SOFTWARE ENGINEERING

UNIT – 2

TOPIC – 9

GIT COMMANDS: WORKING WITH REMOTE REPOSITORIES - REMOTE, CLONE, PULL, PUSH, FORK

1. Git Remote

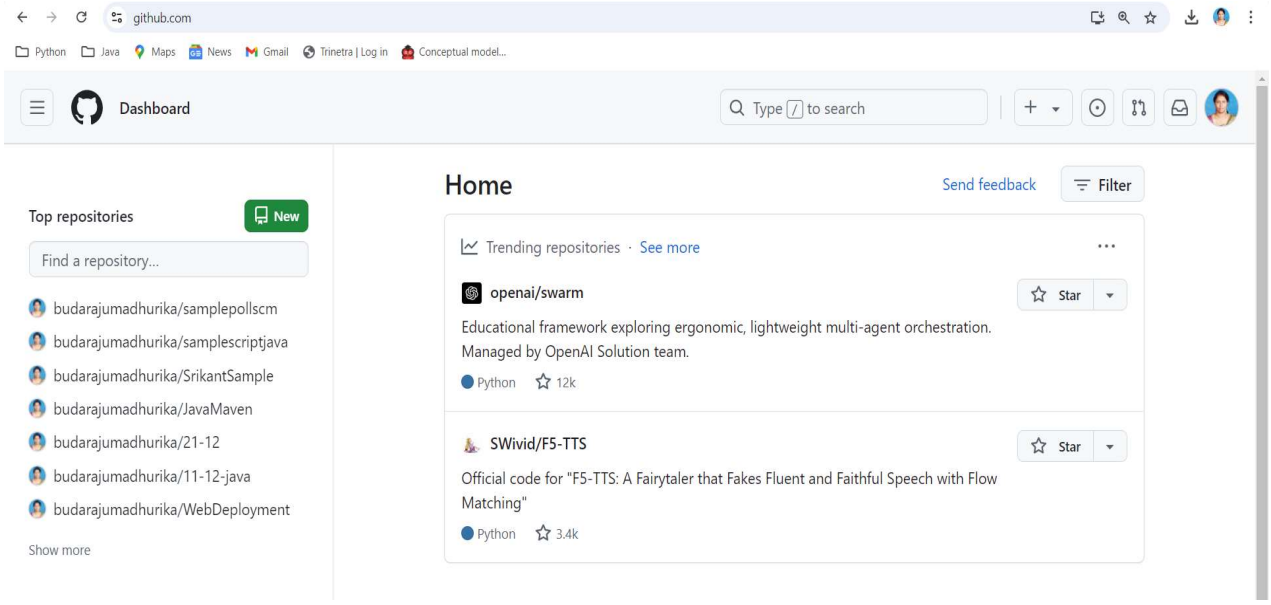
Git remote allows you to manage connections to **remote repositories**, which are Git repositories hosted on the internet (like **GitHub** or **Bitbucket**). A remote repository is where you can save or retrieve your project from a server, and you use this command to add, remove, or view the addresses (URLs) of these repositories.

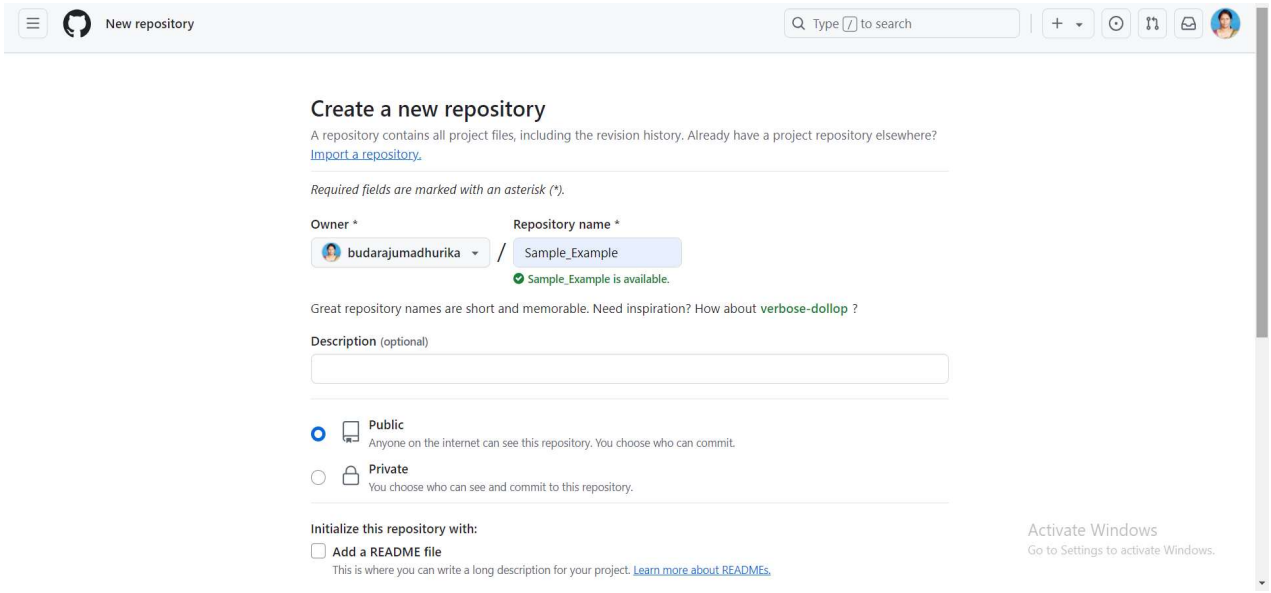
- To add a new remote repository, you use:

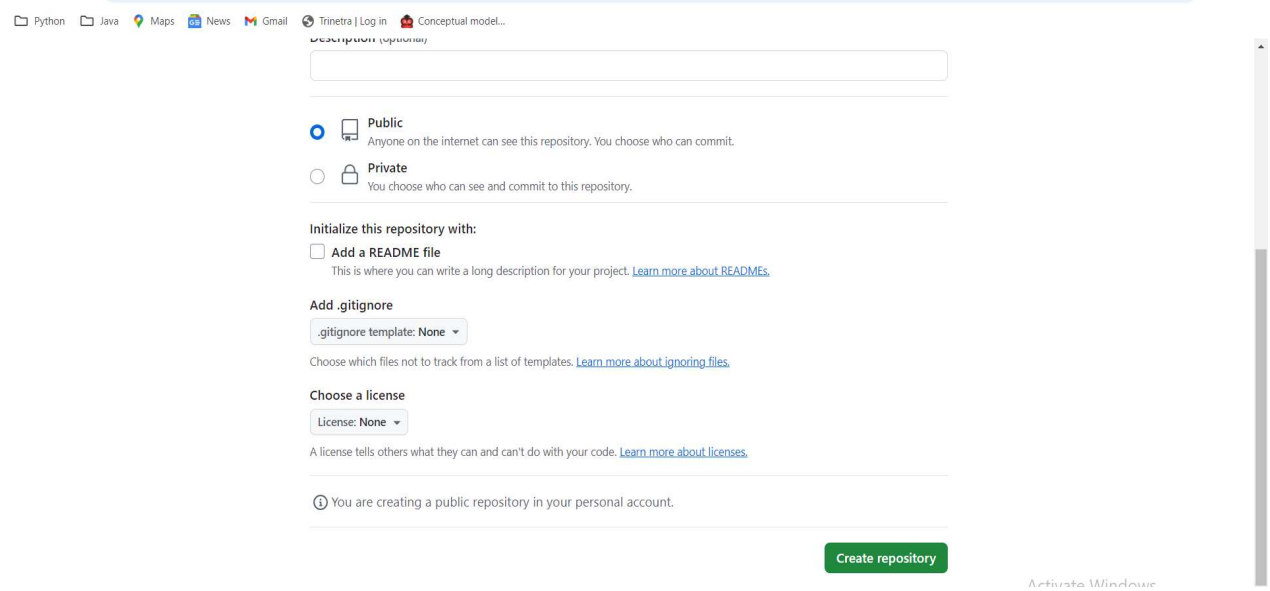
  ```
  git remote add origin https://github.com/user/repo.git
  ```

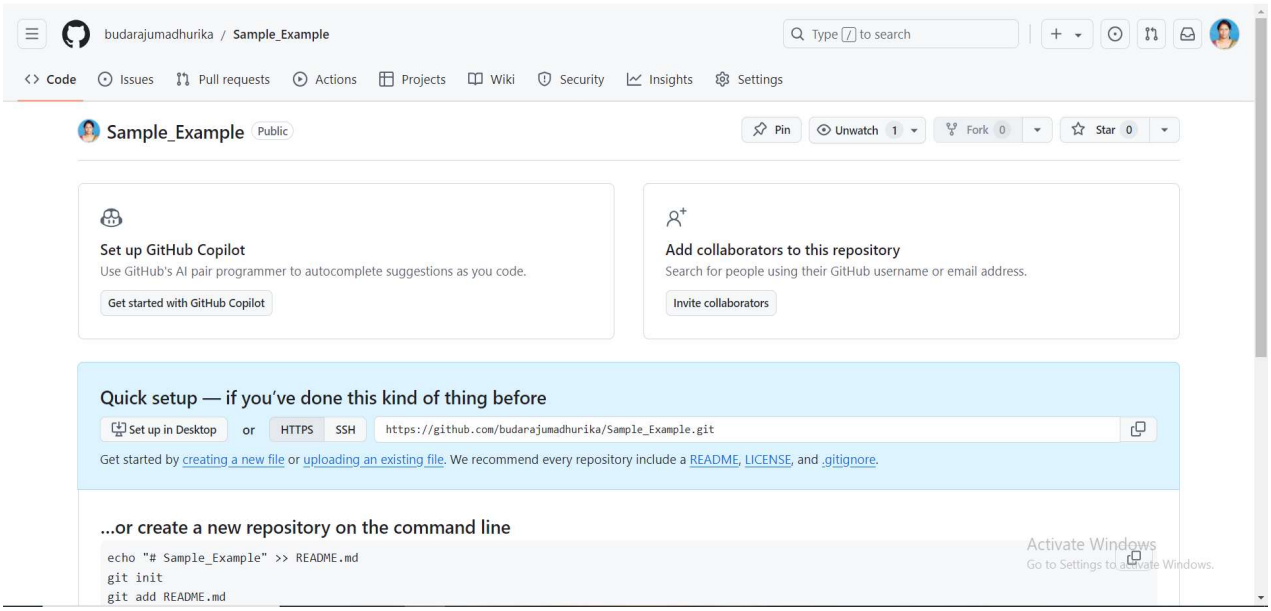
  This adds a new connection to a remote repository called `origin`, which is the common default name for remote repositories. After setting up the remote, you can start interacting with it, like pushing or pulling code.

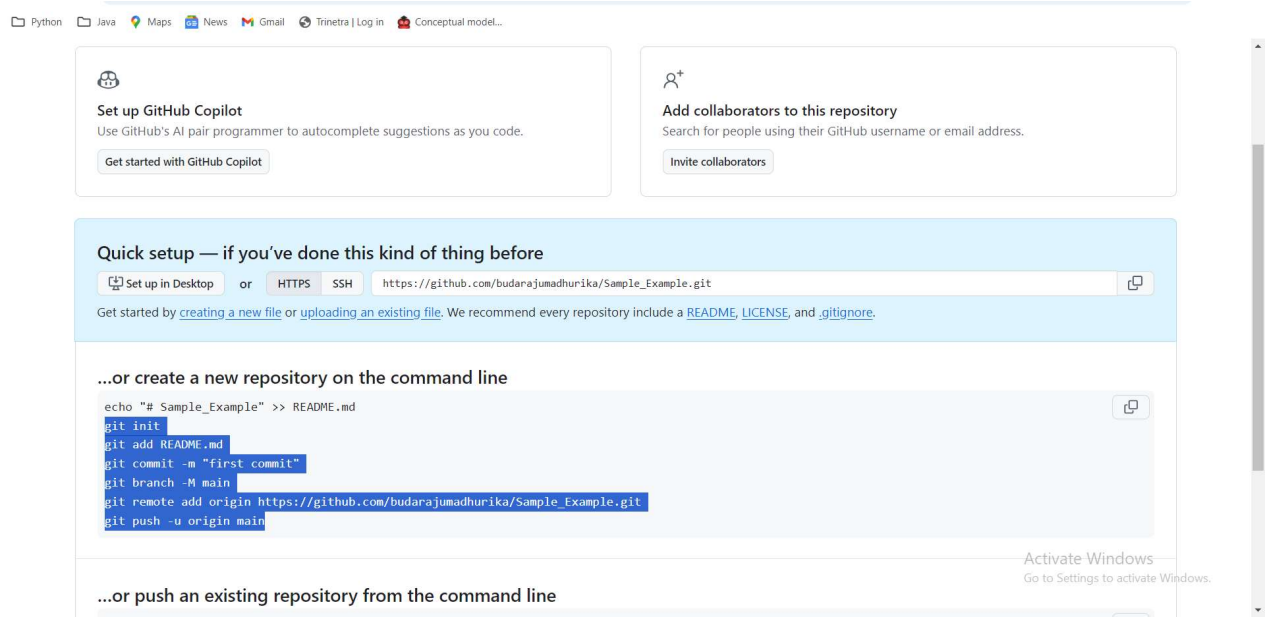
- **Important Commands**:
  - `git remote -v`: Shows the current remotes and their URLs.
  - `git remote add <name> <url>`: Adds a new remote connection.
  - `git remote remove <name>`: Removes an existing remote.

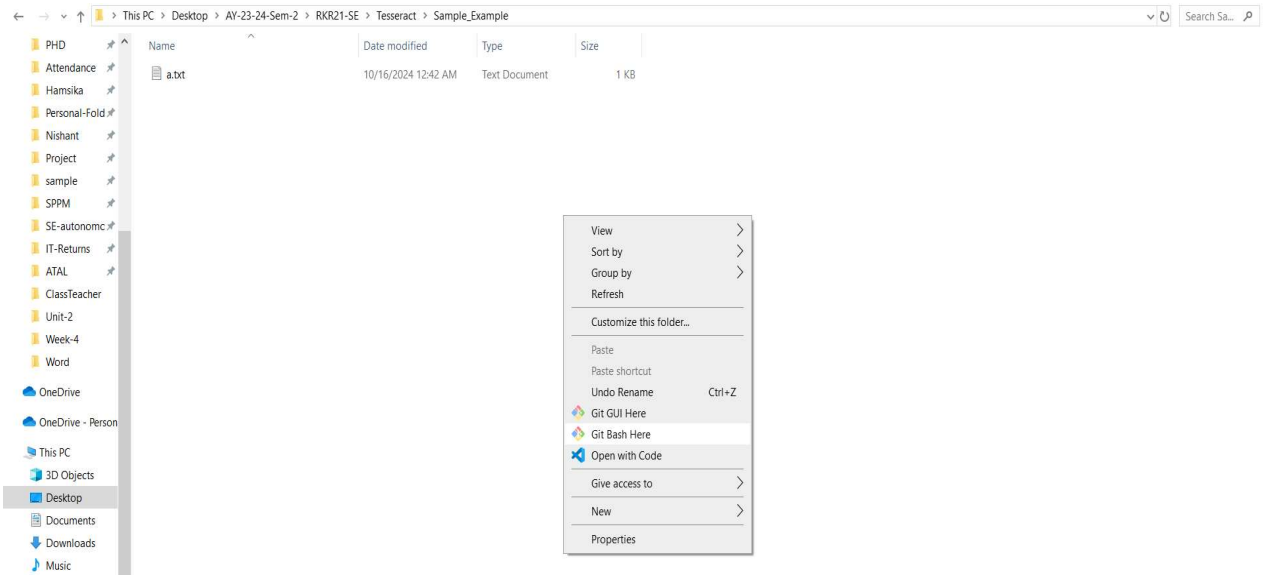

github.com
Python
Java
Maps
News
Gmail
Trinetra | Log in
Conceptual model...
Dashboard
Type / to search
Top repositories
New
Find a repository...
budarajumadhurika/samplepollscm
budarajumadhurika/samplescriptjava
budarajumadhurika/SrikantSample
budarajumadhurika/JavaMaven
budarajumadhurika/21-12
budarajumadhurika/11-12-java
budarajumadhurika/WebDeployment
Show more
Home
Send feedback
Filter
Trending repositories · See more
openai/swarm
Star
Educational framework exploring ergonomic, lightweight multi-agent orchestration. Managed by OpenAI Solution team.
Python
12k
SWivid/F5-TTS
Star
Official code for "F5-TTS: A Fairytaler that Fakes Fluent and Faithful Speech with Flow Matching"
Python
3.4k


New repository
Type / to search
Create a new repository
A repository contains all project files, including the revision history. Already have a project repository elsewhere?
Import a repository.
Required fields are marked with an asterisk (*).
Owner *
budarajumadhurika
/
Repository name *
Sample_Example
Sample_Example is available.
Great repository names are short and memorable. Need inspiration? How about verbose-dollop ?
Description (optional)
Public
Anyone on the internet can see this repository. You choose who can commit.
Private
You choose who can see and commit to this repository.
Initialize this repository with:
Add a README file
This is where you can write a long description for your project. Learn more about READMEs.
Activate Windows
Go to Settings to activate Windows.


Python
Java
Maps
News
Gmail
Trinetra | Log in
Conceptual model...
Public
Anyone on the internet can see this repository. You choose who can commit.
Private
You choose who can see and commit to this repository.
Initialize this repository with:
Add a README file
This is where you can write a long description for your project. Learn more about READMEs.
Add .gitignore
.gitignore template: None
Choose which files not to track from a list of templates. Learn more about ignoring files.
Choose a license
License: None
A license tells others what they can and can't do with your code. Learn more about licenses.
You are creating a public repository in your personal account.
Create repository

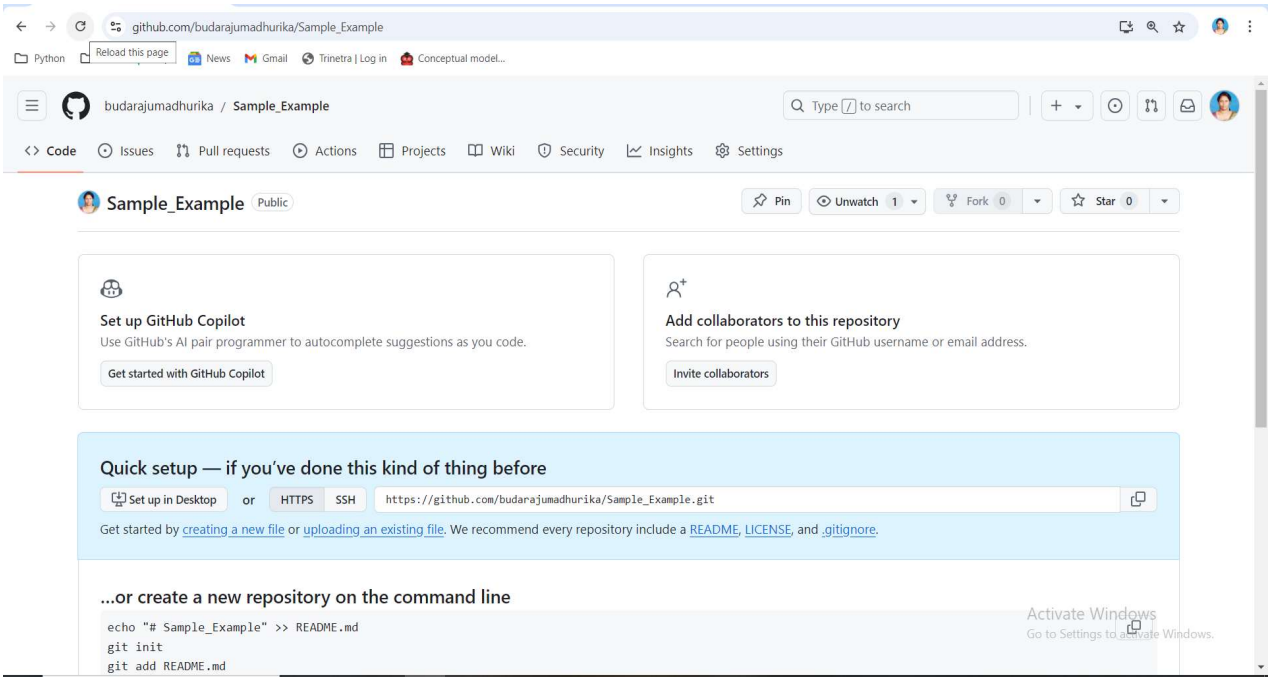

budarajumadhurika / Sample_Example
Type / to search
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
Sample_Example
Public
Pin
Unwatch 1
Fork 0
Star 0
Set up GitHub Copilot
Use GitHub's AI pair programmer to autocomplete suggestions as you code.
Get started with GitHub Copilot
Add collaborators to this repository
Search for people using their GitHub username or email address.
Invite collaborators
Quick setup — if you've done this kind of thing before
Set up in Desktop
or
HTTPS
SSH
https://github.com/budarajumadhurika/Sample_Example.git
Get started by creating a new file or uploading an existing file. We recommend every repository include a README, LICENSE, and .gitignore.
...or create a new repository on the command line
echo "# Sample_Example" >> README.md
git init
git add README.md
Activate Windows
Go to Settings to activate Windows.

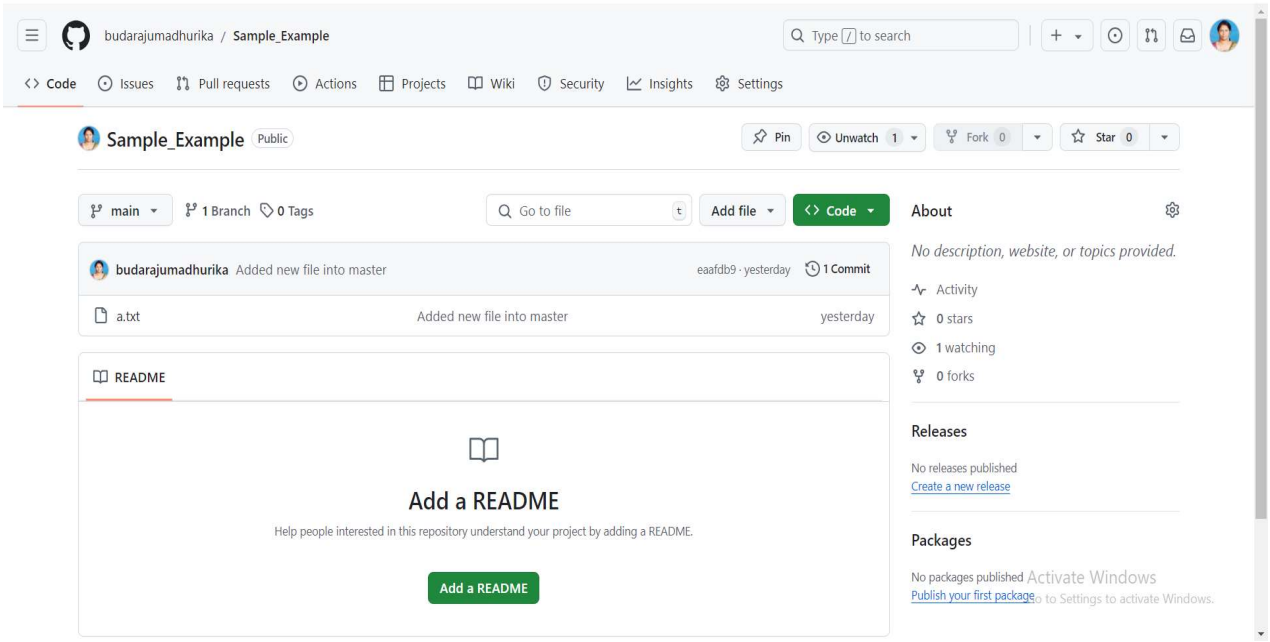





```
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tes
seract/Sample_Example (master)
$ git branch -M main

Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tes
seract/Sample_Example (main)
$ git remote add origin https://github.com/budarajumadhurika/Sample
_Example.git

Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tes
seract/Sample_Example (main)
$ git remote -v
origin  https://github.com/budarajumadhurika/Sample_Example.git (fe
tch)
origin  https://github.com/budarajumadhurika/Sample_Example.git (pu
sh)
```

```
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tes
seract/Sample_Example (main)
$ git push -u origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 248 bytes | 82.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/budarajumadhurika/Sample_Example.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.
```





2. Connecting Git to GitHub Using SSH Key

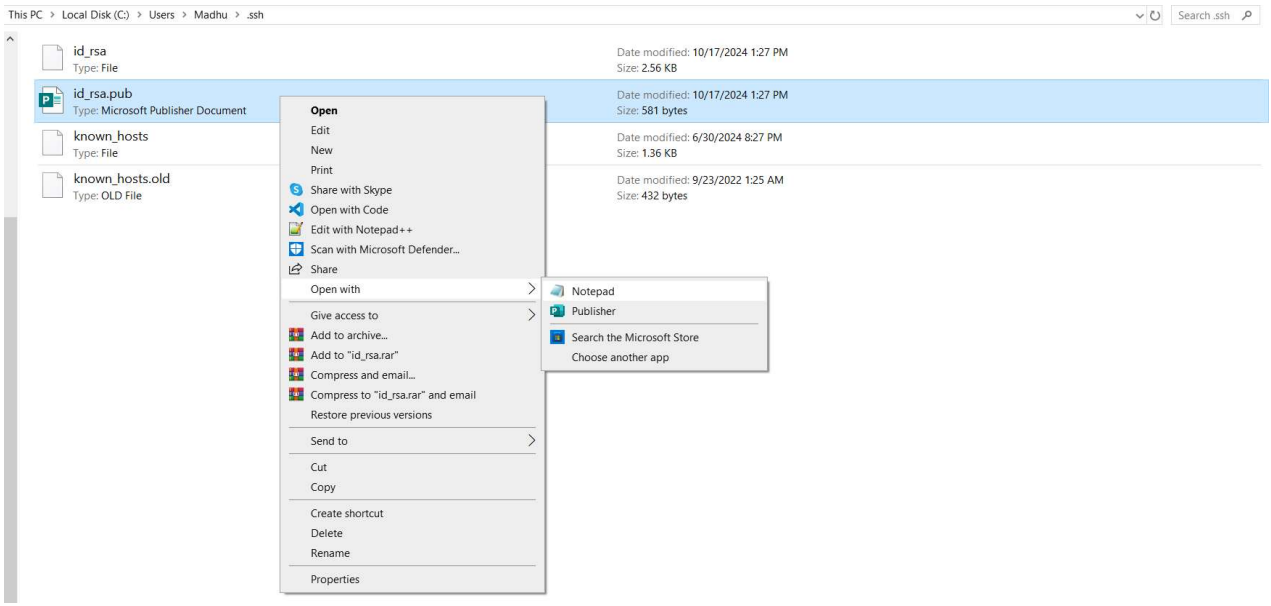
SSH (**Secure Shell**) keys are a way to connect your computer to GitHub without needing to enter a password each time.

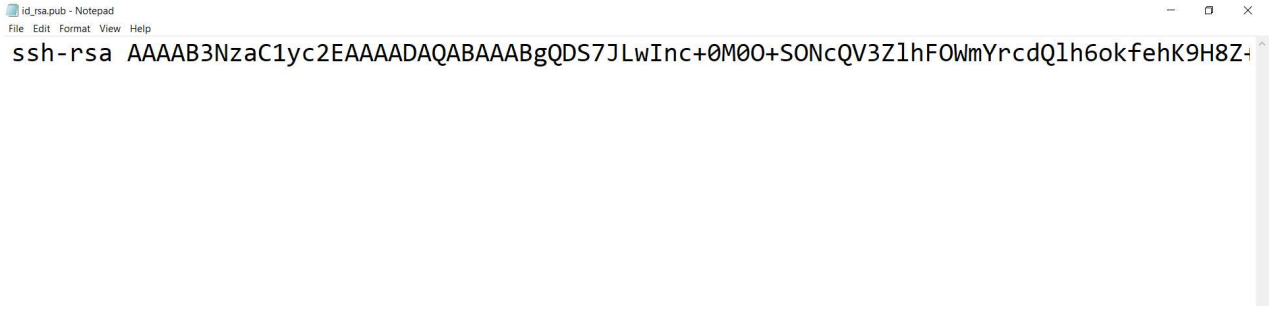
It uses a **key pair**:

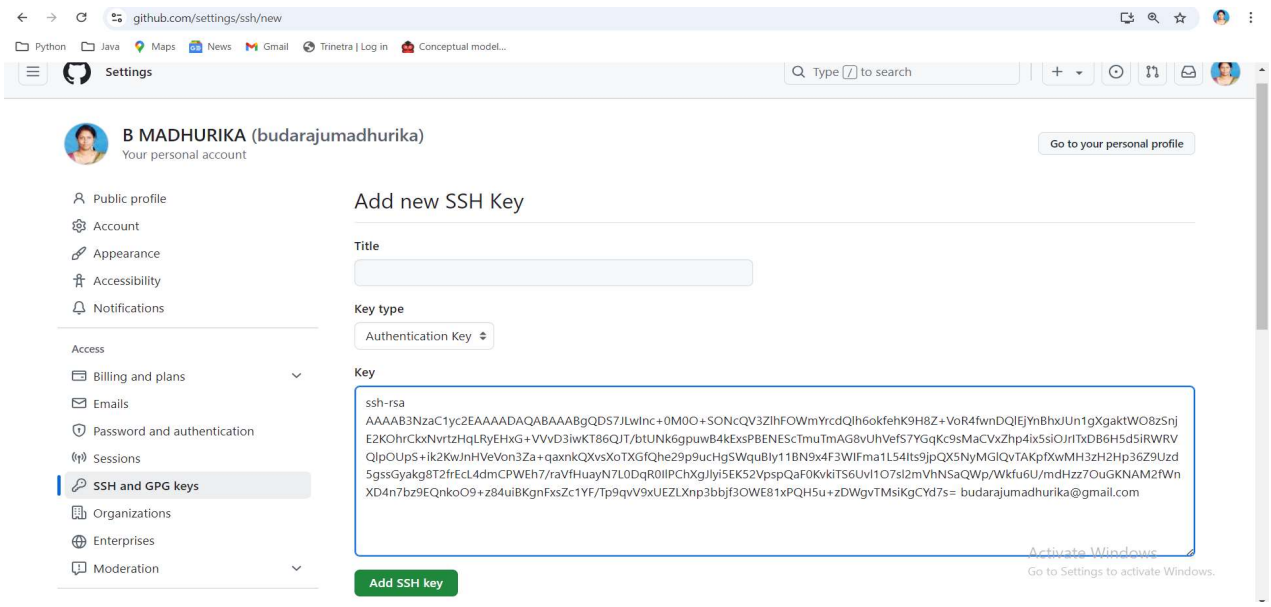
- A **private key** that stays on your computer.
- A **public key** that is shared with GitHub to verify your identity.
- **Steps for Generating SSH Key**:
    1. **Generate SSH Key**: Use the command `ssh-keygen -t rsa` to generate the key on your system.
    2. **Copy the Public Key**: The public key is stored in a file (usually `id_rsa.pub`), and you copy this key.
    3. **Add to GitHub**: In GitHub, go to Settings > SSH and GPG keys > New SSH Key. Paste the copied key into the text box and click "Add SSH key."

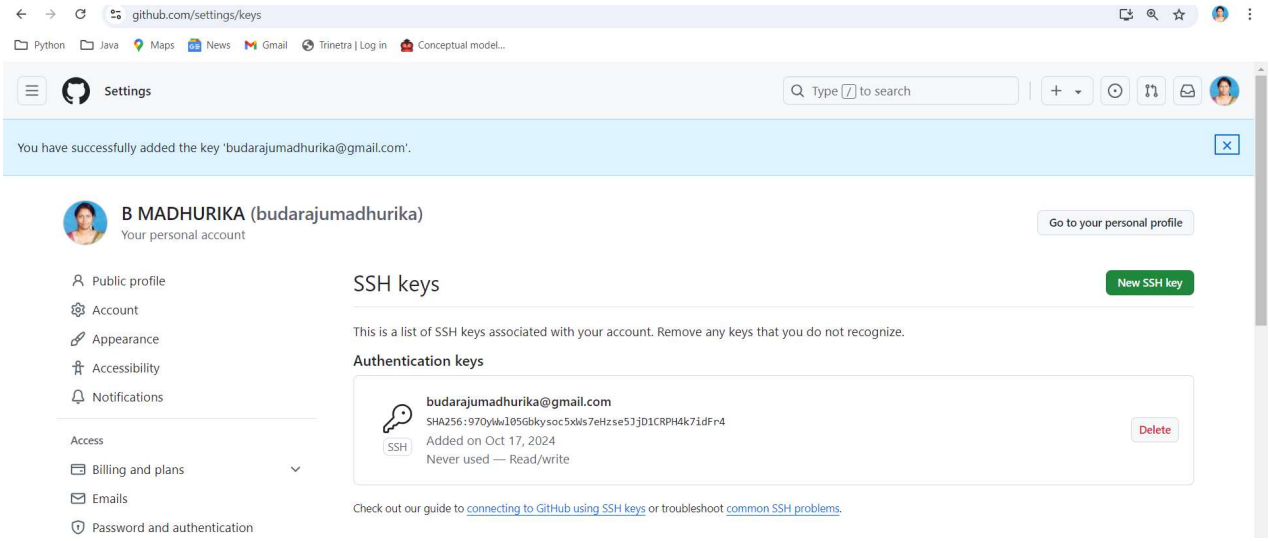
This allows you to securely interact with GitHub without typing your password every time.

```
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tes
seract/Example (master)
$ ssh-keygen -t rsa -C budarajumadhurika@gmail.com
Generating public/private rsa key pair.
Enter file in which to save the key (/c/Users/Madhu/.ssh/id_rsa):
/c/Users/Madhu/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /c/Users/Madhu/.ssh/id_rsa
Your public key has been saved in /c/Users/Madhu/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:97OyWwl05Gbkysoc5xWs7eHzse5JjD1CRPH4k7idFr4 budarajumadhurik
a@gmail.com
The key's randomart image is:
+---[RSA 3072]----+
|             =.  |
|            B o  |
|           . @ . |
|          o O + .|
|         S B * = |
|        o * B X +|
|         + . % @ |
|           .. O *|
|          o+.oE  |
+----[SHA256]-----+
```


This PC > Local Disk (C:) > Users > Madhu > .ssh
Search .ssh
id_rsa
Type: File
Date modified: 10/17/2024 1:27 PM
Size: 2.56 KB
id_rsa.pub
Type: Microsoft Publisher Document
Date modified: 10/17/2024 1:27 PM
Size: 581 bytes
known_hosts
Type: File
Date modified: 6/30/2024 8:27 PM
Size: 1.36 KB
known_hosts.old
Type: OLD File
Date modified: 9/23/2022 1:25 AM
Size: 432 bytes
Open
Edit
New
Print
Share with Skype
Open with Code
Edit with Notepad++
Scan with Microsoft Defender...
Share
Open with
Give access to
Add to archive...
Add to "id_rsa.rar"
Compress and email...
Compress to "id_rsa.rar" and email
Restore previous versions
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties
Notepad
Publisher
Search the Microsoft Store
Choose another app


id_rsa.pub - Notepad
File Edit Format View Help
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQDS7JLwInc+0M0O+SONcQV3ZlhFOWmYrcdQlh6okfehK9H8Z+


github.com/settings/ssh/new
Python Java Maps News Gmail Trinetra | Log in Conceptual model...
Settings
Type / to search
B MADHURIKA (budarajumadhurika)
Your personal account
Go to your personal profile
Public profile
Account
Appearance
Accessibility
Notifications
Access
Billing and plans
Emails
Password and authentication
Sessions
SSH and GPG keys
Organizations
Enterprises
Moderation
Add new SSH Key
Title
Key type
Authentication Key
Key
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABgQDS7JLwInc+0M0O+SONcQV3ZlhFOWmYrcdQlh6okfehK9H8Z+VoR4fwnDQlEjYnBhxJUn1gXgaktWO8zSnj
E2KOhrCkxNvrtzHqLRyEHxG+VVvD3iwKT86QJT/btUNk6gpuwB4kExsPBENEScTmuTmAG8vUhVefS7YGqKc9sMaCVxZhp4ix5siOJrITxDB6H5d5iRWRV
QlpOUpS+ik2KwJnHVeVon3Za+qaxnkQXvsXoTXGfQhe29p9ucHgSWquBly11BN9x4F3WIFma1L54Its9jpQX5NyMGlQvTAKpfXwMH3zH2Hp36Z9Uzd
5gssGyakg8T2frEcL4dmCPWEh7/raVfHuayN7L0DqR0IlPChXgJlyi5EK52VpspQaF0KvkiTS6Uvl1O7sl2mVhNSaQWp/Wkfu6U/mdHzz7OuGKNAM2fWn
XD4n7bz9EQnkoO9+z84uiBKgnFxsZc1YF/Tp9qvV9xUEZLXnp3bbjf3OWE81xPQH5u+zDWgvTMsiKgCYd7s= budarajumadhurika@gmail.com
Add SSH key
Activate Windows
Go to Settings to activate Windows.



3. Git Clone

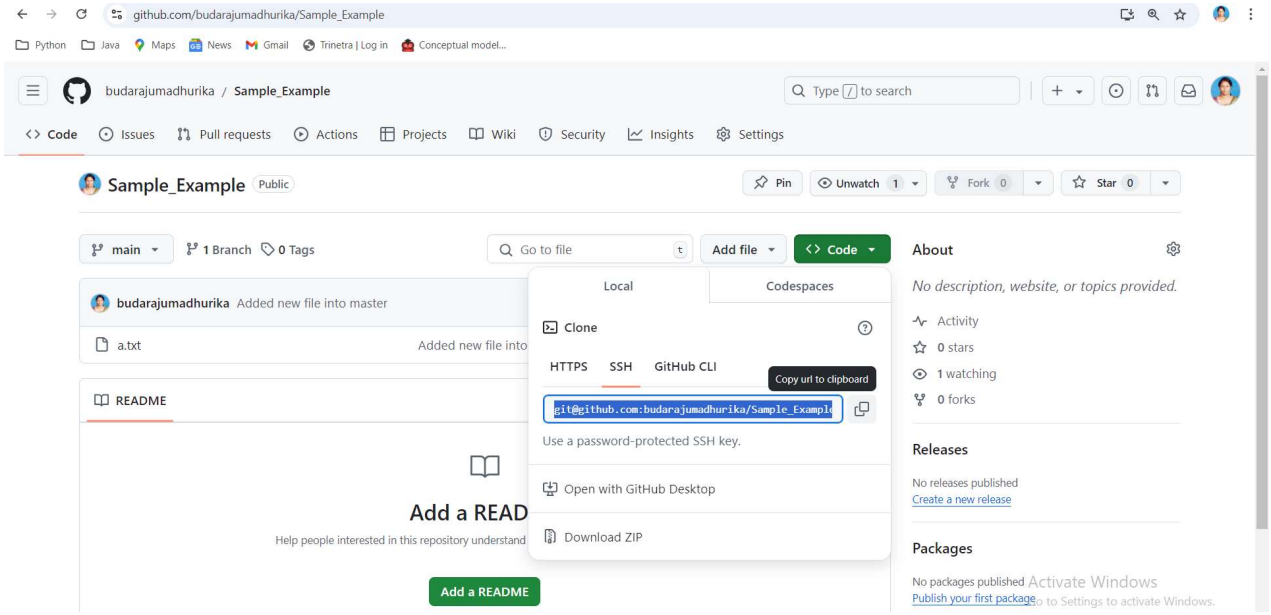
The **git clone** command is used to **download** a copy of a project from a remote repository to your computer. It creates a local version of the project that you can start working on right away.

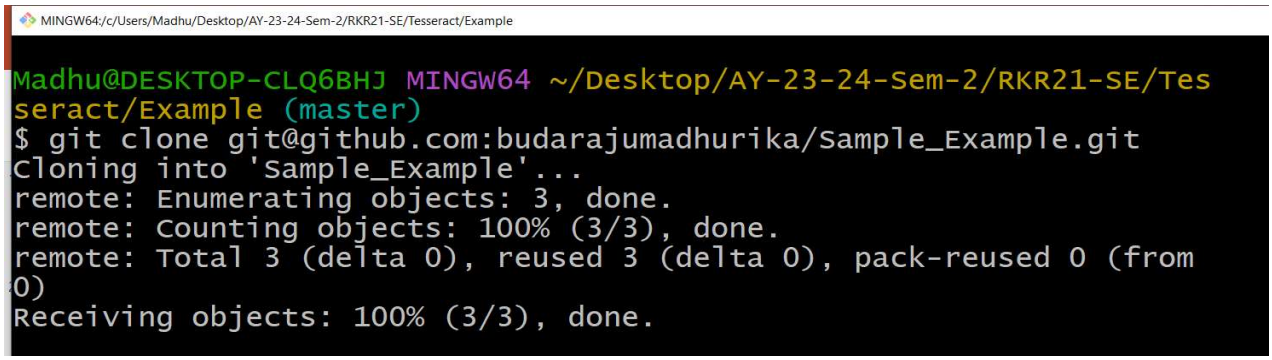
- If you want to work on a project hosted on GitHub, you would use:

  ```
  git clone https://github.com/user/repo.git
  ```

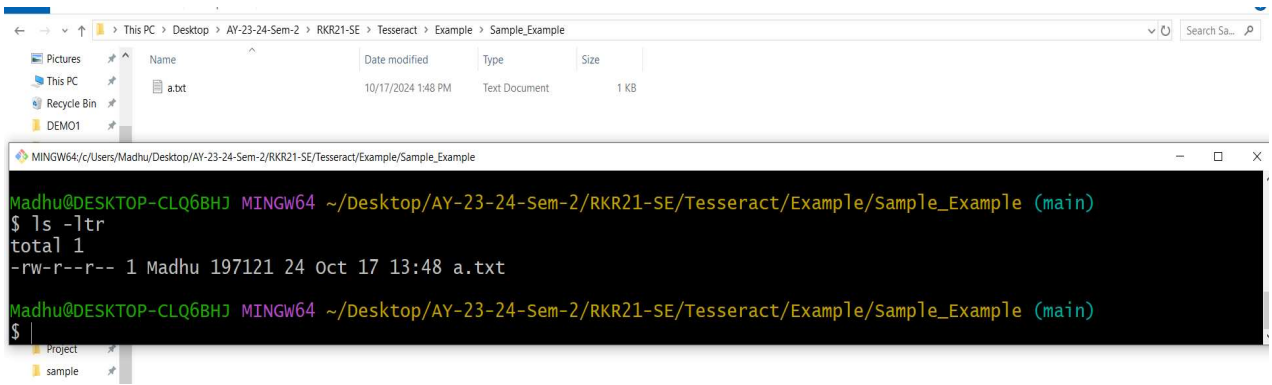
  This creates a local copy of the project so you can begin editing the code on your computer.

- **Other Commands**:
  - `ls -ltr`: Lists the files in the current directory, showing the latest modified files after the cloning is done.


github.com/budarajumadhurika/Sample_Example
budarajumadhurika / Sample_Example
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
Sample_Example
Public
Pin
Unwatch 1
Fork 0
Star 0
main
1 Branch
0 Tags
Go to file
Add file
Code
budarajumadhurika Added new file into master
a.txt
README
Local
Codespaces
Clone
HTTPS
SSH
GitHub CLI
Copy url to clipboard
git@github.com:budarajumadhurika/Sample_Exampl
Use a password-protected SSH key.
Open with GitHub Desktop
Download ZIP
Add a README
About
No description, website, or topics provided.
Activity
0 stars
1 watching
0 forks
Releases
No releases published
Create a new release
Packages
No packages published
Publish your first package


MINGW64:/c/Users/Madhu/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example (master)
$ git clone git@github.com:budarajumadhurika/Sample_Example.git
Cloning into 'Sample_Example'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 3 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.


Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example (master)
$ ls -ltr
total 0
drwxr-xr-x 1 Madhu 197121 0 Oct 17 13:48 Sample_Example/
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example (master)
$ cd Sample_Example
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example/Sample_Example (main)
$


This PC > Desktop > AY-23-24-Sem-2 > RKR21-SE > Tesseract > Example > Sample_Example
Search Sa...
Pictures
This PC
Recycle Bin
DEMO1
Name
Date modified
Type
Size
a.txt
10/17/2024 1:48 PM
Text Document
1 KB
MINGW64:/c/Users/Madhu/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example/Sample_Example
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example/Sample_Example (main)
$ ls -ltr
total 1
-rw-r--r-- 1 Madhu 197121 24 Oct 17 13:48 a.txt
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example/Sample_Example (main)
$
Project
sample

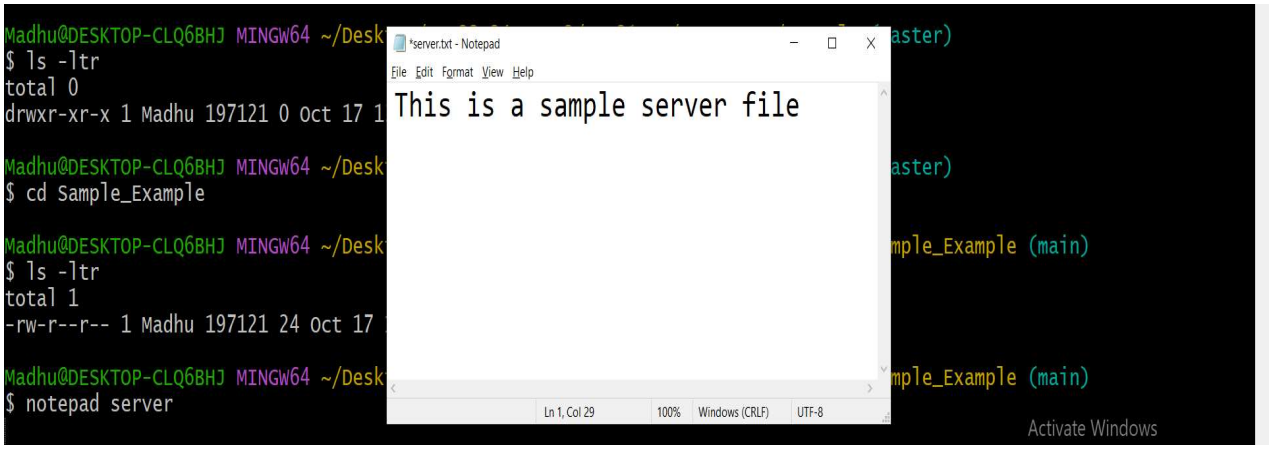
4. Git Push

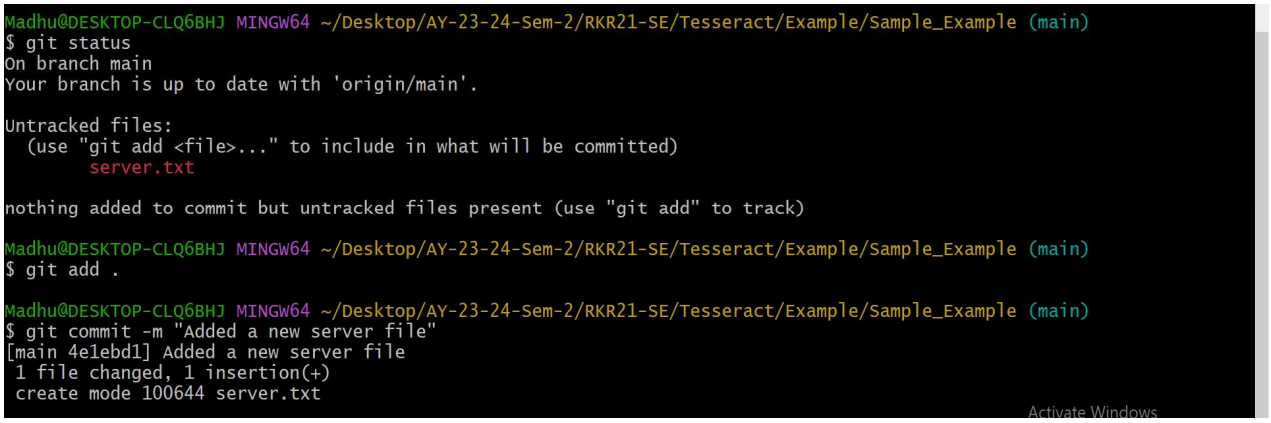
After making changes locally, you use the **git push** command to send these changes from your local repository to the **remote repository** (for example, back to GitHub). This is how you **share your work** with others or keep your remote repository updated with your changes.

- After editing files on your computer and committing the changes, you would push them to the remote repository using:

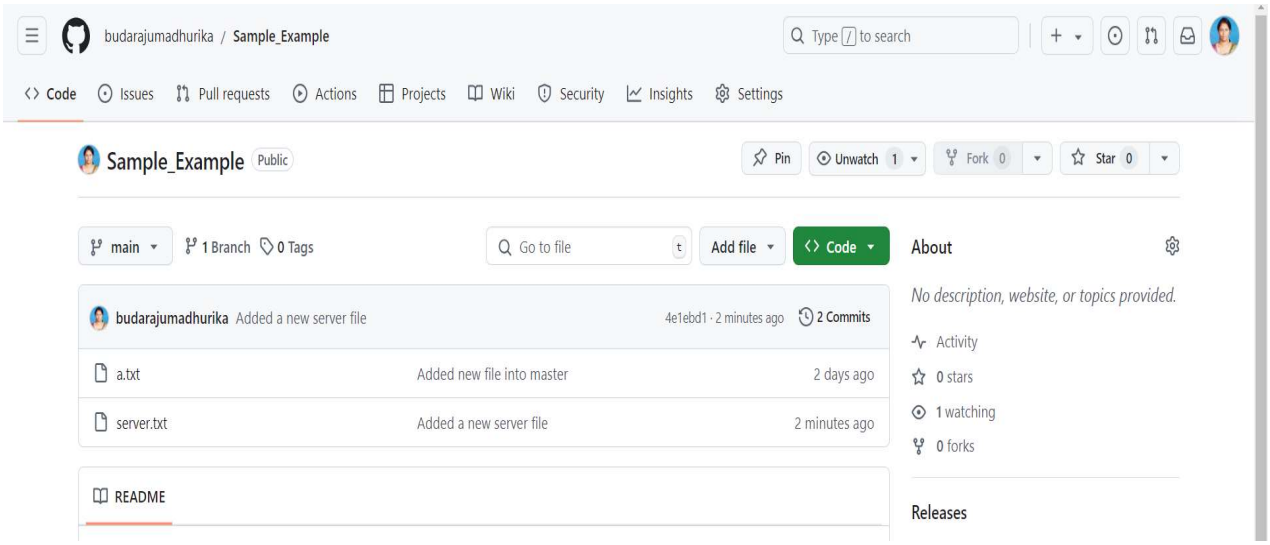
  ```
  git push origin master
  ```

  This pushes the changes from your local `master` branch to the `origin` remote (which is the GitHub repository).





```
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example/Sample_Example (main)
$ git remote -v
origin  git@github.com:budarajumadhurika/Sample_Example.git (fetch)
origin  git@github.com:budarajumadhurika/Sample_Example.git (push)

Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example/Sample_Example (main)
$ git push origin main
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 314 bytes | 314.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:budarajumadhurika/Sample_Example.git
   eaafdb9..4e1ebd1  main -> main

Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Example/Sample_Example (main)
$
```

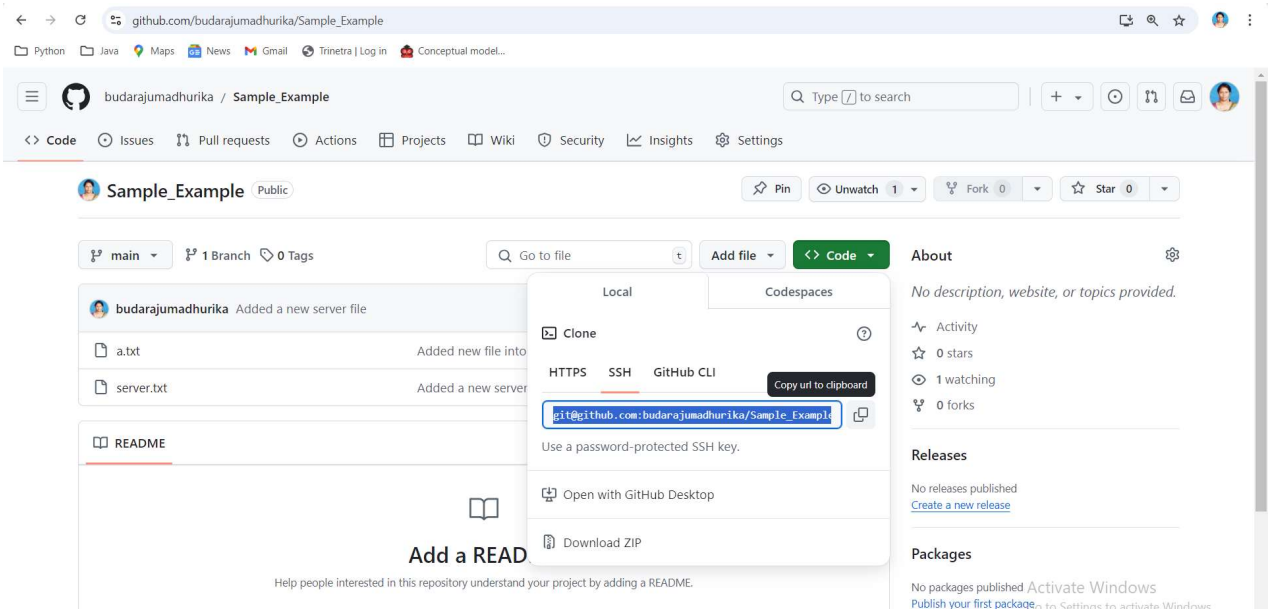
5. Git Pull

The **git pull** command fetches changes from the remote repository and merges them into your local repository. This ensures that you have the latest version of the project, including updates made by your teammates or collaborators.

- If you're working on a project with others and want to get the latest updates they made on GitHub, you would use:

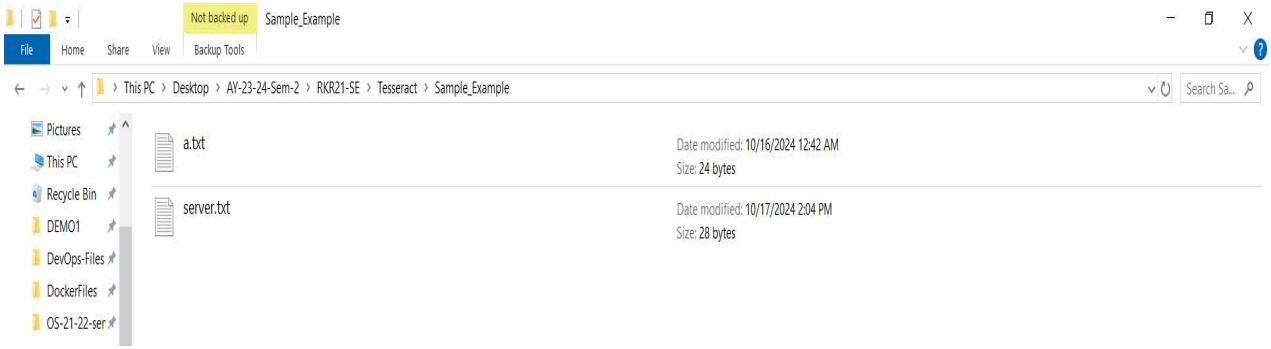
  `git pull origin master`

  This will download any new commits from the `master` branch of the remote repository (`origin`) and merge them with your local code.




```
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Sample_Example (main)
$ git remote -v
origin  https://github.com/budarajumadhurika/Sample_Example.git (fetch)
origin  https://github.com/budarajumadhurika/Sample_Example.git (push)

Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Sample_Example (main)
$ ls -ltr
total 1
-rw-r--r-- 1 Madhu 197121 24 Oct 16 00:42 a.txt
```

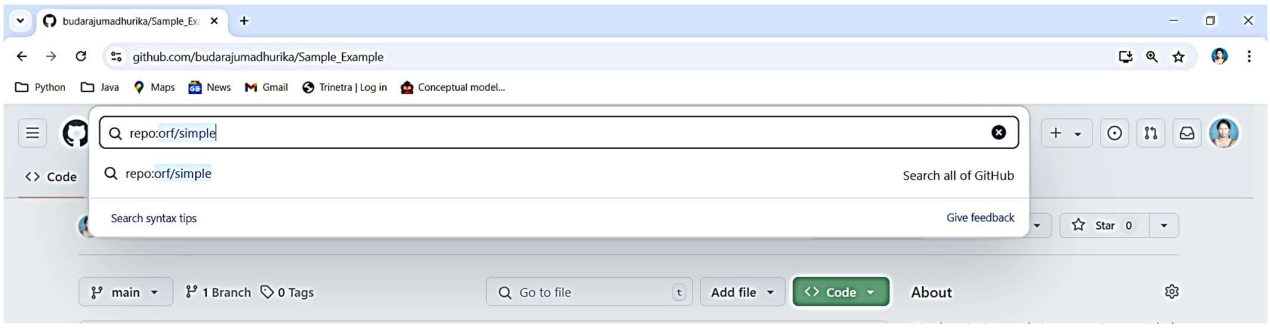
```
Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Sample_Example (main)
$ git pull origin main
remote: Enumerating objects: 4, done.
remote: Counting objects: 100% (4/4), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 3 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (3/3), 294 bytes | 21.00 KiB/s, done.
From https://github.com/budarajumadhurika/Sample_Example
 * branch            main       -> FETCH_HEAD
   eaafdb9..4e1ebd1  main       -> origin/main
Updating eaafdb9..4e1ebd1
Fast-forward
 server.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 server.txt

Madhu@DESKTOP-CLQ6BHJ MINGW64 ~/Desktop/AY-23-24-Sem-2/RKR21-SE/Tesseract/Sample_Example (main
)
$ ls -ltr
total 2
-rw-r--r-- 1 Madhu 197121 24 Oct 16 00:42 a.txt
-rw-r--r-- 1 Madhu 197121 28 Oct 17 14:04 server.txt
```

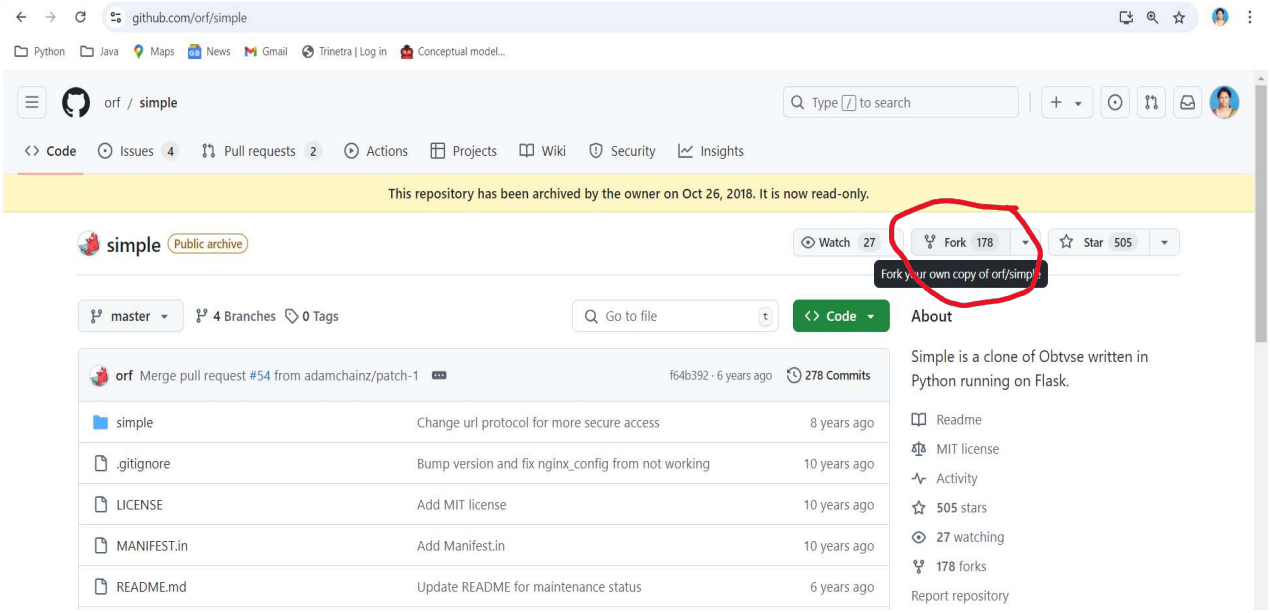


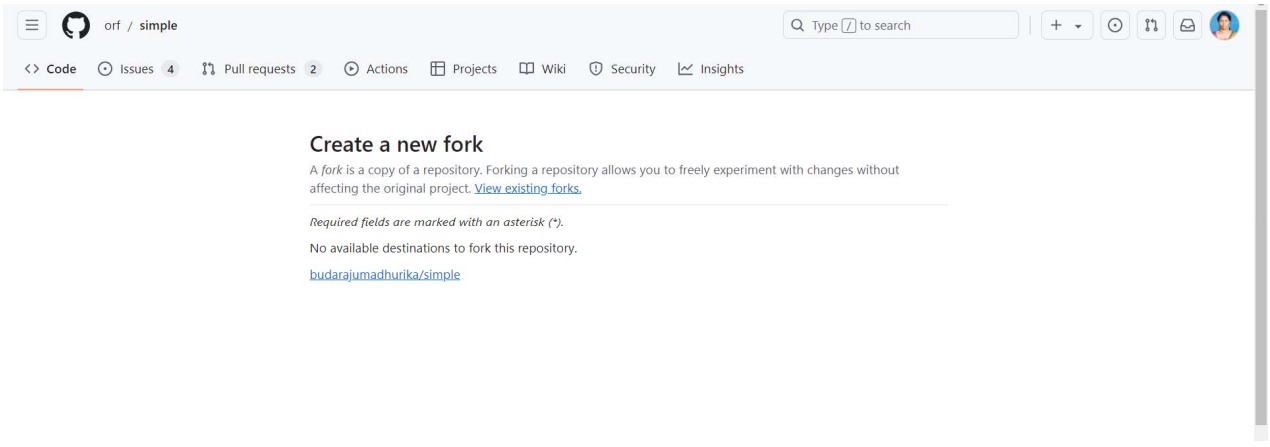
6. Git Fork

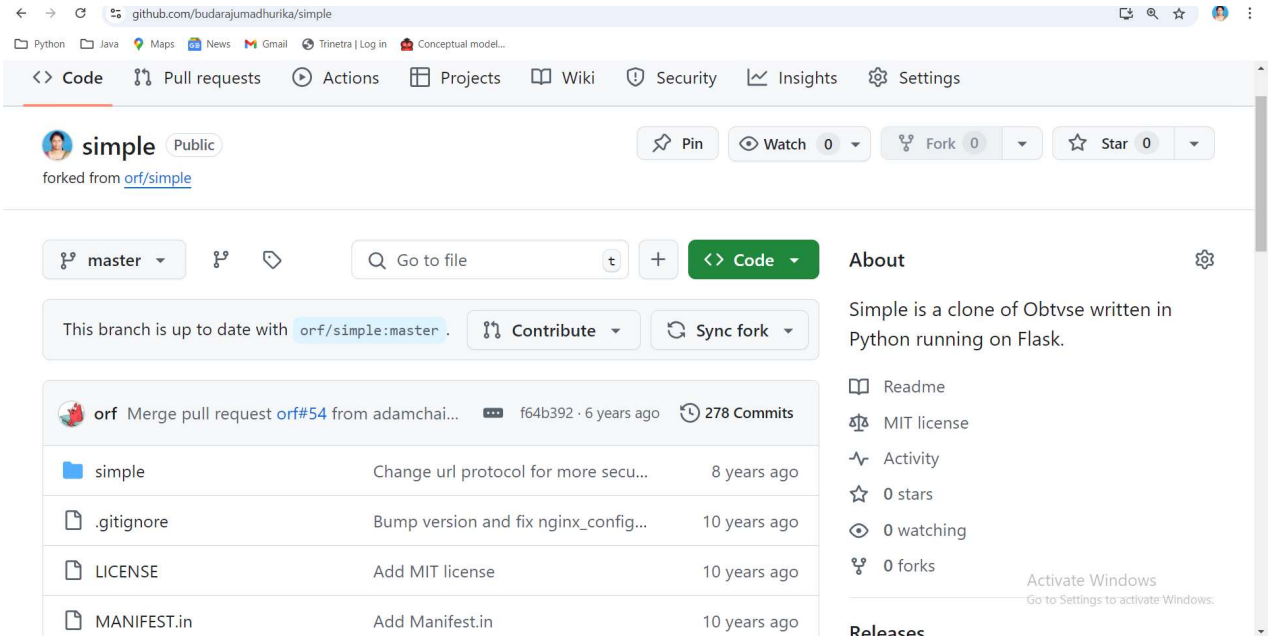
A **fork** is a personal copy of someone else's repository, typically used in open-source projects. When you **fork** a repository, you get your own version of the project on GitHub that you can edit without affecting the original project. You can then propose changes to the original project by making a **pull request**.

- To fork a repository, go to the original repository on GitHub and click the **"Fork"** button. This makes a copy of the repository under your GitHub account where you can make your own changes.




github.com/orf/simple
orf / simple
Code Issues 4 Pull requests 2 Actions Projects Wiki Security Insights
This repository has been archived by the owner on Oct 26, 2018. It is now read-only.
simple Public archive
Watch 27 Fork 178 Star 505
master 4 Branches 0 Tags Go to file Code
About
Simple is a clone of Obtvse written in Python running on Flask.
orf Merge pull request #54 from adamchainz/patch-1 f64b392 · 6 years ago 278 Commits
simple Change url protocol for more secure access 8 years ago
.gitignore Bump version and fix nginx_config from not working 10 years ago
LICENSE Add MIT license 10 years ago
MANIFEST.in Add Manifest.in 10 years ago
README.md Update README for maintenance status 6 years ago
Readme
MIT license
Activity
505 stars
27 watching
178 forks
Report repository


orf / simple
Code Issues 4 Pull requests 2 Actions Projects Wiki Security Insights
Create a new fork
A fork is a copy of a repository. Forking a repository allows you to freely experiment with changes without affecting the original project. View existing forks.
Required fields are marked with an asterisk (*).
No available destinations to fork this repository.
budarajumadhurika/simple


github.com/budarajumadhurika/simple
Code Pull requests Actions Projects Wiki Security Insights Settings
simple Public
forked from orf/simple
Pin Watch 0 Fork 0 Star 0
master Go to file Code
About
This branch is up to date with orf/simple:master. Contribute Sync fork
Simple is a clone of Obtvse written in Python running on Flask.
orf Merge pull request orf#54 from adamchai... f64b392 · 6 years ago 278 Commits
simple Change url protocol for more secu... 8 years ago
.gitignore Bump version and fix nginx_config... 10 years ago
LICENSE Add MIT license 10 years ago
MANIFEST.in Add Manifest.in 10 years ago
Readme
MIT license
Activity
0 stars
0 watching
0 forks
Activate Windows
Go to Settings to activate Windows.
Releases

Detailed Flow with Examples

1. **Clone a Repository**: If you want to contribute to an open-source project or collaborate with others, you first clone the repository to your computer:

   ```
   git clone https://github.com/user/repo.git
   ```

2. **Make Changes Locally**: Once you have the project on your local machine, you can make changes to the files, such as fixing bugs or adding new features. After editing, you commit the changes:

   ```
   git commit -m "Added new feature"
   ```

3. **Push Changes to Remote**: After committing your changes, you push them back to the remote repository (GitHub):

   ```
   git push origin master
   ```

4. **Pull Changes Made by Others**: If someone else makes changes to the project while you're working on it, you can pull those updates to ensure your version is up-to-date:

   ```
   git pull origin master
   ```

5. **Use SSH Keys for Security**: Instead of typing your password every time you push or pull changes, you can set up an SSH key to make this process secure and automatic:

   ```
   ssh-keygen -t rsa # Generate SSH key
   ```

6. **Forking a Repository**: If you want to make your own changes to someone else's project (such as in open-source), you fork the repository first, creating your own copy:
   - Visit the original project on GitHub.
   - Click the **Fork** button.
   - Make your changes in your personal copy, and then propose your updates back to the original repository by creating a **pull request**.