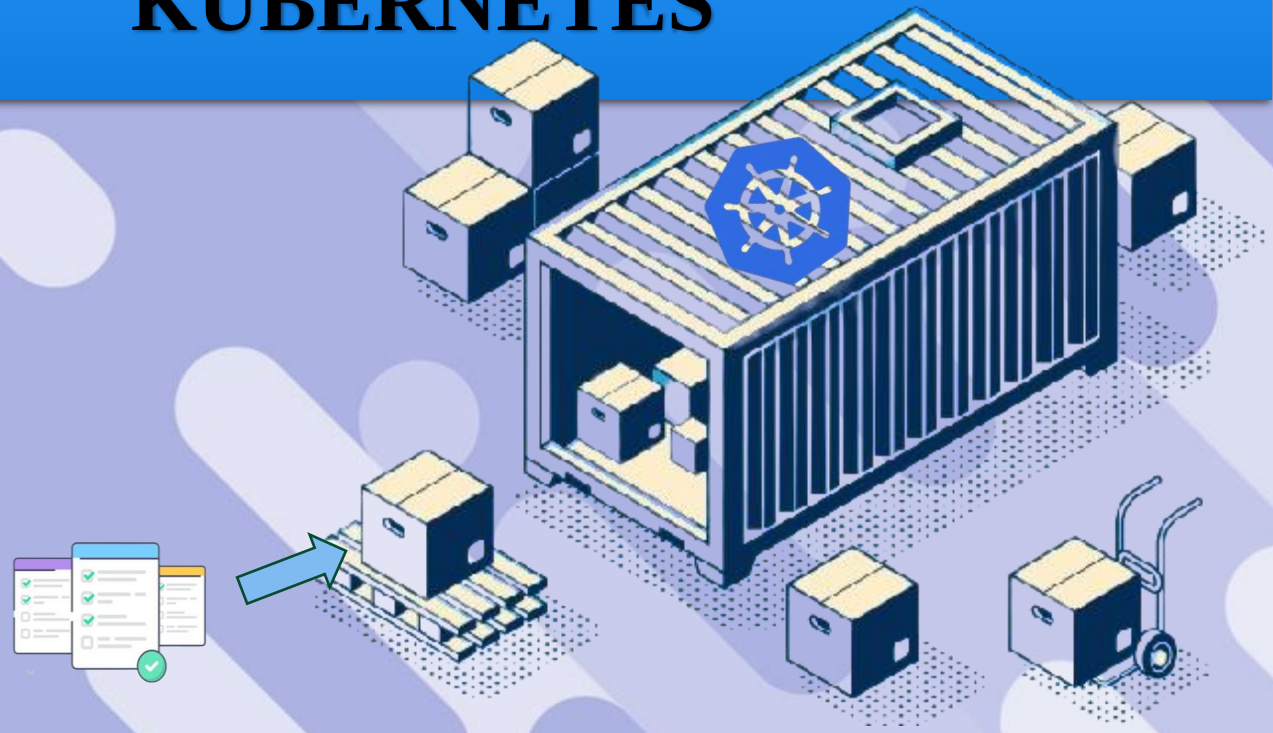
CLOUD COMPUTING EXERCISE: KUBERNETES



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Herr Martin Henke

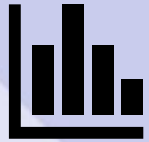
SUMMARY :

I. CODING TOOLS

II. INTERACTION SCHEME

III. CODE ARCHITECTURE

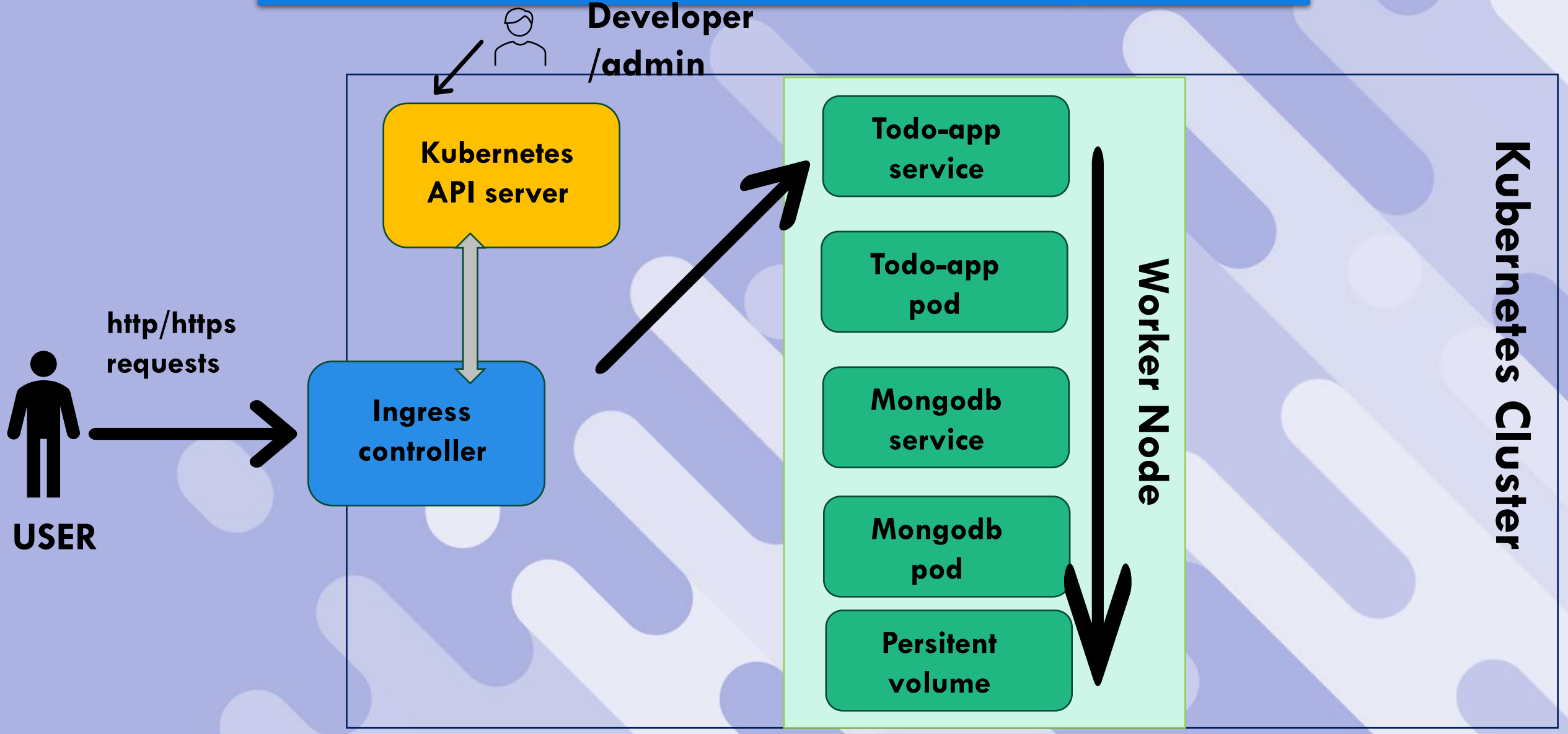
IV. LESSON-LEARNED



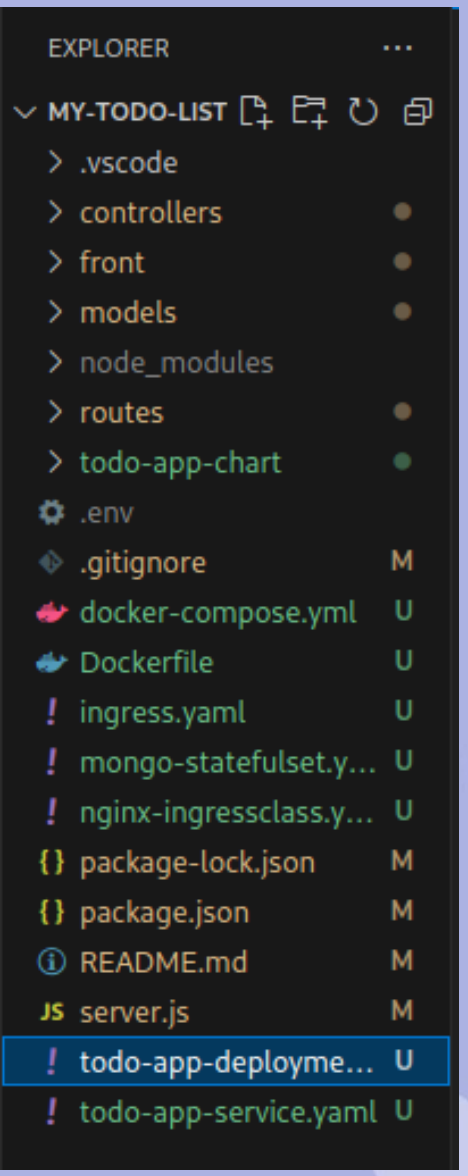
V. DEMONSTRATION

CODING TOOLS:

INTERACTION SCHEME



CODE ARCHITECTURE : #1/4




```
┌──(kaliuser㉿kali)-[~/Documents/my-todo-list]
└─$ kubectl apply -f todo-app-deployment.yaml
deployment.apps/todo-app created
```

! deployment.yaml U ●

todo-app-chart > templates > ! deployment.yaml

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: {{ include "todo-app-chart.fullname" . }}
  labels:
    app: todo-app
spec:
  replicas: {{ .Values.replicaCount }}
  selector:
    matchLabels:
      app: todo-app
  template:
    metadata:
      labels:
        app: todo-app
    spec:
      containers:
        - name: todo-app
          image: "{{ .Values.image.repository }}:{{ .Values.image.tag }}"
          ports:
            - containerPort: {{ .Values.containerPort }}
          env:
            - name: ENV_MONGO
              value: {{ .Values.mongoConnectionString }}

```

! mongo-statefulset.yaml

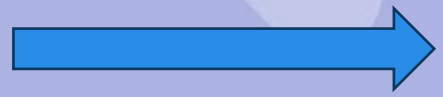
```yaml
  metadata:
    labels:
      app: mongo
  spec:
    ports:
    - port: 27017
      targetPort: 27017
    clusterIP: None
    selector:
      app: mongo
  ---
  apiVersion: apps/v1
  kind: StatefulSet
  metadata:
    name: mongo
  spec:
    serviceName: "mongo"
    replicas: 1
    selector:
      matchLabels:
        app: mongo
    template:
      metadata:
        labels:
          app: mongo
      spec:
        containers:
        - name: mongo
          image: mongo:latest
          ports:
          - containerPort: 27017
          volumeMounts:
          - name: mongo-persistent-storage
            mountPath: /data/db
    volumeClaimTemplates:
    - metadata:
        name: mongo-persistent-storage
      spec:
        accessModes: [ "ReadWriteOnce" ]
        resources:
          requests:
            storage: 1Gi
```

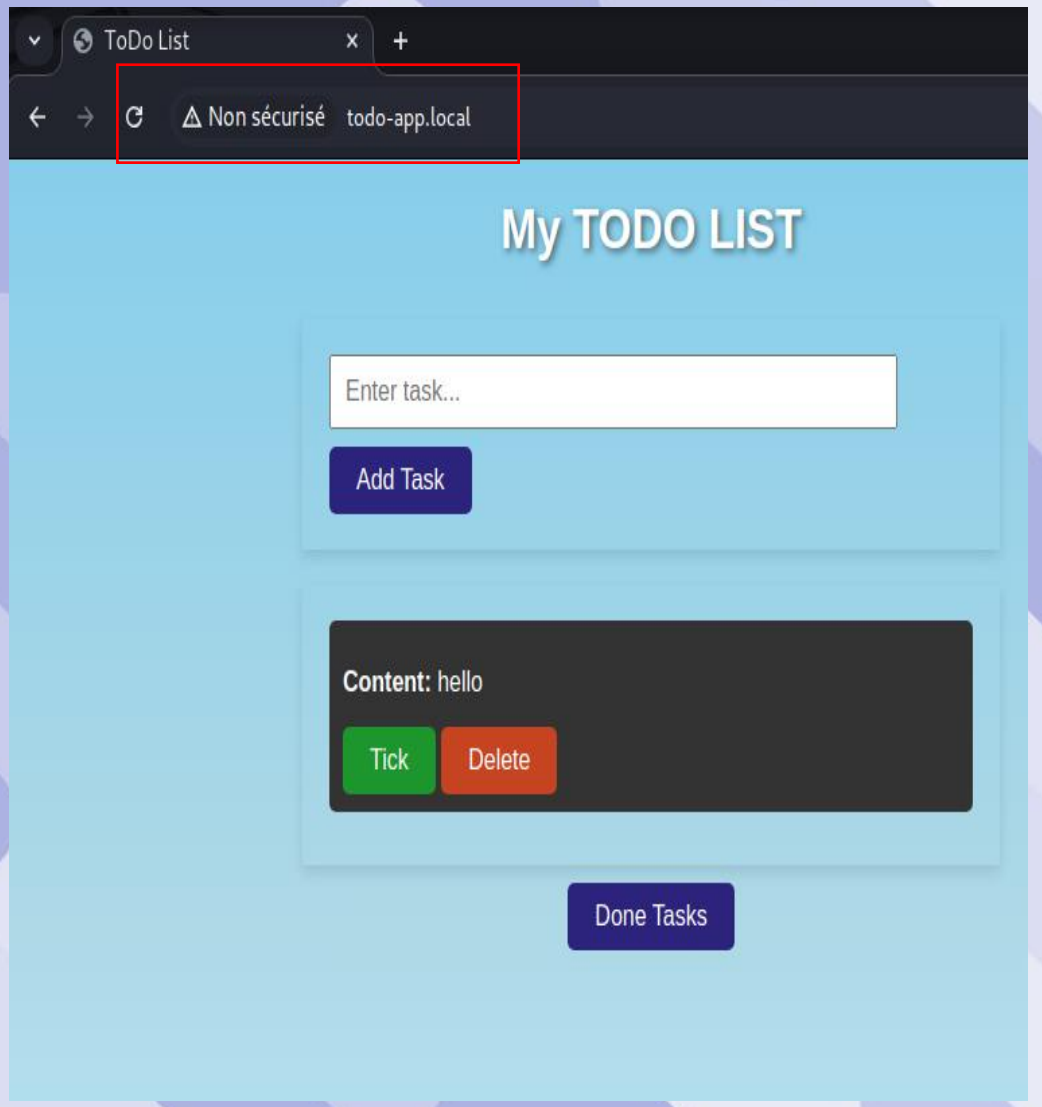
CODE ARCHITECTURE : #2/4

! nginx-ingressclass.yaml U ×

! nginx-ingressclass.yaml

```yaml
apiVersion: networking.k8s.io/v1
kind: IngressClass
metadata:
  name: nginx
  labels:
    app.kubernetes.io/managed-by: "Helm"
  annotations:
    meta.helm.sh/release-name: "nginx-ingress"
    meta.helm.sh/release-namespace: "default"
spec:
  controller: k8s.io/ingress-nginx
```

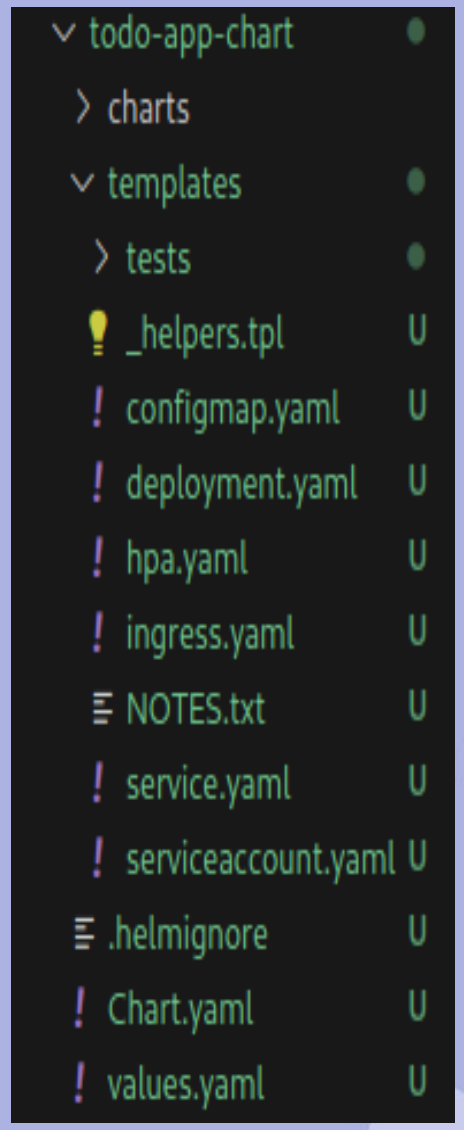





```
(kaliuser㉿kali)-[~/Documents/my-todo-list]
$ kubectl get pods -A
```

NAMESPACE	NAME	READY	STATUS	RESTARTS	AGE
default	mongo-0	1/1	Running	2 (44m ago)	3h44m
default	todo-app-fbd64f874-f5hx4	1/1	Running	0	18m
default	todo-app-fbd64f874-pppf4	1/1	Running	0	18m
ingress-nginx	ingress-nginx-admission-create-hxpxp	0/1	Completed	0	3h51m
ingress-nginx	ingress-nginx-admission-patch-jdkws	0/1	Completed	1	3h51m
ingress-nginx	ingress-nginx-controller-768f948f8f-qqqcm	1/1	Running	2 (44m ago)	3h51m
kube-system	coredns-7db6d8ff4d-tx77l	1/1	Running	4 (44m ago)	16h
kube-system	etcd-minikube	1/1	Running	4 (44m ago)	16h
kube-system	kube-apiserver-minikube	1/1	Running	4 (44m ago)	16h
kube-system	kube-controller-manager-minikube	1/1	Running	4 (44m ago)	16h
kube-system	kube-proxy-tlzzx	1/1	Running	4 (44m ago)	16h
kube-system	kube-scheduler-minikube	1/1	Running	4 (44m ago)	16h
kube-system	storage-provisioner	1/1	Running	9 (39m ago)	16h

CODE ARCHITECTURE : #3/4



deployment.yaml U

todo-app-chart > templates > deployment.yaml

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: {{ include "todo-app-chart.fullname" . }}
  labels:
    app: todo-app
spec:
  replicas: {{ .Values.replicaCount }}
  selector:
    matchLabels:
      app: todo-app
  template:
    metadata:
      labels:
        app: todo-app
    spec:
      containers:
        - name: todo-app
          image: "{{ .Values.image.repository }}:{{ .Values.image.tag }}"
          ports:
            - containerPort: {{ .Values.containerPort }}
          env:
            - name: ENV_MONGO
              value: {{ .Values.mongoConnectionString }}
```

CODE ARCHITECTURE : #4/4

nginx-ingressclass.yaml U

nginx-ingressclass.yaml

```yaml
apiVersion: networking.k8s.io/v1
kind: IngressClass
metadata:
  name: nginx
  labels:
    app.kubernetes.io/managed-by: "Helm"
  annotations:
    meta.helm.sh/release-name: "nginx-ingress"
    meta.helm.sh/release-namespace: "default"
spec:
  controller: k8s.io/ingress-nginx

```

```
┌──(kaliuser㉿kali)-[~/Documents/my-todo-list]
└─$ kubectl get pods
NAME                                                  READY   STATUS    RESTARTS        AGE
mongo-0                                               1/1     Running   2 (3h16m ago)   6h15m
my-release-todo-app-chart-77b7bc8459-bngcg            1/1     Running   0               121m
my-todo-app-todo-app-chart-fbd64f874-g9brm            1/1     Running   0               88m
my-todo-app-todo-app-chart-fbd64f874-qqpcl            1/1     Running   0               88m
nginx-ingress-ingress-nginx-controller-657b44cd6f-mh2tm   1/1     Running   0               21m
todo-app-fbd64f874-f5hx4                              1/1     Running   0               170m
todo-app-fbd64f874-pppf4                              1/1     Running   0               170m
```

LESSON-LEARNED

New Technologies : Kubernetes, Helm Charts …

Thoroughly Review Logs

Adaptability and problem solving

DEMONSTRATION :

THANKS

THANK YOU FOR YOUR ATTENTION!