Project: 1

Project Overview: This project involves creating a simple web application. We will set up a CI/CD pipeline with Jenkins, Dockerize the application, deploy it to a Kubernetes cluster.

Project Steps:

1. **Application Development**:
    - Create a simple web page
2. **Dockerization**:
    - Build the artifact by using Maven.
    - Create a Dockerfile and copy this artifact and build a Docker image.
    - Tag the Docker image.
    - Push it to docker Hub.
3. **Version Control**:
    - Initialize a Git repository and commit the project code.
    - Host the repository on a version control platform (e.g., GitHub, GitLab).
4. **Jenkins Setup**:
    - Install Jenkins on a server.
    - Install necessary plugins (e.g., Git, Ansible, Docker, Kubernetes, Pipeline).
    - Configure Jenkins to connect to your version control system.
5. **Jenkins Pipeline**:
    - Create a Jenkinsfile in the project root to define the CI/CD pipeline.
    - The pipeline should include stages for building the Docker image, running tests, and deploying to Kubernetes.
6. **Kubernetes Setup**:
    - Set up a Kubernetes cluster (e.g., using Minikube or a cloud provider such as AWS EKS).
    - Create Kubernetes deployment and service configurations (**kubernetes/deployment.yaml** and **kubernetes/service.yaml**).
7. **CI/CD Pipeline Execution**:
    - Jenkins should automatically trigger the pipeline whenever changes are pushed to the repository.

- The pipeline should build the Docker image, push it to docker hub and deploy the application to the Kubernetes cluster.

8. **Documentation**:

    - Maintain documentation in the **README.md** file, explaining the project structure, setup instructions, and how the CI/CD pipeline works.