

讲师: collen7788@126.com

P r e s e n t a t i o n

子查询

本章目标

1 描述子查询可以解决的问题

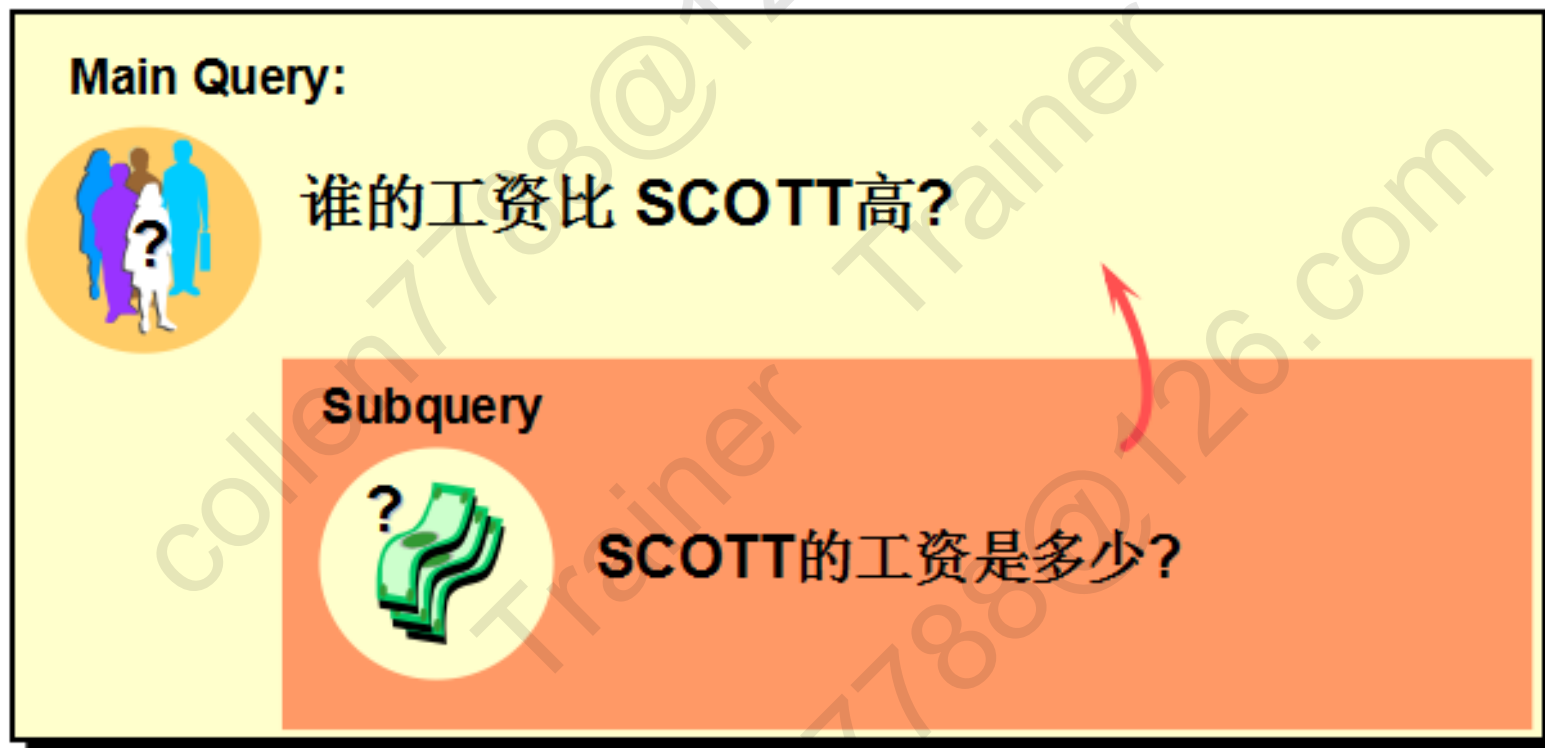
2 定义子查询。

3 列出子查询的类型。

4 书写单行子查询和多行子查询

使用子查询解决问题

❖ 谁的工资比 **SCOTT**高?



子查询语法

```
SELECT    select_list
FROM      table
WHERE     expr operator
          (SELECT    select_list
           FROM      table);
```

- ❖ 子查询（内查询）在主查询之前一次执行完成。
- ❖ 子查询的结果被主查询使用（外查询）。

子查询

```
SELECT *  
FROM EMP  
WHERE SAL > (SELECT SAL  
              FROM EMP  
              WHERE ENAME = 'SCOTT');
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7839	KING	PRESIDENT		17-11月-81	5000		10

注意事项

- ❖ 子查询要包含在括号内。
- ❖ 将子查询放在比较条件的右侧。
- ❖ 单行操作符对应单行子查询，多行操作符对应多行子查询。

子查询类型

- 单行子查询



- 多行子查询



单行子查询

- ❖ 只返回一行。
- ❖ 使用单行比较操作符。

操作符	含义
=	Equal to
>	Greater than
>=	Greater than or equal to
<	Less than
<=	Less than or equal to
<>	Not equal to

执行单行子查询

```
SELECT ename, job, sal
FROM emp
WHERE job =
      (SELECT job
        FROM emp
        WHERE empno = 7566)
AND sal >
      (SELECT sal
        FROM emp
        WHERE empno = 7782);
```

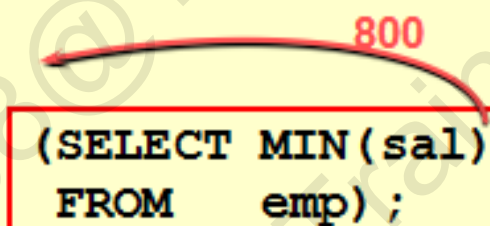
MANAGER

2450

ENAME	JOB	SAL
JONES	MANAGER	2975
BLAKE	MANAGER	2850

在子查询中使用组函数

```
SELECT ename, job, sal
FROM emp
WHERE sal =  
      (SELECT MIN(sal)
       FROM emp);
```



ENAME	JOB	SAL
SMITH	CLERK	800

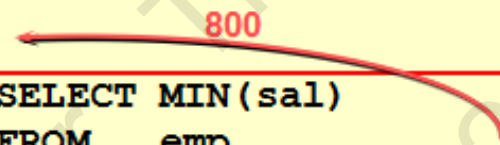
子查询中的 HAVING 子句

- ❖ 首先执行子查询。
- ❖ 向主查询中的 HAVING 子句返回结果。

```
SELECT deptno, MIN(sal)
FROM emp
GROUP BY deptno
HAVING MIN(sal) >
```

800

```
(SELECT MIN(sal)
FROM emp
WHERE deptno = 10);
```



DEPTNO	MIN(SAL)
30	950
10	1300

非法使用子查询

```
SELECT empno, ename  
FROM emp  
WHERE sal =
```

```
(SELECT MIN(sal)  
FROM emp  
GROUP BY deptno);
```

ERROR at line 4:

ORA-01427: single-row subquery returns more than one row

多行子查询使用单行比较符

单行子查询中的空值问题

```
SELECT ename, job  
FROM    emp  
WHERE   job =
```

```
(SELECT job  
FROM    emp  
WHERE   ename = 'Mike');
```

no rows selected

子查询不返回任何行

多行子查询

- ❖ 返回多行。
- ❖ 使用多行比较操作符。

操作符	含义
IN	等于列表中的任何一个
ANY	和子查询返回的任意一个值比较
ALL	和子查询返回的所有值比较

在多行子查询中使用 ANY 操作符

❖ 查询工资比**30**号部门任意一个员工高的员工信息

```
SELECT *  
FROM emp  
WHERE sal > any ( SELECT sal  
                  FROM emp  
                  WHERE deptno = 30) ;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7839	KING	PRESIDENT		17-11月-81	5000		10
7902	FORD	ANALYST	7566	03-12月-81	3000		20
7788	SCOTT	ANALYST	7566	13-7月 -87	3000		20
7566	JONES	MANAGER	7839	02-4月 -81	2975		20
7698	BLAKE	MANAGER	7839	01-5月 -81	2850		30
7782	CLARK	MANAGER	7839	09-6月 -81	2450		10
7499	ALLEN	SALESMAN	7698	20-2月 -81	1600	300	30
7844	TURNER	SALESMAN	7698	08-9月 -81	1500	0	30
7934	MILLER	CLERK	7782	23-1月 -82	1300		10
7521	WARD	SALESMAN	7698	22-2月 -81	1250	500	30
7654	MARTIN	SALESMAN	7698	28-9月 -81	1250	1400	30
7876	ADAMS	CLERK	7788	13-7月 -87	1100		20

在多行子查询中使用 ALL 操作符

❖ 查询工资比30号部门所有员工高的员工信息

```
SELECT *  
FROM emp  
WHERE sal > all ( SELECT sal  
                  FROM emp  
                  WHERE deptno = 30) ;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7566	JONES	MANAGER	7839	02-4月 -81	2975		20
7788	SCOTT	ANALYST	7566	13-7月 -87	3000		20
7839	KING	PRESIDENT		17-11月-81	5000		10
7902	FORD	ANALYST	7566	03-12月-81	3000		20

多行子查询中的空值问题

❖ 查询不是老板的员工信息

```
SELECT *  
FROM emp  
WHERE empno not in( SELECT mgr  
                     FROM emp) ;
```

no rows selected

摘自Oracle官方培训讲义

- ❖ **Returning Nulls in the Resulting Set of a Subquery**

- ❖ The SQL statement on the slide attempts to display all the employees who do not have any subordinates. Logically, this SQL statement should have returned 12 rows. However, the SQL statement does not return any rows. One of the values returned by the inner query is a null value, and hence the entire query returns no rows. The reason is that all conditions that compare a null value result in a null. So whenever null values are likely to be part of the results set of a subquery, do not use the NOT IN operator. The NOT IN operator is equivalent to \neq ALL.

- ❖ **Notice** that the null value as part of the results set of a subquery is not a problem if you use the IN operator. The IN operator is equivalent to $=$ ANY. For example, to display the employees who have subordinates, use the following SQL statement:

- ❖ `SELECT emp.last_name`
- ❖ `FROM employees emp`
- ❖ `WHERE emp.employee_id IN`
- ❖ `(SELECT mgr.manager_id`
- ❖ `FROM employees mgr);`

- ❖ Alternatively, a WHERE clause can be included in the subquery to display all employees who do not have any subordinates:

- ❖ `SELECT last_name FROM employees`
- ❖ `WHERE employee_id NOT IN`
- ❖ `(SELECT manager_id`
- ❖ `FROM employees`
- ❖ `WHERE manager_id IS NOT NULL);`

总结

❖ 通过本章学习，您已经学会：

- 如何使用子查询。
- 在查询是基于未知的值时应使用子查询。

```
SELECT    select_list
FROM      table
WHERE     expr operator
          (SELECT select_list
           FROM    table);
```

课堂练习

- ❖ 找到员工表中工资最高的前三名，如下格式：

ROWNUM	EMPNO	ENAME	SAL
1	7839	KING	5000
2	7788	SCOTT	3000
3	7902	FORD	3000



oracle分页.txt

- ❖ 找到员工表中薪水大于本部门平均薪水的员工。

EMPNO	ENAME	SAL	AUGSAL
7499	ALLEN	1600	1566.66667
7566	JONES	2975	2175
7698	BLAKE	2850	1566.66667
7788	SCOTT	3000	2175
7839	KING	5000	2916.66667
7902	FORD	3000	2175

- ❖ 统计每年入职的员工个数。

Total	1980	1981	1982	1987
14	1	10	1	2

面试题一:

- 已知:

```
SQL> desc test1;
```

名称	是否为空?	类型
----	-------	----

ID	NOT NULL	NUMBER(38)
NAME		VARCHAR2(20)
MONEY		NUMBER(38)



(.txt)

```
SQL> select * from test1;
```

ID	NAME	MONEY
1	Tom	1000
2	Mary	2000
3	Mike	3000
4	Jeff	4000

- 要求:

ID	NAME	MONEY	MONEY1
1	Tom	1000	
2	Mary	2000	1000
3	Mike	3000	2000
4	Jeff	4000	3000

面试题二:



(.txt)

• 表 pm_ci

```
SQL> desc pm_ci;
```

名称	是否为空?	类型
CI_ID	NOT NULL	VARCHAR2(20)
STU_IDS		VARCHAR2(100)

```
SQL> select * from pm_ci;
```

CI_ID	STU_IDS
1	1,2,3,4
2	1,4

• 表 pm_stu

```
SQL> desc PM_STU;
```

名称	是否为空?	类型
STU_ID	NOT NULL	VARCHAR2(20)
STU_NAME		VARCHAR2(20)

```
SQL> select * from pm_stu;
```

STU_ID	STU_NAME
1	张三
2	李四
3	王五
4	赵六

• 要求:

CI_ID	STU_NAME
1	张三,李四,王五,赵六
2	张三,赵六

讲师: collen7788@126.com

P r e s e n t a t i o n

Thank you