

Assignment -4

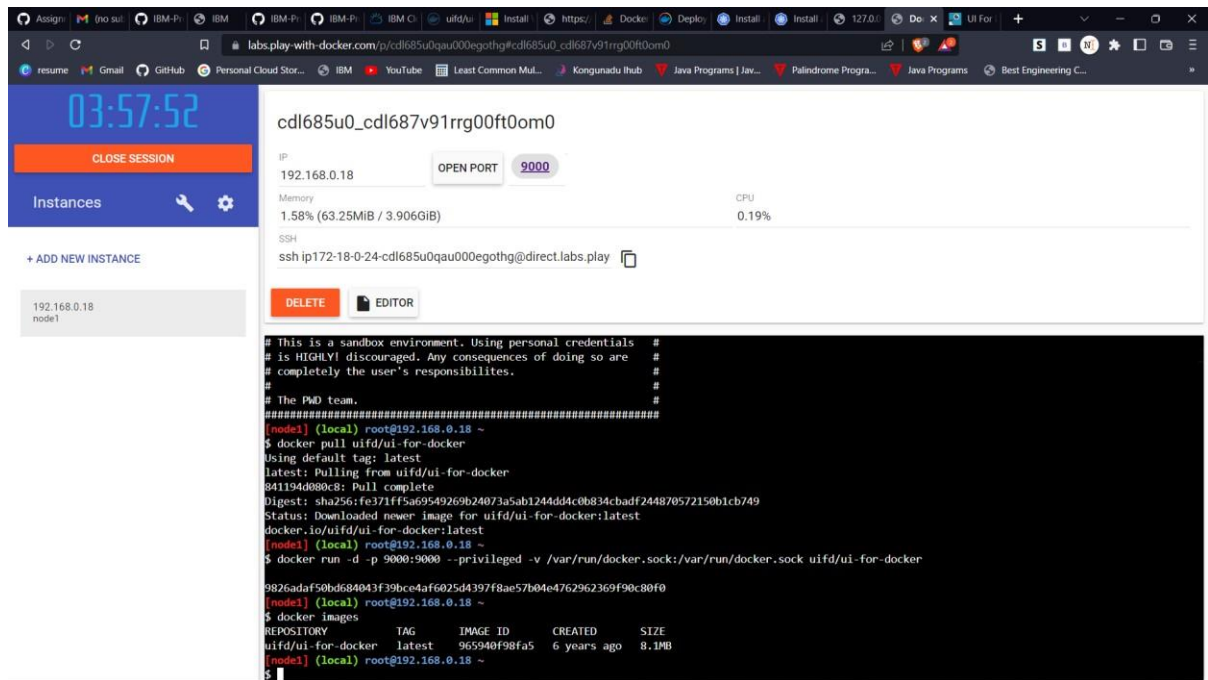
Kubernetes / Docker

PROJECT NAME	Personal Expense Tracker Application
Team ID	PNT2022TMID03044
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Student Roll Number	727719EUEC001

Question-1:

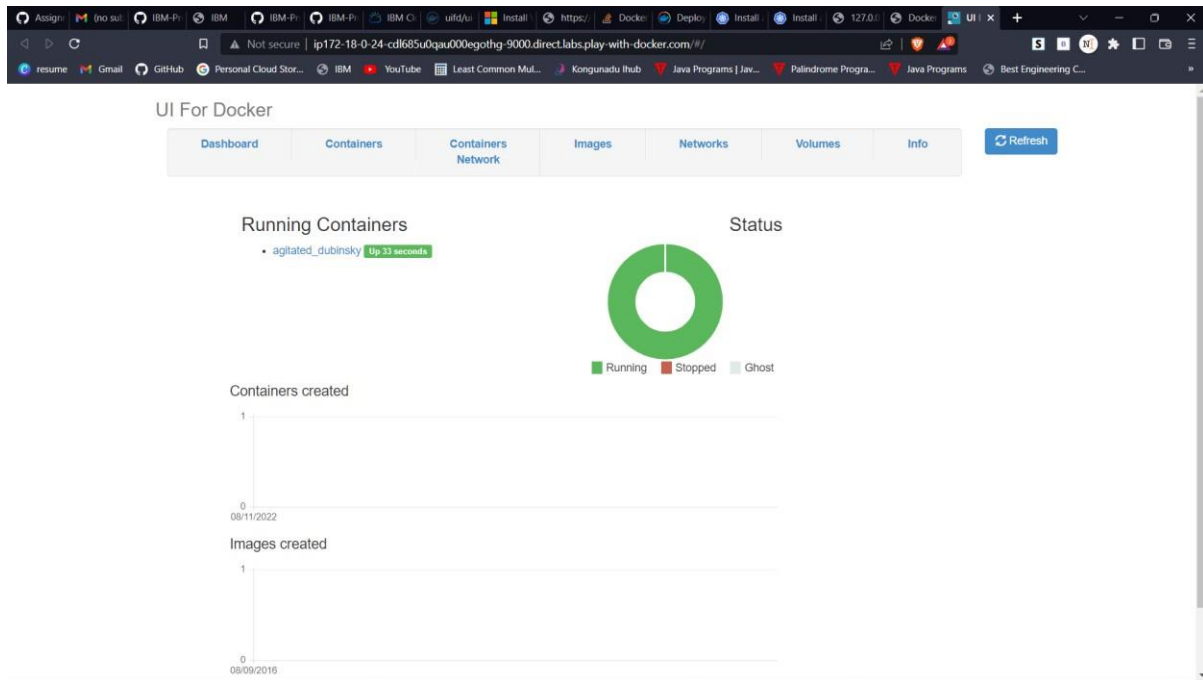
Pull an Image from docker hub and run it in docker playground.

Solution:



The screenshot shows a web-based 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 details of a container named 'cdl685u0_cdl687v91rrg00ft0m0', including its IP (192.168.0.18), memory usage (1.58%), and CPU usage (0.19%). 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
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
9826ada50bd684043f39bce4af6025d4397f8ae57b04e4762962369f90c80f0
[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 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:f8652aafa83c25f8c22354d547d892591067aa4026a7fa9a6819df9f300af6fc  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                                                            0.0s
=> => exporting layers                                                            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

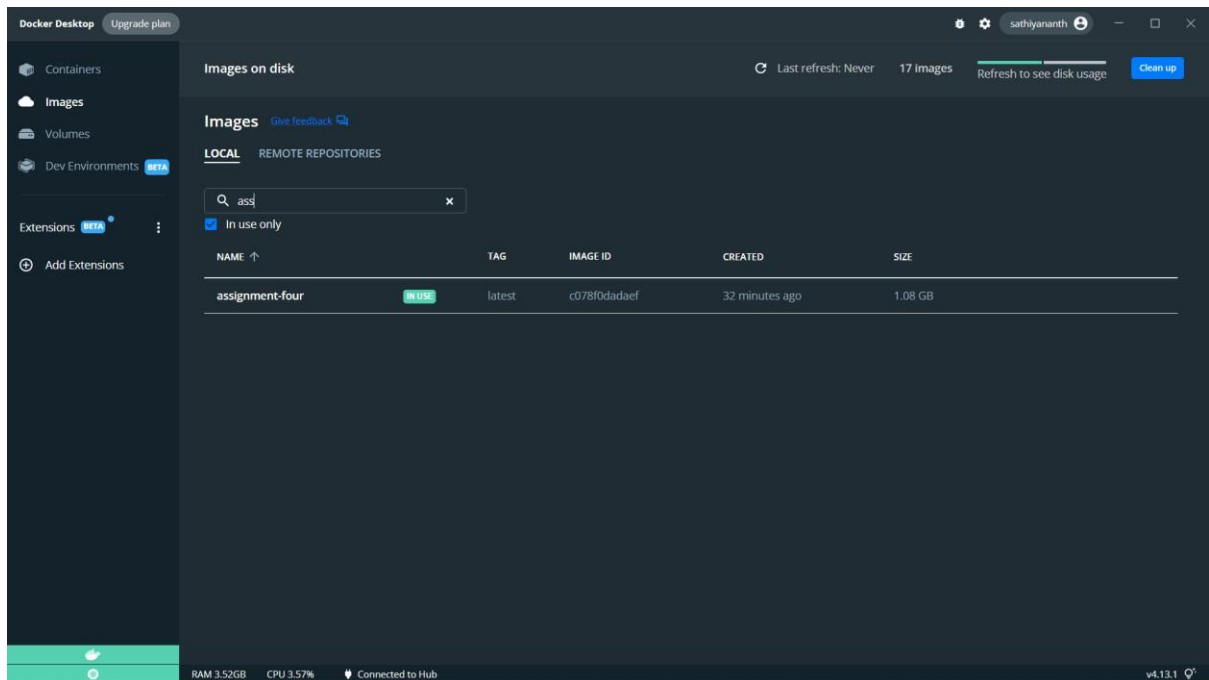
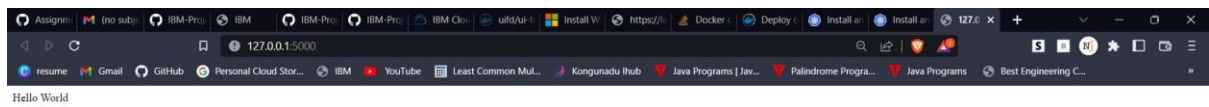
D:\OneDrive\Desktop\IBM Docs\Assignments\assignment-four>
```

```
C:\Windows\System32\cmd.exe
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 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  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
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  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

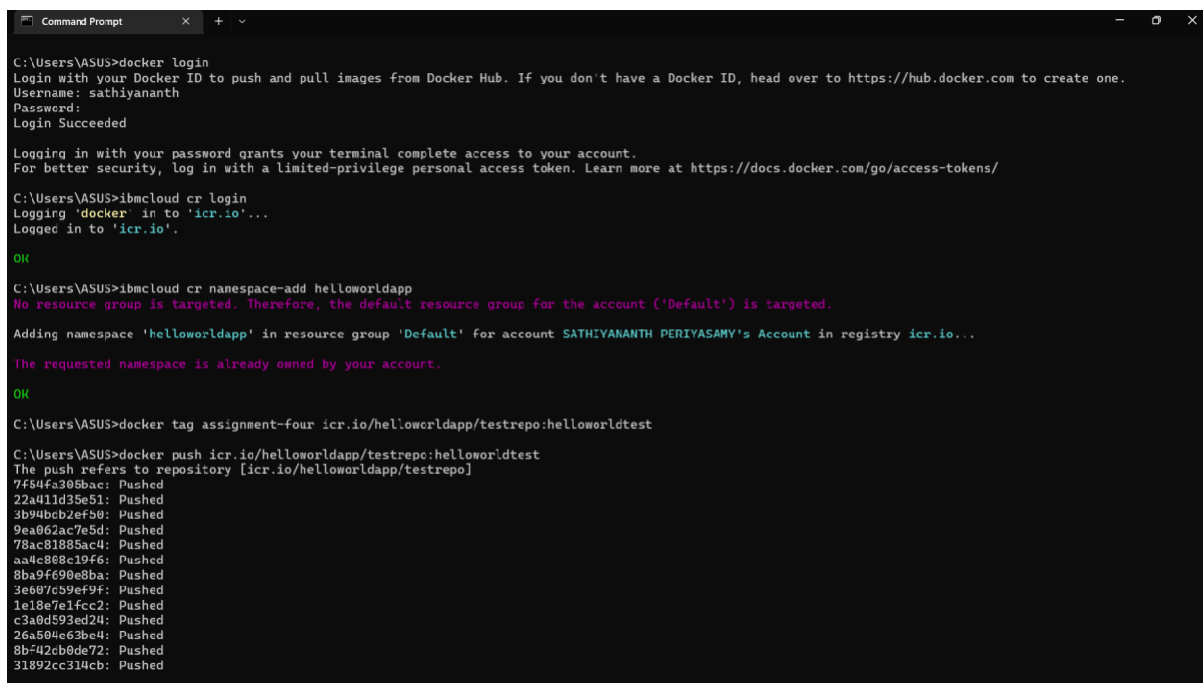
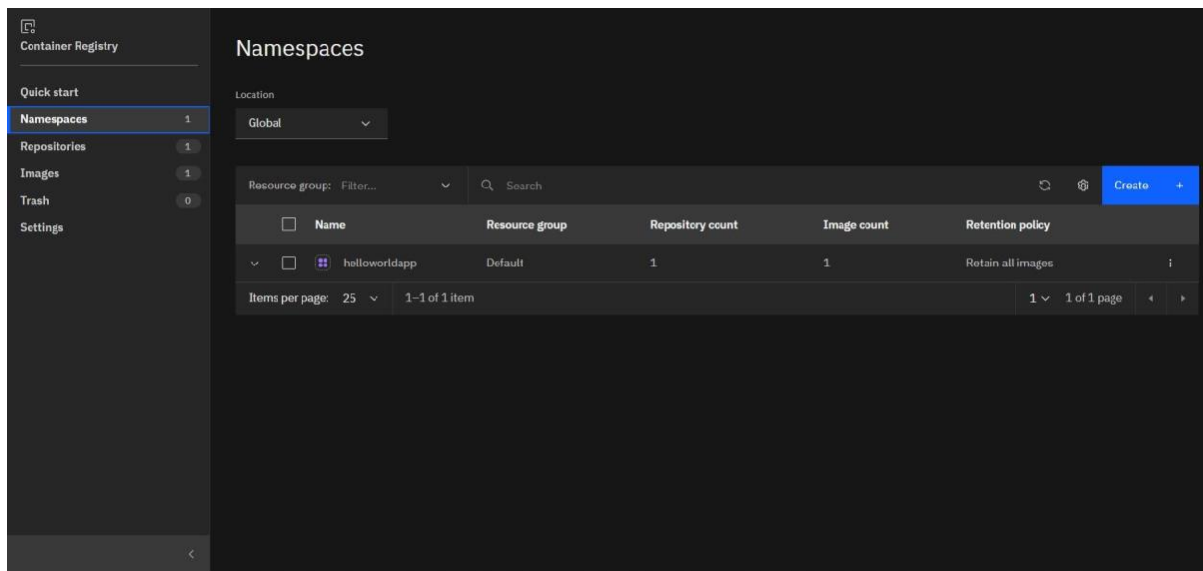
D:\OneDrive\Desktop\IBM Docs\Assignments\assignment-four>docker run -p 5000:5000 assignment-four
* Serving Flask app 'app' (lazy loading)
* Environment: production
WARNING: This is a development server. Do not use it in a production deployment.
Use a production WSGI server instead.
* Debug mode: on
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
* Restarting with stat
* Debugger is active!
* Debugger PIN: 569-750-282
```



Question-3:

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

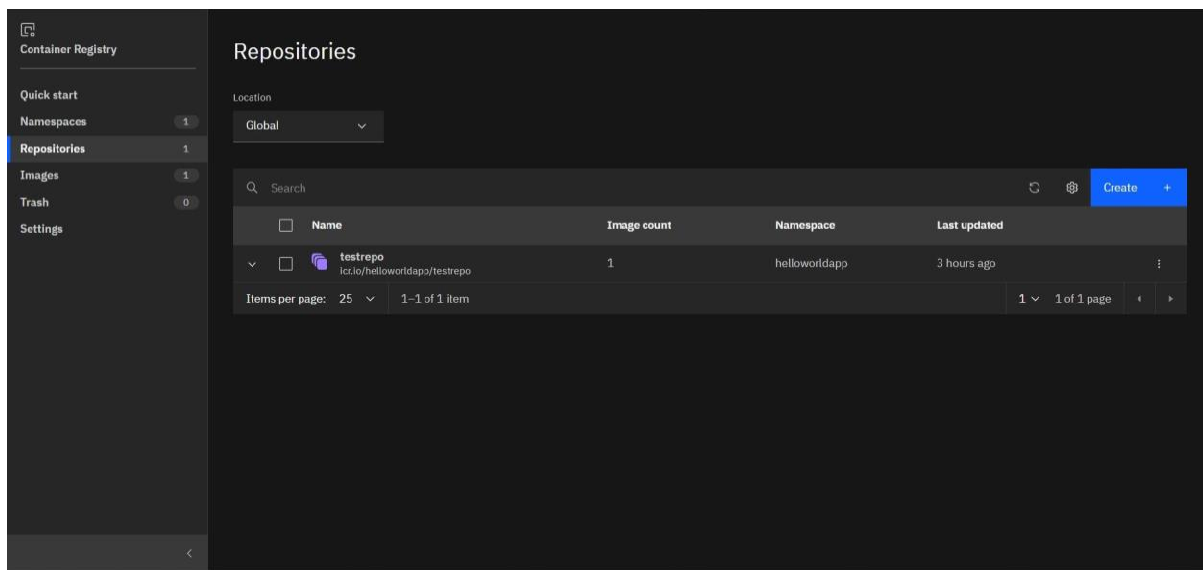
Solution:

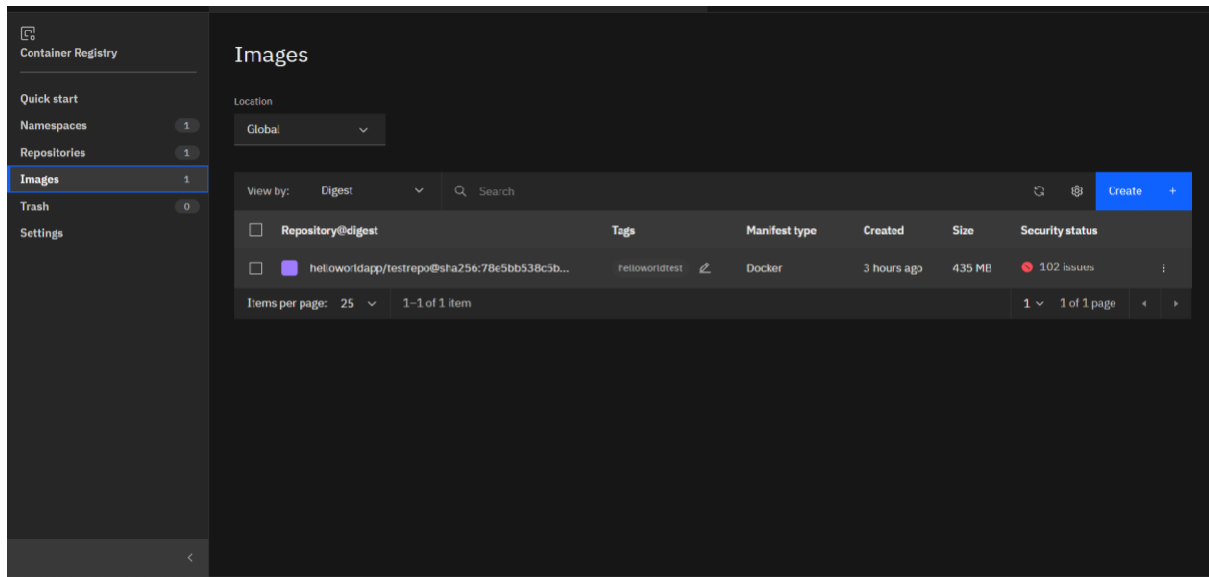


```
Command Prompt
C:\Users\ASUS>docker tag assignment-four icr.io/helloworldapp/testrepo:helloworldtest
C:\Users\ASUS>docker push icr.io/helloworldapp/testrepo:helloworldtest
The push refers to repository [icr.io/helloworldapp/testrepo]
7f54fa385bac: Pushed
22a411d35e51: Pushed
3b94bcb2ef50: Pushed
9ea062ac7e5d: Pushed
78ac81885ac4: Pushed
aa4c888c19f6: Pushed
8ba9f690e8ba: Pushed
3e607c59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d593ed24: Pushed
26a504e63be4: Pushed
8b442cb0de72: Pushed
31892cc31dcb: 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>
```

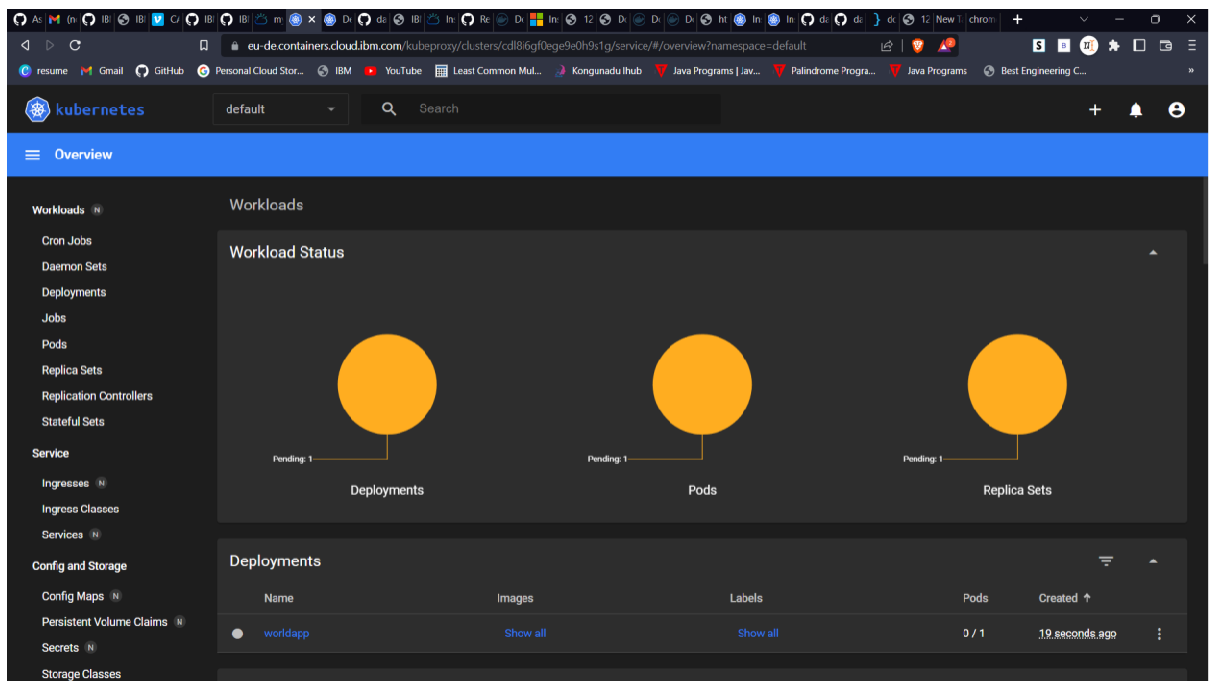




Question-4:

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:



The screenshot displays the Kubernetes Overview page in a web browser. The browser's address bar shows the URL: `eu-de.containers.cloud.ibm.com/kubeproxy/clusters/cdl86gfoege9x0h9s1g/service/#/overview?namespace=default`. The page features a blue header with the 'kubernetes' logo and a search bar. A sidebar on the left contains the 'Overview' tab, which is currently selected. The main content area is titled 'Namespaces' and lists various Kubernetes resources grouped into sections: Workloads (Cron Jobs, Daemon Sets, Deployments, Jobs, Pods, Replica Sets, Replication Controllers, Stateful Sets), Service, Ingresses, Ingress Classes, and Services. Each resource is listed with its Name, Labels, Phase, and Created time. Below this is a section titled 'Nodes' which lists node configurations with columns for Name, Labels, Ready status, CPU requests, CPU limits, CPU capacity, Memory requests, Memory limits, Memory capacity, Pods, and Create time.

Namespaces	Name	Labels	Phase	Created ↑
Workloads	Cron Jobs			
	ibm-carl-store	Show all	Active	an hour ago
	Daemon Sets			
	ibm-operators	Show all	Active	an hour ago
	Deployments			
	ibm-system	Show all	Active	2 hours ago
	Jobs			
	Pods			
	Replica Sets			
	default	Show all	Active	2 hours ago
Replication Controllers				
Stateful Sets				
kube-node-lease	Show all	Active	2 hours ago	
Service				
kube-public	Show all	Active	2 hours ago	
Ingresses				
kube-system	Show all	Active	2 hours ago	
Ingress Classes				
Services				
Nodes				
Config and Storage				
Config Maps				
Persistent Volume Claims				
Secrets				
Storage Classes				