Assignment 4
Docker and Kubernetes

Date	12 November 2022
Team ID	PNT2022TMID03825
Project Name	Project - Inventory Management For Retailers
Maximum Marks	2 Marks

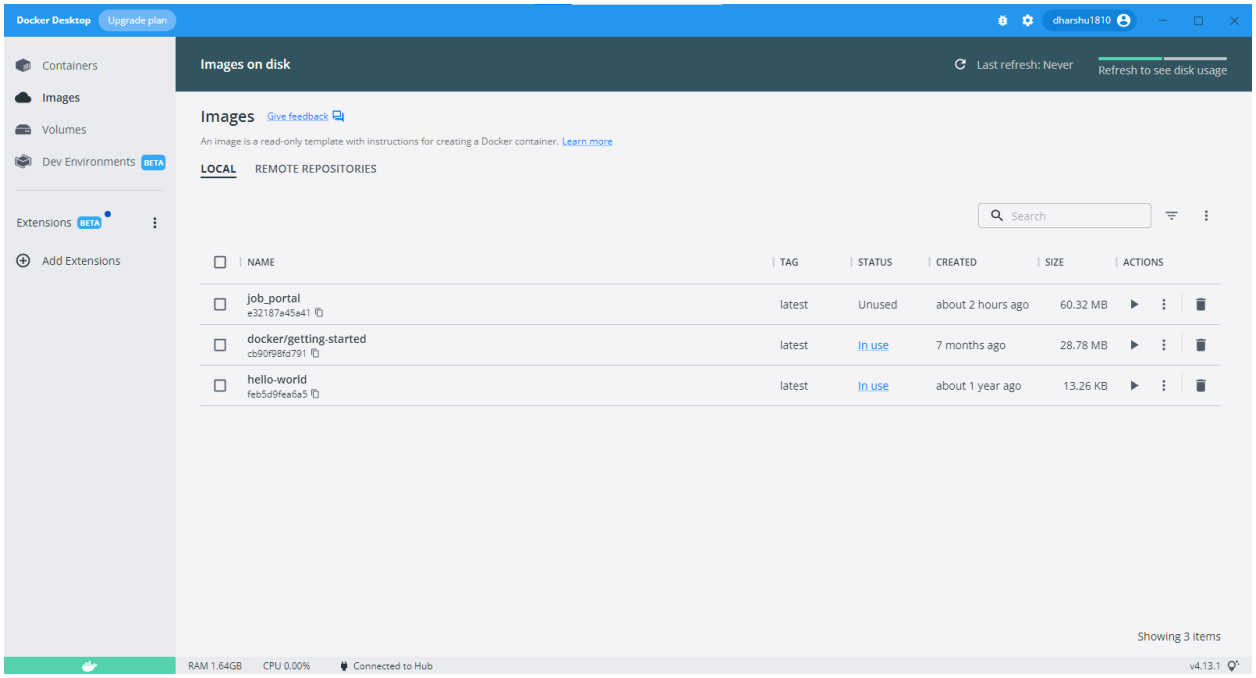
Question 1:

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:faa03e786c97f07ef34423fccceeec2398ec8a5759259f94d99078f264e9d7af
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!
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 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
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For more examples and ideas, visit:
 https://docs.docker.com/get-started/
```
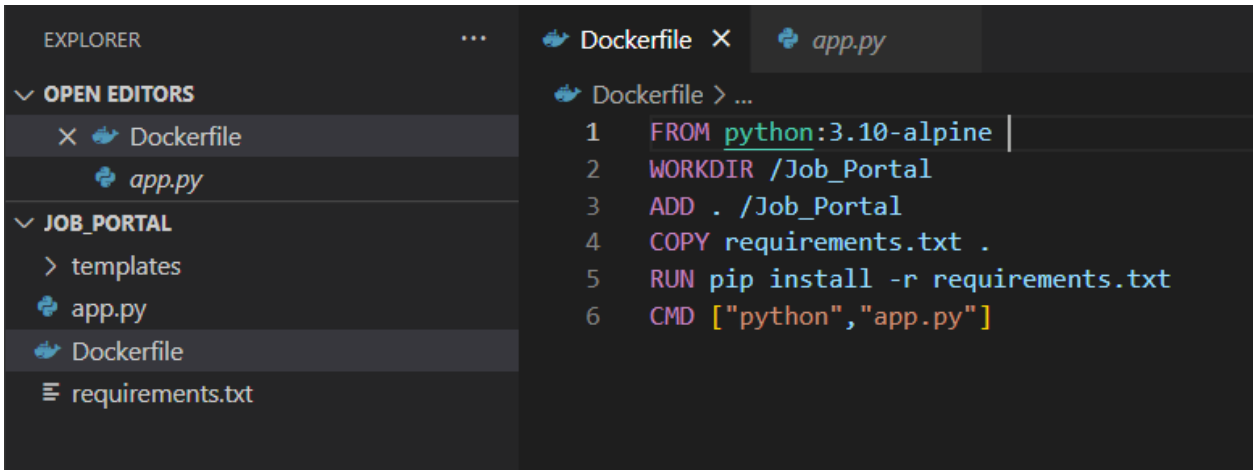

Question 2:

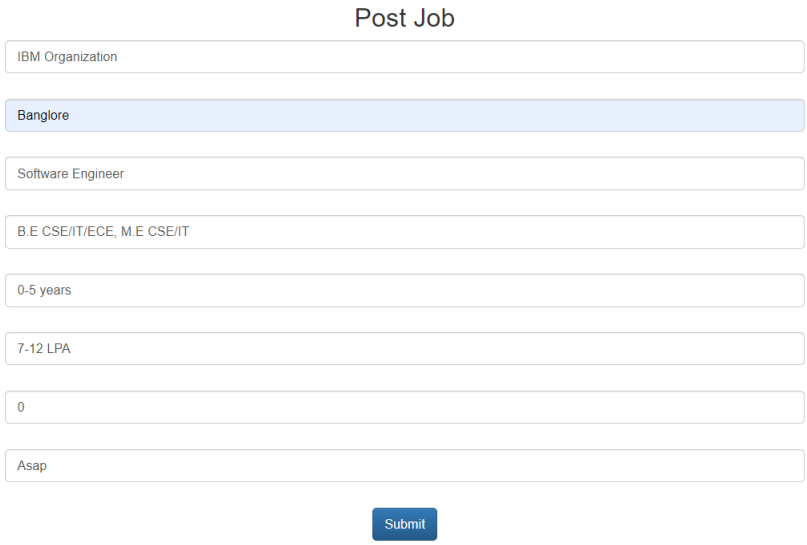
Create a docker file for the jobportal application and deploy it in Docker desktop application.



Dockerfile:

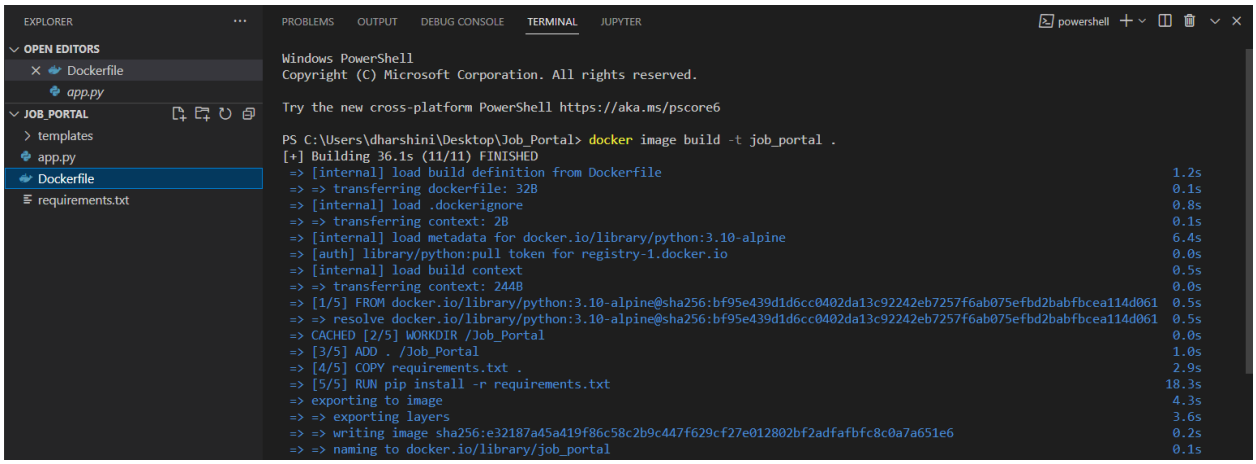
FROM python:3.10-alpine
WORKDIR /Job_Portal
ADD . /Job_Portal
COPY requirements.txt .
RUN pip install -r requirements.txt
CMD ["python","app.py"]

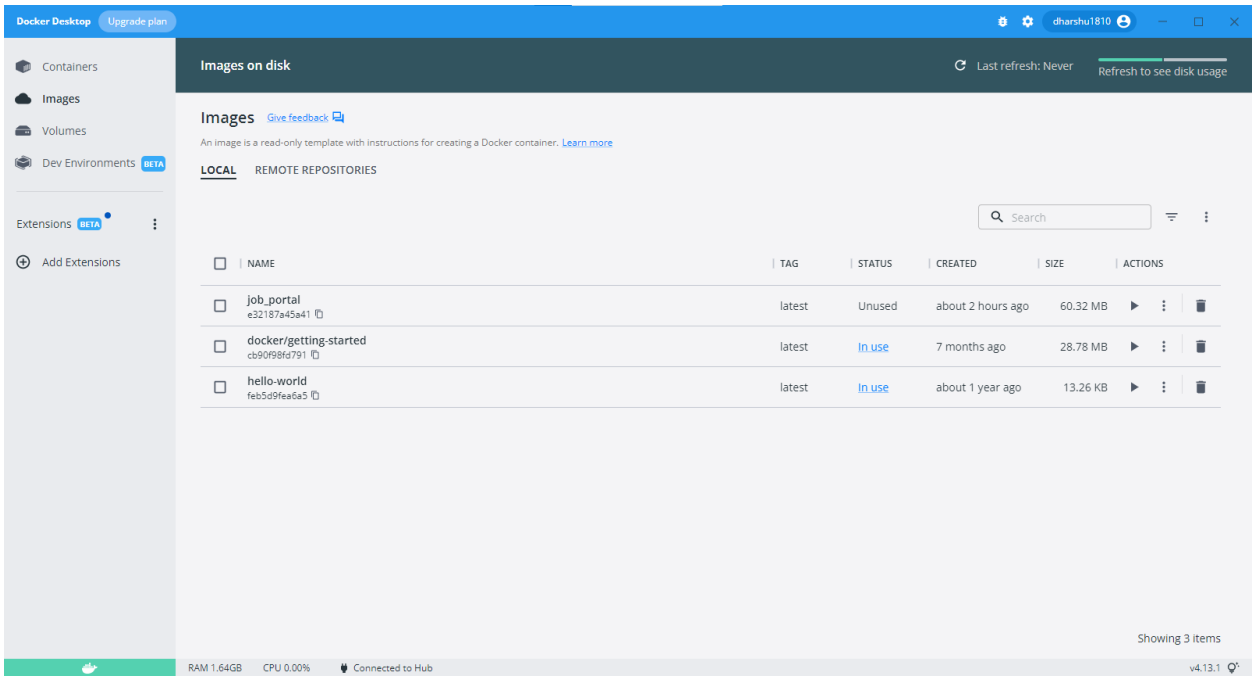
Flask web app for job portal:



Home Post Job

Organization Name: IBM Organization
Location: Banglore
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





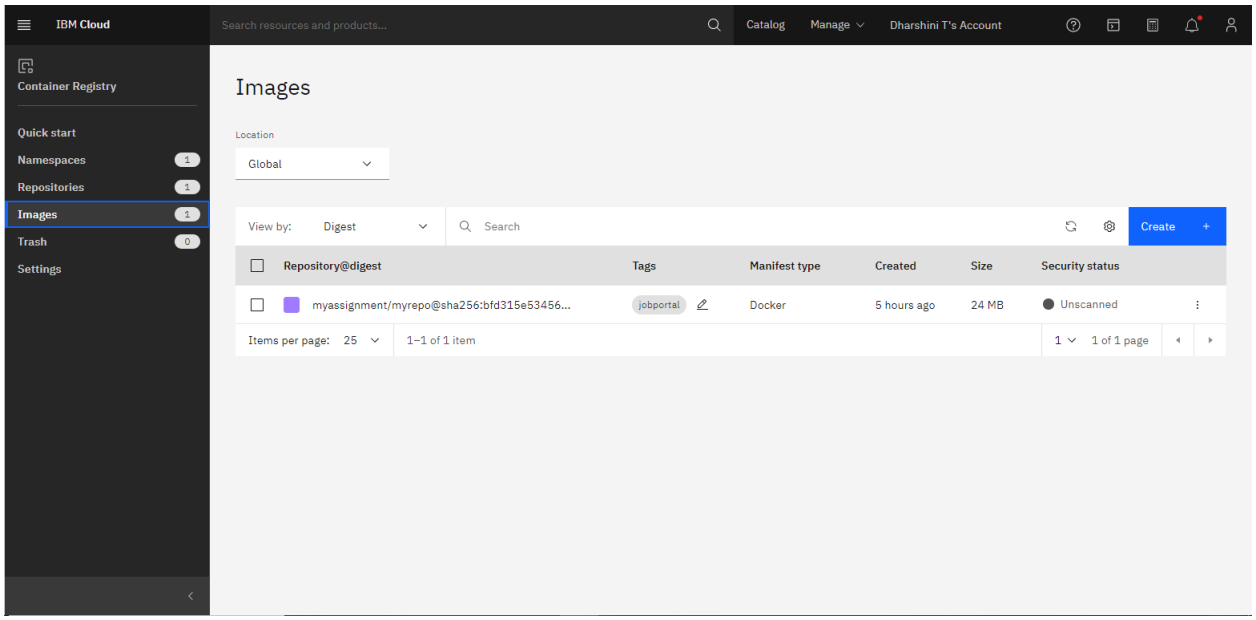
Question 3:

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\dharshini\.bluemix\plugins\container-registry. Use 'ibmcloud plugin show container-registry' to show its details.

C:\Users\dharshini>ibmcloud plugin list
Listing installed plug-ins...

Plugin Name          Version   Status   Private endpoints supported
container-registry   1.0.2             true
```

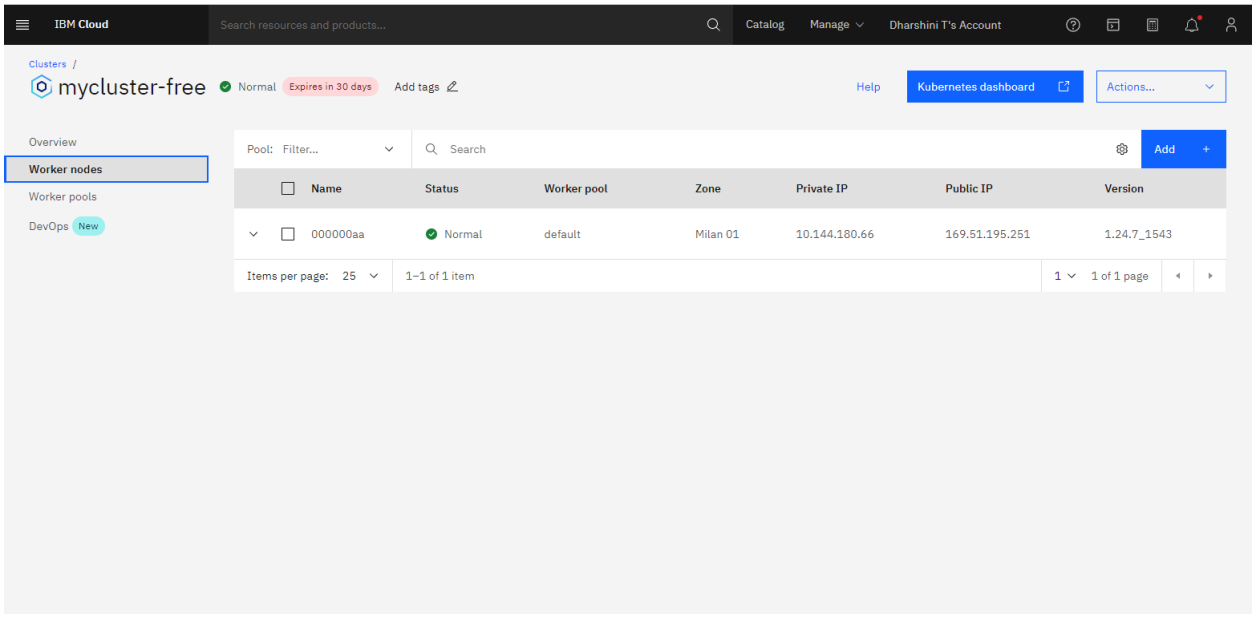
Pushing jobportal image to container registry

```
C:\Users\dharshini>docker push icr.io/myassignment/myrepo:jobportal
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\dharshini>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   -
```



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.



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=
                    node.kubernetes.io/exclude-from-external-load-balancers=
Annotations:        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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  hugepages-2Mi:      0
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System Info:
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  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-gcmx7                         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
```