FULL STACK DEV

Java 9

Visual Studio Code

JDK and VS Code on windows

Presented by:

Rajeev Khoodeeram

OCTOBER 2025

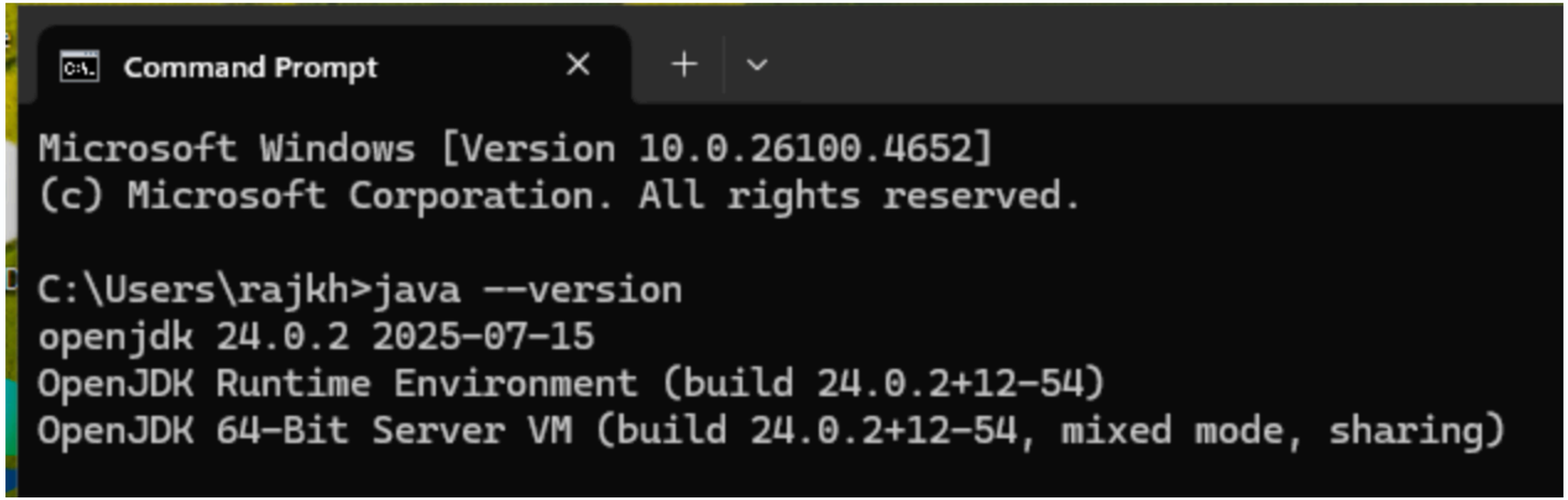
JAVA & JDK

- To be able to run Java Spring Boot, you will to have Java installed in your operating system

- **First thing First**
- Let us see how to verify if Java is installed in our Operating system.
- On Windows (VM) :
  - >> Download JDK from Oracle
  - >> Add JDK bin to PATH
  - >>C:\Program Files\Java\jdk-<version>\bin

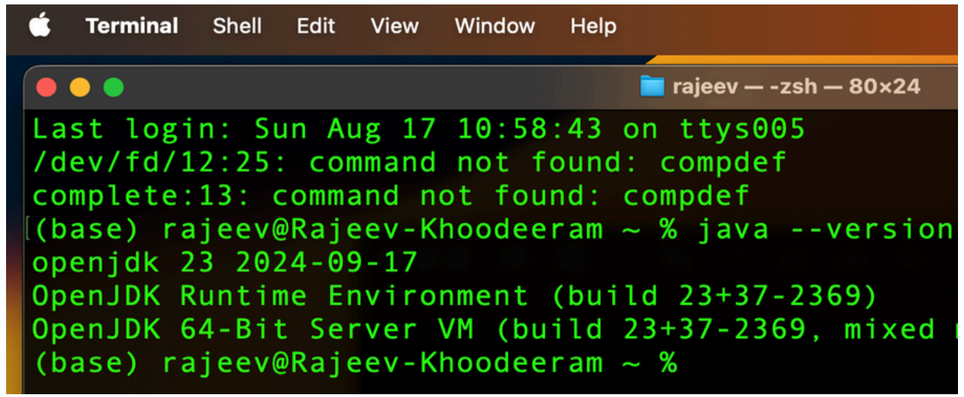
HOW TO CHECK IF JDK IS THERE ?

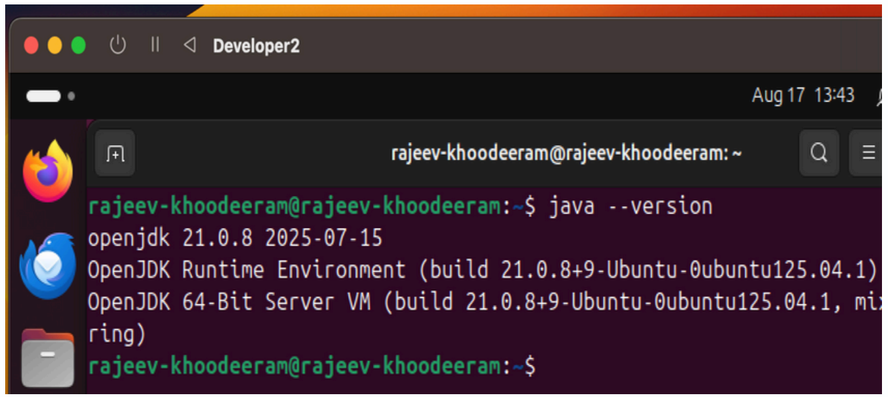
- Type this in the command line :
  - java --version
  - java or javac



ON MAC, LINUX

- MAC
  - >>brew install openjdk@23





- Linux
  - >> sudo apt update
  - >> sudo apt install -y openjdk-21-jdk. (21 or 23)

INSTALLING VS CODE

- Windows
  - https://code.visualstudio.com/docs/setup/windows
- Linux
  - https://code.visualstudio.com/docs/setup/linux Please select the architecture you are using (*I have used arm64 on MAC with UTM VM*)
- Mac
  - https://code.visualstudio.com/docs/setup/mac

INSTALLING EXTENSIONS FOR SPRING BOOT

- Make sure you install the following extensions
  - Java
  - Java extension pack
  - Java language support
  - Maven for Java
  - Spring Boot Dashboard
  - Spring Boot Extension Pack
  - Spring Boot Snippets
  - Spring Boot Tools
  - Spring Boot Initialzr Java Support

FULL STACK DEV

Configuring mySQL as database

Presented by:

Rajeev Khoodeeram

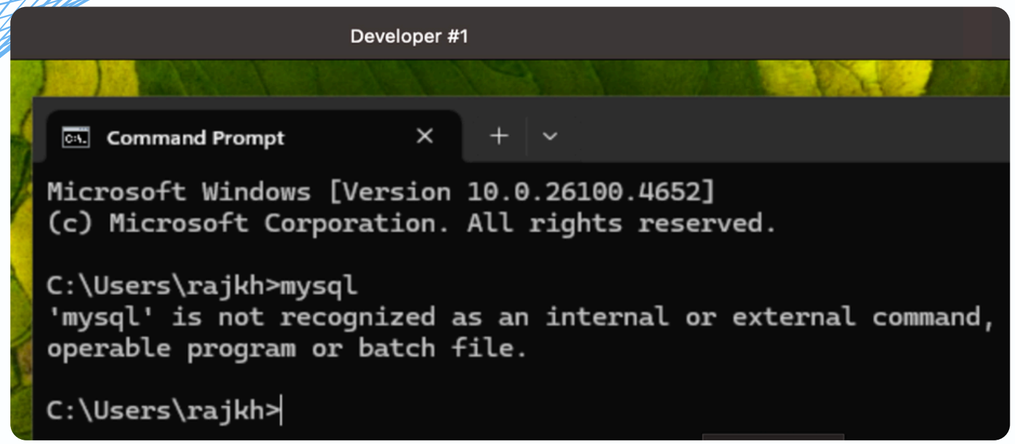
OCTOBER 2025

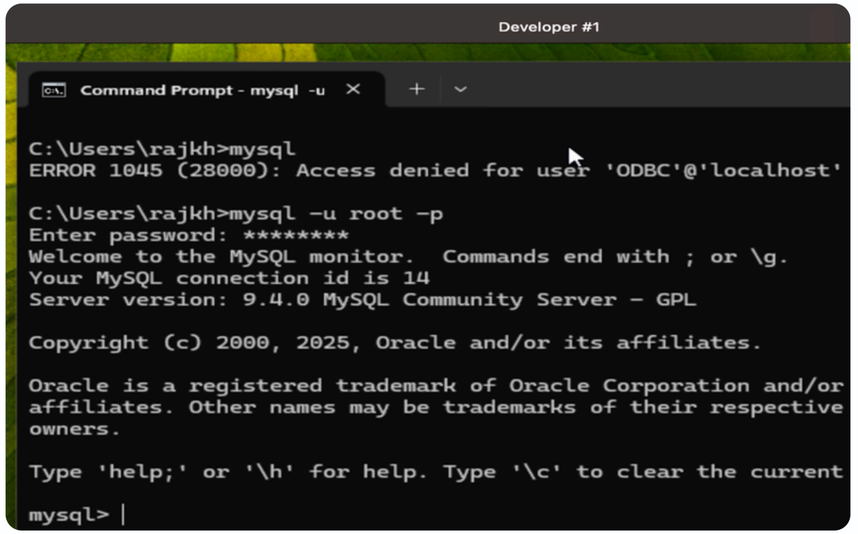
MYSQL & DBEAVER

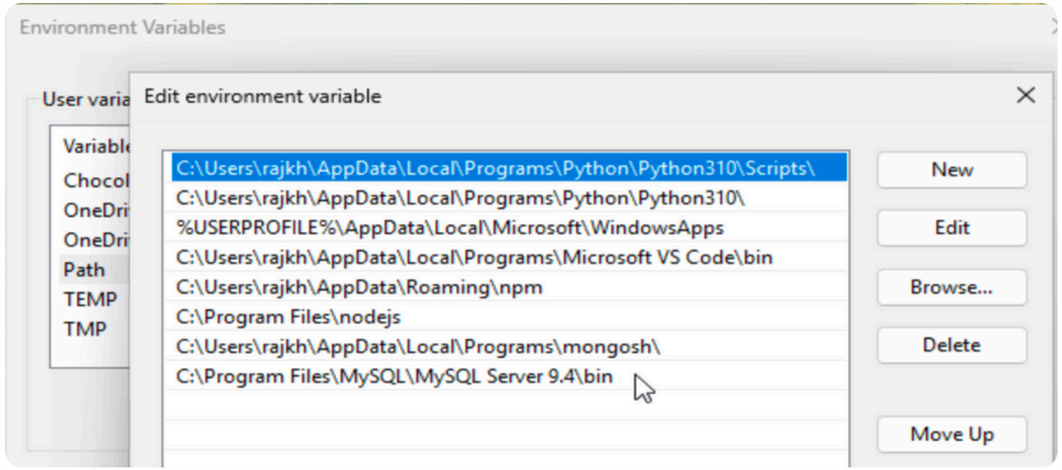
- Next, we need a database for our applications. In this lesson, I'll show you how to download, install, and configure mySQL on your machine.

- We will use DBeaver as GUI software to manage our database
- **Windows**
- **mySQL**
  - Download installer from https://dev.mysql.com/downloads/installer/
  - mySQL is installed in Program Files
- **DBeaver**
  - Install DBeaver Installer from https://dbeaver.io/download/

MYSQL


Developer #1
Command Prompt
Microsoft Windows [Version 10.0.26100.4652]
(c) Microsoft Corporation. All rights reserved.
C:\Users\rajkh>mysql
'mysql' is not recognized as an internal or external command,
operable program or batch file.
C:\Users\rajkh>

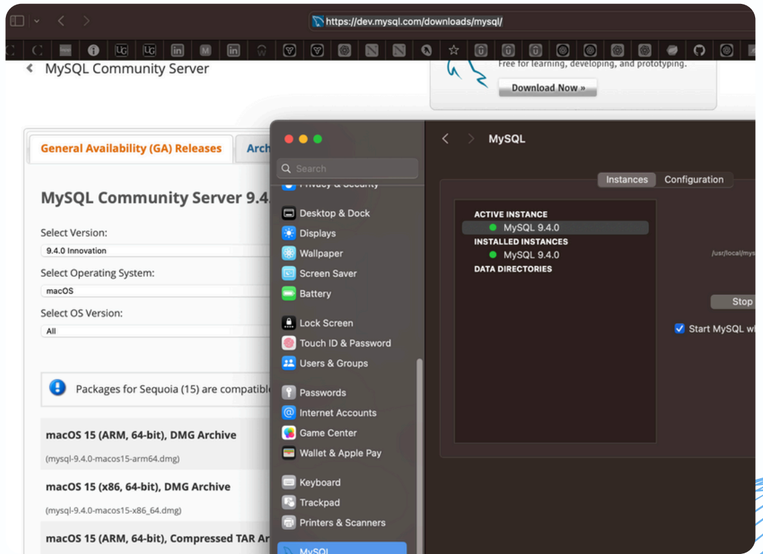

Developer #1
Command Prompt - mysql -u
C:\Users\rajkh>mysql
ERROR 1045 (28000): Access denied for user 'ODBC'@'localhost'
C:\Users\rajkh>mysql -u root -p
Enter password: ********
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 14
Server version: 9.4.0 MySQL Community Server - GPL
Copyright (c) 2000, 2025, Oracle and/or its affiliates.
Oracle is a registered trademark of Oracle Corporation and/or
affiliates. Other names may be trademarks of their respective
owners.
Type 'help;' or '\h' for help. Type '\c' to clear the current
mysql>


Environment Variables
User varia
Edit environment variable
Variable
Chocol
OneDri
OneDri
Path
TEMP
TMP
C:\Users\rajkh\AppData\Local\Programs\Python\Python310\Scripts\
C:\Users\rajkh\AppData\Local\Programs\Python\Python310\
%USERPROFILE%\AppData\Local\Microsoft\WindowsApps
C:\Users\rajkh\AppData\Local\Programs\Microsoft VS Code\bin
C:\Users\rajkh\AppData\Roaming\npm
C:\Program Files\nodejs
C:\Users\rajkh\AppData\Local\Programs\mongosh\
C:\Program Files\MySQL\MySQL Server 9.4\bin
New
Edit
Browse...
Delete
Move Up

MYSQL ON MAC

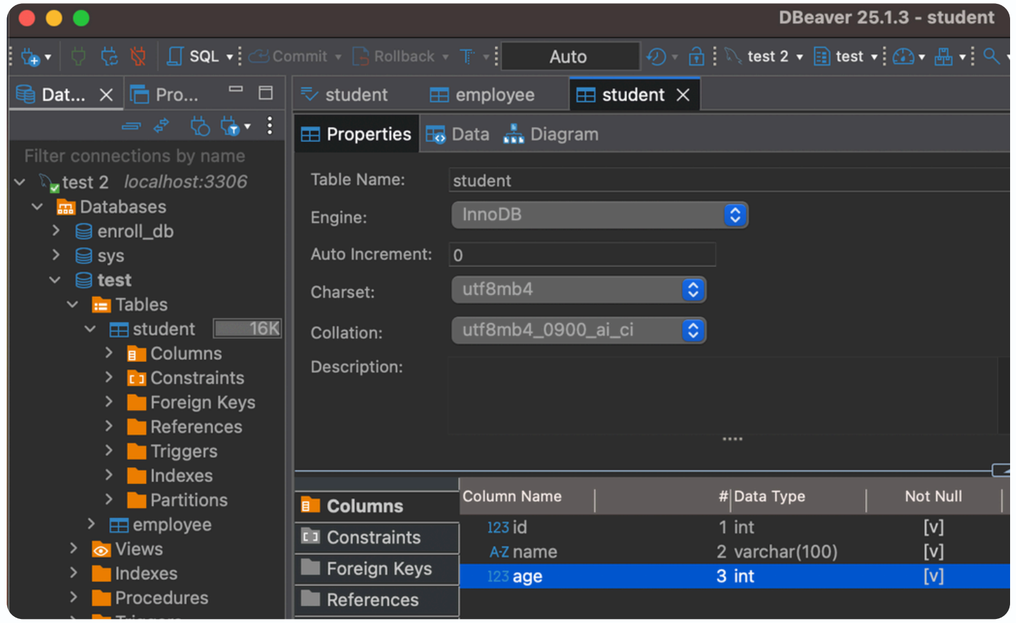
- **mySQL**
  - Download dmg file from https://dev.mysql.com/downloads/mysql/
  - Launch mysql from system-settings or system preferences as you can see here

- **DBeaver**
  - Install Dbeaver dmg file(community edition) which will allow us to manage our mysql databases (of course there are other tools you can download)



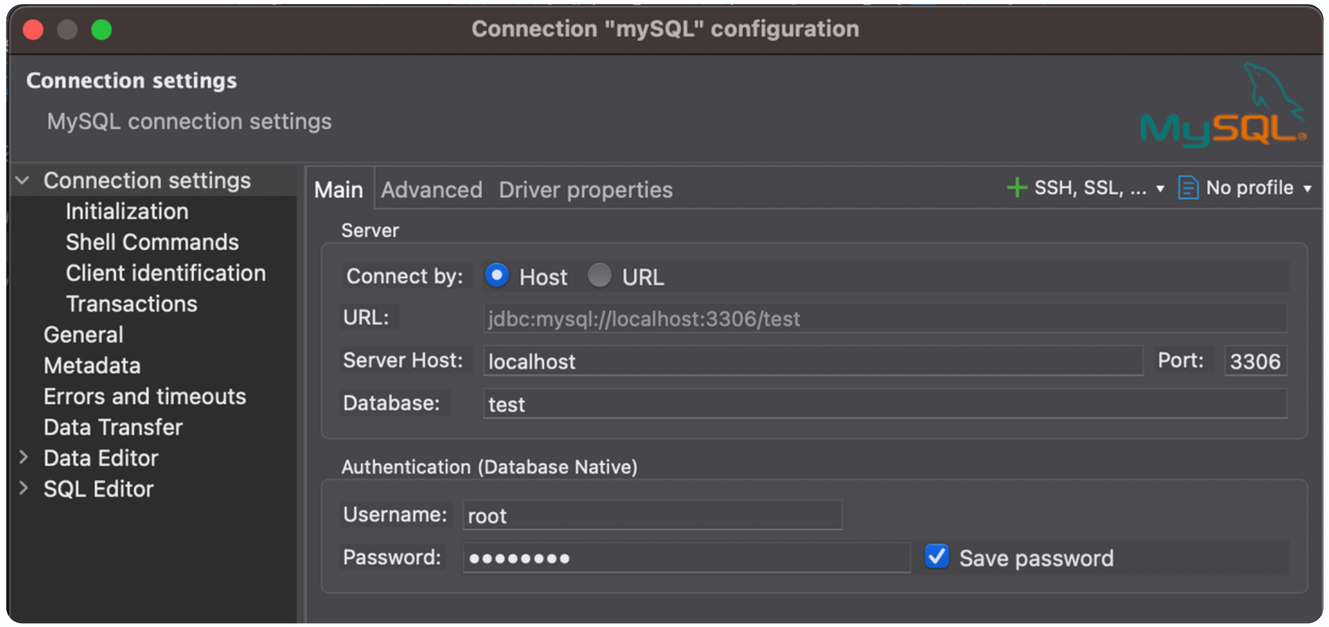
MYSQL ON LINUX

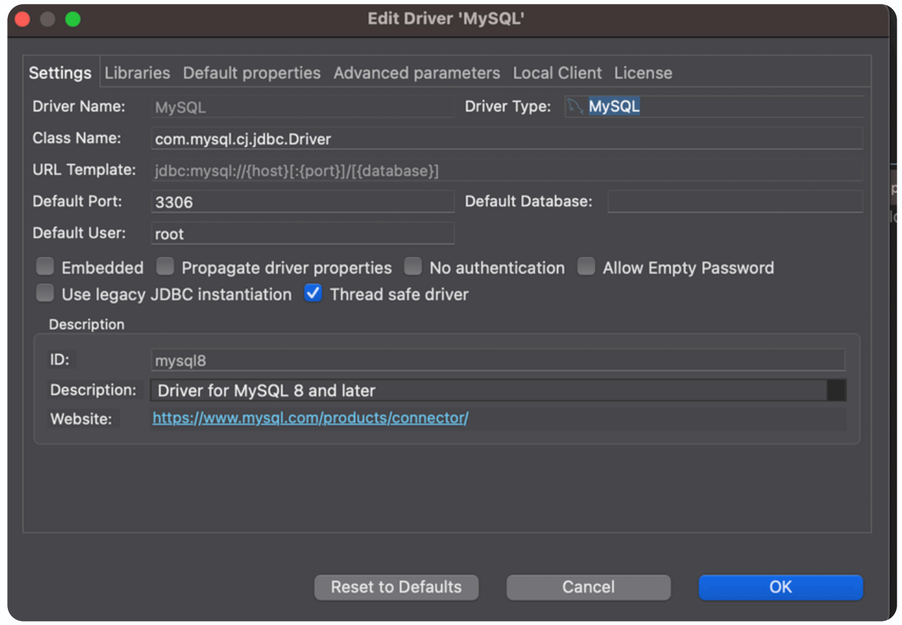
- mySQL
  - >> sudo apt update
  - >> sudo apt install mysql-server
  - >> sudo systemctl status mysql
  - >> sudo mysql
  - >> mysql -u root -p

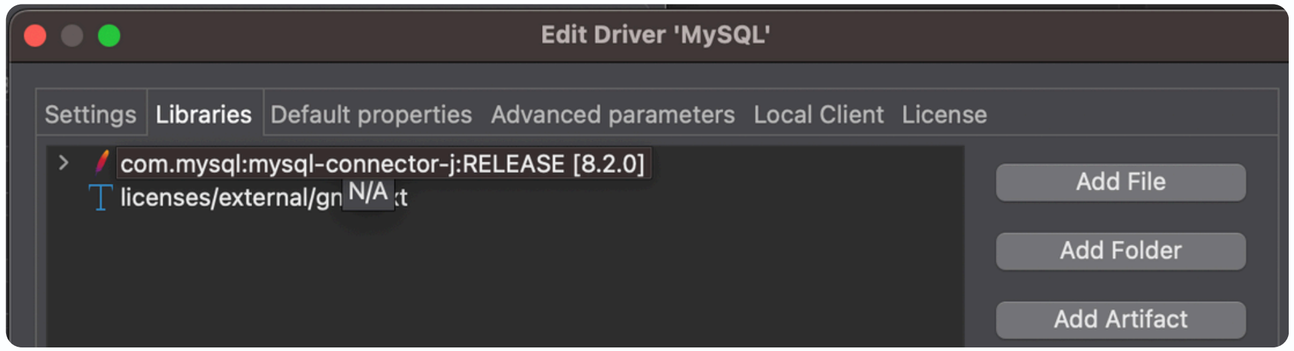


- DBeaver
  - Use snap (>>sudo snap install dbeaver-ce)

CONFIGURATION







FULL STACK DEV

Configuring postgreSQL as database

Presented by:

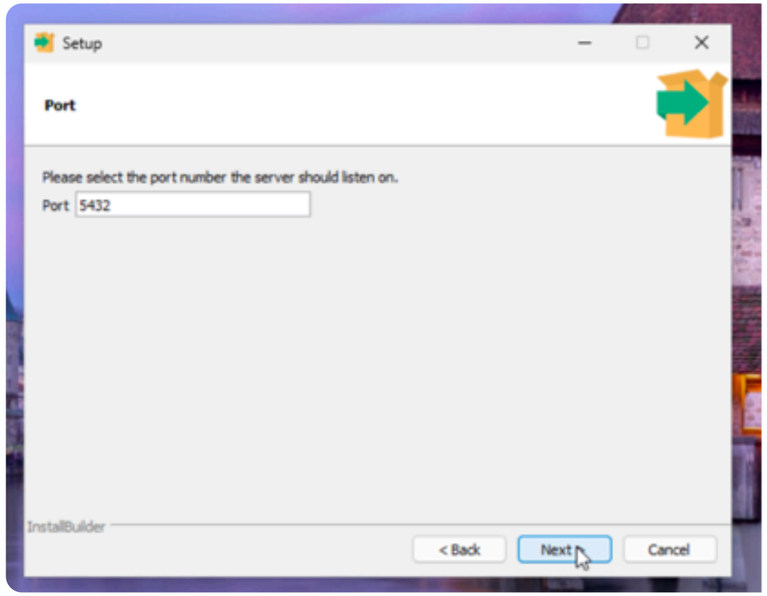
Rajeev Khoodeeram

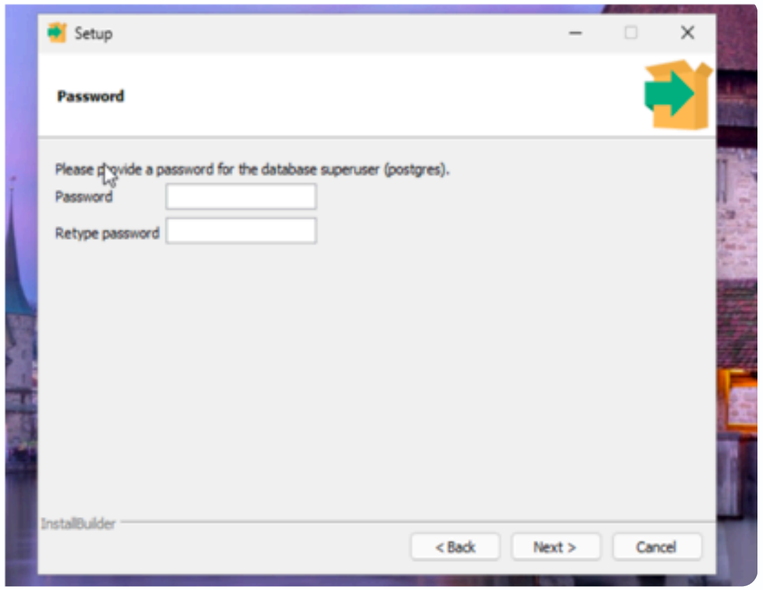
OCTOBER 2025

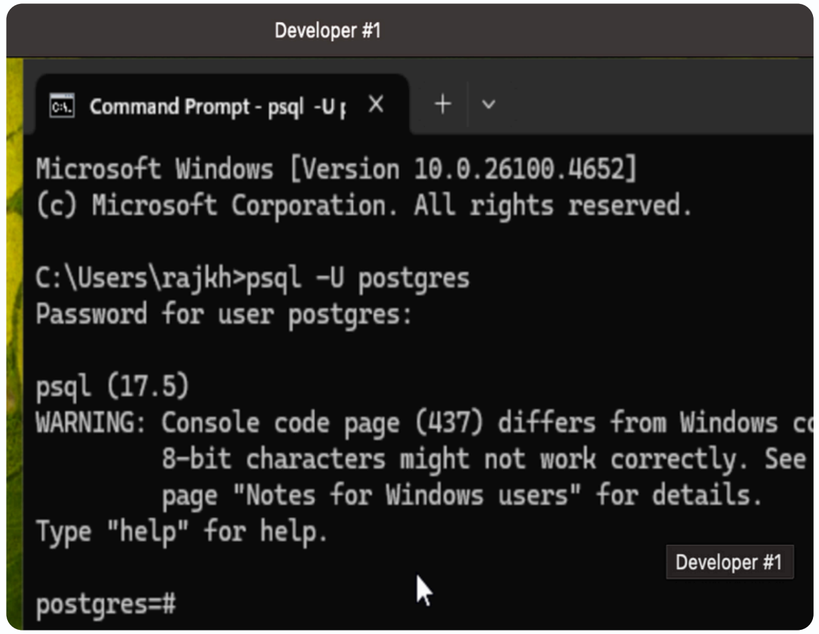
POSTGRESQL ON WINDOWS

- Using Installer
  - Download the installer from the official site: https://www.postgresql.org/download/windows/
  - Run the .exe installer.
  - Choose:
    - Installation folder (add to path : C:\Program Files\PostgreSQL\<version>\bin\)
    - Components (include pgAdmin if you want GUI)
    - Password for postgres user
    - Port (default 5432)

POSTGRESQL ON WINDOWS







..ON MAC, LINUX

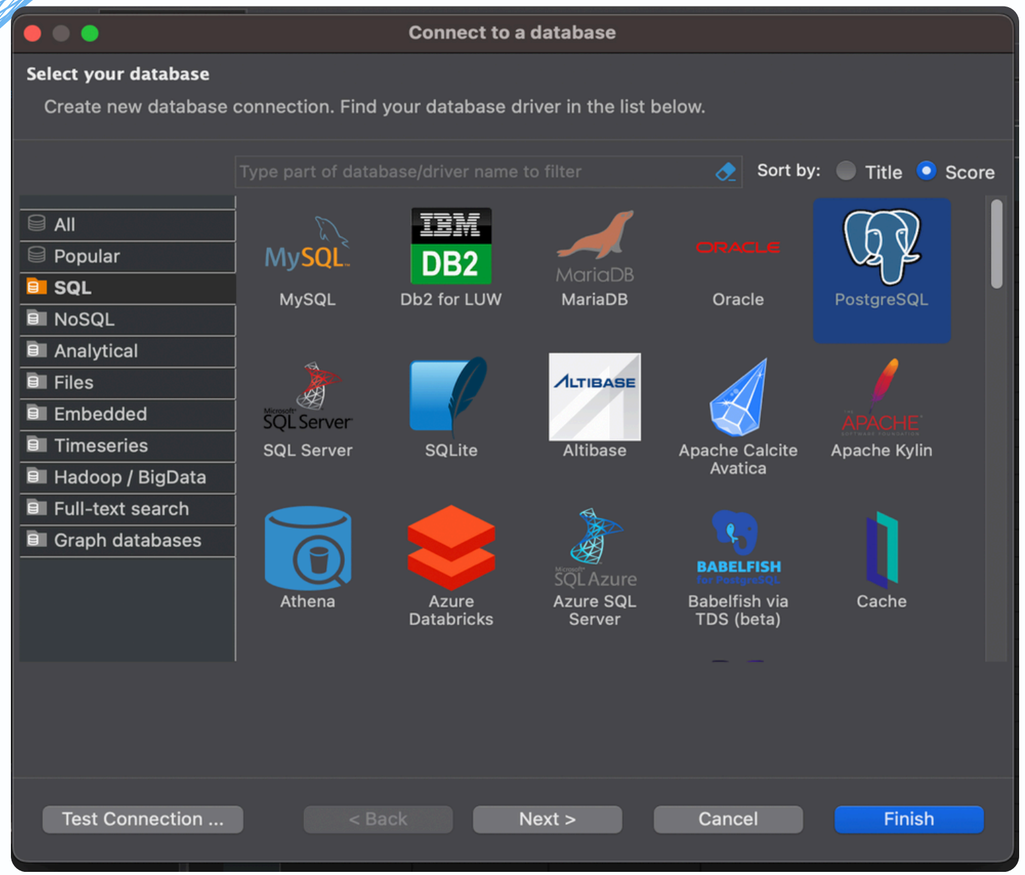
- On MAC
  - >>brew install postgresql@16
  - >>brew link postgresql@16 --force

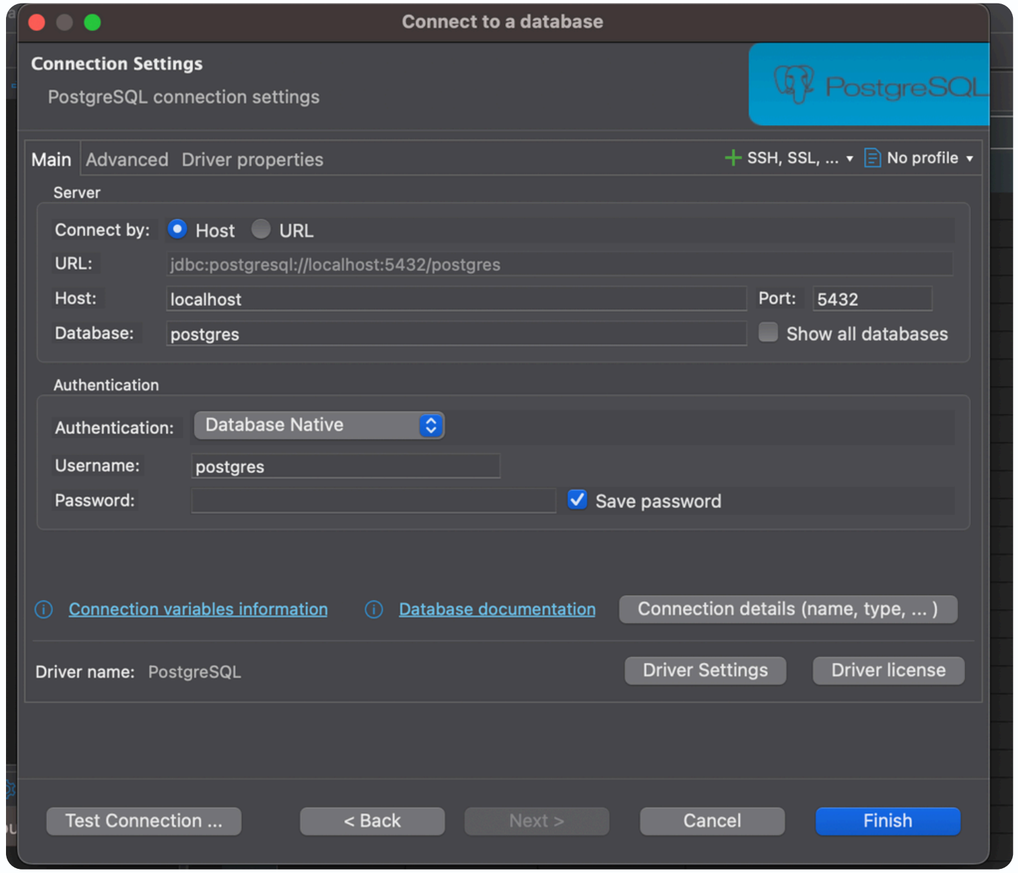
- On Linux
  - >>sudo apt update
  - >>sudo apt install postgresql-client

- Verify Installation
  - >>psql --version

  -

CONFIGURATION





FULL STACK DEV

mongoDB Compass

mongoDB®

Configuring mongodb as database

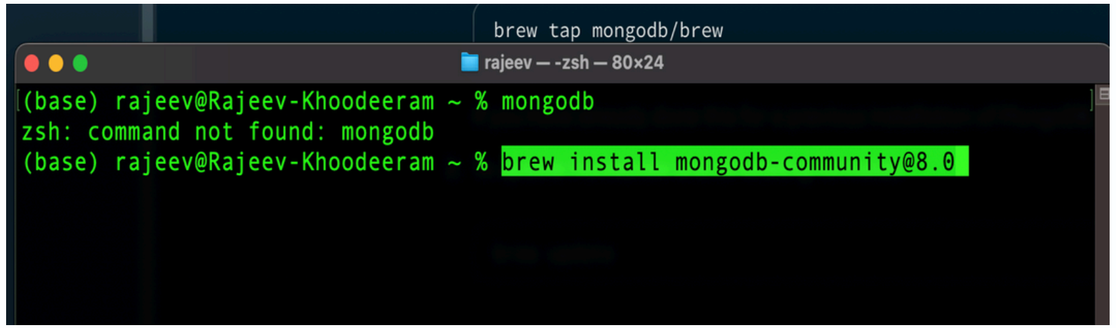
Presented by:

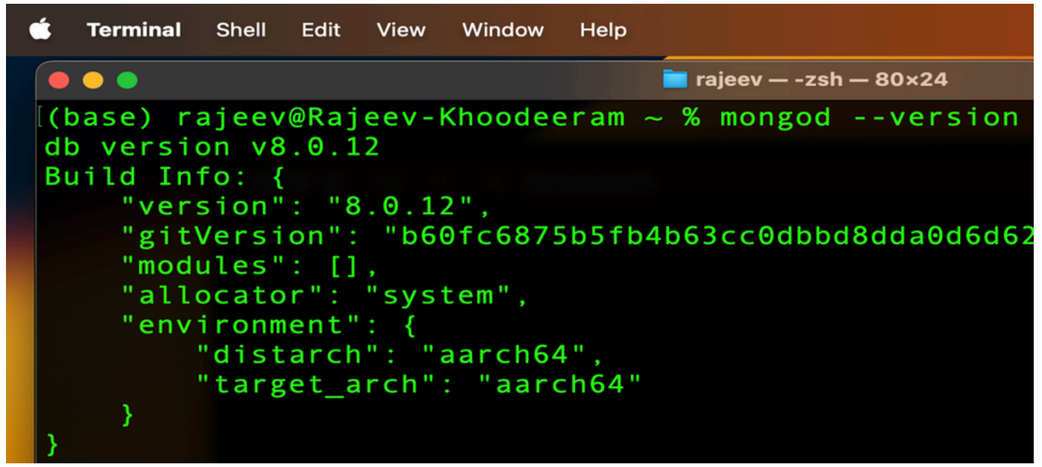
Rajeev Khoodeeram

OCTOBER 2025

MONGODB ON MAC

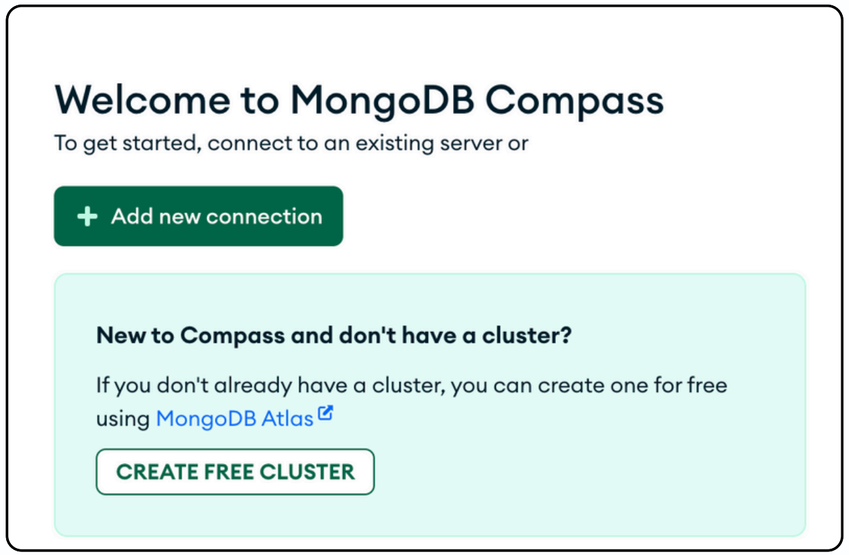
- >>brew install mongodb-community@8.0
  - Will need to configure your pom.xml file for maven to manage the dependencies

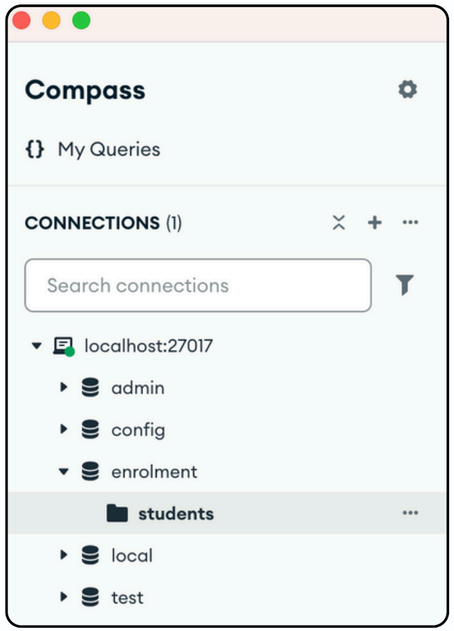




MONGODB WITH COMPASS

- MongoDB Compass : Using DMG Installer
  - Go to: https://www.mongodb.com/try/download/compass
  - Download .dmg for macOS.
  - Open .dmg → drag MongoDB Compass to Applications.
  - Launch from Applications folder → connect to MongoDB.





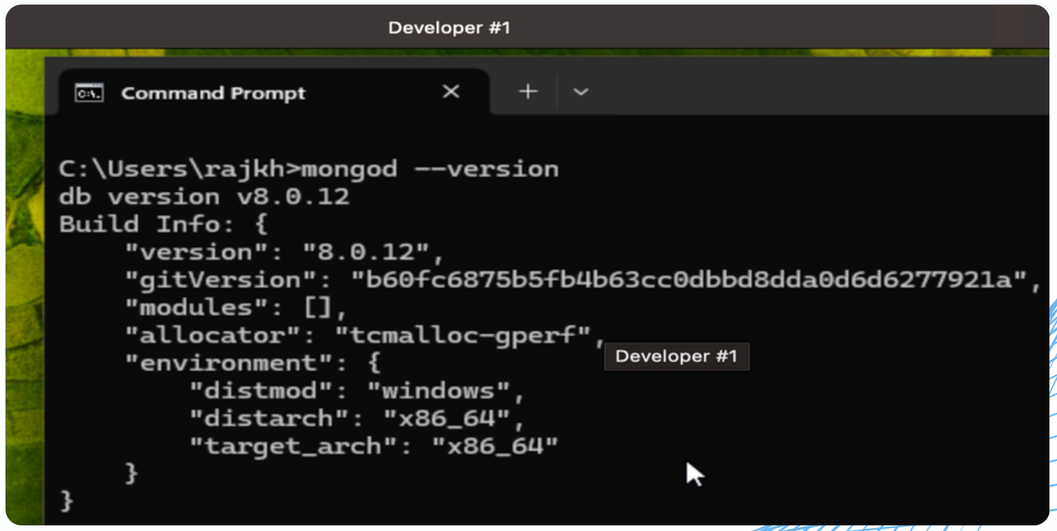
MONGODB ON WINDOWS

- Download mongodb
- Go to the official MongoDB Community Server download page:
- 👉 https://www.mongodb.com/try/download/community
- Select:
  - Version: Latest stable
  - Platform: Windows
  - Package: .msi (Installer)
- Add MongoDB to PATH in Environment variable

MONGODB ON WINDOWS

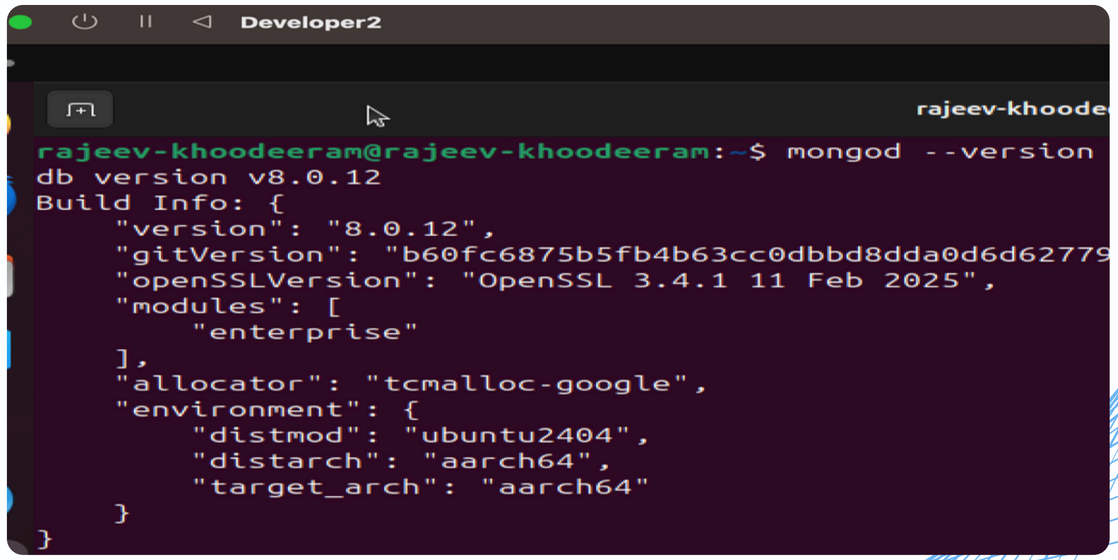
System variables

Variable	Value
CASSANDRA_HOME	C:\Program Files\apache-cassandra-5.0.5
ChocolateyInstall	C:\ProgramData\chocolatey
ComSpec	C:\WINDOWS\system32\cmd.exe
DriverData	C:\Windows\System32\Drivers\DriverData
JAVA_HOME	C:\Program Files\jdk-24.0.2
mongo-rajeev	C:\Program Files\MongoDB\Server\8.0\bin
node	%AppData%\npm



MONGODB ON LINUX

```
# Import public key
curl -fsSL https://pgp.mongodb.com/server-7.0.asc | sudo gpg -o /usr/share/keyrings/mongodb-server-7.0.gpg --dearmor

# Add repository
echo "deb [signed-by=/usr/share/keyrings/mongodb-server-7.0.gpg] https://repo.mongodb.org/apt/ubuntu $(lsb_release -cs)/mongodb-org/7.0 multiverse" | sudo tee /etc/apt/sources.list.d/mongodb-org-7.0.list

# Update
sudo apt-get update

# Install MongoDB
sudo apt-get install -y mongodb-org

# Start service
sudo systemctl start mongod
sudo systemctl enable mongod

# Verify
mongosh
```



FULL STACK DEV

Apache Maven™

Using maven

Presented by:

Rajeev Khoodeeram

OCTOBER 2025

INTRODUCTION

- Apache Maven is a build automation and project management tool for Java (and other JVM-based languages).

- It helps you compile, test, package, and manage dependencies in a consistent, automated way.

- Before Maven, managing dependencies in Java projects could be a tedious process.

DEPENDENCY MANAGEMENT

- At its core, Maven's dependency management is about automating the process of including, managing, and resolving the external libraries (dependencies) that your Java project needs to compile, run, and test.

- For example if you want to connect to a specific database, you will need to have the appropriate driver..that is your app is ***dependent*** on that driver.

HOW DOES IT WORK ?

- Project Object Model (**POM**):

- The pom.xml file is the heart of a Maven project. It's an XML file that contains all the project configuration, including its dependencies.

- For dependency management, you declare your project's direct dependencies within the <dependencies>section of the pom.xml.

```
<dependencies>
.....
<dependency>
        <groupId>com.mysql</groupId>
        <artifactId>mysql-connector-j</artifactId>
        <scope>runtime</scope>
 </dependency>
</dependencies>
```

HOW TO USE MVN ?

- Simple and direct
  - mvn test
- Jenkins file
  - mvn clean package -DskipTests (***we will use this one for CI/CD***)
- Checking the version
  - mvn --version
- Clears the target directory into which Maven normally builds your project.
  - mvn clean
- Builds the project and packages the resulting JAR file into the target directory.
  - mvn package

FULL STACK DEV

Continuous Integration - Continuous Deployment

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OCTOBER 2025

GIT

- Version control is essential for any software project.

- Here, I’ll introduce Git and GitHub, explain basic commands like init, add, commit, push, and show you how to create a remote repository on GitHub to store your project code safely and collaborate with others.

GIT COMMANDS (1)

- Create a new Git repository in the current folder
  - >>git init .
- Stage all changes in the directory
  - >>git add .
- Stage a specific file for commit
  - >>git add filename
- Commit staged changes with a message
  - >>git commit -m “Your clear message here...”

GIT COMMANDS (2)

- List all branches (and let you know on which branch you are currently in)
  - >>git branch

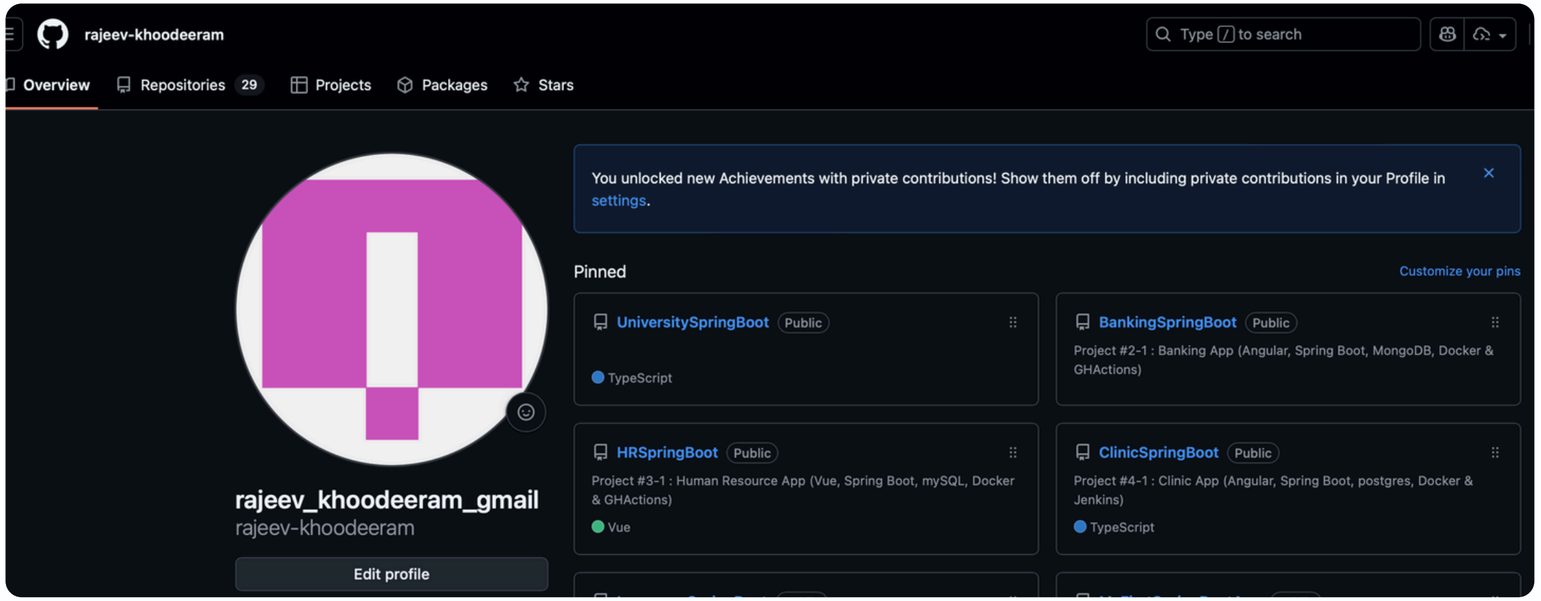
- Create and switch to a new branch
  - >>git checkout -b branch_name

- Fetch and merge changes from remote
  - >>git pull

- Push local commits to remote
  - >>git push

GITHUB

- GitHub is a cloud-based platform for version control, collaboration, and project management, built around Git.
  - Create your account
  - Create your repo.
  - Manage your project / versions
  - Perform continuous integration using Jenkins / GitHub Actions



DOCKER

- Docker helps us package and deploy applications consistently across environments.

- A platform/tool for building, running, and managing containers

- Builds and runs containers using images.

- Analogy
  - Like a kitchen that cooks food (containers).

DOCKER COMMANDS

- Four popular commands :

- Build the image
  - docker build
- Run the image
  - docker run
- Check running images
  - docker ps
- Stop a given image
  - docker stop

- ***You will a Dockerfile at the root of your project !!***

DOCKERFILE

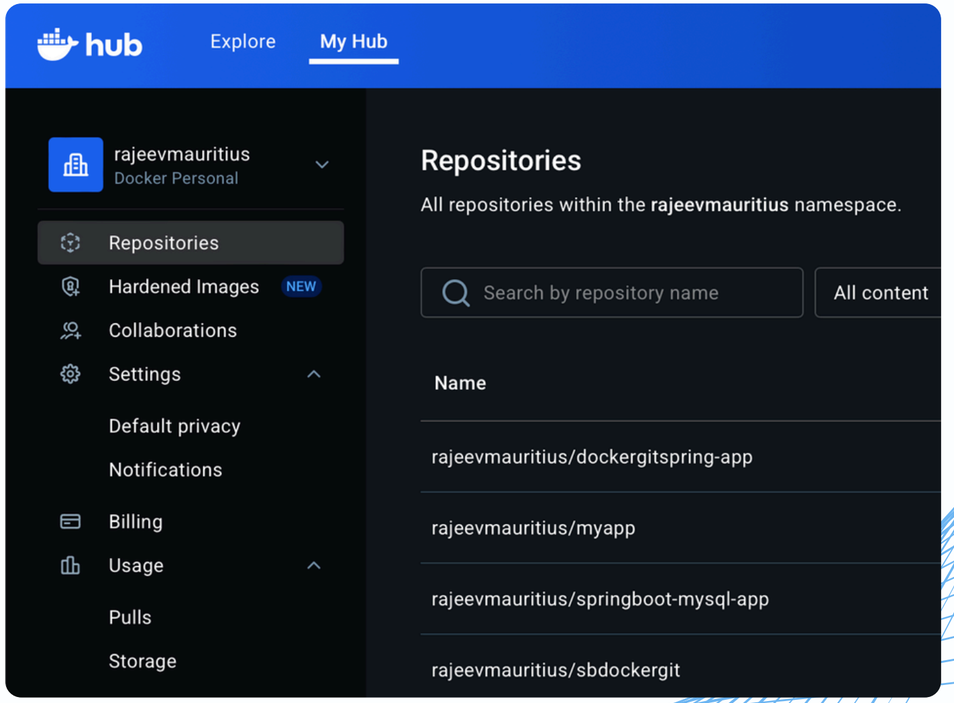
- **# Stage 1 — Build**
- FROM maven:3.9.6-eclipse-temurin-17 AS builder
- WORKDIR /app
- COPY . .
- RUN mvn clean package -DskipTests
- # Skip tests for faster build

- **# Stage 2 — Runtime**
- FROM openjdk:17-jdk-slim AS runner
- WORKDIR /app
- COPY --from=builder /app/target/*.jar app.jar
- EXPOSE 8080
- CMD ["java", "-jar", "app.jar"]

DOCKERHUB

- A cloud-based registry service for storing and sharing container images (Just like we have github for git; we have dockerhub for docker).
  - Storing Docker images
  - Pulling/pushing images
  - Sharing with others or CI/CD pipelines

- Two commonly used commands :
  - docker push
  - docker pull



DOCKER COMPOSE

- Docker Compose is a tool for defining and running multi-container Docker applications (ex web app, your database, etc)

- Key Characteristics:
  - YAML File (**docker-compose.yml**): All configurations are written in a YAML file.
  - **Services**: Each containerized component of your application (e.g., web, db, cache) is defined as a "service."
  - **Networks** and **Volumes**: Allows you to define custom networks for service communication and volumes for data persistence.