

ASSIGNMENT – 4

KUBERNETES, DOCKER

Assignment Date	28 October 2022
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Maximum Marks	2 Mark

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@1 (local) root@192.168.0.8 ~]#
$ docker pull hello-world
Using default tag: latest
latest: Pulling from library/hello-world
Digest: sha256:18a657d0cc1c7d0678a3fbee8b7eb4918bbe25968d3e1b0adebfa71caddbc346
Status: Image is up to date for hello-world:latest
docker.io/library/hello-world:latest
[root@1 (local) root@192.168.0.8 ~]#
$ 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@1 (local) root@192.168.0.8 ~]#
$
```

QUESTION 2:

Create a Dockers file and deploy it in Dockers desktop application

SOLUTION:

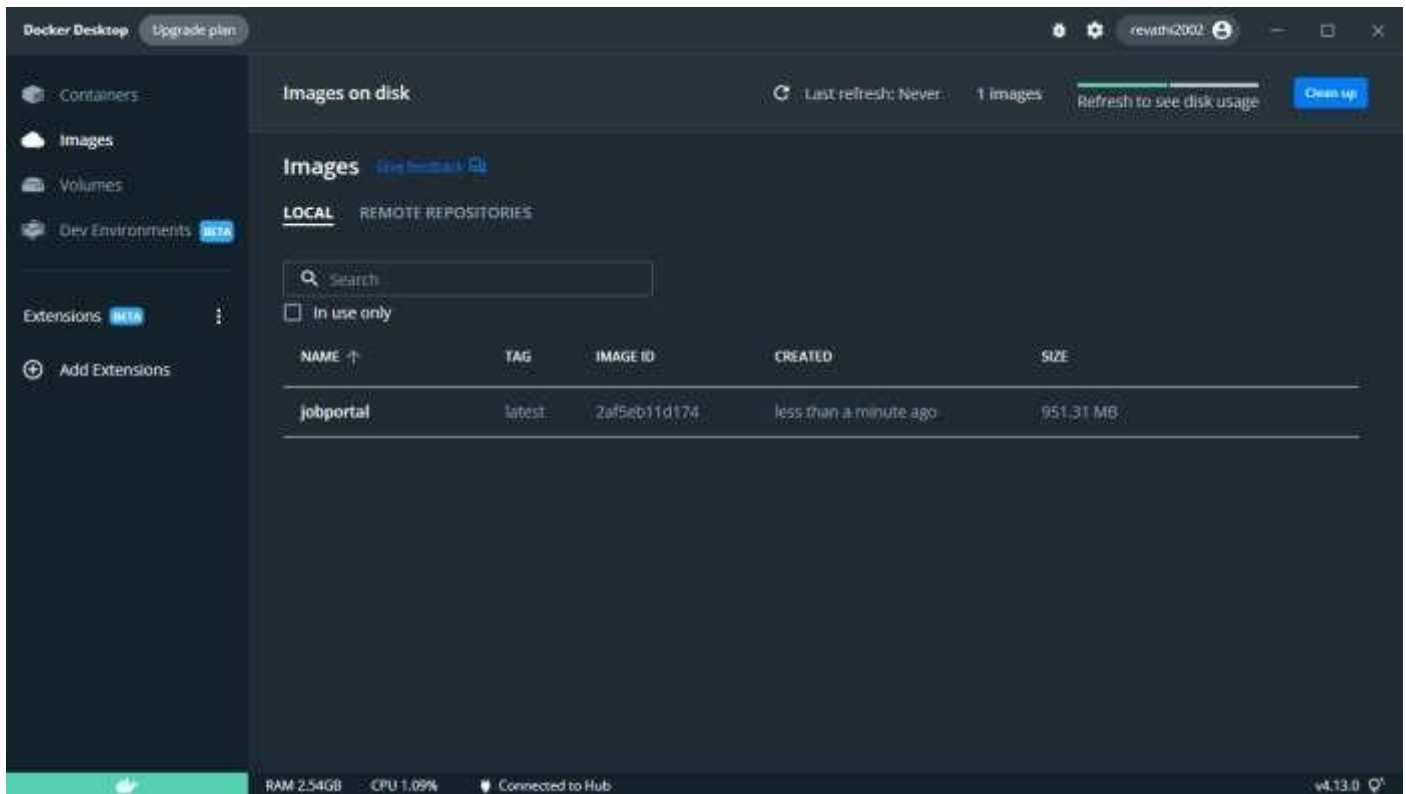
STEP: 1

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

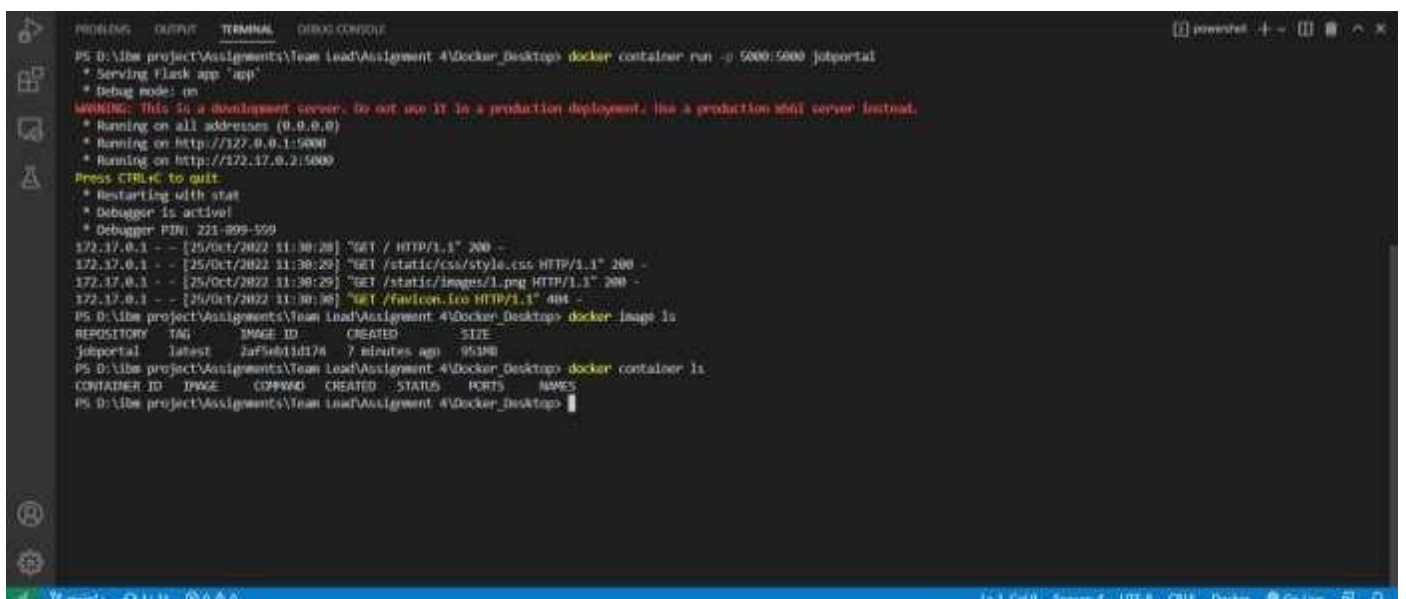
STEP: 2

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
```

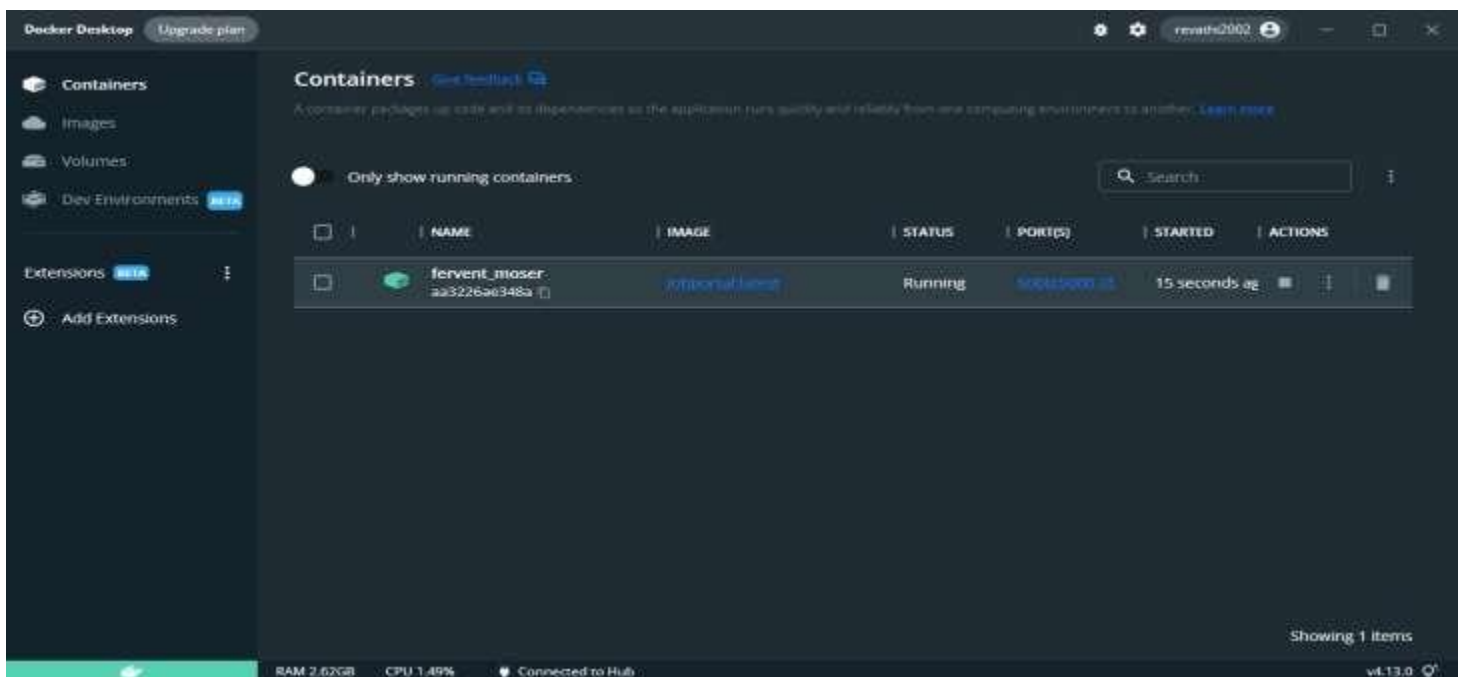


```
$ docker container run -p 5000:5000 jobportal //to run
```





\$ 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 --c '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 MB / 11.90 MB [-----] 100.00% 1m7s
12476416 bytes downloaded

Installing binary...
OK
Plug-in 'container-registry 1.0.2' was successfully installed into C:\Users\ELCOP\ibm\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
FAILED
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 --c https://cloud.ibm.com
API endpoint: https://cloud.ibm.com

Email: revathi30070@gmail.com

Password:
Authenticating...
Credentials were rejected.
Code: B0H0602E, message: The credentials you entered for the user 'revathi30070@gmail.com' are incorrect.

Password:
Authenticating...
Credentials were rejected.
Code: B0H0602E, 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 --c https://cloud.ibm.com
API endpoint: https://cloud.ibm.com

Email: 9006191066@gmail.com

Password:
Authenticating...
Credentials were rejected.
Code: B0H0602E, 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 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 Revathi 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 Revathi 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
20c29710123e: Pull complete
Digest: sha256:13a0578cc1c78057ba3fb8a74b4918ba2596a23e0b0deffa71caddbc36
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/hello-world: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 99 minutes ago 95.0B
hello-world latest f0650fca4a5 13 months ago 13.3kB
icr.io/jobspace1/hello-world v1 f0650fca4a5 13 months ago 13.3kB
PS D:\Ibm project\Assignments\Team lead\Assignment 4\IBM Container_Registry> docker push icr.io/jobspace1/hello-world:v1
The push refers to repository [icr.io/jobspace1/hello-world]
a87e0bba5ff: Pushed
v1: digest: sha256:f54a58bc1aac25d79bae155d722b37be11d04ae77809c46f2f13d8e4 size: 520
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/hello-world v1 f54a58bc1aac jobspace1 1 year ago 2.5 KB -
```

IBM Cloud

Search resources and products...

Catalog Manage Revathi 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
hello-world icr.io/jobspace1/hello-world	1	jobspace1	397 days ago

Digest	Manifest type	Tags	Created	Size	Security status
f54a58bc1aac	Docker	v1	397 days ago	2 KB	Unsupported OS

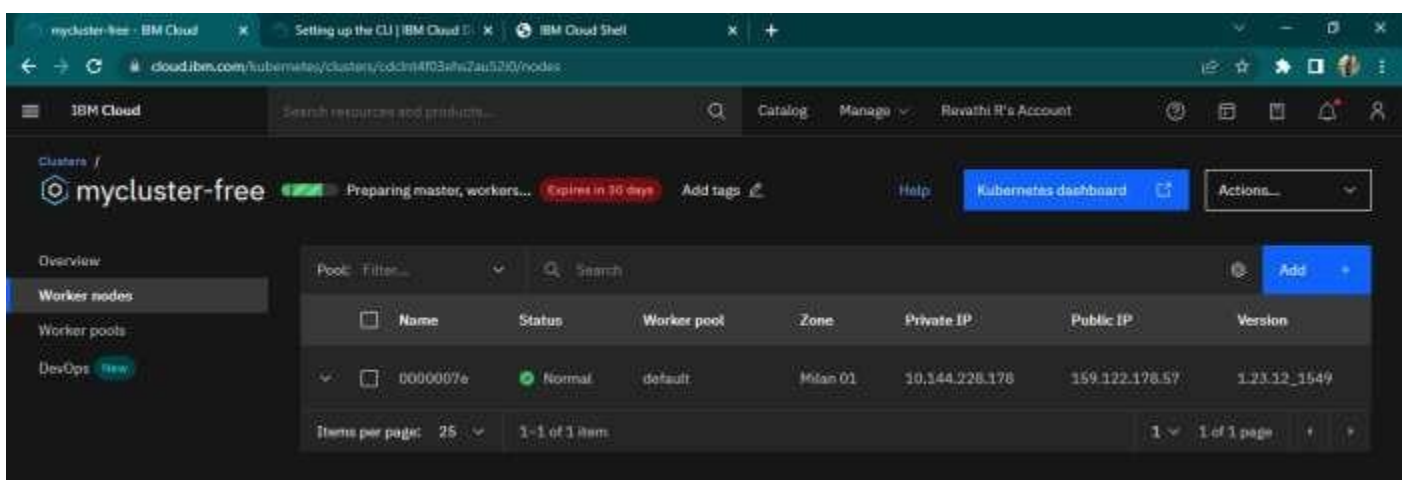
Items per page: 25 1-1 of 1 item 1 1 of 1 page

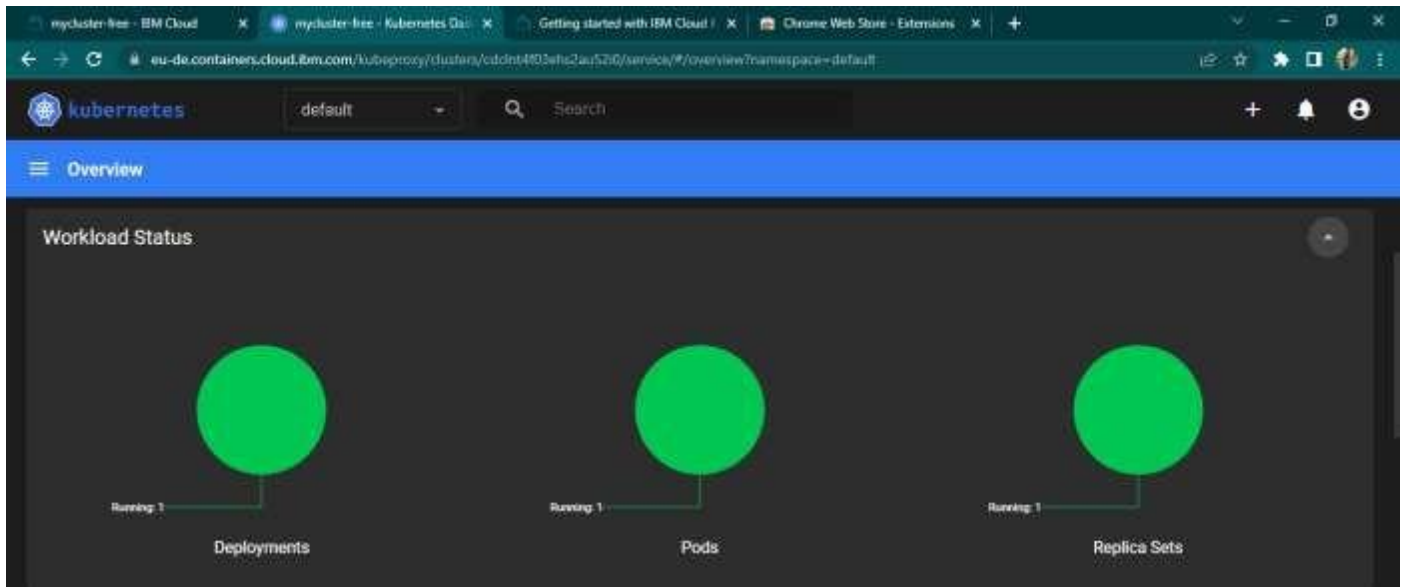
QUESTION 4:

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.





Workload Status

Deployments

Name	Images	Labels	Pods	Created ↑
hello-world	Show all	Show all	1 / 1	4 minutes ago

Pods

Name	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created ↑
hello-world-57bc9fd449-wdcs5	Show all	Show all	10.144.228.178	Running	0	9.00m	229.73MiB	4 minutes ago

Replica Sets

Name	Images	Labels	Pods	Created ↑
hello-world-57bc9fd449	Show all	Show all	1 / 1	4 minutes ago

Discovery and Load Balancing > **Services**

Services

Name	Labels	Type	Cluster IP	Internal Endpoints	External Endpoints	Created ↑
liberty	Show all	NodePort	172.21.160.240	liberty-9080 TCP liberty-30357 TCP	-	25 minutes ago
kubernetes	Show all	ClusterIP	172.21.0.1	kubernetes:443 TCP kubernetes:80 TCP	-	9 days ago