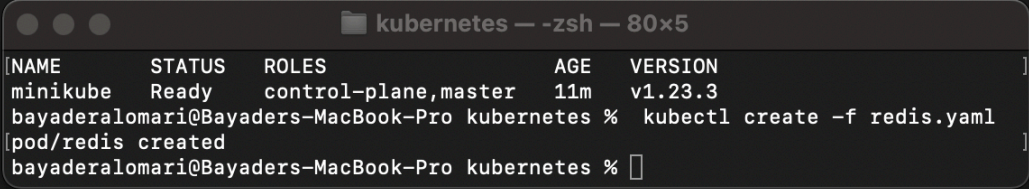


1- Install k8s cluster (minikube) (optional you can use <https://www.katacoda.com/courses/kubernetes/playground>)

2- Create a pod with the name Redis and with the image Redis.

```
! redis.yaml
1  apiVersion: v1
2  kind: Pod
3  metadata:
4    name: redis
5  spec:
6    containers:
7    - name: redis
8      image: redis:5.0.4
```



The terminal window shows the minikube status as 'Ready' and the successful creation of a pod named 'redis' using the 'redis:5.0.4' image.

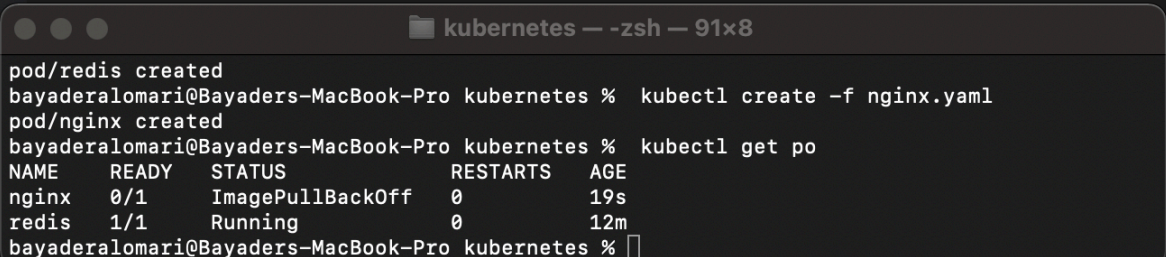
NAME	STATUS	ROLES	AGE	VERSION
minikube	Ready	control-plane,master	11m	v1.23.3

```
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl create -f redis.yaml
pod/redis created
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

3- Create a pod with the name Nginx and with the image nginx123.

Use a pod-definition YAML file. And yes the image name is wrong!

```
! nginx.yaml
1  apiVersion: v1
2  kind: Pod
3  metadata:
4    name: nginx
5  spec:
6    containers:
7    - name: nginx
8      image: nginx123
```



The terminal window shows the creation of a pod named 'nginx' using the 'nginx123' image. The 'pod/nginx created' message is visible, but the pod is not yet running, as indicated by the 'STATUS' column in the subsequent 'kubectl get po' command output.

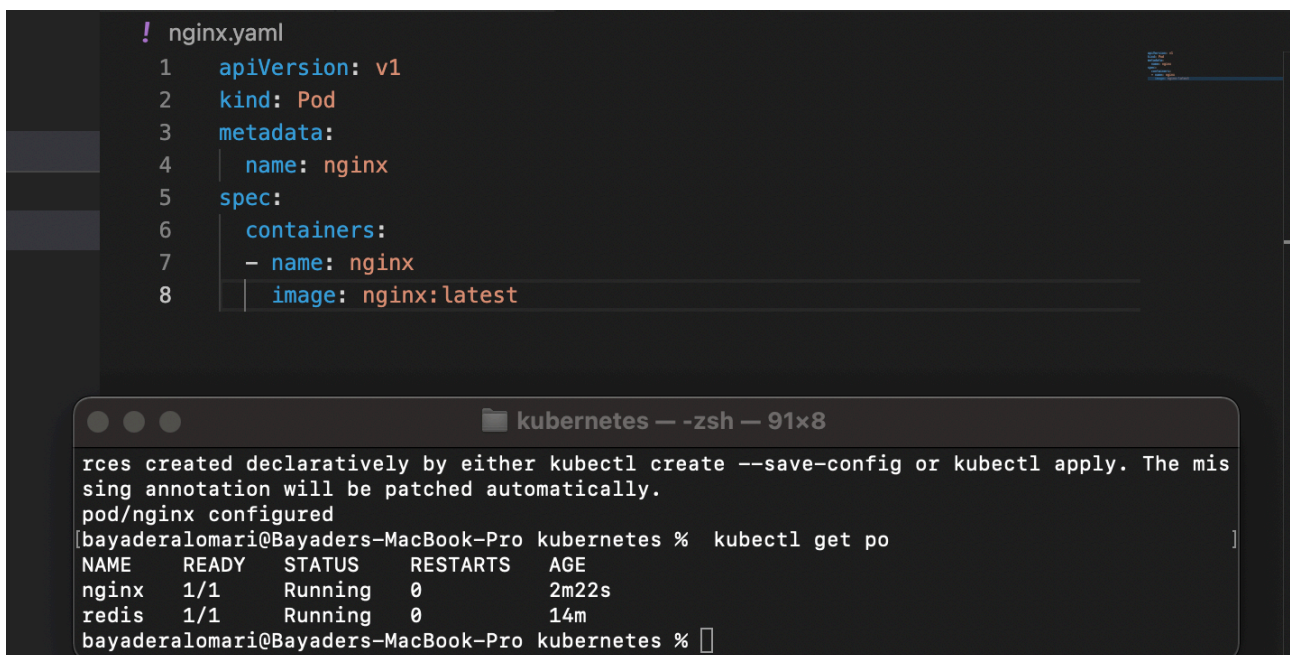
NAME	READY	STATUS	RESTARTS	AGE
nginx	0/1	ImagePullBackOff	0	19s
redis	1/1	Running	0	12m

```
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl create -f nginx.yaml
pod/nginx created
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl get po
NAME      READY   STATUS              RESTARTS   AGE
nginx     0/1     ImagePullBackOff    0           19s
redis     1/1     Running             0           12m
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

4- What is the Nginx pod status?

ImagePullBackOff

5- Change the Nginx pod image to Nginx check the status again



The screenshot shows a code editor with a YAML file named `nginx.yaml` and a terminal window below it.

**nginx.yaml**

```
! nginx.yaml
1  apiVersion: v1
2  kind: Pod
3  metadata:
4    name: nginx
5  spec:
6    containers:
7    - name: nginx
8      image: nginx:latest
```

**Terminal Output**

```
kubernetes — zsh — 91x8
rces created declaratively by either kubectl create --save-config or kubectl apply. The mis
sing annotation will be patched automatically.
pod/nginx configured
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl get po
NAME      READY   STATUS    RESTARTS   AGE
nginx     1/1     Running   0           2m22s
redis     1/1     Running   0           14m
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

6- How many ReplicaSets exist on the system?

None

7- Create a ReplicaSet with

name= replica-set-1

image= busybox

replicas= 3

```
Get Started  ! redis.yaml  ! nginx.yaml  ! replicaset-definition.yaml X ...
! replicaset-definition.yaml
3  metadata:
4    name: busybox
5    labels:
6      app: myapp
7      type: frontend
8  spec:
9    # modify replicas according to your case
10   replicas: 3
11   selector:
12     matchLabels:
13       type: frontend
14   template:
15     metadata:
16       name: myapp-pod
17       labels:
18         type: frontend
19   spec:
20     containers:
21     - name: busybox
22       image: busybox

kubernetes -- zsh -- 128x5
The ReplicaSet "busybox" is invalid: spec.template.metadata.labels: Invalid value: map[string]string{"tier":"frontend"}: `selector` does not match template `labels`
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl create -f replicaset-definition.yaml --validate=false
replicaset.apps/busybox created
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

8- Scale the ReplicaSet replica-set-1 to 5 PODs.

```
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl scale --replicas=5 -f replicaset-definition.yaml
replicaset.apps/busybox scaled
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

9- How many PODs are READY in the replica-set-1?

None

```
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
busybox-94tv5        0/1     CrashLoopBackOff   1 (4s ago)    13s
busybox-f2x24        0/1     CrashLoopBackOff   12 (36s ago)   37m
busybox-kxsm4        0/1     CrashLoopBackOff   12 (30s ago)   37m
busybox-pstk8        0/1     CrashLoopBackOff   1 (6s ago)     13s
busybox-zc9pz        0/1     CrashLoopBackOff   11 (3m8s ago)  35m
```

10- Delete any one of the 5 PODs then check How many PODs exist now?

```
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl delete pod busybox-zc9pz
pod "busybox-zc9pz" deleted
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl get pods
```

NAME	READY	STATUS	RESTARTS	AGE
busybox-94tv5	0/1	CrashLoopBackOff	6 (2m ago)	8m18s
busybox-f2x24	0/1	CrashLoopBackOff	13 (3m27s ago)	45m
busybox-kxsm4	0/1	CrashLoopBackOff	13 (3m23s ago)	45m
busybox-nhvff	0/1	Completed	0	8s
busybox-pstk8	0/1	CrashLoopBackOff	6 (2m7s ago)	8m18s

Why are there still 5 PODs, even after you deleted one?

Because we scale the replicaset so it generate a new one

11- How many Deployments and ReplicaSets exist on the system?

None

12- Create a Deployment with

name= deployment-1

image= busybox

replicas= 3

```
! deployment.yaml
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: deployment-1
5    labels:
6      app: busybox
7  spec:
8    replicas: 3
9    selector:
10     matchLabels:
11       app: busybox
12    template:
13     metadata:
14       labels:
15         app: busybox
16     spec:
17       containers:
18       - name: busybox
19         image: busybox
20
```

```
kubernetes -- zsh -- 128x5
nginx          1/1    Running    0          64m
redis          1/1    Running    0          76m
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl logs busybox-zc9pz --previous --tail 10
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl create -f deployment.yaml
deployment.apps/deployment-1 created
```

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

8

```
pod "busybox-zc9pz" deleted
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl get pods
NAME                                READY   STATUS             RESTARTS   AGE
busybox-94tv5                       0/1     CrashLoopBackOff   6 (2m ago)  8m18s
busybox-f2x24                       0/1     CrashLoopBackOff   13 (3m27s ago)  45m
busybox-kxsm4                       0/1     CrashLoopBackOff   13 (3m23s ago)  45m
busybox-nhvff                       0/1     Completed          0           8s
busybox-pstk8                       0/1     CrashLoopBackOff   6 (2m7s ago)   8m18s
deployment-1-6d84b7796d-v9n9w       0/1     CrashLoopBackOff   6 (3m21s ago)  9m29s
deployment-1-6d84b7796d-x7w74       0/1     CrashLoopBackOff   6 (3m25s ago)  9m29s
deployment-1-6d84b7796d-zhvk8       0/1     CrashLoopBackOff   6 (3m19s ago)  9m29s
nginx                               1/1     Running            0           85m
redis                               1/1     Running            0           96m
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

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



2

15- Update deployment-1 image to Nginx then check the ready pods again

```
! deployment.yaml
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: deployment-1
5    labels:
6      app: nginx
7  spec:
8    replicas: 3
9    selector:
10     matchLabels:
11       app: nginx
12   template:
13     metadata:
14       labels:
15         app: nginx
16     spec:
17       containers:
18         - name: nginx
19           image: nginx:1.14.2
20           ports:
21             - containerPort: 80
```

kubernetes — -zsh — 128x14

```
deployment.apps/deployment-1 created
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl get pods
NAME                                READY   STATUS              RESTARTS   AGE
busybox-94tv5                       0/1     CrashLoopBackOff    8 (4m52s ago)  21m
busybox-f2x24                       0/1     CrashLoopBackOff    16 (71s ago)   59m
busybox-kxsm4                       0/1     CrashLoopBackOff    16 (69s ago)   59m
busybox-nhvff                       0/1     CrashLoopBackOff    7 (98s ago)    13m
busybox-pstk8                       0/1     CrashLoopBackOff    8 (4m57s ago)  21m
deployment-1-9456bbbf9-f2chn        1/1     Running             0           119s
deployment-1-9456bbbf9-gg9sr        1/1     Running             0           119s
deployment-1-9456bbbf9-p6sb8        1/1     Running             0           119s
nginx                               1/1     Running             0           98m
redis                               1/1     Running             0           110m
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

16- Run kubectl describe deployment deployment-1 and check events

What is the deployment strategy used to upgrade the deployment-1?

RollingUpdate

```
kubernetes — -zsh — 128x33
[bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl describe deployment deployment-1
Name: deployment-1
Namespace: default
CreationTimestamp: Sat, 05 Mar 2022 15:10:11 +0300
Labels: app=nginx
Annotations: deployment.kubernetes.io/revision: 1
Selector: app=nginx
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=nginx
  Containers:
    nginx:
      Image: nginx:1.14.2
      Port: 80/TCP
      Host Port: 0/TCP
      Environment: <none>
      Mounts: <none>
      Volumes: <none>
  Conditions:
    Type          Status    Reason
    ----          -
    Available      True      MinimumReplicasAvailable
    Progressing    True      NewReplicaSetAvailable
  OldReplicaSets: <none>
  NewReplicaSet: deployment-1-9456bbbf9 (3/3 replicas created)
  Events:
    Type          Reason          Age    From          Message
    ----          -
    Normal        ScalingReplicaSet 7m41s deployment-controller Scaled up replica set deployment-1-9456bbbf9 to 3
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

## 17- Rollback the deployment-1

What is the used image with the deployment-1?

It should be busybox but I delete the deployment and created again with Nginx because I couldn't apply it without created it again.

```
kubernetes — -zsh — 93x5
-----
Normal ScalingReplicaSet 7m41s deployment-controller Scaled up replica set bbbbbbbbbbbb
bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl rollout undo deployment/deployment-1
error: no rollout history found for deployment "deployment-1"
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

18- How many Namespaces exist on the system?

4

```
kubernetes — zsh — 93x7
[ bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl get ns
NAME                STATUS    AGE
default             Active    132m
kube-node-lease     Active    132m
kube-public         Active    132m
kube-system         Active    132m
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

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

7

```
[ bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl get po -n kube-system
NAME                                READY   STATUS    RESTARTS   AGE
coredns-64897985d-pzs82            1/1     Running   0           133m
etcd-minikube                      1/1     Running   0           133m
kube-apiserver-minikube             1/1     Running   0           133m
kube-controller-manager-minikube    1/1     Running   0           133m
kube-proxy-4bnth                   1/1     Running   0           133m
kube-scheduler-minikube             1/1     Running   0           133m
storage-provisioner                 1/1     Running   1 (133m ago) 133m
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

20- Create a deployment with

Name: beta

Image: Redis

Replicas: 2



Namespace: finance

Resources Requests:

CPU: .5 vcpu

Mem: 1G

Resources Limits:

CPU: 1 vcpu

Mem: 2G

```
! redis-deployment.yaml
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: beta
5    namespace: finance
6    labels:
7      app: redis
8  spec:
9    replicas: 3
10   selector:
11     matchLabels:
12       app: redis
13   template:
14     metadata:
15       labels:
16         app: redis
17     spec:
18       containers:
19         - name: redis
20           image: redis:5.0.4
21           resources:
22             requests:
23               memory: "1Gi"
24               cpu: 1
25             limits:
26               memory: "2Gi"
27               cpu: 5
```

kubernetes — -zsh — 93x10

```
Error from server (NotFound): error when creating "redis-deployment.yaml": namespaces "finance" not found
[bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl create namespace finance ]
namespace/finance created
[bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl create -f redis-deployment.yaml ]
The Deployment "beta" is invalid: spec.template.spec.containers[0].resources.requests: Invalid value: "5": must be less than or equal to cpu limit
[bayaderalomari@Bayaders-MacBook-Pro kubernetes % kubectl create -f redis-deployment.yaml ]
deployment.apps/beta created
bayaderalomari@Bayaders-MacBook-Pro kubernetes %
```

