Save points in your code history.
 - **Branches:** Independent versions of the code to test or develop features.
 - **Merging:** Combining changes from different branches.
 - **Distributed:** Every developer has a full copy of the repository.
- **Commands to Know:** git init, git clone, git status, git add, git commit, git push, git pull, git merge, git branch.

2. GitHub: Code Hosting Platform

- **Definition:** GitHub is a cloud-based platform for hosting and managing Git repositories.
- **Purpose:** It provides tools for collaboration, code sharing, and project management.
- **Key Features:**
 - **Repositories (Repos):** Projects stored online.
 - **Pull Requests (PRs):** Propose changes and get them reviewed.
 - **Issues:** Track bugs or tasks.
 - **Actions:** Automate workflows like testing or deployment.
 - **Social Coding:** Collaborate through forks, stars, followers.
- **Common Use:** Team projects, open source, portfolio hosting.

3. Visual Studio

IDE (Integrated Development Environment)

- **Definition:** Visual Studio is a comprehensive IDE from Microsoft used to develop applications for Windows, the web, cloud, and more.

- Purpose: It helps developers write, debug, and deploy code efficiently.
- Key Features:
 - Code Editor with IntelliSense (auto-complete & suggestions).
 - Debugger to find and fix errors.
 - Designer Tools for UI/UX.
 - Extensions to support many languages and tools (e.g., Git integration).
 - GitHub integration: Push/pull code, manage branches, and handle commits from within the IDE.

Procedure:

1. Install Git on your system

- Visit <https://git-scm.com/downloads>
- Download and install Git based on your OS (Windows/Mac/Linux)
- After installation, open terminal (or Git Bash) and verify by running:
- `git --version`

2. Create a GitHub account

- Go to <https://github.com>
- Sign up with your email, choose a username, and set a password
- After logging in, click **New Repository** to create a remote repo
- Give it a name (e.g., OST-Lab), make it public/private, and **do not initialize with README** (optional if pushing from local)

3. Initialize Git in your local project folder

- Open terminal in the folder where you want to keep your project files
- Run the following command:
 - `git init`
- This creates a `.git` folder and makes it a Git repository

4. Create a README.md file

- Inside your project folder, create a file named README.md
- Add basic content to it, such as:
- `# OST Lab`

- This repository contains experiments and assignments for the Operating Systems & Technology Lab.

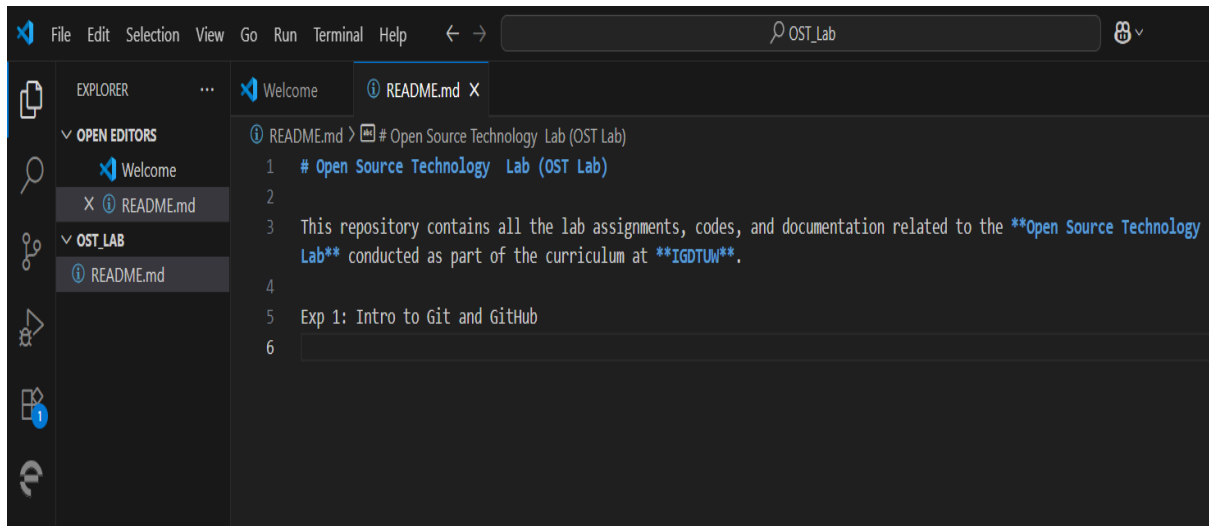
5. Stage and commit the file

- Use the following commands:
- `git add README.md`
- `git commit -m "Initial commit with README"`

6. Connect to GitHub and push the code

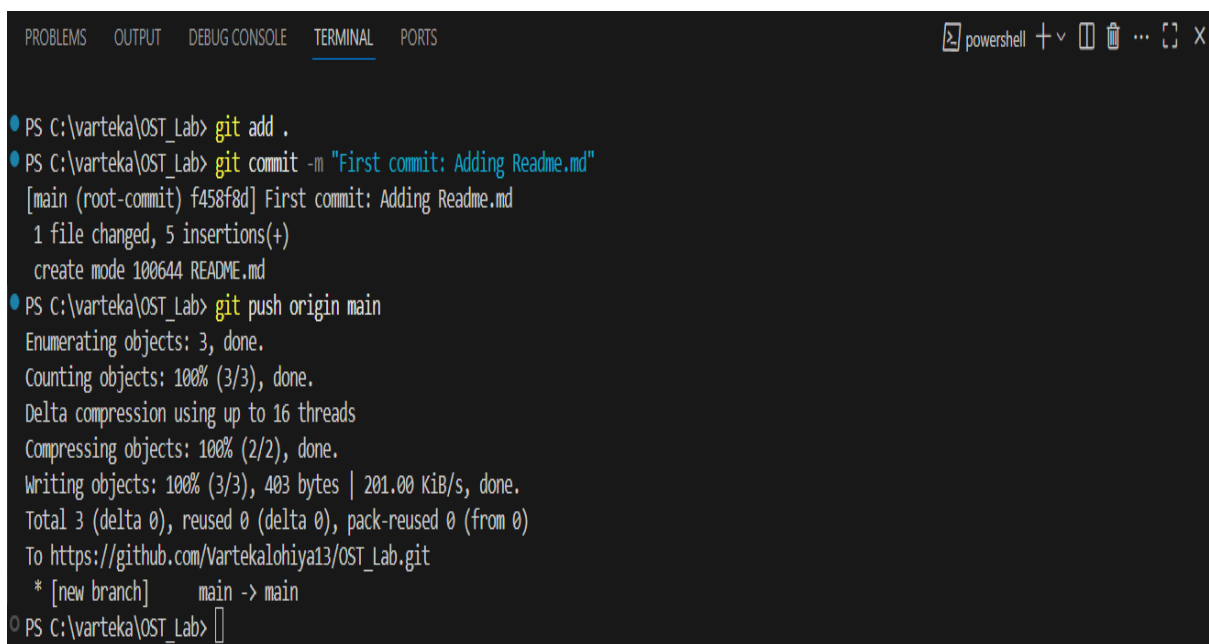
- `git add .`
- `git commit -m "First Commit"`
- `git push origin main`

Code:



The screenshot shows the Visual Studio Code interface with the Explorer sidebar on the left. The Explorer sidebar shows the 'OST_LAB' folder containing 'README.md'. The main editor area displays the content of 'README.md' with the following text:

```
1 # Open Source Technology Lab (OST Lab)
2
3 This repository contains all the lab assignments, codes, and documentation related to the **Open Source Technology Lab** conducted as part of the curriculum at **IGDTUW**.
4
5 Exp 1: Intro to Git and GitHub
6
```



The screenshot shows the PowerShell terminal in Visual Studio Code with the following commands and output:

```
PS C:\varteka\OST_Lab> git add .
PS C:\varteka\OST_Lab> git commit -m "First commit: Adding Readme.md"
[main (root-commit) f458f8d] First commit: Adding Readme.md
1 file changed, 5 insertions(+)
create mode 100644 README.md
PS C:\varteka\OST_Lab> git push origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 16 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 403 bytes | 201.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Vartekalohiya13/OST_Lab.git
 * [new branch]      main -> main
PS C:\varteka\OST_Lab>
```

Output:

```
Git CMD

C:\Users\varti>git --version
git version 2.49.0.windows.1

C:\Users\varti>
```

