

## Assignment -4

### Kubernetes / Docker

Assignment Date	02 November 2022
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Student Roll Number	621319104037
Maximum Marks	2 Marks

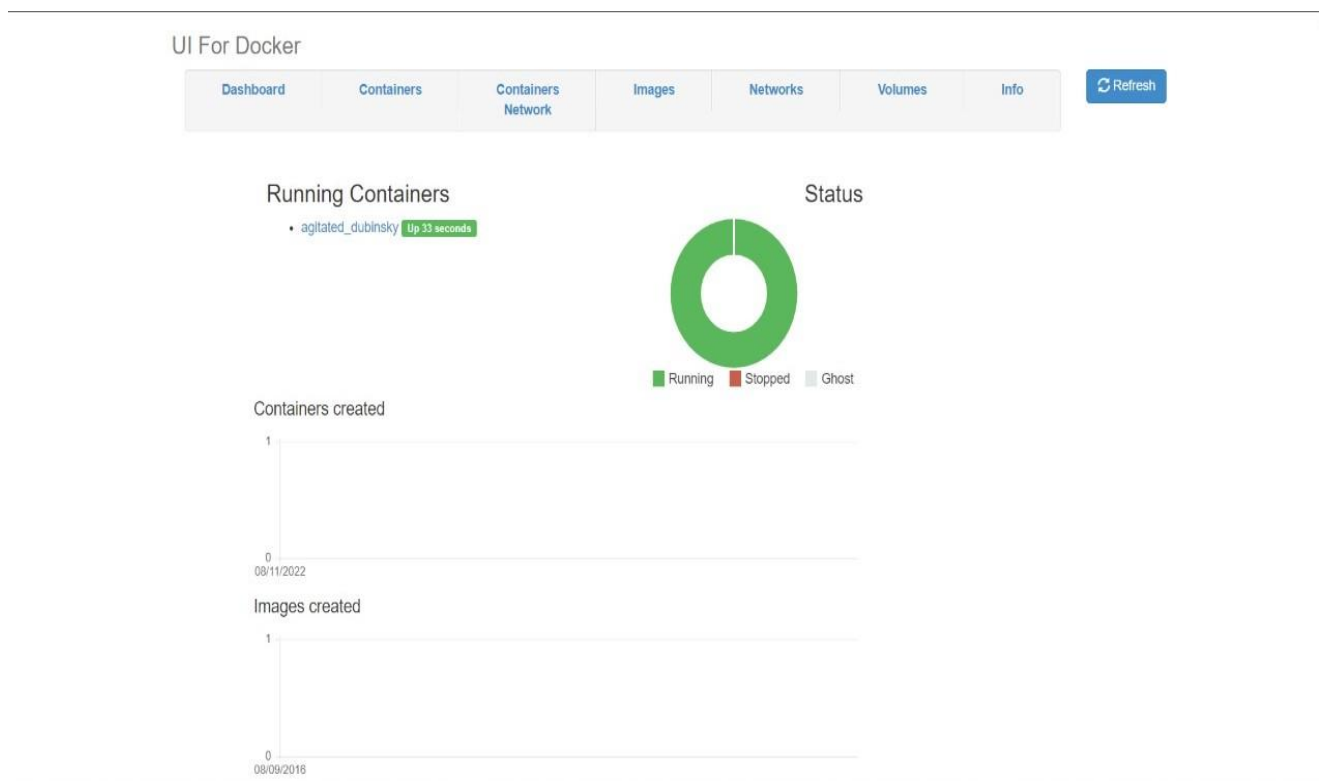
#### Question-1:

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

#### Solution:

The screenshot displays the Docker Playground interface. On the left, a sidebar shows a timer at 03:57:52, a 'CLOSE SESSION' button, and a list of instances with one instance named 'node1' at IP 192.168.0.18. The main panel shows details for instance 'cdl685u0\_cdl687v91rrg00ft0om0' with IP 192.168.0.18, memory usage of 1.58% (63.25MiB / 3.906GiB), and CPU usage of 0.19%. An 'OPEN PORT' button is set to 9000. Below this, an SSH command is provided: `ssh ip172-18-0-24-cdl685u0qau000egothg@direct.labs.play`. At the bottom, 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 PwD 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
841194d080c8: Pull complete
Digest: sha256:fe371ff5a69549269b24073a5ab1244dd4c0b834cbadf244870572150b1cb749
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.exe
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
=> == transferring dockerfile: 231B 0.0s
=> [internal] load .dockerignore
=> == 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:f8652afaf88c25f6d22354d547d892591867aa4026a7fa9a6019df9f308af6fc 0.0s
=> [internal] load build context
=> == 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 400.6s
=> exporting to image 0.0s
=> == exporting layers 0.7s
=> == writing image sha256:c078f0dadaefc509e6a60028e5640f17a4aa981c68d3f7c7c416ec0c88fcbac 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.e x + v
D:\OneDrive\Desktop\IBM Docs\Assignments\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             42alcda0ba24       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 efe2d67c403b       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\Assignments\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.e x + v
docker101tutorial      latest             3da8546f1c85       5 days
ago                    28.9MB
alpine/git              latest             42alcda0ba24       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 efe2d67c403b       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\Assignments\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
```

Hello World

Containers

Images

Volumes

Dev Environments BETA

Extensions BETA

Add Extensions

Images on disk

Last refresh: Never17 ImagesRefresh to see disk usageClean up

Images [Give feedback](#)

LOCALREMOTE REPOSITORIES

🔍 assign

✕

☒ In use only

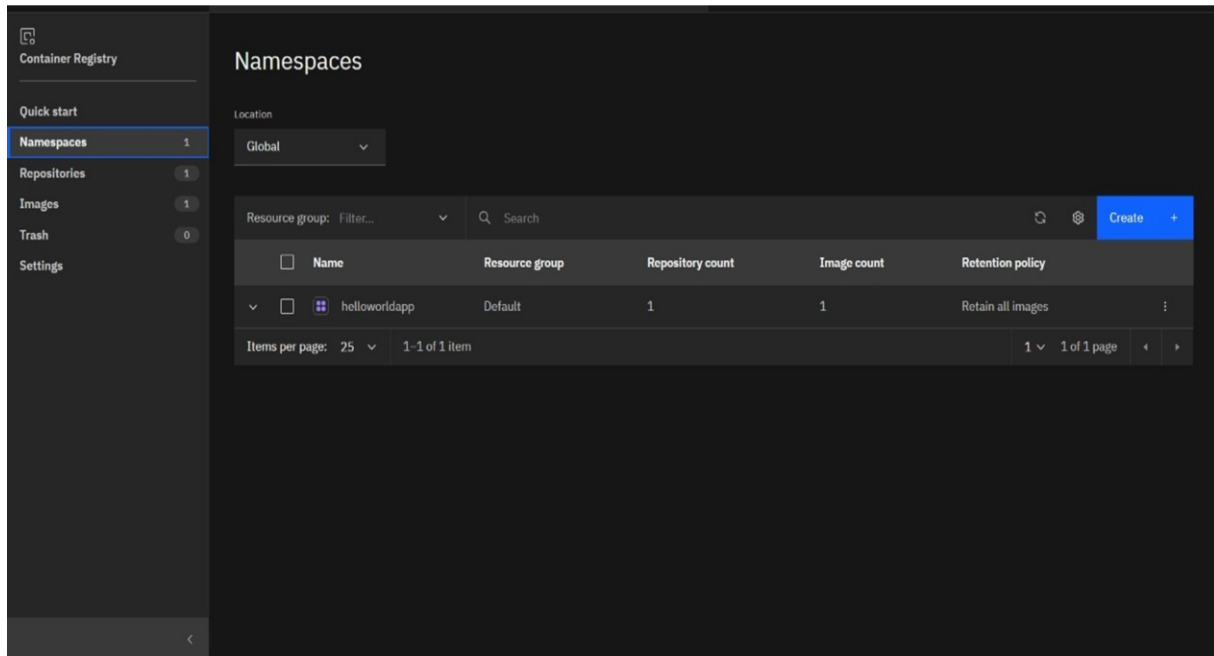
NAME ↑		TAG	IMAGE ID	CREATED	SIZE
assignment-four	<span>IN USE</span>	latest	c078f0dadaef	32 minutes ago	1.08 GB

RAM 3.52GBCPU 3.57%📶 Connected to Hubv4.13.1

### 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: sathiyananth
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

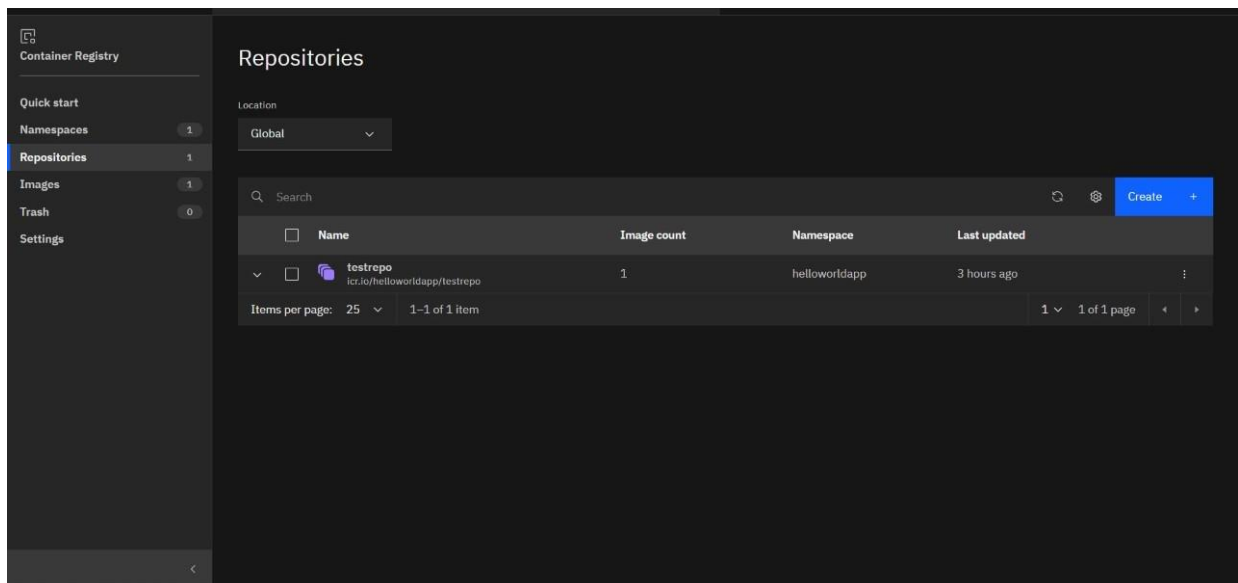
C:\Users\ASUS>docker tag assignment-four icr.io/helloworldapp/testrepo:helloworldtest

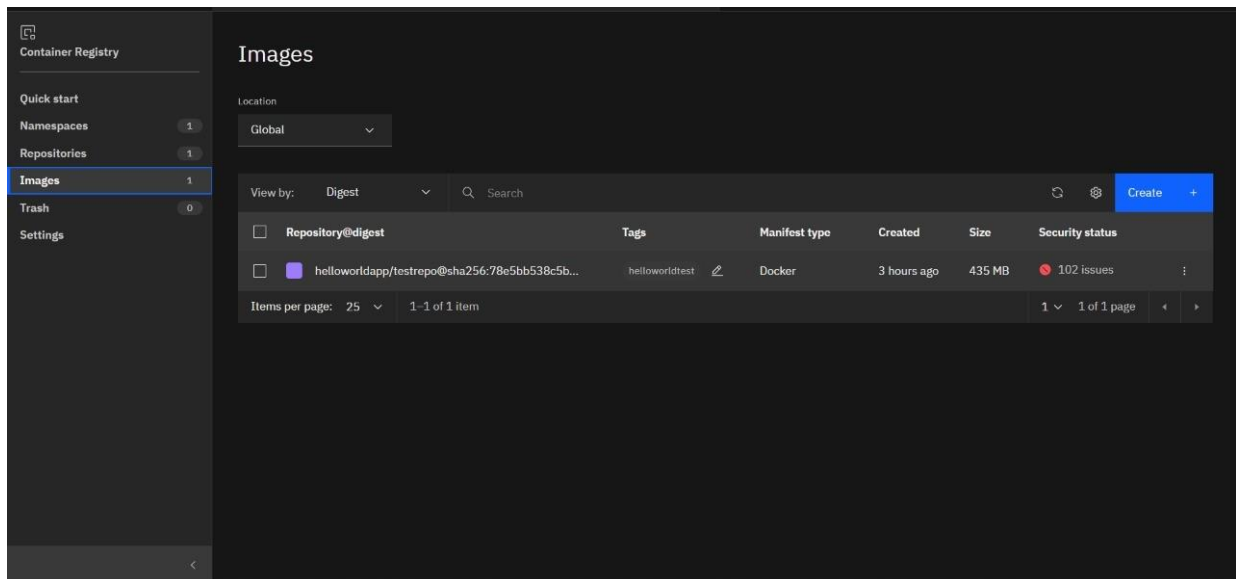
C:\Users\ASUS>docker push icr.io/helloworldapp/testrepo:helloworldtest
The push refers to repository [icr.io/helloworldapp/testrepo]
7f54fa305bac: Pushed
22a411d35e51: Pushed
3b94bdb2ef50: Pushed
9ea062ac7e5d: Pushed
78ac81885ac4: Pushed
aa4c808c19f6: Pushed
8ba9f690e8ba: Pushed
3e607d59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d592ed7d: Pushed
26a504e63be0: 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]
7f54fa305bac: Pushed
22a411d35e51: Pushed
3b94db2ef59: 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: sha256:78e5bb538c5b55e5827f8eecf765cb3698a4cf37ec0195dc98cb222669f0155e 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>
```

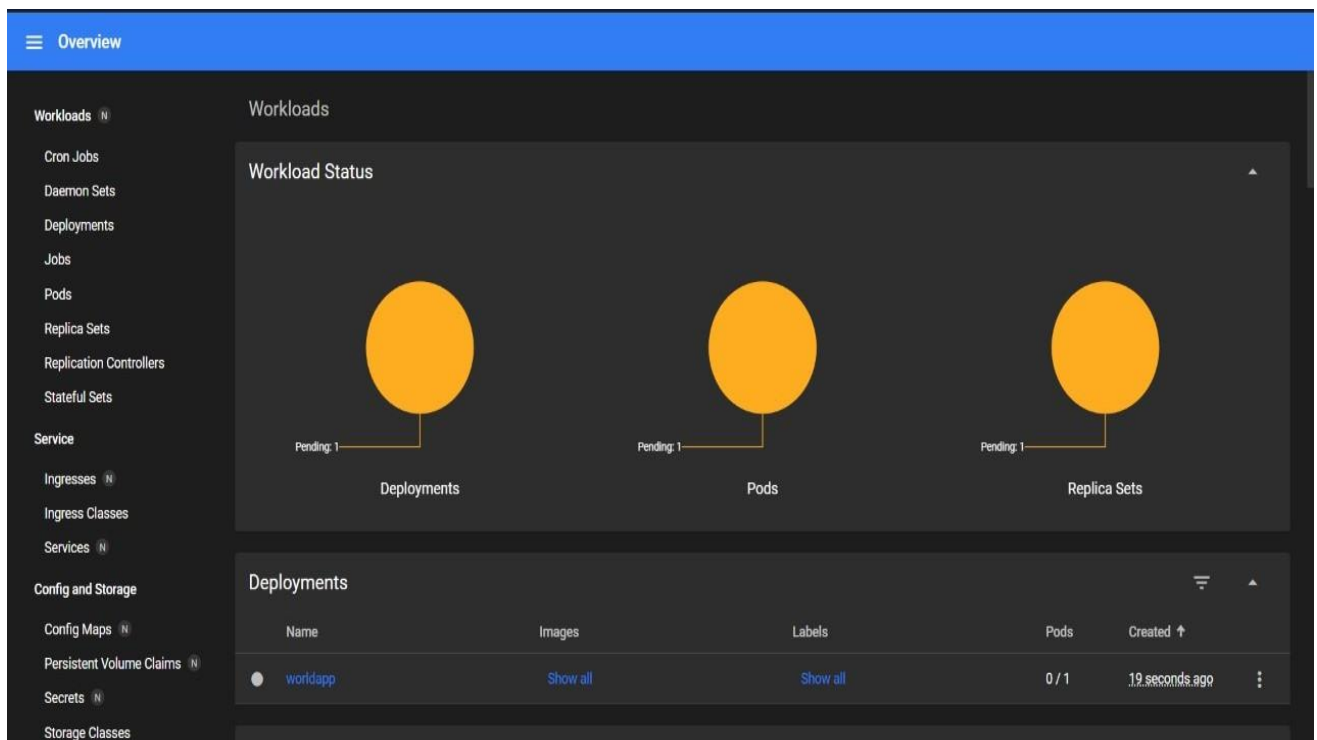




#### Question-4:

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:





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