

Deployment of a Java Microservices Spring Boot project on Docker, by pulling the image from the DockerHub – Hands-on guide.

Mr. Subramanyam Tirumani Vemala

subramanyam.vemala@capgemini.com



Information:

This document contains the detailed steps with screenshots, to setup a Java Microservices project using Spring Boot, generate jar, generate local docker image and its deployment.

Also contains pulling the docker image from the DockerHub and the deployment of the same.

Target Audience:

All, with knowledge of Java or coding and Containerization.

Artifacts needed:

1. JDK11
2. Eclipse – IDE
3. Docker Desktop installation.
4. Docker Hub Repository (Create an account repository on <https://hub.docker.com/>) -
5. Internet

Phases of project Implementation and deployment steps:

- A. Microservices project Implementation and deployment steps.
- B. Docker deployment steps.
- C. DockerHub deployment steps.

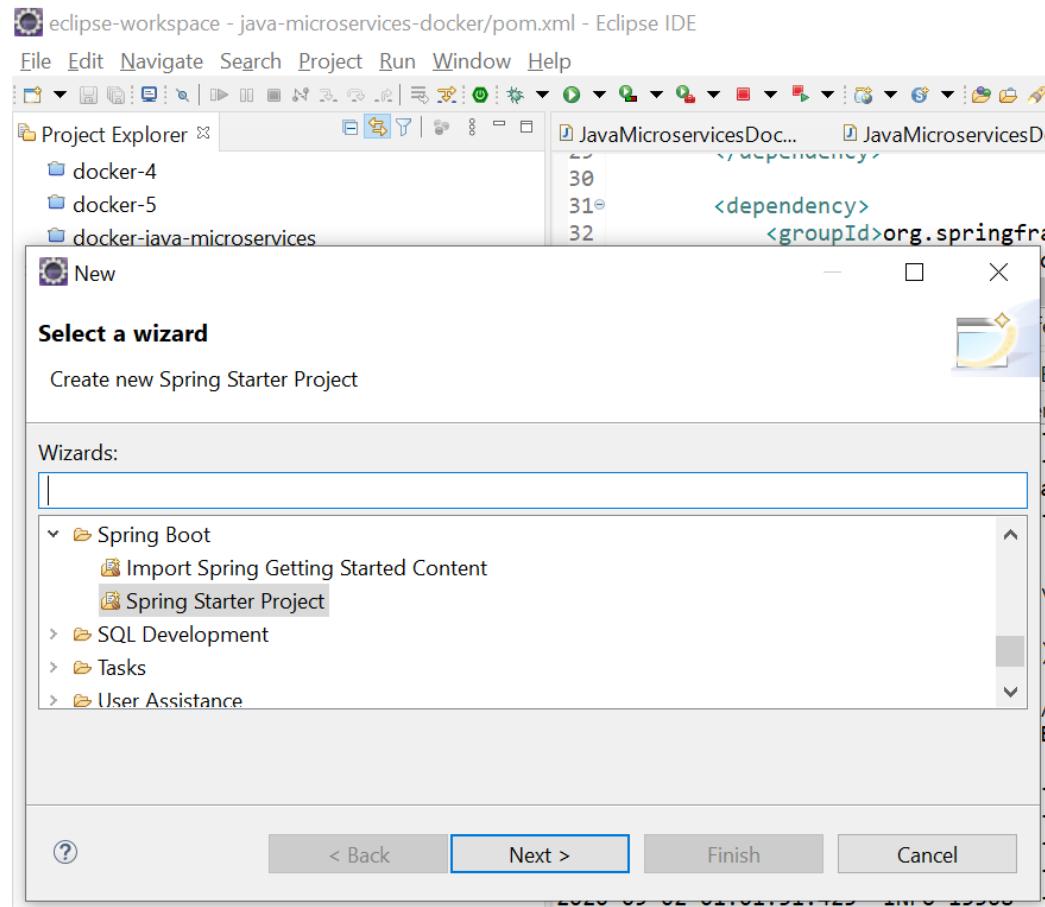
Part-A

Microservices project Implementation and deployment steps

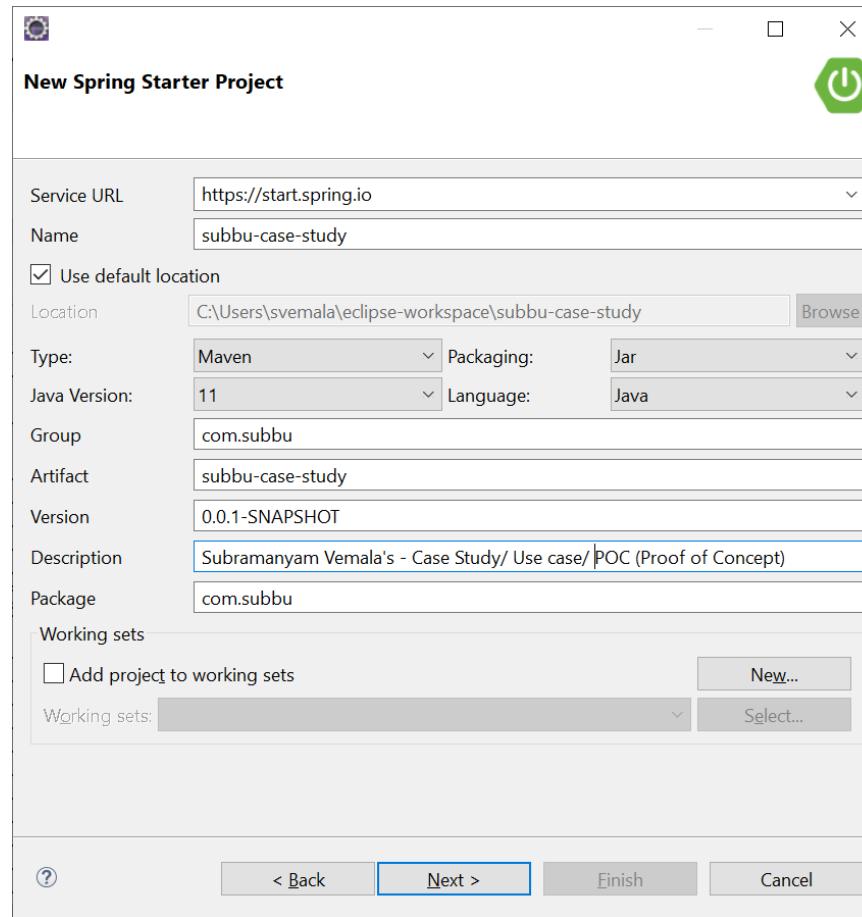
A. Microservices project Implementation and deployment steps:

1. Create a Spring Starter Project.
2. Add all the necessary classes and dependencies in the pom.xml
3. Run as Spring Boot App on the Eclipse. Check for the output both on the Console and the Browser.
4. Create the jar in the target folder, through maven install.
5. Check for the expected output on the Browser.

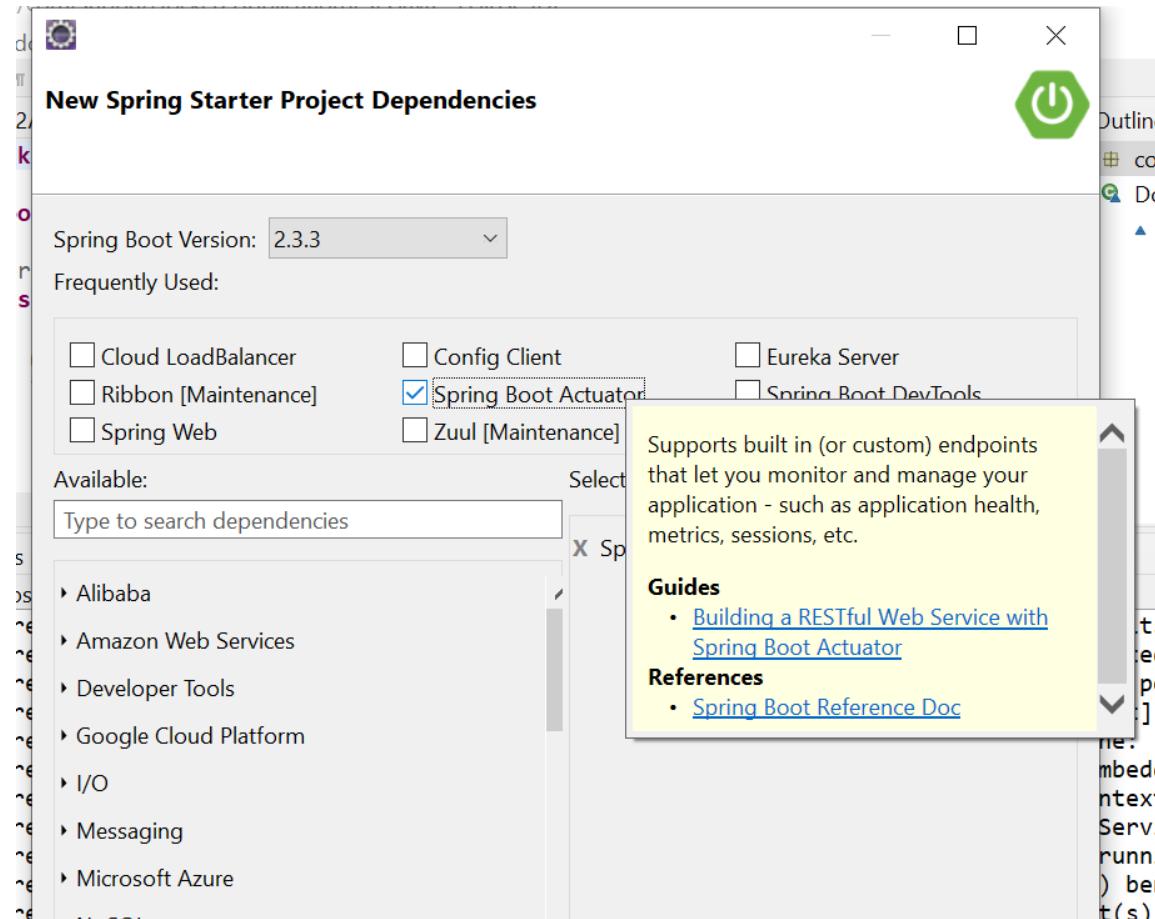
File – New – Spring Starter Project - Create



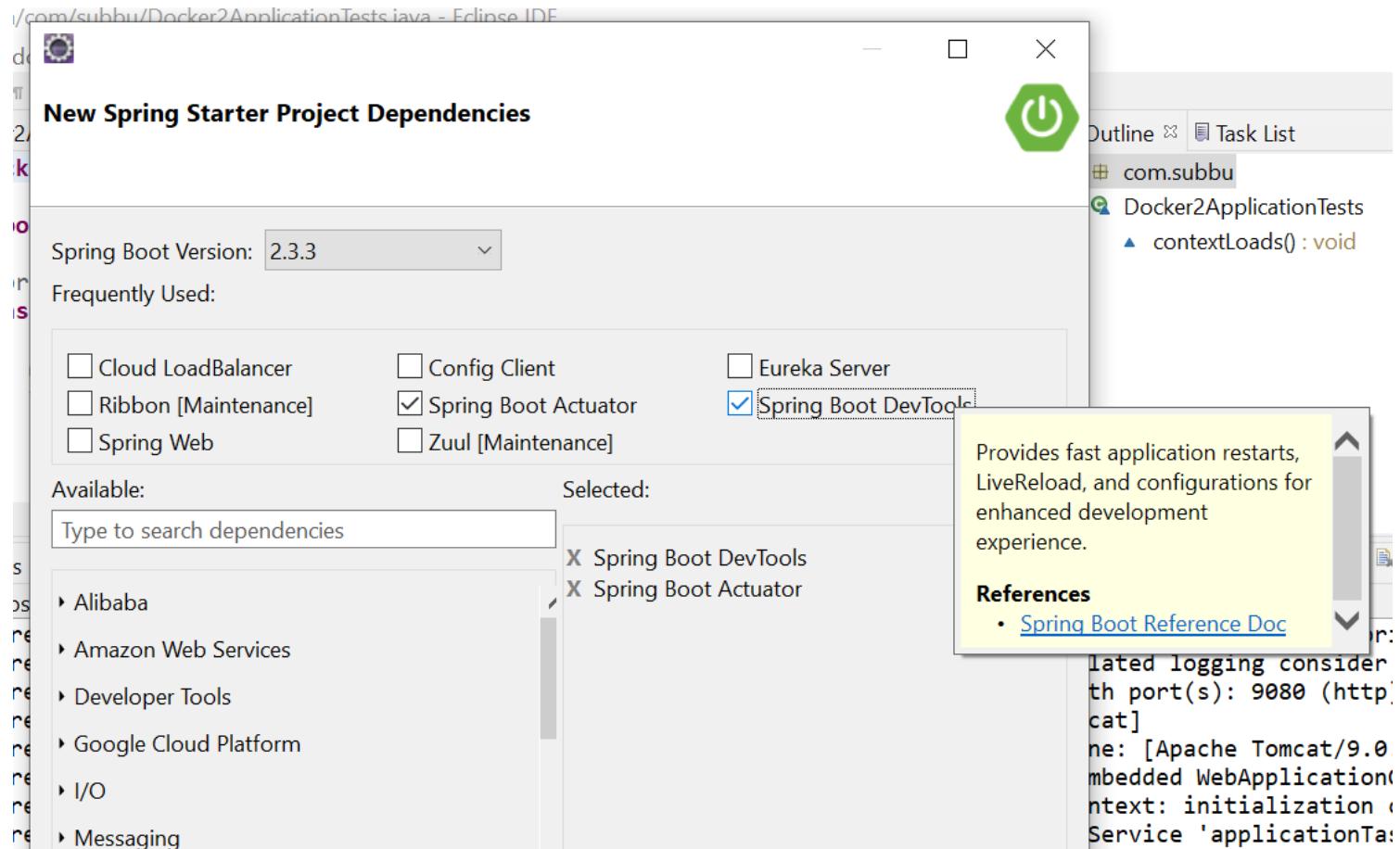
Provide the project details:



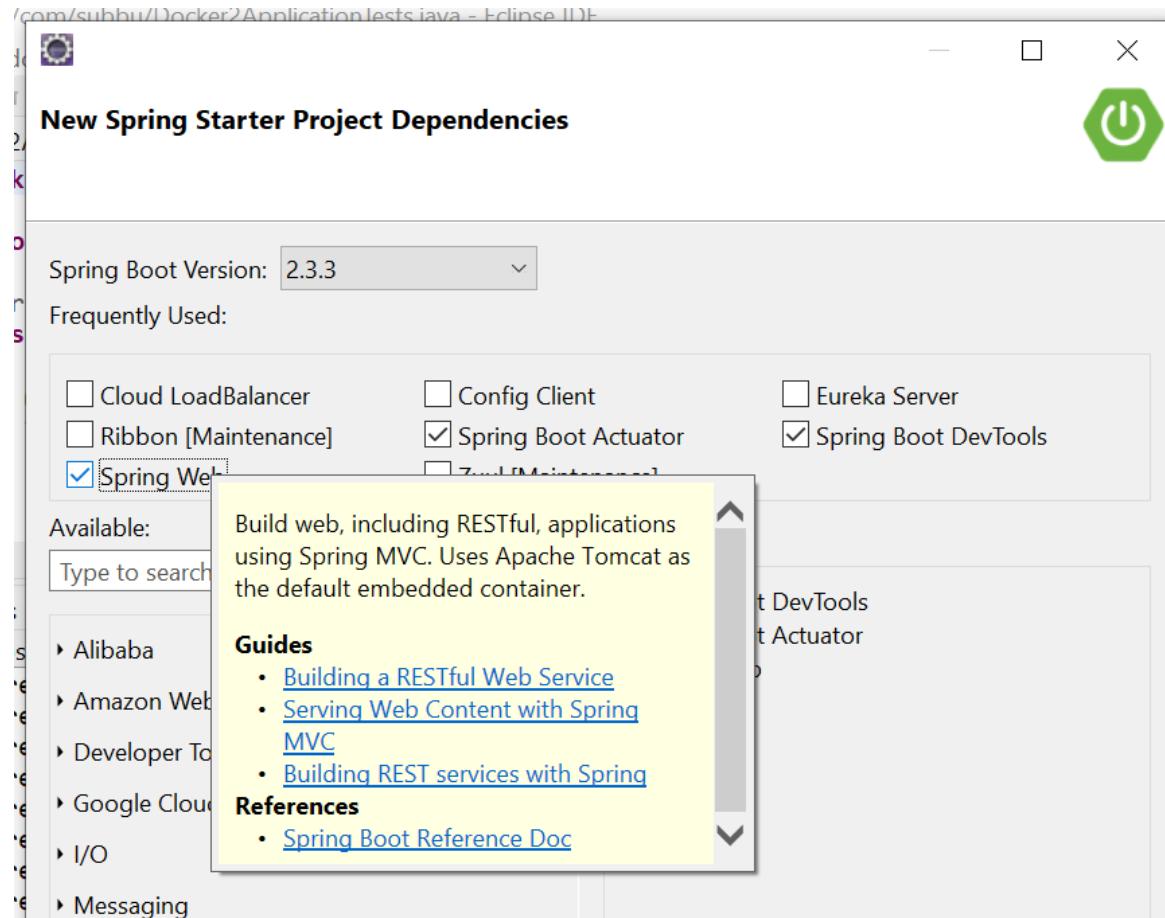
Choose the dependencies - Actuator:



Choose the dependencies - DevTools:

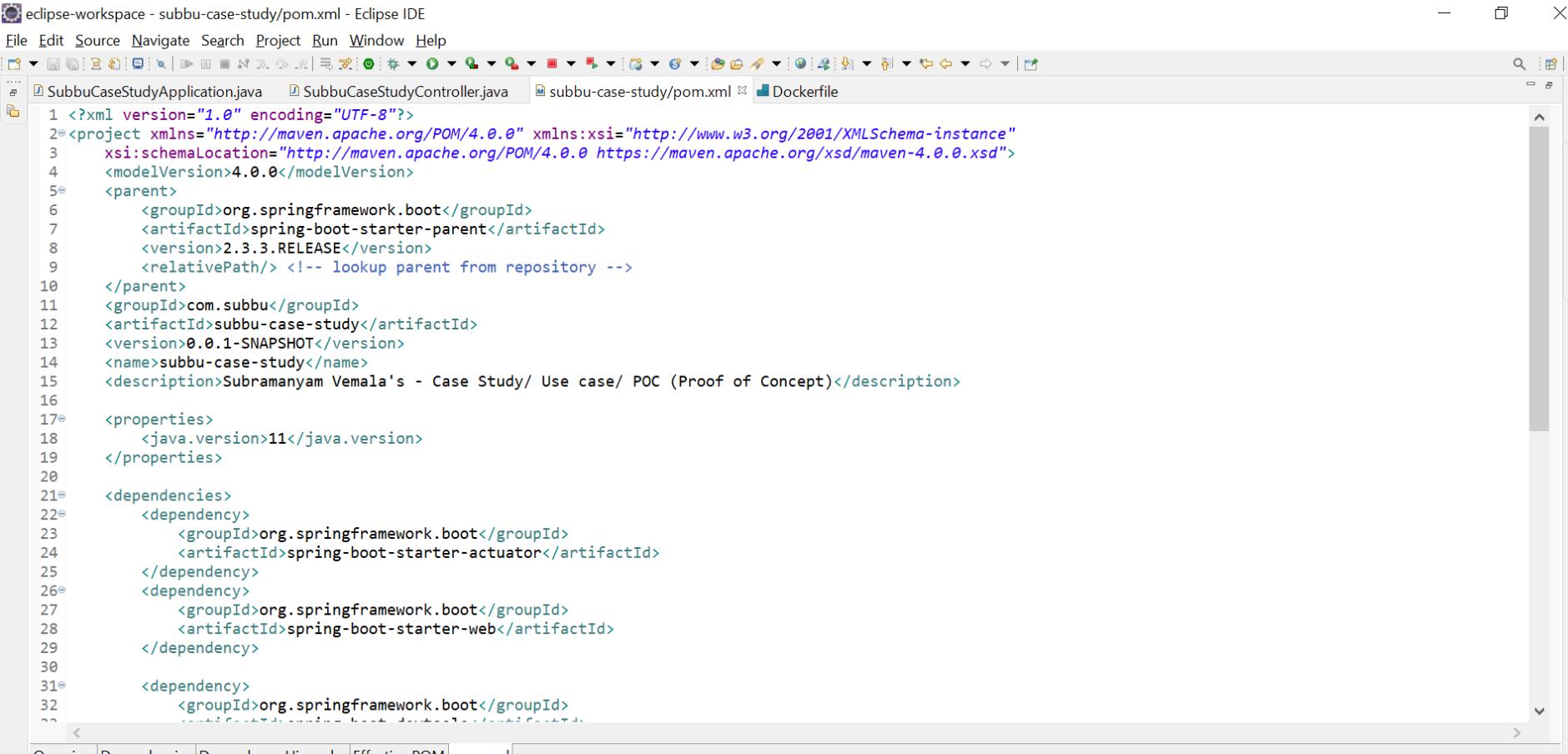


Choose the dependencies – Spring Web:



Project is created (subbu-case-study):

pom.xml – Deployment descriptor

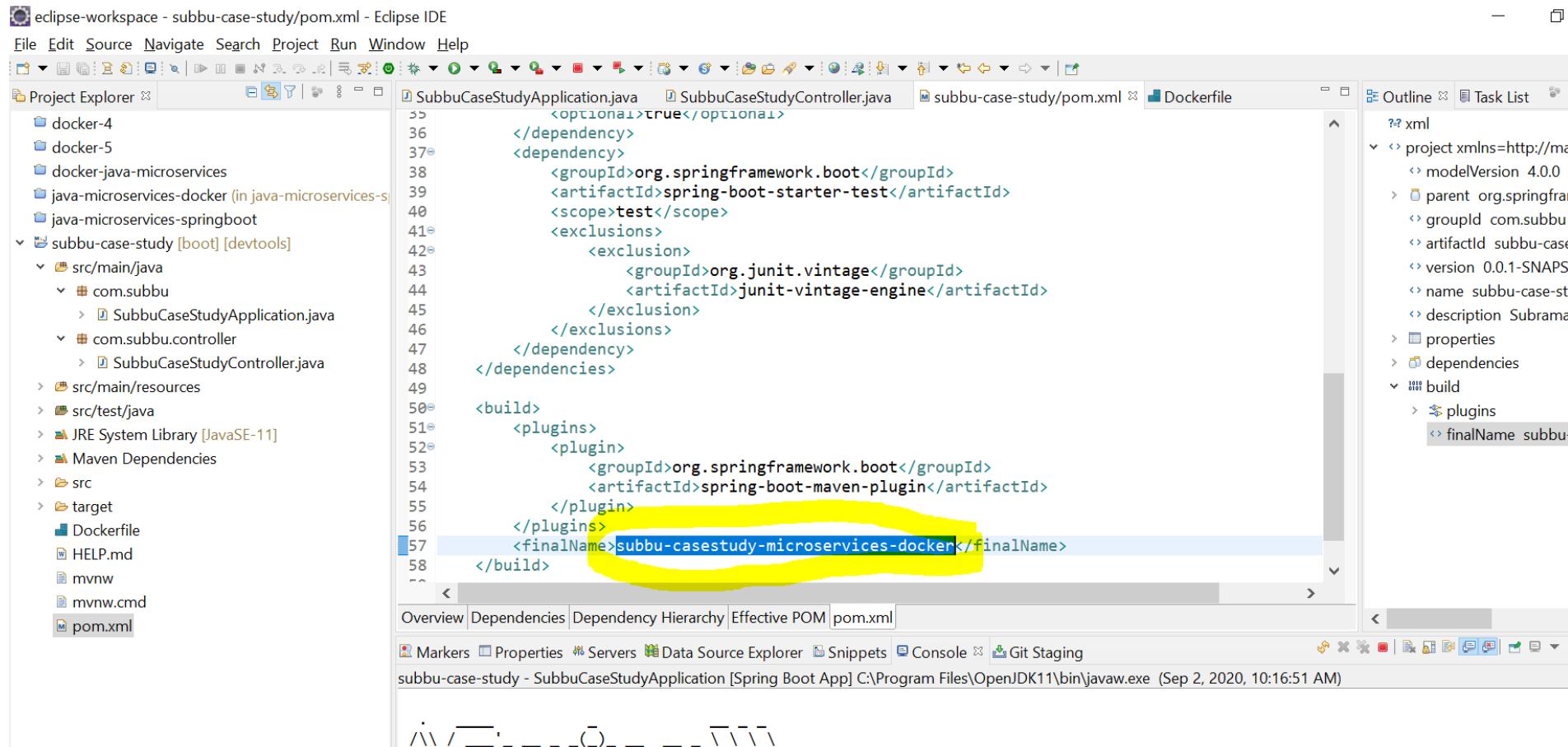


The screenshot shows the Eclipse IDE interface with the title bar "eclipse-workspace - subbu-case-study/pom.xml - Eclipse IDE". The menu bar includes File, Edit, Source, Navigate, Search, Project, Run, Window, and Help. The toolbar has various icons for file operations like Open, Save, Cut, Copy, Paste, Find, and Run. The left-hand view shows files SubbuCaseStudyApplication.java, SubbuCaseStudyController.java, subbu-case-study/pom.xml (which is currently selected), and Dockerfile. The main editor area displays the XML content of the pom.xml file:

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 https://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>2.3.3.RELEASE</version>
    <relativePath/> <!-- lookup parent from repository -->
  </parent>
  <groupId>com.subbu</groupId>
  <artifactId>subbu-case-study</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <name>subbu-case-study</name>
  <description>Subramanyam Vemala's - Case Study/ Use case/ POC (Proof of Concept)</description>
  <properties>
    <java.version>11</java.version>
  </properties>
  <dependencies>
    <dependency>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-starter-actuator</artifactId>
    </dependency>
    <dependency>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-starter-web</artifactId>
    </dependency>
    <dependency>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-devtools</artifactId>
    </dependency>
  </dependencies>
</project>
```

At the bottom of the editor, there are tabs for Overview, Dependencies, Dependency Hierarchy, Effective POM, and pom.xml.

Give the jar name in the pom.xml:



The screenshot shows the Eclipse IDE interface with the following details:

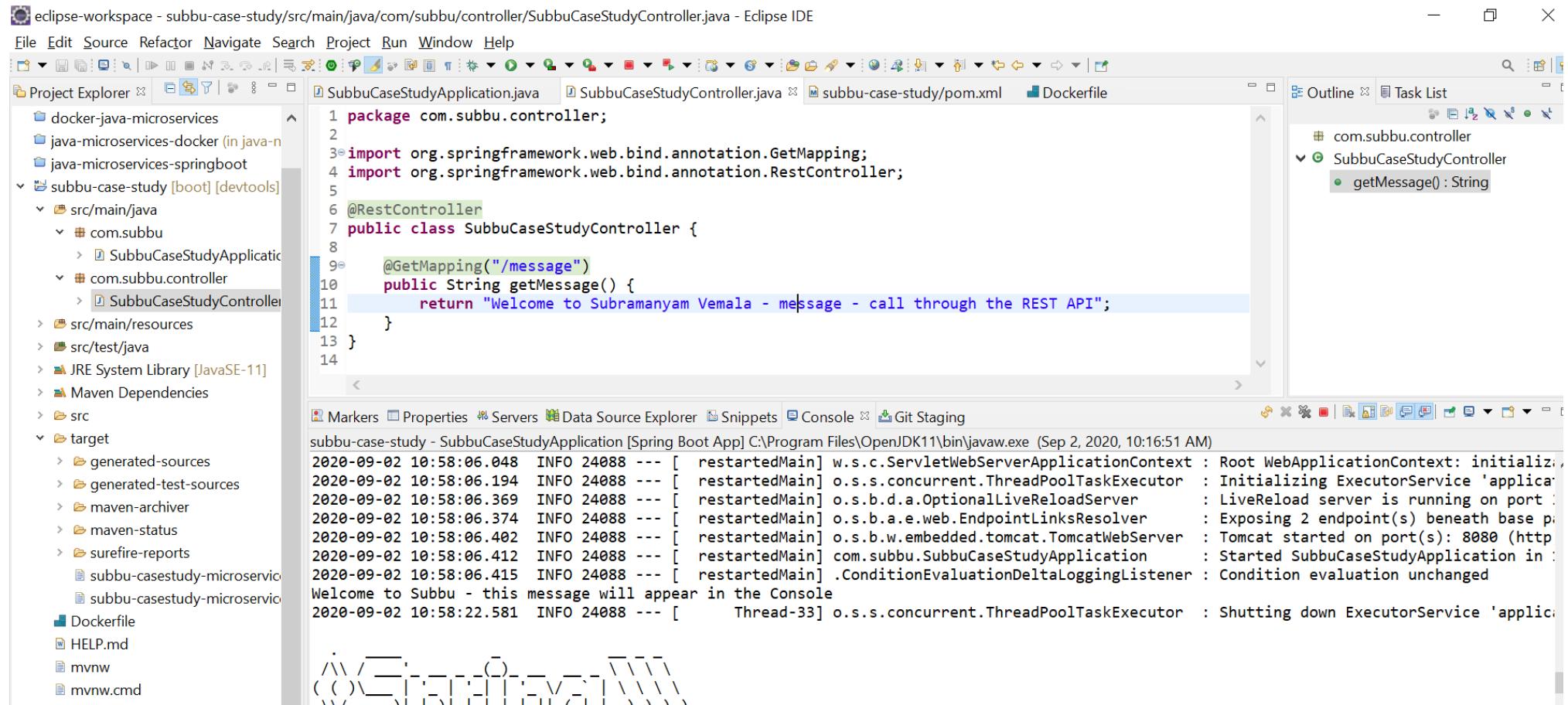
- Title Bar:** eclipse-workspace - subbu-case-study/pom.xml - Eclipse IDE
- Menu Bar:** File Edit Source Navigate Search Project Run Window Help
- Toolbar:** Standard Eclipse toolbar icons.
- Project Explorer:** Shows the project structure with a node for "subbu-case-study [boot] [devtools]" expanded, revealing "src/main/java", "src/main/resources", "src/test/java", and "target". Other nodes like "docker-4", "docker-5", and "java-microservices-springboot" are also listed.
- Editor:** The "pom.xml" file is open in the editor. The code is as follows:

```
<dependency>
    <optional>true</optional>
</dependency>
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-test</artifactId>
    <scope>test</scope>
    <exclusions>
        <exclusion>
            <groupId>org.junit.vintage</groupId>
            <artifactId>junit-vintage-engine</artifactId>
        </exclusion>
    </exclusions>
</dependency>
</dependencies>

<build>
    <plugins>
        <plugin>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-maven-plugin</artifactId>
        </plugin>
    </plugins>
    <finalName>subbu-casestudy-microservices-docker</finalName>
</build>
```

- Outline View:** Shows the XML structure of the pom.xml file, with the "finalName" element highlighted.
- Task List:** Shows a list of tasks related to the project.
- Bottom Status Bar:** subbu-case-study - SubbuCaseStudyApplication [Spring Boot App] C:\Program Files\OpenJDK11\bin\javaw.exe (Sep 2, 2020, 10:16:51 AM)

Create Controller with GetMapping and RestController:



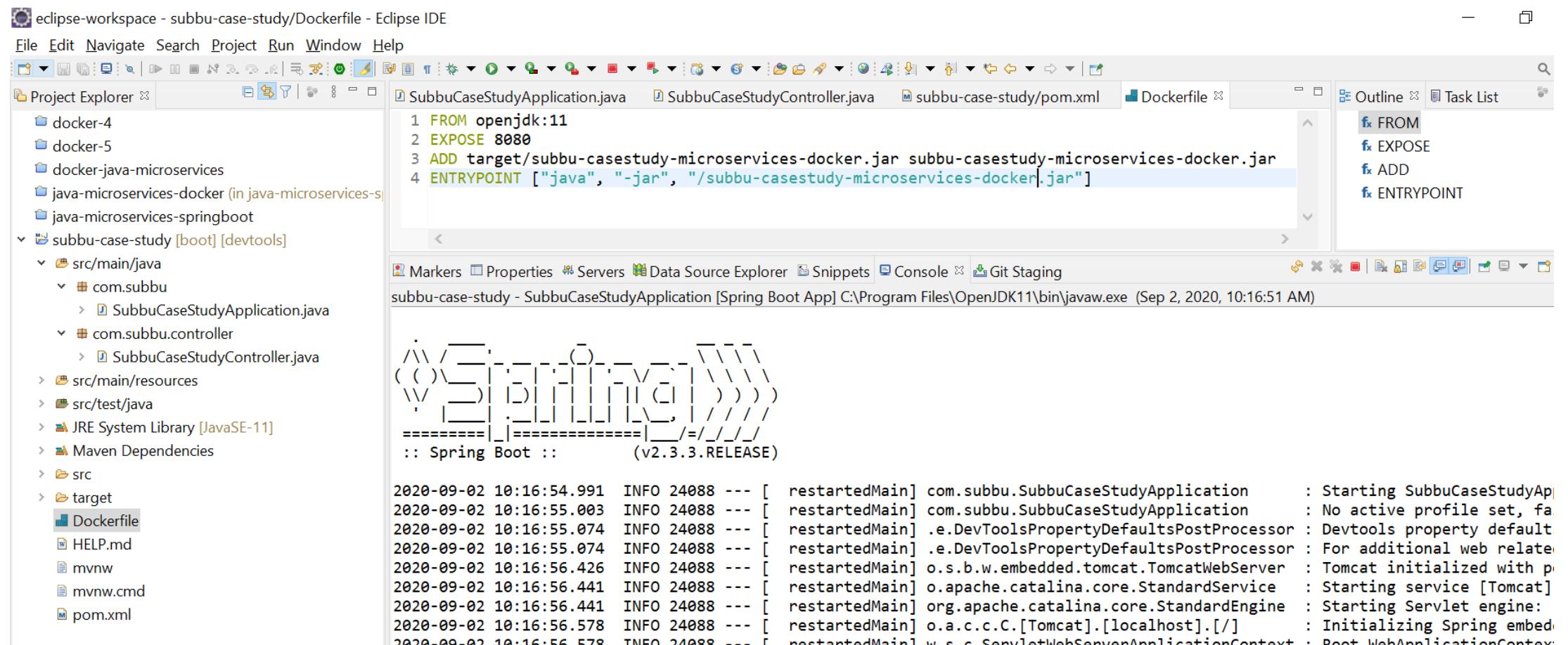
The screenshot shows the Eclipse IDE interface with the following details:

- Title Bar:** eclipse-workspace - subbu-case-study/src/main/java/com/subbu/controller/SubbuCaseStudyController.java - Eclipse IDE
- Menu Bar:** File Edit Source Refactor Navigate Search Project Run Window Help
- Toolbar:** Standard Eclipse toolbar icons.
- Project Explorer:** Shows the project structure:
 - docker-java-microservices
 - java-microservices-docker (in java-n)
 - java-microservices-springboot
 - subbu-case-study [boot] [devtools]
 - src/main/java
 - com.subbu
 - SubbuCaseStudyApplication
 - SubbuCaseStudyController
 - src/main/resources
 - src/test/java
 - JRE System Library [JavaSE-11]
 - Maven Dependencies
 - src
 - target
 - generated-sources
 - generated-test-sources
 - maven-archiver
 - maven-status
 - surefire-reports
 - subbu-casestudy-microservice
 - subbu-casestudy-microservice
 - Dockerfile
 - HELP.md
 - mvnw
 - mvnw.cmd
- Editor:** Displays the code for SubbuCaseStudyController.java:

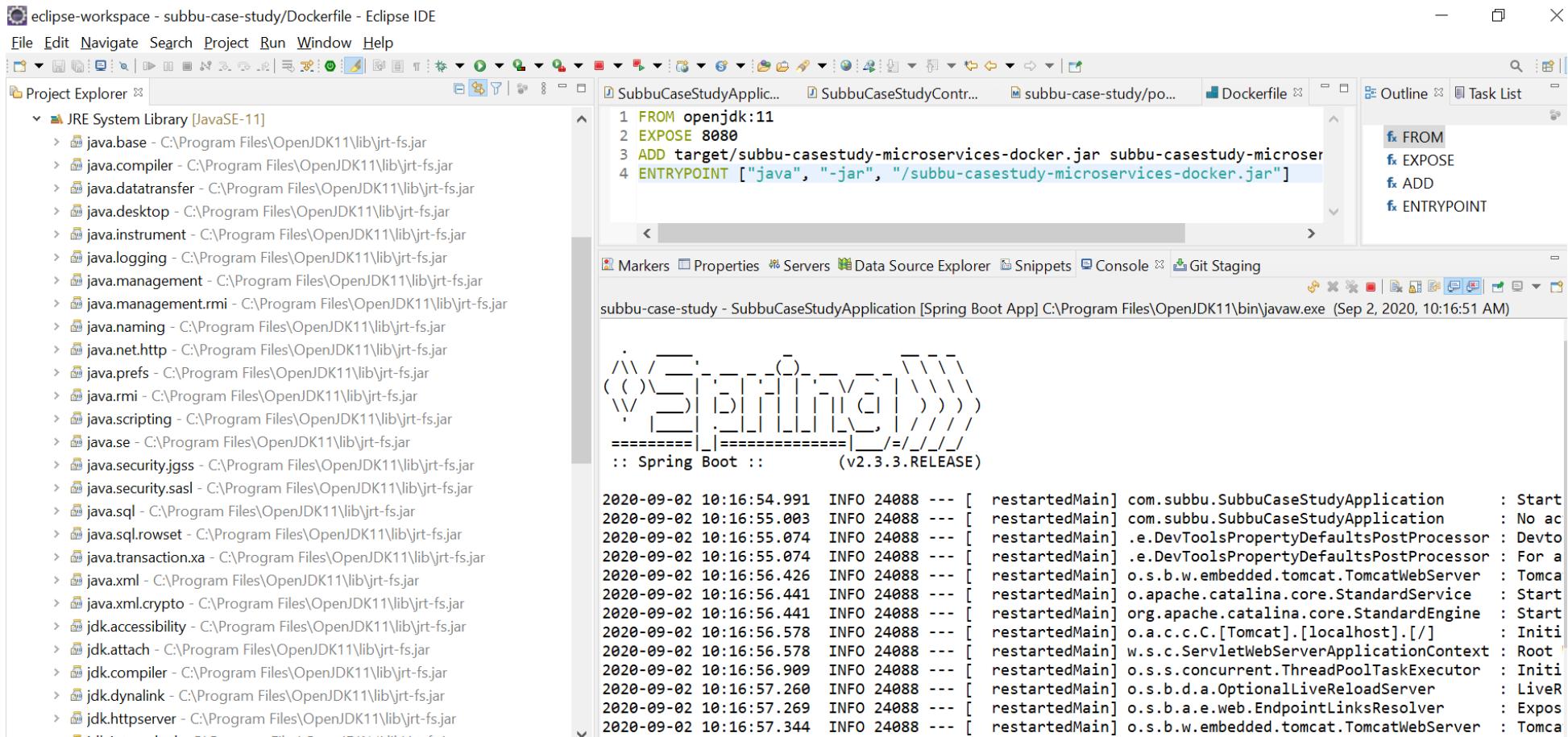
```
1 package com.subbu.controller;
2
3 import org.springframework.web.bind.annotation.GetMapping;
4 import org.springframework.web.bind.annotation.RestController;
5
6 @RestController
7 public class SubbuCaseStudyController {
8
9     @GetMapping("/message")
10    public String getMessage() {
11        return "Welcome to Subramanyam Vemala - message - call through the REST API";
12    }
13 }
14
```
- Outline View:** Shows the class structure:
 - com.subbu.controller
 - SubbuCaseStudyController
 - getMessage() : String
- Console:** Shows the application logs:

```
2020-09-02 10:58:06.048 INFO 24088 --- [ restartedMain] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialized by 'org.springframework.boot.web.servlet.context.AnnotationConfigServletWebServerApplicationContext@6a3f333'; root of context hierarchy
2020-09-02 10:58:06.194 INFO 24088 --- [ restartedMain] o.s.s.concurrent.ThreadPoolTaskExecutor : Initializing ExecutorService 'application-0'
2020-09-02 10:58:06.369 INFO 24088 --- [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is running on port 3567
2020-09-02 10:58:06.374 INFO 24088 --- [ restartedMain] o.s.b.a.e.web.EndpointLinksResolver : Exposing 2 endpoint(s) beneath base path /actuator
2020-09-02 10:58:06.402 INFO 24088 --- [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http)
2020-09-02 10:58:06.412 INFO 24088 --- [ restartedMain] com.subbu.SubbuCaseStudyApplication : Started SubbuCaseStudyApplication in 0.194 seconds (JVM running for 0.202)
2020-09-02 10:58:06.415 INFO 24088 --- [ restartedMain] .ConditionEvaluationDeltaLoggingListener : Condition evaluation unchanged
Welcome to Subbu - this message will appear in the Console
2020-09-02 10:58:22.581 INFO 24088 --- [ Thread-33] o.s.s.concurrent.ThreadPoolTaskExecutor : Shutting down ExecutorService 'application-0'
```

Create Dockerfile:



JRE System Library:



Maven Dependencies:

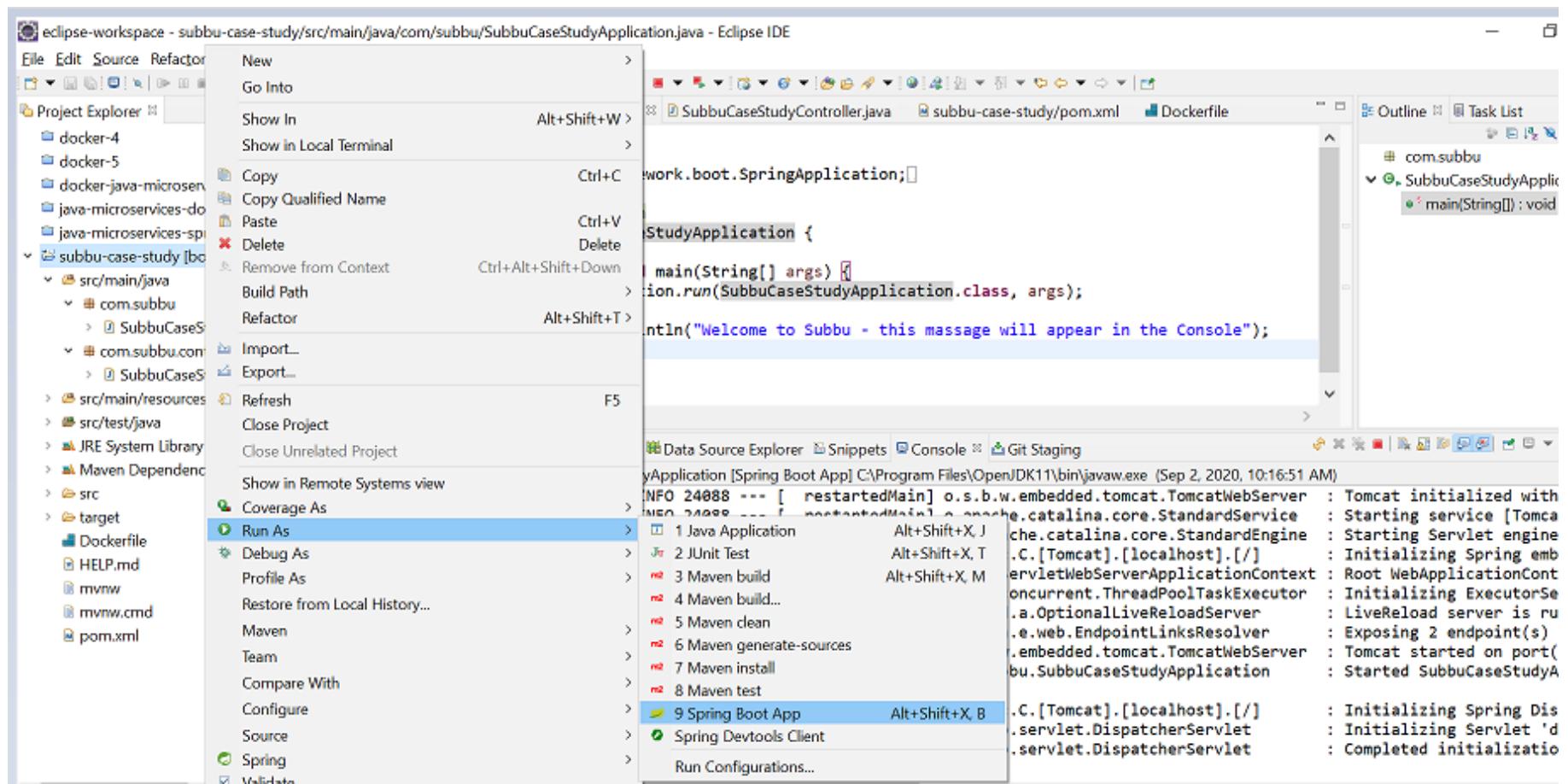
The screenshot shows the Eclipse IDE interface with the following details:

- Project Explorer:** Shows the Maven Dependencies tree, listing various Spring Boot and logging jars.
- Dockerfile:** Contains the following Docker configuration:

```
FROM openjdk:11
EXPOSE 8080
ADD target/subbu-casestudy-microservices-docker.jar subbu-casestudy-microservices-docker.jar
ENTRYPOINT ["java", "-jar", "/subbu-casestudy-microservices-docker.jar"]
```
- Outline:** Displays the Dockerfile's FROM, EXPOSE, ADD, and ENTRYPOINT directives.
- Console:** Shows the application logs from a Java process running on OpenJDK 11, indicating a successful startup of the SubbuCaseStudyApplication.

```
2020-09-02 10:16:54.991 INFO 24088 --- [ restartedMain] com.subbu.SubbuCaseStudyApplication : Started SubbuCaseStudyApplication in 0.051 seconds (JVM running for 0.101)
2020-09-02 10:16:55.003 INFO 24088 --- [ restartedMain] com.subbu.SubbuCaseStudyApplication : No active profile is defined. Falling back to default profiles: default
2020-09-02 10:16:55.074 INFO 24088 --- [ restartedMain] .e.DevToolsPropertyDefaultsPostProcessor : Devtools property defaults post processor initialized
2020-09-02 10:16:55.074 INFO 24088 --- [ restartedMain] .e.DevToolsPropertyDefaultsPostProcessor : For more info about this feature, see https://docs.spring.io/spring-boot/docs/2.3.3.RELEASE/reference/htmlsingle/#features.devtools.property-defaults
2020-09-02 10:16:56.426 INFO 24088 --- [ restartedMain] o.s.w.e.tomcat.TomcatWebServer : Tomcat web server initialized
2020-09-02 10:16:56.441 INFO 24088 --- [ restartedMain] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2020-09-02 10:16:56.441 INFO 24088 --- [ restartedMain] org.apache.catalina.core.StandardEngine : Starting Servlet Engine: [Apache Tomcat/9.0.37]
2020-09-02 10:16:56.578 INFO 24088 --- [ restartedMain] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Servlet [Root]
2020-09-02 10:16:56.578 INFO 24088 --- [ restartedMain] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext is starting at [/]
2020-09-02 10:16:56.909 INFO 24088 --- [ restartedMain] o.s.s.concurrent.ThreadPoolTaskExecutor : Initializing ExecutorService [tomcat-executor]
2020-09-02 10:16:57.260 INFO 24088 --- [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is active on port 3567
2020-09-02 10:16:57.269 INFO 24088 --- [ restartedMain] o.s.b.a.e.web.EndpointLinksResolver : Exposing 1 endpoint(s) beneath base path '/actuator'
2020-09-02 10:16:57.344 INFO 24088 --- [ restartedMain] o.s.w.e.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http)
```

Run as a Spring Boot App:

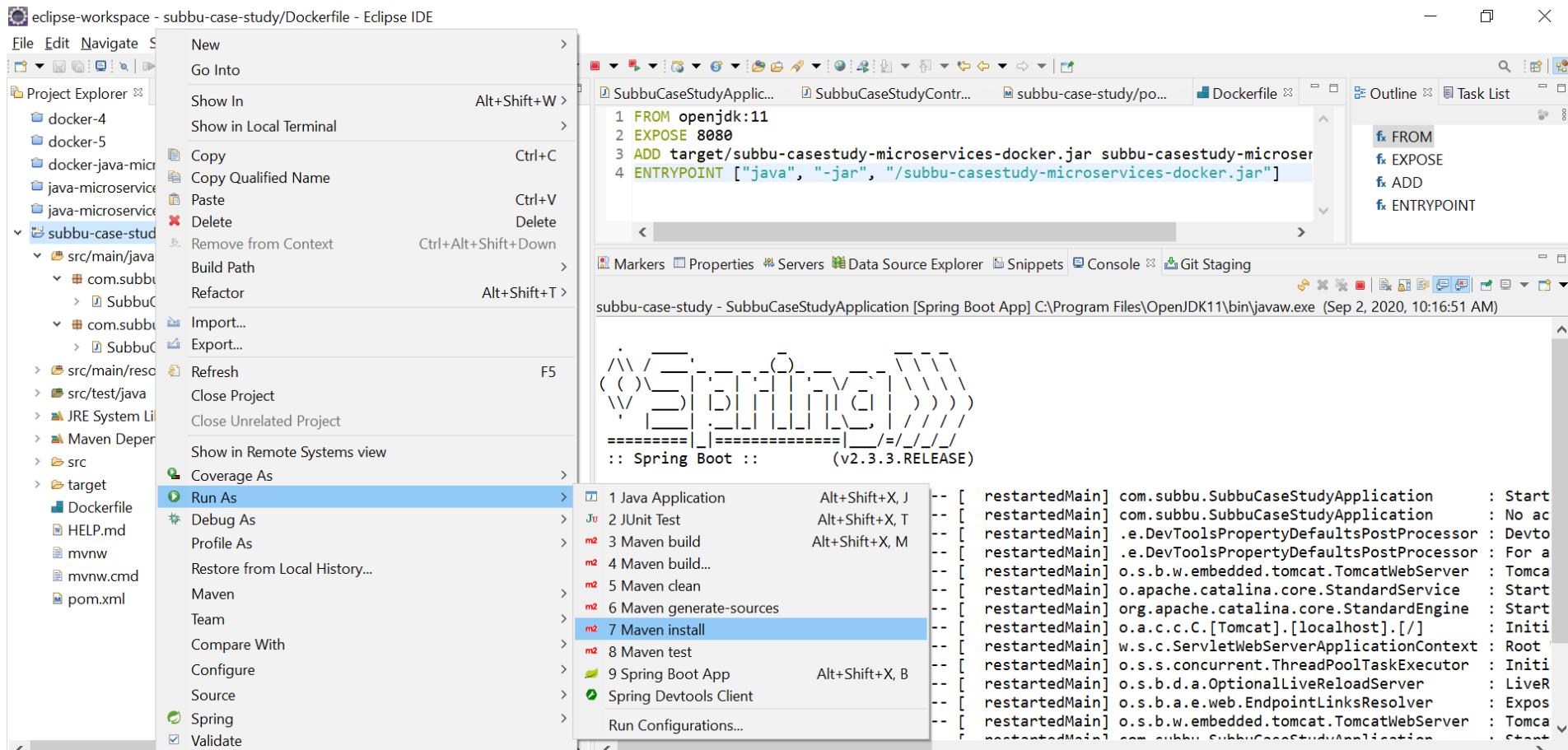


Tomcat started successfully and message can be seen on Console:

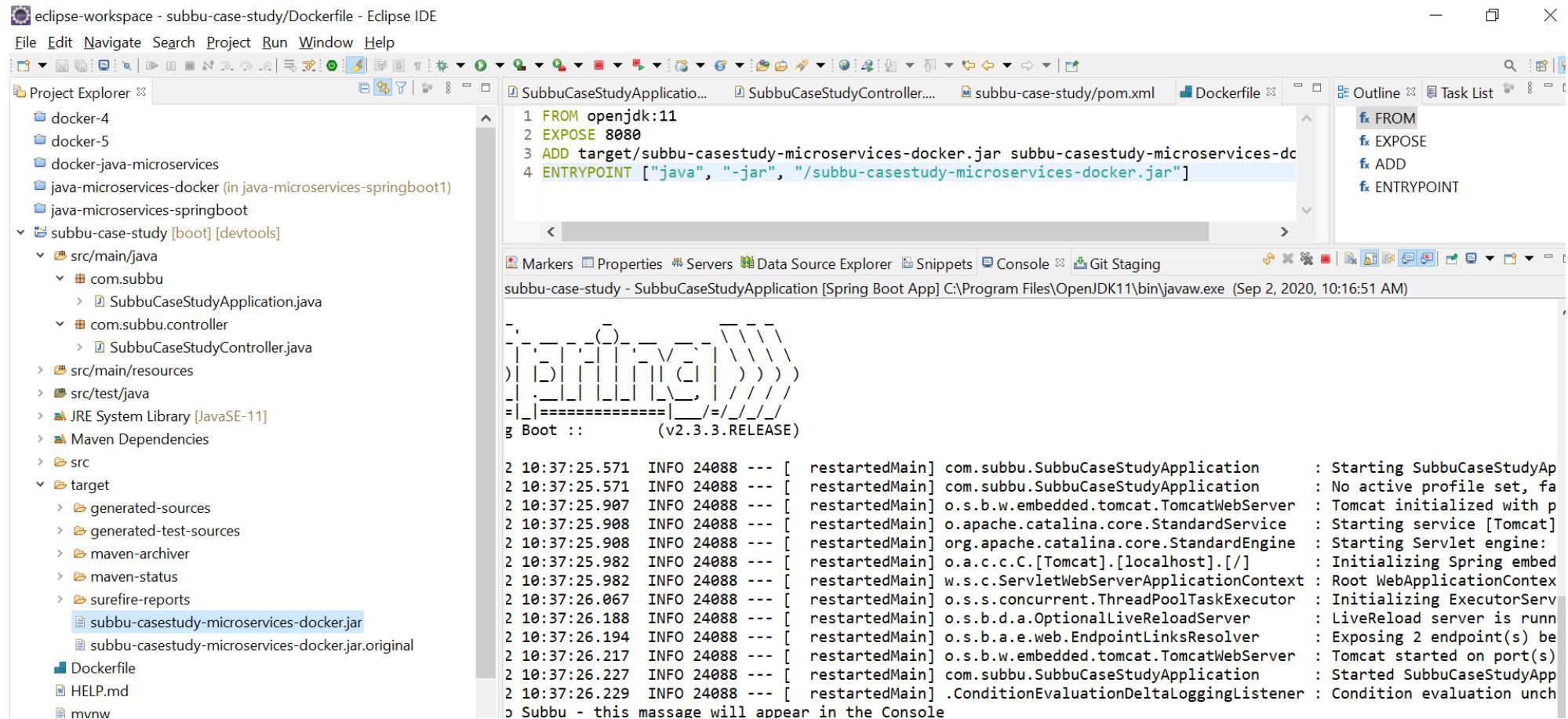
The screenshot shows the Eclipse IDE interface with the following details:

- Title Bar:** eclipse-workspace - subbu-case-study/src/main/java/com/subbu/SubbuCaseStudyApplication.java - Eclipse IDE
- Menu Bar:** File Edit Source Refactor Navigate Search Project Run Window Help
- Toolbar:** Standard Eclipse toolbar icons.
- ActionBar:** Markers, Properties, Servers, Data Source Explorer, Snippets, Console, Git Staging.
- Console View:** Displays the output of the Spring Boot application run. The output includes:
 - A decorative ASCII art logo representing a tree or plant.
 - The Spring Boot version information: :: Spring Boot :: (v2.3.3.RELEASE)
 - Log entries from 2020-09-02 at 10:16:54.991 to 10:16:57.605. These entries detail the startup process of the SubbuCaseStudyApplication, including the start of Tomcat (port 8080), the initialization of the application context, and the exposure of endpoints like /actuator.
 - A yellow box highlights the message "Welcome to Subbu - this message will appear in the Console".
 - A yellow box highlights the log entry "Tomcat initialized with port(s): 8080 (http)".

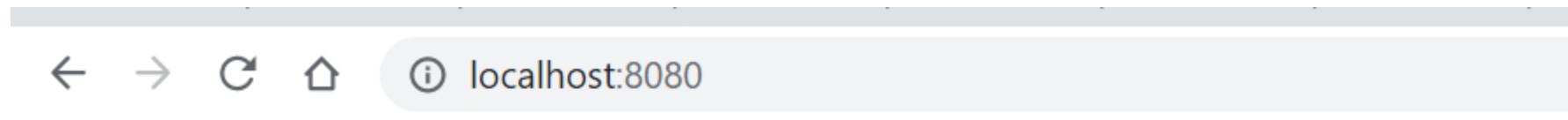
Run as Maven Install to create jar:



Jar is created in the Target folder:



<http://localhost:8080>



Whitelabel Error Page

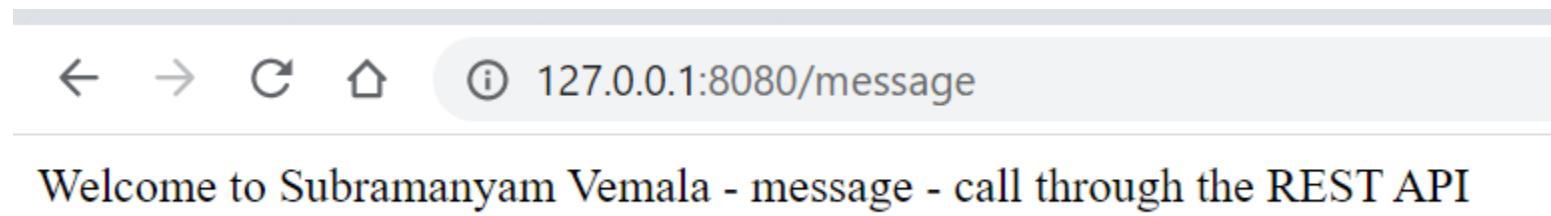
This application has no explicit mapping for /error, so you are seeing this as a fallback.

Wed Sep 02 10:39:02 IST 2020

There was an unexpected error (type=Not Found, status=404).

No message available

<http://127.0.0.1:8080/message>

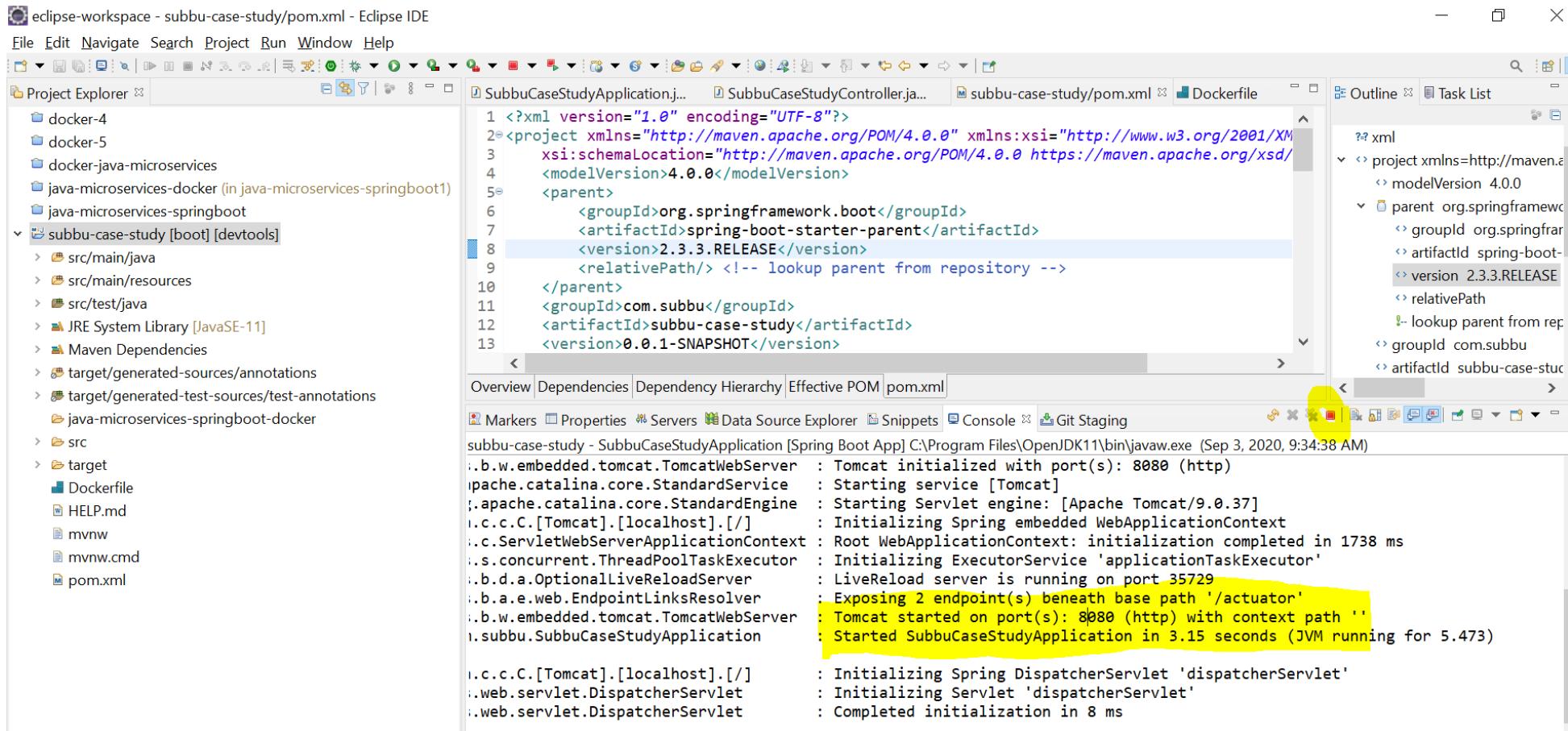


<http://localhost:8080/message>

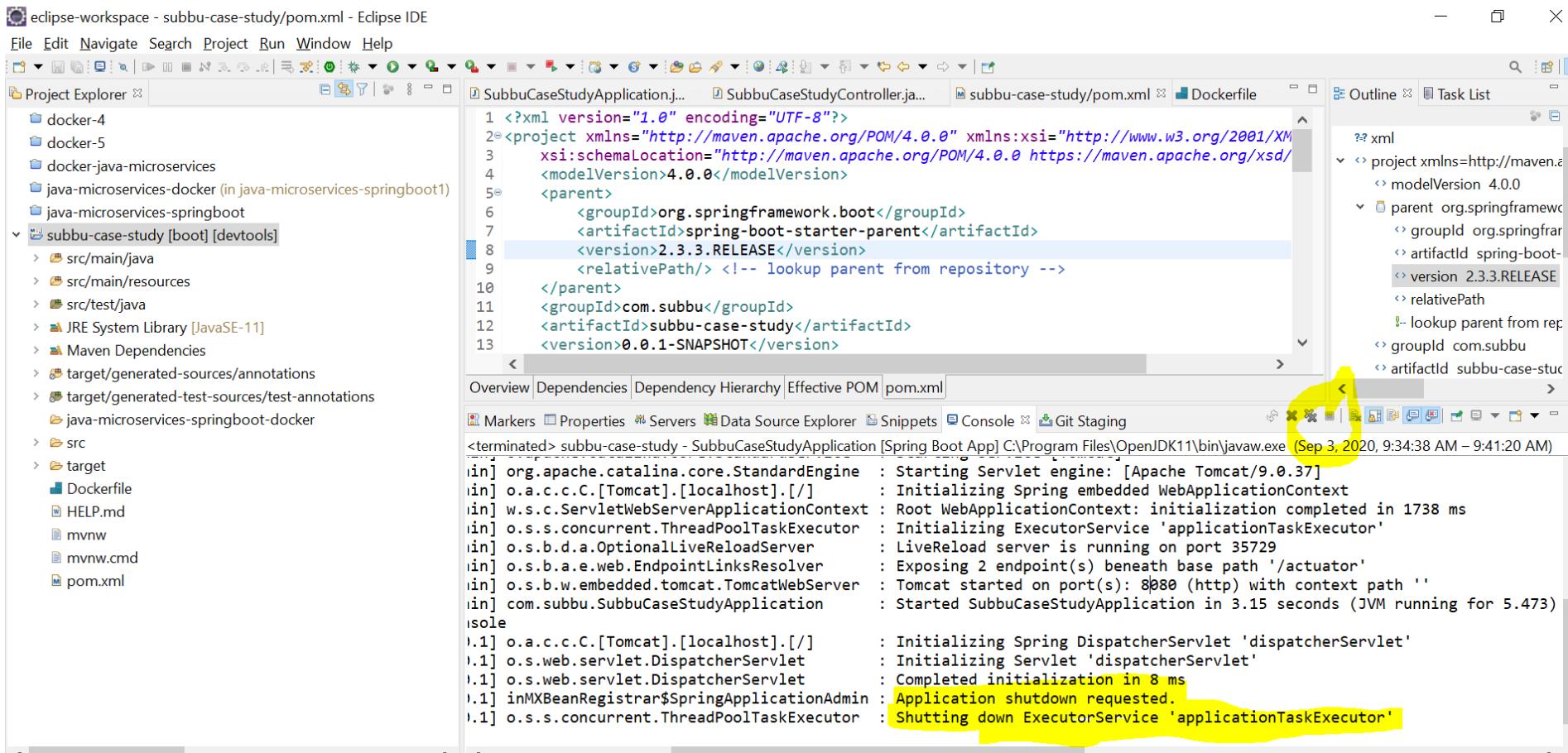


Welcome to Subramanyam Vemala - message - call through the REST API

Stop the application:



Application is stopped:



Check for the output on the browser - Now no output, on the browser as the application is stopped:

<http://localhost:8080/message>



This site can't be reached

localhost refused to connect.

Try:

- Checking the connection
- Checking the proxy and the firewall

ERR_CONNECTION_REFUSED

Part-B

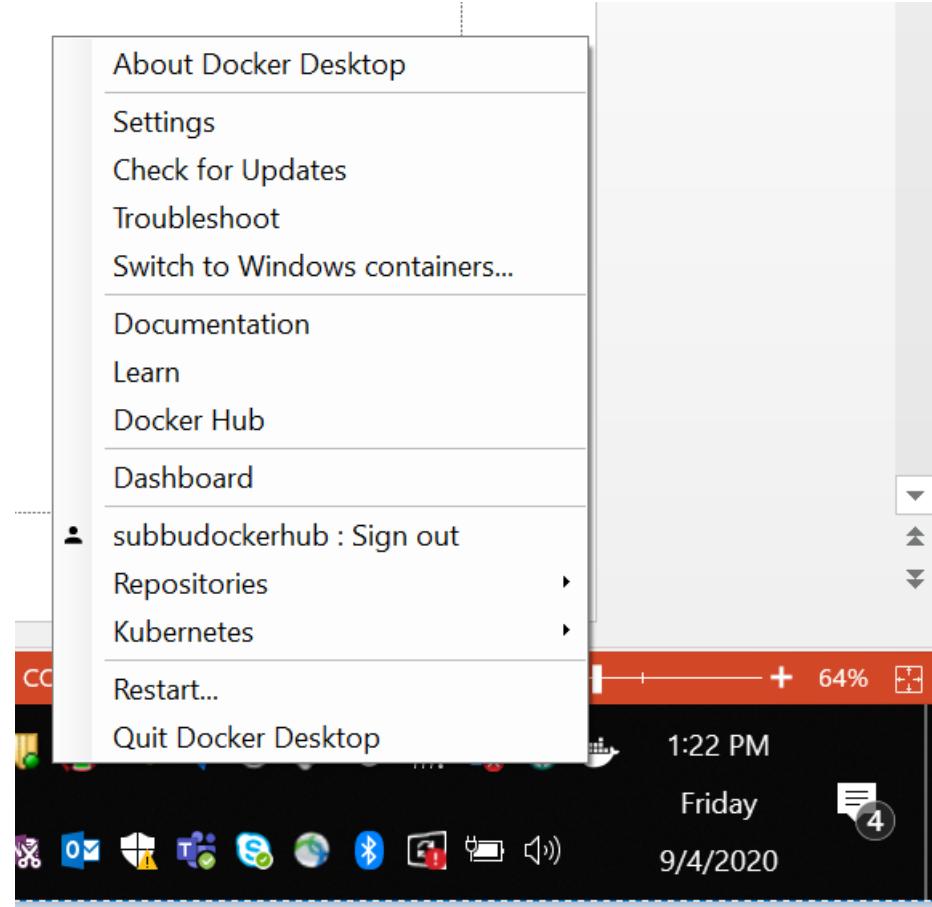
Docker - Implementation and deployment steps

B. Docker deployment steps:

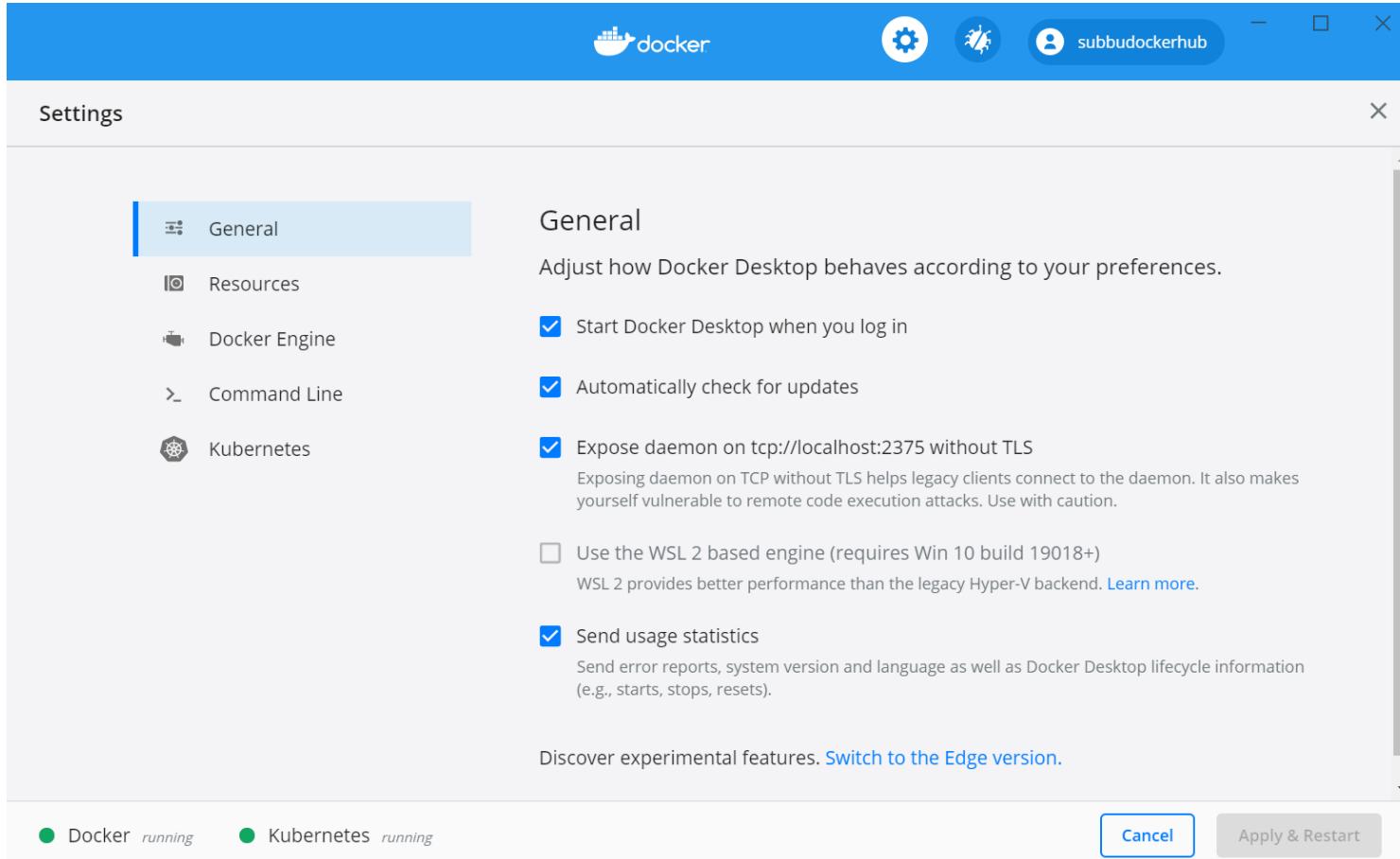
Docker deployment steps:

1. Create the jar in the target folder – as explained in the above Part-A.
2. Install the Docker Desktop and make sure like it is up and running.
3. Create Dockerfile.
4. Create docker image using Dockerfile through build command.
5. Run the docker image. Map an external to the images internal port.
6. Check the output on the browser, with the appropriate mapping URL.

Shows the successfully installed Docker Desktop:



Click on Settings, and make sure that Docker is running:



C:\Users\svemala\eclipse-workspace\subbu-case-study

File Explorer View				
C:\Users\svemala\eclipse-workspace\subbu-case-study				
	Name	Date modified	Type	Size
ads	.mvn	9/2/2020 9:59 AM	File folder	
nts	.settings	9/2/2020 1:29 PM	File folder	
T	java-microservices-springboot-docker	9/2/2020 1:48 PM	File folder	
va	src	9/2/2020 9:59 AM	File folder	
- Capge	target	9/3/2020 1:59 PM	File folder	
cts	.classpath	9/2/2020 1:29 PM	CLASSPATH File	2 KB
nts	.gitignore	9/2/2020 9:59 AM	Text Document	1 KB
ads	.project	9/2/2020 1:29 PM	PROJECT File	2 KB
	Dockerfile	9/3/2020 2:47 PM	File	1 KB
	HELP.md	9/2/2020 9:59 AM	MD File	2 KB
	mvnw	9/2/2020 9:59 AM	File	10 KB
	mvnw.cmd	9/2/2020 9:59 AM	Windows Command ...	7 KB
	pom.xml	9/3/2020 1:57 PM	XML Document	2 KB

Launch Power Shell – goto the Dockerfile folder:

```
Windows PowerShell
PS C:\Users\svemala\eclipse-workspace> ls

Directory: C:\Users\svemala\eclipse-workspace

Mode                LastWriteTime       Length  Name
----                -----          -----  --
d-----        8/27/2020  7:12 PM           .metadata
d-----        8/31/2020 12:10 PM           docker-2
d-----        8/31/2020  5:35 PM           docker-4
d-----        8/31/2020  8:31 PM           docker-5
d-----        9/1/2020   2:46 PM          docker-java-microservices
d-----        9/1/2020   3:49 PM          java-microservices-springboot
d-----        9/1/2020   6:48 PM          java-microservices-springboot1
d-----        9/2/2020 10:10 AM          subbu-case-study

PS C:\Users\svemala\eclipse-workspace> cd subbu*
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

View of list of docker images before our image is created:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images
REPOSITORY          TAG      IMAGE ID   CREATED    SIZE
subbu-casestudy-microservices-docker.jar  latest    e7554d59f74b  28 hours ago  646MB
<none>              <none>   54538fc8948d  28 hours ago  646MB
microservicesdockerjar3.jar    latest    2eb634581cbb  2 days ago   636MB
<none>              <none>   e41c35024224  2 days ago   636MB
<none>              <none>   bfc7ead597e5  2 days ago   636MB
openjdk              11      455ecea6f4f2  2 days ago   627MB
docker/desktop-storage-provisioner  v1.1    e704287ce753  5 months ago  41.8MB
docker/desktop-vpnkit-controller    v1.0    79da37e5a3aa  6 months ago  36.6MB
docker/desktop-kubernetes          kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0  a86647f0b376  7 months ago  279MB
k8s.gcr.io/kube-scheduler          v1.16.5  b4d073a9efda  7 months ago  83.5MB
k8s.gcr.io/kube-proxy              v1.16.5  0ee1b8a3ebe0  7 months ago  82.7MB
k8s.gcr.io/kube-apiserver         v1.16.5  fc838b21afbb  7 months ago  159MB
k8s.gcr.io/kube-controller-manager v1.16.5  441835dd2301  7 months ago  151MB
docker/kube-compose-controller    v0.4.25-alpha1 129151cdf35f  10 months ago 35.6MB
docker/kube-compose-api-server    v0.4.25-alpha1 989749268895  10 months ago 50.7MB
docker/kube-compose-installer     v0.4.25-alpha1 2a71ac5a1359  10 months ago 42.3MB
k8s.gcr.io/etcfd                3.3.15-0   b2756210eeab  12 months ago 247MB
k8s.gcr.io/kube-proxy             v1.14.6   ed8adf767eeb  12 months ago 82.1MB
k8s.gcr.io/kube-apiserver        v1.14.6   0e422c9884cf  12 months ago 209MB
k8s.gcr.io/kube-scheduler        v1.14.6   d27987bc993e  12 months ago 81.6MB
k8s.gcr.io/kube-controller-manager v1.14.6   4bb274b1f2c3  12 months ago 157MB
k8s.gcr.io/coredns               1.6.2    bf261d157914  12 months ago 44.1MB
docker/kube-compose-controller    v0.4.23   a8c3d87a58e7  15 months ago 35.3MB
docker/kube-compose-api-server    v0.4.23   f3591b2cb223  15 months ago 49.9MB
k8s.gcr.io/coredns               1.3.1    eb516548c180  19 months ago 40.3MB
k8s.gcr.io/etcfd                3.3.10   2c4adeb21b4f  21 months ago 258MB
k8s.gcr.io/pause                 3.1      da86e6ba6ca1  2 years ago  742kB
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

“docker images” – command:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images

REPOSITORY          TAG      IMAGE ID   CREATED    SIZE
subbu-casestudy-microservices-docker.jar  latest        e7554d59f74b  28 hours ago  646MB
<none>            <none>    54538fc8948d  28 hours ago  646MB
microservicesdockerjar3.jar    latest        2eb634581cbb  2 days ago   636MB
<none>            <none>    e41c35024224  2 days ago   636MB
<none>            <none>    bfc7ead597e5  2 days ago   636MB
openjdk             11       455ecea6f4f2  2 days ago   627MB
docker/desktop-storage-provisioner    v1.1       e704287ce753  5 months ago  41.8MB
docker/desktop-vpnkit-controller     v1.0       79da37e5a3aa  6 months ago  36.6MB
docker/desktop-kubernetes           kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0 a86647f0b376  7 months ago  279MB
k8s.gcr.io/kube-scheduler          v1.16.5    b4d073a9efda  7 months ago  83.5MB
k8s.gcr.io/kube-proxy              v1.16.5    0ee1b8a3eb0   7 months ago  82.7MB
k8s.gcr.io/kube-apiserver         v1.16.5    fc838b21afbb  7 months ago  159MB
k8s.gcr.io/kube-controller-manager v1.16.5    441835dd2301  7 months ago  151MB
docker/kube-compose-controller     v0.4.25-alpha1 129151cdf35f  10 months ago  35.6MB
docker/kube-compose-api-server     v0.4.25-alpha1 989749268895  10 months ago  50.7MB
docker/kube-compose-installer      v0.4.25-alpha1 2a71ac5a1359  10 months ago  42.3MB
k8s.gcr.io/etcd                  3.3.15-0    b2756210eeab  12 months ago  247MB
k8s.gcr.io/kube-proxy             v1.14.6     ed8adf767eeb  12 months ago  82.1MB
k8s.gcr.io/kube-apiserver        v1.14.6     0e422c9884cf  12 months ago  209MB
```

Build the Docker image using the Dockerfile using the command: docker build –t <jar name> .

```
k8s.gcr.io/pause          3.1           da86e6ba6ca1      2 years ago      742kB
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker build -t subbu-casestudy-microservices-docker-dockerhub.jar .
Sending build context to Docker daemon 28.15MB
Step 1/4 : FROM openjdk:11
--> 455eceaa6f4f2
Step 2/4 : EXPOSE 8080
--> Using cache
--> 6ede0b7d669c
Step 3/4 : ADD target/subbu-casestudy-microservices-docker-dockerhub.jar subbu-casestudy-microservices-docker-dockerhub.jar
--> c8f0306d960e
Step 4/4 : ENTRYPOINT ["java", "-jar", "/subbu-casestudy-microservices-docker-dockerhub.jar"]
--> Running in d051c8501378
Removing intermediate container d051c8501378
--> ca813a46d63d
Successfully built ca813a46d63d
Successfully tagged subbu-casestudy-microservices-docker-dockerhub.jar:latest
SECURITY WARNING: You are building a Docker image from Windows against a non-Windows Docker host. All files and directories added to build context will have '-rwxr-xr-x' permissions. It is recommended to double check and reset permissions for sensitive files and directories.
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

“docker build -t subbu-casestudy-microservices-docker-dockerhub.jar” – command:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker build -t subbu-casestudy-microservices-docker-dockerhub.jar .
```

```
Sending build context to Docker daemon 28.15MB
```

```
Step 1/4 : FROM openjdk:11
```

```
---> 455ecea6f4f2
```

```
Step 2/4 : EXPOSE 8080
```

```
---> Using cache
```

```
---> 6ede0b7d669c
```

```
Step 3/4 : ADD target/subbu-casestudy-microservices-docker-dockerhub.jar subbu-casestudy-microservices-docker-dockerhub.jar
```

```
---> c8f0306d960e
```

```
Step 4/4 : ENTRYPOINT ["java", "-jar", "/subbu-casestudy-microservices-docker-dockerhub.jar"]
```

```
---> Running in d051c8501378
```

```
Removing intermediate container d051c8501378
```

```
---> ca813a46d63d
```

```
Successfully built ca813a46d63d
```

```
Successfully tagged subbu-casestudy-microservices-docker-dockerhub.jar:latest
```

```
SECURITY WARNING: You are building a Docker image from Windows against a non-Windows Docker host. All files and directories added to build context will have '-rwxr-xr-x' permissions. It is recommended to double check and reset permissions for sensitive files and directories.
```

New local docker image created:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images
REPOSITORY                                TAG      IMAGE ID      CREATED       SIZE
subbu-casestudy-microservices-dockerhub.jar    latest   ca813a46d63d  About a minute ago  646MB
subbu-casestudy-microservices-docker.jar        latest   e7554d59f74b  28 hours ago   646MB
<none>                                    <none>   54538fc8948d  28 hours ago   646MB
microservicesdockerjar3.jar                  latest   2eb634581cbb  2 days ago    636MB
<none>                                    <none>   e41c35024224  2 days ago    636MB
<none>                                    <none>   bfc7ead597e5  2 days ago    636MB
openjdk                                     11      455ceea6f4f2  2 days ago    627MB
docker/desktop-storage-provisioner          v1.1    e704287ce753  5 months ago   41.8MB
docker/desktop-vpnkit-controller           v1.0    79da37e5a3aa  6 months ago   36.6MB
docker/desktop-kubernetes                  kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0  a86647f0b376  7 months ago   279MB
k8s.gcr.io/kube-proxy                      v1.16.5  0ee1b8a3ebe0  7 months ago   82.7MB
k8s.gcr.io/kube-apiserver                 v1.16.5  fc838b21afbb  7 months ago   159MB
k8s.gcr.io/kube-scheduler                 v1.16.5  b4d073a9efda  7 months ago   83.5MB
k8s.gcr.io/kube-controller-manager         v1.16.5  441835dd2301  7 months ago   151MB
docker/kube-compose-controller            v0.4.25-alpha1 129151cdf35f  10 months ago  35.6MB
docker/kube-compose-api-server            v0.4.25-alpha1 989749268895  10 months ago  50.7MB
docker/kube-compose-installer             v0.4.25-alpha1 2a71ac5a1359  10 months ago  42.3MB
k8s.gcr.io/etcfd                         3.3.15-0   b2756210eeab  12 months ago  247MB
k8s.gcr.io/kube-proxy                    v1.14.6    ed8adf767eeb  12 months ago  82.1MB
k8s.gcr.io/kube-apiserver               v1.14.6    0e422c9884cf  12 months ago  209MB
k8s.gcr.io/kube-scheduler               v1.14.6    d27987bc993e  12 months ago  81.6MB
k8s.gcr.io/kube-controller-manager       v1.14.6    4bb274b1f2c3  12 months ago  157MB
k8s.gcr.io/coredns                       1.6.2     bf261d157914  12 months ago  44.1MB
docker/kube-compose-controller            v0.4.23    a8c3d87a58e7  15 months ago  35.3MB
docker/kube-compose-api-server            v0.4.23    f3591b2cb223  15 months ago  49.9MB
k8s.gcr.io/coredns                       1.3.1     eb516548c180  19 months ago  40.3MB
k8s.gcr.io/etcfd                         3.3.10    2c4adeb21b4f  21 months ago  258MB
k8s.gcr.io/pause                          3.1      da86e6ba6ca1  2 years ago   742kB
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

subbu-casestudy-microservices-docker-dockerhub.jar latest
ca813a46d63d About a minute ago 646MB

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
subbu-casestudy-microservices-docker-dockerhub.jar	latest	ca813a46d63d	About a minute ago	646MB
subbu-casestudy-microservices-docker.jar	latest	e7554d59f74b	28 hours ago	646MB
<none>	<none>	54538fc8948d	28 hours ago	646MB
microservicesdockerjar3.jar	latest	2eb634581cbb	2 days ago	636MB
<none>	<none>	e41c35024224	2 days ago	636MB
<none>	<none>	bfc7ead597e5	2 days ago	636MB
openjdk	11	455eceea6f4f2	2 days ago	627MB
docker/desktop-storage-provisioner	v1.1	e704287ce753	5 months ago	41.8MB
docker/desktop-vpnkit-controller	v1.0	79da37e5a3aa	6 months ago	36.6MB
docker/desktop-kubernetes	kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0	a86647f0b376	7 months ago	279MB
k8s.gcr.io/kube-proxy	v1.16.5	0ee1b8a3ebe0	7 months ago	82.7MB
k8s.gcr.io/kube-apiserver	v1.16.5	fc838b21afbb	7 months ago	159MB
k8s.gcr.io/kube-scheduler	v1.16.5	b4d073a9efda	7 months ago	83.5MB
k8s.gcr.io/kube-controller-manager	v1.16.5	441835dd2301	7 months ago	151MB
docker/kube-compose-controller	v0.4.25-alpha1	129151cdf35f	10 months ago	35.6MB
docker/kube-compose-api-server	v0.4.25-alpha1	989749268895	10 months ago	50.7MB
docker/kube-compose-installer	v0.4.25-alpha1	2a71ac5a1359	10 months ago	42.3MB
k8s.gcr.io/etcd	3.3.15-0	b2756210eeab	12 months ago	247MB
k8s.gcr.io/kube-proxy	v1.14.6	ed8adf767eeb	12 months ago	82.1MB
k8s.gcr.io/kube-apiserver	v1.14.6	0e422c9884cf	12 months ago	209MB
k8s.gcr.io/kube-scheduler	v1.14.6	d27987bc993e	12 months ago	81.6MB
k8s.gcr.io/kube-controller-manager	v1.14.6	4bb274b1f2c3	12 months ago	157MB
k8s.gcr.io/coredns	1.6.2	bf261d157914	12 months ago	44.1MB

Running containers by default:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS               NAMES
ba4431a5c2fa      subbu-casestudy-microservices-docker.jar   "java -jar /subbu-ca..."   28 hours ago       Up 28 hours        0.0.0.0:9091->8080/tcp
ac9a3d272039      54538fc8948d      "java -jar /subbu-ca..."   28 hours ago       Up 28 hours        0.0.0.0:9090->8080/tcp
867a94ed25e3      e704287ce753     "/storage-provisione..."  2 days ago        Up 2 days
isioner_kube-system_cf41569a-33ac-4693-be2a-1e673e45ebba_1
96ea327e35ef      129151cdf35f      "/compose-controller..."  2 days ago        Up 2 days
_docker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0
149fdc1a31b3      bf261d157914     "/coredns -conf /etc..."   2 days ago        Up 2 days
_kube-system_48269134-3fb...-4a5c-8f10-f671e07917cd_0
f205cecb47c7      bf261d157914     "/coredns -conf /etc..."   2 days ago        Up 2 days
_kube-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0
bbb644f85e92      989749268895    "/api-server --kubec..."  2 days ago        Up 2 days
6w7k_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0
2521e3c928dd      79da37e5a3aa     "/kube-vpnkit-forwar..."  2 days ago        Up 2 days
ler_kube-system_a9ab932e-b5df-4426-8ed5-478bf96302ba_0
90c864b57709      k8s.gcr.io/pause:3.1
ker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0
cb2cc7d18486      k8s.gcr.io/pause:3.1
_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0
f7aeb917f72b      k8s.gcr.io/pause:3.1
e-system_48269134-3fb...-4a5c-8f10-f671e07917cd_0
174ffbfb30737    k8s.gcr.io/pause:3.1
e-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0
c8cf83b6bf5c      0ee1b8a3ebe0
-system_69795b23-d199-4265-8998-a24f3aa...-9b4_0
7a7e9c6bc221      k8s.gcr.io/pause:3.1
m_a9ab932e-b5df-4426-8ed5-478bf96302ba_0
81982e6ea504      k8s.gcr.io/pause:3.1
tem_cf41569a-33ac-4693-be2a-1e673e45ebba_0
62ef55945511      k8s.gcr.io/pause:3.1
_69795b23-d199-4265-8998-a24f3aa...-9b4_0
41779161b3af      b2756210eeab
stem_bc3eca0122540ccc59e959a7805e87e8_0
f55fe687dc20      b4d073a9efda

```

“docker ps” - command only shows running containers by default.

PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
ba4431a5c2fa	subbu-casestudy-microservices-docker.jar	"java -jar /subbu-ca..."	28 hours ago	Up 28 hours	0.0.0.0:9091->8080/tcp	crazy_meninsky
ac9a3d272039	54538fc8948d	"java -jar /subbu-ca..."	28 hours ago	Up 28 hours	0.0.0.0:9090->8080/tcp	boring_heisenberg
867a94ed25e3_1e673e45ebba_1	e704287ce753	"/storage-provisione..."	2 days ago	Up 2 days		k8s_storage-provisioner_storage-provisioner_kube-system_cf41569a-33ac-4693-be2a-
96ea327e35eb	129151cdf35f	"/compose-controller..."	2 days ago	Up 2 days		k8s_compose_compose-78f95d4f8c-j4lhk_docker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0
149fdc1a31b3	bf261d157914	"/coredns -conf /etc..."	2 days ago	Up 2 days		k8s_coredns_coredns-5644d7b6d9-zv6m4_kube-system_48269134-3fbc-4a5c-8f10-f671e07917cd_0
f205cecb47c7	bf261d157914	"/coredns -conf /etc..."	2 days ago	Up 2 days		k8s_coredns_coredns-5644d7b6d9-85fz6_kube-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0
bbb644f85e92	989749268895	"/api-server --kubec..."	2 days ago	Up 2 days		k8s_compose_compose-api-6ffb89dc58-96w7k_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0
2521e3c928dd	79da37e5a3aa	"/kube-vpnkit-forwar..."	2 days ago	Up 2 days		k8s_vpnkit-controller_vpnkit-controller_kube-system_a9ab932e-b5df-4426-8ed5-478bf96302ba_0
90c864b57709	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_compose-78f95d4f8c-j4lhk_docker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0
cb2cc7d18486	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_compose-api-6ffb89dc58-96w7k_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0
f7aeb917f72b	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_coredns-5644d7b6d9-zv6m4_kube-system_48269134-3fbc-4a5c-8f10-f671e07917cd_0
174fffb30737	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_coredns-5644d7b6d9-85fz6_kube-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0
c8cf83b6bf5c	0ee1b8a3ebe0	"/usr/local/bin/kube..."	2 days ago	Up 2 days		k8s_kube-proxy_kube-proxy-g4v94_kube-system_69795b23-d199-4265-8998-a24f3aaf69b4_0
7a7e9c6bc221	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_vpnkit-controller_kube-system_a9ab932e-b5df-4426-8ed5-478bf96302ba_0

Run the Docker image using the command: docker run -p <port number mapped to the exposed port>:<Exposed port> <jar name>: Here external port 9092 is mapped to the exposed containers internal port 8080:

“docker run -p 9092:8080 subbu-casestudy-microservices-docker-dockerhub.jar” – command:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker run -p 9092:8080 subbu-casestudy-microservices-docker-dockerhub.jar
```

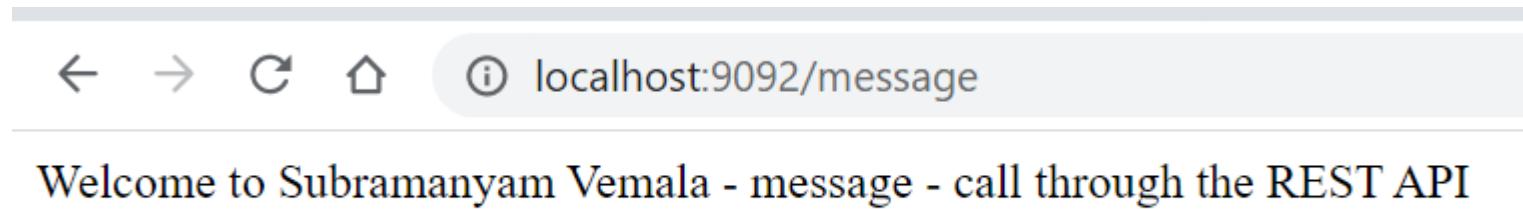
```
 . _ _ - _ ---  
 \\\'_---( )_ _ _\\\  
 ((\_)_ _'_|'_|'_V_`|\\\  
 \|_|||)|||||(||))  
 ' |__| ._|_|||_|||_\\|/_//  
 ======|_|=====|_|=/_/_/_  
 :: Spring Boot :: (v2.3.3.RELEASE)
```

```
2020-09-03 09:29:18.381 INFO 1 --- [    main] com.subbu.SubbuCaseStudyApplication : Starting SubbuCaseStudyApplication v0.0.1-SNAPSHOT on e723271c4b10 with PID 1 (/subbu-casestudy-microservices-docker-dockerhub.jar started by root in /)  
2020-09-03 09:29:18.387 INFO 1 --- [    main] com.subbu.SubbuCaseStudyApplication : No active profile set, falling back to default profiles: default  
2020-09-03 09:29:21.610 INFO 1 --- [    main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port(s): 8080 (http)  
2020-09-03 09:29:21.652 INFO 1 --- [    main] o.apache.catalina.core.StandardService : Starting service [Tomcat]  
2020-09-03 09:29:21.653 INFO 1 --- [    main] org.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/9.0.37]  
2020-09-03 09:29:21.849 INFO 1 --- [    main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext  
2020-09-03 09:29:21.851 INFO 1 --- [    main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 3162 ms  
2020-09-03 09:29:22.752 INFO 1 --- [    main] o.s.s.concurrent.ThreadPoolTaskExecutor : Initializing ExecutorService 'applicationTaskExecutor'  
2020-09-03 09:29:23.283 INFO 1 --- [    main] o.s.b.a.e.web.EndpointLinksResolver : Exposing 2 endpoint(s) beneath base path '/actuator'  
2020-09-03 09:29:23.422 INFO 1 --- [    main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path ""  
2020-09-03 09:29:23.466 INFO 1 --- [    main] com.subbu.SubbuCaseStudyApplication : Started SubbuCaseStudyApplication in 6.691 seconds (JVM running for 8.016)
```

Welcome to Subbu - this message will appear in the Console

Check for the output on the browser – append the tag “message”, as it is mapped in the Java Controller:

<http://localhost:9092/message>



Docker images, after ran with “docker run” – now container is created:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images
REPOSITORY                                TAG      IMAGE ID      CREATED       SIZE
subbu-casestudy-microservices-dockerhub.jar    latest   ca813a46d63d  16 minutes ago  646MB
subbu-casestudy-microservices-docker.jar        latest   e7554d59f74b  28 hours ago   646MB
<none>                                    <none>   54538fc8948d  28 hours ago   646MB
microservicesdockerjar3.jar                  latest   2eb634581cbb  2 days ago    636MB
<none>                                    <none>   e41c35024224  2 days ago    636MB
<none>                                    <none>   bfc7ead597e5  2 days ago    636MB
openjdk                                     11      455eceaf4f2  2 days ago    627MB
docker/desktop-storage-provisioner          v1.1    e704287ce753  5 months ago   41.8MB
docker/desktop-vpnkit-controller           v1.0    79da37e5a3aa  6 months ago   36.6MB
docker/desktop-kubernetes                  kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0  a86647f0b376  7 months ago   279MB
k8s.gcr.io/kube-controller-manager         v1.16.5  441835dd2301  7 months ago   151MB
k8s.gcr.io/kube-proxy                      v1.16.5  0ee1b8a3ebe0  7 months ago   82.7MB
k8s.gcr.io/kube-apiserver                 v1.16.5  fc838b21afbb  7 months ago   159MB
k8s.gcr.io/kube-scheduler                 v1.16.5  b4d073a9efda  7 months ago   83.5MB
docker/kube-compose-controller            v0.4.25-alpha1 129151cdf35f  10 months ago  35.6MB
docker/kube-compose-api-server            v0.4.25-alpha1 989749268895  10 months ago  50.7MB
docker/kube-compose-installer             v0.4.25-alpha1 2a71ac5a1359  10 months ago  42.3MB
k8s.gcr.io/etcfd                         3.3.15-0   b2756210eeab  12 months ago  247MB
k8s.gcr.io/kube-proxy                     v1.14.6    ed8adf767eeb  12 months ago  82.1MB
k8s.gcr.io/kube-apiserver                v1.14.6    0e422c9884cf  12 months ago  209MB
k8s.gcr.io/kube-controller-manager       v1.14.6    4bb274b1f2c3  12 months ago  157MB
k8s.gcr.io/kube-scheduler                v1.14.6    d27987bc993e  12 months ago  81.6MB
k8s.gcr.io/coredns                       1.6.2     bf261d157914  12 months ago  44.1MB
docker/kube-compose-controller            v0.4.23    a8c3d87a58e7  15 months ago  35.3MB
docker/kube-compose-api-server            v0.4.23    f3591b2cb223  15 months ago  49.9MB
k8s.gcr.io/coredns                      1.3.1     eb516548c180  19 months ago  40.3MB
k8s.gcr.io/etcfd                        3.3.10    2c4adeb21b4f  21 months ago  258MB
k8s.gcr.io/pause                         3.1      da86e6ba6ca1  2 years ago   742kB
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

“docker images” – command ran after “docker run”:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images

REPOSITORY          TAG      IMAGE ID   CREATED    SIZE
subbu-casestudy-microservices-dockerhub.jar  latest        ca813a46d63d  16 minutes ago  646MB
subbu-casestudy-microservices-docker.jar        latest        e7554d59f74b  28 hours ago  646MB
<none>              <none>     54538fc8948d  28 hours ago  646MB
microservicesdockerjar3.jar        latest        2eb634581cbb  2 days ago   636MB
<none>              <none>     e41c35024224  2 days ago   636MB
<none>              <none>     bfc7ead597e5  2 days ago   636MB
openjdk              11       455eceaa6f4f2  2 days ago   627MB
docker/desktop-storage-provisioner    v1.1       e704287ce753  5 months ago  41.8MB
docker/desktop-vpnkit-controller     v1.0       79da37e5a3aa  6 months ago  36.6MB
docker/desktop-kubernetes           kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0 a86647f0b376  7 months ago  279MB
k8s.gcr.io/kube-controller-manager  v1.16.5    441835dd2301  7 months ago  151MB
k8s.gcr.io/kube-proxy                v1.16.5    0ee1b8a3ebe0  7 months ago  82.7MB
k8s.gcr.io/kube-apiserver           v1.16.5    fc838b21afbb  7 months ago  159MB
k8s.gcr.io/kube-scheduler           v1.16.5    b4d073a9efda  7 months ago  83.5MB
docker/kube-compose-controller      v0.4.25-alpha1 129151cdf35f  10 months ago  35.6MB
docker/kube-compose-api-server      v0.4.25-alpha1 989749268895  10 months ago  50.7MB
docker/kube-compose-installer       v0.4.25-alpha1 2a71ac5a1359  10 months ago  42.3MB
k8s.gcr.io/etcld                  3.3.15-0   b2756210eeab  12 months ago  247MB
```

Docker ps, after docker run – now container is created:

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
e723271c4b10	subbu-casestudy-microservices-docker-dockerhub.jar	"java -jar /subbu-ca..."	10 minutes ago	Up 10 minutes	0.0.0.0:9092->8080/tcp	hopeful_cerf
ba4431a5c2fa	subbu-casestudy-microservices-docker.jar	"java -jar /subbu-ca..."	28 hours ago	Up 28 hours	0.0.0.0:9091->8080/tcp	crazy_meninsky
ac9a3d272039	54538fc8948d	"java -jar /subbu-ca..."	28 hours ago	Up 28 hours	0.0.0.0:9090->8080/tcp	boring_heisenberg
867a94ed25e3	e704287ce753	"/storage-provisione..."	2 days ago	Up 2 days		k8s_storage-provisioner_st
orange-provisioner_kube-system_cf41569a-33ac-4693-be2a-1e673e45ebba_1						
96ea327e35eb	129151cdf35f	"/compose-controller..."	2 days ago	Up 2 days		k8s_compose_compose-78f95d
4f8c-j4lhk_docker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0		"/coredns -conf /etc..."	2 days ago	Up 2 days		k8s_coredns_coredns-5644d7
149fdc1a31b3	bf261d157914	"/coredns -conf /etc..."	2 days ago	Up 2 days		k8s_coredns_coredns-5644d7
b6d9-zv6m4_kube-system_48269134-3fbcc-4a5c-8f10-f671e07917cd_0		"/api-server --kubec..."	2 days ago	Up 2 days		k8s_compose_compose-api-6f
f205cecba7c7	bf261d157914	"/kube-vpnkit-forwar..."	2 days ago	Up 2 days		k8s_vpnkit-controller_vpnk
b6d9-85fz6_kube-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0		"/pause"	2 days ago	Up 2 days		k8s_POD_compose-78f95d4f8c
bbb644f85e92	989749268895	"/pause"	2 days ago	Up 2 days		k8s_POD_compose-api-6ffb89
fb89dc58-96w7k_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0		"/pause"	2 days ago	Up 2 days		k8s_POD_coredns-5644d7b6d9
2521e3c928dd	79da37e5a3aa	"/usr/local/bin/kube..."	2 days ago	Up 2 days		k8s_kube-proxy_kube-proxy-
it-controller_kube-system_a9ab932e-b5df-4426-8ed5-478bf96302ba_0		"/pause"	2 days ago	Up 2 days		k8s_POD_vpnkit-controller_vpnk
90c864b57709	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		
-j4lhk_docker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0		"/pause"	2 days ago	Up 2 days		
cb2cc7d18486	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		
dc58-96w7k_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0		"/pause"	2 days ago	Up 2 days		
f7ae917f72b	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		
-zv6m4_kube-system_48269134-3fbcc-4a5c-8f10-f671e07917cd_0		"/pause"	2 days ago	Up 2 days		
174fffbf30737	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		
-85fz6_kube-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0		"/usr/local/bin/kube..."	2 days ago	Up 2 days		
c8cf83b6bf5c	0ee1b8a3ebe0	"/pause"	2 days ago	Up 2 days		
g4v94_kube-system_69795b23-d199-4265-8998-a24f3aaf69b4_0		"/pause"	2 days ago	Up 2 days		
7a7e9c6bc211	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		
kube-system_a9ab932e-b5df-4426-8ed5-478bf96302ba_0		"/pause"	2 days ago	Up 2 days		
81982e6ea504	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		
r_kube-system_cf41569a-33ac-4693-be2a-1e673e45ebba_0		"/pause"	2 days ago	Up 2 days		
62ef55945511	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		
ube-system_69795b23-d199-4265-8998-a24f3aaf69b4_0		"etcd --advertise-cl..."	2 days ago	Up 2 days		k8s_etcd_etcd-docker-deskt
41779161b3af	b2756210eeab	"kube-scheduler --au..."	2 days ago	Up 2 days		k8s_kube-scheduler_kube-sc
op_kube-system_bc3eca0122540ccc59e959a7805e87e8_0		"kube-controller-man..."	2 days ago	Up 2 days		k8s_kube-controller-manage
f55fe687dc20	b4d073a9efda					
heduler-docker-desktop_kube-system_28dd1b1230fbe15350eb1b896ae9493d_0						
3cb0f87dd299	441835dd2301					

“docker ps”, command after ran with “docker run”:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
e723271c4b10	subbu-casestudy-microservices-docker-dockerhub.jar	"java -jar /subbu-ca..."	10 minutes ago	Up 10 minutes	0.0.0.0:9092->8080/tcp	hopeful_cerf
ba4431a5c2fa	subbu-casestudy-microservices-docker.jar	"java -jar /subbu-ca..."	28 hours ago	Up 28 hours	0.0.0.0:9091->8080/tcp	crazy_meninsky
ac9a3d272039	54538fc8948d	"java -jar /subbu-ca..."	28 hours ago	Up 28 hours	0.0.0.0:9090->8080/tcp	boring_heisenberg
867a94ed25e3	e704287ce753	"/storage-provisioner..."	2 days ago	Up 2 days		k8s_storage-provisioner_storage-provisioner_kube-system_cf41569a-33ac-4693-be2a-1e673e45ebba_1
96ea327e35eb	129151cdf35f	"/compose-controller..."	2 days ago	Up 2 days		k8s_compose_compose-78f95d4f8c-j4lhk_docker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0
149fdc1a31b3	bf261d157914	"/coredns -conf /etc..."	2 days ago	Up 2 days		k8s_coredns_coredns-5644d7b6d9-zv6m4_kube-system_48269134-3fbc-4a5c-8f10-f671e07917cd_0
f205cecb47c7	bf261d157914	"/coredns -conf /etc..."	2 days ago	Up 2 days		k8s_coredns_coredns-5644d7b6d9-85fz6_kube-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0
bbb644f85e92	989749268895	"/api-server --kubec..."	2 days ago	Up 2 days		k8s_compose_compose-api-6ffb89dc58-96w7k_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0
2521e3c928dd	79da37e5a3aa	"/kube-vpnkit-forwar..."	2 days ago	Up 2 days		k8s_vpnkit-controller_vpnkit-controller_kube-system_a9ab932e-b5df-4426-8ed5-478bf96302ba_0
90c864b57709	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_compose-78f95d4f8c-j4lhk_docker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0
cb2cc7d18486	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_compose-api-6ffb89dc58-96w7k_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0
f7aeb917f72b	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_coredns-5644d7b6d9-zv6m4_kube-system_48269134-3fbc-4a5c-8f10-f671e07917cd_0
174ffbf30737	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_coredns-5644d7b6d9-85fz6_kube-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0
c8cf83b6bf5c	0ee1b8a3ebe0	"/usr/local/bin/kube..."	2 days ago	Up 2 days		k8s_kube-proxy_kube-proxy-g4v94_kube-system_69795b23-d199-4265-8998-a24f3aaf69b4_0
7a7e9c6bc221	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_vpnkit-controller_kube-system_a9ab932e-b5df-4426-8ed5-478bf96302ba_0
81982e6ea504	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_storage-provisioner_kube-system_cf41569a-33ac-4693-be2a-1e673e45ebba_0
62ef55945511	k8s.gcr.io/pause:3.1	"/pause"	2 days ago	Up 2 days		k8s_POD_kube-proxy-g4v94_kube-system_69795b23-d199-4265-8998-a24f3aaf69b4_0
41779161b3af	b2756210eeab	"etcd --advertise-cl..."	2 days ago	Up 2 days		k8s_etcd_etcd-docker-desktop_kube-system_bc3eca0122540ccc59e959a7805e87e8_0

Part-C

Docker Hub - Implementation and Deployment steps

C. DockerHub deployment steps:

Docker Hub deployment steps:

1. Create an account in the <https://hub.docker.com/>
2. Validate your email, which enables you to create a repository in the DockerHub.
3. Push the local docker image to the DockerHub repository.
4. Stop the local application and remove all the local images.
5. Now run the docker image, choosing the DockerHub image. Docker pulls the image from the DockerHub, as it will not find it locally.
6. Check the output on the browser, with the appropriate mapping URL.

Docker Hub, logged-in view.

The screenshot shows the Docker Hub homepage. At the top, there's a banner with the message "We've updated our Terms of Service. [Learn more.](#)". Below the banner is the Docker Hub navigation bar with links for Explore, Repositories, Organizations, Get Help, and a dropdown for the user's account (subbudoockerhub). The main content area displays two public repositories owned by "subbudoockerhub": "subbudockerhub / subbu-casestudy-microservices-docker.jar" (updated 2 days ago) and "subbudockerhub / subbu-dockerhub-repo". Each repository card includes a star icon (0), a download icon (4), and a "Public" status. To the right, there's a sidebar with a "Create an Organization" section featuring three icons (lock, padlock, and key) and text encouraging users to manage repositories with their team.

“docker login”- command: Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to <https://hub.docker.com> to create one.

```
[svemala@DESKTOP-9JF0D8K eclipse-workspace]$ docker login
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker login
Authenticating with existing credentials...
Login Succeeded
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

Tag the docker image:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker tag  
subbu-casestudy-microservices-docker-dockerhub.jar  
subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar  
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

Generalized command will be, “docker tag <local image name>
<registered DockerHub userid>/<name of image used to have on
DockerHub>”

“`docker tag subbu-casestudy-microservices-docker-dockerhub.jar
subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar`
” – command executed, local image is tagged:

```
k8s.gcr.io/etcd          3.3.10           2c4adeb21b4f      21 months ago    258MB
k8s.gcr.io/pause         3.1              da86e6ba6ca1     2 years ago     742kB
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker tag subbu-casestudy-microservices-docker-dockerhub.jar subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

Push the docker images into DockerHub
subbudockerhub: Command – “docker push <tagged name of the image>”

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker push subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar
The push refers to repository [docker.io/subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar]
e87e5457167a: Pushed
beec189e63c5: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar
03ae48cd6c8d: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar
de9aadc6b492: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar
e5df62d9b33a: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar
7a9460d53218: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar
b2765ac0333a: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar
0ced13fcf944: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar
latest: digest: sha256:a96fc0c8a1cc09a7391e0e659e062cf64dec43a45fa94b4ea9a64c5412862da5 size: 2006
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

Command - “docker push subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar”

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker push subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar
```

The push refers to repository [docker.io/subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar]

e87e5457167a: Pushed

beec189e63c5: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar

03ae48cd6c8d: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar

de9aadc6b492: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar

e5df62d9b33a: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar

7a9460d53218: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar

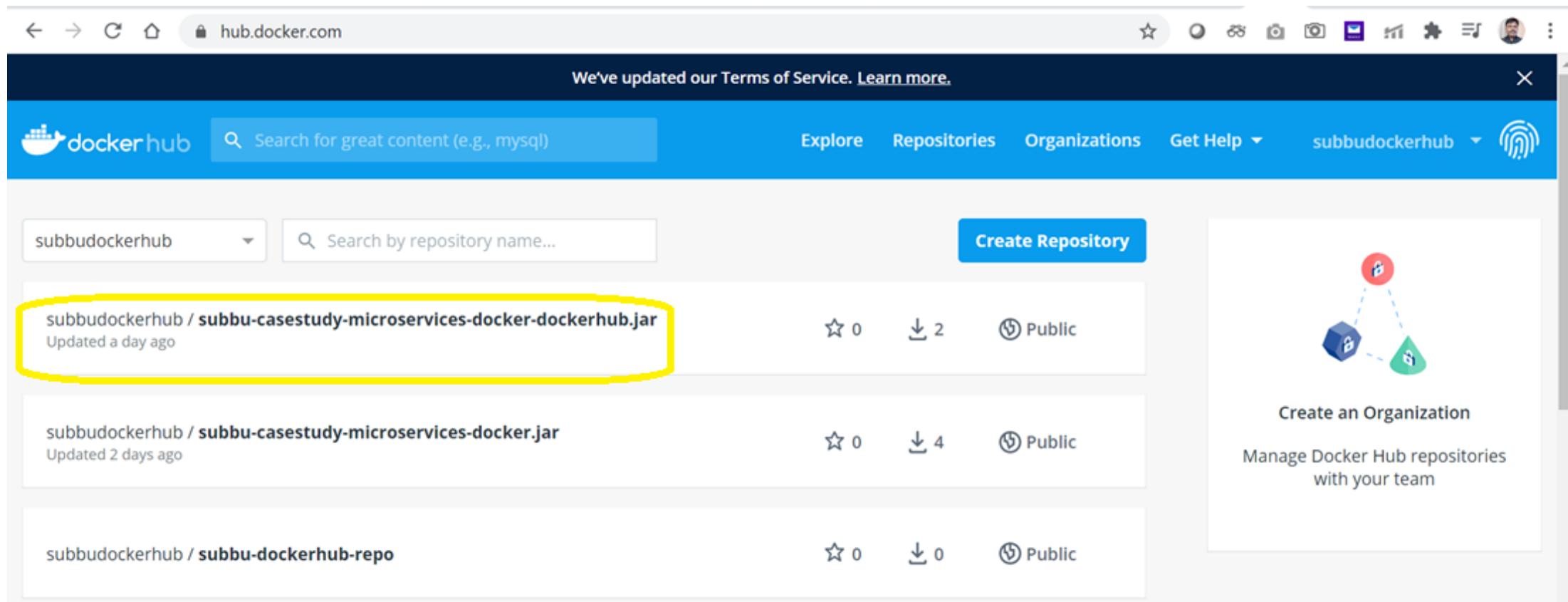
b2765ac0333a: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar

0ced13fcf944: Mounted from subbudockerhub/subbu-casestudy-microservices-docker.jar

latest: digest: sha256:a96fc0c8a1cc09a7391e0e659e062cf64dec43a45fa94b4ea9a64c5412862da5 size: 2006

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

docker image “subbu-casestudy-microservices-docker-dockerhub.jar”, is pushed into the DockerHub:



The screenshot shows the DockerHub interface. At the top, there's a header bar with links for Explore, Repositories, Organizations, Get Help, and a user profile for subbudo...erhub. Below the header is a search bar and a dropdown menu set to 'subbudo...erhub'. A secondary search bar below it is set to 'Search by repository name...'. The main content area displays three repository cards. The first card, 'subbudo...erhub / subbu-casestudy-microservices-docker-dockerhub.jar', is highlighted with a yellow box. It was updated 'a day ago' and has 0 stars, 2 downloads, and is public. The second card, 'subbudo...erhub / subbu-casestudy-microservices-docker.jar', was updated '2 days ago' and has 0 stars, 4 downloads, and is public. The third card, 'subbudo...erhub / subbu-dockerhub-repo', has 0 stars, 0 downloads, and is public. To the right of the repositories is a sidebar with options to 'Create an Organization' and 'Manage Docker Hub repositories with your team', accompanied by icons for a lock and a gear.

We've updated our Terms of Service. [Learn more.](#)

Explore Repositories Organizations Get Help subbudo...erhub

subbudo...erhub Search for great content (e.g., mysql)

Search by repository name...

Create Repository

subbudo...erhub / subbu-casestudy-microservices-docker-dockerhub.jar
Updated a day ago

0 2 Public

subbudo...erhub / subbu-casestudy-microservices-docker.jar
Updated 2 days ago

0 4 Public

subbudo...erhub / subbu-dockerhub-repo

0 0 Public

Create an Organization
Manage Docker Hub repositories with your team

“docker images” – command, for listing all the images:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images
REPOSITORY          TAG      IMAGE ID      CREATED       SIZE
subbu-casestudy-microservices-docker-dockerhub.jar    latest   ca813a46d63d  2 hours ago  646MB
subbu-casestudy-microservices-docker.jar              latest   e7554d59f74b  30 hours ago  646MB
<none>            <none>   54538fc8948d  30 hours ago  646MB
microservicesdockerjar3.jar                         latest   2eb634581cbb  2 days ago   636MB
<none>            <none>   e41c35024224  2 days ago   636MB
<none>            <none>   bfc7ead597e5  2 days ago   636MB
openjdk             11      455eceaa6f4f2  2 days ago   627MB
docker/desktop-storage-provisioner                  v1.1     e704287ce753  5 months ago  41.8MB
docker/desktop-vpnkit-controller                    v1.0     79da37e5a3aa  6 months ago  36.6MB
docker/desktop-kubernetes                          kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0  a86647f0b376  7 months ago  279MB
k8s.gcr.io/kube-controller-manager                v1.16.5  441835dd2301  7 months ago  151MB
k8s.gcr.io/kube-apiserver                        v1.16.5  fc838b21afbb  7 months ago  159MB
k8s.gcr.io/kube-scheduler                        v1.16.5  b4d073a9efda  7 months ago  83.5MB
k8s.gcr.io/kube-proxy                            v1.16.5  0ee1b8a3ebe0  7 months ago  82.7MB
docker/kube-compose-controller                   v0.4.25-alpha1 129151cdf35f  10 months ago 35.6MB
docker/kube-compose-api-server                   v0.4.25-alpha1 989749268895 10 months ago 50.7MB
docker/kube-compose-installer                   v0.4.25-alpha1 2a71ac5a1359 10 months ago 42.3MB
k8s.gcr.io/etcld                                3.3.15-0   b2756210eeab  12 months ago 247MB
k8s.gcr.io/kube-proxy                           v1.14.6   ed8adf767eeb  12 months ago 82.1MB
k8s.gcr.io/kube-apiserver                      v1.14.6   0e422c9884cf  12 months ago 209MB
k8s.gcr.io/kube-scheduler                      v1.14.6   d27987bc993e  12 months ago 81.6MB
k8s.gcr.io/kube-controller-manager               v1.14.6   4bb274b1f2c3  12 months ago 157MB
k8s.gcr.io/coredns                             1.6.2     bf261d157914  12 months ago 44.1MB
docker/kube-compose-controller                 v0.4.23    a8c3d87a58e7  15 months ago 35.3MB
docker/kube-compose-api-server                 v0.4.23    f3591b2cb223  15 months ago 49.9MB
k8s.gcr.io/coredns                           1.3.1     eb516548c180  19 months ago 40.3MB
k8s.gcr.io/etcld                              3.3.10    2c4adeb21b4f  21 months ago 258MB
k8s.gcr.io/pause                             3.1      da86e6ba6ca1  2 years ago  742kB
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

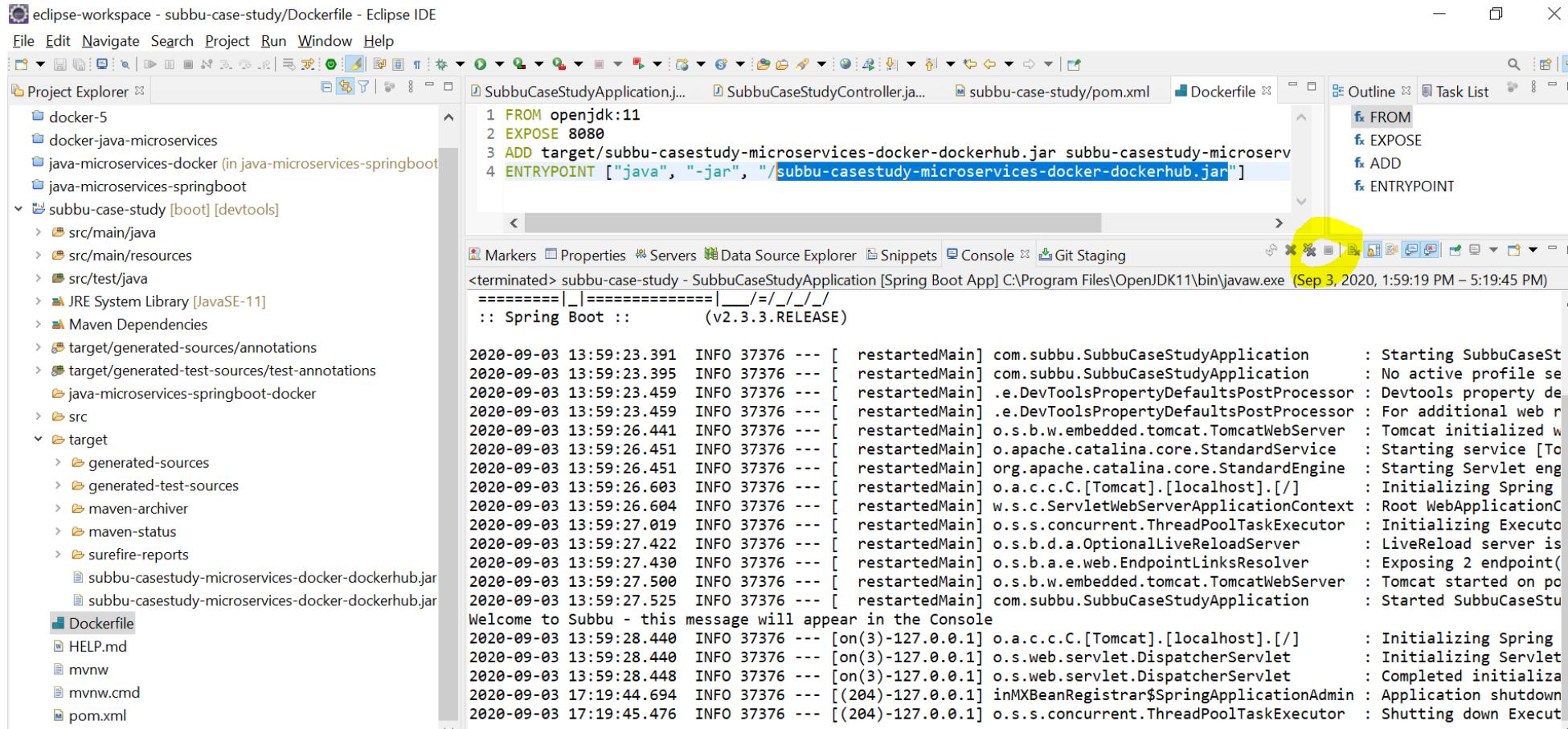
“docker ps” – command, to list the active containers:

```
Windows PowerShell
k8s.gcr.io/pause          3.1
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker ps
CONTAINER ID   IMAGE               COMMAND                  CREATED        STATUS       PORTS     NAMES
e723271c4b10   subbu-casestudy-microservices-docker-dockerhub.jar   "java -jar /subbu-ca..." 2 hours ago   Up 2 hours  0.0.0.0:9092->8080/tcp   hopeful_cerf
ba4431a5c2fa   subbu-casestudy-microservices-docker.jar           "java -jar /subbu-ca..." 30 hours ago  Up 30 hours  0.0.0.0:9091->8080/tcp   crazy_meninsky
ac9a3d272039   54538fc8948d          "java -jar /subbu-ca..." 30 hours ago  Up 30 hours  0.0.0.0:9090->8080/tcp   boring_heisenberg
867a94ed25e3   e704287ce753          "/storage-provisione..." 2 days ago    Up 2 days   742kB    k8s_storage-provisioner_st
orange-provisioner_kube-system_cf41569a-33ac-4693-be2a-1e673e45ebba_1
96ea327e35eb   129151cdf35f          "/compose-controller..." 2 days ago    Up 2 days   k8s_compose_compose-78f95d
4f8c-j4lhk_docker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0
149fdc1a31b3   bf261d157914          "/coredns -conf /etc..." 2 days ago    Up 2 days   k8s_coredns_coredns-5644d7
b6d9-zv6m4_kube-system_48269134-3fbf-4a5c-8f10-f671e07917cd_0
f205ccb47c7   bf261d157914          "/coredns -conf /etc..." 2 days ago    Up 2 days   k8s_coredns_coredns-5644d7
b6d9-85fz6_kube-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0
bbb644f85e92   989749268895          "/api-server --kubec..." 2 days ago    Up 2 days   k8s_compose_compose-api-6f
fb89dc58-96w7k_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0
2521e3c928dd   79da37e5a3aa          "/kube-vpnkit-forwar..." 2 days ago    Up 2 days   k8s_vpnkit-controller_vpnk
it-controller_kube-system_a9ab932e-b5df-4426-8ed5-478bf96302ba_0
90c864b57709   k8s.gcr.io/pause:3.1
-j4lhk_docker_e5bb9b12-338d-4f4e-99a0-973ece0f631d_0
cb2cc7d18486   k8s.gcr.io/pause:3.1
dc58-96w7k_docker_faed47b7-753f-4acf-a61f-b4e6976c97d3_0
f7aeb917f72b   k8s.gcr.io/pause:3.1
-zv6m4_kube-system_48269134-3fbf-4a5c-8f10-f671e07917cd_0
174ffbf30737   k8s.gcr.io/pause:3.1
-85fz6_kube-system_8da76ca1-bc13-4a95-90ac-330cad6f6d20_0
c8cf83b6bf5c   0ee1b8a3ebe0          "/usr/local/bin/kube..." 2 days ago    Up 2 days   k8s_kube-proxy_kube-proxy-
g4v94_kube-system_69795b23-d199-4265-8998-a24f3aaaf69b4_0
7a79c6bc221   k8s.gcr.io/pause:3.1
kube-system_a9ab932e-b5df-4426-8ed5-478bf96302ba_0
81982e6ea504   k8s.gcr.io/pause:3.1
r_kube-system_cf41569a-33ac-4693-be2a-1e673e45ebba_0
62ef55945511   k8s.gcr.io/pause:3.1
ube-system_69795b23-d199-4265-8998-a24f3aaaf69b4_0
41779161b3af   b2756210eeab          "etcd --advertise-cl..." 2 days ago    Up 2 days   k8s_etcd_etcd-docker-deskt
op_kube-system_bc3eca0122540ccc59e959a7805e87e8_0
f55fe687dc20   b4d073a9efda          "kube-scheduler --au..." 2 days ago    Up 2 days   k8s_kube-scheduler_kube-sc
heduler_docker-desktop_kube-system_28dd1b1230fbe15350eb1b896ae9493d_0
3cb0f87dd299   441835dd2301          "kube-controller-man..." 2 days ago    Up 2 days   k8s_kube-controller-manage
r_kube-controller-manager-docker-desktop_kube-system_9076958db0c2cc26f76def745bfc1928_0
a50445846a88   fc838b21afbb          "kube-apiserver --ad..." 2 days ago    Up 2 days   k8s_kube-apiserver_kube-ap
icsever_docker_desktop_kube-system_20661de771a4d42b270990-7f-e517e_0
```

Detailed steps for Testing for the Docker Hub:

1. Login to Docker Hub.
2. Tag the local image.
3. Push the local image into the Docker Hub.
4. Test the application by pulling the image from the Docker Hub:
 - Make sure like, no local images (subbu-casestudy-microservices-docker-dockerhub.jar and subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar) of your application. Delete all local and tagged images.
 - Make sure like, no local application on Eclipse or tomcat is running.
 - Run the command: “docker run –p 9092:8080 subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar”
 - As there is no local image by the name, subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar, it pulls from the public DockerHub subbudockerhub
 - Check the output on the browser.

Stop the Tomcat on Eclipse if it is running, before we test for the DockerHub image:

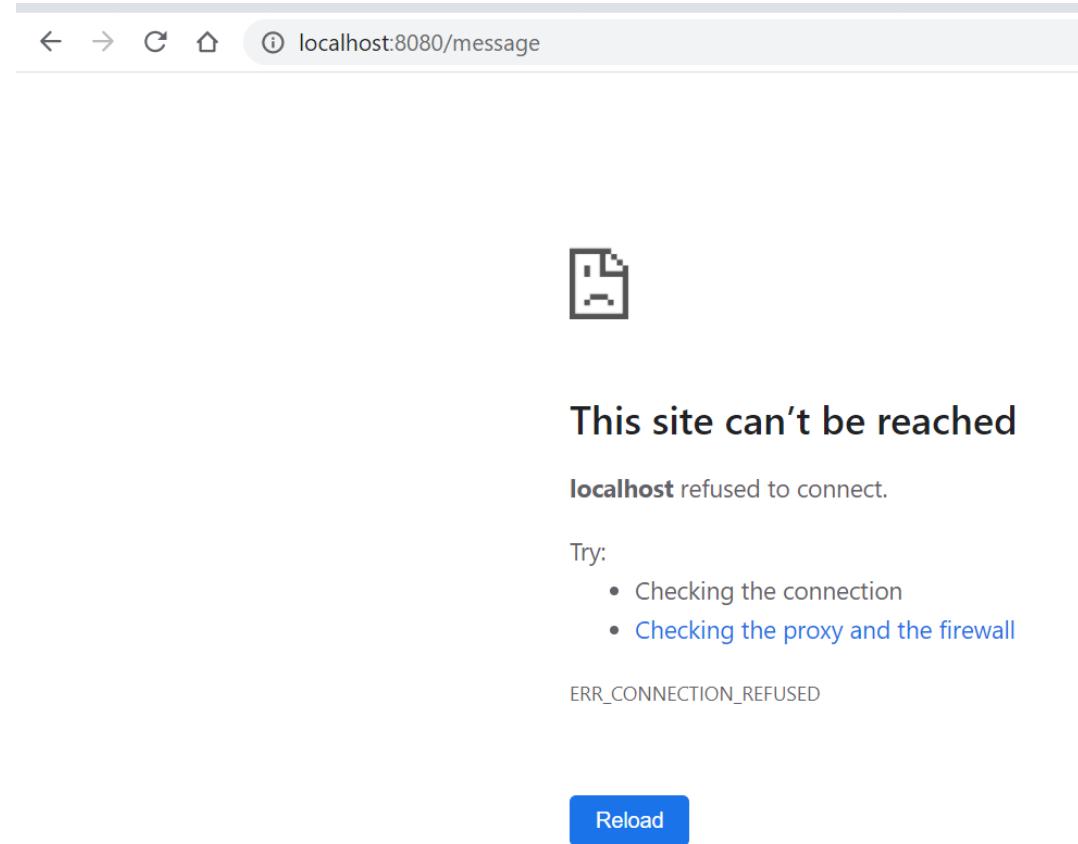


“ping 8080” command – make sure like local application on Eclipse is not running:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> ping 8080
Pinging 0.0.31.144 with 32 bytes of data:
PING: transmit failed. General failure.

Ping statistics for 0.0.31.144:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

Check for the location application on the browser:
<http://localhost:8080/message>



Currently we can see a local image
“subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar”:

Windows PowerShell

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar	latest	ca813a46d63d	20 hours ago	646MB
subbu-casestudy-microservices-docker.jar	latest	e7554d59f74b	2 days ago	646MB
<none>	<none>	54538fc8948d	2 days ago	646MB
microservicesdockerjar3.jar	latest	2eb634581cbb	2 days ago	636MB
<none>	<none>	e41c35024224	2 days ago	636MB
<none>	<none>	bfc7ead597e5	2 days ago	636MB
openjdk	11	455eceaf4f2	3 days ago	627MB
docker/desktop-storage-provisioner	v1.1	e704287ce753	5 months ago	41.8MB
docker/desktop-vpnkit-controller	v1.0	79da37e5a3aa	6 months ago	36.6MB
docker/desktop-kubernetes	kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0	a86647f0b376	7 months ago	279MB
k8s.gcr.io/kube-scheduler	v1.16.5	b4d073a9efda	7 months ago	83.5MB
k8s.gcr.io/kube-proxy	v1.16.5	0ee1b8a3ebe0	7 months ago	82.7MB
k8s.gcr.io/kube-apiserver	v1.16.5	fc838b21afbb	7 months ago	159MB
k8s.gcr.io/kube-controller-manager	v1.16.5	441835dd2301	7 months ago	151MB
docker/kube-compose-controller	v0.4.25-alpha1	129151cdf35f	10 months ago	35.6MB
docker/kube-compose-api-server	v0.4.25-alpha1	989749268895	10 months ago	50.7MB
docker/kube-compose-installer	v0.4.25-alpha1	2a71ac5a1359	10 months ago	42.3MB
k8s.gcr.io/etcfd	3.3.15-0	b2756210eeab	12 months ago	247MB
k8s.gcr.io/kube-proxy	v1.14.6	ed8adf767eeb	12 months ago	82.1MB
k8s.gcr.io/kube-apiserver	v1.14.6	0e422c9884cf	12 months ago	209MB
k8s.gcr.io/kube-controller-manager	v1.14.6	4bb274b1f2c3	12 months ago	157MB
k8s.gcr.io/kube-scheduler	v1.14.6	d27987bc993e	12 months ago	81.6MB
k8s.gcr.io/coredns	1.6.2	bf261d157914	12 months ago	44.1MB
docker/kube-compose-controller	v0.4.23	a8c3d87a58e7	15 months ago	35.3MB
docker/kube-compose-api-server	v0.4.23	f3591b2cb223	15 months ago	49.9MB
k8s.gcr.io/coredns	1.3.1	eb516548c180	19 months ago	40.3MB
k8s.gcr.io/etcfd	3.3.10	2c4adeb21b4f	21 months ago	258MB
k8s.gcr.io/pause	3.1	da86e6ba6ca1	2 years ago	742kB

Execute this command to delete the local images, “docker rmi -f subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar”:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker rmi -f subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar
Untagged: subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar:latest
Untagged: subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar@sha256:a96fc0c8a1cc09a7391e0e659e062cf64dec43a45fa94b4ea9a64c5412862da5
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images
```

Now there are no local “subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar” images:

```
untagged: subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar@sha256:a967c0c8a1cc09a7391e0e659e062c164dec43a451a9404ea9a64c54128620a5
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
<none>              <none>              ca813a46d63d    20 hours ago      646MB
subbu-casestudy-microservices-docker.jar   latest              e7554d59f74b    2 days ago        646MB
<none>              <none>              54538fc8948d    2 days ago        646MB
microservicesdockerjar3.jar    latest              2eb634581cbb    2 days ago        636MB
<none>              <none>              e41c35024224    2 days ago        636MB
<none>              <none>              bfc7ead597e5    2 days ago        636MB
openjdk              11                 455ecea6f4f2    3 days ago        627MB
docker/desktop-storage-provisioner       v1.1                e704287ce753    5 months ago      41.8MB
docker/desktop-vpnkit-controller        v1.0                79da37e5a3aa    6 months ago      36.6MB
docker/desktop-kubernetes               kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0  a86647f0b376    7 months ago      279MB
k8s.gcr.io/kube-apiserver              v1.16.5             fc838b21afbb    7 months ago      159MB
k8s.gcr.io/kube-scheduler              v1.16.5             b4d073a9efda    7 months ago      83.5MB
k8s.gcr.io/kube-proxy                 v1.16.5             0ee1b8a3ebe0    7 months ago      82.7MB
k8s.gcr.io/kube-controller-manager     v1.16.5             441835dd2301    7 months ago      151MB
docker/kube-compose-controller         v0.4.25-alpha1      129151cdf35f    10 months ago     35.6MB
docker/kube-compose-api-server         v0.4.25-alpha1      989749268895    10 months ago     50.7MB
docker/kube-compose-installer         v0.4.25-alpha1      2a71ac5a1359    10 months ago     42.3MB
k8s.gcr.io/etcd                      3.3.15-0            b2756210eeeab    12 months ago     247MB
k8s.gcr.io/kube-proxy                v1.14.6             ed8adf767eeb    12 months ago     82.1MB
k8s.gcr.io/kube-apiserver            v1.14.6             0e422c9884cf    12 months ago     209MB
k8s.gcr.io/kube-controller-manager   v1.14.6             4bb274b1f2c3    12 months ago     157MB
k8s.gcr.io/kube-scheduler            v1.14.6             d27987bc993e    12 months ago     81.6MB
k8s.gcr.io/coredns                  1.6.2                bf261d157914    12 months ago     44.1MB
docker/kube-compose-controller         v0.4.23             a8c3d87a58e7    15 months ago     35.3MB
docker/kube-compose-api-server         v0.4.23             f3591b2cb223    15 months ago     49.9MB
k8s.gcr.io/coredns                  1.3.1                eb516548c180    19 months ago     40.3MB
k8s.gcr.io/etcd                      3.3.10               2c4adeb21b4f    21 months ago     258MB
k8s.gcr.io/pause                     3.1                 da86e6ba6ca1    2 years ago       742kB
PS C:\Users\svemala\eclipse-workspace\subbu-case-study>
```

Run the command: “`docker run -p 9092:8080 subbudoctorhub/subbu-casestudy-microservices-docker-dockerhub.jar`”

As there is no local image by the name, subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar, it pulls from the public DockerHub subbudockerhub:

“docker run -p 9092:8080 subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar” command:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker run -p 9092:8080 subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar
Unable to find image 'subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar:latest' locally
latest: Pulling from subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar
Digest: sha256:a96fc0c8a1cc09a7391e0e659e062cf64dec43a45fa94b4ea9a64c5412862da5
Status: Downloaded newer image for subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar:latest
```

```
   _ _ _ _ _  
 \\\/_\_\_(_)_\_ _\_\_\\\  
 ((\_)_|_|_|_|V_|_|\_\\\  
 \|_|_|_|_|_|_|_|_|(|_|))  
 ' |__| ._|_|_|_|_|_|_|| / / / /  
 ======|_|=====|_|/_=/_/_/_/  
 :: Spring Boot :: (v2.3.3.RELEASE)
```

```
2020-09-04 05:31:32.919 INFO 1 --- [    main] com.subbu.SubbuCaseStudyApplication : Starting SubbuCaseStudyApplication v0.0.1-SNAPSHOT on 8ce9b5baff80 with PID 1 (/subbu-casestudy-microservices-docker-dockerhub.jar started by root in /)
2020-09-04 05:31:32.935 INFO 1 --- [    main] com.subbu.SubbuCaseStudyApplication : No active profile set, falling back to default profiles: default
2020-09-04 05:31:35.332 INFO 1 --- [    main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port(s): 8080 (http)
2020-09-04 05:31:35.353 INFO 1 --- [    main] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2020-09-04 05:31:35.354 INFO 1 --- [    main] org.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/9.0.37]
2020-09-04 05:31:35.477 INFO 1 --- [    main] o.a.c.c.C.[Tomcat].[localhost].[] : Initializing Spring embedded WebApplicationContext
2020-09-04 05:31:35.477 INFO 1 --- [    main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 2399 ms
2020-09-04 05:31:36.029 INFO 1 --- [    main] o.s.s.concurrent.ThreadPoolTaskExecutor : Initializing ExecutorService 'applicationTaskExecutor'
2020-09-04 05:31:36.471 INFO 1 --- [    main] o.s.b.a.e.web.EndpointLinksResolver : Exposing 2 endpoint(s) beneath base path '/actuator'
2020-09-04 05:31:36.555 INFO 1 --- [    main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path "
```

Output on the port 9092:

<http://localhost:9092/message>



Again docker, keeps the local image, once it pulls for the executed deployment:

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker images
REPOSITORY                                     TAG      IMAGE ID      CREATED       SIZE
subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar  latest   ca813a46d63d  21 hours ago  646MB
subbu-casestudy-microservices-docker.jar        latest   e7554d59f74b  2 days ago   646MB
<none>                                         <none>   54538fc8948d  2 days ago   646MB
microservicesdockerjar3.jar                   latest   2eb634581cbb  2 days ago   636MB
<none>                                         <none>   e41c35024224  2 days ago   636MB
<none>                                         <none>   bfc7ead597e5  2 days ago   636MB
openjdk                                         11      455eceaf4f2  3 days ago   627MB
docker/desktop-storage-provisioner           v1.1    e704287ce753  5 months ago  41.8MB
docker/desktop-vpnkit-controller             v1.0    79da37e5a3aa  6 months ago  36.6MB
docker/desktop-kubernetes                    kubernetes-v1.16.5-cni-v0.7.5-critools-v1.15.0  a86647f0b376  7 months ago  279MB
k8s.gcr.io/kube-scheduler                   v1.16.5  b4d073a9efda  7 months ago  83.5MB
k8s.gcr.io/kube-proxy                        v1.16.5  0ee1b8a3ebe0  7 months ago  82.7MB
k8s.gcr.io/kube-controller-manager          v1.16.5  441835dd2301  7 months ago  151MB
k8s.gcr.io/kube-apiserver                  v1.16.5  fc838b21afbb  7 months ago  159MB
docker/kube-compose-controller              v0.4.25-alpha1 129151cdf35f  10 months ago 35.6MB
docker/kube-compose-api-server              v0.4.25-alpha1 989749268895  10 months ago 50.7MB
docker/kube-compose-installer               v0.4.25-alpha1 2a71ac5a1359  10 months ago 42.3MB
k8s.gcr.io/etcd                            3.3.15-0   b2756210eeab  12 months ago 247MB
k8s.gcr.io/kube-proxy                      v1.14.6    ed8adf767eeb  12 months ago 82.1MB
k8s.gcr.io/kube-apiserver                 v1.14.6    0e422c9884cf  12 months ago 209MB
k8s.gcr.io/kube-scheduler                  v1.14.6    d27987bc993e  12 months ago 81.6MB
k8s.gcr.io/kube-controller-manager         v1.14.6    4bb274b1f2c3  12 months ago 157MB
k8s.gcr.io/coredns                         1.6.2     bf261d157914  12 months ago 44.1MB
docker/kube-compose-controller              v0.4.23    a8c3d87a58e7  15 months ago 35.3MB
docker/kube-compose-api-server              v0.4.23    f3591b2cb223  15 months ago 49.9MB
k8s.gcr.io/coredns                         1.3.1     eb516548c180  19 months ago 40.3MB
k8s.gcr.io/etcd                            3.3.10    2c4adeb21b4f  21 months ago 258MB
k8s.gcr.io/pause                           3.1      da86e6ba6ca1  2 years ago  742kB
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> ping 9092
```

Generalized commands used:

docker rmi <image>

docker rmi -f <image>

docker rm <container>

docker rm -f <container>

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker rm -f 942ef9467464  
942ef9467464
```

```
PS C:\Users\svemala\eclipse-workspace\subbu-case-study> docker run -p 9092:8080 subbudockerhub/subbu-casestudy-microservices-docker-dockerhub.jar
```

docker images

docker ps

docker build -t <jar name> .

docker run -p 9092:8080 <image>

Kill the tasks if the port has been used by other services - optional:

```
C:\Users\svemala>netstat -ano | findstr :9080
  TCP    0.0.0.0:9080          0.0.0.0:0              LISTENING      31576
  TCP    [::]:9080            [::]:0                LISTENING      31576
```

```
C:\Users\svemala>taskkill /PID 31576 /F
SUCCESS: The process with PID 31576 has been terminated.
```

```
C:\Users\svemala>
```

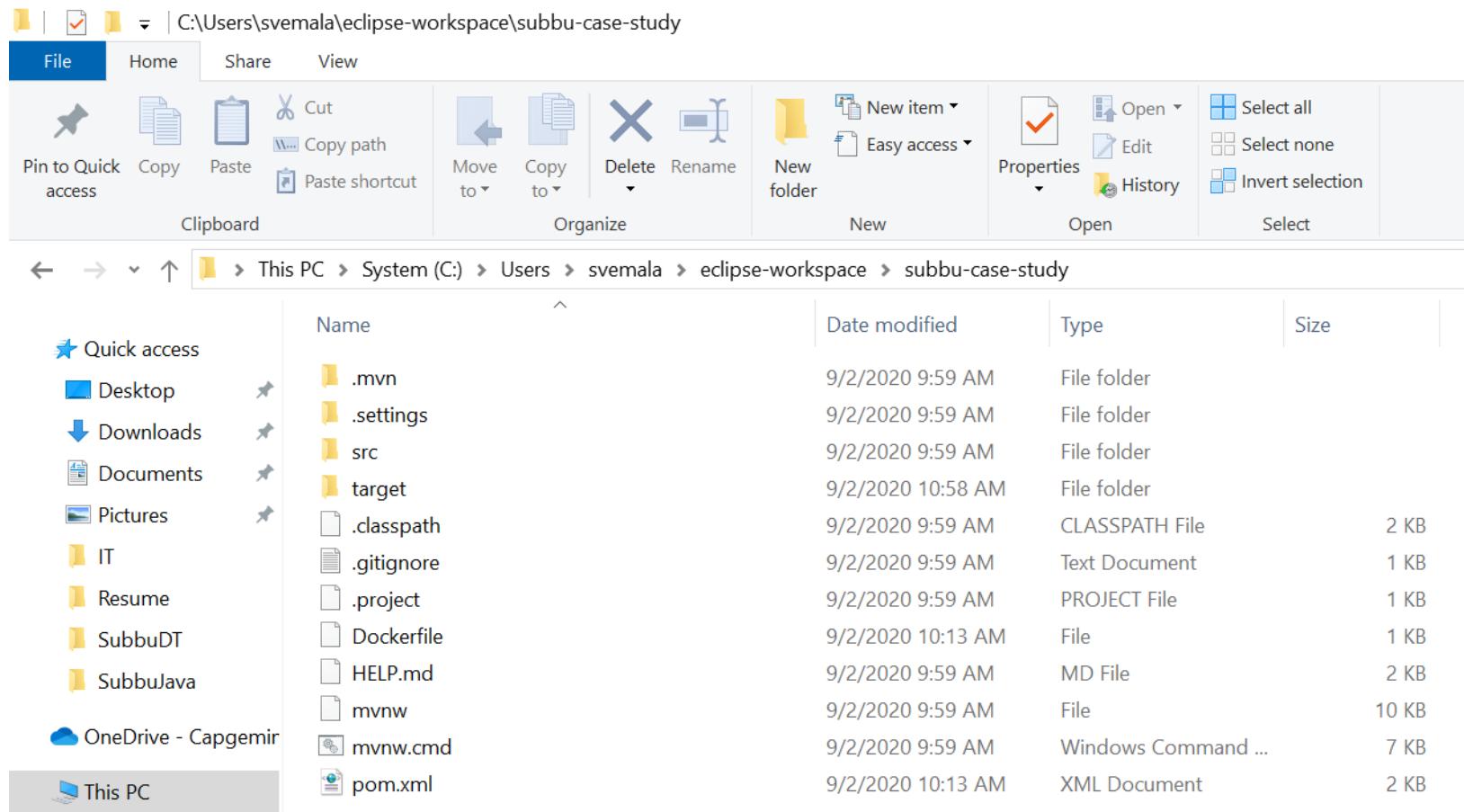
Kill the tasks if the port has been used by other services - optional:

```
C:\Users\svemala>netstat -ano | findstr :9080  
TCP 0.0.0.0:9080 0.0.0.0:0 LISTENING 31576  
TCP [::]:9080 [::]:0 LISTENING 31576
```

```
C:\Users\svemala>taskkill /PID 31576 /F  
SUCCESS: The process with PID 31576 has been terminated.
```

```
C:\Users\svemala>
```

C:\Users\svemala\eclipse-workspace\subbu-case-study



Appendix:

Download the code from public GitHub:

1. HTTPS:

<https://github.com/subbugh/java-microservices-springboot-docker-dockerhub.git>

2. SSH:

<git@github.com:subbugh/java-microservices-springboot-docker-dockerhub.git>

3. Code Zip file:



java-microservices-springboot-docker-dockerhub-master.zip

4. Detailed Logs:



dockerhub_ps_logs.txt