**GIT AND GITHUB**

**What is Git?**

**Git** is a **distributed version control system (DVCS)** used to track changes in source code during software development. It allows multiple developers to collaborate, manage versions, and maintain a history of modifications efficiently.

**Key Features of Git:**

* Tracks changes in files and directories
* Enables collaboration among multiple developers
* Supports branching and merging for feature development
* Provides a history of all changes made to the codebase
* Works locally and can be synced with remote repositories

**What is GitHub?**

**GitHub** is a **cloud-based platform** that provides Git repository hosting with additional collaboration and project management features. It allows teams to store, manage, and collaborate on Git repositories online.

**Key Features of GitHub:**

* Cloud storage for Git repositories
* User-friendly interface for managing repositories
* Supports Pull Requests (PRs) and Code Reviews
* Provides Actions for automation and CI/CD
* Offers Issue tracking and project management tools

**GitHub Account Opening Procedure:**

1. Go to [GitHub](https://github.com/) and click **"Sign up"**.
2. Enter a **Username**, **Email**, and **Password** → Click **"Continue"**.
3. Solve the **CAPTCHA** and click **"Create account"**.
4. Check your email and click the **verification link**.
5. Set up your profile (optional) and proceed to the **GitHub Dashboard**.

**Git Installation Steps:**

1. **Download Git** from [git-scm.com](https://git-scm.com/downloads).
2. **Install Git**:
   * **Windows**: Run the installer with default settings.
   * **macOS**: Run brew install git in Terminal.
   * **Linux (Ubuntu/Debian)**: Run sudo apt update && sudo apt install git.
3. **Verify Installation**: Run git --version in Terminal/Command Prompt.

**Cloning a Repository and Pushing a File to GitHub:**

**1.Navigate to the directory where you want to store your project:**

* + cd Desktop/

**2. Clone the GitHub repository to your local system:**

* + git clone https://github.com/your-username/Data\_Science.git

**3.Navigate into the repository folder:**

* + cd Data\_Science/

**4.Check the status of the repository:**

* + git status

**5.Stage the Java file for commit:**

* + git add Sample.java

**6.Commit the file with a message:**

* + git commit –m “Added Sample.java file”

**7. Push the changes to GitHub:**

* + git push

**Steps to Add a File in GitHub & Pull It to Local Git:**

**1.Add a File in GitHub:**

1. Go to your GitHub repository.
2. Click **"Add file" → "Create new file"**.
3. Enter a filename and content.
4. Click **"Commit changes"**.

**2️.Pull the File to Local Git:**

1. Open Terminal/Command Prompt.
2. Navigate to your local repository:
   * cd path/to/your/local-repository
3. Pull the latest changes from GitHub:
   * git pull origin main

### ****Conclusion:****

In this guide, we covered the essential steps for working with **Git and GitHub**, from account creation to managing repositories. The process includes:

1. **Setting up Git and GitHub** **:**

Installing Git, configuring user details, and connecting with GitHub.

1. **Cloning a Repository :**

Copying a GitHub repository to a local system for development.

1. **Making Changes and Pushing Files :**

Adding, committing, and pushing files from the local repository to GitHub.

1. **Pulling Updates from GitHub** **:**

Fetching the latest changes from GitHub to keep the local repository updated.