work 4

PPT作业

- **找出所有顾客、代理商和商品都在同一个城市的三元组(cid,aid,pid)**

$$\Pi_{CID,AID,PID}(Customuers \bowtie Agents \bowtie Products)$$

```
select CID, AID, PID
FROM Customers
NATURAL INNER JOIN Agents
NATURAL INNER JOIN products;
```

- **找出所有顾客、代理商和商品两两不在同一个城市的三元组(cid,aid,pid)**

$$\Pi_{Customers.CID,Agents.AID,Products.PID}$$
$$(\sigma_{Customers.City \neq Agents.City \wedge Customers.City \neq Products.City \wedge Agents.City \neq Products.City}$$
$$(C \times A \times P))$$

```
select Customers.CID, Agents.AID, products.PID
FROM Customers CROSS JOIN Agents CROSS JOIN products
WHERE Customers.City <> Agents.City AND Customers.City <>
products.City AND Agents.City <> products.City;
```

- **取出至少被一个在杭州的顾客通过位于上海的代理商定购的商品的名字**

$$\Pi_{Products.Pname}$$
$$\sigma_{Customers.City='Hangzhou' \wedge Agents.City='Shanghai'}$$
$$(Orders \bowtie_{Orders.CID=Customers.CID} Customers$$
$$\bowtie_{Orders.AID=Agents.AID} Agents$$
$$\bowtie_{Orders.PID=Products.PID} Products)$$

```
select *
FROM Orders
NATURAL INNER JOIN Customers
INNER JOIN Agents on Orders.AID = Agents.AID
INNER JOIN products on Orders.PID = p    roducts.PID
WHERE Customers.City = 'Hangzhou' AND  Agents.City =
'Shanghai';
```

列出所有在同一个城市的代理商的aid对

$$\Pi_{Agents.AID,Agent'.AID}(\sigma_{Agents.City=Agent'.City}(Agents \times Agents))$$

```
select t1.AID, t2.AID
FROM Agents t1
CROSS JOIN Agents t2 on t1.City = t2.City;
```

- **取出销售过所有曾被顾客c002定购过的商品的代理商的名字**

$$\Pi_{AID,PID}(\sigma_{CID='c002'}Orders) \div \Pi_{PID}(\sigma_{CID='c002'}Orders)$$

- **取出所有的三元组（cid，aid，pid），要求对应的顾客，代理商和商品中至少有两者是位于同一座城市**

$$\Pi_{Orders.CID,Agents.AID,Products.PID}(\sigma_{Customers.City=Agents.City \vee Customers.City=Products.City \vee Agents.City=Products.City}(Orders \bowtie_{Orders.CID=Customers.CID} Customers \bowtie_{Orders.AID=Agents.AID} Agents \bowtie_{Orders.PID=Products.PID} Products))$$

- **取出接受过上海的顾客一笔总额超过￥500的订单的代理商的aid值**

$$\Pi_{Orders.AID}$$
$$(\sigma_{Customers.City='Shanghai' \wedge Qty>500}$$
$$(Orders \bowtie_{Orders.CID=Customers.CID} Customers$$
$$\bowtie_{Orders.AID=Agents.AID} Agents$$
$$\bowtie_{Orders.PID=Products.PID} Products))$$

```
select Agents.AID
FROM Orders
INNER JOIN Customers ON Customers.CID = Orders.CID
INNER JOIN Agents ON Agents.AID = Orders.AID
INNER JOIN products ON products.PID = Orders.PID
WHERE Customers.City = 'Shanghai' AND Orders.Qty > 500;
```

- **取出只从一家代理商处定购过商品的顾客的cid值**

$$\Pi_{CID}(Orders) -$$
$$\Pi_{T1.CID}($$
$$\sigma_{T1.CID=T2.CID \wedge T1.AID \neq T2.AID}($$
$$\Pi_{CID,AID}(Orders) \times \Pi_{CID,AID}(Orders)))$$

-

书本习题

- **SPJ 数据库**
  - **求供应工程 J1 零件的供应商号码 SNO**

$$\Pi_{SNO}(\sigma_{JNO='J1'}(SPJ))$$

  - **求供应工程 J1 零件P1的供应商号码 SNO**

$$\Pi_{SNO}(\sigma_{JNO='J1' \wedge PNO='P1'}(SPJ))$$

  - **求供应工程 J1 零件为红色的供应商号码 SNO**

$$\Pi_{SNO}(\sigma_{COLOR='红' \wedge JNO='J1'}(SPJ \bowtie P))$$

- **求没有使用天津供应商生产的红色零件的工程号 JNO**

$$\Pi_{JNO} - \Pi_{JNO}(\sigma_{City='天津' \wedge COLOR='红'}(SPJ \bowtie S \bowtie P))$$

- **求至少用了供应商 S1所供应的全部零件的工程号 JNO**

$$\Pi_{JNO,PNO}(SPJ) \div \Pi_{PNO}(\sigma_{SNO='S1'}(SPJ))$$

- **试述等值连接与自然连接的区别和联系**

  两者都为连接运算，但自然连接是一种特殊的等值连接，要求两个关系中进行比较的分量必须是相同的属性组，并且要在结果中去除其中一个的重复属性

- **关系代数的基本运算有哪些?如何用这些基本运算来表示其他运算**

  基本运算有并、差、笛卡尔积、投影、选择，总共 5 种

  交、连接、除都可以用这五种进行表示

$$R \cap S = R - (R - s)$$
$$R \bowtie_{A\theta B} S = \sigma_{A\theta B}(R \times S)$$
$$R \div S = \Pi_X(R) - \Pi_X(\Pi_X(R) \times \Pi_Y(S) - R)$$