

- 1- Create a pod with the name "imperative-nginx" and with the image nginx and latest tag. using Imperative command (not yaml).

```
[mohamed@Azzam ~]$ kubectl get pods
No resources found in default namespace.
[mohamed@Azzam ~]$ kubectl run imperative-nginx --image=nginx
pod/imperative-nginx created
[mohamed@Azzam ~]$ kubectl get pods
```

NAME	READY	STATUS	RESTARTS	AGE
imperative-nginx	1/1	Running	0	21m

```
[mohamed@Azzam ~]$
```

- 2- Create a pod with the name webserver and with the image "nginx123"Use a pod-definition YAML file.

```
Activities Terminal
File Edit View Search Terminal Help
apiVersion: v1
kind: Pod
metadata:
  name: webserver
spec:
  containers:
  - name: web-server
    image: nginx123
~
~
~
~
~
~
```

```
[mohamed@Azzam kubernetes]$ vim web-server.yaml
[mohamed@Azzam kubernetes]$ kubectl apply -f web-server.yaml
pod/nginx created
[mohamed@Azzam kubernetes]$ kubectl get pods
NAME                READY   STATUS              RESTARTS   AGE
imperative-nginx    1/1     Running            0          34m
nginx                0/1     ImagePullBackOff   0          95s
[mohamed@Azzam kubernetes]$
```

3- What is the nginx pod status?

```
[mohamed@Azzam kubernetes]$ kubectl get pods
NAME                READY   STATUS              RESTARTS   AGE
imperative-nginx    1/1     Running            0          34m
nginx                0/1     ImagePullBackOff   0          95s
[mohamed@Azzam kubernetes]$
```

4- Change the nginx pod image to "nginx" check the status again

```
[mohamed@Azzam kubernetes]$ vim web-server.yaml
[mohamed@Azzam kubernetes]$ kubectl apply -f web-server.yaml
pod/nginx configured
[mohamed@Azzam kubernetes]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
imperative-nginx    1/1     Running   0           35m
nginx               1/1     Running   0           2m42s
[mohamed@Azzam kubernetes]$
```

5- How many pods are running in the system? Type the command to show this

```
[mohamed@Azzam kubernetes]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
imperative-nginx    1/1     Running   0           35m
nginx               1/1     Running   0           2m42s
[mohamed@Azzam kubernetes]$
```

6- What does READY column in the output of get pods command indicate? that the pod is up and running

7- Delete first pod named imperative-nginx you just created. Type the command to do this

```
nginx 1/1 Running 0 2m42s
[mohamed@Azzam kubernetes]$ kubectl delete pod imperative-nginx
pod "imperative-nginx" deleted
[mohamed@Azzam kubernetes]$ kubectl get pods
NAME      READY   STATUS    RESTARTS   AGE
nginx     1/1     Running   0           3m58s
[mohamed@Azzam kubernetes]$
```

8- Which node is pod named webserver running on (list two commands to do this)

```
[mohamed@Azzam kubernetes]$ kubectl get pods -o wide
NAME      READY   STATUS    RESTARTS   AGE   IP           NODE      NOMINATED NODE   READINESS GATES
webserver 1/1     Running   0           56s   172.17.0.3   minikube  <none>           <none>
[mohamed@Azzam kubernetes]$ kubectl describe pod web-server
Error from server (NotFound): pods "web-server" not found
[mohamed@Azzam kubernetes]$ kubectl describe pod webserver
Name:      webserver
Namespace: default
Priority:   0
Service Account: default
Node:      minikube/192.168.49.2
Start Time: Tue, 31 Jan 2023 14:32:42 +0200
Labels:    <none>
Annotations: <none>
Status:    Running
IP:        172.17.0.3
```

9- Get a shell to the running container i.e ssh into it (figure out the command)

10- Run cat /etc/os-release inside the container

11- Exit from the shell (/bin/bash) session

```
[mohamed@Azzam kubernetes]$ kubectl exec -it webserver -- /bin/bash
root@webserver:/# cat /etc/os-release
PRETTY_NAME="Debian GNU/Linux 11 (bullseye)"
NAME="Debian GNU/Linux"
VERSION_ID="11"
VERSION="11 (bullseye)"
VERSION_CODENAME=bullseye
ID=debian
HOME_URL="https://www.debian.org/"
SUPPORT_URL="https://www.debian.org/support"
BUG_REPORT_URL="https://bugs.debian.org/"
root@webserver:/# exit
exit
[mohamed@Azzam kubernetes]$
```

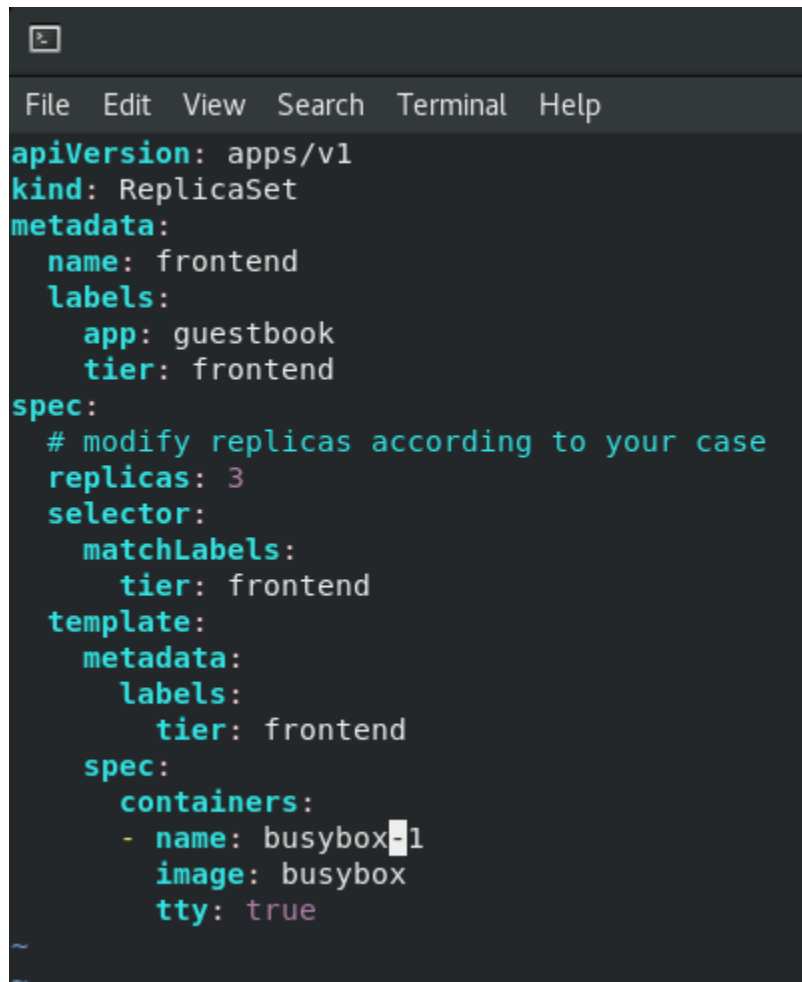
12- Get logs of pod, what are logs and what they are used for?

```
[mohamed@Azzam kubernetes]$ kubectl logs webserver
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2023/01/31 12:32:48 [notice] 1#1: using the "epoll" event method
2023/01/31 12:32:48 [notice] 1#1: nginx/1.23.3
2023/01/31 12:32:48 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2023/01/31 12:32:48 [notice] 1#1: OS: Linux 4.18.0-408.el8.x86_64
2023/01/31 12:32:48 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2023/01/31 12:32:48 [notice] 1#1: start worker processes
2023/01/31 12:32:48 [notice] 1#1: start worker process 29
2023/01/31 12:32:48 [notice] 1#1: start worker process 30
[mohamed@Azzam kubernetes]$
```

13- How many ReplicaSets exist on the system?

```
[mohamed@Azzam kubernetes]$ kubectl get rs
No resources found in default namespace.
[mohamed@Azzam kubernetes]$
```

14- create a ReplicaSet with name= replica-set-1 image= busybox replicas= 3



```
File Edit View Search Terminal Help
apiVersion: apps/v1
kind: ReplicaSet
metadata:
  name: frontend
  labels:
    app: guestbook
    tier: frontend
spec:
  # modify replicas according to your case
  replicas: 3
  selector:
    matchLabels:
      tier: frontend
  template:
    metadata:
      labels:
        tier: frontend
    spec:
      containers:
        - name: busybox
          image: busybox
          tty: true
```

```
File Edit View Search Terminal Help
[mohamed@Azzam kubernetes]$ vim test-rs.yaml
[mohamed@Azzam kubernetes]$ kubectl apply -f test-rs.yaml
replicaset.apps/frontend configured
[mohamed@Azzam kubernetes]$ kubectl get pod
NAME             READY   STATUS    RESTARTS   AGE
frontend-4crh8    1/1     Running   0           83s
frontend-h9ss7    1/1     Running   0           71s
frontend-zhjcq    1/1     Running   0           99s
webserver         1/1     Running   0           18m
[mohamed@Azzam kubernetes]$
```

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

```
webserver         1/1     Running   0           18m
[mohamed@Azzam kubernetes]$ kubectl scale --replicas=5 -f test-rs.yaml
replicaset.apps/frontend scaled
[mohamed@Azzam kubernetes]$ kubectl get pod
```

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

```
[mohamed@Azzam kubernetes]$ kubectl get pod
NAME             READY   STATUS    RESTARTS   AGE
frontend-2tgg9    1/1     Running   0           55s
frontend-4crh8    1/1     Running   0           3m20s
frontend-6r5mn    1/1     Running   0           55s
frontend-h9ss7    1/1     Running   0           3m8s
frontend-zhjcq    1/1     Running   0           3m36s
webserver         1/1     Running   0           20m
```

17- Delete any one of the 5 PODs then check How many PODs exist now? Why are there still 5 PODs, even after you deleted one?

```
webserver 1/1 Running 0 20m
[mohamed@Azzam kubernetes]$ kubectl delete pod frontend-2tgg9
pod "frontend-2tgg9" deleted
[mohamed@Azzam kubernetes]$ kubectl get pod
NAME          READY   STATUS    RESTARTS   AGE
frontend-4crh8 1/1     Running   0           4m16s
frontend-6r5mn 1/1     Running   0           111s
frontend-dqbrs 1/1     Running   0           40s
frontend-h9ss7 1/1     Running   0           4m4s
frontend-zhjcq 1/1     Running   0           4m32s
webserver      1/1     Running   0           21m
[mohamed@Azzam kubernetes]$ vim web-server.yaml
[mohamed@Azzam kubernetes]$
```