**Github Repository:**

**https://github.com/manoj-gaonkar/EcommerceApp**

**Solution Architecture:**

Overview:

The E-commerce App will handle product listings, orders, and payments. It is secured, scalable, and highly available, using Docker, Azure Kubernetes Service (AKS), and GitHub Actions for CI/CD.

Architecture:

* Frontend & Backend: Flask app serving HTML based web page.
* Deployment:
  + Docker: Containerizes the application for easy deployment.
  + AKS: Deploys and scales the app using Kubernetes on Azure.
  + CI/CD: GitHub Actions automates the build, test, and deploy pipeline.
  + Terraform: Provisions Azure infrastructure using infrastructure-as-code.

Security:

* SSL/TLS: Ensures HTTPS encryption for secure data transfer.
* Azure Identity: Manages authentication securely with Azure's managed identities.

Scalability:

* Auto-scaling: AKS scales the app based on traffic, ensuring optimal resource usage.

**Report:**

Summary:

This solution leverages Docker for containerization, AKS for deployment, and GitHub Actions for CI/CD. The app is secure, scalable, and highly available with automated infrastructure provisioning via Terraform.

Benefits:

1. Security: HTTPS and Azure Managed Identities ensure secure communication and authentication.
2. Scalability: AKS auto-scales to handle varying traffic loads.
3. High Availability: Kubernetes ensures app availability even during node failures.
4. Automation: CI/CD and Terraform streamline deployment and infrastructure management.
5. Cost-Efficiency: Scalable resources reduce costs by using only what’s needed.
6. Maintainability: Docker and GitHub Actions ensure consistency across environments.