**Assignment: Application Deployment with Docker, Kubernetes, and CI/CD**

**Question 1: Containerize and Push the Application**

• Fork and clone a sample application repository (Java, Node.js, or Python preferred).

• Package the application as required (e.g., JAR, ZIP, etc.).

• Write a Dockerfile to containerize the application. • Build the Docker image and push it to DockerHub.

**Question 2: Kubernetes Deployment and Service Exposure**

• Create Kubernetes `deployment.yaml` to deploy your Docker image.

• Create `service.yaml` to expose it using NodePort.

• Apply both YAMLs using `kubectl`, and verify deployment.

• Use `curl` with public IP and node port to access the service.

**Question 3: Scale the Deployment**

• Scale the application to 3 replicas using `kubectl scale`.

• Validate scaling with `kubectl get pods`.

• Scale it back down to 1 replica.

**Question 4: Automate Deployment with Jenkins**

• Install Jenkins and create a Freestyle Job that:

- Pulls code from GitHub

- Builds and packages the application

- Builds and pushes the Docker image

- Applies Kubernetes deployment and service YAMLs

• Configure GitHub webhook to trigger Jenkins job on push.