# 数据库关系代数练习：

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## 一、基本查询.

1、$\Pi_{sName}(\sigma_{age<18 \wedge sex='男'}(Student))$.

2、$\Pi_{cName}(\sigma_{credit>3}(Course))$.

3、$\Pi_{cName}(\sigma_{cPNo=null}(Course))$.

## 二、连接查询.

1、$\Pi_{sName}(\Pi_{dNo}(\sigma_{dName='信息学院'}(Department)) \bowtie Student)$.

2、$\Pi_{sName}(\Pi_{sNo}(\sigma_{score<60}(SC)) \bowtie Student)$.

3、$\Pi_{sName}(\Pi_{dNo}(\sigma_{dName='信息学院'}(Department)) \bowtie \sigma_{sex='女' \wedge age<18}(Student))$.

4、$\Pi_{sName}(\Pi_{sNo}(\Pi_{cNo}(\sigma_{cName='数据库'}(Course)) \bowtie SC) \bowtie Student)$.

5、$\Pi_{sName}(\Pi_{sNo}(\Pi_{cNo}(\sigma_{cName='科学技术简史'}(Course) \bowtie SC) \bowtie \Pi_{dNo}(\sigma_{dName='信息学院'}(Department)) \bowtie Student)$.

6、$\Pi_{sName}(\Pi_{sNo}(\sigma_{score<60}(\Pi_{cNo}(\sigma_{cName='数据结构'}(Course)) \bowtie SC)) \bowtie Student)$.

7、$\Pi_{sName,score}((\Pi_{dNo}(\sigma_{dName='计算机学院'}(Department)) \bowtie (\sigma_{score\geq 80}(\Pi_{cNo}(\sigma_{cName='概率论'}(Course))) \bowtie SC)) \bowtie Student)$.

8、$\Pi_{cName}(\sigma_{credit>3}((\Pi_{dNo}(\sigma_{dName='文学院'}(Department))) \bowtie Course))$.

9、$\Pi_{sName,score}((\Pi_{dNo}(\sigma_{dName='信息学院'}(Department))) \bowtie ((\sigma_{score<60}(\Pi_{cNo}(\sigma_{cName='数据库'}(Course)) \bowtie SC)) \bowtie S) \bowtie Student))$.

10、$\Pi_{cName,credit,dName}(\Pi_{dNo}(\Pi_{cNo}(\Pi_{sNo}(\sigma_{sName='王强'}(Student)) \bowtie SC) \bowtie Course) \bowtie Department)$.

## 三、综合查询.

1、$\Pi_{sName}(\Pi_{sNo}(\Pi_{cNo}(\sigma_{cName='数据库' \vee cName='算法'}(Course)) \bowtie SC) \bowtie Student)$.

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2. $\Pi_{sName}((\Pi_{sNo}(\Pi_{cNo}(\sigma_{cName='数据库'}(Course))) \bowtie SC) \cap (\Pi_{sNo}(\Pi_{cNo}(\sigma_{cName='算法'}(Course))) \bowtie SC)) \bowtie Student)$.

3. $\Pi_{sName}((\Pi_{sNo}(\Pi_{cNo}(\sigma_{cName='数据库'}(Course))) \bowtie SC) - \Pi_{sNo}(\Pi_{cNo}(\sigma_{cName='算法'}(Course))) \bowtie SC)) \bowtie Student)$.

4. $\Pi_{sName}((\Pi_{sNo}(SC) - \Pi_{sNo}((\Pi_{cNo}(\sigma_{cName='算法'}(Course))) \bowtie SC)) \bowtie Student)$.

5. $\Pi_{sName}((\Pi_{sNo}(Student) - \Pi_{sNo}(\Pi_{cNo}(\sigma_{cName\neq'算法'}(Course)) \bowtie SC)) \bowtie Student)$.

6. ① $\Pi_{sName}((\Pi_{sNo}((\Pi_{cNo}(SC) \div (\Pi_{cNo}(Course) - \Pi_{cNo}(\sigma_{cName='算法'}(Course)))) \bowtie SC) - \Pi_{sNo}(\Pi_{cNo}(\sigma_{cName='算法'}(Course)) \bowtie SC)) \bowtie Student)$.

② $\Pi_{sName}(\Pi_{sNo}((\Pi_{cNo}(SC) \div \Pi_{cNo}(\Pi_{dNo}(\sigma_{dName='信息学院'}(Department)) \bowtie Course)) \bowtie Student))$.

7. $\Pi_{sName}(\Pi_{sNo}(\Pi_{cNo}(SC) \div \Pi_{cNo}(\sigma_{Credit>3}(Course))) \bowtie Student)$.

8. $\Pi_{sName,dName}(\Pi_{dNo}(\Pi_{sNo}(\sigma_{Score<60}(\Pi_{cNo}(\sigma_{cName='数据库'}(Course)) \bowtie SC)) \bowtie Student) \bowtie Department)$.

9. $\Pi_{cName}(\Pi_{cpNo}(\sigma_{cName='数据库'}(Course) \underset{cpNo=cNo}{\bowtie} Course))$.

10. $\Pi_{cName}(\Pi_{cNo}(\sigma_{cName='数据库'}(Course) \underset{cNo=cpNo}{\bowtie} \Pi_{cpNo,cName}(Course)))$.