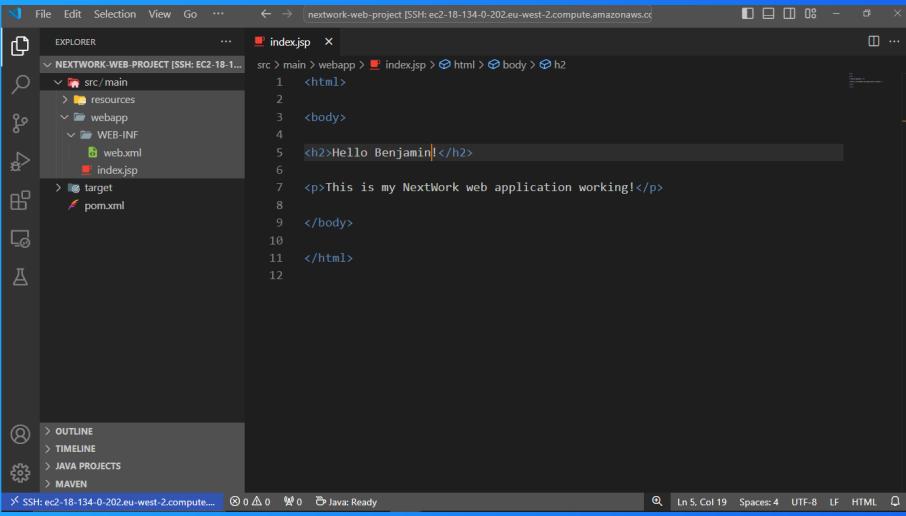




Set Up a Web App in the Cloud

AM

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The screenshot shows an IDE interface with the following details:

- File Path:** nextwork-web-project [SSH: ec2-18-134-0-202.eu-west-2.compute.amazonaws.c]
- Code Editor:** Content of index.jsp:

```
<html>
<body>
<h2>Hello Benjamin!</h2>
<p>This is my NextWork web application working!</p>
</body>
</html>
```
- Explorer:** Shows the project structure:
 - NEXTWORK-WEB-PROJECT [SSH: EC2-18-134-0-202.eu-west-2.compute.amazonaws.c]
 - src/main
 - resources
 - webapp
 - WEB-INF
 - index.jsp
 - target
 - pom.xml
- Sidebar:** Outline, Timeline, Java Projects, Maven.
- Bottom Status Bar:** SSH: ec2-18-134-0-202.eu-west-2.compute.amazonaws.c, 0 △ 0, 0 W 0, Java: Ready, Line 5, Column 19, Spaces: 4, UTF-8, LF, HTML.

Introducing Today's Project!

What is VSCode and why is it useful?

In today's project, I used VSCode to edit JSP and configuration files. I leveraged its Java extensions for syntax highlighting and debugging and used Git integration to manage version control, ensuring efficient development and easy collaboration.

How I'm using VSCode in this project

In today's project, I used VSCode to edit JSP and configuration files. I leveraged its Java extensions for syntax highlighting and debugging and used Git integration to manage version control, ensuring efficient development and easy collaboration.

One thing I didn't expect...

One thing I didn't expect in this project was the delay when connecting my VSCode to the remote server using SSH, and also connecting to EC2 with SSH. Despite doing everything correctly, it took longer than expected to establish the connection.

This project took me...

This project took approximately 2 hours and 10 minutes to complete, including the time spent troubleshooting the SSH connection delays with VSCode and EC2.

Launching an EC2 instance

I started this project by launching an EC2 instance because it allows me to rent compute resources in the cloud to securely host my web application, store files, and enable seamless development and deployment using tools like AWS and my local VS Code

I also enabled SSH

SSH (Secure Shell) is a protocol that provides secure remote access to a server. It authenticates users and encrypts data for secure communication. I enabled SSH to connect from my local machine to the EC2 instance and perform operations remotely....

Key pairs

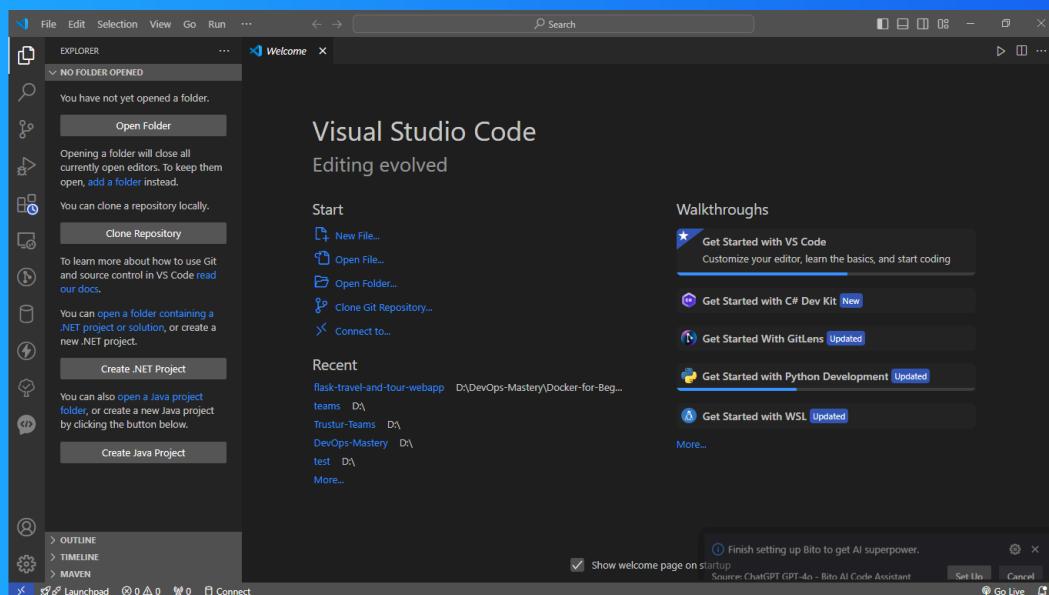
A key pair is a set of cryptographic keys used for secure access to cloud resources. It includes a server's public key and a local machine's private key. The private key is used for authentication when connecting to an EC2 instance.

Once I set up my key pair, AWS automatically downloaded the private key file (.pem) to my local computer. This file is essential for securely accessing my EC2 instance via SSH and establishing a connection to manage and deploy my web application.

Set up VSCode

VSCode is a popular, open-source code editor used by developers for various programming tasks. It supports many programming languages and offers features like debugging, version control, syntax highlighting, and extensions, making it a versatile tool.

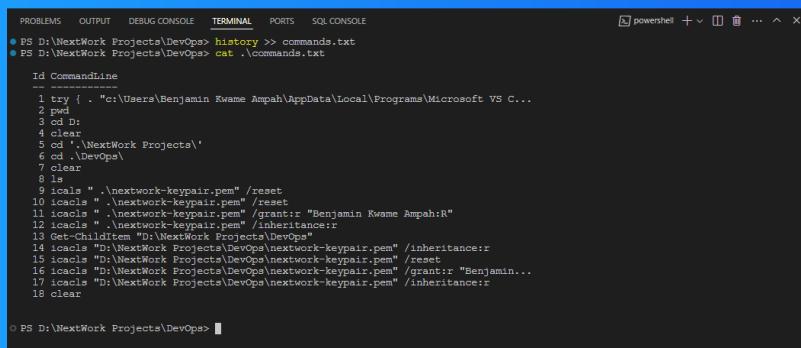
I installed VSCode to work on my personal projects and software development tasks. As a software engineer, I use it for coding, debugging, and managing different development workflows, benefiting from its flexibility and extensive features.



My first terminal commands

A terminal is a system interface where I use commands to navigate and perform operations on my system. The first command I ran for this project is `cd D:` followed by `cd NextWork` and `cd DevOps` since my project is located on my D drive.

I also updated my private key's permissions by using the `icacls` command on my Windows machine. I removed inheritance to ensure only my user account has the necessary permissions to securely access and use the private key file for SSH connections.



The screenshot shows a terminal window titled "powershell" with the following content:

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SQL CONSOLE
● PS D:\NextWork Projects\DevOps> history >> commands.txt
● PS D:\NextWork Projects\DevOps> cat .\commands.txt

Id CommandLine
-
1 try [ .. "c:\Users\Benjamin.Kwame.Ampah\AppData\Local\Programs\Microsoft VS C...
2 pwd
3 cd D:
4 clear
5 cd '\NextWork Projects\' 
6 cd '\DevOps\
7 clear
8 ls
9 icacls ".\nextwork-keypair.pem" /reset
10 icacls ".\nextwork-keypair.pem" /reset
11 icacls ".\nextwork-keypair.pem" /grant:"Benjamin.Kwame.Ampah:r"
12 icacls ".\nextwork-keypair.pem" /inheritance:r
13 Get-ChildItem "D:\NextWork Projects\DevOps"
14 icacls "D:\NextWork Projects\DevOps\nextwork-keypair.pem" /inheritance:r
15 icacls "D:\NextWork Projects\DevOps\nextwork-keypair.pem" /reset
16 icacls "D:\NextWork Projects\DevOps\nextwork-keypair.pem" /grant:r "Benjamin...
17 icacls "D:\NextWork Projects\DevOps\nextwork-keypair.pem" /inheritance:e
18 clear

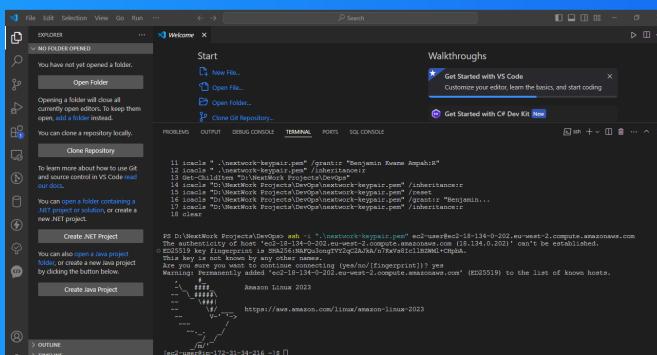
○ PS D:\NextWork Projects\DevOps>
```

SSH connection to EC2 instance

To connect to my EC2 instance, I ran the command `ssh -i "myprivate_key_file" ec2-user@public_ipv4_dns_address`. I followed the prompt by typing "yes" to proceed and successfully established the connection using SSH for secure remote access.

This command required an IPv4 address

A server's IPV4 DNS is the public address of the EC2 server, based on Internet Protocol version 4. It acts as a Domain Name System (DNS), enabling the internet to locate and connect to the server, facilitating communication and resource access.



The screenshot shows the VS Code interface with the terminal tab active. The terminal window displays the following command and its output:

```
ssh -i ".\nextwork-keypair.pem" grantic "MyAmazon RDS MySQL"
```

The output shows an authentication error:

```
Warning: Permanently added "ec2-18-134-0-202.eu-west-2.compute.amazonaws.com" (IP:18.134.0.202) to the list of known hosts.
```

Below the terminal, the status bar indicates the connection is still in progress:

```
[ec2-user:~] 172-01-24-216 ~$
```

Maven & Java

Apache Maven is a tool for building and managing Java projects. It automates builds, handles dependencies, and uses archetypes as templates to quickly set up project structures like web apps. This simplifies development, allowing developers to focus.

Maven is required in this project because I'll be building a Java project. It simplifies dependency management, automates builds, and provides templates (archetypes) to quickly set up the project structure, helping streamline the development process.

Java is a versatile programming language used to develop applications ranging from mobile apps to enterprise systems. It's platform-independent, meaning Java programs can run on any device with a Java Virtual Machine (JVM).

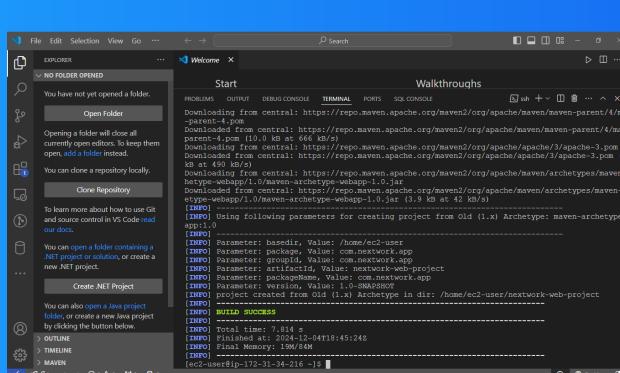
Java is required in this project because Maven depends on it to function. Without Java, I wouldn't be able to use Maven to build or manage the web app. It's also the primary language for developing the web application I'm working on.

Create the Application

I generated a Java web app using the command: mvn archetype:generate \ -DgroupId=com.nextwork.app \ -DartifactId=nextwork-web-project \ -DarchetypeArtifactId=maven-archetype-webapp \ -DinteractiveMode=false

I installed Remote - SSH, which is a VSCode extension that allows remote development over SSH. I installed it to securely connect to my EC2 instance, enabling me to access, edit files, and run commands directly from VSCode for efficient remote work.

- Host: A custom name for the connection.
- HostName: The actual address or domain name of the server.
- IdentityFile: The path to the SSH private key for authentication.
- User: The username used to log into the server.



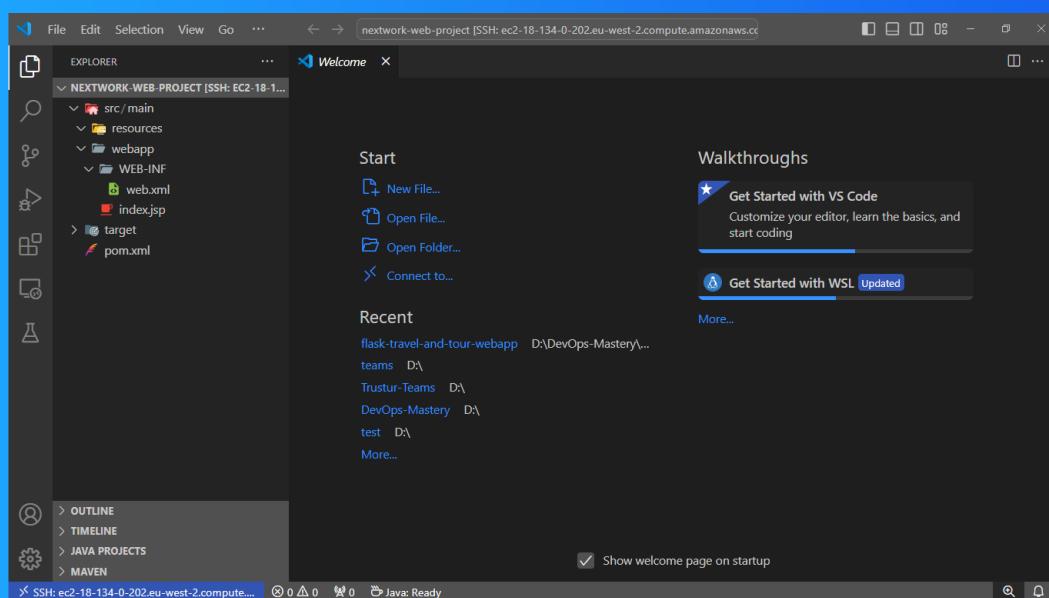
```
mvn archetype:generate \ -DgroupId=com.nextwork.app \ -DartifactId=nextwork-web-project \ -DarchetypeArtifactId=maven-archetype-webapp \ -DinteractiveMode=false
[INFO] Using following parameters for creating project from Old (1.x) Archetype: maven-archetype-webapp
[INFO] Parameter: basedir, Value: /home/ec2-user
[INFO] Parameter: archetype, Value: maven-archetype-webapp
[INFO] Parameter: groupId, Value: com.nextwork.app
[INFO] Parameter: artifactId, Value: nextwork-web-project
[INFO] Parameter: packaging, Value: com.nextwork.app
[INFO] Parameter: variation, Value: 1.0-SNAPSHOT
[INFO] project created from Old (1.x) Archetype in dir: /home/ec2-user/nextwork-web-project
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 7.814 s
[INFO] Final Memory: 13M/64M
[INFO]
```

Create the Application

Using VSCode's file explorer, I could see the project structure of the QEB app, including:

- src: Source code files
- resources: Configuration and non-code files
- webapp: Frontend assets
- WEB-INF: Web configuration
- target: Compiled build output.

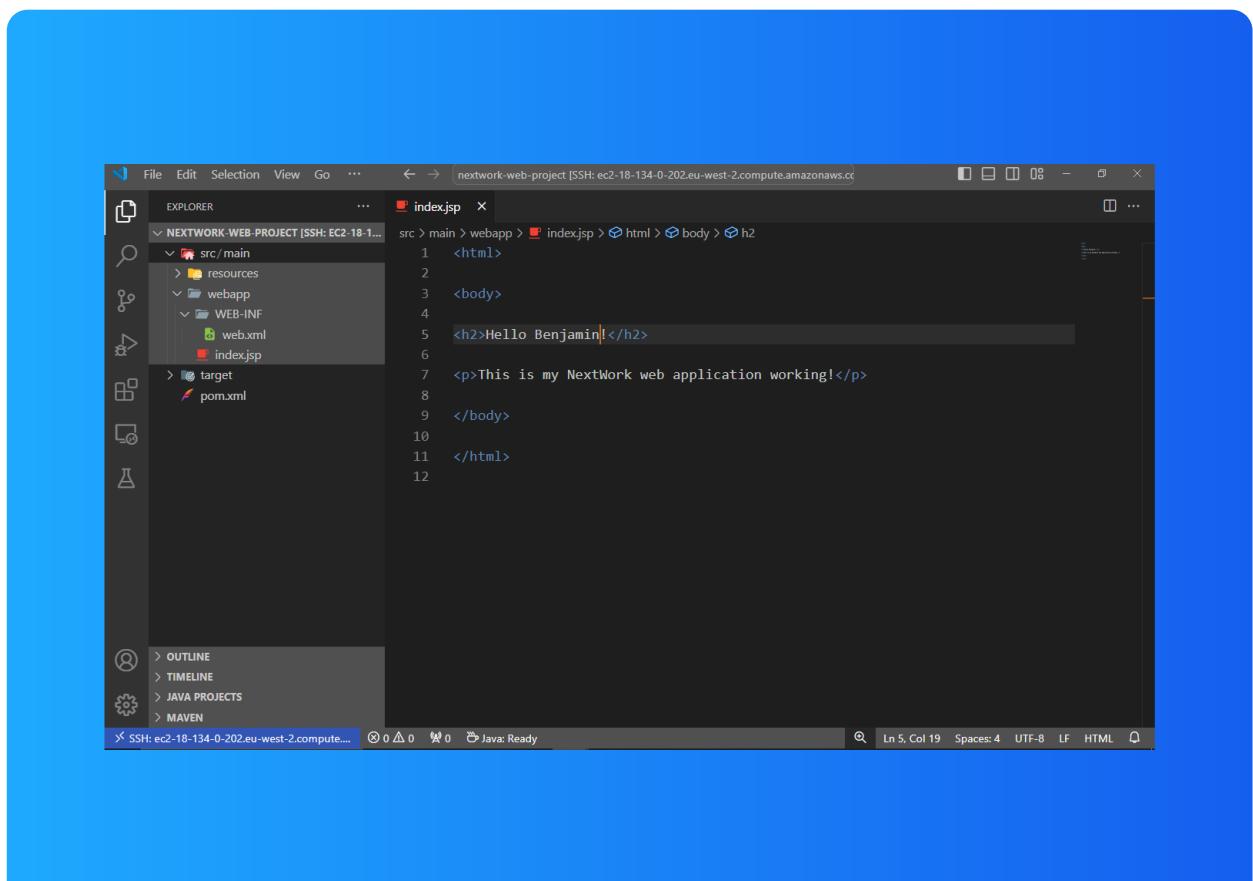
The src folder contains resources (configuration and assets) and webapp(frontend files like HTML, CSS, JS). Inside WEB-INF, you'll find the web.xml (web configuration) and index.jsp(entry point).The target folder holds the compiled output,eg. pom.xml



Using Remote - SSH

index.jsp is a file used in Java web apps, similar to HTML for displaying web pages. However, it can include Java code to generate dynamic content based on user input or database data, unlike static HTML files, which can't execute Java code.

I edited index.jsp by opening the file in VSCode, modifying the HTML for static content, and adding Java code within JSP tags to generate dynamic content. This allows the page to change based on conditions, such as user input or data from a database.





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