**DevOps Assignments (Local Setup, No Cloud Required)**

**2. Kubernetes Deployment with Minikube**

**Objective:** Deploy a Dockerized app to a local Kubernetes cluster using Minikube or

kind.

**• Tasks:**

**o** Dockerize a simple app

**o** Create Kubernetes manifests (Deployment, Service)

**o** Deploy to Minikube or kind

**o** Use kubectl to verify pods/services

**Setup instructions :**

Deploy a Dockerized application to a **local Kubernetes cluster** using **Minikube**.

#### **Dockerize the App**

Ensure your app has a **Dockerfile** (as used earlier).

**Build the Docker image inside Minikube’s Docker environment**:  
 Run these commands in your terminal:  
  
eval $(minikube docker-env) # Point Docker to Minikube’s Docker daemon

docker build -t sample-app:latest # Build the image locally

#### **Create Kubernetes Manifests**

**Create a Deployment file** named **deployment.yaml**:  
  
apiVersion: apps/v1

kind: Deployment

metadata:

name: my-node-deployment

spec:

replicas: 2

selector:

matchLabels:

app: my-node-app

template:

metadata:

labels:

app: my-node-app

spec:

containers:

- name: my-node-container

image: my-node-app

imagePullPolicy: Never # Required for local images

ports:

- containerPort: 3000

**Create a Service file** named **service.yaml:**

apiVersion: v1

kind: Service

metadata:

name: my-node-service

spec:

type: NodePort

selector:

app: my-node-app

ports:

- port: 3000

targetPort: 3000

nodePort: 30080

#### **Deploy to Minikube**

Apply the Kubernetes configuration files using **kubectl:**

kubectl apply -f deployment.yaml

kubectl apply -f service.yaml

#### **Verify the Deployment**

**Check the pods**:  
  
kubectl get pods

**Check the service and its exposed port**:  
  
kubectl get svc

**Access the application in your browser**:  
  
minikube service sample-app-service

This command opens the app URL (like http://127.0.0.1:30080) in your browser.