Assignment – 4

Cloud Application Development

Assignment Date	19 September 2022
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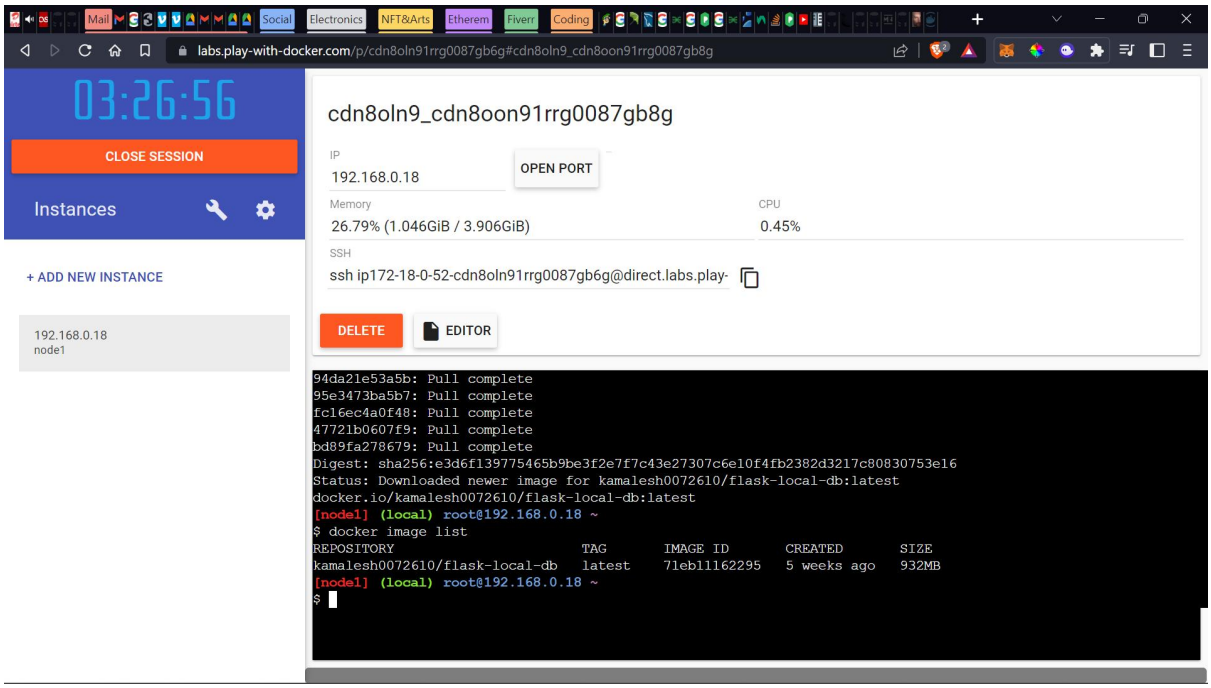
Student Roll Number	211719106027
Maximum Mark	2 Marks

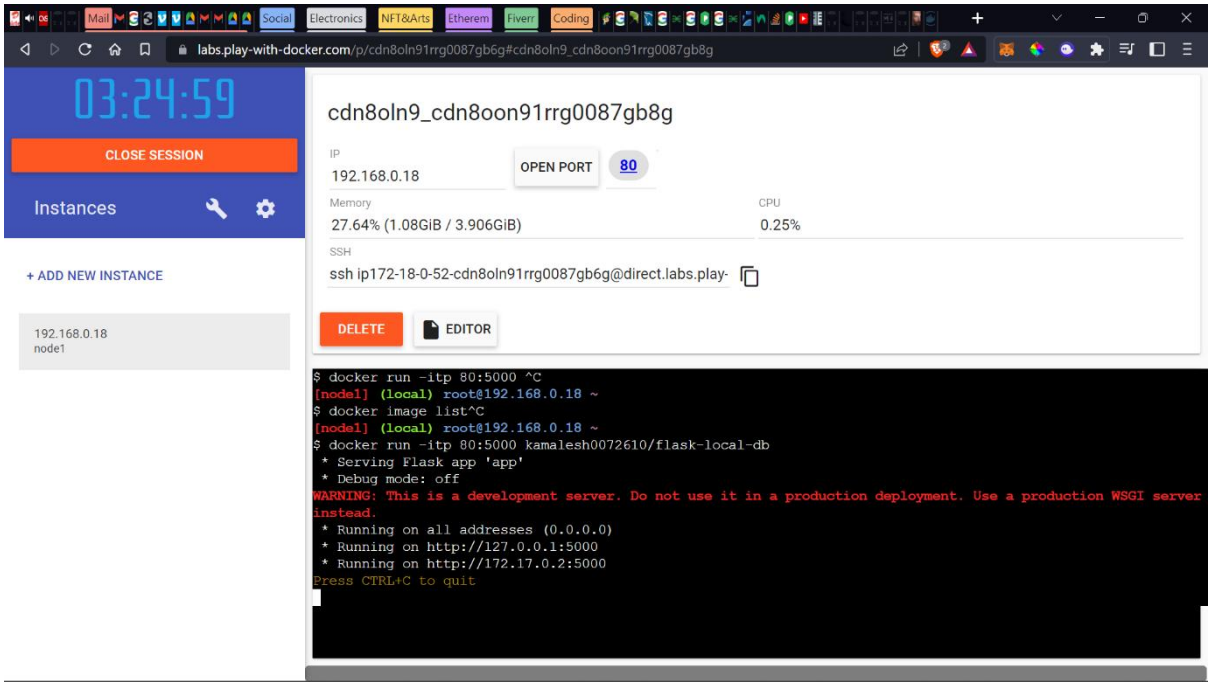
1.Pull an Image from docker hub and run it in docker playground.

Pushed my own Image to Docker Hub and used that for this assignment.

```
docker pull kamalesh0072610/flask-local-db:latest
docker image list
```

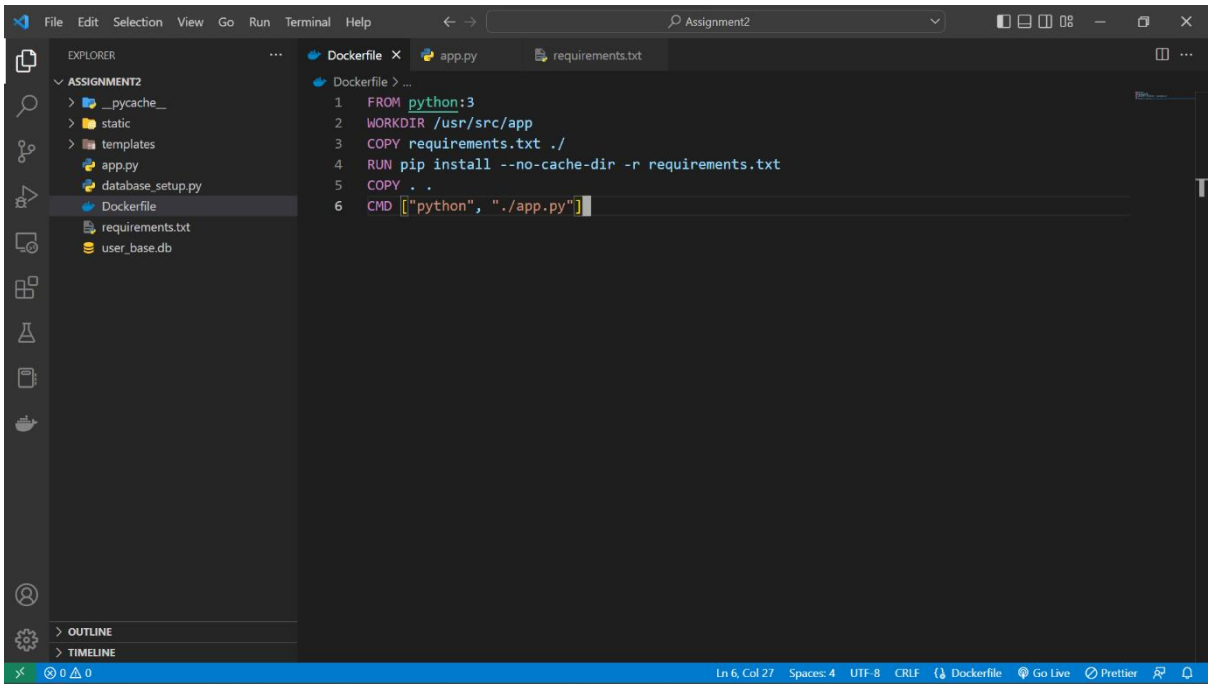


`docker run -itp 80:5000 kamalesh0072610/flask-local-db` – run in interactive mode.



2. Create a dockerfile for the job portal / flask application and deploy it in Docker desktop application.

I've used the flask application used for assignment 2 for this assignment.



`docker build -t flask-app-assi4 .` – build the image

```
C:\WINDOWS\system32\cmd.

E:\KAMALESH\IBM_trying\Assignment2>docker build -t flask-app-assi4 .
[+] Building 4.4s (11/11) FINISHED
 => [internal] load build definition from Dockerfile                                                    0.0s
 => => transferring dockerfile: 190B                                                                    0.0s
 => [internal] load .dockerignore                                                                       0.0s
 => => transferring context: 2B                                                                         0.0s
 => [internal] load metadata for docker.io/library/python:3                                             4.2s
 => [auth] library/python:pull token for registry-1.docker.io                                           0.0s
 => [1/5] FROM docker.io/library/python:3@sha256:b941b836b18734f4992a168b579b7c16ff4c3b544782953eeab3a5  0.0s
 => => resolve docker.io/library/python:3@sha256:b941b836b18734f4992a168b579b7c16ff4c3b544782953eeab3a5  0.0s
 => [internal] load build context                                                                       0.0s
 => => transferring context: 135.83kB                                                                   0.0s
 => CACHED [2/5] WORKDIR /usr/src/app                                                                   0.0s
 => CACHED [3/5] COPY requirements.txt ./                                                               0.0s
 => CACHED [4/5] RUN pip install --no-cache-dir -r requirements.txt                                     0.0s
 => [5/5] COPY . .                                                                                      0.0s
 => exporting to image                                                                                  0.0s
 => => exporting layers                                                                                 0.0s
 => => writing image sha256:5fed83284be3857af98b40fda3e74ef876558 1f9cf21edf6257d8d8c78d1325d           0.0s
 => => naming to docker.io/library/flask-app-assi4                                                      0.0s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them

E:\KAMALESH\IBM_trying\Assignment2>
```

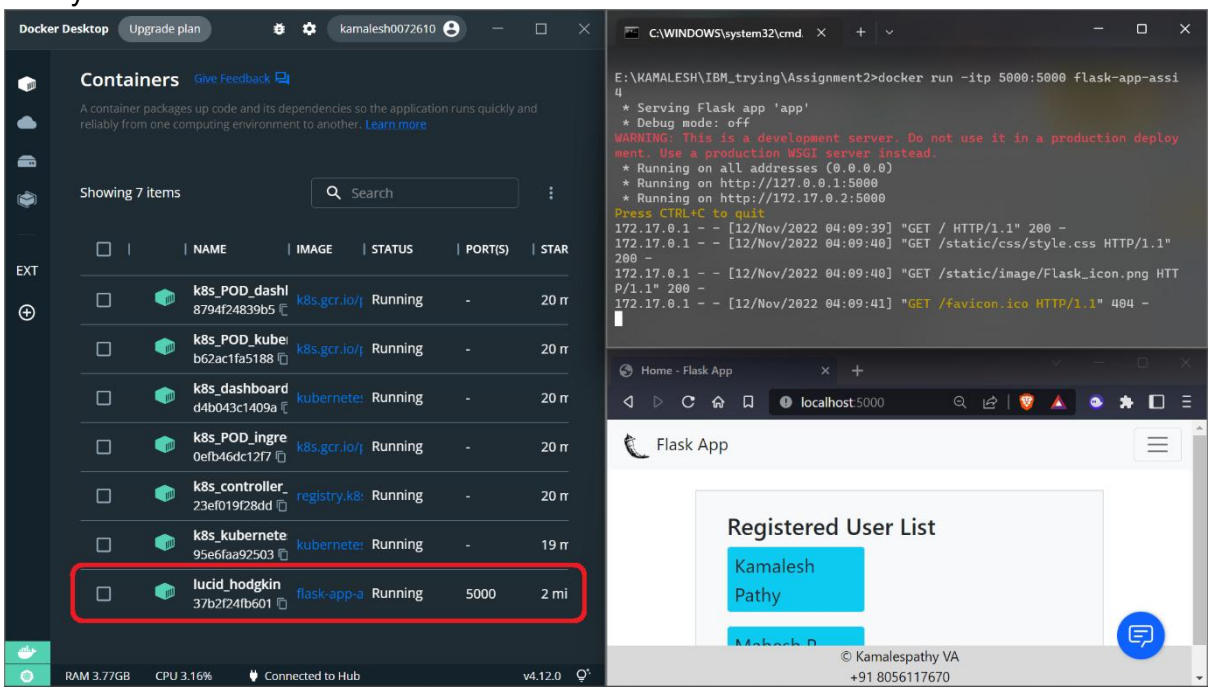
```
C:\WINDOWS\system32\cmd.

E:\KAMALESH\IBM_trying\Assignment2>docker build -t flask-app-assi4 .
[+] Building 4.4s (11/11) FINISHED
 => [internal] load build definition from Dockerfile                                                    0.0s
 => => transferring dockerfile: 190B                                                                    0.0s
 => [internal] load .dockerignore                                                                       0.0s
 => => transferring context: 2B                                                                         0.0s
 => [internal] load metadata for docker.io/library/python:3                                             4.2s
 => [auth] library/python:pull token for registry-1.docker.io                                           0.0s
 => [1/5] FROM docker.io/library/python:3@sha256:b941b836b18734f4992a168b579b7c16ff4c3b544782953eeab3a5  0.0s
 => => resolve docker.io/library/python:3@sha256:b941b836b18734f4992a168b579b7c16ff4c3b544782953eeab3a5  0.0s
 => [internal] load build context                                                                       0.0s
 => => transferring context: 135.83kB                                                                   0.0s
 => CACHED [2/5] WORKDIR /usr/src/app                                                                   0.0s
 => CACHED [3/5] COPY requirements.txt ./                                                               0.0s
 => CACHED [4/5] RUN pip install --no-cache-dir -r requirements.txt                                     0.0s
 => [5/5] COPY . .                                                                                      0.0s
 => exporting to image                                                                                  0.0s
 => => exporting layers                                                                                 0.0s
 => => writing image sha256:5fed83284be3857af98b40fda3e74ef876558 1f9cf21edf6257d8d8c78d1325d           0.0s
 => => naming to docker.io/library/flask-app-assi4                                                      0.0s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them

E:\KAMALESH\IBM_trying\Assignment2>docker image list
REPOSITORY                                                          TAG
                          IMAGE ID       CREATED          SIZE
flask-app-assi4                                                     latest
                          5fed83284be3   49 seconds ago   951MB
flask-app-testing                                                   latest
                          2d8f454de374   11 hours ago     905MB
flask-testing-app                                                   latest
                          78a4955b95b2   10 days ago      905MB
jp.icr.io/training/flask-local-db                                   latest
                          71eb11162295   5 weeks ago      932MB
kamalesh0072610/flask-local-db                                      latest
                          71eb11162295   5 weeks ago      932MB
flask-local-db                                                      latest
                          71eb11162295   5 weeks ago      932MB
registry.k8s.io/ingress-nginx/controller                            <none>
                          d681a4ce3c50   6 weeks ago      264MB
```

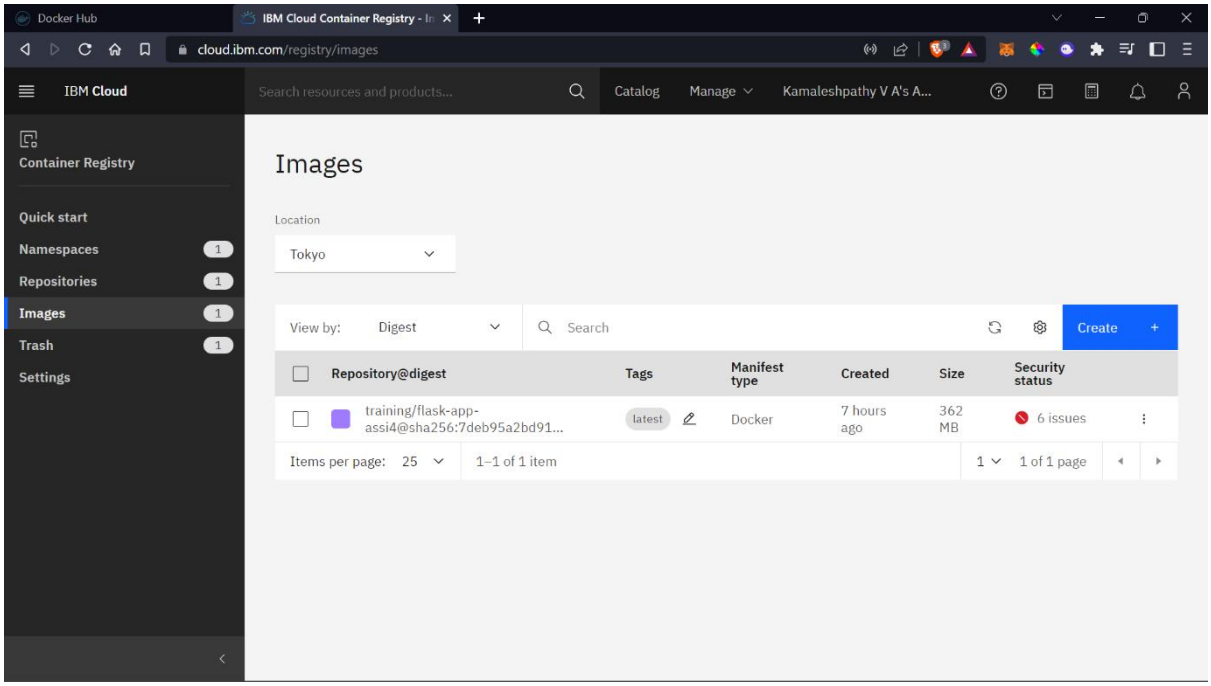
Running the docker application locally.



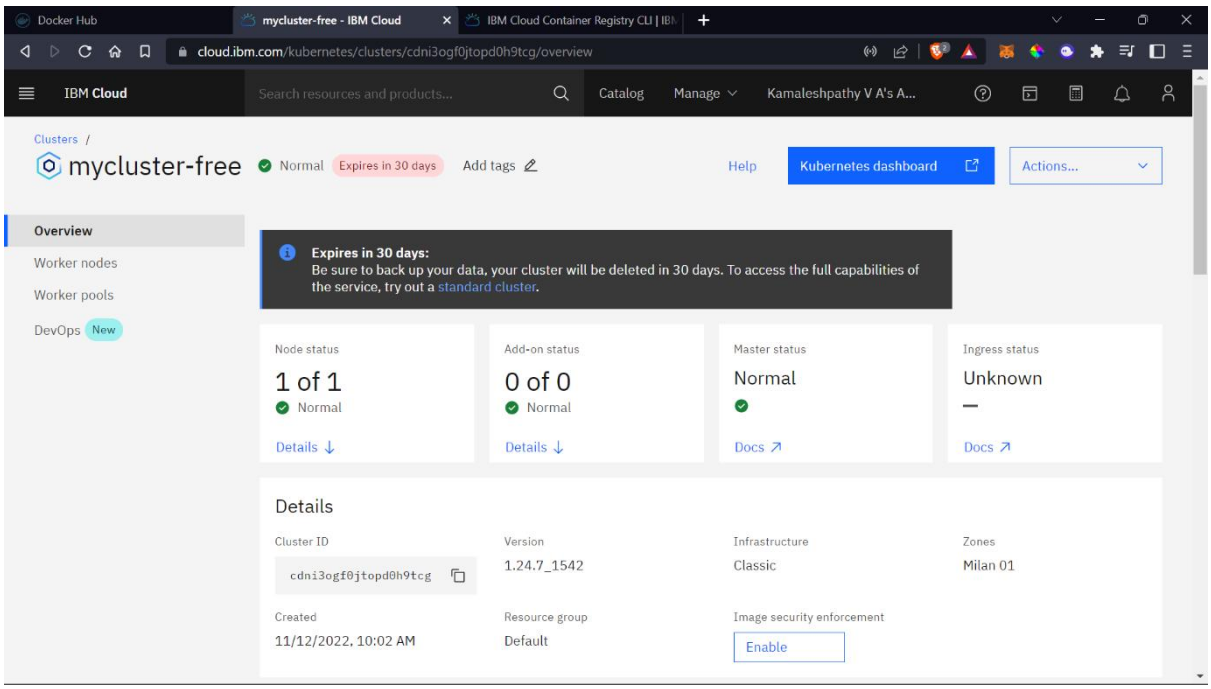
3. Create a IBM container registry and push docker image of flask application or job portal app.

Pushed the image to ibm container registry.

```
ibmcloud login
ibmcloud plugin install container-registry -r “IBM Cloud”
ibmcloud cr namespace-add training
ibmcloud cr login
docker tag flask-app-assig4 jp.icr.io/training/flask-app-assi4:latest
docker push jp.icr.io/training/flask-app-
assi4:latest
```

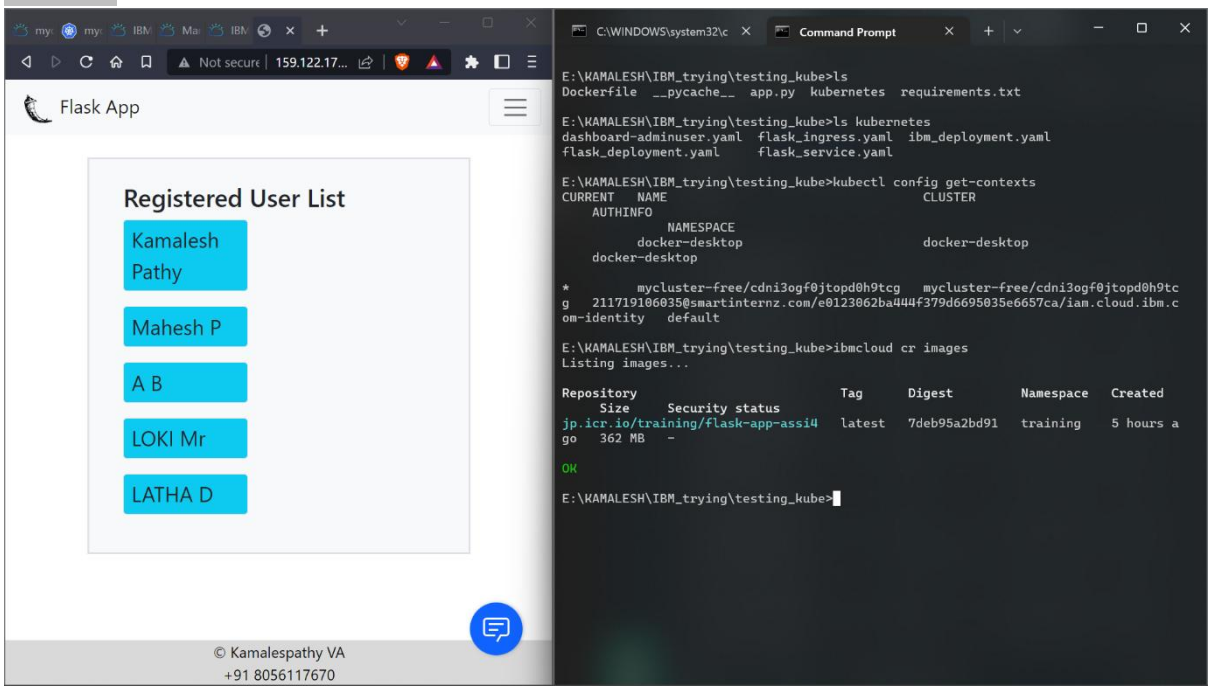


4. Create a Kubernetes cluster in IBM cloud and deploy flask application image or job portal image and also expose the same app to run in nodeport.




```
ibmcloud plugin install container-service
ibmcloud ks cluster config --cluster cdni3ogf0jtopd0h9tcg
```

kubectl config current-context



ibm_deployment.yaml

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: flask-app

spec:
  replicas: 5
  selector:
    matchLabels:
      app: flask-app
  template:
    metadata:
      labels:
        app: flask-app

    spec:
      containers:
      - name: flask-app-container
        image: jp.icr.io/training/flask-app-assi4
        imagePullPolicy: Always
        ports:
        - containerPort: 5000
          protocol: TCP
```

flask_service.yaml

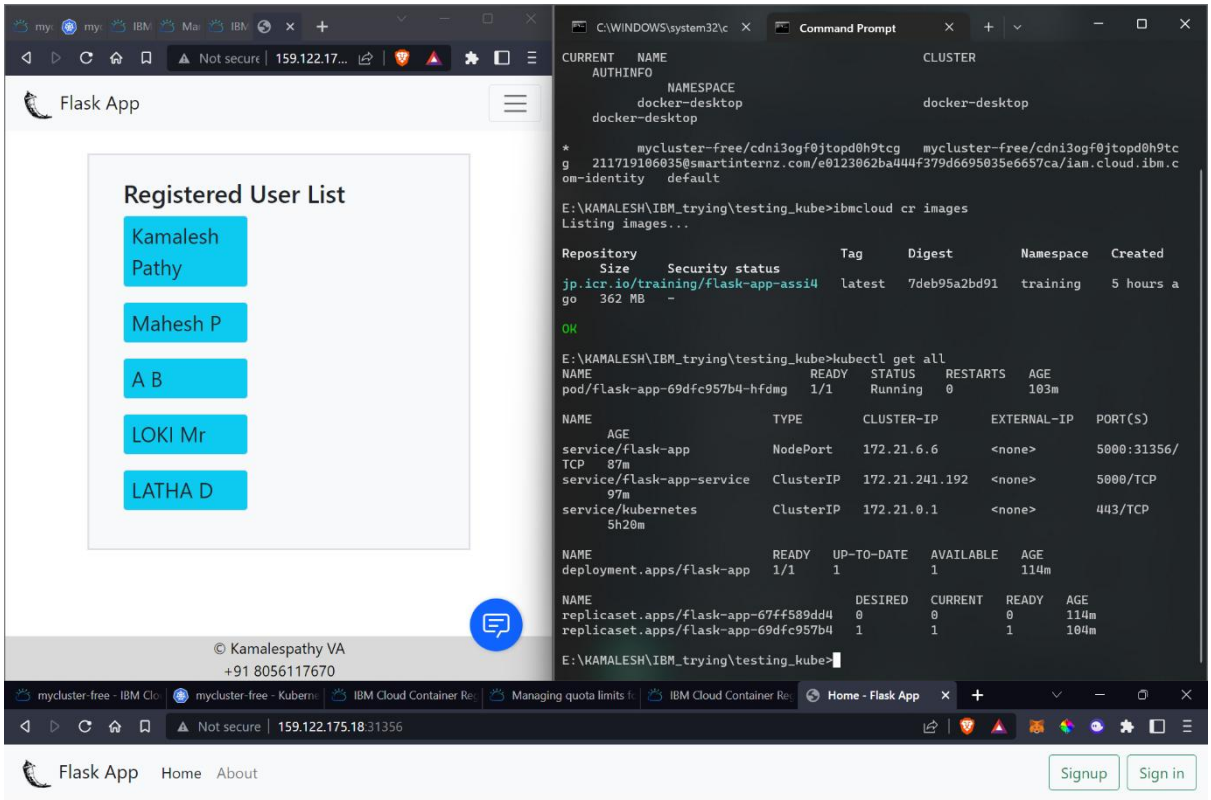
```
apiVersion: v1
kind: Service
metadata:
  name: flask-app-service
spec:
  type: ClusterIP
  ports:
    - port: 5000
  selector:
    app: flask-app
```

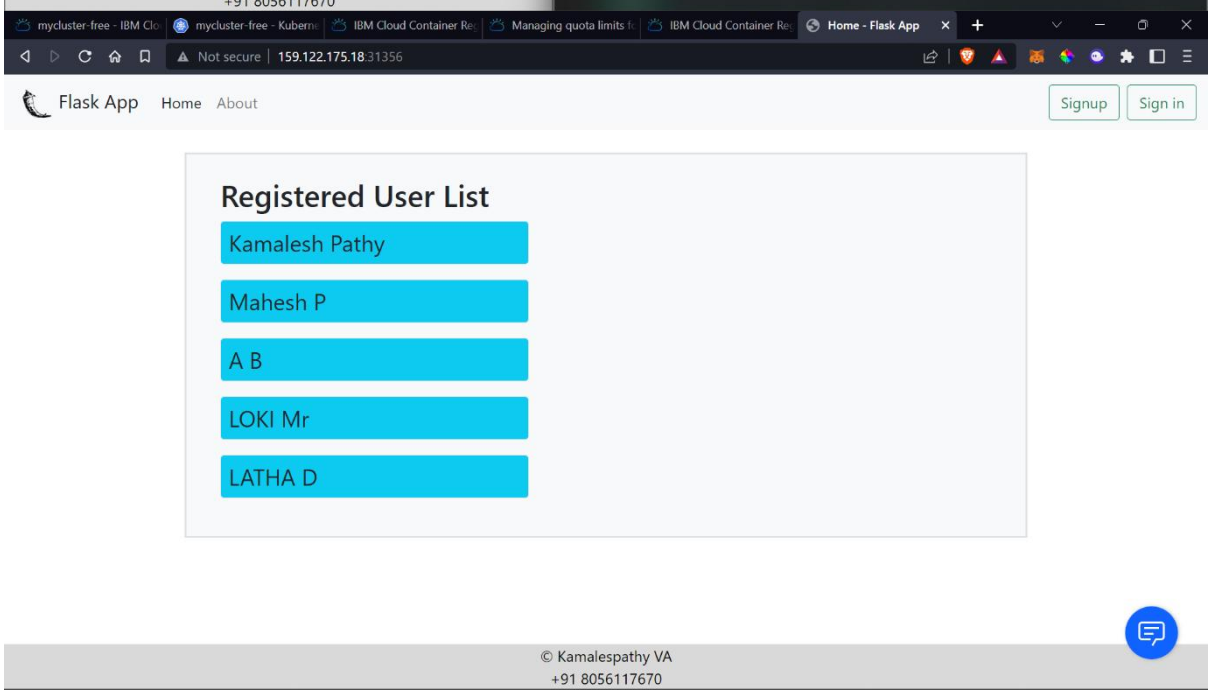
flask_ingress.yaml

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: flask-app-ingress
  annotations:
    kubernetes.io/ingress.class: nginx
    nginx.ingress.kubernetes.io/ssl-redirect: "false"

spec:
  # ingressClassName: nginx
  rules:
    - http:
        paths:
          - backend:
              service:
                name: flask-app-service
                port:
                  number: 5000
            path: /
            pathType: Prefix
```

```
kubectl apply -f kubernetes/ibm_deployment.yaml
kubectl apply -f kubernetes/flask_service.yaml
kubectl apply -f kubernetes/flask_ingress.yaml
kubectl expose deployment flask-app --type=NodePort --name=flask-
app
```


Not secure | 159.122.17...
Flask App
Registered User List
Kamalesh Pathy
Mahesh P
A B
LOKI Mr
LATHA D
© Kamalespathy VA
+91 8056117670
C:\WINDOWS\system32\c
Command Prompt
CURRENT NAME CLUSTER
AUTHINFO
NAMESPACE
docker-desktop docker-desktop
docker-desktop
* mycluster-free/cdni3ogf0jtopd0h9tcg mycluster-free/cdni3ogf0jtopd0h9tcg 211719106035@smartinternz.com/e0123062ba444f379d6695035e6657ca/iam.cloud.ibm.com-identity default
E:\KAMALESH\IBM_trying\testing_kube>ibmcloud cr images
Listing images...
Repository Tag Digest Namespace Created
Size Security status
jp.icr.io/training/flask-app-assi4 latest 7deb95a2bd91 training 5 hours ago 362 MB -
OK
E:\KAMALESH\IBM_trying\testing_kube>kubectl get all
NAME READY STATUS RESTARTS AGE
pod/flask-app-69dfc957b4-hfdmg 1/1 Running 0 103m
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
service/flask-app NodePort 172.21.6.6 <none> 5000:31356/TCP 87m
service/flask-app-service ClusterIP 172.21.241.192 <none> 5000/TCP 97m
service/kubernetes ClusterIP 172.21.0.1 <none> 443/TCP 5h20m
NAME READY UP-TO-DATE AVAILABLE AGE
deployment.apps/flask-app 1/1 1 1 114m
NAME DESIRED CURRENT READY AGE
replicaset.apps/flask-app-67ff589dd4 0 0 0 114m
replicaset.apps/flask-app-69dfc957b4 1 1 1 104m
E:\KAMALESH\IBM_trying\testing_kube>


Not secure | 159.122.175.18:31356
Home - Flask App
Flask App
Home
About
Signup
Sign in
Registered User List
Kamalesh Pathy
Mahesh P
A B
LOKI Mr
LATHA D
© Kamalespathy VA
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