

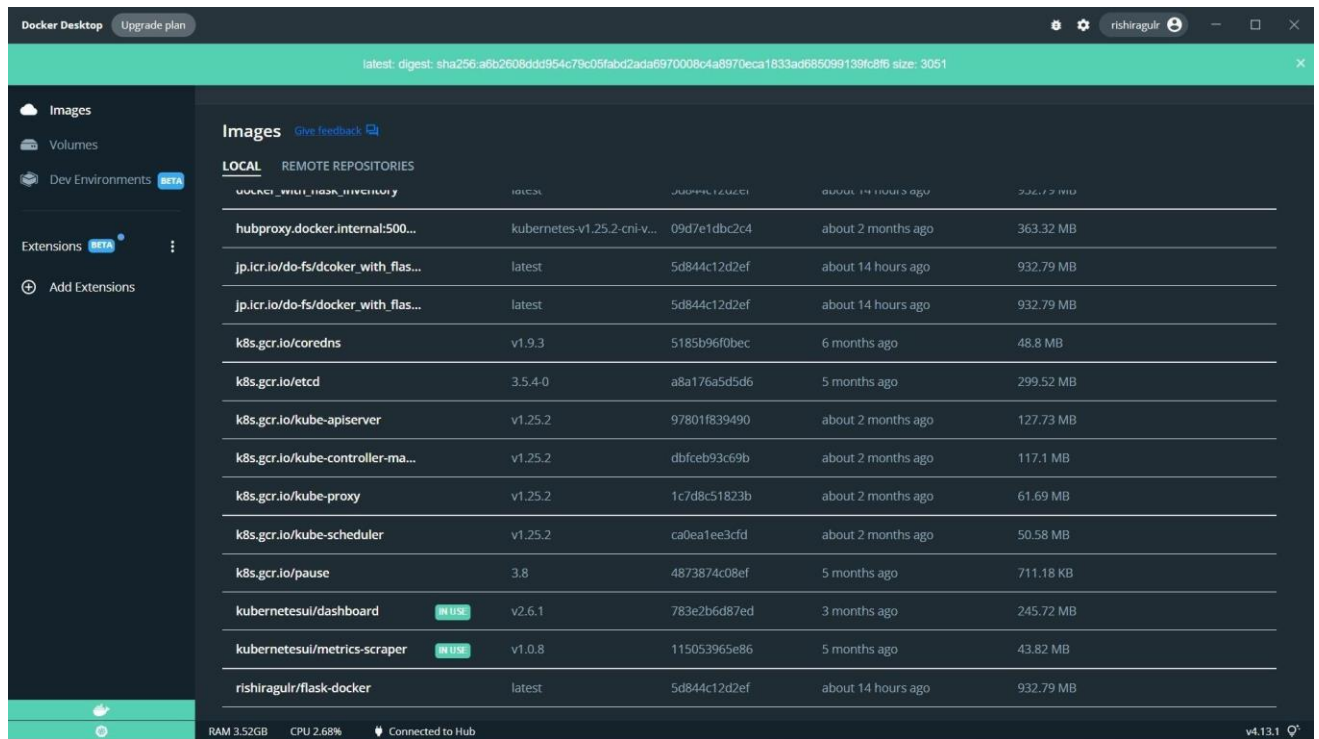
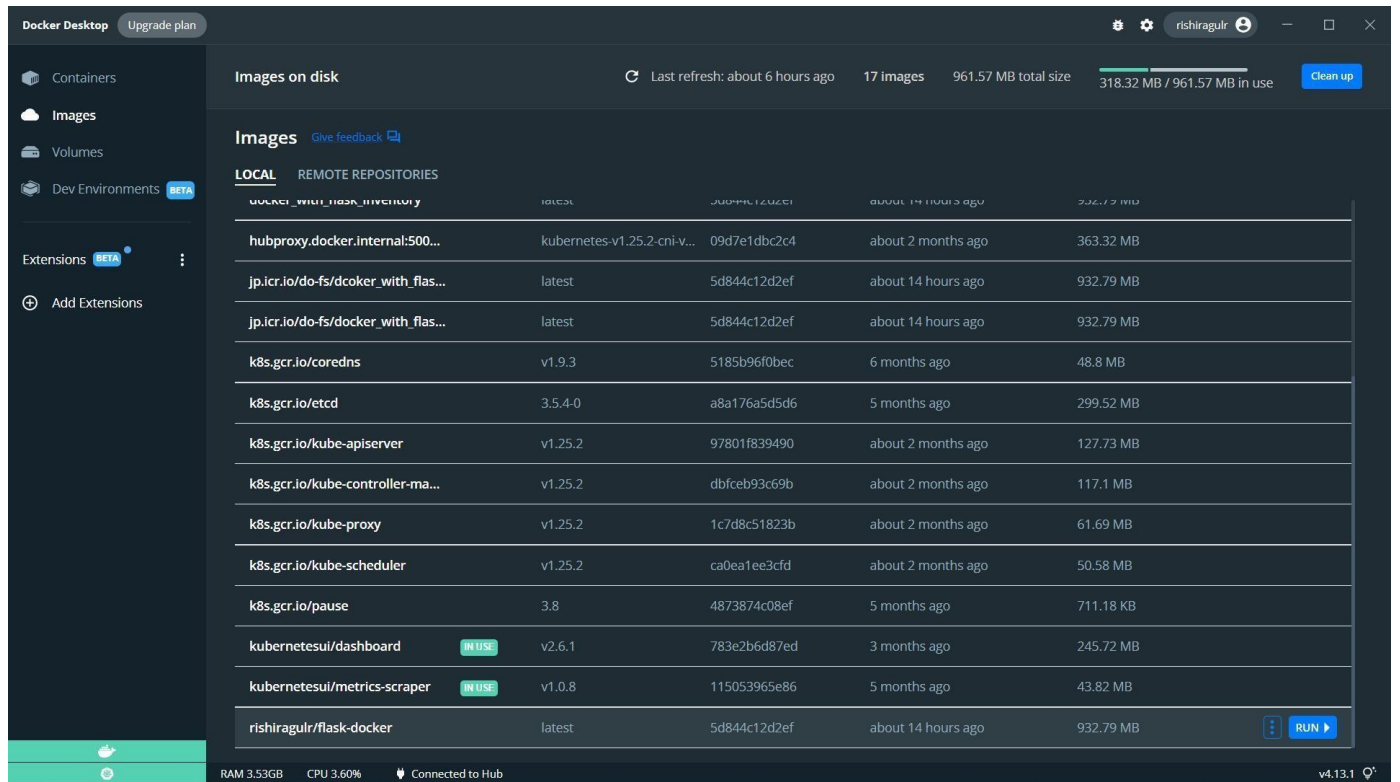
Assignment-4

Assignment Date	29 October 2022
Student Name	Mohankumar S
Student Roll Number	610519104065
Maximum Marks	2 Marks

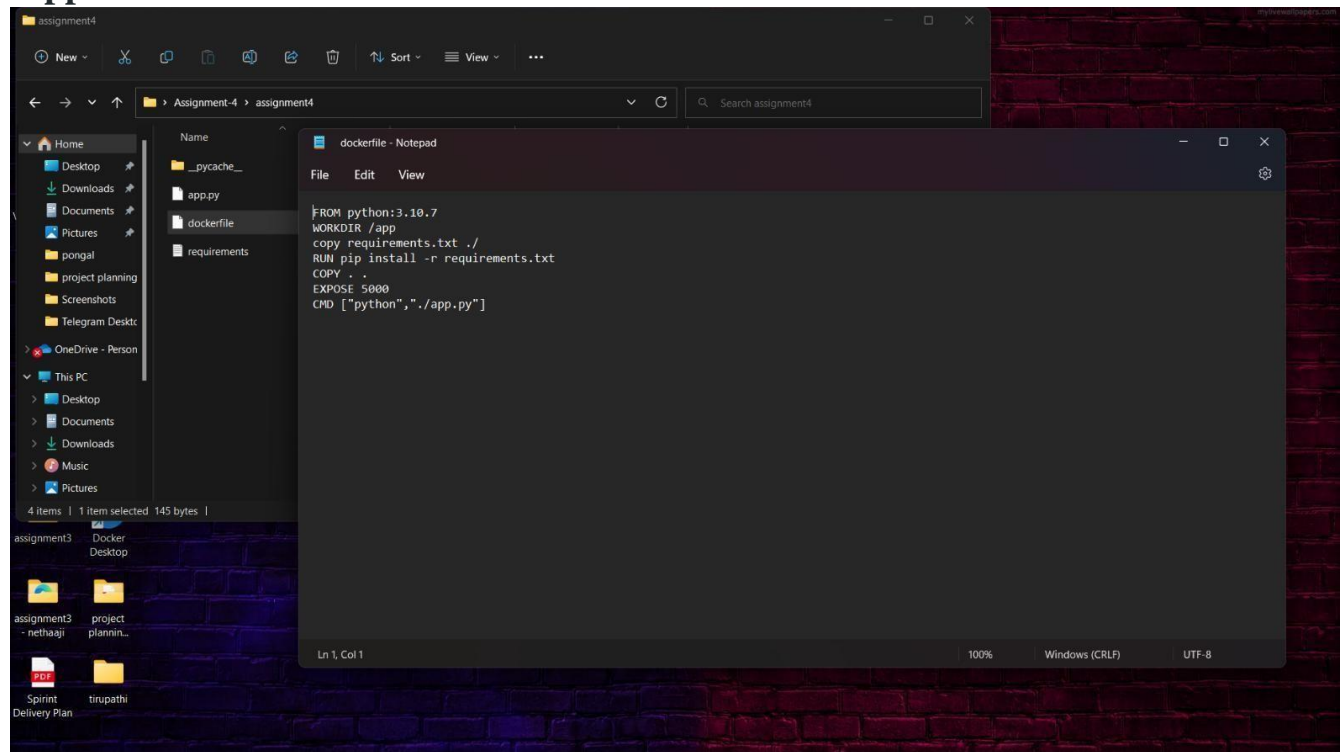
Question:

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

```
Windows PowerShell
PS C:\Users\RISHI> docker images
REPOSITORY                                TAG                                IMAGE ID        CREATED        SIZE
docker_with_flask_inventory              latest                            5d844c12d2ef    18 hours ago  933MB
rishiaguly/flask-docker                  latest                            5d844c12d2ef    18 hours ago  933MB
jp.icr.io/do-fs/docker_with_flask_inventory latest                            5d844c12d2ef    18 hours ago  933MB
jp.icr.io/do-fs/docker_with_flask_inventory latest                            5d844c12d2ef    18 hours ago  933MB
hubproxy.docker.internal:5000/docker/desktop-kubernetes kubernet-v1.25.2-cni-v1.1.1-critools-v1.24.2-cri-dockerd-v0.2.5-1-debian 09d7e1dbc2c4    6 weeks ago    363MB
k8s.gcr.io/kube-apiserver                 v1.25.2                          97801f839490    7 weeks ago    128MB
k8s.gcr.io/kube-scheduler                 v1.25.2                          ca0ea1ee3cfd    7 weeks ago    50.6MB
k8s.gcr.io/kube-controller-manager        v1.25.2                          dbfceb93c69b    7 weeks ago    117MB
k8s.gcr.io/kube-proxy                     v1.25.2                          1c7d8c51923b    7 weeks ago    61.7MB
kubernetesui/dashboard                   v2.6.1                           783e2b6d87ed    2 months ago   246MB
k8s.gcr.io/pause                          3.8                              4873874c08ef    4 months ago   711kB
k8s.gcr.io/etcd                           3.5.4-0                          a8a176a5d5d6    5 months ago   300MB
kubernetesui/metrics-scraper              v1.0.8                          115053965e86    5 months ago   43.8MB
k8s.gcr.io/coredns                        v1.9.3                          5185b96f0bec    5 months ago   48.8MB
docker/getting-started                    latest                            c090f96fd791    7 months ago   28.8MB
docker/desktop-vpnkit-controller          v2.0                             8c2c38aa676e    18 months ago  21MB
docker/desktop-storage-provisioner        v2.0                             99f89471f470    18 months ago  41.9MB
PS C:\Users\RISHI>
```



2. Create a docker file for the job portal application and deploy it in Docker desktop application.



Deploy in docker application

```

C:\Users\RISHI\Desktop\Assignment-4\assignment4>docker build -t docker_with_flask_inventory .
[+] Building 115.0s (10/10) FINISHED
=> [internal] load build definition from Dockerfile
=> transferring dockerfile: 320
=> [internal] load .dockerignore
=> transferring context: 20
=> [internal] load metadata for docker.io/library/python:3.10.7
=> [1/5] FROM docker.io/library/python:3.10.7@sha256:53e577204d362233ee92aeb5119449271f5eb24f99c6146defe9167ddbc8640f
=> resolve docker.io/library/python:3.10.7@sha256:53e577204d362233ee92aeb5119449271f5eb24f99c6146defe9167ddbc8640f
=> sha256:d8a8de337eae99cddc439279f15b0818e5e2287c7ee9ea4180558a13e107 8.53MB / 8.53MB
=> sha256:f68e0873ae5178229f246b094b50dca239f9980efc57acbf9340bd298d5ddf 55.85MB / 55.85MB
=> sha256:47db815ca4547d224b75222193cb1851cf52b2dcbdf26f854b0bbf97099b08 5.16MB / 5.16MB
=> sha256:53e577204d362233ee92aeb5119449271f5eb24f99c6146defe9167ddbc8640f 2.36KB / 2.36KB
=> sha256:d40bcf9859b0814b180d9c8b522917b13a1ce49fc190f2a084722030fede1a5c 2.22KB / 2.22KB
=> sha256:bfa8840800081a837b72870d2aa2536f9a4bdc5d1ceadd7d79f41fe7a6b6 10.80MB / 10.80MB
=> sha256:a522f7a256d6a91a0977940771b120c5d7dce79ea2a2d30944d793b2b2ef1 54.50MB / 54.50MB
=> sha256:8f708525895528f0b73153451e112b0d0e1854e4bdc08ef4ca0ba2ee98172 196.85MB / 196.85MB
=> sha256:7110f04115ae2d7232e08e50807db7c7f337c91f95edc2542bba3e5220641b7 6.29MB / 6.29MB
=> sha256:c4b413c6a489a490e2ee74f958d411ccfcc899dceffe61de71cbb433ede76143 20.05MB / 20.05MB
=> sha256:22311b72a3c8993d70dc2f9440feb09ca571ae931b080d975c81f4270ca90908 231B / 231B
=> sha256:8dcf638b6fa1182030e006f135471f3726cef064f6fc90edbdff80f450efad79 3.04MB / 3.04MB
=> extracting sha256:f68e0873ae5178229f246b094b50dca239f9980efc57acbf9340bd298d5ddf 2.3s
=> extracting sha256:47db815ca4547d224b75222193cb1851cf52b2dcbdf26f854b0bbf97099b08 0.3s
=> extracting sha256:bfa8840800081a837b72870d2aa2536f9a4bdc5d1ceadd7d79f41fe7a6b6 0.4s
=> extracting sha256:a522f7a256d6a91a0977940771b120c5d7dce79ea2a2d30944d793b2b2ef1 3.0s
=> extracting sha256:8f708525895528f0b73153451e112b0d0e1854e4bdc08ef4ca0ba2ee98172 6.8s
=> extracting sha256:7110f04115ae2d7232e08e50807db7c7f337c91f95edc2542bba3e5220641b7 0.4s
=> extracting sha256:c4b413c6a489a490e2ee74f958d411ccfcc899dceffe61de71cbb433ede76143 0.8s
=> extracting sha256:22311b72a3c8993d70dc2f9440feb09ca571ae931b080d975c81f4270ca90908 0.8s
=> extracting sha256:8dcf638b6fa1182030e006f135471f3726cef064f6fc90edbdff80f450efad79 0.2s
=> [internal] load build context
=> transferring context: 190B
=> [2/5] WORKDIR /app
=> [3/5] COPY requirements.txt ./
=> [4/5] RUN pip install -r requirements.txt
=> [5/5] COPY .
=> exporting to image
=> exporting layers
=> writing image sha256:5d84dc12d2eff0ba170fc15034f8c9c0b0fed528ead2c8ba351f21377ddc8bd
=> naming to docker.io/library/docker_with_flask_inventory

```

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

```

C:\Users\RISHI\Desktop\Assignment-4\assignment4>

```

Running in docker desktop

The image shows a Visual Studio Code editor window with the title bar "app.py - assignment4 - Visual Studio Code". The interface is divided into three main sections: Explorer, Editor, and Terminal.

Explorer: The left sidebar shows the file explorer with the following structure:

- ASSIGNMENT4
 - __pycache__
 - app.py (selected)
 - dockerfile
 - requirements.txt

Editor: The main area displays the content of `app.py`:

```
1 from flask import Flask
2 from markupsafe import escape
3
4 app = Flask(__name__)
5
6 @app.route("/")
7 def index():
8     return "<p> Inventory Management System <br> Hello Guys <p>"
9
10 @app.route("/<name>")
11 def hello(name):
12     return f"hello,{escape(name)}!"
13
14 if __name__ == "__main__":
15     app.run(host="0.0.0.0",port=5000)
```

Terminal: The bottom section shows the output of the command `python app.py`:

```
PS C:\Users\RISHI\Desktop\Assignment-4\assignment4> & C:/Users/RISHI/AppData/Local/Programs/Python/Python310/python.exe c:/Users/RISHI/Desktop/Assignment-4/assignment4/app.py
* Serving Flask app 'app'
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5000
* Running on http://192.168.101.5:5000
Press CTRL+C to quit
```

The status bar at the bottom indicates the current file is at line 15, column 38, using UTF-8 encoding, with 4 spaces. It also shows the Python version as 3.10.7 64-bit and the Go Live extension.

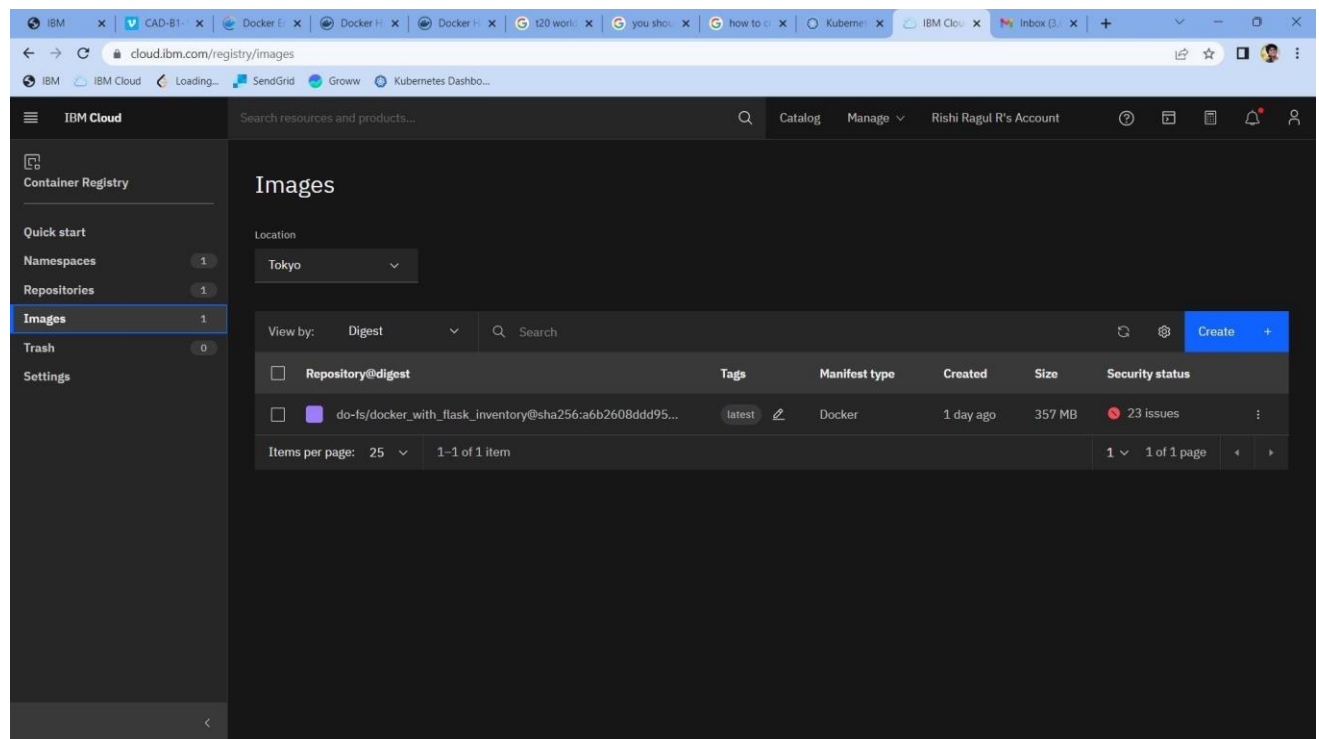
3. Create a IBM container registry and deploy hello world app or job portal app.

```
Windows PowerShell
Email> 610519104082@smartinternz.com

Password>
Authenticating...
OK

Targeted account Rishi Ragul R's Account (68a0040c508e44ffa939bddb1044d350)

API endpoint:      https://cloud.ibm.com
Region:            jp-tok
User:              610519104082@smartinternz.com
Account:           Rishi Ragul R's Account (68a0040c508e44ffa939bddb1044d350)
Resource group:    No resource group targeted, use 'C:\Program Files\IBM\Cloud\bin\ibmcloud.exe target -g RESOURCE_GROUP'
CF API endpoint:
Org:
Space:
PS C:\Users\RISHI> docker images
REPOSITORY                                TAG                                IMAGE ID            CREATED            SIZE
docker_with_flask_inventory               latest                           5d844c12d2ef        13 hours ago      933MB
rishiragulr/flask-docker                 latest                           5d844c12d2ef        13 hours ago      933MB
jp.icr.io/do-fs/docker_with_flask_inventory latest                           5d844c12d2ef        13 hours ago      933MB
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 weeks ago        363MB
k8s.gcr.io/kube-apiserver                 v1.25.2                         97801f839490        7 weeks ago        128MB
k8s.gcr.io/kube-controller-manager        v1.25.2                         dbfceb93c69b        7 weeks ago        117MB
k8s.gcr.io/kube-scheduler                 v1.25.2                         ca0ea1ee3cfd        7 weeks ago        50.6MB
k8s.gcr.io/kube-proxy                     v1.25.2                         1c7d8c51823b        7 weeks ago        61.7MB
kubernetesui/dashboard                   v2.6.1                         783e2b6d87ed        2 months ago       246MB
k8s.gcr.io/pause                          3.8                             4873874c08ef        4 months ago       711kB
k8s.gcr.io/etcd                           3.5.4-0                         a8a176a5d5d6        5 months ago       300MB
kubernetesui/metrics-scraper              v1.0.8                         115053965e86        5 months ago       43.8MB
k8s.gcr.io/coredns                       v1.9.3                         5185b96f0bec        5 months ago       48.8MB
docker/getting-started                    latest                           cb90f98fd791        7 months ago       28.8MB
docker/desktop-vpnkit-controller           v2.0                             8c2c38aa676e        18 months ago       21MB
docker/desktop-storage-provisioner         v2.0                             99f89471f470        18 months ago       41.9MB
PS C:\Users\RISHI> docker tag docker_with_flask_inventory jp.icr.io/do-fs/docker_with_flask_inventory
PS C:\Users\RISHI> docker push jp.icr.io/do-fs/docker_with_flask_inventory
Using default tag: latest
The push refers to repository [jp.icr.io/do-fs/docker_with_flask_inventory]
439020a385be: Preparing
7143fbalc510: Preparing
f36426436017: Preparing
b9c0c0fe7120: Preparing
cf399be408ea: Preparing
793b971ccb99: Waiting
d172a9e6f9e6: Waiting
0c7da9a72c8: Waiting
75ba02937496: Waiting
230cf3a46c32: Waiting
186da837955d: Waiting
955c9335e041: Waiting
8e079fee2186: Waiting
```



Deploy hello world or job portal

```
Windows PowerShell
PS C:\Users\RISHI> ibmcloud cr login
Logging 'docker' in to 'jp.icr.io' ...
logged in to 'jp.icr.io'.

OK
PS C:\Users\RISHI> docker tag docker_with_flask_inventory jp.icr.io/do-fs/docker_with_flask_inventory
PS C:\Users\RISHI> docker push jp.icr.io/do-fs/docker_with_flask_inventory:latest
The push refers to repository [jp.icr.io/do-fs/docker_with_flask_inventory]
d39020a385be: Pushed
7143fba1c510: Pushed
f36426d436017: Pushed
09c0c0fe7120: Pushed
cf399be408ea: Pushed
793b971ccb99: Pushed
d172a9e6f9e6: Pushed
0c7da9a72c8: Pushed
75ba02937496: Pushed
288cf3a46e32: Pushed
186da837555d: Pushed
955c9335e041: Pushed
ba079fee2186: Pushed
latest: digest: sha256:a6b2608ddd954c79c05fabd2ada6970008c4a8970eca1833ad685099139fc8f6 size: 3051
PS C:\Users\RISHI> docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
docker_with_flask_inventory	latest	5d844c12d2ef	18 hours ago	933MB
rishiragulr/flask-docker	latest	5d844c12d2ef	18 hours ago	933MB
jp.icr.io/do-fs/docker_with_flask_inventory	latest	5d844c12d2ef	18 hours ago	933MB
jp.icr.io/do-fs/docker_with_flask_inventory	latest	5d844c12d2ef	18 hours ago	933MB
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 weeks ago	363MB
k8s.gcr.io/kube-apiserver	v1.25.2	97801f839490	7 weeks ago	128MB
k8s.gcr.io/kube-scheduler	v1.25.2	ca0e1ee3cfd	7 weeks ago	50.6MB
k8s.gcr.io/kube-controller-manager	v1.25.2	dbfceb93c60b	7 weeks ago	117MB
k8s.gcr.io/kube-proxy	v1.25.2	1c7d8c51823b	7 weeks ago	61.7MB
kubernetesui/dashboard	v2.6.1	783e2b6d87ed	2 months ago	246MB
k8s.gcr.io/pause	3.8	4873874c08ef	4 months ago	711KB
k8s.gcr.io/etcd	3.5.4-0	a8a176a5d5d6	5 months ago	300MB
kubernetesui/metrics-scraper	v1.0.8	115053965e86	5 months ago	43.8MB
k8s.gcr.io/coredns	v1.9.3	5185b96f0bec	5 months ago	48.8MB
docker/getting-started	latest	cb90f98fd791	7 months ago	28.8MB
docker/desktop-vpnkit-controller	v2.0	8c2c38aa576e	18 months ago	21MB
docker/desktop-storage-provisioner	v2.0	99f89471f470	18 months ago	41.9MB

```
PS C:\Users\RISHI>
```

4. Create a Kubernetes cluster in IBM cloud and deploy hello world image or job portal image and also expose the same app to run in node port.

Creating a Kubernetes cluster in IBM cloud

The screenshot shows the IBM Cloud Kubernetes dashboard for a cluster named 'mycluster-free'. The cluster is in a 'Normal' state and expires in 29 days. The 'Worker nodes' tab is selected, displaying a table with one node.

Name	Status	Worker pool	Zone	Private IP	Public IP	Version
0000007d	Normal	default	Milan 01	10.144.214.101	169.51.205.202	1.24.7_1543

Navigation links on the left include Overview, Worker nodes (selected), Worker pools, and DevOps (New). The top navigation bar includes IBM Cloud, Search resources and products..., Catalog, Manage, Rishi Ragul R's Account, Help, and a link to the Kubernetes dashboard.

Expose the same app to run in notepoint


```
C:\Users\IRISHI>cd C:\Users\IRISHI\Desktop\Assignment-4\assignment4
C:\Users\IRISHI\Desktop\Assignment-4\assignment4>kubectl apply -f kubernetes/deployment.yaml
error: the path "kubernetes/deployment.yaml" does not exist

C:\Users\IRISHI\Desktop\Assignment-4\assignment4>ibmcloud ks cluster config --cluster cd1tlpof0uv2a9hfiubg
OK
The configuration for cd1tlpof0uv2a9hfiubg was downloaded successfully.

Added context for cd1tlpof0uv2a9hfiubg to the current kubeconfig file.
You can now execute 'kubectl' commands against your cluster. For example, run 'kubectl get nodes'.
If you are accessing the cluster for the first time, 'kubectl' commands might fail for a few seconds while RBAC synchronizes.

C:\Users\IRISHI\Desktop\Assignment-4\assignment4>kubectl apply -f kubernetes/flask_deployment.yaml
error: the path "kubernetes/flask_deployment.yaml" does not exist

C:\Users\IRISHI\Desktop\Assignment-4\assignment4>kubectl apply -f kubernetes/flask_deployment.yaml
deployment.apps/flask-app created

C:\Users\IRISHI\Desktop\Assignment-4\assignment4>kubect_
```

IBM

CAD-B1-

t20 work

you shou

how to c

Kubernete

mycluste

Inbox (3)

ibm clou

mycluste

mycluste

eu-de.containers.cloud.ibm.com/kubeproxy/clusters/cdltpof0uv2a9hfiubg/service/#/workloads?namespace=default

IBMIBM CloudLoading...SendGridGrowwKubernetes Dashbo...Docker Hub

kubernetes

default

Search

+

Workloads

Workloads ^N

Cron Jobs

Daemon Sets

Deployments

Jobs

Pods

Replica Sets

Replication Controllers

Stateful Sets

Service

Ingresses ^N

Ingress Classes

Services ^N

Config and Storage

Config Maps ^N

Persistent Volume Claims ^N

Secrets ^N

Storage Classes

Workload Status

Failed: 1

Failed: 5

Failed: 1

Deployments

Pods

Replica Sets

Deployments

Name	Images	Labels	Pods	Created ↑
flask-app	Show all	-	0 / 5	4 minutes ago

Pods

IBM

CAD-B1-

t20 work

you shou

how to c

Kubernete

mycluste

Inbox (3)

ibm clou

mycluste

mycluste

eu-de.containers.cloud.ibm.com/kubeproxy/clusters/cdltpof0uv2a9hfiubg/service/#/pod?namespace=default

IBMIBM CloudLoading...SendGridGrowwKubernetes Dashbo...Docker Hub

kubernetes

default

Search

+

Workloads > Pods

Workloads ^N

Cron Jobs

Daemon Sets

Deployments

Jobs

Pods

Replica Sets

Replication Controllers

Stateful Sets

Service

Ingresses ^N

Ingress Classes

Services ^N

Config and Storage

Config Maps ^N

Persistent Volume Claims ^N

Secrets ^N

Storage Classes

Pods

Name	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created ↑
flask-app-5c85fdb465-fqx8b	Show all	Show all	10.144.214.101	ErrImageNev 0	-	-	-	5 minutes ago
flask-app-5c85fdb465-gvv9x	Show all	Show all	10.144.214.101	ErrImageNev 0	-	-	-	5 minutes ago
flask-app-5c85fdb465-wmrb6	Show all	Show all	10.144.214.101	ErrImageNev 0	-	-	-	5 minutes ago
flask-app-5c85fdb465-xqf5h	Show all	Show all	10.144.214.101	ErrImageNev 0	-	-	-	5 minutes ago
flask-app-5c85fdb465-zqpb9	Show all	Show all	10.144.214.101	ErrImageNev 0	-	-	-	5 minutes ago