1. Use of imagePullSecrets

    A secret (dockerhub-creds) was configured to pull private images from Docker Hub.

    Best practice: Use secrets for private registries instead of embedding credentials directly in manifests.

2. Readiness, Liveness, and Startup Probes

    The deployment manifest includes:

    StartupProbe – ensures containers fully initialize before liveness checks start.

    LivenessProbe – restarts containers when unhealthy.

    ReadinessProbe – signals when containers are ready to accept traffic.

    Best practice: Probes maintain cluster stability by preventing traffic from reaching unhealthy pods.

3. Resource Requests and Limits

```
resources:
  requests:
    memory: "64Mi"
    cpu: "50m"
  limits:
    memory: "128Mi"
    cpu: "100m"
```

Best practice: Defining resource requests and limits ensures proper pod scheduling and prevents resource contention.

4. Use of NodePort for Testing

    Services were exposed through NodePort for local or cluster-level access.

    Best practice: NodePort is suitable for development or testing; use LoadBalancer or Ingress in production environments.

5. Deployment over Standalone Pods

    Applications were deployed using Deployments instead of individual pods.

    Best practice: Deployments enable replica management, rolling updates, and increased resiliency.

6. Handling Image Pull Issues

Image pull errors (ImagePullBackOff, ErrImagePull) were resolved by loading container images directly into Minikube when internet access was unavailable.

Best practice: Validate image accessibility and maintain local image-loading procedures for isolated environments.

7. Namespace Separation

Environments were organized into staging and production namespaces.

Best practice: Namespace isolation improves organization, resource management, and security.

8. Incremental Troubleshooting

Cluster health was verified through systematic checks of pods, services, secrets, and logs.

Best practice: Structured troubleshooting enables faster diagnosis and reproducibility of issues.