# WHERE to Filter Data

*by Sophia*

WHAT'S COVERED

This lesson explains how to use the WHERE clause within a SELECT statement to filter data. Specifically, this lesson will cover:



## 1. Getting Started

The **WHERE clause** is one of the most useful clauses to know when working with a SELECT statement. WHERE is used to filter records according to specified criteria. The WHERE clause is optional and adds conditional restrictions to the SELECT statement that will help limit the result set so that the user is not overwhelmed with data that is hard to read or understand.

WHERE displays only the records that fit the condition listed in the WHERE clause. By using the WHERE clause, you can easily answer questions like:

- Which invoices have a total greater than 14?
- Which customers live in Canada?
- Which employees report to the General Manager?

For example, if we wanted to find the customer information of the customer_id that was equal to 5, we would run it as:

```
SELECT *
FROM customer
WHERE customer_id = 5;
```

Query Results

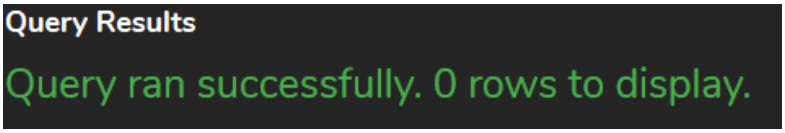
Row count: 1

| customer_id | first_name | last_name | company | address | city | state | country | postal_code | phone | fax | email | support_rep_id |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | František | Wichterlová | JetBrains s.r.o. | Klanova 9/506 | Prague | | Czech Republic | 14700 | +420 2 4172 5555 | +420 2 4172 5555 | frantisekw@jetbrains.com | 4 |

Notice that in the WHERE clause, we define the column (customer_id), the comparison operator (=), and the value that we wanted to compare it to (5).

If there are no rows that match the criteria in the WHERE clause, you should see a message similar to the following:

```
SELECT *
FROM customer
WHERE customer_id = 1000;
```




TERM TO KNOW

**WHERE Clause**

A clause that filters records in a SELECT statement.

# 2. Filtering Strings

SQL requires single quotes around text values. Numeric values should not be enclosed in quotes. Here is an example of what would happen if we forgot to include quotes around the text value 'Helena':

```
SELECT *
FROM customer
WHERE first_name = Helena;
```

We would get an error message:


This is because the database thinks the text value is a column. This could also present a problem if the text value is also an actual column. You would not get an error message; however, the results would not be what you wanted, either.

To properly use the WHERE clause, you would use the single quotes around the text values:

```
SELECT *
FROM customer
WHERE first_name = 'Helena';
```

Query Results

Row count: 1

| customer_id | first_name | last_name | company | address | city | state | country | postal_code | phone | fax | email | support_rep_id |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Helena | Holý | | Rilská 3174/6 | Prague | | Czech Republic | 14300 | +420 2 4177 0449 | | hholy@gmail.com | 5 |

# 3. Comparison Operators

We looked at the = operator above, but there are many other operators that can be used in the WHERE clause. Other comparison operators include:

| | |
|---|---|
| = | Equal to |
| < | Less than |
| <= | Less than or equal to |
| > | Greater than |
| >= | Greater than or equal to |
| <> | Not equal to |

For example, let's find the invoices that have a total greater than 14.

```
SELECT *
FROM invoice
WHERE total > 14;
```

Query Results

Row count: 12

| invoice_id | customer_id | invoice_date | billing_address | billing_city | billing_state | billing_country | billing_postal_code | total |
|---|---|---|---|---|---|---|---|---|
| 88 | 57 | 2010-01-13T00:00:00.000Z | Calle Lira, 198 | Santiago | | Chile | | 18 |
| 89 | 7 | 2010-01-18T00:00:00.000Z | Rotenturmstraße 4, 1010 Innere Stadt | Vienne | | Austria | 1010 | 19 |
| 96 | 45 | 2010-02-18T00:00:00.000Z | Erzsébet krt. 58. | Budapest | | Hungary | H-1073 | 22 |
| 103 | 24 | 2010-03-21T00:00:00.000Z | 162 E Superior Street | Chicago | IL | USA | 60611 | 16 |
| 193 | 37 | 2011-04-23T00:00:00.000Z | Berger Straße 10 | Frankfurt | | Germany | 60316 | 15 |
| 194 | 46 | 2011-04-28T00:00:00.000Z | 3 Chatham Street | Dublin | Dublin | Ireland | | 22 |
| 201 | 25 | 2011-05-29T00:00:00.000Z | 319 N. Frances Street | Madison | WI | USA | 53703 | 19 |
| 208 | 4 | 2011-06-29T00:00:00.000Z | Ullevålsveien 14 | Oslo | | Norway | 0171 | 16 |
| 299 | 26 | 2012-08-05T00:00:00.000Z | 2211 W Berry Street | Fort Worth | TX | USA | 76110 | 24 |
| 306 | 5 | 2012-09-05T00:00:00.000Z | Klanova 9/506 | Prague | | Czech Republic | 14700 | 17 |
| 313 | 43 | 2012-10-06T00:00:00.000Z | 68, Rue Jouvence | Dijon | | France | 21000 | 17 |
| 404 | 6 | 2013-11-13T00:00:00.000Z | Rilská 3174/6 | Prague | | Czech Republic | 14300 | 26 |

The result set includes 12 rows. If we change the WHERE clause to >= 14 (greater than or equal to 14) and include all invoices with the value of 14, the result set goes from 12 rows to 61 rows returned.

```
SELECT *
FROM invoice
WHERE total >= 14;
```

Query Results
Row count: 61

| invoice_id | customer_id | invoice_date | billing_address | billing_city | billing_state | billing_country | billing_postal_code | total |
|---|---|---|---|---|---|---|---|---|
| 5 | 23 | 2009-01-11T00:00:00.000Z | 69 Salem Street | Boston | MA | USA | 2113 | 14 |
| 12 | 2 | 2009-02-11T00:00:00.000Z | Theodor-Heuss-Straße 34 | Stuttgart | | Germany | 70174 | 14 |
| 19 | 40 | 2009-03-14T00:00:00.000Z | 8, Rue Hanovre | Paris | | France | 75002 | 14 |
| 26 | 19 | 2009-04-14T00:00:00.000Z | 1 Infinite Loop | Cupertino | CA | USA | 95014 | 14 |
| 33 | 57 | 2009-05-15T00:00:00.000Z | Calle Lira, 198 | Santiago | | Chile | | 14 |
| 40 | 36 | 2009-06-15T00:00:00.000Z | Tauentzienstraße 8 | Berlin | | Germany | 10789 | 14 |
| 47 | 15 | 2009-07-16T00:00:00.000Z | 700 W Pender Street | Vancouver | BC | Canada | V6C 1G8 | 14 |
| 54 | 53 | 2009-08-16T00:00:00.000Z | 113 Lupus St | London | | United Kingdom | SW1V 3EN | 14 |
| 61 | 32 | 2009-09-16T00:00:00.000Z | 696 Osborne Street | Winnipeg | MB | Canada | R3L 2B9 | 14 |

When it comes to integer values being compared, there would be no difference between using these two statements:

```
SELECT *
FROM invoice
WHERE total >= 15;
```

or

```
SELECT *
FROM invoice
WHERE total > 14;
```

However, not all numbers are integers. Many are percentages like 25% or decimals like 14.5. The WHERE clause handles data like this differently depending on the column's data type. For example, if its type is decimal, that means that numbers like 12.4 and .25 are stored in that column.

If you had decimal numbers and used SELECT * FROM invoice WHERE total > 14, the query would return all numbers larger than 14, so 14.091 is larger and would be in the data set.

The data type for your column matters, and it is a good thing to know when you are working with databases and the data in them.

WATCH

TRY IT

Your turn! Open the SQL tool by clicking on the LAUNCH DATABASE button below. Then, enter in one of the examples above and see how it works. Next, try your own WHERE clauses.

## SUMMARY

In this lesson, you learned that the WHERE clause enables you to filter or retrieve specific rows based on conditions specified in the SELECT statement. It functions as a conditional **filter string** by specifying

criteria for the rows to meet in order to appear in the query results. The WHERE clause supports a wide range of **comparison operators**, including equal to, not equal to, and less than.

Source: THIS TUTORIAL WAS AUTHORED BY DR. VINCENT TRAN, PHD (2020) AND Faithe Wempen (2024) FOR SOPHIA LEARNING. PLEASE SEE OUR **TERMS OF USE**.

## TERMS TO KNOW

**WHERE Clause**

A clause that filters records in a SELECT statement.