Kubernetes Deployment - Week 3 Task

# 1. What is Kubernetes?

Kubernetes (also known as K8s) is an open-source platform for automating the deployment, scaling, and management of containerized applications. It groups containers into logical units for easy management and service discovery. Kubernetes is widely used to ensure applications are always running, easy to scale, and resilient to failure.

# 2. What is a Deployment?

A Kubernetes Deployment provides declarative updates for Pods and ReplicaSets. It allows you to describe an application’s lifecycle, such as updating the app to a new version, scaling replicas, or rolling back to a previous stable state. The Deployment controller continuously monitors the app and makes changes as necessary to match the desired state.

# 3. Sample Deployment YAML

Below is a sample Kubernetes deployment YAML file for running an Nginx web server:

apiVersion: apps/v1  
kind: Deployment  
metadata:  
 name: nginx-deployment  
spec:  
 replicas: 2  
 selector:  
 matchLabels:  
 app: nginx  
 template:  
 metadata:  
 labels:  
 app: nginx  
 spec:  
 containers:  
 - name: nginx  
 image: nginx:latest  
 ports:  
 - containerPort: 80

# 4. Explanation of YAML File

- apiVersion: Defines the version of the Kubernetes API.  
- kind: Specifies the resource type (Deployment).  
- metadata: Contains the name of the deployment.  
- replicas: Number of desired pod replicas.  
- selector: Matches the Pods managed by this deployment.  
- template: Blueprint for the pods to be created.  
- containers: List of containers within the pod (here we use nginx).  
- image: Docker image to use.  
- ports: Exposed port on the container.

# 5. Conclusion

Kubernetes deployments help developers and DevOps teams manage containerized applications efficiently. Using a simple YAML file, you can create robust applications that are scalable and self-healing.