

Project AQE

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Introduction

This project involves creating a Maven-based Java web application using Spring Boot, containerizing it with Docker, and automating the build process with Jenkins.

Technologies Used:

- ✓ Spring Boot for application development
- ✓ Maven for build management
- ✓ Docker for containerization
- ✓ Jenkins for Continuous Integration

To streamline development, build, and deployment processes for efficient software delivery.



Spring Initialiser

start.spring.io

Project

☐ Gradle - Groovy

☐ Gradle - Kotlin

☒ Maven

Language

☒ Java

☐ Kotlin

☐ Groovy

Spring Boot

☐ 3.4.0 (SNAPSHOT)

☐ 3.4.0 (M1)

☐ 3.3.3 (SNAPSHOT)

☒ 3.3.2

☐ 3.2.9 (SNAPSHOT)

☐ 3.2.8

Project Metadata

Group

com.AQEProject1

Artifact

DemoAQEProject

Name

DemoAQEProject

Description

Demo project for Spring Boot

Package name

com.AQEProject1

Packaging

☒ Jar

☐ War

Java

☐ 22

☐ 21

☒ 17

Dependencies

ADD DEPENDENCIES... CTRL + B

Spring Web

WEB

Build web, including RESTful, applications using Spring MVC. Uses Apache Tomcat as the default embedded container.

Thymeleaf

TEMPLATE ENGINES

A modern server-side Java template engine for both web and standalone environments. Allows HTML to be correctly displayed in browsers and as static prototypes.

GENERATE

CTRL + ↵

EXPLORE

CTRL + SPACE

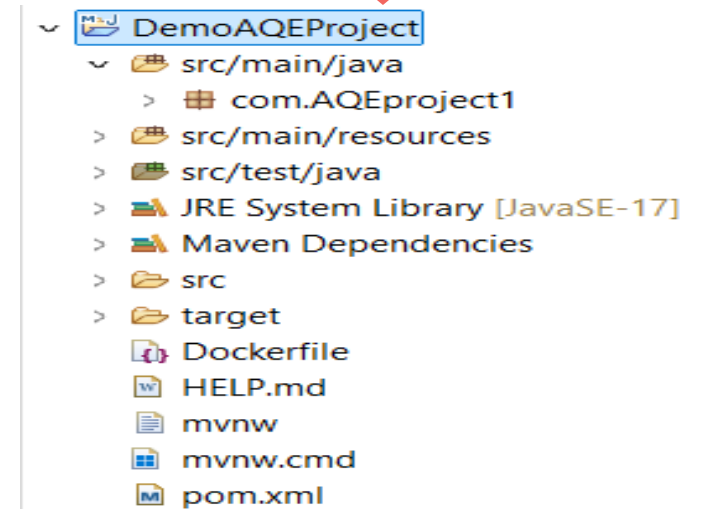
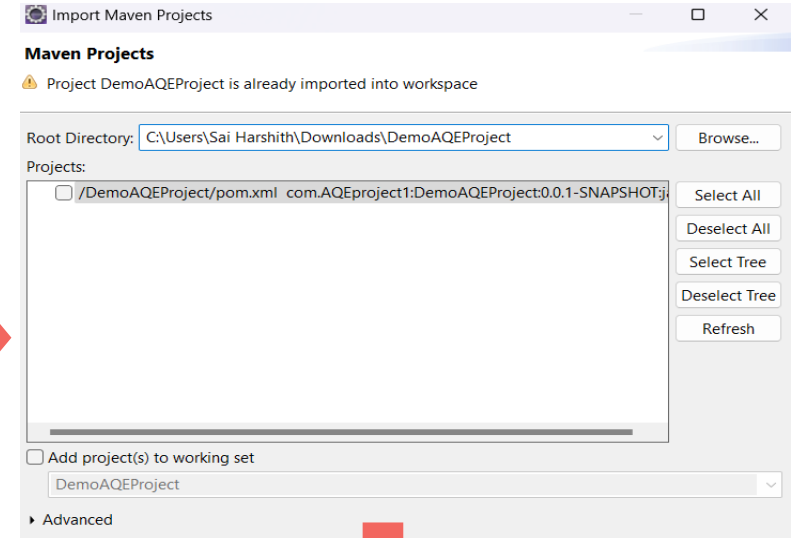
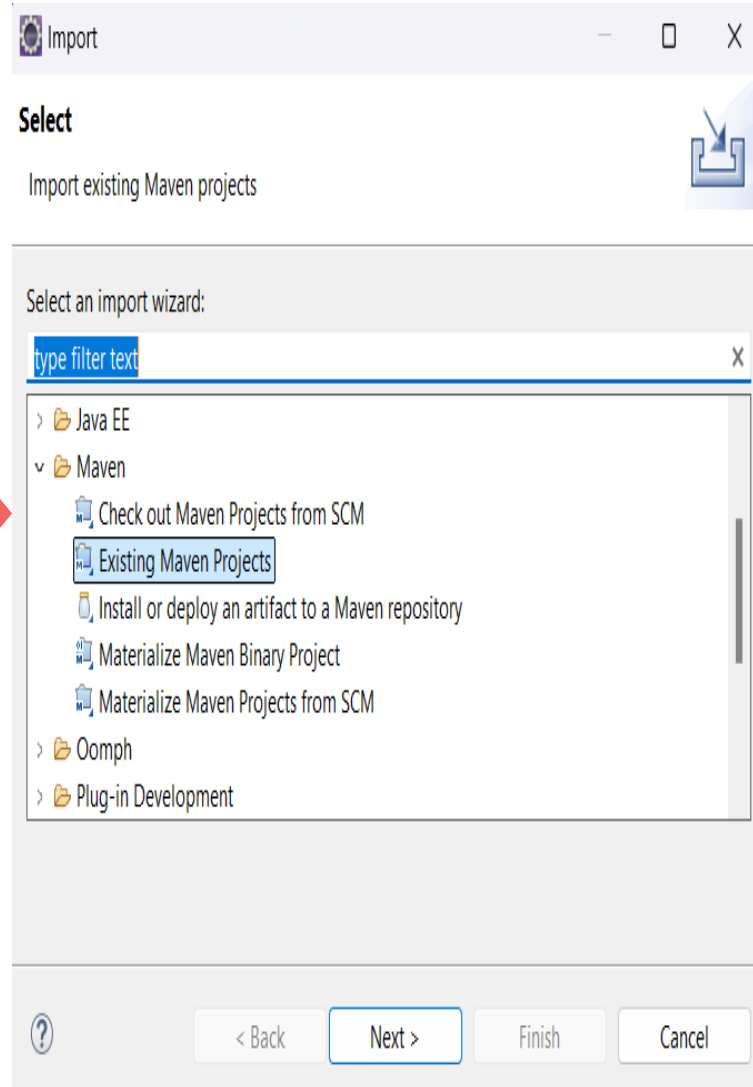
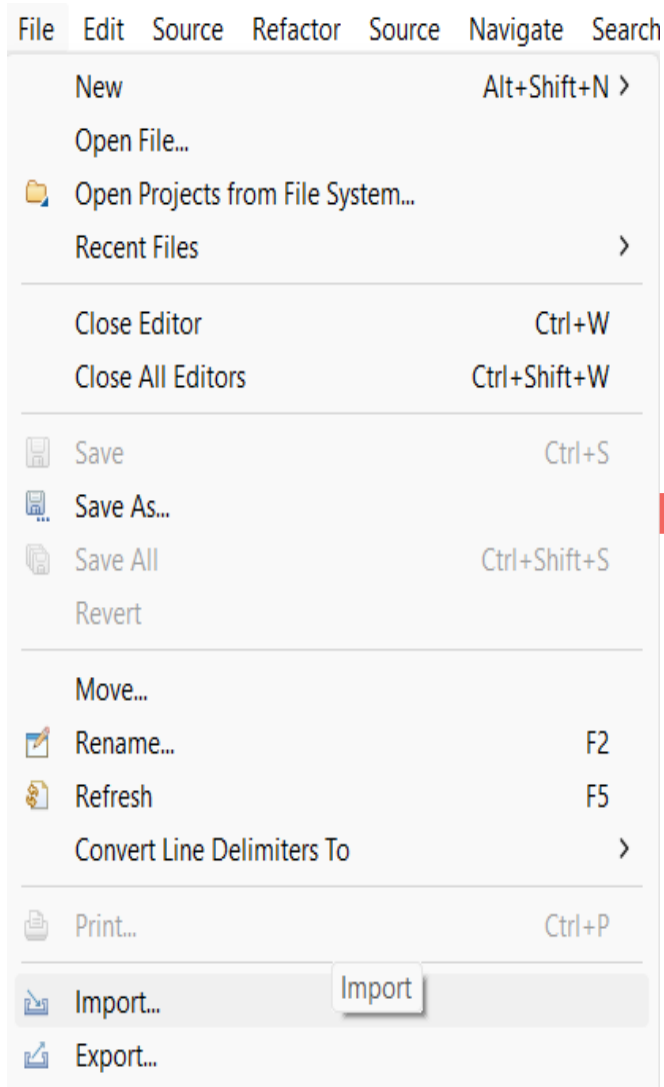
SHARE...

Spring Initialiser Dependencies

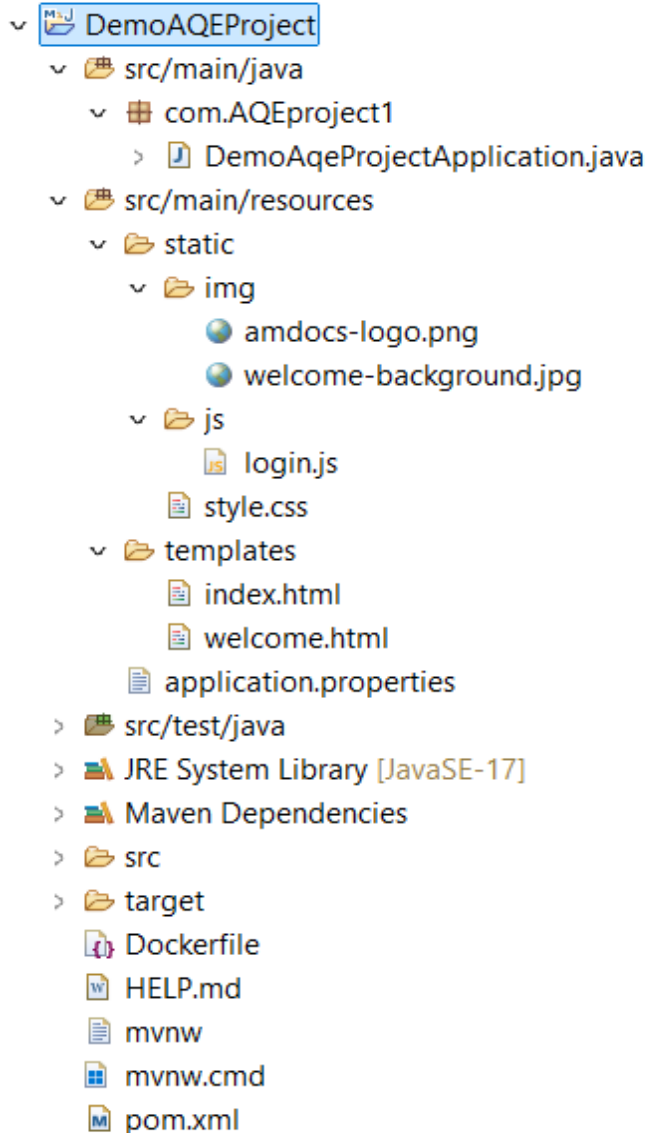
- Spring Web is a module in the Spring Framework that provides comprehensive support for building web applications. It offers a range of functionalities and tools to create robust, scalable, and maintainable web applications.
- Thymeleaf is a modern server-side Java template engine for web and standalone environments. It is designed to process and render HTML, XML, JavaScript, and other text-based formats.



Importing Project into Eclipse IDE



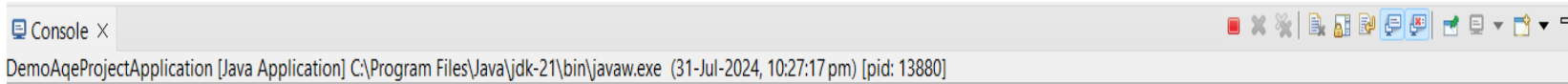
Application logic in Project File



```
1 package com.AQEproject1;
2
3 import org.springframework.boot.SpringApplication;
4
5 @Controller
6 @SpringBootApplication
7 public class DemoAqeProjectApplication {
8     @GetMapping("/project")
9     public String home() {
10         return "index";
11     }
12     @GetMapping("/welcome")
13     public String welcome(@RequestParam(name="employeeName", required=false) String employeeName) {
14         model.addAttribute("employeeName", employeeName);
15         return "welcome";
16     }
17
18     public static void main(String[] args) {
19         SpringApplication.run(DemoAqeProjectApplication.class, args);
20     }
21 }
22
23
24
25
26
27
```

spring.application.name=DemoAQEProject
server.port=8083

Run as Java Application

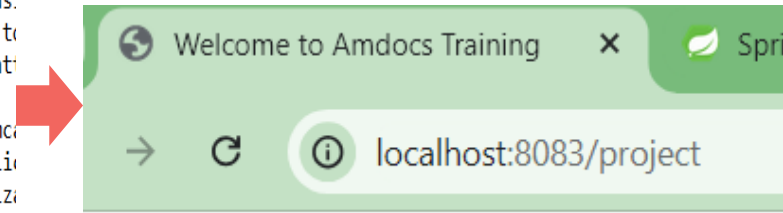


```
\N / _ , . - - - ( ) - - - \ \ \ \
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' _ _ | . _ _ | _ _ | _ _ , / / / /
=====|_|=====|_|=/ / / /
```

```
:: Spring Boot ::      (v3.3.2)
```

```
2024-07-31T22:27:23.916+05:30 INFO 13880 --- [DemoAQEProject] [
2024-07-31T22:27:23.930+05:30 INFO 13880 --- [DemoAQEProject] [
2024-07-31T22:27:26.041+05:30 INFO 13880 --- [DemoAQEProject] [
2024-07-31T22:27:26.070+05:30 INFO 13880 --- [DemoAQEProject] [
2024-07-31T22:27:26.070+05:30 INFO 13880 --- [DemoAQEProject] [
2024-07-31T22:27:26.188+05:30 INFO 13880 --- [DemoAQEProject] [
2024-07-31T22:27:26.193+05:30 INFO 13880 --- [DemoAQEProject] [
2024-07-31T22:27:26.413+05:30 INFO 13880 --- [DemoAQEProject] [
2024-07-31T22:27:26.930+05:30 INFO 13880 --- [DemoAQEProject] [
2024-07-31T22:27:26.944+05:30 INFO 13880 -- [DemoAQEProject] [
```

```
main] c.AQEproject1.DemoAqeProjectApplication : Starting DemoAqeProjectApplication us
main] c.AQEproject1.DemoAqeProjectApplication : No active profile set, falling back to
main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port 8083 (ht
main] o.apache.catalina.core.StandardService : Starting service [Tomcat]
main] o.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat
main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplic
main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initializ
main] o.s.b.a.w.s.WelcomePageHandlerMapping : Adding welcome page template: index
main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8083 (http) wi
main] c.AQEproject1.DemoAqeProjectApplication : Started DemoAqeProjectApplication in
```




Output



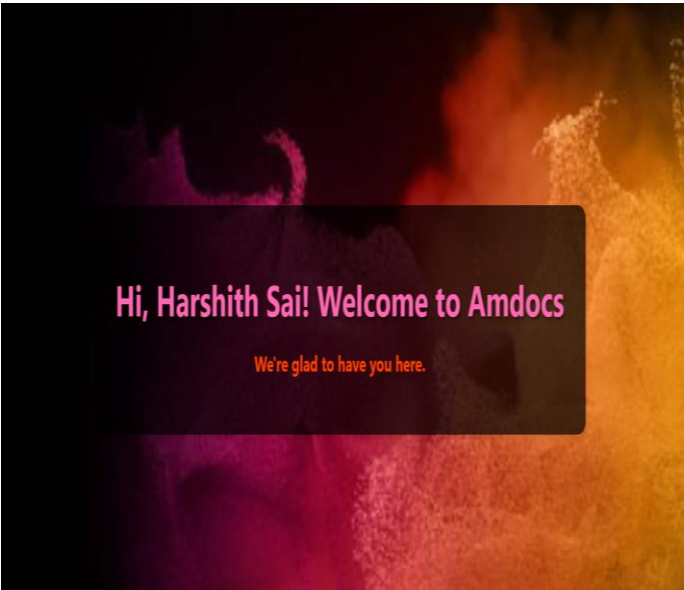
Welcome to Amdocs Training

Login



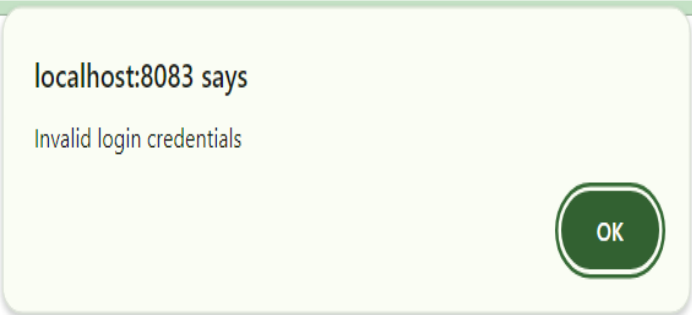
Welcome to Amdocs Training

Login



Welcome to Amdocs Training

Login



Creating .jar file

The image shows a sequence of steps in an IDE to create a JAR file. On the left, the 'Run As' menu is open, and '6 Maven install' is selected. A red arrow points from this menu item to the right, where a file explorer view shows the 'target' directory. This directory contains several subfolders: 'generated-sources', 'generated-test-sources', 'maven-archiver', 'maven-status', and 'surefire-reports'. At the bottom of the 'target' directory, two JAR files are listed: 'DemoAQEProject-0.0.1-SNAPSHOT.jar' and 'DemoAQEProject-0.0.1-SNAPSHOT.jar.original'.

Run As Menu:

- Coverage As
- Run As
- Debug As
- Profile As
- Restore from Local History...
- Maven
- Team
- Compare With
- GitHub
- Configure
- Validate
- TestNG

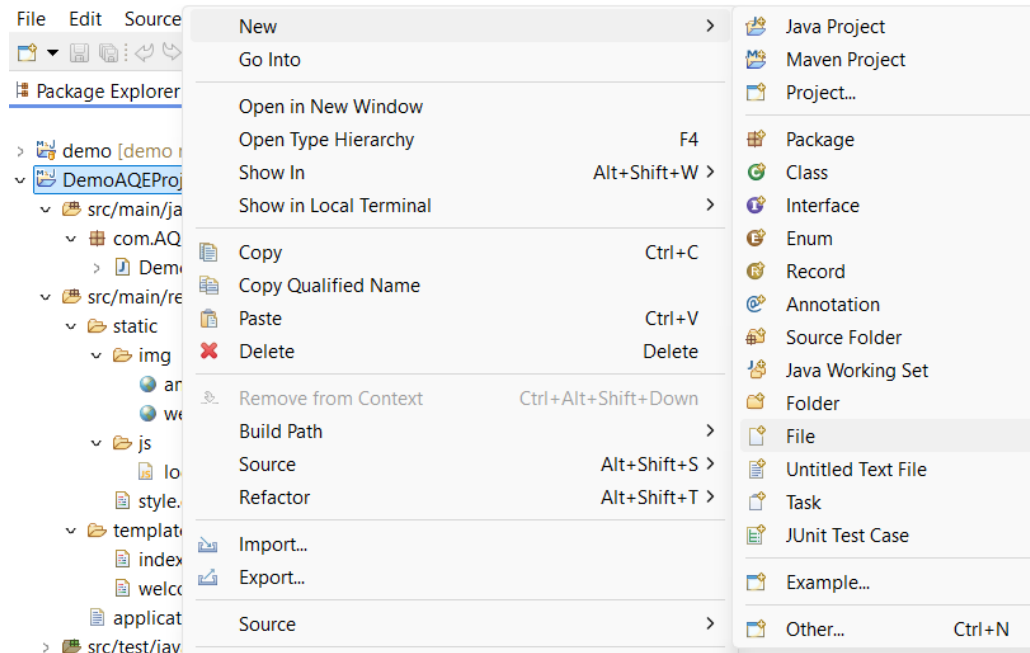
Run As Sub-menu:

- 1 Java Application (Alt+Shift+X, J)
- 2 JUnit Test (Alt+Shift+X, T)
- 3 Maven build...
- 4 Maven clean
- 5 Maven generate-sources
- 6 Maven install
- 7 Maven test
- 8 Maven verify
- 9 TestNG Test (Alt+Shift+X, N)
- Run Configurations...

target Directory Structure:

- target
 - generated-sources
 - generated-test-sources
 - maven-archiver
 - maven-status
 - surefire-reports
 - DemoAQEProject-0.0.1-SNAPSHOT.jar
 - DemoAQEProject-0.0.1-SNAPSHOT.jar.original

Dockerizing the Application



```
1 # Use an official Java runtime as a parent image
2 FROM openjdk:21
3
4 # Set the working directory in the container
5 WORKDIR /app
6
7 # Copy the executable JAR file to the container
8 COPY target/DemoAQEProject-0.0.1-SNAPSHOT.jar DemoAQEProject.jar
9
10 # Expose the port the app runs on
11 EXPOSE 9090
12
13 # Run the JAR file
14 ENTRYPOINT ["java", "-jar", "DemoAQEProject.jar"]
15
```

- **Build docker image** : `docker build -t mywebapp .`
- **Run docker container** : `docker run -p 9090:8083 mywebapp`

```
C:\Users\Sai Harshith\Downloads\DemoAQEProject\DemoAQEProject>docker build -t mywebapp .
[+] Building 34.1s (9/9) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 408B
=> [internal] load metadata for docker.io/library/openjdk:21
=> [auth] library/openjdk:pull token for registry-1.docker.io
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/3] FROM docker.io/library/openjdk:21@sha256:af9de795d1f8d3b6172f6c55ca9ba1c5768baa11bb2dc8af7045c7db9d4c3
=> => resolve docker.io/library/openjdk:21@sha256:af9de795d1f8d3b6172f6c55ca9ba1c5768baa11bb2dc8af7045c7db9d4c33
=> => sha256:7c002e8f606286a649b6f6cc6420c9056f7d3075fe3094b9cc33a715ff609335 203.93MB / 203.93MB
=> => sha256:af9de795d1f8d3b6172f6c55ca9ba1c5768baa11bb2dc8af7045c7db9d4c33ac 1.04kB / 1.04kB
=> => sha256:c67f402f77197f2e6ae84ff1fca868699ce3b38bfa78604524051420fa2e4383 954B / 954B
=> => sha256:079114de2be199f2ae0f7766ac0187d24a0c3a2d658fc51bffc6af5b8bd85469 4.42kB / 4.42kB
=> => sha256:5262579e8e45cb87fdc8fb6182d30da3c9e4f1036e02223508f287899ea434c0 44.96MB / 44.96MB
=> => sha256:0eab4e2287a59db00ae2d401e107a120e21ac3a291b097fafb1af38a1bc773c 15.03MB / 15.03MB
=> => extracting sha256:5262579e8e45cb87fdc8fb6182d30da3c9e4f1036e02223508f287899ea434c0
=> => extracting sha256:0eab4e2287a59db00ae2d401e107a120e21ac3a291b097fafb1af38a1bc773c
=> => extracting sha256:7c002e8f606286a649b6f6cc6420c9056f7d3075fe3094b9cc33a715ff609335
=> [internal] load build context
=> => transferring context: 21.90MB
=> [2/3] WORKDIR /app
=> [3/3] COPY target/DemoAQEProject-0.0.1-SNAPSHOT.jar DemoAQEProject.jar
=> exporting to image
=> => exporting layers
=> => writing image sha256:9b91f4687592cb07a477e09f2bbb92fa45b10120b8f0240b48028081bbdfa93b
=> => naming to docker.io/library/mywebapp
```

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/4s7h3pexs2hqzmmgqncptj9lv

What's next:

View a summary of image vulnerabilities and recommendations → [docker scout quickview](#)

```
C:\Users\Sai Harshith\Downloads\DemoAQEProject\DemoAQEProject>docker run -d -p 9090:8083 --name mywebapp-container myweb
app
bae299b1e43babe336d6f7edb67620d5f06c1b25f9e87467e6648d92613a6d3e
```

```
C:\Users\Sai Harshith\Downloads\DemoAQEProject\DemoAQEProject>docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
mywebapp latest 9b91f4687592 About a minute ago 526MB
```



Accessing web page through docker port

A dark gray rectangular box containing the Amdocs logo at the top. Below the logo, the text 'Welcome to Amdocs Training' is displayed in pink. Underneath, there are two white input fields: 'Employee ID' and 'Password'. At the bottom of the box is an orange 'Login' button.

Pushing to docker hub

- **Login to docker hub** : docker login
- **Tag the docker image** : docker tag mywebapp harshithsai45/mywebapp:latest
- **Push the image to docker Hub** : docker push harshithsai45/mywebapp:latest

```
C:\Users\Sai Harshith\Downloads\DemoAQEProject\DemoAQEProject>docker login
Authenticating with existing credentials...
Login Succeeded
C:\Users\Sai Harshith\Downloads\DemoAQEProject\DemoAQEProject>
C:\Users\Sai Harshith\Downloads\DemoAQEProject\DemoAQEProject>docker tag mywebapp harshithsai45/mywebapp:latest

C:\Users\Sai Harshith\Downloads\DemoAQEProject\DemoAQEProject>docker push harshithsai45/mywebapp:latest
The push refers to repository [docker.io/harshithsai45/mywebapp]
7a08bb8b3c2e: Pushed
7e29205f12fa: Pushed
10359c5dc4ba: Mounted from library/openjdk
601b48657e0c: Mounted from library/openjdk
b42107e74152: Mounted from library/openjdk
latest: digest: sha256:c237a51baaf26d636fe69e041ec39f2dd2d18bad7bbd55b5c8c245b222eaff73 size: 1372
```



Images [Give feedback](#)

Local Hub

harshithsai45

Search

[View Scout dashboard](#)

Tags

OS

Vulnerabilities

Last pushed

Size



harshithsai45/mywebapp

latest



Inactive

8 hours ago

283.67 MB

[View in Hub](#)

[Pull](#)

Repositories per page

5

1-1 of 1

< >



Pushing to git hub

- **Git initialization** : git init
- **Adding files** : git add .
- **Checking status** : git status
- **Adding file to git hub** : git remote add origin <https://github.com/saiharshith-45/project-aqe.git>
- **Commit the file** : git commit -m "Initial commit"
- **Push the file to git hub** : git push -u origin main

The screenshot shows the GitHub interface for a repository named 'ProjectAQEdemo' owned by 'saiharshith-45'. The repository is public and has 1 branch (main) and 0 tags. The commit history shows 9 commits, with the latest commit being 'Delete Jenkinsfile' 1 hour ago. The file list includes:


File	Commit	Time
.mvn/wrapper	first commit	18 hours ago
src	first commit	18 hours ago
.gitignore	first commit	18 hours ago
Dockerfile	first commit	18 hours ago
mvnw	first commit	18 hours ago
mvnw.cmd	first commit	18 hours ago
pom.xml	first commit	18 hours ago


Jenkins


Enter an item name


MyWebAppPipeline1

» Required field

**Freestyle project**
Classic, general-purpose job type that checks out from up to archiving artifacts and sending email notifications.

**Maven project**
Build a maven project. Jenkins takes advantage of your POM

**Pipeline**
Orchestrates long-running activities that can span multiple builds and/or organizing complex activities that do not easily fit in a freestyle project

**Multi-configuration project**
Suitable for projects that need a large number of different configurations, builds, etc.

OK

Git

Repositories

Repository URL
https://github.com/saiharshith-45/ProjectAQEdemo.git

Credentials
saiharshith-45/***** (Git Hub Credentials)

+ Add

Advanced

Add Repository

Branches to build

Branch Specifier (blank for 'any')
*/main

S	W	Name ↓	Last Success
⊗	☁	demoaqe_jenkins	N/A
✓	☁	MyWebAppPipeline	1 hr 26 min #7

```
[INFO] Installing C:\ProgramData\Jenkins\.jenkins\workspace\
C:\WINDOWS\system32\config\systemprofile\.m2\repository\
[INFO] Installing C:\ProgramData\Jenkins\.jenkins\workspace\
C:\WINDOWS\system32\config\systemprofile\.m2\repository\
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 26.730 s
[INFO] Finished at: 2024-08-01T10:52:16+05:30
[INFO] -----
Finished: SUCCESS
```





Thank You