

ASSIGNMENT – 4

KUBERNETES, DOCKER

Assignment Date	25 October 2022
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Maximum Marks	2 Marks

Question-1

Pull an image from Dockers hub and run it in Dockers playground.

SOLUTION:

STEP: 1

Login to Dockers hub and get an image

STEP: 2

- Open Dockers playground
- Login with Dockers
- Create new instance

STEP: 3

In the command prompt run the following:

```
$ docker pull hello-world //To pull an image from docker hub
$ docker run hello-world //To run the image in docker playground
```

```
[root@localhost ~]# docker pull hello-world
Using default tag: latest
latest: Pulling from library/hello-world
Digest: sha256:18a657d0cc1c7d0678a3fbae8b7eb4918bbe25968d3e1b0adebfa71caddbc346
Status: Image is up to date for hello-world:latest
docker.io/library/hello-world:latest
[root@localhost ~]# docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

[root@localhost ~]#
```

QUESTION 2:

Create a Dockers file and deploy it in Dockers desktop application

SOLUTION:

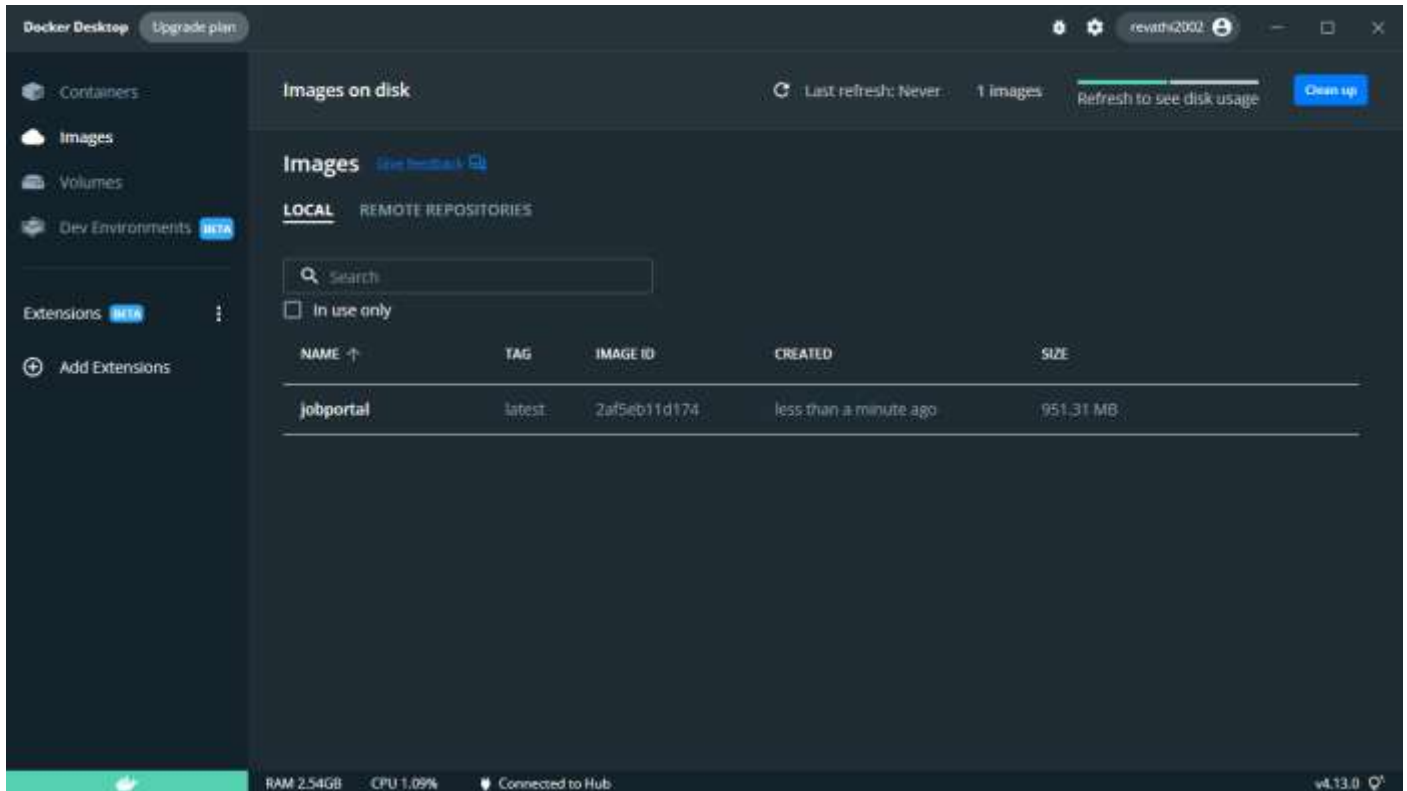
STEP: 1

- Create a flask application
- Create a Dockerfile in the same folder

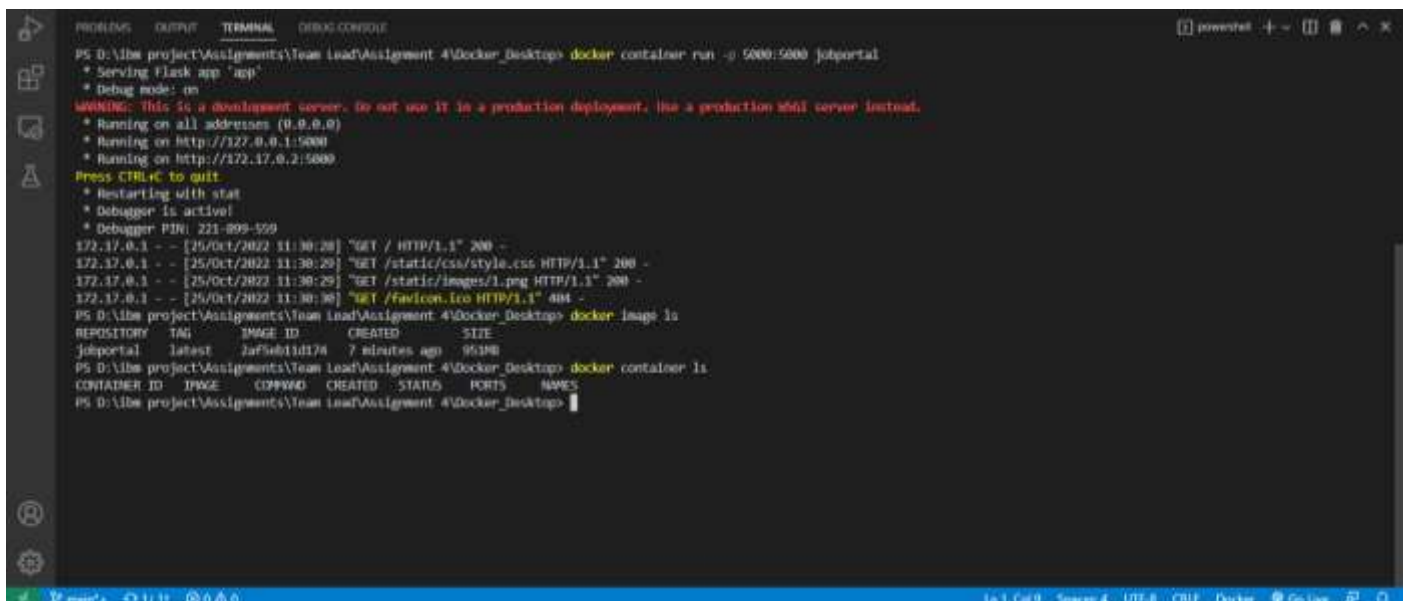
STEP: 2

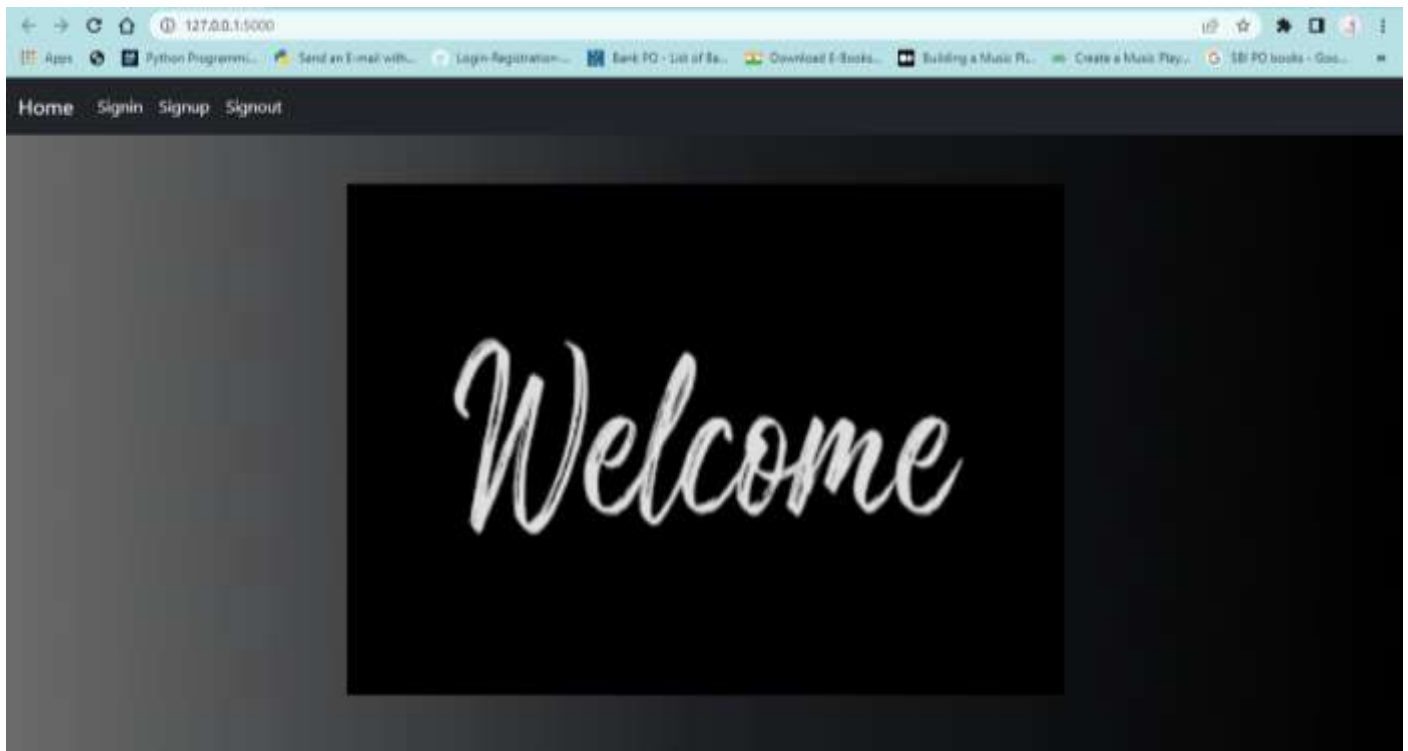
Run the following commands to deploy it in docker desktop

```
$ docker build -t jobportal // to deploy all the folders to docker desktop
$ docker image ls //to show the list of images in docker desktop
```

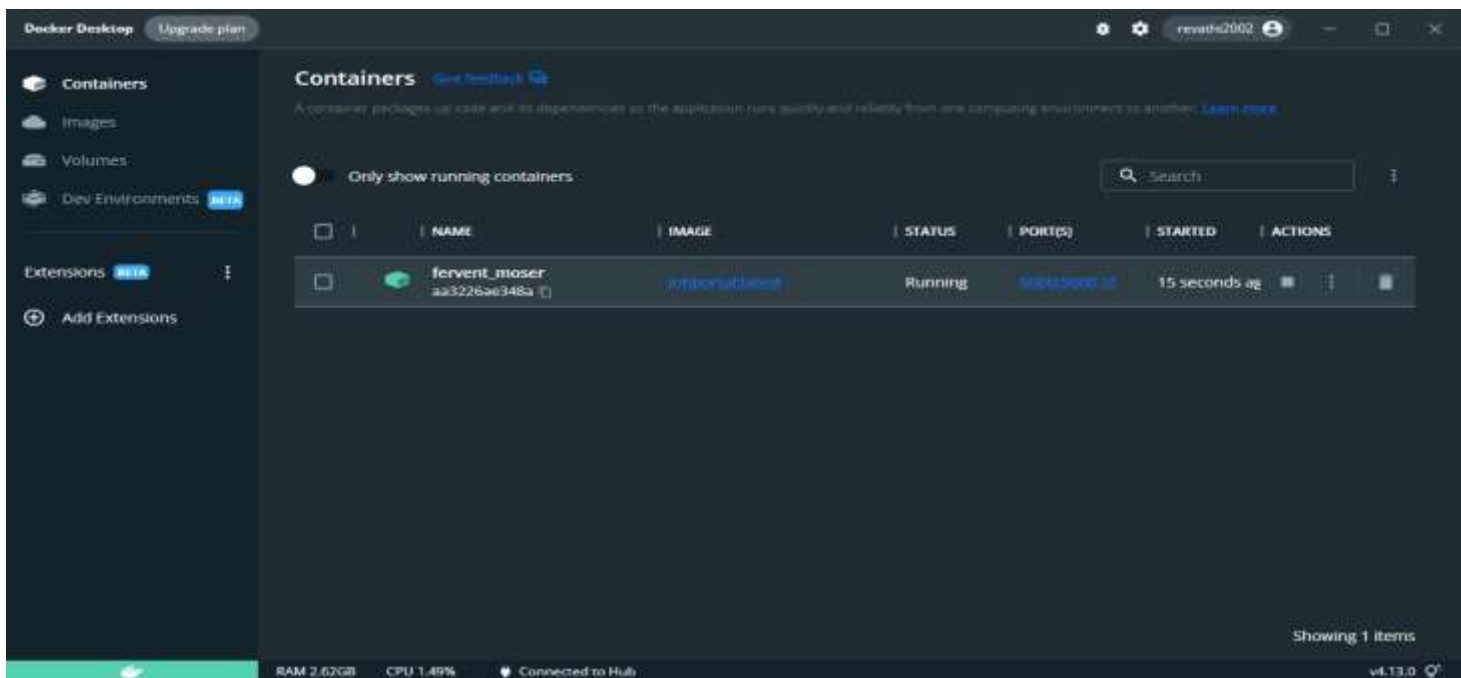


```
$ docker container run -p 5000:5000 jobportal //to run
```





\$ docker container ls //to show the list of containers



QUESTION 3:

Create an IBM container registry and deploy hello-world-app or job-portal-app

SOLUTION:

```
PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> ibmcloud plugin install container-registry -r 'IBM Cloud'
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% 1m7s
12476416 bytes downloaded

Installing binary...
OK
Plug-in 'container-registry 1.0.2' was successfully installed into C:\Users\Bhavitha\plugins\container-registry. Use 'C:\Program Files\IBM\Cloud\bin\ibmcloud.exe plugin show container-registry' to show its details.
PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> ibmcloud cr region-set global
640110
You are not logged in to IBM Cloud.
Log in by running the 'C:\Program Files\IBM\Cloud\bin\ibmcloud.exe login' command.

PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> ibmcloud login -o https://cloud.ibm.com
API endpoint: https://cloud.ibm.com

Email> revathi30070@gmail.com

Password:
Authenticating...
Credentials were rejected.
Code: B0ND0602E, message: The credentials you entered for the user 'revathi30070@gmail.com' are incorrect.

Password:
Authenticating...
Credentials were rejected.
Code: B0ND0602E, message: The credentials you entered for the user 'revathi30070@gmail.com' are incorrect.

PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> ibmcloud login -o https://cloud.ibm.com
API endpoint: https://cloud.ibm.com

Email> 9065191065@quartintech.com

Password:
PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> ibmcloud cr region-set global
The region is set to 'global', the registry is 'icr.io'.

No resource group is targeted, therefore, the default resource group for the account ('Default') is targeted.

Adding namespace 'jobportal' in resource group 'Default' for account Bhavitha R's Account in registry icr.io...

The requested namespace is already in use in registry 'icr.io'.
Choose a different namespace.

No resource group is targeted, therefore, the default resource group for the account ('Default') is targeted.

Adding namespace 'jobspace1' in resource group 'Default' for account Bhavitha R's Account in registry icr.io...

Successfully added namespace 'jobspace1'

OK
PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> ibmcloud cr login
Logging 'docker' in to 'icr.io'...
Logged in to 'icr.io'.

OK
PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> docker pull hello-world
Using default tag: latest
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:19ae57b6c1c7d0678a3fba667b4912bda25964d3e1b0e6d7a71cadd3c46
Status: Downloaded newer image for hello-world:latest
docker.io/library/hello-world:latest
PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> docker tag hello-world icr.io/jobspace1/helloworld:v1
PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> docker image ls
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE
jobportal            latest      2af5eb11d124   59 minutes ago 951MB
hello-world         latest     f065d9feaa55   13 months ago 13.3kB
icr.io/jobspace1/helloworld v1         f065d9feaa55   13 months ago 13.3kB
PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> docker push icr.io/jobspace1/helloworld:v1
The push refers to repository [icr.io/jobspace1/helloworld]
a07b0ba05f: Pushed
v1: digest: sha256:f54a58bc1aa25d79bae155dc228b3f0e11d04nac270b9c46f2f13d8c4 size: 525
PS D:\Ibm_project\Assignments\Team Lead\Assignment 4\IBM_Container_Registry> ibmcloud cr image-list
Listing images...

Repository          Tag         Digest          Namespace       Created        Size    Security status
icr.io/jobspace1/helloworld v1         f54a58bc1aa2    jobspace1       1 year ago    2.5 kB    -
```

IBM Cloud

Search resources and products...

Catalog Manage Manage Bhavitha R's Account

Container Registry

Quick start

Namespaces 1

Repositories 1

Images 1

Trash 0

Settings

Repositories

Location

Global

Search

Create

Name	Image count	Namespace	Last updated		
helloworld icr.io/jobspace1/helloworld	1	jobspace1	397 days ago		
Digest	Manifest type	Tags	Created	Size	Security status
f54a58bc1aa2	Docker	v1	397 days ago	2 KB	Unsupported OS

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QUESTION 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.

SOLUTION:

1. Select your cluster from the cluster list to open the details for your cluster.
2. Click Kubernetes dashboard.
3. From the menu bar, click the Create new resource icon (+).
4. Select the Create from form tab.
 - a) Enter a name for your app, i.e **hello-world**.
 - b) Enter **websphere-liberty** for your container image.
 - c) Enter the number of pods for your app deployment, such as 1.
 - d) Leave the Service drop-down menu set to None.
5. Click Deploy. During the deployment, the cluster downloads the websphere-liberty container image from Docker Hub and deploys the app in your cluster.
6. Create a node port so that your app can be accessed by other users internally or externally. Because your cluster is a free cluster, you can only expose an app with a node port, not a load balancer or Ingress.
 - a) Click the Create new resource icon (+).
 - b) Copy the node port YAML from GitHub.
 - c) In the Create from input box, paste the node port YAML that you copied in the previous step.
 - d) Click Upload. The node port service is created.
7. From the menu, click Services, and note the TCP endpoint port of your liberty service in the node port range 30000 - 32767, i.e **liberty:30357 TCP**.
8. From the menu, click Pods, and note the Node that your pod runs on, such as 10.xxx.xx.xxx.
9. Return to the IBM Cloud clusters console, select your cluster, and click the Worker Nodes tab. Find the Public IP of the worker node that matches the private IP of the node that the pod runs on.
10. In a tab in your browser, form the URL of your app by combining http:// with the public IP and TCP port that you previously retrieved i.e. **http:// 159.122.178.57: 30357**. The Welcome to Liberty page is displayed. Great job! You just deployed your first app in your Kubernetes cluster.

