

Step-by-Step Guide to Deploying a Spring Boot Application with Docker and Kubernetes

1. Initialize and Clone the Repository

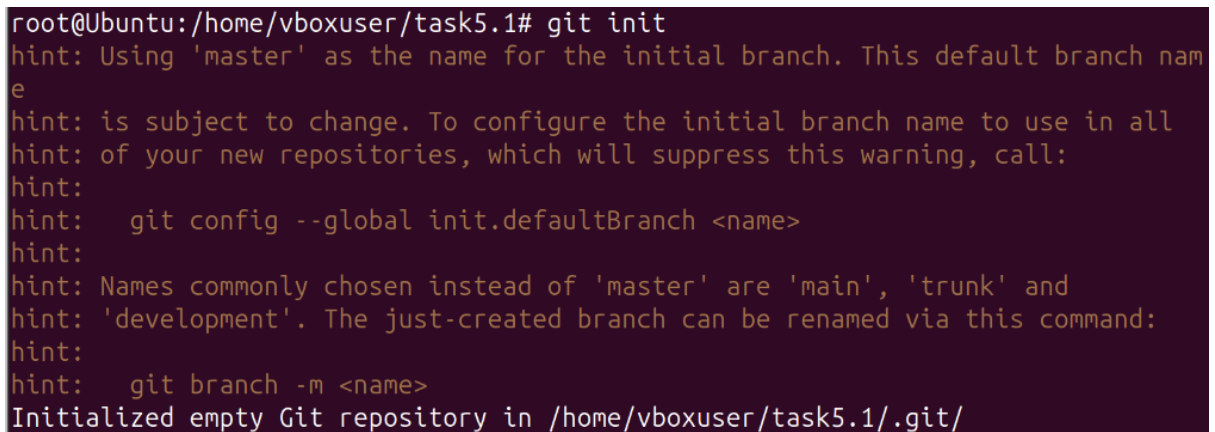
Initializes a new Git repository.

Clones the Spring Framework PetClinic project from GitHub.

Code:

```
git init
git clone "https://github.com/AranganathanPrakash/spring-framework-petclinic"
```

Screenshot:



```
root@Ubuntu:/home/vboxuser/task5.1# git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint:   git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint:   git branch -m <name>
Initialized empty Git repository in /home/vboxuser/task5.1/.git/
```

2. Navigate to the Project Directory

Moves into the cloned repository folder.

Code:

```
cd spring-framework-petclinic
```

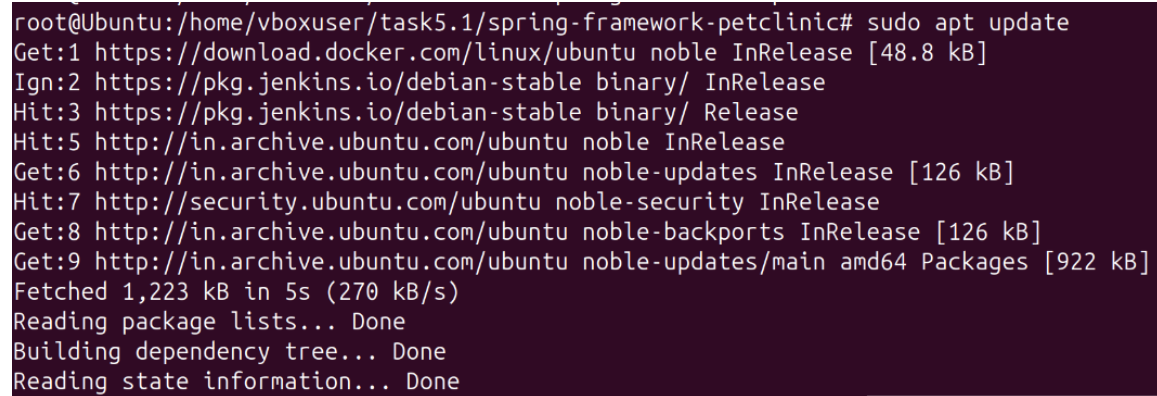
3. Update System Packages

Updates the package list to ensure the latest versions are available.

Code:

```
sudo apt update
```

Screenshot:

A terminal window with a dark purple background and light green text. The prompt is 'root@Ubuntu:/home/vboxuser/task5.1/spring-framework-petclinic#'. The command 'sudo apt update' has been executed. The output shows the system fetching package lists from various sources, including Docker, Jenkins, and the Ubuntu archive. It lists the size of the fetched data for each source and the total size of the package lists. The process concludes with 'Reading package lists... Done', 'Building dependency tree... Done', and 'Reading state information... Done'.

```
root@Ubuntu:/home/vboxuser/task5.1/spring-framework-petclinic# sudo apt update
Get:1 https://download.docker.com/linux/ubuntu noble InRelease [48.8 kB]
Ign:2 https://pkg.jenkins.io/debian-stable binary/ InRelease
Hit:3 https://pkg.jenkins.io/debian-stable binary/ Release
Hit:5 http://in.archive.ubuntu.com/ubuntu noble InRelease
Get:6 http://in.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Hit:7 http://security.ubuntu.com/ubuntu noble-security InRelease
Get:8 http://in.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [922 kB]
Fetched 1,223 kB in 5s (270 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
```

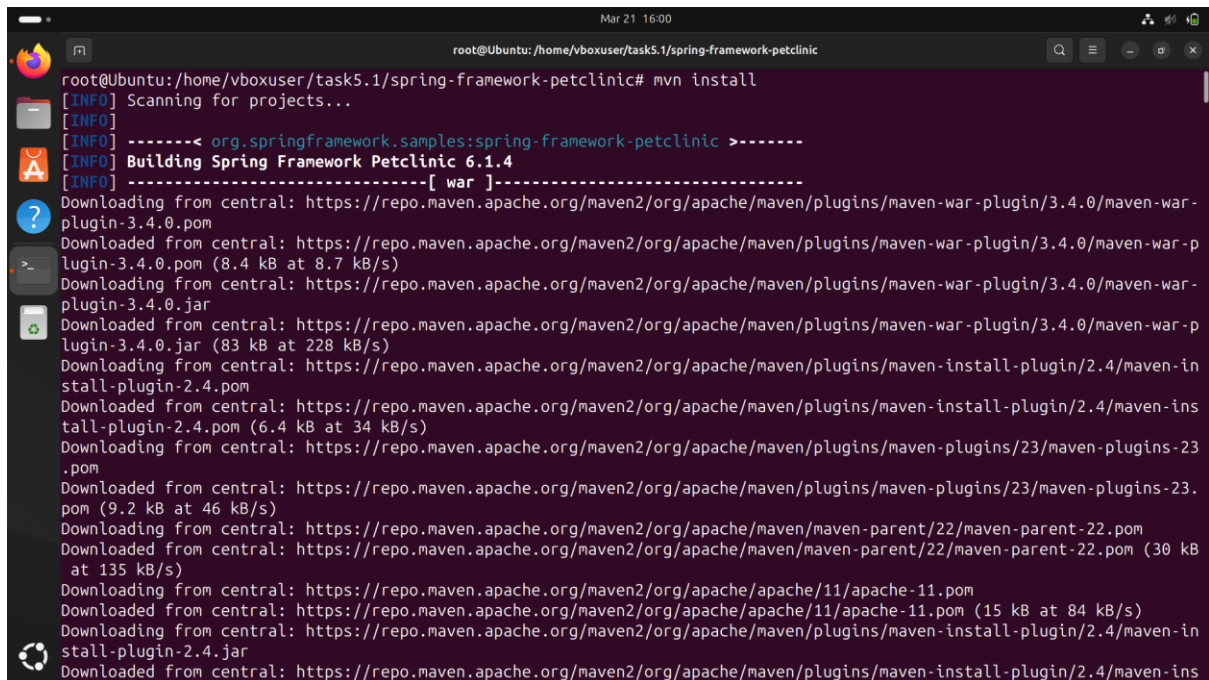
4. Install Maven

Installs Apache Maven, required for building the Spring Boot application.

Code:

```
sudo apt install maven
```

Screenshot:

A terminal window titled 'root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic' showing the output of the 'mvn install' command. The output includes status messages like '[INFO] Scanning for projects...', '[INFO] Building Spring Framework Petclinic 6.1.4', and '[INFO] [war]'. It also lists several download progress bars for Maven plugins and parent POMs from the central repository, such as 'maven-war-plugin-3.4.0.pom', 'maven-war-plugin-3.4.0.jar', 'maven-install-plugin-2.4.pom', 'maven-install-plugin-2.4.jar', 'maven-plugins-23.pom', 'maven-parent-22.pom', and 'apache-11.pom'. The window has a dark theme and standard Ubuntu window controls.

```
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# mvn install
[INFO] Scanning for projects...
[INFO]
[INFO] -----< org.springframework.samples:spring-framework-petclinic >-----
[INFO] Building Spring Framework Petclinic 6.1.4
[INFO] -----[ war ]-----
[INFO]
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-war-plugin/3.4.0/maven-war-plugin-3.4.0.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-war-plugin/3.4.0/maven-war-plugin-3.4.0.pom (8.4 kB at 8.7 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-war-plugin/3.4.0/maven-war-plugin-3.4.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-war-plugin/3.4.0/maven-war-plugin-3.4.0.jar (83 kB at 228 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.4/maven-install-plugin-2.4.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.4/maven-install-plugin-2.4.pom (6.4 kB at 34 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/23/maven-plugins-23.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/23/maven-plugins-23.pom (9.2 kB at 46 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/22/maven-parent-22.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/22/maven-parent-22.pom (30 kB at 135 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/apache/11/apache-11.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/11/apache-11.pom (15 kB at 84 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.4/maven-install-plugin-2.4.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.4/maven-install-plugin-2.4.jar
```

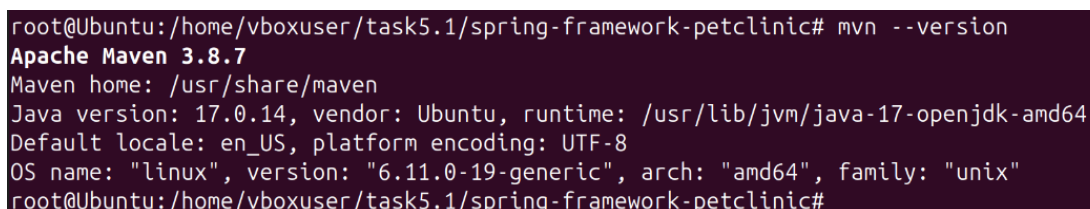
5. Verify Maven Installation

Checks if Maven is installed correctly and displays the version.

Code:

```
mvn --version
```

ScreenShot:

A terminal window showing the output of the 'mvn --version' command. The output displays the Apache Maven version as 3.8.7, the Maven home directory as /usr/share/maven, the Java version as 17.0.14, and the default locale as en_US. The window has a dark theme and standard Ubuntu window controls.

```
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# mvn --version
Apache Maven 3.8.7
Maven home: /usr/share/maven
Java version: 17.0.14, vendor: Ubuntu, runtime: /usr/lib/jvm/java-17-openjdk-amd64
Default locale: en_US, platform encoding: UTF-8
OS name: "linux", version: "6.11.0-19-generic", arch: "amd64", family: "unix"
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic#
```

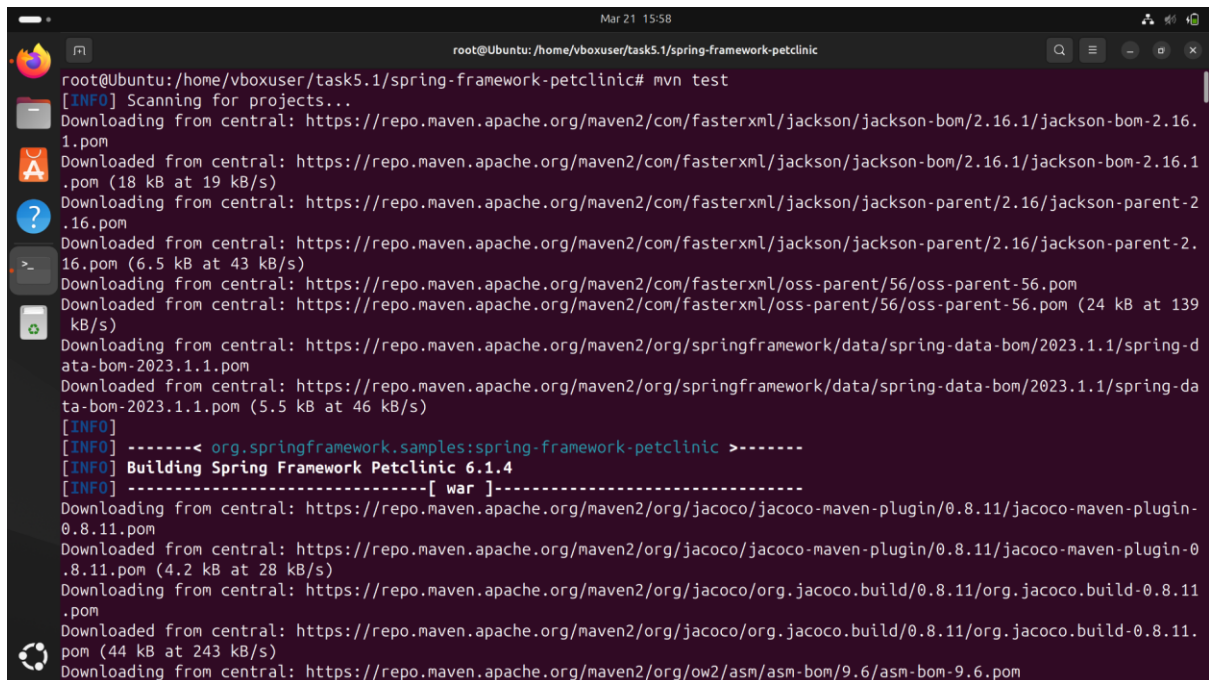
6. Run Tests (Optional)

Executes unit tests to ensure the application works correctly.

Code:

```
mvn test
```

Screenshot:

A terminal window screenshot showing the output of the 'mvn test' command. The terminal title is 'root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic'. The output shows the Maven process downloading various dependencies from the central repository, including Jackson, Spring Data, and Jacoco. It then proceeds to build the 'org.springframework.samples:spring-framework-petclinic' project, specifically building the 'war' package. The terminal output is as follows:

```
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# mvn test
[INFO] Scanning for projects...
Downloading from central: https://repo.maven.apache.org/maven2/com/fasterxml/jackson/jackson-bom/2.16.1/jackson-bom-2.16.1.pom
Downloaded from central: https://repo.maven.apache.org/maven2/com/fasterxml/jackson/jackson-bom/2.16.1/jackson-bom-2.16.1.pom (18 kB at 19 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/com/fasterxml/jackson/jackson-parent/2.16/jackson-parent-2.16.pom
Downloaded from central: https://repo.maven.apache.org/maven2/com/fasterxml/jackson/jackson-parent/2.16/jackson-parent-2.16.pom (6.5 kB at 43 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/com/fasterxml/oss-parent/56/oss-parent-56.pom
Downloaded from central: https://repo.maven.apache.org/maven2/com/fasterxml/oss-parent/56/oss-parent-56.pom (24 kB at 139 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/springframework/data/spring-data-bom/2023.1.1/spring-data-bom-2023.1.1.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/springframework/data/spring-data-bom/2023.1.1/spring-data-bom-2023.1.1.pom (5.5 kB at 46 kB/s)
[INFO] -----< org.springframework.samples:spring-framework-petclinic >-----
[INFO] Building Spring Framework Petclinic 6.1.4
[INFO] -----[ war ]-----
Downloading from central: https://repo.maven.apache.org/maven2/org/jacoco/jacoco-maven-plugin/0.8.11/jacoco-maven-plugin-0.8.11.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/jacoco/jacoco-maven-plugin/0.8.11/jacoco-maven-plugin-0.8.11.pom (4.2 kB at 28 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/jacoco/org.jacoco.build/0.8.11/org.jacoco.build-0.8.11.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/jacoco/org.jacoco.build/0.8.11/org.jacoco.build-0.8.11.pom (44 kB at 243 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/ow2/asm/asm-bom/9.6/asm-bom-9.6.pom
```

7. Clean and Build the Application

mvn clean: Cleans previous builds.

mvn install: Compiles and packages the application.

mvn package: Generates the final JAR/WAR file in the **target/** directory.

Code:

```
mvn clean
```

```
mvn install
```

```
mvn package
```

Screenshot:

```
Mar 21 15:59
root@Ubuntu: /home/vboxuser/tasks5.1/spring-framework-petclinic

root@Ubuntu:/home/vboxuser/tasks5.1/spring-framework-petclinic# mvn clean
[INFO] Scanning for projects...
[INFO]
[INFO] -----< org.springframework.samples:spring-framework-petclinic >-----
[INFO] Building Spring Framework Petclinic 6.1.4
[INFO] -----[ war ]-----
[INFO]
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/2.5/maven-clean-plugin-2.5.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/2.5/maven-clean-plugin-2.5.pom (3.9 kB at 3.4 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/22/maven-plugins-22.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/22/maven-plugins-22.pom (13 kB at 65 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/21/maven-parent-21.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/21/maven-parent-21.pom (26 kB at 133 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/10/apache-10.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/10/apache-10.pom (15 kB at 89 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/2.5/maven-clean-plugin-2.5.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/2.5/maven-clean-plugin-2.5.jar (25 kB at 129 kB/s)
[INFO]
[INFO] --- maven-clean-plugin:2.5:clean (default-clean) @ spring-framework-petclinic ---
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-plugin-api/2.0.6/maven-plugin-api-2.0.6.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-plugin-api/2.0.6/maven-plugin-api-2.0.6.pom (1.5 kB at 8.2 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven/2.0.6/maven-2.0.6.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven/2.0.6/maven-2.0.6.pom (9.0 kB at 56 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/5/maven-parent-5.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/5/maven-parent-5.pom (15 kB at 80 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/3/apache-3.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/3/apache-3.pom (3.4 kB at 21 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-utils/3.0/plexus-utils-3.0.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-utils/3.0/plexus-utils-3.0.pom (4.1 kB at 24 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/sonatype/spice/spice-parent/16/spice-parent-16.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/sonatype/spice/spice-parent/16/spice-parent-16.pom (8.4 kB at 44 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-plugin-api/2.0.6/maven-plugin-api-2.0.6.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-utils/3.0/plexus-utils-3.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-plugin-api/2.0.6/maven-plugin-api-2.0.6.jar (13 kB at 58 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-utils/3.0/plexus-utils-3.0.jar (226 kB at 355 kB/s)
[INFO] Deleting /home/vboxuser/tasks5.1/spring-framework-petclinic/target
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 4.392 s
[INFO] Finished at: 2025-03-21T15:59:18Z
[INFO]
root@Ubuntu:/home/vboxuser/tasks5.1/spring-framework-petclinic#
```

```
Mar 21 16:00
root@Ubuntu: /home/vboxuser/tasks5.1/spring-framework-petclinic

root@Ubuntu:/home/vboxuser/tasks5.1/spring-framework-petclinic# mvn install
[INFO] Scanning for projects...
[INFO]
[INFO] -----< org.springframework.samples:spring-framework-petclinic >-----
[INFO] Building Spring Framework Petclinic 6.1.4
[INFO] -----[ war ]-----
[INFO]
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-war-plugin/3.4.0/maven-war-plugin-3.4.0.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-war-plugin/3.4.0/maven-war-plugin-3.4.0.pom (8.4 kB at 8.7 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-war-plugin/3.4.0/maven-war-plugin-3.4.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-war-plugin/3.4.0/maven-war-plugin-3.4.0.jar (83 kB at 228 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.4/maven-install-plugin-2.4.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.4/maven-install-plugin-2.4.pom (6.4 kB at 34 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/23/maven-plugins-23.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/23/maven-plugins-23.pom (9.2 kB at 46 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/22/maven-parent-22.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/22/maven-parent-22.pom (30 kB at 135 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/11/apache-11.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/11/apache-11.pom (15 kB at 84 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.4/maven-install-plugin-2.4.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-install-plugin/2.4/maven-install-plugin-2.4.jar (226 kB at 355 kB/s)
```



```
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# mvn package
[INFO] Scanning for projects...
[INFO] -----< org.springframework.samples:spring-framework-petclinic >-----
[INFO] Building Spring Framework Petclinic 6.1.4
[INFO] -----[ war ]-----
[INFO] --- maven-enforcer-plugin:3.4.1:enforce (enforce-maven) @ spring-framework-petclinic ---
[INFO] Rule 0: org.apache.maven.enforcer.rules.version.RequireMavenVersion passed
[INFO] --- jacoco-maven-plugin:0.8.11:prepare-agent (prepare-agent) @ spring-framework-petclinic ---
[INFO] argLine set to -javaagent:/root/.m2/repository/org/jacoco/org.jacoco.agent/0.8.11/org.jacoco.agent-0.8.11-runtime.jar=destfile=/home/vboxuser/task5.1/spring-framework-petclinic/target/jacoco.exec
[INFO] --- maven-resources-plugin:3.3.1:resources (default-resources) @ spring-framework-petclinic ---
[INFO] Copying 21 resources from src/main/resources to target/classes
[INFO] --- maven-compiler-plugin:3.11.0:compile (default-compile) @ spring-framework-petclinic ---
[INFO] Nothing to compile - all classes are up to date
[INFO] --- maven-resources-plugin:3.3.1:testResources (default-testResources) @ spring-framework-petclinic ---
[INFO] Copying 11 resources from src/test/java to target/test-classes
[INFO] Copying 1 resource from src/test/resources to target/test-classes
[INFO] --- maven-compiler-plugin:3.11.0:testCompile (default-testCompile) @ spring-framework-petclinic ---
[INFO] Nothing to compile - all classes are up to date
[INFO] --- maven-surefire-plugin:3.2.3:test (default-test) @ spring-framework-petclinic ---
[INFO] Using auto detected provider org.apache.maven.surefire.junitplatform.JUnitPlatformProvider
```

8. Verify the Built Application

Navigates to the **target** folder where the compiled application is stored.

Code:

```
cd target
ls
cd ..
```

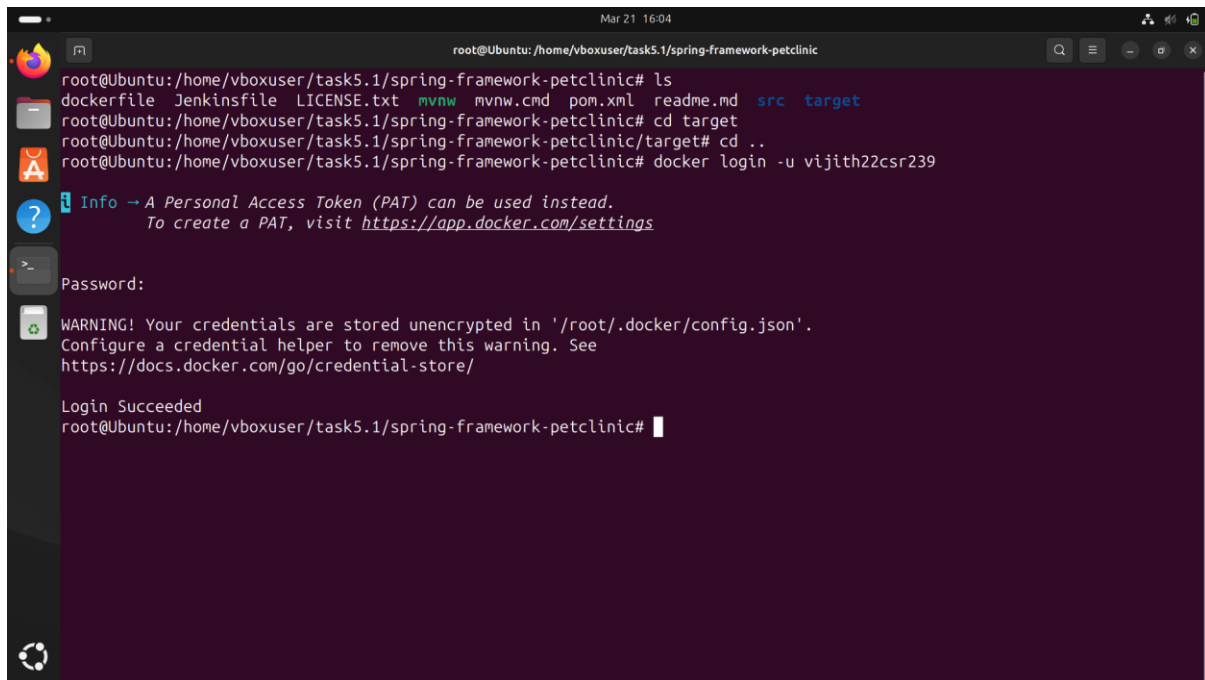
9. Login to Docker

Logs into Docker Hub to push container images.

Code:

```
docker login -u vijith22csr239
```

Screenshot:

A terminal window screenshot showing the Docker login process. The terminal title is 'root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic'. The user runs 'ls' showing files like 'dockerfile', 'Jenkinsfile', 'LICENSE.txt', 'mvnw', 'mvnw.cmd', 'pom.xml', 'readme.md', 'src', and 'target'. Then they run 'cd target' and 'cd ..'. Finally, they run 'docker login -u vijith22csr239'. The terminal shows an info message about PAT, a password prompt, a warning about unencrypted credentials, and a successful login message.

```
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# ls
dockerfile Jenkinsfile LICENSE.txt mvnw mvnw.cmd pom.xml readme.md src target
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# cd target
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic/target# cd ..
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# docker login -u vijith22csr239

Info → A Personal Access Token (PAT) can be used instead.
To create a PAT, visit https://app.docker.com/settings

Password:

WARNING! Your credentials are stored unencrypted in '/root/.docker/config.json'.
Configure a credential helper to remove this warning. See
https://docs.docker.com/go/credential-store/

Login Succeeded
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic#
```

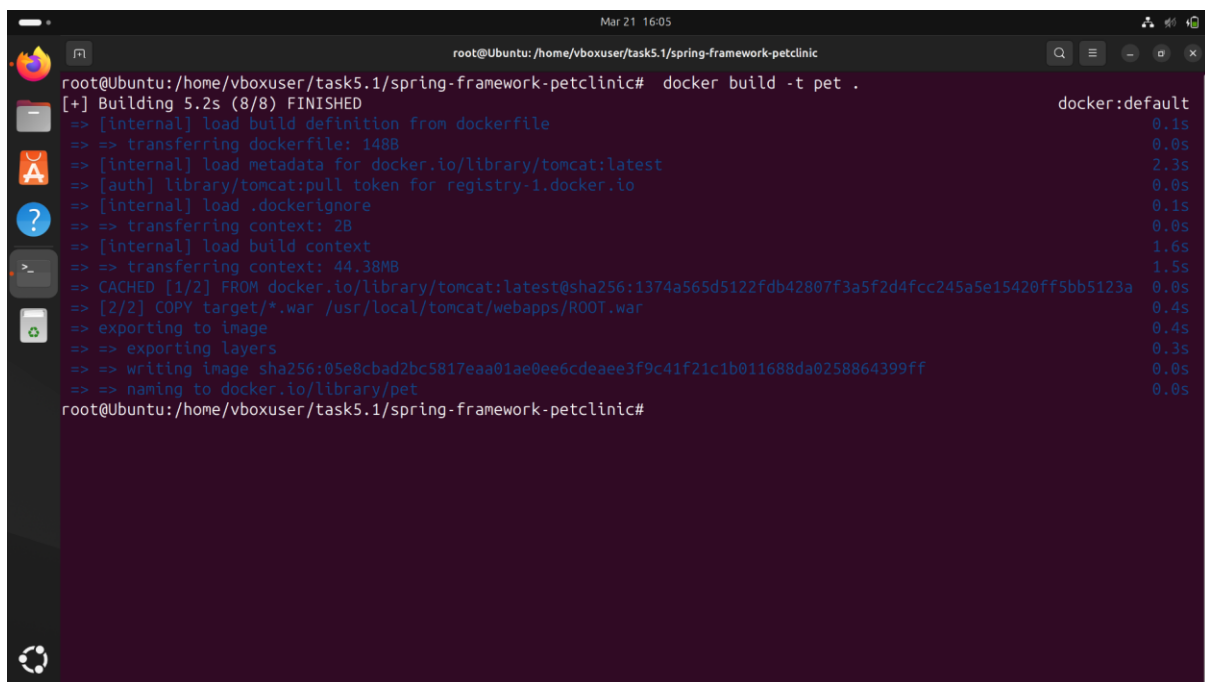
10. Build Docker Image

Builds a Docker image with the tag `pet` from the project directory.

Code:

```
docker build -t pet .
```

Screenshot:



```
root@Ubuntu:/home/vboxuser/task5.1/spring-framework-petclinic# docker build -t pet .
[+] Building 5.2s (8/8) FINISHED
=> [internal] load build definition from dockerfile                                0.1s
=> => transferring dockerfile: 148B                                              0.0s
=> [internal] load metadata for docker.io/library/tomcat:latest                  2.3s
=> [auth] library/tomcat:pull token for registry-1.docker.io                    0.0s
=> [internal] load .dockerignore                                                  0.1s
=> => transferring context: 2B                                                    0.0s
=> [internal] load build context                                                  1.6s
=> => transferring context: 44.38MB                                              1.5s
=> CACHED [1/2] FROM docker.io/library/tomcat:latest@sha256:1374a565d5122fdb42807f3a5f2d4fcc245a5e15420ff5bb5123a 0.0s
=> [2/2] COPY target/*.war /usr/local/tomcat/webapps/ROOT.war                  0.4s
=> exporting to image                                                            0.4s
=> => exporting layers                                                            0.3s
=> => writing image sha256:05e8cbad2bc5817eaa01ae0ee6cdeae3f9c41f21c1b011688da0258864399ff 0.0s
=> => naming to docker.io/library/pet                                           0.0s
root@Ubuntu:/home/vboxuser/task5.1/spring-framework-petclinic#
```


11. Tag and Push Image to Docker Hub

Tags the image for Docker Hub.

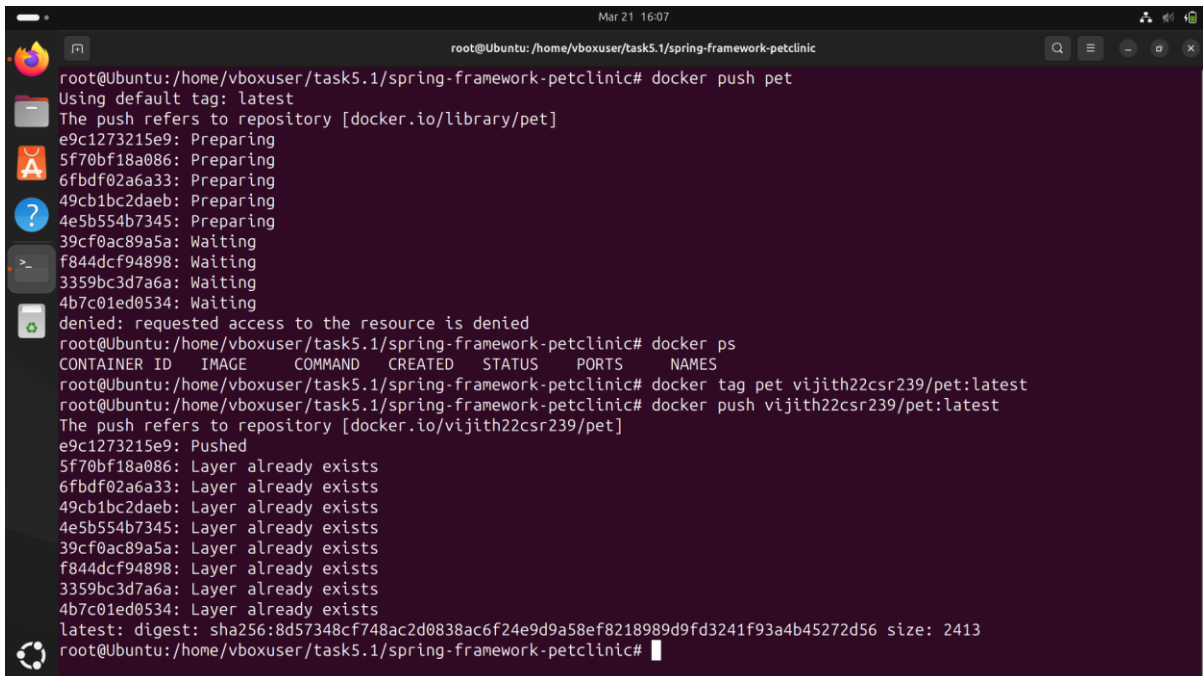
Pushes the image to your Docker Hub repository.

Code:

```
docker tag pet vijith22csr239/pet:latest
```

```
docker push vijith22csr239/pet:latest
```

Screenshot:

A terminal window screenshot showing the execution of Docker commands. The terminal title is 'root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic'. The user runs 'docker push pet', which fails with a 'denied: requested access to the resource is denied' error. Then, the user runs 'docker ps', showing a table of containers. Next, the user runs 'docker tag pet vijith22csr239/pet:latest'. Finally, the user runs 'docker push vijith22csr239/pet:latest', which succeeds, pushing the image to Docker Hub. The output shows the image layers being pushed and the final digest and size of the image.

```
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# docker push pet
Using default tag: latest
The push refers to repository [docker.io/library/pet]
e9c1273215e9: Preparing
5f70bf18a086: Preparing
6fbd02a6a33: Preparing
49cb1bc2daeb: Preparing
4e5b554b7345: Preparing
39cf0ac89a5a: Waiting
f844dcf94898: Waiting
3359bc3d7a6a: Waiting
4b7c01ed0534: Waiting
denied: requested access to the resource is denied
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# docker tag pet vijith22csr239/pet:latest
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic# docker push vijith22csr239/pet:latest
The push refers to repository [docker.io/vijith22csr239/pet]
e9c1273215e9: Pushed
5f70bf18a086: Layer already exists
6fbd02a6a33: Layer already exists
49cb1bc2daeb: Layer already exists
4e5b554b7345: Layer already exists
39cf0ac89a5a: Layer already exists
f844dcf94898: Layer already exists
3359bc3d7a6a: Layer already exists
4b7c01ed0534: Layer already exists
latest: digest: sha256:8d57348cf748ac2d0838ac6f24e9d9a58ef8218989d9fd3241f93a4b45272d56 size: 2413
root@Ubuntu: /home/vboxuser/task5.1/spring-framework-petclinic#
```

12. Start Minikube

Starts a Minikube cluster for Kubernetes.

Checks if Minikube is running properly.

Code:

```
minikube start
```

```
minikube status
```

13. Verify Kubernetes Nodes

Lists available Kubernetes nodes.

Code:

```
kubectl get nodes
```

ScreenShot:



```
mathav@Mathav-Desktop: ~$ minikube start
🐹 minikube v1.35.0 on Ubuntu 24.04 (amd64)
🔧 Using the docker driver based on existing profile
👉 Starting "minikube" primary control-plane node in "minikube" cluster
📡 Pulling base image v0.0.46 ...
🔄 Restarting existing docker container for "minikube" ...
❗ Failing to connect to https://registry.k8s.io/ from inside the minikube container
💡 To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking/proxy/
📡 Preparing Kubernetes v1.32.0 on Docker 27.4.1 ...
🔍 Verifying Kubernetes components...
  • Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌞 Enabled addons: default-storageclass, storage-provisioner
🎉 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
```

14. Deploy the Application on Kubernetes & Expose the Application

Creates a Kubernetes deployment using your Docker image.

Exposes the deployment as a service, making it accessible via Minikube.

Lists all running pods to verify the deployment is successful.

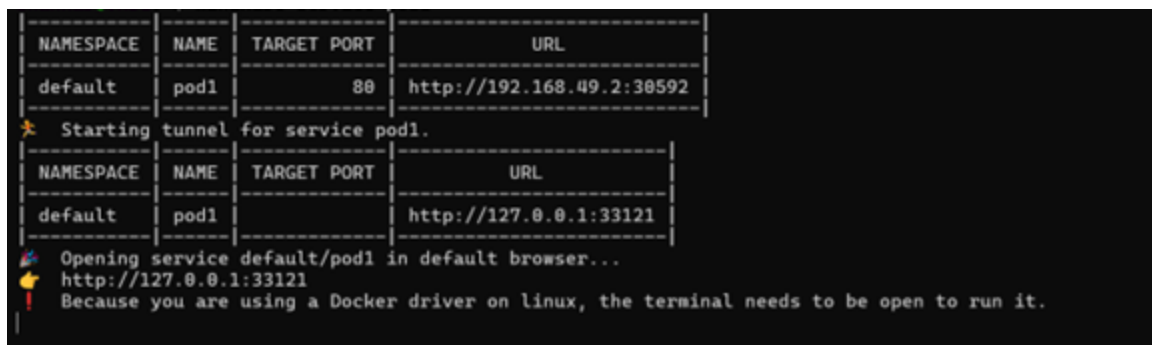
Code:

```
kubectl create deployment pet --image=vijith22csr239/pet --port=8080
```

```
kubectl expose deployment pet --port=8080 --type=NodePort
```

```
kubectl get pods
```

Screenshot:



```
|-----|
| NAMESPACE | NAME | TARGET PORT | URL |
|-----|
| default | pod1 | 80 | http://192.168.49.2:30592 |
|-----|
★ Starting tunnel for service pod1.
|-----|
| NAMESPACE | NAME | TARGET PORT | URL |
|-----|
| default | pod1 | | http://127.0.0.1:33121 |
|-----|
🌈 Opening service default/pod1 in default browser...
👉 http://127.0.0.1:33121
! Because you are using a Docker driver on linux, the terminal needs to be open to run it.
```

16. Access the Application

Opens the application in the browser via Minikube.

Code:

minikube service pet

Screenshot:

