

ASSIGNMENT-4 DOCKER AND KUBERNETES



Assignment Date	04 November 2022
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Student Roll Number	2019103022
Maximum Marks	2 Marks

Question-1:

Pull an image from docker hub and run it on a docker playground

03:47:04

CLOSE SESSION

Instances  

+ ADD NEW INSTANCE


192.168.0.8
node1


cdjvhaf9_cdjvmjm0qau0008f5ccg

IP
192.168.0.8

OPEN PORT

Memory CPU

SSH
ssh ip172-18-0-14-cdjvhaf91rrg00fv78h0@direct.labs.play-witl 

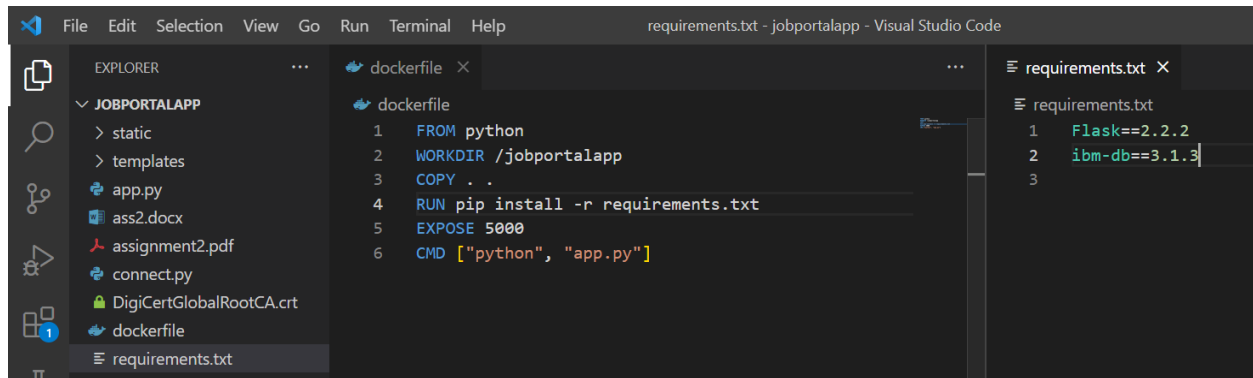
DELETE  EDITOR

```
# This is a sandbox environment. Using personal credentials #
# is HIGHLY! discouraged. Any consequences of doing so are #
# completely the user's responsibilities. #
# #
# The PWD team. #
#####
[node1] (local) root@192.168.0.8 ~
$ docker pull ubuntu:20.04
20.04: Pulling from library/ubuntu
eaead16dc43b: 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
```

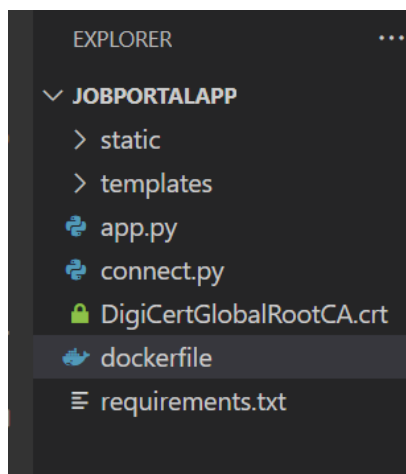
Question-2:

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

Dockerfile and Requirements.txt :



File structure:



Building a docker 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 build -t jobportalapp . --no-cache
[+] Building 16.3s (8/9)
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 31B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/python:latest
=> [auth] library/python:pull token for registry-1.docker.io
```

```
=> [1/4] FROM docker.io/library/python@sha256:fc809ada71c087cec7e2d2244bcb9fba137638978a669f2aaf6267db43e89fdf
=> [internal] load build context
=> => transferring context: 563B
=> CACHED [2/4] WORKDIR /jobportalapp
=> [3/4] COPY . .
=> [4/4] RUN pip install -r requirements.txt
=> exporting to image
=> => exporting layers
=> => writing image sha256:27af2017b3cf89729aec86cacb28670ac6ff02b4180ca2dc205d4bc29b9fc210
=> => naming to docker.io/library/jobportalapp
```

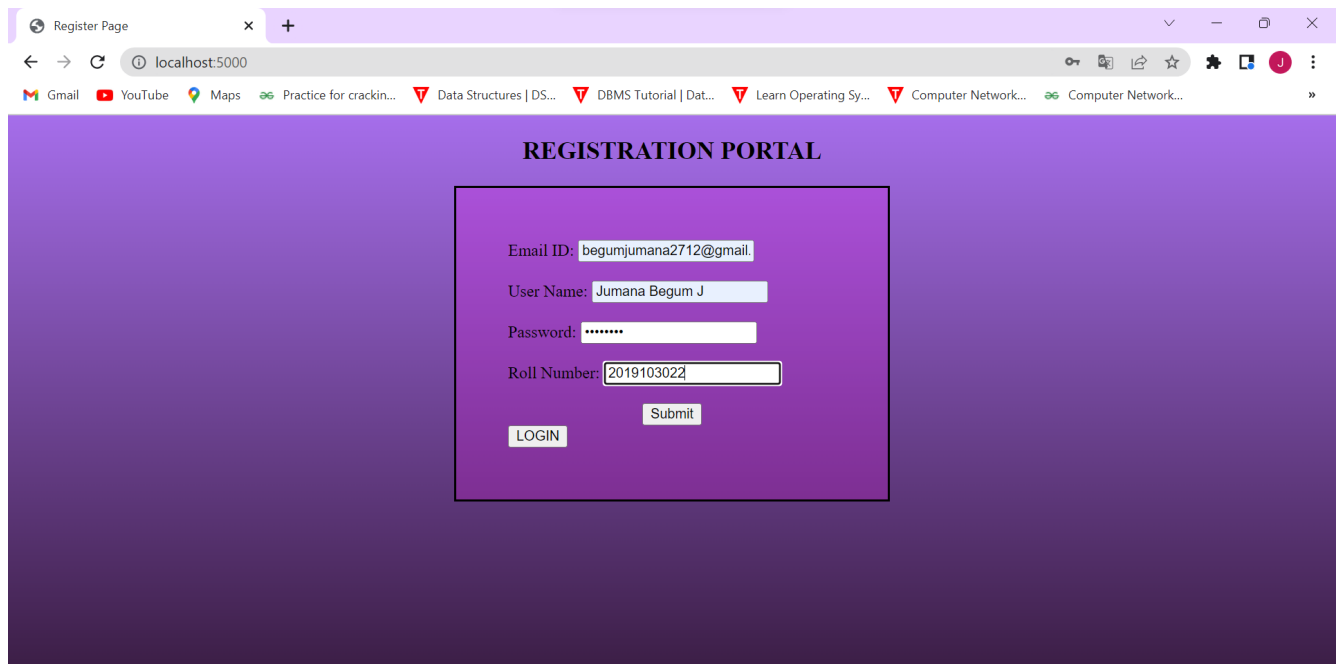
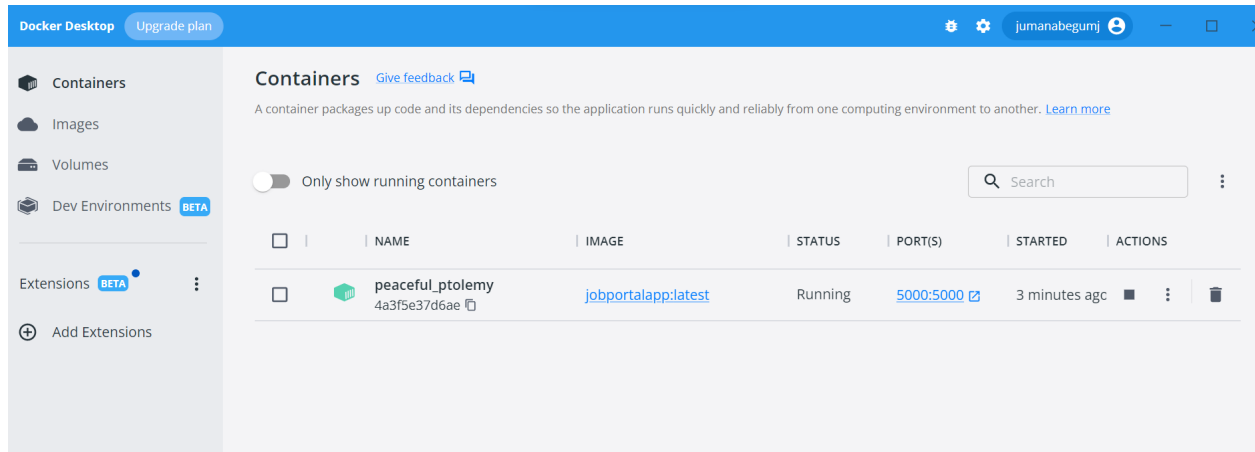
Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them

The screenshot shows the Docker Desktop application window. The left sidebar contains navigation options: Containers, Images, Volumes, Dev Environments (with a BETA badge), Extensions (with a BETA badge), and Add Extensions. The main panel is titled 'Images on disk' and shows a list of local Docker images. At the top, it indicates '4 images' and '1.19 GB total size'. Below this, there is a search bar and a filter for 'In use only'. The image list is as follows:

NAME ↑	TAG	IMAGE ID	CREATED	SIZE
alpine/git	latest	42a1cda0ba24	18 days ago	43.61 MB
docker101tutorial	latest	fbda065df936	about 20 hours ago	28.94 MB
jobportalapp	latest	eaafc73ce6c5	less than a minute ago	1.12 GB
jumanabegumj/docker101...	latest	fbda065df936	about 20 hours ago	28.94 MB

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 -
```



LOGIN PORTAL

User Name:

Password:


Authentication Successful



```
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
53b8bfef7a0a: 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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[Upgrade](#)

 jumanabegumj

jumanabegumj

Search by repository name

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

```
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:
```

Install the container-registry plugin and set region

```
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
53b8bfee7a0a: 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 Overview tab is selected, showing a sidebar with '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 a table showing 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
cdki752f04dhk3s1i3ug	1.24.7_1542	Classic	Milan 01


The screenshot shows the IBM Cloud Clusters page for 'mycluster-free' with the 'Worker nodes' tab selected. The cluster status is now 'Normal'. A table lists the worker nodes with columns for Name, Status, Worker pool, Zone, Private IP, Public IP, and Version. There is one node listed with ID 00000032.




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

Name	Images	Labels	Pods	Created
 jobportalapp	Show all	Show all	1 / 1	54.seconds.ago

Pods

Name	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created
 jobportalapp-9dd69c877-25mg6	Show all	Show all	10.144.185.58	Running	0	-	-	54.seconds.ago

Replica Sets

Name	Images	Labels	Pods	Created
 jobportalapp-9dd69c877	Show all	Show all	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:



The image shows a web browser window with a purple gradient background. At the top center, the text "REGISTRATION PORTAL" is displayed in bold black font. Below this, a white rectangular form is centered. Inside the form, there are four input fields with labels to their left: "Email ID:" followed by a text box containing "begumjumana2712@gmail.", "User Name:" followed by a text box containing "Jumana Begum J", "Password:" followed by a text box containing seven asterisks "*****", and "Roll Number:" followed by a text box containing "2019103022". Below these fields, there are two buttons: a "LOGIN" button on the left and a "Submit" button on the right.

REGISTRATION PORTAL

Email ID:

User Name:

Password:

Roll Number:

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