

# 数据库系统实验 实验报告

题目	(实验 4)
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## 一 实验环境

- 1、操作系统: ubuntu 14.04 LTS;
- 2、DBMS : mysql 5.5.44;

## 二 实验内容

### 2.1 创建数据库以及表

创建一个名为 jxgl 的数据库, 包含表 student、course、sc, 步骤同实验教材中实验 3, 此处不赘述。

### 2.2 基于 jxgl 数据库, 使用 SQL 语句表达以下查询

#### 2.2.1 检索年龄大于 23 岁的男学生的学号和姓名

代码:

```
select sno,sname
from student
where ssex = '男' and sage > 23;
```

运行结果:

```
Empty set (0.00 sec)
```

#### 2.2.2 检索至少选修一门课程的女学生姓名

代码:

```
select student.sno, sname
from student, sc
where student.sno = sc.sno and ssex = '女';
```

运行结果:

sno	sname
2005002	王林

1 row in set (0.00 sec)

### 2.2.3 检索王林不学的课程的课程号

代码:

```
select course.cno
from course
where course.cno not in (
    select sc.cno
    from student,sc
    where student.sno = sc.sno
    and student.sname = '王林');
```

运行结果:

cno
6
3
1
4
7
5

6 rows in set (0.00 sec)

### 2.2.4 检索至少选修两门课程的学生学号

代码:

```
select student.sno
from student, sc
where student.sno = sc.sno
group by sc.sno
having count(*) >= 2;
```

运行结果:

```
+-----+
| sno   |
+-----+
| 2005001 |
+-----+
1 row in set (0.00 sec)
```

### 2.2.5 检索全部学生都选修的课程的课程号和课程名

代码:

```
select course.cno, cname
from course, sc
where course.cno = sc.cno
group by sc.cno
having count(*) = (
    select count(*)
    from student);
```

运行结果:

```
Empty set (0.00 sec)
```

### 2.2.6 检索选修了所有 3 学分的每门课程的学生的平均成绩

代码:

```
select avg(grade)
from sc as X
where not exists(
    select Y.cno
    from course as Y
    where Y.cno not in (
        select Z.cno
        from sc as Z
        where X.sno = Z.sno)
    and credit = 3)
group by X.sno;
```

运行结果:

```
Empty set (0.00 sec)
```

## 2.3 基于 jxgl 数据库，使用 SQL 语句表达以下查询

### 2.3.1 统计有学生选修的课程门数

代码:

```
select count(*) from course where course.cno in (select sc.cno from sc);
```

运行结果:

```
+-----+
| count(*) |
+-----+
|         3 |
+-----+
1 row in set (0.00 sec)
```

### 2.3.2 求选修 4 号课程的学生的平均年龄

代码:

```
select avg(sage)
from student, sc
where student.sno = sc.sno and sc.cno = 4;
```

运行结果:

```
+-----+
| avg(sage) |
+-----+
|         NULL |
+-----+
1 row in set (0.00 sec)
```

### 2.3.3 求学分为 3 的每门课程的学生的平均成绩

代码:

```
select cname, avg(grade)
from course, sc
where credit = 3 and course.cno = sc.cno
group by cname;
```

运行结果:

```
+-----+-----+
| cname | avg(grade) |
+-----+-----+
```

信息系统导论	89.0000
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1 row in set (0.00 sec)

**2.3.4 统计每门课程的学生选课人数，要求超过 3 人的课程才统计，要求输出课程号和选修人数，查询结果按人数降序排列，若人数相同，按课程号升序排列**

代码：

```
select cno, count(cno)
from sc
group by cno
having count(cno) > 3
order by count(cno) desc, cno asc;
```

运行结果：

Empty set (0.00 sec)

**2.3.5 检索学号比“王林”同学大而年龄比她小的学生的姓名**

代码：

```
select X.sname
from student as X, student as Y
where Y.sname = '王林' and X.sno > Y.sno and X.sage < Y.sage;
```

运行结果：

sname
赵欣然

1 row in set (0.00 sec)

**2.3.6 检索姓名以“王”开头的所有学生的姓名和年龄**

代码：

```
select sname, sage
from student
where sname like '王%';
```

运行结果：

sname	sage
王林	19

1 row in set (0.02 sec)

### 2.3.7 在 sc 表中检索成绩为空值的学生的学号可课程号

代码:

```
select sno, cno
from sc
where grade is NULL;
```

运行结果:

Empty set (0.00 sec)

### 2.3.8 求年龄大于女学生平均年龄的男学生的姓名和年龄

代码:

```
select sname, sage
from student
where ssex = '男' and sage > (
    select avg(sage)
    from student
    group by (ssex)
    having ssex = '女');
```

运行结果:

sname	sage
钱横	18
李民	20

2 rows in set (0.00 sec)

### 2.3.9 求年龄大于所有女学生年龄的男学生的姓名和年龄

代码:

```

select sname, sage
from student
where ssex = '男' and sage > all(
    select sage
    from student
    where ssex = '女');

```

运行结果:

```

+-----+-----+
| sname  | sage  |
+-----+-----+
| 李民   | 20    |
+-----+-----+
1 row in set (0.01 sec)

```

**2.3.10** 检索选修 4 门以上课程的学生的总成绩（不同机不及格课程），并要求案总成绩的降序排列出来

代码:

```

select sum(grade)
from sc
where grade >= 60
group by sno
having count(*) > 4
order by sum(grade) desc;

```

运行结果:

```

Empty set (0.00 sec)

```