Connect Git to GitHub Using SSH

Enechukwu Chibuike · Follow

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Git and GitHub have over the years become an essential tool that developers cannot do without. Git and GitHub have become the developer's best friends when controlling different versions of their codebase. In this article, I will explain to you how you can connect git to your GitHub account using SSH (Secure Shell).

Prerequisite:

- You have git installed on your local machine.
- You have a GitHub account.

What's SSH?

SSH stands for Secure Shell. It is a cryptographic network protocol used to secure communication over a computer network. SSH is widely used for secure remote administration of systems and secure file transfer. The primary purpose of SSH is to provide a secure way to access and manage network devices and systems over an unsecured network.

Some features of SSH:

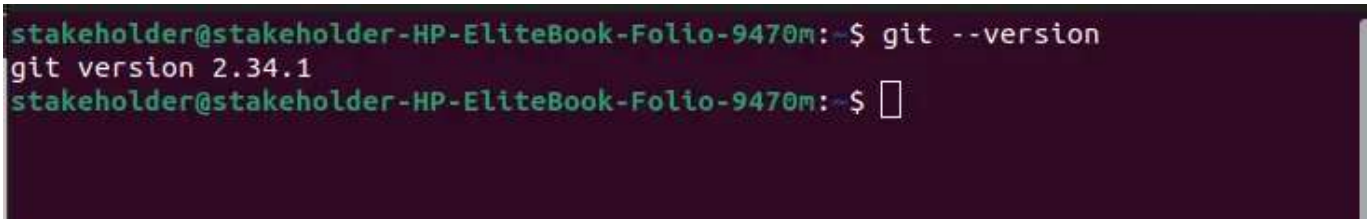
1. **Encryption/Decryption**: Encryption is converting a plaintext into ciphertext (encoded unreadable data) while the inverse process of converting a ciphertext back to a plaintext is called Decryption. SSH encrypts the data exchanged between the client and the server, preventing unauthorized access to the information during transmission.
2. **Authentication:** SSH provides a secure method for users to authenticate themselves to the system or server. This can be done using a combination of usernames and passwords, or, more securely, through cryptographic keys.
3. **Secure Remote Access**: SSH allows users to log into a remote machine securely and execute commands. It is a secure alternative to older

protocols like Telnet, which transmit data in an unencrypted form.

Connect Git to GitHub using SSH

If you have read up to this point, you have installed and configured Git on your local machine and created a GitHub account. Let's now connect Git to GitHub using SSH.

Step 1: Open your terminal for Linux users and Git bash for Windows users. To confirm if you have Git installed on your local machine, type `git --version`



Step 2: Generate a new SSH key pair with the Ed25519 algorithm. Run this code on your terminal/Gitbash `ssh-keygen -t ed25519 -C "your_email@example.com"` replace "your_email@example.com" with your email.

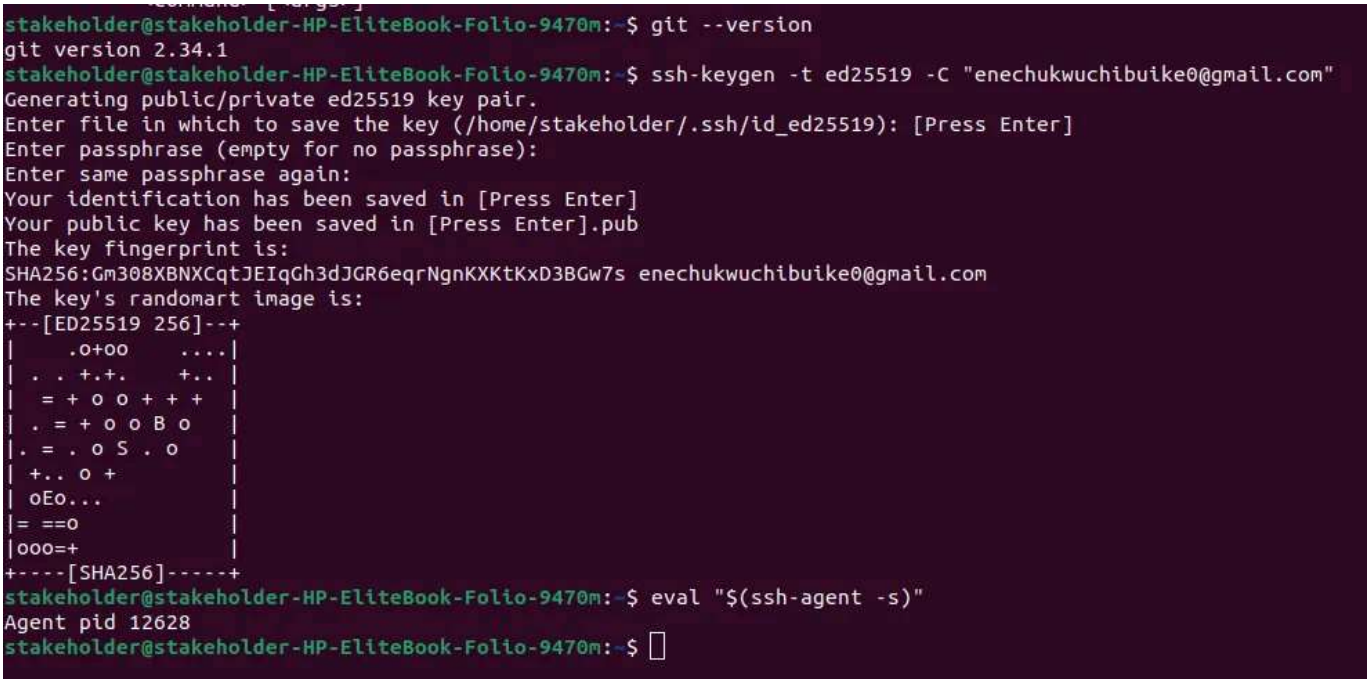
When you run this command, you will be prompted to "Enter a file in which to save the file", press **ENTER** to save in your default file location.

```
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ git --version
git version 2.34.1
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ ssh-keygen -t ed25519 -C "enechukwuchibuike0@gmail.com"
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/stakeholder/.ssh/id_ed25519): [Press Enter]
```

After that, you will be prompted to enter a passphrase. Type a secure passphrase you can remember. **NOTE:** the paraphrase will be invisible to you so you have to be careful while typing. Once you are done, press **ENTER**. You will be prompted to retype the passphrase for confirmation.

```
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ git --version
git version 2.34.1
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ ssh-keygen -t ed25519 -C "enechukwuchibuike0@gmail.com"
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/stakeholder/.ssh/id_ed25519): [Press Enter]
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in [Press Enter]
Your public key has been saved in [Press Enter].pub
The key fingerprint is:
SHA256:Gm308XBNXCqtJEIqGh3dJGR6eqrNgnKXKtKxD3BGw7s enechukwuchibuike0@gmail.com
The key's randomart image is:
+--[ED25519 256]--+
|     .o+oo    ....|
| . . +.+.    +.. |
|  = + o o + + +  |
| . = + o o B o   |
|. = . o S . o    |
| +.. o +         |
| oEo...          |
|= ==o            |
|ooo=+            |
+----[SHA256]-----+
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$
```

Step 3: Start the ssh-agent in the background. Run this command `eval "$(ssh-agent -s)"` to start the ssh-agent in the background.



Alternative for Windows users

If step 3 does not work, run Windows Powershell as administrator and paste the two commands below one after the other. Press **Enter** after the first command before running the second one.

```
Get-Service -Name ssh-agent | Set-Service -StartupType Manual
Start-Service ssh-agent
```

Step 4: Add your SSH private key to the ssh-agent. Run this command `ssh-add ~/.ssh/id_ed25519` to add your SSH private key to the ssh-agent.
Once you run the command, you will be prompted to put in your passphrase. Type the passphrase you created initially and press **Enter.**

```
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ git --version
git version 2.34.1
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ ssh-keygen -t ed25519 -C "enechukwuchibuike0@gmail.com"
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/stakeholder/.ssh/id_ed25519): [Press Enter]
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in [Press Enter]
Your public key has been saved in [Press Enter].pub
The key fingerprint is:
SHA256:Gm308XBNXCqtJEIqGh3dJGR6eqrNgnKXKtKxD3BGw7s enechukwuchibuike0@gmail.com
The key's randomart image is:
+--[ED25519 256]--+
|    .o+oo    ....|
| . . +.+.    +.. |
|  = + o o + + +  |
| . = + o o B o   |
|. = . o S . o    |
| +.. o +         |
| oEo...          |
|= ==o            |
|ooo=+            |
+----[SHA256]-----+
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ eval "$(ssh-agent -s)"
Agent pid 12628
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ ssh-add ~/.ssh/id_ed25519
Identity added: /home/stakeholder/.ssh/id_ed25519 (enechukwuchbiuike0@gmail.com)
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$
```

Step 5: Copy the SSH public key to your clipboard. Run this command `cat ~/.ssh/id_ed25519.pub` to get the SSH public key.

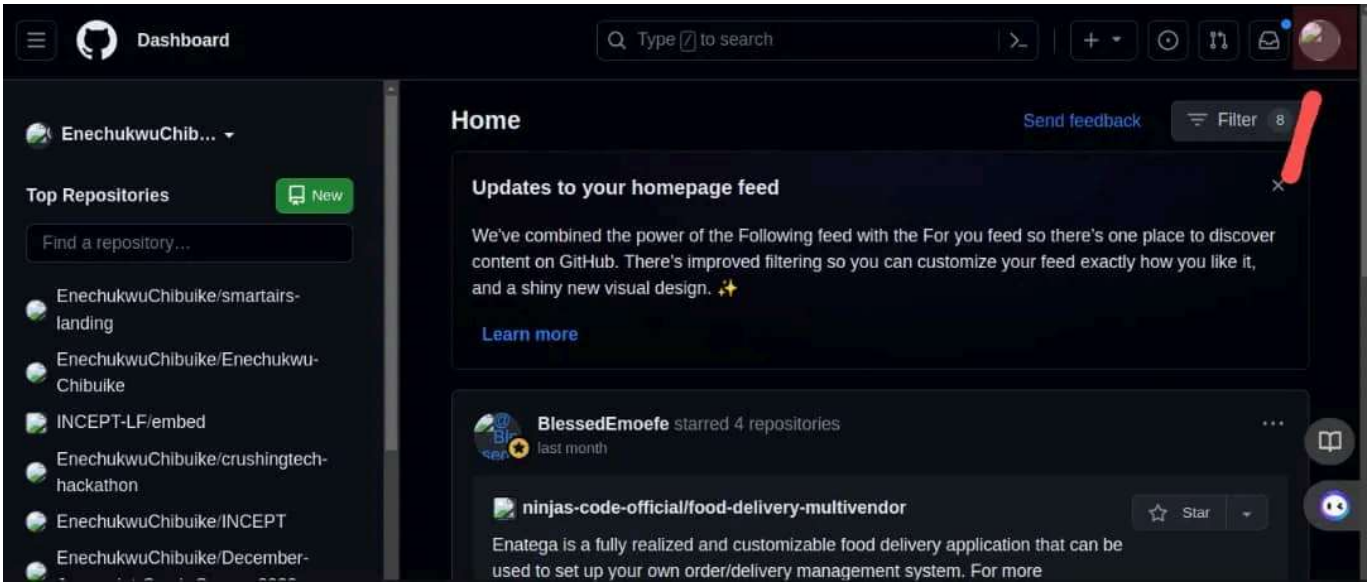
Once you run this command, you will see your SSH public key. Copy the public key and move to the next step.

```
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ git --version
git version 2.34.1
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ ssh-keygen -t ed25519 -C "enechukwuchibuike0@gmail.com"
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/stakeholder/.ssh/id_ed25519): [Press Enter]
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in [Press Enter]
Your public key has been saved in [Press Enter].pub
The key fingerprint is:
SHA256:Gm308XBNXCqtJEIqGh3dJGR6eqrNgnKXKtKxD3BGw7s enechukwuchibuike0@gmail.com
The key's randomart image is:
+--[ED25519 256]--+
|    .o+oo    ....|
| . . +.+.    +.. |
|  = + o o + + +  |
| . = + o o B o   |
|. = . o S . o    |
| +.. o +         |
| oEo...          |
|= ==o            |
|ooo=+            |
+----[SHA256]-----+
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ eval "$(ssh-agent -s)"
Agent pid 12628
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ ssh-add ~/.ssh/id_ed25519
Identity added: /home/stakeholder/.ssh/id_ed25519 (enechukwuchbiuike0@gmail.com)
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$ cat ~/.ssh/id_ed25519.pub
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIH+2mqfCkvX1gI8CAph1gi8Rc37mVhEW4cU5myVXlqpr enechukwuchbiuike0@gmail.com
stakeholder@stakeholder-HP-EliteBook-Folio-9470m:~$
```

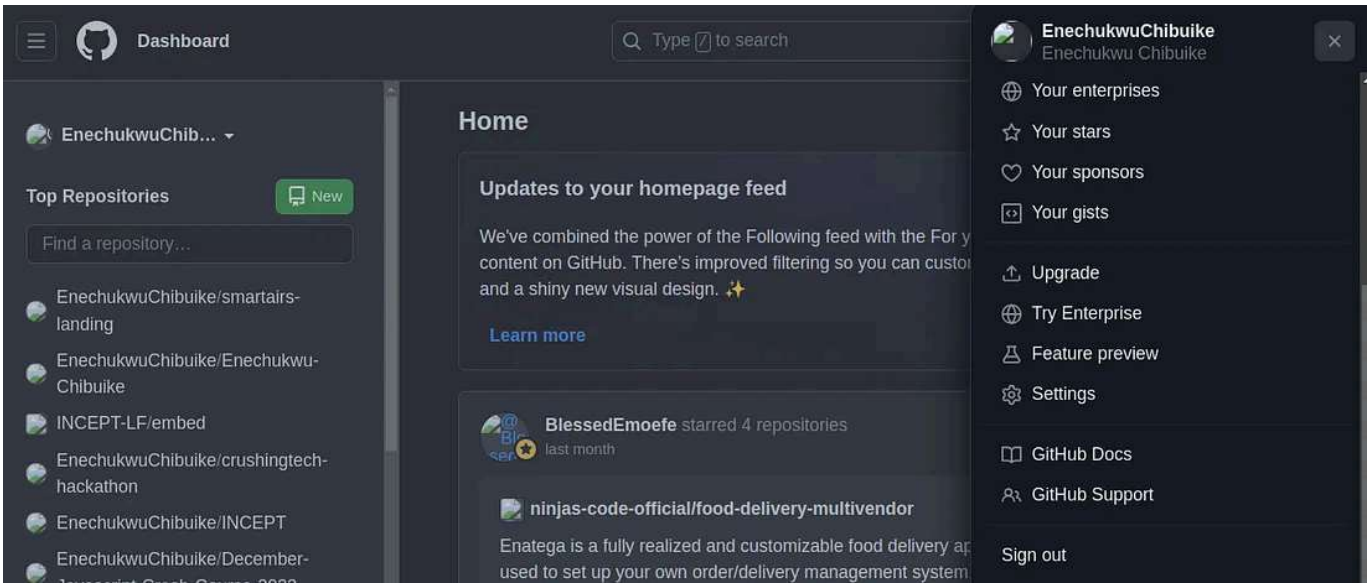
Step 6: Add the public key to your GitHub account.

a. Open your GitHub Account

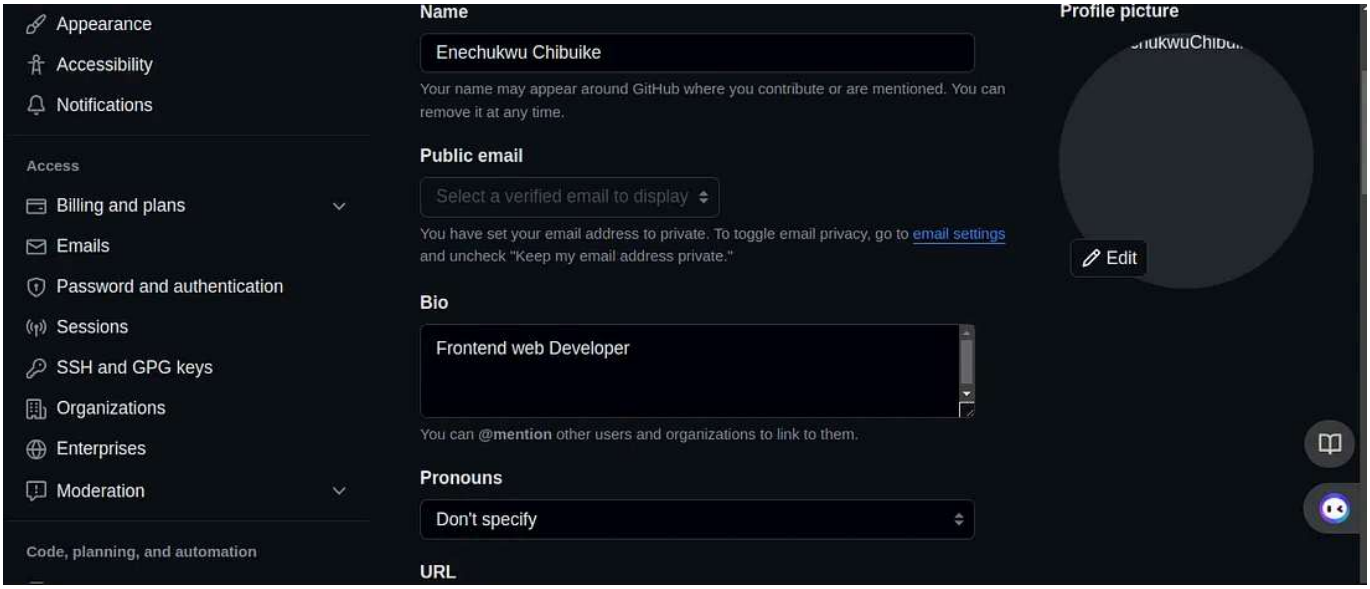
b. Click on the profile avatar at the right end of your GitHub header.



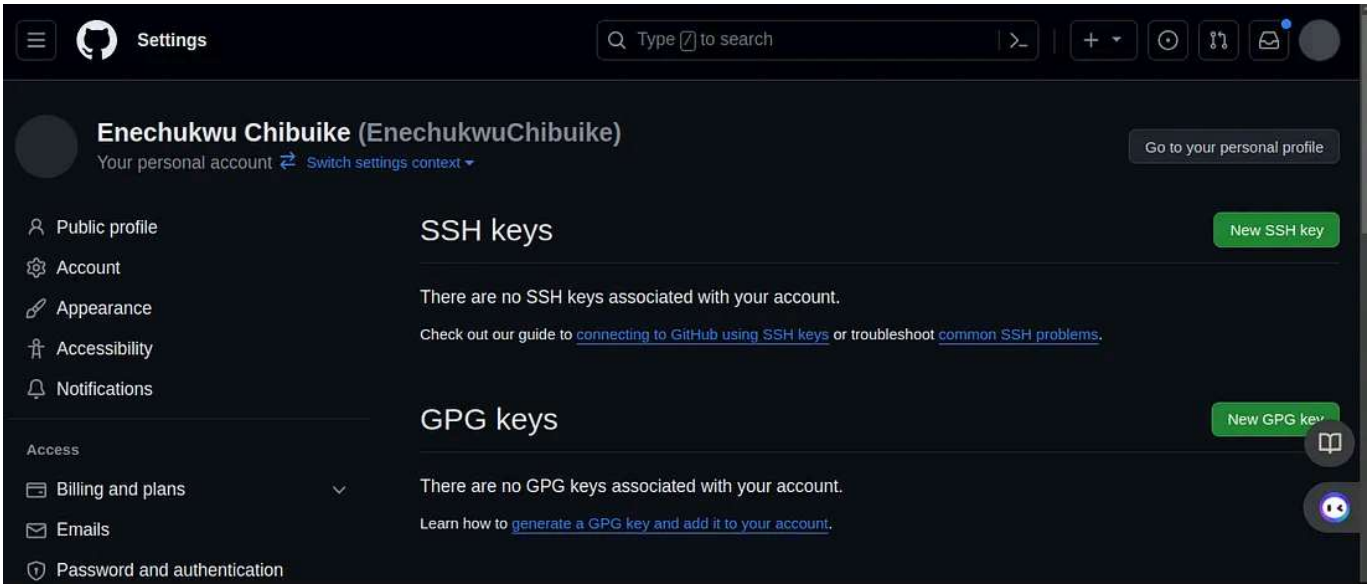
c. Among the dropdown list, select and click on “Settings”.



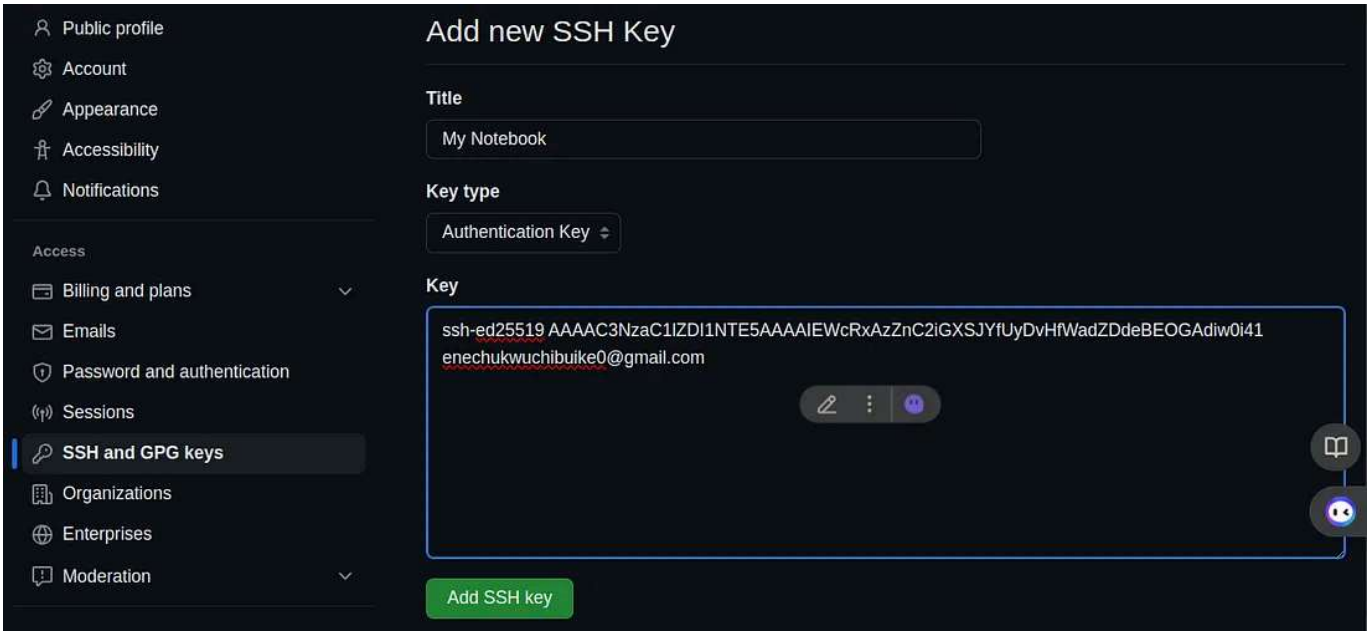
d. At the sidebar of settings, select and click on “SSH and GPG Keys”.



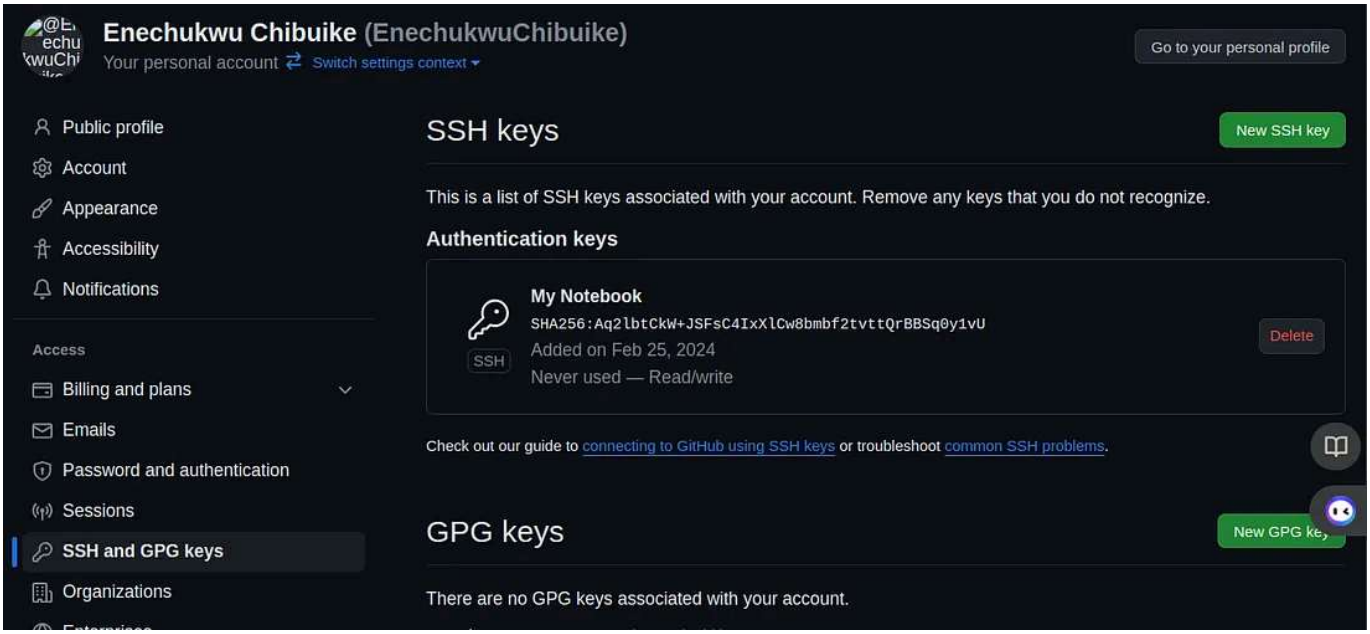
e. Click on the “New SSH Key” button.



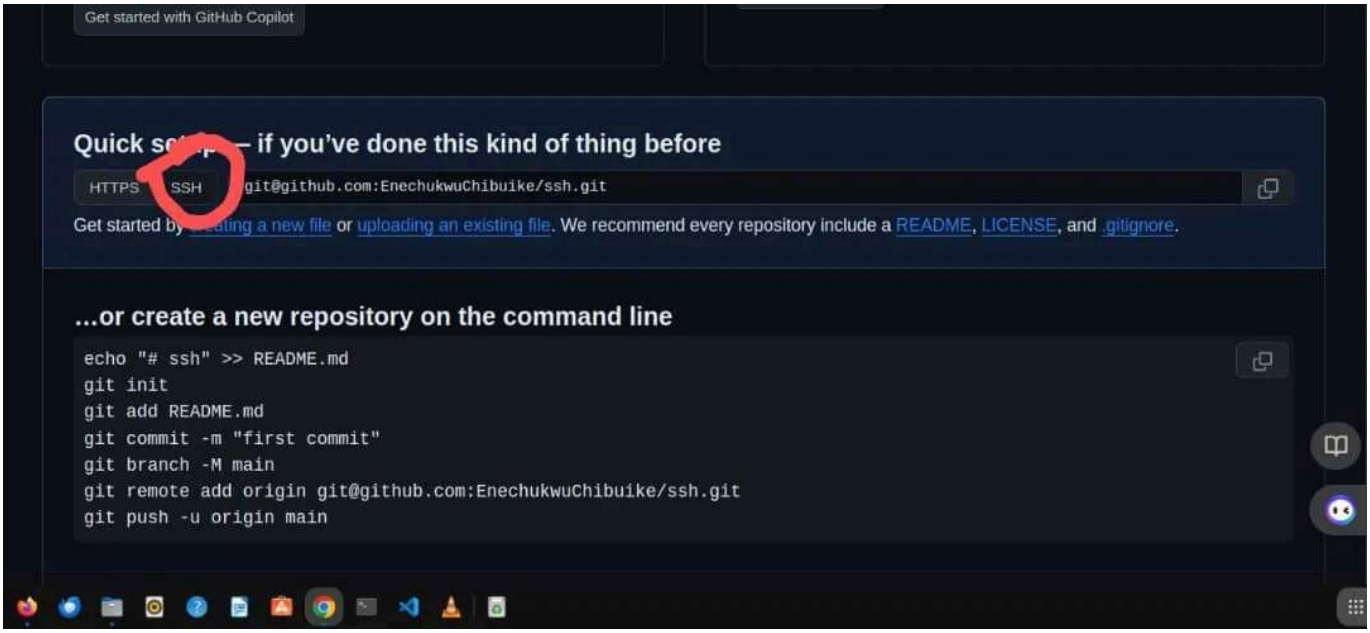
f. In the Title bar, add a title for your SSH key and in the key textarea, paste the SSH public key you copied from your Terminal/Gitbash. After that, click “Add SSH Key” button.



Congratulations!! You have connected your Git to GitHub using SSH (Secure Shell).



Next time, when you push your code to GitHub, ensure to use SSH URL instead of HTTPS.



In conclusion, when connecting Git to GitHub using SSH, it utilizes the SSH protocol to establish a secure and authenticated connection between your local machine and the GitHub server, ensuring the confidentiality and integrity of the data being transmitted during Git operations.

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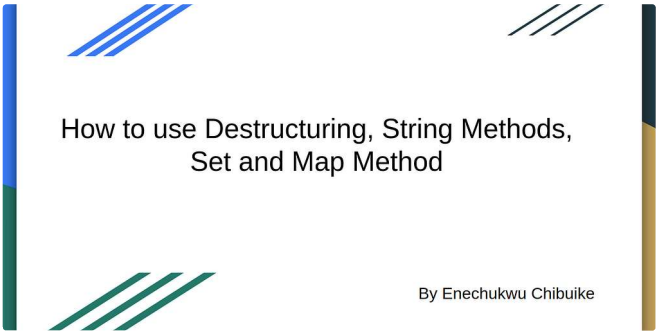

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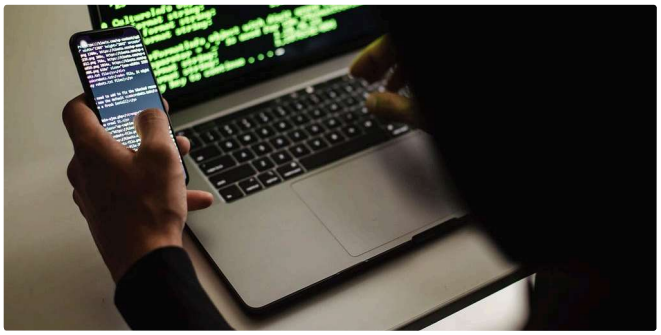

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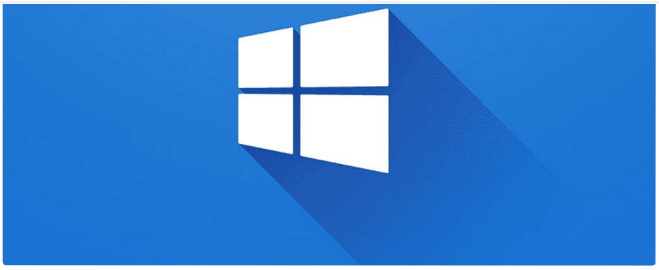

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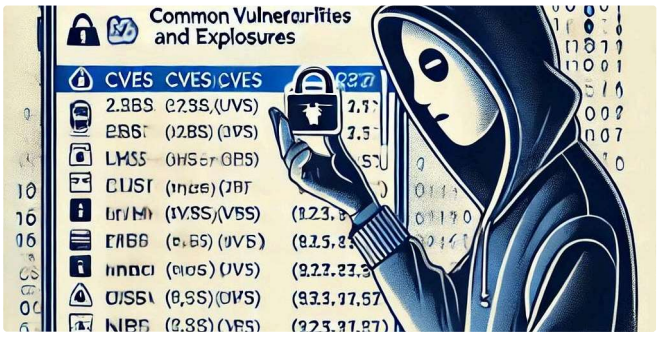

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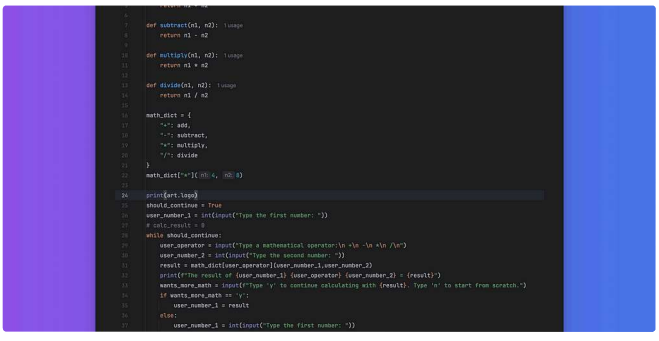

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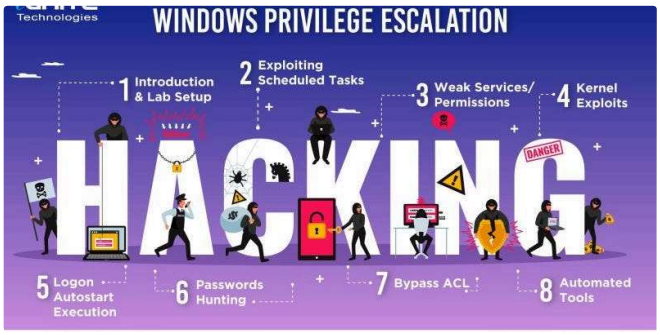

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