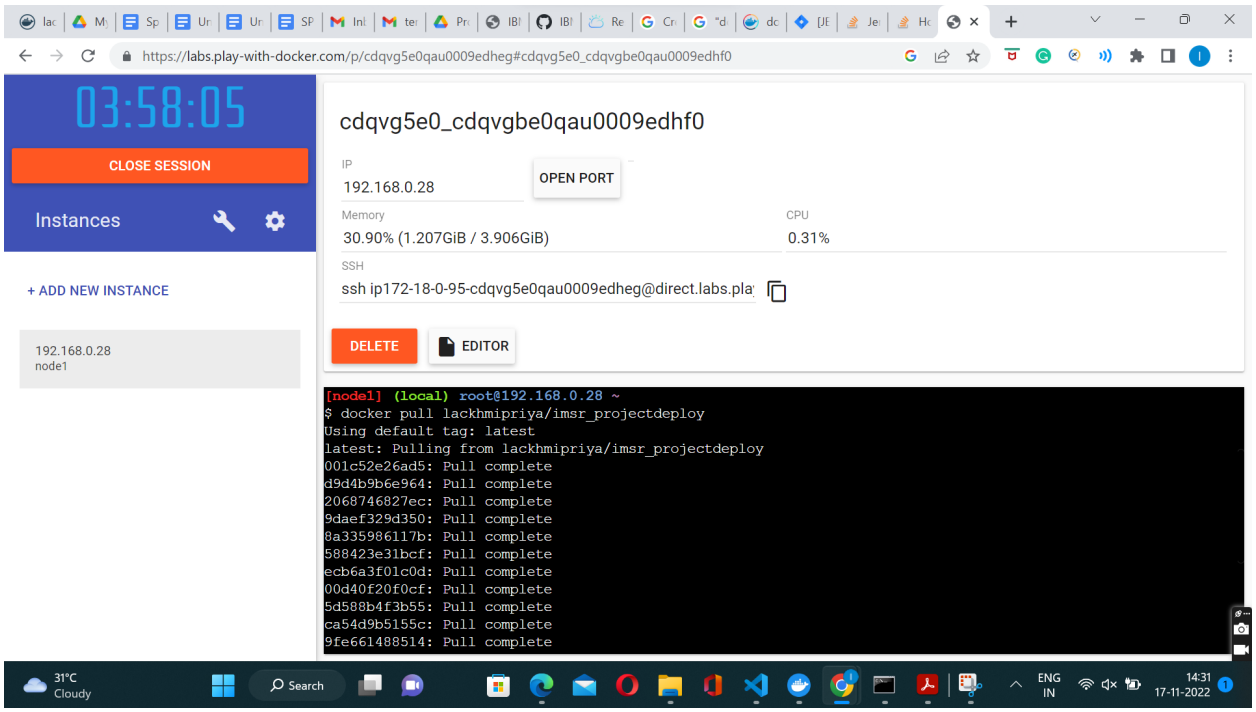
ASSIGNMENT-4

Kubernetes / Docker

ASSIGNMENT DATE	**25 OCTOBER 2022**
STUDENT NAME	**Lackhmi Priya G**
STUDENT ROLL NO	**9517201903081**
MAXIMUM MARKS	**2 Marks**

Question1 Pull an Image from docker hub and run it in docker playground.



cdqvg5e0_cdqvgbe0qau0009edhf0

IP
192.168.0.28
OPEN PORT

Memory
30.89% (1.207GiB / 3.906GiB)

CPU
0.18%

SSH
ssh ip172-18-0-95-cdqvg5e0qau0009edheg@direct.labs.pla

DELETE
EDITOR

```
5d588b4f3b55: Pull complete
ca54d9b5155c: Pull complete
9fe661488514: Pull complete
f6fc4f9725f4: Pull complete
c8d3c8a0060c: Pull complete
7dc8e0a43ce2: Pull complete
Digest: sha256:23bb0601d8893c42dd4c0c7084d9e4e77e6c5c9016007f67211e38f04625be3c
Status: Downloaded newer image for lackhmipriya/imsr_projectdeploy:latest
docker.io/lackhmipriya/imsr_projectdeploy:latest
[node1] (local) root@192.168.0.28 ~
$ docker images
REPOSITORY                        TAG       IMAGE ID       CREATED             SIZE
lackhmipriya/imsr_projectdeploy   latest    6d667290ffeb   About an hour ago   1.1GB
[node1] (local) root@192.168.0.28 ~
$
```

Command Prompt - docker run -p 8080:5000 lackhmipriya/imsrprojectdeploy

```
service/kubernetes-dashboard created
secret/kubernetes-dashboard-certs created
secret/kubernetes-dashboard-csrf created
secret/kubernetes-dashboard-key-holder created
configmap/kubernetes-dashboard-settings created
role.rbac.authorization.k8s.io/kubernetes-dashboard created
clusterrole.rbac.authorization.k8s.io/kubernetes-dashboard configured
rolebinding.rbac.authorization.k8s.io/kubernetes-dashboard created
clusterrolebinding.rbac.authorization.k8s.io/kubernetes-dashboard configured
deployment.apps/kubernetes-dashboard created
service/dashboard-metrics-scraper created
deployment.apps/dashboard-metrics-scraper created

C:\Users\lackh\OneDrive\Desktop\imsr_project>
C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl proxy
Starting to serve on 127.0.0.1:8001
^C
C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl create -f imsrproject18119-deployment.yaml
error: the path "imsrproject18119-deployment.yaml" does not exist

C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl create -f imsrproject18119.yaml
error: the path "imsrproject18119.yaml" does not exist

C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl get pods
NAME                                        READY   STATUS             RESTARTS   AGE
imsrproject-deployment-7df9649b7b-6rcnm     0/1     ImagePullBackOff   0          23m
imsrproject-deployment-7df9649b7b-b7xr5     0/1     ImagePullBackOff   0          9m14s
imsrproject18119-deployment-878fcf5cb-mbkv2 0/1     ImagePullBackOff   0          6m43s
imsrproject18119-deployment-878fcf5cb-prh4t 0/1     ImagePullBackOff   0          6m43s

C:\Users\lackh\OneDrive\Desktop\imsr_project>docker run -p 8080:5000 lackhmipriya/imsrprojectdeploy
 * Serving Flask app 'runweb'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 288-019-273
```

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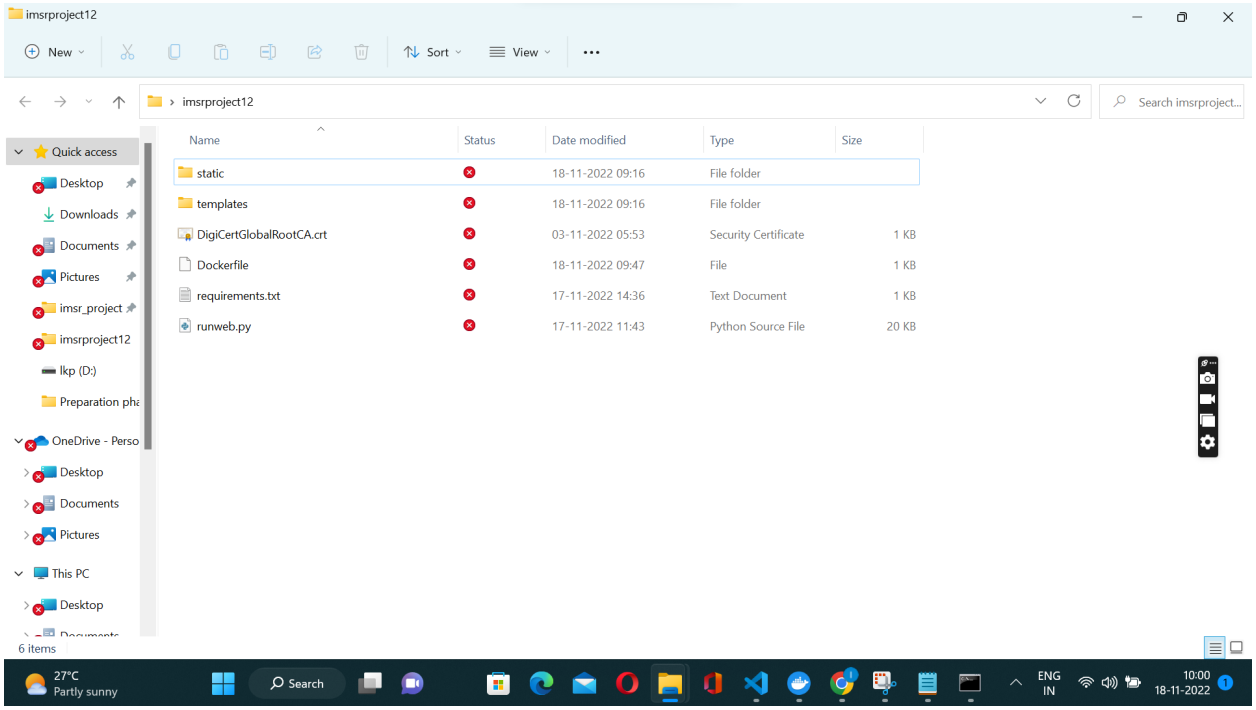
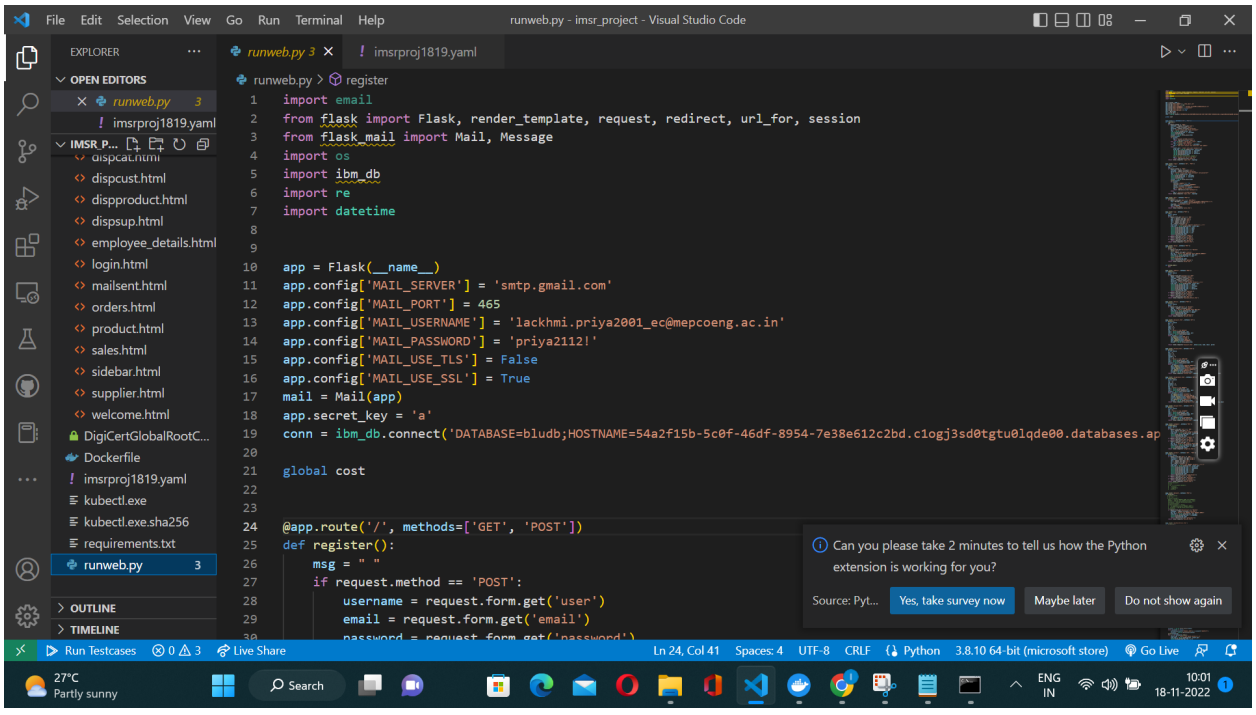
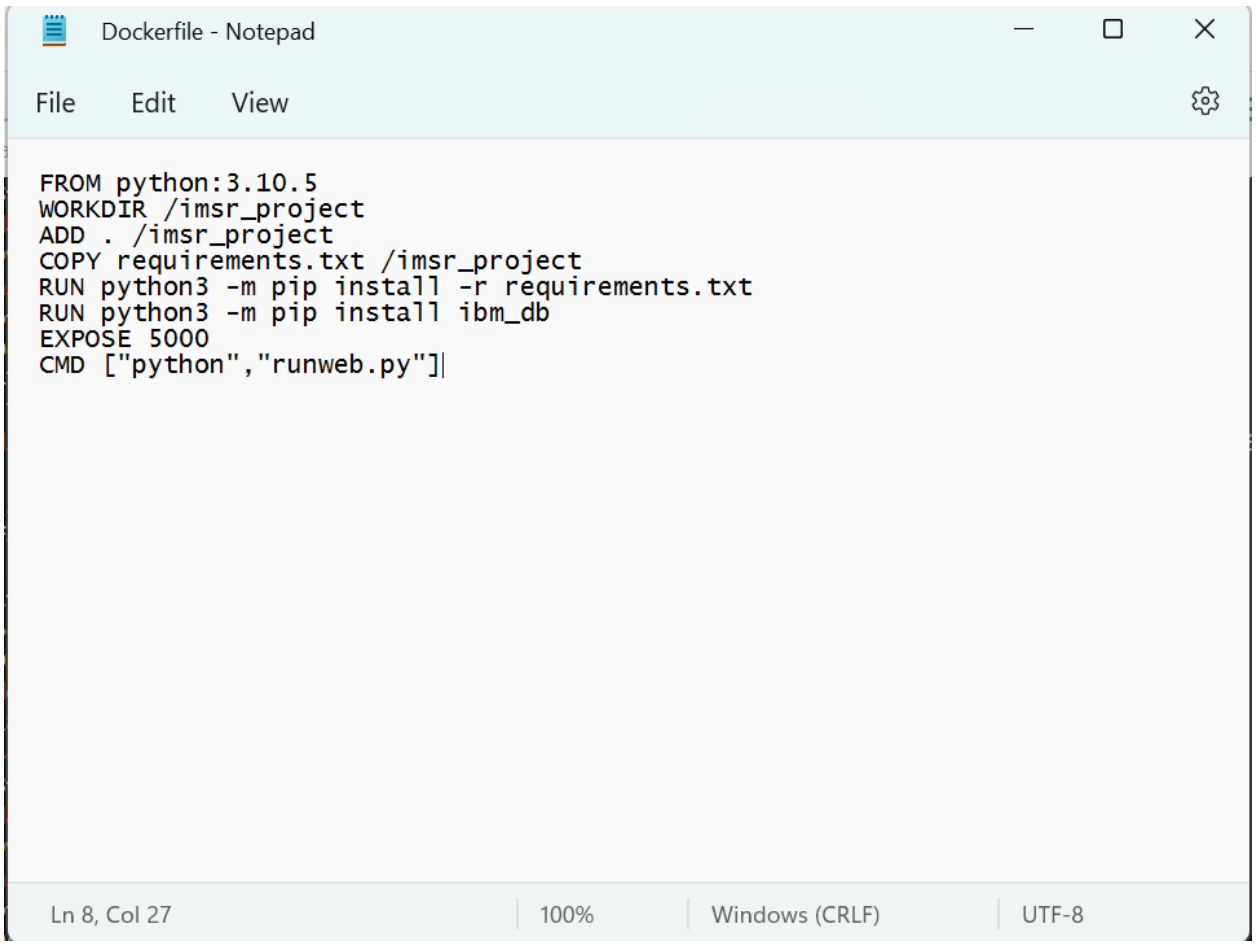
2. Create a docker file for the application and deploy it in the Docker desktop application.

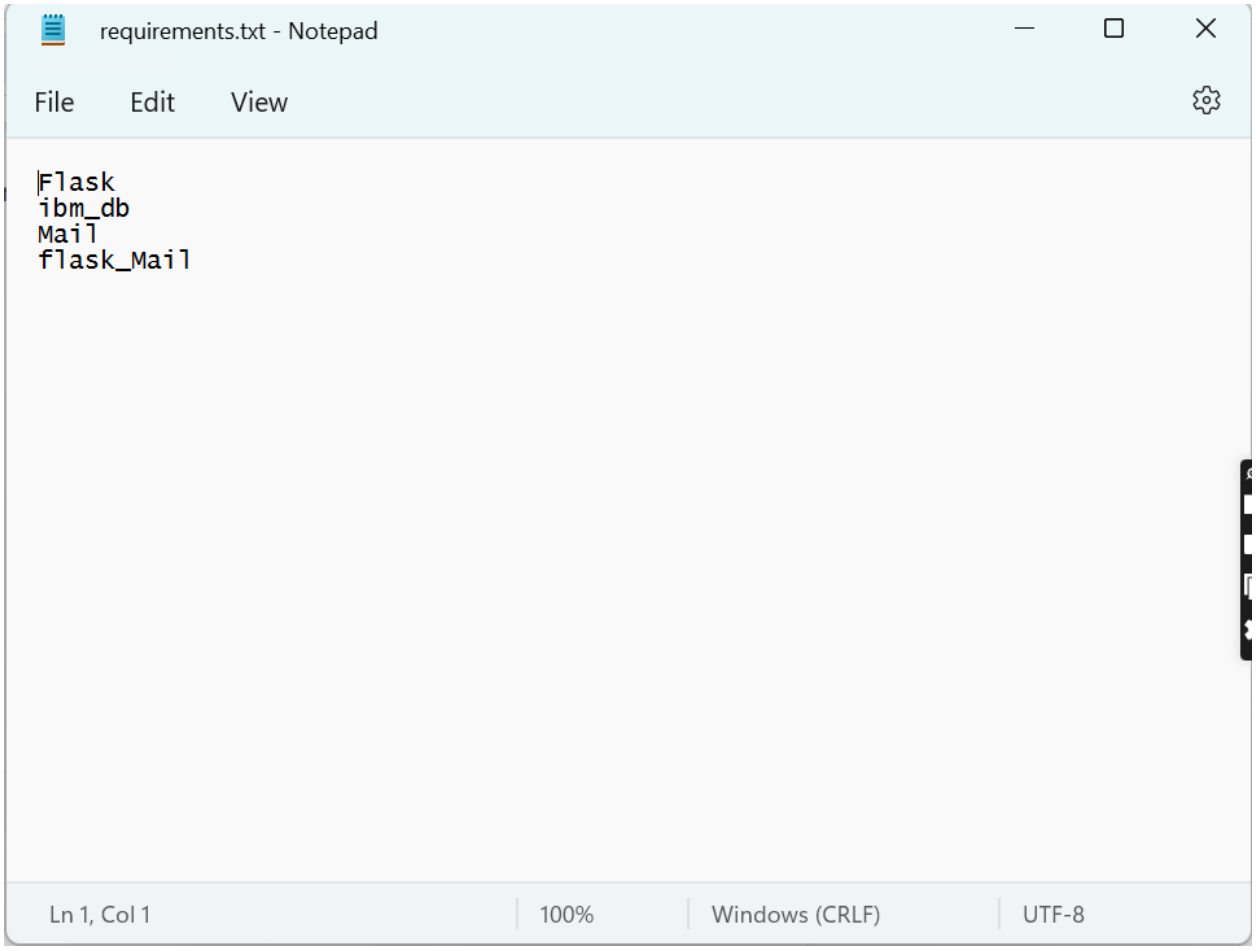




Create a docker file



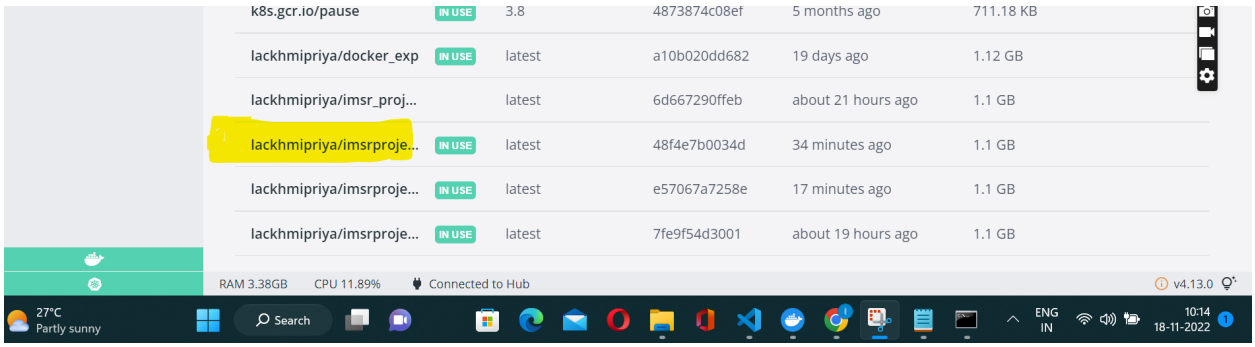
Create a requirement file

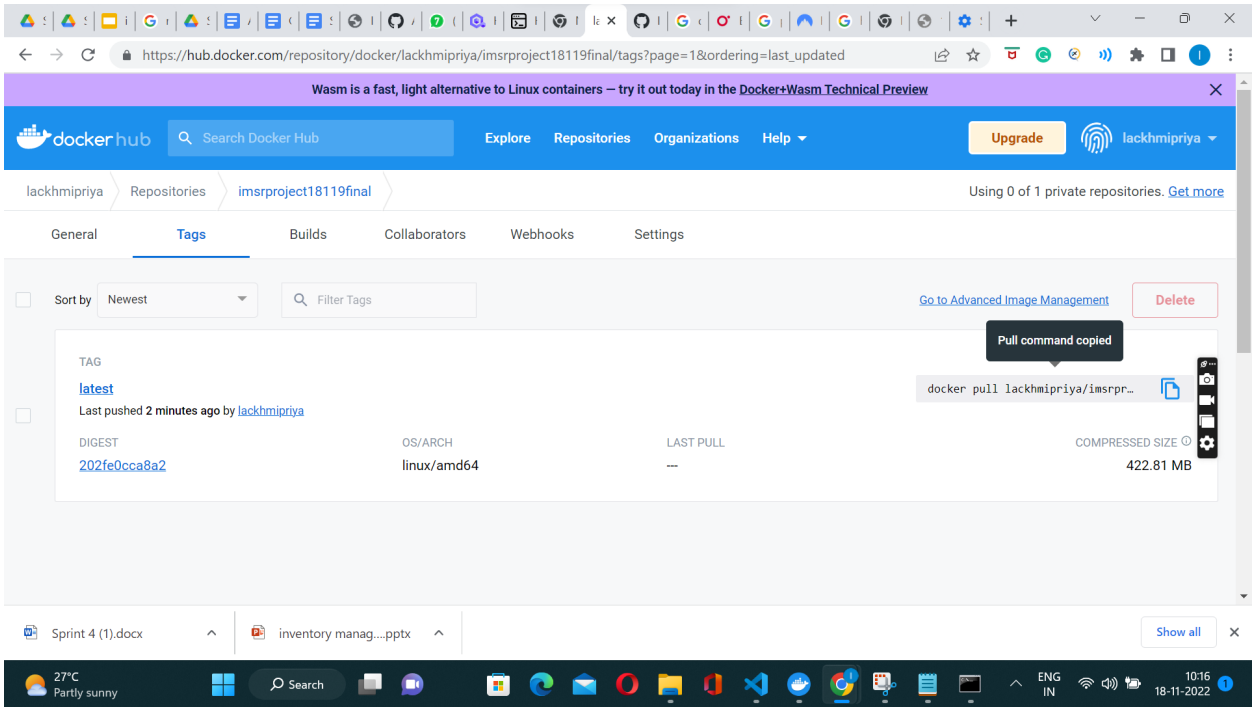


Build the application

-> The commands are highlighted

```
C:\Users\lackh>cd C:\Users\lackh\OneDrive\Desktop\imsrproject12

C:\Users\lackh\OneDrive\Desktop\imsrproject12>docker build -t imsrproject12 .
[+] Building 177.0s (12/12) FINISHED
 => [internal] load build definition from Dockerfile                                                0.1s
 => => transferring dockerfile: 235B                                                                0.0s
 => [internal] load .dockerignore                                                                   0.0s
 => => transferring context: 2B                                                                     0.0s
 => [internal] load metadata for docker.io/library/python:3.10.5                                    2.9s
 => [auth] library/python:pull token for registry-1.docker.io                                       0.0s
 => [1/6] FROM docker.io/library/python:3.10.5@sha256:fecbf94b56ce1f20a29427ff697bccbc659952f0b99eb8f3ba8296b8e51   0.0s
 => [internal] load build context                                                                   0.0s
 => => transferring context: 1.63kB                                                                 0.0s
 => CACHED [2/6] WORKDIR /app                                                                       0.0s
 => [3/6] ADD . /app                                                                                0.1s
 => [4/6] COPY requirements.txt /app                                                                0.1s
 => [5/6] RUN python3 -m pip install -r requirements.txt                                          169.1s
 => [6/6] RUN python3 -m pip install ibm_db                                                         2.4s
 => exporting to image                                                                              2.1s
 => => exporting layers                                                                             2.1s
 => => writing image sha256:e57067a7258edcbc857fd5396305a58262016ae1805eec0375aad73f4069b3a6        0.0s
 => => naming to docker.io/library/imsrproject12                                                    0.0s

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

C:\Users\lackh\OneDrive\Desktop\imsrproject12>docker tag imsrproject12 lackhmipriya/imsrproject18119final

C:\Users\lackh\OneDrive\Desktop\imsrproject12>docker push lackhmipriya/imsrproject18119
Using default tag: latest
The push refers to repository [docker.io/lackhmipriya/imsrproject18119]
aed444cc5133: Layer already exists
a9636a1e73dc: Layer already exists
0d367f38d54c: Layer already exists
d6b23a085084: Layer already exists
05ddba6a286d: Layer already exists
c4c2f1c63c2f: Layer already exists
4be7fe848f91: Layer already exists
```

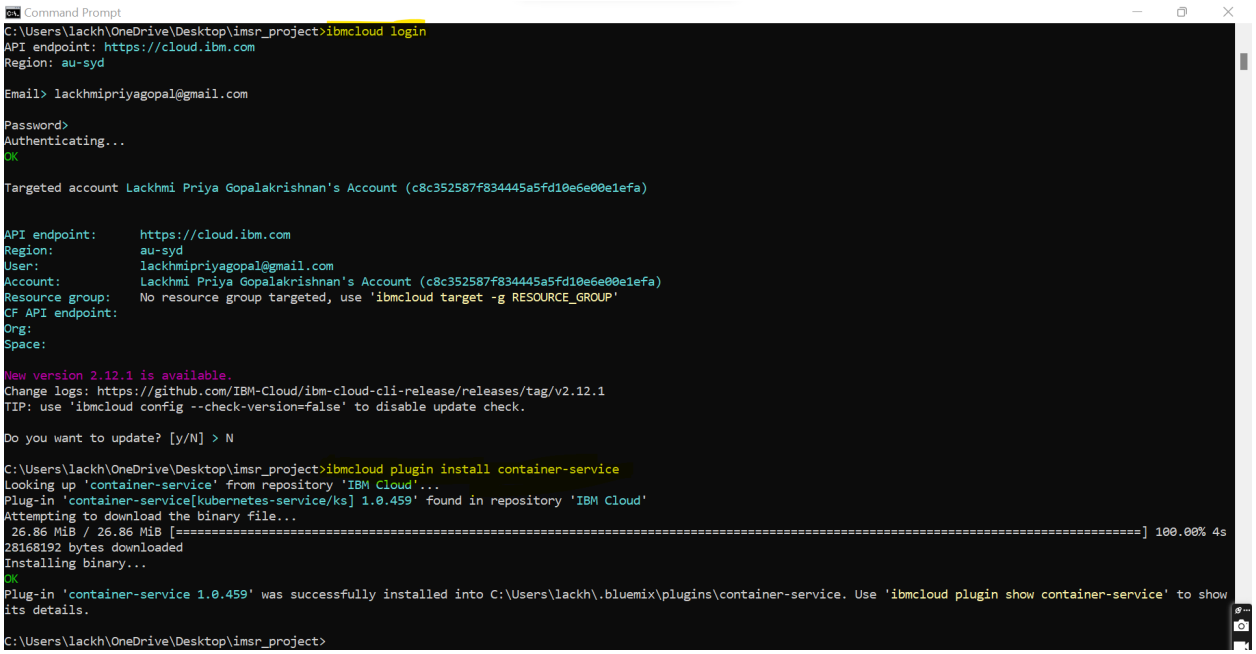




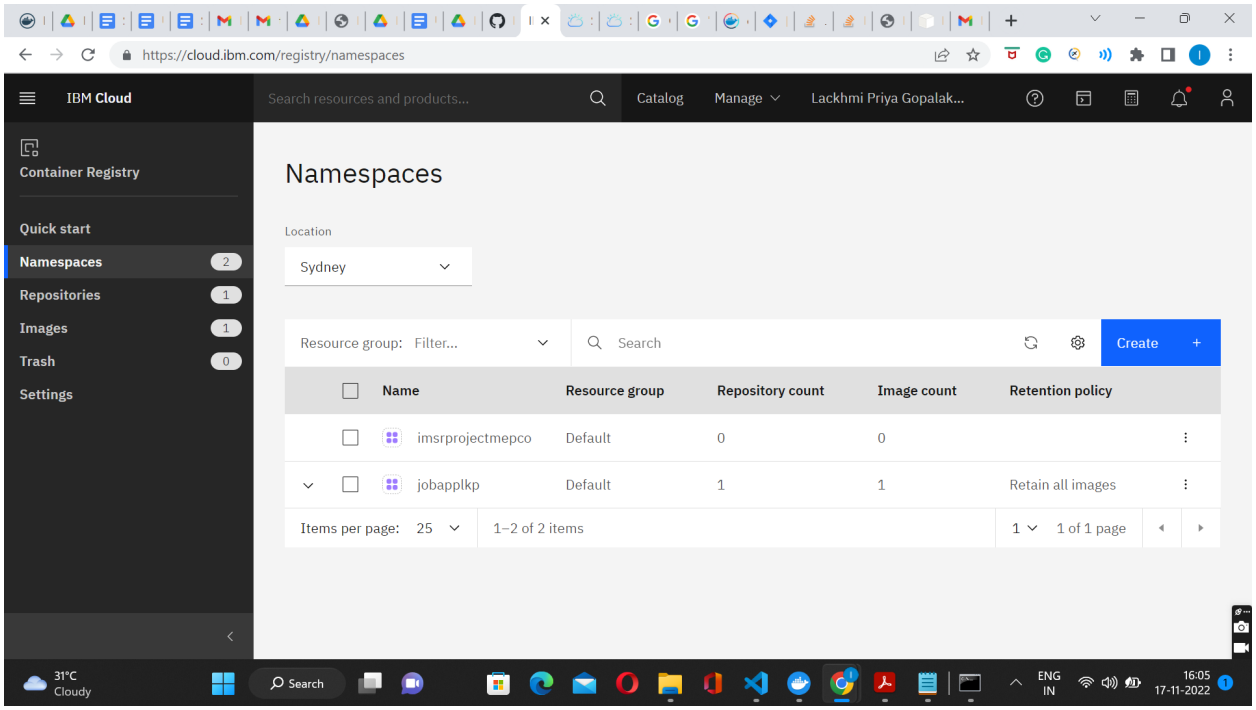
Question 3. Create an IBM container registry and deploy an app.

IBM CLOUD CLI

1) Login to IBM cloud CLI



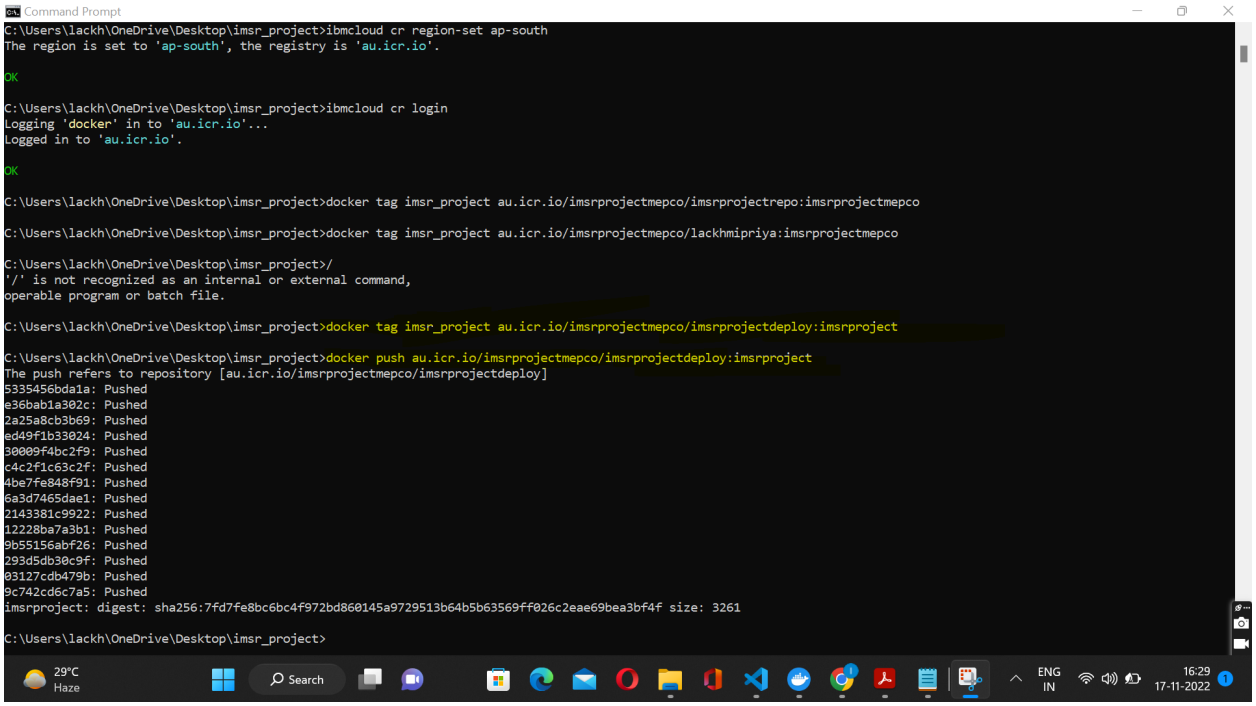
2) Create a namespace in the IBM Container registry



4) Log your local Docker daemon into the IBM Cloud Container Registry.

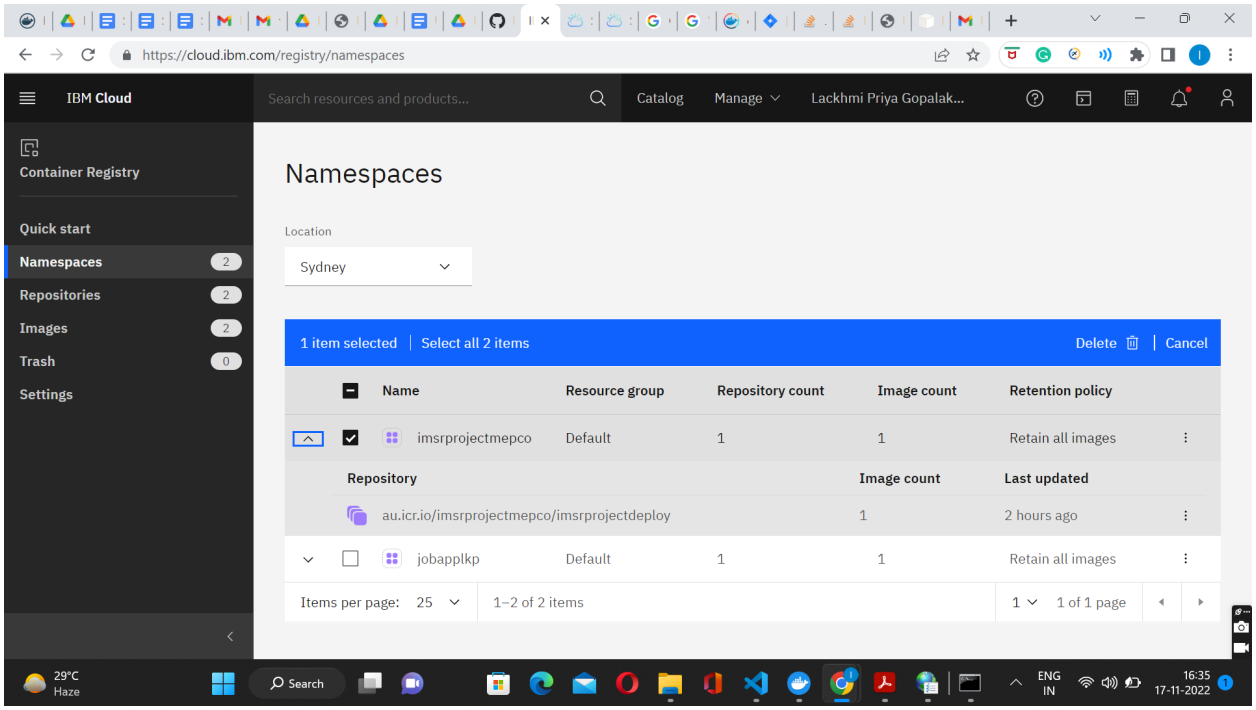
```
New version 2.12.1 is available.
Change logs: https://github.com/IBM-Cloud/ibm-cloud-cli-release/releases/tag/v2.12.1
TIP: use 'ibmcloud config --check-version=false' to disable update check.

Do you want to update? [y/N] > N

C:\Users\lackh\OneDrive\Desktop\imsr_project>docker login
Authenticating with existing credentials...
Login Succeeded

Logging in with your password grants your terminal complete access to your account.
For better security, log in with a limited-privilege personal access token. Learn more at https://docs.docker.com/go/access-tokens/

C:\Users\lackh\OneDrive\Desktop\imsr_project>ibmcloud cr region-set ap-south
The region is set to 'ap-south', the registry is 'au.icr.io'.

OK

C:\Users\lackh\OneDrive\Desktop\imsr_project>ibmcloud cr login
Logging 'docker' in to 'au.icr.io'...
Logged in to 'au.icr.io'.

OK
```

5) Pushing the project into IBM Container Registry.



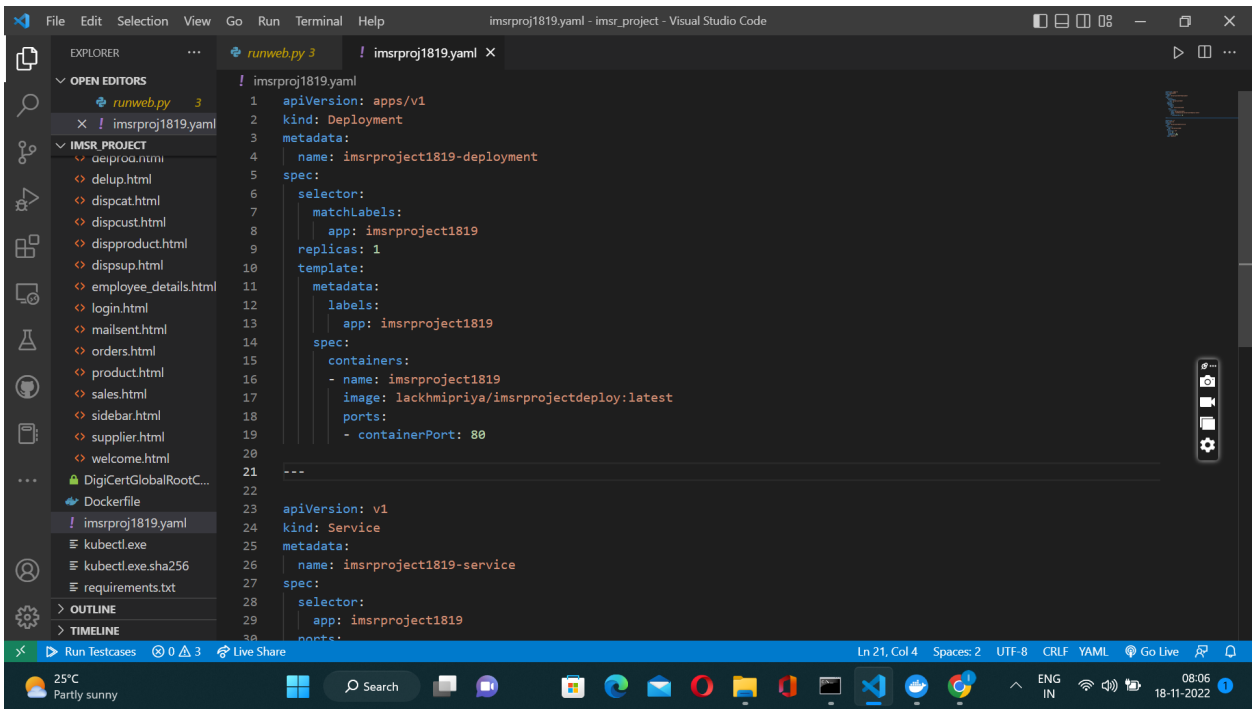
5. Verify that your image is in your private registry

```
C:\Users\lackh\OneDrive\Desktop\imsr_project>ibmcloud cr image-list
Listing images...

Repository                                  Tag            Digest        Namespace          Created       Size     Security status
au.icr.io/imsrprojectmepco/imsrprojectdeploy   imsrproject    7fd7fe8bc6bc  imsrprojectmepco   1 hour ago    443 MB   -
au.icr.io/jobapplkp/testrepo                jobportaltest  ae8079f651d8  jobapplkp          2 weeks ago   449 MB   -

OK
```



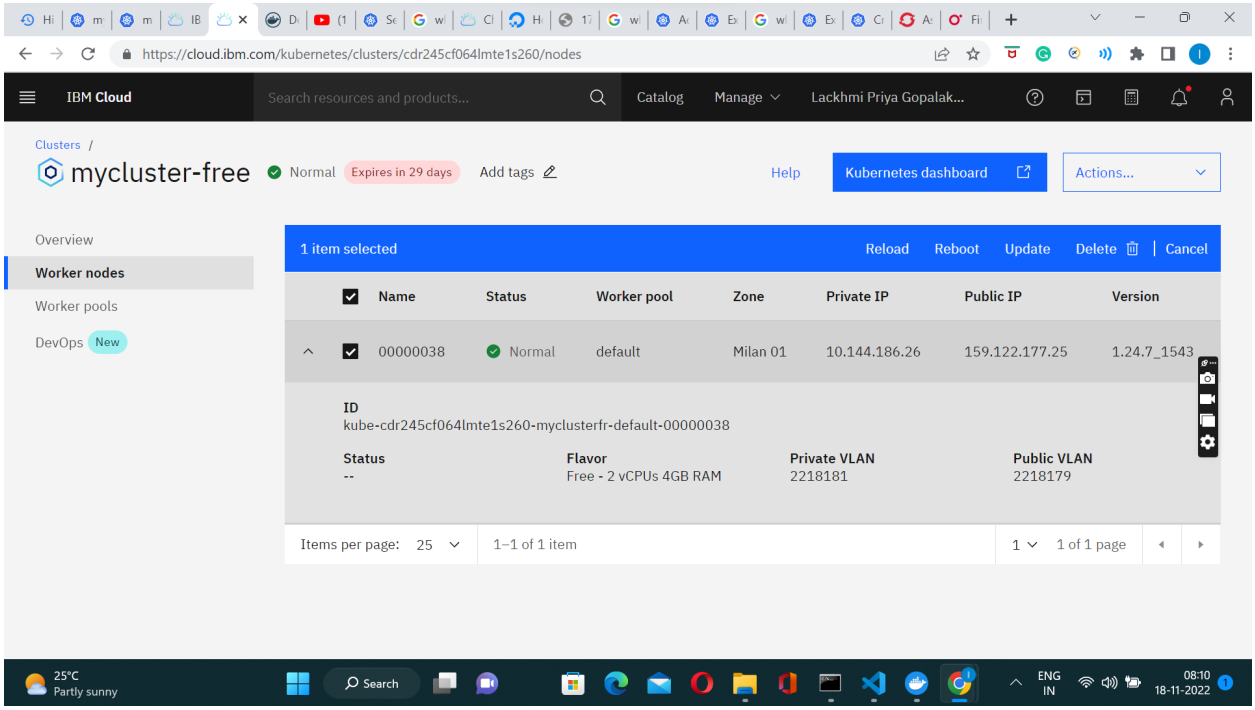
4. Create a Kubernetes cluster in IBM cloud and deploy image and also expose the same app to run in node port.

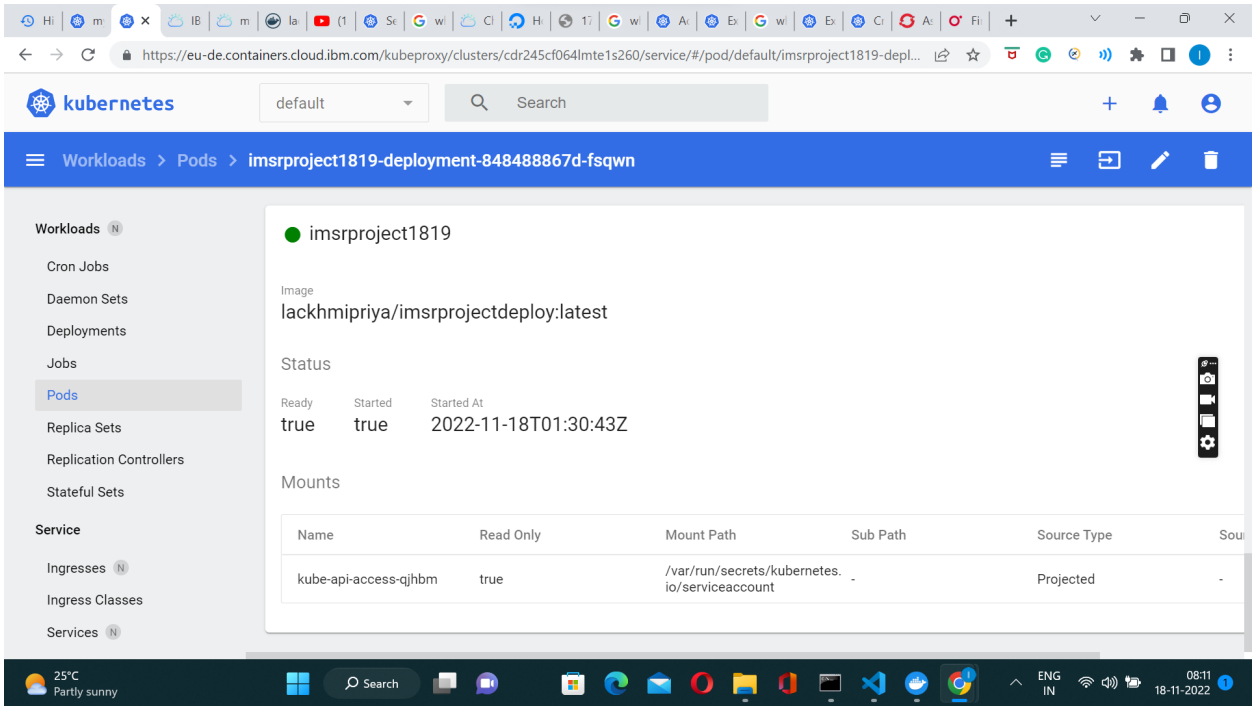
1) Created an YAML file



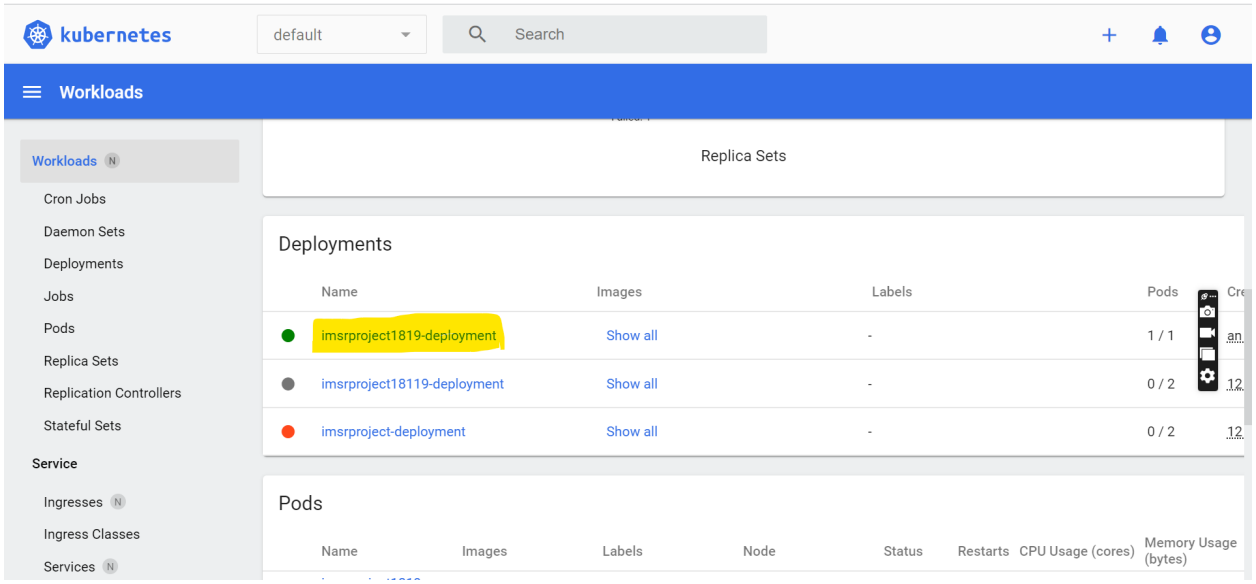
2)Deploy the YAML file in Kubernetes

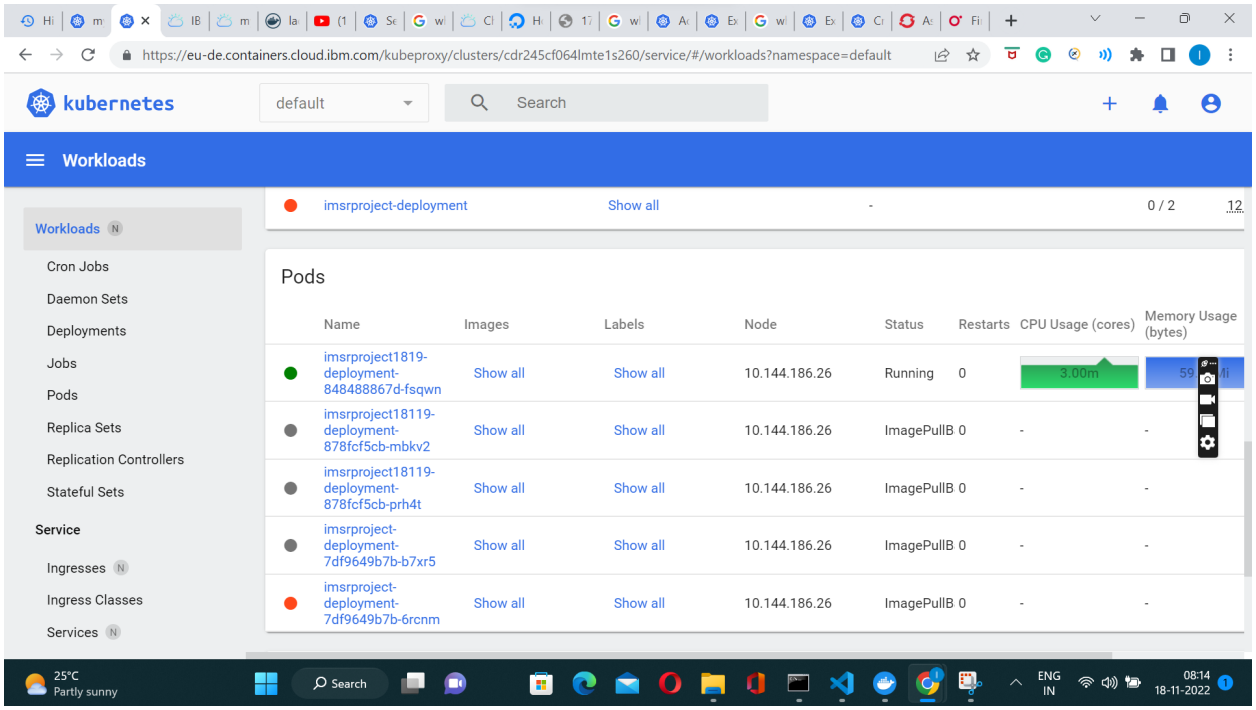
```
C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl apply -f imsrproj1819.yaml
deployment.apps/imsrproject1819-deployment created

C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl apply -f imsrproj1819.yaml
deployment.apps/imsrproject1819-deployment unchanged
error: error validating "imsrproj1819.yaml": error validating data: ValidationError(Service.spec.ports[0]): unknown field "targetport" in io.k8s.api.core.v1.ServicePort; if
 you choose to ignore these errors, turn validation off with --validate=false

C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl apply -f imsrproj1819.yaml
deployment.apps/imsrproject1819-deployment unchanged
service/imsrproject1819-service created
```



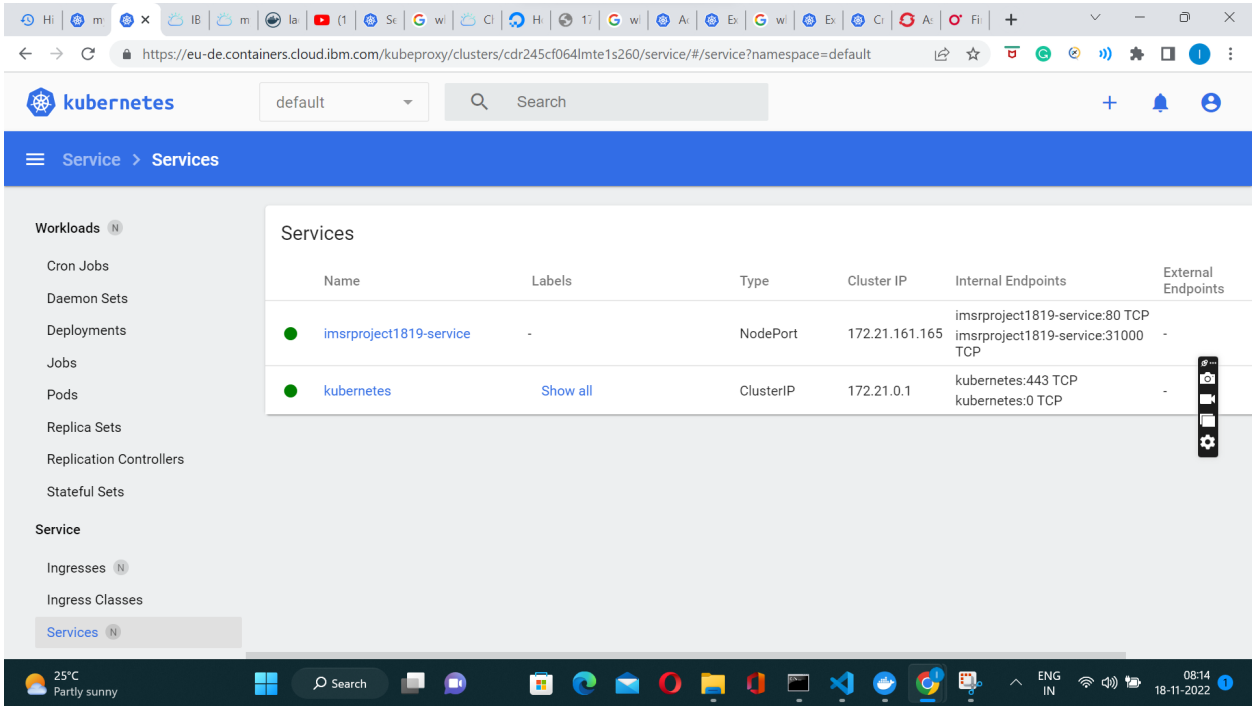


The deployed file is highlighted





Nodeport:31000
Target port :80



3)View all the files deployed in Kubernetes

```
C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl get deployments
NAME                        READY   UP-TO-DATE   AVAILABLE   AGE
imsrproject-deployment      0/2     2            0           11h
imsrproject18119-deployment 0/2     2            0           11h
imsrproject1819-deployment  1/1     1            1           18m

C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl get pod -o wide
NAME                                        READY   STATUS             RESTARTS   AGE   IP              NODE            NOMINATED NODE   READINESS GATES
imsrproject-deployment-7df9649b7b-6rcnm     0/1     ImagePullBackOff   0          11h   172.30.45.205   10.144.186.26   <none>           <none>
imsrproject-deployment-7df9649b7b-b7xr5     0/1     ImagePullBackOff   0          11h   172.30.45.207   10.144.186.26   <none>           <none>
imsrproject18119-deployment-878fcf5cb-mbkv2 0/1     ImagePullBackOff   0          11h   172.30.45.208   10.144.186.26   <none>           <none>
imsrproject18119-deployment-878fcf5cb-prh4t 0/1     ErrImagePull       0          11h   172.30.45.209   10.144.186.26   <none>           <none>
imsrproject1819-deployment-848488867d-fsqwn 1/1     Running            0          35m   172.30.45.210   10.144.186.26   <none>           <none>

C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl get service --all-namespaces
NAMESPACE              NAME                                TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)                  AGE
default                imsrproject1819-service             NodePort    172.21.161.165   <none>        80:31000/TCP             25m
default                kubernetes                          ClusterIP   172.21.0.1       <none>        443/TCP                  14h
kube-system            calico-typha                        ClusterIP   172.21.148.38    <none>        5473/TCP                 13h
kube-system            dashboard-metrics-scraper           ClusterIP   172.21.78.107    <none>        8000/TCP                 13h
kube-system            ibm-k8s-controller-default-backend  ClusterIP   172.21.245.51    <none>        80/TCP                   13h
kube-system            kube-dns                            ClusterIP   172.21.0.10      <none>        53/UDP,53/TCP,9153/TCP   13h
kube-system            kubernetes-dashboard                ClusterIP   172.21.209.178   <none>        443/TCP                  13h
kube-system            metrics-server                      ClusterIP   172.21.67.149    <none>        443/TCP                  13h
kube-system            node-local-dns                      ClusterIP   172.21.81.212    <none>        53/UDP,53/TCP            13h
kubernetes-dashboard   dashboard-metrics-scraper           ClusterIP   172.21.219.150   <none>        8000/TCP                 12h
```

```
C:\Users\lackh\OneDrive\Desktop\imsr_project>kubectl describe services imsrproject1819-service
Name:                     imsrproject1819-service
Namespace:                default
Labels:                   <none>
Annotations:              <none>
Selector:                 app=imsrproject1819
Type:                     NodePort
IP Family Policy:         SingleStack
IP Families:              IPv4
IP:                       172.21.161.165
IPs:                      172.21.161.165
Port:                     <unset>  80/TCP
TargetPort:               80/TCP
NodePort:                 <unset>  31000/TCP
Endpoints:                172.30.45.210:80
Session Affinity:         None
External Traffic Policy:  Cluster
Events:                   <none>
```

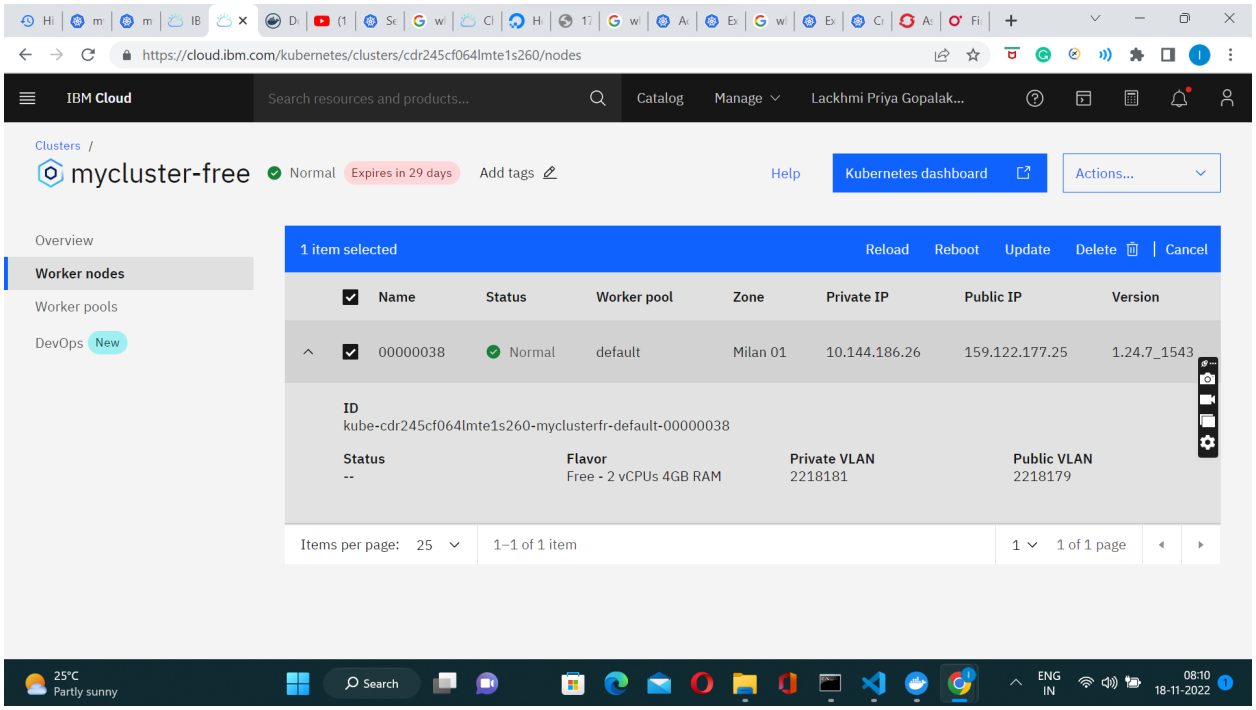
To access the web application deployed in Kubernetes

http://<external-ip>:<port>

External -ip :- 159.122.177.25

Port:31000

http://159.122.177.25:31000


https://cloud.ibm.com/kubernetes/clusters/cdr245cf064lmte1s260/nodes
IBM Cloud
Search resources and products...
Catalog
Manage
Lackhmi Priya Gopalak...
Clusters /
mycluster-free
Normal
Expires in 29 days
Add tags
Help
Kubernetes dashboard
Actions...
Overview
Worker nodes
Worker pools
DevOps
New
1 item selected
Reload
Reboot
Update
Delete
Cancel
Name
Status
Worker pool
Zone
Private IP
Public IP
Version
00000038
Normal
default
Milan 01
10.144.186.26
159.122.177.25
1.24.7_1543
ID
kube-cdr245cf064lmte1s260-myclusterfr-default-00000038
Status
--
Flavor
Free - 2 vCPUs 4GB RAM
Private VLAN
2218181
Public VLAN
2218179
Items per page: 25
1–1 of 1 item
1
1 of 1 page
25°C
Partly sunny
Search
ENG
IN
08:10
18-11-2022