Assignment – 4

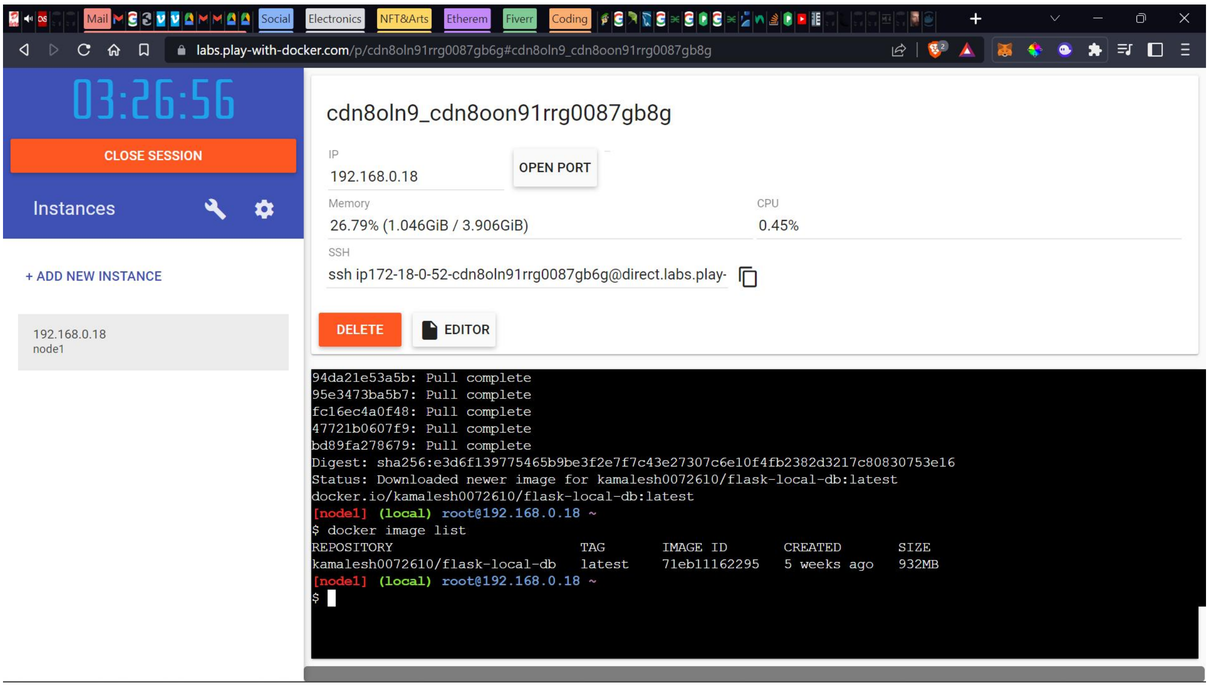
Cloud Application Development

Assignment Date	19 September 2022
Student Name	Mahesh P
Student Roll Number	211719106044
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
```



cdn8oln9_cdn8oon91rrg0087gb8g

IP: 192.168.0.18

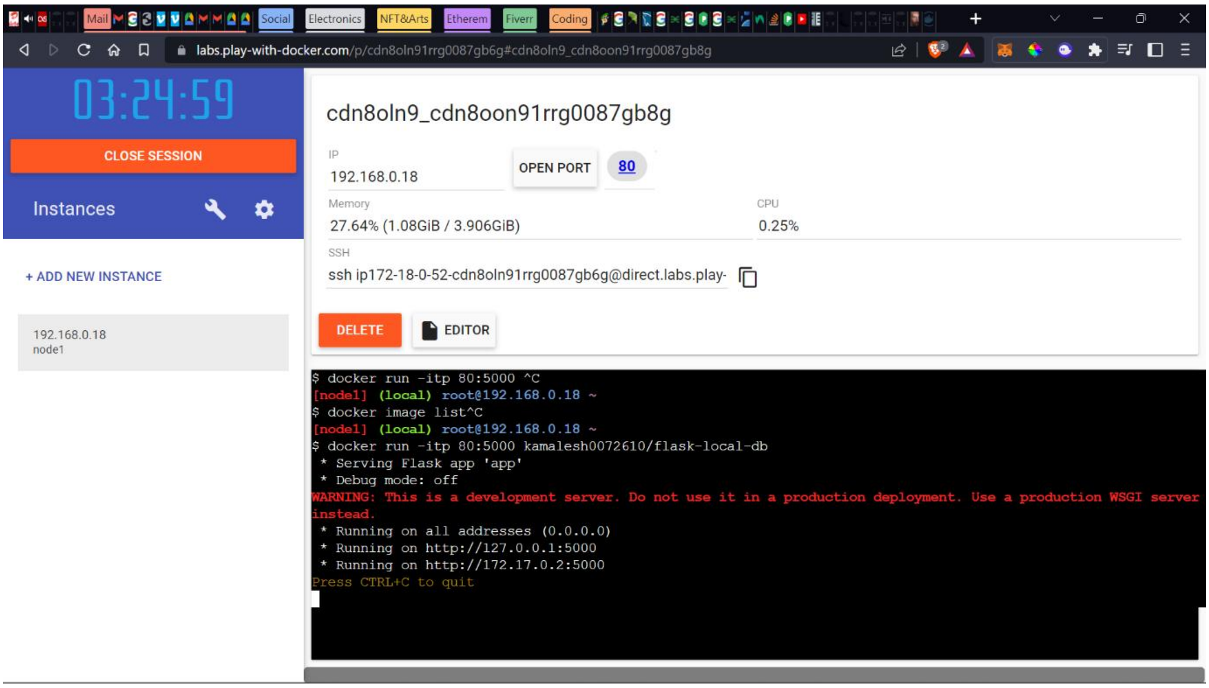
Memory: 26.79% (1.046GiB / 3.906GiB)

CPU: 0.45%

SSH: ssh ip172-18-0-52-cdn8oln91rrg0087gb6g@direct.labs.play-

```
94da21e53a5b: Pull complete
95e3473ba5b7: Pull complete
fc16ec4a0f48: Pull complete
47721b0607f9: Pull complete
bd89fa278679: Pull complete
Digest: sha256:e3d6f139775465b9be3f2e7f7c43e27307c6e10f4fb2382d3217c80830753e16
Status: Downloaded newer image for kamalesh0072610/flask-local-db:latest
docker.io/kamalesh0072610/flask-local-db:latest
[node1] (local) root@192.168.0.18 ~
$ docker image list
REPOSITORY                       TAG       IMAGE ID       CREATED       SIZE
kamalesh0072610/flask-local-db   latest    71eb11162295   5 weeks ago   932MB
[node1] (local) root@192.168.0.18 ~
$ 
```

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



cdn8oln9_cdn8oon91rrg0087gb8g

IP: 192.168.0.18

Memory: 27.64% (1.08GiB / 3.906GiB)

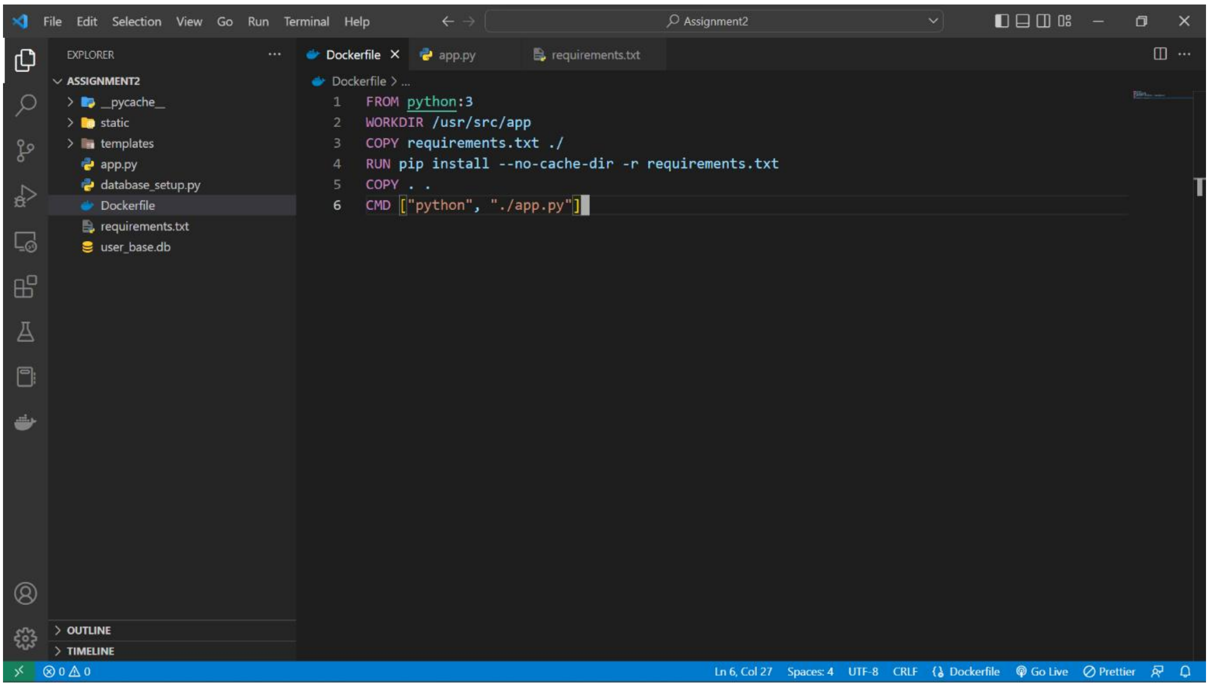
CPU: 0.25%

SSH: ssh ip172-18-0-52-cdn8oln91rrg0087gb6g@direct.labs.play-

```
$ docker run -itp 80:5000 ^C
[node1] (local) root@192.168.0.18 ~
$ docker image list^C
[node1] (local) root@192.168.0.18 ~
$ docker run -itp 80:5000 kamalesh0072610/flask-local-db
 * Serving Flask app 'app'
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server
instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5000
 * Running on http://172.17.0.2:5000
Press CTRL+C to quit
```

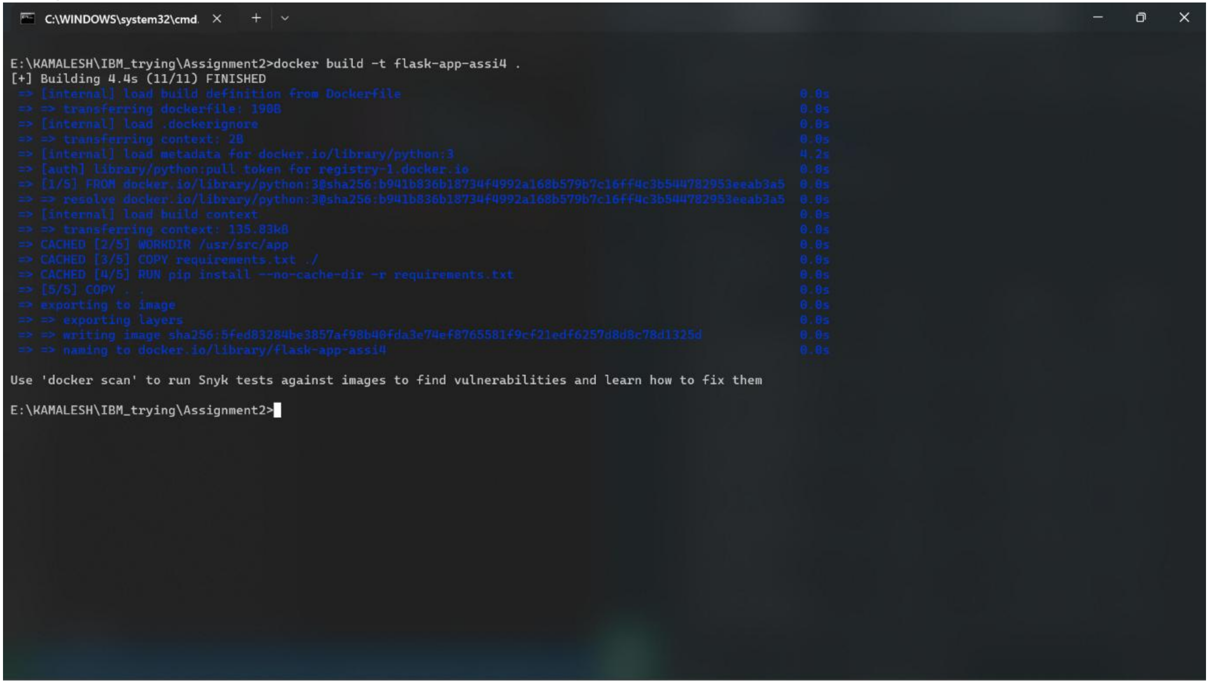
2. Create a docker file for the job portal / flask application and deploy it in Docker desktop application.

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



```
FROM python:3
WORKDIR /usr/src/app
COPY requirements.txt ./
RUN pip install --no-cache-dir -r requirements.txt
COPY . .
CMD ["python", "./app.py"]
```

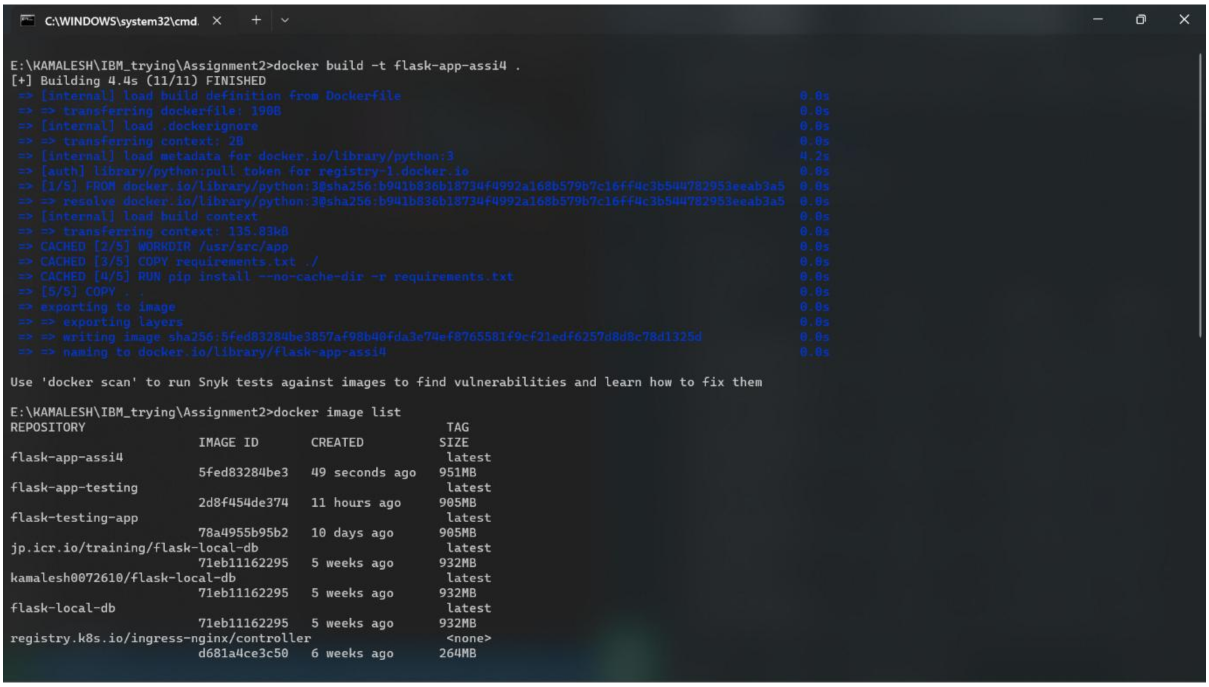
`docker build -t flask-app-assi4 .` **–** build the image



```
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 sha256:5fed83284be3857af98b40fda3e74ef8765581f9cf21edf6257d8d8c78d1325d             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>
```

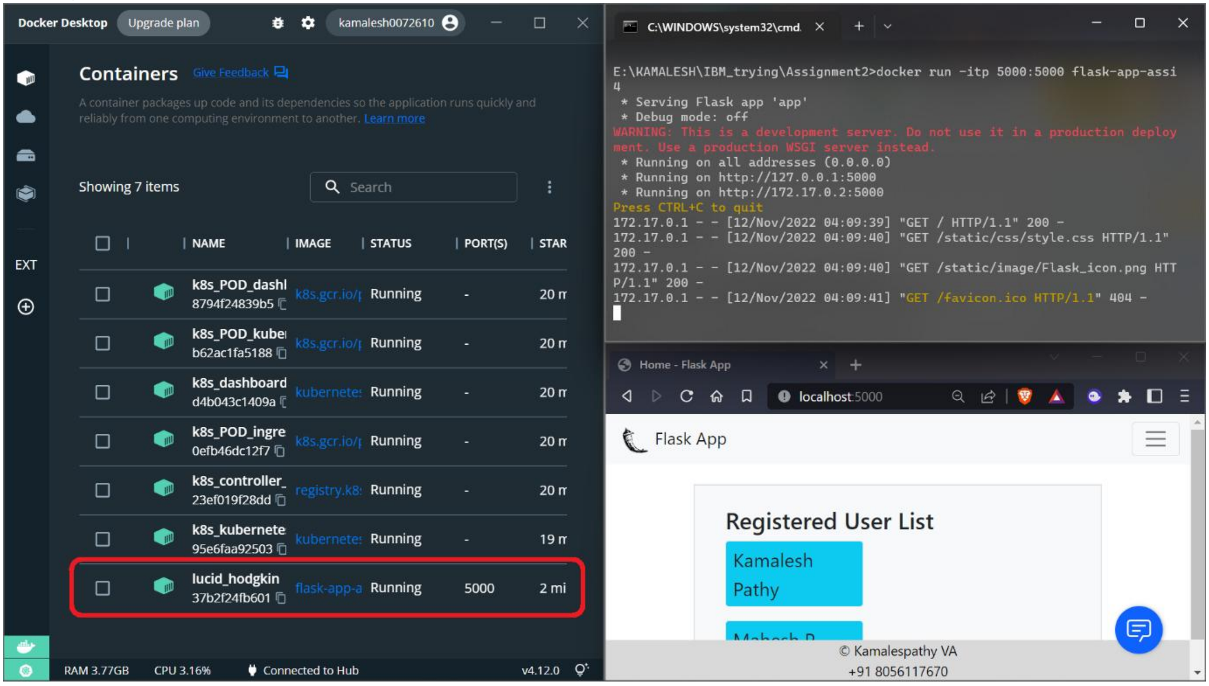


```
E:\KAMALESH\IBM_trying\Assignment2>docker build -t flask-app-assi4 .
[+] Building 4.4s (11/11) FINISHED
 => [internal] load build definition from Dockerfile                                                     0.0s
 => => transferring dockerfile: 190B                                                                     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 sha256:5fed83284be3857af98b40fda3e74ef8765581f9cf21edf6257d8d8c78d1325d             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.



Containers Give Feedback

A container packages up code and its dependencies so the application runs quickly and reliably from one computing environment to another. Learn more

Showing 7 items

□	NAME	IMAGE	STATUS	PORT(S)	STAR
□	k8s_POD_dashl 8794f24839b5	k8s.gcr.io/	Running	-	20 m
□	k8s_POD_kube b62ac1fa5188	k8s.gcr.io/	Running	-	20 m
□	k8s_dashboard d4b043c1409a	kubernete:	Running	-	20 m
□	k8s_POD_ingre 0efb46dc12f7	k8s.gcr.io/	Running	-	20 m
□	k8s_controller_ 23ef019f28dd	registry.k8:	Running	-	20 m
□	k8s_kubernete 95e6faa92503	kubernete:	Running	-	19 m
□	lucid_hodgkin 37b2f24fb601	flask-app-a	Running	5000	2 mi

RAM 3.77GB CPU 3.16% Connected to Hub v4.12.0

```
E:\KAMALESH\IBM_trying\Assignment2>docker run -itp 5000:5000 flask-app-assi
4
 * Serving Flask app 'app'
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deploy
ment. Use a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5000
 * Running on http://172.17.0.2:5000
Press CTRL+C to quit
172.17.0.1 - - [12/Nov/2022 04:09:39] "GET / HTTP/1.1" 200 -
172.17.0.1 - - [12/Nov/2022 04:09:40] "GET /static/css/style.css HTTP/1.1"
200 -
172.17.0.1 - - [12/Nov/2022 04:09:40] "GET /static/image/Flask_icon.png HTT
P/1.1" 200 -
172.17.0.1 - - [12/Nov/2022 04:09:41] "GET /favicon.ico HTTP/1.1" 404 -
```

Registered User List

Kamalesh Pathy

Mahesh R

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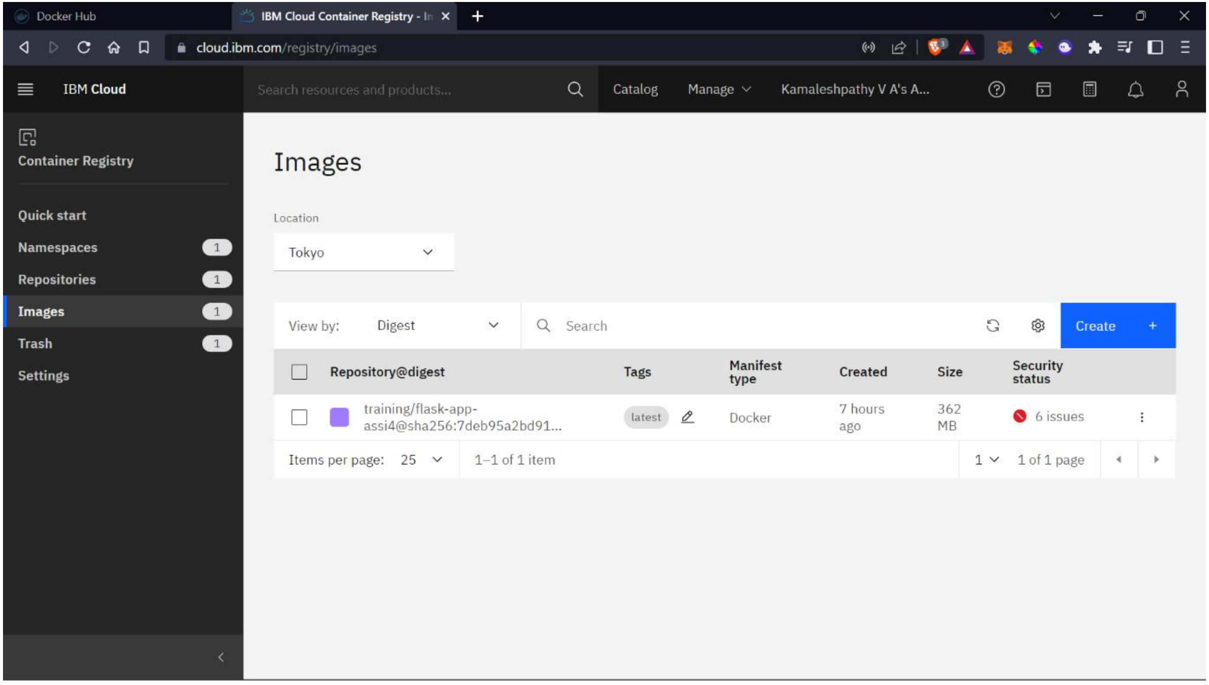
+91 8056117670

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
```



Images

Location: Tokyo

View by: Digest

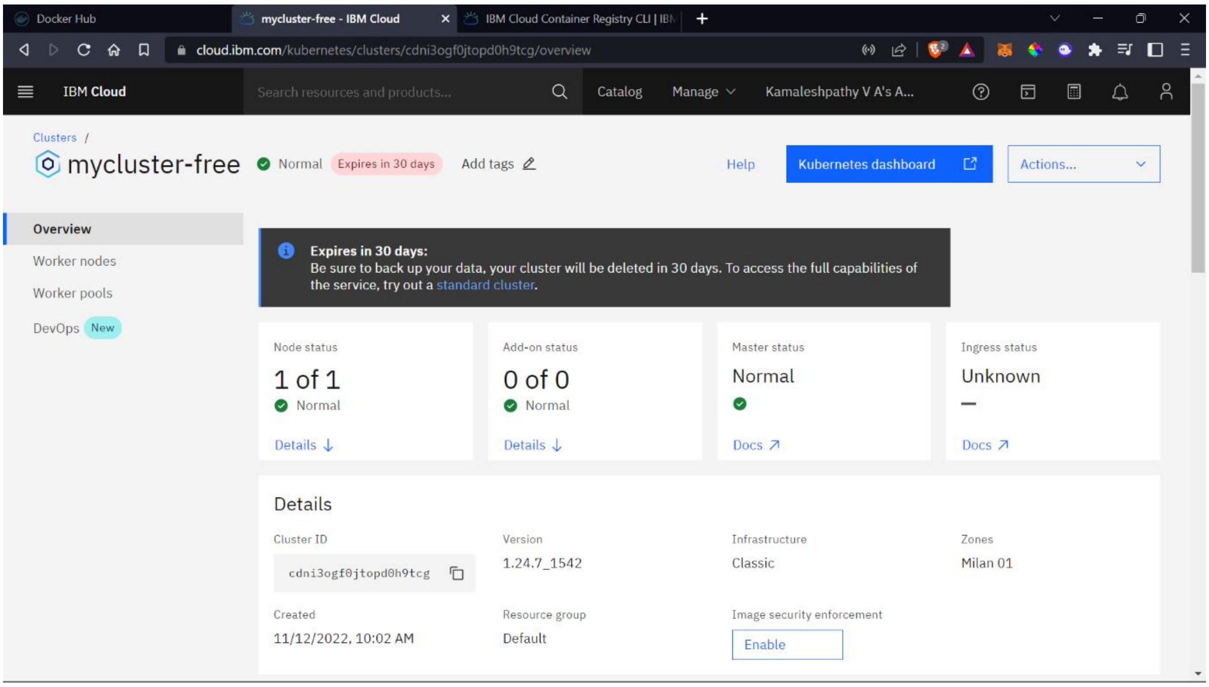
Search

Create +

Repository@digest	Tags	Manifest type	Created	Size	Security status
training/flask-app-assi4@sha256:7deb95a2bd91...	latest	Docker	7 hours ago	362 MB	6 issues

Items per page: 25 1–1 of 1 item 1 1 of 1 page

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.



Docker Hub
mycluster-free - IBM Cloud
IBM Cloud Container Registry CLI | IBM
cloud.ibm.com/kubernetes/clusters/cdni3ogf0jtopd0h9tcg/overview
IBM Cloud
Search resources and products...
Catalog
Manage
Kamaleshpathy V A's A...
Clusters /
Help
Kubernetes dashboard
Actions...
Overview
Worker nodes
Worker pools
DevOps New

mycluster-free Normal Expires in 30 days Add tags

Expires in 30 days:
Be sure to back up your data, your cluster will be deleted in 30 days. To access the full capabilities of the service, try out a standard cluster.

Node status: 1 of 1 Normal Details

Add-on status: 0 of 0 Normal Details

Master status: Normal Docs

Ingress status: Unknown — Docs

Details

Cluster ID: cdni3ogf0jtopd0h9tcg

Version: 1.24.7_1542

Infrastructure: Classic

Zones: Milan 01

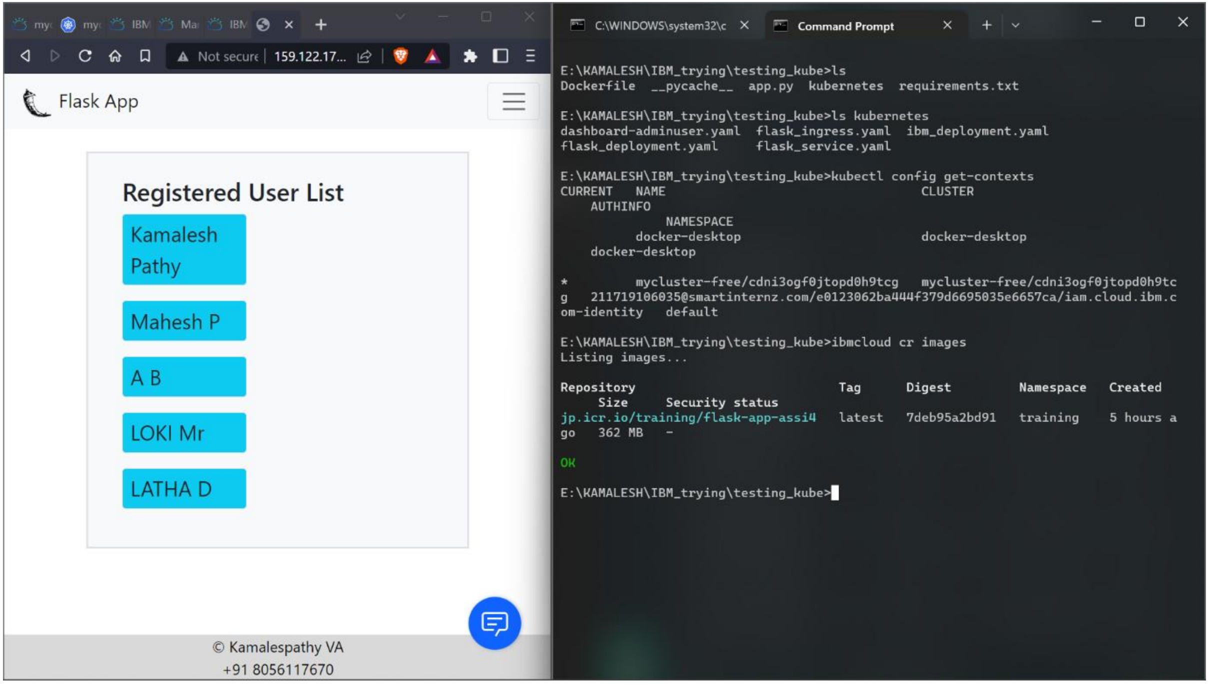
Created: 11/12/2022, 10:02 AM

Resource group: Default

Image security enforcement: Enable

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

```
kubectl config current-
context
```



Flask App

Registered User List

- Kamalesh Pathy
- Mahesh P
- A B
- LOKI Mr
- LATHA D

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```
E:\KAMALESH\IBM_trying\testing_kube>ls
Dockerfile  __pycache__  app.py  kubernetes  requirements.txt

E:\KAMALESH\IBM_trying\testing_kube>ls kubernetes
dashboard-adminuser.yaml  flask_ingress.yaml  ibm_deployment.yaml
flask_deployment.yaml     flask_service.yaml

E:\KAMALESH\IBM_trying\testing_kube>kubectl config get-contexts
CURRENT   NAME                                            CLUSTER
    AUTHINFO
              NAMESPACE
          docker-desktop                                  docker-desktop
    docker-desktop

*         mycluster-free/cdni3ogf0jtopd0h9tcg   mycluster-free/cdni3ogf0jtopd0h9tc
g   211719106035@smartinternz.com/e0123062ba444f379d6695035e6657ca/iam.cloud.ibm.c
om-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 a
go   362 MB   -

OK

E:\KAMALESH\IBM_trying\testing_kube>
```

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
```

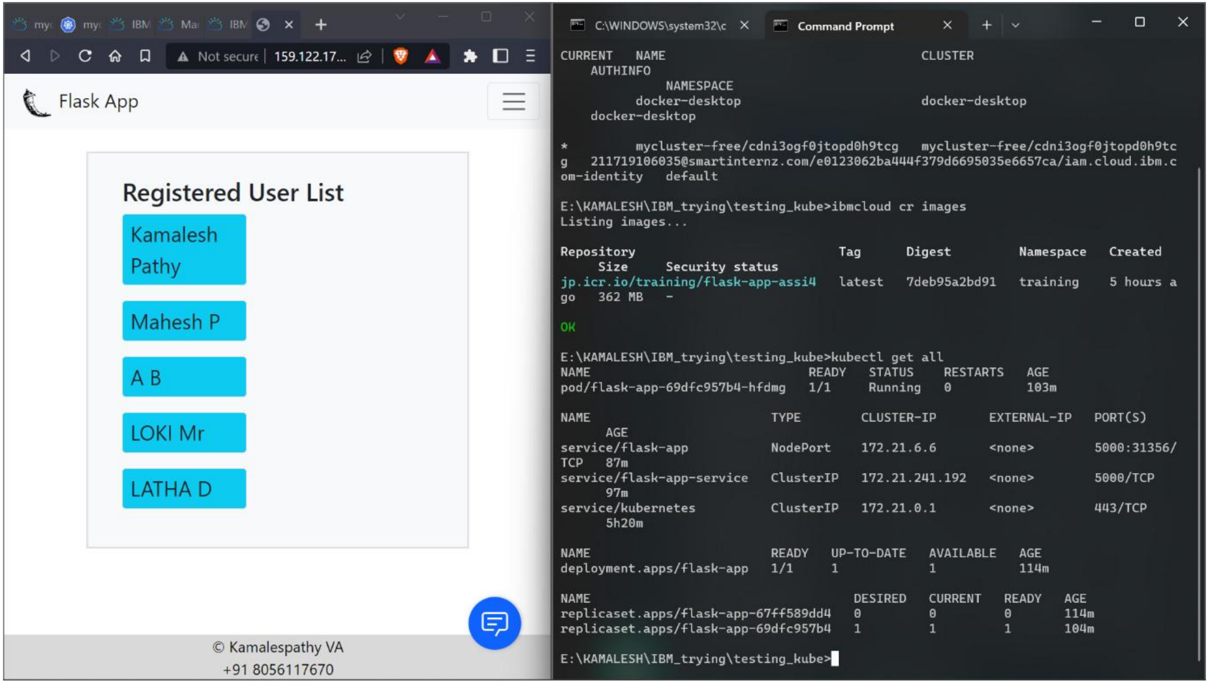
flask_service.yaml

```
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
```



Registered User List

Kamalesh Pathy

Mahesh P

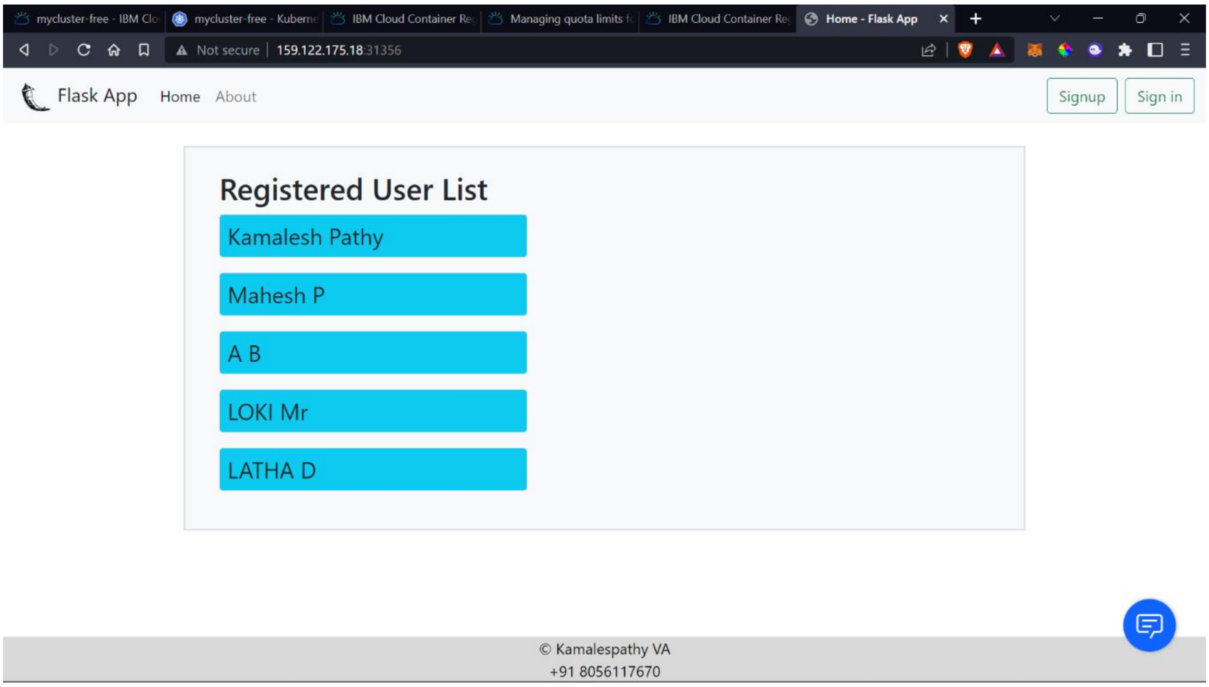
A B

LOKI Mr

LATHA D

© Kamalespathy VA
+91 8056117670

```
CURRENT   NAME                                   CLUSTER
    AUTHINFO
              NAMESPACE
          docker-desktop                         docker-desktop
    docker-desktop

*         mycluster-free/cdni3ogf0jtopd0h9tcg   mycluster-free/cdni3ogf0jtopd0h9tc
g   211719106035@smartinternz.com/e0123062ba444f379d6695035e6657ca/iam.cloud.ibm.c
om-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 a
go   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>
```



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Mahesh P

A B

LOKI Mr

LATHA D

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+91 8056117670