

Assignment - 4

Kubernetes/Docker

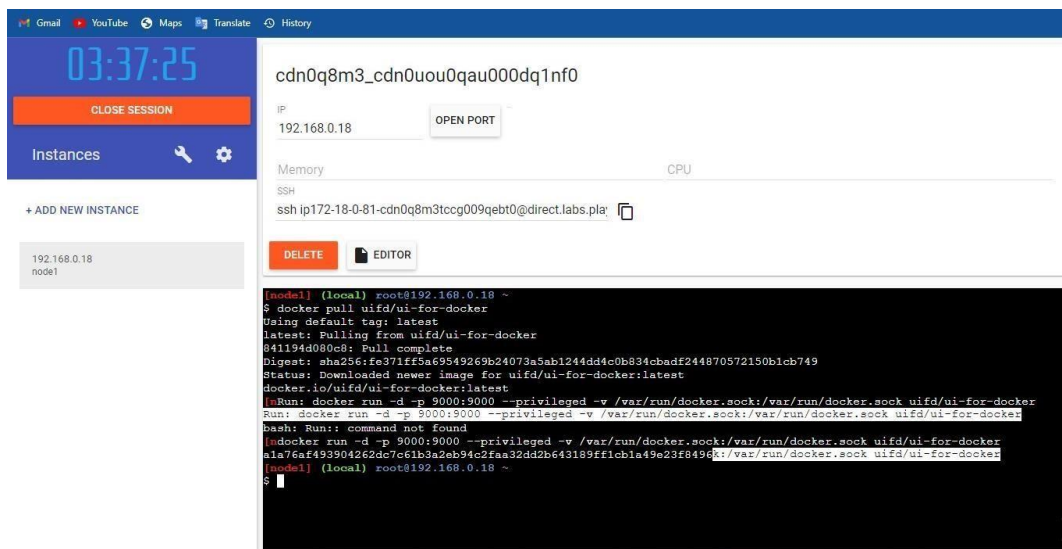
Assignment Date	19 November 2022
Student Name	PRAVEEN KUMAR R
Student Roll Number	113219041087
Maximum Marks	2 Marks

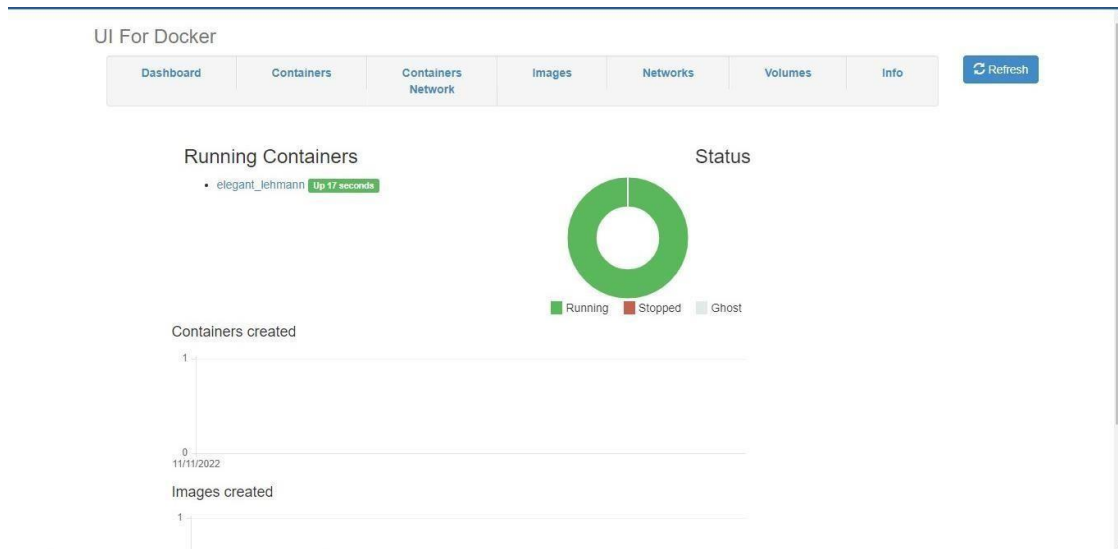
1. Pull an image from docker hub and run it on docker playground.

The screenshot displays the Docker Playground interface. On the left, a sidebar shows a timer at 03:45:29, a 'CLOSE SESSION' button, and an 'Instances' section with a '+ ADD NEW INSTANCE' button and a list of instances including '192.168.0.18 node1'. The main panel shows the instance details for 'cdn0q8m3_cdn0uou0qau000dq1nf0', including its IP (192.168.0.18), memory, CPU, and SSH command. Below this, there are 'DELETE' and 'EDITOR' buttons. The terminal window shows the following commands and output:

```
[node1] (local) root@192.168.0.18 ~
$ docker pull uifd/ui-for-docker
Using default tag: latest
latest: Pulling from uifd/ui-for-docker
841194d000e8: Pull complete
Digest: sha256:fe371ff5a69549269b24073a5ab1244dd4e0b834cbadf244870572150b1cb749
Status: Downloaded newer image for uifd/ui-for-docker:latest
docker.io/uifd/ui-for-docker:latest
[node1] (local) root@192.168.0.18 ~
$
```

To run a pulled image in docker playground, copy the run command of the pulled image.



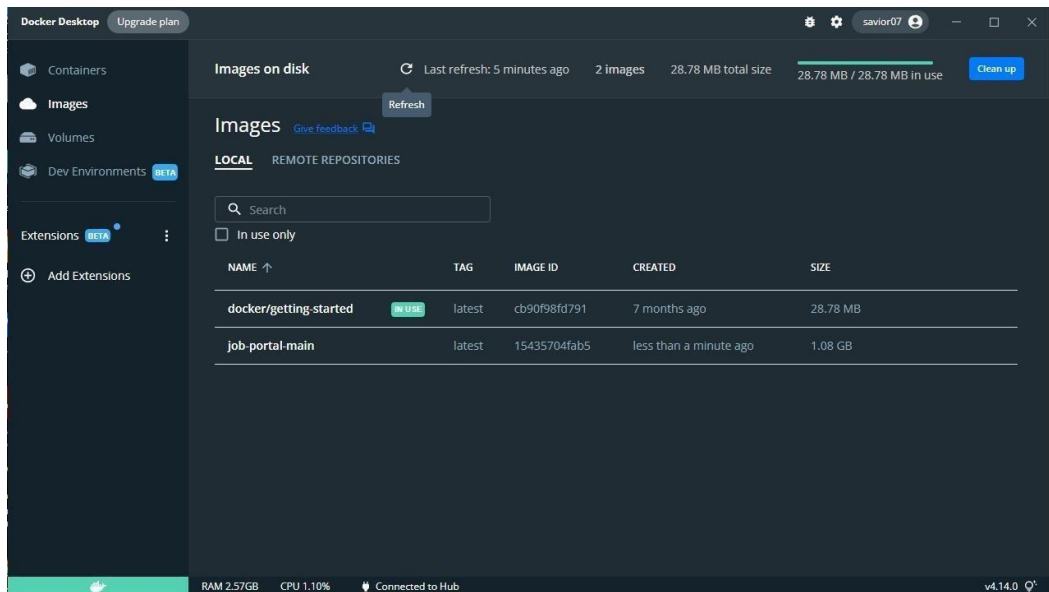


2. Create a docker file for the job portal application and deploy it in Docker desktop application.

```
1 FROM python:3.6
2 WORKDIR /app
3 ADD . /app
4 COPY requirements.txt /app
5 RUN python3 -m pip install -r requirements.txt
6 RUN python3 -m pip install ibm_db
7 EXPOSE 5000
8 CMD ["python", "app.py"]
```

```
C:\WINDOWS\system32\CMD.exe
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5000
* Running on http://192.168.50.106:5000
Press CTRL+C to quit
127.0.0.1 - - [11/Nov/2022 21:04:39] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [11/Nov/2022 21:04:39] "GET /css/style.css HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:04:41] "GET /static/img/smartinternz.png HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:05:26] "GET /login HTTP/1.1" 200 -
127.0.0.1 - - [11/Nov/2022 21:05:26] "GET /css/style.css HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:05:27] "GET /static/img/smartinternz.png HTTP/1.1" 404 -
False
127.0.0.1 - - [11/Nov/2022 21:05:37] "POST /login HTTP/1.1" 200 -
127.0.0.1 - - [11/Nov/2022 21:05:37] "GET /css/style.css HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:05:37] "GET /static/img/smartinternz.png HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:05:52] "GET /register HTTP/1.1" 200 -
127.0.0.1 - - [11/Nov/2022 21:05:52] "GET /css/style.css HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:05:53] "GET /static/img/smartinternz.png HTTP/1.1" 404 -
False
127.0.0.1 - - [11/Nov/2022 21:06:14] "POST /register HTTP/1.1" 200 -
127.0.0.1 - - [11/Nov/2022 21:06:14] "GET /css/style.css HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:06:14] "GET /static/img/smartinternz.png HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:06:17] "GET /login HTTP/1.1" 200 -
127.0.0.1 - - [11/Nov/2022 21:06:17] "GET /css/style.css HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:06:17] "GET /static/img/smartinternz.png HTTP/1.1" 404 -
({'USERNAME': 'savior', 'EMAIL': 'sarkarsathish003@gmail.com', 'PASSWORD': '123456'})
127.0.0.1 - - [11/Nov/2022 21:06:27] "POST /login HTTP/1.1" 200 -
127.0.0.1 - - [11/Nov/2022 21:06:28] "GET /css/style.css HTTP/1.1" 404 -
127.0.0.1 - - [11/Nov/2022 21:06:28] "GET /static/img/smartinternz.png HTTP/1.1" 404 -
C:\Users\ELCOT\News tracker>docker build -t jobportal.
```

```
C:\WINDOWS\system32\CMD.exe - docker build -t job-portal-main.
[+] Building 1413.9s (9/11)
=> sha256:cb5b7ae361722f070eca53f35823ed21baa85d61d5d95cd5a95ab53d740cdd56 10.87MB / 10.87MB 30.9s
=> sha256:6494e4811622b31c027ccac322ca463937fd805f569a93e6f15c01aade718793 54.57MB / 54.57MB 114.3s
=> sha256:6f9f74896dfa93fe0172f594faba85e0b4e8a0481a0fef9112efc7e4d3c78f7 196.51MB / 196.51MB 219.7s
=> sha256:5a3b1213efc56598e78bd602983945c164de2a37205e06a62dada823124dc743 6.29MB / 6.29MB 117.0s
=> sha256:404f02044bac0432ca522cbb9f254b1c91fcea6806bfeef0be0b243b2f31bab7 235B / 235B 122.7s
=> sha256:9fddfdc56334f2e6efad7e241bf5e7459c40ed105c5478676f41c1244bd96752 14.21MB / 14.21MB 140.2s
=> sha256:c4f42be2be53b900ebffcc040c1df13de538434ccc5f5d954a56848a6169a3a3f 2.21MB / 2.21MB 134.0s
=> extracting sha256:0e29546d541cddb309281d21a73a9d1db78665c1b95b74f32b009e0b77a6e1e3 55.7s
=> extracting sha256:9b829c73b52b92b97d5c07a54fb0f3e921995a296c714b53a32ae67d19231fcd 4.2s
=> extracting sha256:cb5b7ae361722f070eca53f35823ed21baa85d61d5d95cd5a95ab53d740cdd56 3.6s
=> extracting sha256:6494e4811622b31c027ccac322ca463937fd805f569a93e6f15c01aade718793 28.2s
=> extracting sha256:6f9f74896dfa93fe0172f594faba85e0b4e8a0481a0fef9112efc7e4d3c78f7 85.1s
=> extracting sha256:5a3b1213efc56598e78bd602983945c164de2a37205e06a62dada823124dc743 5.9s
=> extracting sha256:9fddfdc56334f2e6efad7e241bf5e7459c40ed105c5478676f41c1244bd96752 82.4s
=> extracting sha256:404f02044bac0432ca522cbb9f254b1c91fcea6806bfeef0be0b243b2f31bab7 0.7s
=> extracting sha256:c4f42be2be53b900ebffcc040c1df13de538434ccc5f5d954a56848a6169a3a3f 21.3s
=> [internal] load build context 10.9s
=> transferring context: 35.97kB 7.8s
=> [2/6] WORKDIR /app 36.0s
=> [3/6] ADD . /app 31.9s
=> [4/6] COPY requirements.txt /app 37.2s
=> [5/6] RUN python3 -m pip install -r requirements.txt 598.3s
=> # Installing build dependencies: started
=> # Installing build dependencies: finished with status 'done'
=> # Getting requirements to build wheel: started
=> # Getting requirements to build wheel: still running...
=> # Getting requirements to build wheel: finished with status 'done'
=> # Installing backend dependencies: started
```



```

C:\WINDOWS\system32\CMD.exe
=> sha256:c4f42be2be53b900ebffc040c1df13de538434ccc5f5d954a56848a6169a3a3f 2.21MB / 2.21MB 134.0s
=> extracting sha256:8e29546d541cd302281d21a73a9d1db78665c1b95b74f32b009e0b77a6a1a3 55.7s
=> extracting sha256:9b829c73b52b92b97d5c07a54fb0f3e921995a296c714b53a32ae67d19231fcd 4.2s
=> extracting sha256:cb5b7ae361722f070eca53f35823ed21baa85d61d5d95cd5a95ab53d740cdd56 3.6s
=> extracting sha256:6494e4811622b31c027ccac322ca463937fd805f569a93eef15c01aade718793 28.2s
=> extracting sha256:6f9f74896dfa93fe0172f594faba85e0b4e8a0481a0fef9d9112efc7e4d3c78f7 85.1s
=> extracting sha256:5e3b1213efc56598e78bd602983945c164de2a37205e06a62da823124dc743 5.9s
=> extracting sha256:9fddfdc56334f2e6efad7e241bf5e7459c40ed105c5478676f41c1244bd96752 82.4s
=> extracting sha256:404f02844bac0432ca522cbb9f254b1c91fcea6806bfeef0ba0b243b2f31ba07 0.7s
=> extracting sha256:c4f42be2be53b900ebffc040c1df13de538434ccc5f5d954a56848a6169a3a3f 21.3s
[internal] load build context
=> transferring context: 35.97kB 10.9s
=> [2/6] WORKDIR /app 7.8s
=> [3/6] ADD . /app 36.0s
=> [4/6] COPY requirements.txt /app 31.9s
=> [5/6] RUN python3 -m pip install -r requirements.txt 37.2s
=> [6/6] RUN python3 -m pip install ibm_db 946.7s
=> exporting to image 45.3s
=> exporting layers 19.1s
=> writing image sha256:15435704fab5239e59f1eb5cb1f2104fd6133351496e3871abf885993ccecf202 17.3s
=> naming to docker.io/library/job-portal-main 0.3s
=> naming to docker.io/library/job-portal-main 0.2s

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

C:\Program Files\job-portal-main\job-portal-main>docker images
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE
job-portal-main     latest     15435704fab5  7 minutes ago 1.08GB
docker/getting-started latest     cb90f98fd791  7 months ago 28.8MB

C:\Program Files\job-portal-main\job-portal-main>

```

Pushing the image to repository

```

C:\Users\ELCOT>docker tag job-portal icr.io/job-portal/sathish
error during connect: This error may indicate that the docker daemon is not running.: Post "http://%2F%2F.%2Fpipe%2Fdocker_engine/v1.24/images/job-portal/tag?repo=icr.io%2Fjob-portal%2Fsathish&tag=latest": open //./pipe/docker_engine: The system cannot find the file specified.

C:\Users\ELCOT>docker tag job-portal icr.io/jobportalmain/sathish
Error response from daemon: open \\.\pipe\docker_engine_linux: The system cannot find the file specified.

C:\Users\ELCOT>docker tag job-portal icr.io/jobportalmain/sathish
Error response from daemon: No such image: job-portal:latest

C:\Users\ELCOT>docker tag job-portal-main icr.io/jobportalmain/sathish

C:\Users\ELCOT>docker push au.icr.io/myjobportalmain/sathish
The system cannot find the path specified.

C:\Users\ELCOT>docker push au.icr.io/jobportalmain/sathish
Using default tag: latest
The push refers to repository [au.icr.io/jobportalmain/sathish]
An image does not exist locally with the tag: au.icr.io/jobportalmain/sathish

C:\Users\ELCOT>docker tag job-portal-main au.icr.io/jobportalmain/sathish

C:\Users\ELCOT>

```

```

C:\WINDOWS\system32\CMD.exe - docker push au.icr.io/jobportalmain/sathish
Logged in to 'au.icr.io'.
OK
C:\Users\ELCOT>docker push icr.io/jobportalmain/sathish:jobportal
The push refers to repository [icr.io/jobportalmain/sathish]
tag does not exist: icr.io/jobportalmain/sathish:jobportal

C:\Users\ELCOT>docker push au.icr.io/jobportalmain/sathish:jobportal
The push refers to repository [au.icr.io/jobportalmain/sathish]
tag does not exist: au.icr.io/jobportalmain/sathish:jobportal

C:\Users\ELCOT>docker push au.icr.io/jobportalmain/sathish
Using default tag: latest
The push refers to repository [au.icr.io/jobportalmain/sathish]
1e837fb79336: Pushed
633a4d1a497f: Pushing [>] 2.148MB/178.4MB
f147c00294c3: Pushed
1b3259c0b03e: Pushed
076ac8d0ae8a: Pushed
aa4c808c19f6: Pushing [=====>] 5.752MB/8.054MB
8ba9f690e8ba: Pushing [=====>] 4.608kB
3e607d59ef9f: Pushing [=====>] 3.823MB/41.36MB
1e18e7e1fcc2: Pushing [=====>] 4.859MB/18.48MB
c3a0d593ed24: Waiting
26a504e63be4: Waiting
8bf42db0de72: Waiting
31892cc314cb: Waiting
11936051f93b: Waiting

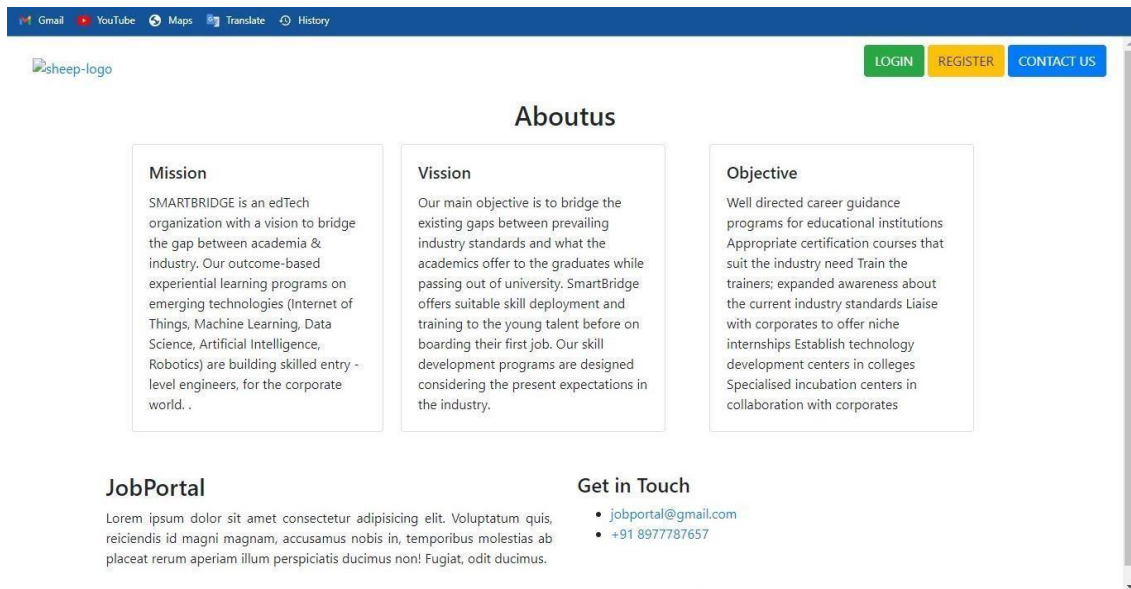
```

Pulling the image from IBM container and running it.


```
C:\WINDOWS\system32\CMD.exe - docker run -p 5000:5000 au.icr.io/jobportalmain/sathish
1b3259c0b03e: Pushed
976ac8d0ae8a: Pushed
aa4c808c19f6: Pushed
8ba9f690e8ba: Pushed
3e607d59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d593ed24: Pushed
26a504a63be4: Pushed
8bf42db0de72: Pushed
31892cc314cb: Pushed
11936051f93b: Pushed
latest: digest: sha256:479751a5ed571237901d53f2c92d18b7cc0b2cf4d2fa69b0a7bcb883703544a3 size: 3259

C:\Users\ELCOT>docker pull au.icr.io/jobportalmain/sathish
Using default tag: latest
latest: Pulling from jobportalmain/sathish
Digest: sha256:479751a5ed571237901d53f2c92d18b7cc0b2cf4d2fa69b0a7bcb883703544a3
Status: Image is up to date for au.icr.io/jobportalmain/sathish:latest
au.icr.io/jobportalmain/sathish:latest

C:\Users\ELCOT>docker run -p 5000:5000 au.icr.io/jobportalmain/sathish
* 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: off
* Running on all addresses.
WARNING: This is a development server. Do not use it in a production deployment.
* Running on http://172.17.0.2:5000/ (Press CTRL+C to quit)
```

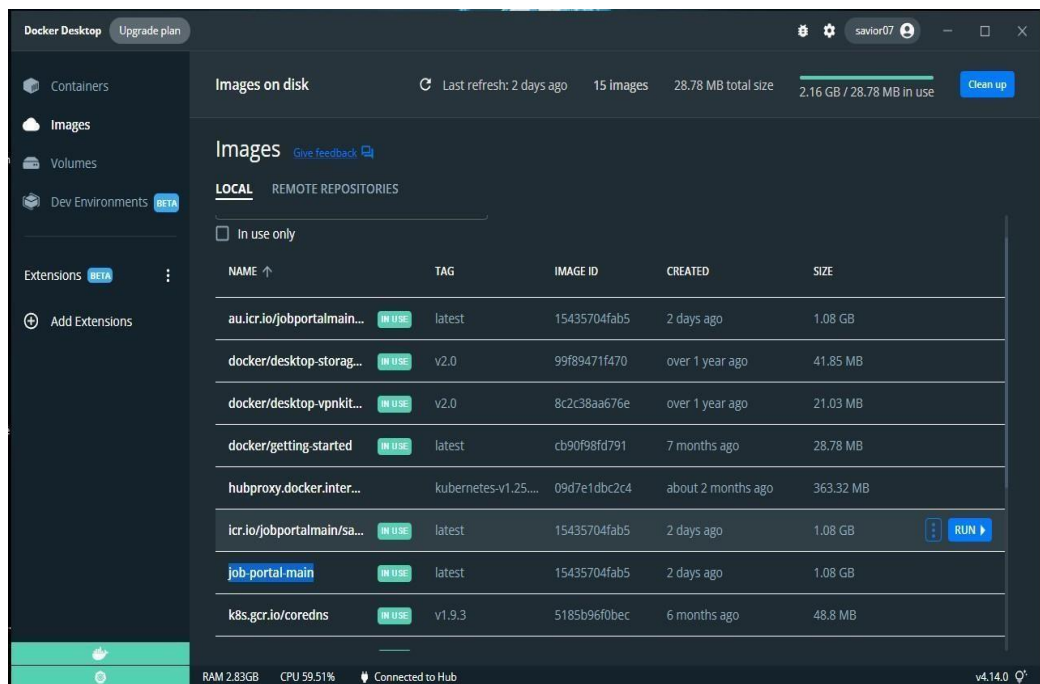
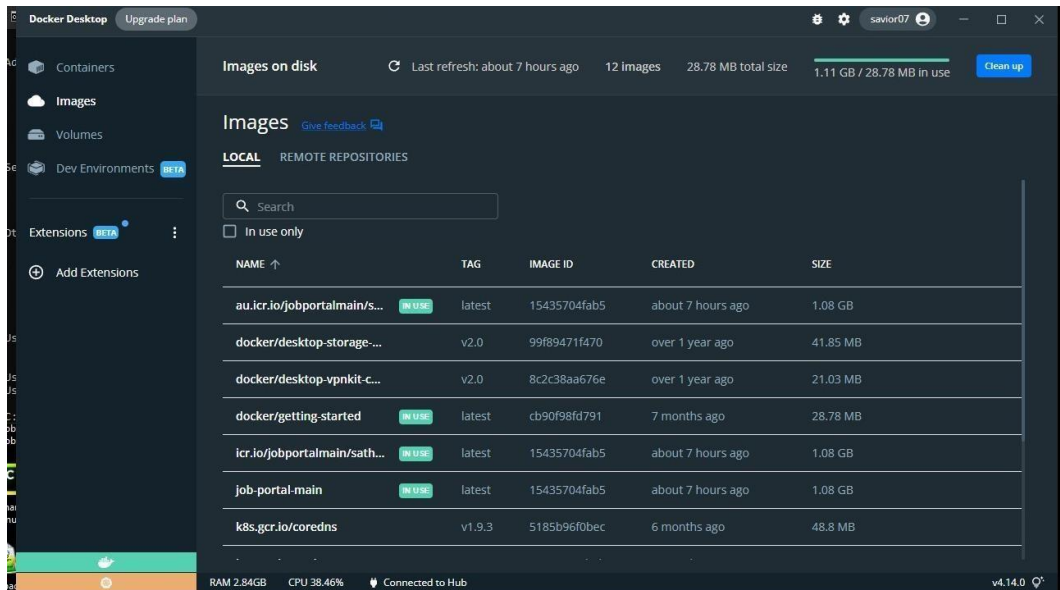


```
C:\WINDOWS\system32\CMD.exe - docker run -p 5000:5000 au.icr.io/jobportalmain/sathish
3e607d59ef9f: Pushed
1e18e7e1fcc2: Pushed
c3a0d593ed24: Pushed
26a504a63be4: Pushed
8bf42db0de72: Pushed
31892cc314cb: Pushed
11936051f93b: Pushed
latest: digest: sha256:479751a5ed571237901d53f2c92d18b7cc0b2cf4d2fa69b0a7bcb883703544a3 size: 3259

C:\Users\ELCOT>docker pull au.icr.io/jobportalmain/sathish
Using default tag: latest
latest: Pulling from jobportalmain/sathish
Digest: sha256:479751a5ed571237901d53f2c92d18b7cc0b2cf4d2fa69b0a7bcb883703544a3
Status: Image is up to date for au.icr.io/jobportalmain/sathish:latest
au.icr.io/jobportalmain/sathish:latest

C:\Users\ELCOT>docker run -p 5000:5000 au.icr.io/jobportalmain/sathish
* 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: off
* Running on all addresses.
WARNING: This is a development server. Do not use it in a production deployment.
* Running on http://172.17.0.2:5000/ (Press CTRL+C to quit)
172.17.0.1 - - [13/Nov/2022 13:42:33] "GET / HTTP/1.1" 200 -
172.17.0.1 - - [13/Nov/2022 13:42:34] "GET /css/style.css HTTP/1.1" 404 -
172.17.0.1 - - [13/Nov/2022 13:42:34] "GET /static/img/smartinternz.png HTTP/1.1" 404 -
172.17.0.1 - - [13/Nov/2022 13:42:35] "GET /assets/img/favicon-32x32.png HTTP/1.1" 404 -
```

3. Create a Kubernetes Cluster in IBM cloud and deploy hello world image or job portal image.




```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.19042.1706]
(c) Microsoft Corporation. All rights reserved.

C:\Users\ELCOT>kubectl
kubectl controls the Kubernetes cluster manager.

Find more information at: https://kubernetes.io/docs/reference/kubectl/

Basic Commands (Beginner):
  create      Create a resource from a file or from stdin
  expose      Take a replication controller, service, deployment or pod and expose it as a new Kubernetes service
  run         Run a particular image on the cluster
  set         Set specific features on objects

Basic Commands (Intermediate):
  explain     Get documentation for a resource
  get         Display one or many resources
  edit        Edit a resource on the server
  delete      Delete resources by file names, stdin, resources and names, or by resources and label selector

Deploy Commands:
  rollout     Manage the rollout of a resource
  scale       Set a new size for a deployment, replica set, or replication controller
  autoscale   Auto-scale a deployment, replica set, stateful set, or replication controller

Cluster Management Commands:
  certificate Modify certificate resources.
  cluster-info Display cluster information
  top          Display resource (CPU/memory) usage
  cordon       Mark node as unschedulable
  uncordon     Mark node as schedulable
  drain        Drain node in preparation for maintenance
  taint        Update the taints on one or more nodes

Troubleshooting and Debugging Commands:
  describe    Show details of a specific resource or group of resources
  logs        Print the logs for a container in a pod
  attach      Attach to a running container
  exec        Execute a command in a container
  port-forward Forward one or more local ports to a pod
  proxy       Run a proxy to the Kubernetes API server
  cp          Copy files and directories to and from containers
  auth        Inspect authorization
  debug       Create debugging sessions for troubleshooting workloads and nodes

Advanced Commands:
```

```
C:\WINDOWS\system32\cmd.exe - docker login
kubectl [flags] [options]

Use "kubectl <command> --help" for more information about a given command.
Use "kubectl options" for a list of global command-line options (applies to all commands).

C:\Users\ELCOT>cd C:\Program Files\job-portal-main\job-portal-main
C:\Program Files\job-portal-main\job-portal-main>kubectl create -f deployment.yaml
error: the path "deployment.yaml" does not exist

C:\Program Files\job-portal-main\job-portal-main>kubectl create -f deployment.yaml
error: the path "deployment.yaml" does not exist

C:\Program Files\job-portal-main\job-portal-main>docker login
Authenticating with existing credentials...
Login Succeeded
```

```
C:\WINDOWS\system32\CMD.exe
--template='':
  Template string or path to template file to use when -o go-template, -o go-template-file. The template format
  is golang templates [http://golang.org/pkg/text/template/#pkg-overview].

--validate='strict':
  Must be one of: strict (or true), warn, ignore (or false). "true" or "strict" will use a schema to validate
  the input and fail the request if invalid. It will perform server side validation if ServerSideFieldValidation
  is enabled on the api-server, but will fall back to less reliable client-side validation if not. "warn" will
  warn about unknown or duplicate fields without blocking the request if server-side field validation is enabled
  on the API server, and behave as "ignore" otherwise. "false" or "ignore" will not perform any schema
  validation, silently dropping any unknown or duplicate fields.

--windows-line-endings=true:
  Only relevant if --edit=true. Defaults to the line ending native to your platform.

Usage:
  kubectl create -f FILENAME [options]

Use "kubectl <command> --help" for more information about a given command.
Use "kubectl options" for a list of global command-line options (applies to all commands).

C:\Program Files\job-portal-main\job-portal-main>kubectl create -f service.yaml
error: the path "service.yaml" does not exist

C:\Program Files\job-portal-main\job-portal-main>kubectl create -f deployment.yaml
deployment.apps/flask-node-deployment created

C:\Program Files\job-portal-main\job-portal-main>
```

```
C:\WINDOWS\system32\CMD.exe
--template='':
  Template string or path to template file to use when -o go-template, -o go-template-file. The template format
  is golang templates [http://golang.org/pkg/text/template/#pkg-overview].

--validate='strict':
  Must be one of: strict (or true), warn, ignore (or false). "true" or "strict" will use a schema to validate
  the input and fail the request if invalid. It will perform server side validation if ServerSideFieldValidation
  is enabled on the api-server, but will fall back to less reliable client-side validation if not. "warn" will
  warn about unknown or duplicate fields without blocking the request if server-side field validation is enabled
  on the API server, and behave as "ignore" otherwise. "false" or "ignore" will not perform any schema
  validation, silently dropping any unknown or duplicate fields.

--windows-line-endings=true:
  Only relevant if --edit=true. Defaults to the line ending native to your platform.

Usage:
  kubectl create -f FILENAME [options]

Use "kubectl <command> --help" for more information about a given command.
Use "kubectl options" for a list of global command-line options (applies to all commands).

C:\Program Files\job-portal-main\job-portal-main>kubectl create -f service.yaml
error: the path "service.yaml" does not exist

C:\Program Files\job-portal-main\job-portal-main>kubectl create -f deployment.yaml
deployment.apps/flask-node-deployment created

C:\Program Files\job-portal-main\job-portal-main>kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
flask-node-deployment-8489d6db57-pmjg4  0/1     ContainerCreating  0           3m13s

C:\Program Files\job-portal-main\job-portal-main>
```