Solution

1. Assuming the frontend is a React application and the backend is a Node.js application
2. Create 2 docker file for frontend and backend which is available in Frontend Dockerfile and Backend Dockerfile
3. Run the below code for creating docker images
4. docker build -t frontend-app:latest -f frontend/Dockerfile .
5. docker build -t backend-app:latest -f backend/Dockerfile .
6. Created 2 Kubernetes Deployment Manifests frontend-deployment.yaml and backend- deployment.yaml
7. Created Kubernetes Service for frontend-service.yaml
8. Implement Horizontal Pod Autoscaling (HPA) for Backend
9. Deployed the Web Application
10. kubectl apply -f k8s/frontend-deployment.yaml
11. kubectl apply -f k8s/frontend-service.yaml
12. kubectl apply -f k8s/backend-deployment.yaml
13. kubectl apply -f k8s/backend-hpa.yaml
14. Verify by using below commands
15. For checking all deployments

kubectl get deployments

1. For checking all services

kubectl get services

1. For checking HPA status

kubectl get hpa

1. Use Apache JMeter to perform load testing and observe scaling.
2. Install Prometheus and Grafana Using Helm which is available in Installing\_Prometheus\_grafana
3. Access the grafana dashboard though <http://localhost:3000> which is present in

Access\_grafana\_Dashboard