MAX & MIN to Find Extremes

by Sophia

WHAT'S COVERED

In this lesson, you will use MIN and MAX aggregate functions to find the largest and smallest values, in two parts. Specifically, this lesson will cover:

1. Introduction to MIN and MAX

This lesson begins a multi-session study of various summary statistics you can gather about the data in a database. Summary statistics can help identify trends and patterns in the data.

Finding the smallest (minimum) and/or largest (maximum) values in a dataset can be useful in a number of ways. For example, those values can help you determine the range of the data by calculating the difference between them.

Querying for the minimum and maximum values can help you quickly identify outliers, including inappropriate values due to data entry errors. For example, if you are measuring human body temperature and the minimum value is 97.1 and the maximum is 1003.8, there's obviously a data entry error there.

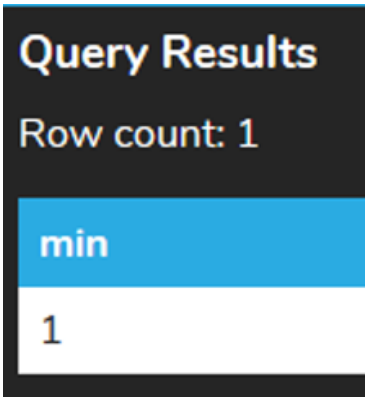
2. MIN and MAX on Numeric Values

The **MIN and MAX functions** are used in SQL to identify the smallest and largest values for a particular column in a dataset. The most common use for these functions is in columns containing numeric data such as prices or invoice totals. The structure of the MIN command is as follows:

```
SELECT MIN(<columnname>)
FROM <tablename>
```

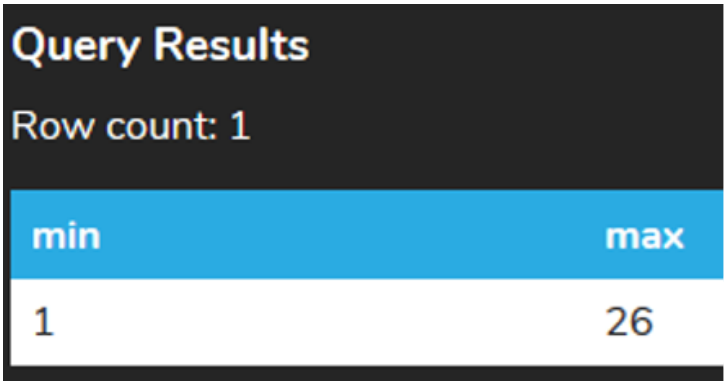
The MAX function's syntax is identical except MAX appears instead of MIN. For example, if we wanted to find the smallest total in the invoice table, we would run the following:

```
SELECT MIN(total)
FROM invoice;
```



You can have as many aggregate functions as you want in the SELECT clause. To add the MAX of the invoice total column name in the same statement, we would add it within the SELECT clause:

```
SELECT MIN(total), MAX(total)
FROM invoice;
```



We can also combine it with additional filters within the WHERE clause. For example, we may want to look at the minimum and maximum invoice totals when the billing country is set to Canada:

```
SELECT MIN(total), MAX(total)
FROM invoice
WHERE billing_country = 'Canada';
```

Query Results

Row count: 1

min	max
1	14

TERMS TO KNOW

MIN Function

A function that reports the smallest value for a certain column in a dataset or result set.

MAX Function

A function that reports the largest value for a certain column in a dataset or result set.

3. MIN and MAX on Other Data Types

The MIN and MAX can also be used for other data types outside of numeric values. With text-based columns, using the MIN would return the minimum value in alphabetical order, whereas MAX would return the maximum value in alphabetical order.

For example, if we looked at the MIN and MAX of the country in alphabetical order, it would return this:

```
SELECT MIN(country), MAX(country)
FROM customer;
```

Query Results

Row count: 1

min	max
Argentina	USA

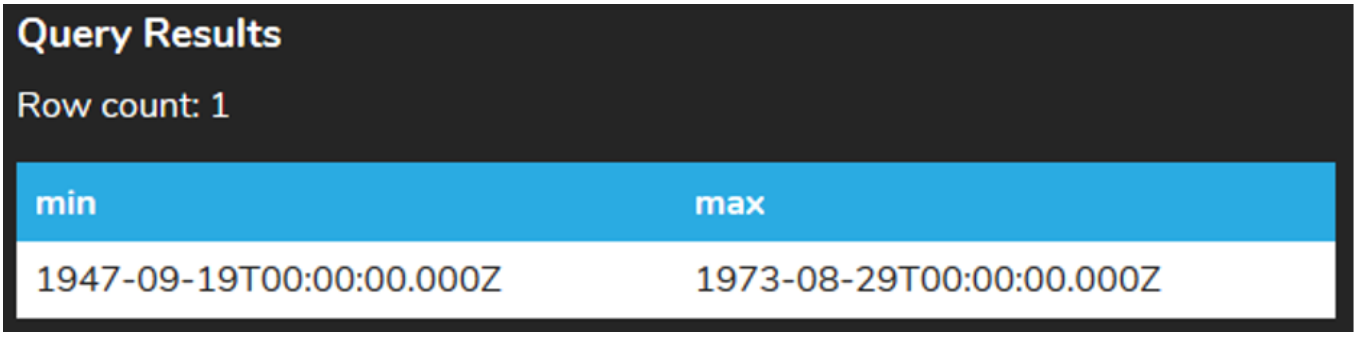
The MIN and MAX can work for dates as well. Dates in databases are stored as a day number, which focuses on the number of days that have passed since a specific point in time. As a day number, the date for yesterday is one less than the day number for today. Older dates therefore end up being smaller numbers than future dates. So, the oldest date is actually the MIN, or smallest date, whereas the most recent date is the MAX, or largest date.

HINT

Remember that PostgreSQL expresses dates in YYYY-MM-DD format.

For example, if we wanted to find the oldest and youngest employee, we could run the following:

```
SELECT MIN(birth_date), MAX(birth_date)
FROM employee;
```



Notice that the oldest employee, or the one with the earliest date, is returned using the MIN aggregate function. The youngest employee, or the one with the latest date, is returned using the MAX aggregate function.

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 choices for which columns you want the query to provide.

SUMMARY

In this lesson, you were **introduced to the MIN and MAX functions**. You learned some reasons why finding the smallest and largest values in a certain column in a dataset is useful for data analysis. The MIN function is used in SQL to locate the smallest value, and the MAX function to locate the largest value. These values are most commonly **numeric values** (numbers) but can also be **other data types**, such as text (where minimum is A and maximum is Z) or dates (where minimum is earliest, and maximum is most recent). You can apply the MIN and MAX functions to a single column or multiple columns, and you can combine both in a single query.

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TERMS TO KNOW

MAX Function

A function that reports the largest value for a certain column in a dataset or result set.

MIN Function

A function that reports the smallest value for a certain column in a dataset or result set.