1- How many Namespaces exist on the system?

```
controlplane $ kubectl get namespaces
NAME              STATUS   AGE
default           Active   28d
kube-node-lease   Active   28d
kube-public       Active   28d
kube-system       Active   28d
controlplane $
```

2-How many pods exist in the kube-system namespace?

```
controlplane $ kubectl get po -n kube-system
NAME                                   READY   STATUS    RESTARTS   AGE
calico-kube-controllers-5f94594857-zsh2v   1/1     Running   3          28d
canal-2ck88                            2/2     Running   0          28d
canal-cvbwj                            2/2     Running   0          28d
coredns-68dc769db8-drf8h               1/1     Running   0          28d
coredns-68dc769db8-sbbx7               1/1     Running   0          28d
etcd-controlplane                      1/1     Running   0          28d
kube-apiserver-controlplane            1/1     Running   2          28d
kube-controller-manager-controlplane   1/1     Running   2          28d
kube-proxy-xnz4r                       1/1     Running   0          28d
kube-proxy-zbxrb                       1/1     Running   0          28d
kube-scheduler-controlplane            1/1     Running   2          28d
controlplane $
```

3- create a Deployment with name= deployment-1 image= busybox replicas= 3

```
deployment.apps/deployment-1 created
controlplane $
```

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: deployment-1
  labels:
    app: busybox
spec:
  replicas: 3
  selector:
    matchLabels:
      app: busybox
  template:
    metadata:
      labels:
        app: busybox
    spec:
      containers:
      - name: busybox
        image: busybox
        command: ["/bin/sh"]
        args: ["-c", "sleep 1000"]
~
~
```

4- How many Deployments and ReplicaSets exist on the system now?

```
controlplane $ kubectl get deployments --all-namespaces
NAMESPACE     NAME                      READY   UP-TO-DATE   AVAILABLE   AGE
default       deployment-1              3/3     3            3           3m7s
kube-system   calico-kube-controllers   1/1     1            1           28d
kube-system   coredns                   2/2     2            2           28d
controlplane $ kubectl get rs --all-namespaces
NAMESPACE     NAME                                DESIRED   CURRENT   READY   AGE
default       deployment-1-7fdcf77fff             3         3         3       3m11s
kube-system   calico-kube-controllers-5f94594857   1         1         1       28d
kube-system   coredns-68dc769db8                  2         2         2       28d
kube-system   coredns-787d4945fb                  0         0         0       28d
controlplane $
```

5- How many pods are ready with the deployment-1?

```
controlplane $ kubectl get pods
NAME                            READY   STATUS    RESTARTS   AGE
deployment-1-7fdcf77fff-8mtqw   1/1     Running   0          4m33s
deployment-1-7fdcf77fff-pnrvt   1/1     Running   0          4m34s
deployment-1-7fdcf77fff-rldgn   1/1     Running   0          4m33s
controlplane $
```

6- Update deployment-1 image to nginx then check the ready pods again

```
deployment.apps/deployment-1 configured
controlplane $
```

```
controlplane $ kubectl get pods
NAME                            READY   STATUS    RESTARTS   AGE
deployment-1-56c967f8df-gpq79   1/1     Running   0          55s
deployment-1-56c967f8df-m6nf4   1/1     Running   0          54s
deployment-1-56c967f8df-p56kg   1/1     Running   0          59s
controlplane $
```

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: deployment-1
  labels:
    app: busybox
spec:
  replicas: 3
  selector:
    matchLabels:
      app: busybox
  template:
    metadata:
      labels:
        app: busybox
    spec:
      containers:
      - name: nginx
        image: nginx
        #command: ["/bin/sh"]
        #args: ["-c", "sleep 1000"]

~
~
~
```

7- Run kubectl describe deployment deployment-1 and check events
Deployment strategy RollingUpdate

```
StrategyType:           RollingUpdate
MinReadySeconds:        0
RollingUpdateStrategy:  25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=busybox
  Containers:
   nginx:
    Image:        nginx
    Port:         <none>
    Host Port:    <none>
    Environment:  <none>
    Mounts:       <none>
  Volumes:        <none>
Conditions:
  Type           Status  Reason
  ----           ------  ------
  Available      True    MinimumReplicasAvailable
  Progressing    True    NewReplicaSetAvailable
OldReplicaSets:  <none>
NewReplicaSet:   deployment-1-56c967f8df (3/3 replicas created)
Events:
  Type    Reason             Age   From                   Message
  ----    ------             ----  ----                   -------
  Normal  ScalingReplicaSet  16m   deployment-controller  Scaled up replica set deployment-1-7fdcf77fff to 3
  Normal  ScalingReplicaSet  2m2s  deployment-controller  Scaled up replica set deployment-1-56c967f8df to 1
  Normal  ScalingReplicaSet  118s  deployment-controller  Scaled down replica set deployment-1-7fdcf77fff to 2 from 3
  Normal  ScalingReplicaSet  118s  deployment-controller  Scaled up replica set deployment-1-56c967f8df to 2 from 1
  Normal  ScalingReplicaSet  117s  deployment-controller  Scaled down replica set deployment-1-7fdcf77fff to 1 from 2
  Normal  ScalingReplicaSet  117s  deployment-controller  Scaled up replica set deployment-1-56c967f8df to 3 from 2
  Normal  ScalingReplicaSet  115s  deployment-controller  Scaled down replica set deployment-1-7fdcf77fff to 0 from 1
```

8- Rollback the deployment-1 What is the used image with the deployment-1? **busybox**

```
controlplane $ kubectl rollout undo deployment/deployment-1
deployment.apps/deployment-1 rolled back
controlplane $ kubectl describe deployment deployment-1
Name:                   deployment-1
Namespace:              default
CreationTimestamp:      Thu, 19 Jan 2023 21:07:18 +0000
Labels:                 app=busybox
Annotations:            deployment.kubernetes.io/revision: 3
Selector:               app=busybox
Replicas:               3 desired | 3 updated | 3 total | 3 available | 0 unavailable
StrategyType:           RollingUpdate
MinReadySeconds:        0
RollingUpdateStrategy:  25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=busybox
  Containers:
   busybox:
    Image:      busybox
    Port:       <none>
    Host Port:  <none>
    Command:
      /bin/sh
    Args:
      -c
      sleep 1000
```

10- Create a deployment with Name: dev-deploy Image: redis Replicas: 2 Namespace: dev Resources Requests: CPU: .5 vcpu Mem: 1G Resources Limits: CPU: 1 vcpu Mem: 2G

```yaml
apiVersion: v1
kind: Namespace
metadata:
  name: dev
~
~
~
~
```

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: dev-deploy
  namespace: dev
  labels:
    app: redis
spec:
  replicas: 2
  selector:
    matchLabels:
      app: redis
  template:
    metadata:
      labels:
        app: redis
    spec:
      containers:
      - name: redis
        image: redis
        resources:
          requests:
            memory: "1G"
            cpu: .5
          limits:
            memory: "2G"
            cpu: 1
~
~
```

```
controlplane $ kubectl apply -f create-deploy.yaml
deployment.apps/dev-deployment created
controlplane $ vim create-deploy.yaml
controlplane $ kubectl get pod -n dev
NAME                              READY   STATUS    RESTARTS   AGE
dev-deployment-6c675974d8-6768b   1/1     Running   0          100s
dev-deployment-6c675974d8-rwwsj   0/1     Pending   0          100s
```