

# 《数据库概论》实验一：用 SQL 进行数据操作 实验报告

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## 实验环境

使用 windows10 , MySQL Server 5.5。

## 实验过程

```
CREATE DATABASE experiment1;
use experiment1;
#1
CREATE TABLE Customers
(
    cid Char(4) NOT NULL,
    cname Char(20) NOT NULL,
    city Char(20),
    discnt real,
    PRIMARY KEY(cid)
);
CREATE TABLE Agents
(
    aid Char(3) NOT NULL,
    aname Char(20) NOT NULL,
    city Char(20),
    perc smallint,
    PRIMARY KEY(aid)
);
CREATE TABLE Products
(
    pid Char(3) NOT NULL,
    pname Char(20) NOT NULL,
    city Char(20),
    quantity int NOT NULL,
    price real NOT NULL,
    PRIMARY KEY(pid)
);
CREATE TABLE Orders
(
    ordno int NOT NULL,
    orddate Date NOT NULL,
    cid Char(4) NOT NULL,
```

```

    aid Char(3) NOT NULL,
    pid Char(3) NOT NULL,
    qty int,
    dols real,
    PRIMARY KEY(ordno)
);
#2
INSERT INTO Customers
VALUES
('c001', 'Tiptop', 'Duluth', 10.00),
('c002', 'Basics', 'Dallas', 12.00),
('c003', 'Allied', 'Dallas', 8.00),
('c004', 'ACME', 'Duluth', 8.00),
('c006', 'ACME', 'Kyoto', 0.00);

INSERT INTO Agents
VALUES
('a01', 'Smith', 'New York', 6),
('a02', 'Jones', 'Newark', 6),
('a03', 'Brown', 'Tokyo', 7),
('a04', 'Gray', 'New York', 6),
('a05', 'Otasi', 'Duluth', 5),
('a06', 'Smith', 'Dallas', 5);

INSERT INTO Products
VALUES
('p01', 'comb', 'Dallas', 111400, 0.50),
('p02', 'brush', 'Newark', 203000, 0.50),
('p03', 'razor', 'Duluth', 150600, 1.00),
('p04', 'pen', 'Dallas', 125300, 1.00),
('p05', 'pencil', 'Dallas', 221400, 1.00),
('p06', 'folder', 'Dallas', 123100, 2.00),
('p07', 'case', 'Newark', 100500, 1.00);

INSERT INTO Orders
VALUES
(1011, '2016-01-08', 'c001', 'a01', 'p01', 1000, 450.00),
(1012, '2016-01-12', 'c001', 'a01', 'p01', 1000, 450.00),
(1019, '2016-02-24', 'c001', 'a02', 'p02', 400, 180.00),
(1017, '2016-02-10', 'c001', 'a06', 'p03', 600, 540.00),
(1018, '2016-02-16', 'c001', 'a03', 'p04', 600, 540.00),
(1023, '2016-03-12', 'c001', 'a04', 'p05', 500, 450.00),
(1022, '2016-03-08', 'c001', 'a05', 'p06', 400, 720.00),
(1025, '2016-04-07', 'c001', 'a05', 'p07', 800, 720.00),

```

```
(1013, '2016-01-13', 'c002', 'a03', 'p03', 1000, 880.00),
(1026, '2016-05-20', 'c002', 'a05', 'p03', 800, 704.00),
(1015, '2016-01-23', 'c003', 'a03', 'p05', 1200, 1104.00),
(1014, '2016-01-18', 'c003', 'a03', 'p05', 1200, 1104.00),
(1021, '2016-02-28', 'c004', 'a06', 'p01', 1000, 460.00),
(1016, '2016-01-25', 'c006', 'a01', 'p01', 1000, 500.00),
(1020, '2016-02-05', 'c006', 'a03', 'p07', 600, 600.00),
(1024, '2016-03-12', 'c006', 'a06', 'p01', 800, 400.00);
```

#3.1

```
SELECT a1.aid FROM Agents a1
where a1.aid not in
(
    SELECT o1.aid
    from Customers C1, Orders O1
    where C1.cid=O1.cid and C1.city='Duluth'
);
结果截图
```

	aid
	HULL

#3.2

```
SELECT O1.aid FROM Orders O1, Customers C1
where O1.cid=C1.cid and (C1.city='Duluth' or C1.city='Kyoto')
and not exists
(
    SELECT * from Customers C2
    where (C2.city='Duluth' or C2.city='Kyoto') and C2.cid not in
    (
        select O2.cid from Orders O2
        where O2.aid=O1.aid and O2.pid=O1.pid
    )
);
结果截图
```

	aid
	HULL

#3.3

```
SELECT distinct O1.cid from Orders O1
where O1.cid not in
(
    select O2.cid from Orders O2
```

```
        where o2.aid!='a03' and o2.aid!='a05'  
);
```

结果截图

cid
c002
c003

```
#3.4  
select P1.pid from Products P1  
where not exists  
(  
    select * from customers c1  
    where P1.pid not in  
(  
        select o1.pid from Orders o1  
        where o1.cid=c1.cid  
    )  
)  
select * from  
(  
    select o1.aid,o1.pid,sum(o1.qty) as sumqty from orders o1  
    group by o1.aid,o1.pid  
    having sumqty>1000  
    order by sumqty desc  
    limit 3  
)q;
```

结果截图

pid
NUL

```
#3.5  
create table max select o1.cid,o1.orddate from orders o1  
where o1.orddate>=ALL(select o2.orddate from orders o2 where o2.cid=o1.cid);  
create table temp select o1.cid,o1.orddate from orders o1 left join max  
on o1.cid=max.cid where o1.orddate!=max.orddate;  
insert into max select t.cid,t.orddate from temp t  
where t.orddate>=all(select t1.orddate from temp t1 where t1.cid=t.cid);  
select * from max
```

```
order by cid,orddate ;
drop table max;drop table temp;
结果截图
```

	cid	orddate
	c001	2016-03-12
	c001	2016-04-07
	c002	2016-01-13
	c002	2016-05-20
	c003	2016-01-18
	c003	2016-01-23
	c004	2016-02-28
	c006	2016-02-05
	c006	2016-03-12

```
#3.6
select p1.pid from products p1
where not exists
(
    select * from customers c1
    where c1.city='Dallas' and c1.cid not in
    (
        select o1.cid from orders o1
        where o1.pid=p1.pid
    )
);
结果截图
```

pid
NULL

```
#3.7
select a1.aid,a1.perc from agents a1
where not exists
(
    select * from customers c1
    where c1.city='Duluth' and c1.cid not in
    (
        select o1.cid from orders o1
        where o1.aid=a1.aid
    )
)
order by a1.perc desc;
结果截图
```

	aid	perc
	a06	5

#3.8

```
select o1.pid from Orders o1,customers c1,agents a1
where o1.cid=c1.cid and o1.aid=a1.aid and c1.city=a1.city;
```

结果截图

	pid
	006
	007

#3.9

```
select * from agents a1
where a1.perc in
(
    select max(a2.perc) from agents a2
);

select * from agents a1
where a1.perc in
(
    select a2.perc from agents a2
    where a2.perc not in
    (
        select a3.perc from agents a3,agents a4
        where a3.perc<a4.perc
    )
);

```

结果截图

	aid	aname	city	perc
	a03	Brown	Tokvo	7

#3.10

```
select o1.cid,sum(o1.dols) from orders o1
where o1.cid not in
(
    select o2.cid from orders o2
    where o2.aid<>'a03'
)group by o1.cid;
```

结果截图(它的输出是空的也就是结果是 NULL)

	cid	sum(o1.dols)

#3.11

```
select q.pid,q.aid from
```

```
(  
    select o1.pid,o1.aid,sum(o1.qty) as sumqty from orders o1  
    group by o1.aid,o1.pid  
    having sumqty>1000  
    order by o1.pid  
    limit 3  
)q;
```

结果截图

pid	aid
o01	a01
o01	a06
o05	a03

```
#3.12  
select distinct q.cid from  
(  
    select o1.cid,o1.pid,avg(o1.qty) as avgqty from orders o1  
    group by o1.cid,o1.pid  
)q  
where q.avgqty>=300;
```

结果截图

cid
c001
c002
c003
c004
c006

```
#4  
drop table orders;  
drop table customers;  
drop table agents;  
drop table products;
```

## 实验中遇到的困难及解决办法

困难在于有些题目的意思叙述得不太清楚，导致理解错误。而且自己对一些函数的用法以及 join 的用法不是特别熟悉，做的时候磕磕绊绊的。建议数据集可以再丰富一些，可以观察到更多的结果从而测试自己的实现是否正确。

## 参考文献及致谢

[1] MySQL 教程 <https://www.runoob.com/mysql/mysql-tutorial.html>