



中山大學  
SUN YAT-SEN UNIVERSITY

# 数据库实验报告

实验人： 伍建霖 学号： 20337251 日期： \_\_\_\_\_

院（系）： 计算机学院 专业（班级）： 网络空间安全

联系方式： QQ 773542531

实验题目： 1.3 数据高级查询

## 一. 实验目的

掌握 SQL 嵌套查询和集合查询等各种高级查询的设计方法。

## 二. 实验内容和要求

针对 TPC-H 数据库，正确分析用户查询要求，设计各种嵌套查询和集合查询。

## 三. 实验重点和难点

实验重点：嵌套查询

实验难点：相关子查询、多层 exist 嵌套查询

## 四. 实验工具

MySQL、SQL Server、Navicat

## 五. 实验过程

(1) In 嵌套查询

查询订购了“佳能”制造的“佳能墨盒”的顾客。

方法一

SELECT \*

FROM customer

WHERE customer.custkey IN (SELECT orders.custkey

FROM orders, part,

lineitem

WHERE part.mfgr = '

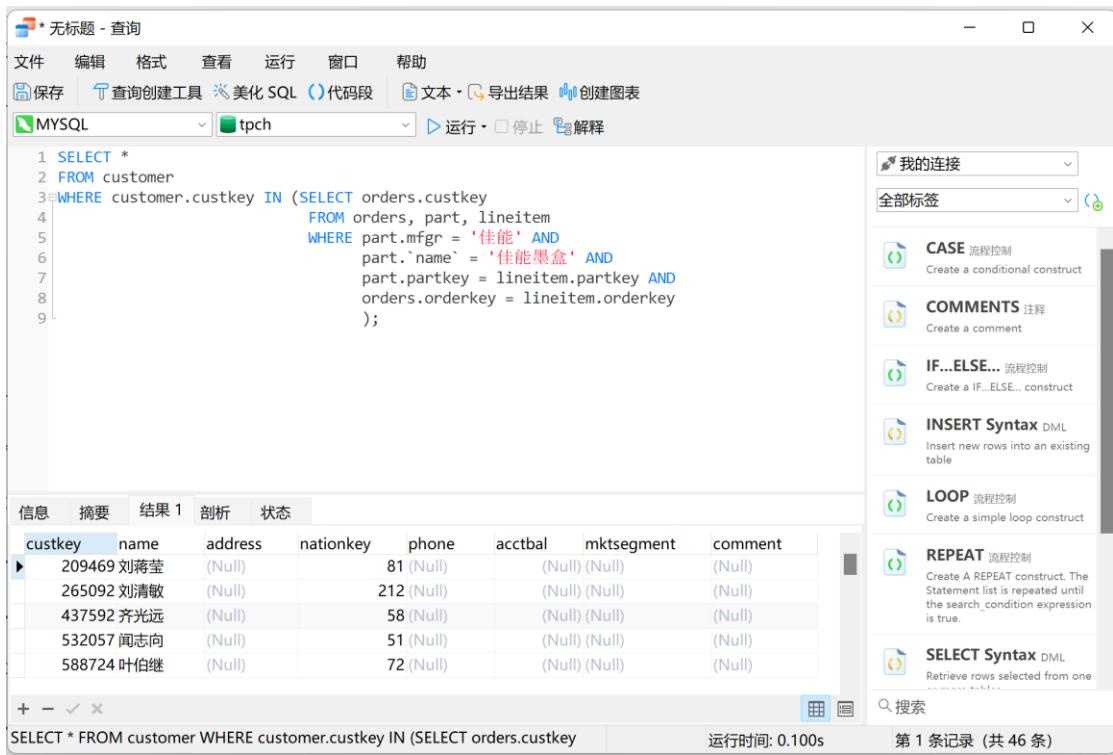
佳能' AND

part.`name` = '佳能墨盒' AND

part.partkey = lineitem.partkey AND

```
orders.orderkey = lineitem.orderkey  
);
```

部分结果截屏如下：



方法二

```
(SELECT customer.*  
FROM orders, part,  
lineitem, customer  
WHERE part.mfgr = '  
佳能' AND  
part.name = '佳能墨盒' AND  
part.partkey = lineitem.partkey AND  
orders.orderkey = lineitem.orderkey AND  
customer.custkey = orders.custkey  
);
```

部分结果截屏如下：



```

FROM orders, part,
lineitem

WHERE part.mfgr = '佳能'

part.`name`

= '佳能墨盒' AND

part.partkey = lineitem.partkey AND

orders.orderkey = lineitem.orderkey AND

customer.custkey = orders.custkey

);

```

第一个用的是 not in

第二个用的是 not exists

部分结果截屏如下：

The screenshot shows a MySQL query editor with the following SQL query:

```

1 SELECT *
2 FROM customer
3 WHERE NOT EXISTS (SELECT *
4 FROM orders, part, lineitem
5 WHERE part.mfgr = '佳能' AND
6 part.`name` = '佳能墨盒' AND
7 part.partkey = lineitem.partkey AND
8 orders.orderkey = lineitem.orderkey AND
9 customer.custkey = orders.custkey
10 );
11

```

The results table shows the following data:

| custkey | name  | address | nationkey | phone      |
|---------|-------|---------|-----------|------------|
| 1       | 阿宝宝   | (Null)  |           | 138 (Null) |
| 2       | 阿爆    | (Null)  |           | 186 (Null) |
| 3       | 阿倍仲麻吕 | (Null)  |           | 190 (Null) |
| 4       | 阿比    | (Null)  |           | 222 (Null) |
| 5       | 阿碧    | (Null)  |           | 13 (Null)  |

The status bar at the bottom indicates: 运行时间: 0.696s, 第 1 条记录 (共 661350 条). The date and time are 2022/09/20 19:00.

(3) 双层 exists 嵌套查询（注：由于表太大，可能非常耗时！）

查询至少购买过顾客“齐光远”购买过的全部零件的顾客姓名。

```

SELECT customer.`name`
FROM customer
WHERE EXISTS (SELECT *

```

```

FROM
WHERE EXISTS (

```

```

SELECT *
FROM
WHERE
)
)

```

部分结果截屏如下：

时间过长。。。。。

(4) From 子句中的嵌套查询

查询订单平均金额超过 25 万元的顾客中的中国籍顾客信息。

```

SELECT customer.*
FROM nation, customer, (SELECT custkey
                           FROM orders
                           GROUP BY custkey
                           HAVING AVG(totalprice)>250000) AS c(ck)
WHERE (nation.`name` = '中国' AND
       customer.nationkey = nation.nationkey AND
       customer.custkey = ck);

```

部分结果截屏如下：



The screenshot shows a MySQL query execution window titled "无标题 - 查询". The query is as follows:

```

1 SELECT customer.*
2 FROM nation, customer, (SELECT custkey
3                           FROM orders
4                           GROUP BY custkey
5                           HAVING AVG(totalprice)>250000) AS c(ck)
6 WHERE (nation.`name` = '中国' AND
7        customer.nationkey = nation.nationkey AND
8        customer.custkey = ck);

```

The results are displayed in a table with the following columns: custkey, name, address, nationkey, and phone. The results are as follows:

| custkey | name | address | nationkey | phone     |
|---------|------|---------|-----------|-----------|
| 549186  | 项子娟  | (Null)  |           | 40 (Null) |
| 206232  | 刘家澍  | (Null)  |           | 40 (Null) |
| 335882  | 刘严开  | (Null)  |           | 40 (Null) |
| 561391  | 徐乐   | (Null)  |           | 40 (Null) |
| 114571  | 郎亮亮  | (Null)  |           | 40 (Null) |

The status bar at the bottom indicates the query execution time is 0.079s and the first record is displayed out of 66 records.

(5) 集合查询（交）

查询顾客“陈朋”和“宋金保”都订过的全部零件的信息。

```
( SELECT
    *
FROM
    Part
WHERE
    partkey IN ( SELECT partkey FROM Lineitem WHERE orderkey IN ( SELECT
orderkey FROM Orders WHERE custkey IN ( SELECT custkey FROM Customer WHERE name =
'陈朋' ) ) )
) INTERSECT
(
SELECT
    *
FROM
    Part
WHERE
    partkey IN ( SELECT partkey FROM Lineitem WHERE orderkey IN ( SELECT orderkey
FROM Orders WHERE custkey IN ( SELECT custkey FROM Customer WHERE name = '宋金保
' ) ) )
)
```

部分结果截屏如下：



#### (6) 集合查询（并）

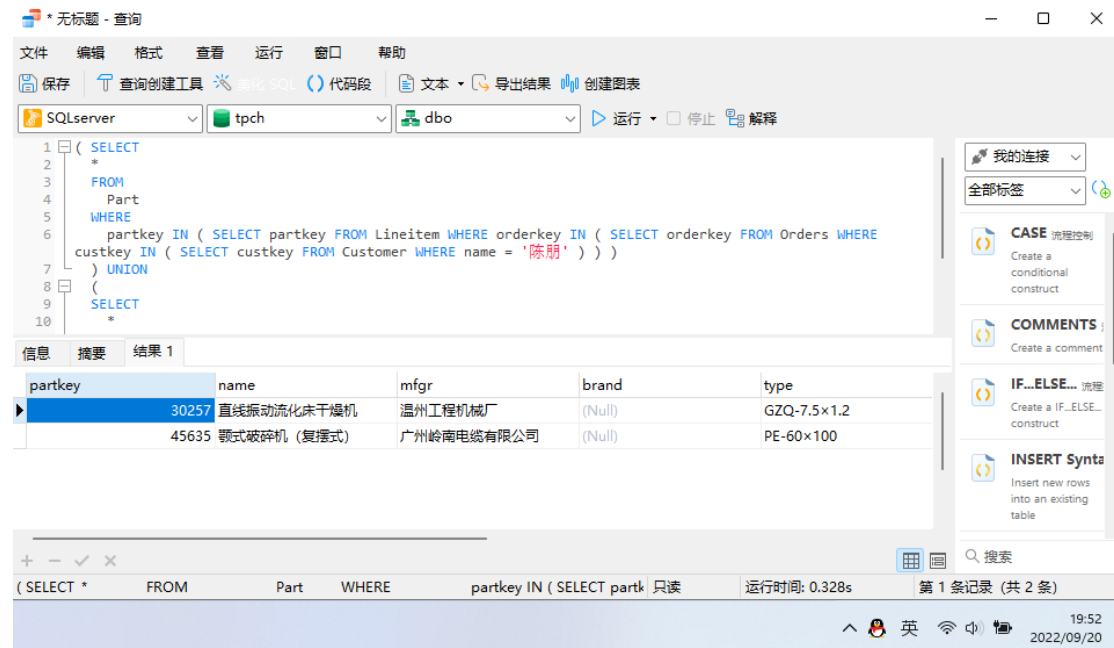
查询顾客“陈朋”和“宋金保”订购的全部零件的信息。

```

( SELECT
    *
FROM
    Part
WHERE
    partkey IN ( SELECT partkey FROM Lineitem WHERE orderkey IN ( SELECT orderkey
FROM Orders WHERE custkey IN ( SELECT custkey FROM Customer WHERE name = '陈朋' ) ) )
) UNION
(
SELECT
    *
FROM
    Part
WHERE
    partkey IN ( SELECT partkey FROM Lineitem WHERE orderkey IN ( SELECT orderkey
FROM Orders WHERE custkey IN ( SELECT custkey FROM Customer WHERE name = '宋金保'
) ) )
)

```

部分结果截屏如下：



The screenshot shows a SQL Server window with a query editor and a results pane. The query is a set difference query. The results pane shows two rows of data from the 'Part' table.

| partkey | name        | mfgr       | brand  | type        |
|---------|-------------|------------|--------|-------------|
| 30257   | 直线振动流化床干燥机  | 温州工程机械厂    | (Null) | GZQ-7.5×1.2 |
| 45635   | 颚式破碎机 (复摆式) | 广州岭南电缆有限公司 | (Null) | PE-60×100   |

#### (7) 集合查询 (差)

查询顾客“宋金保”订过而顾客“陈朋”没订过的零件的信息。

```

( SELECT
    *
FROM

```

```

Part
WHERE
    partkey IN ( SELECT partkey FROM Lineitem WHERE orderkey IN ( SELECT orderkey
FROM Orders WHERE custkey IN ( SELECT custkey FROM Customer WHERE name = '宋金保'
) ) ) )
) EXCEPT
(
SELECT
    *
FROM
    Part
WHERE
    partkey IN ( SELECT partkey FROM Lineitem WHERE orderkey IN ( SELECT orderkey
FROM Orders WHERE custkey IN ( SELECT custkey FROM Customer WHERE name = '陈朋' ) ) )
)

```

部分结果截屏如下：



## 六. 与实验结果相关的文件

无

## 七. 实验总结



