

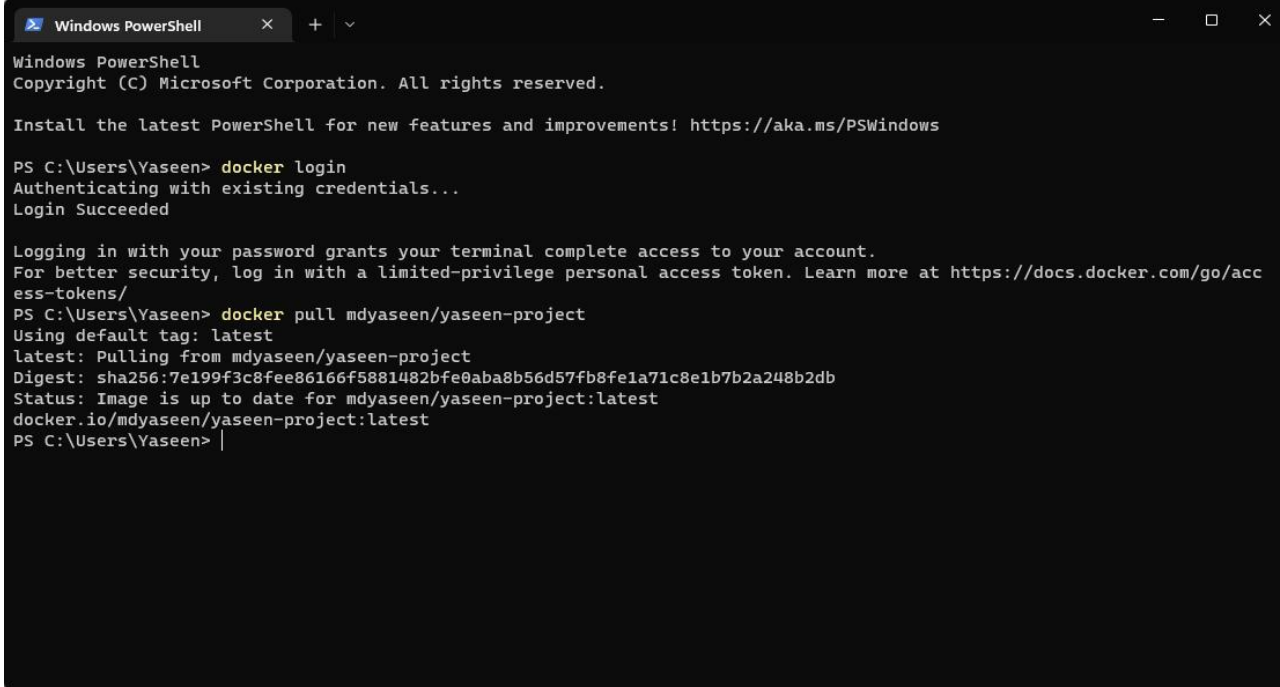
Assignment -4
Docker and Kubernetes

Assignment Date	10 October 2022
Team ID	PNT2022TMID24001
Maximum Marks	2 Marks

Question-1:

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

1) Pull an image form docker hub

A screenshot of a Windows PowerShell terminal window. The title bar reads "Windows PowerShell" with standard window controls. The terminal output shows the following sequence of commands and responses:
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! <https://aka.ms/PSWindows>

PS C:\Users\Yaseen> docker login
Authenticating with existing credentials...
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/>
PS C:\Users\Yaseen> docker pull mdyaseen/yaseen-project
Using default tag: latest
latest: Pulling from mdyaseen/yaseen-project
Digest: sha256:7e199f3c8fee86166f5881482bfe0aba8b56d57fb8fe1a71c8e1b7b2a248b2db
Status: Image is up to date for mdyaseen/yaseen-project:latest
docker.io/mdyaseen/yaseen-project:latest
PS C:\Users\Yaseen> |

2) Running docker locally

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Yaseen> docker login
Authenticating with existing credentials...
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/acc
ess-tokens/
PS C:\Users\Yaseen> docker pull mdyaseen/yaseen-project
Using default tag: latest
latest: Pulling from mdyaseen/yaseen-project
Digest: sha256:7e199f3c8fee86166f5881482bfe9aba8b56d57fb8fe1a71c8e1b7b2a248b2db
Status: Image is up to date for mdyaseen/yaseen-project:latest
docker.io/mdyaseen/yaseen-project:latest
PS C:\Users\Yaseen> docker run --name Assignment4 -d -p 5000:5000 mdyaseen/yaseen-project
d430c6bcc96cf37b483277d98936de34a83976ee96beb3e5287594221be00779
PS C:\Users\Yaseen> |
```

Containers

Images

Volumes

Dev Environments BETA

Extensions BETA

Newman

OpenShift

Add Extensions

Containers Give feedback

A container packages up code and its dependencies so the application runs quickly and reliably from one computing environment to another. [Learn more](#)

Only show running containers

Search

	NAME	IMAGE	STATUS	PORT(S)	STARTED	ACTIONS
<input type="checkbox"/>	Assignment4 d430c6bcc96c	ibm-project:latest	Running	5000:5000	52 seconds ago	
<input type="checkbox"/>	k8s_kubernetes-dashboard_kubern 794e784150b8	kubernetesui/dashboard:v2.6.1	Running		7 minutes ago	
<input type="checkbox"/>	k8s_vpnkit-controller_vpnkit-contr 97d6b68ebcf7	docker/desktop-vpnkit-controller:v2	Running		7 minutes ago	
<input type="checkbox"/>	k8s_storage-provisioner_storage-p 841e3ff75f70	docker/desktop-storage-provisioner	Running		7 minutes ago	
<input type="checkbox"/>	k8s_POD_flask-app-8569bc947b-7d 5c8de426e7fe	k8s.gcr.io/pause:3.8	Running		7 minutes ago	
<input type="checkbox"/>	k8s_POD_flask-app-8569bc947b-kt bf2d3632339c	k8s.gcr.io/pause:3.8	Running		7 minutes ago	
<input type="checkbox"/>	k8s_POD_flask-app-8569bc947b-b6 bc5101add248	k8s.gcr.io/pause:3.8	Running		7 minutes ago	
<input type="checkbox"/>	k8s_POD_flask-app-8569bc947b-r9 ae32f5c308fa	k8s.gcr.io/pause:3.8	Running		7 minutes ago	
<input type="checkbox"/>	k8s_POD_flask-app-8569bc947b-vfi e2b8d0c7f3a0	k8s.gcr.io/pause:3.8	Running		7 minutes ago	

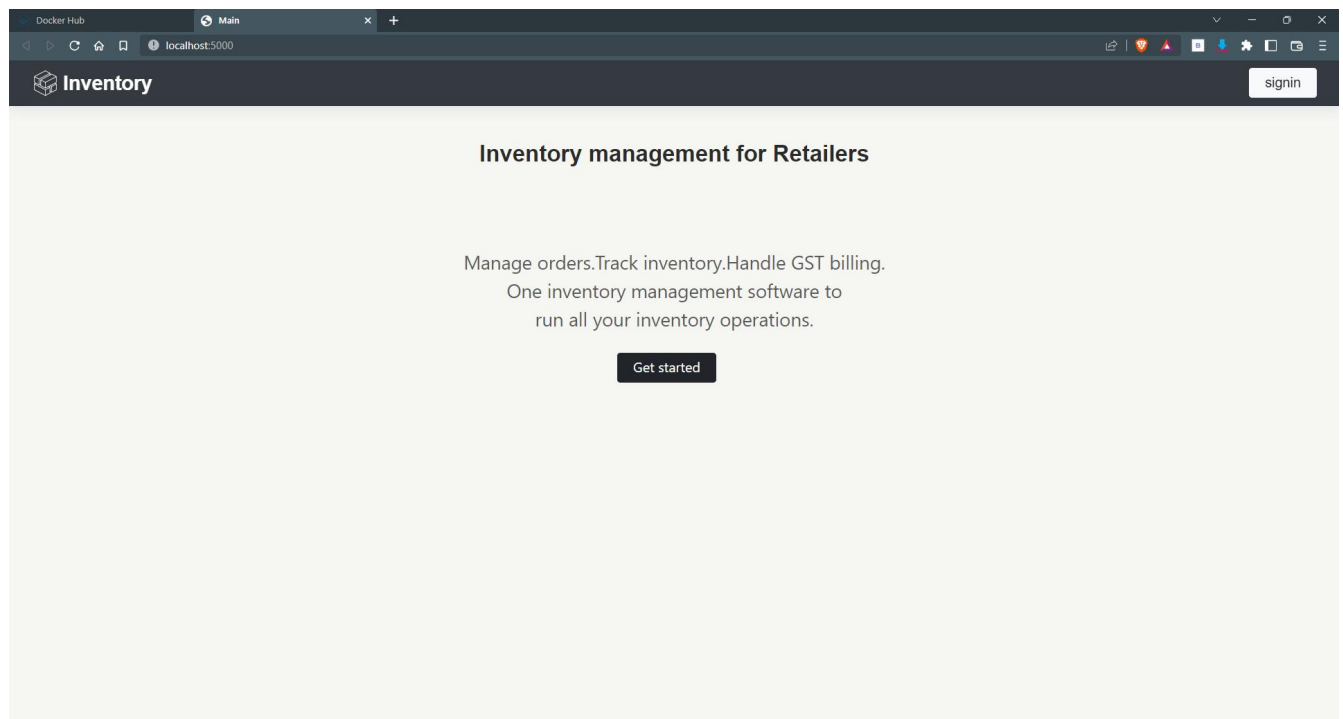
Showing 33 items

RAM 3.54GB

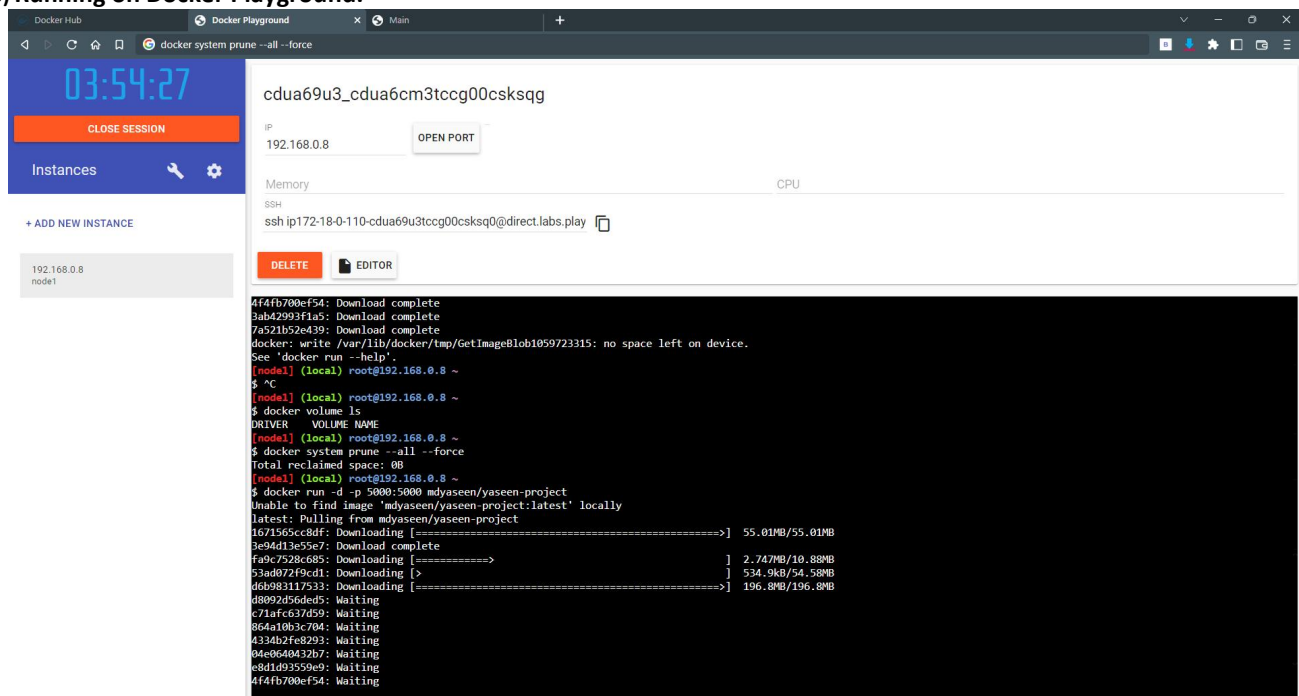
CPU 0.33%

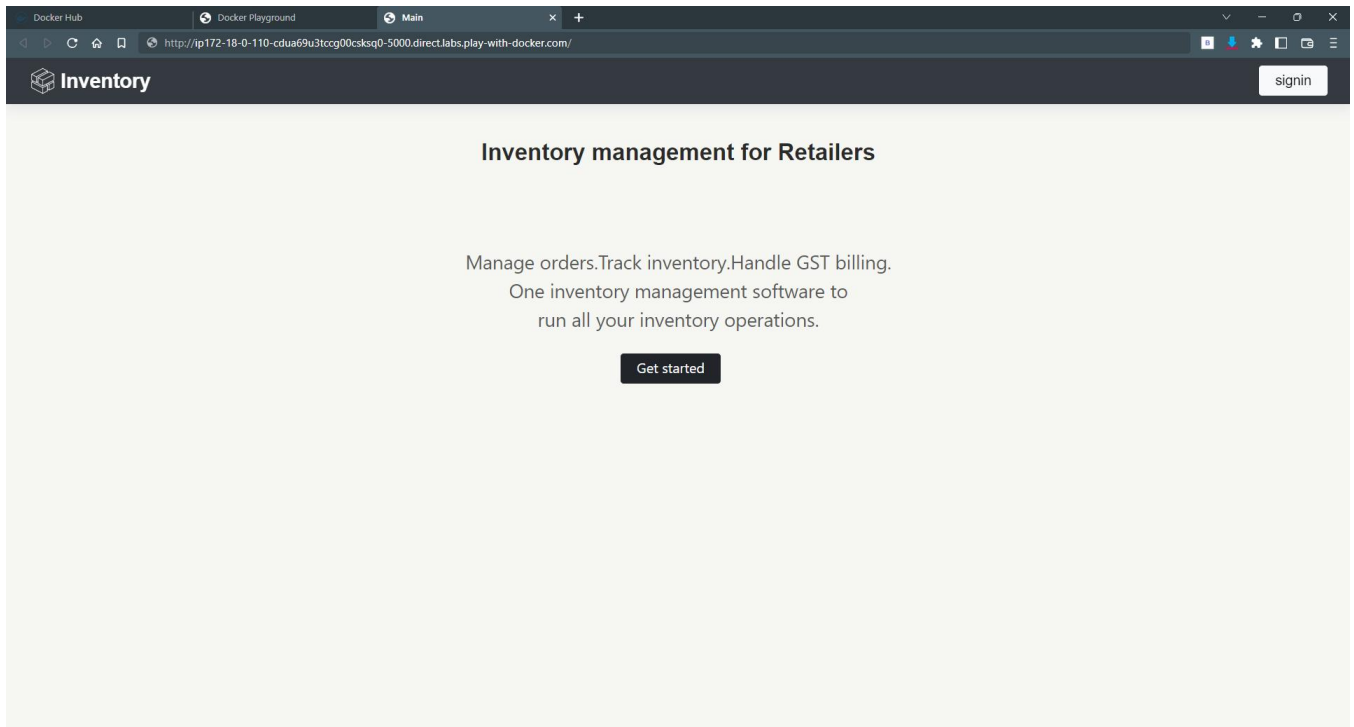
Connected to Hub

v4.14.0



3) Running on Docker Playground.

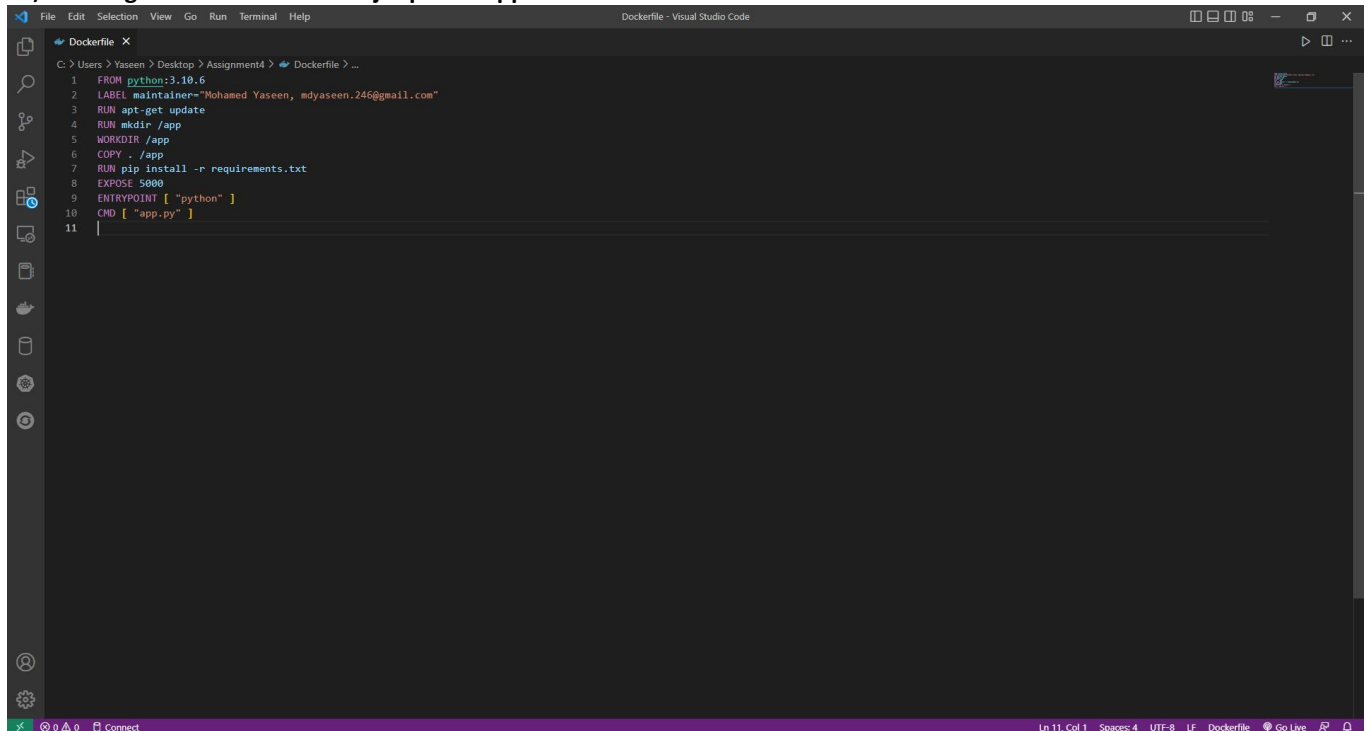




Question-2:

Create a docker file for the jobportal application or any other application and deploy it in docker application.

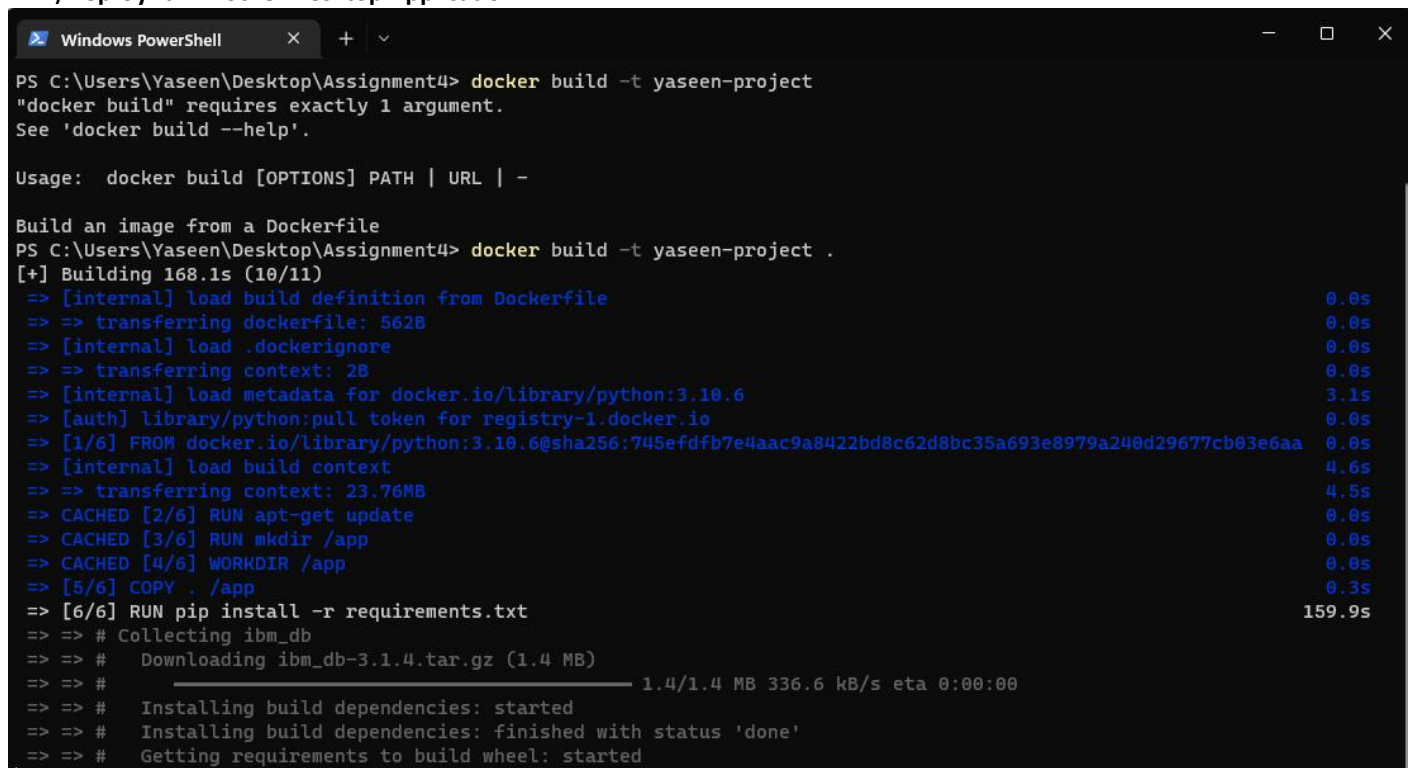
1) Creating a docker file for the jobportal application

A screenshot of a Visual Studio Code editor window titled 'Dockerfile - Visual Studio Code'. The editor shows a Dockerfile with the following content:

```
1 FROM python:3.10.6
2 LABEL maintainer="Mohamed Yaseen, mdyaseen.246@gmail.com"
3 RUN apt-get update
4 RUN mkdir /app
5 WORKDIR /app
6 COPY . /app
7 RUN pip install -r requirements.txt
8 EXPOSE 5000
9 ENTRYPOINT [ "python" ]
10 CMD [ "app.py" ]
11
```

The left sidebar shows the Explorer view with the Dockerfile selected. The bottom status bar indicates 'Ln 11, Col 1', 'Spaces: 4', 'UTF-8', 'LF', 'Dockerfile', and 'Go Live'.

2) Deploy it in Docker Desktop Application

A screenshot of a Windows PowerShell terminal window. The terminal shows the command 'docker build -t yaseen-project' being executed. The output shows the build process, including downloading the Dockerfile, transferring context, and installing build dependencies. The build is successful, and the image is ready to be deployed.

```
PS C:\Users\Yaseen\Desktop\Assignment4> docker build -t yaseen-project
"docker build" requires exactly 1 argument.
See 'docker build --help'.

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

Build an image from a Dockerfile
PS C:\Users\Yaseen\Desktop\Assignment4> docker build -t yaseen-project .
[+] Building 168.1s (10/11)
=> [internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 562B 0.0s
=> [internal] load .dockerignore 0.0s
=> => transferring context: 2B 0.0s
=> [internal] load metadata for docker.io/library/python:3.10.6 3.1s
=> [auth] library/python:pull token for registry-1.docker.io 0.0s
=> [1/6] FROM docker.io/library/python:3.10.6@sha256:745efdfb7e4aac9a8422bd8c62d8bc35a693e8979a240d29677cb03e6aa 0.0s
=> [internal] load build context 4.6s
=> => transferring context: 23.76MB 4.5s
=> CACHED [2/6] RUN apt-get update 0.0s
=> CACHED [3/6] RUN mkdir /app 0.0s
=> CACHED [4/6] WORKDIR /app 0.0s
=> [5/6] COPY . /app 0.3s
=> [6/6] RUN pip install -r requirements.txt 159.9s
=> => # Collecting ibm_db
=> => #   Downloading ibm_db-3.1.4.tar.gz (1.4 MB)
=> => #   _____ 1.4/1.4 MB 336.6 kB/s eta 0:00:00
=> => #   Installing build dependencies: started
=> => #   Installing build dependencies: finished with status 'done'
=> => #   Getting requirements to build wheel: started
```

Docker Desktop

Update to latest

Search

Ctrl+K

mdyaseen

Containers

Images

Volumes

Dev Environments

Extensions

Newman

OpenShift

Add Extensions

Containers

A container packages up code and its dependencies so the application runs quickly and reliably from one computing environment to another.

Only show running containers

Search

	NAME	IMAGE	STATUS	PORT(S)	STARTED	ACTIONS
<input type="checkbox"/>	Assignment4 559e4d094d64	ibm-project:latest	Running	5000:5000	39 seconds ago	

Showing 1 items

RAM 3.07GB

CPU 0.07%

Connected to Hub

v4.14.0

Docker Desktop

Update to latest

Search

Ctrl+K

mdyaseen

Containers

Images

Volumes

Dev Environments

Extensions

Newman

OpenShift

Add Extensions

<

Assignment4

yaseen-project:latest

RUNNING

Logs

Inspect

Terminal

Stats

2022-11-22 16:11:42 WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.

2022-11-22 16:11:42 * Running on all addresses (0.0.0.0)

2022-11-22 16:11:42 * Running on http://127.0.0.1:5000

2022-11-22 16:11:42 * Running on http://172.17.0.2:5000

2022-11-22 16:11:42 Press CTRL+C to quit

2022-11-22 16:11:42 * Serving Flask app 'app'

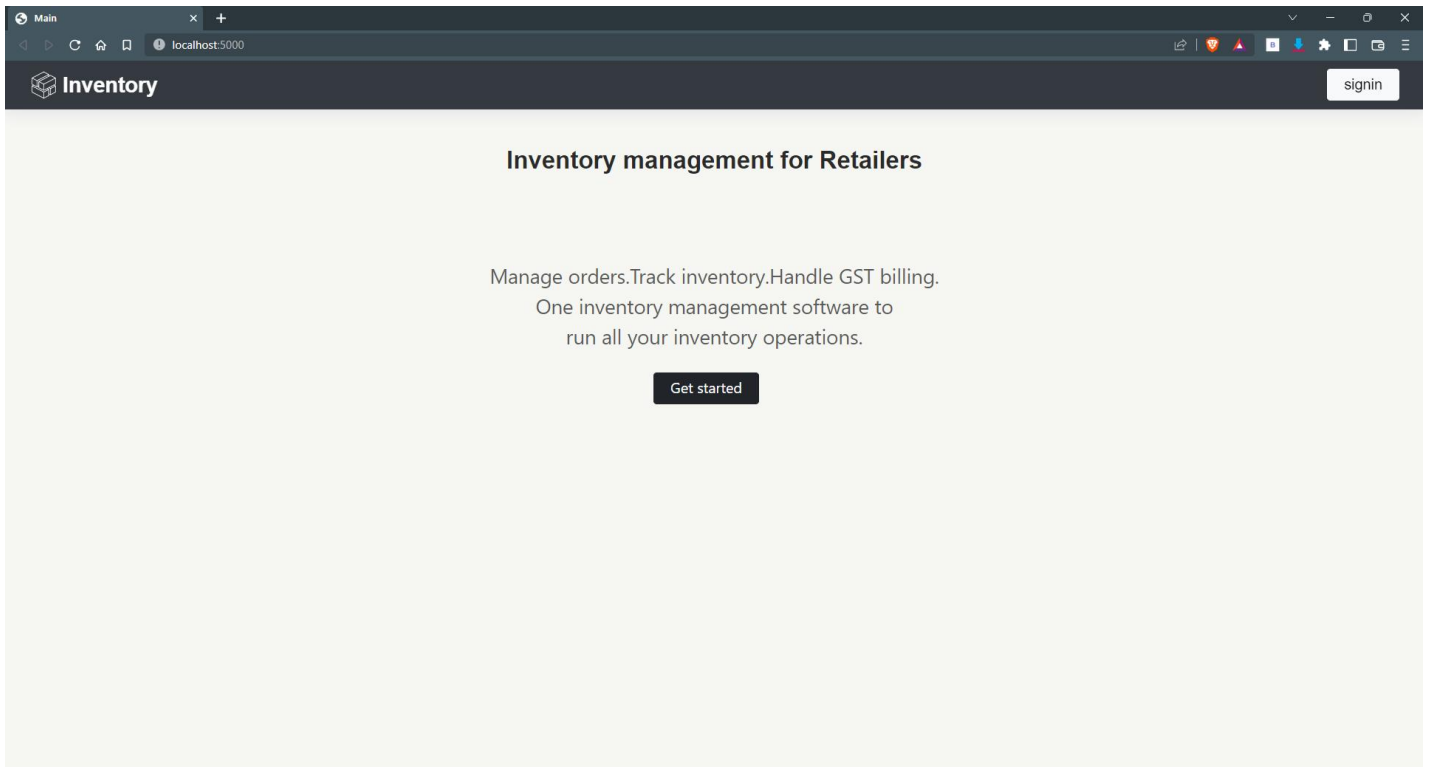
2022-11-22 16:11:42 * Debug mode: off

RAM 3.07GB

CPU 0.00%

Connected to Hub

v4.14.0



Inventory management for Retailers

Manage orders.Track inventory.Handle GST billing.
One inventory management software to
run all your inventory operations.

Get started

Question-3:

Create an IBM container registry and deploy helloworld app or jobportalapp or any other app.

1) create a ibm container registry

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Yaseen\Desktop\Assignment4> ibmcloud plugin install container-registry
Looking up 'container-registry' from repository 'IBM Cloud'...
Plug-in 'container-registry[cr] 1.0.2' found in repository 'IBM Cloud'
Plug-in 'container-registry 1.0.2' was already installed. Do you want to update it with 'container-registry[cr] 1.0.2' or not? [y/N] > n
Plugin installation was canceled.
PS C:\Users\Yaseen\Desktop\Assignment4> |
```

2) Deploy helloworld or jobportal or any other application

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Yaseen\Desktop\Assignment4> ibmcloud plugin install container-registry
Looking up 'container-registry' from repository 'IBM Cloud'...
Plug-in 'container-registry[cr] 1.0.2' found in repository 'IBM Cloud'
Plug-in 'container-registry 1.0.2' was already installed. Do you want to update it with 'container-registry[cr] 1.0.2' or not? [y/N] > n
Plugin installation was canceled.
PS C:\Users\Yaseen\Desktop\Assignment4> docker tag yaseen-project jp.icr.io/ns-ibm-project/yaseen-project
PS C:\Users\Yaseen\Desktop\Assignment4> docker push jp.icr.io/ns-ibm-project/yaseen-project
Using default tag: latest
The push refers to repository [jp.icr.io/ns-ibm-project/yaseen-project]
3391382053b1: Preparing
16bb821aa8d5: Preparing
5f70bf18a086: Preparing
ad02e4ab118b: Preparing
8488b33b6249: Preparing
bfc1deb8136e: Waiting
1f123186824c: Waiting
3d6eb1152931: Waiting
100796cdf3b1: Waiting
54acb5a6fa0b: Waiting
8d51c618126f: Waiting
9ff6e4d46744: Waiting
a89d1d47b5a1: Waiting
655ed1b7a428: Waiting
unauthorized: The login credentials are not valid, or your IBM Cloud account is not active.
```



```
Windows PowerShell
54acb5a6fa0b: Waiting
8d51c618126f: Waiting
9ff6e4d46744: Waiting
a89d1d47b5a1: Waiting
655ed1b7a428: Waiting
unauthorized: The login credentials are not valid, or your IBM Cloud account is not active.
PS C:\Users\Yaseen\Desktop\Assignment4> ibmcloud cr login
Logging 'docker' in to 'jp.icr.io'...
Logged in to 'jp.icr.io'.

OK
PS C:\Users\Yaseen\Desktop\Assignment4> docker push jp.icr.io/ns-ibm-project/yaseen-project
Using default tag: latest
The push refers to repository [jp.icr.io/ns-ibm-project/yaseen-project]
3391382053b1: Layer already exists
16bb821aa8d5: Layer already exists
5f70bf18a086: Layer already exists
ad02e4ab118b: Layer already exists
8488b33b6249: Layer already exists
bfc1deb8136e: Layer already exists
1f123186824c: Layer already exists
3d6eb1152931: Layer already exists
100796cdf3b1: Layer already exists
54acb5a6fa0b: Layer already exists
8d51c618126f: Layer already exists
9ff6e4d46744: Layer already exists
a89d1d47b5a1: Layer already exists
655ed1b7a428: Layer already exists
latest: digest: sha256:7e199f3c8fee86166f5881482bfe0aba8b56d57fb8fe1a71c8e1b7b2a248b2db size: 3266
PS C:\Users\Yaseen\Desktop\Assignment4> |
```

IBM Cloud

Container Registry

Quick start

Namespaces1

Repositories1

Images1

Trash5

Settings

Search resources and products...

CatalogManageMohamed Yaseen's Account

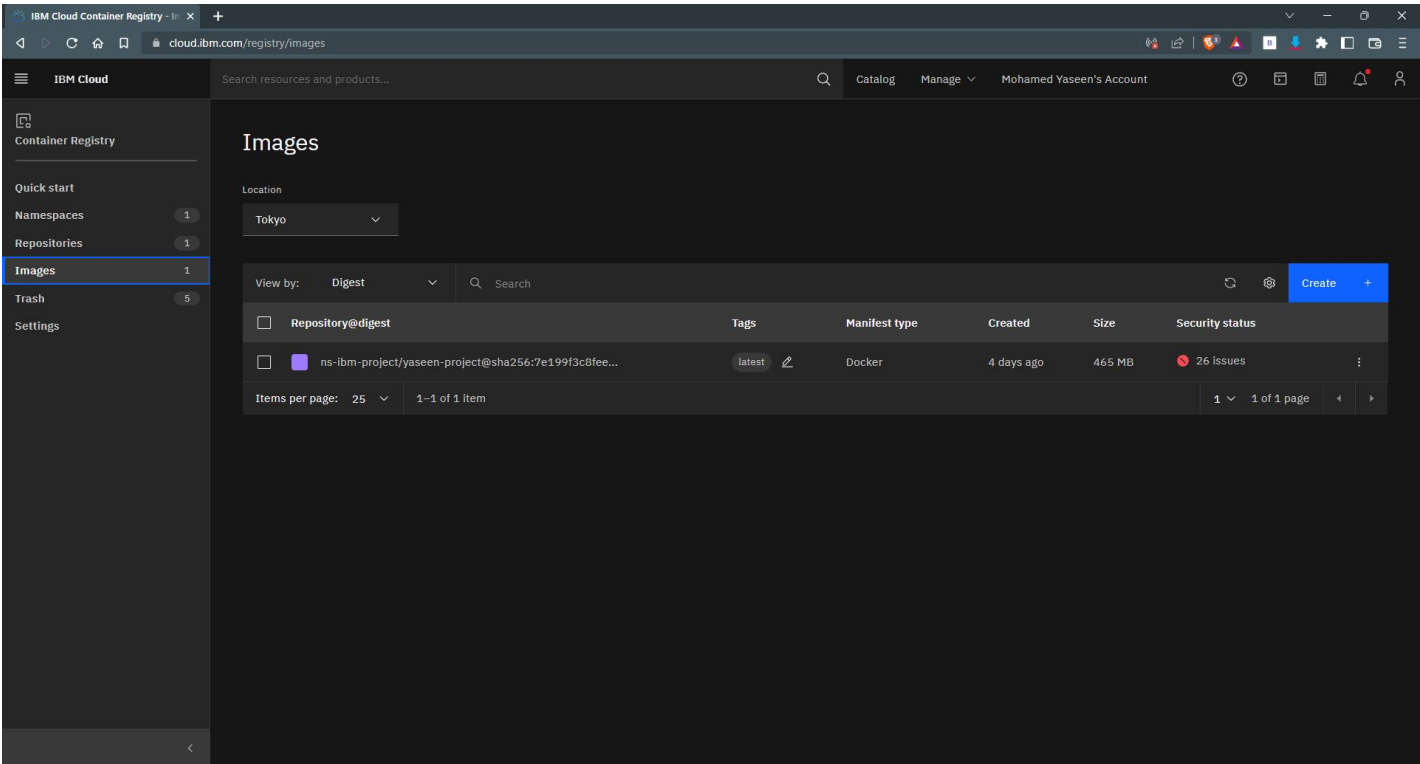
Namespaces

LocationTokyo

Resource group: Filter...Search

Name	Resource group	Repository count	Image count	Retention policy
ns-ibm-project	Default	1	1	Retain all Images
Repository		Image count		Last updated
jp.icr.io/ns-ibm-project/yaseen-project		1	1	4 days ago

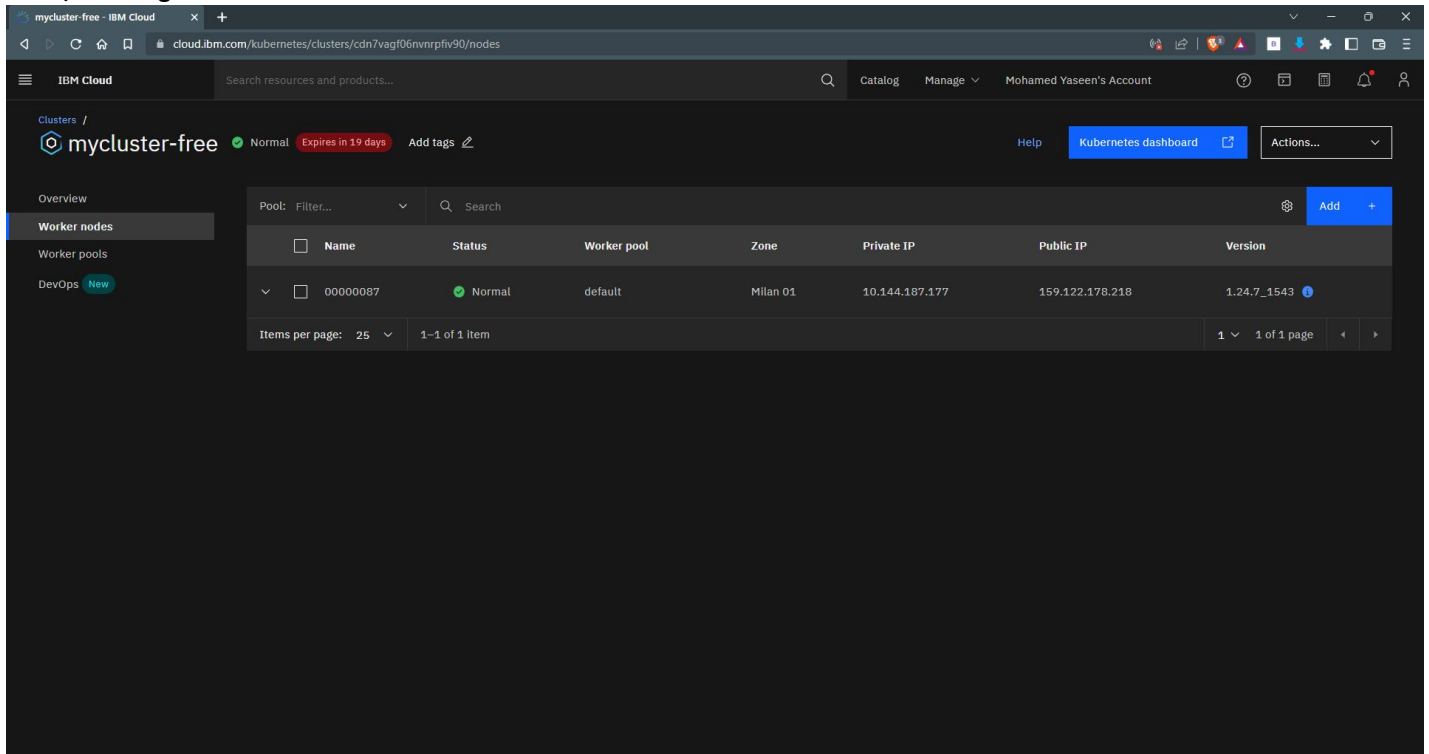
Items per page: 251-1 of 1 item



Question-4:

Create a Kubernetes cluster in IBM cloud and deploy helloworld image or jobportal image or any other image and also expose the same app to run in nodeport.

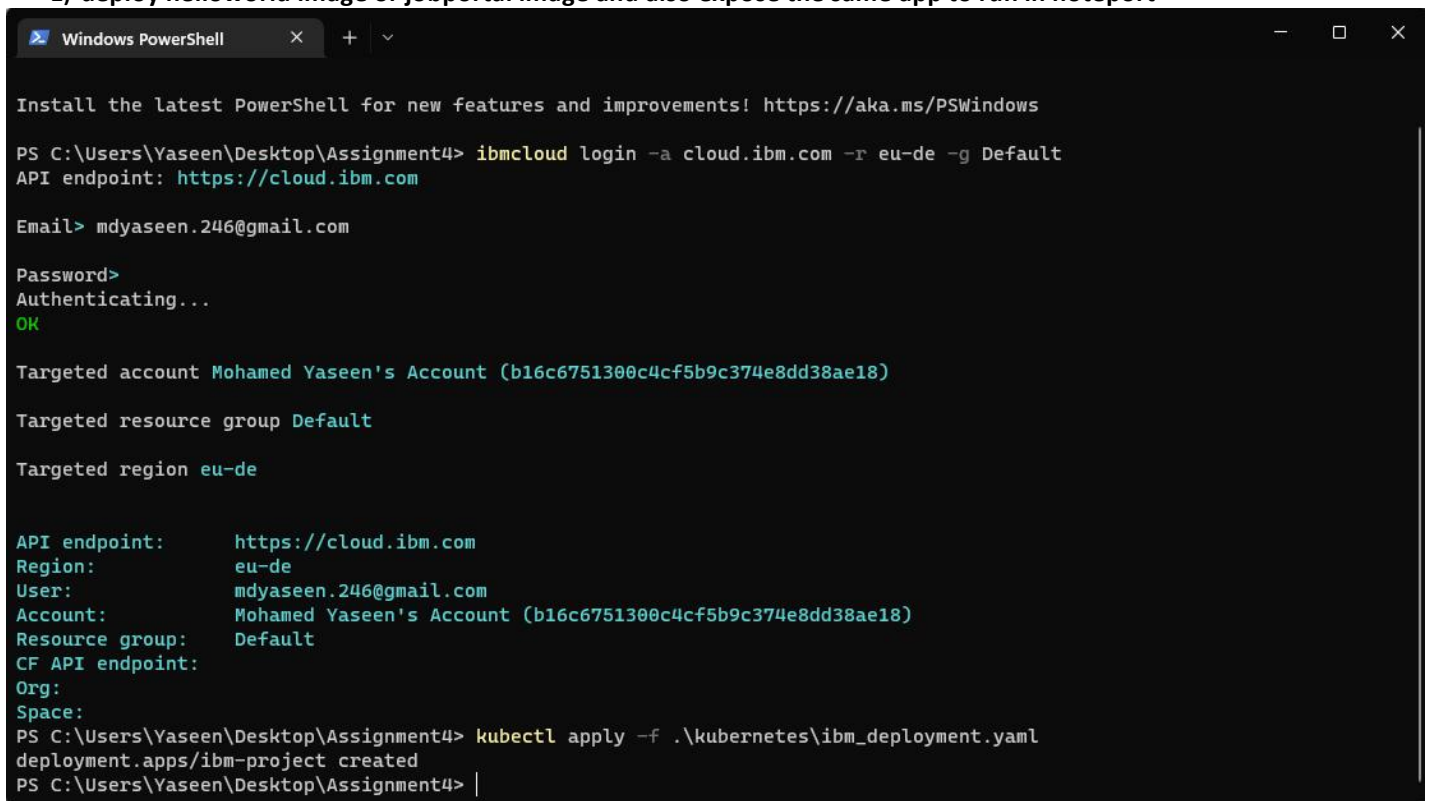
1) Creating Kubernetes cluster in IBM cloud



The screenshot shows the IBM Cloud console interface. The top navigation bar includes the IBM Cloud logo, a search bar, and user account information for 'Mohamed Yaseen's Account'. The main content area displays the 'Clusters' section for 'mycluster-free', which is in a 'Normal' state and 'Expires in 19 days'. A 'Kubernetes dashboard' button is visible. On the left sidebar, 'Worker nodes' is selected. The main table lists the worker nodes with columns: Name, Status, Worker pool, Zone, Private IP, Public IP, and Version. One node is listed with ID '00000087', status 'Normal', worker pool 'default', zone 'Milan 01', private IP '10.144.187.177', public IP '159.122.178.218', and version '1.24.7_1543'. The table also shows 'Items per page: 25' and '1-1 of 1 item'.

Name	Status	Worker pool	Zone	Private IP	Public IP	Version
00000087	Normal	default	Milan 01	10.144.187.177	159.122.178.218	1.24.7_1543

2) deploy helloworld image or jobportal image and also expose the same app to run in nodeport



```
Windows PowerShell

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Yaseen\Desktop\Assignment4> ibmcloud login -a cloud.ibm.com -r eu-de -g Default
API endpoint: https://cloud.ibm.com

Email> mdyaseen.246@gmail.com

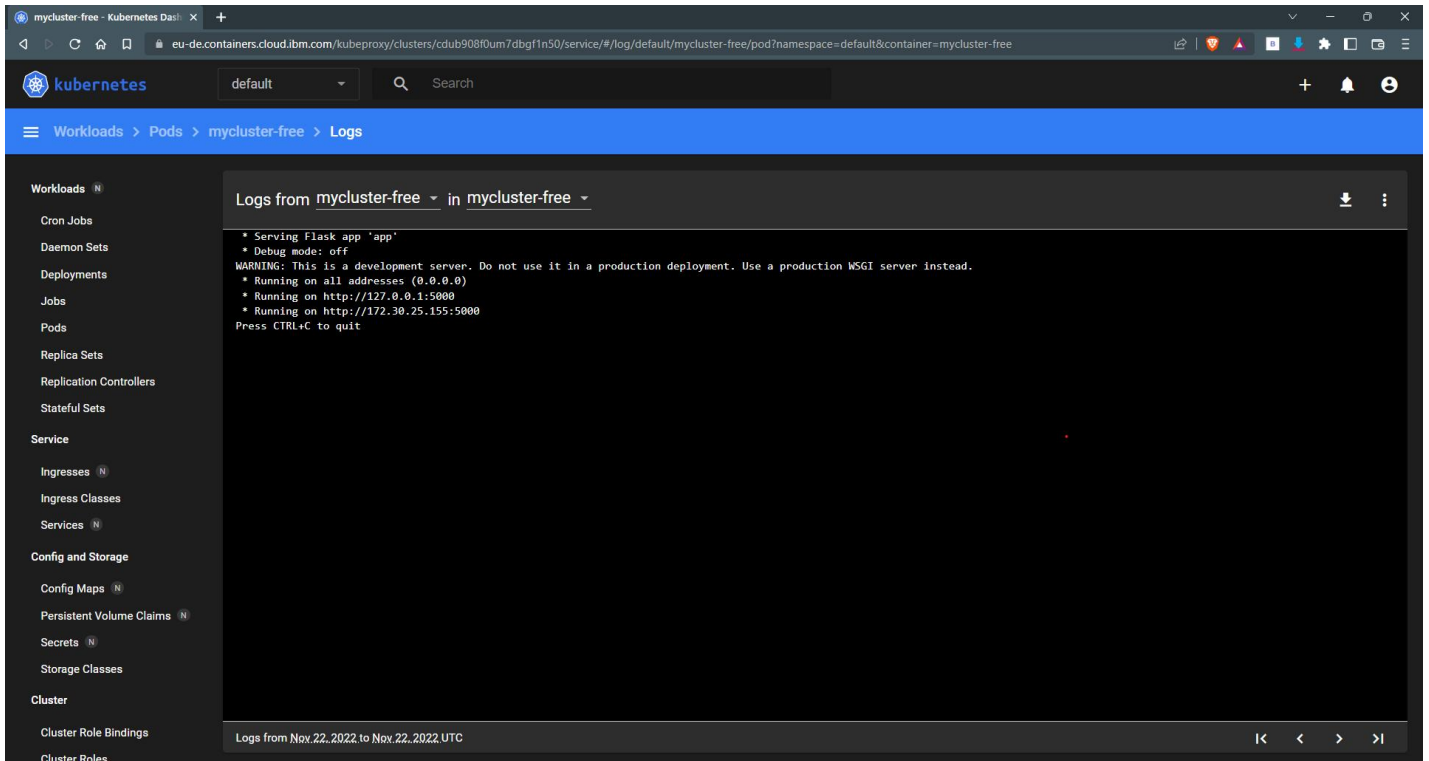
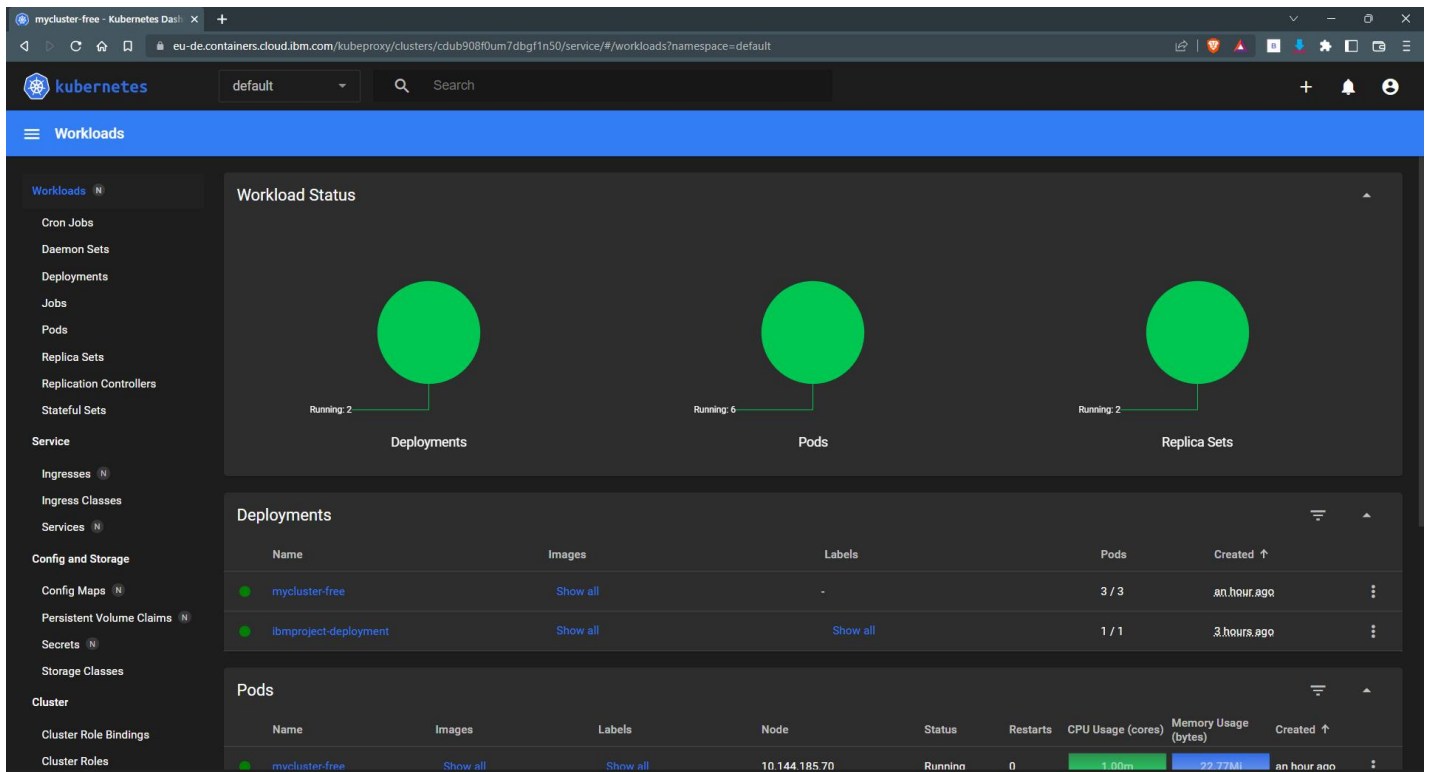
Password>
Authenticating...
OK

Targeted account Mohamed Yaseen's Account (b16c6751300c4cf5b9c374e8dd38ae18)

Targeted resource group Default

Targeted region eu-de

API endpoint: https://cloud.ibm.com
Region: eu-de
User: mdyaseen.246@gmail.com
Account: Mohamed Yaseen's Account (b16c6751300c4cf5b9c374e8dd38ae18)
Resource group: Default
CF API endpoint:
Org:
Space:
PS C:\Users\Yaseen\Desktop\Assignment4> kubectl apply -f .\kubernetes\ibm_deployment.yaml
deployment.apps/ibm-project created
PS C:\Users\Yaseen\Desktop\Assignment4> |
```



```
Windows PowerShell

Targeted region eu-de

API endpoint:      https://cloud.ibm.com
Region:           eu-de
User:             mdyaseen.246@gmail.com
Account:          Mohamed Yaseen's Account (b16c6751300c4cf5b9c374e8dd38ae18)
Resource group:   Default
CF API endpoint:
Org:
Space:
PS C:\Users\Yaseen\Desktop\Assignment4> kubectl apply -f .\kubernetes\ibm_deployment.yaml
deployment.apps/ibm-project created
PS C:\Users\Yaseen\Desktop\Assignment4> kubectl get ing
NAME                CLASS  HOSTS  ADDRESS  PORTS  AGE
flask-app-ingress   <none> *      80       106m
PS C:\Users\Yaseen\Desktop\Assignment4> kubectl expose deployment mycluster-free --type=NodePort --name=flask-service
service/flask-service exposed
PS C:\Users\Yaseen\Desktop\Assignment4> kubectl proxy
Starting to serve on 127.0.0.1:8001
PS C:\Users\Yaseen\Desktop\Assignment4> kubectl get svc
NAME                TYPE        CLUSTER-IP    EXTERNAL-IP  PORT(S)          AGE
flask-app-service   NodePort    172.21.169.184 <none>        5000:32672/TCP   110m
flask-service       NodePort    172.21.250.81  <none>        5000:32015/TCP   117s
ibmproject          NodePort    172.21.91.42   <none>        3000:30960/TCP   3h34m
kubernetes          ClusterIP   172.21.0.1     <none>        443/TCP          4h1m
mycluster-free-service NodePort    172.21.163.161 <none>        5000:31134/TCP   92m
yaseen-project-service ClusterIP   172.21.65.168  <none>        5000/TCP         119m
PS C:\Users\Yaseen\Desktop\Assignment4> |
```

