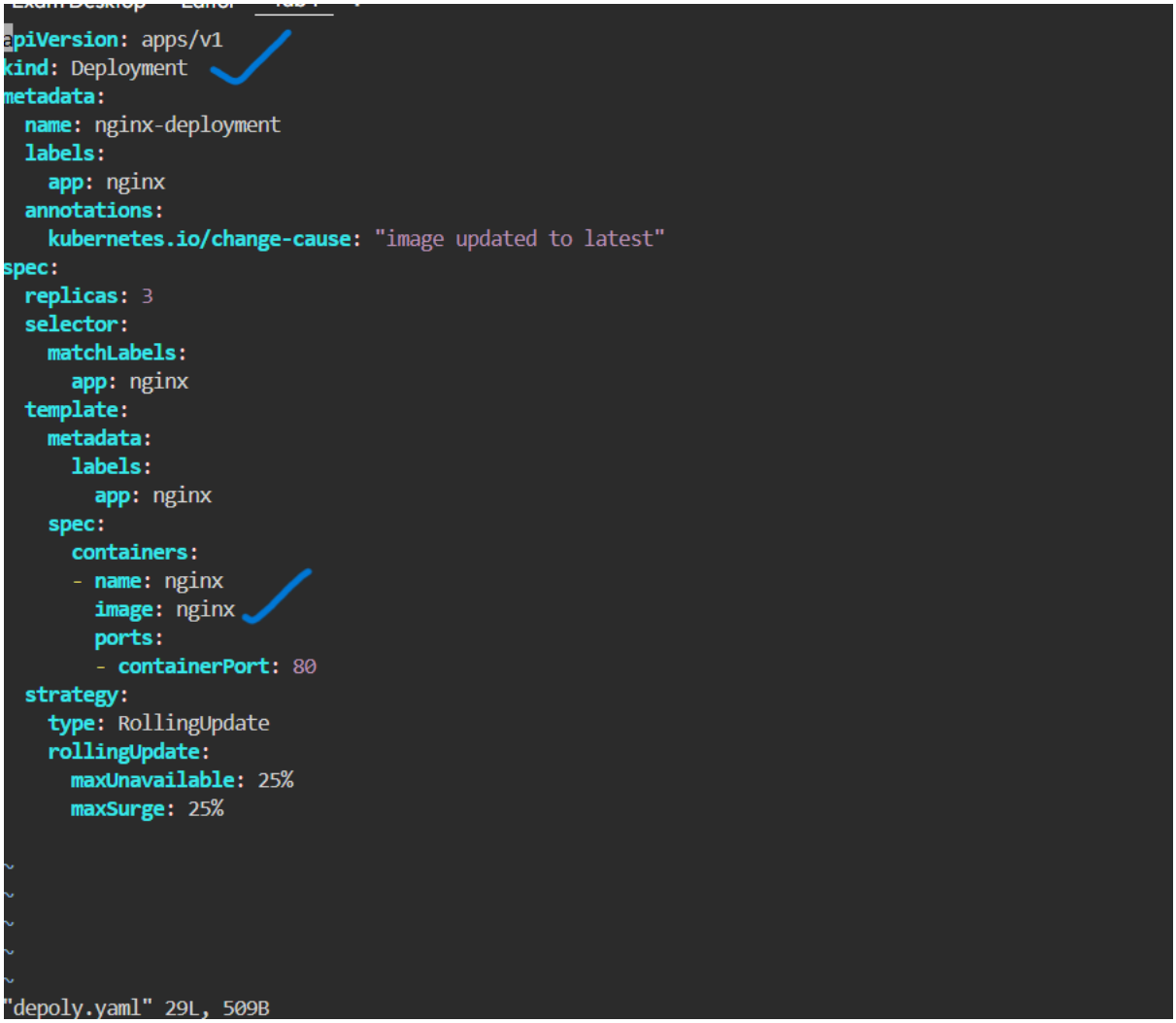
Deployment in k8s

wrote a YAML file for a Kubernetes Deployment and ran some basic kubectl commands to create and manage the Deployment.



```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
  labels:
    app: nginx
  annotations:
    kubernetes.io/change-cause: "image updated to latest"
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
      - name: nginx
        image: nginx
        ports:
        - containerPort: 80
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxUnavailable: 25%
      maxSurge: 25%
~
~
~
~
~
"depoly.yaml" 29L, 509B
```

```
Exam Desktop    Editor    Tab 1    +
controlplane:~$ vi  depoly.yaml
controlplane:~$ kubectl apply -f depoly.yaml
deployment.apps/nginx-deployment created
controlplane:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-86c57bc6b8-82d5r   1/1     Running   0          7s
nginx-deployment-86c57bc6b8-gt2n7   1/1     Running   0          7s
nginx-deployment-86c57bc6b8-vhrwg   1/1     Running   0          7s
controlplane:~$ kubectl get rs
NAME                          DESIRED   CURRENT   READY   AGE
nginx-deployment-86c57bc6b8   3         3         3       13s
controlplane:~$ kubectl get deployment
NAME               READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment   3/3     3            3           19s
controlplane:~$ kubectl delete pod nginx-deployment-86c57bc6b8-82d5r
pod "nginx-deployment-86c57bc6b8-82d5r" deleted
controlplane:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-86c57bc6b8-dnpqm   1/1     Running   0          8s
nginx-deployment-86c57bc6b8-gt2n7   1/1     Running   0          52s
nginx-deployment-86c57bc6b8-vhrwg   1/1     Running   0          52s
controlplane:~$ kubectl scale deployment nginx-deployment --replicas=5
deployment.apps/nginx-deployment scaled
controlplane:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-86c57bc6b8-2ssbh   1/1     Running   0          12s
nginx-deployment-86c57bc6b8-dnpqm   1/1     Running   0          60s
nginx-deployment-86c57bc6b8-gt2n7   1/1     Running   0          104s
nginx-deployment-86c57bc6b8-jtrjb   1/1     Running   0          12s
nginx-deployment-86c57bc6b8-vhrwg   1/1     Running   0          104s
controlplane:~$ kubectl scale deployment nginx-deployment --replicas=2
deployment.apps/nginx-deployment scaled
controlplane:~$ kubectl get pod
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-86c57bc6b8-dnpqm   1/1     Running   0          98s
nginx-deployment-86c57bc6b8-gt2n7   1/1     Running   0          2m22s
controlplane:~$ kubectl describe pod nginx-deployment-86c57bc6b8-dnpqm
Name:             nginx-deployment-86c57bc6b8-dnpqm
Namespace:        default
```

```
    Host Port:      0/TCP
    State:          Running
      Started:      Tue, 08 Apr 2025 11:55:43 +0000
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-wf265 (ro)
onditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
olumes:
  kube-api-access-wf265:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
oS Class:                    BestEffort
ode-Selectors:               <none>
olerations:                  node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
vents:
  Type    Reason     Age   From               Message
  ----    ------     ----  ----               -------
  Normal  Scheduled  2m8s  default-scheduler  Successfully assigned default/nginx-deployment-86c57bc6b8-dnpqm to node01
  Normal  Pulling    2m8s  kubelet            Pulling image "nginx"
  Normal  Pulled     2m7s  kubelet            Successfully pulled image "nginx" in 657ms (657ms including waiting). Image size: 72207578 bytes.
  Normal  Created    2m7s  kubelet            Created container: nginx
  Normal  Started    2m7s  kubelet            Started container nginx
ontrolplane:~$
```

wrote a Deployment YAML file specifying the nginx:1.16.1 image.

```
controlplane:~$ kubectl apply -f deploy1.yaml
deployment.apps/my-deployment created
controlplane:~$ kubectl get deploy
NAME            READY   UP-TO-DATE   AVAILABLE   AGE
my-deployment   3/3     3            3           10s
controlplane:~$ kubectl get rs
NAME                       DESIRED   CURRENT   READY   AGE
my-deployment-688497878f   3         3         3       23s
controlplane:~$ kubectl get pods
NAME                             READY   STATUS    RESTARTS   AGE
my-deployment-688497878f-829pv   1/1     Running   0          28s
my-deployment-688497878f-dk287   1/1     Running   0          28s
my-deployment-688497878f-h2pbz   1/1     Running   0          28s
controlplane:~$ kubectl describe pod my-deployment-688497878f-829pv
Name:             my-deployment-688497878f-829pv
Namespace:        default
Priority:         0
Service Account:  default
Node:             node01/172.30.2.2
Start Time:       Tue, 08 Apr 2025 16:18:22 +0000
Labels:           app=my-app
```

```
Volumes:
  kube-api-access-gkvvj:
    Type:                     Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:   3607
    ConfigMapName:            kube-root-ca.crt
    ConfigMapOptional:        <nil>
    DownwardAPI:              true
QoS Class:                    BestEffort
Node-Selectors:               <none>
Tolerations:                  node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                              node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type    Reason     Age   From               Message
  ----    ------     ----  ----               -------
  Normal  Scheduled  46s   default-scheduler  Successfully assigned default/my-deployment-688497878f-829pv to node01
  Normal  Pulling    46s   kubelet            Pulling image "nginx:1.16.1"
  Normal  Pulled     40s   kubelet            Successfully pulled image "nginx:1.16.1" in 5.461s (5.461s including waiting). Image size: 509866
 bytes.
  Normal  Created    40s   kubelet            Created container: my-container
  Normal  Started    40s   kubelet            Started container my-container
```

Edited the Deployment YAML file to update the container to use the nginx:1 image

```
controlplane:~$ kubectl edit deployment my-deployment
deployment.apps/my-deployment edited
controlplane:~$ kubectl get deploy
NAME            READY   UP-TO-DATE   AVAILABLE   AGE
my-deployment   3/3     3            3           4m10s
controlplane:~$ kubectl get rs
NAME                       DESIRED   CURRENT   READY   AGE
my-deployment-688497878f   0         0         0       4m14s
my-deployment-7f6769b79    3         3         3       10s
my-deployment-99759d94c    0         0         0       2m28s
controlplane:~$ kubectl get pods
NAME                             READY   STATUS    RESTARTS   AGE
my-deployment-7f6769b79-8lkg4    1/1     Running   0          15s
my-deployment-7f6769b79-qvcdg    1/1     Running   0          18s
my-deployment-7f6769b79-rrlmg    1/1     Running   0          16s
controlplane:~$ kubectl describe pod my-deployment-7f6769b79-8lkg4
Name:             my-deployment-7f6769b79-8lkg4
Namespace:        default
Priority:         0
Service Account:  default
Node:             node01/172.30.2.2
Start Time:       Tue, 08 Apr 2025 16:25:31 +0000
Labels:           app=my-app
                  pod-template-hash=7f6769b79
Annotations:      cni.projectcalico.org/containerID: 1f83c14c16f58f26d68482047c15d0f1abc1db3e18e4e8483bc2399bf2b04f4a
                  cni.projectcalico.org/podIP: 192.168.1.18/32
                  cni.projectcalico.org/podIPs: 192.168.1.18/32
Status:           Running
```

```
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-m26hh (ro)
onditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
olumes:
  kube-api-access-m26hh:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
oS Class:                    BestEffort
ode-Selectors:               <none>
olerations:                  node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
vents:
  Type    Reason     Age   From               Message
  ----    ------     ----  ----               -------
  Normal  Scheduled  43s   default-scheduler  Successfully assigned default/my-deployment-99759d94c-2cqkw to node01
  Normal  Pulled     43s   kubelet            Container image "nginx:1" already present on machine
  Normal  Created    43s   kubelet            Created container: my-container
  Normal  Started    43s   kubelet            Started container my-container
ontrolplane:~$ kubectl edit deployment my-deployment
```

Edited the Deployment YAML file to update the container to use the nginx:latest image

```
controlplane:~$ kubectl edit deployment my-deployment
deployment.apps/my-deployment edited
controlplane:~$ kubectl get deploy
NAME            READY   UP-TO-DATE   AVAILABLE   AGE
my-deployment   3/3     3            3           4m10s
controlplane:~$ kubectl get rs
NAME                       DESIRED   CURRENT   READY   AGE
my-deployment-688497878f   0         0         0       4m14s
my-deployment-7f6769b79    3         3         3       10s
my-deployment-99759d94c    0         0         0       2m28s
controlplane:~$ kubectl get pods
NAME                             READY   STATUS    RESTARTS   AGE
my-deployment-7f6769b79-8lkg4    1/1     Running   0          15s
my-deployment-7f6769b79-qvcdg    1/1     Running   0          18s
my-deployment-7f6769b79-rrlmg    1/1     Running   0          16s
controlplane:~$ kubectl describe pod my-deployment-7f6769b79-8lkg4
Name:             my-deployment-7f6769b79-8lkg4
Namespace:        default
Priority:         0
Service Account:  default
olumes:
  kube-api-access-h7fgd:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
oS Class:                    BestEffort
ode-Selectors:               <none>
olerations:                  node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
vents:
  Type    Reason     Age   From               Message
  ----    ------     ----  ----               -------
  Normal  Scheduled  41s   default-scheduler  Successfully assigned default/my-deployment-7f6769b79-8lkg4 to node01
  Normal  Pulled     41s   kubelet            Container image "nginx:latest" already present on machine
  Normal  Created    41s   kubelet            Created container: my-container
  Normal  Started    41s   kubelet            Started container my-container
ontrolplane:~$ kubectl rollout history deployment my-deployment
eployment.apps/my-deployment
```

Having issues with the latest version, I checked the rollout history and rolled back to the previous version

```
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
vents:
  Type    Reason     Age   From               Message
  ----    ------     ----  ----               -------
  Normal  Scheduled  34s   default-scheduler  Successfully assigned default/my-deployment-99759d94c-dh2hq to node01
  Normal  Pulled     34s   kubelet            Container image "nginx:1" already present on machine
  Normal  Created    33s   kubelet            Created container: my-container
  Normal  Started    33s   kubelet            Started container my-container
```

Wanting to go back to the latest version, I checked the rollout history using kubectl rollout history and then rolled back to the specified version using --to-revision.

```
controlplane:~$ kubectl rollout history deployment my-deployment
deployment.apps/my-deployment
REVISION  CHANGE-CAUSE
1         image updated to 1.16.1
3         image updated to latest
4         image updated to 1
```

```
controlplane:~$ kubectl rollout history  deployment my-deployment --revision=3
deployment.apps/my-deployment with revision #3
Pod Template:
  Labels:       app=my-app
        pod-template-hash=7f6769b79
  Annotations:  kubernetes.io/change-cause: image updated to latest
  Containers:
   my-container:
    Image:      nginx:latest
    Port:       80/TCP
    Host Port:  0/TCP
    Environment:        <none>
    Mounts:     <none>
  Volumes:      <none>
  Node-Selectors:       <none>
  Tolerations:  <none>

controlplane:~$ kubectl rollout undo  deployment my-deployment --to-revision=3
deployment.apps/my-deployment rolled back
controlplane:~$ kubectl get pods
NAME                             READY   STATUS    RESTARTS   AGE
my-deployment-7f6769b79-b2mzn    1/1     Running   0          13s
my-deployment-7f6769b79-dfp2s    1/1     Running   0          12s
my-deployment-7f6769b79-mh4kz    1/1     Running   0          11s
controlplane:~$ kubectl get rs
NAME                        DESIRED   CURRENT   READY   AGE
my-deployment-688497878f    0         0         0       13m
my-deployment-7f6769b79     3         3         3       9m33s
my-deployment-99759d94c     0         0         0       11m
controlplane:~$ kubectl describe pod my-deployment-7f6769b79-b2mzn
Name:             my-deployment-7f6769b79-b2mzn
Namespace:        default
Priority:         0
Service Account:  default
Node:             node01/172.30.2.2
```

```
Volumes:
  kube-api-access-bbzzp:
    Type:                     Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:   3607
    ConfigMapName:            kube-root-ca.crt
    ConfigMapOptional:        <nil>
    DownwardAPI:              true
QoS Class:                    BestEffort
Node-Selectors:               <none>
Tolerations:                  node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                              node.kubernetes.io/unreachable:NoExecute op=Exists for 300s

Events:
  Type    Reason     Age   From               Message
  ----    ------     ----  ----               -------
  Normal  Scheduled  46s   default-scheduler  Successfully assigned default/my-deployment-7f6769b79-b2mzn to node01
  Normal  Pulled     46s   kubelet            Container image "nginx:latest" already present on machine
  Normal  Created    46s   kubelet            Created container: my-container
  Normal  Started    46s   kubelet            Started container my-container
```