# **Devops Intern Assessment**

**Project:** CI/CD Implementation for Java App using Jenkins, Docker, and Kubernetes

### **Tools and Services Used**

- 1. GitHub Source code management (repository hosting)
- 2. Jenkins CI/CD pipeline automation
- 3. Maven Java build tool
- 4. Docker Containerization platform
- 5. Kubernetes (Minikube or local cluster) Application deployment and orchestration

# **Step 1: Clone the GitHub Repository**

- 1. Go to GitHub and fork or create a new repository for your project.
- 2. Clone the sample Java "Hello World" app (or use the provided one).

### **Command:**

git clone https://github.com/YOUR USERNAME/hello-world-java.git

3. Navigate to the project directory.

### **Command:**

cd hello-world-java

# **Step 2: Create Maven Build Setup**

- 1. Ensure the pom.xml file exists and is correct.
- 2. To verify the build, use Maven:

### **Command:**

mvn clean package

3. The generated .jar file should be in the target/ folder.

## **Step 3: Set Up Jenkins**

- 1. Install Jenkins and configure it.
- 2. Create a new Freestyle or Declarative Pipeline project.

## **Jenkins Job Configuration:**

• Source Code Management: Git

- o Repository URL: https://github.com/YOUR\_USERNAME/hello-world-java.git
- Build Step:
  - o Execute Shell Command: mvn clean package
- Post-build Action:
  - o Archive Artifacts: target/\*.jar

# **Step 4: Dockerize the Application**

- 1. Create a file named Dockerfile in the project root directory.
- 2. Use the following Dockerfile contents:

```
FROM openjdk:17
COPY target/*.jar app.jar
ENTRYPOINT ["java", "-jar", "app.jar"]
```

3. Build the Docker image.

#### **Command:**

```
docker build -t hello-world-app .
```

4. Run the Docker container locally to test.

### **Command:**

```
docker run -p 8080:8080 hello-world-app
```

5. Test by accessing: http://localhost:8080 (or check logs to verify output).

# Step 5: Push Code and Dockerfile to GitHub

1. Add all changes:

### **Commands:**

```
git add .
git commit -m "Added Dockerfile and Maven setup"
git push origin main
```

## **Step 6: Kubernetes Deployment (Minikube or Local Cluster)**

1. Start Minikube:

### **Command:**

minikube start

## 2. Create a deployment.yaml file:

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: hello-world-deployment
spec:
  replicas: 1
  selector:
    matchLabels:
      app: hello-world
  template:
    metadata:
      labels:
       app: hello-world
    spec:
      containers:
      - name: hello-world
        image: hello-world-app:latest
        imagePullPolicy: Never
        ports:
        - containerPort: 8080
```

## 3. Create a service.yaml file:

```
apiVersion: v1
kind: Service
metadata:
  name: hello-world-service
spec:
  type: NodePort
  selector:
    app: hello-world
  ports:
  - protocol: TCP
    port: 80
    targetPort: 8080
    nodePort: 30036
```

## 4. Apply the deployment and service:

## **Commands:**

```
kubectl apply -f deployment.yaml
kubectl apply -f service.yaml
```

# 5. Verify the pods and services:

## **Commands:**

```
kubectl get pods
kubectl get svc
```

## 6. To access the app:

### **Command:**

minikube service hello-world-service

Or manually: http://\$(minikube ip):30036

**Output:** 

















