Flask Docker App with CI/CD Pipeline

A simple Flask app Dockerized and deployed using GitHub Actions and EC2 with auto-deployment.

# Tech Stack

- Python (Flask)  
- Docker  
- GitHub Actions (CI/CD)  
- AWS EC2 (Ubuntu)  
- Nginx (optional for production)

# Run Locally Using Docker

Build and run the container:  
  
docker build -t flask-docker-app .  
docker run -d -p 8000:8000 flask-docker-app  
  
Visit: http://localhost:8000

# Deploy to EC2

1. SSH into your EC2:  
ssh -i ~/Documents/ec2\_key\_pair.pem ubuntu@<EC2\_PUBLIC\_IP>  
  
2. Run Docker container:  
sudo docker run -d -p 8080:8000 riya8186/flask-docker-app  
  
Visit: http://<EC2\_PUBLIC\_IP>:8080

# CI/CD with GitHub Actions

This is the GitHub Actions workflow to build, push, and deploy the Docker container:

name: CI/CD Pipeline  
on:  
 push:  
 branches:  
 - main  
jobs:  
 build-and-deploy:  
 runs-on: ubuntu-latest  
 steps:  
 - name: Checkout Code  
 uses: actions/checkout@v3  
 - name: Set up Docker  
 uses: docker/setup-buildx-action@v3  
 - name: Login to DockerHub  
 uses: docker/login-action@v3  
 with:  
 username: ${{ secrets.DOCKER\_USERNAME }}  
 password: ${{ secrets.DOCKER\_PASSWORD }}  
 - name: Build and Push Docker Image  
 run: |  
 docker build -t ${{ secrets.DOCKER\_USERNAME }}/flask-docker-app .  
 docker push ${{ secrets.DOCKER\_USERNAME }}/flask-docker-app  
 - name: Deploy to EC2 via SSH  
 uses: appleboy/ssh-action@v1.0.0  
 with:  
 host: ${{ secrets.EC2\_HOST }}  
 username: ubuntu  
 key: ${{ secrets.EC2\_SSH\_KEY }}  
 script: |  
 docker pull ${{ secrets.DOCKER\_USERNAME }}/flask-docker-app  
 docker stop flask || true && docker rm flask || true  
 docker run -d --name flask -p 8080:8000 ${{ secrets.DOCKER\_USERNAME }}/flask-docker-app

# GitHub Secrets Needed

DOCKER\_USERNAME, DOCKER\_PASSWORD, EC2\_HOST, EC2\_SSH\_KEY

# Architecture Diagram (ASCII)

+------------+ Push to GitHub +--------------------+  
| Developer +---------------------------> GitHub Repo (main) |  
+------------+ +--------------------+  
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 v  
 +--------------------+  
 | GitHub Actions |  
 | CI/CD Workflow |  
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 |  
 v  
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 | DockerHub: Build & Push |  
 +-----------------------------+  
 |  
 v  
 +------------------------+  
 | EC2 Instance (Ubuntu) |  
 | Pull & Run Container |  
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