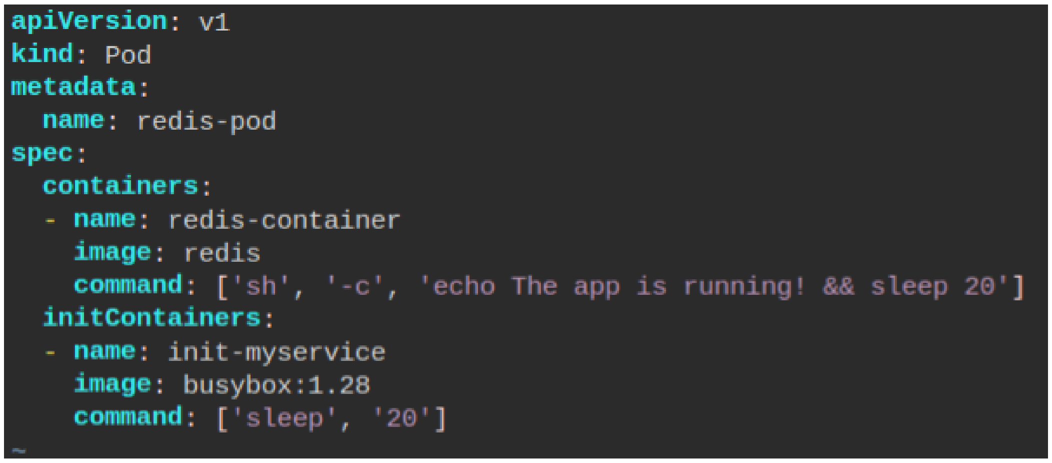
LAB 4

1- Create a pod red with redis image and use an initContainer that uses the busybox image and sleeps for 20 seconds



```yaml
apiVersion: v1
kind: Pod
metadata:
  name: redis-pod
spec:
  containers:
  - name: redis-container
    image: redis
    command: ['sh', '-c', 'echo The app is running! && sleep 20']
  initContainers:
  - name: init-myservice
    image: busybox:1.28
    command: ['sleep', '20']
~
```

2- Create a pod named print-envars-greeting.

1. Configure spec as, the container name should be print-env-container and use bash image.

2. Create three environment variables:

   a. GREETING and its value should be “Welcome to”

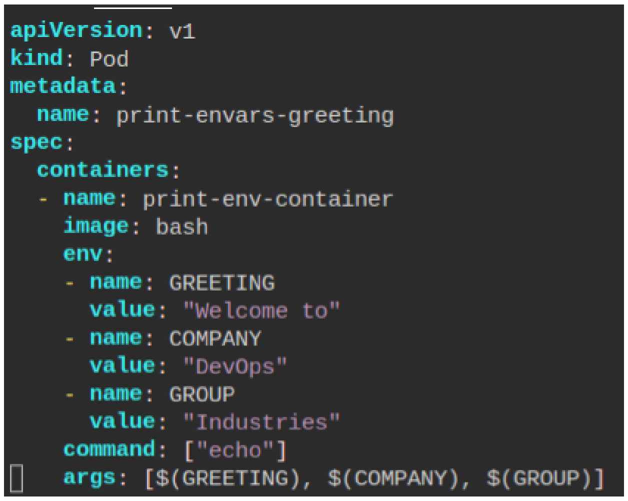
   b. COMPANY and its value should be “DevOps”

   c. GROUP and its value should be “Industries”

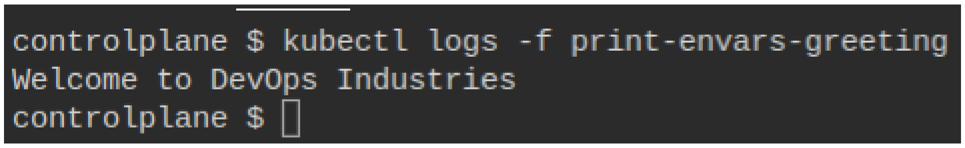
3. Use command to echo ["$(GREETING) $(COMPANY) $(GROUP)"]

message.

4. You can check the output using <kubctl logs -f [pod-name]>command



```yaml
apiVersion: v1
kind: Pod
metadata:
  name: print-envars-greeting
spec:
  containers:
  - name: print-env-container
    image: bash
    env:
    - name: GREETING
      value: "Welcome to"
    - name: COMPANY
      value: "DevOps"
    - name: GROUP
      value: "Industries"
    command: ["echo"]
    args: [$(GREETING), $(COMPANY), $(GROUP)]
```



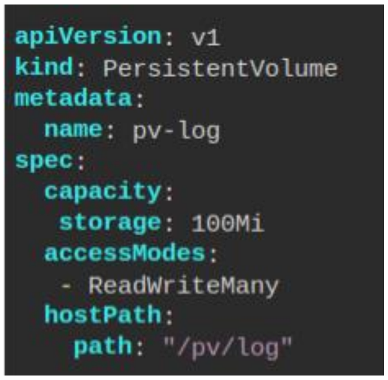
```
controlplane $ kubectl logs -f print-envars-greeting
Welcome to DevOps Industries
controlplane $ 
```

3- Create a Persistent Volume with the given specification.Volume Name: pv-log

Storage: 100Mi

Access Modes: ReadWriteMany

Host Path: /pv/log

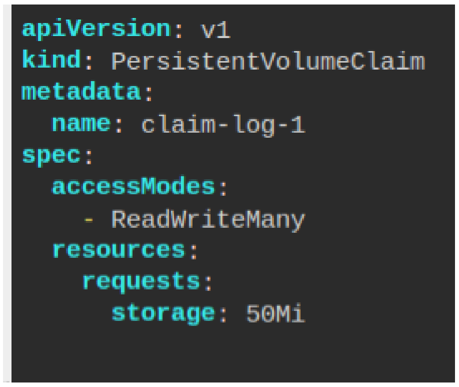


```yaml
apiVersion: v1
kind: PersistentVolume
metadata:
  name: pv-log
spec:
  capacity:
   storage: 100Mi
  accessModes:
   - ReadWriteMany
  hostPath:
    path: "/pv/log"
```

4- Create a Persistent Volume Claim with the given specification.Volume Name: claim-log-1

Storage Request: 50Mi

Access Modes: ReadWriteMany



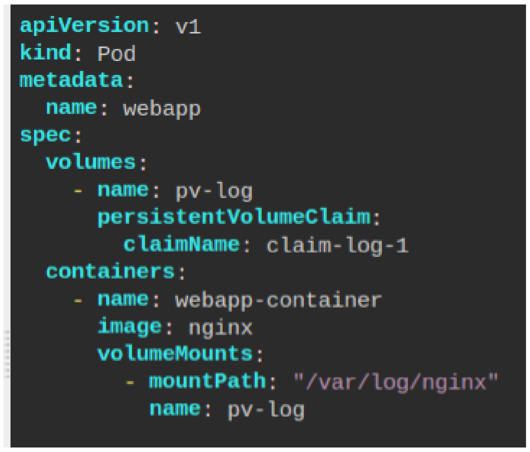
```yaml
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: claim-log-1
spec:
  accessModes:
    - ReadWriteMany
  resources:
    requests:
      storage: 50Mi
```

5- Create a webapp pod to use the persistent volume claim as its storage.

Name: webapp

Image Name: nginx

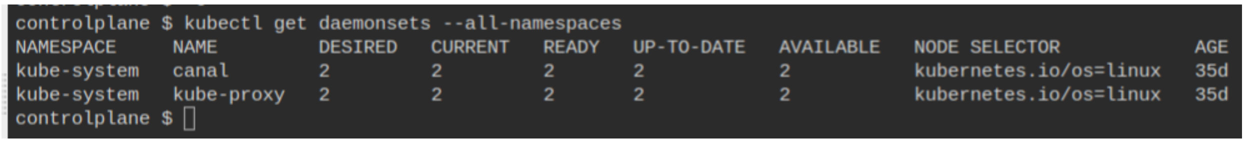
Volume: PersistentVolumeClaim=claim-log-1Volume Mount: /var/log/nginx



```yaml
apiVersion: v1
kind: Pod
metadata:
  name: webapp
spec:
  volumes:
    - name: pv-log
      persistentVolumeClaim:
        claimName: claim-log-1
  containers:
    - name: webapp-container
      image: nginx
      volumeMounts:
        - mountPath: "/var/log/nginx"
          name: pv-log
```

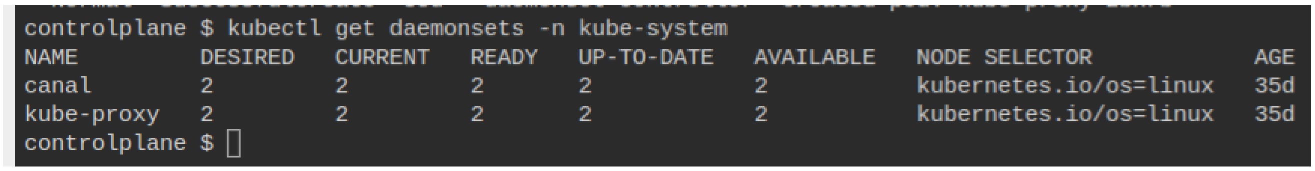
6- How many DaemonSets are created in the cluster in all namespaces?

Ans4



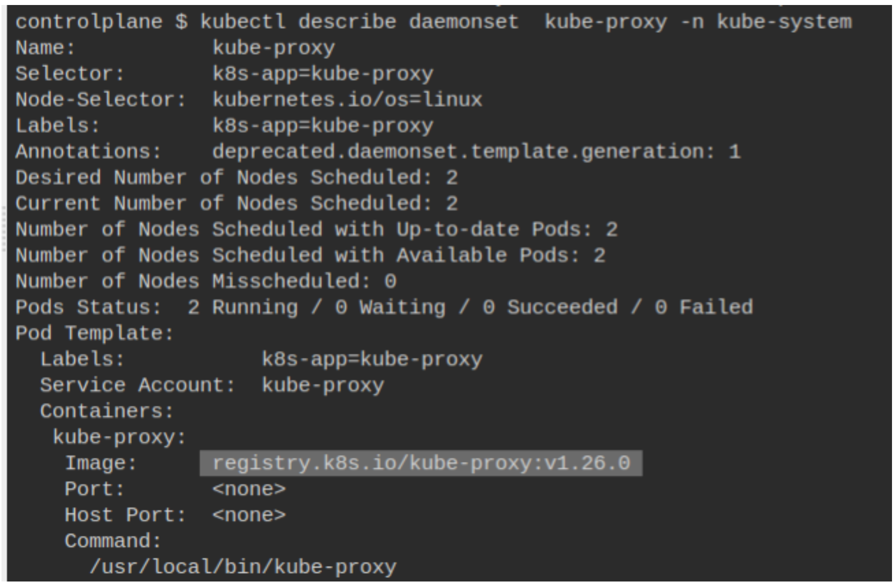
```
controlplane $ kubectl get daemonsets --all-namespaces
NAMESPACE     NAME         DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR            AGE
kube-system   canal        2         2         2       2            2           kubernetes.io/os=linux   35d
kube-system   kube-proxy   2         2         2       2            2           kubernetes.io/os=linux   35d
controlplane $ 
```

7- what DaemonSets exist on the kube-system namespace?



```
controlplane $ kubectl get daemonsets -n kube-system
NAME         DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR            AGE
canal        2         2         2       2            2           kubernetes.io/os=linux   35d
kube-proxy   2         2         2       2            2           kubernetes.io/os=linux   35d
controlplane $ 
```

8- What is the image used by the POD deployed by the kube-proxyDaemonSet



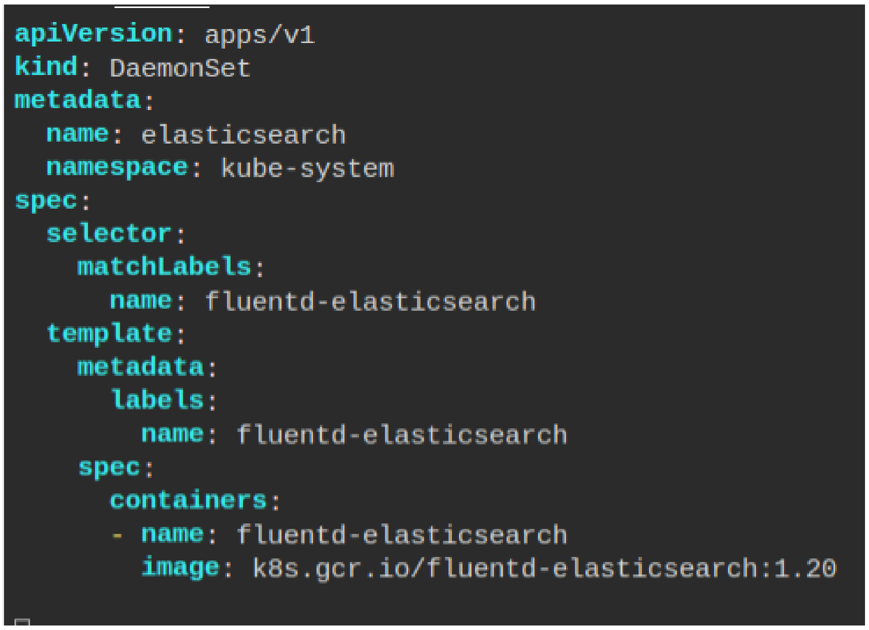
```
controlplane $ kubectl describe daemonset  kube-proxy -n kube-system
Name:           kube-proxy
Selector:       k8s-app=kube-proxy
Node-Selector:  kubernetes.io/os=linux
Labels:         k8s-app=kube-proxy
Annotations:    deprecated.daemonset.template.generation: 1
Desired Number of Nodes Scheduled: 2
Current Number of Nodes Scheduled: 2
Number of Nodes Scheduled with Up-to-date Pods: 2
Number of Nodes Scheduled with Available Pods: 2
Number of Nodes Misscheduled: 0
Pods Status:  2 Running / 0 Waiting / 0 Succeeded / 0 Failed
Pod Template:
  Labels:           k8s-app=kube-proxy
  Service Account:  kube-proxy
  Containers:
   kube-proxy:
    Image:      registry.k8s.io/kube-proxy:v1.26.0
    Port:       <none>
    Host Port:  <none>
    Command:
      /usr/local/bin/kube-proxy
```

9- Deploy a DaemonSet for FluentD Logging. Use the givenspecifications.

Name: elasticsearch

Namespace: kube-system

Image: k8s.gcr.io/fluentd-elasticsearch:1.20



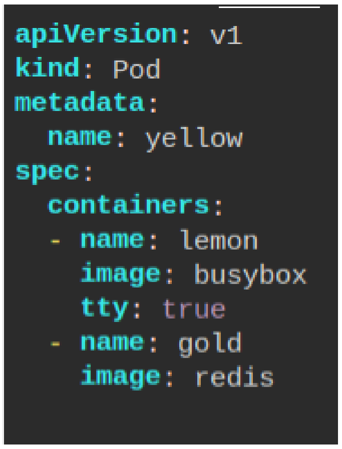
```
apiVersion: apps/v1
kind: DaemonSet
metadata:
  name: elasticsearch
  namespace: kube-system
spec:
  selector:
    matchLabels:
      name: fluentd-elasticsearch
  template:
    metadata:
      labels:
        name: fluentd-elasticsearch
    spec:
      containers:
      - name: fluentd-elasticsearch
        image: k8s.gcr.io/fluentd-elasticsearch:1.20
```

10- Create a multi-container pod with 2 containers.

Name: yellow

Container 1 Name: lemon Container 1 Image: busyboxContainer 2

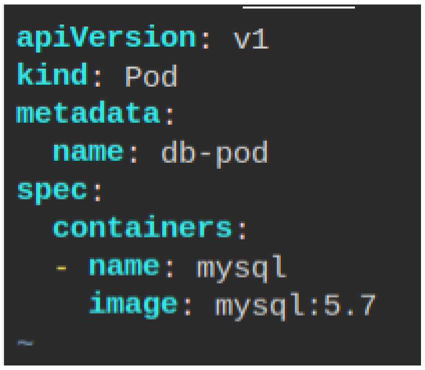
Name: gold Container 2 Image: redis



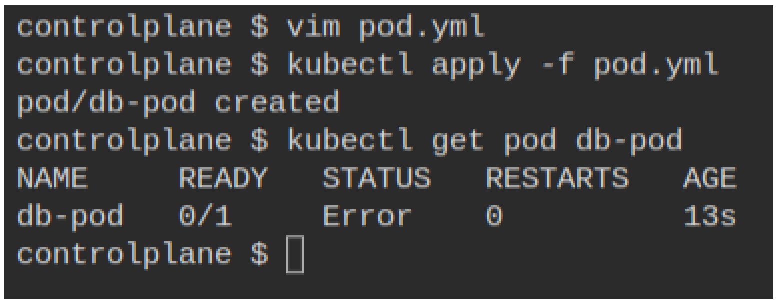
```yaml
apiVersion: v1
kind: Pod
metadata:
  name: yellow
spec:
  containers:
  - name: lemon
    image: busybox
    tty: true
  - name: gold
    image: redis
```

########## Bonus Question OR if you couldn't Pull MongoDB image yesterday ;) ########

11- create a POD called db-pod with the image mysql:5.7 then check the POD status

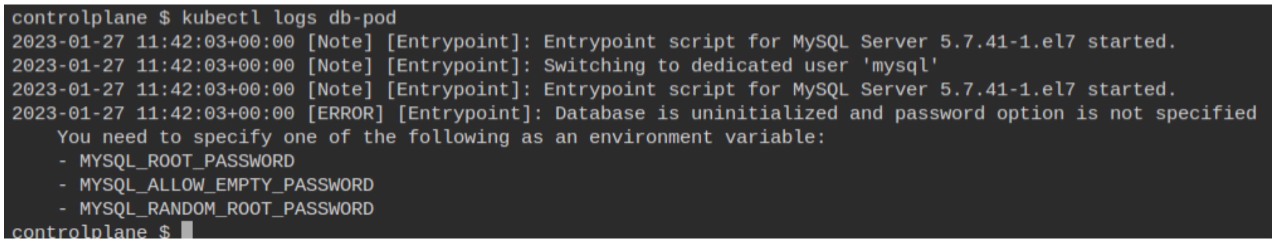


```yaml
apiVersion: v1
kind: Pod
metadata:
  name: db-pod
spec:
  containers:
  - name: mysql
    image: mysql:5.7
~
```



```
controlplane $ vim pod.yml
controlplane $ kubectl apply -f pod.yml
pod/db-pod created
controlplane $ kubectl get pod db-pod
NAME      READY   STATUS    RESTARTS   AGE
db-pod    0/1     Error     0          13s
controlplane $ 
```

12- why the db-pod status not ready



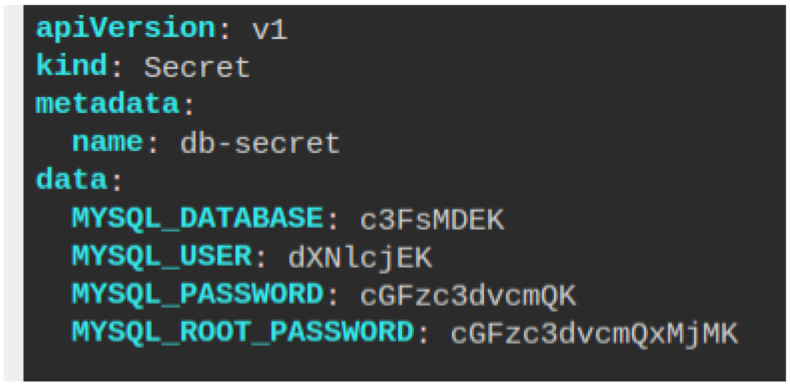
```
controlplane $ kubectl logs db-pod
2023-01-27 11:42:03+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.41-1.el7 started.
2023-01-27 11:42:03+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'
2023-01-27 11:42:03+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.41-1.el7 started.
2023-01-27 11:42:03+00:00 [ERROR] [Entrypoint]: Database is uninitialized and password option is not specified
    You need to specify one of the following as an environment variable:
    - MYSQL_ROOT_PASSWORD
    - MYSQL_ALLOW_EMPTY_PASSWORD
    - MYSQL_RANDOM_ROOT_PASSWORD
controlplane $ 
```

13- Create a new secret named db-secret with the data given below.Secret Name: db-secret

Secret 1: MYSQL_DATABASE=sql01

Secret 2: MYSQL_USER=user1

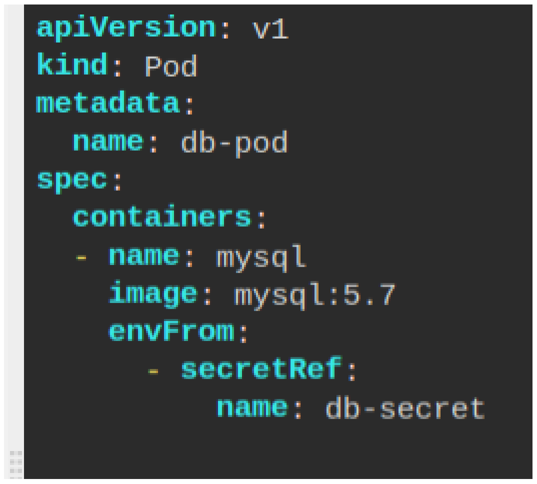
Secret3: MYSQL_PASSWORD=password
Secret 4: MYSQL_ROOT_PASSWORD=password123



```yaml
apiVersion: v1
kind: Secret
metadata:
  name: db-secret
data:
  MYSQL_DATABASE: c3FsMDEK
  MYSQL_USER: dXNlcjEK
  MYSQL_PASSWORD: cGFzc3dvcmQK
  MYSQL_ROOT_PASSWORD: cGFzc3dvcmQxMjMK
```

14- Configure db-pod to load environment variables fromthe newly createdsecret.

Delete and recreate the pod if required.



```yaml
apiVersion: v1
kind: Pod
metadata:
  name: db-pod
spec:
  containers:
  - name: mysql
    image: mysql:5.7
    envFrom:
      - secretRef:
          name: db-secret
```