Common SQL Functions

Introduction to SQL functions

Aside from using operators to manually construct expressions, SQL provides built-in functions (small blocks of code that can perform operations and return a value). Functions are available simply by making a call to them and passing the value and/or values on which you want the function to operate.

Common SQL Functions

Introduction to SQL functions

The functions outlined in this lecture represent a generic list of common SQL functions that most databases support. It’s important to understand that not all databases support the same functions. Although in most cases all databases support similar functions, the way the function is written can differ syntactically from database to database. We’ll explore the following functions and associated clauses:

- The COUNT function
- The AVG function
- The SUM function
- The MIN and MAX functions
- The GROUP BY clause
- The HAVING clause
- Other database specific functions

Common SQL Functions

The COUNT function

One of the most commonly used functions is the COUNT function. The COUNT function is used when you want to perform a simple count of records. Consider the following data from the employees table:

name	username	password
Wally	wwebmaster	password
Wilbur	wfounder	password
Tina	ttechie	abc123
Agnes	aaccountant	12345
Damon	ddeveloper	ispeakbinary

If you were building a password protected site complete with a login system that authenticates users, the COUNT function would be something to consider taking advantage of.

Common SQL Functions

The COUNT function

In the previous table you see that users, aside from storing their name and email, store their usernames and passwords within the employees table. Assuming usernames must be unique, we could write our query as follows:

```
SELECT COUNT(*) FROM employees WHERE username = 'wwebmaster' AND password = 'password'
```

In this scenario either a 1 or 0 will be returned in the query. Either someone matches that username and password combination or no one does. If the numeric value of 1 is returned back to your application, you would know that the user is valid and could let them pass. If 0 is returned back, you know that they are not a valid user.

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The AVG function

The AVG function can be used in SQL with numeric columns to return the average value of a numeric column. Let's assume that we had a table of records that looked like this:

product	price	instock
Widget	10.00	true
Gadget	16.00	true
Doodad	20.00	true

To return the average price of the three products, we could write a query that looked like this:

```
SELECT AVG(price) FROM products
```

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The SUM function

The SUM function can be used in SQL with numeric columns to return the total (or sum) of a numeric column. Let's assume that we had a table of records that looked like this:

product	price	instock
Widget	10.00	true
Gadget	16.00	true
Doodad	20.00	true

We could write a query that looked like this:

```
SELECT SUM(price) FROM products
```

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The MIN and MAX functions

Like the AVG and SUM functions, the MIN and MAX functions are also used to work with numeric values. The MIN function returns the smallest value of the selected column. The MAX function returns the largest value of the selected column. Consider the following data:

product	price	instock
Widget	10.00	true
Gadget	16.00	true
Doodad	20.00	true

To return the cheapest price of the three products, we could write the following query:

```
SELECT MIN(price) FROM products
```

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The GROUP BY statement

The GROUP BY statement is often used with aggregate functions (COUNT, MAX, MIN, SUM, AVG) to group the result-set by one or more columns. Consider the following data:

customerid	name	region
1	Mark Jones	United States
2	Sally Smith	United Kingdom
3	David Doe	United States

To list the number of customers in each country, we could write the following query:

COUNT(customerid)	region
2	United States
1	United Kingdom

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The HAVING clause

The HAVING clause exists primarily because the WHERE keyword could not be used with aggregate functions. Consider the following data:

customerid	name	region
1	Mark Jones	United States
2	Sally Smith	United Kingdom
3	David Doe	United States

The following SQL statement lists the number of customers in each country but only includes countries with more than 1 customer:

```
SELECT COUNT(customerid), region FROM customers GROUP BY region HAVING COUNT(customerid) > 1
```

Common SQL Functions

Other database specific functions

So far we've covered functions that are generally supported by most database systems. Again, all databases usually have a subset of features that are proprietary to their systems. Proprietary functions allow you to work with dates and times, math, string manipulation, and much more.

As an example, suppose you wanted to find all tickets submitted within a particular date range. The SQL Server DATEADD function is one of several functions you could use:

```
SELECT * FROM tickets WHERE submitteddate > DATEADD(m, -1, Date())
```

Assuming the current date is 5/30/2018, all submitted help desk tickets beginning one month prior to today’s date and up to today’s date would be returned.

Common SQL Functions

Other database specific functions

Depending on the database that you choose, I encourage you to seek out that particular database's documentation to get an idea as to what additional functionality is supported outside of the generic functionality covered in this course.