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

```
! redis.yml > {} spec > [ ] initContainers
  1   apiVersion: v1
  2   kind: Pod
  3   metadata:
  4     name: redis
  5     labels:
  6       app: redis
  7   spec:
  8     containers:
  9     - name: redis
 10       image: redis
 11     initContainers:
 12       - name: init-myservice
 13         image: busybox:1.28
 14         command: ['sh', '-c', "sleep 20"]
```

| redis | 0/1 | Pending | 0 | 2m40s |

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

```yaml
! print-envars-greeting.yml > {} metadata > {} labels
1   apiVersion: v1
2   kind: Pod
3   metadata:
4     name: print-envars-greeting
5     labels:
6       app: greeting
7   spec:
8     containers:
9     - name: print-env-container
10      image: bash
11      env:
12      - name: GREETING
13        value: "welcome to"
14      - name: COMPANY
15        value: "DevOps"
16      - name: GROUP
17        value: "Industries"
18      command: ['sh', '-c', 'echo "$GREETING $COMPANY $GROUP" ']
```

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kub
ectl apply -f print-envars-greeting.yml
pod/print-envars-greeting created
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kub
```

3- Create a Persistent Volume with the given specification.

```yaml
! pv-log.yml > {} spec > {} claimRef
1  apiVersion: v1
2  kind: PersistentVolume
3  metadata:
4    name: pv-log
5    labels:
6      app: pv-log
7  spec:
8    accessModes:
9      - ReadWriteMany
10   capacity:
11     storage: 100Mi
12   hostPath:
13     path: "/pv/log"
14   claimRef:
15     name: clain-log-1
16
```

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kub
ectl apply -f pv-log.yml
persistentvolume/pv-log created
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$
```

4- Create a Persistent Volume Claim with the given specification.

```yaml
! pv.yml > {} spec > {} selector > {} matchLabels > app
1  apiVersion: v1
2  kind: PersistentVolumeClaim
3  metadata:
4    name: claim-log-1
5    namespace: default
6  spec:
7    accessModes:
8      - ReadWriteMany
9    resources:
10     requests:
11       storage: "50Mi"
12   selector:
13     matchLabels:
14       app: pv-log
```

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$
ectl apply -f pv.yml
persistentvolumeclaim/claim-log-1 created
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$
```

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

```yaml
webapp.yml > {} spec > [ ] volumes > {} 0 > {} PersistentVolumeClaim > 🔤 claimName
 1   apiVersion: v1
 2   kind: Pod
 3   metadata:
 4     name: webapp
 5     labels:
 6       app: nginx
 7   spec:
 8     containers:
 9     - name: webapp-pod
10       image: nginx
11       volumeMounts:
12         - name: vol
13           mountPath: /var/log/nginx
14     volumes:
15     - name: vol
16       PersistentVolumeClaim:
17           claimName: claim-log-1
```

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kube
ctl apply -f webapp.yml
pod/webapp created
```

6- How many DaemonSets are created in the cluster in all namespaces? 1

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kubectl get DaemonSets --all-namespaces
NAMESPACE     NAME          DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR           AGE
kube-system   kube-proxy    1         1         1       1            1           kubernetes.io/os=linux   12d
```

7- what DaemonSets exist on the kube-system namespace? 1

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kubectl get DaemonSets -n kube-system
NAME          DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR           AGE
kube-proxy    1         1         1       1            1           kubernetes.io/os=linux   12d
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$
```

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

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kubectl describe pod kube-proxy -n kube
-system | grep Image
    Image:          registry.k8s.io/kube-proxy:v1.26.1
    Image ID:       docker-pullable://registry.k8s.io/kube-proxy@sha256:85f705e7d98158a67432c53885b0d470c673b0fad3693440b45d07efe
bcda1c3
```

9- Deploy a DaemonSet for FluentD Logging.

```yaml
elasticsearch.yml > {} spec > {} template > {} spec > [ ] containers > {} 0 > ⌨ image
1  apiVersion: apps/v1
2  kind: DaemonSet
3  metadata:
4    name: elasticsearch
5    namespace: kube-system
6    labels:
7      k8s-app: fluentd-logging
8  spec:
9    selector:
10     matchLabels:
11       name: fluentd-elasticsearch
12   template:
13     metadata:
14       labels:
15         name: fluentd-elasticsearch
16     spec:
17       containers:
18       - name: fluentd-elasticsearch
19         image:  k8s.gcr.io/fluentd-elasticsearch:1.20
```

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kubectl apply -f elasticsearch.yml
daemonset.apps/elasticsearch created
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$
```

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kubectl get -A daemonset
NAMESPACE     NAME          DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
kube-system   elasticsearch 0         0         0       0            0           <none>          12m
```

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

```yaml
! yellow.yml > {} spec > [ ] containers > {} 1 > ▣ image
1   apiVersion: v1
2   kind: Pod
3   metadata:
4     name: yellow
5   spec:
6     containers:
7     - name: lemon
8       image: busybox
9       tty: true
10    - name: gold
11      image: redis
```

```
ahmed@ahmed-IdeaPad-Gaming-3-15ARH05:/media/ahmed/k/Ahmed/Sprints Tasks/K8s tasks/Task4$ kubectl apply -f yellow.yml
pod/yellow created
```

```
yellow                    0/2     Pending          0             3m21s
```