LESSON 4

LEFT JOIN, RIGHT JOIN, AND FULL OUTER JOIN

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Content

1. LEFT JOIN (LEFT OUTER JOIN)
2. RIGHT JOIN (RIGHT OUTER JOIN)
3. FULL OUTER JOIN

Short description

Teach students the purpose and syntax of Left Join, Right Join, and Full Outer Join. Explain the differences between these joins and when to use them. Provide hands-on exercises to reinforce understanding of join operations.

Kurzbeschreibung

Bringen Sie den Schülern den Zweck und die Syntax von Left Join, Right Join und Full Outer Join bei. Erklären Sie die Unterschiede zwischen diesen Verknüpfungen und wann sie zu verwenden sind. Bieten Sie praktische Übungen an, um das Verständnis von Verknüpfungsvorgängen zu festigen.

LEFT JOIN (LEFT OUTER JOIN)

Definition:

Returns all rows from the left table and

the matching rows from the right table.

If no match exists, NULL is returned for columns of the right table

Syntax:

```
SELECT columns
FROM table1
LEFT JOIN table2
ON table1.column = table2.column;
```

LEFT JOIN (LEFT OUTER JOIN) 2

Example:

```
SELECT students.name, enrollments.course
FROM students
LEFT JOIN enrollments
ON students.student_id = enrollments.student_id;
```

Result:

```
name  | course
----------------
John  | Math
Alice | Science
Bob   | NULL
```

students

```
student_id | name
-----------------
1          | John
2          | Alice
3          | Bob
```

enrollments

```
student_id | course
-------------------
1          | Math
2          | Science
```

RIGHT JOIN (RIGHT OUTER JOIN)

Definition:

Returns all rows from the right table and

the matching rows from the left table.

If no match exists, NULL is returned for columns of the left table.

Syntax:

```
SELECT columns
FROM table1
RIGHT JOIN table2
ON table1.column = table2.column;
```

RIGHT JOIN (RIGHT OUTER JOIN) 2

Example:

```
SELECT students.name, enrollments.course
FROM students
RIGHT JOIN enrollments
ON students.student_id = enrollments.student_id;
```

students

student_id	name
1	John
2	Alice
3	Bob

Result:

```
name  | course
----------------
John  | Math
Alice | Science
NULL  | Physics
```

enrollments

student_id	course
1	Math
2	Science
3	Physics

FULL OUTER JOIN

Definition:

Combines the results of LEFT JOIN and RIGHT JOIN.

Returns all rows from both tables, with NULL

for unmatched rows in either table.

Syntax:

```
SELECT columns
FROM table1
FULL OUTER JOIN table2
ON table1.column = table2.column;
```

FULL OUTER JOIN

Example:

```
SELECT students.name, enrollments.course
FROM students
FULL OUTER JOIN enrollments
ON students.student_id = enrollments.student_id;
```

students

```
student_id | name
-----------------
1          | John
2          | Alice
3          | Bob
```

Result:

```
name  | course
----------------
John  | Math
Alice | Science
Bob   | NULL
NULL  | Physics
```

enrollments

```
student_id | course
-------------------
1          | Math
2          | Science
4          | Physics
```

Simulating FULL OUTER JOIN

In MySQL, simulate with UNION:

```
SELECT students.name, enrollments.course
FROM students
LEFT JOIN enrollments
ON students.student_id = enrollments.student_id
UNION
SELECT students.name, enrollments.course
FROM students
RIGHT JOIN enrollments
ON students.student_id = enrollments.student_id;
```

The `UNION` operator in MySQL is used to combine the result sets of two or more `SELECT` statements into a single result set.
It removes duplicate rows between the `SELECT` statements.
Each `SELECT` statement within the `UNION` must have the same number of columns in the result sets with similar data types.