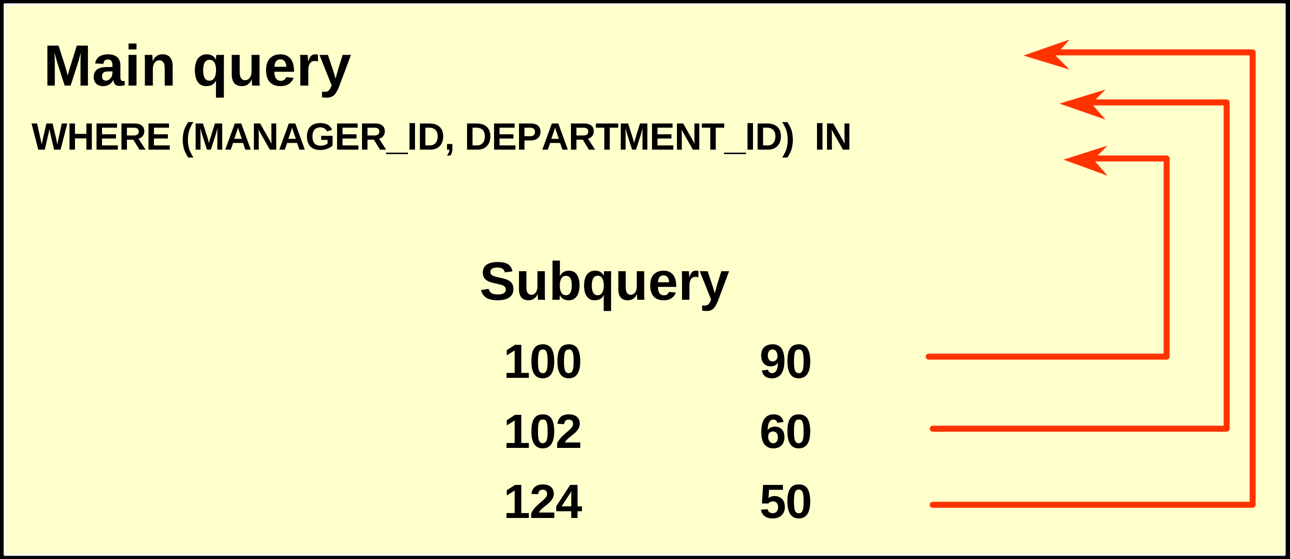
18

Advanced Subqueries

Multiple-Column Subqueries



Main query

WHERE (MANAGER_ID, DEPARTMENT_ID) IN

Subquery

100	90
102	60
124	50

Each row of the main query is compared to values from a multiple-row and multiple-column subquery.

Column Comparisons

Column comparisons in a multiple-column subquery can be:

- Pairwise comparisons
- Nonpairwise comparisons

Pairwise Comparison Subquery

Display the details of the employees who are managed by the same manager *and* work in the same department as the employees with EMPLOYEE_ID 178 or 174.

```
SELECT employee_id, manager_id, department_id
FROM   employees
WHERE  (manager_id, department_id) IN
                      (SELECT manager_id, department_id
                       FROM   employees
                       WHERE  employee_id IN (178,174))
AND    employee_id NOT IN (178,174);
```

Nonpairwise Comparison Subquery

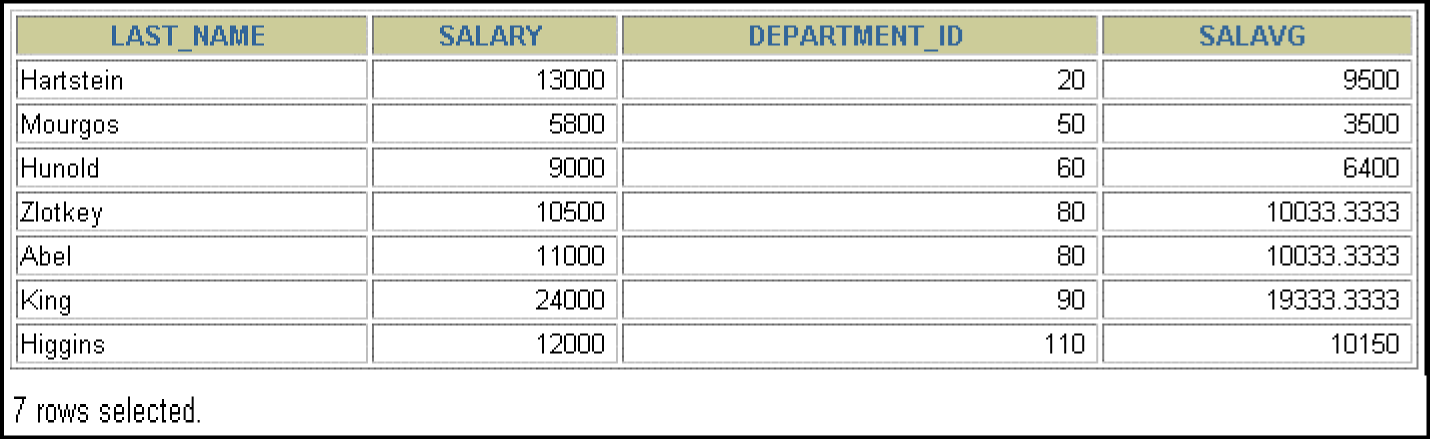
Display the details of the employees who are managed by the same manager as the employees with `EMPLOYEE_ID` 174 or 141 *and* work in the same department as the employees with `EMPLOYEE_ID` 174 or 141.

```
SELECT  employee_id, manager_id, department_id
FROM    employees
WHERE   manager_id IN
                  (SELECT  manager_id
                   FROM    employees
                   WHERE   employee_id IN (174,141))
AND     department_id IN
                  (SELECT  department_id
                   FROM    employees
                   WHERE   employee_id IN (174,141))

AND    employee_id NOT IN(174,141);
```

Using a Subquery in the FROM Clause

```
SELECT  a.last_name, a.salary,
        a.department_id, b.salavg
FROM    employees a, (SELECT   department_id,
                      AVG(salary) salavg
                      FROM     employees
                      GROUP BY department_id) b
WHERE   a.department_id = b.department_id
AND     a.salary > b.salavg;
```

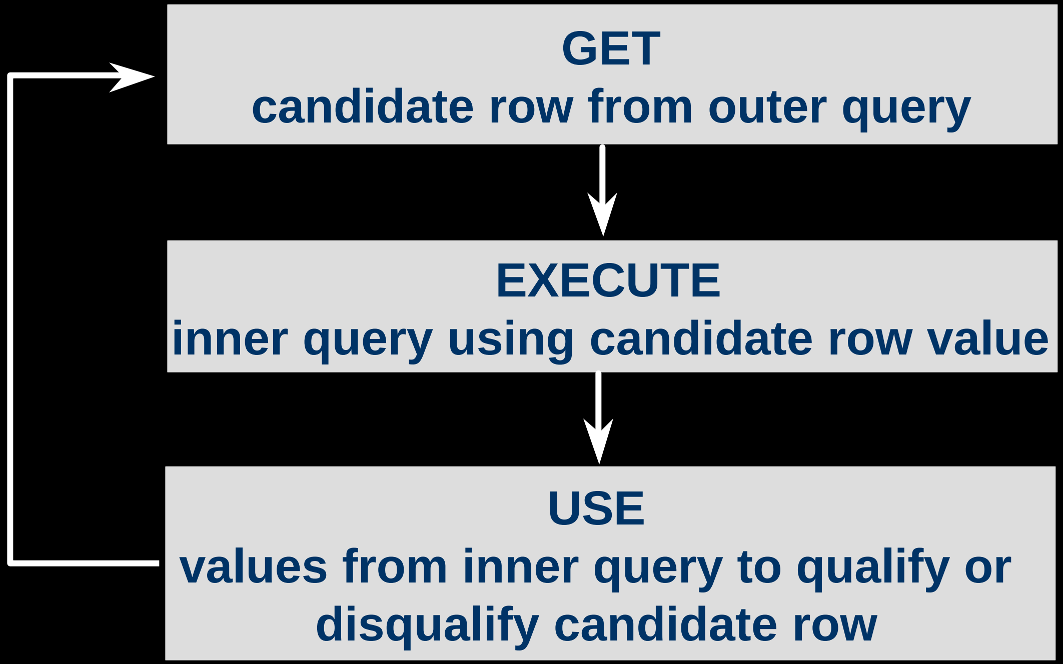


LAST_NAME	SALARY	DEPARTMENT_ID	SALAVG
Hartstein	13000	20	9500
Mourgos	5800	50	3500
Hunold	9000	60	6400
Zlotkey	10500	80	10033.3333
Abel	11000	80	10033.3333
King	24000	90	19333.3333
Higgins	12000	110	10150

7 rows selected.

Correlated Subqueries

Correlated subqueries are used for row-by-row processing. Each subquery is executed once for every row of the outer query.



GET
candidate row from outer query

EXECUTE
inner query using candidate row value

USE
values from inner query to qualify or disqualify candidate row

Correlated Subqueries

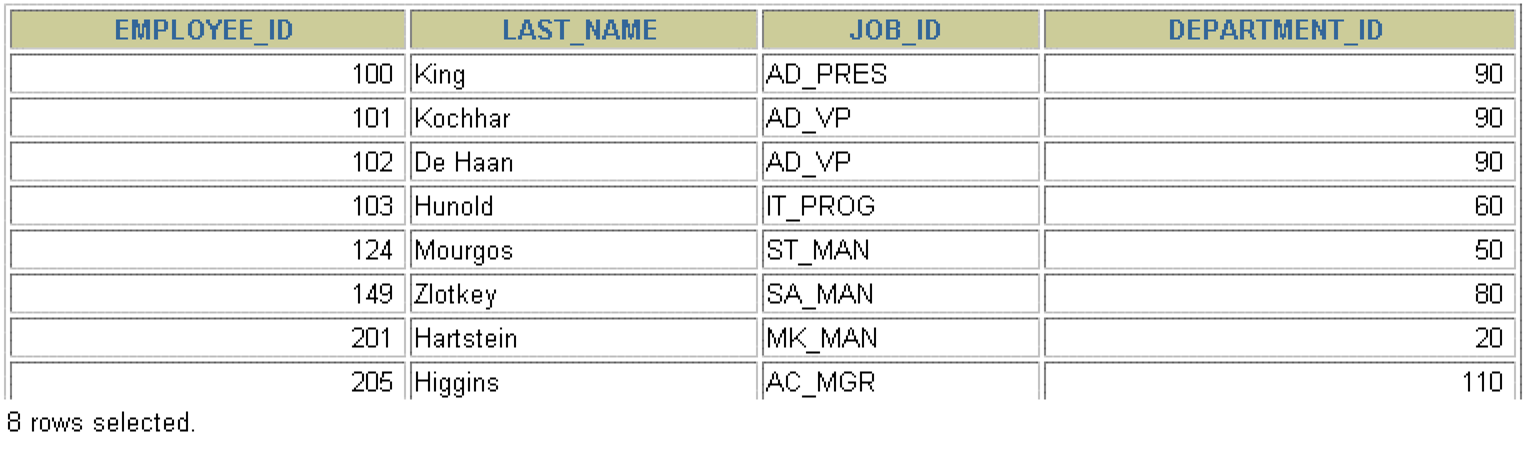
```
SELECT column1, column2, ...
FROM   table1  outer
WHERE  column1 operator
                     (SELECT  colum1, column2
                      FROM    table2
                      WHERE   expr1 =
                                 outer.expr2);
```

The subquery references a column from a table in the parent query.

Using the EXISTS Operator

Find employees who have at least one person reporting to them.

```
SELECT employee_id, last_name, job_id, department_id
FROM   employees outer
WHERE  EXISTS ( SELECT 'X'
                FROM   employees
                WHERE  manager_id =
                       outer.employee_id);
```



EMPLOYEE_ID	LAST_NAME	JOB_ID	DEPARTMENT_ID
100	King	AD_PRES	90
101	Kochhar	AD_VP	90
102	De Haan	AD_VP	90
103	Hunold	IT_PROG	60
124	Mourgos	ST_MAN	50
149	Zlotkey	SA_MAN	80
201	Hartstein	MK_MAN	20
205	Higgins	AC_MGR	110

8 rows selected.