SQL Clauses

by Sophia

WHAT'S COVERED

In this lesson, you will begin learning how to use Structured Query Language (SQL), a programming language designed for creating, manipulating, and querying a relational database. The most common action in SQL is to select certain columns from a table where a certain condition exists. You will learn to do this using the SELECT, FROM, and WHERE clauses. Specifically, this lesson will cover:

1. Statements and Clauses

SQL is based on statements and clauses. A **statement** is a standalone instruction that the DBMS can interpret and execute. **Clauses** are the individual commands used in statements. For example,

```
SELECT * FROM sales WHERE value > 10;
```

is a statement.

This statement consists of three clauses:

```
SELECT *
FROM sales
WHERE value > 10
```

The **SELECT clause** is used to indicate which columns (attributes) you want to include in the information you receive.

The **FROM clause** is used to indicate which table the data should come from.

The WHERE clause specifies any criteria that should be applied when choosing which rows (records) to include.

TERMS TO KNOW

Statement

A standalone instruction that the DBMS can interpret and execute.

Clause

An individual command used in a statement.

SELECT Clause

The part of a SELECT statement that specifies which columns should be included.

FROM Clause

The part of a SQL SELECT statement that identifies which tables should be used as the data source.

2. The SELECT Statement

The most common statement in SQL requests information from certain columns in a certain table. This is commonly called a **SELECT statement**. At a minimum, it uses the SELECT and FROM clauses. It may optionally also include the WHERE clause. If the WHERE clause is not included, the results will include all rows from the table.

The most basic SELECT statement has the format of:

```
SELECT *
FROM <tablename>;
```

Let's break this down.

SELECT	Select data from a table.
*	A wildcard character that includes all columns.
FROM	From a specific table (or tables).
Tablename	The name(s) of the table(s) to include.
;	A character that indicates the end of the statement.

Results from SELECT statements are stored in a result table called a **result set**. This is not a new table in the database; it's more like a window that looks into the database. The result set can be temporary (residing only in memory) or permanent (saved to storage as a named query for later reuse). If it is saved to storage, it doesn't save the actual data results but rather the instructions on how to reproduce the results. If changes are made to the underlying data, those changes show up in the result set when the query is rerun.

SQL keywords are not case-sensitive; select is the same as Select or SELECT. However, it is common practice to use uppercase for clause keywords to separate them from the table or column names visually.

TERMS TO KNOW

SELECT Statement

A SQL statement that retrieves rows of data from one or more tables.

Result Set

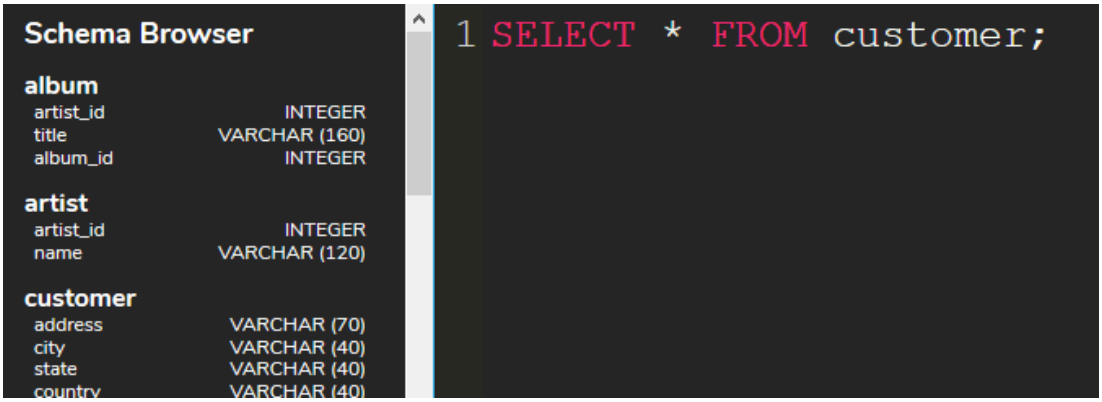
The results returned from a SELECT statement.

3. Running a Query

Throughout this course, you will use a free and open-source relational database management system called PostgreSQL to practice running queries. To access the PostgreSQL database environment, open the following link in another browser window or tab: postgres.sophia.org. When you enter the PostgreSQL database environment, you will see a list of database tables on the left side under the schema browser (album, artist, customer, employee, genre, invoice, etc.) Under each table name is a list of columns of data and their data types.

Using the PostgreSQL database environment for this course, you can query the customer table by entering in:

```
SELECT *
FROM customer;
```



Then, click on the run/play button at the top right.

This will execute the query and return the result set from the query. You should see that there are 59 rows of data. Each row is a unique record from the customer table. Each column name is listed, along with the data associated with it.

This is a useful way to be able to see all of the data in a single table at once.

Query Results

Row count: 59

customer_id	first_name	last_name	company	address	city
1	Luís	Gonçalves	Embraer - Empresa Brasileira de Aeronáutica S.A.	Av. Brigadeiro Faria Lima, 2170	São
2	Leonie	Köhler		Theodor-Heuss-Straße 34	Stut
3	François	Tremblay		1498 rue Bélanger	Mor
4	Bjørn	Hansen		Ullevålsveien 14	Oslo
5	František	Wichterlová	JetBrains s.r.o.	Klanova 9/506	Prag
6	Helena	Holý		Rilská 3174/6	Prag
7	Astrid	Gruber		Rotenturmstraße 4, 1010 Innere Stadt	Vier
8	Daan	Peeters		Grétrystraat 63	Brus

TRY IT

Your turn! Try a query in the SQL tool. Start with the example above to see if you can replicate the results. Then, try a SELECT query on any other tables listed in the database on the left side under the schema browser. To start, press the LAUNCH DATABASE button below to open the SQL tool in a new tab.

WATCH

4. Adding WHERE

The third main clause of the SELECT statement is the **WHERE clause**. The WHERE clause is used to filter records and only returns those rows/records that meet the WHERE clause's criteria. There are many ways to filter data using the WHERE clause, which can be used not only in SELECT statements but also in other statements like the UPDATE and DELETE statements. We will cover these other statements in later lessons.

```
SELECT * FROM Customers WHERE customer_ID=2
```

Let's look at how this breaks down:

SELECT	Select data from a table.
*	A wildcard character that includes all columns.
FROM	From a specific table Customer the name(s) of the table.
WHERE	The records included will be limited to the criteria specified.
customer_ID=2	The criteria; The value in the customer_ID column must be 2 in order for a record to be included.
;	A character that indicates the end of the statement.

THINK ABOUT IT

What are other things you would want to ask about the data in a table, or in multiple tables, that are not possible with only these three clauses?

TERM TO KNOW

WHERE Clause

A SQL clause that applies conditions to filter the result set.

SUMMARY

In this lesson, you learned about databases and tables. You learned that **statements** are fully formed commands issued to a database via SQL, and **clauses** are the individual parts of statements. You learned that there are three main SQL clauses: **SELECT**, FROM, and WHERE. You can use them to form **queries** that display the desired data from a database. SELECT defines the columns to return from the table. FROM identifies the desired table. **WHERE** filters the data to meet your chosen conditions.

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TERMS TO KNOW

Clause

An individual command used in a statement.

FROM Clause

The part of a SQL SELECT statement that identifies which tables should be used as the data source.

Result Set

The results returned from a SELECT statement.

SELECT Clause

The part of a SELECT statement that specifies which columns should be included.

SELECT Statement

A SQL statement that retrieves rows of data from one or more tables.

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A standalone instruction that the DBMS can interpret and execute.

WHERE Clause

A SQL clause that applies conditions to filter the result set.