**Deploy a FastAPI Application Using AWS CDK and ECS**

**Objective:** You are required to deploy a simple FastAPI application on AWS using ECS (Elastic Container Service) and AWS CDK (Cloud Development Kit). The application should return a "Hello" message via an API. You will also need to document each step of the process, including how to redeploy the application after making modifications.

**Application Code :** the app with FastAPI is in the document main.py

You need to install uvicorn

‘’’

pip install fastapi uvicorn

‘’’

To run the app, you can use the following command

‘’’

uvicorn main:app --reload

‘’’

**Requirements**

1. **Containerization**:
   * Containerize the FastAPI application using Docker.
2. **Infrastructure Setup**:
   * Use AWS CDK to create the necessary infrastructure on AWS.
   * The infrastructure should include an ECS cluster where your application will be deployed.
   * Set up a Load Balancer to expose the API publicly.
3. **Deployment**:
   * Deploy the containerized FastAPI application to the ECS cluster.
4. **Modification and Redeployment**:
   * Modify the FastAPI application (e.g., change the message returned by the API).
   * Redeploy the updated application using AWS CDK.

**Documentation**

* **Document each step of the process**, including:
  + How you containerized the application.
  + How you set up the AWS infrastructure using CDK.
  + How you deployed the application to ECS.
  + How you handled networking, security groups, and any other AWS-specific configurations.
  + The steps you took to redeploy the application after making modifications.
* **Highlight any challenges** you encountered during the process and how you overcame them.

**Deliverables**

1. The codebase for the FastAPI application, including the Dockerfile.
2. The CDK code used to set up the AWS infrastructure.
3. A README.md file with detailed documentation of the entire process, including instructions for redeploying the application after modifications.