**Task 1 : Kubernetes Deployment**

1. **Create a Deployment in Kubernetes for nginx with 3 replicas, and name it nginx-deployment.**

Here's the YAML configuration file for the Deployment. You can name the file as **nginx-deployment.yaml**.

apiVersion: apps/v1

kind: Deployment

metadata:

name: nginx-deployment

spec:

replicas: 3

selector:

matchLabels:

app: nginx

strategy:

type: RollingUpdate

rollingUpdate:

maxUnavailable: 1

template:

metadata:

labels:

app: nginx

spec:

containers:

- name: nginx

image: nginx:latest

ports:

- containerPort: 80

**Apply this Deployment:**

kubectl apply -f nginx-deployment.yaml

Create a Service that exposes the Deployment to the outside world, mapping the service's port 8080 to the deployment's port 80.

Here's the YAML configuration file for the Service. You can name the file as nginx-service.yaml.

apiVersion: v1

kind: Service

metadata:

name: nginx-service

spec:

selector:

app: nginx

ports:

- protocol: TCP

port: 8080

targetPort: 80

type: NodePort

**Apply this Service:**

kubectl apply -f nginx-service.yaml

**Task 2 : Kubernetes rolling updates to deployment**

Update the nginx-deployment to use the nginx:1.16 image instead of the nginx:latest.

You can update the image in the deployment by running the following command:

kubectl set image deployment/nginx-deployment nginx=nginx:1.16

Monitor the rollout status of this update and ensure it's successful.

To monitor the status of the rollout, you can use the following command:

kubectl rollout status deployment/nginx-deployment

This will show you the status of the rollout and will return control to the terminal once the rollout is complete.

Confirm that the new image is being used by checking the image used in the running Pods.

To do this, you can describe the deployment and look at the Pod Template:

kubectl describe deployment nginx-deployment

In the output, under "Pod Template," you should see nginx:1.16 next to "Image."

If something goes wrong, roll back the update to the previous stable version.

To roll back the update, you can use the following command:

kubectl rollout undo deployment/nginx-deployment

After running this command, Kubernetes will begin the process of rolling back the deployment to the previous version. You can monitor this process using the kubectl rollout status command again:

kubectl rollout status deployment/nginx-deployment

And you can confirm the rollback by describing the deployment again and checking the image used in the Pod Template.