Kubernetes task

Task 1 :

Create a deployment.yaml file for your application which is being accessed using the nodeport service and also add few environment variables with the help of secrets and configmap. and the pods should only be scheduled on the node which has label country=India(use the concept of Node Affinity)

ANS :

```
kubectl create ns devops
kubectl get nodes
kubectl label nodes minikube country=India
kubectl describe nodes minikube
kubectl apply -f config.yaml
kubectl apply -f secret.yaml
kubectl apply -f deploy.yaml
kubectl apply -f service.yaml
kubectl get secret -n devops
kubectl get cm -n devops
kubectl get all -n devops -o wide
kubectl describe pod deployment-6949c8f78-29xzz -n devops
minikube service service -n devops
```

Use below Uname and Password to access application
Uname : AkashRaut
Password: AkashRaut@123

Output of above commands:

```
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl create ns devops
namespace/devops created
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl get nodes
NAME       STATUS   ROLES           AGE   VERSION
minikube   Ready    control-plane   11d   v1.26.1
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl label nodes minikube country=India
node/minikube not labeled
```

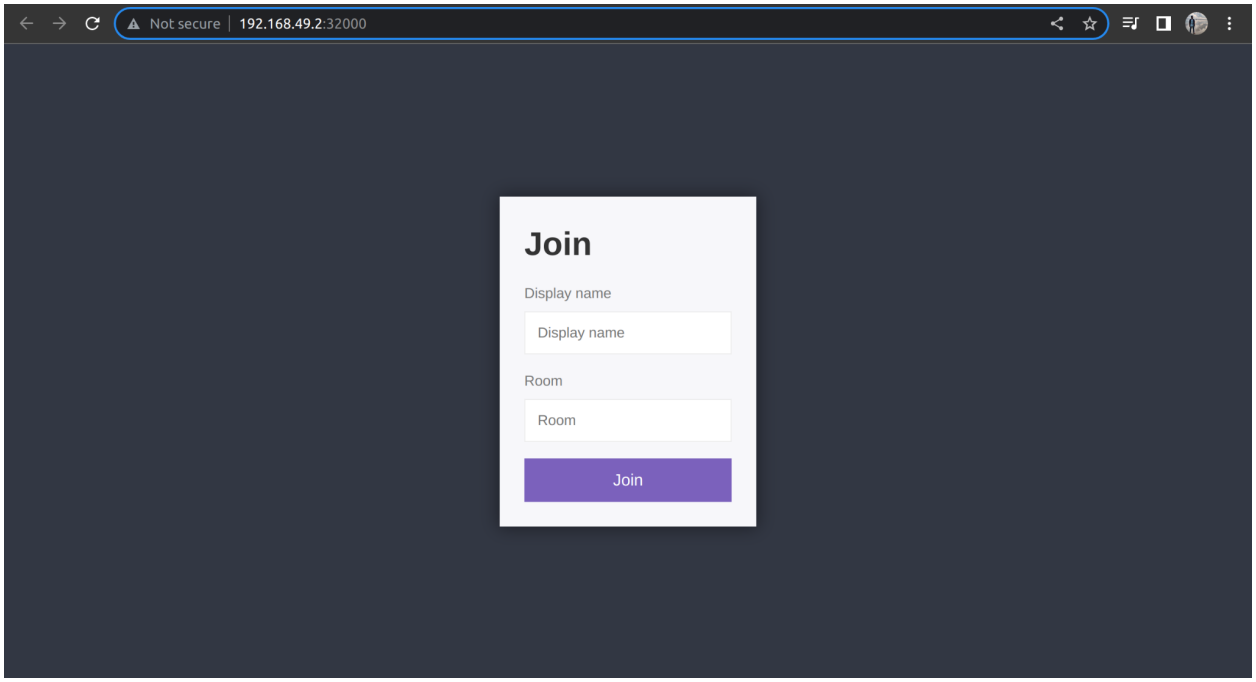
```
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl describe nodes minikube
Name:               minikube
Roles:              control-plane
Labels:             beta.kubernetes.io/arch=amd64
                    beta.kubernetes.io/os=linux
                    country=India
                    kubernetes.io/arch=amd64
                    kubernetes.io/hostname=minikube
                    kubernetes.io/os=linux
                    minikube.k8s.io/commit=ddac20b4b34a9c8c857fc602203b6ba2679794d3
                    minikube.k8s.io/name=minikube
                    minikube.k8s.io/primary=true
                    minikube.k8s.io/updated_at=2023_03_01T15_49_10_0700
                    minikube.k8s.io/version=v1.29.0
                    node-role.kubernetes.io/control-plane=
                    node.kubernetes.io/exclude-from-external-load-balancers=
Annotations:        kubeadm.alpha.kubernetes.io/cri-socket: unix:///var/run/cri-dockerd.sock
                    node.alpha.kubernetes.io/ttl: 0
                    volumes.kubernetes.io/controller-managed-attach-detach: true
CreationTimestamp:  Wed, 01 Mar 2023 15:49:06 +0530
Taints:             <none>
Unschedulable:      false
Lease:
  HolderIdentity:  minikube
  AcquireTime:     <unset>
  RenewTime:       Mon, 13 Mar 2023 12:48:46 +0530
Conditions:
  Type             Status  LastHeartbeatTime                 LastTransitionTime                Reason                       Message
  ----             ------  -----------------                 ------------------                ------                       -------
  MemoryPressure   False   Mon, 13 Mar 2023 12:44:34 +0530   Wed, 01 Mar 2023 15:49:05 +0530   KubeletHasSufficientMemory   kubelet has sufficient memory available
  DiskPressure     False   Mon, 13 Mar 2023 12:44:34 +0530   Wed, 01 Mar 2023 15:49:05 +0530   KubeletHasNoDiskPressure     kubelet has no disk pressure
  PIDPressure      False   Mon, 13 Mar 2023 12:44:34 +0530   Wed, 01 Mar 2023 15:49:05 +0530   KubeletHasSufficientPID      kubelet has sufficient PID available
  Ready            True    Mon, 13 Mar 2023 12:44:34 +0530   Wed, 01 Mar 2023 15:49:11 +0530   KubeletReady                 kubelet is posting ready status
Addresses:
  InternalIP:  192.168.49.2
  Hostname:    minikube
```

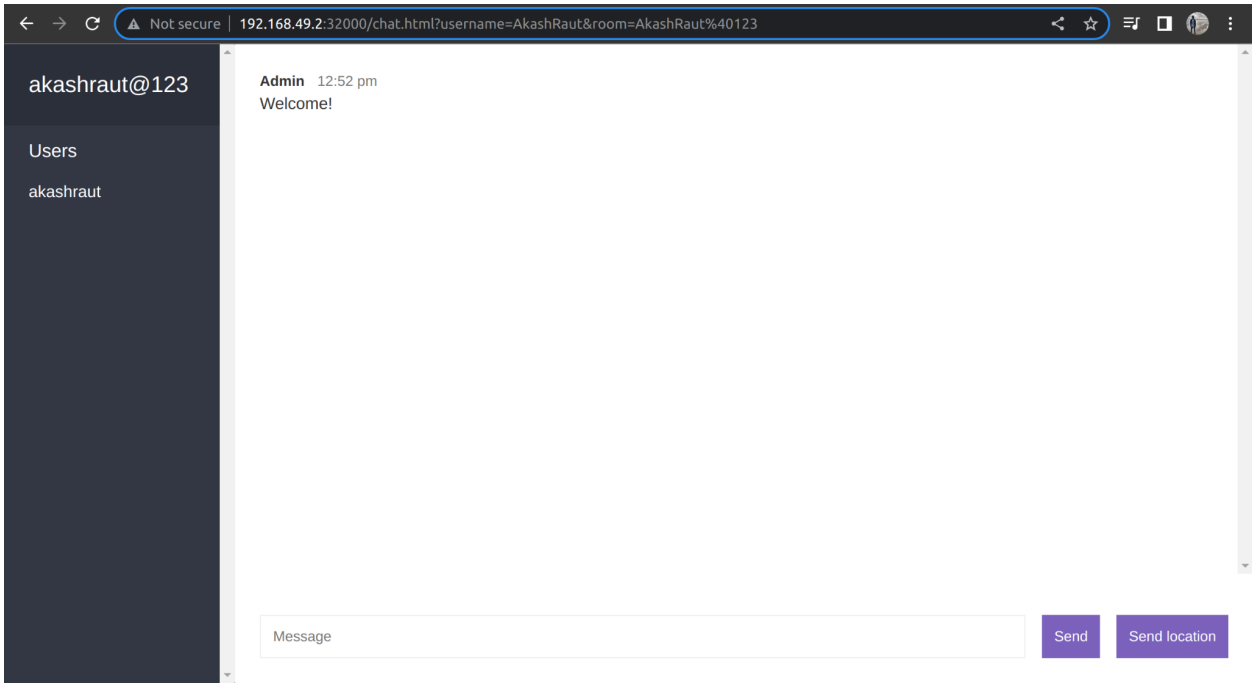
```
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl apply -f config.yaml
configmap/config created
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl apply -f secret.yaml
secret/secret created
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl apply -f deploy.yaml
deployment.apps/deployment created
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl apply -f service.yaml
service/service created
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl get secret -n devops
NAME     TYPE     DATA   AGE
secret   Opaque   2      12s
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl get cm -n devops
NAME               DATA   AGE
config             2      20s
kube-root-ca.crt   1      88s
akashraut@akash:~/DevOps_Training/k8s/Task 1$
```

```
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl get all -n devops -o wide
NAME                             READY   STATUS    RESTARTS   AGE   IP            NODE       NOMINATED NODE   READINESS GATES
pod/deployment-6949c8f78-7lb7k   1/1     Running   0          36s   10.244.0.67   minikube   <none>           <none>
pod/deployment-6949c8f78-9r98w   1/1     Running   0          36s   10.244.0.65   minikube   <none>           <none>
pod/deployment-6949c8f78-bqmc9   1/1     Running   0          36s   10.244.0.68   minikube   <none>           <none>
pod/deployment-6949c8f78-l5rw4   1/1     Running   0          36s   10.244.0.64   minikube   <none>           <none>
pod/deployment-6949c8f78-vdlnl   1/1     Running   0          36s   10.244.0.66   minikube   <none>           <none>

NAME              TYPE       CLUSTER-IP       EXTERNAL-IP   PORT(S)          AGE   SELECTOR
service/service   NodePort   10.100.171.154   <none>        9000:32000/TCP   32s   app=node

NAME                         READY   UP-TO-DATE   AVAILABLE   AGE   CONTAINERS   IMAGES              SELECTOR
deployment.apps/deployment   5/5     5            5           36s   node         akashraut/demo-app   app=node

NAME                                   DESIRED   CURRENT   READY   AGE   CONTAINERS   IMAGES              SELECTOR
replicaset.apps/deployment-6949c8f78   5         5         5       36s   node         akashraut/demo-app   app=node,pod-template-hash=6949c8f78
akashraut@akash:~/DevOps_Training/k8s/Task 1$
```

```
akashraut@akash:~/DevOps_Training/k8s/Task 1$ kubectl describe pod deployment-6949c8f78-7lb7k -n devops
Name:             deployment-6949c8f78-7lb7k
Namespace:        devops
Priority:         0
Service Account:  default
Node:             minikube/192.168.49.2
Start Time:       Mon, 13 Mar 2023 12:49:29 +0530
Labels:           app=node
                  pod-template-hash=6949c8f78
Annotations:      <none>
Status:           Running
IP:               10.244.0.67
IPs:
  IP:           10.244.0.67
Controlled By:  ReplicaSet/deployment-6949c8f78
Containers:
  node:
    Container ID:   docker://bfde67e3af570885a88b928a7b738de1e375dd5d0cce2e34bf9e954de8bde425
    Image:          akashraut/demo-app
    Image ID:       docker-pullable://akashraut/demo-app@sha256:c8499c374b758643fae630b73abe539025c340cc5949ad86291d62fc3f21be2a
    Port:           9000/TCP
    Host Port:      0/TCP
    State:          Running
      Started:      Mon, 13 Mar 2023 12:49:47 +0530
    Ready:          True
    Restart Count:  0
    Environment:
      Password:  <set to the key 'password' in secret 'secret'>  Optional: false
      PORT:      <set to the key 'PORT' of config map 'config'>  Optional: false
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-2jcbt (ro)
Conditions:
  Type              Status
```

```
akashraut@akash:~/DevOps_Training/k8s/Task 1$ minikube service service -n devops
|-----------|---------|-------------|--------------------------|
| NAMESPACE |  NAME   | TARGET PORT |            URL           |
|-----------|---------|-------------|--------------------------|
| devops    | service |        9000 | http://192.168.49.2:32000 |
|-----------|---------|-------------|--------------------------|
🎉  Opening service devops/service in default browser...
akashraut@akash:~/DevOps_Training/k8s/Task 1$ MESA-INTEL: warning: Performance support disabled, consider sysctl dev.i915.perf_stream_paranoid=0

Opening in existing browser session.
```





Task 2 :

Create a cron job which will have two containers one will generate the output of command "df -T -h" in a text file and the second container should print that value. First container should be the init container.

ANS :

kubectl apply -f cronjob.yaml

kubectl get cronjob -n devops

kubectl describe cronjob cron -n devops

kubectl get pods -n devops

kubectl logs cron-27978206-pfbrs -n devops

```
akashraut@akash:~/DevOps_Training/k8s/Task 2$ kubectl apply -f cronjob.yaml
cronjob.batch/cron created
akashraut@akash:~/DevOps_Training/k8s/Task 2$ kubectl get cronjob -n devops
NAME   SCHEDULE      SUSPEND   ACTIVE   LAST SCHEDULE   AGE
cron   */2 * * * *   False     0        <none>          3s
akashraut@akash:~/DevOps_Training/k8s/Task 2$ kubectl describe cronjob cron -n devops
Name:                          cron
Namespace:                     devops
Labels:                        <none>
Annotations:                   <none>
Schedule:                      */2 * * * *
Concurrency Policy:            Allow
Suspend:                       False
Successful Job History Limit:  3
Failed Job History Limit:      1
Starting Deadline Seconds:     <unset>
Selector:                      <unset>
Parallelism:                   <unset>
Completions:                   <unset>
Pod Template:
  Labels:  <none>
  Init Containers:
   init-container:
    Image:      busybox:1.28
    Port:       <none>
    Host Port:  <none>
    Command:
      /bin/sh
      -c
    Args:
      echo Generate the output file to store the disk details used by filesystem; df -T -h > output.txt && sleep 25; mv output.txt /cron;
    Environment:  <none>
    Mounts:
      /cron from cron-volume (rw)
  Containers:
   output-container:
    Image:      busybox:1.28
    Port:       <none>
```

```
akashraut@akash:~/DevOps_Training/k8s/Task 2$ kubectl get pods -n devops
NAME                 READY   STATUS    RESTARTS   AGE
cron-27978206-pfbrs   1/1     Running   0          29s
akashraut@akash:~/DevOps_Training/k8s/Task 2$ kubectl logs cron-27978206-pfbrs -n devops
Defaulted container "output-container" out of: output-container, init-container (init)
total 48
drwxr-xr-x    2 root     root         12288 May 22  2018 bin
drwxr-xr-x    3 root     root          4096 May 22  2018 usr
drwxrwxrwt    2 root     root          4096 May 22  2018 tmp
drwx------    2 root     root          4096 May 22  2018 root
drwxr-xr-x    2 nobody   nogroup       4096 May 22  2018 home
dr-xr-xr-x   13 root     root             0 Mar 13 07:26 sys
drwxrwxrwx    2 root     root          4096 Mar 13 07:26 cron
drwxr-xr-x    1 root     root          4096 Mar 13 07:26 etc
-rwxr-xr-x    1 root     root             0 Mar 13 07:26 .dockerenv
drwxr-xr-x    1 root     root          4096 Mar 13 07:26 var
dr-xr-xr-x  431 root     root             0 Mar 13 07:26 proc
drwxr-xr-x    5 root     root           360 Mar 13 07:26 dev
drwxr-xr-x    1 root     root          4096 Mar 13 07:26 ..
drwxr-xr-x    1 root     root          4096 Mar 13 07:26 .
total 12
-rw-r--r--    1 root     root          1372 Mar 13 07:26 output.txt
drwxrwxrwx    2 root     root          4096 Mar 13 07:26 .
drwxr-xr-x    1 root     root          4096 Mar 13 07:26 ..
Displaying the results of the file that the init container created
Filesystem           Type            Size      Used Available Use% Mounted on
overlay              overlay       217.9G     37.5G    169.3G  18% /
tmpfs                tmpfs          64.0M         0     64.0M   0% /dev
tmpfs                tmpfs           7.7G         0      7.7G   0% /sys/fs/cgroup
/dev/sda4            ext4          217.9G     37.5G    169.3G  18% /cron
/dev/sda4            ext4          217.9G     37.5G    169.3G  18% /dev/termination-log
/dev/sda4            ext4          217.9G     37.5G    169.3G  18% /etc/resolv.conf
/dev/sda4            ext4          217.9G     37.5G    169.3G  18% /etc/hostname
/dev/sda4            ext4          217.9G     37.5G    169.3G  18% /etc/hosts
shm                  tmpfs          64.0M         0     64.0M   0% /dev/shm
tmpfs                tmpfs          15.5G     12.0K     15.5G   0% /var/run/secrets/kubernetes.io/serviceaccount
tmpfs                tmpfs           7.7G         0      7.7G   0% /proc/acpi
```