

## Assignment - 4

### Kubernetes / Docker

Assignment Date	11 November 2022
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Maximum Marks	2 Marks

### Question-1:

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

### Solution:

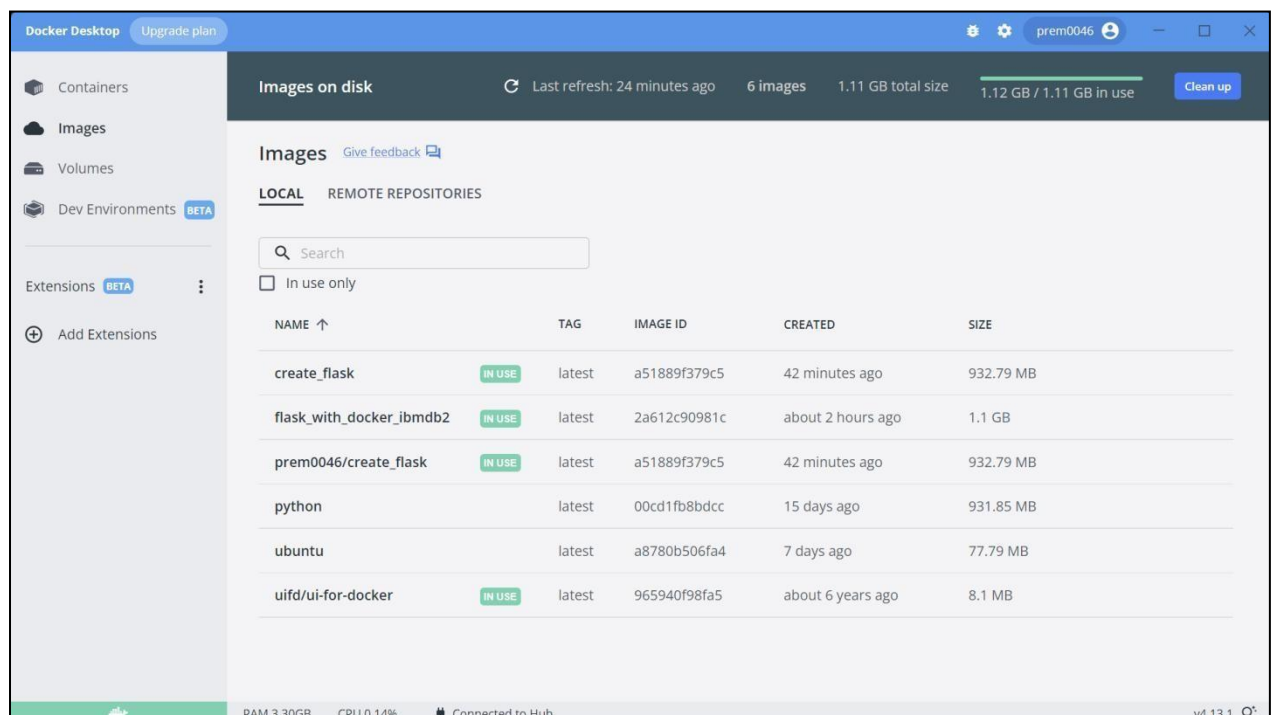
**docker pull uifd/ui-for-docker** - command is used to pull an image from docker hub using command prompt.

```
C:\Users\Dhana Pragathish>docker pull nginx
Using default tag: latest
latest: Pulling from library/nginx
a603fa5e3b41: Pull complete
c39e1cda007e: Pull complete
90cfeffa34d7: Pull complete
a38226fb7aba: Pull complete
62583498bae6: Pull complete
9002a2cfd08d: Pull complete
Digest: sha256:e209ac2f37c70c1e0e9873a5f7231e91dc83fd71178d8ed36c2ec09974210ba
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest

C:\Users\Dhana Pragathish>docker images
REPOSITORY              TAG         IMAGE ID      CREATED      SIZE
nginx                   latest      88736fe82739 6 days ago   142MB
dailycodebuffer/docker/getting-started latest      cb90f98fd791 7 months ago 28.8MB
docker/getting-started  latest      cb90f98fd791 7 months ago 28.8MB

C:\Users\Dhana Pragathish>
```

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:

03:56:41

CLOSE SESSION

Instances

+ ADD NEW INSTANCE

192.168.0.8  
node1

cdmhhns9\_cdmhhun91rrg009jd3v0

ip  
192.168.0.8

OPEN PORT

Memory  
26.79% (1.046GiB / 3.906GiB)

CPU  
0.17%

SSH  
ssh ip172-18-0-46-cdmhhns91rrg009jd3ug@direct.labs.play

DELETE

EDITOR

Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to <https://hub.docker.com> to create one.  
Username: nmani3008@gmail.com  
Password:  
Error response from daemon: Get "https://registry-1.docker.io/v2/": unauthorized: incorrect username or password  
(node1) (local) root@192.168.0.8 ~  
\$ docker login  
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to <https://hub.docker.com> to create one.  
Username: prem0046  
Password:  
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.  
Configure a credential helper to remove this warning. See  
<https://docs.docker.com/engine/reference/commandline/login/#credentials-store>  
Login Succeeded  
(node1) (local) root@192.168.0.8 ~  
\$ docker pull prem0046/create\_flask:latest  
latest: Pulling from prem0046/create\_flask  
f606d8928ed3: Pull complete  
47db815c6a45: Pull complete  
bf4849400000: Pull complete  
a572fa256d3: Pull complete  
8f7d05258955: Pull complete  
711d0f04115ae: Pull complete  
c4b413c6a489: Pull complete  
22311b72a3cb: Pull complete  
8dcbe38b6fa: Pull complete  
9b05935b0f2c: Pull complete  
2f1a0c141488: Pull complete  
07a24093a86e: Pull complete  
7569e209559b: Pull complete  
Digest: sha256:ddf311c89b8affc4c6242b84fc949f329cedf8905cd691b4b95a5e5d022877ad  
Status: Downloaded newer image for prem0046/create\_flask:latest  
docker.io/prem0046/create\_flask:latest  
(node1) (local) root@192.168.0.8 ~  
\$

Docker API Version: 1.41 UI Version: v0.11.0

UI For Docker

UI For Docker

Dashboard

Containers

Containers Network

Images

Info

Refresh

Running Containers

Status

Containers created

Images created

Docker API Version: UI Version: v0.11.0

UI For Docker

## 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@sha256:53e577204d362233ee92aeb5119449271f5eb24f99c61464efe9167ddbc 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 sha256:02b4aa4395a168417d48df9b210b540aa95f54c9fc72aa4aaa2340c793c8cflb 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>
```

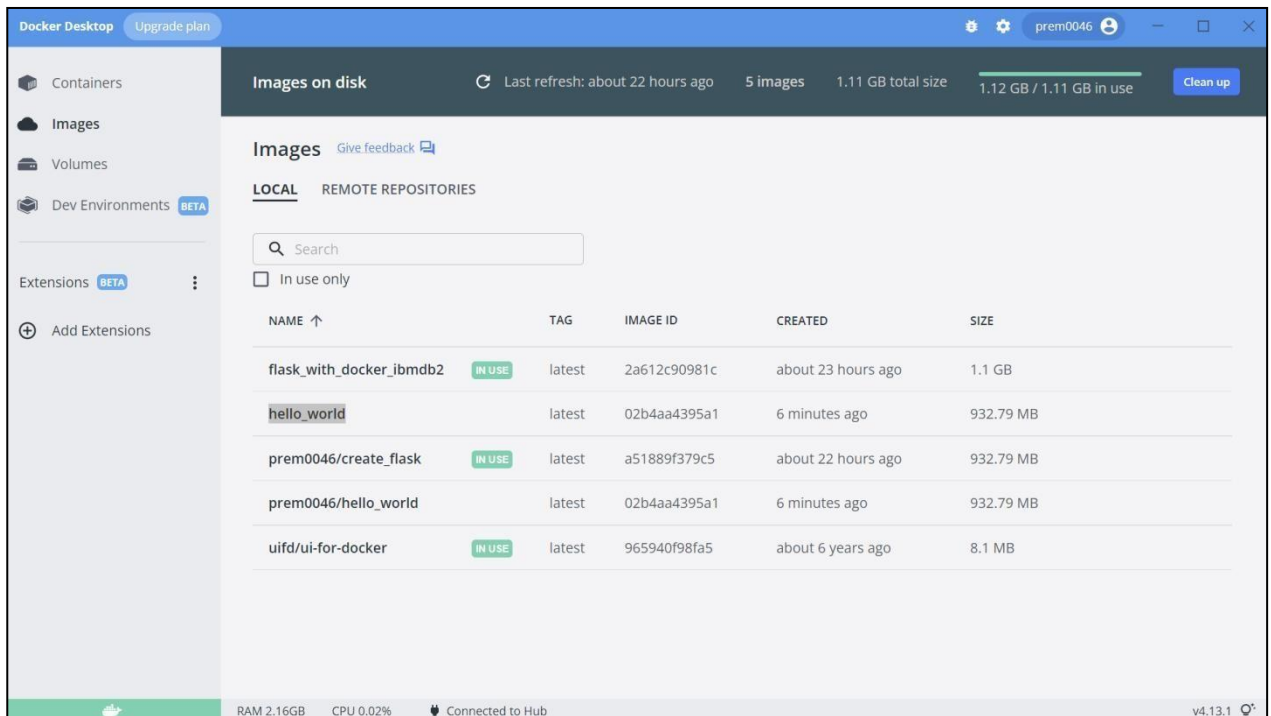
### Pushing the image into repository in docker hub:

```
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
af399be408aa: 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
955c9335e0d1: Mounted from prem0046/create_flask
8e079fee2186: Mounted from prem0046/create_flask
latest: digest: sha256:a66e081d30bff36740ec97fe3f5bca2cbc87f7750dfd359b260e6c89d2fd8f1b size: 3050

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



## Testing it using docker playground:

03:56:04  
CLOSE SESSION  
Instances  
+ ADD NEW INSTANCE  
192.168.0.8  
node1

cdmimr63\_cdmimnte3tccg009qdgjgg

IP: 192.168.0.8 [OPEN PORT](#) 5002

Memory: 28.12% (1.098GiB / 3.906GiB) CPU: 0.32%

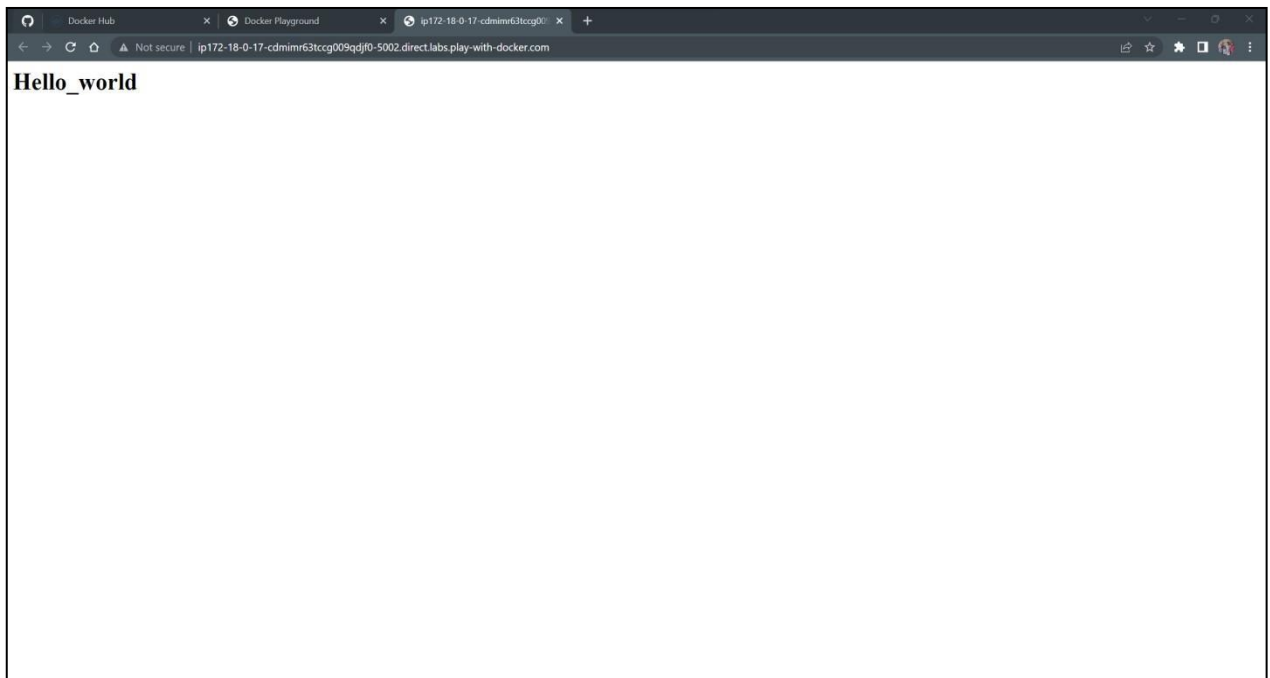
SSH: ssh ip172-18-0-17-cdmimr63tccg009qdgjfg0@direct.labs.play-

[DELETE](#) [EDITOR](#)

```

lcb21a2b0930: Download complete
failed to register layer: Error processing tar file(exit status 1): write /usr/share/bash-completion/completions/delpart: no space left on device
(node1) (local) root@192.168.0.8 ~
$ docker pull prem0046/hello_world
Using default tag: latest
latest: Pulling from prem0046/hello_world
f606d8928ed3: Pull complete
47db815c6a45: Pull complete
bf4849400000: Pull complete
a572f7a256d3: Pull complete
8f7d05258955: Pull complete
7110f04115ae: Pull complete
c4b413c6a489: Pull complete
22311b72a3cb: Pull complete
8dc8fe38b6fa: Pull complete
9b05935b0f2c: Pull complete
2f1a0c141488: Pull complete
07a24093d86e: Pull complete
lcb21a2b0930: Pull complete
Digest: sha256:a66e00d30bfff36740ec97fe3f5bca2cbc87f7750dfd359b260e6c89d2fd8f1b
Status: Downloaded newer image for prem0046/hello_world:latest
docker.io/prem0046/hello_world:latest
(node1) (local) root@192.168.0.8 ~
$ docker run -p 5002:5002 prem0046/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!

```



### 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](https://cr.console.ibm.com/home/region/jp-tok/images/ibmcloud/container-registry/containers/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 details.

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 details.
```

```
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...

Plug-in Name          Version  Status  Private endpoints supported
container-registry    1.0.2   true    false
container-service[kubernetes-service/ks]  1.0.459 false    false
observe-service[ob]   1.0.82   false    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
90b70bc0510f: Pushed
cf399be408ea: Pushed
793b971cc099: Pushed
d172a9e6f9e6: Pushed
0c7daf9a72c8: Pushed
75ba02937496: Pushed
288cf3a46e32: Pushed
186da837555d: Pushed
955c9335e0u1: Pushed
8e079fee2186: Pushed
latest: digest: sha256:a66e01d30bff36740ec97fe3f5bca2cbc87f7750dfd359b260e6c89d2fd8f1b size: 3050

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

Repository      Created      Size      Tag      Digest      Namespace      Security status
icr.io/create_flask/hello_world  latest      a66e01d30bf  create_flask  19 hours ago  356 MB  -

OK
```

IBM Cloud

Search resources and products...

Container Registry

Quick start

Namespaces 1

**Repositories 1**

Images 1

Trash 0

Settings

## Repositories

Location: Global

Search

Name	Image count	Namespace	Last updated
hello_world icr.io/create_flask/hello_world	1	create_flask	1 day ago

Items per page: 25 1-1 of 1 item

Create +

```
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 -
```

IBM Cloud Container Registry - 1 x 127.0.0.1:5002

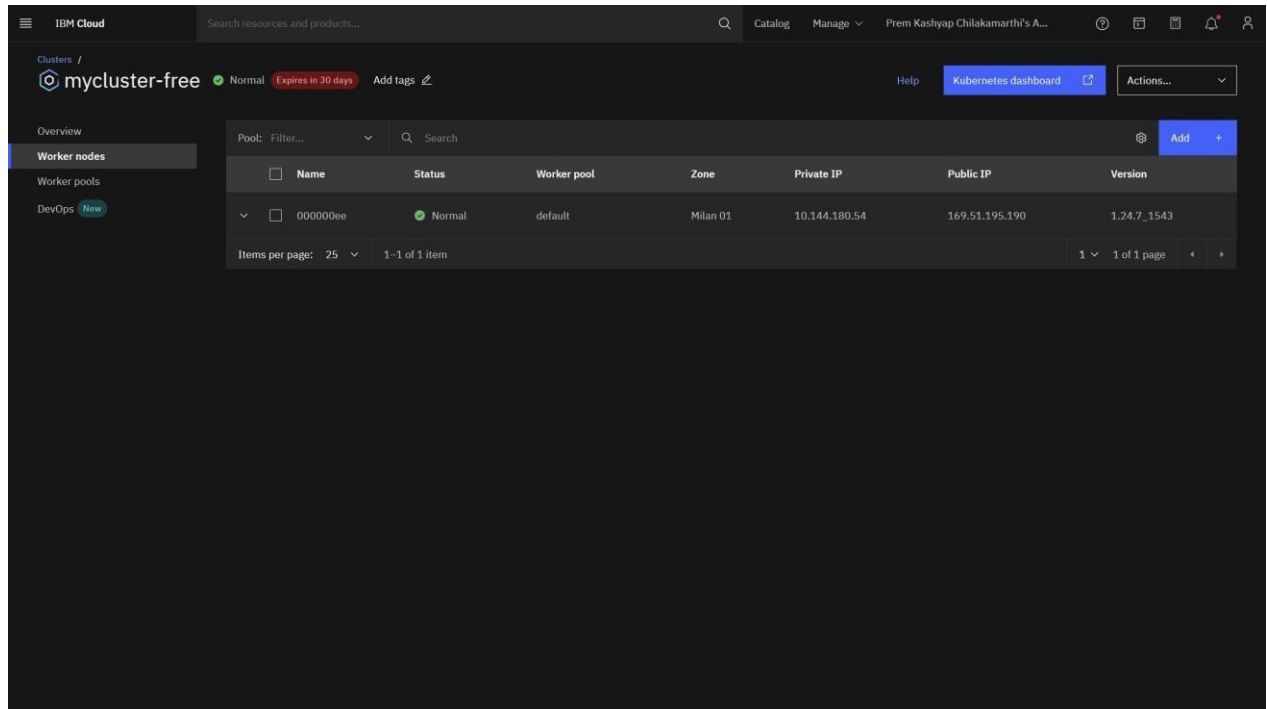
127.0.0.1:5002

# Hello\_world

#### 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.

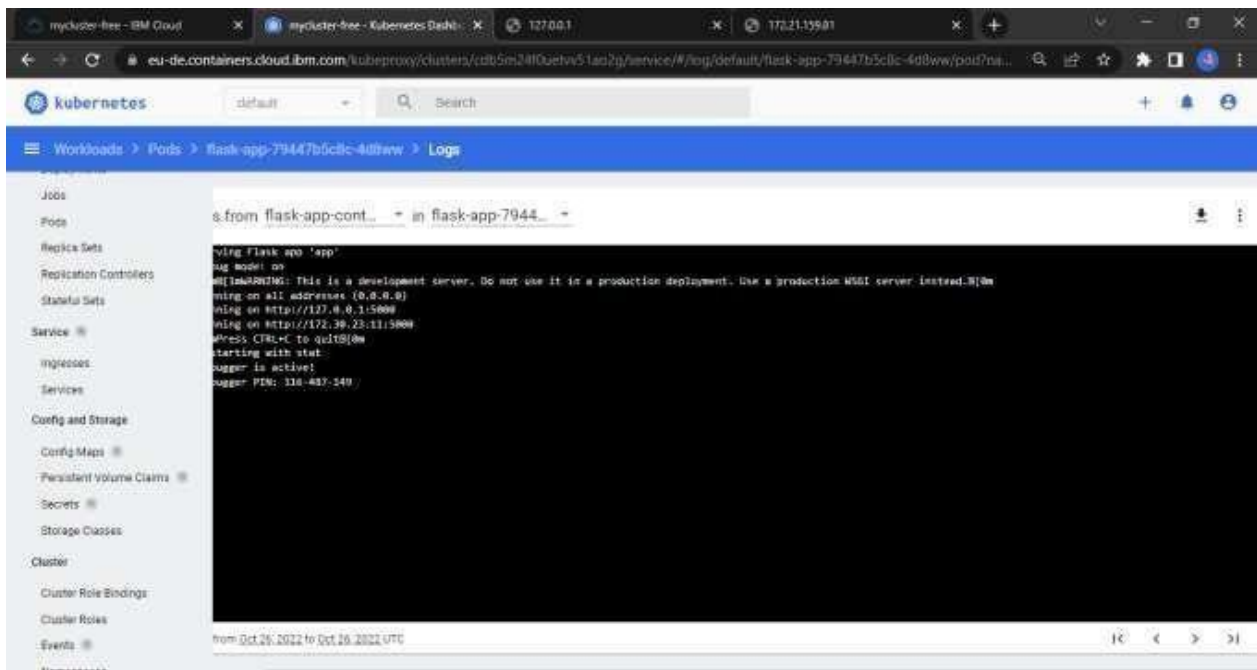
C:\Users\gani\Desktop>kubect1 apply -f kubernetes/depoly.yaml
error: the path "kubernetes/depoly.yaml" does not exist

C:\Users\gani\Desktop>kubect1 apply -f depoly.yaml
error: the path "depoly.yaml" does not exist

C:\Users\gani\Desktop>kubect1 apply -f C:\Users\gani\Desktop\deploy.yaml
deployment.apps/flask-app created

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





```
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 kubernetesh-dashboard get deploy
No resources found in kubernetesh-dashboard namespace.
C:\Windows\system32>kubectl -n kubernetesh-dashboard get deploy
No resources found in kubernetesh-dashboard namespace.
C:\Windows\system32>kubectl proxy
Starting to serve on 127.0.0.1:8081
C:\Windows\system32>kubectl -n kubernetesh-dashboard get deploy
No resources found in kubernetesh-dashboard namespace.
C:\Windows\system32>kubectl -n kubernetesh-dashboard get pods
No resources found in kubernetesh-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
```