MySQLTUTORIAL

MySQL LIMIT

Summary: in this tutorial, you will learn how to use MySQL `LIMIT` clause to constrain the number of rows returned by a query.

Introduction to MySQL LIMIT clause

The `LIMIT` clause is used in the `SELECT (https://www.mysqltutorial.org/mysql-select-statement-query-data.aspx)` statement to constrain the number of rows to return. The `LIMIT` clause accepts one or two arguments. The values of both arguments must be zero or positive integers (https://www.mysqltutorial.org/mysql-int/) .

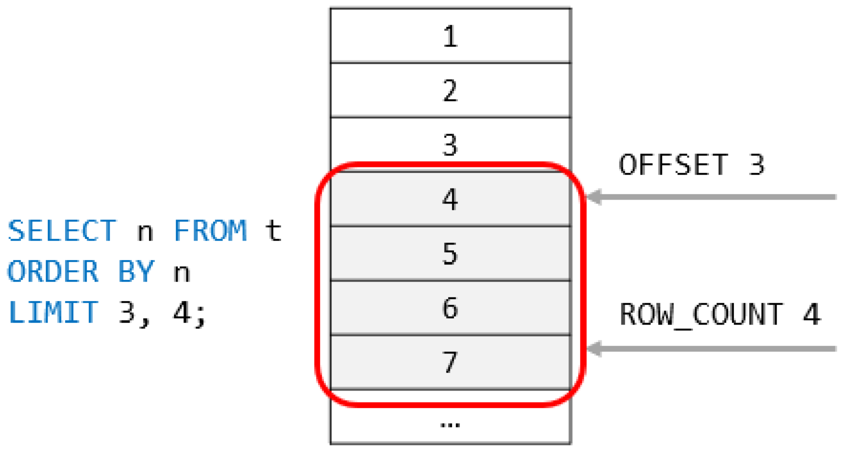
The following illustrates the `LIMIT` clause syntax with two arguments:

```
SELECT
    select_list
FROM
    table_name
LIMIT [offset,] row_count;
```

In this syntax:

- The `offset` specifies the offset of the first row to return. The `offset` of the first row is 0, not 1.
- The `row_count` specifies the maximum number of rows to return.

The following picture illustrates the `LIMIT` clause:



When you use the `LIMIT` clause with one argument, MySQL will use this argument to determine the maximum number of rows to return from the first row of the result set.

Therefore, these two clauses are equivalent:

```
LIMIT row_count;
```

And

```
LIMIT 0 , row_count;
```

In addition to the above syntax, MySQL provides the following alternative `LIMIT` clause syntax:

```
LIMIT row_count OFFSET offset
```

The LIMIT and ORDER BY clauses

By default, the `SELECT` statement returns rows in an unspecified order. When you add the `LIMIT` clause to the `SELECT` statement, the returned rows are unpredictable.

Therefore, to ensure the `LIMIT` clause returns an expected output, you should always use it with an `ORDER BY (https://www.mysqltutorial.org/mysql-order-by/)` clause like this:

```
SELECT
    select_list
FROM
```

```
    table_name
ORDER BY
    sort_expression
LIMIT offset, row_count;
```

The following picture illustrates the evaluation order of the `LIMIT` clause in the `SELECT` statement:

MySQL LIMIT clause examples

We'll use the `customers` table from the sample database (https://www.mysqltutorial.org/mysql-sample-database.aspx) for demonstration.

1) Using MySQL LIMIT to get the highest or lowest rows

This statement uses the `LIMIT` clause to get the top five customers who have the highest credit:

```
SELECT
    customerNumber,
    customerName,
    creditLimit
FROM
    customers
```

```
ORDER BY creditLimit DESC
LIMIT 5;
```

Try It Out ❯

In this example:

- First, the `ORDER BY` clause sorts the customers by credits in high to low.
- Then, the `LIMIT` clause returns the first 5 rows.

Similarly, this example uses the `LIMIT` clause to find five customers who have the lowest credits:

```
SELECT
    customerNumber,
    customerName,
    creditLimit
FROM
    customers
ORDER BY creditLimit
LIMIT 5;
```

Try It Out ❯

In this example:

- First, the `ORDER BY` clause sorts the customers by credits in low to high.

- Then, the `LIMIT` clause returns the first 5 rows.

Because there are more than 5 customers that have credits zero, the result of the query above may lead to an inconsistent result.

To fix this issue, you need to add more columns to the `ORDER BY` clause to constrain the row in unique order:

```
SELECT
    customerNumber,
    customerName,
    creditLimit
FROM
    customers
ORDER BY
    creditLimit,
    customerNumber
LIMIT 5;
```

Try It Out

2) Using MySQL LIMIT clause for pagination

When you display data on the screen, you often want to divide rows into pages, where each page contains a limited number of rows like 10 or 20.

To calculate the number of pages, you take the total rows divided by the number of rows per page. For fetching rows of a specific page, you can use the `LIMIT` clause.

This query uses the `COUNT(*)` aggregate function (https://www.mysqltutorial.org/mysql-aggregate-functions.aspx) to get the total rows from the `customers` table:

```
SELECT
    COUNT(*)
FROM
    customers;
```

```
+----------+
| COUNT(*) |
+----------+
|      122 |
+----------+
1 row in set (0.00 sec)
```

Suppose that each page has 10 rows; to display 122 customers, you have 13 pages. The last 13th page contains two rows only.

This query uses the `LIMIT` clause to get rows of page 1 which contains the first 10 customers sorted by the customer name:

```
SELECT
    customerNumber,
    customerName
FROM
    customers
ORDER BY customerName
LIMIT 10;
```

Try It Out

This query uses the `LIMIT` clause to get the rows of the second page that include rows 11 – 20:

```
SELECT
    customerNumber,
    customerName
FROM
    customers
ORDER BY customerName
LIMIT 10, 10;
```

Try It Out

In this example, the clause `LIMIT 10, 10` returns 10 rows for the row 11 – 20.

3) Using MySQL LIMIT to get the nth highest or lowest value

To get the nth highest or lowest value, you use the following `LIMIT` clause:

```
SELECT select_list
FROM table_name
ORDER BY sort_expression
LIMIT n-1, 1;
```

The clause `LIMIT n-1, 1` returns `1` row starting at the row `n`.

For example, the following finds the customer who has the second-highest credit:

```
SELECT
    customerName,
    creditLimit
FROM
    customers
ORDER BY
    creditLimit DESC
LIMIT 1,1;
```

Try It Out

Let’s double-check the result. This query returns all customers sorted by credits from high to low:

```
SELECT
    customerName,
    creditLimit
FROM
    customers
ORDER BY
    creditLimit DESC;
```

Try It Out

As you can see clearly from the output, the result was correct as expected.

Note that this technique works when there are no two customers who have the same credit limits. To get a more accurate result, you should use the `DENSE_RANK() (https://www.mysqltutorial.org/mysql-window-functions/mysql-dense_rank-function/)` window function (https://www.mysqltutorial.org/mysql-window-functions/) .

MySQL LIMIT & DISTINCT clauses

If you use the `LIMIT` clause with the `DISTINCT (https://www.mysqltutorial.org/mysql-distinct.aspx)` clause, MySQL immediately stops searching when it finds the number of unique rows specified in the `LIMIT` clause.

The example uses the `LIMIT` clause with the `DISTINCT` clause to return the first five unique states in the `customers` table:

```
SELECT DISTINCT
    state
FROM
    customers
WHERE
    state IS NOT NULL
LIMIT 5;
```

Try It Out

Summary

- Use the MySQL `LIMIT` clause to constrain the number of rows returned by the `SELECT` statement.