Deploying a Web Server Using Docker and Kubernetes on Ubuntu

1. Create a Dockerfile:

web-app-project > Dockerfile

```
1  FROM nginx:latest
2  COPY index.html /usr/share/nginx/html/index.html
```

2. Create an index.html file:

- Index.html code

web-app-project > index.html > ...

```
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <meta name="viewport" content="width=device-width, initial-scale=1.0">
6      <title>DevOps Hub</title>
7      <style>
8          body {
9              font-family: Arial, sans-serif;
10             margin: 0;
11             padding: 0;
12             background-color: #f4f4f4;
13             color: #333;
14         }
15         header {
16             background: #333;
17             color: white;
18             text-align: center;
19             padding: 20px;
20             font-size: 24px;
21         }
22         nav {
23             text-align: center;
24             padding: 15px;
25             background: #008080;
26         }
27         nav a {
```

3. Build the Docker image:

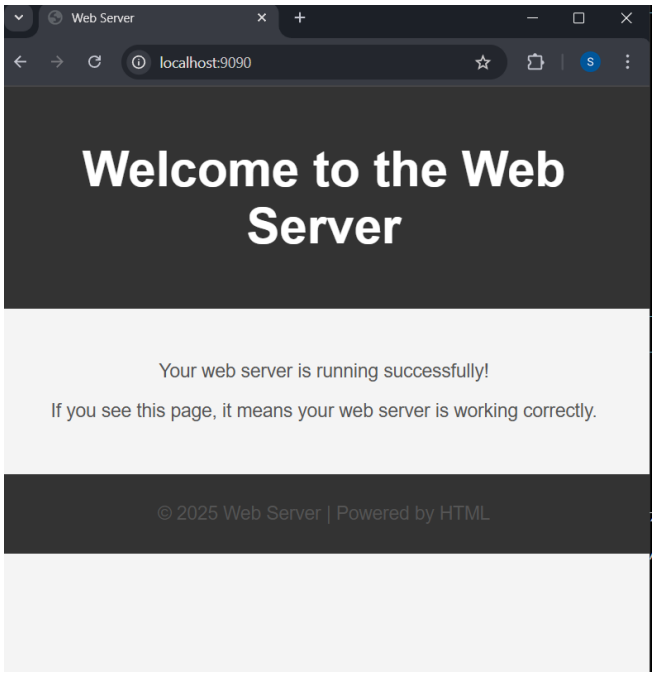
```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Docker\web-app-project> docker build -t web-server-image .
[+] Building 20.5s (8/8) FINISHED                          docker:desktop-linux
 => [internal] load build definition from Dockerfile                       0.1s
 => => transferring dockerfile: 104B                                       0.0s
 => [internal] load metadata for docker.io/library/nginx:latest            3.9s
 => [auth] library/nginx:pull token for registry-1.docker.io               0.0s
 => [internal] load .dockerignore                                          0.1s
 => => transferring context: 2B                                            0.0s
 => [internal] load build context                                          0.1s
 => => transferring context: 1.27kB                                        0.0s
```

```
PS C:\Docker\web-app-project> docker run -d -p 9090:80 web-server-image
b246ce16eeee542126c83e8384f94cfda488ef1a5ba29669ee2cd5a0f2711759
```

3.1 Access on web browser:

- http://localhost:9090



4. Push the Docker Image to Docker Hub:

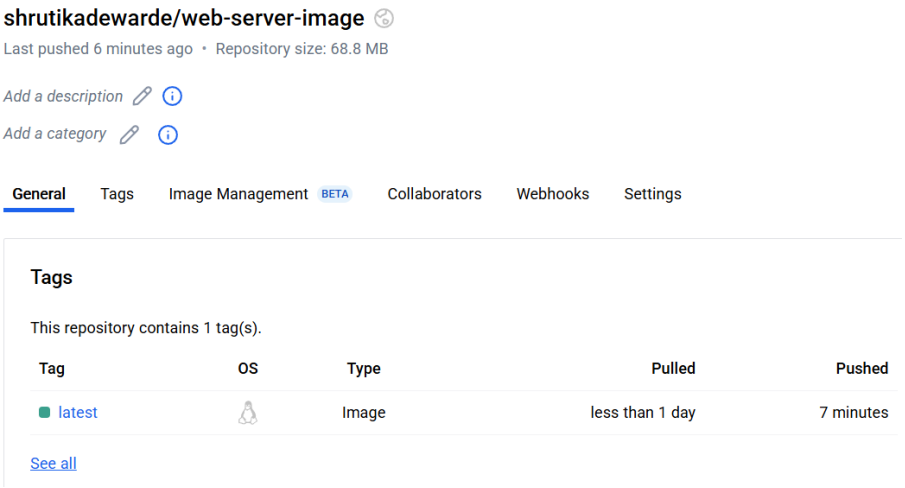
4.1 Tag the docker image & login to dockerhub-

```
PS C:\Docker\web-app-project> docker tag web-server-image shrutikadewarde/web-server-image:latest
PS C:\Docker\web-app-project> docker login
Authenticating with existing credentials...
Login Succeeded
```

4.2

```
PS C:\Docker\web-app-project> docker push shrutikadewarde/web-server-image:latest
The push refers to repository [docker.io/shrutikadewarde/web-server-image]
3468150c9614: Pushed
```

4.3 Verify the Image on Docker Hub-

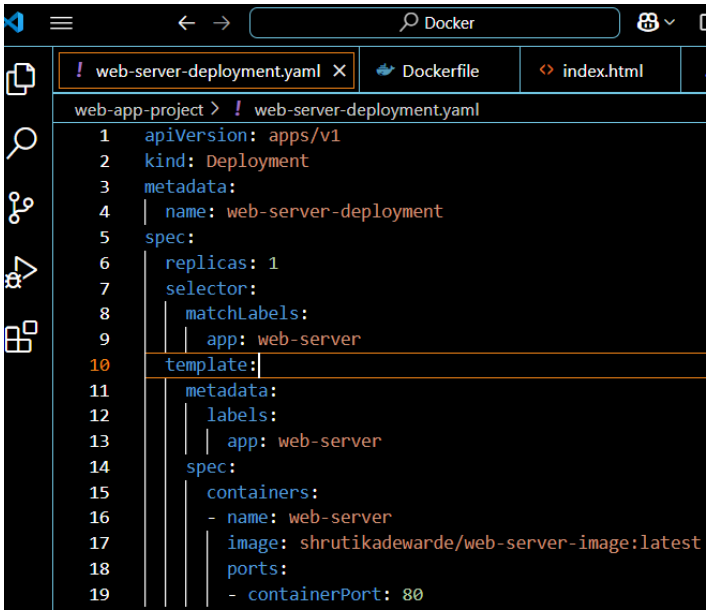


5. Set Up a Kubernetes Cluster

-minikube start

Deploy the Web Server on Kubernetes

5.1 Create a Kubernetes Deployment Configuration (web-server-deployment.yaml):

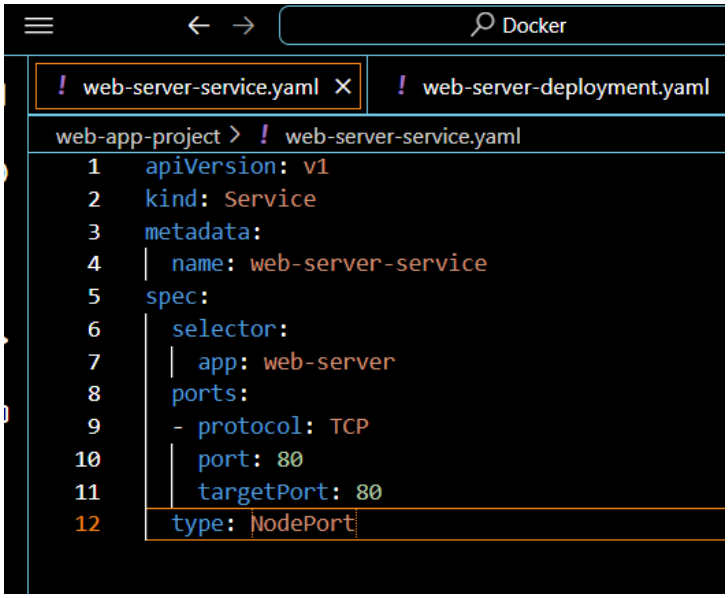


5.2 Apply and verify the Deployment Configuration:

- kubectl apply -f web-server-deployment.yaml

- kubectl get deployments

5.3 Create a Kubernetes Service configuration:



Apply and verify:

6 Access the Web Server Application:

6.1 Retrieve the Node port:

- kubectl get service web-server-service

6.2 Access the application:

- Minikube service web-server-service

```
PS C:\Docker\web-app-project> kubectl get  service web-server-service
NAME                 TYPE       CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
web-server-service   NodePort   10.102.2.180    <none>        80:32237/TCP   2m56s
PS C:\Docker\web-app-project> minikube service web-server-service
|-----------|--------------------|-------------|---------------------------|
| NAMESPACE |        NAME        | TARGET PORT |            URL            |
|-----------|--------------------|-------------|---------------------------|
| default   | web-server-service |          80 | http://192.168.49.2:32237 |
|-----------|--------------------|-------------|---------------------------|
🏃  Starting tunnel for service web-server-service.
|-----------|--------------------|-------------|------------------------|
| NAMESPACE |        NAME        | TARGET PORT |          URL           |
|-----------|--------------------|-------------|------------------------|
| default   | web-server-service |             | http://127.0.0.1:53058 |
|-----------|--------------------|-------------|------------------------|
```

7 Cleaning up resources:

-kubectl delete -f web-server-service.yaml

kubectl delete -f web-server-deployment.yaml