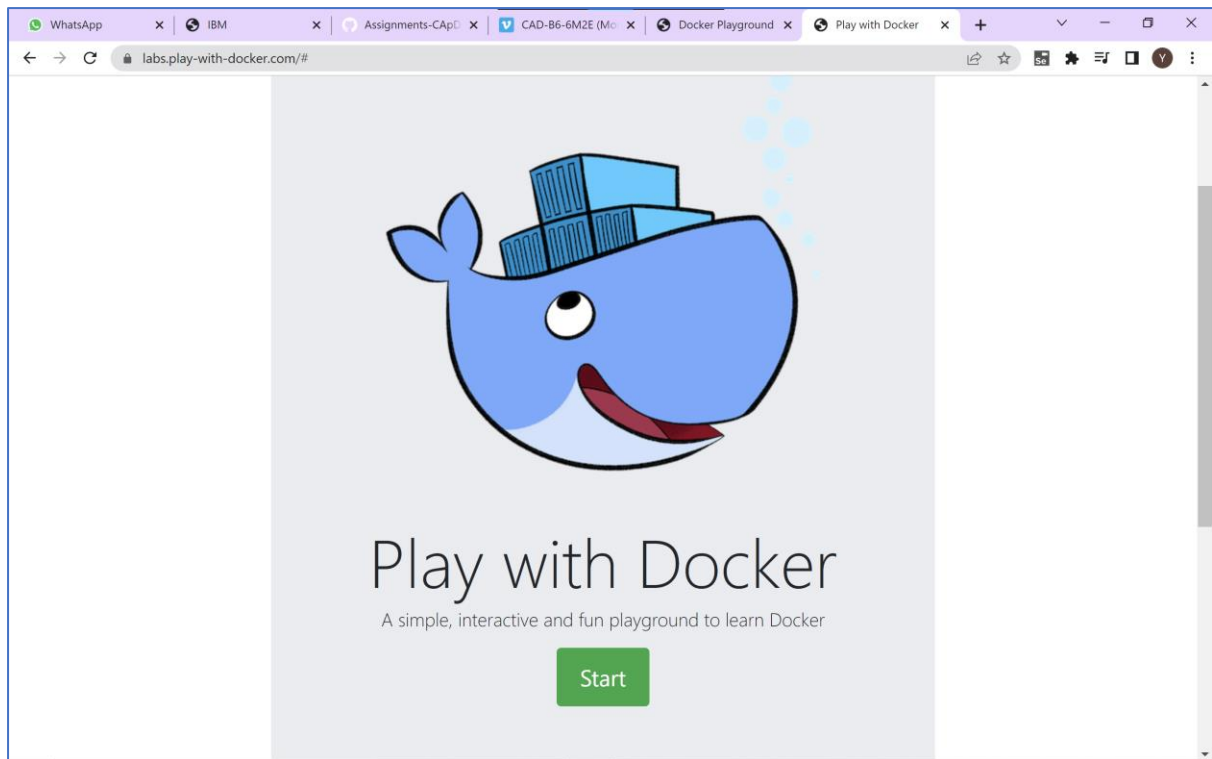


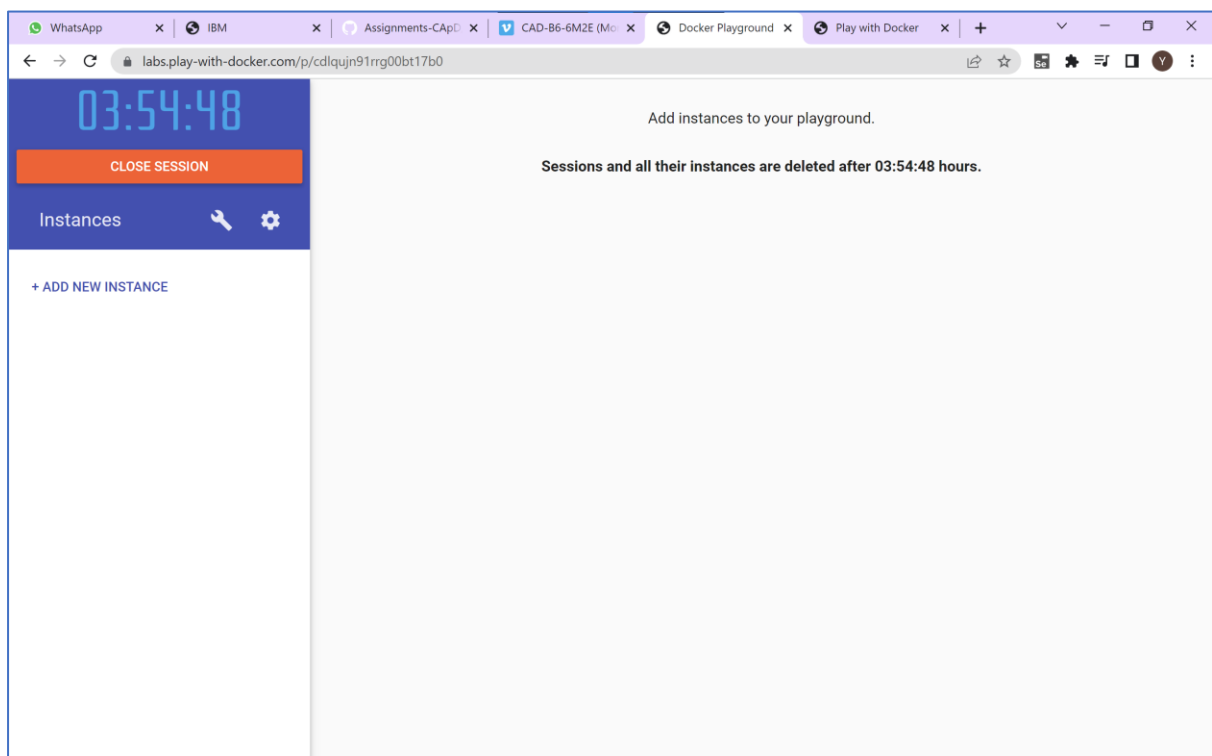
Assignment Kubernetes / Docker

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

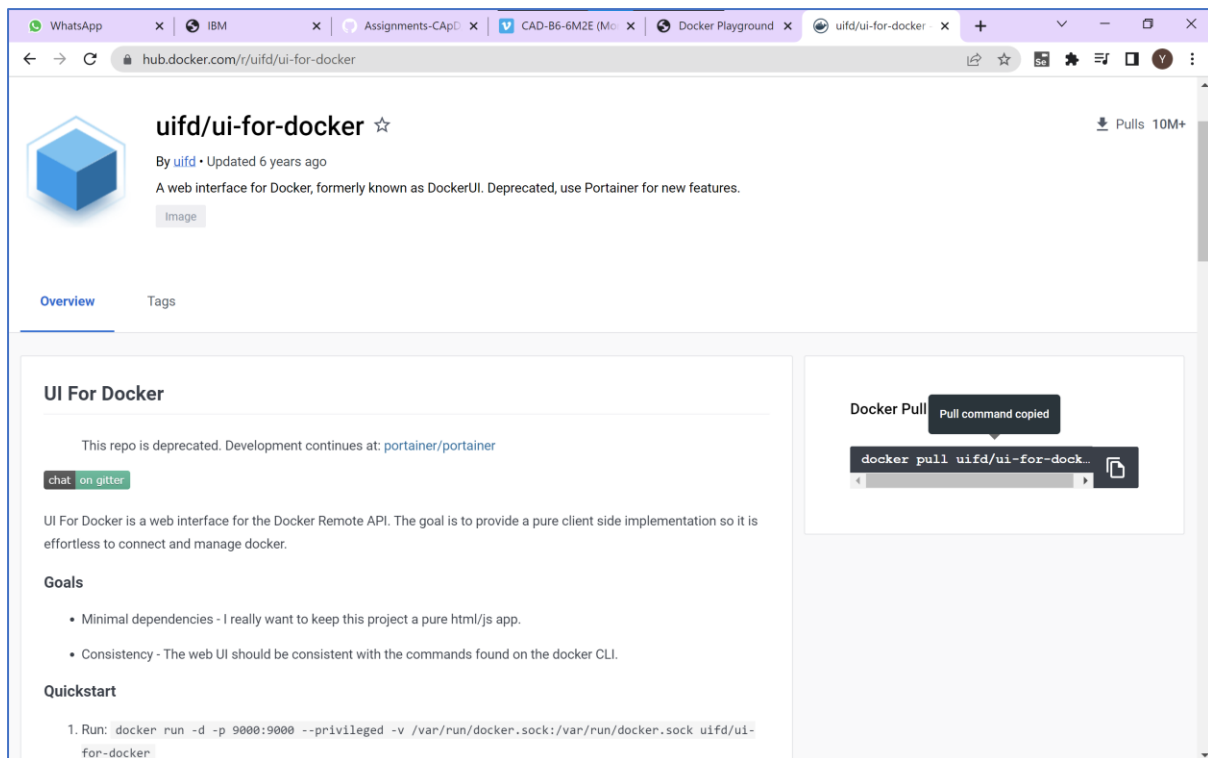
Start page of docker hub:



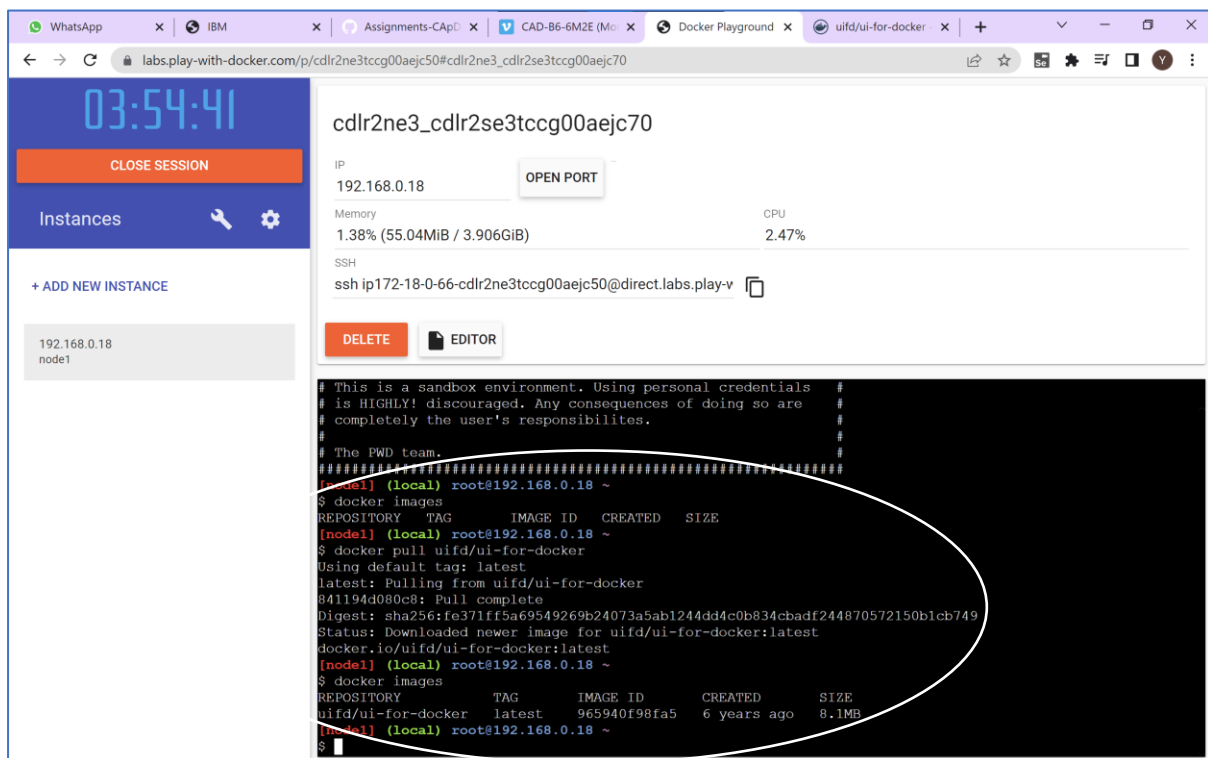
Homepage of Docker hub:



UI for docker image from hub.docker.com:



Pulling and viewing the image in the command line of our docker playground interface:



Running the image, (command and the output side by side)

OPEN PORT

9000

Memory
1.63% (65.05MiB / 3.906GiB)

CPU
0.41%

SSH
ssh ip172-18-0-66-cdlr2ne3tccg00aejc50@direct.labs.play-v

DELETE EDITOR

```
$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
[node1] (local) root@192.168.0.18 ~
$ docker pull uifd/ui-for-docker
Using default tag: latest
latest: Pulling from uifd/ui-for-docker
841194d080c8: Pull complete
Digest: sha256:fe371ff5a69549269b24073a5ab1244dd4c0b834cbadf244870572150b1cb749
Status: Downloaded newer image for uifd/ui-for-docker:latest
docker.io/uifd/ui-for-docker:latest
[node1] (local) root@192.168.0.18 ~
$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
uifd/ui-for-docker  latest   965940f98fa5   6 years ago    8.1MB
[node1] (local) root@192.168.0.18 ~
$ docker run -d -p 9000:9000 --privileged -v /var/run/docker.sock:/var/run/docker.sock uifd/ui-for-docker
67193f9e37c0265e411634ba224878683
[node1] (local) root@192.168.0.18 ~
```

UI For Docker

Dashboard Containers Containers Network Images Networks Volun Re

Running Containers

Status

wizardly_prosl

Up 25 seconds

Running Stopped Ghost

Containers created

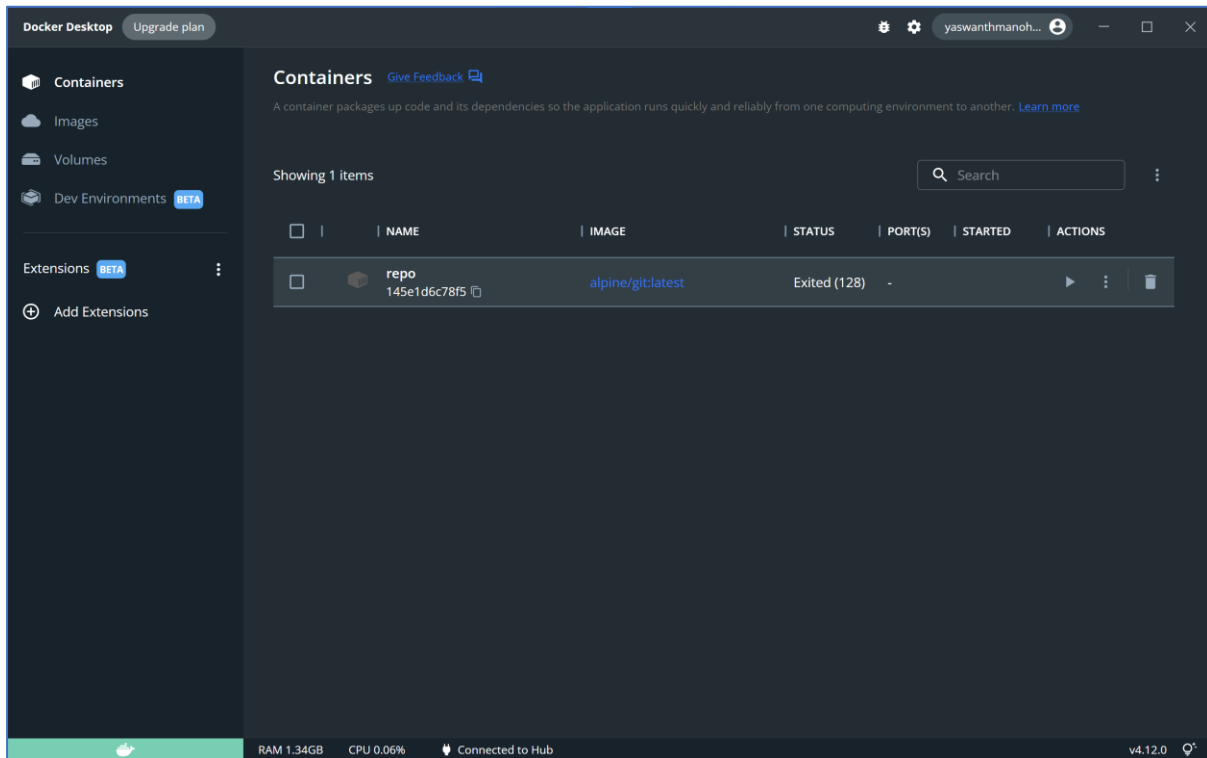
1
0
11/9/2022

Images created

1

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

Homepage of running docker desktop:



Build an image in docker hub after logging in,

```
Microsoft Windows [Version 10.0.19044.2130]
(c) Microsoft Corporation. All rights reserved.

C:\Users\yaswa>cd "C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal"

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>docker login --username=yaswanthmanoharan
[+] Building 83.0s (9/11)
-> [internal] load build definition from Dockerfile                                0.0s
-> -- transferring dockerfile: 229B                                              0.0s
-> [internal] load .dockerignore                                                  0.0s
-> -- transferring context: 2B                                                    0.0s
-> [internal] load metadata for docker.io/library/python:3.6                    15.1s
[+] Building 83.6s (9/11)
-> [internal] load build definition from Dockerfile                                0.0s
-> -- transferring dockerfile: 229B                                              0.0s
-> [internal] load .dockerignore                                                  0.0s
-> -- transferring context: 2B                                                    0.0s
-> [internal] load metadata for docker.io/library/python:3.6                    15.1s
-> [auth] library/python:pull token for registry-1.docker.io                    0.0s
-> [internal] load build context                                                  0.1s
-> -- transferring context: 61.39kB                                              0.0s
-> [1/6] FROM docker.io/library/python:3.6@sha256:f8652afaf88c25f0d22354d547d892591067aa4026a7fa9a6819df9f300af6fc 48.1s
-> resolve docker.io/library/python:3.6@sha256:f8652afaf88c25f0d22354d547d892591067aa4026a7fa9a6819df9f300af6fc 0.0s
-> sha256:f8652afaf88c25f0d22354d547d892591067aa4026a7fa9a6819df9f300af6fc 1.86kB / 1.86kB
-> sha256:cb5b7ae36172f078eca53f35823ed21baa85d61d5d95c5d5a95ab53d740cdd56 10.87MB / 10.87MB
-> sha256:9a829c73b52b02b97d5e07c54f6af3e921995a296c714b53a32ae67d19231fcd 5.15MB / 5.15MB
-> sha256:d097a49b7a8nc879df5ac31872359c2de510f82214c0448a9263b3b376d3b60d 2.22kB / 2.22kB
-> sha256:54268638d07c5e3ad24c6e21fc889abbc8486a27634c0892086ff71f3f44b104 9.27kB / 9.27kB
-> sha256:8e29546d541cbbd309281d21a73a9d1db78665c1b95b74f32b009e0b77a6e1e3 54.92MB / 54.92MB
-> sha256:6494de4811622b31c027ccac122ca463937fd809f569a91eef15c01aade718793 54.57MB / 54.57MB
-> sha256:6f9f74896dffa93fe0172f594faba85e0b4e8a0481a0fef9d112efc7e4d3c78f7 196.51MB / 196.51MB
-> sha256:5e3b1213efc56598e78bd602983945c164de2a37205e06e62dada823124dc743 6.29MB / 6.29MB
-> sha256:9fddfd3c56334f2e6fad7e241bf5e7459c40ed105c5478676f41c1244bd96752 14.21MB / 14.21MB
-> sha256:484f0204bac0432ca522cbb9f254b1c91fcea6806bfeef0be8b243b2f31bab7 235B / 235B
-> sha256:c4f42be2be53b900ebffcd040c1df13de538434cccc5f5d954a5684a6169a3a3f 2.21MB / 2.21MB
[+] Building 85.3s (9/11)
-> [internal] load build definition from Dockerfile                                0.0s
-> -- transferring dockerfile: 229B                                              0.0s
-> [internal] load .dockerignore                                                  0.0s
-> -- transferring context: 2B                                                    0.0s
-> [internal] load metadata for docker.io/library/python:3.6                    15.1s
-> [auth] library/python:pull token for registry-1.docker.io                    0.1s
-> [internal] load build context                                                  0.1s
-> -- transferring context: 61.39kB                                              0.0s
-> [1/6] FROM docker.io/library/python:3.6@sha256:f8652afaf88c25f0d22354d547d892591067aa4026a7fa9a6819df9f300af6fc 48.1s
-> resolve docker.io/library/python:3.6@sha256:f8652afaf88c25f0d22354d547d892591067aa4026a7fa9a6819df9f300af6fc 0.0s
-> sha256:f8652afaf88c25f0d22354d547d892591067aa4026a7fa9a6819df9f300af6fc 1.86kB / 1.86kB
-> sha256:cb5b7ae36172f078eca53f35823ed21baa85d61d5d95c5d5a95ab53d740cdd56 10.87MB / 10.87MB
```

Push the code by creating the tag of image,

```
Command Prompt - docker push yaswanthmanoharan/testjob
-> [5/6] RUN python3 -m pip install -r requirements.txt 166.0s
-> [6/6] RUN python3 -m pip install ibm_db 1.4s
-> exporting to image 1.5s
-> exporting layers 1.5s
-> writing image sha256:350e37d0107344bcfa8f089642ca1bbabc9fe05f885926018ced4e5625016a33b 0.0s
-> naming to docker.io/library/testjob 0.0s

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

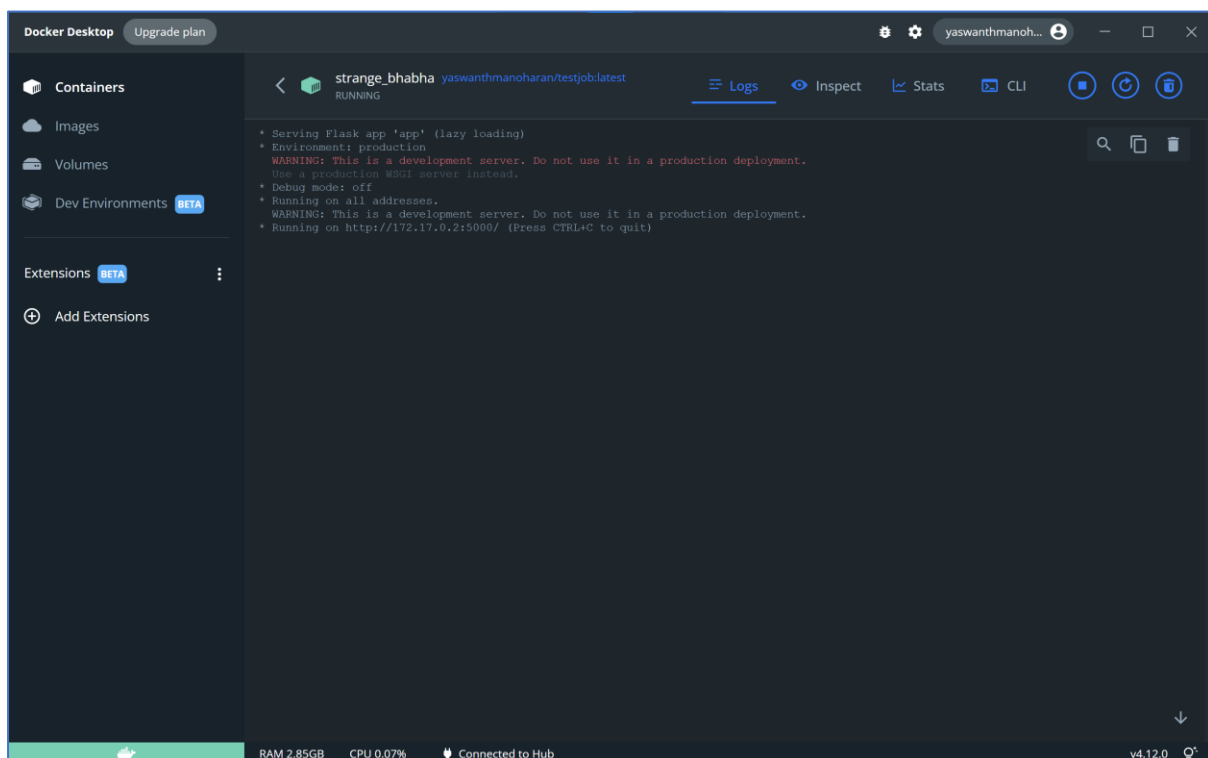
C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
testjob latest 350e37d01073 10 minutes ago 1.08GB
alpine/git latest b80d2cac43e4 4 weeks ago 43.6MB

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>docker tag testjob yaswanthmanoharan/testjob

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>docker push yaswanthmanoharan/testjob:testjob
The push refers to repository [docker.io/yaswanthmanoharan/testjob]
tag does not exist: yaswanthmanoharan/testjob:testjob

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>docker push yaswanthmanoharan/testjob
Using default tag: latest
The push refers to repository [docker.io/yaswanthmanoharan/testjob]
6a4107e09a86: Pushed
01c4b2a49ef1: Pushed [=====] 25.52MB/178.4MB
423945fbbfe2: Pushed
ffa07e24faa3: Pushed
b7f98cf3b6c5: Pushed
aa4c808c19f6: Preparing
8ba9f690e8ba: Waiting
3a607d59ef9f: Waiting
1e187e1fcc2: Waiting
c3a0d593ed24: Preparing
26a504e63be4: Waiting
8bf42db0de72: Waiting
31892cc314cb: Preparing
11936051f93b: Waiting
```

Container for the “testjob” image has been created and deployed in docker desktop.



3. Create a IBM container registry and deploy hello world app or job portal app.

Setting up of Environment:

```
Command Prompt
Looking up 'container-registry' from repository 'IBM Cloud'...
Plug-in 'container-registry[cr] 1.0.2' found in repository 'IBM Cloud'
Attempting to download the binary file...
 11.90 MiB / 11.90 MiB [=====] 100.00% 1s
12476416 bytes downloaded
Installing binary...
Plug-in 'container-registry 1.0.2' was successfully installed into C:\Users\yaswa\bluemix\plugins\container-registry. Use 'ibmcloud plugin show container-registry' to show its details.

C:\Users\yaswa>ibmcloud login -a https://cloud.ibm.com
API endpoint: https://cloud.ibm.com

Email> 191361@psgtech.ac.in

Password>
Authenticating...
OK

Targeted account Yaswanth M's Account (e3948ccc7042453fb3d3d240f28f3c29)

Select a region (or press enter to skip):
1. au-syd
2. in-che
3. jp-osa
4. jp-tok
5. kr-seo
6. eu-de
7. eu-gb
8. ca-tor
9. us-south
10. us-east
11. br-sao
Enter a number> 1
Targeted region au-syd

API endpoint: https://cloud.ibm.com
Region: au-syd
User: 191361@psgtech.ac.in
Account: Yaswanth M's Account (e3948ccc7042453fb3d3d240f28f3c29)
Resource group: No resource group targeted, use 'ibmcloud target -g RESOURCE_GROUP'
CF API endpoint:
Org:
Space:

C:\Users\yaswa>
```

Container has been created and both images of jobportal app and hello world have been deployed in IBM container registry.

```
Command Prompt

C:\Users\yaswa>docker push icr.io/jobtest-yas/testjob
Using default tag: latest
The push refers to repository [icr.io/jobtest-yas/testjob]
An image does not exist locally with the tag: icr.io/jobtest-yas/testjob

C:\Users\yaswa>docker tag hello-world icr.io/jobtest-yas/testjob:latest

C:\Users\yaswa>docker push icr.io/jobtest-yas/testjob:latest
The push refers to repository [icr.io/jobtest-yas/testjob]
e07ee1baac5f: Pushed
latest: digest: sha256:f54a58bc1aac5ea1a25d796ae155dc228b3f0e11d046ae276b39c4bf2f13d8c4 size: 525

C:\Users\yaswa>docker tag yaswanthmanoharan/testjob icr.io/jobtest1-yas/testjob1:latest

C:\Users\yaswa>docker push icr.io/jobtest1-yas/testjob1:latest
The push refers to repository [icr.io/jobtest1-yas/testjob1]
6a4107e09a86: Pushed
01c4b2a49ef1: Pushed
423945f0bfe2: Pushed
f4a07024faa3: Pushed
b7f98cf3b6c5: Pushed
aa4c808c19f6: Pushed
8ba9f690e8ba: Pushed
3e607d59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d593ed24: Pushed
26a504e63be4: Pushed
8bf42db0de72: Pushed
31892cc314cb: Pushed
11936051f93b: Pushed
latest: digest: sha256:50da05d3f76d457604a931f5783adb4f0f260f9d84599f258770f0ee3d468165 size: 3260

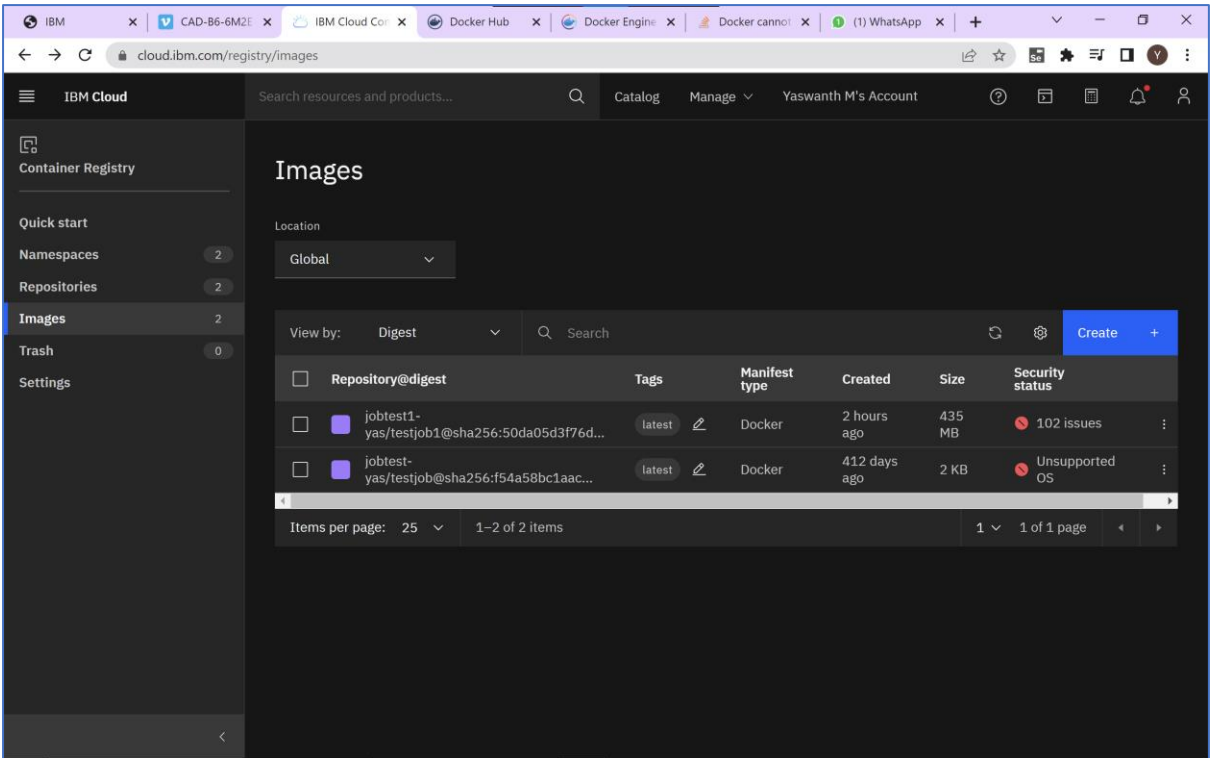
C:\Users\yaswa>ibmcloud cr image-list
Listing images...

Repository          Tag      Digest          Namespace      Created      Size      Security status
icr.io/jobtest-yas/testjob  latest  f54a58bc1aac    jobtest-yas    1 year ago   2.5 kB    -
icr.io/jobtest1-yas/testjob1  latest  50da05d3f76d    jobtest1-yas    2 hours ago  436 MB    -

OK

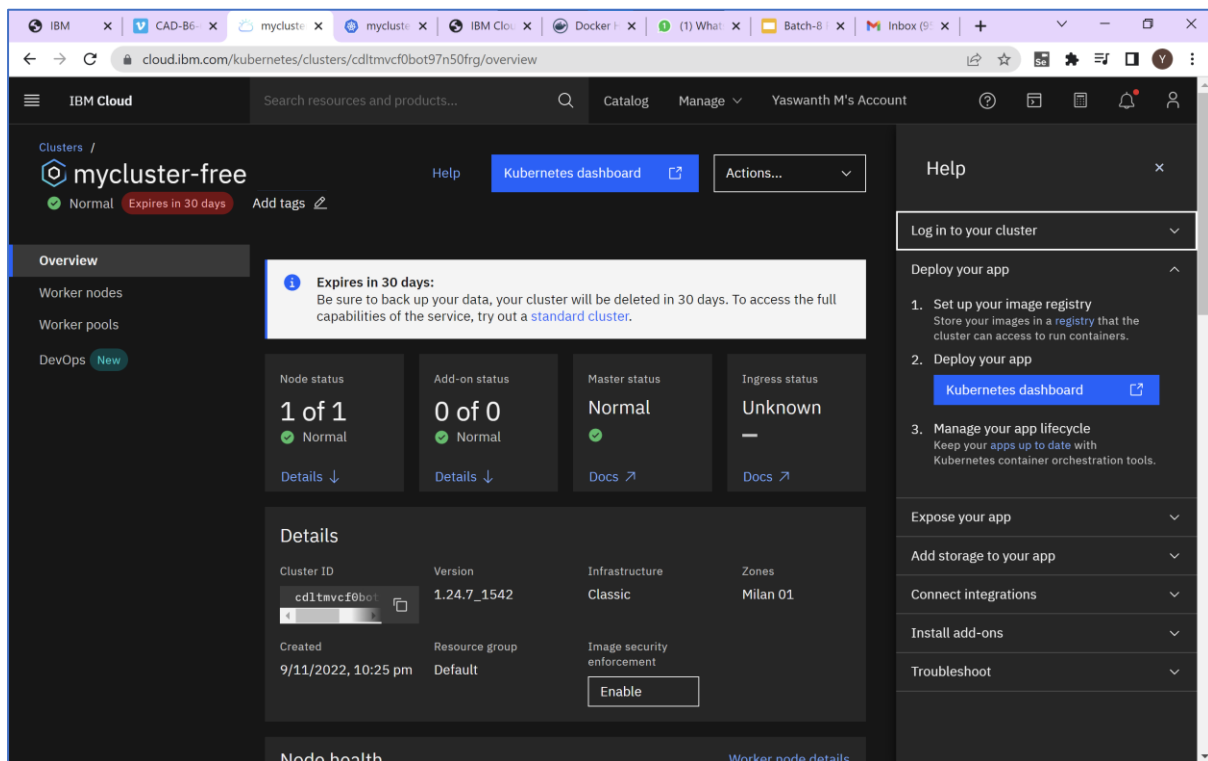
C:\Users\yaswa>
```

IBM Cloud Registry,



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

Creation of Kubernetes cluster in IBM Cloud:



Thus, job portal app is deployed and exposed:

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19044.2130]
(c) Microsoft Corporation. All rights reserved.

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl create -f deployment.yaml
deployment.apps/flask-node-deployment created

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl get deployment
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
flask-node-deployment  0/1     1             0           95s

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl get deployment
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
flask-node-deployment  0/1     1             0           2m12s

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl get deployment
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
flask-node-deployment  0/1     1             0           2m30s

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl create -f deployment.yaml
deployment.apps/job-app created

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl get deployment
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
flask-node-deployment  0/1     1             0           2m40s
job-app        0/1     1             0           4s

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl expose deployment jobapp --type=NodePort --name=newportal
Error from server (NotFound): deployments.apps "jobapp" not found

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl expose deployment job-app --type=NodePort --name=newportal
service/newportal exposed

C:\Users\yaswa\OneDrive\Desktop\IBM Project\job-portal>
```


Details of the exposed job portal app.

```
C:\Windows\System32\cmd.exe
C:\Users\Yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl describe deployment job-app
Name: job-app
Namespace: default
CreationTimestamp: Wed, 09 Nov 2022 22:52:08 +0530
Labels: <none>
Annotations: deployment.kubernetes.io/revision: 1
Selector: app=flasknode
Replicas: 1 desired | 1 updated | 1 total | 0 available | 1 unavailable
StrategyType: RollingUpdate
MinReadySeconds: 0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels: app=flasknode
  Containers:
    flasknode:
      Image: us.icr.io/jobportal/jobportal
      Port: 5000/TCP
      Host Port: 0/TCP
      Environment: <none>
      Mounts: <none>
  Volumes: <none>
Conditions:
  Type           Status  Reason
  ----           -
  Available      False   MinimumReplicasUnavailable
  Progressing    True    ReplicaSetUpdated
OldReplicaSets: <none>
NewReplicaSet:  job-app-5d9d6b7594 (1/1 replicas created)
Events:
  Type      Reason      Age    From          Message
  ----      -
  Normal    ScalingReplicaSet   4m31s  deployment-controller  Scaled up replica set job-app-5d9d6b7594 to 1

C:\Users\Yaswa\OneDrive\Desktop\IBM Project\job-portal>kubectl describe service newportal
Name: newportal
Namespace: default
Labels: <none>
Annotations: <none>
Selector: app=flasknode
Type: NodePort
IP Family Policy: SingleStack
IP Families: IPv4
IP: 172.21.16.65
IPs: 172.21.16.65
Port: <unset> 5000/TCP
TargetPort: 5000/TCP
NodePort: <unset> 30112/TCP
Endpoints:
```

Kubernetes is used to manage the docker images and the number of replicas of each image.