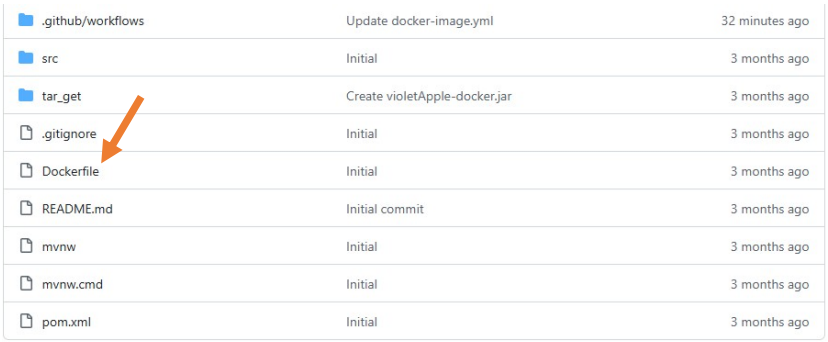
CI/CD Pipeline: Building and Pushing Docker Images from GitHub to Docker Hub Using GitHub Actions

Prerequisites

Before starting, make sure you have:

- A GitHub account
- A Docker Hub account
- Docker installed locally (for testing)
- Your project hosted on GitHub (e.g., a simple Spring Boot App with a Dockerfile)

Step 1: Create a "Dockerfile" in Your Project

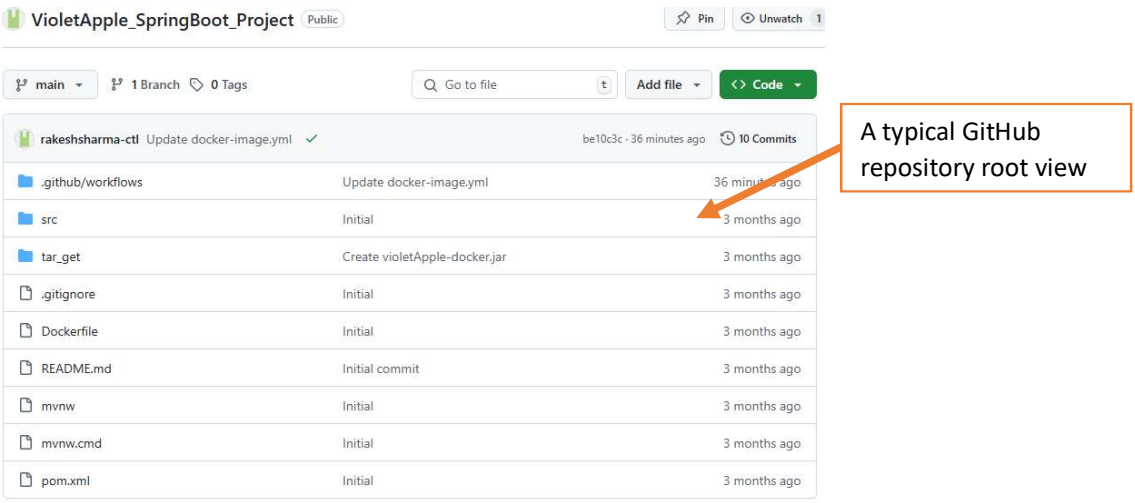



```
# 1Use an official Java runtime as the base image
FROM openjdk:17-jdk-slim

# 2Set the working directory inside the container
WORKDIR /app

# 3Copy the built JAR file into the container
COPY target/violetApple-docker.jar app.jar

# 4Expose the application port
EXPOSE 8080

# 5Run the application
ENTRYPOINT ["java", "-jar", "app.jar"]
```

Step 2: Create a Repository on GitHub

If you haven't already:

1. Push your local project to GitHub
2. Make sure the Dockerfile is in the root or specified directory

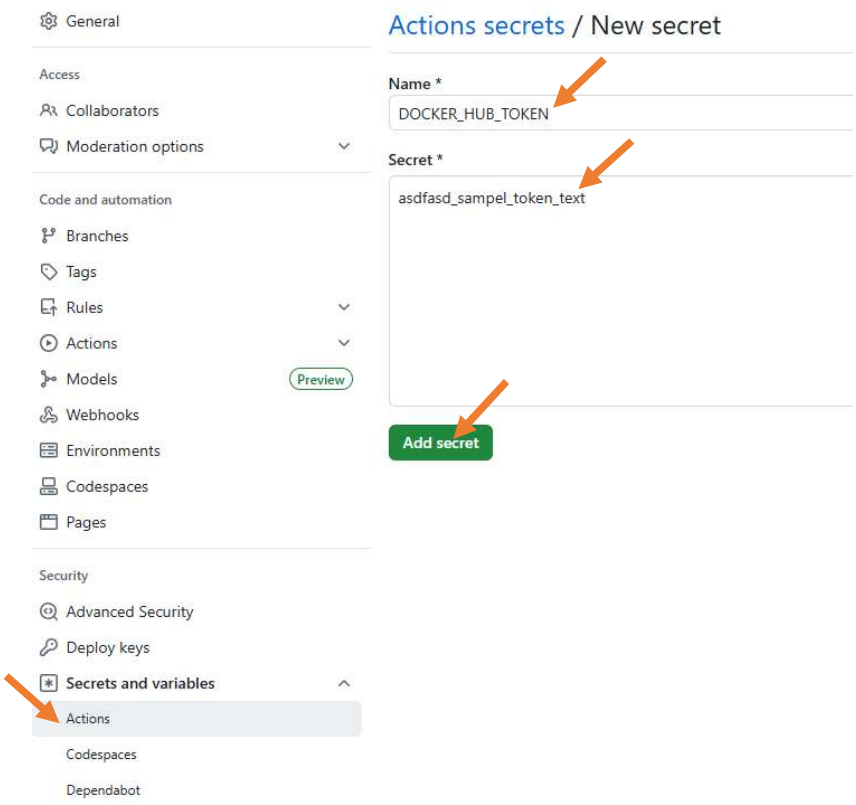


Step 3: Store Docker Hub Credentials as GitHub Secrets

Go to your GitHub repo → Settings → Secrets and variables → Actions → New repository secret

Add these secrets:

Name	Value
DOCKER_HUB_TOKEN	Your Docker Hub username



Step 4: Create GitHub Actions Workflow

In your repo, create this file:

```
1. .github/workflows/docker-image.yml
```

Sample “docker-image.yml” for a SpringBoot Application

```
 1. name: Docker Image CI
 2.
 3. on:
 4.   push:
 5.     branches: [ "main" ]
 6.   pull_request:
 7.     branches: [ "main" ]
 8.
 9. jobs:
10.   build-and-push:
11.     runs-on: ubuntu-latest
12.
13.     steps:
14.       - name: Checkout Code
15.         uses: actions/checkout@v4
16.
17.       - name: Set up JDK 17
18.         uses: actions/setup-java@v3
19.         with:
20.           java-version: '17'
21.           distribution: 'temurin'
22.
23.       - name: Build with Maven
24.         run: mvn clean package -DskipTests
```

Action workflow gets executed when push or pull request is initiated in “main” branch.

We have used ubuntu latest version as operating system.

```
25.
26.       - name: Log in to Docker Hub using CLI
27.         run: docker login -u sharmarakesh -p ${{ secrets.DOCKER_HUB_TOKEN }}
28.
29.       - name: Build Docker Image
30.         run: |
31.           docker build -t sharmarakesh/violetapple-springboot-project:latest .
32.
33.       - name: Push Docker Image to Docker Hub
34.         run: |
35.           docker push sharmarakesh/violetapple-springboot-project:latest
```

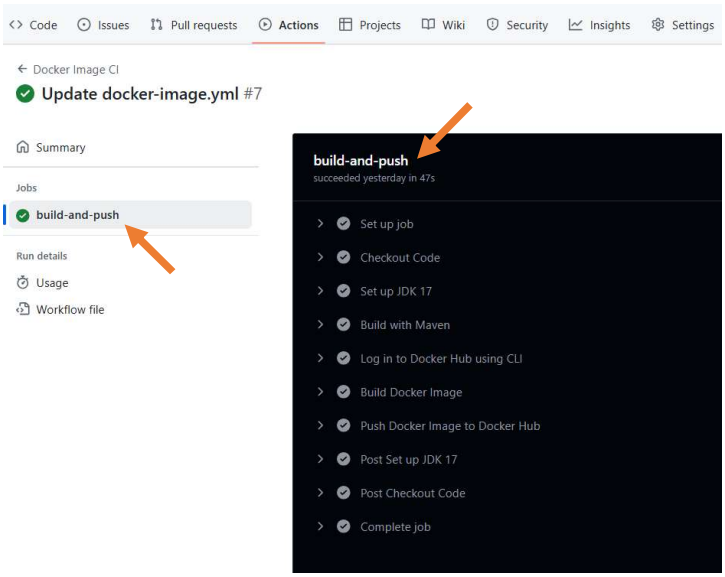
Github username

Docker token stored in Action secrets

Name image always as latest.

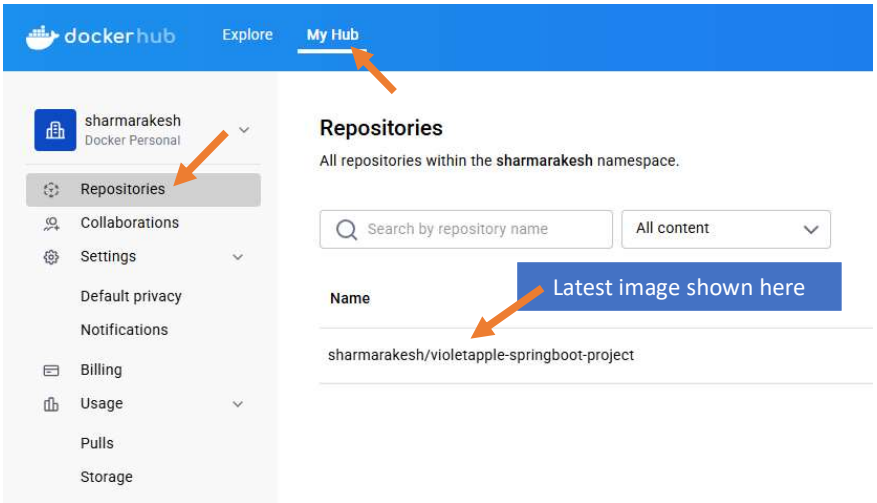
Step 5: Commit and Push the Workflow

Once the workflow YAML is committed and pushed to the main branch, it will automatically trigger the pipeline.



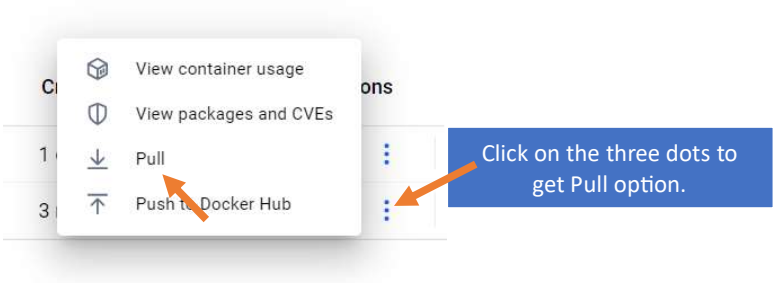
Step 6: Confirm on Docker Hub

Go to Docker Hub → Check your repository → The latest image should be pushed.

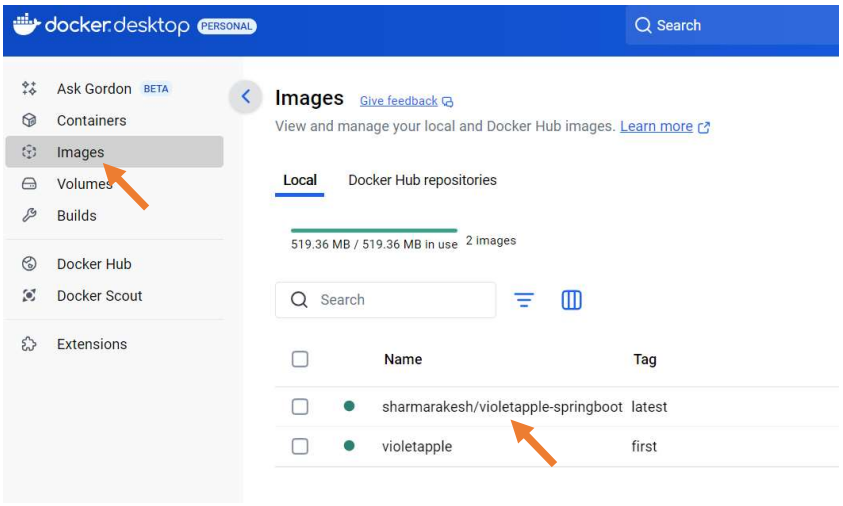


Step 6: Test on Docker Desktop

1. Once the image is pushed to Docker Hub, you can test it locally using Docker Desktop.
2. Pull the image from Docker Hub.



3. Run a container from the image.



4. Open Docker Desktop to confirm the container is running.
5. Visit http://localhost:8080 (or your chosen port) in a browser to test the application.