Accuknox DevOps Trainee Practical Assessment

Problem Statement 1: Containerization and Deployment of Wisecow Application on Kubernetes

Objective: The primary objective is to containerize and deploy the Wisecow application, hosted in the specified GitHub repository, onto a Kubernetes environment with secure TLS communication.

Requirements:

1. **Dockerization:**
   - **Dockerfile Creation:**
     - Develop a Dockerfile to create a container image for the Wisecow application. The Dockerfile should include all necessary instructions to build and run the application in a containerized environment.
2. **Kubernetes Deployment:**
   - **Kubernetes Manifest Files:**
     - Create Kubernetes manifest files (YAML) to deploy the Wisecow application in a Kubernetes environment. These manifest files should define the deployment, service, and any other necessary resources.
   - **Kubernetes Service:**
     - Ensure that the Wisecow application is exposed as a Kubernetes service to allow external access.
3. **Continuous Integration and Deployment (CI/CD):**
   - **GitHub Actions Workflow:**
     - Implement a GitHub Actions workflow to automate the build and push of the Docker image to a container registry whenever changes are committed to the repository.
   - **Continuous Deployment (Challenge Goal):**
     - Configure the GitHub Actions workflow to automatically deploy the updated application to the Kubernetes environment after a successful image build.
4. **TLS Implementation (Challenge Goal):**
   - **Secure TLS Communication:**
     - Configure the Wisecow application to support secure TLS communication, ensuring that data transmitted to and from the application is encrypted.

Expected Artifacts:

1. **GitHub Repository:**
   - A private repository containing the following:
     - The source code of the Wisecow application.
     - A Dockerfile for containerizing the application.
     - Kubernetes manifest files for deploying the application.
     - CI/CD pipeline configuration.
     - A GitHub Actions workflow file to facilitate Continuous Integration and Deployment.
2. **Access Control:**
   - Ensure the GitHub repository is public.

End Goal: Successfully containerize and deploy the Wisecow application to the Kubernetes environment, with an automated CI/CD pipeline and secure TLS communication.

Problem Statement 2: Choose Any Two Objectives

Objective 1: System Health Monitoring Script

Develop a script (using Bash or Python) to monitor the health of a Linux system by checking the following metrics:

- CPU usage
- Memory usage
- Disk space
- Running processes

If any of these metrics exceed predefined thresholds (e.g., CPU usage > 80%), the script should send an alert to the console or a log file.

Objective 2: Automated Backup Solution

Create a script (using Bash or Python) to automate the backup of a specified directory to a remote server or cloud storage solution. The script should provide a report on the success or failure of the backup operation.

Objective 3: Log File Analyzer

Write a script (using Bash or Python) to analyze web server logs (e.g., Apache, Nginx) for common patterns such as:

- Number of 404 errors
- Most requested pages
- IP addresses with the most requests

The script should output a summarized report.

Objective 4: Application Health Checker

Develop a script (using Bash or Python) to check the uptime of an application and determine if it is functioning correctly. The script should:

- Assess the application's status by checking HTTP status codes.
- Detect if the application is 'up' (functioning correctly) or 'down' (unavailable or not responding).