关系代数作业

1. $\Pi_{cid,aid,pid}(Customers \bowtie Agents \bowtie products)$
2. $\Pi_{cid,aid,pid}(\sigma_{Customers.city \neq Agents.city \wedge Agents.city \neq products.city \wedge products.city \neq Customers.city}(Customers \times Agents \times products))$
3. $\Pi_{Pname}(\sigma_{Customers.city='Hangzhou' \wedge Agents.city='Shanghai'}(Customers \times Agents \times products) \bowtie Orders)$
4. $A1 = Agents, A2 = Agents$

   $\Pi_{A1.aid,A2.aid}(\sigma_{A1.city=A2.city \wedge A1.aid \neq A2.aid}(A1 \times A2))$
5. $\Pi_{aname}(\Pi_{aid,pid}(Orders) \div \Pi_{pid}(\sigma_{cid='002'}(Orders)) \bowtie Agents)$
6. $\Pi_{cid,aid,pid}(\sigma_{Customers.city=Agents.city \vee Agents.city=products.city \vee products.city=Customers.city}(Customers \times Agents \times products))$
7. $\Pi_{aid}(\sigma_{price \times Qty > 500}((\sigma_{Customers.city='Shanghai'}(Customers) \bowtie Orders) \bowtie products))$
8. $O1 = Orders, O2 = Orders$

   $\Pi_{cid}(Orders) - \Pi_{cid}(\sigma_{O1.cid=O2.cid \wedge O1.aid \neq O2.aid}(O1 \times O2))$

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

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

   (3). $\Pi_{SNO}(\Pi_{SNO,PNO}(\sigma_{JNO='J1'}(SPJ)) \bowtie \Pi_{PNO}(\sigma_{COLOR='红'}(P)))$

   (4). $\Pi_{JNO}(J) - \Pi_{JNO}(\Pi_{SNO}(\sigma_{CITY='天津'}(S)) \bowtie \Pi_{SNO,PNO,JNO}(SPJ))$

   (5). $\Pi_{JNO,PNO}(SPJ) \div \Pi_{PNO}(\sigma_{SNO='S1'}(SPJ))$
7. 它们是连接运算中两种最为重要也最为常用的连接。

   自然连接是一种特殊的等值连接，它要求两个关系中进行比较的分量，即连接属性必须是相同的属性组，并且要在结果中去掉其中一个重复属性。
8. 关系代数基本运算：并、差、笛卡尔积、投影、选择。

   交：$R \cap S = R - (R - S)$

   连接：$R \bowtie_{A\theta B} S = \sigma_{A\theta B}(R \times S)$

   除：$R(X,Y) \div S(Y,Z) = \Pi_X(R) - \Pi_X(\Pi_X(R) \times \Pi_Y(S) - R)$