

# CREATE, ALTER, TRUNCATE, DROP

We will learn some commonly used DDL (Data Definition Language) statements of SQL. First you will learn the CREATE statement, which is used to create a new table in a database. Next, you will learn the ALTER statement which is used to add, delete, or modify columns in an existing table. Then, you will learn the TRUNCATE statement which is used to remove all rows from an existing table without deleting the table itself. Lastly, you will learn the DROP statement which is used to delete an existing table in a database.

## How does the syntax of a CREATE statement look?

```
CREATE TABLE table_name (  
    column1 datatype,  
    column2 datatype,  
    column3 datatype,  
    ....  
);
```

## How does the syntax of an ALTER statement look?

```
ALTER TABLE table_name  
ADD COLUMN column_name data_type column_constraint;  
  
ALTER TABLE table_name  
DROP COLUMN column_name;  
  
ALTER TABLE table_name  
ALTER COLUMN column_name SET DATA TYPE data_type;  
  
ALTER TABLE table_name  
RENAME COLUMN current_column_name TO new_column_name;
```

## How does the syntax of a TRUNCATE statement look?

```
TRUNCATE TABLE table_name;
```

## How does the syntax of a DROP statement look?

```
DROP TABLE table_name;
```

## Software Used in this Lab

In this lab, you will use [IBM Db2 Database](#). Db2 is a Relational Database Management System (RDBMS) from IBM, designed to store, analyze and retrieve the data efficiently.

To complete this lab you will utilize a Db2 database service on IBM Cloud. If you did not already complete this lab task earlier in this module, you will not yet have access to Db2 on IBM Cloud, and you will need to follow this lab first:

- [Hands-on Lab : Sign up for IBM Cloud, Create Db2 service instance and Get started with the Db2 console](#)

## Database Used in this Lab

The databases used in this lab are internal databases.

## Objectives

- Creating a new table in a database
- Adding, deleting, or modifying columns in an existing table
- Removing all rows from an existing table without deleting the table itself
- Deleting an existing table in a database

## Instructions

When you approach the exercises in this lab, follow the instructions to run the queries on Db2:

- Go to the [Resource List](#) of IBM Cloud by logging in where you can find the Db2 service instance that you created in a previous lab under **Services** section. Click on the **Db2-xx service**. Next, open the Db2 Console by clicking on **Open Console** button. Click on the 3-bar menu icon in the top left corner and go to the **Run SQL** page. The Run SQL tool enables you to run SQL statements.
  - If needed, follow [Hands-on Lab : Sign up for IBM Cloud, Create Db2 service instance and Get started with the Db2 console](#)

## Exercise 1: CREATE

In this exercise, you will use the CREATE statement to create two new tables using Db2.

1. You need to create two tables, **PETSALE** and **PET**. To create the two tables PETSALE and PET, copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.
2. **CREATE TABLE PETSALE (**
3.     **ID INTEGER NOT NULL,**
4.     **PET CHAR(20),**
5.     **SALEPRICE DECIMAL(6,2),**
6.     **PROFIT DECIMAL(6,2),**
7.     **SALEDATE DATE**
8.     **);**
- 9.
10. **CREATE TABLE PET (**
11.     **ID INTEGER NOT NULL,**
12.     **ANIMAL VARCHAR(20),**
13.     **QUANTITY INTEGER**
14.     **);**

The screenshot displays the IBM Db2 on Cloud RUN SQL interface. The top navigation bar includes 'IBM Db2 on Cloud', 'Storage: 14%', 'Cookie Preferences', 'Discover', and user icons. The main editor area, titled 'RUN SQL', shows two SQL scripts. The first script, 'CREATE TABLE PETSALE', is highlighted in blue and contains the following code:

```
1. CREATE TABLE PETSALE (  
2.     ID INTEGER NOT NULL,  
3.     PET CHAR(20),  
4.     SALEPRICE DECIMAL(6,2),  
5.     PROFIT DECIMAL(6,2),  
6.     SALEDATE DATE  
7. );  
8.  
9.  
10. CREATE TABLE PET (  
11.     ID INTEGER NOT NULL,  
12.     ANIMAL VARCHAR(20),  
13.     QUANTITY INTEGER  
14. );
```

The second script, 'CREATE TABLE PET', is also highlighted in blue and contains the following code:

```
10. CREATE TABLE PET (  
11.     ID INTEGER NOT NULL,  
12.     ANIMAL VARCHAR(20),  
13.     QUANTITY INTEGER  
14. );
```

The right-hand pane, titled 'Result - Dec 8, 2020 7:2...', shows the execution results for both scripts. The first script, 'CREATE TABLE PETSALE', has a status of 'Success' and 'Affected Rows: 0'. The second script, 'CREATE TABLE PET', also has a status of 'Success' and 'Affected Rows: 0'. The bottom of the interface features a 'Run all' button and a checkbox labeled 'Remember my last behavior'.

15. Now insert some records into the two newly created tables and show all the records of the two tables. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

```
16. INSERT INTO PETSale VALUES
17.     (1, 'Cat', 450.09, 100.47, '2018-05-29'),
18.     (2, 'Dog', 666.66, 150.76, '2018-06-01'),
19.     (3, 'Parrot', 50.00, 8.9, '2018-06-04'),
20.     (4, 'Hamster', 60.60, 12, '2018-06-11'),
21.     (5, 'Goldfish', 48.48, 3.5, '2018-06-14');
22.
23. INSERT INTO PET VALUES
24.     (1, 'Cat', 3),
25.     (2, 'Dog', 4),
26.     (3, 'Hamster', 2);
27.
28. SELECT * FROM PETSale;
29. SELECT * FROM PET;
```

The screenshot displays the IBM DB2 on Cloud 'Run SQL' interface. The left pane contains the SQL script, and the right pane shows the execution results for three queries.

**Query 1: INSERT INTO PETSale VALUES**

Status: Success | Affected Rows: 5 | Run time: 0.000s

**Query 2: INSERT INTO PET VALUES**

Status: Success | Affected Rows: 3 | Run time: 0.007s

**Query 3: SELECT \* FROM PETSale**

Run time: 0.004s

ID	PET	SALEPRICE	PROFIT	SALEDATE
1	Cat	450.09	100.47	2018-05-29
2	Dog	666.66	150.76	2018-06-01
3	Parrot	50.00	8.90	2018-06-04
4	Hamster	60.60	12.00	2018-06-11
5	Goldfish	48.48	3.50	2018-06-14

**Query 4: SELECT \* FROM PET**

Run time: 0.003s

ID	ANIMAL	QUANTITY
1	Cat	3
2	Dog	4
3	Hamster	2

At the bottom left, there is a 'Run all' button and a checkbox labeled 'Remember my last behavior'.

## Exercise 2: ALTER

In this exercise, you will use the ALTER statement to add, delete, or modify columns in two of the existing tables created in exercise 1.

### Task A: ALTER using ADD COLUMN

1. Add a new **QUANTITY** column to the **PETSALE** table and show the altered table. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.
2. `ALTER TABLE PETSale`
3. `ADD COLUMN QUANTITY INTEGER;`
- 4.
5. `SELECT * FROM PETSale;`

The screenshot shows the IBM Db2 on Cloud Run SQL interface. The top bar indicates 'IBM Db2 on Cloud' and 'Storage: 14%'. The main area is divided into a left pane for SQL code and a right pane for results.

**SQL Code:**

```
1. ALTER TABLE PETSale
2. ADD COLUMN QUANTITY INTEGER;
3.
4. SELECT * FROM PETSale;
```

**Results:**

- ALTER TABLE PETSale ADD COLUMN QUANTITY INTEGER**  
Status: Success | Affected Rows: 0 | Runtime: 0.017s
- SELECT \* FROM PETSale**  
Runtime: 0.002s

**Result set 1:**

ID	PET	SALEPRICE	PROFIT	SALEDATE	QUANTITY
1	Cat	450.59	100.47	2018-05-29	
2	Dog	666.66	150.76	2018-06-01	
3	Parrot	90.00	8.90	2018-06-04	
4	Hamster	60.60	12.00	2018-06-11	
5	Goldfish	48.48	3.50	2018-06-14	

At the bottom, there is a 'Run all' button and a checkbox for 'Remember my last behavior'.

6. Now update the newly added **QUANTITY** column of the **PETSALE** table with some values and show all the records of the table. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

7. **UPDATE** PETSALE **SET** QUANTITY = 9 **WHERE** ID = 1;
8. **UPDATE** PETSALE **SET** QUANTITY = 3 **WHERE** ID = 2;
9. **UPDATE** PETSALE **SET** QUANTITY = 2 **WHERE** ID = 3;
10. **UPDATE** PETSALE **SET** QUANTITY = 6 **WHERE** ID = 4;
11. **UPDATE** PETSALE **SET** QUANTITY = 24 **WHERE** ID = 5;
- 12.
13. **SELECT** \* **FROM** PETSALE;

The screenshot shows the IBM Db2 on Cloud interface. The top bar indicates 'IBM Db2 on Cloud' and 'Storage: 14%'. The 'Run SQL' page is active, showing a script editor on the left and a results pane on the right.

**SQL Script:**

```
1. UPDATE PETSALE SET QUANTITY = 9 WHERE ID = 1;
2. UPDATE PETSALE SET QUANTITY = 3 WHERE ID = 2;
3. UPDATE PETSALE SET QUANTITY = 2 WHERE ID = 3;
4. UPDATE PETSALE SET QUANTITY = 6 WHERE ID = 4;
5. UPDATE PETSALE SET QUANTITY = 24 WHERE ID = 5;
6.
7. SELECT * FROM PETSALE;
```

**Execution Results:**

- UPDATE PETSALE SET QUANTITY = 9 WHERE ID = 1: Status: Success | Affected Rows: 1 | Runtime: 0.000 s
- UPDATE PETSALE SET QUANTITY = 3 WHERE ID = 2: Status: Success | Affected Rows: 1 | Runtime: 0.000 s
- UPDATE PETSALE SET QUANTITY = 2 WHERE ID = 3: Status: Success | Affected Rows: 1 | Runtime: 0.000 s
- UPDATE PETSALE SET QUANTITY = 6 WHERE ID = 4: Status: Success | Affected Rows: 1 | Runtime: 0.000 s
- UPDATE PETSALE SET QUANTITY = 24 WHERE ID = 5: Status: Success | Affected Rows: 1 | Runtime: 0.000 s
- SELECT \* FROM PETSALE: Status: Success | Affected Rows: 5 | Runtime: 0.000 s

**Result set 1:**

ID	PET	SALEPRICE	PROFIT	SALEDATE	QUANTITY
1	Cat	490.00	100.07	2018-05-29	9
2	Dog	666.66	130.79	2018-05-01	3
3	Parrot	50.00	8.90	2018-06-04	2
4	Hamster	60.60	13.00	2018-06-11	6
5	Goldfish	48.48	5.50	2018-06-14	24

## Task B: ALTER using DROP COLUMN

1. Delete the **PROFIT** column from the **PETSALE** table and show the altered table.  
Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.
2. `ALTER TABLE PETSALE`
3. `DROP COLUMN PROFIT;`
- 4.
5. `SELECT * FROM PETSALE;`

The screenshot shows the IBM Db2 on Cloud 'Run SQL' interface. The top bar indicates 'IBM Db2 on Cloud' and 'Storage: 14%'. The main area is divided into a left pane for SQL code and a right pane for results.

**SQL Code:**

```
1 ALTER TABLE PETSALE
2 DROP COLUMN PROFIT;
3
4 SELECT * FROM PETSALE;
```

**Results:**

The results pane shows two successful queries. The first query, 'ALTER TABLE PETSALE DROP COLUMN PROFIT', has a status of 'Success' and 'Affected Rows: 0'. The second query, 'SELECT \* FROM PETSALE', has a status of 'Success' and 'Run time: 0.004 s'. The results for the second query are displayed in a table with 5 columns: ID, PET, SALEPRICE, SALEDATE, and QUANTITY.

ID	PET	SALEPRICE	SALEDATE	QUANTITY
1	Cat	450.00	2018-05-29	9
2	Dog	666.66	2018-06-01	3
3	Rabbit	90.00	2018-06-04	2
4	Hamster	40.00	2018-06-11	6
5	Goldfish	48.48	2018-06-14	24

## Task C: ALTER using ALTER COLUMN

1. Change the data type to **VARCHAR(20)** type of the column **PET** of the table **PETSALE** and show the altered table. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.
2. **ALTER TABLE PETSALE**
3. **ALTER COLUMN PET SET DATA TYPE VARCHAR(20);**
- 4.
5. **SELECT \* FROM PETSALE;**

The screenshot displays the IBM Db2 on Cloud console interface. The top navigation bar includes 'IBM Db2 on Cloud', 'Storage: 14%', 'Cookie Preferences', 'Discover', and user profile icons. The main area is titled 'RUN SQL' and shows a script editor with the following SQL code:

```
1 ALTER TABLE PETSALE
2 ALTER COLUMN PET SET DATA TYPE VARCHAR(20);
3
4 SELECT * FROM PETSALE;
```

The right-hand pane shows the execution results for the second statement, 'SELECT \* FROM PETSALE'. It indicates a successful execution with a run time of 0.005 s and 5 rows returned. The results are displayed in a table with the following columns: ID, PET, SALEPRICE, SALEDATE, and QUANTITY.

ID	PET	SALEPRICE	SALEDATE	QUANTITY
1	Cat	450.09	2018-05-19	3
2	Dog	666.66	2018-06-01	3
3	Parrot	50.00	2018-06-04	1
4	Hamster	60.60	2018-06-11	6
5	Goldfish	48.48	2018-06-14	14

At the bottom left, there is a 'Run all' button and a checkbox for 'Remember my last behavior'.



- Now verify if the data type of the column **PET** of the table **PETSALE** changed to **VARCHAR(20)** type or not. Click on the 3 bar menu icon in the top left corner and click **Explore > Tables**. Find the **PETSALE** table from Schemas by clicking **Select All**. Click on the **PETSALE** table to open the Table Definition page of the table. Here, you can see all the current data type of the columns of the **PETSALE** table.

The screenshot displays a database management interface with three panels:

- Schemas:** A list of schemas including TPZ00692, AUDIT, DB2INST1, ERRORSHEMA, SQL74730, and ST\_INFORMTN\_SCHEMA. A 'New implicit schema' button is visible.
- Tables:** A table listing tables under the TPZ00692 schema. The table 'PETSale' is selected and highlighted in red.
- Table Definition:** A detailed view of the 'PETSale' table structure. It shows columns: ID (INTEGER), PET (VARCHAR(20)), SALEPRICE (DECIMAL), SALEDATE (DATE), and QUANTITY (INTEGER). The 'PET' column is highlighted with a red box, indicating its data type is VARCHAR and its length is 20.

COLUMN NAME	DATA TYPE	NULLABLE	LENGTH	SCALE
ID	INTEGER	N		0
PET	VARCHAR	Y	20	0
SALEPRICE	DECIMAL	Y	8	2
SALEDATE	DATE	Y	4	0
QUANTITY	INTEGER	Y		0

## Task D: ALTER using RENAME COLUMN

1. Rename the column **PET** to **ANIMAL** of the **PETSALE** table and show the altered table. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.
2. `ALTER TABLE PETSale`
3. `RENAME COLUMN PET TO ANIMAL;`
- 4.
5. `SELECT * FROM PETSale;`

The screenshot shows the IBM Db2 on Cloud Run SQL interface. The left pane contains the following SQL code:

```
1 ALTER TABLE PETSale
2 RENAME COLUMN PET TO ANIMAL;
3
4 SELECT * FROM PETSale;
```

The right pane shows the execution results. The first command, `ALTER TABLE PETSale RENAME COLUMN PET TO ANIMAL`, executed successfully with a runtime of 0.021s. The second command, `SELECT * FROM PETSale`, executed successfully with a runtime of 0.004s. The results of the second command are displayed in a table:

ID	ANIMAL	SALEPRICE	SALEDATE	QUANTITY
1	Cat	450.09	2018-06-19	9
2	Dog	665.88	2018-06-01	8
3	Parrot	60.00	2018-06-04	2
4	Hamster	60.60	2018-06-11	6
5	Goldfish	48.48	2018-06-14	24

## Exercise 3: TRUNCATE

In this exercise, you will use the TRUNCATE statement to remove all rows from an existing table created in exercise 1 without deleting the table itself.

1. Remove all rows from the **PET** table and show the empty table. Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

2. `TRUNCATE TABLE PET IMMEDIATE;`
- 3.
4. `SELECT * FROM PET;`

The screenshot shows the IBM Db2 on Cloud RUN SQL interface. The top bar includes 'IBM Db2 on Cloud', 'Storage: 14%', 'Cookie Preferences', 'Discover', and user icons. The main area is divided into a script editor on the left and a results pane on the right.

**Script Editor:** Contains two lines of SQL code:  
1. `TRUNCATE TABLE PET IMMEDIATE;`  
2. `SELECT * FROM PET;`

**Results Pane:** Shows the execution results for the two statements.  
- The first statement, `TRUNCATE TABLE PET IMMEDIATE`, executed successfully with a run time of 0.954 s. The status is 'Success' and 'Affected Rows: 0'.  
- The second statement, `SELECT * FROM PET`, also executed successfully with a run time of 0.925 s. Below the statement, there is a table header with columns 'ID', 'ANIMAL', and 'QUANTITY'. However, the table is empty, and a message states 'No available items to display'.

## Exercise 4: DROP

In this exercise, you will use the DROP statement to delete an existing table created in exercise 1.

1. Delete the **PET** table and verify if the table still exists or not (SELECT statement won't work if a table doesn't exist). Copy the code below and paste it to the textbox of the **Run SQL** page. Click **Run all**.

2. DROP TABLE PET;
- 3.
4. SELECT \* FROM PET;

The screenshot displays the IBM Db2 on Cloud RUN SQL interface. The top header bar includes the IBM Db2 on Cloud logo, storage usage (1.4%), and links for Cookie Preferences, Discover, and user profile. The main workspace is titled "RUN SQL" and shows a script editor with two lines of SQL: "DROP TABLE PET;" and "SELECT \* FROM PET;". The script is numbered 1 through 15. To the right, the "Result" pane shows the execution history. The first query, "DROP TABLE PET", executed successfully with a runtime of 0.000 s and affected 0 rows. The second query, "SELECT \* FROM PET", failed with a runtime of 0.000 s. The error message is: "TABLE 'PET' is in undefined state. SQLCODE=-204, SQLSTATE=42704, DRIVER=4.34.34". A link to "Learn more about this error" is provided. At the bottom left, there is a "Run all" button and a checkbox for "Remember my last behavior". A red error icon is visible in the bottom right corner of the script editor.

IBM Db2 on Cloud Storage: 1.4%

Cookie Preferences Discover

RUN SQL

Unsaved - 1

Script Library Result History

1 DROP TABLE PET;

2

3 SELECT \* FROM PET;

4

5

6

7

8

9

10

11

12

13

14

15

Result - Db2 B.3020 7.1...

✓ DROP TABLE PET Runtime: 0.000 s

Status: Success Affected Rows: 0

✗ SELECT \* FROM PET Runtime: 0.000 s

Status: Failed

Error message:  
"TABLE 'PET' is in undefined state. SQLCODE=-204, SQLSTATE=42704, DRIVER=4.34.34"

[Learn more about this error](#)

Run all Remember my last behavior