

Multiple Table Part II

Lesson Agenda

- Self-join
- OUTER join :
 - LEFT OUTER join
 - RIGHT OUTER join
 - FULL OUTER join

ORACLE

Copyright © 2018, Oracle. All rights reserved.

6 - 2

ORACLE

Copyright © 2018, Oracle. All rights reserved.

Joining a Table to Itself

- Sometimes you need to join a table to itself. To find the name of each employee's manager, you need to join the EMPLOYEES table to itself, or perform a self-join. For example, to find the name of Lorentz's manager, you need to:
 - Find Lorentz in the EMPLOYEES table by looking at the LAST_NAME column
 - Find the manager number for Lorentz by looking at the MANAGER_ID column. Lorentz's manager number is 103.
 - Find the name of the manager with EMPLOYEE_ID 103 by looking at the LAST_NAME column. Hunold's employee number is 103, so Hunold is Lorentz's manager.

Joining a Table to Itself

EMPLOYEES (WORKER)

EMPLOYEE_ID	LAST_NAME	MANAGER_ID
1	King	(null)
2	Kochhar	100
3	De Haan	100
4	Hunold	102
5	Ernst	103
6	Lorentz	103
7	Mourgos	100
8	Rajs	124
9	Davies	124
10	Matos	124

EMPLOYEES (MANAGER)

EMPLOYEE_ID	LAST_NAME
100	King
101	Kochhar
102	De Haan
103	Hunold
104	Ernst
107	Lorentz
124	Mourgos
141	Rajs
142	Davies
143	Matos

**MANAGER_ID in the WORKER table is equal to
EMPLOYEE_ID in the MANAGER table.**

ORACLE

6 - 3

Copyright © 2018, Oracle. All rights reserved.

ORACLE

6 - 4

Copyright © 2018, Oracle. All rights reserved.

Self-Joins Using the ON Clause

EMP	MGR
1 Hunold	De Haan
2 Fay	Hartstein
3 Gietz	Higgins
4 Lorentz	Hunold
5 Ernst	Hunold
6 Zlotkey	King
7 Mourgos	King
8 Kochhar	King
9 Hartstein	King
10 De Haan	King

The example shown is a self-join of the EMPLOYEES table, based on the EMPLOYEE_ID and MANAGER_ID column.

```
SELECT worker.last_name emp, manager.last_name mgr
FROM employees worker JOIN employees manager
```

Self-Joins Using the ON Clause

Practice:

Find the name of **Lorentz's** manager.

EMPLOYEE	MANAGER
1 Lorentz	Hunold

INNER Versus OUTER Joins

- In SQL:1999, the join of two tables returning only matched rows is called an inner join.
- A join between two tables that returns the results of the inner join as well as the unmatched rows from the left (or right) table is called a left (or right) outer join.
- A join between two tables that returns the results of an inner join as well as the results of a left and right join is a full outer join.
- There are three types of outer joins:
 - LEFT OUTER
 - RIGHT OUTER
 - FULL OUTER

Returning Records with No Direct Match with Outer Joins

DEPARTMENTS

DEPARTMENT_NAME	DEPARTMENT_ID
Administration	10
Marketing	20
Shipping	50
IT	60
Sales	80
Executive	90
Accounting	110
Contracting	190

There are no employees in department 190.

EMPLOYEES

DEPARTMENT_ID	LAST_NAME
1	90 King
2	90 Kochhar
3	90 De Haan
4	60 Hunold
5	60 Ernst
6	60 Lorentz
7	50 Mourgos
8	50 Rajas
9	50 Davies
10	50 Matos
...	
19	110 Higgins
20	110 Gietz

Employee "Grant" has not been assigned a department ID.

LEFT OUTER Join

This query retrieves all rows in the EMPLOYEES table, which is the left table, even if there is no match in the DEPARTMENTS 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	DEPARTMENT_ID	DEPARTMENT_NAME
77 Taylor	80 Sales	
78 Livingston	80 Sales	
79 Grant	(null)	(null)
80 Johnson	80 Sales	
81 Taylor	50 Shipping	
82 Fleaur	50 Shipping	
83 Sullivan	50 Shipping	
84 Geoni	50 Shipping	

ORACLE

6 - 9

Copyright © 2018, Oracle. All rights reserved.

RIGHT OUTER Join

This query retrieves all rows in the DEPARTMENTS table, which is the right table, even if there is no match in the EMPLOYEES table.

```
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	DEPARTMENT_ID	DEPARTMENT_NAME
101 Chen	100 Finance	
102 Sciarra	100 Finance	
103 Urman	100 Finance	
104 Popp	100 Finance	
105 Higgins	110 Accounting	
106 Gietz	110 Accounting	
107 (null)	120 Treasury	
108 (null)	130 Corporate Tax	
109 (null)	140 Control And ...	

ORACLE

6 - 10

Copyright © 2018, Oracle. All rights reserved.

FULL OUTER Join

This query retrieves all rows in the EMPLOYEES table, even if there is no match in the DEPARTMENTS table. It also retrieves all rows in the DEPARTMENTS table, even if there is no match in the EMPLOYEES table.

```
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	DEPARTMENT_ID	DEPARTMENT_NAME
76 Hutton	80 Sales	
77 Taylor	80 Sales	
78 Livingston	80 Sales	
79 Grant	(null)	(null)
80 Johnson	80 Sales	
105 Baer	70 Public Relat...	
106 Higgins	110 Accounting	
107 Gietz	110 Accounting	
108 (null)	120 Treasury	
109 (null)	130 Corporate Tax	
110 (null)	140 Control And ...	

ORACLE

6 - 11

Copyright © 2018, Oracle. All rights reserved.

Applying OUTER Join

Practice

Create a report to display department name, state province for department which have no state province and department number in 10,20,30 or 40

DEPARTMENT_NAME	STATE_PROVINCE
1 Administration	Washington
2 Marketing	Ontario
3 Purchasing	Washington
4 Human Resources	(null)

ORACLE

6 - 12

Copyright © 2018, Oracle. All rights reserved.

Summary

In this lesson, you should have learned how to use joins to display data from multiple tables by using:

- Equijoins
- INNER joins
- Self - joins
- Natural joins
- Full(or two-sided) OUTER joins
- Table Aliases
- Table aliases speed up database access.
- Table aliases can help SQL code smaller by conserving memory.
- Table aliases are sometimes mandatory to avoid column ambiguity.

ORACLE

6 - 13

Copyright © 2018, Oracle. All rights reserved.

Practice

จงแสดงข้อมูลรหัสพนักงาน ชื่อ-สกุล รหัสงาน เงินเดือนขั้นต่ำ โดยแสดงเฉพาะ job_title ที่ไม่ได้ขึ้นต้นด้วย A และ P มีเงินเดือนขั้นต่ำเท่ากับ 4000

	EMPLOYEE_ID	FULLNAME	JOB_ID	MIN_SALARY
1	202	Pat Fay	MK_REP	4000
2	203	Susan Mavris	HR_REP	4000

ORACLE

6 - 14

Copyright © 2018, Oracle. All rights reserved.

ORACLE

6 - 15

Copyright © 2018, Oracle. All rights reserved.

ORACLE

6 - 16

Copyright © 2018, Oracle. All rights reserved.