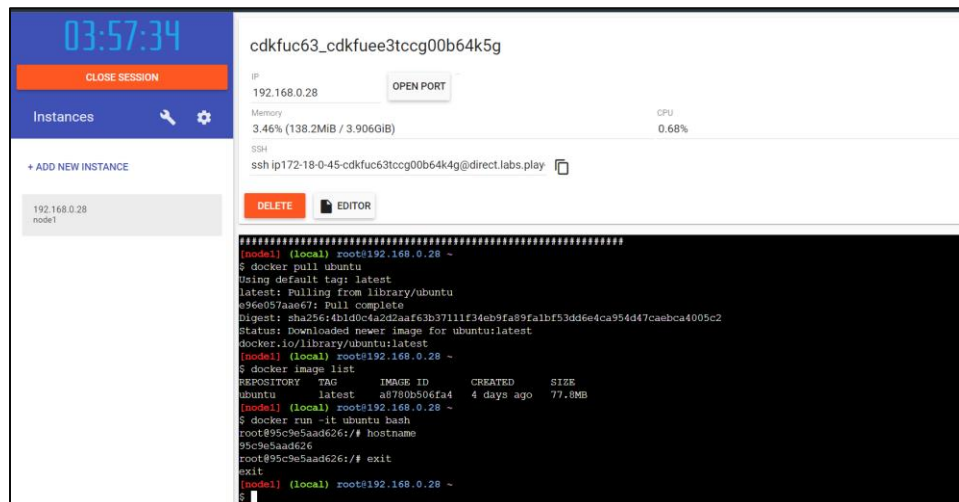


Assignment –4

EXPLORE KUBERNETES/ DOCKER

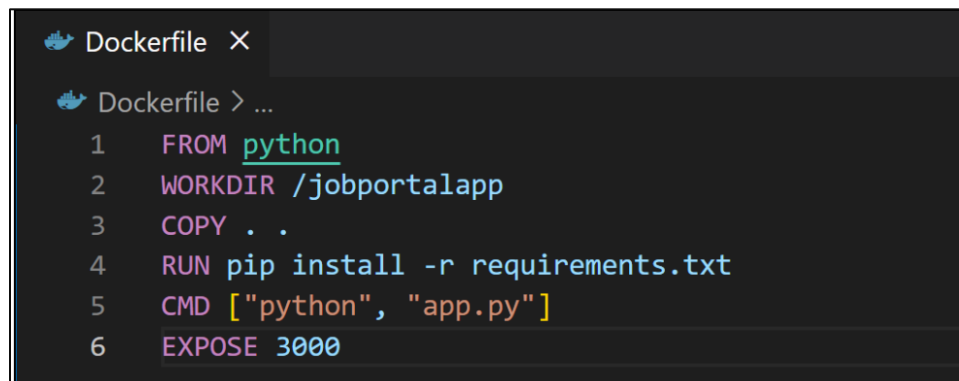
Assignment Date	27 October 2022
Student Name	Priyadharshini P
Student Roll Number	2019103562
Maximum Marks	2 Marks

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



2. Create a docker file for the jobportal application and deploy it in Docker desktop application.

Dockerfile



Requirements.txt

```
≡ requirements.txt ✕

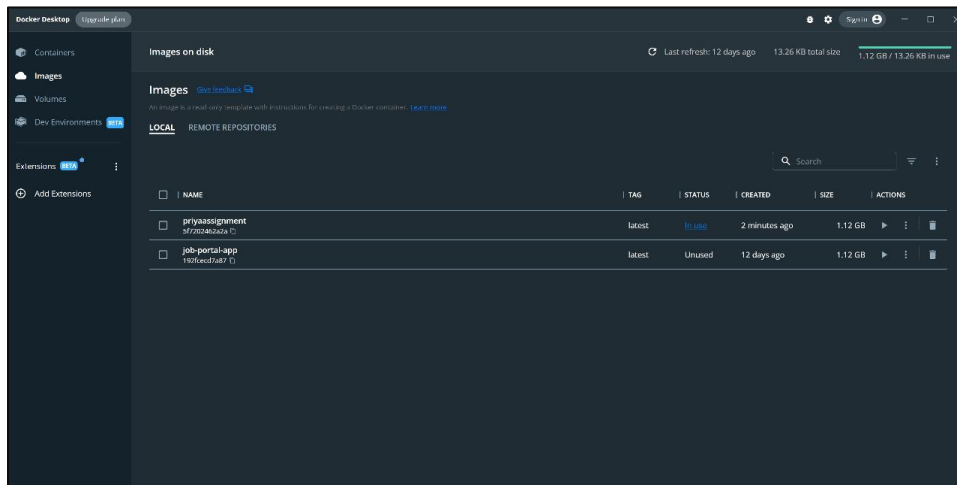
≡ requirements.txt
1 flask
2 ibm_db
```

Build image

```
Developer PowerShell
+ Developer PowerShell | |
*****
** Visual Studio 2022 Developer PowerShell v17.3.4
** Copyright (c) 2022 Microsoft Corporation
*****
PS C:\Users\user\source\repos\IBMAss> docker build -t pri03/priyaassignment . --no-cache

[+] Building 159.3s (9/9) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 31B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/python:latest
=> [1/4] FROM docker.io/library/python@sha256:fc809ada71c087cec7e2d2244bcb9fba137638978a669f2aaf6267db43e89fdf
=> => resolve docker.io/library/python@sha256:fc809ada71c087cec7e2d2244bcb9fba137638978a669f2aaf6267db43e89fdf
=> [internal] load build context
=> => transferring context: 353B
=> CACHED [2/4] WORKDIR /priyaassignment
=> [3/4] COPY . .
=> [4/4] RUN pip install -r requirements.txt
=> exporting to image
=> => exporting layers
=> => writing image sha256:018a38224dde17c126dbaf2fbbbf31b4f68bf78ba16bc6edca545fa0a8431c1a
=> => naming to docker.io/pri03/priyaassignment

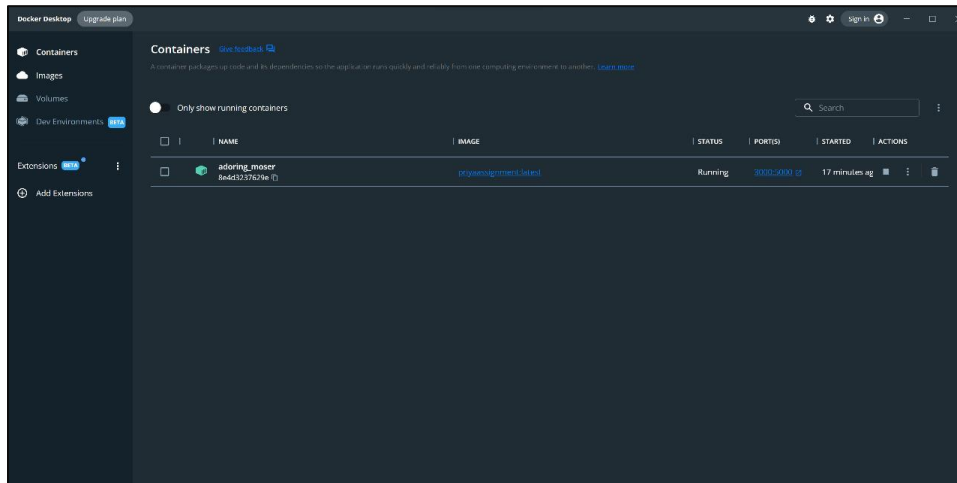
Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
```



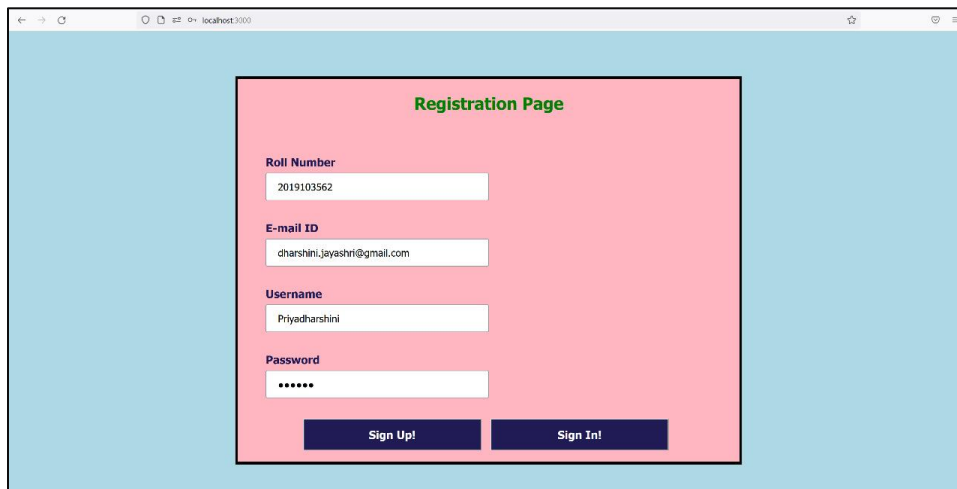
Run Image

```
Developer PowerShell
+ Developer PowerShell | |
*****
** Visual Studio 2022 Developer PowerShell v17.3.4
** Copyright (c) 2022 Microsoft Corporation
*****
PS C:\Users\user\source\repos\IBMAss> docker run -p 3000:5000 priyaassignment
```

```
* 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 - - [26/Oct/2022 15:55:02] "GET / HTTP/1.1" 200 -
172.17.0.1 - - [26/Oct/2022 15:55:02] "GET /static/styles.css HTTP/1.1" 304 -
172.17.0.1 - - [26/Oct/2022 15:55:04] "GET /login HTTP/1.1" 200 -
172.17.0.1 - - [26/Oct/2022 15:55:04] "GET /static/styles.css HTTP/1.1" 200 -
172.17.0.1 - - [26/Oct/2022 15:55:04] "GET /favicon.ico HTTP/1.1" 404 -
172.17.0.1 - - [26/Oct/2022 15:55:08] "GET / HTTP/1.1" 200 -
172.17.0.1 - - [26/Oct/2022 15:55:08] "GET /static/styles.css HTTP/1.1" 304 -
172.17.0.1 - - [26/Oct/2022 15:58:51] "POST / HTTP/1.1" 200 -
172.17.0.1 - - [26/Oct/2022 15:58:51] "GET /static/styles.css HTTP/1.1" 304 -
172.17.0.1 - - [26/Oct/2022 15:59:19] "POST /login HTTP/1.1" 200 -
172.17.0.1 - - [26/Oct/2022 15:59:19] "GET /static/styles.css HTTP/1.1" 304 -
172.17.0.1 - - [26/Oct/2022 16:00:30] "GET /logout HTTP/1.1" 302 -
172.17.0.1 - - [26/Oct/2022 16:00:30] "GET /login HTTP/1.1" 200 -
172.17.0.1 - - [26/Oct/2022 16:00:30] "GET /static/styles.css HTTP/1.1" 304 -
█
```



OUTPUT



Browser address bar: localhost:3000/login

Login

Username: Priyadharshini

Password: *****

Sign In! Sign Up!

PUSH TO DOCKER HUB

```
Developer PowerShell
+ Developer PowerShell
*****
** Visual Studio 2022 Developer PowerShell v17.3.4
** Copyright (c) 2022 Microsoft Corporation
*****
PS C:\Users\user\source\repos\IBMAss> docker push pri03/priyaassignment
```

```
Using default tag: latest
The push refers to repository [docker.io/pri03/priyaassignment]
5a7afa24a041: Pushed
f082a73bc33a: Pushed
2e81ecbaa616: Pushed
6f6e69c2c592: Mounted from jesima/jobportalapp
53b8bfee7a0a: Mounted from jesima/jobportalapp
5b3f1ed98915: Mounted from jesima/jobportalapp
6b183c62e3d7: Mounted from jesima/jobportalapp
882fd36bfd35: Mounted from jesima/jobportalapp
d1dec9917839: Mounted from jesima/jobportalapp
d38adf39e1dd: Mounted from jesima/jobportalapp
4ed121b04368: Mounted from jesima/jobportalapp
d9d07d703dd5: Mounted from jesima/jobportalapp
latest: digest: sha256:f4726e0212331c55b93f862420d1e456b1ed4b2d53f4727641c5903e5673dfff size: 2845
```

https://hub.docker.com/repository/docker/pri03/priyaassignment

docker hub Search for great content (e.g., mysql) Explore Repositories Organizations Help Upgrade pri03

pri03 Repositories priyaassignment Using 0 of 1 private repositories. Get more

General Tags Builds Collaborators Webhooks Settings

Add a short description for this repository. The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search results. Update

pri03 / priyaassignment

Description: This repository does not have a description. Last pushed: a minute ago

Docker commands: To push a new tag to this repository, docker push pri03/priyaassignment:tagname

Tags and scans: This repository contains 1 tag(s). VULNERABILITY SCANNING - DISABLED

Tag	OS	Type	Pulled	Pushed
latest	linux	image	—	a minute ago

Automated Builds: Manually pushing images to Hub? Connect your account to GitHub or Bitbucket to automatically build and tag new images whenever your code is updated, so you can focus your time on creating. Available with Pro, Team and Business subscriptions. Upgrade Learn more

3. Create an IBM container registry and deploy helloworld app or jobportalapp.

a. Log in to IBM Cloud Account

```
C:\Users\user>ibmcloud login -a https://cloud.ibm.com
```

```
API endpoint: https://cloud.ibm.com
Email> 2019103562@smartinternz.com
Password>
Authenticating...
OK
Targeted account Priyadharshini P's Account (19500340606e411baa67922289f29ac6)

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: 2019103562@smartinternz.com
Account: Priyadharshini P's Account (19500340606e411baa67922289f29ac6)
Resource group: No resource group targeted, use 'ibmcloud target -g RESOURCE_GROUP'
CF API endpoint:
Org:
Space:
```

b. Set desired region for namespace to be created

```
C:\Users\user>ibmcloud cr region-set us-south
```

```
The region is set to 'us-south', the registry is 'us.icr.io'.
OK
```

c. Create Namespace.

```
C:\Users\user>ibmcloud cr namespace-add pri-1
```

```
No resource group is targeted. Therefore, the default resource group for the account ('Default') is targeted.
Adding namespace 'pri-1' in resource group 'Default' for account Priyadharshini P's Account in registry us.icr.io...
Successfully added namespace 'pri-1'
OK
```

d. Log the local Docker daemon into the IBM Cloud Container Registry.

```
C:\Users\user>ibmcloud cr login
```

```
Logging 'docker' in to 'us.icr.io'...
Logged in to 'us.icr.io'.
```

OK

e. Give appropriate repository name and tag.

```
C:\Users\user>docker tag priyaassignment us.icr.io/pri-1/pri-1-repo-1:priyaassignment
```

f. Push the image

```
C:\Users\user>docker push us.icr.io/pri-1/pri-1-repo-1:priyaassignment
```

```
The push refers to repository [us.icr.io/pri-1/pri-1-repo-1]
e87cdbdd5870: Pushed
c4c8f5a2f4e4: Pushed
2e81ecbaa616: Pushed
6f6e69c2c592: Pushed
53b8bfee7a0a: Pushed
5b3f1ed98915: Pushed
6b183c62e3d7: Pushed
882fd36bfd35: Pushed
d1dec9917839: Pushed
d38adf39e1dd: Pushed
4ed121b04368: Pushed
d9d07d703dd5: Pushed
priyaassignment: digest: sha256:b9f856e892b75d3d25cd5c3c60e4145df25c297b5f5ef461355d055f438302 size: 2845
```

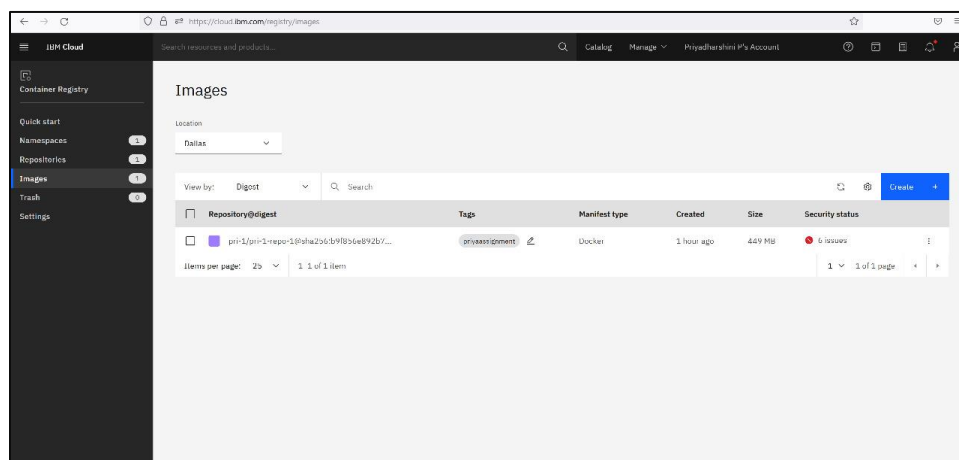
g. Verify that the image is in the private registry.

```
C:\Users\user>ibmcloud cr image-list
```

Listing images...

Repository	Tag	Digest	Namespace	Created	Size	Security status
us.icr.io/pri-1/pri-1-repo-1	priyaassignment	b9f856e892b7	pri-1	54 minutes ago	449 MB	-

OK



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

The screenshot shows the IBM Cloud Kubernetes cluster overview page for a cluster named 'priya'. The cluster is in a 'Normal' state and expires in 30 days. A warning message states: 'Expires in 30 days: Be sure to back up your data, your cluster will be deleted in 30 days. To access the full capabilities of the service, try out a standard cluster.' The overview includes the following status cards:

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

The details section provides the following information:

- Cluster ID:** cdkfzncf0ztbnddfjpm0
- Version:** 1.24.7_1542
- Infrastructure:** Classic
- Zones:** Milan 01
- Created:** 11/7/2022, 6:15 PM
- Resource group:** Default
- Image security enforcement:** Enable

The 'Node health' section is visible at the bottom.

The screenshot shows the IBM Cloud Kubernetes cluster worker nodes page for the 'priya' cluster. The 'Worker nodes' tab is selected. The page displays a table of worker nodes:

Name	Status	Worker pool	Zone	Private IP	Public IP	Version
000000aa	Normal	default	Milan 01	10.144.195.115	169.51.206.26	1.24.6_1541

The table indicates 1 item per page and 1 of 1 page.

The screenshot shows the Kubernetes 'Create' page for a Service. The 'Service' section is selected in the left sidebar. The configuration is as follows:

- Container image:** pri03/priyaassignment.latest
- Number of pods:** 1
- Service:** External
- Port:** 5000
- Target port:** 5000
- Protocol:** TCP
- Namespace:** default

The 'Deploy' button is visible at the bottom.

The screenshot shows the Kubernetes Overview dashboard. At the top, there are three green circles representing the state of Deployments, Pods, and Replica Sets, each with a 'Running 1' label. Below this, there are two tables:

Name	Images	Labels	Pods	Created
assignment-4	Show all	Show all	1 / 1	26 minutes ago

Name	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created
assignment-4-86c48b89-lm6v6	Show all	Show all	10.144.195.115	Running	0	1.000v	24.39M	26 minutes ago

The screenshot shows the 'Edit a resource' dialog for a Service. The dialog has two tabs: 'YAML' and 'JSON'. The 'JSON' tab is active, showing the following configuration:

```

{
  "selector": {
    "k8s-app": "assignment-4"
  },
  "clusterIP": "172.21.238.65",
  "clusterIPs": [
    "172.21.238.65"
  ],
  "type": "NodePort",
  "sessionAffinity": "None",
  "externalTrafficPolicy": "Cluster",
  "ipFamilies": [
    "IPv4"
  ],
  "ipFamilyPolicy": "Singlestack",
  "allocateLoadBalancerNodePorts": true,
  "internalTrafficPolicy": "Cluster"
},
{
  "status": {
    "loadBalancer": {}
  }
}

```

At the bottom of the dialog, there is a note: "This action is equivalent to kubectl apply -f <spec.json>". Below the note are 'Update' and 'Cancel' buttons.

The screenshot shows the Kubernetes Services dashboard. It displays a table with the following data:

Name	Labels	Type	Cluster IP	Internal Endpoints	External Endpoints	Created
assignment-4	Show all	LoadBalancer	172.21.238.65	assignment-4:5000 TCP assignment-4:31441 TCP	-	30 minutes ago
kubernetes	Show all	ClusterIP	172.21.0.1	kubernetes:443 TCP kubernetes:0 TCP	-	an hour ago

Deployed IP:

<http://169.51.206.26:31441>

