Exercise: Design and Deploy a Solution on AWS

Objective:
Design and deploy a solution on AWS that demonstrates your proficiency in networking, IaC, and Docker containerization.

Requirements:
1. **Networking:**
   - Create a new Virtual Private Cloud (VPC) with at least two subnets (one public and one private).
   - Configure an Internet Gateway and attach it to the VPC.
   - Set up appropriate route tables for the subnets to ensure correct routing.
   - Implement security groups to control traffic to the EC2 instances.

2. **Infrastructure as Code (IaC):**
   - Use Terraform (or AWS CloudFormation) to define the infrastructure.
   - Ensure that the IaC scripts are modular and reusable.
   - Document the steps to initialize and apply the IaC scripts.

3. **Docker Deployment:**
   - Create a Dockerfile for a simple "Hello World" application.
   - Push the Docker image to Amazon Elastic Container Registry (ECR).
   - Use Amazon Elastic Container Service (ECS) or Kubernetes (EKS) to deploy the Docker container.
   - Ensure the "Hello World" application is accessible from the public subnet.

Instructions:
1. **Deliverables**
   - IaC Scripts - Terraform (or CloudFormation) scripts to set everything up.
   - Diagram of the network architecture.
   - README file with instructions on how to use the scripts and a description of the network setup and security configurations.
2. **ChatGPT** (and friends) - Allowed.

Evaluation Criteria:
- **Correctness:** The solution meets all the specified requirements.
- **Efficiency:** The infrastructure is designed efficiently with minimal resource wastage.
- **Security:** Proper security practices are followed, including the use of security groups and IAM roles.
- **Documentation:** Clear and concise documentation for setup and deployment.
- **Code Quality:** Clean, modular, and reusable IaC scripts.

Feel free to reach out if you have any questions, any issues with the environment, or need clarification on the requirements. Good luck!