APPLICATION CONTAINERIZATION AND ORCHESTRATION

Experiment 1

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Lab Exercise 1

Performing CRUD Operation on Containers

Objective: Performing CRUD Operation on Containers

Tools required: Docker Configuration

Pre-requisites: Ubuntu Configuration, Docker

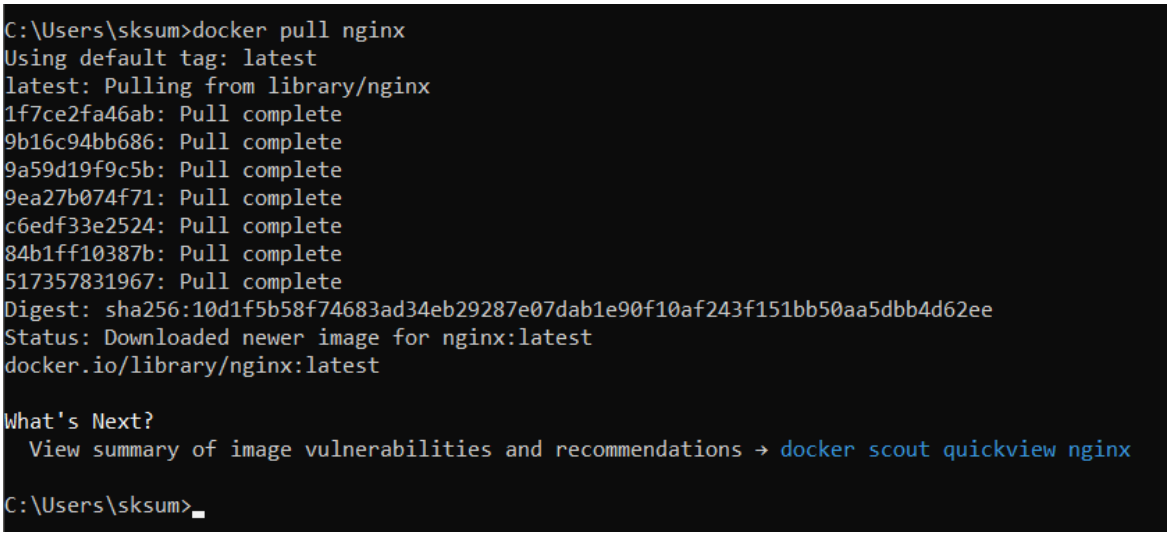
Steps to be followed:

1. Pulling a Docker image
2. Creating a new container
3. Stopping the container
4. Listing all the containers
5. Deleting the container
6. Removing the image

Step 1: Pulling a Docker image

1.1 Open the terminal and pull an image using the command:

sudo docker pull nginx



1.2 List all the docker images to check the newly pulled *nginx* image:

sudo docker images

```
C:\Users\sksum>docker images
REPOSITORY                TAG       IMAGE ID       CREATED        SIZE
nginx                     latest    a6bd71f48f68   12 days ago    187MB
nginx                     <none>    61395b4c586d   2 months ago   187MB
docker/welcome-to-docker  latest    912b66cfd46e   5 months ago   13.4MB
```

Step 2: Creating a new container

2.1 Create a new container from the *nginx* image:

sudo docker run -dt -p 81:81 nginx

```
C:\Users\sksum>docker run -dt -p 81:81 nginx
e5fa1bae057cdc2ae8ef0629ba2ca1520a80232f85b8f285bd2fab0b5555324a

C:\Users\sksum>
```

2.2 List all the running containers to check the newly created container. You can find various details like port of container, it's time of creation and ID.

sudo docker ps

```
C:\Users\sksum>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS                          NAMES
e5fa1bae057c   nginx     "/docker-entrypoint.…"   36 seconds ago   Up 34 seconds   80/tcp, 0.0.0.0:81->81/tcp   lucid_colden

C:\Users\sksum>
```

Step 3: Stopping the container

3.1 Use the following command to stop the running container. ***(***You can also us the container ID to stop the container: *sudo docker stop CONTAINER_ID****)***

sudo docker stop CONTAINER_NAME

Note: Replace CONTAINER_NAME with the name of the newly created container. In this case CONTAINER_NAME is stoic_darwin. The container name may differ from the one shown in the image below.

```
C:\Users\sksum>docker stop e5fa1bae057c
e5fa1bae057c

C:\Users\sksum>docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES

C:\Users\sksum>
```

3.2 Use the following command to list all the running containers and verify if the container has stopped running:

sudo docker ps

```
C:\Users\sksum>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS                          NAMES
e5fa1bae057c   nginx     "/docker-entrypoint.…"   36 seconds ago   Up 34 seconds   80/tcp, 0.0.0.0:81->81/tcp   lucid_colden

C:\Users\sksum>
```

3.3 You can start the container again and check the running containers. ***(***You can also us the container ID to start the container: *sudo docker start CONTAINER_ID****)***

sudo docker start CONTAINER_NAME

docker ps

Note: Replace CONTAINER_NAME with the name of the newly created container. In this case CONTAINER_NAME is stoic_darwin. The container name may differ from the one shown in the image below.

```
manikumarsimpli@ip-172-31-71-23:~$ sudo docker start compassionate_tereshkova
compassionate_tereshkova
manikumarsimpli@ip-172-31-71-23:~$ sudo docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED         STATUS          PORTS                                      NAMES
b7ff44ef0883   nginx     "/docker-entrypoint.…"   7 minutes ago   Up 15 seconds   80/tcp, 0.0.0.0:81->81/tcp, :::81->81/tcp   compas
sionate_tereshkova
manikumarsimpli@ip-172-31-71-23:~$
```

3.4 To start the container in interactive mode, use the –i and –t options.

sudo docker run -it --name=Test_1 ubuntu

```
PS C:\Users\manya\OneDrive\Desktop\ACO> docker run -it --name=Test_1 ubuntu
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
5e8117c0bd28: Pull complete
Digest: sha256:8eab65df33a6de2844c9aefd19efe8ddb87b7df5e9185a4ab73af936225685bb
Status: Downloaded newer image for ubuntu:latest
root@92c6d0134498:/#
```

Step 4: Listing all the containers

4.1 Use the below command to list all the containers started and the once which are stopped:

sudo docker ps -a

```
C:\Users\sksum>docker ps -a
CONTAINER ID   IMAGE                          COMMAND                  CREATED         STATUS                     PORTS
          NAMES
e5fa1bae057c   nginx                          "/docker-entrypoint.…"   8 minutes ago   Exited (0) 5 minutes ago
          lucid_colden
71c2c74b12fb   61395b4c586d                   "/docker-entrypoint.…"   20 minutes ago  Exited (0) 11 minutes ago
          conteiner0
8bc70a4ca72b   61395b4c586d                   "/docker-entrypoint.…"   8 weeks ago     Up 2 minutes               80/tcp
          container1
3f702fb419e2   docker/welcome-to-docker:latest   "/docker-entrypoint.…"   8 weeks ago     Exited (255) 37 minutes ago   80/tcp
          confident_swartz
6abb5a9d6b3d   docker/welcome-to-docker:latest   "/docker-entrypoint.…"   3 months ago    Exited (255) 8 weeks ago      80/tcp
          romantic_cerf
a26a4d411547   docker/welcome-to-docker:latest   "/docker-entrypoint.…"   3 months ago    Exited (255) 3 months ago     0.0.0.0:8088->
80/tcp    welcome-to-docker
```

4.2 To list the containers by their ID, use the below command

sudo docker ps -aq

```
C:\Users\sksum>docker ps -aq
e5fa1bae057c
71c2c74b12fb
8bc70a4ca72b
3f702fb419e2
6abb5a9d6b3d
a26a4d411547
```

You can see the containers with ID are listed.

4.3 To list the total file size of each container, use the below command:

sudo docker ps -s

```
C:\Users\sksum>docker ps -s
CONTAINER ID   IMAGE          COMMAND                  CREATED       STATUS         PORTS     NAMES       SIZE
8bc70a4ca72b   61395b4c586d   "/docker-entrypoint.…"   8 weeks ago   Up 4 minutes   80/tcp    container1   1.09kB (virtual 187MB)
```

4.4 To list the latest created containers, use the following command:

sudo docker ps -l

```
C:\Users\sksum>docker ps -l
CONTAINER ID   IMAGE     COMMAND                  CREATED         STATUS                     PORTS     NAMES
e5fa1bae057c   nginx     "/docker-entrypoint.…"   11 minutes ago   Exited (0) 8 minutes ago             lucid_colden

C:\Users\sksum>
```

Step 5: Deleting the container

5.1 Stop the running container and remove it using the following commands:

sudo docker stop CONTAINER_NAME

sudo docker container rm CONTAINER_NAME

```
C:\Users\sksum>docker stop container1
container1

C:\Users\sksum>docker container rm container1
container1
```

Note: Replace CONTAINER_NAME with the name of the newly created container. In this case CONTAINER_NAME is sweet_brown. The container name may differ from the one shown in the image below.

Step 6: Removing the image

6.1 Remove the image using the command:

sudo docker image rm nginx

```
manikumarsimpli@ip-172-31-71-23:~$ sudo docker image rm nginx
Untagged: nginx:latest
Untagged: nginx@sha256:47ae43cdfc7064d28800bc42e79a429540c7c80168e8c8952778c0d5af1c09db
Deleted: sha256:4f380adfc10f4cd34f775ae57a17d2835385efd5251d6dfe0f246b0018fb0399
Deleted: sha256:2855bbcefcf95050e64049447e99e77efa2bff32374e586982d69be4612467ce
Deleted: sha256:bad169ad8b30eab551acbb8cd8fbdcd824528189e3dd0cc52dd88a37bbf121cd
Deleted: sha256:36d83ebf5fec7ae1be4c431f0945f2dbe6828ecdc936c604daa48f17c0b50ed7
Deleted: sha256:b4c9a251dc81d52dd1cca9b4c69ca9e4db602a9a7974019f212846577f739699
Deleted: sha256:038ca5b801cea48e9f40f6ffb4cda61a2fe0b6b0f378a7434a0d39d2575a4082
Deleted: sha256:764055ebc9a7a290b64d17cf9ea550f1099c202d83795aa967428ebdf335c9f7
manikumarsimpli@ip-172-31-71-23:~$
```