

选修 2 门课程以上学生学号

Select sno

from sc

group by sno

having count(*) > 2

先分组，再聚集函数，having 给出选择条件

where 作用于表名(或视图) → 不可用聚集函数

having . . 分组 .

~~Select sno~~

~~from sc~~

~~group by sno~~

~~having count(*) > 2;~~

11. 聚合函数

fun ([distinct | all] <列名>)

sum
avg } 数值型

select count (distinct) sno
from sc;

select avg (grade)

from sc

where cno = '1';

select sum (ccredit)

from sc, course

where sno = '200215121' and sc.cno = course.cno
等值连接. 连接 (后面再讲)

select max
min (grade) (本跳过空值) count (*) 除外
from sc;

select *

from sc

where grade > avg (grade); error 不可放在 where 子句中
聚合函数 { Having 子句
select (列表子查询)

12. 分组查询: 细化聚合函数作用对象
分组后聚合函数作用于每一个组, 每组一个取值

select ^{sno}cno, count (sno)

from sc

(group by cno) 列名 否则报错

① 分组编号

select sno, MIN(grade)
from sc

↓ 类别无对应函数
先求出.

↖ 无对应关系.

~~where~~
~~having~~ X

→ 子句在 group by 中
{ 子句在 聚合函数中

select sno, grade
from sc
where grade in (select MIN(grade)
from sc);

8. 空值查询

SC 加 NULL 2012 20015123 1 NULL

```
select sno, cno
from sc
where grade is not null / (NULL); 不能为 = NULL
```

9. 多重条件查询

```
select sname, sage, sdept
from student
where sdept = 'CS' and sage < 20;
```

不学子 not

```
select sname, sage, sdept
from student
where sdept = 'CS' or sage < 20;
```

与谓词转换: 其实作为多个 or 的缩写

10. 排列

```
select sno, grade
from sc
where cno = '3'
order by grade desc;
```

'3' → '1' 空值由具体系统决定

可省略
(asc);

```
select *
from student
order by sdept, sage desc;
```

连接查询

select student.*, SC.* 等值连接
from student, SC
where student.sno = SC.sno

自然连接

select student.sno, Student.*
不可去 sname, ssex, sage, sdept, cno, grade
from student, SC
where student.sno = SC.sno

连接加选择

select student.sno, sname
from student, SC
where student.sno = SC.sno
and SC.cno = '2' 可省略
and SC.grade > 90

自身连接

— 课程的先修课和先修课

select F.sno, S.cno
from course First, course Second
where First.cno = Second.cno;

外连接

full / left / right

~~select student.sno, sname, ssex, sage, sdept, cno, grade
from student ☐ outer join sc ~~on~~
on student.sno = sc.sno;~~

多表连接 (姓, 学号, 姓名, ~~成绩~~ 课程, ~~成绩~~)
cname

select student.sno, sname, grade
from student, sc, course
where student.sno = sc.sno
and sc.cno = course.cno

父查询/外层查询

嵌套查询: (子查询/内层查询)

查询与刘晨同一个系

确定刘晨院系。

select course.*, sno, grade
from course, sc

where course.cno = sc.cno

无符号字段

select course.*, sno, grade
from course full outer join sc
on course.cno = sc.cno

→ left / right