Assignment - 4

Kubernetes / Docker

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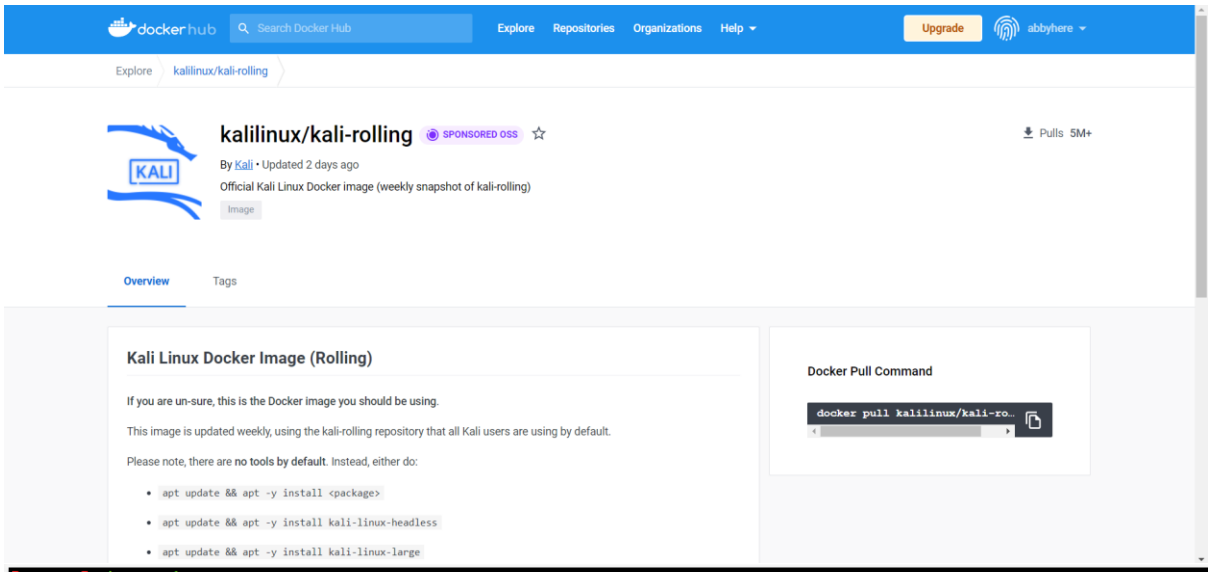
Maximum Marks	2 Marks

Question-1:

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




```
[node1] (local) root@192.168.0.13 ~
$ docker pull kalilinux/kali-rolling
Using default tag: latest
[node1] (local) root@192.168.0.13 ~
$ docker --version
Docker version 20.10.17, build 100c701
[node1] (local) root@192.168.0.13 ~
$ docker pull kalilinux/kali-rolling
Using default tag: latest
latest: Pulling from kalilinux/kali-rolling
Digest: sha256:9e7b7f96775a7354cd89239304baa88a5646c03c5da50529472d02ae04b21cfd
Status: Image is up to date for kalilinux/kali-rolling:latest
docker.io/kalilinux/kali-rolling:latest
[node1] (local) root@192.168.0.13 ~
$ docker run -d -t --name abishek kalilinux/kali-rolling
53e58f92e7bf82c27f0cb5d1bc1f88cf81f52320e3286a9b008c5f80c89cf4a4
[node1] (local) root@192.168.0.13 ~
$ docker ps
CONTAINER ID   IMAGE                  COMMAND   CREATED          STATUS          PORTS     NAMES
53e58f92e7bf   kalilinux/kali-rolling   "bash"    14 seconds ago   Up 12 seconds             abishek
```

```
[node1] (local) root@192.168.0.13 ~
$ docker exec -it abishek bash
┌──(root㉿53e58f92e7bf)-[/]
└─# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var

┌──(root㉿53e58f92e7bf)-[/]
└─# uname -a
Linux 53e58f92e7bf 4.4.0-210-generic #242-Ubuntu SMP Fri Apr 16 09:57:56 UTC 2021 x86_64 GNU/Linux

┌──(root㉿53e58f92e7bf)-[/]
└─#
```

Question-2:

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

Solution:

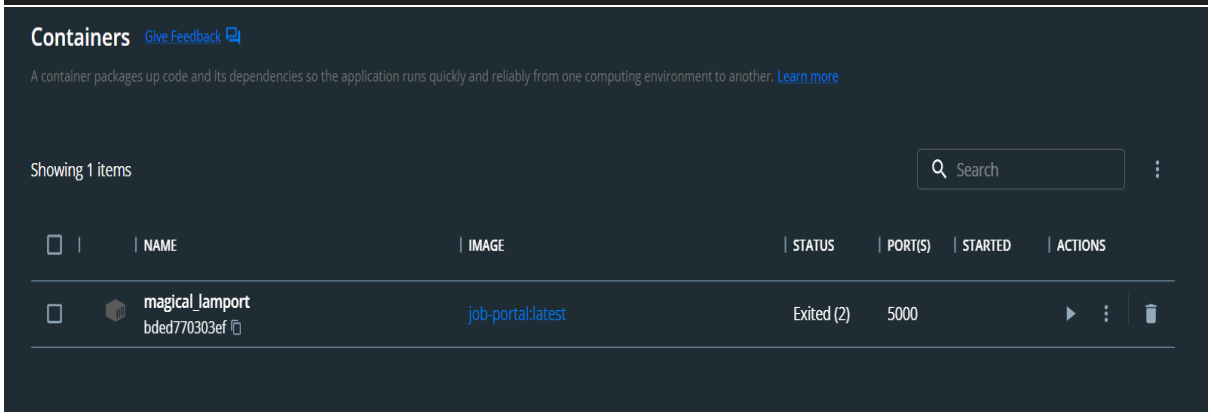
DockerFile:

```
FROM python:3.8-slim
WORKDIR /usr/src/app
COPY . .
RUN pip install -r requirements.txt
EXPOSE 5000
CMD ["flask", "run", "-h", "0.0.0.0"]
```

Commands:

```
Docker build -t job-portal.
Docker run -dp 5000:5000 job-portal
```

```
PS C:\Users\Abby\Desktop\New folder (2)> docker build -t job-portal .
[+] Building 1.0s (9/9) FINISHED
 => [internal] load build definition from Dockerfile                                                0.0s
 => => transferring dockerfile: 32B                                                                 0.0s
 => [internal] load .dockerignore                                                                   0.0s
 => => transferring context: 2B                                                                     0.0s
 => [internal] load metadata for docker.io/library/python:3.8-slim                                  0.9s
 => [internal] load build context                                                                   0.0s
 => => transferring context: 94B                                                                    0.0s
 => [1/4] FROM docker.io/library/python:3.8-slim@sha256:921922c663fa84f67022b9cd5f0687f21b7644fc9be87bfdeb1a9d9c1810975a  0.0s
 => CACHED [2/4] WORKDIR /usr/src/app                                                               0.0s
 => CACHED [3/4] COPY . .                                                                           0.0s
 => CACHED [4/4] RUN pip install -r requirements.txt                                                0.0s
 => exporting to image                                                                              0.0s
 => => exporting layers                                                                             0.0s
 => => writing image sha256:150008b28a40cbf3daffb6d3c90c0d1807dcf9ce133b64c5133dd1be4b816154        0.0s
 => => naming to docker.io/library/job-portal                                                       0.0s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
PS C:\Users\Abby\Desktop\New folder (2)>
```



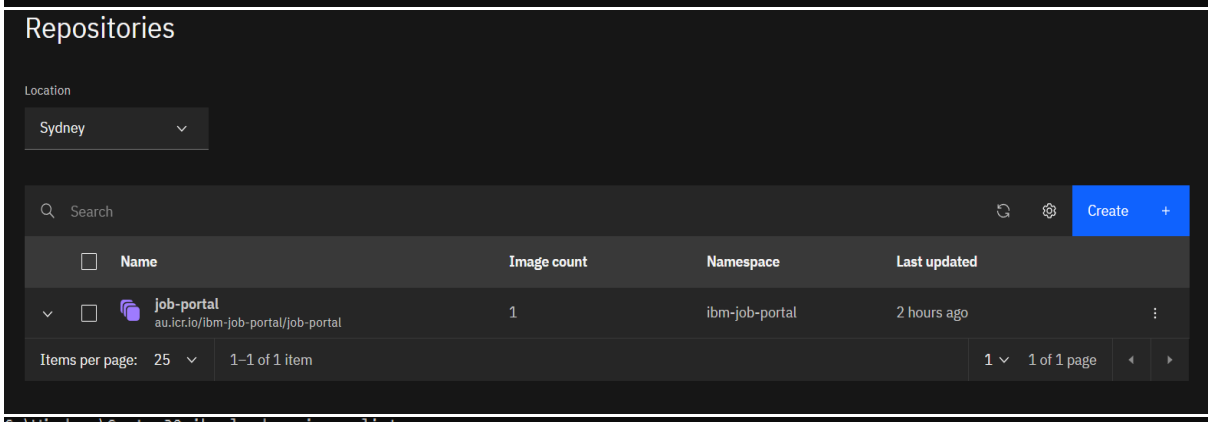
Question-3:

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

```
PS C:\Users\Abby\Desktop\NaalayaThiran\Assignment_IV\DockerFile> docker rmi -f job-image
Error: No such image: job-image
PS C:\Users\Abby\Desktop\NaalayaThiran\Assignment_IV\DockerFile> docker rmi -f jobportal
Untagged: jobportal:latest
PS C:\Users\Abby\Desktop\NaalayaThiran\Assignment_IV\DockerFile> docker build -t jobportal .
[+] Building 2.5s (10/10) FINISHED
 => [internal] load build definition from Dockerfile                                                                0.0s
 => => transferring dockerfile: 32B                                                                                 0.0s
 => [internal] load .dockerignore                                                                                   0.0s
 => => transferring context: 2B                                                                                     0.0s
 => [internal] load metadata for docker.io/library/python:3.10                                                      2.4s
 => [1/5] FROM docker.io/library/python:3.10@sha256:daed8d46dfc607976178e2f2beb96f03f91240bcb553e0fffd8186b73929db9c  0.0s
 => [internal] load build context                                                                                   0.0s
 => => transferring context: 388B                                                                                   0.0s
 => CACHED [2/5] WORKDIR /app                                                                                       0.0s
 => CACHED [3/5] ADD . /app                                                                                         0.0s
 => CACHED [4/5] COPY requirements.txt /app                                                                         0.0s
 => CACHED [5/5] RUN python3 -m pip install -r requirements.txt                                                     0.0s
 => exporting to image                                                                                              0.0s
 => => exporting layers                                                                                             0.0s
 => => writing image sha256:164a0fcf9c723c2a68c64e65951eb64a2d21fc1a2ceb36f2766739c0e5a26f30                        0.0s
 => => naming to docker.io/library/jobportal                                                                        0.0s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
PS C:\Users\Abby\Desktop\NaalayaThiran\Assignment_IV\DockerFile>
```

```
C:\Windows\System32>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'
Plug-in 'container-registry 1.0.2' was already installed. Do you want to update it with 'container-registry[cr] 1.0.2' or not? [y/N] > y
Attempting to download the binary file...
 11.90 MiB / 11.90 MiB [================================================================================] 100.00% 6s
12476416 bytes downloaded
Installing binary...
OK
Plug-in 'container-registry 1.0.2' was successfully installed into C:\Users\Abby\.bluemix\plugins\container-registry. Use 'ibmcloud plugin show container-registry' to show its details.

C:\Windows\System32>ibmcloud login -a https://cloud.ibm.com
API endpoint: https://cloud.ibm.com

Email> abishek.1901002@srec.ac.in

Password>
Authenticating...
OK

Targeted account ABISHEK PS (d1537797ff3c457ebbc7ce87d8ef0de2)


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> 1
Targeted region au-syd


API endpoint:      https://cloud.ibm.com
Region:            au-syd
User:              abishek.1901002@srec.ac.in
Account:           ABISHEK PS (d1537797ff3c457ebbc7ce87d8ef0de2)
Resource group:    No resource group targeted, use 'ibmcloud target -g RESOURCE_GROUP'
CF API endpoint:
Org:
Space:
```

```
C:\Windows\System32>ibmcloud cr region-set ap-south
The region is set to 'ap-south', the registry is 'au.icr.io'.

OK

C:\Windows\System32>ibmcloud cr namespace-add ibm-job-portal
No resource group is targeted. Therefore, the default resource group for the account ('Default') is targeted.

Adding namespace 'ibm-job-portal' in resource group 'Default' for account ABISHEK PS in registry au.icr.io...

Successfully added namespace 'ibm-job-portal'

OK

C:\Windows\System32>ibmcloud cr login
Logging 'docker' in to 'au.icr.io'...
Logged in to 'au.icr.io'.

OK

C:\Windows\System32>docker pull abbyhere/jobportal
Using default tag: latest
latest: Pulling from abbyhere/jobportal
Digest: sha256:fdb53909d64443b0e3d246c62874d8b09a2fe59f5df1ded31b8b865cc947a669
Status: Image is up to date for abbyhere/jobportal:latest
docker.io/abbyhere/jobportal:latest

C:\Windows\System32>docker tag abbyhere/jobportal au.icr.io/doc-jobportal/job-portal:Job-Portal

C:\Windows\System32>docker tag abbyhere/jobportal au.icr.io/ibm-job-portal/job-portal:Job-Portal

C:\Windows\System32>docker push au.icr.io/ibm-job-portal/job-portal:Job-Portal
The push refers to repository [au.icr.io/ibm-job-portal/job-portal]
d85e5f406cdb: Pushed
d6693062292e: Pushed
867dab89e60a: Pushed
6bfddd10e340: Pushed
5183217745a1: Pushed
905ede8abeca: Pushed
63ab2579942e: Pushed
e6e9854ca999: Pushed
397a239a053b: Pushed
89c3244a87b2: Pushed
80231db1194c: Pushed
f1c1f2298584: Pushed
ccba29d69370: Pushed
Job-Portal: digest: sha256:fdb53909d64443b0e3d246c62874d8b09a2fe59f5df1ded31b8b865cc947a669 size: 3052

C:\Windows\System32>
```




```
C:\Windows\System32>ibmcloud cr image-list
Listing images...

Repository                          Tag         Digest        Namespace       Created      Size     Security status
au.icr.io/ibm-job-portal/job-portal   Job-Portal   fdb53909d644   ibm-job-portal   2 hours ago   442 MB   -

OK

C:\Windows\System32>docker pull au.icr.io/ibm-job-portal/job-portal
Using default tag: latest
```

Question-4:

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

Yaml file:

```
apiVersion: apps/v1
kind: Deployment
metadata:
name: flask-node-deployment
spec:
 replicas: 1
 selector:
  matchLabels:
   app: flasknode
 template:
  metadata:
   labels:
    app: flasknode
  spec:
   containers:
    -name: flasknode
    image: abbyhere/jobportal
    imagePullPolicy: Always
  ports:
    -containerPort: 5000
```