Lab3 - W2D2

Minikube with two nodes

```
sufiyanmemon@Sufiyans-MacBook-Air Labs % minikube start --nodes 2 -p multinode-demo
😄  [multinode-demo] minikube v1.32.0 on Darwin 13.4 (arm64)
✨  Automatically selected the docker driver
📌  Using Docker Desktop driver with root privileges
👍  Starting control plane node multinode-demo in cluster multinode-demo
🚜  Pulling base image ...
🔥  Creating docker container (CPUs=2, Memory=3928MB) ...
🐳  Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
    ▪ Generating certificates and keys ...
    ▪ Booting up control plane ...
    ▪ Configuring RBAC rules ...
🔗  Configuring CNI (Container Networking Interface) ...
🔎  Verifying Kubernetes components...
    ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌟  Enabled addons: storage-provisioner, default-storageclass

👍  Starting worker node multinode-demo-m02 in cluster multinode-demo
🚜  Pulling base image ...
🔥  Creating docker container (CPUs=2, Memory=3928MB) ...
🌐  Found network options:
    ▪ NO_PROXY=192.168.49.2
🐳  Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
    ▪ env NO_PROXY=192.168.49.2
🔎  Verifying Kubernetes components...
🏄  Done! kubectl is now configured to use "multinode-demo" cluster and "default" namespace by default
sufiyanmemon@Sufiyans-MacBook-Air Labs %
```

Get list of nodes

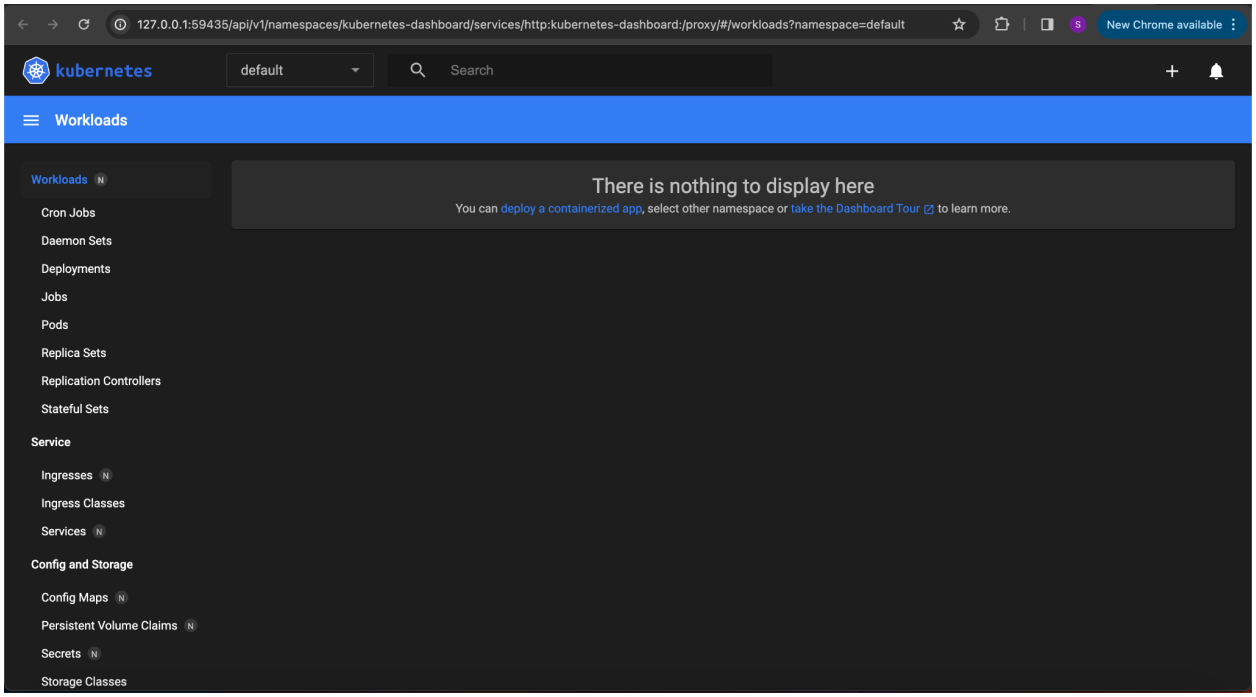
```
sufiyanmemon@Sufiyans-MacBook-Air Labs % kubectl get nodes
NAME                 STATUS   ROLES           AGE    VERSION
multinode-demo       Ready    control-plane   111s   v1.28.3
multinode-demo-m02   Ready    <none>          92s    v1.28.3
sufiyanmemon@Sufiyans-MacBook-Air Labs %
```

Check status of nodes

```
sufiyanmemon@Sufiyans-MacBook-Air Labs % minikube status -p multinode-demo
multinode-demo
type: Control Plane
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured

multinode-demo-m02
type: Worker
host: Running
kubelet: Running

sufiyanmemon@Sufiyans-MacBook-Air Labs %
```

To view dashboard

```
sufiyanmemon@Sufiyans-MacBook-Air Labs % minikube dashboard -p multinode-demo
🔌  Enabling dashboard ...
    ▪ Using image docker.io/kubernetesui/metrics-scraper:v1.0.8
    ▪ Using image docker.io/kubernetesui/dashboard:v2.7.0
💡  Some dashboard features require the metrics-server addon. To enable all features please run:

        minikube -p multinode-demo addons enable metrics-server


🤔  Verifying dashboard health ...
🚀  Launching proxy ...
🤔  Verifying proxy health ...
🎉  Opening http://127.0.0.1:59435/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/ in your default browser...
```



To stop the node and clean minikube environment

```
sufiyanmemon@Sufiyans-MacBook-Air Labs % minikube stop -p multinode-demo
✋  Stopping node "multinode-demo"  ...
🛑  Powering off "multinode-demo" via SSH ...
✋  Stopping node "multinode-demo-m02"  ...
🛑  Powering off "multinode-demo-m02" via SSH ...
🛑  2 nodes stopped.
sufiyanmemon@Sufiyans-MacBook-Air Labs %
```

```
sufiyanmemon@Sufiyans-MacBook-Air Labs % minikube delete --all
🔥  Deleting "multinode-demo" in docker ...
🔥  Removing /Users/sufiyanmemon/.minikube/machines/multinode-demo ...
🔥  Removing /Users/sufiyanmemon/.minikube/machines/multinode-demo-m02 ...
💀  Removed all traces of the "multinode-demo" cluster.
🔥  Successfully deleted all profiles
sufiyanmemon@Sufiyans-MacBook-Air Labs %
```

Replica Set YAML and apply.

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl apply -f replicaset.yaml
replicaset.apps/nginx created
```

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-8r749   1/1     Running   0          5m16s
nginx-p9ghd   1/1     Running   0          5m16s
nginx-s56gl   1/1     Running   0          5m16s
sufiyanmemon@Sufiyans-Air Lab3 %
```

Delete a pod in the ReplicaSet

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl delete pod nginx-8r749
pod "nginx-8r749" deleted
```

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl get pods
NAME          READY   STATUS    RESTARTS   AGE
nginx-p9ghd   1/1     Running   0          6m2s
nginx-s56gl   1/1     Running   0          6m2s
nginx-s9dnn   1/1     Running   0          7s
sufiyanmemon@Sufiyans-Air Lab3 %
```

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl get replicasets
NAME    DESIRED   CURRENT   READY   AGE
nginx   3         3         3       6m31s
```

Deployment YAML with ReplicaSet

```
sufiyanmemon@Sufiyans-Air Lab3 % Kubectl apply -f nginx.yaml
deployment.apps/nginx-deployment created
```

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl get deployments
NAME               READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment   3/3     3            3           25s
```

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl rollout status deployment nginx-deployment
deployment "nginx-deployment" successfully rolled out
```

StatefulSet YAML

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl apply -f stateful-nginx.yaml
service/nginx created
statefulset.apps/web created
```

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl get statefulsets
NAME   READY   AGE
web    0/3     16s
```

DaemonSet YAML

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl apply -f daemonset-nginx.yaml
daemonset.apps/nginx created
```

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl get daemonset
NAME    DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
nginx   1         1         1       1            1           <none>          18s
```

Deployment example with resource limits.

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl apply -f nginx-deployment-resource-limit.yaml
deployment.apps/nginx-deployment configured
sufiyanmemon@Sufiyans-Air Lab3 % kubectl get deployments
NAME               READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment   3/3     3            3           6m37s
```

Deployment with health checks

```
sufiyanmemon@Sufiyans-Air Lab3 % kubectl apply -f nginx-deployment-health-check.yaml
deployment.apps/nginx-deployment configured
sufiyanmemon@Sufiyans-Air Lab3 % kubectl get deployments
NAME               READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment   3/3     3            3           8m26s
```

Deploying Full Stack Application Deployment

```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl apply -f mongodb-secret.yaml
secret/mongodb-secret created
```

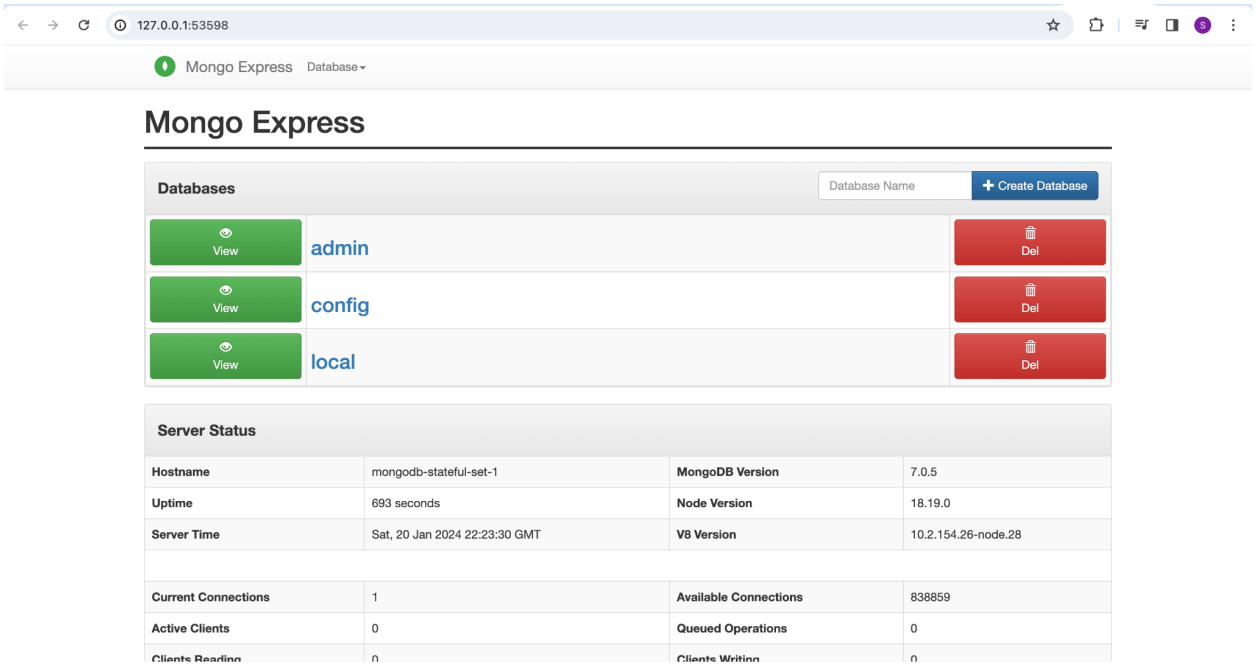
```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl apply -f mongodb-stateful-set.yaml
statefulset.apps/mongodb-stateful-set created
```

```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl apply -f mongodb-service.yaml
service/mongodb-service created
```

```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl apply -f note-server-depl.yaml
deployment.apps/mongo-express-deployment created
```

```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl apply -f note-server-service.yaml
service/mongo-express-service created
```

```
sufiyanmemon@Sufiyans-Air MERN-app % minikube service mongo-express-service
|-----------|----------------------|-------------|---------------------------|
| NAMESPACE |         NAME         | TARGET PORT |            URL            |
|-----------|----------------------|-------------|---------------------------|
| default   | mongo-express-service |        8081 | http://192.168.49.2:30639 |
|-----------|----------------------|-------------|---------------------------|
🏃  Starting tunnel for service mongo-express-service.
|-----------|----------------------|-------------|------------------------|
| NAMESPACE |         NAME         | TARGET PORT |          URL           |
|-----------|----------------------|-------------|------------------------|
| default   | mongo-express-service |             | http://127.0.0.1:53598 |
|-----------|----------------------|-------------|------------------------|
🎉  Opening service default/mongo-express-service in default browser...
❗  Because you are using a Docker driver on darwin, the terminal needs to be open to run it.
```




```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl apply -f mongo-express-depl.yaml
deployment.apps/note-server-deployment created
```

```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl apply -f mongo-express-service.yaml
service/note-server-service created
```

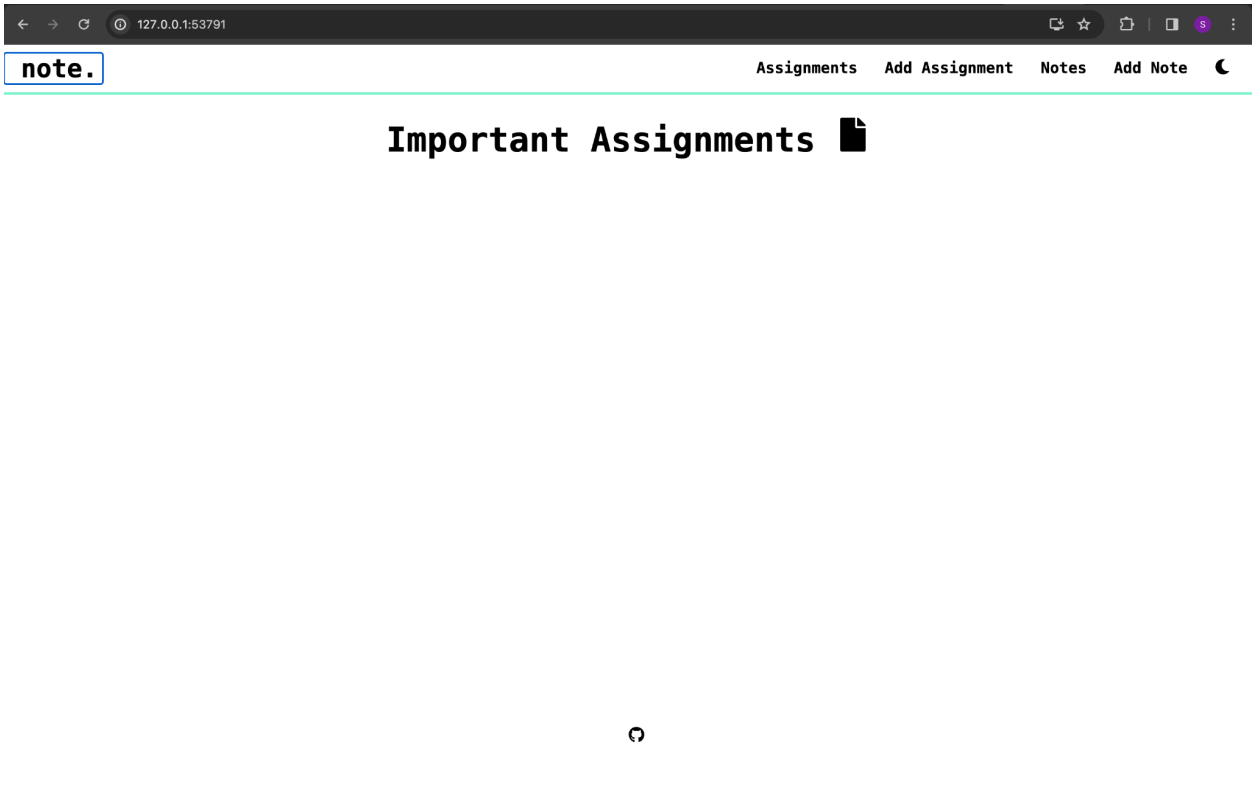
```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl apply -f note-react-deployment.yaml
deployment.apps/note-deployment created
```

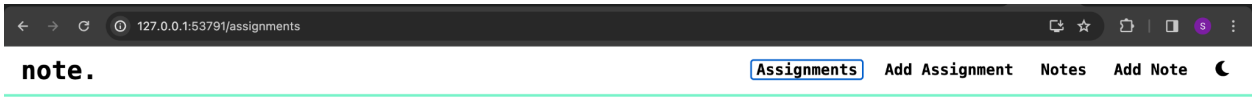
```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl apply -f note-react-service.yaml
service/note-service created
```

```
sufiyanmemon@Sufiyans-Air MERN-app % minikube service note-service
|-----------|--------------|-------------|---------------------------|
| NAMESPACE |     NAME     | TARGET PORT |            URL            |
|-----------|--------------|-------------|---------------------------|
| default   | note-service |        3000 | http://192.168.49.2:32625 |
|-----------|--------------|-------------|---------------------------|
🏃  Starting tunnel for service note-service.
|-----------|--------------|-------------|------------------------|
| NAMESPACE |     NAME     | TARGET PORT |          URL           |
|-----------|--------------|-------------|------------------------|
| default   | note-service |             | http://127.0.0.1:53791 |
|-----------|--------------|-------------|------------------------|
🎉  Opening service default/note-service in default browser...
❗  Because you are using a Docker driver on darwin, the terminal needs to be open to run it.
```

```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl get pods
NAME                                    READY   STATUS    RESTARTS   AGE
mongo-express-deployment-b88f6d45f-z7n44   1/1     Running   0          21m
mongodb-stateful-set-0                  1/1     Running   0          27m
mongodb-stateful-set-1                  1/1     Running   0          27m
note-deployment-74cc946cd8-jvsl7        1/1     Running   0          11s
note-deployment-74cc946cd8-wc6zb        1/1     Running   0          4m58s
note-server-deployment-6fb5fcb67f-7tt5h    1/1     Running   0          11m
note-server-deployment-6fb5fcb67f-bpfr7    1/1     Running   0          11m
sufiyanmemon@Sufiyans-Air MERN-app % kubectl delete pod note-deployment-74cc946cd8-jvsl7
pod "note-deployment-74cc946cd8-jvsl7" deleted
sufiyanmemon@Sufiyans-Air MERN-app %
```

```
sufiyanmemon@Sufiyans-Air MERN-app % kubectl get pods
NAME                                    READY   STATUS    RESTARTS   AGE
mongo-express-deployment-b88f6d45f-z7n44   1/1     Running   0          21m
mongodb-stateful-set-0                  1/1     Running   0          27m
mongodb-stateful-set-1                  1/1     Running   0          27m
note-deployment-74cc946cd8-jvsl7        1/1     Running   0          11s
note-deployment-74cc946cd8-wc6zb        1/1     Running   0          4m58s
note-server-deployment-6fb5fcb67f-7tt5h    1/1     Running   0          11m
note-server-deployment-6fb5fcb67f-bpfr7    1/1     Running   0          11m
```





note.

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