**Assignment - 4**

Kubernetes / Docker

| | |
|---|---|
| Assignment Date | 11 November 2022 |
| Student Name | Mohamed Musammil |
| Student Roll Number | 412519104076 |
| Maximum Marks | 2 Marks |

**Question-1:**

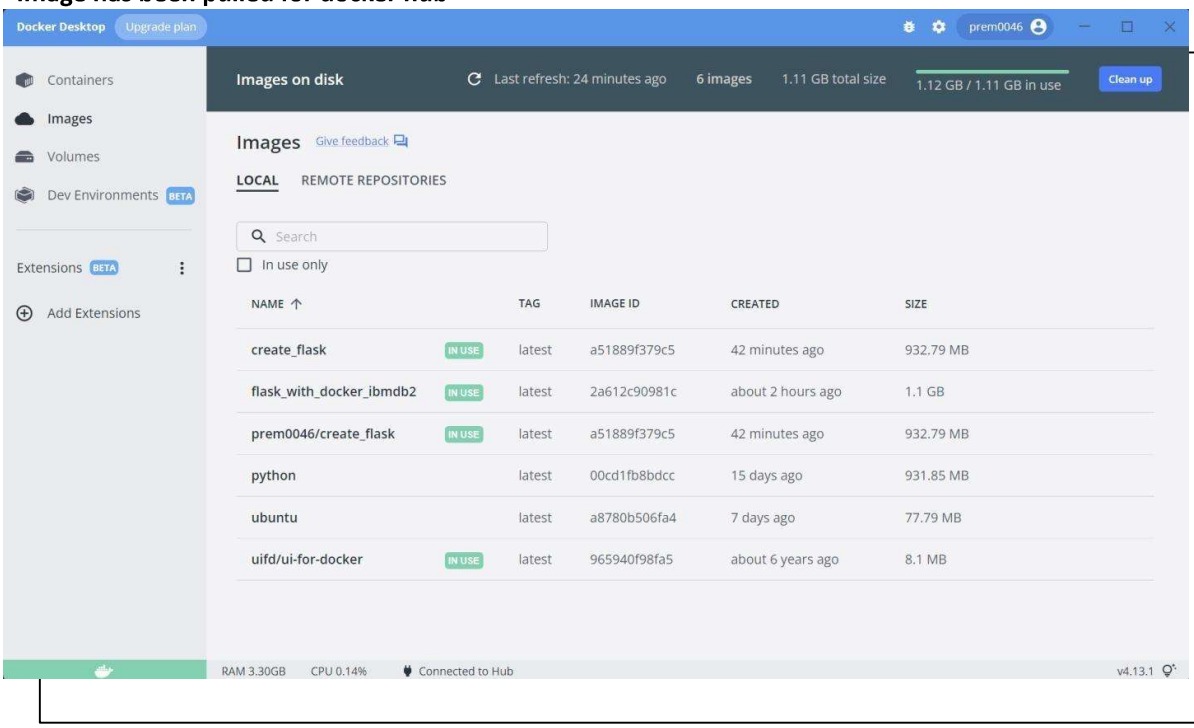
**Pull an Image from docker hub and run it in docker playground.**

**Solution:**

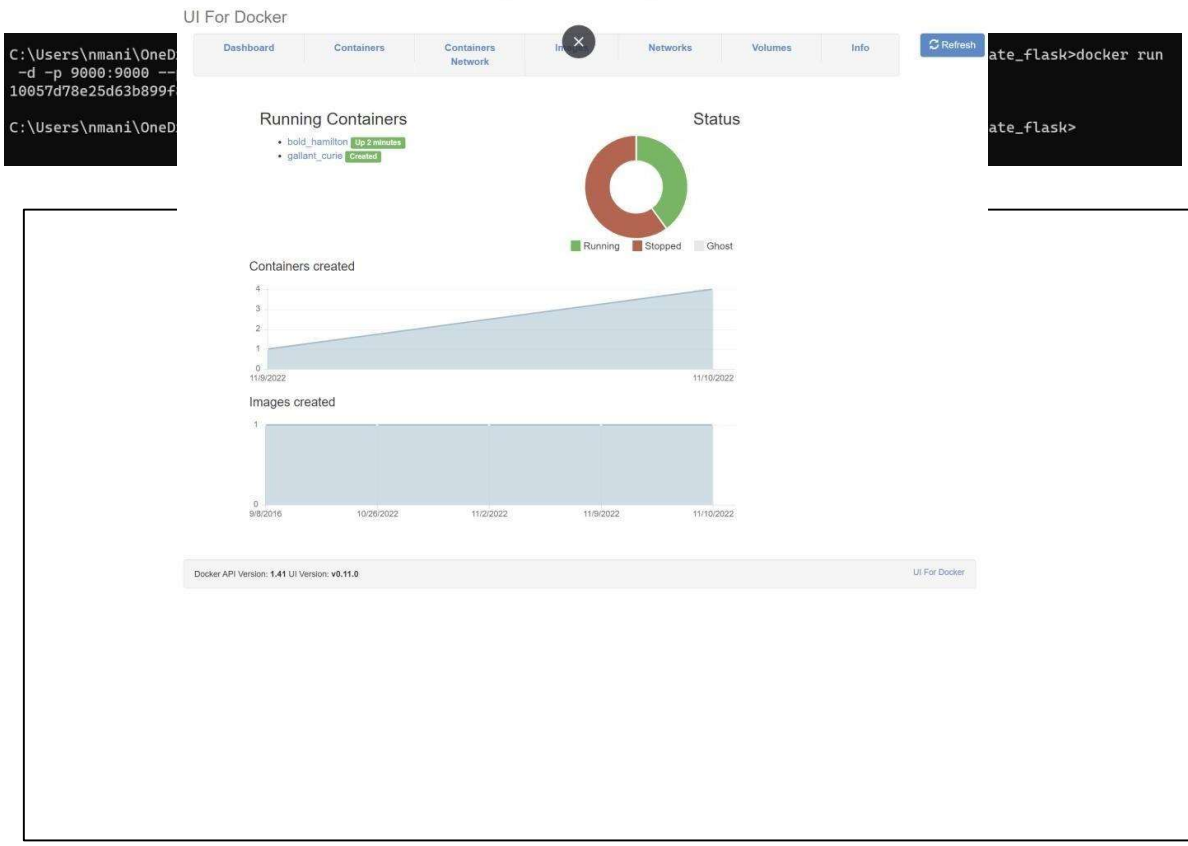
**docker pull uifd/ui-for-docker** - command is used to pull an image form docker hub using command prompt.

```
C:\Users\nmani\OneDrive\Desktop\IBM_Project\Assignments\Chilakamarthi Prem Kashyap(Team Leader)\Assignment-4\
create_flask>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

C:\Users\nmani\OneDrive\Desktop\IBM_Project\Assignments\Chilakamarthi Prem Kashyap(Team Leader)\Assignment-4\
create_flask>
```

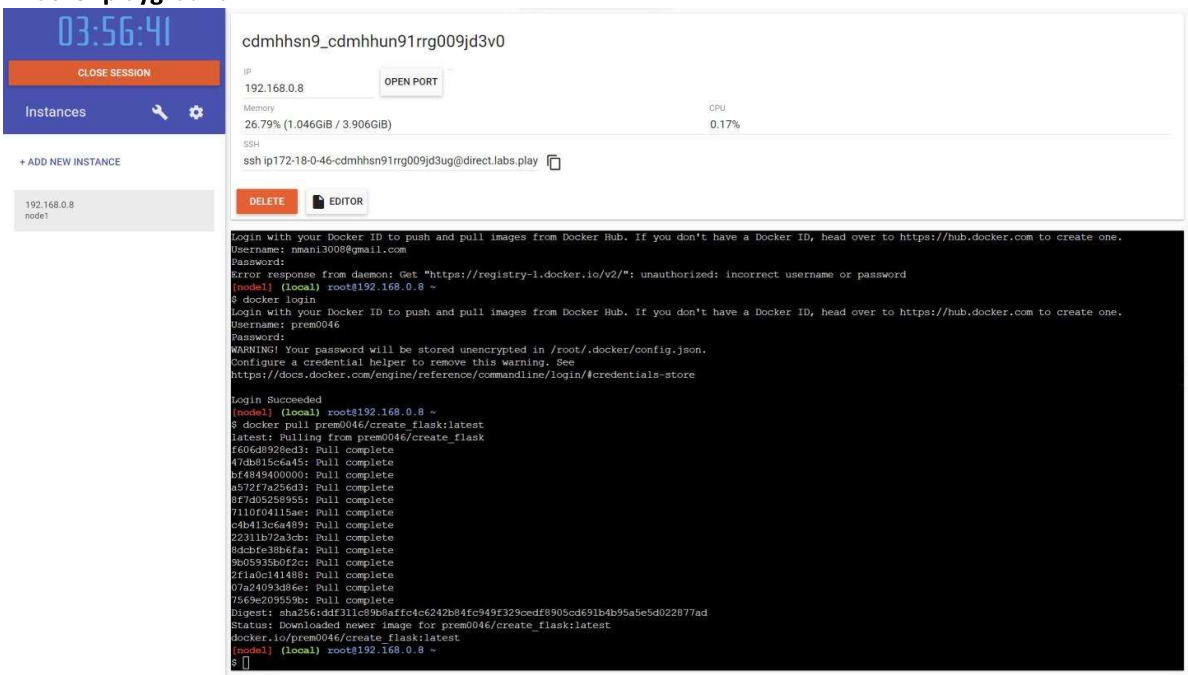
**Image has been pulled for docker hub**

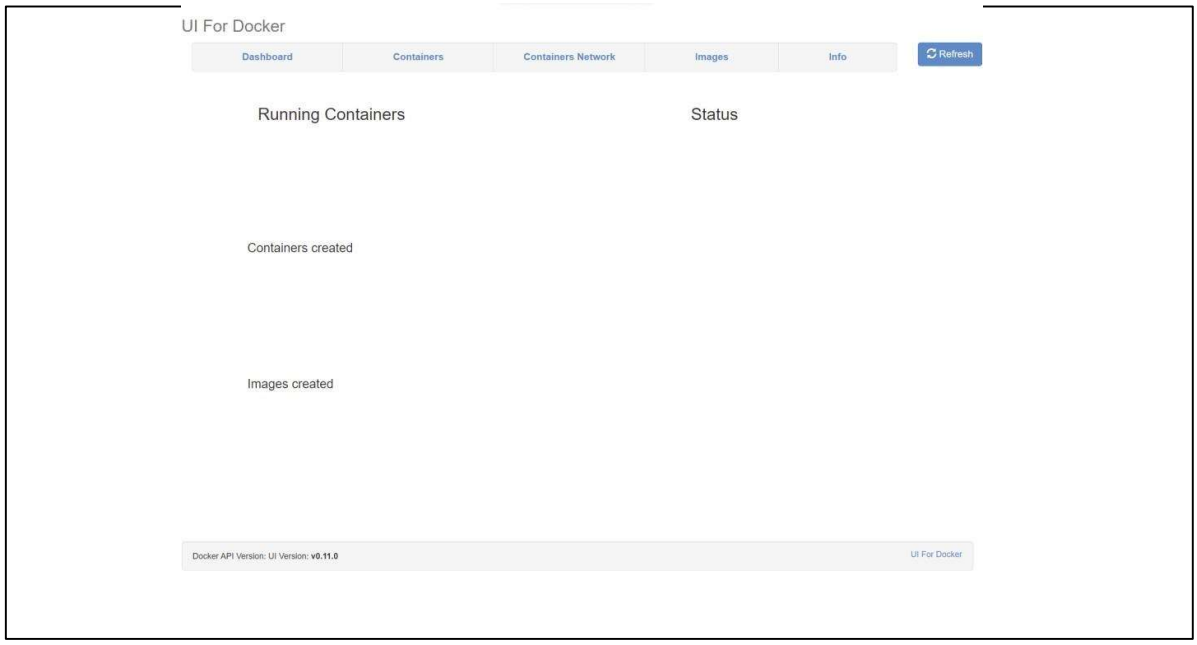


**docker run -d -p 9000:9000 --privileged -v /var/run/docker.sock:/var/run/docker.sock uifd/ui-for-docker -** command is used to run an image form docker hub using command prompt.




**Docker playground:**






**Question-2:**

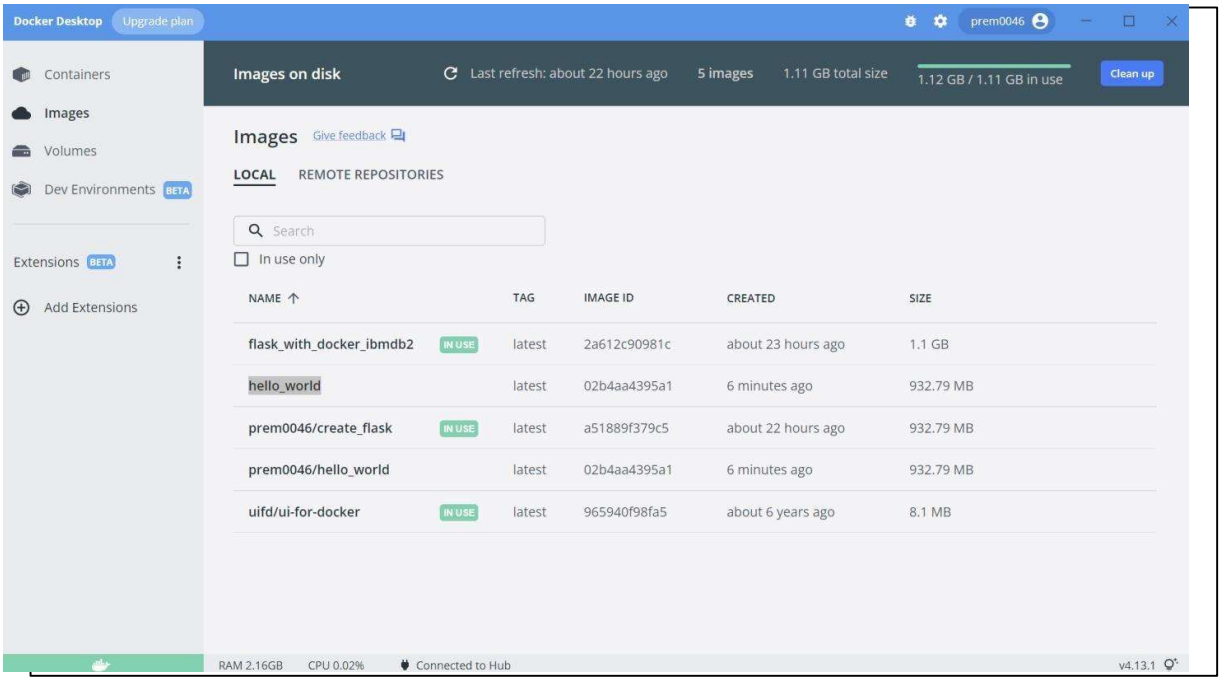
Create a docker file for the job portal application or helloworld app and deploy it in Docker desktop application.

**Building docker image: hello_world**

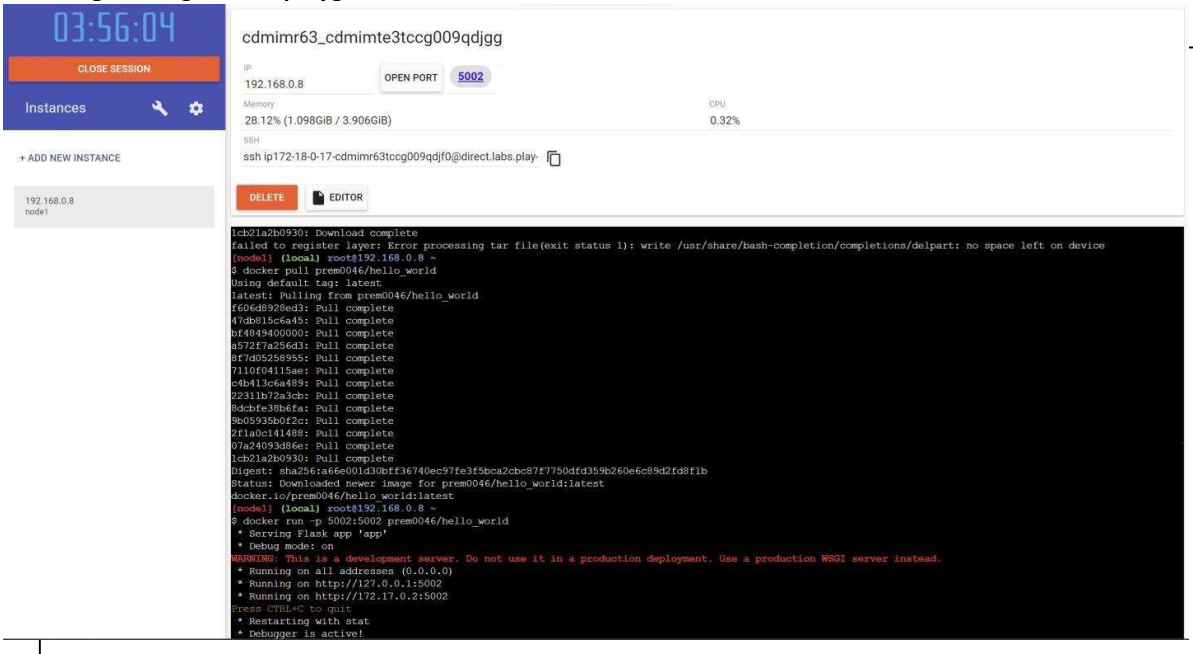
```
Microsoft Windows [Version 10.0.22623.885]
(c) Microsoft Corporation. All rights reserved.

C:\Users\nmani\OneDrive\Desktop\IBM_Project\Assignments\Chilakamarthi Prem Kashyap(Team Leader)\Assignment-4\hello_world>docker build -t hello_world .
[+] Building 2.8s (11/11) FINISHED
 => [internal] load build definition from Dockerfile                                                0.0s
 => => transferring dockerfile: 184B                                                                0.0s
 => [internal] load .dockerignore                                                                   0.0s
 => => transferring context: 2B                                                                     0.0s
 => [internal] load metadata for docker.io/library/python:3.10.7                                    2.7s
 => [auth] library/python:pull token for registry-1.docker.io                                       0.0s
 => [internal] load build context                                                                   0.0s
 => => transferring context: 545B                                                                   0.0s
 => [1/5] FROM docker.io/library/python:3.10.7@sha256:53e577204d362233ee92aeb51194492f1f5eb24f99c61464efe9167ddbc  0.0s
 => CACHED [2/5] WORKDIR /app                                                                       0.0s
 => CACHED [3/5] COPY requirements.txt ./                                                           0.0s
 => CACHED [4/5] RUN pip install -r requirements.txt                                                0.0s
 => [5/5] COPY . .                                                                                  0.0s
 => exporting to image                                                                              0.0s
 => => exporting layers                                                                             0.0s
 => => writing image sha256:62b4aa4395a108417d48df9b218b540aa95f54c9fc72aa4aea2340c783c8cf1b        0.0s
 => => naming to docker.io/library/hello_world                                                      0.0s

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

C:\Users\nmani\OneDrive\Desktop\IBM_Project\Assignments\Chilakamarthi Prem Kashyap(Team Leader)\Assignment-4\hello_world>
```

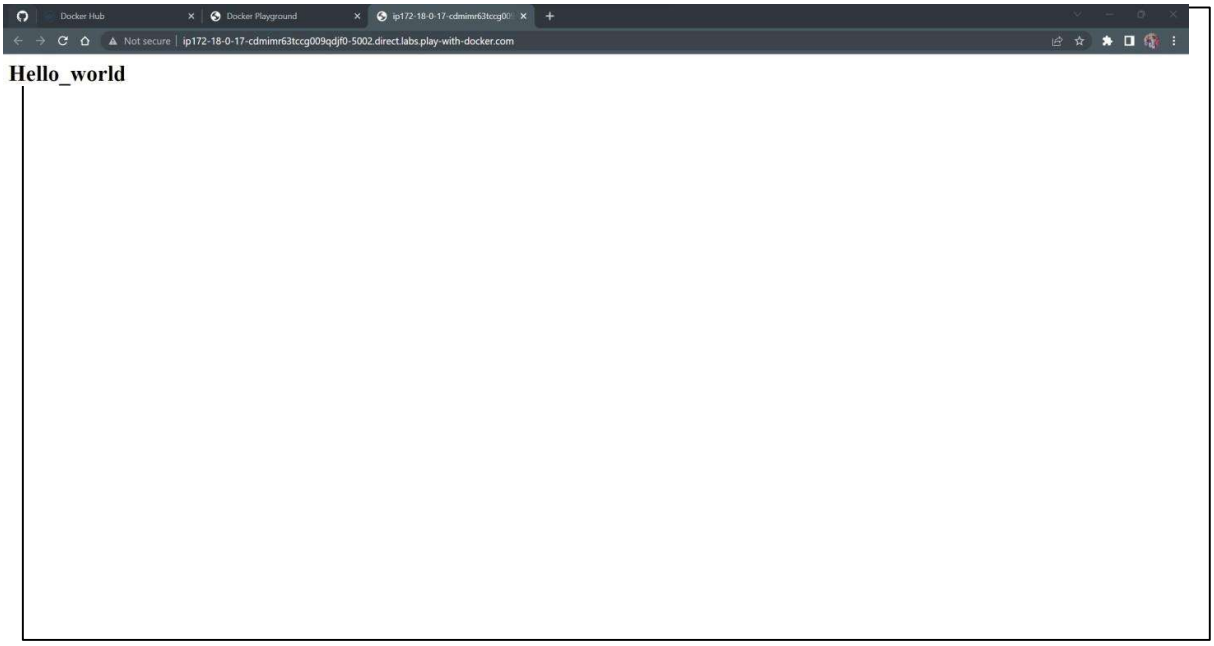
**Pushing the image into repository in docker hub:**

```
C:\Users\nmani\OneDrive\Desktop\IBM_Project\Assignments\Chilakamarthi Prem Kashyap(Team Leader)\Assignment-4\hello_world>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\nmani\OneDrive\Desktop\IBM_Project\Assignments\Chilakamarthi Prem Kashyap(Team Leader)\Assignment-4\hello_world>docker tag hello_world prem0046/hello_world

C:\Users\nmani\OneDrive\Desktop\IBM_Project\Assignments\Chilakamarthi Prem Kashyap(Team Leader)\Assignment-4\hello_world>docker push prem0046/hello_world
Using default tag: latest
The push refers to repository [docker.io/prem0046/hello_world]
096703ae4106: Pushed
30b75c628008: Mounted from prem0046/create_flask
265d09ef557c: Mounted from prem0046/create_flask
94b76bc8510f: Mounted from prem0046/create_flask
cf399be408ea: Mounted from prem0046/create_flask
793b971ccb99: Mounted from prem0046/create_flask
d172a9e6f9e6: Mounted from prem0046/create_flask
0c7daf9a72c8: Mounted from prem0046/create_flask
75ba02937496: Mounted from prem0046/create_flask
288cf3a46e32: Mounted from prem0046/create_flask
186da837555d: Mounted from prem0046/create_flask
955c9335e041: Mounted from prem0046/create_flask
8e079fee2186: Mounted from prem0046/create_flask
latest: digest: sha256:a66e001d30bff36740ec97fe3f5bca2cbc87f7750dfd359b260e6c89d2fd8f1b size: 3050

C:\Users\nmani\OneDrive\Desktop\IBM_Project\Assignments\Chilakamarthi Prem Kashyap(Team Leader)\Assignment-4\hello_world>
```




**Testing it using docker playground:**






## Question- 3:

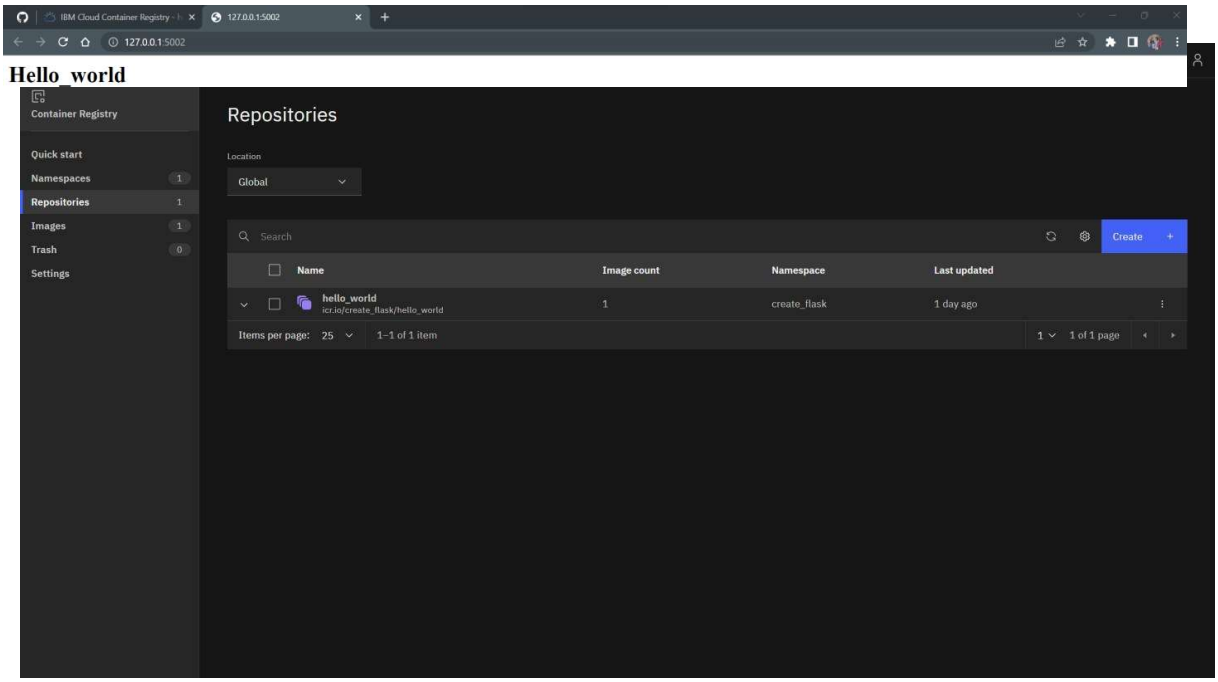
Create a IBM container registry and deploy hello world app or job portal app.

Hello_world Image link: icr.io/create_flask/hello_world

```
C:\Users\nmani>ibmcloud login
API endpoint: https://cloud.ibm.com
Region: jp-tok

Email> sec19cs095@sairamtap.edu.in

Password>
Authenticating...
OK

Targeted account Prem Kashyap Chilakamarthi's Account (c50714902c8f4427b45032b104b525a1)


API endpoint:      https://cloud.ibm.com
Region:            jp-tok
User:              sec19cs095@sairamtap.edu.in
Account:           Prem Kashyap Chilakamarthi's Account (c50714902c8f4427b45032b104b525a1)
Resource group:    No resource group targeted, use 'ibmcloud target -g RESOURCE_GROUP'
CF API endpoint:
Org:
Space:

C:\Users\nmani>ibmcloud plugin install container-service
Looking up 'container-service' from repository 'IBM Cloud'...
Plug-in 'container-service[kubernetes-service/ks] 1.0.459' found in repository 'IBM Cloud'
Attempting to download the binary file...
 26.86 MiB / 26.86 MiB [=============================================================================] 100.00% 1s
28168192 bytes downloaded
Installing binary...
OK
Plug-in 'container-service 1.0.459' was successfully installed into C:\Users\nmani\.bluemix\plugins\container-service. Use 'ibmcloud plugin show container-service' to show its det
ails.

C:\Users\nmani>ibmcloud plugin install container-registry
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% 0s
12476416 bytes downloaded
Installing binary...
OK
Plug-in 'container-registry 1.0.2' was successfully installed into C:\Users\nmani\.bluemix\plugins\container-registry. Use 'ibmcloud plugin show container-registry' to show its de
tails.
```

```
C:\Users\nmani>ibmcloud plugin install observe-service
Looking up 'observe-service' from repository 'IBM Cloud'...
Plug-in 'observe-service 1.0.82' found in repository 'IBM Cloud'
Attempting to download the binary file...
 13.38 MiB / 13.38 MiB [=============================================================================] 100.00% 0s
14024704 bytes downloaded
Installing binary...
OK
Plug-in 'observe-service 1.0.82' was successfully installed into C:\Users\nmani\.bluemix\plugins\observe-service. Use 'ibmcloud plugin show observe-service' to show its details.

C:\Users\nmani>ibmcloud plugin list
Listing installed plug-ins...

Plugin Name                          Version   Status   Private endpoints supported
container-registry                   1.0.2             true
container-service[kubernetes-service/ks]   1.0.459           false
observe-service[ob]                  1.0.82            false
```

```
C:\Users\nmani>docker tag hello_world icr.io/create_flask/hello_world:latest

C:\Users\nmani>docker push icr.io/create_flask/hello_world:latest
The push refers to repository [icr.io/create_flask/hello_world]
096703ae4106: Pushed
30b75c628008: Pushed
265d09ef557c: Pushed
94b76bc8510f: Pushed
cf399be408ea: Pushed
793b971ccb99: Pushed
d172a9e6f9e6: Pushed
0c7daf9a72c8: Pushed
75ba02937496: Pushed
288cf3a46e32: Pushed
186da837555d: Pushed
955c9335e041: Pushed
8e079fee2186: Pushed
latest: digest: sha256:a66e001d30bff36740ec97fe3f5bca2cbc87f7750dfd359b260e6c89d2fd8f1b size: 3050

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

Repository                       Tag      Digest         Namespace
    Created         Size     Security status
icr.io/create_flask/hello_world   latest   a66e001d30bf   create_flask   19 hours ago   356 MB   -

OK
```



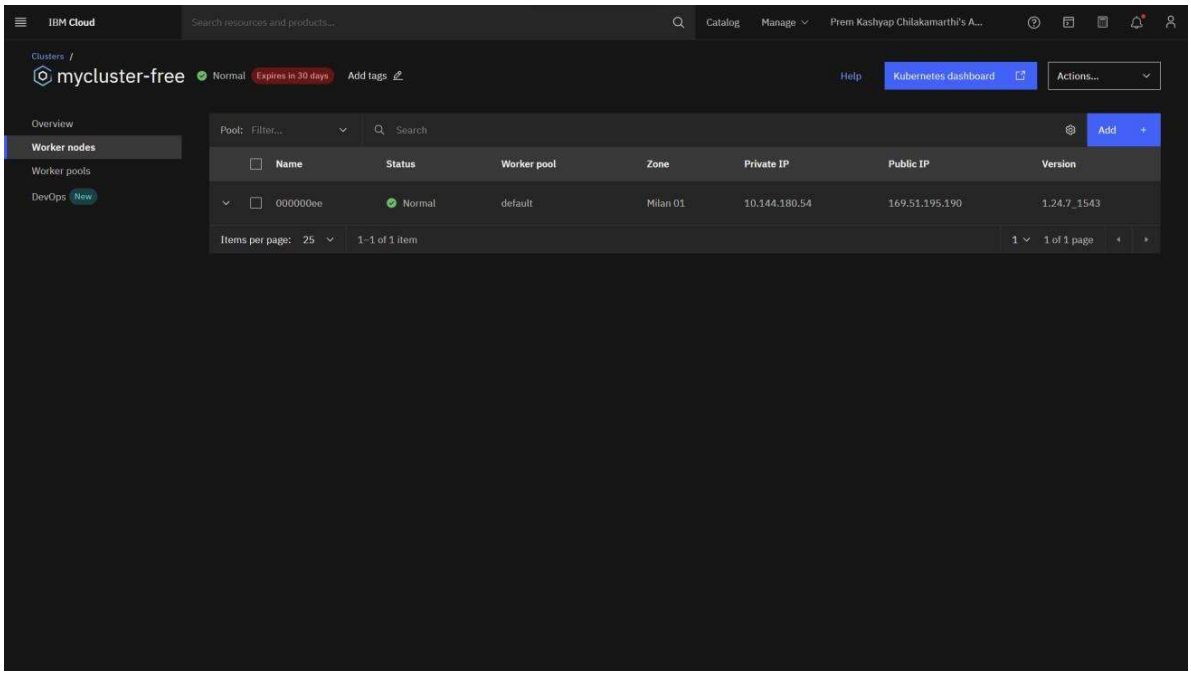

**Hello_world**

```
PS C:\Users\nmani> docker run -p 5002:5002 icr.io/create_flask/hello_world
 * Serving Flask app 'app'
 * 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 all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5002
 * Running on http://172.17.0.2:5002
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 166-878-257
172.17.0.1 - - [11/Nov/2022 12:09:17] "GET / HTTP/1.1" 200 -
```

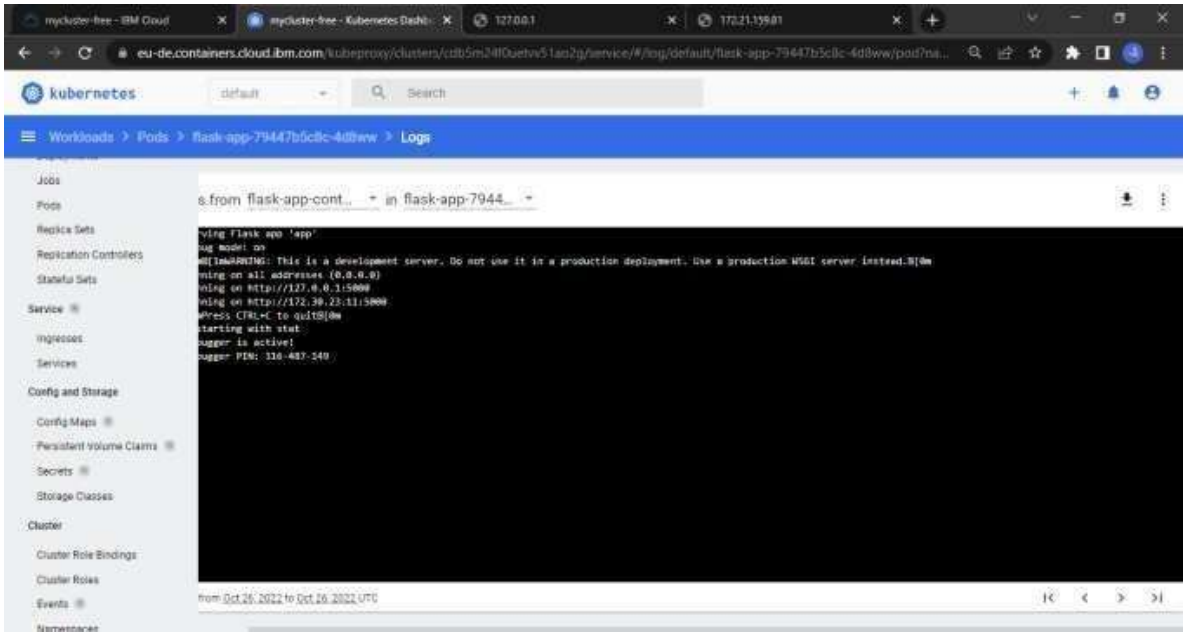
**Question -4:**

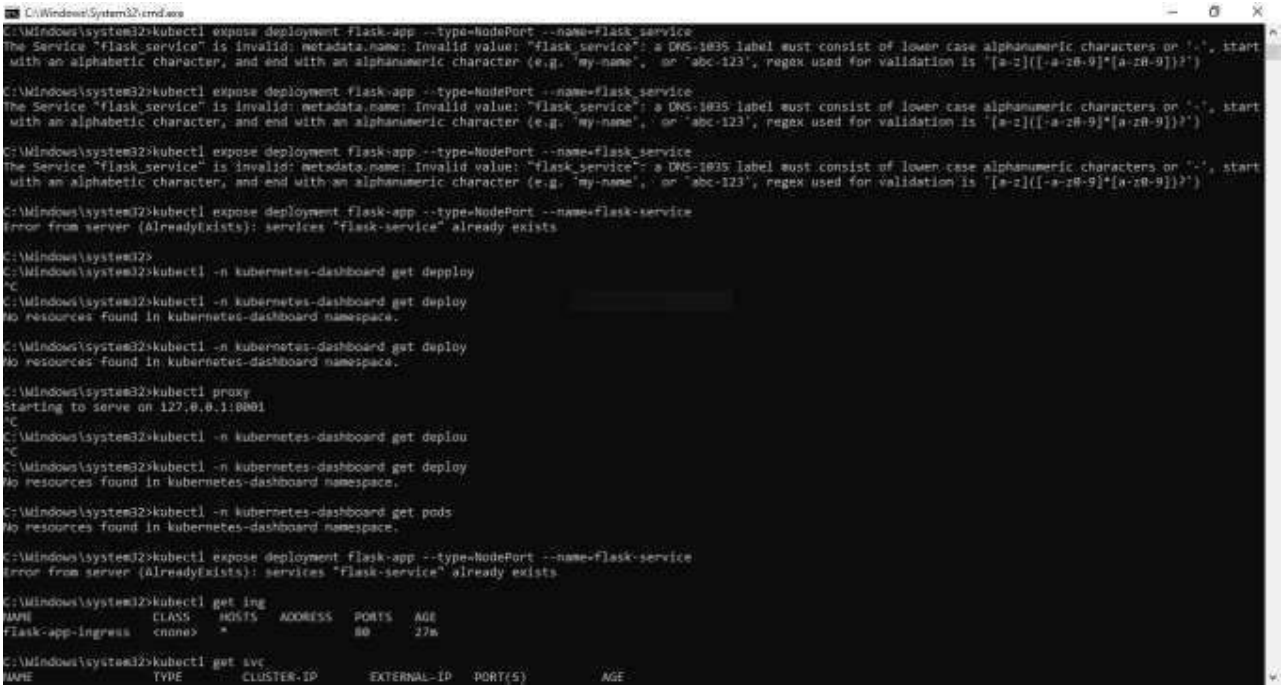
Create a Kubernetes cluster in IBM cloud and deploy helloworld image or jobportal image and also expose the same app to run in node port.

Creating a Kubernetes cluster in IBM cloud




```
C:\Users\gani\Desktop>cd deploy
The system cannot find the path specified.

C:\Users\gani\Desktop>kubectl apply -f kubernetes/depoly.yaml
error: the path "kubernetes/depoly.yaml" does not exist

C:\Users\gani\Desktop>kubectl apply -f depoly.yaml
error: the path "depoly.yaml" does not exist

C:\Users\gani\Desktop>kubectl apply -f C:\Users\gani\Desktop\deploy.yaml
deployment.apps/flask-app created

C:\Users\gani\Desktop>
```


mycluster-free - IBM Cloud
mycluster-free - Kubernetes Dashb...
127.0.0.1
172.21.159.81
eu-de.containers.cloud.ibm.com/kubeproxy/clusters/cdb5m2480uehv51as2g/service/#/log/default/flask-app-79447b5c8c-4d8ww/pod?na...
kubernetes
default
Search
Workloads > Pods > flask-app-79447b5c8c-4d8ww > Logs
Jobs
Pods
Replica Sets
Replication Controllers
Stateful Sets
Service
Ingresses
Services
Config and Storage
Config Maps
Persistent Volume Claims
Secrets
Storage Classes
Cluster
Cluster Role Bindings
Cluster Roles
Events
Namespaces
s from flask-app-cont...
in flask-app-7944...
ving Flask app 'app'
ug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
ning on all addresses (0.0.0.0)
ning on http://127.0.0.1:5000
ning on http://172.30.23.11:5000
Press CTRL+C to quit
starting with stat
ugger is active!
ugger PIN: 116-487-149
from Oct 26, 2022 to Oct 26, 2022 UTC


C:\Windows\System32\cmd.exe
C:\Windows\system32>kubectl expose deployment flask-app --type=NodePort --name=flask_service
The Service "flask_service" is invalid: metadata.name: Invalid value: "flask_service": a DNS-1035 label must consist of lower case alphanumeric characters or '-', start with an alphabetic character, and end with an alphanumeric character (e.g. 'my-name', or 'abc-123', regex used for validation is '[a-z]([-a-z0-9]*[a-z0-9])?')
C:\Windows\system32>kubectl expose deployment flask-app --type=NodePort --name=flask_service
The Service "flask_service" is invalid: metadata.name: Invalid value: "flask_service": a DNS-1035 label must consist of lower case alphanumeric characters or '-', start with an alphabetic character, and end with an alphanumeric character (e.g. 'my-name', or 'abc-123', regex used for validation is '[a-z]([-a-z0-9]*[a-z0-9])?')
C:\Windows\system32>kubectl expose deployment flask-app --type=NodePort --name=flask_service
The Service "flask_service" is invalid: metadata.name: Invalid value: "flask_service": a DNS-1035 label must consist of lower case alphanumeric characters or '-', start with an alphabetic character, and end with an alphanumeric character (e.g. 'my-name', or 'abc-123', regex used for validation is '[a-z]([-a-z0-9]*[a-z0-9])?')
C:\Windows\system32>kubectl expose deployment flask-app --type=NodePort --name=flask-service
Error from server (AlreadyExists): services "flask-service" already exists
C:\Windows\system32>
C:\Windows\system32>kubectl -n kubernetes-dashboard get depploy
^C
C:\Windows\system32>kubectl -n kubernetes-dashboard get deploy
No resources found in kubernetes-dashboard namespace.
C:\Windows\system32>kubectl -n kubernetes-dashboard get deploy
No resources found in kubernetes-dashboard namespace.
C:\Windows\system32>kubectl proxy
Starting to serve on 127.0.0.1:8001
^C
C:\Windows\system32>kubectl -n kubernetes-dashboard get deplou
^C
C:\Windows\system32>kubectl -n kubernetes-dashboard get deploy
No resources found in kubernetes-dashboard namespace.
C:\Windows\system32>kubectl -n kubernetes-dashboard get pods
No resources found in kubernetes-dashboard namespace.
C:\Windows\system32>kubectl expose deployment flask-app --type=NodePort --name=flask-service
Error from server (AlreadyExists): services "flask-service" already exists
C:\Windows\system32>kubectl get ing
NAME CLASS HOSTS ADDRESS PORTS AGE
flask-app-ingress <none> * 80 27m
C:\Windows\system32>kubectl get svc
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE