

## Assignment -4 Kubernetes / Docker

PROJECT NAME	Personal Expense Tracker Application
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Student Name	BHARATH S
Student Roll Number	710719104021

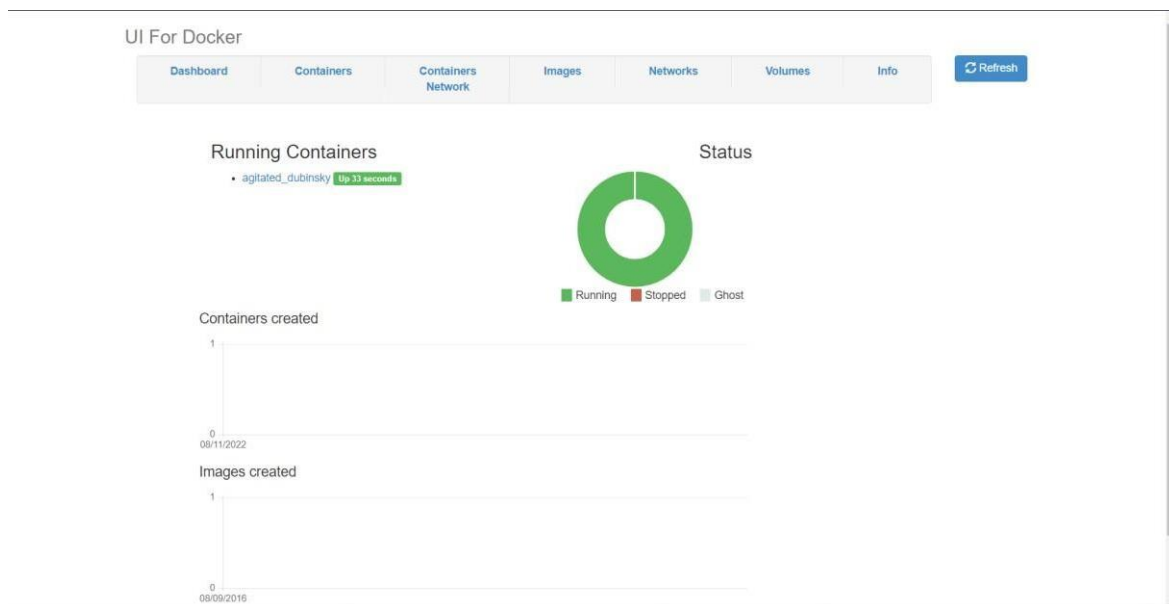
### Question-1:

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

### Solution:

The screenshot displays a 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 the instance details for 'cdl685u0\_cdl687v91rrg00ft0om0' with IP 192.168.0.18, memory usage of 1.58%, and CPU usage of 0.19%. Below this, there are 'DELETE' and 'EDITOR' buttons. The 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"]

```
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
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/python:3.6
=> [auth] library/python:pull token for registry-1.docker.io
=> [1/6] FROM docker.io/library/python:3.6@sha256:f8652afaf83c25f8c22354d547d892591067aa4026a7fa9a6819df9f300af6fc
=> [internal] load build context
=> => transferring context: 292B
=> CACHED [2/6] WORKDIR /app
=> [3/6] ADD . /app
=> [4/6] COPY requirements.txt /app
=> [5/6] RUN python3 -m pip install -r requirements.txt
=> [6/6] RUN python3 -m pip install ibm_db
=> exporting image
=> => exporting layers
=> => writing image sha256:c078f0dadaefc509e6a60020e5640f17a4aae981c68d3f7c7c416ec0c88fcbac
=> => naming to docker.io/library/assignment-four

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

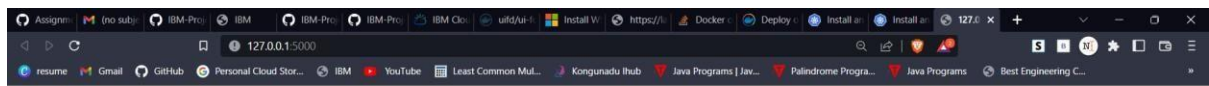
D:\OneDrive\Desktop\IBM Docs\Assignments\assignment-four>
```

```
C:\Windows\System32\cmd.exe x + v
D:\OneDrive\Desktop\IBM Docs\Assignments\assignment-four>docker images
REPOSITORY                                TAG                                IMAGE ID                                CREATE
D SIZE
assignment-four                            latest                            c078f0dadaef                            55 sec
ons ago 1.08GB
<none>                                     <none>                            43c70dac96eb                            15 min
utes ago 912MB
docker101tutorial                         latest                            3da8546f1c85                            5 days
ago 28.9MB
alpine/git                                latest                            42a1cda8ba24                            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 390MB
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

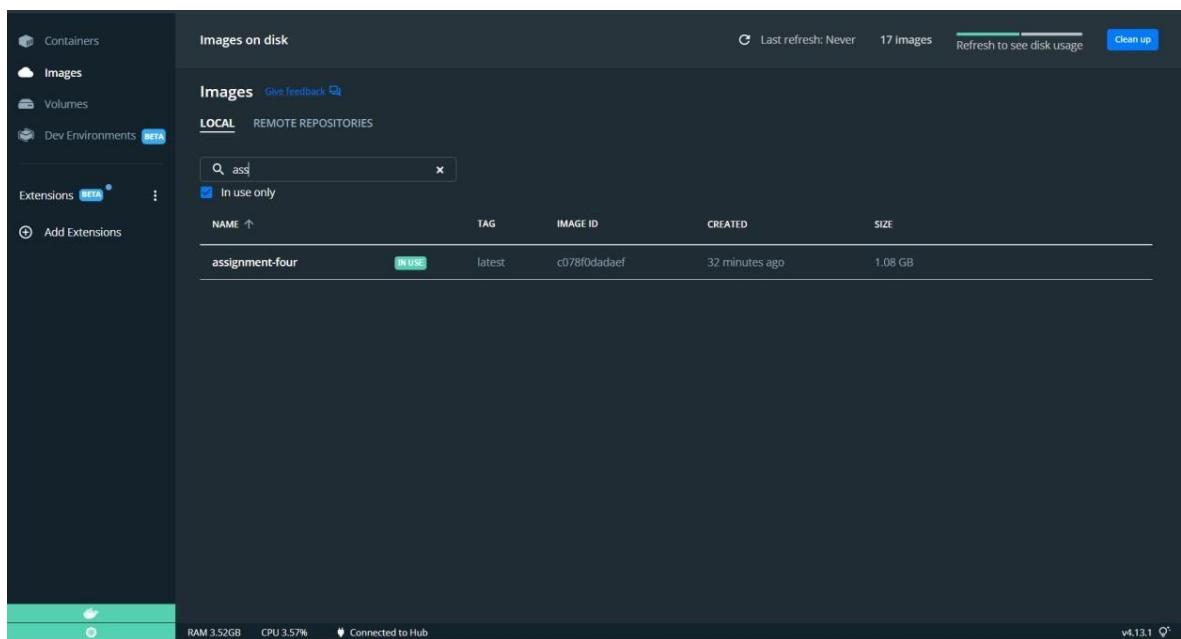
D:\OneDrive\Desktop\IBM Docs\Assignments\assignment-four>docker run -p 5000:5000 assignment-four
* Serving Flask app 'app' (lazy loading)
* Environment: production
WARNING: This is a development server. Do not use it in a production deployment.
```

```
C:\Windows\System32\cmd.exe x + v
docker101tutorial                         latest                            3da8546f1c85                            5 days
ago 28.9MB
alpine/git                                latest                            42a1cda8ba24                            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 390MB
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: 569-750-282
```



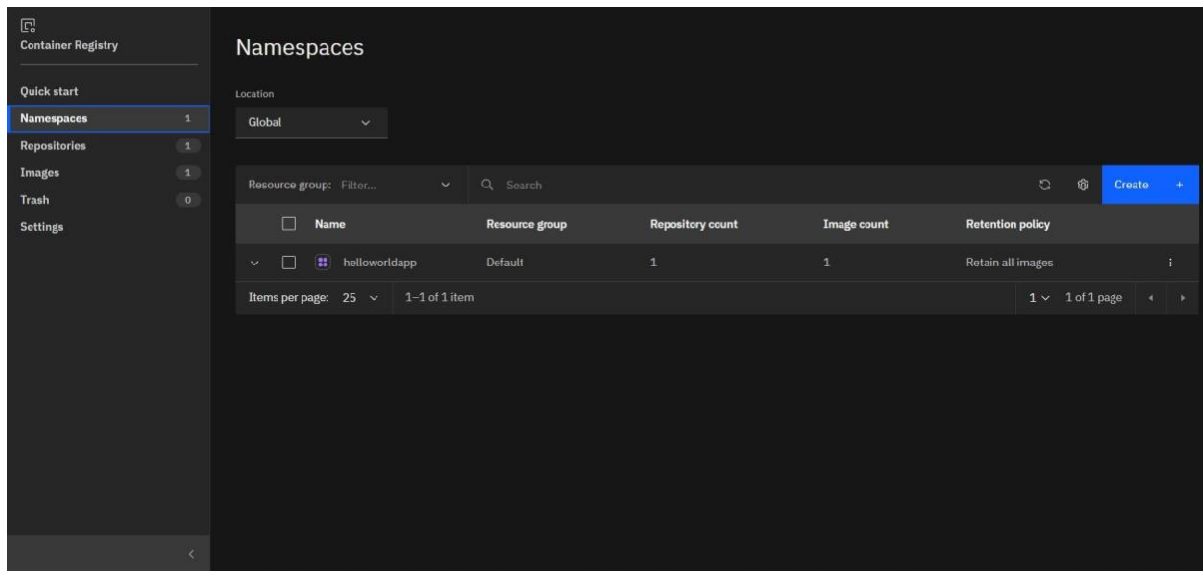
Hello World



### Question-3:

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

### Solution:



```
OK
C:\Users\VASUS>docker tag assignment-four icr.io/helloworldapp/testrepo:helloworldtest
C:\Users\VASUS>docker push icr.io/helloworldapp/testrepo:helloworldtest
The push refers to repository [icr.io/helloworldapp/testrepo]
7f54fa308bac: Pushed
22a411d35e51: Pushed
3b94bcb2efb0: Pushed
9ea062ac7e5d: Pushed
73ac01885ac4: Pushed
aa4e868e19f6: Pushed
8ba9f690a8ba: Pushed
3e097c39ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d593ed24: Pushed
26a504e63be4: Pushed
8b742cb0de72: 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
3b94bcb2ef50: Pushed
9ea062ac7e5d: Pushed
78ac81885ac4: Pushed
aa4c868c19f6: Pushed
8ba9fb90e8ba: Pushed
3e607c59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d692ed2d: Pushed
26a504e63bed: Pushed
8b442cb0de72: Pushed
31892cc314cb: Pushed
11936651f93b: 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

Location

Global

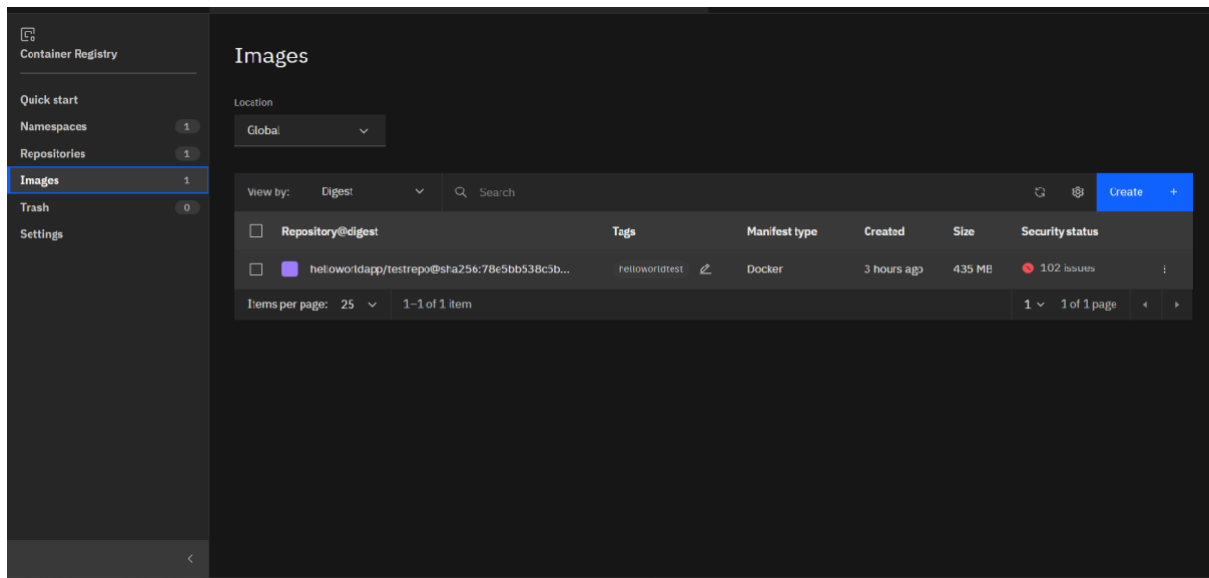
Search

Create

	Name	Image count	Namespace	Last updated
	<div>testrepo</div> <div>icr.io/helloworldapp/testrepo</div>	1	helloworldapp	3 hours ago

Items per page: 251-1 of 1 item

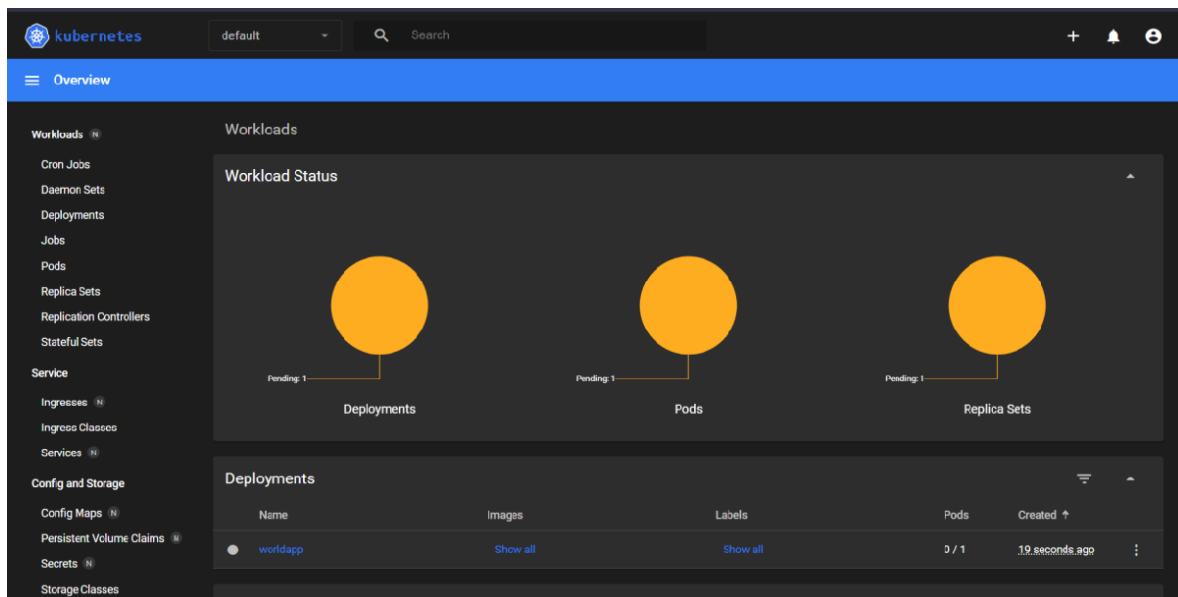
11 of 1 page




#### 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-cart-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	CPU 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 (49.93%)	498.00m (25.94%)	1.92	724.52Mi (26.81%)	5.43Gi (205.90%)	2.64Gi	16 (14.55%)	an hour ago