



**IBM Developer
SKILLS NETWORK**

Hands-on Lab : INSERT, UPDATE, DELETE

Estimated time needed: 20 minutes

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

After completing this lab, you will be able to:

- Insert new rows into a table
- Update data in existing rows of the table
- Remove 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**.

```
SELECT * FROM Instructor;
```



home / Practice SQL / Instructors

Practice SQL

Database: Instructors

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

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

2. Click **Submit Query**.

3. 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

4. These are the column attribute descriptions from the **Instructor** table:

```
Instructor (  
  ins_id:      unique identification number of the instructors,  
  lastname:    last name of the instructors,  
  firstname:   first name of the instructors,  
  city:        name of the cities where instructors are located,  
  country:     two-letter country code of the countries where instructors are  
)
```

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');
```



- Copy the solution code above by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.
- Copy the code below by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.

```
SELECT * FROM Instructor;
```



- Your output resultset should look like the image below:

The screenshot shows the 'Practice SQL' interface. At the top, there's a breadcrumb 'home / Practice SQL / Instructors'. Below it, the title 'Practice SQL' is displayed. The database is set to 'Instructors'. A query input box contains '1 SELECT * FROM Instructor;'. Below the input box, a tip says 'Tip: Autocomplete with Ctrl+Enter or Cmd+Enter'. A 'Submit query' button is present. The 'Results' section shows a green bar indicating 'All commands ran successfully'. Below this, the query 'SELECT * FROM instructor' is shown. The result is a table with 5 columns: ins_id, lastname, firstname, city, and country. The table contains 4 rows of data. At the bottom, it says 'Powered by Datasette'.

ins_id	lastname	firstname	city	country
1	Ahuja	Rav	Toronto	CA
2	Chong	Raul	Toronto	CA
3	Vitodevan	Hima	Chicago	US
4	Saha	Sandip	Edmonton	CA

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

- 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')
```

3. Copy the solution code above by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.
4. Copy the code below by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.

```
SELECT * FROM Instructor;
```

5. Your output resultset should look like the image below:

The screenshot shows the 'Practice SQL' interface. At the top, the database is set to 'Instructors'. The query input field contains '1 SELECT * FROM Instructor;'. Below the input field, a tip states: '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 query 'SELECT * FROM instructor' is displayed. The result set is a table with 5 columns: ins_id, lastname, firstname, city, and country. It contains 6 rows of data. At the bottom, it says 'Powered by Datasette'.

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

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.

▼ Hint

Follow example 1 of the INSERT exercise.

▼ Solution

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

SELECT * FROM Instructor;
```



▼ Output

```

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	Ahuja	Rav	Toronto	CA
2	Chong	Raul	Toronto	CA
3	Vasudevan	Hima	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.

▼ Hint

Follow example 2 of the INSERT exercise.

▼ Solution

```

INSERT INTO Instructor(ins_id, lastname, firstname, city, country)
VALUES(8, 'Ryan', 'Steve', 'Barlby', 'GB'), (9, 'Sannareddy', 'Ramesh', 'Hyder
SELECT * FROM Instructor;

```



▼ Output

```

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	Vasudevan	Hima	Chicago	US
4	Saha	Sandip	Edmonton	CA
5	Doe	John	Sydney	AU
6	Doe	Jane	Dhaka	BD
7	Cangiano	Antonio	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";
```



- Copy the solution code above by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.
- Copy the code below by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.

```
SELECT * FROM Instructor;
```



- Your output resultset should look like the image below:

The screenshot shows a web interface for practicing SQL. At the top, it says "Practice SQL" and "Database: Instructors". Below this is a text input field containing the SQL query: `1 SELECT * FROM Instructor;`. A tip below the input field says: "Tip: Autocomplete with Ctrl+Enter or Cmd+Enter". Below the tip is a "Submit query" button. Underneath the button, the word "Results" is displayed. A green banner below "Results" says "All commands ran successfully". Below this banner, the SQL query `SELECT * FROM instructor` is shown. At the bottom, a table displays the results of the query. The table has five columns: `ins_id`, `lastname`, `firstname`, `city`, and `country`. The table contains 9 rows of data.

ins_id	lastname	firstname	city	country
1	Ahuja	Rav	Toronto	CA
2	Chong	Raul	Toronto	CA
3	Vasudevan	Hima	Chicago	US
4	Saha	Sandip	Toronto	CA
5	Doe	John	Sydney	AU
6	Doe	Jane	Dhaka	BD
7	Cagliano	Antonio	Vancouver	CA
8	Ryan	Steve	Barby	GB
9	Sannareddy	Ramesh	Hyderabad	IN

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

- 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;
```



3. Copy the solution code above by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.

4. Copy the code below by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.

```
SELECT * FROM Instructor;
```



5. Your output resultset should look like the image below:

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	Rav	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	Dhaka	BD
7	Cagliano	Antonio	Vancouver	CA
8	Ryan	Steve	Barby	GB
9	Sannareddy	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.

▼ Hint

Follow example 1 of the UPDATE exercise.

▼ Solution

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

SELECT * FROM Instructor;
```



▼ Output

```
5 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	Chong	Raul	Toronto	CA
3	Vasudevan	Hima	Chicago	US
4	Saha	Sandip	Toronto	CA
5	Doe	John	Dubai	AE
6	Doe	Jane	Dhaka	BD
7	Cangiano	Antonio	Vancouver	CA
8	Ryan	Steve	Barlby	GB
9	Sannareddy	Ramesh	Hyderabad	IN

Support

2. Problem:

Update the city and country for Sandip with id 4 to Dhaka and BD respectively.

▼ Hint

Follow example 2 of the UPDATE exercise.

▼ Solution

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

SELECT * FROM Instructor;
```



▼ Output

```
4
5 SELECT * FROM Instructor;
```

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

```
UPDATE Instructor
SET city='Dhaka', country='BD'
WHERE ins_id=4
1 row affected
```

```
SELECT * FROM Instructor
```

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

Support

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. Copy the solution code above by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of **Custom SQL query** of the Datasette tool. Then click **Submit query**.
4. Copy the code below by clicking on the little copy button on the bottom right of the codeblock below and paste it to the textbox of the Datasette tool. Then click **Submit query**.

```
SELECT * FROM Instructor;
```



5. Your output resultset should look like the image below:

home / Practice SQL / Instructors

Practice SQL

Database: instructors

```
1 SELECT * FROM Instructors;
```

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	Rav	Markham	CA
2	Chong	Raul	Toronto	CA
3	Vasudevan	Hima	Chicago	US
4	Saha	Sandip	Dhaka	BD
5	Doe	John	Dubai	AE
7	Cagliano	Antonio	Vancouver	CA
8	Ryan	Steve	Barby	GB
9	Sannareddy	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.

▼ Hint

Follow example 1 of the DELETE exercise.

▼ Solution

```
DELETE FROM instructor
```

```
WHERE firstname = 'Hima';

SELECT * FROM Instructor;
```



▼ Output

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

Tip: Autocomplete with Ctrl+Enter or Cmd+Enter

Submit query

Results

All commands ran successfully

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

SELECT * FROM Instructor

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

Support

Congratulations! You have completed this Lab.

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Changelog

Date	Version	Changed by	Change Description
2020-12-23	1.1	Steve Ryan	ID Review
2020-11-30	1.0	Sandip Saha Joy	Initial version created

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