TP1 Devops

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I. Dockerizing a Springboot Application

1. SpringBoot Application Overview

We start by creating a basic SpringBoot application with a single controller. The controller responds to a GET request by returning a simple "Hello" message.

2. Unit tests of the controller with Junit

Test 1: `shouldReturnDefaultMessage()`: This test checks if calling the `/hello` endpoint without passing any parameters returns "Hello World!".
Test 2: `shouldReturnCustomMessage()`: This test checks if calling the `/hello` endpoint with the `name` parameter returns the correct personalized message.

```
@Test
    void shouldReturnDefaultMessage() throws Exception {
        this.mockMvc.perform(get("/hello"))
                .andExpect(status().isOk())
                .andExpect(content().string("Hello World!"));
    }

    @Test
    void shouldReturnCustomMessage() throws Exception {
        this.mockMvc.perform(get("/hello").param("name", "GL5"))
                .andExpect(status().isOk())
                .andExpect(content().string("Hello GL5!"));
    }
```

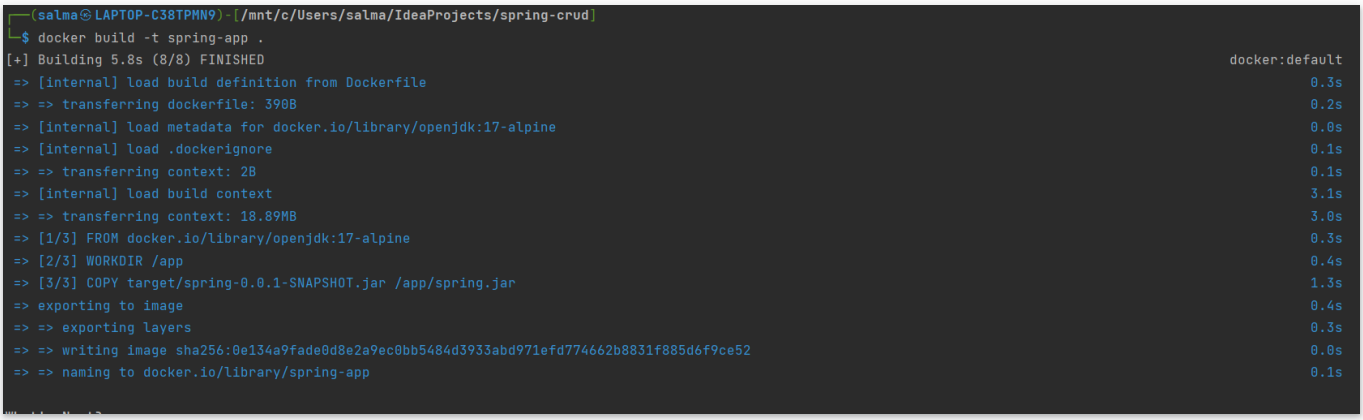
Dockerfile

To containerize the SpringBoot application, we define this Dockerfile.

```
# Use OpenJDK 17 as base image
FROM openjdk:17-alpine

# Set the working directory in the container
WORKDIR /app

# Copy the packaged jar file into the container at /app
COPY target/spring-0.0.1-SNAPSHOT.jar /app/spring.jar

# Expose port 8080
EXPOSE 8080

# Command to run the spring boot application
CMD ["java", "-jar", "spring.jar"]
```

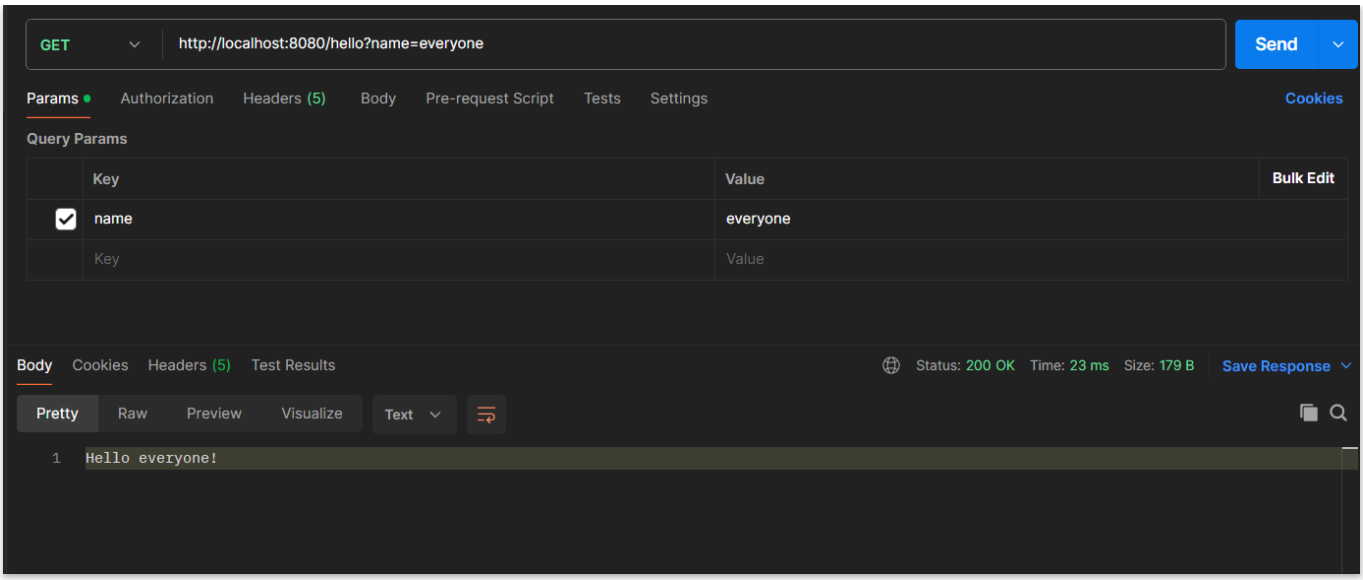
Building and Running the Docker Image

```
docker build -t .
```



Then, we launch the Docker container while exposing port 8080 to allow access to the SpringBoot application.

```
docker run -p 8080:8080 spring-app
```



II. Building and pushing docker image with github actions

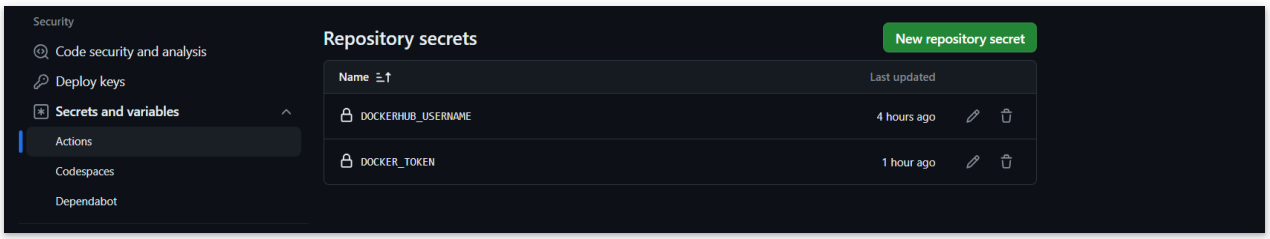
1. GitHub Actions workflow

This GitHub Actions workflow file automates the process of building a Spring Boot application, packaging and testing it with Maven, building a Docker image, and pushing it to Docker Hub.

```yaml
name: Build, Test, and Push Docker Image
on:
  push:
    branches:
      - master
env:
  USERNAME: ${{ secrets.DOCKERHUB_USERNAME }}
  DOCKER_TOKEN: ${{ secrets.DOCKER_TOKEN }}

jobs:

  build:

    runs-on: ubuntu-latest

    steps:
      # Checkout the code
      - name: Checkout code
        uses: actions/checkout@v2
      # Set up JDK 17
      - name: Set up JDK 17
        uses: actions/setup-java@v2
        with:
          java-version: 17
          distribution: "adopt"
```

```
    # Build and run unit tests with Maven
    - name: Build and run tests with Maven
      run: ./mvnw clean verify
    # Login to DockerHub
    - name: Login to DockerHub
      run: docker login -u $USERNAME --password $DOCKER_TOKEN
    #  Build and push Docker image
    - name: Build and push Docker image
      run: |

        docker build -t salmaghabri/with-ga:latest .

        docker push salmaghabri/with-ga:latest
```

1. **Workflow Triggers**:
   - The workflow triggers on `push` events to the `master` branch.
2. **Environment Variables**:
   - It sets up environment variables `USERNAME` and `DOCKER_TOKEN` to store Docker Hub credentials. These are sourced from GitHub secrets.



3. **Jobs**:
   - **build**: This job runs on an `ubuntu-latest` virtual machine.
     - **Steps**:
       - `Checkout code`: Checks out the source code from the repository.
       - `Set up JDK 17`: Sets up JDK 17 using the `actions/setup-java@v2` action.
       - `Build and run tests with Maven`: Runs the Maven wrapper script (`mvnw`) to clean the project, compile the code, and execute unit tests using JUnit. This step ensures that all tests pass before proceeding to the packaging and Docker build stages. If any test fails, the workflow stops here to prevent further actions.
       - `Login to DockerHub`: Logs in to Docker Hub using the provided credentials.
       - `Build and push Docker image`: Builds a Docker image from the Dockerfile in the repository and pushes it to Docker Hub. The Docker image is tagged as `salmaghabri/with-ga:latest`.
4. **Docker Hub Credentials**:

- The workflow uses the `DOCKERHUB_USERNAME` and `DOCKER_TOKEN` secrets to authenticate with Docker Hub.

5. **Docker Image Tagging**:
   - The Docker image is tagged with `salmaghabri/with-ga:latest`.

2. Build finished

After running run the jobs of the workflow, we can see that the build succeded and the image was pushed.