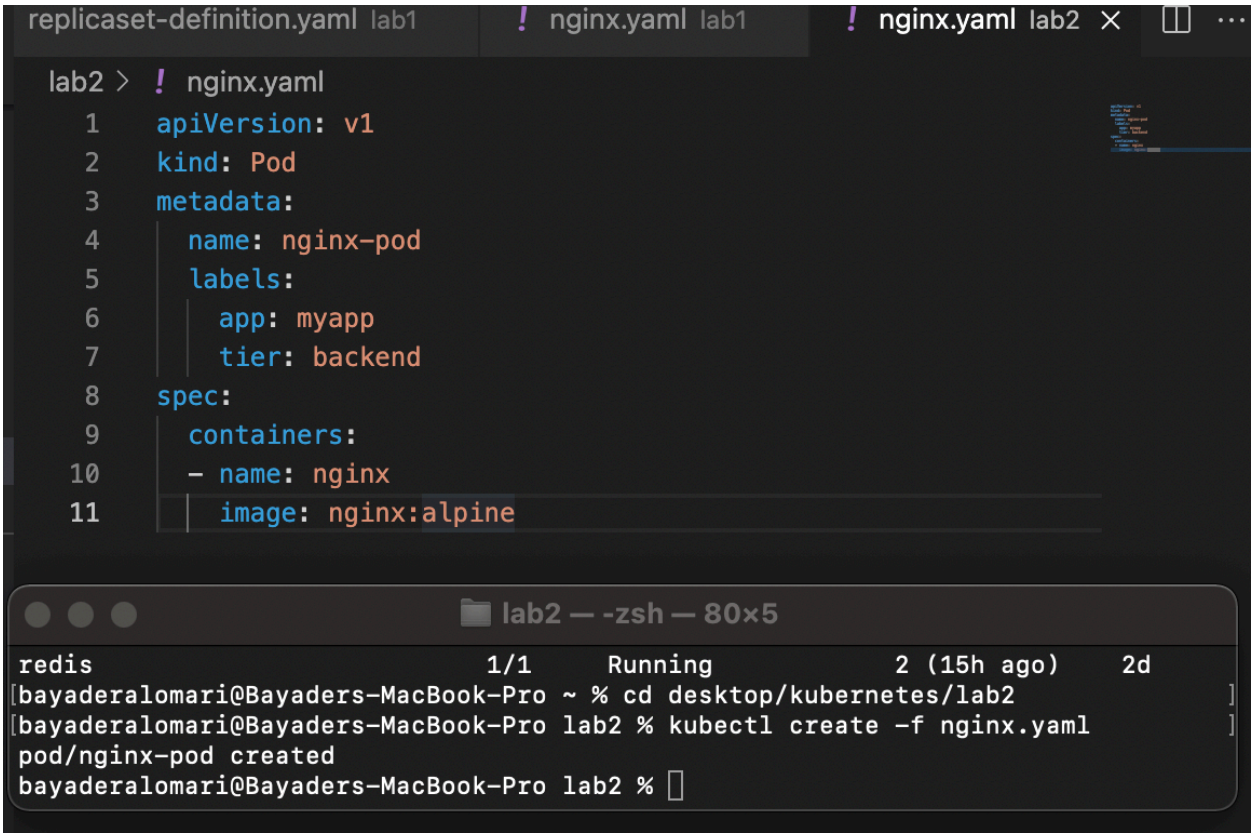
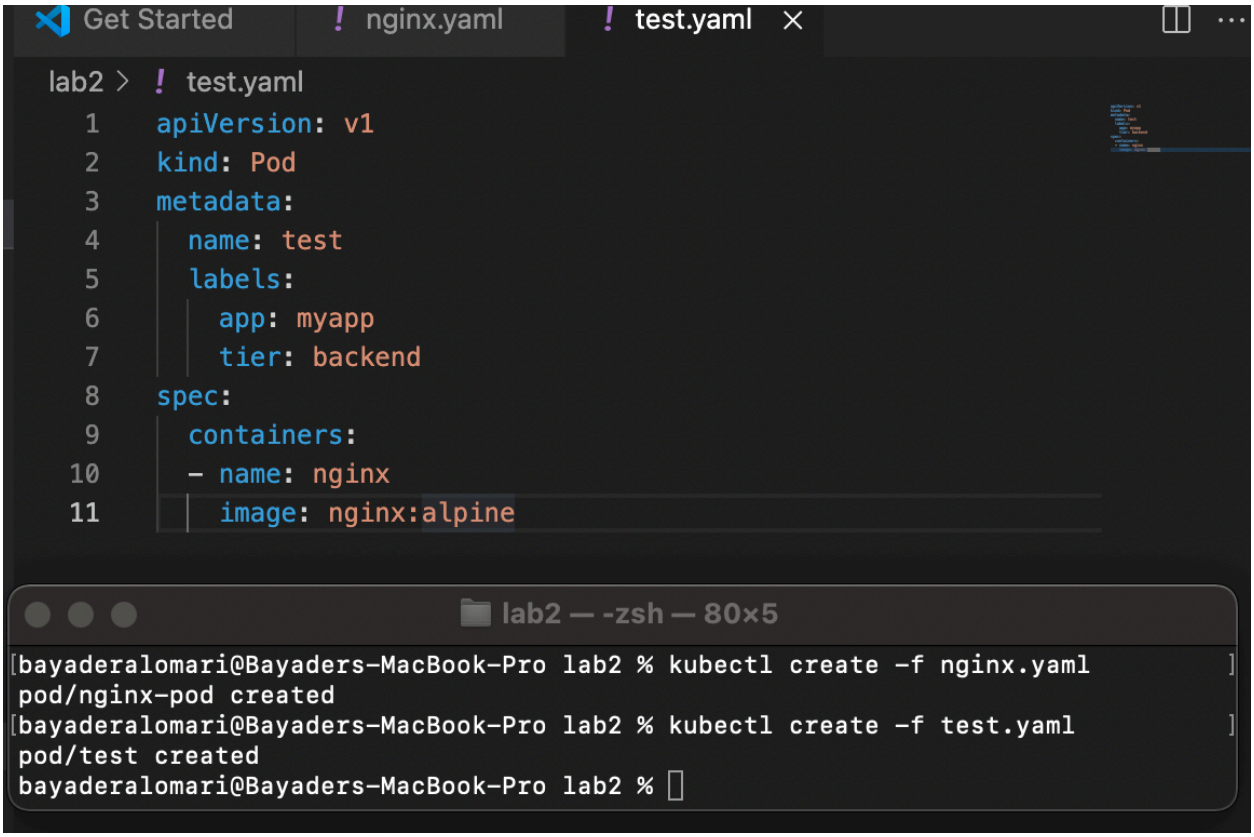
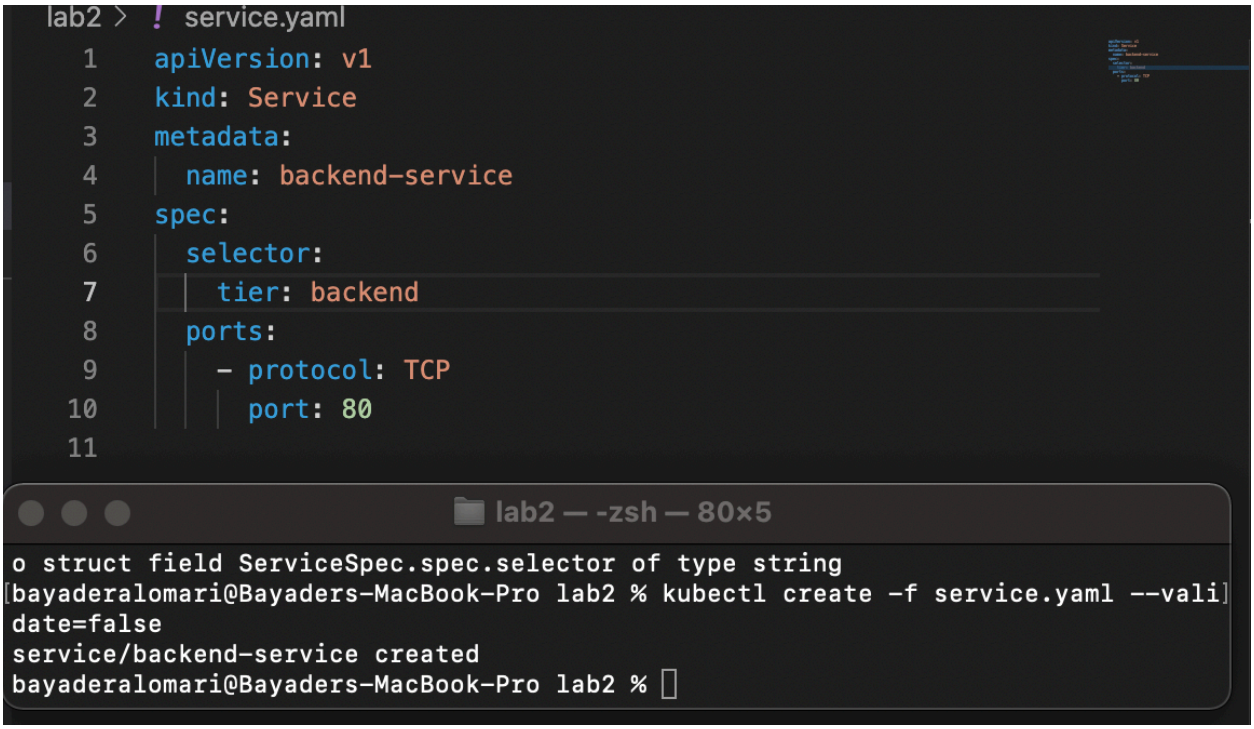
1- Deploy a pod named `nginx-pod` using the `nginx:alpine` image with the labels set to `tier=backend`.



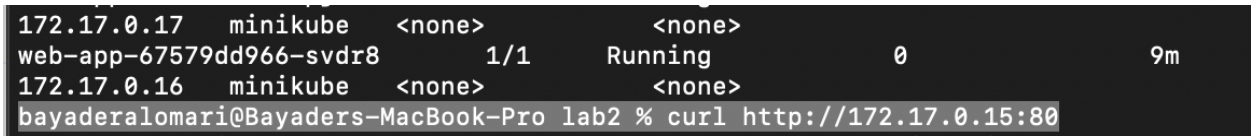
2- Deploy a `test` pod using the `nginx:alpine` image.



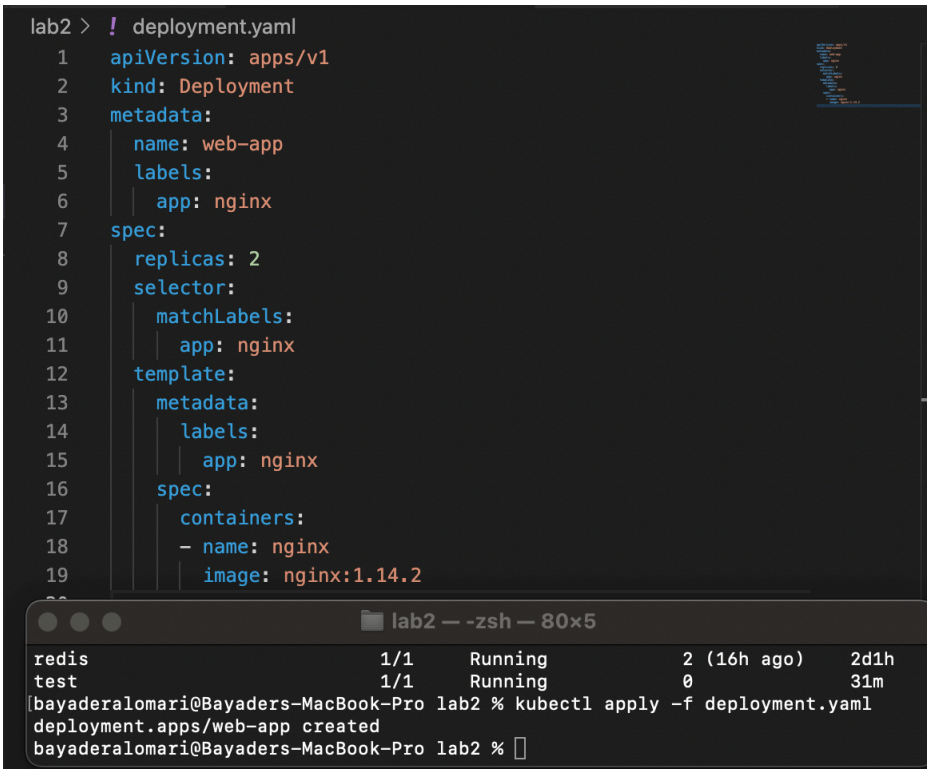
3- Create a service `backend-service` to expose the `backend` application within the cluster on port `80`.



4- try to curl the backend-service from the test pod. What is the response?



5- Create a deployment named `web-app` using the image `nginx` with `2` replicas



6- Expose the `web-app` as service `web-app-service` application on port 80 and nodeport `30082` on the nodes on the cluster

lab2 > ! web-app-service.yaml

```yaml
apiVersion: v1
kind: Service
metadata:
  name: web-app-service
spec:
  selector:
    app: nginx
  type: NodePort
  ports:
    - targetPort: 80
      port: 80
      nodePort: 30082
```

lab2 — -zsh — 82×5

```
bayaderalomari@Bayaders-MacBook-Pro lab2 % kubectl apply -f web-app-service.yaml
service/web-app-service created
bayaderalomari@Bayaders-MacBook-Pro lab2 % kubectl apply -f web-app-service.yaml
service/web-app-service unchanged
bayaderalomari@Bayaders-MacBook-Pro lab2 %
```

7- access the web app from the node

```
bayaderalomari@Bayaders-MacBook-Pro ~ % curl 192.168.49.2:80
```

8- How many Nodes exist on the system?

```
minikube   Ready    control-plane,master   2d2h   v1.23.3
bayaderalomari@Bayaders-MacBook-Pro lab2 % kubectl get no
NAME       STATUS   ROLES                  AGE    VERSION
minikube   Ready    control-plane,master   2d2h   v1.23.3
bayaderalomari@Bayaders-MacBook-Pro lab2 %
```

9- Do you see any taints on `master ?`

```
                    volumes.kubernetes.io/controller-managed-attach-detach: true
CreationTimestamp:  Sat, 05 Mar 2022 13:10:22 +0300
Taints:             <none>
Unschedulable:      false
Lease:
```

```
bayaderalomari@Bayaders-MacBook-Pro ~ % kubectl label nodes minikube color=blue
node/minikube labeled
bayaderalomari@Bayaders-MacBook-Pro ~ % kubectl get no
NAME       STATUS   ROLES                  AGE     VERSION
minikube   Ready    control-plane,master   2d21h   v1.23.3
bayaderalomari@Bayaders-MacBook-Pro ~ % kubectl get nodes --show-labels
NAME       STATUS   ROLES                  AGE     VERSION   LABELS
minikube   Ready    control-plane,master   2d21h   v1.23.3   beta.kubernetes.io/ar
/os=linux,color=blue,kubernetes.io/arch=arm64,kubernetes.io/hostname=minikube,kube
.k8s.io/commit=362d5fdc0a3dbee389b3d3f1034e8023e72bd3a7,minikube.k8s.io/name=minik
```

10- Apply a label `color=blue` to the master node

lab2 > ! blue-deployment.yaml

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: blue
  labels:
    app: nginx
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      affinity:
        podAntiAffinity:
          requiredDuringSchedulingIgnoredDuringExecution:
          - labelSelector:
              matchExpressions:
              - key: color
                operator: In
                values:
                - blue
            topologyKey: "kubernetes.io/hostname"
      containers:
      - name: nginx
        image: nginx:1.14.2
```

lab2 — -zsh — 109×7

```
NOMINATED NODE   READINESS GATES
blue-96d54cb5d-kfzp8           1/1     Running           0                35s     172.17.0.18   minikube
<none>           <none>
blue-96d54cb5d-skppk           1/1     Running           0                35s     172.17.0.20   minikube
<none>           <none>
blue-96d54cb5d-zv2gh           1/1     Running           0                35s     172.17.0.19   minikube
<none>           <none>
```

11- Create a new deployment named `blue` with the `nginx` image and 3 replicas
Set Node Affinity to the deployment to place the pods on `master` only
NodeAffinity: requiredDuringSchedulingIgnoredDuringExecution
Key: color
values: blue

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

```
error: the server doesn't have a resource type "deamonset"
bayaderalomari@Bayaders-MacBook-Pro lab2 % kubectl get deamonset --all-namespaces
error: the server doesn't have a resource type "deamonset"
bayaderalomari@Bayaders-MacBook-Pro lab2 %
```

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

```
error: the server doesn't have a resource type "deamonset"
bayaderalomari@Bayaders-MacBook-Pro lab2 % kubectl get deamonset -n kube-system
error: the server doesn't have a resource type "deamonset"
bayaderalomari@Bayaders-MacBook-Pro lab2 %
```

14- What is the image used by the POD deployed by the `kube-proxy` DaemonSet

```
  kube-proxy:
    Container ID:  docker://b6812f8007c5fce3396781ca3a3059fb37e9306ce88d573c75278958f9915ce3
    Image:         k8s.gcr.io/kube-proxy:v1.23.3
    Image ID:      docker-pullable://k8s.gcr.io/kube-proxy@sha256:def87f007b49d50693aed83d4703d0e56c69ae28615
4b1c7a20cd1b3a320cf7c
```

15- Deploy a DaemonSet for `FluentD` Logging. Use the given specifications.
Name: elasticsearch
Namespace: kube-system
Image: k8s.gcr.io/fluentd-elasticsearch:1.20

16- Create a taint on node01 with key of `spray`, value of `mortein` and effect of `NoSchedule`

`17- Create a new pod named mosquito with the NGINX image`

`18-` What is the state of the `mosquito` POD?

19- Create another pod named `bee` with the NGINX image, which has a toleration set to the taint `Mortein`
Image name: nginx
Key: spray
Value: mortein
Effect: NoSchedule
Status: Running

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: bee
  labels:
    app: myapp
    tier: backend
spec:
  containers:
  - name: nginx
    image: nginx:alpine
  tolerations:
  - key: spray
    Value: mortein
    effect: NoSchedule
```

```
lab2 — -zsh — 109×5
field "Value" in io.k8s.api.core.v1.Toleration; if you choose to ignore these errors, turn validation off w
h --validate=false
bayaderalomari@Bayaders-MacBook-Pro lab2 % kubectl apply -f bee.yaml --validate=false
pod/bee created
bayaderalomari@Bayaders-MacBook-Pro lab2 %
```

```yaml
      effect: NoSchedule
  containers:
  - name: fluentd-elasticsearch
    image: k8s.gcr.io/fluentd-elasticsearch:1.20
```

```
lab2 — -zsh — 109×6
Events:                  <none>

bayaderalomari@Bayaders-MacBook-Pro lab2 % kubectl apply -f deamonset.yaml --validate=false

daemonset.apps/fluentd-elasticsearch created
bayaderalomari@Bayaders-MacBook-Pro lab2 %
```

20- Remove the taint on master/controlplane, which currently has the taint effect of NoSchedule

```
CreationTimestamp:  Tue, 08 Mar 2022 11:56:02 +0300
Taints:             <none>
Unschedulable:      false
```

21- What is the state of the pod `mosquito` now and Which node is the POD `mosquito` on?

```
S
bee        1/1     Running   0          5m40s   10.244.0.4   multinode-demo   <none>           <none>
mosquito   1/1     Running   0          12m     10.244.0.3   multinode-demo   <none>           <none>
```

22- Create a job countdown-job.

The container should be named as container-countdown-job

Use image debian:latest, and restart policy should be Never.

Use command for i in ten nine eight seven six five four three two one ; do echo $i ; done

```yaml
apiVersion: batch/v1
kind: Job
metadata:
  name: countdown-job
spec:
  template:
    spec:
      containers:
      - name: container-countdown-job
        image: debian:latest
        command: [for i in ten nine eight seven six five four three two one ; do echo $i ; done]
      restartPolicy: Never
```

```
lab2 — -zsh — 109×5
bee        1/1     Running   0          5m40s   10.244.0.4   multinode-demo   <none>           <none>
mosquito   1/1     Running   0          12m     10.244.0.3   multinode-demo   <none>           <none>
bayaderalomari@Bayaders-MacBook-Pro lab2 % kubectl apply -f countdown.yaml --validate=false
job.batch/countdown-job created
bayaderalomari@Bayaders-MacBook-Pro lab2 %
```