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Database Programming with SQL

6-3
Inner versus Outer Joins

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Objectives

This lesson covers the following objectives:

- Compare and contrast an inner and an outer join
- Construct and execute a query to use a left outer join
- Construct and execute a query to use a right outer join
- Construct and execute a query to use a full outer join

Purpose

- Up to now, all of the joins returned data that matched the join condition.
- Sometimes, however, we want to retrieve both the data that meets the join condition, and the data that does not meet the join condition.
- The outer joins in ANSI-99 SQL allow this functionality.

INNER And OUTER Joins

- In ANSI-99 SQL, a join of two or more tables that returns only the matched rows is called an inner join.
- When a join returns the unmatched rows as well as the matched rows, it is called an outer join.
- Outer join syntax uses the terms "left, full, and right".
- These names are associated with the order of the table names in the FROM clause of the SELECT statement.

LEFT and RIGHT OUTER Joins

- In the example shown of a left outer join, note that the table name listed to the left of the words "left outer join" is referred to as the "left table."

```
SELECT e.last_name, d.department_id, d.department_name
FROM employees e LEFT OUTER JOIN departments d
ON (e.department_id = d.department_id);
```

LAST_NAME	DEPT_ID	DEPT_NAME
Whalen	10	Administration
Fay	20	Marketing
…		
Zlotkey	80	Sales
De Haan	90	Executive
Kochhar	90	Executive
King	90	Executive
Gietz	110	Accounting
Higgins	110	Accounting
Grant	-	-

LEFT and RIGHT OUTER Joins

- This query will return all employee last names, both those that are assigned to a department and those that are not.

```
SELECT e.last_name, d.department_id, d.department_name
FROM employees e LEFT OUTER JOIN departments d
ON (e.department_id = d.department_id);
```

LAST_NAME	DEPT_ID	DEPT_NAME
Whalen	10	Administration
Fay	20	Marketing
…		
Zlotkey	80	Sales
De Haan	90	Executive
Kochhar	90	Executive
King	90	Executive
Gietz	110	Accounting
Higgins	110	Accounting
Grant	-	-

LEFT and RIGHT OUTER Joins

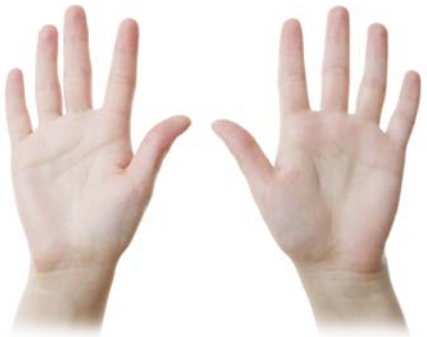
- This right outer join would return all department IDs and department names, both those that have employees assigned to them and those that do not.

```
SELECT e.last_name, d.department_id, d.department_name
FROM employees e RIGHT OUTER JOIN departments d
ON (e.department_id = d.department_id);
```

LAST_NAME	DEPT_ID	DEPT_NAME
Whalen	10	Administration
Hartstein	20	Marketing
…		
King	90	Executive
Kochhar	90	Executive
De Haan	90	Executive
Higgins	110	Accounting
Gietz	110	Accounting
-	190	Contracting

FULL OUTER Join

- It is possible to create a join condition to retrieve all matching rows and all unmatched rows from both tables.
- Using a full outer join solves this problem.
- The result set of a full outer join includes all rows from a left outer join and all rows from a right outer join combined together without duplication.



FULL OUTER Join Example

- The example shown is a full outer join.

```
SELECT e.last_name, d.department_id, d.department_name
FROM employees e FULL OUTER JOIN departments d
ON (e.department_id = d.department_id);
```

LAST_NAME	DEPT_ID	DEPT_NAME
King	90	Executive
Kochhar	90	Executive
…		
Taylor	80	Sales
Grant	-	-
Mourgos	50	Shipping
…		
Fay	20	Marketing
-	190	Contracting

Join Scenario

- Construct a join to display a list of employees, their current job_id and any previous jobs they may have held.
- The job_history table contains details of an employee's previous jobs.

```
SELECT last_name, e.job_id AS "Job", jh.job_id AS "Old job", end_date
FROM employees e LEFT OUTER JOIN job_history jh
  ON(e.employee_id = jh.employee_id);
```

LAST_NAME	Job	Old job	END_DATE
King	AD_PRES	-	-
Kochhar	AD_VP	AC_MGR	15-Mar-1997
Kochhar	AD_VP	AC_ACCOUNT	27-Oct-1993
De Haan	AD_VP	IT_PROG	24-Jul-1998
Whalen	AD_ASST	AD_ASST	17-Jun-1993
Whalen	AD_ASST	AC_ACCOUNT	31-Dec-1998
Higgins	AC_MGR	-	-

Terminology

Key terms used in this lesson included:

- FULL OUTER JOIN
- Inner join
- LEFT OUTER JOIN
- Outer join
- RIGHT OUTER JOIN

Summary

In this lesson, you should have learned how to:

- Compare and contrast an inner and an outer join
- Construct and execute a query to use a left outer join
- Construct and execute a query to use a right outer join
- Construct and execute a query to use a full outer join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