Lab Exercise 3

Working with Docker Volumes

Objective:

- Learn how to create and manage Docker volumes.
- Understand how Docker volumes can be used to persist data across container restarts.
- Practice mounting Docker volumes to containers.

Prerequisites:

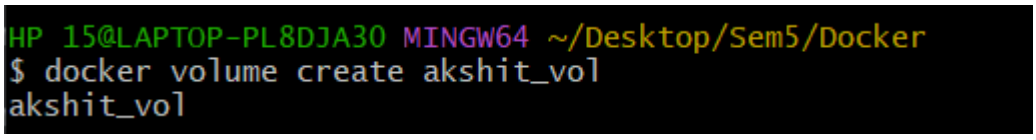
- Docker installed on your system.
- Basic understanding of Docker commands and container concepts.

Step 1: Create a Docker Volume

Create a new Docker volume:

```
docker volume create my_data_volume
```

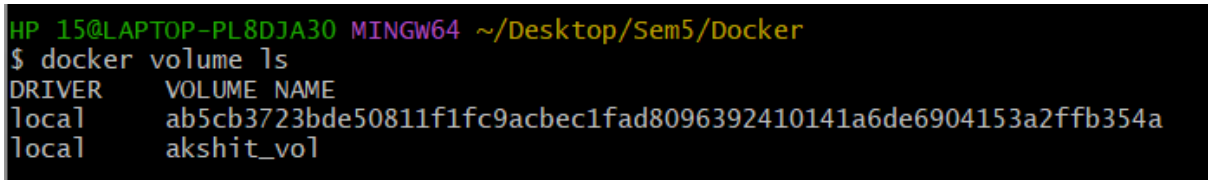
This command creates a Docker volume named my_data_volume.



Verify that the volume was created:

```
docker volume ls
```

You should see my_data_volume listed among the volumes.



Step 2: Run a Container with the Volume Mounted

Run an Nginx container with the volume mounted:

```
docker run -d --name my_nginx -v my_data_volume:/usr/share/nginx/html -p 8008:80 nginx
```

This command starts an Nginx container named my_nginx and mounts the my_data_volume volume to the /usr/share/nginx/html directory inside the container.

```
HP 15@LAPTOP-PL8DJA30 MINGW64 ~/Desktop/Sem5/Docker
$ docker run -d --name my_nginx -v akshit_vol:/usr/share/nginx/html -p 8008:80 n
ginx
Unable to find image 'nginx:latest' locally
latest: Pulling from library/nginx
2d429b9e73a6: Already exists
9b1039c85176: Pull complete
9ad567d3b8a2: Pull complete
773c63cd62e4: Pull complete
1d2712910bdf: Pull complete
4b0adc47c460: Pull complete
171eebbdf235: Pull complete
Digest: sha256:bc5eac5eafc581aeda3008b4b1f07ebba230de2f27d47767129a6a905c84f470
Status: Downloaded newer image for nginx:latest
81199ea30e4fe22aa9bd432c3cdbebb5ebcd549e2fa80349a6fb5502241462c9
```

Verify that the container is running:

```
docker ps
```

You should see my_nginx listed as one of the running containers.

```
HP 15@LAPTOP-PL8DJA30 MINGW64 ~/Desktop/Sem5/Docker
$ docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED         STATUS
 PORTS                  NAMES
81199ea30e4f   nginx     "/docker-entrypoint.…"   2 minutes ago   Up 2 minutes
 0.0.0.0:8008->80/tcp   my_nginx
```

Step 3: Interact with the Volume

Create a simple HTML file in the volume:

```
docker exec -it my_nginx bash
```

```
echo "<h1>Hello, Docker Volume</h1>" > /usr/share/nginx/html/index.html

exit
```

```
C:\Users\HP 15>docker exec -it my_nginx bash
root@81199ea30e4f:/# echo "<h1>Hello, Docker Volume</h1>" > /usr/share/nginx/html/index.html
root@81199ea30e4f:/# exit
exit
```

This command creates an HTML file inside the /usr/share/nginx/html directory, which is backed by my_data_volume.

Access the Nginx server to see your file: Open a browser and navigate to http://localhost:8008. You should see the message "Hello, Docker Volume!" displayed on the page.

Hello, Docker Volume

Step 4: Test Data Persistence

Stop and remove the container:

```
docker stop my_nginx

docker rm my_nginx
```

```
HP 15@LAPTOP-PL8DJA30 MINGW64 ~/Desktop/Sem5/Docker
$ docker stop my_nginx
my_nginx

HP 15@LAPTOP-PL8DJA30 MINGW64 ~/Desktop/Sem5/Docker
$ docker rm my_nginx
my_nginx
```

Run a new Nginx container using the same volume:

```
docker run -d -p 8011:80 -v my_data_volume:/usr/share/nginx/html nginx
```

```
HP 15@LAPTOP-PL8DJA30 MINGW64 ~/Desktop/Sem5/Docker
$ docker run -d -p 8011:80 -v akshit_vol:/usr/share/nginx/html nginx
77a25fbf982a409a9f3632780d8de1619ccc26605bc49bbaa7ff3f8358a0653e
```

Access the Nginx server again: Navigate to http://localhost in your browser. You should still see the "Hello, Docker Volume!" message, demonstrating that the data persisted across container instances.

Hello, Docker Volume

Step 5: Clean Up

Stop and remove the container:

```
docker stop new_nginx

docker rm new_nginx
```

Remove the Docker volume:

```
docker volume rm my_data_volume
```

Verify that the volume is removed:

```
docker volume ls
```

```
HP 15@LAPTOP-PL8DJA30 MINGW64 ~/Desktop/Sem5/Docker
$ docker stop 77a25fbf982a409a9f3632780d8de1619ccc26605bc49bbaa7ff3f8358a0653e
77a25fbf982a409a9f3632780d8de1619ccc26605bc49bbaa7ff3f8358a0653e

HP 15@LAPTOP-PL8DJA30 MINGW64 ~/Desktop/Sem5/Docker
$ docker rm 77a25fbf982a409a9f3632780d8de1619ccc26605bc49bbaa7ff3f8358a0653e
77a25fbf982a409a9f3632780d8de1619ccc26605bc49bbaa7ff3f8358a0653e

HP 15@LAPTOP-PL8DJA30 MINGW64 ~/Desktop/Sem5/Docker
$ docker volume rm akshit_vol
akshit_vol
```

```
HP 15@LAPTOP-PL8DJA30 MINGW64 ~/Desktop/Sem5/Docker
$ docker volume ls
DRIVER    VOLUME NAME
```

Ensure that my_data_volume is no longer listed.