

## Assignment 4

### Docker and Kubernetes

Date	12 November 2022
Team ID	PNT2022TMID03794
Project Name	Project - Nutrition Assistant Application
Maximum Marks	2 Marks

#### Question 1:

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

Pulling hello-world image from docker:

```
docker run hello-world
```

```
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:faa03e786c97f07ef34423fccceec2398ec8a5759259f94d99078f264e9d7af
Status: Downloaded newer image for hello-world:latest
```

```
Hello from Docker!
This message shows that your installation appears to be working correctly.
```

To generate this message, Docker took the following steps:

1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.  
(amd64)
3. The Docker daemon created a new container from that image which runs the executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it to your terminal.

To try something more ambitious, you can run an Ubuntu container with:

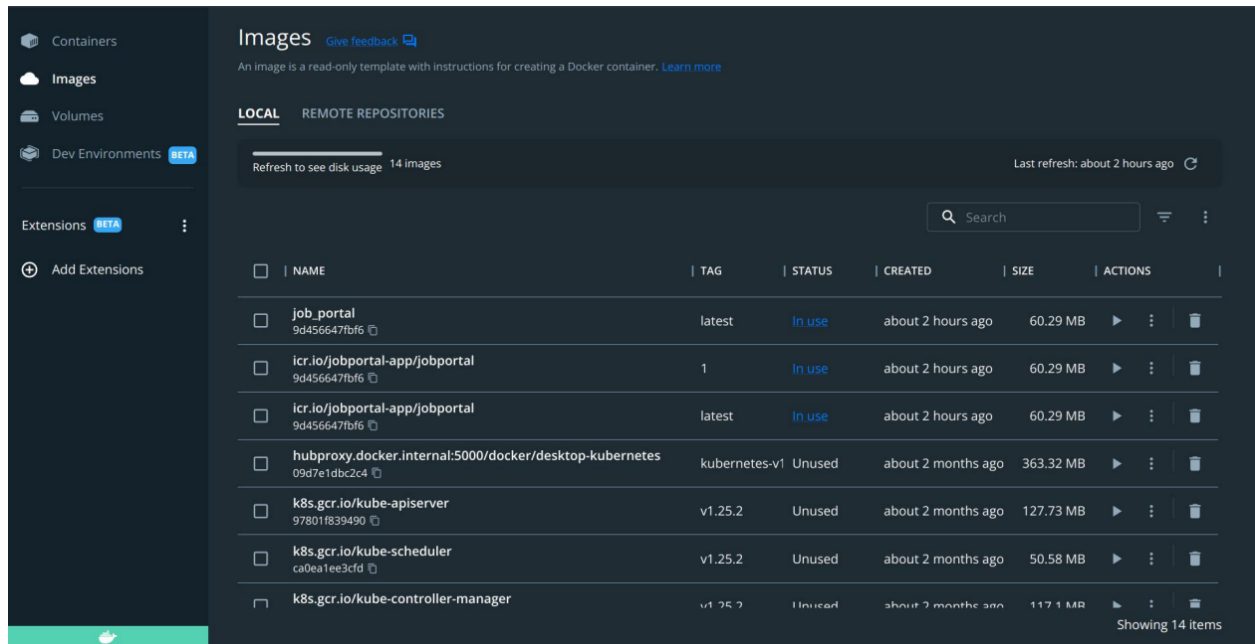
```
$ docker run -it ubuntu bash
```

Share images, automate workflows, and more with a free Docker ID:

<https://hub.docker.com/>

For more examples and ideas, visit:

<https://docs.docker.com/get-started/>



## Running docker image:

```
Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
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    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

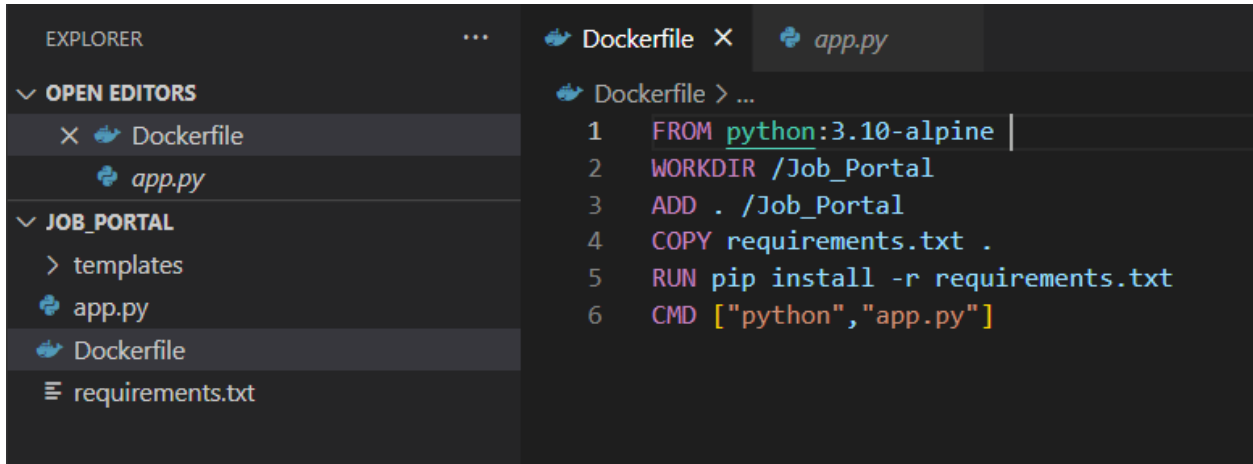
To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

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```

## Question 2:

Create a docker file for the jobportal application and deploy it in Docker desktop application.



The screenshot shows a VS Code editor with two files open: Dockerfile and app.py. The Explorer sidebar on the left shows the project structure with folders 'OPEN EDITORS' and 'JOB\_PORTAL'. The 'JOB\_PORTAL' folder contains 'templates', 'app.py', 'Dockerfile', and 'requirements.txt'. The Dockerfile editor shows the following content:

```
Dockerfile > ...  
1 FROM python:3.10-alpine |  
2 WORKDIR /Job_Portal  
3 ADD . /Job_Portal  
4 COPY requirements.txt .  
5 RUN pip install -r requirements.txt  
6 CMD ["python","app.py"]
```

### Dockerfile:

FROM python:3.10-alpine

WORKDIR /Job\_Portal

ADD . /Job\_Portal

COPY requirements.txt .

RUN pip install -r requirements.txt

CMD ["python","app.py"]

### Flask web app for job portal:

Post Job

IBM Organization
Banglore
Software Engineer
B.E CSE/IT/ECE, M.E CSE/IT
0-5 years
7-12 LPA
0
Asap

Submit

Organization Name: IBM Organization  
 Location: Bangalore  
 Job Role: Software Engineer  
 Eligibility: B.E CSE/IT/ECE, M.E CSE/IT  
 Experience: 0-5 years  
 Compensation 7-12 LPA  
 Service Agreement: 0  
 Apply Within: Asap

```

EXPLORER
OPEN EDITORS
  Dockerfile
  app.py
JOB_PORTAL
  templates
  app.py
  Dockerfile
  requirements.txt

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\dharsini\Desktop\Job_Portal> docker image build -t job_portal .
[*] Building 36.1s (11/11) FINISHED
=> [internal] load build definition from Dockerfile                                1.2s
=> => transferring dockerfile: 32B                                              0.1s
=> [internal] load .dockerignore                                                0.8s
=> => transferring context: 2B                                                  0.1s
=> [internal] load metadata for docker.io/library/python:3.10-alpine          6.4s
=> [auth] library/python:pull token for registry-1.docker.io                  0.0s
=> [internal] load build context                                              0.5s
=> => transferring context: 244B                                               0.0s
=> [1/5] FROM docker.io/library/python:3.10-alpine@sha256:bf95e439d1d6cc0402da13c92242eb7257f6ab075efbd2babfbcea114d061 0.5s
=> => resolve docker.io/library/python:3.10-alpine@sha256:bf95e439d1d6cc0402da13c92242eb7257f6ab075efbd2babfbcea114d061 0.5s
=> CACHED [2/5] WORKDIR /Job_Portal                                           0.0s
=> [3/5] ADD . /Job_Portal                                                    1.0s
=> [4/5] COPY requirements.txt .                                              2.9s
=> [5/5] RUN pip install -r requirements.txt                                  18.3s
=> exporting to image                                                         4.3s
=> => exporting layers                                                         3.6s
=> => writing image sha256:e32187a45a419f86c58c2b9c447f629cf27e012802bf2adfafbfc8c0a7a651e6 0.2s
=> => naming to docker.io/library/job_portal                                  0.1s
    
```

Containers Images Volumes Dev Environments BETA Extensions BETA Add Extensions

## Images [Give feedback](#)

An image is a read-only template with instructions for creating a Docker container. [Learn more](#)

LOCAL REMOTE REPOSITORIES

Refresh to see disk usage 14 Images Last refresh: about 2 hours ago

Search

	NAME	TAG	STATUS	CREATED	SIZE	ACTIONS
<input type="checkbox"/>	job_portal 9d456647fbf6	latest	In use	about 2 hours ago	60.29 MB	<a href="#">▶</a> <a href="#">⋮</a> <a href="#">🗑</a>
<input type="checkbox"/>	icr.io/jobportal-app/jobportal 9d456647fbf6	1	In use	about 2 hours ago	60.29 MB	<a href="#">▶</a> <a href="#">⋮</a> <a href="#">🗑</a>
<input type="checkbox"/>	icr.io/jobportal-app/jobportal 9d456647fbf6	latest	In use	about 2 hours ago	60.29 MB	<a href="#">▶</a> <a href="#">⋮</a> <a href="#">🗑</a>
<input type="checkbox"/>	hubproxy.docker.internal:5000/docker/desktop-kubernetes 09d7e1dbc2c4	kubernetes-v1	Unused	about 2 months ago	363.32 MB	<a href="#">▶</a> <a href="#">⋮</a> <a href="#">🗑</a>
<input type="checkbox"/>	k8s.gcr.io/kube-apiserver 97801f839490	v1.25.2	Unused	about 2 months ago	127.73 MB	<a href="#">▶</a> <a href="#">⋮</a> <a href="#">🗑</a>
<input type="checkbox"/>	k8s.gcr.io/kube-scheduler ca0ea1ee3cfd	v1.25.2	Unused	about 2 months ago	50.58 MB	<a href="#">▶</a> <a href="#">⋮</a> <a href="#">🗑</a>
<input type="checkbox"/>	k8s.gcr.io/kube-controller-manager	v1.25.2	Unused	about 2 months ago	117.1 MB	<a href="#">▶</a> <a href="#">⋮</a> <a href="#">🗑</a>

Showing 14 items

### Question 3:

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

```
Looking up 'container-registry' from repository 'IBM Cloud'...
Plug-in 'container-registry[cr] 1.0.2' found in repository 'IBM Cloud'
Attempting to download the binary file...
11.90 MiB / 11.90 MiB [=====] 100.00% 2s
12476416 bytes downloaded
Installing binary...
OK
Plug-in 'container-registry 1.0.2' was successfully installed into C:\Users\dhharshini\bluemix\plugins\container-registry. Use 'ibmcloud plugin show container-registry' to show its details.
C:\Users\dhharshini>ibmcloud plugin list
Listing installed plug-ins...
Plugin Name      Version  Status  Private endpoints supported
container-registry 1.0.2    true
```

### Pushing jobportal image to container registry

```
The push refers to repository [icr.io/myassignment/myrepo]
fcba356b279f: Pushed
3021648f56fd: Pushed
2228cb72ea5e: Pushed
10247be4aa41: Pushed
be6b216728ff: Pushed
b9a7a7381abe: Pushed
2306fb7a5a47: Pushed
6666686122fd: Pushed
994393dc58e7: Pushed
jobportal: digest: sha256:bfd315e5345623a9459154469a742417515c27cf709acf0bcc7b6c55f85bde48 size: 2201

C:\Users\dhharshini>ibmcloud cr image-list
Listing images...

Repository          Tag          Digest          Namespace      Created      Size      Security status
icr.io/myassignment/myrepo  jobportal    bfd315e53456    myassignment   5 hours ago  24 MB    -
```

IBM Cloud

Search resources and products...

Container Registry

Quick start

Namespaces 1

Repositories 1

Images 1

Trash 0

Settings

### Images

Location: Global

View by: Digest

Search

Create +

Repository@digest	Tags	Manifest type	Created	Size	Security status
myassignment/myrepo@sha256:bfd315e53456...	jobportal	Docker	5 hours ago	24 MB	Unscanned

Items per page: 25 1-1 of 1 item

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## 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.

Overview

Worker nodes

Worker pools

DevOps New

Pool: Filter...

Q

Search

Add

+

<div></div>	Name	Status	Worker pool	Zone	Private IP	Public IP	Version
<div>▼</div> <div><div></div></div>	000000aa	<div></div> Normal	default	Milan 01	10.144.180.66	169.51.195.251	1.24.7_1543

Items per page: 25

1-1 of 1 item

1

1 of 1 page

◀

▶

```
Administrator: Windows PowerShell
PS C:\Windows\system32> kubectl run jobportal --image=icr.io/myassignment/myrepo
pod/jobportal created
PS C:\Windows\system32> kubectl describe nodes
Name:         docker-desktop
Roles:        control-plane
Labels:        beta.kubernetes.io/arch=amd64
               beta.kubernetes.io/os=linux
               kubernetes.io/arch=amd64
               kubernetes.io/hostname=docker-desktop
               kubernetes.io/os=linux
               node-role.kubernetes.io/control-plane=
Annotations:   node.kubernetes.io/exclude-from-external-load-balancers=
               kubeadm.alpha.kubernetes.io/cri-socket: unix:///var/run/cri-dockerd.sock
               node.alpha.kubernetes.io/ttl: 0
               volumes.kubernetes.io/controller-managed-attach-detach: true
CreationTimestamp: Sat, 12 Nov 2022 21:10:15 +0530
Taints:         <none>
Unschedulable:  false
Lease:
  HolderIdentity:  docker-desktop
  AcquireTime:     <unset>
  RenewTime:       Sat, 12 Nov 2022 21:44:53 +0530
Conditions:
  Type            Status  LastHeartbeatTime     LastTransitionTime     Reason                    Message
  ----            -
MemoryPressure   False   Sat, 12 Nov 2022 21:44:31 +0530   Sat, 12 Nov 2022 21:10:08 +0530   KubeletHasSufficientMemory   kubelet has sufficient memory available
DiskPressure     False   Sat, 12 Nov 2022 21:44:31 +0530   Sat, 12 Nov 2022 21:10:08 +0530   KubeletHasNoDiskPressure     kubelet has no disk pressure
PIDPressure      False   Sat, 12 Nov 2022 21:44:31 +0530   Sat, 12 Nov 2022 21:10:08 +0530   KubeletHasSufficientPID      kubelet has sufficient PID available
Ready            True    Sat, 12 Nov 2022 21:44:31 +0530   Sat, 12 Nov 2022 21:10:49 +0530   KubeletReady                  kubelet is posting ready status
Addresses:
  InternalIP:  192.168.65.4
  Hostname:    docker-desktop
Capacity:
  cpu:                4
  ephemeral-storage:  263174212Ki
  hugepages-1Gi:      0
  hugepages-2Mi:      0
  memory:             6234028Ki
  pods:              110
Allocatable:
  cpu:                4
  ephemeral-storage:  242541353378
  hugepages-1Gi:      0
  hugepages-2Mi:      0
  memory:             6131628Ki
  pods:              110
System Info:
  Machine ID:         7e926ddc-1750-4076-a1e1-4a3007910195
  System UUID:        7e926ddc-1750-4076-a1e1-4a3007910195
  Boot ID:            867f5dd8-2ce4-48cf-8ec4-654bdd993cc7
  Kernel Version:     5.10.102.1-microsoft-standard-WSL2
  OS Image:           Docker Desktop
  Operating System:    linux
  Architecture:       amd64
  Container Runtime Version: docker://20.10.20
  Kubelet Version:     v1.25.2
  Kube-Proxy Version:  v1.25.2
Non-terminated Pods:  (10 in total)
Namespace             Name           CPU Requests  CPU Limits  Memory Requests  Memory Limits  Age
```

```
MemoryPressure   False   Sat, 12 Nov 2022 21:44:31 +0530   Sat, 12 Nov 2022 21:10:08 +0530   KubeletHasSufficientMemory   kubelet has sufficient memory available
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  System UUID:         7e926ddc-1750-4076-a1e1-4a3007910195
  Boot ID:             867f5dd8-2ce4-48cf-8ec4-654bdd993cc7
  Kernel Version:      5.10.102.1-microsoft-standard-WSL2
  OS Image:            Docker Desktop
  Operating System:    linux
  Architecture:        amd64
  Container Runtime Version: docker://20.10.20
  Kubelet Version:      v1.25.2
  Kube-Proxy Version:   v1.25.2
Non-terminated Pods: (10 in total)
  Namespace          Name                                CPU Requests  CPU Limits  Memory Requests  Memory Limits  Age
  -----
  default            jobportal                           0 (0%)        0 (0%)       0 (0%)          0 (0%)         12m
  kube-system        coredns-95db45d46-6d514            100m (2%)     0 (0%)       70Mi (1%)       170Mi (2%)     33m
  kube-system        coredns-95db45d46-6nfzk            100m (2%)     0 (0%)       70Mi (1%)       170Mi (2%)     33m
  kube-system        etcd-docker-desktop                100m (2%)     0 (0%)       100Mi (1%)      0 (0%)         34m
  kube-system        kube-apiserver-docker-desktop       250m (6%)     0 (0%)       0 (0%)          0 (0%)         33m
  kube-system        kube-controller-manager-docker-desktop 200m (5%)     0 (0%)       0 (0%)          0 (0%)         34m
  kube-system        kube-proxy-gcmw7                   0 (0%)        0 (0%)       0 (0%)          0 (0%)         33m
  kube-system        kube-scheduler-docker-desktop       100m (2%)     0 (0%)       0 (0%)          0 (0%)         34m
  kube-system        storage-provisioner                 0 (0%)        0 (0%)       0 (0%)          0 (0%)         32m
  kube-system        vpnkit-controller                   0 (0%)        0 (0%)       0 (0%)          0 (0%)         32m
Allocated resources:
  (Total limits may be over 100 percent, i.e., overcommitted.)
  Resource           Requests  Limits
  -----
  cpu                850m (21%)  0 (0%)
  memory             240Mi (4%)  340Mi (5%)
  ephemeral-storage  0 (0%)      0 (0%)
  hugepages-1Gi      0 (0%)      0 (0%)
  hugepages-2Mi      0 (0%)      0 (0%)
Events:
  Type    Reason      Age    From    Message
  ----    -
  Normal  Starting    33m    kube-proxy
  Normal  RegisteredNode 33m    node-controller Node docker-desktop event: Registered Node docker-desktop in Controller
```

