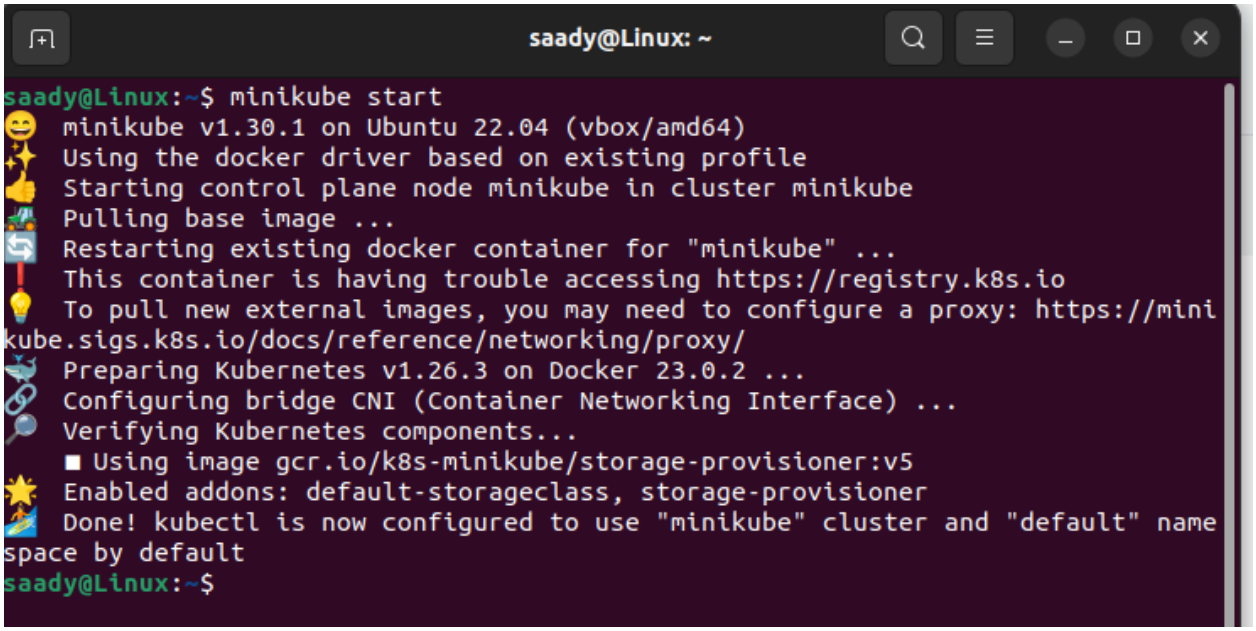
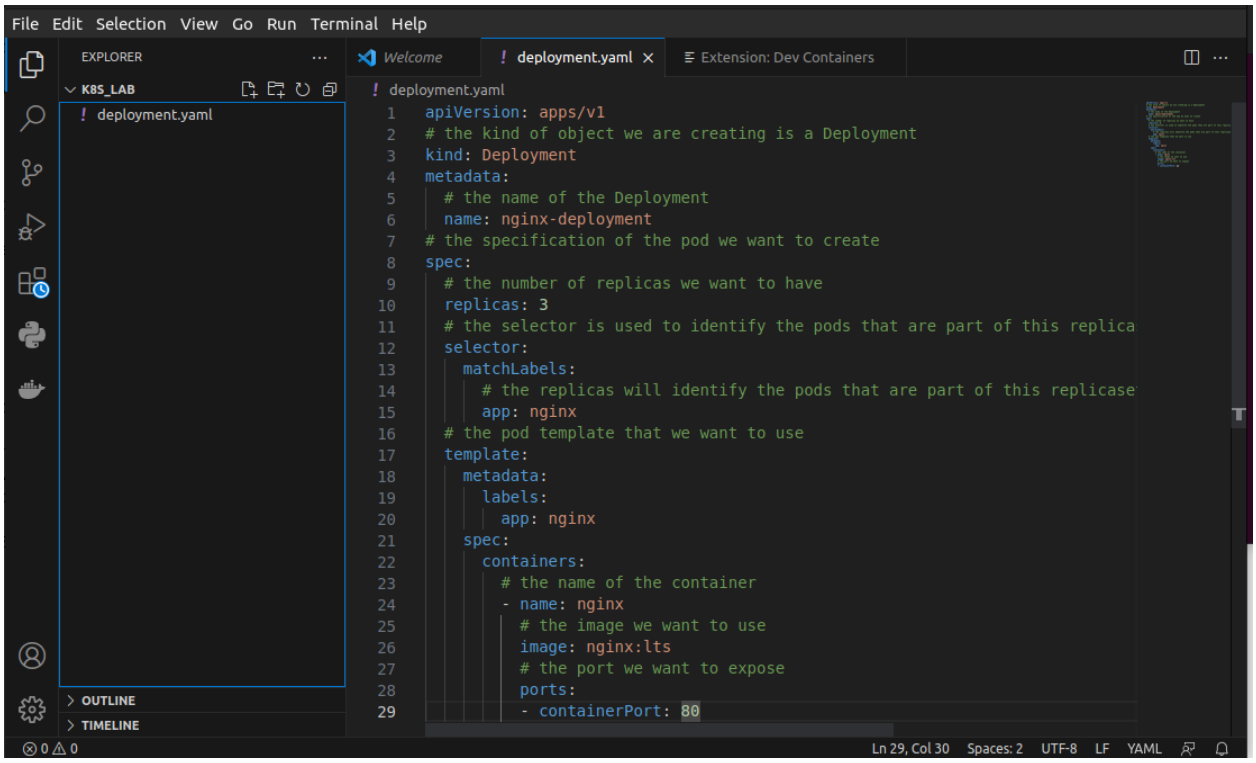
Kubernetes deployment project

1.)minikube cluster



2.) The Deployment with 3 replicas:-



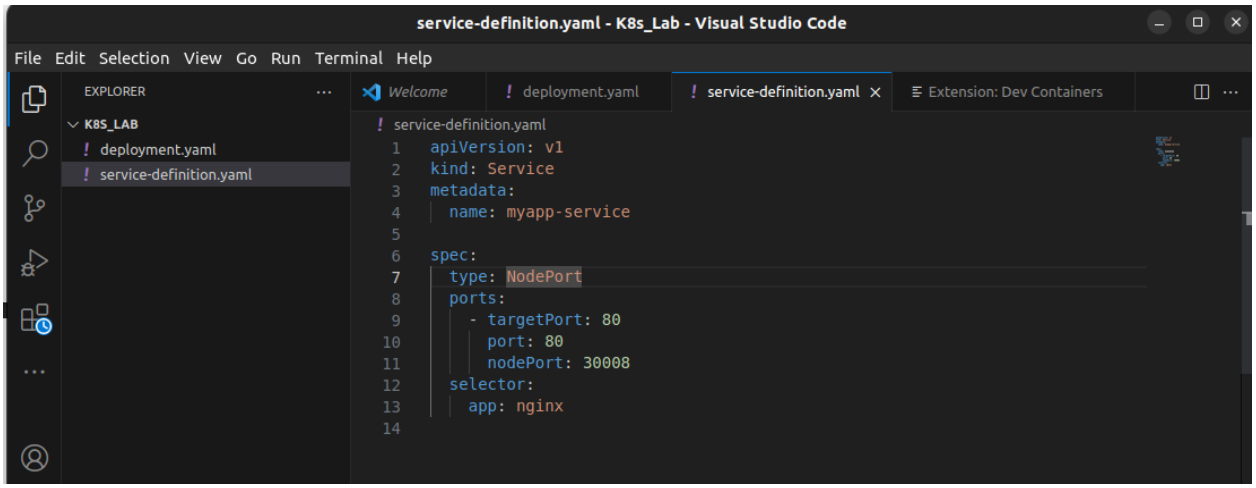

```yaml
apiVersion: apps/v1
# the kind of object we are creating is a Deployment
kind: Deployment
metadata:
  # the name of the Deployment
  name: nginx-deployment
# the specification of the pod we want to create
spec:
  # the number of replicas we want to have
  replicas: 3
  # the selector is used to identify the pods that are part of this replica
  selector:
    matchLabels:
      # the replicas will identify the pods that are part of this replicase
      app: nginx
  # the pod template that we want to use
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        # the name of the container
        - name: nginx
          # the image we want to use
          image: nginx:lts
          # the port we want to expose
          ports:
          - containerPort: 80
```

```
saady@Linux:~/Documents$ mkdir K8s_Lab
saady@Linux:~/Documents$ cd k8s_Lab
bash: cd: k8s_Lab: No such file or directory
saady@Linux:~/Documents$ cd K8s_Lab
saady@Linux:~/Documents/K8s_Lab$ code .
saady@Linux:~/Documents/K8s_Lab$ kubectl apply deployment.yaml
error: Unexpected args: [deployment.yaml]
See 'kubectl apply -h' for help and examples
saady@Linux:~/Documents/K8s_Lab$ kubectl apply -f deployment.yaml
deployment.apps/nginx-deployment created
saady@Linux:~/Documents/K8s_Lab$ kubectl get po
NAME                                READY   STATUS              RESTARTS   AGE
nginx-deployment-5d96978b55-65ztz   0/1     ContainerCreating   0          11s
nginx-deployment-5d96978b55-6z4mg   0/1     ContainerCreating   0          11s
nginx-deployment-5d96978b55-b68xs   0/1     ContainerCreating   0          11s
```

```
saady@Linux:~/Documents/K8s_Lab$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-85996f8dbd-8hltc   1/1     Running   0          69s
nginx-deployment-85996f8dbd-cs7hx   1/1     Running   0          21s
nginx-deployment-85996f8dbd-hn5zn   1/1     Running   0          25s
saady@Linux:~/Documents/K8s_Lab$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-85996f8dbd-8hltc   1/1     Running   0          72s
nginx-deployment-85996f8dbd-cs7hx   1/1     Running   0          24s
nginx-deployment-85996f8dbd-hn5zn   1/1     Running   0          28s
saady@Linux:~/Documents/K8s_Lab$
```

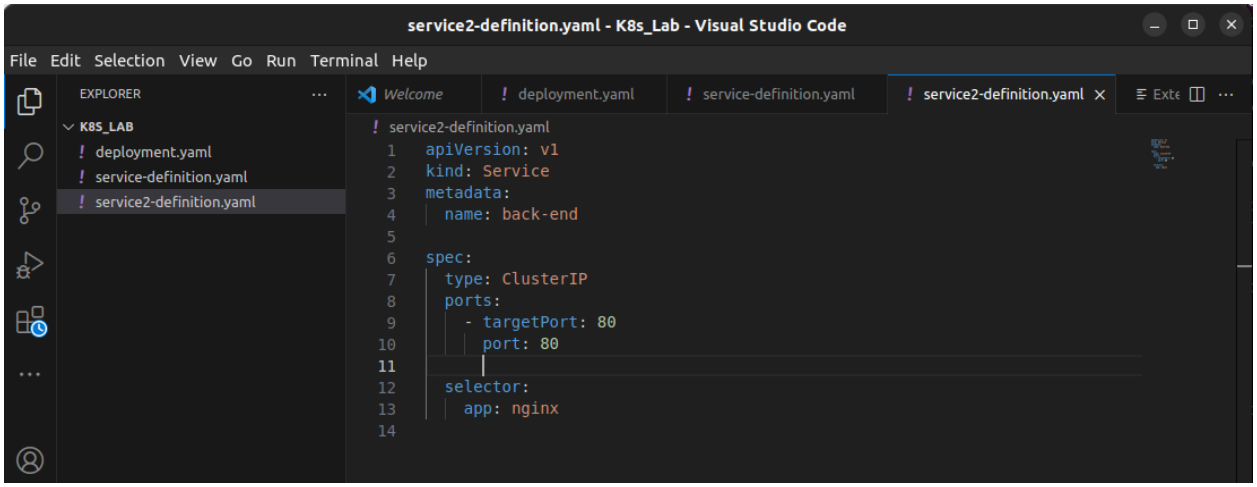
```
saady@Linux:~/Documents/K8s_Lab$ kubectl describe Deployment nginx-deployment
Name:                   nginx-deployment
Namespace:              default
CreationTimestamp:      Sat, 17 Jun 2023 18:42:12 +0300
Labels:                 <none>
Annotations:            deployment.kubernetes.io/revision: 1
Selector:               app=nginx
Replicas:               3 desired | 3 updated | 3 total | 0 available | 3 unavailable
StrategyType:           RollingUpdate
MinReadySeconds:        0
RollingUpdateStrategy:  25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=nginx
  Containers:
   nginx:
    Image:        nginx:lts
    Port:         80/TCP
    Host Port:    0/TCP
    Environment:  <none>
    Mounts:       <none>
  Volumes:        <none>
Conditions:
  Type           Status  Reason
  ----           ------  ------
  Available      False   MinimumReplicasUnavailable
  Progressing    True    ReplicaSetUpdated
OldReplicaSets:  <none>
NewReplicaSet:   nginx-deployment-5d96978b55 (3/3 replicas created)
Events:
  Type    Reason             Age   From                   Message
  ----    ------             ----  ----                   -------
  Normal  ScalingReplicaSet  3m4s  deployment-controller  Scaled up replica set nginx-deployment-5d96978b55 to 3
saady@Linux:~/Documents/K8s_Lab$
```

service to point to this deployment , type NodePort :-



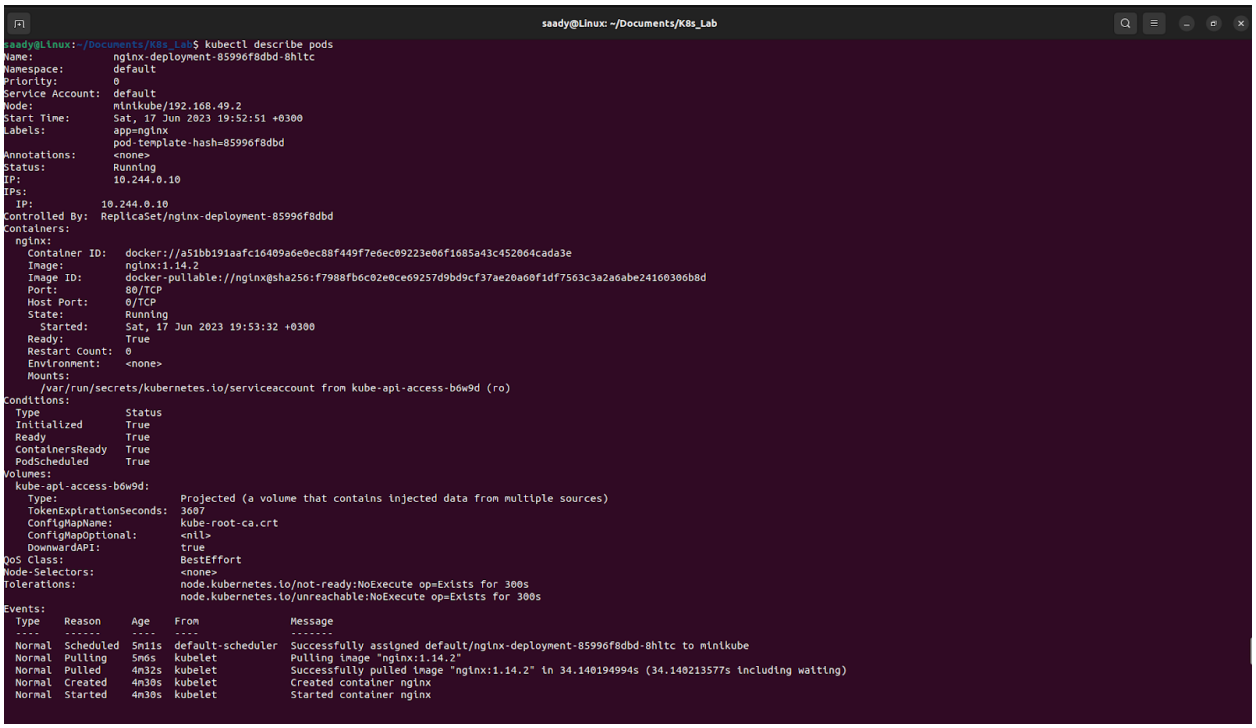

```
saady@Linux:~/Documents/K8s_Lab$ kubectl create -f service-definition.yaml
service/myapp-service created
saady@Linux:~/Documents/K8s_Lab$ kubectl get services
NAME             TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
kubernetes       ClusterIP   10.96.0.1       <none>        443/TCP        5d
myapp-service    NodePort    10.106.80.59    <none>        80:30008/TCP   18s
saady@Linux:~/Documents/K8s_Lab$
```

service to point to this deployment , type cluster IP :-



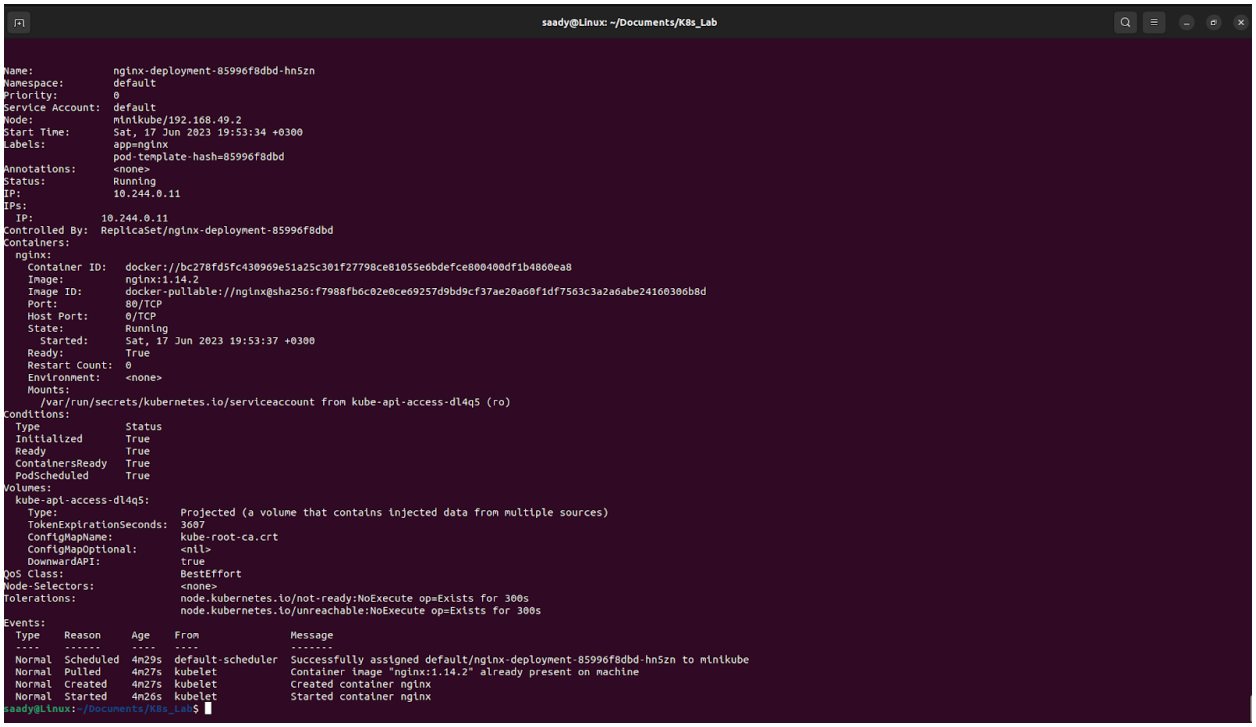

```
saady@Linux:~/Documents/K8s_Lab$ kubectl create -f service2-definition.yaml
service/back-end created
saady@Linux:~/Documents/K8s_Lab$ kubectl get services
NAME             TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)        AGE
back-end         ClusterIP   10.103.162.137   <none>        80/TCP         5s
kubernetes       ClusterIP   10.96.0.1        <none>        443/TCP        5d
myapp-service    NodePort    10.106.80.59     <none>        80:30008/TCP   5m7s
saady@Linux:~/Documents/K8s_Lab$
```

debug pod to test the service



```
saady@Linux:~/Documents/K8s_Lab$ kubectl describe pods
Name:             nginx-deployment-85996f8dbd-8hltc
Namespace:        default
Priority:         0
Service Account:  default
Node:             minikube/192.168.49.2
Start Time:       Sat, 17 Jun 2023 19:52:51 +0300
Labels:           app=nginx
                  pod-template-hash=85996f8dbd
Annotations:      <none>
Status:           Running
IP:               10.244.0.10
IPs:
  IP:           10.244.0.10
Controlled By:  ReplicaSet/nginx-deployment-85996f8dbd
Containers:
  nginx:
    Container ID:   docker://a51bb191aafc16409a6e0ec88f449f7e6ec09223e06f1685a43c452064cada3e
    Image:          nginx:1.14.2
    Image ID:       docker-pullable://nginx@sha256:f7988fb6c02e0ce69257d9bd9cf37ae20a60f1df7563c3a2a6abe24160306b8d
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Sat, 17 Jun 2023 19:53:32 +0300
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-b6w9d (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  kube-api-access-b6w9d:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s

Events:
  Type    Reason     Age    From               Message
  ----    ------     ----   ----               -------
  Normal  Scheduled  5m11s  default-scheduler  Successfully assigned default/nginx-deployment-85996f8dbd-8hltc to minikube
  Normal  Pulling    5m6s   kubelet            Pulling image "nginx:1.14.2"
  Normal  Pulled     4m32s  kubelet            Successfully pulled image "nginx:1.14.2" in 34.140194994s (34.140213577s including waiting)
  Normal  Created    4m30s  kubelet            Created container nginx
  Normal  Started    4m30s  kubelet            Started container nginx
```



```
Name:             nginx-deployment-85996f8dbd-hn5zn
Namespace:        default
Priority:         0
Service Account:  default
Node:             minikube/192.168.49.2
Start Time:       Sat, 17 Jun 2023 19:53:34 +0300
Labels:           app=nginx
                  pod-template-hash=85996f8dbd
Annotations:      <none>
Status:           Running
IP:               10.244.0.11
IPs:
  IP:           10.244.0.11
Controlled By:  ReplicaSet/nginx-deployment-85996f8dbd
Containers:
  nginx:
    Container ID:   docker://bc278fd5fc430969e51a25c301f27798ce81055e6bdefce800400df1b4860ea8
    Image:          nginx:1.14.2
    Image ID:       docker-pullable://nginx@sha256:f7988fb6c02e0ce69257d9bd9cf37ae20a60f1df7563c3a2a6abe24160306b8d
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Sat, 17 Jun 2023 19:53:37 +0300
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-dl4q5 (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  kube-api-access-dl4q5:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s

Events:
  Type    Reason     Age    From               Message
  ----    ------     ----   ----               -------
  Normal  Scheduled  4m29s  default-scheduler  Successfully assigned default/nginx-deployment-85996f8dbd-hn5zn to minikube
  Normal  Pulled     4m27s  kubelet            Container image "nginx:1.14.2" already present on machine
  Normal  Created    4m27s  kubelet            Created container nginx
  Normal  Started    4m26s  kubelet            Started container nginx
saady@Linux:~/Documents/K8s_Lab$
```

```
saady@Linux: ~/Documents/K8s_Lab

Name:             nginx-deployment-85996f8dbd-cs7hx
Namespace:        default
Priority:         0
Service Account:  default
Node:             minikube/192.168.49.2
Start Time:       Sat, 17 Jun 2023 19:53:38 +0300
Labels:           app=nginx
                  pod-template-hash=85996f8dbd
Annotations:      <none>
Status:           Running
IP:               10.244.0.12
IPs:
  IP:           10.244.0.12
Controlled By:  ReplicaSet/nginx-deployment-85996f8dbd
Containers:
  nginx:
    Container ID:   docker://80d913b1c3bb2634714f63bec8787285acec9ad51f5deb37300ed405ea1e8dee
    Image:          nginx:1.14.2
    Image ID:       docker-pullable://nginx@sha256:f7988fb6c02e0ce69257d9bd9cf37ae20a60f1df7563c3a2a6abe24160306b8d
    Port:           80/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Sat, 17 Jun 2023 19:53:41 +0300
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-jrj6n (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  kube-api-access-jrj6n:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s

Events:
  Type    Reason     Age    From               Message
  ----    ------     ----   ----               -------
  Normal  Scheduled  4m25s  default-scheduler  Successfully assigned default/nginx-deployment-85996f8dbd-cs7hx to minikube
  Normal  Pulled     4m23s  kubelet            Container image "nginx:1.14.2" already present on machine
  Normal  Created    4m23s  kubelet            Created container nginx
  Normal  Started    4m22s  kubelet            Started container nginx
```

Access the Node by Public IP and NodePort Service :-