

ASSIGNMENT-4  
DOCKER AND KUBERNETES

Assignment Date	25 November 2022
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Maximum Marks	2 Marks

Question-1:

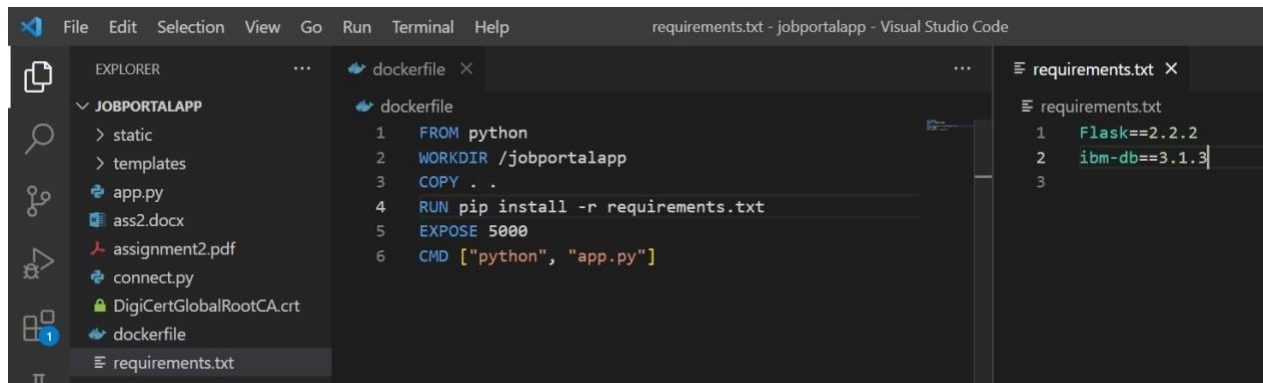
Pull an image from docker hub and run it on a docker playground Question-2:

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

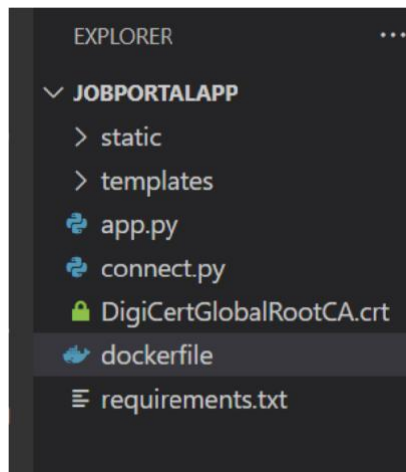
Dockerfile and Requirements.txt :

The screenshot displays a Docker playground interface. On the left, a sidebar shows a timer at 03:47:04, a 'CLOSE SESSION' button, and a list of instances with one instance named 'node1' at IP 192.168.0.8. The main panel shows details for instance 'cdjvhaf9\_cdjvmjm0qau0008f5ccg' with IP 192.168.0.8. It includes buttons for 'OPEN PORT', 'DELETE', and 'EDITOR'. Below these, a terminal window shows the following commands and output:

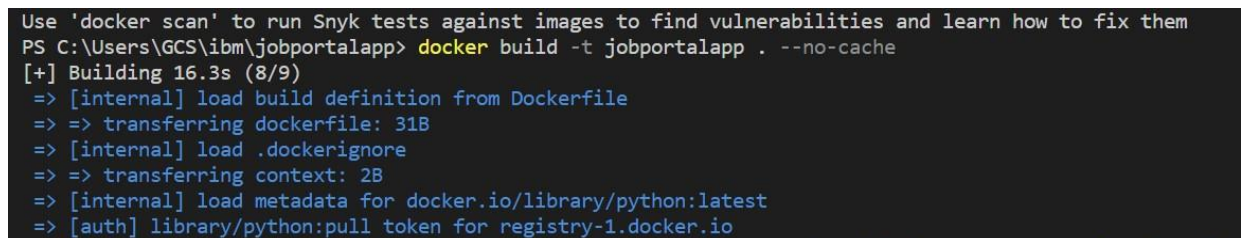
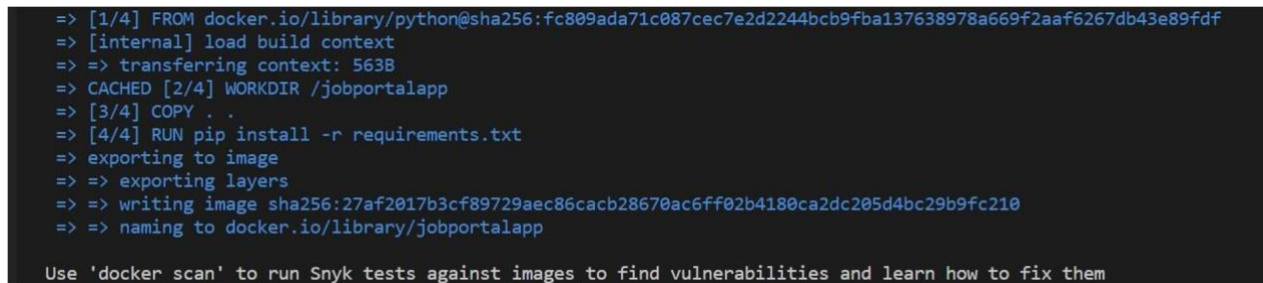
```
# This is a sandbox environment. Using personal credentials #
# is HIGHLY! discouraged. Any consequences of doing so are #
# completely the user's responsibilities. #
# The FWD team. #
#####
[node1] (local) root@192.168.0.8 ~
$ docker pull ubuntu:20.04
20.04: Pulling from library/ubuntu
eaeadi6dc43b: Pull complete
Digest: sha256:450e066588f42ebe1551f3b1a535034b6aa46cd936fe7f2c6b0d72997ec61dbd
Status: Downloaded newer image for ubuntu:20.04
docker.io/library/ubuntu:20.04
[node1] (local) root@192.168.0.8 ~
$ docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
ubuntu 20.04 680e5dfb52c7 12 days ago 72.8MB
[node1] (local) root@192.168.0.8 ~
$ docker run -it ubuntu:20.04 bash
root@1e3bae34d1e9:/# hostname
```

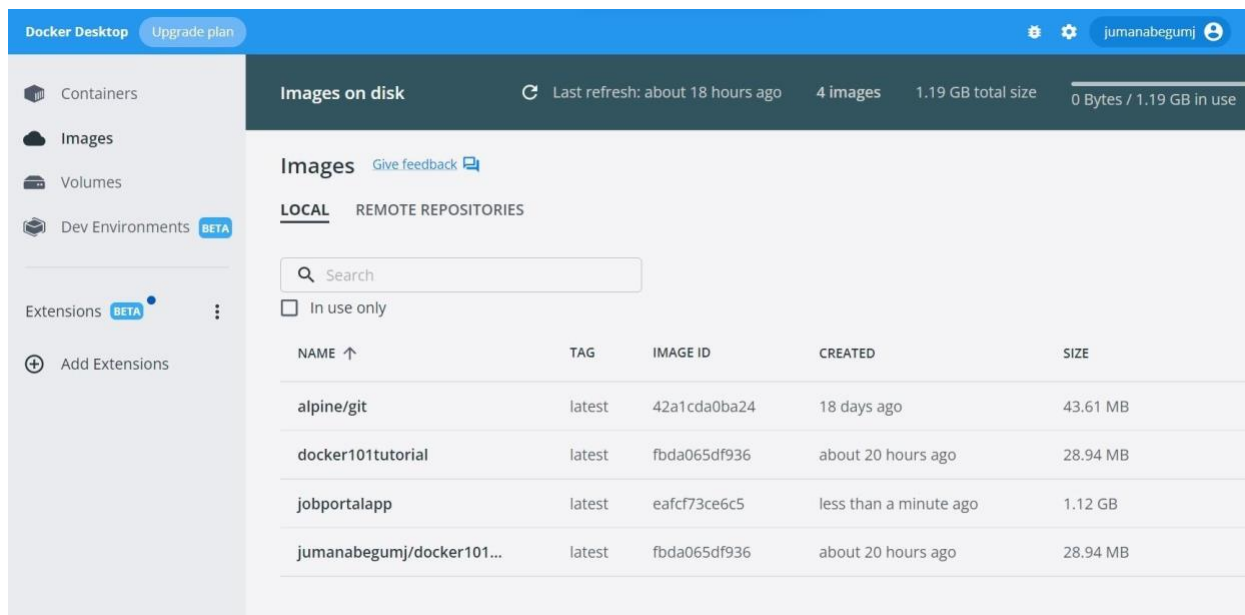


File structure:



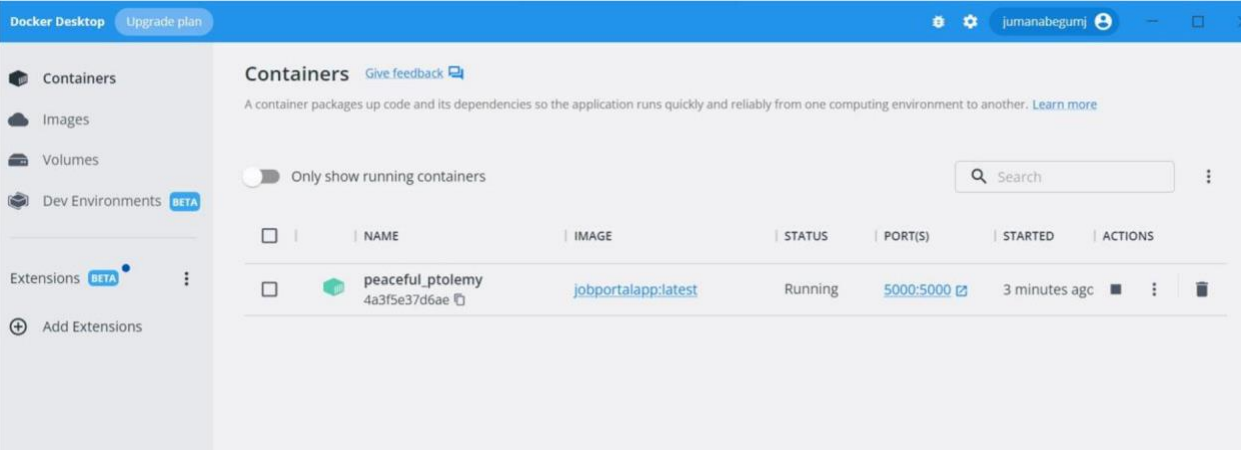
Building a docker image:





Run the image:

```
Use docker scan to run Snyk tests against images to find vulnerabilities and learn how to fix them
PS C:\Users\GCS\ibm\jobportalapp> docker run -p 5000:5000 jobportalapp
* Serving Flask app 'app'
* Debug mode: off
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://127.0.0.1:5000
* Running on http://172.17.0.2:5000
Press CTRL+C to quit
172.17.0.1 - - [07/Nov/2022 13:42:45] "GET / HTTP/1.1" 200 -
172.17.0.1 - - [07/Nov/2022 13:42:45] "GET /static/styles.css HTTP/1.1" 200 -
172.17.0.1 - - [07/Nov/2022 13:42:46] "GET /favicon.ico HTTP/1.1" 404 -
```





```
PS C:\Users\GCS\ibm\jobportalapp> docker push jumanabegumj/jobportalapp
Using default tag: latest
The push refers to repository [docker.io/jumanabegumj/jobportalapp]
An image does not exist locally with the tag: jumanabegumj/jobportalapp
PS C:\Users\GCS\ibm\jobportalapp>
```

```
* History restored
```

Windows PowerShell

4dc7bb0417b9: Pushed

44fc8fdbf057: Pushed

1af3c9e07cc8: Pushed

6f6e69c2c592: Mounted from library/python

53b8bfee7a0a: Mounted from library/python

5b3f1ed98915: Mounted from library/python

6b183c62e3d7: Mounted from library/python

882fd36bfd35: Mounted from library/python

d1dec9917839: Mounted from library/python


d38adf39e1dd: Mounted from library/python

4ed121b04368: Mounted from library/python

d9d07d703dd5: Mounted from library/python


latest: digest: sha256:757e93556ceb70add341df5dc38f5e78857577d8c209e9dd2200d1f0fbdf769f size: 2847

Wasm is a fast, light alternative to Linux containers – try it out today in the [Docker+Wasm Technical Preview](#)

 dockerhub

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 jumanabegumj


jumanabegumj


Content


Create repository


jumanabegumj / jobportalapp


Contains: Image | Last pushed: 35 minutes ago

 Not Scanned

 0

 1

 Public



Tip: Not finding your repository? Try a different namespace.

### Question-3

Create an IBM container registry and deploy helloworld or jobportal app

Log into ibm cloud using ibm cloud CLI

Install the container-registry plugin and set region

```
C:\Users\GCS>ibmcloud login
API endpoint: https://cloud.ibm.com

Email> 2019103022@student.annauniv.edu

Password>
Authenticating...
OK

Targeted account Jumana Begum J's Account (20acf123c7c641a0a4d73e3afab989d2)

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> 9
Targeted region us-south

API endpoint:      https://cloud.ibm.com
Region:           us-south
User:             2019103022@student.annauniv.edu
Account:          Jumana Begum J's Account (20acf123c7c641a0a4d73e3afab989d2)
Resource group:   No resource group targeted, use 'ibmcloud target -g RESOURCE_GROUP'
CF API endpoint:
Org:
Space:
```



```

C:\Users\GCS>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 [=====]
12476416 bytes downloaded
Installing binary...
OK
Plug-in 'container-registry 1.0.2' was successfully installed into C:\Users\GCS
its details.

C:\Users\GCS>ibmcloud cr region-set us-south
The region is set to 'us-south', the registry is 'us.icr.io'.

OK

C:\Users\GCS>

```

Add a namespace

```

C:\Users\GCS>ibmcloud cr namespace-add jum-ns-1
No resource group is targeted. Therefore, the default resource group for the account ('Default') is targeted.
Adding namespace 'jum-ns-1' in resource group 'Default' for account Jumana Begum J's Account in registry us.icr.io...
Successfully added namespace 'jum-ns-1'

OK

C:\Users\GCS>ibmcloud cr namespace-list
Listing namespaces for account 'Jumana Begum J's Account' in registry 'us.icr.io'...

Namespace
jum-ns-1

OK

C:\Users\GCS>_

```

Log the local docker daemon into IBM cloud container registry and give repository name and tag

```
C:\Users\GCS>ibmcloud cr login
Logging 'docker' in to 'us.icr.io'...
Logged in to 'us.icr.io'.
```

OK

```
C:\Users\GCS>docker images
REPOSITORY                                TAG      IMAGE ID      CREATED        SIZE
jumanabegumj/jobportalapp                 latest   277a934ed29e  About an hour ago  1.12GB
jobportalapp                              latest   eafcf73ce6c5  3 hours ago    1.12GB
jumanabegumj/jobportalapp                 <none>   eafcf73ce6c5  3 hours ago    1.12GB
jumanabegumj/docker101tutorial            latest   fbda065df936  22 hours ago    28.9MB
docker101tutorial                        latest   fbda065df936  22 hours ago    28.9MB
alpine/git                                latest   42a1cda0ba24  2 weeks ago    43.6MB
```

```
C:\Users\GCS>docker tag jobportalapp us.icr.io/jum-ns-1/repo1:jobportalapp
```

```
C:\Users\GCS>docker images
REPOSITORY                                TAG      IMAGE ID      CREATED        SIZE
jumanabegumj/jobportalapp                 latest   277a934ed29e  About an hour ago  1.12GB
jobportalapp                              latest   eafcf73ce6c5  3 hours ago    1.12GB
us.icr.io/jum-ns-1/repo1                  jobportalapp eafcf73ce6c5  3 hours ago    1.12GB
jumanabegumj/jobportalapp                 <none>   eafcf73ce6c5  3 hours ago    1.12GB
jumanabegumj/docker101tutorial            latest   fbda065df936  22 hours ago    28.9MB
docker101tutorial                        latest   fbda065df936  22 hours ago    28.9MB
alpine/git                                latest   42a1cda0ba24  2 weeks ago    43.6MB
```

Push the image and check if it is available in the container registry's images list

```
C:\Users\GCS>docker push us.icr.io/jum-ns-1/repo1:jobportalapp
The push refers to repository [us.icr.io/jum-ns-1/repo1]
4dc7bb0417b9: Pushed
44fc8fdbf057: Layer already exists
1af3c9e07cc8: Layer already exists
6f6e69c2c592: Layer already exists
53b8bfef7a0a: Layer already exists
5b3f1ed98915: Layer already exists
6b183c62e3d7: Layer already exists
882fd36bfd35: Layer already exists
d1dec9917839: Layer already exists
d38adf39e1dd: Pushed
4ed121b04368: Layer already exists
d9d07d703dd5: Layer already exists
jobportalapp: digest: sha256:757e93556ceb70add341df5dc38f5e78857577d8c209e9dd2200d1f0fbdf769f size: 2847
```

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

Repository	Tag	Digest	Namespace	Created	Size	Security status
us.icr.io/jum-ns-1/repo1	jobportalapp	757e93556ceb	jum-ns-1	3 hours ago	449 MB	-

OK

```
C:\Users\GCS>
```

IBM Cloud

Container Registry

Quick start

Namespaces1

Repositories1

Images1

Trash0

Settings

Search resources and products...


CatalogManageJumana Begum J's Acc...

Images

Location

Dallas

View by: DigestSearch

<input type="checkbox"/>	Repository@digest	Tags	Manifest type	Created	Size
<input type="checkbox"/>	 jum-ns-1/repo1@sha256:757e93556ceb...	jobportalapp	Docker	3 hours ago	449 MB

Items per page: 251-1 of 1 item

#### Question-4

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

Create a new cluster

The screenshot shows the IBM Cloud Clusters page for a cluster named 'mycluster-free'. The cluster is in the 'Preparing master, workers...' state. A warning banner indicates it expires in 30 days. The left sidebar shows navigation options: Overview, Worker nodes, Worker pools, and DevOps (marked as New). The main content area displays four status cards: Node status (1 of 1 Pending), Add-on status (0 of 0 Normal), Master status (Unknown), and Ingress status (Pending). Below these is a 'Details' section with fields for Cluster ID, Version, Infrastructure, and Zones.

Node status	Add-on status	Master status	Ingress status
1 of 1 Pending	0 of 0 Normal	Unknown	Pending

Cluster ID	Version	Infrastructure	Zones
cdk1752f04dhk3s1i3ug	1.24.7_1542	Classic	Milan 01

The screenshot shows the 'Worker nodes' tab selected in the sidebar. The main content area displays a table of worker nodes. The table has columns for Name, Status, Worker pool, Zone, Private IP, Public IP, and Version. There is one node listed with ID 00000032, status Normal, in the default worker pool, Milan 01 zone, with private IP 10.144.185.58 and public IP 169.51.203.185. The table also includes a search bar, a filter dropdown, and pagination controls.

Name	Status	Worker pool	Zone	Private IP	Public IP	Version
00000032	Normal	default	Milan 01	10.144.185.58	169.51.203.185	1.24.7_1543

Access the Kubernetes dashboard and deploy the application image

kubernetes

default

Search

Overview

Workloads

Cron Jobs

Daemon Sets

Deployments

Jobs

Pods

Replica Sets

Replication Controllers

Stateful Sets

Service

Ingresses

Ingress Classes

Services

Config and Storage

Workloads

Workload Status

Pending: 1

Deployments

Pending: 1

Pods

Pending: 1

Replica Sets

Deployments

Overview

Workloads

Cron Jobs

Daemon Sets

Deployments

Jobs

Pods

Replica Sets

Replication Controllers

Stateful Sets

Service

Ingresses

Ingress Classes

Services

Config and Storage

Deployments

Name	Images	Labels	Pods	Created
<div><div></div>jobportalapp</div>	<a href="#">Show all</a>	<a href="#">Show all</a>	1 / 1	54 seconds ago

Pods

Name	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created
<div><div></div>jobportalapp-9dd69c877-25mg6</div>	<a href="#">Show all</a>	<a href="#">Show all</a>	10.144.185.58	Running	0	-	-	54 seconds ago

Replica Sets

Name	Images	Labels	Pods	Created
<div><div></div>jobportalapp-9dd69c877</div>	<a href="#">Show all</a>	<a href="#">Show all</a>	1 / 1	55 seconds ago

In services tab edit the YAML file of the jobportal application

## Edit a resource

YAML	JSON
50 spec:	
51 ports:	
52 - name: tcp-5000-488-ct4tf	
53 protocol: TCP	
54 port: 5000	
55 targetPort: 5000	
56 nodePort: 32576	
57 selector:	
58 k8s-app: jobportalapp	
59 clusterIP: 172.21.63.60	
60 clusterIPs:	
61 - 172.21.63.60	
62 type: NodePort	
63 sessionAffinity: None	
64 externalTrafficPolicy: Cluster	
65 ipFamilies:	
66 - IPv4	
67 ipFamilyPolicy: SingleStack	
68 allocateLoadBalancerNodePorts: true	
69 internalTrafficPolicy: Cluster	
70 status:	
71 loadBalancer: {}	
72	

[Update](#) [Cancel](#)

OUTPUT:

**REGISTRATION PORTAL**

Email ID:

User Name:

Password:

Roll Number:

DEPLOYED IP address: <http://169.51.203.185:32576/>