

SEPM EXPERIMENT -2

Aim: To understand Version Control System / Source Code Management, install git and create a GitHub account

Theory: **Understanding Version Control System (VCS) / Source Code Management (SCM)**

Version Control Systems (VCS) or Source Code Management (SCM) systems are tools that help developers manage changes to code over time. They allow multiple developers to work on the same project simultaneously, track every modification to the code, and revert to previous versions if necessary.

Key Concepts:

1. **Version Control:** This refers to managing changes to a project's codebase over time. Each change is recorded, allowing developers to track and revert to previous versions when needed.
2. **Source Code Management (SCM):** This is a broader term that encompasses version control and also manages all the artifacts associated with the development process, including code, documentation, and configurations.
3. **Why Version Control is Important:**
 - **Track Changes:** Version control lets you see who made changes to the code and when. This is important for debugging and understanding the evolution of the project.
 - **Collaboration:** Multiple developers can work on the same codebase without overwriting each other's work. Changes can be merged from different branches or forks.

- **Backup and Recovery:** In case something goes wrong, you can easily revert to a stable version of the project.
- **History:** Version control systems maintain a history of changes, allowing you to track the development process and understand why certain decisions were made.

Git: A Distributed Version Control System

Git is one of the most popular VCS tools. It's a distributed system, meaning that every developer has a local copy of the entire project history. Git allows you to track code changes, revert to previous versions, and collaborate with others effectively.

Key Features of Git:

- **Branching and Merging:** Git allows developers to work on multiple branches of a project simultaneously. Each branch can represent a different feature, and changes can be merged back into the main project when ready.
- **Distributed Nature:** Every developer has a complete copy of the repository, which improves performance and makes working offline possible.
- **Speed:** Git is designed to be fast, enabling efficient handling of large codebases.

GitHub: A Platform for Git Repositories

GitHub is a platform that provides Git repository hosting. It's a web-based service that allows developers to share and collaborate on code.

Key Features of GitHub:

- **Remote Repositories:** GitHub hosts remote copies of repositories that can be accessed by multiple users.
- **Collaboration:** GitHub enables developers to collaborate on projects through features like pull requests, issues, and code reviews.
- **Community:** GitHub hosts open-source projects and fosters community contributions, making it a central hub for developers.
- **Integration:** GitHub integrates with a variety of tools, including continuous integration/continuous deployment (CI/CD) services, project management tools, and more.

Steps to Install Git and Create a GitHub Account

1. Install Git:

- Visit [Git's official website](#) and download the Git installer for your operating system.
- **Windows:** Run the installer and follow the instructions. Choose the default settings unless you have specific preferences.

2. •

Linux: You can install Git through your package manager. For Ubuntu, use:

```
sudo apt install git
```

Configure Git: After installing Git, open the terminal and configure your Git identity:

```
git config --global user.name "Your Name"
```

```
git config --global user.email "youremail@example.com"
```

1. Create a GitHub Account:

- Visit [GitHub's official website](#) and sign up for a new account.
- Follow the instructions to create your profile, verify your email, and set up your preferences.

2. Set Up SSH Keys (Optional, but Recommended):

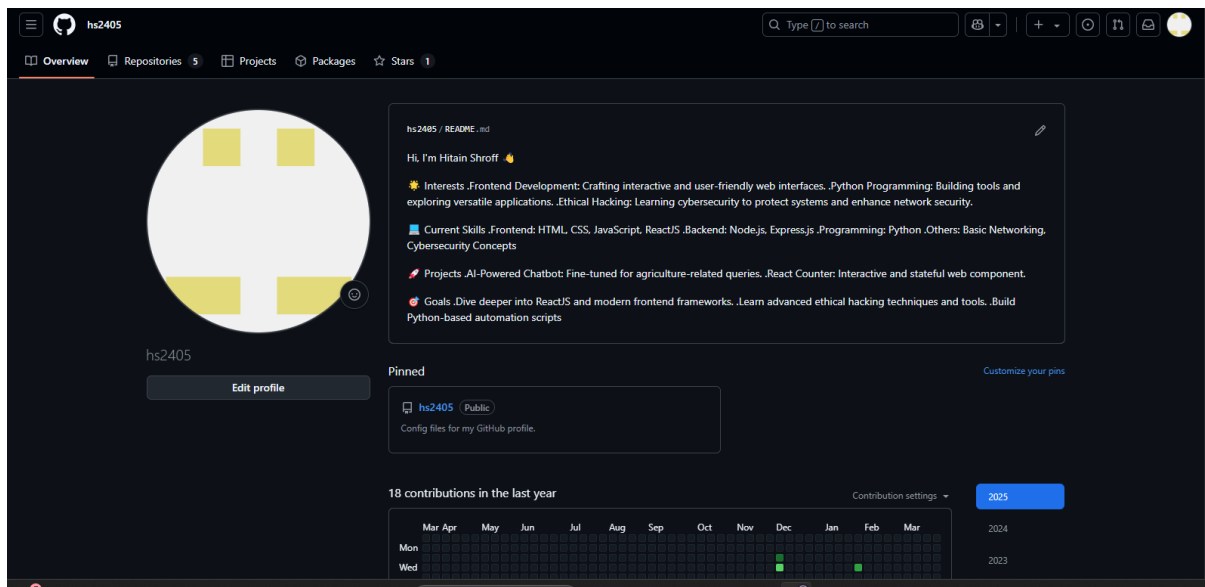
For secure communication with GitHub, you should set up SSH keys. This allows you to interact with GitHub repositories without entering your username and password each time.

- Generate an SSH key on your machine by running the following command:

SSH

```
ssh-keygen -t rsa -b 4096 -C "your_email@example.com"
```

- Add the generated key to GitHub by following [GitHub's guide](#).



Conclusion: Version Control Systems like Git are crucial for modern software development, as they allow developers to collaborate, track changes, and maintain a history of their codebase. GitHub provides a

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platform to host and share Git repositories, making it easier to collaborate on open-source and private projects. By installing Git and setting up a GitHub account, you're taking the first steps in managing your code and contributing to the wider software development community.