

## Task 1: Proved that Docker volumes persist MySQL data even if containers are deleted.


- You created a DB and table.
- You removed the container.
- You started a new container with the same volume.
- Data was still there.

### Learning locked in:

Containers are ephemeral (can be deleted anytime).

Volumes are persistent (stay until you explicitly remove them).

Env variables like `MYSQL\_ROOT\_PASSWORD` only matter on *\*first initialization\** of an empty volume.



```
ubuntu@ip-172-31-20-87: ~/app
mysql> INSERT INTO users (name) VALUES ('Shuaib'), ('Alice');
Query OK, 2 rows affected (0.01 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM users;
+----+-----+
| id | name |
+----+-----+
| 1  | Shuaib |
| 2  | Alice |
+----+-----+
2 rows in set (0.00 sec)

mysql> EXIT;
Bye
ubuntu@ip-172-31-20-87:~/app$ sudo docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS          NAMES
d5a57a18820e   mysql:8    "docker-entrypoint.s..." 3 minutes ago  Up 3 minutes  3306/tcp, 33060/tcp  mysql1
ubuntu@ip-172-31-20-87:~/app$ sudo docker rm -f mysql1
mysql1
ubuntu@ip-172-31-20-87:~/app$ sudo docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS          NAMES
ubuntu@ip-172-31-20-87:~/app$ sudo docker volume ls
DRIVER    VOLUME NAME
local     mydata
local     mydata_sql
local     mysql-data
ubuntu@ip-172-31-20-87:~/app$
```

```
ubuntu@ip-172-31-20-87: ~/app
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
Quick connect...
3 ubuntu@ip-172-31-20-87: ~/app
ubuntu@ip-172-31-20-87:~/app$ sudo docker exec -it mysql1 mysql -u root
-p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.4.6 MySQL Community Server - GPL

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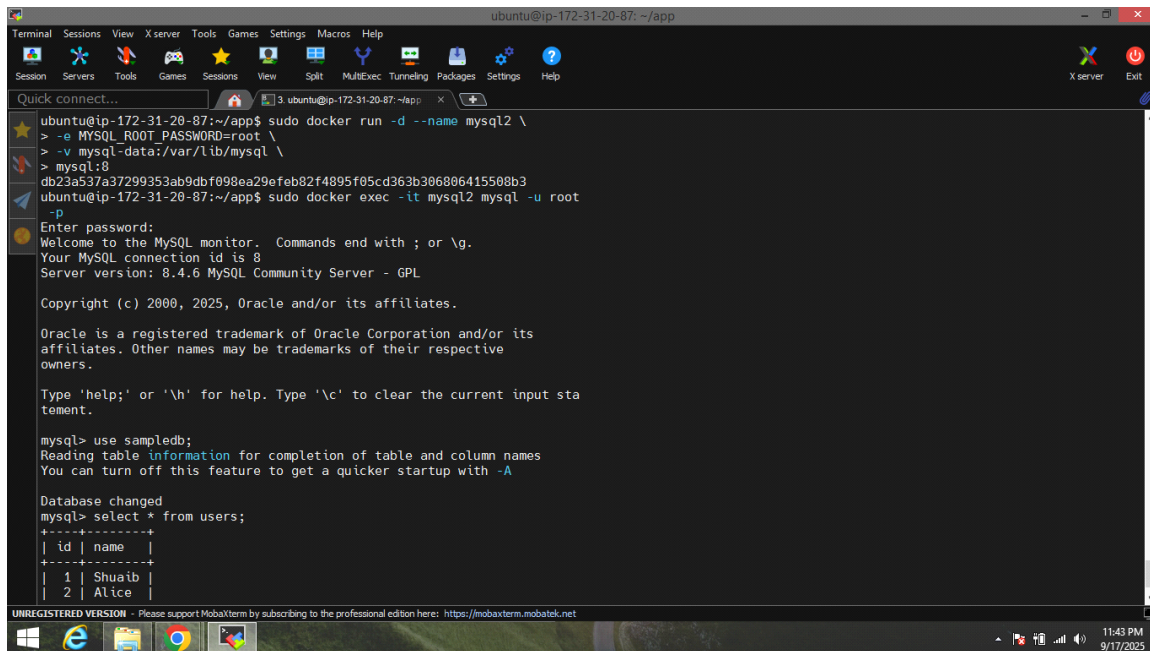
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE sampledb;
Query OK, 1 row affected (0.01 sec)

mysql> USE sampledb;
mysql> CREATE TABLE users (
  name VARCHAR(100)
);
INSERT INTO users (name) VALUES ('Shuaib'), ('Alice');
SELECT * FROM users;
EXIT;
Database changed
mysql> CREATE TABLE users (
  id INT AUTO INCREMENT PRIMARY KEY,
  name VARCHAR(100)
);
Query OK, 0 rows affected (0.03 sec)

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```

```
ubuntu@ip-172-31-20-87: ~/app
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
Quick connect...
3 ubuntu@ip-172-31-20-87: ~/app
ubuntu@ip-172-31-20-87:~/app$ sudo docker volume create mysql-data
mysql-data
ubuntu@ip-172-31-20-87:~/app$ sudo docker run -d --name mysql1 \
-e MYSQL_ROOT_PASSWORD=root \
-v mysql-data:/var/lib/mysql \
> mysql:8
Unable to find image 'mysql:8' locally
8: Pulling from library/mysql
500d7b2546c4: Pull complete
a4e035766269: Pull complete
328796243e0b: Pull complete
998cf6c9454c: Pull complete
b702e6e6dd8f: Pull complete
7894cca000d1: Pull complete
28b5340945f9: Pull complete
f3b274c62c3c: Pull complete
318326631da0: Pull complete
582874d21796: Pull complete
Digest: sha256:6e60ad6d61d8e7f0a4fd07f6b14109331d66a2f0d089e4b7a1f485d671a29604
Status: Downloaded newer image for mysql:8
d5a57a18820ebb3ca6465ade4b9429bab4be2b2190fa871d138e54b971565708
ubuntu@ip-172-31-20-87:~/app$
```



```
ubuntu@ip-172-31-20-87: ~/app
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
Quick connect...
3. ubuntu@ip-172-31-20-87:~/app
ubuntu@ip-172-31-20-87:~/app$ sudo docker run -d --name mysql2 \
> -e MYSQL_ROOT_PASSWORD=root \
> -v mysql-data:/var/lib/mysql \
> mysql:8
db23a537a37299353ab9dbf098ea29efeb82f4895f05cd363b306806415508b3
ubuntu@ip-172-31-20-87:~/app$ sudo docker exec -it mysql2 mysql -u root
-p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.4.6 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> use sampledbs;
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> select * from users;
+----+-----+
| id | name |
+----+-----+
| 1  | Shuaib |
| 2  | Alice |
+----+-----+
```

## Task 2: fully understood how to:

Start a container with a bind mount

Modify your app on the host and see changes reflected instantly inside the container

Stop (CTRL+C) and re-run the app

Re-enter a container after exit using `docker start -ai` or `docker exec -it`

### □ Learning locked in:

Bind mounts = best for development (live sync with your local code).

Named volumes = best for persistent storage (DBs, app data), but don't sync host changes.

You now know how to jump back into containers anytime.

```
ubuntu@ip-172-31-20-87: ~/node-app
ubuntu@ip-172-31-20-87:~/node-app$ sudo docker run -it --name node-bind \
-v $(pwd):/app \
-w /app \
node:18 bash
Unable to find image 'node:18' locally
18: Pulling from library/node
3e6b9d1a9511: Pull complete
37927ed901b1: Pull complete
79b2f47ad444: Pull complete
e23f099911d6: Pull complete
cda7f44f2bdd: Pull complete
c6b30c3f1696: Pull complete
3697be50c98b: Pull complete
461077a72fb7: Pull complete
Digest: sha256:c6ae79e38498325db67193d391e6ec1d224d96c693a8a4d943498556716d3783
Status: Downloaded newer image for node:18
root@070f1db823724:/app# ls
app.js
root@070f1db823724:/app# node app.js
Hello from Node.js app!
App is still running...
App is still running...
App is still running...
App is still running...
App is still running...
```

```
ubuntu@ip-172-31-20-87: ~/node-app
ubuntu@ip-172-31-20-87:~/node-app$ sudo docker run -it --name node-bind \
> -v $(pwd):/app \
> node:18 bash
Unable to find image 'node:18' locally
18: Pulling from library/node
3e6b9d1a9511: Pull complete
37927ed901b1: Pull complete
79b2f47ad444: Pull complete
e23f099911d6: Pull complete
cda7f44f2bdd: Pull complete
c6b30c3f1696: Pull complete
3697be50c98b: Pull complete
461077a72fb7: Pull complete
Digest: sha256:c6ae79e38498325db67193d391e6ec1d224d96c693a8a4d943498556716d3783
Status: Downloaded newer image for node:18
root@87767958d1db:/#
```

```
ubuntu@ip-172-31-20-87: ~/node-app
root@f7a9d08ef18e:/home/node# find -type f -name app /
find: paths must precede expression: '/'
find: possible unquoted pattern after predicate '-name'?
root@f7a9d08ef18e:/home/node# find -type f -name app /lib
find: paths must precede expression: '/lib'
find: possible unquoted pattern after predicate '-name'?
root@f7a9d08ef18e:/home/node# AC
root@f7a9d08ef18e:/home/node# exit
exit
ubuntu@ip-172-31-20-87:~/node-app$ sudo docker start -ai node-bind
root@70f1db823724:/app# ls
app.js
root@70f1db823724:/app# node app.js
Hello from UPDATED Node.js app!
App is still running...
App is still running...
App is still running...
App is still running...
App is still running...
App is still running...
```