

ASSIGNMENT — 4

DOCKER AND KUBERNETES

Student Name	SYED ABDUL RAHMAN S
Student Roll Number	110119104077
Maximum Marks	2 marks

Question-I: pull an image from docker hub and run it in docker playground.

1) pull an image form docker hub

```
PowerShell
Loading personal and system profiles took 541ms.
→ assignment 4 git:(main) docker pull docker/getting-started
Using default tag: latest
latest: Pulling from docker/getting-started
df9b9388f04a: Pull complete
5867cba5fcdb: Pull complete
4b639e65cb3b: Pull complete
061ed9e2b976: Pull complete
bc19f3e8eeb1: Pull complete
4071be97c256: Pull complete
79b586f1a54b: Pull complete
0c9732f525d6: Pull complete
Digest: sha256:b558be874169471bd4e65bd6eac8c303b271a7ee8553ba47481b73b2bf597aae
Status: Downloaded newer image for docker/getting-started:latest
docker.io/docker/getting-started:latest
→ assignment 4 git:(main) |
```

2)run it in docker playground

```
Digest: sha256:b558be874169471bd4e65bd6eac8c303b271a7ee8553ba47481b73b2bf597aae
Status: Downloaded newer image for docker/getting—started : latest docker. io/docker/getting—
started : latest
-i assignment 4 git: (main) docker run  docker/getting—started
ee6d34bd49e201@6c8d3a3cc85babObde9c96a667bb3112bc896358efd6d2f68 -i
assignment 4 git:(main) DI
```

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BETA

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Images on disk

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Images [Give feedback](#)

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

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	NAME ↑	TAG	STATUS	CREATED	SIZE	ACTIONS
<input type="checkbox"/>	flaskapp 9ce8223d2f49	latest	In use	about 1 hour ago	932.41 MB	<div></div> <div></div> <div></div>
<input type="checkbox"/>	alpine 9c6f07244728	latest	In use	3 months ago	5.54 MB	<div></div> <div></div> <div></div>
<input type="checkbox"/>	docker/getting-started cb90f98fd791	latest	In use	7 months ago	28.78 MB	<div></div> <div></div> <div></div>

← → ↺ localhost/tutorial/

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Getting Started

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dc 2.3

Getting Started

[Getting Started](#)

Our Application

Updating our App

Sharing our App

Persisting our DB

Using Bind Mounts

Multi-Container Apps

Using Docker Compose

Image Building Best Practices

What Next?

Getting Started

The command you just ran

Congratulations! You have started the container for this tutorial! Let's first explain the command that you just ran. In case you forgot, here's the command:

docker run -d -p 80:80 docker/getting-started

You'll notice a few flags being used. Here's some more info on them:

- d - run the container in detached mode (in the background)
- p 80:80 - map port 80 of the host to port 80 in the container
- docker/getting-started - the image to use

Pro tip

You can combine single character flags to shorten the full command. As an example, the command above could be written as:

Table of

The com

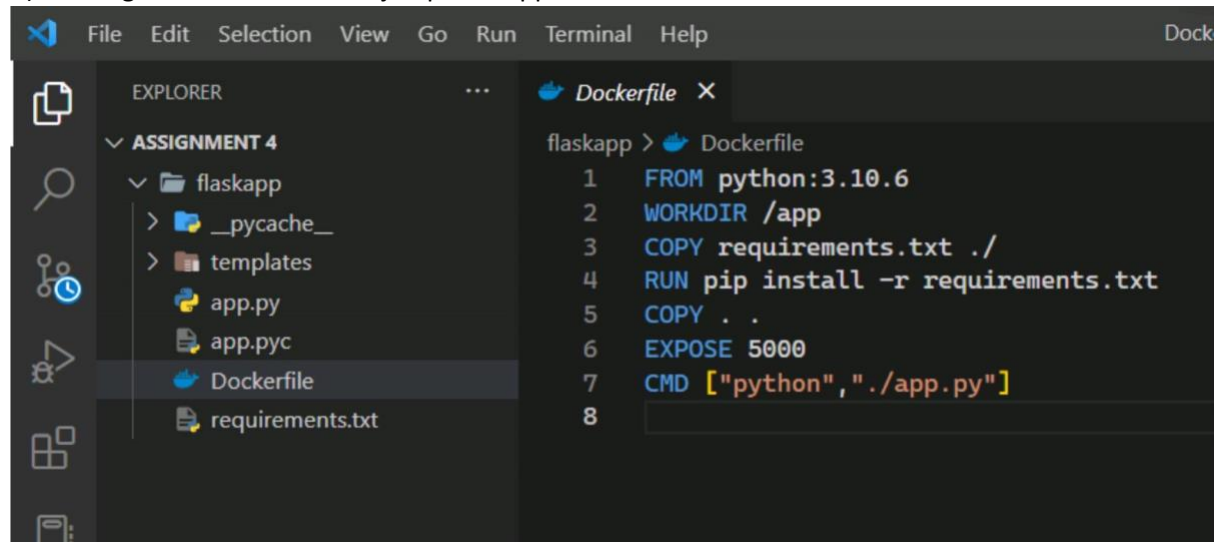
The Doc

What is a

What is a

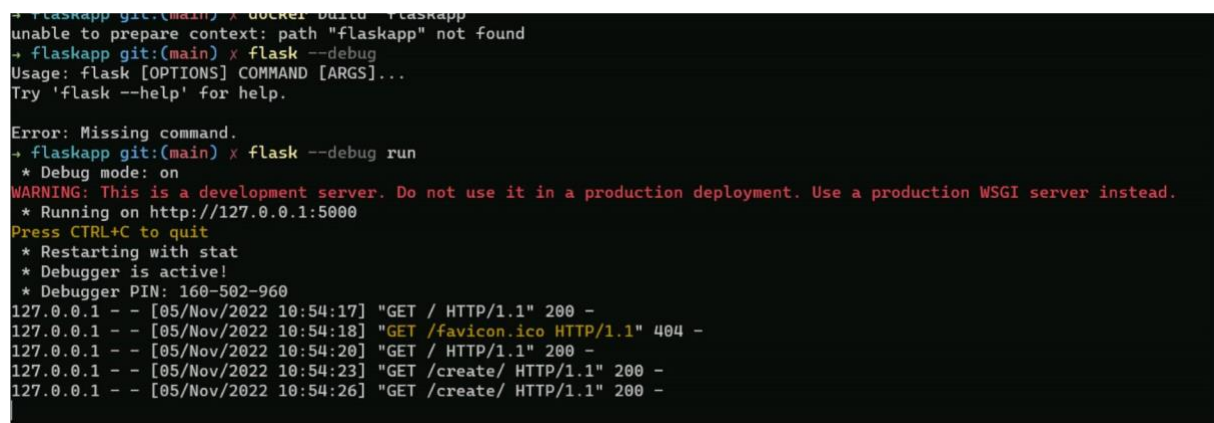
Question-2: Create a docker file for the job portal application and deploy it in docker application.

1)Creating a docker file for the job portal application



The screenshot shows the Visual Studio Code interface. On the left, the Explorer pane shows a project named 'ASSIGNMENT 4' containing a folder 'flaskapp' with files like 'app.py', 'app.pyc', 'Dockerfile', and 'requirements.txt'. The main editor shows the 'Dockerfile' for the 'flaskapp' context. The Dockerfile content is as follows:

```
1 FROM python:3.10.6
2 WORKDIR /app
3 COPY requirements.txt ./
4 RUN pip install -r requirements.txt
5 COPY . .
6 EXPOSE 5000
7 CMD ["python", "./app.py"]
8
```

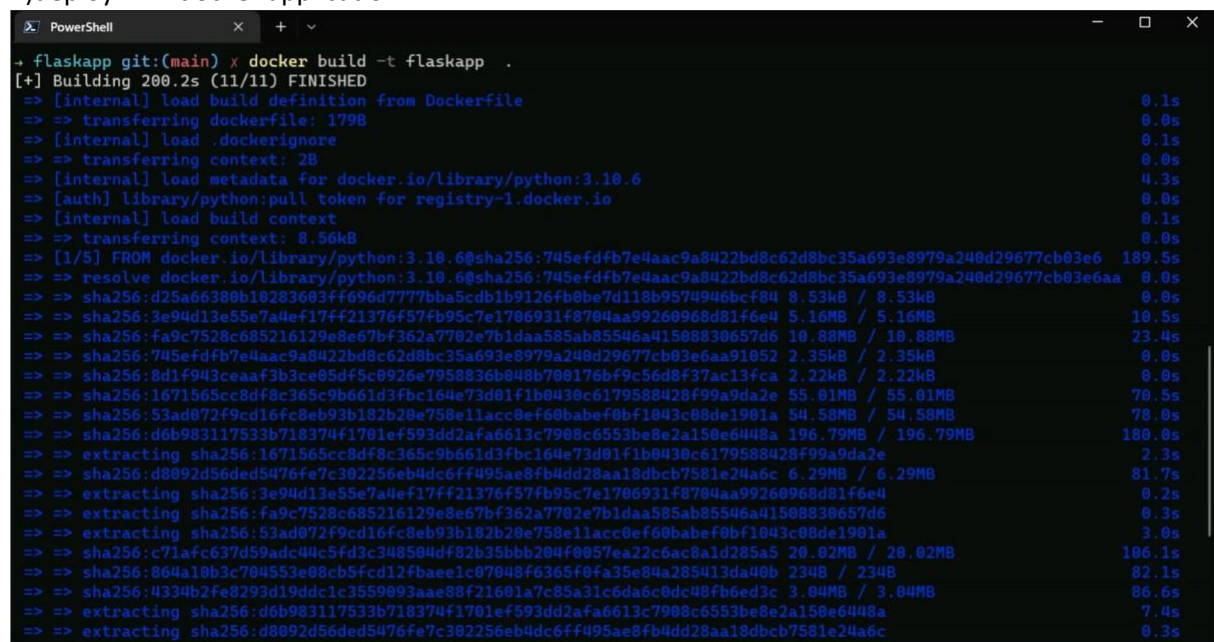


The screenshot shows a terminal window with the following output:

```
flaskapp git:(main) x docker build -t flaskapp
unable to prepare context: path "flaskapp" not found
+ flaskapp git:(main) x flask --debug
Usage: flask [OPTIONS] COMMAND [ARGS]...
Try 'flask --help' for help.

Error: Missing command.
+ flaskapp git:(main) x flask --debug run
* Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on http://127.0.0.1:5000
Press CTRL+C to quit
* Restarting with stat
* Debugger is active!
* Debugger PIN: 160-502-960
127.0.0.1 - - [05/Nov/2022 10:54:17] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [05/Nov/2022 10:54:18] "GET /favicon.ico HTTP/1.1" 404 -
127.0.0.1 - - [05/Nov/2022 10:54:20] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [05/Nov/2022 10:54:23] "GET /create/ HTTP/1.1" 200 -
127.0.0.1 - - [05/Nov/2022 10:54:26] "GET /create/ HTTP/1.1" 200 -
```

2)deploy in in docker application



The screenshot shows a PowerShell terminal window with the following output:

```
flaskapp git:(main) x docker build -t flaskapp .
[+] Building 200.2s (11/11) FINISHED
=> [internal] load build definition from Dockerfile 0.1s
=> => transferring dockerfile: 179B 0.0s
=> [internal] load .dockerignore 0.1s
=> => transferring context: 2B 0.0s
=> [internal] load metadata for docker.io/library/python:3.10.6 4.3s
=> [auth] library/python:pull token for registry-1.docker.io 0.0s
=> [internal] load build context 0.1s
=> => transferring context: 8.56kB 0.0s
=> [1/5] FROM docker.io/library/python:3.10.6@sha256:745efdfb7e4aac9a8422bd8c62d8bc35a693e8979a240d29677cb03e6 189.5s
=> => resolve docker.io/library/python:3.10.6@sha256:745efdfb7e4aac9a8422bd8c62d8bc35a693e8979a240d29677cb03e6aa 0.0s
=> => sha256:d25a66380b10283603ff696d7777bba5cdeb1b9126fb0be7d118b9574946bcf84 8.53kB / 8.53kB 0.0s
=> => sha256:3e94d13e55e7a4ef17ff21376f57fb95c7e1706931f8704aa99260968d81f6e4 5.16MB / 5.16MB 10.5s
=> => sha256:fa9c7528c685216129e8e67bf362a7702e7b1daa585ab85546a41508830657d6 10.88MB / 10.88MB 23.4s
=> => sha256:745efdfb7e4aac9a8422bd8c62d8bc35a693e8979a240d29677cb03e6aa91052 2.35kB / 2.35kB 0.0s
=> => sha256:8d1f943ceaaaf3b3ce05df5c0926e7958836b048b700176bf9c56d8f37ac13fca 2.22kB / 2.22kB 0.0s
=> => sha256:1671565cc8d4f8c365c9b661d3fbc164e73d01f1b0430c6179588428f99a9da2e 55.01MB / 55.01MB 70.5s
=> => sha256:53ad072f9cd16fc8eb93b182b20e758e11acc0ef60babe0bf1043c08de1901a 54.58MB / 54.58MB 78.0s
=> => sha256:d6b983117533b718374f1701ef593dd2afa6613c7908c6553be8e2a150e6448a 196.79MB / 196.79MB 180.0s
=> => extracting sha256:1671565cc8d4f8c365c9b661d3fbc164e73d01f1b0430c6179588428f99a9da2e 2.3s
=> => sha256:d8092d56ded5476fe7c302256eb4dc6ff495ae8fb4dd28aa18dbcb7581e24a6c 6.29MB / 6.29MB 81.7s
=> => extracting sha256:3e94d13e55e7a4ef17ff21376f57fb95c7e1706931f8704aa99260968d81f6e4 0.2s
=> => extracting sha256:fa9c7528c685216129e8e67bf362a7702e7b1daa585ab85546a41508830657d6 0.3s
=> => extracting sha256:53ad072f9cd16fc8eb93b182b20e758e11acc0ef60babe0bf1043c08de1901a 3.0s
=> => sha256:c71afc637d59adc44c5fd3c348504df82b35bbb204f0057ea22c6ac8a1d285a5 20.02MB / 20.02MB 106.1s
=> => sha256:864a10b3c704553e08cb5fcd12fbaee1c07048f6365f0fa35e84a285413da40b 234B / 234B 82.1s
=> => sha256:4334b2fe293d19ddc1c3559093aae88f21601a7c85a31c6da6c0dc48fb6ed3c 3.04MB / 3.04MB 86.6s
=> => extracting sha256:d6b983117533b718374f1701ef593dd2afa6613c7908c6553be8e2a150e6448a 7.4s
=> => extracting sha256:d8092d56ded5476fe7c302256eb4dc6ff495ae8fb4dd28aa18dbcb7581e24a6c 0.3s
```

```
PowerShell
=> => sha256:fa9c7528c685216129e8e67bf362a7702e7b1daa585ab85546a41508830657d6 10.88MB / 10.88MB 23.4s
=> => sha256:745efdfb7e4aac9a8422bd8c62d8bc35a693e8979a240d29677cb03e6aa91052 2.35kB / 2.35kB 0.0s
=> => sha256:8d1f943ceaff3b3ce05df5c0926e7958836b048b700176bf9c56d8f37ac13fca 2.22kB / 2.22kB 0.0s
=> => sha256:1671565cc8df8c365c9b661d3fbc164e73d01f1b0430c6179588428f99a9da2e 55.01MB / 55.01MB 70.5s
=> => sha256:53ad072f9cd16fc8eb93b182b20e758e11acc0ef60babef0bf1043c08de1901a 54.58MB / 54.58MB 78.0s
=> => sha256:d6b983117533b718374f1701ef593dd2afa6613c7908c6553be8e2a150e6448a 196.79MB / 196.79MB 180.0s
=> => extracting sha256:1671565cc8df8c365c9b661d3fbc164e73d01f1b0430c6179588428f99a9da2e 2.3s
=> => sha256:d8092d56ded5476fe7c302256eb4dc6ff495ae8fb4dd28aa18dbcb7581e24a6c 6.29MB / 6.29MB 81.7s
=> => extracting sha256:3e94d13e55e7a4ef17ff21376f57fb95c7e1706931f8704aa99260968d81f6e4 0.2s
=> => extracting sha256:fa9c7528c685216129e8e67bf362a7702e7b1daa585ab85546a41508830657d6 0.3s
=> => extracting sha256:53ad072f9cd16fc8eb93b182b20e758e11acc0ef60babef0bf1043c08de1901a 3.0s
=> => sha256:c71afc637d59adc44c5fd3c348504df82b35bbb204f0057ea22c6ac8ald285a5 20.02MB / 20.02MB 106.1s
=> => sha256:864a10b3c704553e08cb5fcd12fbaee1c07048f6365f0fa35e84a285413da40b 234B / 234B 82.1s
=> => sha256:4334b2fe8293d19ddc1c3559093aae88f21601a7c85a31c6da6c0dc48fb6ed3c 3.04MB / 3.04MB 86.6s
=> => extracting sha256:d6b983117533b718374f1701ef593dd2afa6613c7908c6553be8e2a150e6448a 7.4s
=> => extracting sha256:d8092d56ded5476fe7c302256eb4dc6ff495ae8fb4dd28aa18dbcb7581e24a6c 0.3s
=> => extracting sha256:c71afc637d59adc44c5fd3c348504df82b35bbb204f0057ea22c6ac8ald285a5 0.8s
=> => extracting sha256:864a10b3c704553e08cb5fcd12fbaee1c07048f6365f0fa35e84a285413da40b 0.0s
=> => extracting sha256:4334b2fe8293d19ddc1c3559093aae88f21601a7c85a31c6da6c0dc48fb6ed3c 0.3s
=> [2/5] WORKDIR /app 1.1s
=> [3/5] COPY requirements.txt ./ 0.0s
=> [4/5] RUN pip install -r requirements.txt 4.9s
=> [5/5] COPY . . 0.1s
=> exporting to image 0.2s
=> exporting layers 0.2s
=> writing image sha256:9ce8223d2f49cc126af77c5b826056fccf1f446e84e6e67fa97b58be5718931e 0.0s
=> naming to docker.io/library/flaskapp 0.0s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
-> flaskapp git:(main) |
```

Images on disk

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Images

Give feedback

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

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<input type="checkbox"/>	NAME	TAG	STATUS	CREATED	SIZE	ACTIONS
<input type="checkbox"/>	flaskapp 9ce8223d2f49	latest	Unused	less than a minute a	932.41 MB	<div></div> <div></div> <div></div>
<input type="checkbox"/>	alpine 9cf07244728	latest	In use	3 months ago	5.54 MB	<div></div> <div></div> <div></div>

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Question-3: Create a IBM container registry and deploy hello world app or jobportalapp

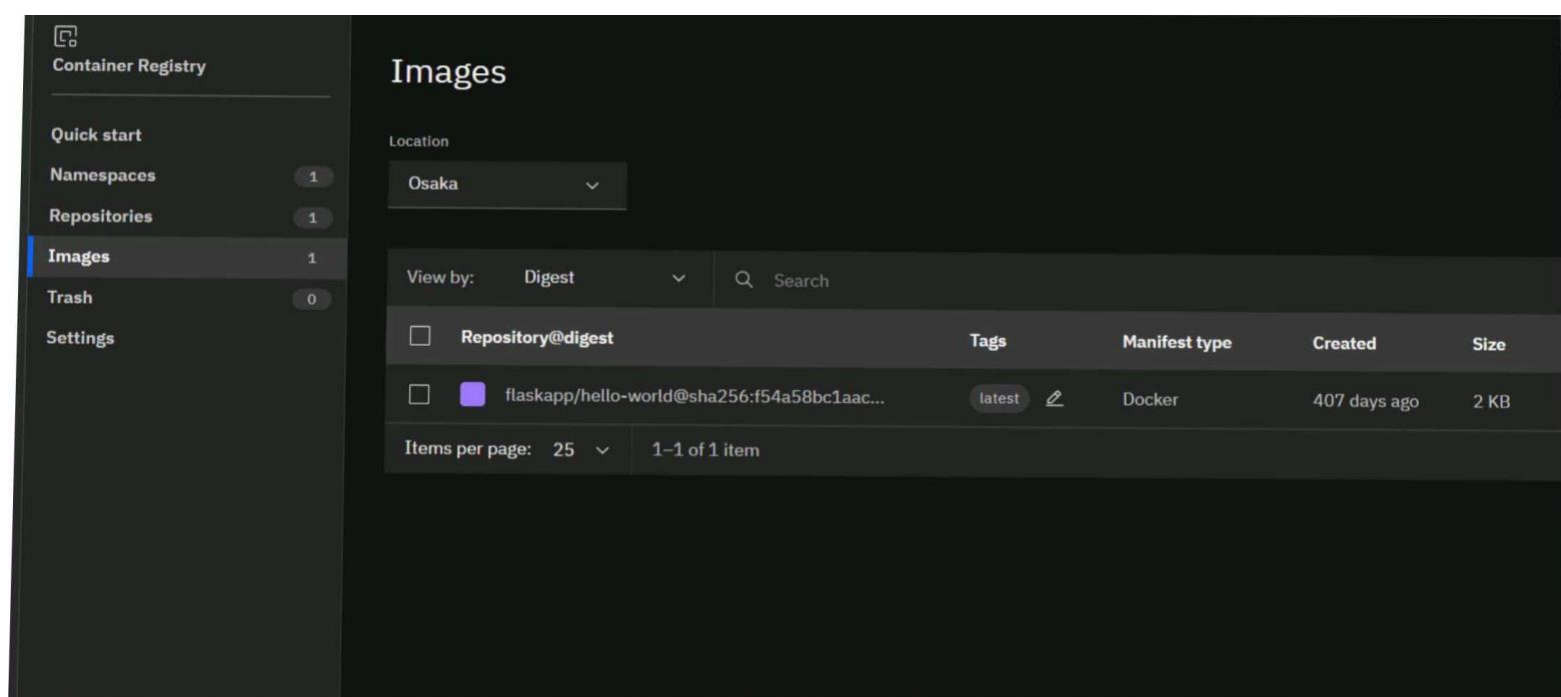
1) create a IBM container registry

```
- ~ git:(main) x ibmcloud
NAME:
  C:\Program Files\IBM\Cloud\bin\ibmcloud.exe - A command line tool to interact with IBM Cloud
  Find more information at: https://ibm.biz/cli-docs

USAGE:
  [environment variables] C:\Program Files\IBM\Cloud\bin\ibmcloud.exe [global options] command [arguments.
  ptions]

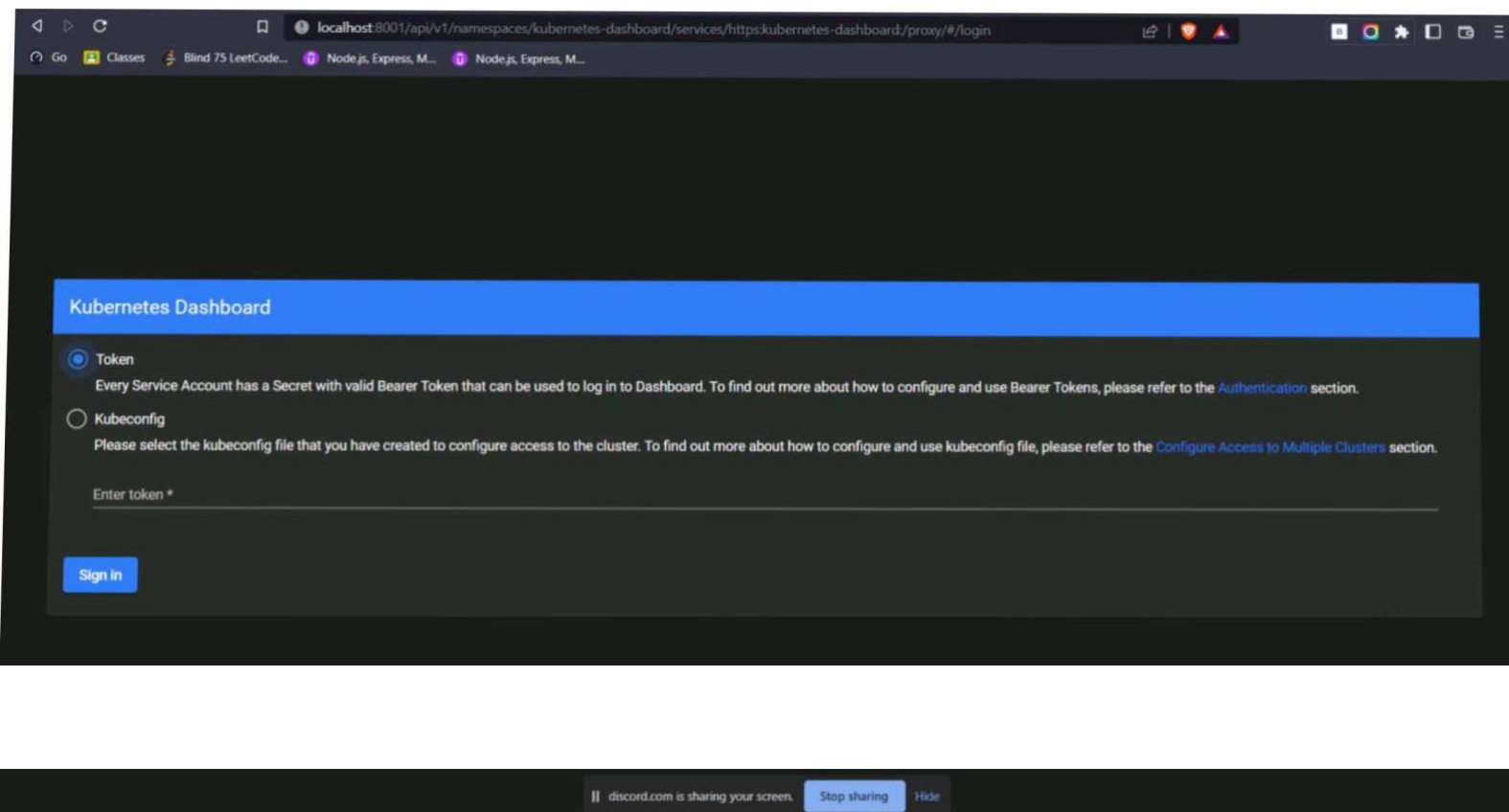
VERSION:
  2.12.1+b8488a1-2022-10-31T15:08:10+00:00

COMMANDS:
  account      Manage accounts, users, orgs and spaces
  api          Set or view target API endpoint
  billing      Retrieve usage and billing information
  catalog      Manage catalog
  cf           Run Cloud Foundry CLI with IBM Cloud CLI context
  config       Write default values to the config
  cr           Manage IBM Cloud Container Registry content and configuration.
  dev         Create, develop, deploy, and monitor applications
  enterprise   Manage enterprise, account groups and accounts.
  iam         Manage identities and access to resources
  login       Log user in
  logout      Log user out
  plugin       Manage plug-ins and plug-in repositories
  regions     List all the regions
```



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 note port

1)Creating a Kubernetes cluster in IBM cloud



Kubernetes Dashboard

localhost:8001/api/v1/namespaces/kubernetes-dashboard/services/https:kubernetes-dashboard:/proxy/#/pod?namespace=kuberne

kubernetes

kubernetes-das... 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

Pods

Name	Images	Labels	Node
flask-app-8569bc947b-7q5l2	flask-app-testing	app: flask-app pod-template-hash: 8569bc947b	docker-desktop
flask-app-8569bc947b-ln2xd	flask-app-testing	app: flask-app pod-template-hash: 8569bc947b	docker-desktop
flask-app-8569bc947b-tmzp8	flask-app-testing	app: flask-app pod-template-hash: 8569bc947b	docker-desktop
dashboard-metrics-scraper-64bcc67c9c-2zstf	kubernetesui/metrics-scraper:v1.0.8	k8s-app: dashboard-metrics-scraper pod-template-hash: 64bcc67c9c	docker-desktop
kubernetes-dashboard-66c887f759-fp85b	kubernetesui/dashboard:v2.6.1	k8s-app: kubernetes-dashboard pod-template-hash: 66c887f759	docker-desktop