



**UNIVERSITY OF PETROLEUM AND  
ENERGY STUDIES**

**APPLICATION CONTAINERIZATION AND  
ORCHESTRATION LAB**

**COURSE: B.Tech CSE (Devops)**

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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:

```
priyanshurai@not-mine ~ % sudo docker pull nginx
Using default tag: latest
2023/08/25 13:03:23 must use ASL logging (which requires CGO) if running as root
latest: Pulling from library/nginx
4ee097f9a366: Pull complete
6710b2157bb5: Pull complete
76d048093f36: Pull complete
658197f4b592: Pull complete
a2543a59b279: Pull complete
3972a57e5575: Pull complete
82359da50743: Pull complete
Digest: sha256:104c7c5c54f2685f0f46f3be607ce60da7085da3eaa5ad22d3d9f01594295e9c
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest
```

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

```
priyanshurai@not-mine ~ % sudo docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
nginx	latest	ab73c7fd6723	9 days ago	192MB
docker/welcome-to-docker	latest	605de626b242	2 months ago	13.9MB
hello-world	latest	b038788ddb22	3 months ago	9.14kB

## Step 2: Creating a new container

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

```
priyanshurai@not-mine ~ % sudo docker run -dt -p 81:81 nginx
[7a87f89cacf709b8f2dfc5c0ce5349def89a6fd1bdbc872170dceee229a47ed8]
```

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.

```
priyanshurai@not-mine ~ % sudo docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
7a87f89cacf7	nginx	"/docker-entrypoint..."	8 seconds ago	Up 7 seconds	80/tcp, 0.0.0.0:81->81/tcp	nice_heisenberg

## Step 3: Stopping the container

3.1 Use the following command to stop the running container. (You can also use the container ID to stop the container: *sudo docker stop CONTAINER\_ID*)

**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.

```
priyanshurai@not-mine ~ % sudo docker stop nice_heisenberg
nice_heisenberg
```

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

```
priyanshurai@not-mine ~ % sudo docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
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3.3 You can start the container again and check the running containers. (You can also use the container ID to start the container: *sudo docker start CONTAINER\_ID*)

```
priyanshurai@not-mine ~ % sudo docker start nice_heisenberg
nice_heisenberg
priyanshurai@not-mine ~ % sudo docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
7a87f89cacf7	nginx	"/docker-entrypoint..."	3 minutes ago	Up 9 seconds	80/tcp, 0.0.0.0:81->81/tcp	nice_heisenberg

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

```
priyanshurai@not-mine ~ % sudo docker run -it --name=Test_1 ubuntu
Unable to find image 'ubuntu:latest' locally
2023/08/25 13:08:29 must use ASL logging (which requires CGO) if running as root
latest: Pulling from library/ubuntu
db76c1f8aa17: Pull complete
Digest: sha256:ec050c32e4a6085b423d36ecd025c0d3ff00c38ab93a3d71a460ff1c44fa6d77
Status: Downloaded newer image for ubuntu:latest
root@c66fefc35ebf:/#
```

## Step 4: Listing all the containers

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

```

priyanshurai@not-mine ~ % sudo docker ps -a
Password:
Sorry, try again.
Password:
Sorry, try again.
Password:
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS                    PORTS                               NAMES
c66fefc35ebf   ubuntu        "/bin/bash"             17 minutes ago Exited (130) About a minute ago    Test_1
7a87f89cacf7   nginx        "/docker-entrypoint...." 24 minutes ago Up 21 minutes              80/tcp, 0.0.0.0:81->81/tcp    nice_heisenberg
3671b6fdbcf97   hello-world   "/hello"                 2 weeks ago    Exited (0) 2 weeks ago              jovial_mahavira
79993f26cf03   hello-world   "/hello"                 2 weeks ago    Exited (0) 2 weeks ago              vigilant_pare
f965947a2dcd   docker/welcome-to-docker:latest "/docker-entrypoint...." 2 weeks ago    Exited (255) 2 weeks ago              welcome-to-docker
priyanshurai@not-mine ~ %

```

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

```
[priyanshurai@not-mine ~ % sudo docker ps -aq
c66fefc35ebf
7a87f89cacf7
3671b6fdb9c97
79993f26cf03
f965947a2dcd
priyanshurai@not-mine ~ %
```

You can see the containers with ID are listed.

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

```
priyanshurai@not-mine ~ % sudo docker ps -s
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES	SIZE
7a87f89cacf7	nginx	"/docker-entrypoint..."	27 minutes ago	Up 24 minutes	80/tcp, 0.0.0.0:81->81/tcp	nice_heisenberg	1.09kB (virtual 192MB)

```
priyanshurai@not-mine ~ %
```

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

```
priyanshurai@not-mine ~ % sudo docker ps -l
CONTAINER ID   IMAGE      COMMAND                  CREATED          STATUS          PORTS          NAMES
c66fefc35ebf   ubuntu    "/bin/bash"            20 minutes ago  Exited (130) 4 minutes ago          Test_1
priyanshurai@not-mine ~ %
```

## Step 5: Deleting the container

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

```
[priyanshurai@not-mine ~ % sudo docker stop nice_heisenberg
nice_heisenberg
[priyanshurai@not-mine ~ % sudo docker container rm nice_heisenberg
nice_heisenberg
priyanshurai@not-mine ~ % █
```

**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:

```
[priyanshurai@not-mine ~ % sudo docker image rm nginx
Untagged: nginx:latest
Untagged: nginx@sha256:104c7c5c54f2685f0f46f3be607ce60da7085da3eaa5ad22d3d9f01594295e9c
Deleted: sha256:ab73c7fd672341e41ec600081253d0b99ea31d0c1acdfb46a1485004472da7ac
Deleted: sha256:84ea63b436b2e500b5f70e39d540ff32ac8848f7cfbee7e0a5f56ede4bbd9aae
Deleted: sha256:6e4f4d7712f59078f77653b1629296eea47fad80251d492c411109eb8a627f65
Deleted: sha256:76537c195838a2622cf9f1742d0c03e00f3493655589bdaf6d476d4772f11382
Deleted: sha256:f7ee0b034b33fb35400b16e242b7fc26b0d94f20e56b6542a7333a957cd5e511
Deleted: sha256:25cd8e7142cdb22583264d650a19b2aed7262dc20a4321fc1f9cfaea59dfd64f
Deleted: sha256:5cfc11224748582651f8d0669aaf50242d094c0a6999924a54ac450d8096d2e4
Deleted: sha256:1c3daa06574284614db07a23682ab6d1c344f09f8093ee10e5de4152a51677a1
priyanshurai@not-mine ~ % █
```

