

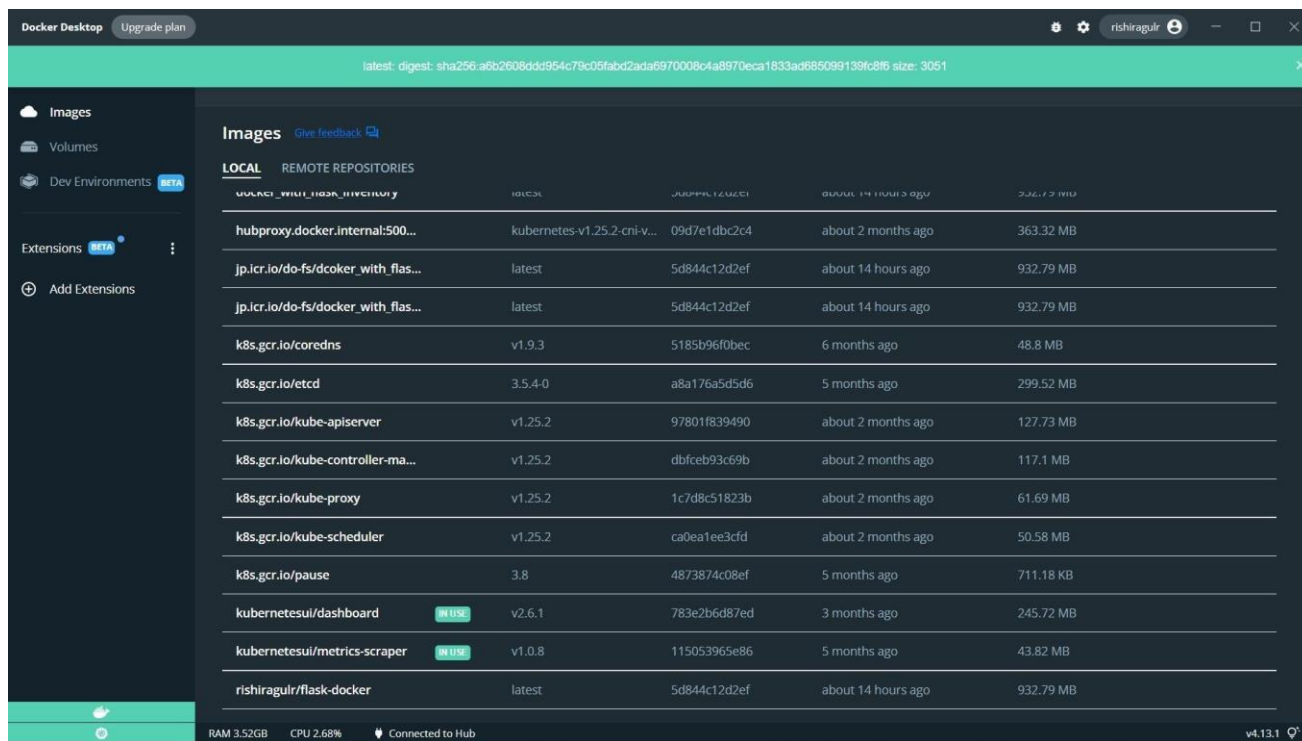
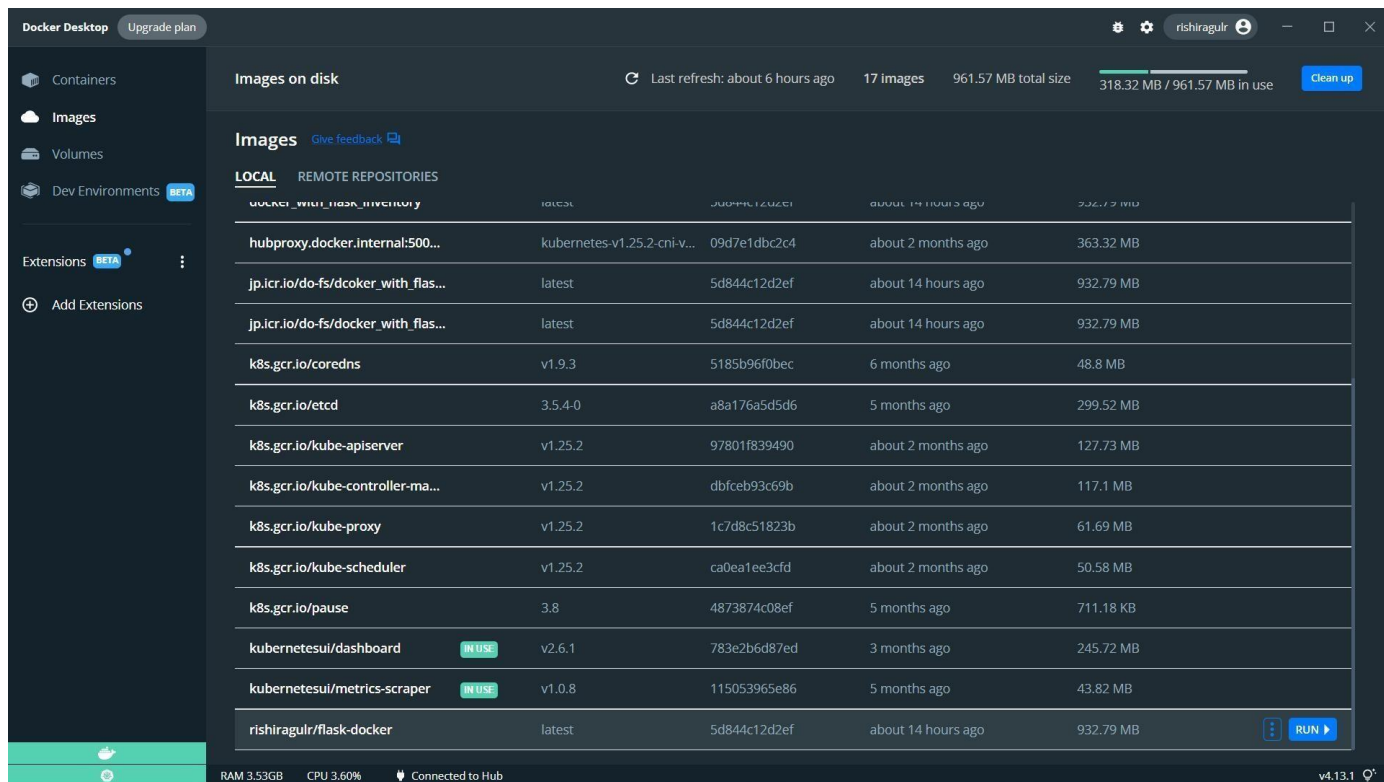
Assignment-4

| | |
|---------------------|-----------------|
| Assignment Date | 29 October 2022 |
| Student Name | Varatharajan N |
| Student Roll Number | 610519104109 |
| Maximum Marks | 2 Marks |

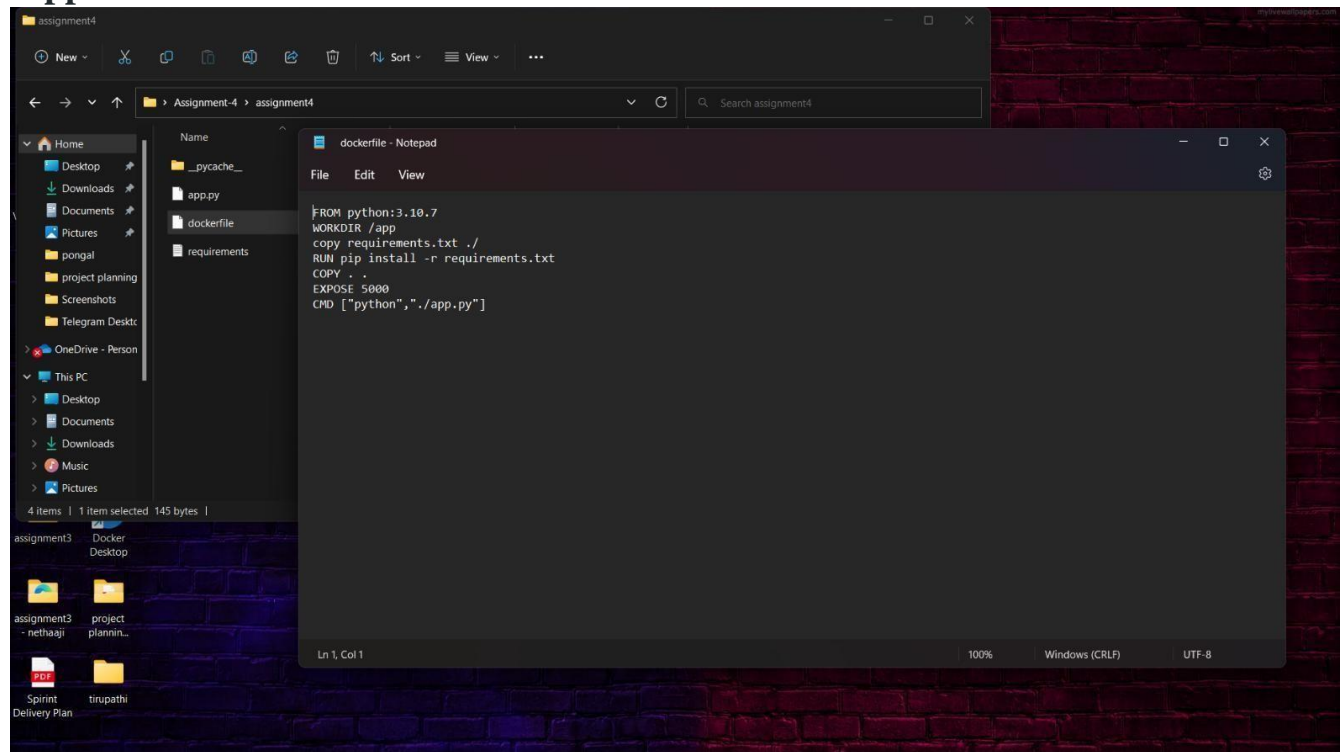
Question:

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 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                          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                          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                            c090f98fd791    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.



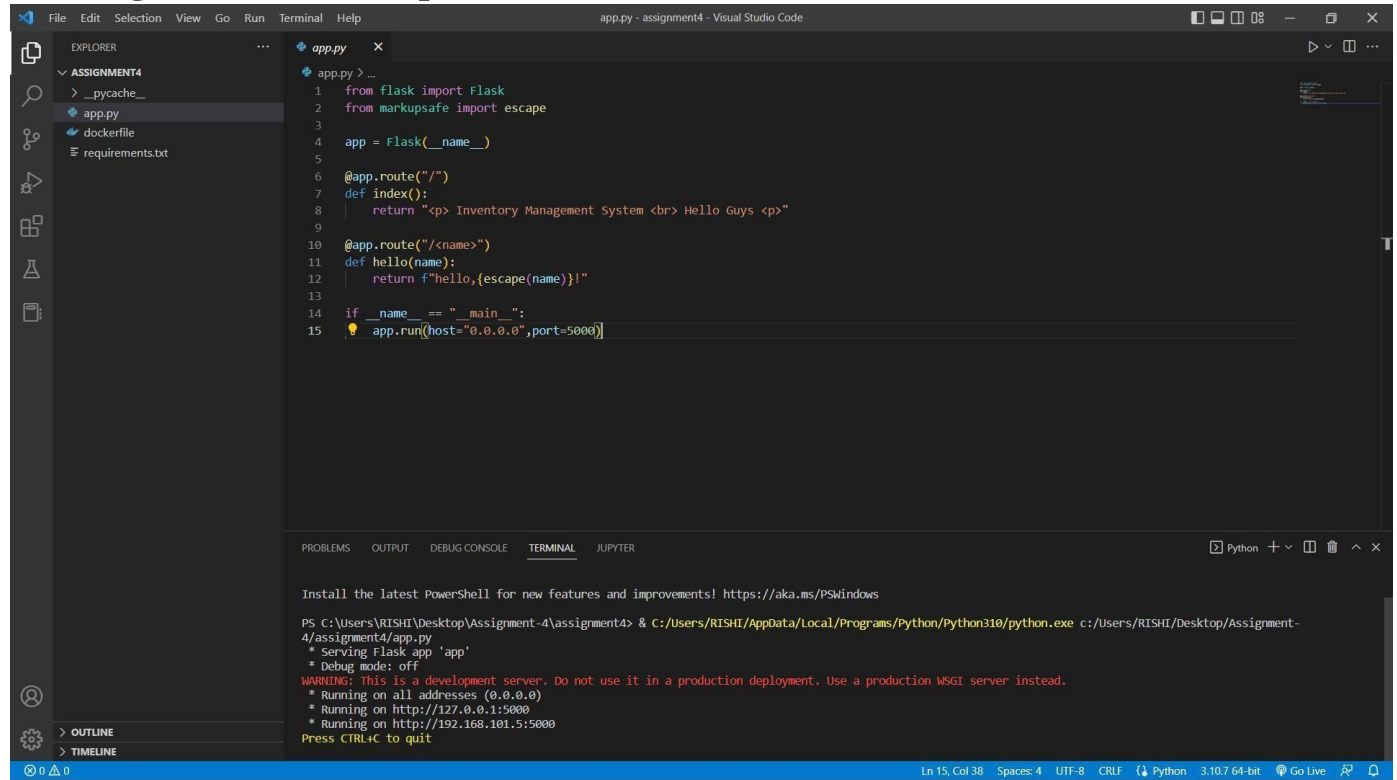
Deploy in docker application

[illegible]

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 screenshot shows the Visual Studio Code interface with a project named 'assignment4'. The Explorer sidebar on the left shows the file structure: 'ASSIGNMENT4' containing 'pycache_', 'app.py', 'dockerfile', and 'requirements.txt'. The main editor displays the 'app.py' file with the following Python code:

```
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)
```

The bottom panel shows the 'TERMINAL' tab with the following output:

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

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 file is at 'Ln 15, Col 38', uses 'Spaces: 4', 'UTF-8' encoding, 'CRLF' line endings, and is a 'Python 3.10.7 64-bit' file. It also shows 'Go Live' and other icons.

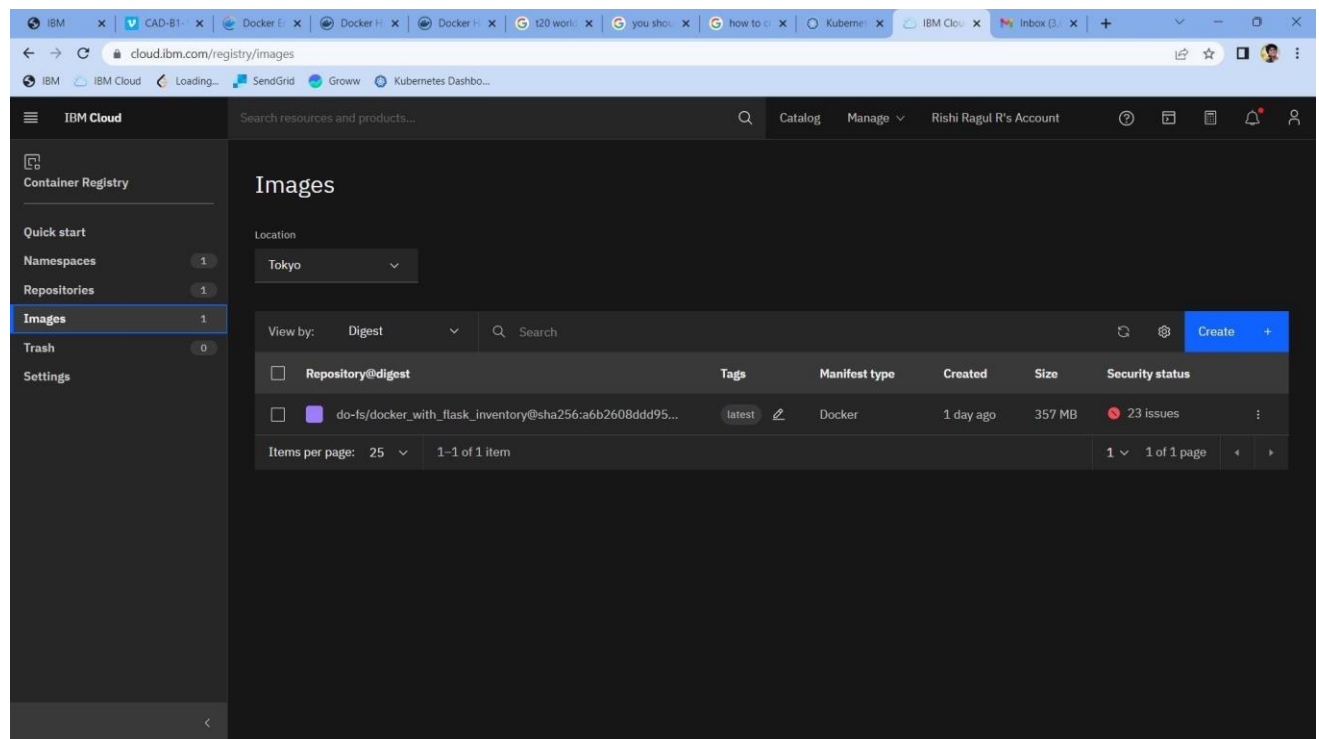
3. Create a IBM container registry and deploy hello world app or job portal app.

```
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 | 50.0MB |
| 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. The top navigation bar includes the IBM Cloud logo, a search bar, and links to Catalog, Manage, and the user's account (Rishi Ragul R's Account). The main header displays the cluster name 'mycluster-free' with a green status icon, a 'Normal' label, and a red 'Expires in 29 days' warning. A 'Kubernetes dashboard' button and an 'Actions...' dropdown are also present.

The left sidebar contains navigation links: Overview, Worker nodes (selected), Worker pools, and DevOps (marked as 'New').

The main content area displays a table of worker nodes. The table has columns for Name, Status, Worker pool, Zone, Private IP, Public IP, and Version. A single node is listed with the name '0000007d', status 'Normal', worker pool 'default', zone 'Milan 01', private IP '10.144.214.101', public IP '169.51.205.202', and version '1.24.7_1543'.

| 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 |

At the bottom of the table, there is a pagination bar showing 'Items per page: 25', '1-1 of 1 item', and '1 of 1 page'.

Expose the same app to run in noteport


```
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_
```

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

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kubernetes

default

Search

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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

DeploymentsPodsReplica Sets

Deployments

| Name | Images | Labels | Pods | Created ↑ |
|----------------------|-----------------|--------|-------|---------------|
| <div>flask-app</div> | <a>Show all | - | 0 / 5 | 4 minutes ago |

Pods

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

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

kubernetes

default

Search

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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 ↑ |
|---------------------------------------|-----------------|-----------------|----------------|---------------|----------|-------------------|----------------------|---------------|
| <div>flask-app-5c85fdb465-fqx8b</div> | <a>Show all | <a>Show all | 10.144.214.101 | ErrImageNev 0 | - | - | - | 5 minutes ago |
| <div>flask-app-5c85fdb465-gvv9x</div> | <a>Show all | <a>Show all | 10.144.214.101 | ErrImageNev 0 | - | - | - | 5 minutes ago |
| <div>flask-app-5c85fdb465-wmrb6</div> | <a>Show all | <a>Show all | 10.144.214.101 | ErrImageNev 0 | - | - | - | 5 minutes ago |
| <div>flask-app-5c85fdb465-xqf5h</div> | <a>Show all | <a>Show all | 10.144.214.101 | ErrImageNev 0 | - | - | - | 5 minutes ago |
| <div>flask-app-5c85fdb465-zqpb9</div> | <a>Show all | <a>Show all | 10.144.214.101 | ErrImageNev 0 | - | - | - | 5 minutes ago |