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How to Number Rows in SQL

Database:

SQL

PostgreSQL

Oracle

SQL Server

MySQL

SQLite

Operators:

ROW_NUMBER

OVER

ORDER BY

ASC

DESC

Problem:

You would like to give each row in the result table a separate number.

Example:

Our database has a table named `furniture` with data in the following columns: `code` (primary key) and `name`.

| code | name |
|------|----------|
| 101 | bed |
| 202 | sofa |
| 333 | chair |
| 123 | bookcase |
| 235 | table |
| 766 | desk |

The `furniture` table stores the name of pieces of furniture that we want to number.

Solution:

Code

```
SELECT ROW_NUMBER() OVER() AS num_row,  
       code,  
       name  
FROM furniture;
```

The query returns the row number of each piece of furniture along with its name and code:

| num_row | name | code |
|---------|------|------|
| | | |

| num_row | name | code |
|---------|----------|------|
| 1 | bed | 101 |
| 2 | sofa | 202 |
| 3 | chair | 333 |
| 4 | bookcase | 123 |
| 5 | table | 235 |
| 6 | desk | 766 |

Note that the names of the pieces of furniture are not sorted.

Discussion:

If you'd like to number each row in a result set, SQL provides the `ROW_NUMBER()` function. This function is used in a `SELECT` clause with other columns. After the `ROW_NUMBER()` clause, we call the `OVER()` function. If you pass in any arguments to `OVER`, the numbering of rows will not be sorted according to any column. Thus, the order of the displayed rows will be non-deterministic; in most cases, it is the order in which the records were inserted into the table. The numbering of rows starts at 1. In our example, each record has a number from 1 to 6.

We can also assign row numbers using a column. In the example below, we number records sorted by name. We do this by passing in that argument to `OVER` along with `ORDER BY` (it

sorts records according to the name column):

Code

```
SELECT ROW_NUMBER() OVER(ORDER BY name) AS num_row,  
       name,  
       code  
FROM furniture;
```

As you look at the result set, you see the sorted rows with their numbers:

| row | name | code |
|-----|----------|------|
| 1 | bed | 101 |
| 2 | bookcase | 123 |
| 3 | chair | 333 |
| 4 | desk | 766 |
| 5 | sofa | 202 |
| 6 | table | 235 |

The numbering provided by `ROW_NUMBER()` is independent of the order of rows in the result table. In the example below, we number records using the sorted column name (`OVER(ORDER BY name)`), but we display records in the result set according to another column (in our example, `ORDER BY code`).

Code

```
SELECT ROW_NUMBER() OVER(ORDER BY name) AS num_row,  
       name,  
       code  
FROM furniture  
ORDER BY code;
```

The query returned the number each row, but these numbers are not in ascending order, because records are sorted according column code:

| row | name | code |
|-----|----------|------|
| 1 | bed | 101 |
| 2 | bookcase | 123 |
| 5 | sofa | 202 |
| 6 | table | 235 |
| 3 | chair | 333 |
| 4 | desk | 766 |

The default order of the sorted rows is ascending, but you can also sort in descending order using the **DESC** keyword after the name of the column by which you want to sort:

Code

```
SELECT ROW_NUMBER() OVER(ORDER BY name ASC) AS num_row,  
       name,  
       code  
FROM furniture  
ORDER BY code DESC;
```

The query above returned the result set:

| row | name | code |
|-----|----------|------|
| 4 | desk | 766 |
| 3 | chair | 333 |
| 6 | table | 235 |
| 5 | sofa | 202 |
| 2 | bookcase | 123 |
| 1 | bed | 101 |

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- [Window Functions in SQL Server](#)
- [SQL Practice Set](#)

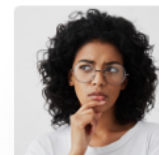
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