

# Insert, Update, and Delete Data in a Database

---

## Scenario

The database operations team has created a relational database called **world** containing three tables: **city**, **country**, and **countrylanguage**. You have to validate the configuration of the database by running **INSERT**, **UPDATE**, and **DELETE** statements on the **country** table.

## Lab overview and objectives

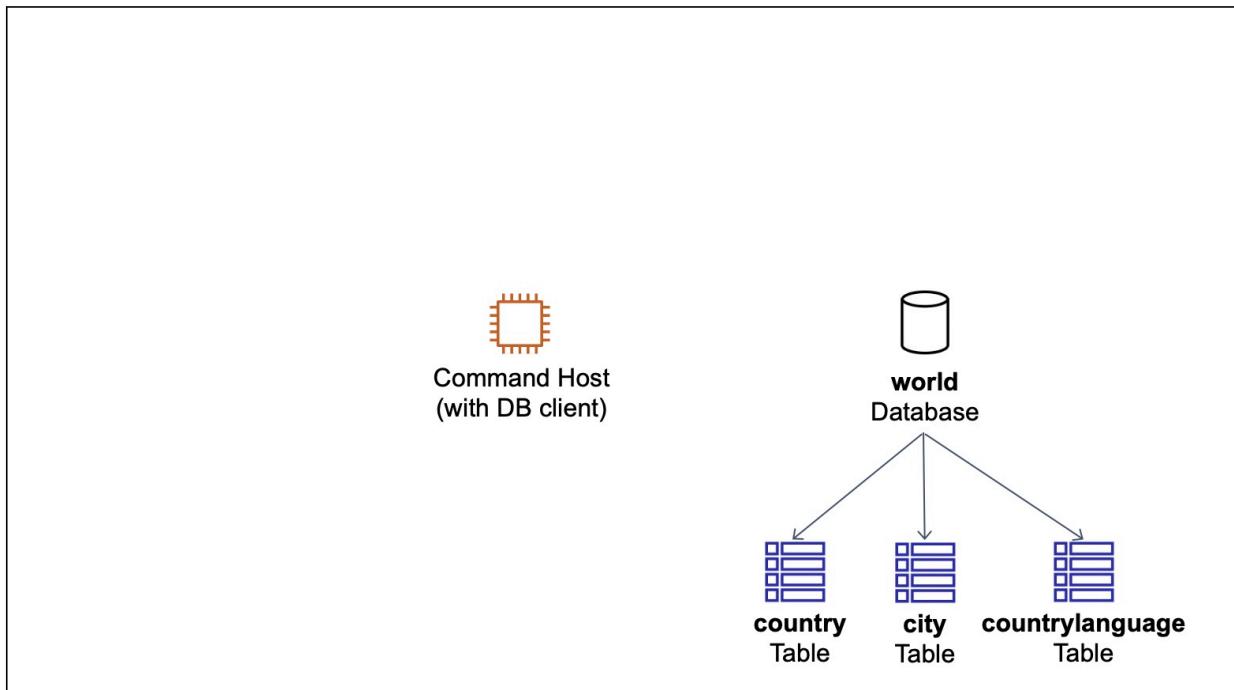
---

This lab demonstrates how to insert, update, delete, and import rows of data using structured query language (SQL).

After completing this lab, you will be able to:

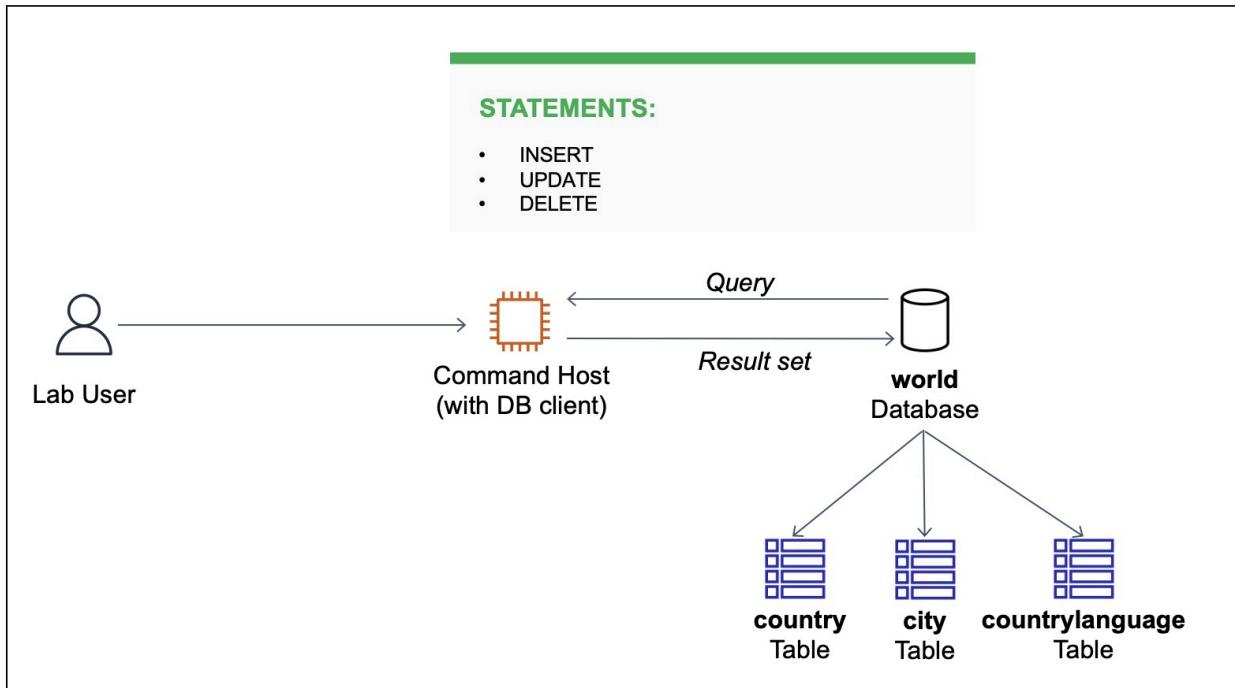
- Insert rows into a table
- Update rows in a table
- Delete rows from a table
- Import rows from a database backup file

When you start this lab, the following resources are already created for you:



*A Command Host instance and world database containing three tables*

At the end of this lab, your architecture will look like the following example:



# Task 1: Connect to a database

In this task, you connect to an instance containing a database client, which is used to connect to a database. This instance is referred to as the Command Host.

5. In the AWS Management Console, choose the **Services** menu. Under **Compute**, choose **EC2**.
6. In the left navigation pane, choose **Instances**.
7. Next to the instance labelled **Command Host**, select the check box and then choose **Connect**.

**Note:** If you do not see the **Command Host**, the lab is possibly still being provisioned, or you may be using another Region.

8. For **Connect to instance**, choose the **Session Manager** tab.
  9. Choose **Connect** to open a terminal window.
- Note:** If the **Connect** button is not available, wait for a few minutes and try again.
10. To configure the terminal to access all required tools and resources, run the following command:
  11. `sudo su`  
`cd /home/ec2-user/`
  12. **Tips:**
    - Copy and paste the command into the Session Manager terminal window.

- If you are using a Windows system, press Shift+Ctrl+v to paste the command.
13. To connect to the database instance, run the following command in the terminal.  
A password was configured when the database was installed.
14. `mysql -u root --password='re:St@rt!9'`
15. The MySQL command-line client is a SQL shell that you can use to interact with database engines.

Switch	Description
-u or --user	The MySQL user name used to connect to a database instance
-p or --password	The MySQL password used to connect to a database instance

- 16.
- Tip:** At any stage of the lab, if the Sessions Manager window is not responsive or if you need to reconnect to the database instance, then follow these steps:
- Close the Sessions Manager window, and try to reconnect using the previous steps.
  - Run the following commands in the terminal.
17. `sudo su`  
`cd /home/ec2-user/`  
`mysql -u root --password='re:St@rt!9'`
18. To show the existing databases, enter the following command in the terminal.  
Make a note of the currently available databases.
19. `SHOW DATABASES;`
- 20.

```

rh-4.2$ sudo su
root@ip-10-1-11-25 bin]# cd /home/ec2-user/
root@ip-10-1-11-25 ec2-user]# mysql -u root password='re:start!9'
ERROR 1049 (42000): Unknown database 'password=re:start!9'
root@ip-10-1-11-25 ec2-user]# mysql -u root --password='re:start!9'
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 15
Server version: 10.5.29-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

MariaDB [(none)]> SHOW DATABASES;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'DATABASES' at line 1
MariaDB [(none)]> SHOW DATABASES;
+-----+
| Database      |
+-----+
| information_schema |
| mysql          |
| performance_schema |
| world          |
+-----+
1 rows in set (0.002 sec)

MariaDB [(none)]> █

```

## Task 2: Insert data into a table

---

In this task, you insert sample data into the **country** table.

13. To verify that the **country** table exists, run the following command. The **SELECT** statement is used to identify the columns that should be included in the result set. The use of the \* denotes all columns. The **FROM** clause is used in the following example to specify the database and table that is queried.

14. `SELECT * FROM world.country;`

15. To insert rows into the **country** table, run the following commands. The values in the **VALUES** clause need to be in the same order as defined by the table schema.

```

INSERT INTO world.country VALUES ('IRL','Ireland','Europe','British
Islands',70273.00,1921,3775100,76.8,75921.00,73132.00,'Ireland/Éire',
'Republic',1447,'IE');

```

16. `INSERT INTO world.country VALUES
 ('AUS','Australia','Oceania','Australia and New
 Zealand',7741220.00,1901,18886000,79.8,351182.00,392911.00,'Aus
 tralia','Constitutional Monarchy, Federation',135,'AU');`

17. To verify that two rows were successfully inserted into the **country** table, run the following query.

18. `SELECT * FROM world.country WHERE Code IN ('IRL', 'AUS');`

Code	Name	Continent	Region	SurfaceArea	IndependentYear	Population	LifeExpectancy	GNI	GNI	LocalName	GovernmentForm	Capital	Code
A U S	A u s t r al ia	O ce an st ral ia an d N e w Z e al an d	A u st ral ia an d N e w Z e al an d	774 122 0	19 01	18 88 60 00	79.8	3 5 1 1 8 2	3 9 2 9 1 1	Australia	Constitutional Monarchy, Federation	1 3 5	A U
I R L	Irland	Europe	British Isles	70273	1921	3775100	76.8	75921	731	Ireland/Éire	Republic	1447	IE

			n																
			d																

```
+-----+-----+-----+
| 1 |   60 |   79 |   80 |
| 2 |   50 |   59 |   65 |
+-----+-----+-----+
2 rows in set (0.000 sec)

MariaDB [(none)]> SELECT * FROM world.country WHERE code IN ('IRL','AUS');
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Code | Name      | Continent | Region           | SurfaceArea | IndepYear | Population | LifeExpectancy | GNP          | GNPOld     | LocalName  | GovernmentForm
|      |            |           | Capital        |             |           |           |              |             |           |           |           |
+-----+-----+-----+-----+-----+
| AUS | Australia | Oceania   | Australia and New Zealand | 7741220.00 | 1901    | 18886000  | 79.8         | 351182.00 | 392911.00 | Australia  | Constitutional Monarchy, Federation |
| IRL | Ireland   | Europe    | British Islands       | 70273.00   | 1921    | 3775100   | 76.8         | 75921.00  | 73132.00  | Ireland/ire | Republic
|      |            |           | Capital        |             |           |           |              |             |           |           |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.000 sec)

MariaDB [(none)]> INSERT INTO school.subjects VALUES ('03','55','56','85');
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> SELECT * FROM school.subject WHERE English IN ('50','55');
ERROR 1146 (42S02): Table 'school.subject' doesn't exist
MariaDB [(none)]> SELECT * FROM school.subjects WHERE English IN ('50','55');
+-----+-----+-----+
| Rollno | English | Telugu | Hindi |
+-----+-----+-----+
| 2 | 50 | 59 | 65 |
| 3 | 55 | 56 | 85 |
+-----+-----+-----+
2 rows in set (0.000 sec)

MariaDB [(none)]>
```

## Task 3: Update rows in a table

In this task, you update both rows in the **country** table using an **UPDATE** statement.

16. To set the value in the **Population** column to 0 for both rows in the **country** table, run the following **UPDATE** statement.
17. `UPDATE world.country SET Population = 0;`
18. All rows are updated because the **UPDATE** statement does not include a **WHERE** condition. A **WHERE** clause uses conditions to filter rows returned by a query. The next lab introduces the **WHERE** clause.
19. To verify that the **Population** column in the **country** table was updated, run the following command.
20. `SELECT * FROM world.country;`
21. To update the **Population** and **SurfaceArea** columns for all rows in the **country** table, run the following **UPDATE** statement.
22. `UPDATE world.country SET Population = 100, SurfaceArea = 100;`

23. To verify that the **Population** and **SurfaceArea** columns in the **country** table were updated, run the following command.

24. `SELECT * FROM world.country;`

```
MariaDB [(none)]> UPDATE world.country SET population = 100, surfaceArea = 100;
Query OK, 2 rows affected (0.002 sec)
Rows matched: 2  Changed: 2  Warnings: 0

MariaDB [(none)]> SELECT * FROM world.country;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Code | Name      | Continent | Region           | SurfaceArea | IndepYear | Population | LifeExpectancy | GNP          | LocalName   | GovernmentForm
|-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| AUS | Australia | Oceania    | Australia and New Zealand | 100.00 | 1901 | 100 | 79.8 | 351182.00 | 392911.00 | Australia | Constitutional Monarchy, Federation
| IRL | Ireland   | Europe     | British Islands       | 100.00 | 1921 | 100 | 76.8 | 75921.00  | 73132.00  | Ireland/ire | Republic
|-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.000 sec)

MariaDB [(none)]> UPDATE school.subjects SET English = 60, Hindi = 45;
Query OK, 3 rows affected (0.001 sec)
Rows matched: 3  Changed: 3  Warnings: 0

MariaDB [(none)]> SELECT * FROM school.subjects;
+-----+-----+-----+-----+
| Rollno | English | Telugu | Hindi |
|-----+-----+-----+-----+
| 1 | 60 | 79 | 45 |
| 2 | 60 | 59 | 45 |
| 3 | 60 | 56 | 45 |
|-----+-----+-----+-----+
3 rows in set (0.000 sec)

MariaDB [(none)]> █
```

## Task 4: Delete rows from a table

In this task, you delete rows in the **country** table using a **DELETE** statement.

Exercise caution when using data manipulation statements such as **UPDATE** and **DELETE** because these changes may not be reversible.

20. To delete **ALL** rows from the **country** table, run the following command.

21. `SET FOREIGN_KEY_CHECKS = 0;`  
`DELETE FROM world.country;`

22. Because the **DELETE** statement does not include a **WHERE** condition, all rows are deleted.

23. To verify that all rows have been deleted from the **country** table, run the following command.

24. `SELECT * FROM world.country;`

```
2 rows in set (0.000 sec)

MariaDB [(none)]> UPDATE school.subjects SET English = 60, Hindi = 45;
Query OK, 3 rows affected (0.001 sec)
Rows matched: 3  Changed: 3  Warnings: 0

MariaDB [(none)]> SELECT * FROM school.subjects;
+-----+-----+-----+-----+
| Rollno | English | Telugu | Hindi |
+-----+-----+-----+-----+
|      1 |      60 |      79 |      45 |
|      2 |      60 |      59 |      45 |
|      3 |      60 |      56 |      45 |
+-----+-----+-----+-----+
3 rows in set (0.000 sec)

MariaDB [(none)]> SET FOREIGN_KEY_CHECKS = 0;
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> DELETE FROM world.country;
Query OK, 2 rows affected (0.001 sec)

MariaDB [(none)]> SELECT * FROM world.country;
Empty set (0.000 sec)

MariaDB [(none)]> █
```

## Task 5: Import data using an SQL file

In this task, you import sample data into the **country** table using an SQL file.

22. To exit the MySQL terminal, run the following command.
23. `QUIT;`
24. To verify that the **world.sql** file has been downloaded, run the following command.
25. `ls /home/ec2-user/world.sql`

Recall Linux commands

Use the `ls` (list) command to list the contents of a directory.

26.

27. It is time-consuming to insert individual rows into a table. You can create a SQL script file containing a group of SQL statements to quickly load data into a database. To load rows into the **country** table, run the following command.

28. `mysql -u root --password='re:St@rt!9' < /home/ec2-user/world.sql`

29. This database file adds two additional tables and inserts data into all three tables.

30. To reconnect to the database, run the following command.

31. `mysql -u root --password='re:St@rt!9'`

32. To verify that the script ran successfully, run the following command.

33. `USE world;`  
`SHOW TABLES;`

34. Observe that there are three tables named **city**, **country**, and **countrylanguage**.

35. To verify that the rows were loaded successfully, run the following command.

36. `SELECT * FROM country;`

37. Notice that there are more entries in the **country** table.

28. Similarly, use the **SELECT** statement to query the **city** and **countrylanguage** tables that were created when you imported the backup file.

```
objects' at line 1
MariaDB [(none)]> QUIT;
Bye
[root@ip-10-1-11-25 ec2-user]# ls /home/ec2-user/world.sql;
/home/ec2-user/world.sql
[root@ip-10-1-11-25 ec2-user]# mysql -u root --password='re:st@rt!9';
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 16
Server version: 10.5.29-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

MariaDB [(none)]> SHOW DATABASES;
->
-> SHOW DATABASES;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near '':
SHOW DATABASES' at line 1
MariaDB [(none)]> SHOW DATABASES;
+-----+
| Database      |
+-----+
| information_schema |
| mysql          |
| performance_schema |
| school         |
| world          |
+-----+
5 rows in set (0.000 sec)

MariaDB [(none)]> SHOW * FROM school;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near ''* FROM school'
t line 1
MariaDB [(none)]> SHOW TABLES FROM school;
```

