Database Programming

Number Functions

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 (cont.)

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
```

ROUND (cont.)

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 the specified number defaults to zero.

Syntax

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

```
TRUNC (45.926, 2)          45.92
```

TRUNC (cont.)

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.

MOD (cont.)

Note: In many programming languages, the modulus operator returns the remainder after a division operation.

MOD (cont.)

```
SELECT MOD(1600,500) FROM DUAL;
100  remainder

SELECT last_name, salary, MOD(salary, 2) As "Mod Demo"
FROM f_staffs
WHERE staff_type IN('Order Taker','Cook','Manager');
```

The "Mod Demo" column will show if the salary is an odd or even number.

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