DevOps Internship Assignment

Objective:

This assignment is designed to assess your fundamental **DevOps skills, problem-solving abilities, and hands-on experience** with **cloud infrastructure, CI/CD, security, automation, and MLOps.** Please complete the tasks below and submit your responses in a **GitHub repository** or as a document with supporting files.

Assignment Tasks:

1. Cloud Infrastructure & Deployment (Azure)

Task: Set up a simple web application (Node.js/Python) and deploy it on **Azure App Service or an Azure Virtual Machine**. Ensure that the application is accessible via a public URL.

✅ **Deliverables:**

- Architecture diagram of your setup
- Steps to deploy the application
- Azure configurations used (Resource Groups, Networking, etc.)
- Screenshots of a successful deployment

2. CI/CD Pipeline Implementation

Task: Create a **CI/CD pipeline** using **GitHub Actions/Jenkins/GitLab CI** to automate the deployment of the above web application.

✅ **Deliverables:**

- CI/CD pipeline YAML or Jenkinsfile
- Explanation of different pipeline stages (Build, Test, Deploy)
- How environment variables/secrets are managed

3. Security & Compliance (ISO, GDPR, SOC 2)

Task: Identify **three security risks** in DevOps workflows and propose **mitigation strategies** that align with **ISO 27001, GDPR, or SOC 2** compliance.

✅ **Deliverables:**

- A document outlining the risks and mitigation strategies
- Explanation of security best practices in cloud deployments

4. Monitoring & Logging

Task: Set up a **monitoring & logging system** using **Prometheus & Grafana OR ELK Stack** to track application performance & errors.

✅ **Deliverables:**

- Steps to configure monitoring/logging tools
- Dashboard screenshots showing application metrics
- Alert setup for critical issues

5. Database & Storage Optimization

Task: Optimize a **PostgreSQL or MongoDB** database for performance. Suggest indexing, query optimization, or data partitioning strategies.

✅ **Deliverables:**

- Explanation of optimization techniques
- Example queries before and after optimization

6. Automation & Scripting

Task: Write a **Bash or Python script** to automate server setup or log analysis.

✅ **Deliverables:**

- Script file (.sh or .py)
- Explanation of what the script does

7. Disaster Recovery & High Availability

Task: Explain how you would implement **backup & disaster recovery** strategies for an enterprise application in the cloud.

✅ **Deliverables:**

- DR strategy document (including RTO & RPO)
- Example of setting up automated backups in Azure

8. AI Model Deployment & MLOps

Task: Deploy a **sample AI model** using **Docker & Kubernetes** and expose it via an API endpoint.

✅ **Deliverables:**

- Dockerfile & Kubernetes YAML files
- Steps to deploy the model
- Screenshot of the model running on Kubernetes

Submission Guidelines:

1. Upload your work to **GitHub** (preferred) or submit a **zipped folder with necessary files.**
2. Ensure clear documentation for each task.
3. Email your submission to **hr@liaplus.com** with the subject: **"DevOps Assignment | {Candidate_name}"**.
4. Deadline: **48 hours from assignment receipt.**

Evaluation Criteria:

✅ Completeness & correctness of tasks
✅ Clarity in documentation & explanations
✅ Best practices in security, CI/CD, and automation
✅ Performance & efficiency in implementation

We look forward to seeing your **technical expertise and problem-solving skills!** 🚀