

K8s Assignment CLOUDETHIX

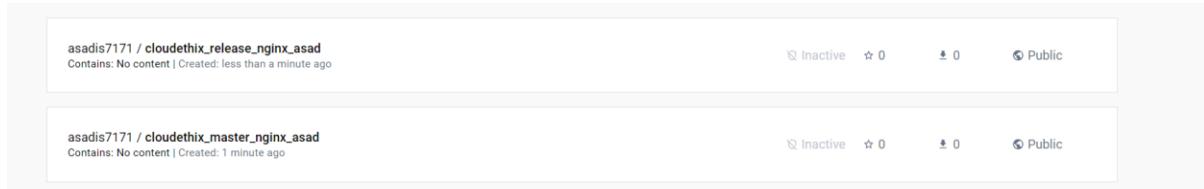
- by Asad Shaikh

Que 1 →

- Create 2 Public Docker Hub registries named

cloudeithix_master_nginx_yourname & cloudeithix_release_nginx_yourname.

→



- Clone below repository on your system.

<https://github.com/zembutsu/docker-sample-nginx.git>

→ cloned above repo locally

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1# git clone https://github.com/zembutsu/docker-sample-nginx.git
Cloning into 'docker-sample-nginx'...
remote: Enumerating objects: 22, done.
remote: Counting objects: 100% (12/12), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 22 (delta 7), reused 6 (delta 6), pack-reused 10
Receiving objects: 100% (22/22), done.
Resolving deltas: 100% (7/7), done.
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1# ll
total 0
drwxrwxrwx 1 root root 4096 Feb 21 19:23 /
drwxrwxrwx 1 root root 4096 Feb 21 19:20 docker-sample-nginx/
drwxrwxrwx 1 root root 4096 Feb 21 19:23 docker-sample-nginx/
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1# cd docker-sample-nginx/
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# ll
total 4
drwxrwxrwx 1 root root 4096 Feb 21 19:23 /
drwxrwxrwx 1 root root 4096 Feb 21 19:23 /
drwxrwxrwx 1 root root 4096 Feb 21 19:23 git/
-rw-rw-rwx 1 root root 95 Feb 21 19:23 Dockerfile*
-rw-rw-rwx 1 root root 1084 Feb 21 19:23 LICENSE*
-rw-rw-rwx 1 root root 73 Feb 21 19:23 README.md*
-rw-rw-rwx 1 root root 286 Feb 21 19:23 default.conf*
-rw-rw-rwx 1 root root 103 Feb 21 19:23 index.html*
```

- Initialize a local repository & copy the code from above repo to your local repository in master branch and then create below branches.

release

main

hotfix

→

Created the above branches from the local master branch

```

TWAIIWXA 1 root root 143 Feb 21 19:28 index.html*
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git branch main
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git branch hotfix
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git branch -l
  hotfix
  main
* master
  release

```

- Once code is copied to local repository, from master branch update the index.html and add word "Cloudethix Master Branch Nginx" and build the docker image & add meaningful tags and push to Docker Hub registry cloudeithix_master_nginx_yourname.

→

changed index.html in master branch. Added "Cloudethix Master Branch Nginx".

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git branch -l
  hotfix
  main
* master
  release
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# cat index.html
<html>
<body>
  <h1>Host: <!--#echo var="HOSTNAME" --></h1>
  Version: 1.1
  Cloudethix Master Branch Nginx
</body>
</html>

```

Built the image and pushed to Docker Hub

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# docker image build -t asadis7171/cloudeithix_master_nginx_asad:v1 .
[+] Building 8.3s (9/9) FINISHED
--> [internal] load build definition from Dockerfile
--> => transferring dockerfile: 132B
--> [internal] load metadata for docker.io/library/nginx:alpine
--> [auth] library/nginx:pull token for registry-1.docker.io
--> [internal] load dockerignore
--> => transferring context: 0B
--> [1/3] COPIY default.conf /etc/nginx/conf.d/
--> => resolving alpine:3.13...@sha256:6a2f2bb28e45c1adea04ec207a251fd4a2df03dc930f782af51e315ebc76e9a9
--> => resolving alpine:3.13...@sha256:6a2f2bb28e45c1adea04ec207a251fd4a2df03dc930f782af51e315ebc76e9a9
--> => sha256:6a2f2bb28e45c1adea04ec207a251fd4a2df03dc930f782af51e315ebc76e9a9 0.1s
--> => sha256:c3aa134a711cd11da0e0217debc0c775ed1ddee9987f7f47211dcd139ce 629B / 629B
--> => sha256:6913ad9ca3d80097HH0101+7008793776/c3+09573b5cc7c733bf60537fb67047 11.74kB / 11.74kB
--> => sha256:619b011613602d98e1961557798c27365cf951f5bcb72ab8 3.46MB / 3.46MB
--> => sha256:019b0065cd9fedff189bd11f60149569nb90e711395f772bfad1273ab3a1800 1.98MB / 1.98MB
--> => sha256:c705f11027780cd054c964477082bc9f509+e720ece0871885074+3u55999b 956B / 956B
--> => sha256:d6au56492xxallc093189fc4c3da0939f31c1925db31u815a196c0004f 1.21kB / 1.21kB
--> => sha256:a191c9482bb08a3fc551039ha162d98a30c9b0501b2+705904110dd0426f2c9b 393B / 393B
--> => sha256:e1c601001a0344f277ec490ccf526881bcc2e006/c9711b5941564800d4c1950 1.04kB / 1.04kB
--> => extracting sha256:a191c9482bb08a3fc551039ha162d98a30c9b0501b2+705904110dd0426f2c9b 393B / 393B
--> => sha256:a83cd9c77bd78909ea3a7ab78013b3c35a370e77367b105a0chaaaef90ccbdf 12.65MB / 12.65MB
--> => extracting sha256:c3ea3340a07114d7111dse02f17debc0b725ed1d0ea998475e072111d4c1399ce 0.5s
--> => extracting sha256:c795943102780cd054c964477082bc9f509+e720ece0871885074+3u55999b 0.0s
--> => extracting sha256:a191c9482bb08a3fc551039ha162d98a30c9b0501b2+705904110dd0426f2c9b 0.0s
--> => extracting sha256:d6au56492xxallc093189fc4c3da0939f31c1925db32fcf1925db31u815a196c4uuf 0.0s
--> => extracting sha256:a1c601001a0344f277ec490ccf526881bcc2e006/c9711b5941564800d4c1950 0.0s
--> => extracting sha256:a85cd9c879d79990e8a37ba870413b035a370e8772367b1045a0c9aaaaef90ccbdf 1.2s
--> [internal] load build context
--> => transferring context: 511B
--> [2/3] COPY default.conf /etc/nginx/conf.d/
--> [3/3] COPY index.html /usr/share/nginx/html/
--> exporting to image
--> => exporting layers
--> => writing image sha256:1acd3732d33b7055ccf7d68f14b4877f15d2a848fd82dd325419086df2e2e3f0
--> => naming to docker.io/asadis7171/cloudeithix_master_nginx_asad:v1
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# docker image push asadis7171/cloudeithix_master_nginx_asad:v1
The push refers to repository [docker.io/asadis7171/cloudeithix_master_nginx_asad]
19c8a138bf76: Pushed
460fbadaab66e: Pushed
667a2u7707f0: Mounted from library/nginx
d8577826595f: Mounted from library/nginx
2593b8e5428: Mounted from library/nginx
9909978d630d: Mounted from library/nginx
c5110fc719dd: Mounted from library/nginx
3137f8f0c641: Mounted from library/nginx
718ab50a47c: Mounted from library/nginx
aecd3bda2944: Mounted from library/nginx
v1: digest: sha256:a5d598d1427473646a6773e0389b472882c9604e8af4bec48157b7fc7774d52ca size: 2403
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx#
```

 Add a short description for this repository

The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search result

asadis7171/cloudethix_master_nginx_asad

Updated 3 minutes ago

This repository does not have a description 

Tags

This repository contains 1 tag(s).

Tag	OS	Type	Pulled	Pushed
 v1		Image	---	3 minutes ago

[See all](#)

- Also from release branch update the index.html and add word "Cloudethix

Release Branch Nginx" and build the docker image & add meaningful tags

and push to Docker Hub registry cloudethix_release_nginx_yourname.

→

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git branch -l
  hotfix
  main
  master
* release
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# cat index.html
<html>
<body>
    <h1>Host: <!--#echo var="HOSTNAME" --></h1>
    Version: 1.1
    Cloudethix Release Branch Nginx
</body>
</html>
```

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# docker image build -t asadis7171/cloudethix_release_nginx_asad:v1 .
[+] Building 1.9s (9/9) FINISHED
--> [internal] load build definition from Dockerfile
--> transferring dockerfile: 132B
--> [internal] load metadata for docker.io/library/nginx:alpine
--> [auth] library/nginx:pull token for registry-1.docker.io
--> [internal] load .dockerignore
--> transferring context: 2B
--> [1/3] FROM docker.io/library/nginx:alpine@sha256:6a2f0b28e45c4adea04ec207a251fd4a2df03ddc930f782af51e315ebc76e9a9
--> [internal] load build context
--> transferring context: 219B
--> CACHED [2/3] COPY default.conf /etc/nginx/conf.d/
--> [3/3] COPY index.html /usr/share/nginx/html/
--> exporting to image
--> exporting layers
--> writing image sha256:f9701324f106e72c91b938c57b4a445a70a59da932b141f1f6522b789f756db
--> naming to docker.io/asadis7171/cloudethix_release_nginx_asad:v1
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# curl -I http://localhost:8080
HTTP/1.1 200 OK
Content-Type: text/html
Content-Length: 13
Date: Mon, 12 Dec 2022 10:29:11 GMT
Connection: keep-alive
Content-Security-Policy: default-src 'self'; script-src 'self' https://code.jquery.com;
Set-Cookie: _ga=GA1.2.1710103111.1670883300; _gat=1; _gid=GA1.2.1710103111.1670883300
asadis7171/cloudethix_release_nginx_asad

```

(i) Add a short description for this repository
The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search results.

asadis7171/cloudethix_release_nginx_asad

Updated less than a minute ago

This repository does not have a description

Tags

This repository contains 1 tag(s).

Tag	OS	Type	Pulled	Pushed
v1		Image	---	a few seconds ago

[See all](#)

- Once Images are copied to Docker hub registries, switch to the main branch.

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git checkout main
M      index.html
Switched to branch 'main'
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git branch -l
  hotfix
* main
  master
  release
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# |

```

- In main branch create directory named kube/clusterIP & inside kube directory create file named master_pod.yaml with pod name master_nginx & with label master_nginx & add image that you have pushed in Docker Hub registry cloudethix_master_nginx_yourname.

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git branch -l
  hotfix
* main
  master
  release
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# ll kube/
total 0
drwxrwxrwx 1 root root 4096 Feb 21 19:55 .
drwxrwxrwx 1 root root 4096 Feb 21 19:54 /
-rwxrwxrwx 1 root root    0 Feb 21 19:55 cluster_ip-service.yaml*
-rwxrwxrwx 1 root root    0 Feb 21 19:54 master_pod.yaml*
-rwxrwxrwx 1 root root    0 Feb 21 19:55 release_pod.yaml*
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# ll
total 4
drwxrwxrwx 1 root root 4096 Feb 21 19:54 .
drwxrwxrwx 1 root root 4096 Feb 21 19:23 /
drwxrwxrwx 1 root root 4096 Feb 21 19:49 .git/
-rwxrwxrwx 1 root root   95 Feb 21 19:23 Dockerfile*
-rwxrwxrwx 1 root root 1084 Feb 21 19:23 LICENSE*
-rwxrwxrwx 1 root root   73 Feb 21 19:23 README.md*
-rwxrwxrwx 1 root root  286 Feb 21 19:23 default.conf*
-rwxrwxrwx 1 root root  144 Feb 21 19:45 index.html*
drwxrwxrwx 1 root root 4096 Feb 21 19:55 kube/
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# |

```

- Also create a file release_pod.yaml with pod name release_nginx & with label release_nginx & add image that you have pushed in Docker Hub registry cloudethix_release_nginx_yourname.
- Create a file called cluster_ip-service.yaml with service name cloudethix_clusterip and with Type clusterIP.
- Then, select the pod with label release_nginx in service.
- Create all these three resources in your k8s cluster.



```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx/kube# cat cluster_ip-service.yaml master_pod.yaml release_pod.yaml
apiVersion: v1
kind: Service
metadata:
  name: cloudeithix-clusterip
spec:
  selector:
    name: release-nginx
  ports:
  - port: 80
    targetPort: 80
    type: ClusterIP
apiVersion: v1
kind: Pod
metadata:
  name: master-nginx
  labels:
    name: master-nginx
spec:
  containers:
  - name: master-nginx
    image: asadis7171/cloudeithix_master_nginx_asad:v1
    ports:
    - containerPort: 80
apiVersion: v1
kind: Pod
metadata:
  name: release-nginx
  labels:
    name: release-nginx
spec:
  containers:
  - name: release-nginx
    image: asadis7171/cloudeithix_release_nginx_asad:v1
    ports:
    - containerPort: 80
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx/kube# |
```

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx/kube# k get po,svc
NAME           READY   STATUS    RESTARTS   AGE
pod/master-nginx   1/1     Running   0          16m
pod/release-nginx  1/1     Running   0          16m

NAME                  TYPE      CLUSTER-IP      EXTERNAL-IP   PORT(S)   AGE
service/cloudeithix-clusterip  ClusterIP  10.108.122.169  <none>        80/TCP    16m
service/kubernetes       ClusterIP  10.96.0.1      <none>        443/TCP   162m
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx/kube# |
```

- Now, access master_nginx pod shell & curl the master_nginx pod & check the result.

- Also try to curl release_nginx pod with DNS name & check the result.

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx/kube# kubectl exec -ti master-nginx -- curl release-nginx
curl: (6) Could not resolve host: release-nginx
command terminated with exit code 6
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx/kube# kubectl exec -ti master-nginx -- /bin/sh
/ # curl release-nginx
curl: (6) Could not resolve host: release-nginx
/ # exit
command terminated with exit code 6
```

- Then curl the clusterip service with its name and check the result.

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx/kube# kubectl exec -ti master-nginx -- curl cloudeithix-clusterip
<html>
<body>
  <h1>Host: release-nginx</h1>
  Version: 1.1
  Cloudeithix Release Branch Nginx
</body>
</html>
```

- Finally, create a GITHUB remote repository named cloudeithix-k8s-yourname and push all the branches to the remote repository.

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git push asad-origin main
Enumerating objects: 30, done.
Counting objects: 100% (30/30), done.
Delta compression using up to 8 threads
Compressing objects: 100% (28/28), done.
Writing objects: 100% (29/29), 3.90 KiB | 71.00 KiB/s, done.
Total 29 (delta 9), reused 6 (delta 1), pack-reused 0
remote: Resolving deltas: 100% (9/9), done.
To github.com:asadis7171/cloudeithix-k8s-asad.git
  941abdf..fa45216  main -> main
```

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git push asad-origin release
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 362 bytes | 32.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:asadis7171/cloudeithix-k8s-asad.git
  a904278..f30877e  release -> release
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git push asad-origin master
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 361 bytes | 24.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:asadis7171/cloudeithix-k8s-asad.git
  a904278..1efb27f  master -> master
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx#
```

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git push asad-origin hotfix
Everything up-to-date
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx#
```

Pushed all the branches to the repo

The screenshot shows a GitHub repository page for 'cloudeithix-k8s-asad'. The repository has 1 star and 1 commit. The main branch is visible with files like README.md, default.conf, and index.html. The README.md file contains the text '#a sample nginx container to display container name'.

Repository: asadis7171 / cloudeithix-k8s-asad

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

Files

main Go to file

kube

- cluster_ip-service.yaml
- master_pod.yaml
- release_pod.yaml
- Dockerfile
- LICENSE

README.md default.conf index.html

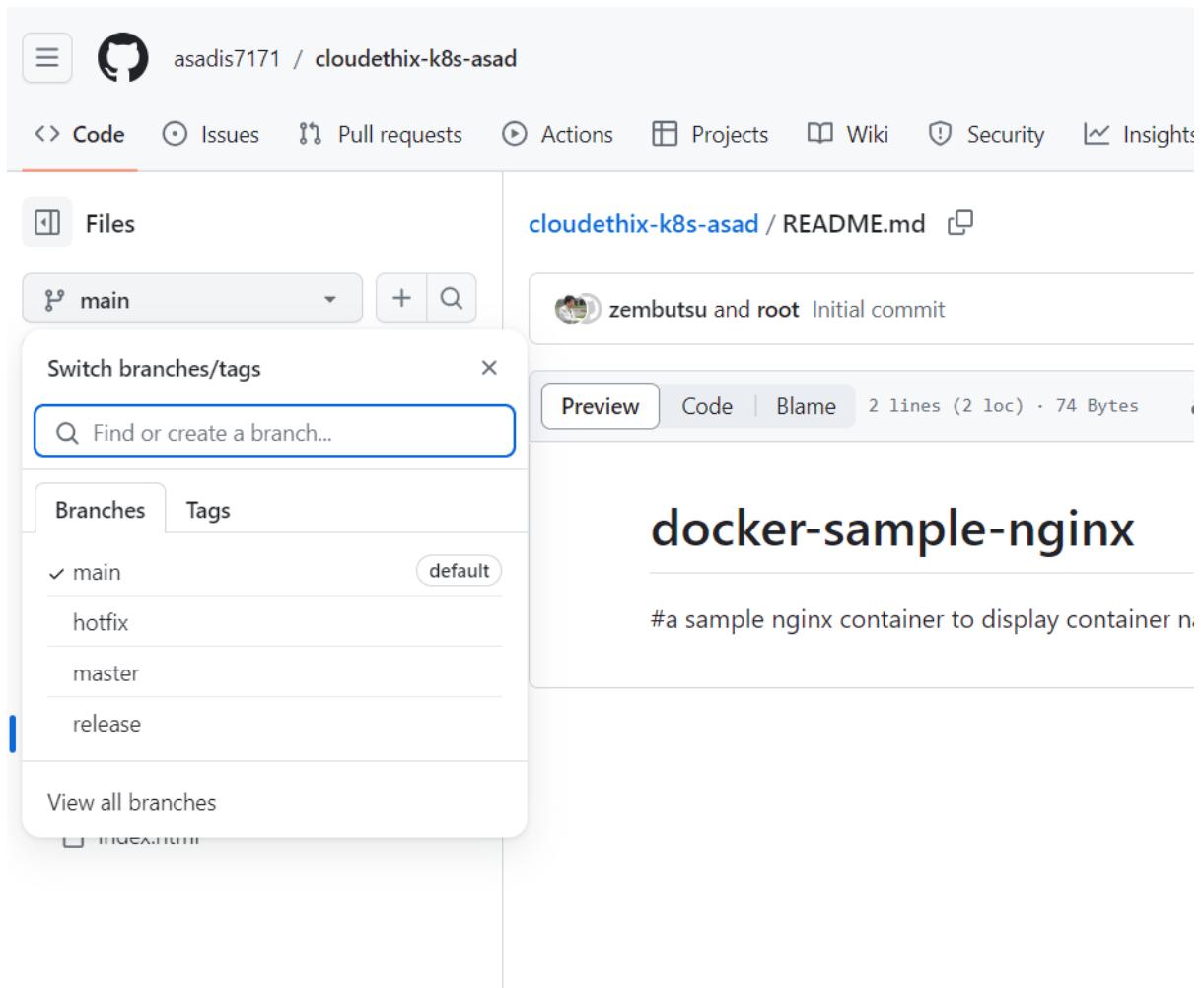
cloudeithix-k8s-asad / README.md

zembutsu and root Initial commit

Preview Code Blame 2 lines (2 loc) · 74 Bytes Code 55% faster with GitHub Copilot

docker-sample-nginx

#a sample nginx container to display container name



Github link:

<https://github.com/asadis7171/cloudethix-k8s-asad.git>

- Take all screenshots and create a well formatted document.

→done

Que 2 →

- In the main branch of your local repository create a directory `kube/NodePort`.

- Create below files from below url. Please make sure you will create `NodePort` service with port 30008 instead of loadbalancer.

<https://kubernetes.io/docs/tasks/access-application-cluster/connecting-frontend-backend/>.

`backend-deployment.yaml`

`backend-service.yaml`

```

! backend-service.yaml U ×
docker-sample-nginx > kube > NodePort > ! backend-service.yaml > {} metadata > [+] namespaces
    io.k8s.api.core.v1.Service (v1@service.json)
1  ---
2  apiVersion: v1
3  kind: Service
4  metadata:
5    name: hello
6    namespace: project-2
7  spec:
8    selector:
9      app: hello
10     tier: backend
11   ports:
12     - protocol: TCP
13       port: 80
14       targetPort: http
15 ...
16
17
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24
25
26
27

! backend-deployment.yaml 1,U ×
docker-sample-nginx > kube > NodePort > ! backend-deployment.yaml > {} metadata > [+] namespaces
    io.k8s.api.apps.v1.Deployment (v1@deployment.json)
1  ---
2  apiVersion: apps/v1
3  kind: Deployment
4  metadata:
5    name: backend
6    namespace: project-2
7  spec:
8    selector:
9      matchLabels:
10        app: hello
11        tier: backend
12        track: stable
13    replicas: 3
14    template:
15      metadata:
16        labels:
17          app: hello
18          tier: backend
19          track: stable
20    spec:
21      containers:
22        - name: hello
23          image: "gcr.io/google-samples/hello-go-gke:1.0"
24          ports:
25            - name: http
26              containerPort: 80
27 ...

```

frontend-deployment.yaml

frontend-NodePort-service.yaml

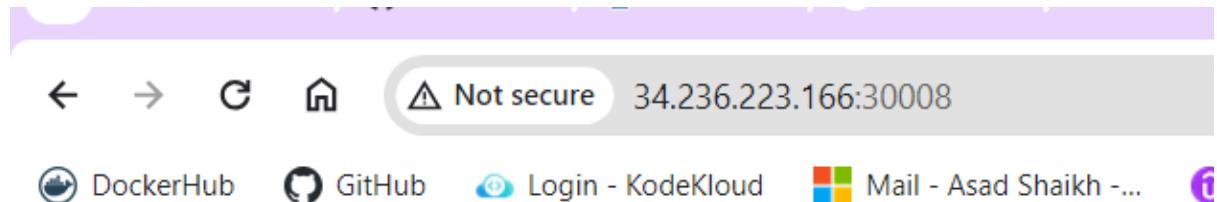
```

! frontend-deployment.yaml 1,U ×
docker-sample-nginx > kube > NodePort > ! frontend-deployment.yaml > {} metadata > [+] namespaces
    io.k8s.api.apps.v1.Deployment (v1@deployment.json)
1  ---
2  apiVersion: apps/v1
3  kind: Deployment
4  metadata:
5    name: frontend
6    namespace: project-2
7  spec:
8    selector:
9      matchLabels:
10        app: hello
11        tier: frontend
12        track: stable
13    replicas: 1
14    template:
15      metadata:
16        labels:
17          app: hello
18          tier: frontend
19          track: stable
20    spec:
21      containers:
22        - name: nginx
23          image: "gcr.io/google-samples/hello-frontend:1.0"
24          lifecycle:
25            prestop:
26              exec:
27                command: ["/usr/sbin/nginx", "-s", "quit"]
28 ...
29

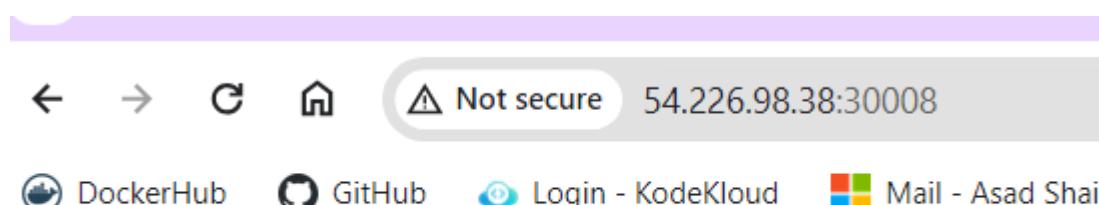
! frontend-NodePort-service.yaml U ×
docker-sample-nginx > kube > NodePort > ! frontend-NodePort-service.yaml > {} metadata > [+] namespaces
    io.k8s.api.core.v1.Service (v1@service.json)
1  ---
2  apiVersion: v1
3  kind: Service
4  metadata:
5    name: frontend
6    namespace: project-2
7  spec:
8    selector:
9      app: hello
10     tier: frontend
11   ports:
12     - protocol: "TCP"
13       port: 80
14       targetPort: 80
15       nodePort: 30008
16   type: NodePort
17 ...
18
19
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- Access all public ips with port 30008 in the browser and then check the result.

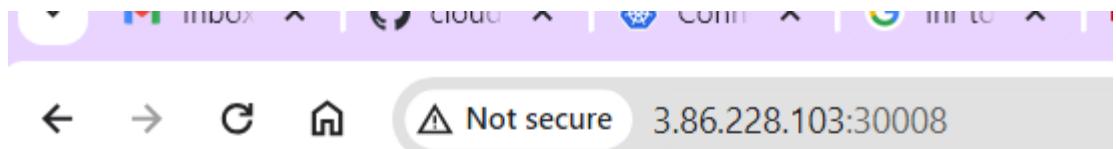
→



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{"message": "Hello"}
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```
{"message": "Hello"}
```

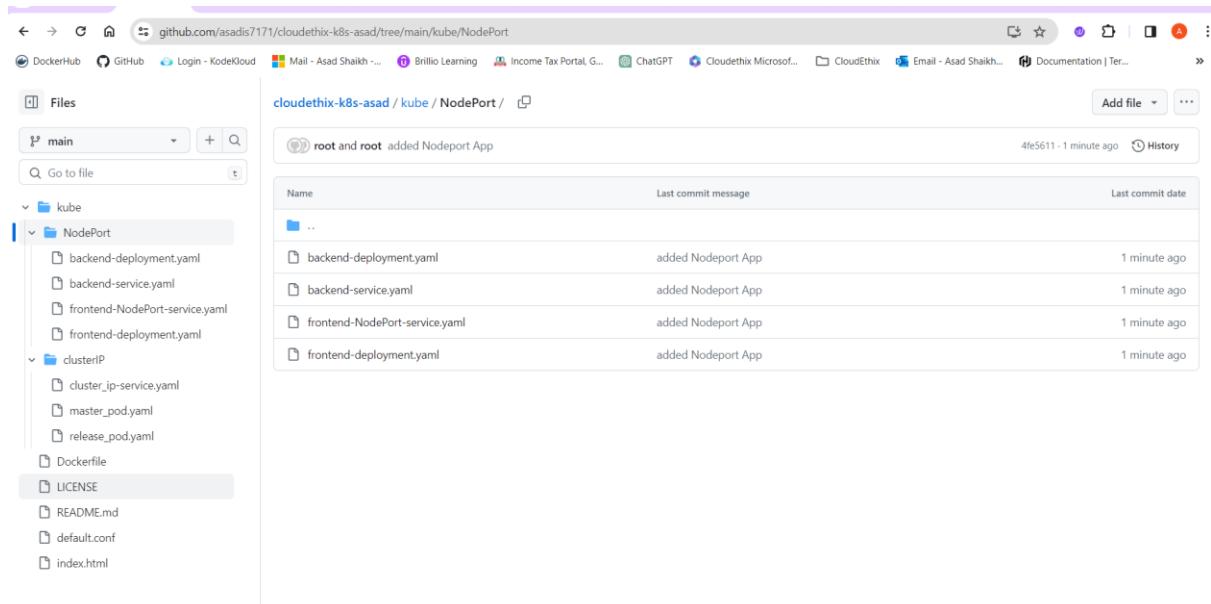


{"message": "Hello"}

- Finally, push all the latest code to the remote repository.

→

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git add .
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git commit -m "added Nodeport App"
[main 4fe5611] added Nodeport App
Committer: root <root@Asad-PC>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly. Run the
following command and follow the instructions in your editor to edit
your configuration file:
git config --global --edit
After doing this, you may fix the identity used for this commit with:
git commit --amend --reset-author
4 files changed, 87 insertions(+)
create mode 100644 kube/NodePort/backend-deployment.yaml
create mode 100644 kube/NodePort/backend-service.yaml
create mode 100644 kube/NodePort/frontend-NodePort-service.yaml
create mode 100644 kube/NodePort/frontend-deployment.yaml
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# git push asad-origin main
Enumerating objects: 10, done.
Counting objects: 100% (10/10), done.
Delta compression using up to 8 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (8/8), 1.10 KiB | 15.00 KiB/s, done.
Total 8 (delta 3), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (3/3), completed with 1 local object.
To github.com:asadis7171/cloudethix-k8s-asad.git
  41ebc96..4fe5611  main -> main
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q1/docker-sample-nginx# |
```



- Take all screenshots and create a well formatted document.

Que 3 →

- Create any 2 pods and assign them to different worker nodes with `nodeName` property.

→

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q3# kubectl create namespace proj-3
namespace/proj-3 created
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q3# kubens proj-3
Context "kubernetes-admin@kubernetes" modified.
Active namespace is "proj-3".
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q3# kaf .
pod/pod1 created
pod/pod2 created
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q3# kgpo
NAME READY STATUS RESTARTS AGE IP NODE NOMINATED NODE READINESS GATES
pod1 1/1 Running 0 11s 10.108.43.5 worker-0 <none> <none>
pod2 1/1 Running 0 10s 10.111.158.69 worker-1 <none> <none>
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q3# cat *
apiVersion: v1
kind: Pod
metadata:
  name: pod1
  namespace: proj-3
spec:
  containers:
  - name: nginx
    image: nginx
  nodeName: worker-0 # Replace <node1> with the name of the first worker node
apiVersion: v1
kind: Pod
metadata:
  name: pod2
  namespace: proj-3
spec:
  containers:
  - name: nginx
    image: nginx
  nodeName: worker-1 # Replace <node2> with the name of the second worker node
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q3# |
```

Que 4 →

- Label both worker nodes such as worker-0 node as cloudeithix-k8s-00 & worker-1 node as cloudeithix-k8s-01.
- Once nodes are labeled, create pod00.yaml file and schedule the pod on worker-0 node with nodeSelector property. Also create one more file named pod01.yaml & schedule the pod on worker-1 node.

```
e=worker-1_kubernetes.io/os=linux
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q4# kubectl label node worker-0 name=cloudeithix-k8s-00
node/worker-0 labeled
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q4# kubectl label node worker-1 name=cloudeithix-k8s-01
node/worker-1 labeled
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q4# kgn --show-labels
NAME STATUS ROLES AGE VERSION LABELS
master Ready control-plane 10h v1.28.2 beta.kubernetes.io/arch=amd64,beta.kubernetes.io/os=linux,kubernetes.io/arch=amd64,kubernetes.io/hostname=e=master,kubernetes.io/os=linux,node-role.kubernetes.io/control-plane=
worker-0 Ready <none> 10h v1.28.2 beta.kubernetes.io/arch=amd64,beta.kubernetes.io/os=linux,kubernetes.io/arch=amd64,kubernetes.io/hostname=e=worker-0,kubernetes.io/os=linux,name=cloudeithix-k8s-00
worker-1 Ready <none> 10h v1.28.2 beta.kubernetes.io/arch=amd64,beta.kubernetes.io/os=linux,kubernetes.io/arch=amd64,kubernetes.io/hostname=e=worker-1,kubernetes.io/os=linux,name=cloudeithix-k8s-01
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q4#
```

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q4# cat pod00.yaml pod01.yaml
apiVersion: v1
kind: Pod
metadata:
  name: pod-00
  namespace: proj-4
spec:
  containers:
  - name: nginx-01
    image: nginx
  nodeSelector:
    name: cloudeithix-k8s-00

apiVersion: v1
kind: Pod
metadata:
  name: pod-01
  namespace: proj-4
spec:
  containers:
  - name: nginx-02
    image: nginx
  nodeSelector:
    name: cloudeithix-k8s-01
```

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q4# kaf .
pod/pod-00 created
pod/pod-01 created
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q4# kgpo
NAME READY STATUS RESTARTS AGE IP NODE NOMINATED NODE READINESS GATES
pod-00 1/1 Running 0 18s 10.108.43.7 worker-0 <none> <none>
pod-01 1/1 Running 0 18s 10.111.158.71 worker-1 <none> <none>
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q4# |
```

Que 5 →

- Clone the below repo locally & create DaemonSet from directory

DaemonSet101.

<https://github.com/collabnix/kubelabs>

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q5/kubelabs/DaemonSet101# 
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q5/kubelabs/DaemonSet101# kaf . 
daemonset.apps/prometheus-daemonset created 
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q5/kubelabs/DaemonSet101# k get daemonset 
NAME           DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE 
prometheus-daemonset   2         2         2         2           2           <none>       9s 
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q5/kubelabs/DaemonSet101# k describe daemonset 
Name:          prometheus-daemonset 
Selector:      name=prometheus-exporter,tier=monitoring 
Node-Selector: <none> 
Labels:        <none> 
Annotations:   deprecated.daemonset.template.generation: 1 
Desired Number of Nodes Scheduled: 2 
Current Number of Nodes Scheduled: 2 
Number of Nodes Scheduled with Up-to-date Pods: 2 
Number of Nodes Scheduled with Available Pods: 2 
Number of Nodes Misscheduled: 0 
Pods Status:  2 Running / 0 Waiting / 0 Succeeded / 0 Failed 
Pod Template: 
  Labels:  name=prometheus-exporter 
           tier=monitoring 
  Containers: 
    prometheus: 
      Image:      prom/node-exporter 
      Port:       80/TCP 
      Host Port:  0/TCP 
      Environment: <none> 
      Mounts:     <none> 
      Volumes:    <none> 
  Events: 
    Type  Reason     Age   From            Message 
    ----  ----       --   --              -- 
    Normal  SuccessfulCreate  71s  daemonset-controller  Created pod: prometheus-daemonset-2fntr 
    Normal  SuccessfulCreate  71s  daemonset-controller  Created pod: prometheus-daemonset-bz9st 
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q5/kubelabs/DaemonSet101# kgp 
NAME          READY   STATUS    RESTARTS   AGE 
prometheus-daemonset-2fntr  1/1    Running   0          88s 
prometheus-daemonset-bz9st  1/1    Running   0          88s 
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q5/kubelabs/DaemonSet101# kgpo 
NAME          READY   STATUS    RESTARTS   AGE   IP           NODE   NOMINATED NODE   READINESS GATES 
prometheus-daemonset-2fntr  1/1    Running   0          93s  10.108.43.8  worker-0  <none>        <none> 
prometheus-daemonset-bz9st  1/1    Running   0          93s  10.111.158.72  worker-1  <none>        <none> 
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q5/kubelabs/DaemonSet101# |
```

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q5/kubelabs/DaemonSet101# cat daemonset.yml 
apiVersion: apps/v1 
kind: DaemonSet 
metadata: 
  name: prometheus-daemonset 
  namespace: proj-5 
spec: 
  selector: 
    matchLabels: 
      tier: monitoring 
      name: prometheus-exporter 
  template: 
    metadata: 
      labels: 
        tier: monitoring 
        name: prometheus-exporter 
    spec: 
      containers: 
        - name: prometheus 
          image: prom/node-exporter 
          ports: 
            - containerPort: 80 
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q5/kubelabs/DaemonSet101# |
```

Que 6 →

- Create a static pod with name cloudethix-static in your k8s cluster. Refer below link.

<https://kubernetes.io/docs/tasks/configure-pod-container/static-pod/>

→ logged in to Worker node

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q6# ssh ubuntu@54.226.98.38
The authenticity of host '54.226.98.38 (54.226.98.38)' can't be established.
ED25519 key fingerprint is SHA256:0xMDMxXYH5unlb0b0xzBg2vZW1fqYwI9vT0hp0t2SQ8.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '54.226.98.38' (ED25519) to the list of known hosts.
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-1103-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

 System information as of Thu Feb 22 19:01:44 UTC 2024

 System load:  0.0                  Users logged in:      0
 Usage of /:   53.3% of 7.57GB    IP address for eth0:  172.31.90.235
 Memory usage: 24%
 Swap usage:   0%                 IP address for docker0: 172.17.0.1
 Processes:    128                IP address for tunl0:  10.108.43.0

Expanded Security Maintenance for Infrastructure is not enabled.

8 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

89 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-90-235:~$ sudo -i
```

```
ubuntu@ip-172-31-90-235:~$ sudo -i
root@ip-172-31-90-235:~# ps -ef | grep kubelet
root      24884 24688  0 19:02 pts/0    00:00
root@ip-172-31-90-235:~# ps -ef | grep kubel
root      5652      1  0 05:39 ?    00:06
-kubelet --config=/var/lib/kubelet/config.yaml --conta
try.k8s.io/pause:3.9
root      24980 24688  0 19:02 pts/0    00:00
root@ip-172-31-90-235:~# |
```

Found static pod path

```
root@ip-172-31-90-235:~# less /var/lib/kubelet/config.yaml
root@ip-172-31-90-235:~# less /var/lib/kubelet/config.yaml | grep -i staticpod
staticPodPath: /etc/kubernetes/manifests
root@ip-172-31-90-235:~# |
```

```
root@ip-172-31-90-235:/etc/kubernetes/manifests# cat static-pod.yaml
apiVersion: v1
kind: Pod
metadata:
  name: static-web
  labels:
    role: myrole
spec:
  containers:
    - name: web
      image: nginx
      ports:
        - name: web
          containerPort: 80
          protocol: TCP
root@ip-172-31-90-235:/etc/kubernetes/manifests# realpath static-pod.yaml
/etc/kubernetes/manifests/static-pod.yaml
root@ip-172-31-90-235:/etc/kubernetes/manifests# |
```

As soon as we restart the kubelet service static pod will be created

```
root@ip-172-31-90-235:/etc/kubernetes/manifests# systemctl restart kubelet.service
root@ip-172-31-90-235:/etc/kubernetes/manifests# systemctl status kubelet.service
● kubelet.service - kubelet: The Kubernetes Node Agent
   Loaded: loaded (/lib/systemd/system/kubelet.service; enabled; vendor preset: enabled)
   Drop-In: /etc/systemd/system/kubelet.service.d
             └─10-kubeadm.conf
   Active: active (running) since Thu 2024-02-22 19:10:39 UTC; 9s ago
     Docs: https://kubernetes.io/docs/home/
 Main PID: 27435 (kubelet)
   Tasks: 9 (limit: 2342)
  CGroup: /system.slice/kubelet.service
          └─27435 /usr/bin/kubelet --bootstrap-kubeconfig=/etc/kubernetes/bootstrap-kubelet.conf --kubeconfig=/etc/kubernetes/kubelet.conf --config=/var/lib/kubelet/conf

Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.318982 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.319008 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.319059 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.319097 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.319161 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.319197 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.319248 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.319315 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.319342 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
Feb 22 19:10:40 ip-172-31-90-235 kubelet[27435]: I0222 19:10:40.319407 27435 reconciler_common.go:258] "operationExecutor.VerifyControllerAttachedVolume started for vol
lines 1-21/21 (END)
```

```
root@Asad-PC:~# kgp
NAME          READY   STATUS    RESTARTS   AGE
pod-01        0/1     Pending   0          178m
static-web-worker-0  1/1     Running   0          7m33s
test-1        0/1     Pending   0          178m
root@Asad-PC:~# |
```

If we delete the static pod it re creates as its managed by kubelet daemon not by api server

```
root@Asad-PC:~# kgp
NAME          READY   STATUS    RESTARTS   AGE
static-web-worker-0  1/1     Running   0          58s
root@Asad-PC:~# kubectl delete pod static-web-worker-0
pod "static-web-worker-0" deleted
root@Asad-PC:~# kgp
NAME          READY   STATUS    RESTARTS   AGE
static-web-worker-0  1/1     Running   0          3s
root@Asad-PC:~# |
```

Que 7 →

- Install Kubectx & kubens in your k8s cluster.

```
root@Asad-PC:~# cat .bashrc | grep -i kubectx
export PATH=$PATH:~/kubectx
source ~/kubectx/completion/kubens.bash
source ~/kubectx/completion/kubectx.bash
root@Asad-PC:~# ll .kubectx/
total 140
drwxr-xr-x 10 root root 4096 Feb 13 18:58 .
drwx----- 15 root root 4096 Feb 23 00:43 ..
drwxr-xr-x  8 root root 4096 Feb 13 18:58 .git/
drwxr-xr-x  3 root root 4096 Feb 13 18:58 .github/
-rw-r--r--  1 root root 2761 Feb 13 18:58 .goreleaser.yml
drwxr-xr-x  2 root root 4096 Feb 13 18:58 .krew/
-rw-r--r--  1 root root  968 Feb 13 18:58 CONTRIBUTING.md
-rw-r--r--  1 root root 11357 Feb 13 18:58 LICENSE
-rw-r--r--  1 root root 10093 Feb 13 18:58 README.md
drwxr-xr-x  4 root root 4096 Feb 13 18:58 cmd/
drwxr-xr-x  2 root root 4096 Feb 13 18:58 completion/
-rw-r--r--  1 root root 2169 Feb 13 18:58 go.mod
-rw-r--r--  1 root root 48940 Feb 13 18:58 go.sum
drwxr-xr-x  2 root root 4096 Feb 13 18:58 img/
drwxr-xr-x  7 root root 4096 Feb 13 18:58 internal/
-rwxr-xr-x  1 root root 6108 Feb 13 18:58 kubectx*
-rwxr-xr-x  1 root root 5555 Feb 13 18:58 kubens*
drwxr-xr-x  3 root root 4096 Feb 13 18:58 test/
root@Asad-PC:~# kubect
kubectl      kubectl-terra  kubectx
root@Asad-PC:~# kube
kubectl      kubectl-terra  kubectx      kubens
root@Asad-PC:~# kubel
```

```
root@Asad-PC:~# which kubectx
/root/.kubectx/kubectx
root@Asad-PC:~# which kubens
/root/.kubectx/kubens
root@Asad-PC:~# |
```

Que 8 →

- Create 1 Public Docker Hub registry named flask_webapp_yourname.

asadis7171 / [Repositories](#) / [flask_webapp_asad](#) / [General](#)

General Tags Builds Collaborators Webhooks Settings

Add a short description for this repository
The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search results.

asadis7171/flask_webapp_asad

Updated less than a minute ago

This repository does not have a description

Tags

This repository contains 1 tag(s).

Tag	OS	Type	Pulled	Pushed
v1		Image	---	a few seconds ago

[See all](#)

- Clone below repository on your system.

<https://github.com/mmumshad/simple-webapp-docker.git>

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8# git clone https://github.com/mmumshad/simple-webapp-docker.git
Cloning into 'simple-webapp-docker'...
remote: Enumerating objects: 14, done.
remote: Counting objects: 100% (7/7), done.
remote: Compressing objects: 100% (5/5), done.
remote: Total 14 (delta 3), reused 2 (delta 2), pack-reused 7
Receiving objects: 100% (14/14), done.
Resolving deltas: 100% (3/3), done.
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8# ll
```

- Initialize a local repository & copy the code from above repo to your local repository in your working branch.

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# ll
total 0
drwxrwxrwx 1 root root 4096 Feb 23 11:14 /
drwxrwxrwx 1 root root 4096 Feb 23 11:05 /
drwxrwxrwx 1 root root 4096 Feb 23 11:05 git/
-rwxrwxrwx 1 root root 194 Feb 23 11:05 Dockerfile*
-rwxrwxrwx 1 root root 229 Feb 23 11:05 app.py*
drwxrwxrwx 1 root root 4096 Feb 23 11:16 kube/
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# |
```

- Once code is copied to the local repository, build the docker image & add meaningful tags with version 1 and push to Docker Hub registry.

```
rwxrwxrwx 1 root root 229 Feb 23 11:05 app.py*
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# docker image build --no-cache -t asadis7171/flask-app:v1 .
[+] Building 12.5s (10/10) FINISHED
--> [internal] load build definition from Dockerfile
--> transferring dockerfile: 23B
--> [internal] load metadata for docker.io/library/ubuntu:20.04
--> [auth] library/ubuntu:pull token for registry-1.docker.io
--> [internal] load .dockerignore
-->> transferring context: 2B
--> [1/4] FROM docker.io/library/ubuntu:20.04@sha256:bb1c41682388d7046f74d183022816d41c58d7b0c89e9d706a74b4e548636e54
--> >> resolve docker.io/library/ubuntu:20.04@sha256:bb1c41682388d7046f74d183022816d41c58d7b0c89e9d706a74b4e548636e54
--> >> sha256:4fab1802f08df089c4b2e0a1c8f1a06f573bd1775687d87fe40f76d3a2e4900 424B / 424B
--> >> sha256:18ca3f4297e795532c9d053ba443d392d5316ee83ddee0de27f1e742a7db273 2.30kB / 2.30kB
--> >> sha256:8ee08747356ecb5ea92128219660506b139dc6cc45dcab84d98b3c6485061 27.51MB / 27.51MB
--> >> sha256:bb1c11682388d7046f74d183022816d41c58d7b0c89e9d706a74b4e548636e54 1.13kB / 1.13kB
--> >> extracting sha256:8ee08747356ecb5ea92128219660506b139dc6cc45dcab84d98b3c6485061
--> [internal] load build context
--> >> transferring context: 264B
--> [2/4] RUN apt-get update && apt-get install -y python3 python3-pip
--> [3/4] RUN pip install flask
--> [4/4] COPY app.py /opt/
--> exporting to image
--> >> exporting layers
--> >> writing image sha256:d881db3e0b3cdd4d4810a1bc123ad25e33004538b6aaed3619937faa4b7a3af1
--> >> naming to docker.io/asadis7171/flask-app:v1
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# docker image push asadis7171/flask-app:v1
[+] Pushing image to docker hub
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# docker image tag asadis7171/flask-app:v1 asadis7171/flask_webapp_asad:v1
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# docker image push asadis7171/flask_webapp_asad:v1
The push refers to repository [docker.io/asadis7171/flask_webapp_asad]
525a24a3bb92: Pushed
0f6d0beff3bcc: Pushed
06c606dbdf01: Pushed
28da045c449: Mounted from library/ubuntu
v1: digest: sha256:c8ba7dd088d028b1091e681708309ee047599b9c2f0d4e2a3793f117186b3e87 size: 1168
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# |
```

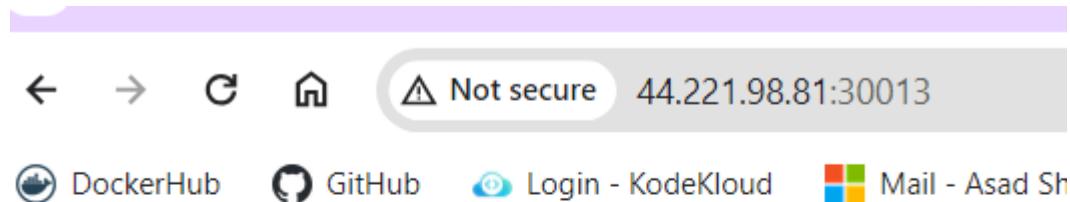
- Once Images are pushed to Docker hub registries, create a directory named kube. Inside the kube directory create deployment.yaml file with 3 replication , labels app: flask-webapp , containerPort: 8080 and add the image that you have pushed in Docker Hub registry.

```
rwxrwxrwx 1 root root 4096 Feb 23 11:16 kube/
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# ll kube/
total 0
drwxrwxrwx 1 root root 4096 Feb 23 11:16 /
drwxrwxrwx 1 root root 4096 Feb 23 11:14 /
-rwxrwxrwx 1 root root 353 Feb 23 11:34 deployment.yaml*
-rwxrwxrwx 1 root root 190 Feb 23 11:30 service.yaml*
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# |
```

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# cat deployment.yaml service.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: myapp
spec:
  replicas: 3
  selector:
    matchLabels:
      app: flask-webapp
  template:
    metadata:
      labels:
        app: flask-webapp
    spec:
      containers:
        - name: myapp
          image: asadis7171/flask_webapp_asad:v1
          ports:
            - containerPort: 8080
apiVersion: v1
kind: Service
metadata:
  name: nodeport
spec:
  selector:
    app: flask-webapp
  ports:
    - port: 8080
      targetPort: 8080
      nodePort: 30013
      type: NodePort
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# |
```

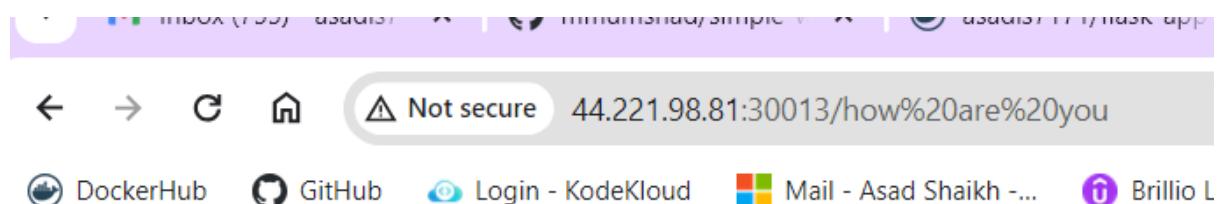
- Create one service.yaml file with type nodeport & select flask-webapp with port 8080 & targetPort 8080 with any nodePort between range 30000-32768.
- Once a service is created try accessing the web page in the browser as below. (30011 is nodeport mentioned in service.yaml). Meanwhile open app.py from your code to understand paths & output.

http://master_ip:30011/



Welcome!

http://master_ip:30011/how are you



I am good, how about you?

- Now , update the app.py from your code and add below route above if

```
__name__ == "__main__"
```

```
@app.route('/Who are you')
```

```
def cloudethix():
```

```
    return 'Yes, I am cloudethix, and You !!!'
```

- Once the file is updated , rebuild the docker image & add meaningful tags

with version 2 and push to Docker Hub registry.

- Now we have the latest docker image in repo, It's time to roll out a new image. Roll out the new Image with all three ways one by one.

1. With kubectl set command

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v2 --record
d
deployment.apps/myapp image updated
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl rollout history deployment myapp
deployment.apps/myapp
REVISION CHANGE-CAUSE
1      <none>
2      kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v2 --record=true
```

2. With kubectl edit deployment

```
# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: apps/v1
kind: Deployment
metadata:
  annotations:
    deployment.kubernetes.io/revision: "2"
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion": "apps/v1", "kind": "Deployment", "metadata": {"annotations": {}, "name": "myapp", "namespace": "default"}, "spec": {"replicas": 3, "selector": {"matchLabels": {"app": "flask-webapp"}}, "template": {"metadata": {"labels": {"app": "flask-webapp"}}, "spec": {"containers": [{"image": "asadis7171/flask-app:v1", "name": "myapp", "ports": [{"containerPort": 8080}]}]}}, "status": {}}
    kubernetes.io/change-cause: kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v1
      --record=true
  creationTimestamp: "2024-02-23T06:05:16Z"
  generation: 4
  name: myapp
  namespace: default
  resourceVersion: "23437"
  uid: "75afcfc7-372a-4cd1-bfd9-eb3e2944fc01"
spec:
  progressDeadlineSeconds: 600
  replicas: 3
  revisionHistoryLimit: 10
  selector:
```



Not Found

The requested URL was not found on the server. If you entered the URL manually please check your spelling and try again.

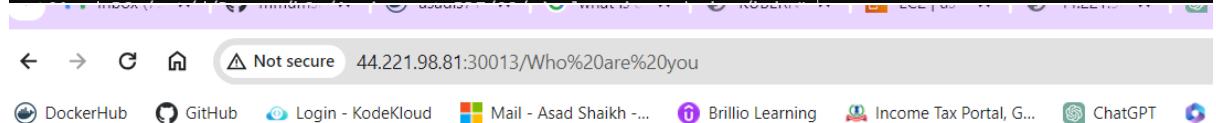
```
kubectl.kubernetes.io/last-applied-configuration: |
  {"apiVersion": "apps/v1", "kind": "Deployment", "metadata": {"annotations": {}, "labels": {"app": "flask-webapp"}, "template": {"metadata": {"labels": {"app": "myapp"}, "ports": [{"containerPort": 8080}]}}}}
  creationTimestamp: "2024-02-23T07:14:44Z"
  generation: 7
  name: myapp
  namespace: default
  resourceVersion: "26414"
  uid: 67b5a67e-1ad8-4a5e-9ca8-29105a593bfc
spec:
  progressDeadlineSeconds: 600
  replicas: 3
  revisionHistoryLimit: 10
  selector:
    matchLabels:
      app: flask-webapp
  strategy:
    rollingUpdate:
      maxSurge: 25%
      maxUnavailable: 25%
    type: RollingUpdate
  template:
    metadata:
      creationTimestamp: null
      labels:
        app: flask-webapp
    spec:
      containers:
        - image: asadis7171/flask_webapp_asad:v2
          imagePullPolicy: IfNotPresent
          name: myapp
          ports:
            - containerPort: 8080
              protocol: TCP
          resources: {}
          terminationMessagePath: /dev/termination-log
          terminationMessagePolicy: File
```



Yes, I am cloudepthix, and You !!!

2. With deployment.yaml file modification.

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# cat deployment.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: myapp
spec:
  replicas: 3
  selector:
    matchLabels:
      app: flask-webapp
  template:
    metadata:
      labels:
        app: flask-webapp
    spec:
      containers:
        - name: myapp
          image: asadis7171/flask_webapp_asad:v1
          ports:
            - containerPort: 8080
```

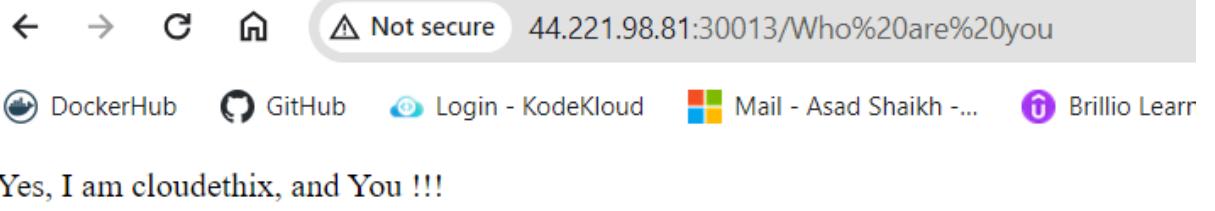


Not Found

The requested URL was not found on the server. If you entered the URL manually please check your spelling and try again.

Now changed to v2

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# vi deployment.yaml
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# cat deployment.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: myapp
spec:
  replicas: 3
  selector:
    matchLabels:
      app: flask-webapp
  template:
    metadata:
      labels:
        app: flask-webapp
    spec:
      containers:
        - name: myapp
          image: asadis7171/flask_webapp_asad:v2
          ports:
            - containerPort: 8080
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kaf deployment.yaml
deployment.apps/myapp configured
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# |
```



- Run the # kubectl rollout command to check status and history.
- Note:- Once above step 1 is done , run # kubectl rollout undo deployment command to rollback the change and then try a second way of rollout.

```
deployment.apps/myapp configmaps
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v2 --record=true
deployment.apps/myapp image updated
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl rollout history deployment myapp
deployment.apps/myapp
REVISION CHANGE-CAUSE
7 <none>
8   kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v2 --record=true
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl rollout undo deployment myapp
deployment.apps/myapp rolled back
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl rollout history deployment myapp
deployment.apps/myapp
REVISION CHANGE-CAUSE
8   kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v2 --record=true
9   <none>
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# |
```



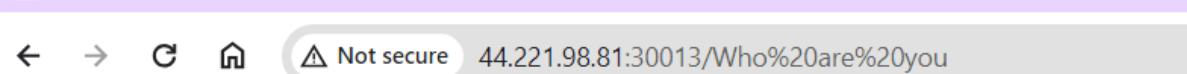
```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v1 --record=true
deployment.apps/myapp image updated
```



```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl rollout history deployment myapp
deployment.apps/myapp
REVISION CHANGE-CAUSE
10  kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v2 --record=true
11  kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v1 --record=true
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl rollout history deployment myapp --revision=10
deployment.apps/myapp with revision #10
Pod Template:
  Labels:      app=flask-webapp
  pod-template-hash=f96bdb89
  Annotations: kubernetes.io/change-cause: kubectl set image deployment/myapp myapp=asadis7171/flask_webapp_asad:v2 --record=true
  Containers:
    myapp:
      Image:      asadis7171/flask_webapp_asad:v2
      Port:       8080/TCP
      Host Port:  8/TCP
      Environment: <none>
      Mounts:     <none>
      Volumes:    <none>
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# |
```



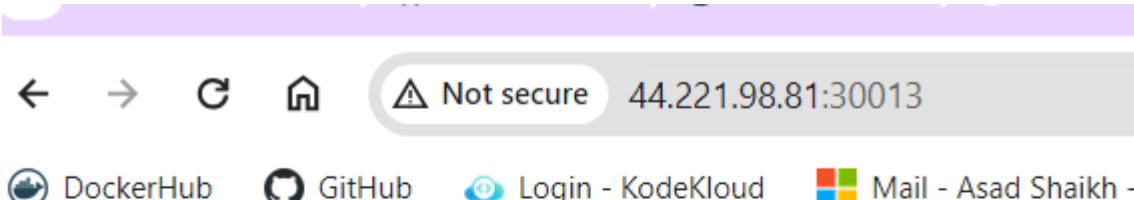
```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# kubectl rollout undo deployment myapp --to-revision=10
deployment.apps/myapp rolled back
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker/kube# |
```



Yes, I am cloudepthix, and You !!!

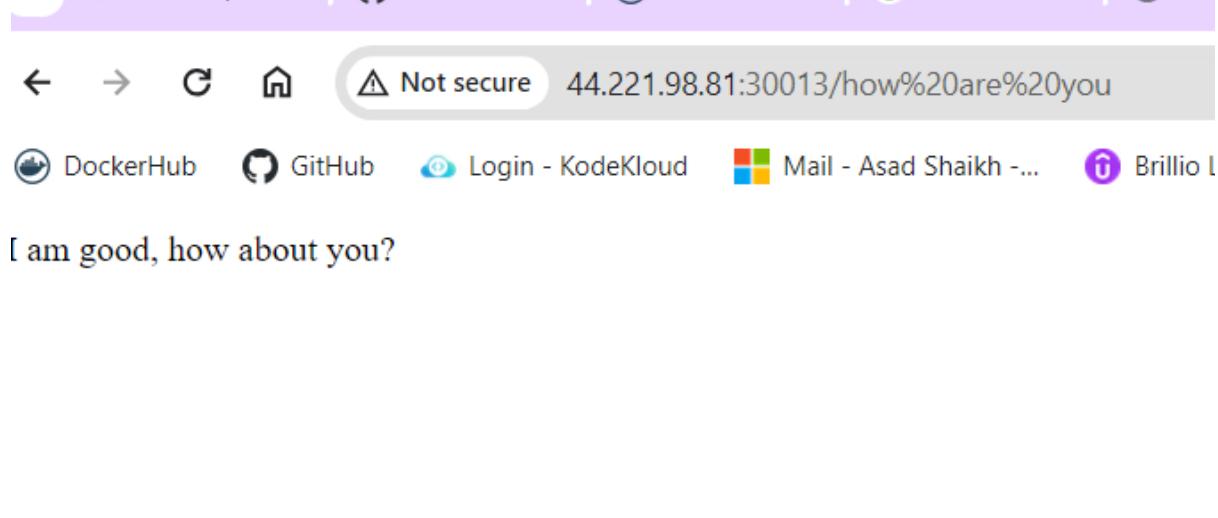
- In the browser run all three routes & notice the changes.

http://master_ip:30011/

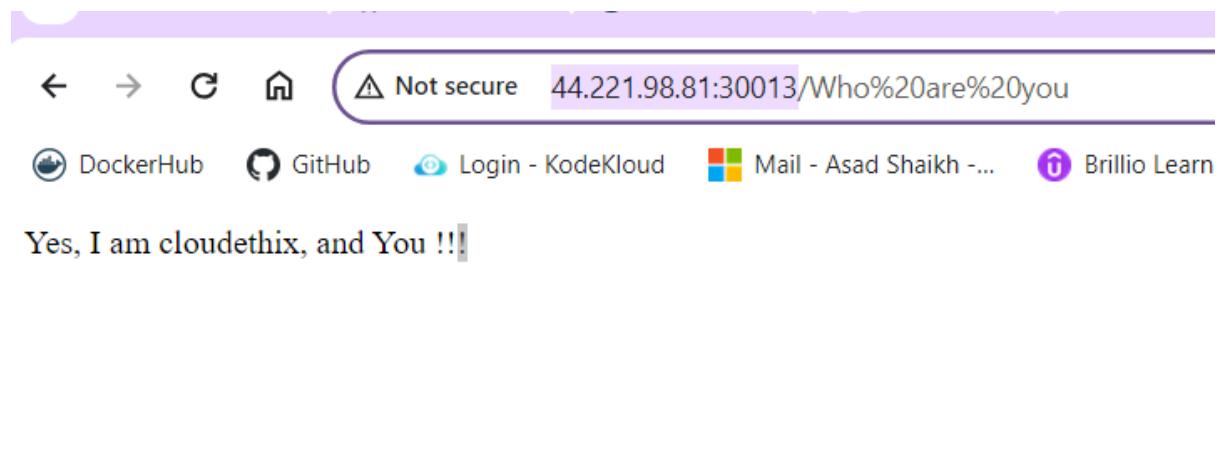


Welcome!

http://master_ip:30011/how are you



http://master_ip:30011/Who are you



- Once done with all above steps , commit all the changes to the remote repository.

```
rebase      reflog      Remote      Repack      Replace      request-pull  reset      Restore
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# git rebase origin/master
Successfully rebased and updated refs/heads/master.
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# ll
total 0
drwxrwxrwx 1 root root 4096 Feb 23 14:53 /
drwxrwxrwx 1 root root 4096 Feb 23 13:12 ./
drwxrwxrwx 1 root root 4096 Feb 23 14:53 .git/
-rw-rw-rwx 1 root root 194 Feb 23 14:53 Dockerfile*
-rw-rw-rwx 1 root root 322 Feb 23 14:53 app.py*
drwxrwxrwx 1 root root 4096 Feb 23 14:53 hub/
drwxrwxrwx 1 root root 4096 Feb 23 14:53 simple-webapp-docker/
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# git push origin master
Enumerating objects: 20, done.
Counting objects: 100% (20/20), done.
Delta compression using up to 8 threads
Compressing objects: 100% (16/16), done.
Writing objects: 100% (19/19), 2.45 KiB | 49.00 KiB/s, done.
Total 19 (delta 4), reused 4 (delta 3), pack-reused 0
remote: Resolving deltas: 100% (4/4), done.
To github.com:asadis7171/web-flask-app.git
  d0256f5..46779fa  master -> master
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q8/simple-webapp-docker# ll
total 0
```

The screenshot shows a GitHub repository page for 'web-flask-app'. The top navigation bar includes links for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. The repository name 'web-flask-app' is displayed with a blue icon, and it is marked as Public. Below the repository name, there are buttons for Pin and Unwatch. The main content area shows a commit history with the following details:

File / Commit	Details	Time Ago
root and root added new files		46779fa · 8 minutes ago
kube	added new files	8 minutes ago
simple-webapp-docker	added new files	1 hour ago
Dockerfile	Update Dockerfile	8 minutes ago
app.py	added new files	8 minutes ago

At the bottom of the commit list, there is a link to 'README' with a file icon. Below the commit list, there is a large button with a book icon and the text 'Add a README'.

- Capture the snap and prepare a well formatted document.

Que 9 →

- Download and install Lens & access your k8s cluster from Lens.
 - Create nginx Pod and Nodeport service. Check the Pod logs from Lens.

The screenshot shows the Kubernetes Dashboard interface. The left sidebar is titled "Workloads" and includes options like Overview, Pods, Deployments, Daemon Sets, Stateful Sets, Replica Sets, Replication Controllers, Jobs, Cron Jobs, Config Maps, Secrets, Resource Quotas, Limit Ranges, Horizontal Pod Autoscalers, Vertical Pod Autoscalers, and Pod Disruption Budgets. The main content area is titled "Pods" and shows a table with 3 items. The table columns are: Name, Namespace, Contain..., CPU, Memory, Restarts, Controlled By, Node, QoS, Age, Status, and more. The rows represent the pods: hpa-demo-deploy, job-test-f7zw7, and nginx-pod. The nginx-pod row is currently selected. Below the table is a terminal window displaying the logs for the nginx-pod, which shows the pod starting up and launching worker processes.

Name	Namespace	Contain...	CPU	Memory	Restarts	Controlled By	Node	QoS	Age	Status
hpa-demo-deploy	default	green	0.000	12.4MiB	0	ReplicaSet	worker-0	Burstable	76m	Running
job-test-f7zw7	default	grey	0.000	0	0	Job	worker-1	BestEffort	36m	Succeeded
nginx-pod	default	green	0.000	0	0		worker-1	BestEffort	28s	Running

```
/docker-entrypoint.sh: Sourcing /docker-entrypoint.d/15-local-resolvers.envsh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2024/02/23 11:30:55 [notice] 1#1: using the "epoll" event method
2024/02/23 11:30:55 [notice] 1#1: nginx/1.25.4
2024/02/23 11:30:55 [notice] 1#1: built by gcc 12.2.0 (Debian 12.2.0-14)
2024/02/23 11:30:55 [notice] 1#1: OS: linux 5.4.0-1103-aws
2024/02/23 11:30:55 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1024:4096
2024/02/23 11:30:55 [notice] 1#1: start worker processes
2024/02/23 11:30:55 [notice] 1#1: start worker process 28
```

- Check the service from lens. Also login to the pod shell using the lens.

The screenshot shows the Kubernetes Lens application interface. On the left is a sidebar with navigation links for Cluster, Applications, Nodes, Workloads (Overview, Pods, Deployments, Daemon Sets, Stateful Sets, Replica Sets, Replication Controllers, Jobs, Cron Jobs), Config, and Network (Services, Endpoints, Ingresses, Ingress Classes, Network Policies, Port Forwarding). The main area has tabs for Services, Endpoints, Ingresses, Ingress Classes, Network Policies, and Port Forwarding. The Services tab is active, displaying a table with 2 items:

Name	Namespace	Type	Cluster IP	Ports	External IP	Selector	Age	Status	⋮
kubernetes	default	ClusterIP	10.96.0.1	443:6443/TCP	-		6h51m	Active	⋮
nodeport	default	NodePort	10.97.38.145	8080:30013/TCP	-	app=flask-w	3h41m	Active	⋮

Below the Services table is a terminal window titled "Pod myapp-fb96bdb89-dg2gs X +". It shows the output of a curl command:

```
* Serving Flask app '/opt/app.py'
* 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://127.0.0.1:8080
* Running on http://10.108.43.23:8080
Press CTRL+C to quit
10.107.205.128 - - [23/Feb/2024 07:40:57] "GET /who%20are%20you HTTP/1.1" 200 -
```

The bottom section shows the Pods table with 3 items:

Name	Namespace	Contai...	CPU	Memory	Restarts	Controlled By	Node	QoS	Age	Status	⋮
hpa-demo-deploy	default	■	0.000	12.4MiB	0	ReplicaSet	worker-0	Burstable	77m	Running	⋮
job-test-f7zw7	default	■	0.000	0	0	Job	worker-1	BestEffort	37m	Succeeded	⋮
nginx-pod	default	■	0.000	3.7MiB	0		worker-1	BestEffort	114s	Running	⋮

Below the pods table is a terminal window titled "Pod: ng X +". It shows the output of a curl command to an Nginx pod:

```
root@nginx-pod:/# curl localhost
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
body { width: 35em; margin: 0 auto; font-family: Tahoma, Verdana, Arial, sans-serif; }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and working. Further configuration is required.</p>
<p>For online documentation and support please refer to</p>
```

- Take snaps and delete the resources that you have just created.
- snap created and deleted pods

Que 10 →

- Create 1 Public Docker Hub registry named cloudethix_configmap_yourname.

The screenshot shows a Docker Hub repository page for 'asadis7171/cloudethix_configmap_asad'. The repository was created 8 minutes ago and has no tags. It includes Docker commands for pushing a new tag, a 'Public View' button, and sections for Tags and Automated Builds.

- Clone below repository on your system.

<https://github.com/zembutsu/docker-sample-nginx.git>

```
xiwxiwixw 1 100t 100t 4096 7cb 22 17.20
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10# git clone https://github.com/zembutsu/docker-sample-nginx.git
Cloning into 'docker-sample-nginx'...
remote: Enumerating objects: 22, done.
remote: Counting objects: 100% (12/12), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 22 (delta 7), reused 6 (delta 6), pack-reused 10
Receiving objects: 100% (22/22), done.
Resolving deltas: 100% (7/7), done.
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10# ll
```

- Initialize a local repository & copy the code from above repo to your local repository in the working branch.

- Once code is copied , build a docker image from docker file and add meaningful tags and push to docker hub repository.

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx# docker image build --no-cache -t asadis7171/cloudethix_configmap_asad:v1 .
[+] Building 25.0s (9/9) FINISHED
--> [internal] load build definition from Dockerfile
--> transferring Dockerfile: 132B
--> [internal] load metadata for docker.io/library/nginx:alpine
--> [auth] library/nginx:pull token for registry-1.docker.io
--> [internal] load .dockercfg
--> transferring context: 2B
--> CACHED [1/3] FROM docker.io/library/nginx:alpine@sha256:6a2f8b28e45c4adea04ec207a251fd4a2df03ddc930f782af51e315ebc76e9a9
--> [internal] load build context
--> transferring context: 469B
--> [2/3] COPY default.conf /etc/nginx/conf.d/
--> [3/3] COPY index.html /usr/share/nginx/html/
--> exporting to image
--> exporting layers
--> writing image sha256:6b8198b04875d13224a78f2eacccbf52b6038d64170bd6fa498fa5256e8c46227
--> naming to docker.io/asadis7171/cloudethix_configmap_asad:v1
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx# ll
```

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx# docker image push asadis7171/cloudeithix_configmap_asad:v1
The push refers to repository [docker.io/asadis7171/cloudeithix_configmap_asad]
30dc88b524c4: Pushed
1fc3e357426f: Pushed
667a247707f0: Mounted from asadis7171/cloudeithix_release_nginx_asad
d8527026595f: Mounted from asadis7171/cloudeithix_release_nginx_asad
2593b08e5428: Mounted from asadis7171/cloudeithix_release_nginx_asad
9909978d630d: Mounted from asadis7171/cloudeithix_release_nginx_asad
c5140fc719dd: Mounted from asadis7171/cloudeithix_release_nginx_asad
3137f8f0c641: Mounted from asadis7171/cloudeithix_release_nginx_asad
718db50a47c0: Mounted from asadis7171/cloudeithix_release_nginx_asad
aedc3bda2944: Mounted from asadis7171/cloudeithix_release_nginx_asad
v1: digest: sha256:5b9e52dfa98c1c0eac2ec5b90f96568cff20642abc3915f587b410e4400cc9c size: 2403
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx# |

```

- Once Images are pushed to Docker hub registries, create a directory named kube. Inside the kube directory create deployment.yaml file with 3 replication , labels app: frontend-webapp , containerPort: 80 and add the image that you have pushed in Docker Hub registry.

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# cat deployment.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: frontend-dep
spec:
  replicas: 3
  selector:
    matchLabels:
      app: frontend-webapp
  template:
    metadata:
      labels:
        app: frontend-webapp
    spec:
      containers:
        - name: myapp
          image: asadis7171/cloudeithix_configmap_asad:v1
          ports:
            - containerPort: 80
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# |

```

- Create one service.yaml file with type nodeport & select frontend-webapp pod with port 80 & targetPort 80 with any nodePort between range 30000-32768.

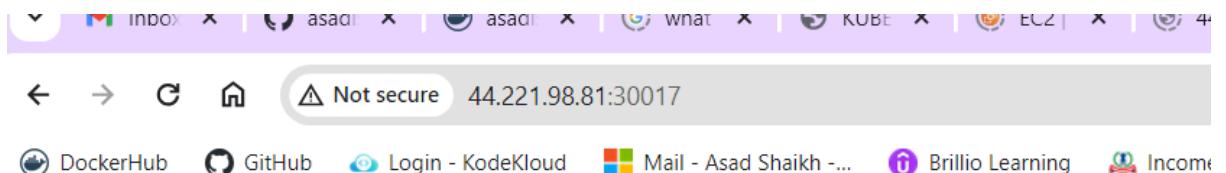
```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# cat service.yaml
apiVersion: v1
kind: Service
metadata:
  name: node-port
spec:
  selector:
    app: frontend-webapp
  ports:
    - port: 80
      targetPort: 80
      nodePort: 30017
    type: NodePort
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# |

```

- Once the service is created try accessing the web page in the browser as

below. Notice the changes & take the snap.



Host: frontend-dep-5998b9cdd8-2q6hp

Version: 1.1

- Now create a configmap.yaml file with below data & delete the deployment that you have created.

```
<html>
<body>
<h1> I am Cludethix Team, Are you ?!! </h1>
Version: 1.1
</body>
</html>
```

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# cat config-map.yaml
apiVersion: v1
kind: ConfigMap
metadata:
  name: my-configmap
data:
  index.html: |
    <html>
    <body>
    <h1> I am Cludethix Team, Are you ?!! </h1>
    Version: 1.1
    </body>
    </html>
```

- Then update the same deployment.yaml file and mount configmap as volume on container using volumeMounts with mountPath /usr/share/nginx/html/

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# cat deployment.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: frontend-dep
spec:
  replicas: 3
  selector:
    matchLabels:
      app: frontend-webapp
  template:
    metadata:
      labels:
        app: frontend-webapp
    spec:
      containers:
        - name: myapp
          image: asadis7171/cloudehix_configmap_asad:v1
          ports:
            - containerPort: 80
          volumeMounts:
            - name: config-volume
              mountPath: /usr/share/nginx/html/
      volumes:
        - name: config-volume
          configMap:
            name: my-configmap
            items:
              - key: index.html
                path: index.html
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# |

```

- Now it's time to create configmap & deployment. Once created , try to access the webpage in the browser & confirm that the index page is the same as we have in configmap.

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# kaf .
configmap/my-configmap created
deployment.apps/frontend-dep created
service/node-port unchanged

```

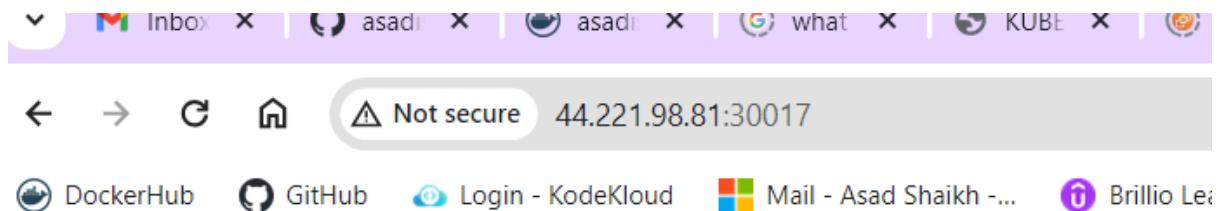
```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# k get po,svc,cm
NAME                               READY   STATUS    RESTARTS   AGE
pod/frontend-dep-54dd8cd94-p9xl2  1/1     Running   0          7m54s
pod/frontend-dep-54dd8cd94-q49xz  1/1     Running   0          7m54s
pod/frontend-dep-54dd8cd94-vbw5m  1/1     Running   0          7m54s

NAME                           TYPE      CLUSTER-IP       EXTERNAL-IP      PORT(S)        AGE
service/hpa-demo-deployment   ClusterIP  10.104.33.234  <none>           80/TCP         134m
service/kubernetes             ClusterIP  10.96.0.1       <none>           443/TCP        9h
service/nginx-service          NodePort   10.99.29.186   <none>           80:30080/TCP   58m
service/node-port              NodePort   10.100.135.237 <none>           80:30017/TCP   18m
service/nodeport               NodePort   10.97.38.145   <none>           8080:30013/TCP 6h27m

NAME          DATA   AGE
configmap/kube-root-ca.crt     1      9h
configmap/my-configmap        1      7m55s
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q10/docker-sample-nginx/kube# |

```



I am Cloudethix Team, Are you ?!!

Version: 1.1

Que 11 →

- Create 1 Public Docker Hub registry named
cloudethix_multicontainer_yourname.

The screenshot shows a Docker Hub page for the repository `asadis7171/cloudethix_multicontainer_asad`. The top navigation bar includes links to GitHub, Login - KodeKloud, Mail - Asad Shaikh ..., Brillio Learning, Income Tax Portal, G..., and ChatGPT. The main navigation menu has tabs for Docker Hub, Explore, **Repositories**, and Organizations, with a search bar. Below the menu, the repository path is shown: `asadis7171 / Repositories / cloudeithix_multicontainer_asad / General`. A sub-menu for the General tab includes Tags, Builds, Collaborators, Webhooks, and Settings. A callout box with an info icon suggests adding a short description for the repository, stating: "Add a short description for this repository. The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search results." The main content area displays the repository name `asadis7171/cloudeithix_multicontainer_asad` with a copy icon, a creation timestamp of "Created less than a minute ago", and a note that "This repository does not have a description" with an edit icon. A "Tags" section below says "This repository is empty. Push some images to it to see them appear here."

- Clone below repository on your system.

<https://github.com/janakiramm/Kubernetes-multi-container-pod.git>

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11# git clone https://github.com/janakiramm/Kubernetes-multi-container-pod.git
Cloning into 'Kubernetes-multi-container-pod'...
remote: Enumerating objects: 51, done.
remote: Total 51 (delta 0), reused 0 (delta 0), pack-reused 51
Receiving objects: 100% (51/51), 88.14 KiB | 1.21 MiB/s, done.
Resolving deltas: 100% (21/21), done.
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11# ll
```

- Initialize a local repository & copy the code from above repo to your local repository in any of your working branches.

- Once code is copied , go to the Build directory and build docker image from docker file and add meaningful tags and push to docker hub repository.

- Now go to the deploy directory and notice the files.

- Here, web-pod-1.yaml file will create the pod with two containers (Multi container). Take a note of labels , name of containers and ports. Also, please make sure you will update the python container image that you have pushed to your docker registry.

- Now, open web-svc.yml file and notice service Type , selectors & targetPort.

Apply the file.

- Now open db-pod.yml & notice the labels , name , Image, containerPort and apply the file.

- Now open the db-svc.yml file and notice service Type . selectors &

`targetPort`. Apply the file.

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# kaf web-pod-1.yml,web-svc.yml,db-pod.yml,db-svc.yml
pod/web1 created
service/web created
pod/mysql created
service/mysql created
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# kcp
```

- Once above files are applied , Check that the Pods and Services are created using command line or lens.

The screenshot shows two panels of the Kubernetes dashboard. The top panel is titled 'Pods' and lists two items: 'mysql' and 'web1'. The bottom panel is titled 'Services' and lists three items: 'kubernetes', 'mysql', and 'web'. Both panels have a sidebar on the left with various navigation options like Overview, Pods, Deployments, etc.

Name	Namespace	Type	Cluster IP	Ports	External IP	Selector	Age	Status
mysql	default	ClusterIP	10.96.0.1	443:6443/TCP	-	-	11h	Active
web	default	NodePort	10.101.234.20	80:30447/TCP	-	name=web	5m24s	Active

- Now , from the command line run below urls & notice the changes.

```
# curl http://$NODE_IP:$NODE_PORT/init
```

Initialize the database with sample schema

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl http://$NODE_IP:$NODE_PORT/init
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# export NODE_IP=44.221.98.81
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# export NODE_PORT=30447
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# echo $NODE_IP
44.221.98.81
```

- Now it's time to Insert some sample data. Make sure you will use correct

\$NODE_IP:\$NODE_PORT

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl http://$NODE_IP:$NODE_PORT/init
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl -i -H "Content-Type: application/json" -X POST -d '[{"uid": "1", "user": "John Doe"}]' http://$NODE_IP:$NODE_PORT/users/add
HTTP/1.0 200 OK
Content-Type: application/json
Content-Length: 5
Server: Werkzeug/1.0.1 Python/2.7.15
Date: Fri, 23 Feb 2024 14:33:11 GMT

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl -i -H "Content-Type: application/json" -X POST -d '[{"uid": "2", "user": "Jane Doe"}]' http://$NODE_IP:$NODE_PORT/users/add
HTTP/1.0 200 OK
Content-Type: application/json
Content-Length: 5
Server: Werkzeug/1.0.1 Python/2.7.15
Date: Fri, 23 Feb 2024 14:33:38 GMT

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl -i -H "Content-Type: application/json" -X POST -d '[{"uid": "3", "user": "Bill Collins"}]' http://$NODE_IP:$NODE_PORT/users/add
HTTP/1.0 200 OK
Content-Type: application/json
Content-Length: 5
Server: Werkzeug/1.0.1 Python/2.7.15
Date: Fri, 23 Feb 2024 14:33:59 GMT
```

```
# curl -i -H "Content-Type: application/json" -X POST -d '{"uid": "1",
"user":"John Doe"}' http://$NODE_IP:$NODE_PORT/users/add

# curl -i -H "Content-Type: application/json" -X POST -d '{"uid": "2",
"user":"Jane Doe"}' http://$NODE_IP:$NODE_PORT/users/add

# curl -i -H "Content-Type: application/json" -X POST -d '{"uid": "3",
"user":"Bill Colls"}' http://$NODE_IP:$NODE_PORT/users/add

# curl -i -H "Content-Type: application/json" -X POST -d '{"uid": "4",
"user":"Mike Taylor"}' http://$NODE_IP:$NODE_PORT/users/add
```

- Now access the data that we have added to database using below command.

```
# curl http://\$NODE\_IP:\$NODE\_PORT/users/1
```

```
Date: Fri, 23 Feb 2024 14:33:59 GMT
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl -i -H "Content-Type: application/json" -X POST -d '{"uid": "4",
"user":"Mike Taylor"}' http://$NODE_IP:$NODE_PORT/users/add
HTTP/1.0 200 OK
Content-type: application/json
Content-Length: 5
Server: Werkzeug/1.0.1 Python/2.7.15
Date: Fri, 23 Feb 2024 14:34:10 GMT
Addedroot@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl http://$NODE_IP:$NODE_PORT/users/1
John Doe
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl -w "\n" http://$NODE_IP:$NODE_PORT/users/1
John Doe
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl -w "\n" http://$NODE_IP:$NODE_PORT/users/1
John Doe
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl -w "\n" http://$NODE_IP:$NODE_PORT/users/1
John Doe(c)
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# |
```

- The second time you access the data, it appends '(c)' indicating that it is pulled from the Redis cache.

```
John Doe
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# curl -w "\n" http://$NODE_IP:$NODE_PORT/users/1
John Doe(c)
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q11/Kubernetes-multi-container-pod/Deploy# |
```

- Also, try to access mysql shell i.e db pod & run select * from the users table.
check app.py for DB related information.

```
PS C:\Users\Asad> kubectl exec -i -t -n default mysql -c mysql -- sh -c "clear; (bash || ash || sh)"
root@mysql:/#
root@mysql:/# m
root@mysql:/# my
root@mysql:/# mys
root@mysql:/# mysq
root@mysql:/# mysql
root@mysql:/# mysql1
bash: mysql1: command not found

root@mysql:/# ll
bash: ll: command not found
root@mysql:/# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.7.25 MySQL Community Server (GPL)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database      |
+-----+
| information_schema |
| USERDB        |
| mysql          |
| performance_schema |
| sys            |
+-----+
5 rows in set (0.00 sec)

mysql> use USERDB;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
```

```

mysql> use USERDB;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+-----+
| Tables_in_USERDB |
+-----+
| users            |
+-----+
1 row in set (0.01 sec)

mysql> select * from users limit 10;
+----+-----+
| ID | USER      |
+----+-----+
| 1  | John Doe  |
| 2  | Jane Doe   |
| 3  | Bill Collins |
| 4  | Mike Taylor |
+----+-----+
4 rows in set (0.00 sec)

```

- Prepare proper documentation in brief & write start to end flow. Refer below link if you face any issues.

<https://github.com/janakiramm/Kubernetes-multi-container-pod>

Que 12 →

- Create 1 Public Docker Hub registry named cloudeithix_Initcontainer_yourname.

asadis7171 / [Repositories](#) / [cloudethix_initcontainer_asad](#) / [General](#)

General Tags Builds Collaborators Webhooks Settings

i Add a short description for this repository
The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search results.

asadis7171/cloudethix_initcontainer_asad

Created less than a minute ago

This repository does not have a description 

Tags

This repository is empty. Push some images to it to see them appear here.

- Clone below repository on your system.

<https://github.com/janakiramm/simpleapp.git>

```
drwxrwxrwx 1 root root 4096 Feb 21 19:20 ./
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12# git clone https://github.com/janakiramm/simpleapp.git
Cloning into 'simpleapp'...
remote: Enumerating objects: 47, done.
remote: Total 47 (delta 0), reused 0 (delta 0), pack-reused 47
Receiving objects: 100% (47/47), 8.20 KiB | 839.00 KiB/s, done.
Resolving deltas: 100% (9/9), done.
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12# ll
total 0
drwxrwxrwx 1 root root 4096 Feb 23 20:29 ./
drwxrwxrwx 1 root root 4096 Feb 21 19:20 ../
drwxrwxrwx 1 root root 4096 Feb 23 20:29 simpleapp/
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12# cd simpleapp/
```

- Initialize a local repository & copy the code from above repo to your local repository in any of your working branch.

- Once code is copied , go to the Build directory and build docker image from docker file and add meaningful tags and push to docker hub repository.

```

Start a build
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12/simpleapp# docker image push asadis7171/cloudeithix_initcontainer_asad:v1
The push refers to repository [docker.io/asadis7171/cloudeithix_initcontainer_asad]
4d3616e4b0fb: Pushed
8736394446ff: Pushed
f205d290cd76: Mounted from asadis7171/web
2b28485849ea: Mounted from asadis7171/web
9f21a390e3f6: Mounted from asadis7171/web
06536efc503a: Mounted from asadis7171/web
84e0c9ef07d7: Mounted from asadis7171/web
83bdf27d9eaa: Mounted from asadis7171/web
fb1bd2fc5282: Mounted from asadis7171/web
v1: digest: sha256:6efa9690a09cd8dea3b4a26f3919043d9b5752971b291376856ac8fe545eca85 size: 2192

```

The screenshot shows the Docker Hub interface for the repository `asadis7171/cloudeithix_initcontainer_asad`. The General tab is active. A callout box highlights the Docker command `docker push asadis7171/cloudeithix_initcontainer_asad:v1`.

Tag	OS	Type	Pulled	Pushed
v1		Image	---	8 minutes ago

[See all](#)

Automated Build

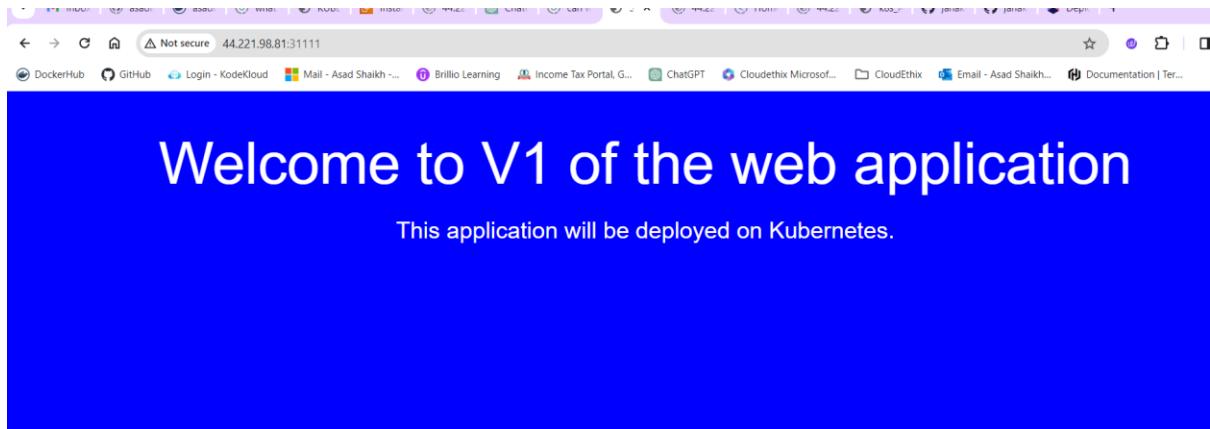
Manually pushin
Bitbucket to auto
code is updated,

Available with Pr
[automated build](#)

[Upgrade](#)

- Once Images are pushed to Docker hub registries, create a directory named kube. Inside the kube directory create deployment.yaml file with 3 replication , label app: simpleapp-webapp , containerPort: 80 and add the image that you have pushed in Docker Hub registry.

- Create one service.yaml file with type nodeport & select simpleapp-webapp pod with port 80 & targetPort 80 with any nodePort between range 30000-32768.
- Open the webpage in the browser and notice the changes and capture the snap.



- Then delete the deployment that you have just created.

```
simpleapp-dep 3/3 3 3 84s
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12/simpleapp/kube# kdd simpleapp-dep
deployment.apps "simpleapp-dep" deleted
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12/simpleapp/kube# |
```

- Update the deployment.yaml file and add volumeMounts with mountPath

/usr/share/nginx/html from emptyDir: {} volume.

- Once above changes are added, add initContainers block with below

parameters. Also add volumeMounts for Init Container with mountPath

"/work-dir" from emptyDir: {} volume.

initContainers:

- name: install

image: busybox:1.28

command:

- wget

- "-O"

- "/work-dir/index.html"

- http://info.cern.ch

volumeMounts:

- name: workdir

mountPath: "/work-dir"

- Add volumes with emptyDir: {} in deployment.yaml file.

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12/simpleapp/kube# cat deployment.yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: simpleapp-dep
spec:
  selector:
    matchLabels:
      app: simpleapp-webapp
  template:
    metadata:
      labels:
        app: simpleapp-webapp
    spec:
      initContainers:
        - name: install
          image: busybox:1.28
          command:
            - wget
            - "-O"
            - "/work-dir/index.html"
          ports:
            - containerPort: 80
          volumeMounts:
            - name: workdir
              mountPath: "/work-dir"
      containers:
        - name: simple-container
          image: asadis7171/cloudeithix_initcontainer_asad:v3
          ports:
            - containerPort: 80
          volumeMounts:
            - name: workdir
              mountPath: /usr/share/nginx/html
      volumes:
        - name: workdir
          emptyDir: {}

```

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12/simpleapp/kube# k get
NAME           READY   STATUS    RESTARTS   AGE
simpleapp-dep-88b9f4c75-mjrhw   1/1     Running   0          10m
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12/simpleapp/kube# k logs simpleapp-dep-88b9f4c75-mjrhw
Defaulted container "simple-container" out of: simple-container, install (init)
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Sourcing /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2024/02/24 07:42:54 [notice] 1#1: using the "epoll" event method
2024/02/24 07:42:54 [notice] 1#1: nginx/1.25.3
2024/02/24 07:42:54 [notice] 1#1: built by gcc 12.2.0 (Debian 12.2.0-14)
2024/02/24 07:42:54 [notice] 1#1: OS: Linux 5.4.0-1183-aws
2024/02/24 07:42:54 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1024:4096
2024/02/24 07:42:54 [notice] 1#1: start worker processes 29
2024/02/24 07:42:54 [notice] 1#1: start worker process 29
10.107.295.120 - [24/Feb/2024:07:43:50 +0000] "GET / HTTP/1.1" 200 646 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/122.0.0.0 Safari/537.36"
10.108.43.0 - - [24/Feb/2024:07:52:48 +0000] "GET / HTTP/1.1" 200 646 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/122.0.0.0 Safari/537.36"
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q12/simpleapp/kube#

```

- Once the deployment.yaml file is ready, create the deployment & access the page in the browser and notice the changes.

Not secure 54.87.176.4:31111

DockerHub GitHub Login - KodeKloud Mail - Asad Shaikh ... Brillio Learning Income Tax

http://info.cern.ch - home of the first website

From here you can:

- [Browse the first website](#)
- [Browse the first website using the line-mode browser simulator](#)
- [Learn about the birth of the web](#)
- [Learn about CERN, the physics laboratory where the web was born](#)

- Prepare a well formatted document and write your understanding step by step.

Que 13 →

- Create 1 Public Docker Hub registry named cloudethix_hpa_yourname.

docker hub Explore Repositories Organizations Search Doc

asadis7171 / [Repositories](#) / [cloudethix_hpa_asad](#) / [General](#)

General Tags Builds Collaborators Webhooks Settings

asadis7171/cloudethix_hpa_asad

Created less than a minute ago

This repository does not have a description

Tags

This repository is empty. Push some images to it to see them appear here.

- Clone below repository on your system.

<https://github.com/vivekamin/kubernetes-hpa-example.git>

```
drwxrwxrwx 1 root root 4096 Feb 21 19:20 /
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14# git clone https://github.com/vivekamin/kubernetes-hpa-example.git
Cloning into 'kubernetes-hpa-example'...
remote: Enumerating objects: 26, done.
remote: Total 26 (delta 0), reused 0 (delta 0), pack-reused 26
Receiving objects: 100% (26/26), done.
Resolving deltas: 100% (9/9), done.
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14# ll
total 0
```

- Initialize a local repository & copy the code from above repo to your local repository in any of your working branch.
- Once code is copied , build a docker image from the docker file and add meaningful tags and push to the docker hub repository.

The screenshot shows a Docker Hub repository page for the user 'asadis7171'. The repository name is 'cloudethix_hpa_asad'. The page includes a general description field, a 'Tags' section showing one tag ('v1'), and a 'See all' link.

Tag	OS	Type	Pulled	Pushed
v1		Image	an hour ago	an hour ago

- Once the image is pushed, go to k8s directory and update deployment.yaml file with image name from your repo. And then create it.

```
twxixwxx 1 root root 210 Feb 24 10:05 service.yml*
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14/kubernetes-hpa-example/k8s# cat deployment.yml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: node-example
spec:
  replicas: 1
  selector:
    matchLabels:
      app: node-example
  template:
    metadata:
      labels:
        app: node-example
    spec:
      containers:
        - name: node-example
          image: asadis7171/cloudeithix_hpa_asad:v1
          imagePullPolicy: Always
          ports:
            - containerPort: 3000
          resources:
            limits:
              cpu: "0.5"
            requests:
              cpu: "0.25"
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14/kubernetes-hpa-example/k8s# |
```

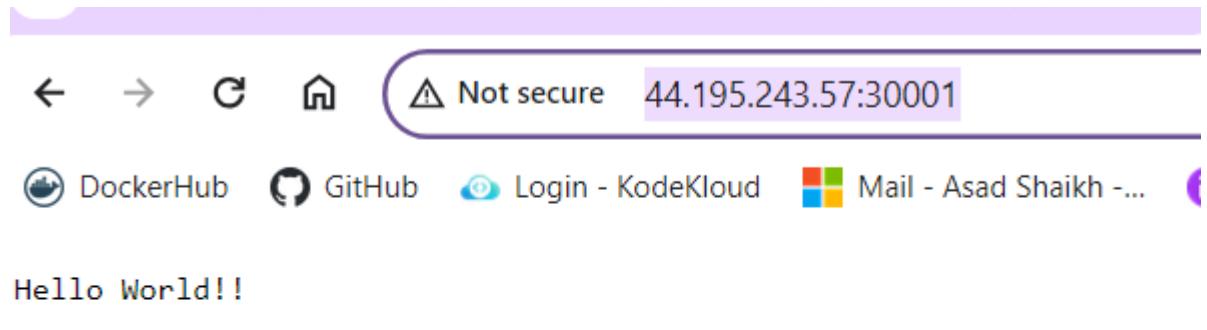
- Open service.yml and change the type to nodePort and apply the same.

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14/kubernetes-hpa-example/k8s# cat service.yml
apiVersion: v1
kind: Service
metadata:
  name: node-example
  labels:
    app: node-example
spec:
  selector:
    app: node-example
  ports:
    - port: 3000
      protocol: TCP
      nodePort: 30001
      type: NodePort
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14/kubernetes-hpa-example/k8s# |
```

- Open the HPA.yaml file, notice it and then apply the same.

```
$ cat hpa.yml
apiVersion: autoscaling/v1
kind: HorizontalPodAutoscaler
metadata:
  annotations:
    name: node-example
    namespace: default
spec:
  maxReplicas: 10
  minReplicas: 2
  scaleTargetRef:
    apiVersion: apps/v1
    kind: Deployment
    name: node-example
  targetCPUUtilizationPercentage: 50
```

- Open the browser, and access the webpage.



Created metric server for collecting the metrics

NAME	READY	STATUS	RESTARTS	AGE
calico-kube-controllers-658d97c59c-zdn4d	1/1	Running	0	6h34m
calico-node-lztfmf	1/1	Running	0	6h34m
calico-node-xdtbz	1/1	Running	0	6h34m
calico-node-z2hbt	1/1	Running	0	6h34m
coredns-5dd5756b68-57cmq	1/1	Running	0	6h41m
coredns-5dd5756b68-94qjw	1/1	Running	0	6h41m
etcd-master	1/1	Running	0	6h41m
kube-apiserver-master	1/1	Running	0	6h41m
kube-controller-manager-master	1/1	Running	0	6h41m
kube-proxy-4ljs4	1/1	Running	0	6h41m
kube-proxy-fvlx7	1/1	Running	0	6h41m
kube-proxy-g6kxq	1/1	Running	0	6h41m
kube-scheduler-master	1/1	Running	0	6h41m
metrics-server-774d4498db-jp2k9	1/1	Running	0	63m

Its started collecting metrics

- Now it's time to test the HPA working with the below command.

```
# kubectl run -i --tty load-generator --rm --image=busybox
--restart=Never -- /bin/sh -c "while sleep 0.01; do wget -q -O http://NODE_PORT_SERVICE_NAME;
done"
```

```
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14/kubernetes-hpa-example/k8s# ^C
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14/kubernetes-hpa-example/k8s# kubectl run -i --tty load-generator --rm --image=busybox --restart
=Never -- /bin/sh -c "while sleep 0.01; do wget -q -O http://44.195.243.57:30001; done"
If you don't see a command prompt, try pressing enter.
Hello World!!
Hello World!!
Hello World!!
Hello World!!
```

- Check the HPA from kubectl command and also check if the deployment is scaling up.

```
$ k get all
NAME                 READY   STATUS    RESTARTS   AGE
pod/load-generator   1/1     Running   0          26m
pod/node-example-c57dbdfc-8hvvtv 1/1     Running   0          27m
pod/node-example-c57dbdfc-d4w2n   1/1     Running   0          107m
pod/node-example-c57dbdfc-fp986   1/1     Running   0          27m
pod/node-example-c57dbdfc-v5gsx   1/1     Running   0          27m

NAME            TYPE        CLUSTER-IP      EXTERNAL-IP      PORT(S)        AGE
service/kubernetes  ClusterIP   10.96.0.1      <none>           443/TCP       6h37m
service/my-service NodePort    10.97.33.212  <none>           80:31111/TCP  5h1m
service/node-example NodePort    10.110.101.48  <none>           3000:30001/TCP 127m

NAME                  READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/node-example  4/4     4           4           107m

NAME                DESIRED   CURRENT   READY   AGE
replicaset.apps/node-example-c57dbdfc  4        4         4        107m

NAME                                REFERENCE          TARGETS  MINPODS  MAXPODS  REPLICAS   AGE
horizontalpodautoscaler.autoscaling/node-example  Deployment/node-example  3%/1%    1        4         4        113m
```

Config Maps	Secrets	Resource Quotas	Limit Ranges	Horizontal Pod Autoscalers	Vertical Pod Autoscalers	Pod Disruption Budgets	Priority Classes
Horizontal Pod Autoscalers				Vertical Pod Autoscalers			
Horizontal Pod Autoscalers				Vertical Pod Autoscalers			
				1 item			
					Namespace: default		
Name	Namespace	Metrics	Min Pods	Max Pods	Replicas	Age	Status
node-example	default	3% / 1%	1	4	4	114m	AbleToScale ScalingA

Overview	Pods	Deployments	Daemon Sets	Stateful Sets	Replica Sets	Replication Controllers	Jobs	Cron Jobs
Pods								Namespace: default
5 items								
Name	Namespace	Contai...	CPU	Memory	Restarts	Controlled By	Node	QoS
load-generator	default	■	0.077	836.0KiB	0		worker-0	BestEffort
node-example-c5	default	■	0.007	27.2MiB	0	ReplicaSet	worker-0	Burstable
node-example-c5	default	■	0.006	27.6MiB	0	ReplicaSet	worker-1	Burstable
node-example-c5	default	■	0.007	27.7MiB	0	ReplicaSet	worker-1	Burstable
node-example-c5	default	■	0.007	27.3MiB	0	ReplicaSet	worker-1	Burstable

- Take the snap , prepare a well formatted doc and write your understanding.

Que 14 →

- Create 1 Public Docker Hub registry named cloudethix_cronjob_yourname.
- Initialize a local repository & copy below code (three files) to your local repository in any of your working branch.
- Once code is copied, build the docker image from Dockerfile , add meaningful tags and then push the docker image to Docker hub registry.
- Now update the pythoncronjob.yml file to change the image name that you have just pushed to docker hub registry.

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14
$ cat pythoncronjob.yml && echo "----" && cat Dockerfile && echo "----" && cat helloworld.py && echo "----"
apiVersion: batch/v1
kind: CronJob
metadata:
  name: python-helloworld
spec:
  schedule: "*/1 * * * *"
  jobTemplate:
    spec:
      template:
        spec:
          containers:
            - name: python-helloworld
              image: asadis7171/cloudeithix_cronjob_asad:v1
              command: ["/app/helloworld.py"]
            restartPolicy: OnFailure
        ---  

FROM python:3.7-alpine
#add user group and ass user to that group
RUN addgroup -S appgroup && adduser -S appuser -G appgroup
#creates work dir
WORKDIR /app
#copy python script to the container folder app
COPY helloworld.py /app/helloworld.py
RUN chmod +x /app/helloworld.py
#user is appuser
USER appuser
ENTRYPOINT ["python", "/app/helloworld.py"]

---  

#!/usr/local/bin/python3
import datetime
x = datetime.datetime.now()
print("Welcome to the Cloudeithix World")
print("Today is")
print(x)
---

```

- Now create a cron job using pythoncronjob.yml file. Check with kubectl command if the cron job is created.

```

root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14 (master)
$ k get cronjobs
NAME           SCHEDULE      SUSPEND   ACTIVE   LAST SCHEDULE   AGE
python-helloworld  */1 * * * *  False      0        23s          103s
root@Asad-PC:/mnt/d/Devops/k8s/Assignment_PDF/Q14 (master)

```

- Check the Job name which is created by cronjob from command line or lens.

Cron Jobs								Namespace: default	<input type="button" value="Q"/>	<input type="button" value="D"/>
<input type="checkbox"/>	Name	<input type="checkbox"/>	Namespace	Schedule	Suspend	Active	Last schedule	Age	<input type="button" value=":"/>	
<input type="checkbox"/>	python-helloworld	<input type="checkbox"/>	default	*/1 * * * *	false	0	4s	2m28s	<input type="button" value=":"/>	

- Then check the pod logs which are created by the job and capture the output.

Name	Namespace	Contai...	CPU	Memory	Restarts	Controlled By	Node	QoS	Age	Status
node-example-c5	default	0.000	28.1MiB	0	0	ReplicaSet	worker-0	Burstable	99m	Running
python-helloworld	default	0.000	0	0	0	Job	worker-1	BestEffort	2m47s	Succeeded
python-helloworld	default	0.000	0	0	0	Job	worker-1	BestEffort	107s	Succeeded
python-helloworld	default	0.000	0	0	0	Job	worker-1	BestEffort	47s	Succeeded

- Prepare well formatted documents and write your understanding.

```
# vim helloworld.py
```

```
#!/usr/local/bin/python3
```

```
import datetime
```

```
x = datetime.datetime.now()
```

```
print("Welcome to the Cloudethix World")
```

```
print("Today is")
```

```
print(x)
```

```
# vim Dockerfile
```

```
FROM python:3.7-alpine
```

```
#add user group and ass user to that group
```

```
RUN addgroup -S appgroup && adduser -S appuser -G appgroup
```

```
#creates work dir
```

```
WORKDIR /app
```

```
#copy python script to the container folder app
```

```
COPY helloworld.py /app/helloworld.py
```

```
RUN chmod +x /app/helloworld.py
```

```
#user is appuser
```

```
USER appuser
```

```
ENTRYPOINT ["python", "/app/helloworld.py"]
```

```
# vim pythoncronjob.yml
```

```
apiVersion: batch/v1
kind: CronJob
metadata:
  name: python-helloworld
spec:
  schedule: "*/1 * * * *"
  jobTemplate:
    spec:
      template:
        spec:
          containers:
            - name: python-helloworld
              image: python-helloworld
              command: [/app/helloworld.py]
          restartPolicy: OnFailure
```

THANKS

ASAD SHAIKH