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Connect a GitHub Repo with AWS



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Introducing Today's Project!

Today, I'm setting up Git and GitHub to store my web app's code in a cloud-based repository. I'll connect my EC2 instance to GitHub, track code changes, and create a README to document the project clearly and professionally.

Key tools and concepts

Services I used were EC2, Git, and GitHub. Key concepts I learnt include version control, using Git commands to track and push changes, setting up authentication with tokens, and linking local and remote repositories for CI/CD workflows.

Project reflection

This project took me approximately 20 minutes. The most challenging part was configuring Git authentication using a personal access token. It was most rewarding to see my web app changes successfully reflected in my GitHub repository.

I did this project today to strengthen my Git and GitHub skills as part of my DevOps learning journey. This project met my goals by helping me understand version control and successfully link my EC2 instance code with a GitHub repository.

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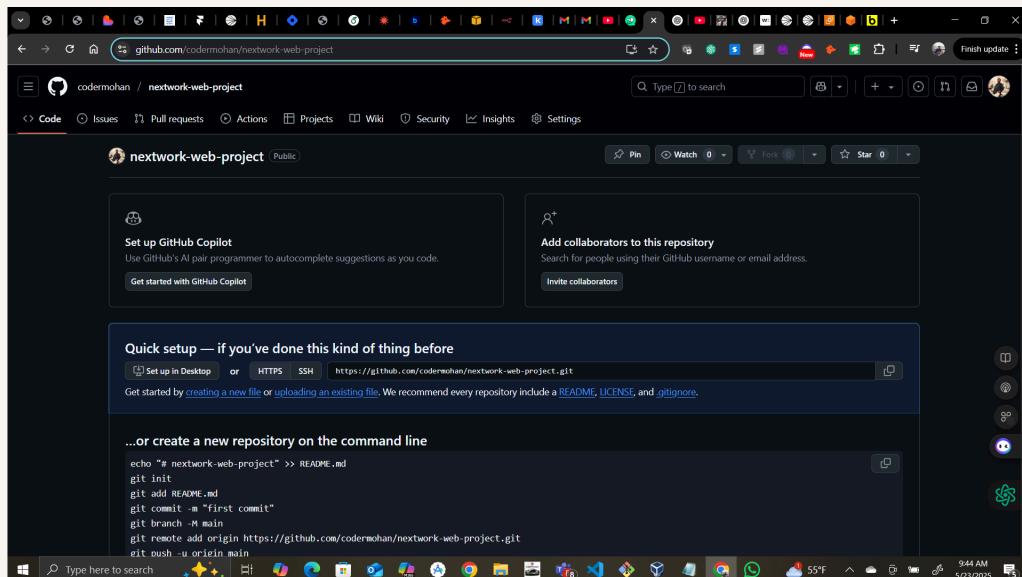
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This project is part two of a series of DevOps projects where I'm building a CI/CD pipeline! I'll be working on the next project right now, continuing tomorrow. I'm excited to keep learning and applying new DevOps tools and practices.

Git and GitHub

Git is a version control system that tracks changes in your code, letting you revert to previous versions and collaborate with others. I installed Git using the commands `sudo yum update -y` and `sudo yum install git -y` on my EC2 instance.

GitHub is an online platform that uses Git to manage and track code changes. I'm using GitHub in this project to store my code, track updates, collaborate easily, and prepare for CI/CD integration in future steps.



My local repository

A Git repository is a storage space for your project's code and its full version history. It tracks every change made, allows collaboration between developers, and helps manage and sync code across different environments.

`git init` is a command that initializes a new Git repository in your project folder. I ran `git init` in my web app directory to start tracking changes and prepare it for connection to my GitHub repository.

After running `git init`, the response from the terminal was "Initialized empty Git repository." A branch in Git is a lightweight pointer to a snapshot of your changes, letting you work on features or fixes independently.

The screenshot shows a terminal window with the following session:

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Search

[ec2-user@ip-172-31-3-108 ~]$ ls
apache-maven-3.5.2-bin.tar.gz nextwork-web-project
[ec2-user@ip-172-31-3-108 ~]$ git --version
git version 2.47.1
[ec2-user@ip-172-31-3-108 ~]$ pwd
/home/ec2-user
[ec2-user@ip-172-31-3-108 ~]$ ls
apache-maven-3.5.2-bin.tar.gz nextwork-web-project
[ec2-user@ip-172-31-3-108 ~]$ cd nextwork-web-project/
[ec2-user@ip-172-31-3-108 nextwork-web-project]$ ls
pom.xml src
[ec2-user@ip-172-31-3-108 nextwork-web-project]$ pad
[ec2-user@ip-172-31-3-108 nextwork-web-project]$ git init
hint: using 'master' as the name for the initial branch, this default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint: git config --global init.defaultBranch name
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint: git branch -m name
initialized empty Git repository in /home/ec2-user/nextwork-web-project/.git/
[ec2-user@ip-172-31-3-108 nextwork-web-project]$ ls -l
total 20
drwxr-xr-x 2 ec2-user ec2-user 44 May 23 14:47 .
drwxr-xr-x 2 ec2-user ec2-user 168 May 23 14:47 ..
drwxr-xr-x 3 ec2-user ec2-user 119 May 23 14:47 git
-rw-r--r-- 1 ec2-user ec2-user 751 May 23 01:16 pom.xml
drwxr-xr-x 3 ec2-user ec2-user 18 May 23 01:16 src
[ec2-user@ip-172-31-3-108 nextwork-web-project]$ [REDACTED]
```

A tooltip "Ask Copilot" is visible above the terminal window.

To push local changes to GitHub, I ran three commands

git add

The first command I ran was `git add .` to stage all modified files. A staging area is where Git gathers changes before committing them, allowing review and ensuring only desired updates are saved in the next snapshot of the project.

git commit

The second command I ran was `git commit -m "Updated index.jsp with new content"`. Using `-m` means I added a message describing the changes made. This command saved the staged changes as a version in my project's history, helping track edits clearly

git push

The third command I ran was `git push -u origin master`. Using `-u` means setting the upstream branch so future pushes can be done with just `git push`. It uploads my committed changes from local to the master branch on GitHub.

Authentication

When I commit changes to GitHub, Git asks for my credentials because it needs to verify my identity and ensure I have permission to push changes to the repository, keeping my code secure and preventing unauthorized access.

Local Git identity

Git needs my name and email because they identify who made each commit. This information is recorded in the project history to track changes and collaborate clearly with others on the code.

Running `git log` showed me that I could see a detailed history of all commits made in the repository, including commit IDs, author names, dates, and the commit messages describing each change.



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GitHub tokens

GitHub authentication failed when I entered my password because GitHub no longer supports password authentication for Git operations. Instead, it requires a Personal Access Token for secure login.

A GitHub token is a secure access key that replaces passwords for authentication. I'm using one in this project because GitHub no longer accepts passwords, making token use safer and required for pushing code.

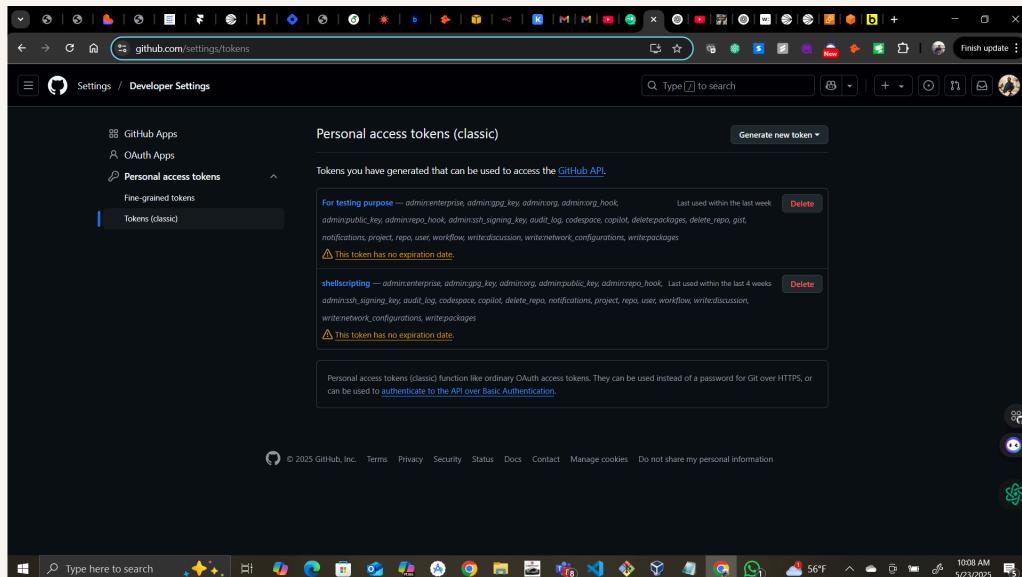
I could set up a GitHub token by going to my GitHub account settings, selecting Developer Settings, then Personal Access Tokens, and generating a new token with the needed permissions to access my repo securely.

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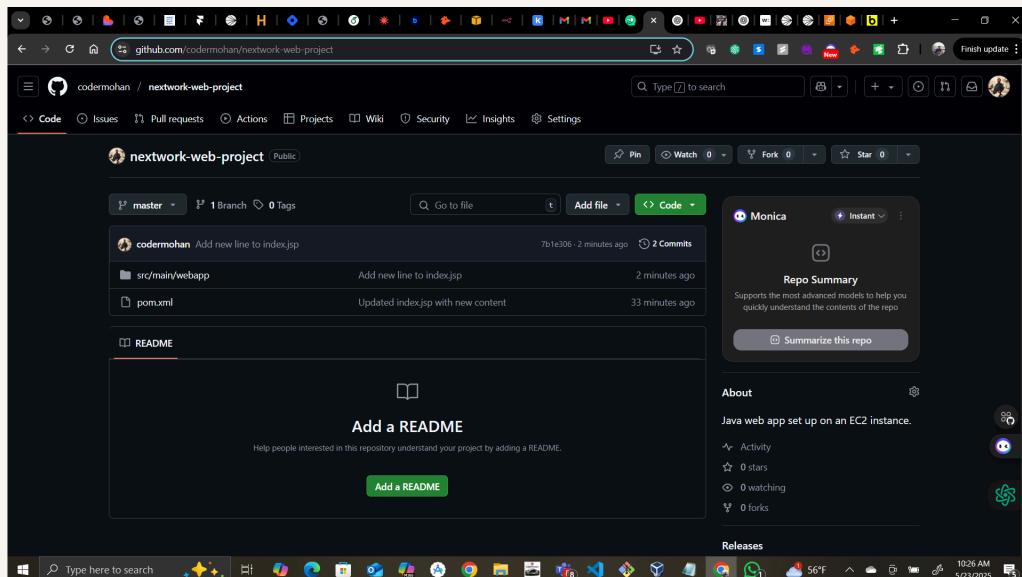
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Making changes again

I wanted to see Git working in action, so I updated the index.jsp file in my nextwork-web-project. I couldn't see the changes in my GitHub repo initially because I forgot to commit and push the changes after editing the file in VS Code.

I finally saw the changes in my GitHub repo after staging the updated files using `git add .`, reviewing them with `git diff --staged`, committing with a message using `git commit -m`, and pushing to GitHub using `git push -u origin master`.





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