

## Assignment -4

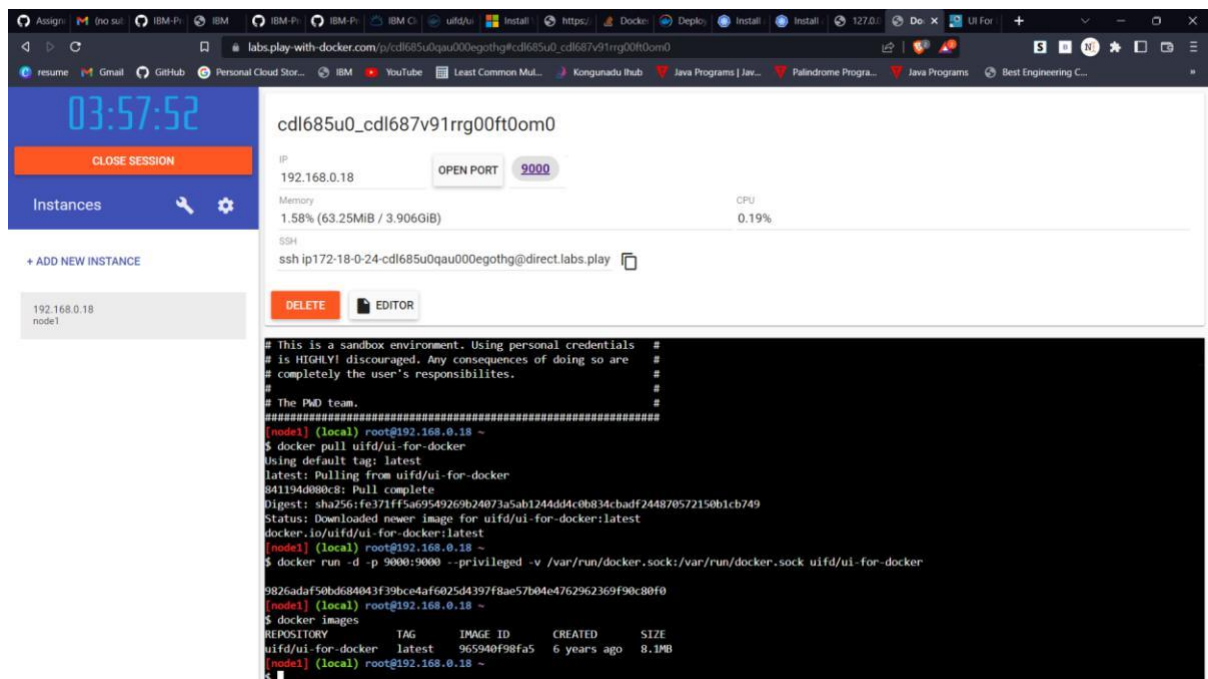
### Kubernetes / Docker

Assignment Date	11 November 2022
Student Name	Arshad Y
Student Roll Number	1919102016
Maximum Marks	2 Marks

#### Question-1:

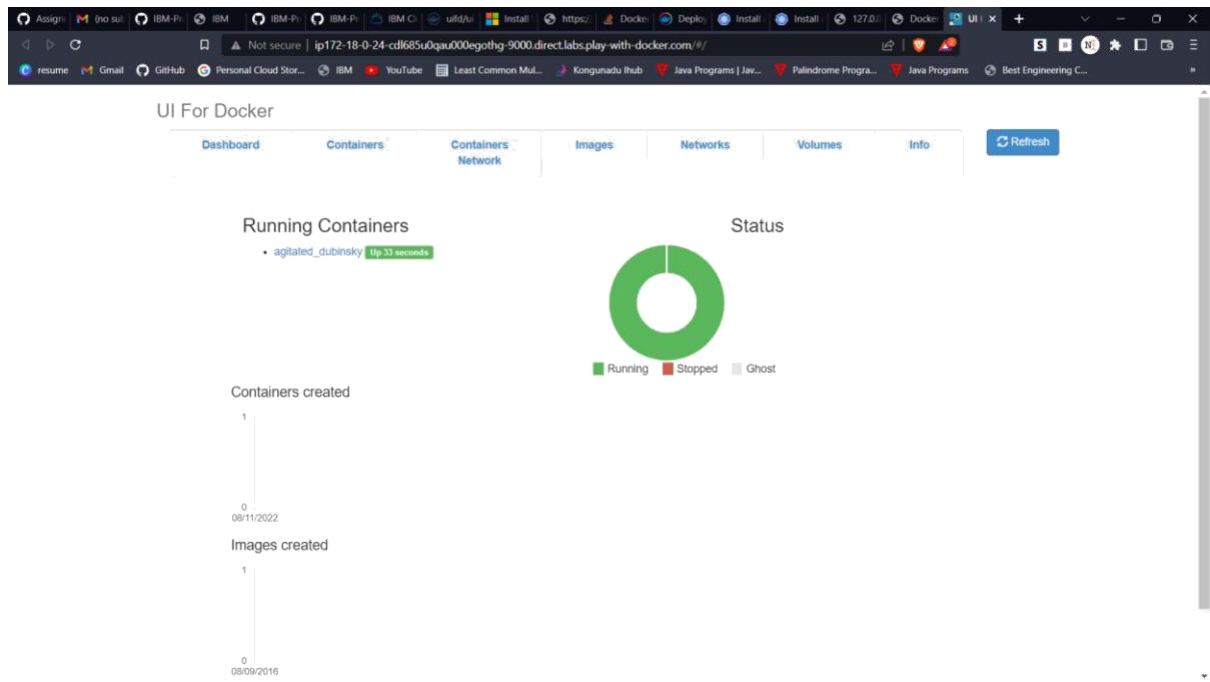
Pull an Image from docker hub and run it in docker playground.

#### Solution:



The screenshot shows the Docker Playground interface. On the left, there's a sidebar with a clock showing 03:57:52, a 'CLOSE SESSION' button, and a list of instances. The main area displays the instance details for 'cdl685u0\_cdl687v91rrg00ft0om0', including its IP (192.168.0.18), memory usage (1.58%), CPU usage (0.19%), and an SSH command. Below this, there's a terminal window showing 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 PMD team. #
#####
(node1) (local) root@192.168.0.18 ~
$ docker pull uifd/ui-for-docker
Using default tag: latest
latest: Pulling from uifd/ui-for-docker
041194d800c8: Pull complete
Digest: sha256:fe371ff5a69549269b24073a5ab1244dd4c0b834cbad244870572150b1cb749
Status: Downloaded newer image for uifd/ui-for-docker:latest
docker.io/uifd/ui-for-docker:latest
(node1) (local) root@192.168.0.18 ~
$ docker run -d -p 9000:9000 --privileged -v /var/run/docker.sock:/var/run/docker.sock uifd/ui-for-docker
9826adaf50bd684043f39bce4af6025d4397f8ae57b04e4762962369f90c80f0
(node1) (local) root@192.168.0.18 ~
$ docker images
REPOSITORY          TAG         IMAGE ID      CREATED      SIZE
uifd/ui-for-docker  latest     965940f98fa5  6 years ago  8.1MB
(node1) (local) root@192.168.0.18 ~
$
```



## Question-2:

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

### Solution:

#### app.py

```
from flask import *  
app = Flask(__name__)  
@app.route("/")  
def home():  
    return "Hello World"  
if __name__ == "__main__":  
    app.run(debug=True)
```

## Dockerfile:

FROM python:3.6

WORKDIR /app

ADD . /app

COPY requirements.txt /app

RUN python3 -m pip install -r requirements.txt

RUN python3 -m pip install ibm\_db

EXPOSE 5000

CMD ["python","app.py"]

```
C:\Windows\System32\cmd.e  x + v
Microsoft Windows [Version 10.0.22621.755]
(c) Microsoft Corporation. All rights reserved.

D:\OneDrive\Desktop\IBM Docs\Assignments\assignment-four>docker build -t assignment-four
"docker build" requires exactly 1 argument.
See 'docker build --help'.

Usage:  docker build [OPTIONS] PATH | URL | -

Build an image from a Dockerfile

D:\OneDrive\Desktop\IBM Docs\Assignments\assignment-four>docker build -t assignment-four .
[+] Building 410.4s (12/12) FINISHED
=> [internal] load build definition from Dockerfile                                0.0s
=> => transferring dockerfile: 231B                                              0.0s
=> [internal] load .dockerignore                                                  0.0s
=> => transferring context: 2B                                                  0.0s
=> [internal] load metadata for docker.io/library/python:3.6                    3.1s
=> [auth] library/python:pull token for registry-1.docker.io                   0.0s
=> [1/6] FROM docker.io/library/python:3.6@sha256:f8652afaf88c25f0d22354d547d892591067aa4026a7fa9a6819df9f300af6fc  0.0s
=> [internal] load build context                                                 0.0s
=> => transferring context: 292B                                                0.0s
=> CACHED [2/6] WORKDIR /app                                                    0.0s
=> [3/6] ADD . /app                                                             0.0s
=> [4/6] COPY requirements.txt /app                                             0.0s
=> [5/6] RUN python3 -m pip install -r requirements.txt                         5.7s
=> [6/6] RUN python3 -m pip install ibm_db                                     480.6s
=> => exporting layers                                                            0.0s
=> => exporting image sha256:c078f0dadaefc509e6a60020e5640f17a4aae981c68d3f7c7c416ec0c88fcbac  0.7s
=> => writing image sha256:c078f0dadaefc509e6a60020e5640f17a4aae981c68d3f7c7c416ec0c88fcbac  0.0s
=> => naming to docker.io/library/assignment-four                             0.0s

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

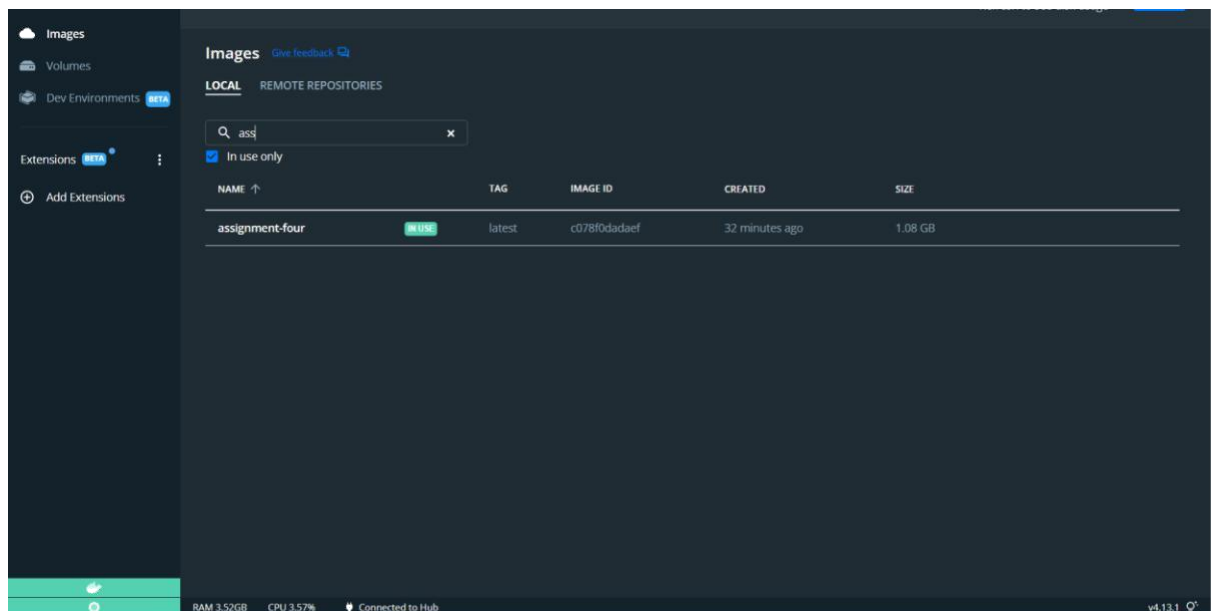
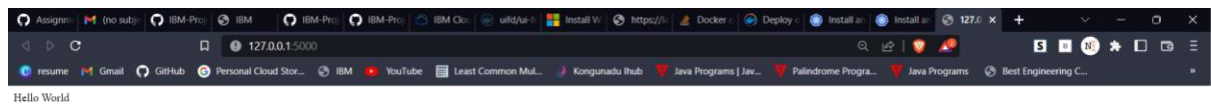
D:\OneDrive\Desktop\IBM Docs\Assignments\assignment-four>
```

```
C:\Windows\System32\cmd.exe x + v
D:\OneDrive\Desktop\IBM Docs\Assigments\assignment-four>docker images
REPOSITORY                                TAG                                IMAGE ID                                CREATE
D                                         SIZE
assignment-four                           latest                           c078f0dadaef                           55 sec
onds ago                                1.08GB
<none>                                    <none>                           43c70dac96eb                           15 min
utes ago                                913MB
docker101tutorial                        latest                           3da8546f1c85                           5 days
ago                                     28.9MB
alpine/git                               latest                           42a1cda0ba24                           2 week
s ago                                   43.6MB
docker/desktop-git-helper                c1e302e18fba86bb07f6b657155011bd6791dfc5 352f04e41a19                           2 week
s ago                                   45.8MB
hubproxy.docker.internal:5000/docker/desktop-kubernetes kubernetes-v1.25.2-cni-v1.1.1-critools-v1.24.2-cri-dockerd-v0.2.5-1-debian 09d7e1dbc2c4                           6 week
s ago                                   363MB
k8s.gcr.io/kube-apiserver                v1.25.2                           97801f839490                           6 week
s ago                                   128MB
k8s.gcr.io/kube-scheduler                v1.25.2                           ca0ea1ee3cfd                           6 week
s ago                                   50.6MB
k8s.gcr.io/kube-controller-manager       v1.25.2                           dbfceb93c69b                           6 week
s ago                                   117MB
k8s.gcr.io/kube-proxy                    v1.25.2                           1c7d8c51823b                           6 week
s ago                                   61.7MB
k8s.gcr.io/pause                         3.8                               4873874c08ef                           4 mont
hs ago                                   711kB
k8s.gcr.io/etcd                          3.5.4-0                           a8a176a5d5d6                           5 mont
hs ago                                   300MB
k8s.gcr.io/coredns                       v1.9.3                           5185b96f0bec                           5 mont
hs ago                                   48.8MB
docker/getting-started                   latest                           cb90f98fd791                           7 mont
hs ago                                   28.8MB
docker/desktop-git-helper                5a4fca126aadcd3f6cc3a011aa991de982ae7000 efe2d67c483b                           15 mon
ths ago                                   44.2MB
docker/desktop-vpnkit-controller         v2.0                               8c2c38aa676e                           18 mon
ths ago                                   21MB
docker/desktop-storage-provisioner       v2.0                               99f89471f470                           18 mon
ths ago                                   41.9MB

D:\OneDrive\Desktop\IBM Docs\Assigments\assignment-four>docker run -p 5000:5000 assignment-four
* Serving Flask app 'app' (lazy loading)
* Environment: production
WARNING: This is a development server. Do not use it in a production deployment.
```

```
C:\Windows\System32\cmd.exe x + v
docker101tutorial                        latest                           3da8546f1c85                           5 days
ago                                     28.9MB
alpine/git                               latest                           42a1cda0ba24                           2 week
s ago                                   43.6MB
docker/desktop-git-helper                c1e302e18fba86bb07f6b657155011bd6791dfc5 352f04e41a19                           2 week
s ago                                   45.8MB
hubproxy.docker.internal:5000/docker/desktop-kubernetes kubernetes-v1.25.2-cni-v1.1.1-critools-v1.24.2-cri-dockerd-v0.2.5-1-debian 09d7e1dbc2c4                           6 week
s ago                                   363MB
k8s.gcr.io/kube-apiserver                v1.25.2                           97801f839490                           6 week
s ago                                   128MB
k8s.gcr.io/kube-scheduler                v1.25.2                           ca0ea1ee3cfd                           6 week
s ago                                   50.6MB
k8s.gcr.io/kube-controller-manager       v1.25.2                           dbfceb93c69b                           6 week
s ago                                   117MB
k8s.gcr.io/kube-proxy                    v1.25.2                           1c7d8c51823b                           6 week
s ago                                   61.7MB
k8s.gcr.io/pause                         3.8                               4873874c08ef                           4 mont
hs ago                                   711kB
k8s.gcr.io/etcd                          3.5.4-0                           a8a176a5d5d6                           5 mont
hs ago                                   300MB
k8s.gcr.io/coredns                       v1.9.3                           5185b96f0bec                           5 mont
hs ago                                   48.8MB
docker/getting-started                   latest                           cb90f98fd791                           7 mont
hs ago                                   28.8MB
docker/desktop-git-helper                5a4fca126aadcd3f6cc3a011aa991de982ae7000 efe2d67c483b                           15 mon
ths ago                                   44.2MB
docker/desktop-vpnkit-controller         v2.0                               8c2c38aa676e                           18 mon
ths ago                                   21MB
docker/desktop-storage-provisioner       v2.0                               99f89471f470                           18 mon
ths ago                                   41.9MB

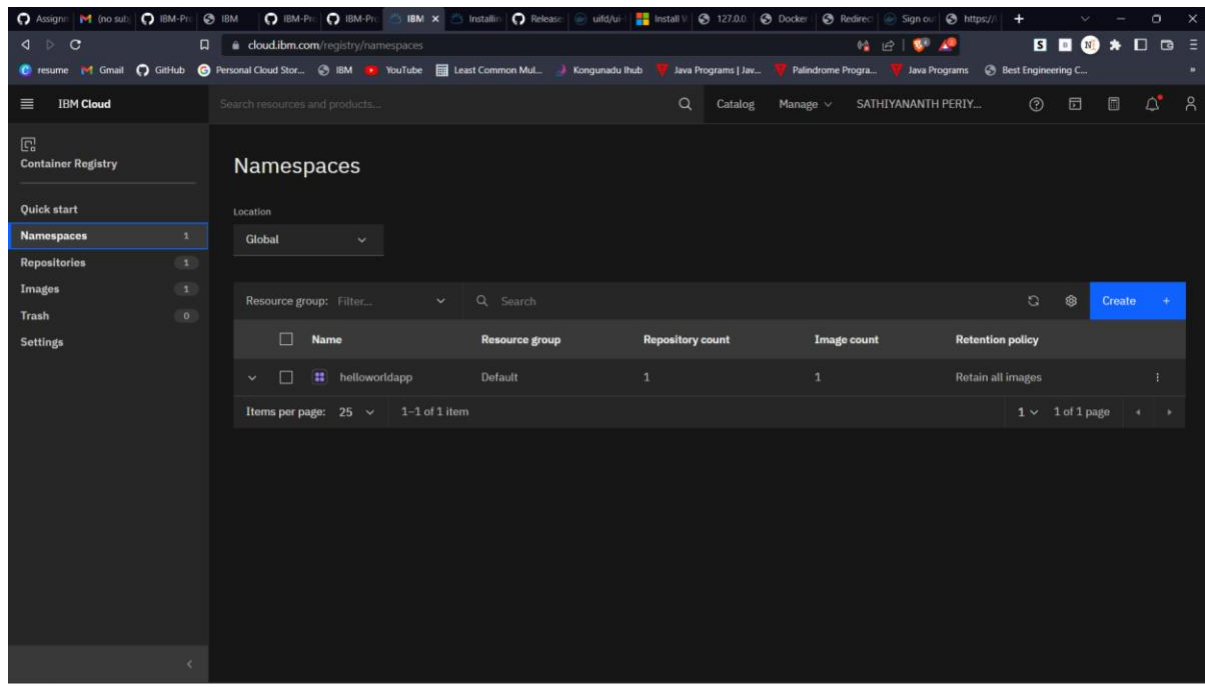
D:\OneDrive\Desktop\IBM Docs\Assigments\assignment-four>docker run -p 5000:5000 assignment-four
* Serving Flask app 'app' (lazy loading)
* Environment: production
WARNING: This is a development server. Do not use it in a production deployment.
Use a production WSGI server instead.
* Debug mode: on
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
* Restarting with stat
* Debugger is active!
* Debugger PIN: 509-750-282
```



Question-3:

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

## Solution:



```
Command Prompt

C:\Users\ASUS>docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one.
Username: sathiyanth
Password:
Login Succeeded

Logging in with your password grants your terminal complete access to your account.
For better security, log in with a limited-privilege personal access token. Learn more at https://docs.docker.com/go/access-tokens/

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

OK

C:\Users\ASUS>ibmcloud cr namespace-add helloworldapp
No resource group is targeted. Therefore, the default resource group for the account ('Default') is targeted.
Adding namespace 'helloworldapp' in resource group 'Default' for account SATHIYANANTH PERIYASAMY's Account in registry icr.io...
The requested namespace is already owned by your account.

OK

C:\Users\ASUS>docker tag assignment-four icr.io/helloworldapp/testrepo:helloworldtest

C:\Users\ASUS>docker push icr.io/helloworldapp/testrepo:helloworldtest
The push refers to repository [icr.io/helloworldapp/testrepo]
7f54fa385bac: Pushed
22a411d35e51: Pushed
3b90b4b2ef59: Pushed
9ea062ac7e5d: Pushed
78ac81885ac4: Pushed
aa4c888c19f6: Pushed
8ba9f698e8ba: Pushed
3e607d59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d593ed24: Pushed
26a504e63be4: Pushed
8bf42db0de72: Pushed
31892cc314cb: Pushed
```

```
Command Prompt
C:\Users\ASUS>docker tag assignment-four icr.io/helloworldapp/testrepo:helloworldtest
C:\Users\ASUS>docker push icr.io/helloworldapp/testrepo:helloworldtest
The push refers to repository [icr.io/helloworldapp/testrepo]
7f54fa385bac: Pushed
22a411d35e51: Pushed
3b94b2ef59: Pushed
9ea862ac7e5d: Pushed
78ac81885ac4: Pushed
aa4c888c19f6: Pushed
8ba9f690e8ba: Pushed
3e607d59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d593ed24: Pushed
26a504e63be4: Pushed
8bf42db0de72: Pushed
31892cc314cb: Pushed
11936051f93b: Pushed
helloworldtest: digest: sha256:78e5bb538c5b55e5827f0eecf765cb3690a4cf37ec0195dc98cb222669f0155e size: 3262
C:\Users\ASUS>ibmcloud cr image-list
Listing images...
Repository          Tag          Digest          Namespace      Created      Size      Security status
icr.io/helloworldapp/testrepo  helloworldtest  78e5bb538c5b    helloworldapp  2 hours ago  435 MB    -
OK
C:\Users\ASUS>|
```

Container Registry

Quick start

Namespaces1

**Repositories1**

Images1

Trash0

Settings

Repositories

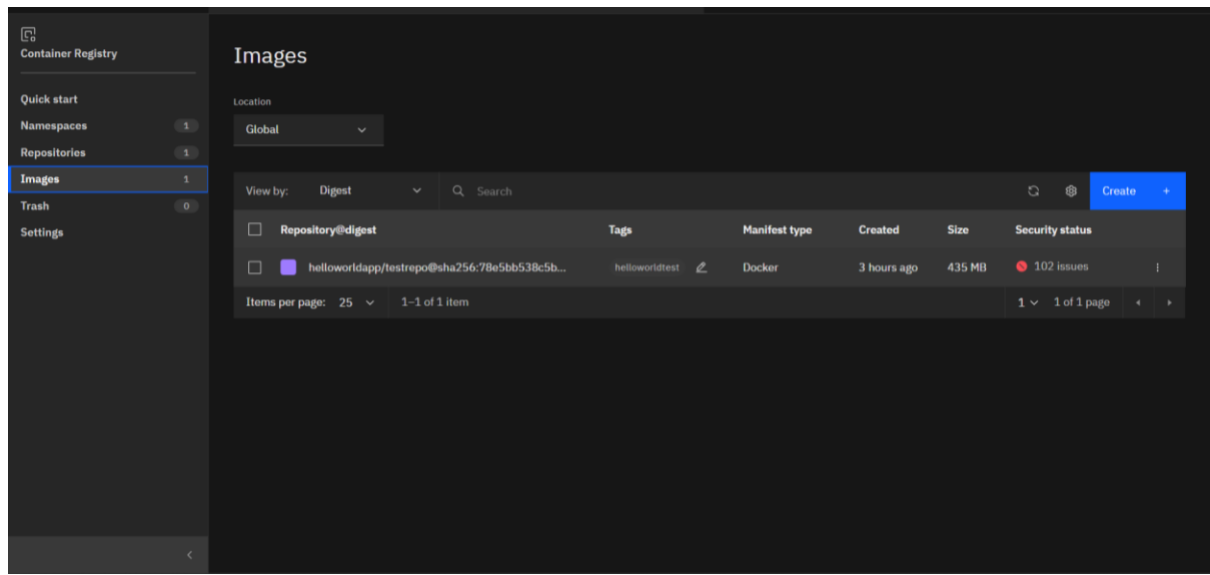
LocationGlobal

Search

Create

<input type="checkbox"/>	Name	Image count	Namespace	Last updated	
<input checked="" type="checkbox"/>	<div>testrepo</div> <div>icr.io/helloworldapp/testrepo</div>	1	helloworldapp	3 hours ago	

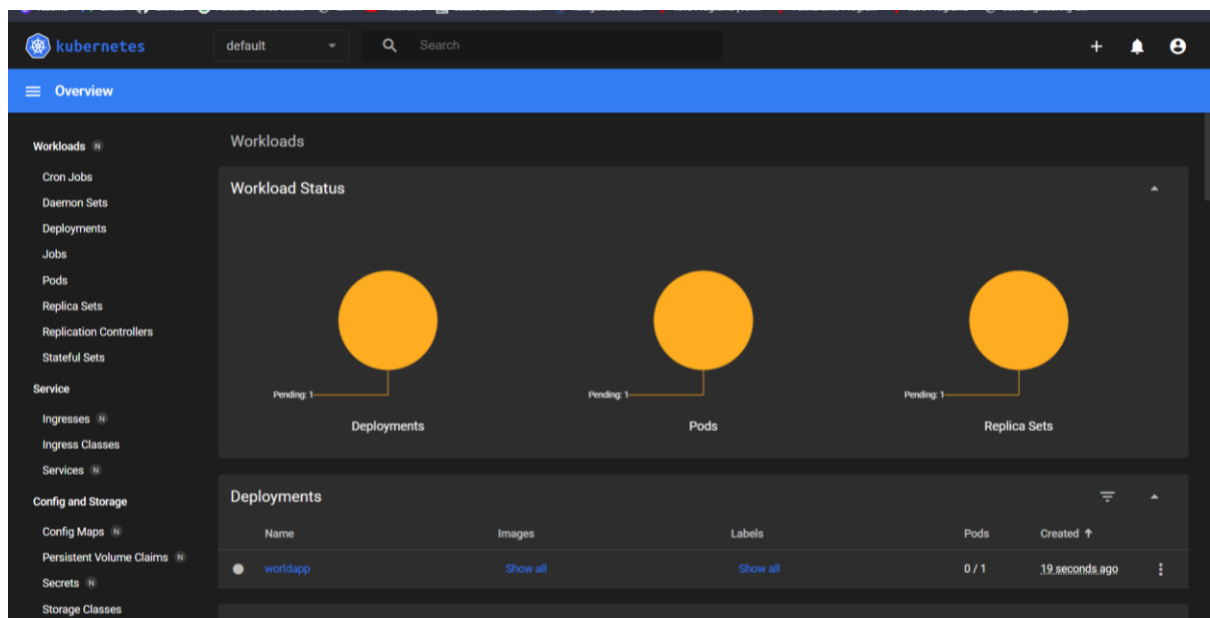
Items per page: 251-1 of 1 item11 of 1 page




#### Question-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.


#### Solution:








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








Config Maps

Persistent Volume Claims


Secrets

Storage Classes

Namespaces

Name	Labels	Phase	Created
 ibm-cert-store	Show all	Active	an hour ago
 ibm-operators	Show all	Active	an hour ago
 ibm-system	Show all	Active	2 hours ago
 default	Show all	Active	2 hours ago
 kube-node-lease	Show all	Active	2 hours ago
 kube-public	Show all	Active	2 hours ago
 kube-system	Show all	Active	2 hours ago

Nodes

Name	Labels	Ready	CPU requests (cores)	CPU limits (cores)	CPU capacity (cores)	Memory requests (bytes)	Memory limits (bytes)	Memory capacity (bytes)	Pods	Create
 10.144.228.173	Show all	True	959.00m (49.95%)	498.00m (25.94%)	1.92	724.52Mi (26.81%)	5.43Gi (205.90%)	2.64Gi	16 (14.55%)	an hour ago