Kubernetes

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Core Concepts
Home Work

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Environment:

```
Operating System: Kali GNU/Linux Rolling
            Kernel: Linux 5.15.0-kali3-amd64
      Architecture: x86-64
```

Tasks Solution

1. Execute a series of commands to
   a. Create a namespace named **homework**

   kubectl create namespace homework

   ```
   vox@vox:~$ kubectl create namespace homework
   namespace/homework created
   vox@vox:~$
   vox@vox:~$
   vox@vox:~$ kubectl get namespaces
   NAME              STATUS   AGE
   default           Active   43m
   homework          Active   9s
   kube-node-lease   Active   43m
   kube-public       Active   43m
   kube-system       Active   43m
   ```

   b. Create a **homework-1** pod in that namespace that uses this (**shekeriev/k8s-oracle**) image and set two labels on it (all at once) - **app=hw** and **tier=gold**

   kubectl run homework-1 --image=shekeriev/k8s-oracle --labels='app=hw,tier=gold' --namespace homework --port='5000'

   ```
   vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl run homework-1 --image=shekeriev/k8s-oracle --labels='app=hw,tier=gold' --namespace homework --port='5000'
   pod/homework-1 created
   vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get pods -n homework --show-labels
   NAME        READY   STATUS    RESTARTS   AGE   LABELS
   homework-1  1/1     Running   0          7s    app=hw,tier=gold
   vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl describe pod homework-1 -n homework
   Name:         homework-1
   Namespace:    homework
   Priority:     0
   Node:         minikube/192.168.59.100
   Start Time:   Sun, 12 Jun 2022 07:47:27 -0400
   Labels:       app=hw
   ```

   c. Remove the **tier=gold** label with a separate command

   kubectl label pod homework-1 tier- -n homework

   ```
   vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl label pod homework-1 tier- -n homework
   pod/homework-1 unlabeled
   vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get pods -n homework --show-labels
   NAME        READY   STATUS    RESTARTS   AGE    LABELS
   homework-1  1/1     Running   0          2m9s   app=hw
   ```

   d. Create a **homework-2** pod in that namespace that uses this (**shekeriev/k8s-oracle**) image

   kubectl run homework-2 --image=shekeriev/k8s-oracle --namespace homework --port='5000'

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl run homework-2 --image=shekeriev/k8s-oracle --namespace homework --port='5000'
pod/homework-2 created
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get pods -n homework --show-labels
NAME          READY   STATUS    RESTARTS   AGE     LABELS
homework-1    1/1     Running   0          4m30s   app=hw
homework-2    1/1     Running   0          5s      run=homework-2
```

e. Add a label to the second pod **app=hw** with a separate command

kubectl label pod homework-2 app=hw -n homework

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl label pod homework-2 app=hw -n homework
pod/homework-2 labeled
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get pods -n homework --show-labels
NAME          READY   STATUS    RESTARTS   AGE     LABELS
homework-1    1/1     Running   0          6m10s   app=hw
homework-2    1/1     Running   0          105s    app=hw,run=homework-2
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl label pod homework-2 run- -n homework
pod/homework-2 unlabeled
```

f. Set annotation on both pods with the following content **purpose=homework**

kubectl annotate pods -l app=hw -n homework purpose=homework

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl annotate pods -l app=hw -n homework purpose=homework
pod/homework-1 annotated
pod/homework-2 annotated
```

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl describe pod homework-1 -n homework
Name:         homework-1
Namespace:    homework
Priority:     0
Node:         minikube/192.168.59.100
Start Time:   Sun, 12 Jun 2022 07:47:27 -0400
Labels:       app=hw
Annotations:  purpose: homework
Status:       Running
IP:           172.17.0.2
```

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl describe pod homework-2 -n homework
Name:         homework-2
Namespace:    homework
Priority:     0
Node:         minikube/192.168.59.100
Start Time:   Sun, 12 Jun 2022 07:51:51 -0400
Labels:       app=hw
Annotations:  purpose: homework
Status:       Running
IP:           172.17.0.4
```

g. Create a **homerwork-svc** service to expose both pods on port **32000** of every node in the cluster

kubectl expose pod homework-1 --name=homework-svc --target-port=5000 --port=32000 --type=NodePort -n homework

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl expose pod homework-1 --name=homework-svc --target-port=5000 --port=32000 --type=NodePort -n homework
service/homework-svc exposed
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get services -n homework
NAME           TYPE       CLUSTER-IP       EXTERNAL-IP   PORT(S)         AGE
homework-svc   NodePort   10.108.228.139   <none>        32000:31719/TCP 6s
```

← → C ⌂   ○ 🔒 192.168.59.100:31719

Hmmmm, I sense that you are wondering …

Will it be difficult for me to learn Kubernetes?

… and I tell you my friend … with **47%** confidence - **Maybe**

_____

Served by **homework-1**

Hmmmm, I sense that you are wondering …

Will I ever master Kubernetes?

… and I tell you my friend … with **10%** confidence - **Yes**

Served by **homework-2**

2. **Create manifests for every object (the namespace, the two pods, and the service) from task 1 and apply them one by one**

        - creating 4 separated manifests

```
-rwxrwxrwx 1 vox vox  58 Jun 12 06:38 homework-namespace.yml
-rwxrwxrwx 1 vox vox 206 Jun 12 06:34 shekeriev-oracle-pod-h1.yml
-rwxrwxrwx 1 vox vox 206 Jun 12 06:39 shekeriev-oracle-pod-h2.yml
-rwxrwxrwx 1 vox vox 191 Jun 12 06:39 shekeriev-oracle-service.yml
```

        kubectl apply -f homework-namespace.yml

        kubectl apply f shekeriev-oracle-pod-h1.yml

        kubectl apply -f shekeriev-oracle-pod-h2.yml

        kubectl apply -f shekeriev-oracle-oracle-service.yml

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl apply -f homework-namespace.yml
namespace/homework created
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get namespaces
NAME              STATUS   AGE
default           Active   5h17m
homework          Active   10s
kube-node-lease   Active   5h17m
kube-public       Active   5h17m
kube-system       Active   5h17m
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl apply -f shekeriev-oracle-pod-h1.yml
pod/homework-1 created
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl apply -f shekeriev-oracle-pod-h2.yml
pod/homework-2 created
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get pods -n homework
NAME         READY   STATUS    RESTARTS   AGE
homework-1   1/1     Running   0          12s
homework-2   1/1     Running   0          9s
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl apply -f shekeriev-oracle-service.yml
service/homework-svc created
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl apply -f shekeriev-oracle-service.yml
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get services -n homework
NAME           TYPE       CLUSTER-IP    EXTERNAL-IP   PORT(S)        AGE
homework-svc   NodePort   10.102.66.5   <none>        80:32000/TCP   14s
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ vi shekeriev-oracle-service.yml
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl apply -f shekeriev-oracle-service.yml
service/homework-svc configured
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get services -n homework
NAME           TYPE       CLUSTER-IP    EXTERNAL-IP   PORT(S)          AGE
homework-svc   NodePort   10.102.66.5   <none>        5000:32000/TCP   55s
```

Hmmmm, I sense that you are wondering ...

Is Kubernetes a good fit for me?

... and I tell you my friend ... with **32%** confidence - **No**

Served by **homework-2**

Hmmmm, I sense that you are wondering ...

Should I start learning Kubernetes?

... and I tell you my friend ... with **53%** confidence - **No**

Served by **homework-1**

3. Is there a way to submit those manifests at once? Find and demonstrate **two ways** of doing it
   - 1-st way: apply over directory that contains manifests

   cd ..

   kubectl apply -f p1/ --recursive

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework$ kubectl delete -f p1/ --recursive
namespace "homework" deleted
pod "homework-1" deleted
pod "homework-2" deleted
service "homework-svc" deleted
```

   - 2-nd way: create one massive manifest file

   kubectl apply -f oracle.yaml

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl apply -f oracle.yaml
namespace/homework created
pod/homework-1 created
pod/homework-2 created
service/homework-svc created
```

```
vox@vox:/media/vox/FashHub/HUB/SoftUni/Kubernetes/local/M1_CoreConcept/homework/p1$ kubectl get services -n homework
NAME            TYPE       CLUSTER-IP       EXTERNAL-IP   PORT(S)          AGE
homework-svc    NodePort   10.102.221.192   <none>        5000:32000/TCP   55s
```