DEVOPS - EXERCISE

CHALLENGE OVERVIEW

Objective: Write the necessary configuration scripts for setting up a CI/CD pipeline and infrastructure deployment using AWS ECS, ensuring best practices for security, scalability, and maintainability.

SPECIFIC TASKS

DOCKERFILE CREATION:

- Modify a Dockerfile for a sample web application (if needed)
- The Dockerfile should be optimized for size, security, and build efficiency.

CI/CD PIPELINE USING GITHUB ACTIONS:

- Write a GitHub Actions workflow file that automates the following steps:
  - Testing: Include steps to run any sample tests.
  - Building: Docker image build process.
  - Publishing: Push the Docker image to Amazon ECR.

IAC USING TERRAFORM/CLOUDFORMATION:

- Write Terraform or CloudFormation scripts to set up:
  - An ECS Cluster with at least one service and task definition.
  - Necessary networking infrastructure (VPC, subnets, NAT Gateways, etc.).
  - An IAM role for ECS tasks with the least privilege access.
  - (Optional) Auto Scaling configuration.

DOCUMENTATION:

- Provide a README.md explaining:
  - The architecture and components used.
  - Instructions on how to run the IaC scripts and the CI/CD pipeline.
  - Any assumptions and design choices made.

DELIVERABLES

- Dockerfile
- .github/workflows/main.yml (or similar) for the GitHub Actions pipeline.
- main.tf (or respective CloudFormation files) for the AWS infrastructure.
- README.md with the necessary documentation.

ADDITIONAL NOTES

- **Security:** Emphasize secure coding practices. Expect the candidate to handle secrets securely and follow the principle of least privilege.
- **Testing:** Include a requirement for unit or integration tests within the pipeline.
- **Scalability:** Look for how they handle load variations (if including Auto Scaling) and manage resources.
- **Cost-efficiency:** Bonus points for addressing cost optimization (e.g., spot instances, efficient resource allocation).
- **Bonus:** Include setting up a basic monitoring/logging solution, or a database service if relevant.

EVALUATION CRITERIA

- **Code Quality:** Clean, readable, and maintainable code.
- **Understanding of Concepts:** Clear grasp of Docker, AWS ECS, CI/CD, and IaC.
- **Security Practices:** How well security considerations are integrated.
- **Documentation:** Clarity in explanation and instructions.