

INSERT, UPDATE, DELETE

In this lab, you will learn some commonly used DML (Data Manipulation Language) statements of SQL other than SELECT. First, you will learn the INSERT statement, which is used to insert new rows into a table. Next, you will learn the UPDATE statement which is used to update the data in existing rows in the table. Lastly, you will learn the DELETE statement which is used to remove rows from a table.

How does the syntax of an INSERT statement look?

```
INSERT INTO table_name (column1, column2, ... )  
VALUES (value1, value2, ... );
```

How does the syntax of an UPDATE statement look?

```
UPDATE table_name  
SET column1 = value1, column2 = value2, ...  
WHERE condition;
```

How does the syntax of a DELETE statement look?

```
DELETE FROM table_name  
WHERE condition;
```

Software Used in this Lab

In this lab, you will use [Datasette](#), an open source multi-tool for exploring and publishing data.

Database Used in this Lab

The dataset used in this lab is an internal database.

Objectives

- Inserting new rows into a table
- Updating data in existing rows of the table
- Removing rows from a table

Exploring the Database

Let us first explore the **Instructors** database using the **Datasette** tool:

1. If the first statement listed below is not already in the Datasette textbox on the right, then copy the code below by clicking on the little copy button on the bottom right of the codeblock below and then paste it into the textbox of the Datasette tool using either **Ctrl+V** or right-click in the text box and choose **Paste**.
2. `SELECT * FROM Instructor;`

home / Practice SQL / Instructors

Practice SQL

Database: Instructors

```
SELECT * FROM Instructor;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

3. Click **Submit Query**.
4. Now you can scroll down the table and explore all the columns and rows of the **Instructor** table to get an overall idea of the table contents.

ins_id	lastname	firstname	city	country
1	Ahuja	Rav	Toronto	CA
2	Chong	Raul	Toronto	CA
3	Vasudevan	Hima	Chicago	US

5. These are the column attribute descriptions from the **Instructor** table:
6. Instructor (
7. ins_id: unique identification number of the instructors,
8. lastname: last name of the instructors,
9. firstname: first name of the instructors,
10. city: name of the cities where instructors are located,
11. country: two-letter country code of the countries where instructors are
 located
12.)

Exercise 1: INSERT

In this exercise, you will first go through some examples of using INSERT in queries and then solve some exercise problems by using it.

Task A: Example exercises on INSERT

Let us go through some examples of INSERT related queries:

1. In this example, suppose we want to insert a new single row into the **Instructor** table.

1. Problem:

Insert a new instructor record with id 4 for Sandip Saha who lives in Edmonton, CA into the "Instructor" table.

2. Solution: `INSERT INTO Instructor(ins_id, lastname, firstname, city, country) VALUES(4, 'Saha', 'Sandip', 'Edmonton', 'CA');`

5. Output from `SELECT * FROM Instructor;` after running solution:

The screenshot shows a web-based SQL practice environment. At the top, there's a navigation bar with 'home / Practice SQL / Instructors'. Below it, the title 'Practice SQL' is displayed. The 'Database:' field is set to 'Instructors'. A text input box contains the query `SELECT * FROM Instructor;`. Below the input box, a tip states: 'Tip: Autocompletes with Ctrl+Enter or Cmd+Enter'. A 'Submit query' button is present. Below the query input, a green banner indicates 'All commands ran successfully'. The 'Results' section shows the output of the query as a table with 5 columns: ins_id, lastname, firstname, city, and country. The table contains 4 rows of data, including the newly inserted record for Sandip Saha.

ins_id	lastname	firstname	city	country
1	Ahuja	Ravi	Toronto	CA
2	Chong	Raul	Toronto	CA
3	Vasudevan	Hema	Chicago	US
4	Saha	Sandip	Edmonton	CA

Powered by Datasheet

2. In this example, suppose we want to insert some new multiple rows into the **Instructor** table.

1. Problem:

Insert two new instructor records into the "Instructor" table. First record with id 5 for John Doe who lives in Sydney, AU. Second record with id 6 for Jane Doe who lives in Dhaka, BD.

2. Solution: `INSERT INTO Instructor(ins_id, lastname, firstname, city, country) VALUES(5, 'Doe', 'John', 'Sydney', 'AU'), (6, 'Doe', 'Jane', 'Dhaka', 'BD');`

6. Output from `SELECT * FROM Instructor;` after running solution:

home / Practice SQL / Instructors

Practice SQL

Database: Instructors

```
SELECT * FROM Instructor;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

SELECT * FROM Instructor

ins_id	lastname	firstname	city	country
1	Ahuja	Roy	Toronto	CA
2	Chong	Raul	Toronto	CA
3	Vasudevan	Itina	Chicago	US
4	Saha	Sandip	Edmonton	CA
5	Doe	John	Sydney	AU
6	Doe	Jane	Dhaka	BD

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Task B: Practice exercises on INSERT

Now, let us practice creating and running some INSERT related queries.

1. Problem:

Insert a new instructor record with id 7 for Antonio Cangiano who lives in Vancouver, CA into the "Instructor" table.

Solution: `INSERT INTO Instructor(ins_id, lastname, firstname, city, country)
VALUES(7, 'Cangiano', 'Antonio', 'Vancouver', 'CA');`

Output from `SELECT * FROM Instructor;` after running the solution:

```
1 INSERT INTO Instructor(ins_id, lastname, firstname, city, country)
2 VALUES(7, 'Cangiano', 'Antonio', 'Vancouver', 'CA');
3
4 SELECT * FROM Instructor;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

```
INSERT INTO Instructor(ins_id, lastname, firstname, city, country)
VALUES(7, 'Cangiano', 'Antonio', 'Vancouver', 'CA')
1 row affected
```

```
SELECT * FROM Instructor
```

ins_id	lastname	firstname	city	country
1	Ahja	Bar	Toronto	CA
2	Chong	Raul	Toronto	CA
3	Vandevan	Hina	Chicago	US
4	Saha	Sandip	Edmonton	CA
5	Doe	John	Sydney	AU
6	Doe	Jane	Dhaka	BD
7	Cangiano	Antonio	Vancouver	CA

2. Problem:

Insert two new instructor records into the "Instructor" table. First record with id 8 for Steve Ryan who lives in Barlby, GB. Second record with id 9 for Ramesh Sannareddy who lives in Hyderabad, IN.

Solution: `INSERT INTO Instructor(ins_id, lastname, firstname, city, country)
VALUES(8, 'Ryan', 'Steve', 'Barlby', 'GB'), (9, 'Sannareddy', 'Ramesh',
'Hyderabad', 'IN');`

Output from `SELECT * FROM Instructor;` after running the solution:

```
1 INSERT INTO Instructor(ins_id, lastname, firstname, city, country)
2 VALUES(8, 'Ryan', 'Steve', 'Barlby', 'GB'), (9, 'Sannareddy', 'Ramesh', 'Hyderabad', 'IN');
3
4 SELECT * FROM Instructor;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

```
INSERT INTO Instructor(ins_id, lastname, firstname, city, country)
VALUES(8, 'Ryan', 'Steve', 'Barlby', 'GB'), (9, 'Sannareddy', 'Ramesh', 'Hyderabad', 'IN')
2 rows affected
```

SELECT * FROM Instructor

ins_id	lastname	firstname	city	country
1	Ahuja	Rav	Toronto	CA
2	Chong	Raul	Toronto	CA
3	Varadhevan	Hema	Chicago	US
4	Saha	Sandip	Edmonton	CA
5	Doe	John	Sydney	AU
6	Doe	Jane	Ottawa	BD
7	Campbell	Aimee	Vancouver	CA
8	Ryan	Steve	Barlby	GB
9	Sannareddy	Ramesh	Hyderabad	IN

Exercise 2: UPDATE

In this exercise, you will first go through some examples of using UPDATE in queries and then solve some exercise problems by using it.

Task A: Example exercises on UPDATE

Let us go through some examples of UPDATE related queries:

1. In this example, we want to update one column of an existing row of the table.

1. Problem:

Update the city for Sandip to Toronto.

2. Solution:

```
UPDATE Instructor
SET city='Toronto'
WHERE firstname="Sandip";
```

3. Output after running the solution:

Practice SQL

Database: instructors

```
1 SELECT * FROM Instructor;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

```
SELECT * FROM Instructor
```

ins_id	lastname	firstname	city	country
1	Ahuja	Roy	Toronto	CA
2	Cheng	Raul	Toronto	CA
3	Vasudevan	Hima	Chicago	US
4	Saha	Sandip	Toronto	CA
5	Doe	John	Sydney	AU
6	Doi	Jane	Dhaka	BD
7	Cagliaro	Antonio	Vancouver	CA
8	Ryan	Steve	Bartby	GB
9	Samarreddy	Ramesh	Hyderabad	IN

2. In this example, we want to update multiple columns of an existing row of the table.

1. Problem:

Update the city and country for Doe with id 5 to Dubai and AE respectively.

2. Solution: UPDATE Instructor SET **city='Dubai'**, **country='AE'** WHERE **ins_id=5;**

4. **SELECT * FROM Instructor;**

Practice SQL

Database: instructors

```
1 SELECT * FROM Instructor;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

```
SELECT * FROM instructor
```

ins_id	lastname	firstname	city	country
1	Ahuja	Ravi	Toronto	CA
2	Chong	Raul	Toronto	CA
3	Vasudevan	Hima	Chicago	US
4	Saha	Sandip	Toronto	CA
5	Doe	John	Dubai	AE
6	Doe	Jane	Bhaka	BD
7	Cargiano	Antonio	Vancouver	CA
8	Ryan	Steve	Sanity	GB
9	Sankaroddy	Ramesh	Hyderabad	IN

Task B: Practice exercises on UPDATE

Now, let us practice creating and running some UPDATE related queries.

1. Problem:

Update the city of the instructor record to Markham whose id is 1.

Solution:

```
UPDATE Instructor  
SET city='Markham'  
WHERE ins_id=1;
```

```
SELECT * FROM Instructor;
```

```
1. SELECT * FROM Instructor;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

```
UPDATE instructor  
SET city='Markham'  
WHERE ins_id=1  
1 row affected
```

```
SELECT * FROM instructor
```

ins_id	lastname	firstname	city	country
1	Ahuja	Rav	Markham	CA
2	Cheng	Raul	Toronto	CA
3	Vasudevan	Hima	Chicago	US
4	Saha	Sandip	Toronto	CA
5	Doe	John	Dubai	AE
6	Doe	Jane	Thakur	BD
7	Cagliostro	Antonio	Vancouver	CA
8	Ryan	Steve	Bartley	GB
9	Samarreddy	Ramesh	Hyderabad	IN

2. Problem:

Solution

```
UPDATE Instructor  
SET city='Dhaka', country='BD'  
WHERE ins_id=4;
```

```
SELECT * FROM Instructor;
```

The screenshot shows a SQL query execution interface. At the top, a text input field contains the query `SELECT * FROM Instructor;`. Below it, a tip reads: "Tip: Autocomplete with Ctrl+Enter or Cmd+Enter". A "Submit query" button is visible. The results section is titled "Results" and contains a green banner stating "All commands ran successfully". Below this, the executed queries are listed: `UPDATE Instructor SET city='Dhaka', country='BD' WHERE ins_id=4` with the note "1 row affected", and `SELECT * FROM Instructor`. A table with 5 columns (`ins_id`, `lastname`, `firstname`, `city`, `country`) and 9 rows of data is displayed. A vertical "Support" button is on the right side of the results area.

ins_id	lastname	firstname	city	country
1	Ahuja	Ravi	Markham	CA
2	Cheng	Raul	Toronto	CA
3	Vasudevan	Ranga	Chicago	US
4	Saha	Sandip	Dhaka	BD
5	Doe	John	Dubai	AE
6	Doe	Jane	Dhaka	BD
7	Carigliano	Antonio	Vancouver	CA
8	Ryan	Steve	Burby	GB
9	Samaraditya	Ramesh	Hyderabad	IN

Exercise 3: DELETE

In this exercise, you will first go through an example of using DELETE in a query and then solve an exercise problem by using it.

Task A: Example exercise on DELETE

Let us go through an example of a DELETE related query:

1. In this example, we want to remove a row from the table.

1. Problem:

Remove the instructor record of Doe whose id is 6.

2. Solution:

```
DELETE FROM instructor  
WHERE ins_id = 6;
```

3. **SELECT * FROM Instructor;**

The screenshot shows a web application titled "Practice SQL" with a breadcrumb "home / Practice SQL / Instructors". The database is set to "instructors". A query box contains the command "SELECT * FROM Instructor;". Below the query box, a tip states: "Tip: Autocomplete with Ctrl+Enter or Cmd+Enter". A "Submit query" button is present. The results section shows a green message: "All commands ran successfully". Below this, the query "SELECT * FROM Instructor" is displayed above a table with the following data:

ins_id	lastname	firstname	city	country
1	Ahujja	Erv	Manhattan	CA
2	Cheng	Raul	Toronto	CA
3	Vasudevan	Hima	Chicago	US
4	Taha	Sandip	Dhaka	BD
5	Doe	John	Dubai	AE
7	Cargiano	Antonio	Vancouver	CA
8	Ryan	Steve	Sanlly	GB
9	Samaroddy	Ramesh	Hyderabad	IN

Task B: Practice exercise on DELETE

Now, let us practice creating and running a DELETE related query.

1. Problem:

Remove the instructor record of Hima.

Solution:

```
DELETE FROM instructor
WHERE firstname = 'Hima';

SELECT * FROM Instructor;
```

The screenshot shows a SQL code editor interface. At the top, a code block contains the following SQL commands:

```
1 DELETE FROM instructor
2 WHERE firstname = 'Hima';
3
4 SELECT * FROM Instructor;
```

Below the code block, a tip reads: "Tip: Autocomplete with Ctrl+Enter or Cmd+Enter". A "Submit query" button is visible. The "Results" section shows a green message: "All commands ran successfully". Below this, the executed queries and their results are displayed:

DELETE FROM instructor
WHERE firstname = 'Hima'
1 row affected

SELECT * FROM Instructor

ins_id	lastname	firstname	city	country
1	Ahuja	Raj	Mumbai	CA
2	Chong	Raul	Toronto	CA
4	Saha	Sandip	Dhaka	BD
5	Owa	John	Dubai	AE
7	Cangiano	Antonio	Vancouver	CA
8	Ryan	Steve	Batley	GB
9	Sannareddy	Ramesh	Hyderabad	IN

A vertical "Support" button is located on the right side of the interface.

This is the end of the notebook. In this code notebook some of knowledge required for a data scientist and some of the skills used by data scientists on a daily basis were shown and applied. The code and images examples were provided by IBM, and the development of the code, solutions and outputs, as well as some notes and editions, were carried out by me, Saulo Villaseñor (<https://www.linkedin.com/in/saulo-villase%C3%B1or-60669610a>), so that this notebook is available to everybody and work as a reference for anyone who wishes to learn new skills.