

Assignment -4

Kubernetes / Docker

Assignment Date	02 November 2022
Student Name	Mr T Karthikeyan
Student Roll Number	621319104022
Maximum Marks	2 Marks

Question-1:

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

Solution:

03:57:52

CLOSE SESSION

Instances

+ ADD NEW INSTANCE

192.168.0.18
node1

cdl685u0_cdl687v91rrg00ft0om0

IP
192.168.0.18

OPEN PORT
9000

Memory
1.58% (63.25MiB / 3.906GiB)

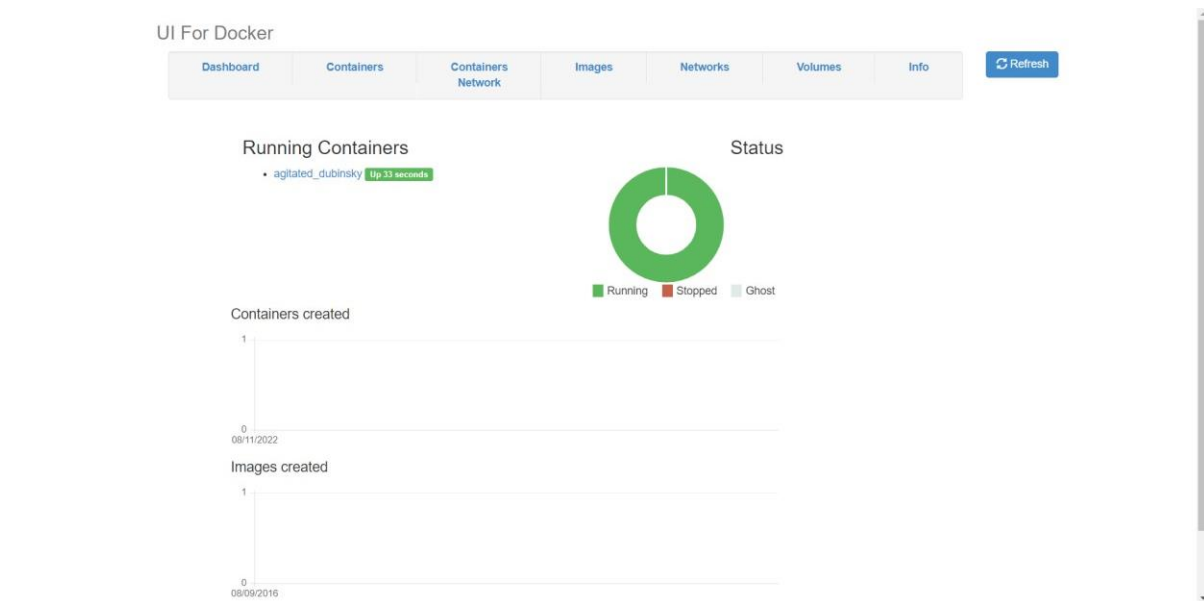
CPU
0.19%

SSH
ssh ip172-18-0-24-cdl685u0qau000egohtg@direct.labs.play

DELETE

EDITOR

```
# This is a sandbox environment. Using personal credentials #
# is HIGHLY discouraged. Any consequences of doing so are #
# completely the user's responsibilities. #
# The PMO 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
041194d00c8: Pull complete
Digest: sha256:fc371ff5a69549269b24073a5ab1244dd4c0b834cbad244870572150b1cb749
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 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 418.4s (12/12) FINISHED
=> [internal] load build definition from Dockerfile                                0.0s
=> => transferring dockerfile: 221B                                              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:f8652afaf88c25f0d22354d547d892591067aa4026a7fa9a6819df9f389af6fc  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                                       400.6s
=> exporting to image                                                            0.8s
=> => exporting layers                                                            0.7s
=> => writing image sha256:c978f0dadaefc509e6a60020e5640f17a4aae981c58d3f7c7c416ec0c88fcbac  0.8s
=> => 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
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>                           43c78dac96eb                          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 352f94e41a19                          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 69d7c1dbc2c4                          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                          ca0ealee3cfd                          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                5a4fca126aadcd3f6cc3a011aa991de982ae7600 efe2d67c403b                          15 mor
ths ago                                  44.2MB
docker/desktop-vpnkit-controller         v2.0                              8c2c38aa676e                          18 mor
ths ago                                  21MB
docker/desktop-storage-provisioner       v2.0                              99f89471f470                          18 mor
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
docker101tutorial                        latest                           3da8546f1c85                          5 days
ago                                      28.9MB
alpine/git                               latest                           42alcda0ba24                          2 week
s ago                                    43.6MB
docker/desktop-git-helper                c1e302e18fba86bb07f6b657155011bd6791dfc5 352f94e41a19                          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 69d7c1dbc2c4                          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                          ca0ealee3cfd                          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                5a4fca126aadcd3f6cc3a011aa991de982ae7600 efe2d67c403b                          15 mor
ths ago                                  44.2MB
docker/desktop-vpnkit-controller         v2.0                              8c2c38aa676e                          18 mor
ths ago                                  21MB
docker/desktop-storage-provisioner       v2.0                              99f89471f470                          18 mor
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

ImagesGive feedback

LOCALREMOTE REPOSITORIES

Search assignment

In use only

NAME		TAG	IMAGE ID	CREATED	SIZE
assignment-four	IN USE	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.

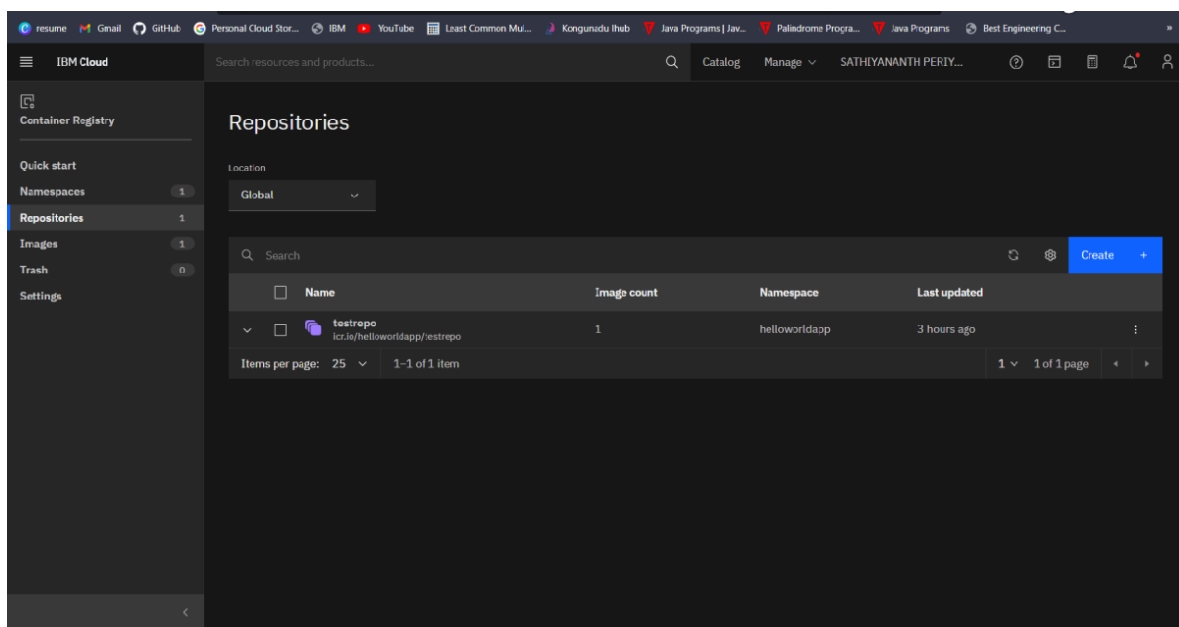
OK

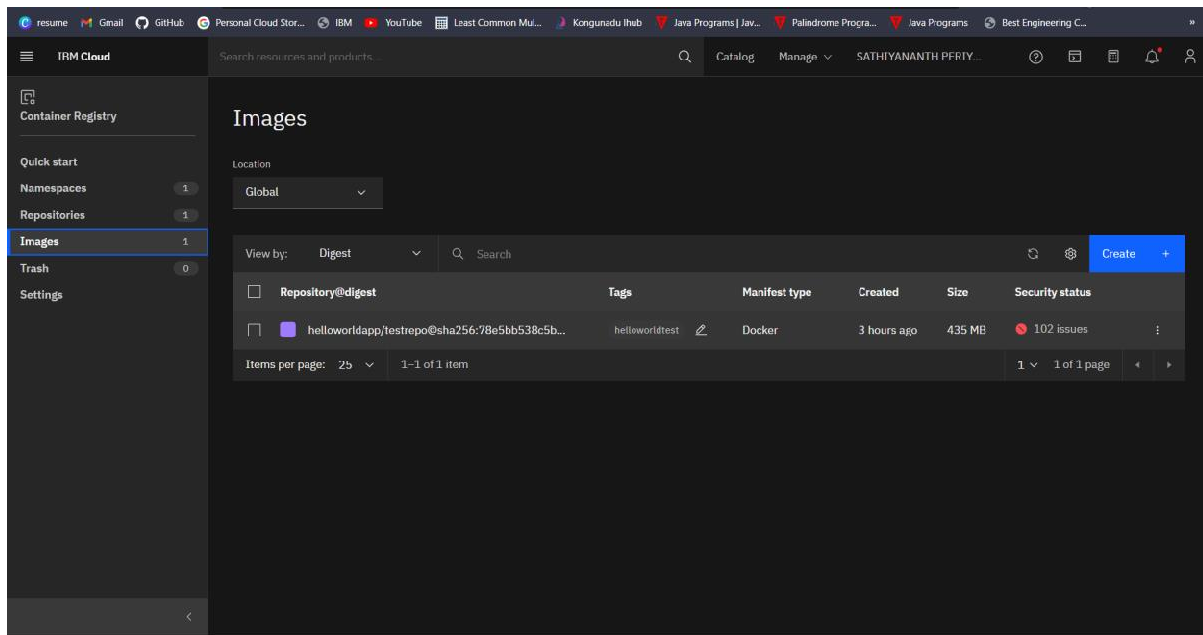
C:\Users\ASUS>docker tag assignment-four icr.io/helloworldapp/testrepo:helloworldtest

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
aa4c808c19f0: Pushed
8ba9f690e8ba: Pushed
3e607d59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d593ed20: 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]
7f54fa3055ac: Pushed
22a411d35e51: Pushed
3b94bdb2ef50: Pushed
9ea062ac7e5d: Pushed
78ac81885ac4: Pushed
aa4c808c19f6: Pushed
8ba9f690e5ba: Pushed
3e607d59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d693ed24: Pushed
26a504e63be4: Pushed
8bf442db0de72: Pushed
31892cc314cb: Pushed
11936051f93b: Pushed
helloworldtest: digest: sha256:78e5bb538c5b55e5827f0eccf765cb3690a4cf37ec0195dc78cb222669f0155e 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:

resumeGmailGitHubPersonal Cloud Stor...IBMYouTubeLeast Common Mu...Kongunadu IthubJava Programs [Jav...Palladrome Progra...Java ProgramsBest Engineering C...

kubernetesdefaultSearch

+🔔👤

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

Workloads

Workload Status

Pending: 1

Deployments

Pending: 1

Pods

Pending: 1

Replica Sets

Deployments

Name	Images	Labels	Pods	Created
worldapp	Show all	Show all	0 / 1	19 seconds ago

resumeGmailGitHubPersonal Cloud Stor...IBMYouTubeLeast Common Mu...Kongunadu IthubJava Programs [Jav...Palladrome Progra...Java ProgramsBest Engineering C...

kubernetesdefaultSearch

+🔔👤

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	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 (49.95%)	498.00m (25.94%)	1.92	724.53Mi (26.81%)	5.43Gi (205.90%)	2.64Gi	16 (14.55%)	an hour ago