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Database Programming with SQL

4-2

Number Functions

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Objectives

- This lesson covers the following objectives:
 - Select and apply the single-row number functions ROUND, TRUNC, and MOD in a SQL query
 - Distinguish between the results obtained when TRUNC is applied to a numeric value and ROUND is applied to a numeric value
 - State the implications for business when applying TRUNC and ROUND to numeric values

Purpose

- One of the reasons we put our money in a bank is to take advantage of the interest it accumulates over time
- Banks adjust the interest rate with various economic indicators such as inflation and the stock market
- Typically, interest rates are expressed as a percent such as 3.45%



Purpose

- If a bank decided to round the percentage rate to 3.5%, would it be to your advantage?
- If it decided to just drop the decimal values and calculate the interest at 3%, would you be happy then?
- Rounding and truncating numbers play an important part in business and in turn with the databases that support these businesses as they store and access numeric data



Number Functions

- The three number functions are:
 - ROUND
 - TRUNC
 - MOD



ROUND

- ROUND can be used with both numbers and dates
- It is mainly used to round numbers to a specified number of decimal places, but it can also be used to round numbers to the left of the decimal point
- Syntax:

```
ROUND(column|expression, decimal places)
```

- Note that if the number of decimal places is not specified or is zero, the number will round to no decimal places
- ROUND(45.926) 46
- ROUND(45.926, 0) 46

Using the ROUND function with dates will be covered in a later lesson.

ROUND

- If the number of decimal places is a positive number, the number is rounded to that number of decimal places to the right of the decimal point
- `ROUND(45.926, 2)` 45.93
- If the number of decimal places is a negative number, the number is rounded to that number of decimal places to the left of the decimal point
- `ROUND(45.926, -1)` 50

TRUNC

- The TRUNC function can be used with both numbers and dates. It is mainly used to terminate the column, expression, or value to a specified number of decimal places
- When TRUNC is used, if the number of decimal places is not specified, then like ROUND, the specified number defaults to zero
- Syntax:

```
TRUNC(column|expression, decimal places)
```

- TRUNC (45.926, 2) 45.92

Using the TRUNC function with dates will be covered in a later lesson.

TRUNC

- As with ROUND, if the TRUNC expression does not specify the number of decimal places or specifies a zero, the number is truncated to zero decimal places
- `TRUNC (45.926, 0)` 45
- `TRUNC (45.926)` 45
- Remember that TRUNC does not round the number
- It simply terminates the number at a given point

MOD

- The MOD function finds the remainder after one value is divided by another value
- For example, the MOD of 5 divided by 2 is 1
- MOD can be used to determine whether a value is odd or even. If you divide a value by 2 and there is no remainder, the number must be an even number
- For example, if the MOD of x divided by 2 is 0, then x must be an even number

Note: The modulus operator is used in many programming languages, and returns the remainder after a division operation.

MOD

- The "Mod Demo" column will show if number of airports for each country is an odd or even number

```
SELECT country_name, MOD(airports,2)
AS "Mod Demo"
FROM wf_countries;
```

- 1 means the number is odd,
and zero means that it is even

COUNTRY_NAME	Mod Demo
Canada	1
Republic of Costa Rica	0
Republic of Cape Verde	1
Greenland	0
Dominican Republic	0
State of Eritrea	1
...	

Terminology

- Key terms used in this lesson included:
 - Number functions
 - MOD
 - ROUND
 - TRUNC

Summary

- In this lesson, you should have learned how to:
 - Select and apply the single-row number functions ROUND, TRUNC, and MOD in a SQL query
 - Distinguish between the results obtained when TRUNC is applied to a numeric value and ROUND is applied to a numeric value
 - State the implications for business when applying TRUNC and ROUND to numeric values

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