

Lab: CREATE, ALTER, TRUNCATE, DROP Tables

Estimated time needed: 15 minutes

In this lab, you 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

After completing this lab, you will be able to:

- Create a new table in a database
- Add, delete, or modify columns in an existing table
- Remove all rows from an existing table without deleting the table itself
- Delete 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**. In the **History** section below the editor box, you will be able to see if the query has been executed successfully or not.

```
CREATE TABLE PETSALE (
    ID INTEGER NOT NULL,
    PET CHAR(20),
    SALEPRICE DECIMAL(6,2),
    PROFIT DECIMAL(6,2),
    SALEDATE DATE
);

CREATE TABLE PET (
    ID INTEGER NOT NULL,
    ANIMAL VARCHAR(20),
    QUANTITY INTEGER
);
```

The screenshot shows the IBM Db2 on Cloud interface with the SQL editor open. The left sidebar has icons for Data objects, Saved objects, and other database management tasks. The main area has tabs for Data objects and Saved objects, with the Data objects tab selected. A red box highlights the 'SQL' tab icon. The SQL editor window has a toolbar with icons for Find objects, Refresh, and Syntax assistant (which is checked). The code area contains two CREATE TABLE statements:

```

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

```

A red box highlights the 'History' section in the bottom right. The history table shows three entries:

Script	Date	Status
Untitled - 1	Apr 21, 2023 4:03:57 PM	<input checked="" type="checkbox"/> 2
CREATE TABLE PETSALE (ID INTEGER NOT NULL, PET CHAR(20), SALEPRIC...		<input checked="" type="checkbox"/>
CREATE TABLE PET (ID INTEGER NOT NULL, ANIMAL VARCHAR(20), QUANTI...		<input checked="" type="checkbox"/>

2. 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.

```

INSERT INTO PETSALE VALUES
(1,'Cat',450.00,100.47,'2018-05-29'),
(2,'Dog',666.66,150.76,'2018-06-01'),
(3,'Parrot',50.00,8.9,'2018-06-04'),
(4,'Hamster',60.60,12,'2018-06-11'),
(5,'Goldfish',48.48,3.5,'2018-06-14');

INSERT INTO PET VALUES
(1,'Cat',3),
(2,'Dog',4),
(3,'Hamster',2);

SELECT * FROM PETSALE;
SELECT * FROM PET;

```

IBM Db2 on Cloud

The screenshot shows the IBM Db2 on Cloud interface. On the left is a sidebar with icons for Data objects, Saved objects, Find objects, SQL, and other database management functions. The main area has tabs for Data objects and Saved objects, with the Data objects tab selected. A search bar labeled 'Find objects' is present. Below it, a dropdown menu shows 'DMT80331'. The central part of the screen is a code editor titled '* Untitled ...' containing the following SQL script:

```

1 INSERT INTO PETSALE VALUES
2   (1,'Cat',450.09,100.47,'2018-05-29'),
3   (2,'Dog',666.66,150.76,'2018-06-01'),
4   (3,'Parrot',50.00,8.9,'2018-06-04'),
5   (4,'Hamster',60.60,12,'2018-06-11'),
6   (5,'Goldfish',48.48,3.5,'2018-06-14');
7
8 INSERT INTO PET VALUES
9   (1,'Cat',3),
10

```

Below the code editor is a 'History' panel with tabs for History and Results. The History tab is active, showing a list of previous queries with their scripts, dates, and statuses. One query, 'SELECT * FROM PETSALE', is highlighted with a red border.

Script	Date	Status
^ Untitled - 1	Apr 21, 2023 4:08:05 PM	✓ 4
INSERT INTO PETSALE VALUES (1,'Cat',450.09,100.47,'2018-05-29'), (...		✓
INSERT INTO PET VALUES (1,'Cat',3), (2,'Dog',4), (3,'Hamster',2)		✓
SELECT * FROM PETSALE		✓
SELECT * FROM PET		✓

You can click on the query in the History section to check its result:

IBM Db2 on Cloud

The screenshot shows the IBM Db2 on Cloud interface. The sidebar and code editor are identical to the previous screenshot. The History tab is still active in the History panel. However, the Results tab is now active, and the 'Result set 1' tab under it is selected. This displays the results of the last query from the history, which was 'SELECT * FROM PETSALE'. The results are presented in a table:

ID	PET	SALEPRICE	PROFIT
1	Cat	450.09	100.47
2	Dog	666.66	150.76
3	Parrot	50.00	8.90
4	Hamster	60.60	12.00

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**.

```
ALTER TABLE PETSALE
ADD COLUMN QUANTITY INTEGER;
SELECT * FROM PETSALE;
```

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with icons for Data objects, Saved objects, Find objects, SQL, History, Results, and Start. The SQL tab is selected. In the main area, there's a toolbar with icons for file operations and a syntax assistant toggle. Below the toolbar is a code editor window titled '* Untitled ...' containing four lines of SQL code:

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

Below the code editor is a results pane with tabs for History and Results. The Results tab is selected, showing a table titled 'Result set 1' with the following data:

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

2. 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**. After the query has executed successfully, click on it to check the result set.

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

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with various icons: Data objects, Saved objects, Find objects, SQL (which is selected), History, Results, and Details. The main area is titled '* Untitled ...' and contains the following SQL code:

```

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;

```

The 'Results' tab is selected, showing a table with the following data:

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	2018-06-01
4	Hamster	60.60	12.00	2018-06-11
5	Goldfish	48.48	3.50	2018-06-14

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**.

```

ALTER TABLE PETSALe
DROP COLUMN PROFIT;
SELECT * FROM PETSALe;

```

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with icons for Data objects, Saved objects, Find objects, SQL (which is selected), DMT80331, History, Details, Filter table, and a lightbulb icon. The main area has a toolbar with icons for file operations, search, and syntax assistance. Below the toolbar is a code editor window titled '* Untitled ...' containing four lines of SQL:

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

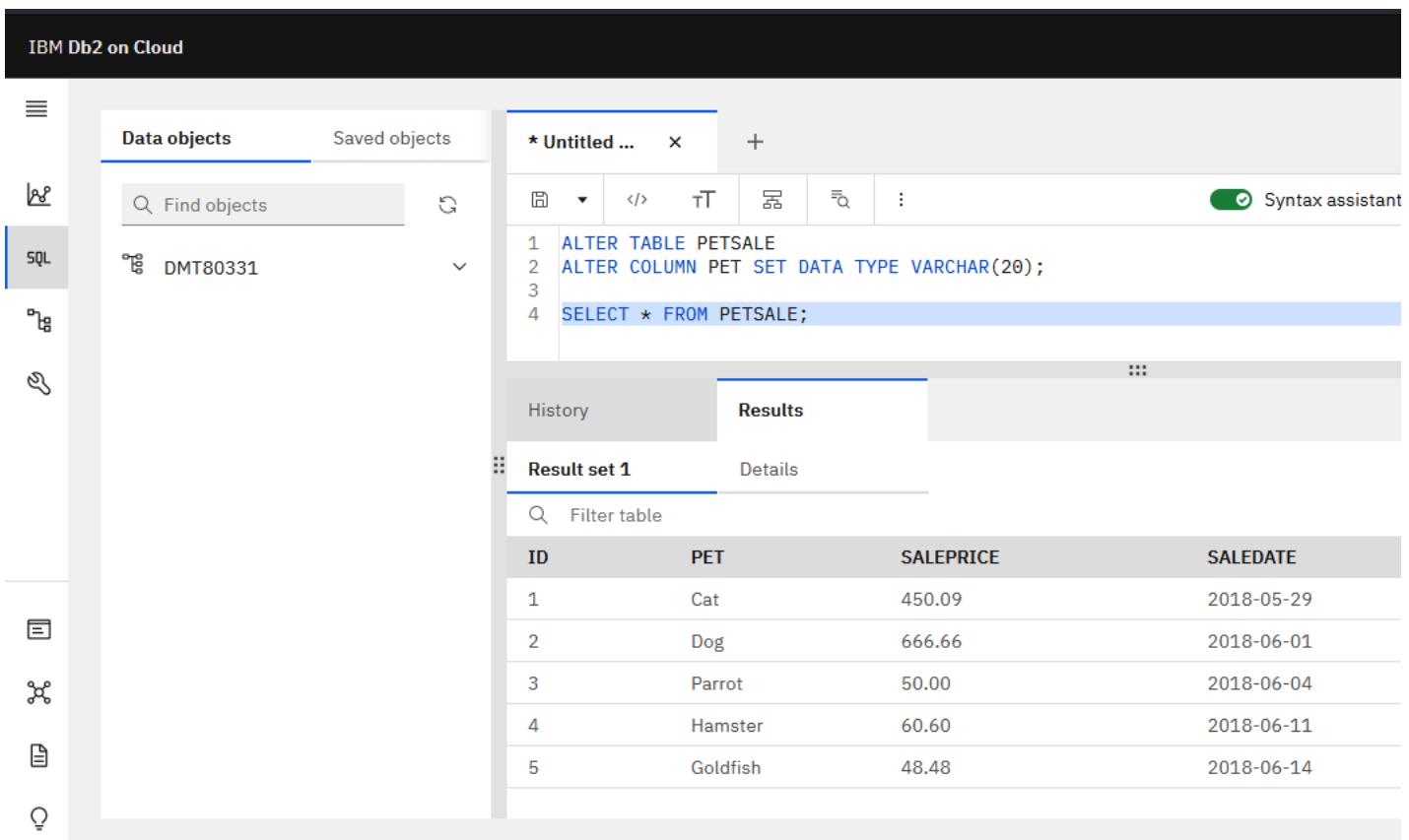
Below the code editor is a results section with tabs for History and Results. The Results tab is active, showing a table titled 'Result set 1' with five rows of data:

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

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.

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



The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with icons for Data objects, Saved objects, Find objects, SQL, Data, Tables, and Help. The SQL icon is selected. In the main area, a SQL editor window titled '* Untitled ...' contains the following code:

```

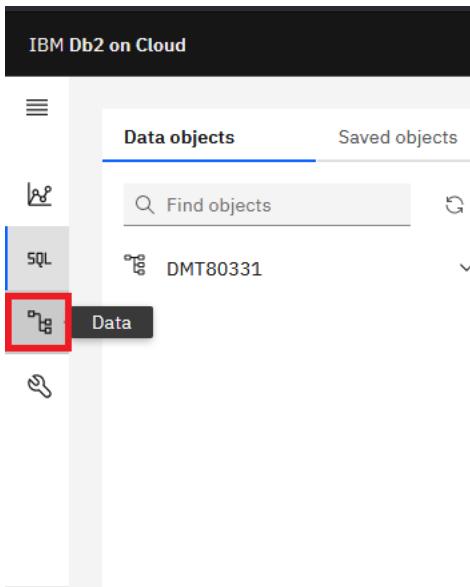
1 ALTER TABLE PETSALE
2 ALTER COLUMN PET SET DATA TYPE VARCHAR(20);
3
4 SELECT * FROM PETSALE;

```

Below the editor, there are tabs for History and Results. The Results tab is active, showing a table named 'Result set 1' with the following data:

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

2. Now verify if the data type of the column **PET** of the table **PETSALE** changed to **VARCHAR(20)** type or not. Click on the Data Section in the left menu bar.



Then click on Tables:

IBM Db2 on Cloud

- Load Data
- Load History
- Tables
- Views
- Indexes
- Aliases
- MQTs
- Sequences
- Application objects

SQL

File selection

Source Target

You are loading the file

My Computer
A single delimited text file (CSV) without header row.

Find your schema and choose the table **PETSALE**

IBM Db2 on Cloud

- Load Data
- Load History
- Tables
- Views
- Indexes
- Aliases
- MQTs
- Sequences
- Application objects

SQL

Schemas

<input checked="" type="checkbox"/> Name	Definer type	Tables ▾
DMT80331	User	3

Total: 1, selected: 1

Tables

<input type="checkbox"/> Name ▾	Schema
BILLING_TEST	DMT80331
PET	DMT80331
PETSALE	DMT80331

Total: 3, selected: 0

You will see that the datatype of the column **PET** has changed to **VARCHAR(20)**

IBM Db2 on Cloud

Load Data Load History Tables Views Indexes Aliases MQTs Sequences Application objects

Find schemas or tables

Tables

New table +

PETSAL

Name	Data type	Nullable
ID	INTEGER	N
PET	VARCHAR	Y
SALEPRICE	DECIMAL	Y
SALEDATE	DATE	Y
QUANTITY	INTEGER	Y

Total: 3, selected: 0

View data

Task D: ALTER using RENAME COLUMN

- In the PETSAL table, rename the column PET to ANIMAL and show the altered table. Copy the code below and paste it to the textbox of the Run SQL page. Click **Run all**.

```
ALTER TABLE PETSAL
RENAME COLUMN PET TO ANIMAL;
SELECT * FROM PETSAL;
```

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with various icons: Data objects (selected), Saved objects, Find objects, SQL (selected), History, Details, Filter table, and a lightbulb icon. The main area has a title bar 'IBM Db2 on Cloud' and a tab 'Data objects'. Below it, a search bar says 'Find objects' and a dropdown shows 'DMT80331'. The central part is a 'Run SQL' window titled '* Untitled ...'. It contains four numbered lines of SQL code:

- 1 ALTER TABLE PETSALE
- 2 RENAME COLUMN PET TO ANIMAL;
- 3
- 4 SELECT * FROM PETSALE;

A 'Syntax assistant' button is at the top right of the SQL window. Below the SQL window is a 'Results' section with tabs 'History' and 'Results'. Under 'Result set 1', there's a table with columns ID, ANIMAL, SALEPRICE, and SALEDATE. The 'ANIMAL' column is highlighted with a red border. The table data is as follows:

ID	ANIMAL	SALEPRICE	SALEDATE
1	Cat	450.09	2018-05-29
2	Dog	666.66	2018-06-01
3	Parrot	50.00	2018-06-04
4	Hamster	60.60	2018-06-11
5	Goldfish	48.48	2018-06-14

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. You will see no data in the Result section.

```
TRUNCATE TABLE PET IMMEDIATE;
SELECT * FROM PET;
```

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with various icons: Data objects, Saved objects, Find objects, SQL (which is selected), Databases, Tables, Views, Procedures, Functions, and Scripts. The main area has a title bar "IBM Db2 on Cloud". Below it, there's a "Data objects" section with a search bar and a list containing "DMT80331". To the right is a SQL editor window titled "* Untitled ...". It contains three lines of code: "1 TRUNCATE TABLE PET IMMEDIATE;", "2", and "3 SELECT * FROM PET;". A "Syntax assistant" toggle is turned on. Below the editor is a results viewer. It has tabs for "History" and "Results", with "Results" being active. It shows a table with columns ID, ANIMAL, and QUANTITY. The table body is empty, displaying a large gray cube icon. A message "You don't have any data currently" is centered below the table.

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**. You will see that the **select statement fails**.

```
DROP TABLE PET;
SELECT * FROM PET;
```

The screenshot shows the IBM Db2 on Cloud interface. The sidebar and main layout are identical to the previous screenshot. The SQL editor window now contains two lines of code: "1 DROP TABLE PET;" and "2 SELECT * FROM PET;". The results viewer shows a history of scripts run. There is one entry: "Untitled - 1" from April 21, 2023, at 4:28:00 PM. The "DROP TABLE PET" row is highlighted with a red border, while the "SELECT * FROM PET" row is also highlighted with a red border, indicating an error. The status column shows a green checkmark next to the first row and a red circle with a white exclamation mark next to the second row.

Congratulations! You have completed this Lab. You are ready for the next topic.

Author(s)

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