《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：

操作系统: Windows 10

应用: MySQL Workbench 8.0 CE

二．实验内容与完成情况：

1. 基于 jxgl 数据库，使用 SQL 语句表达以下查询

(1) 检索年龄大于 23 岁的男学生的学号和姓名

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

结果：

```
mysql> select sno,sname from student where ssex = '男' and sage > 23;
+-------+---------------+
| sno   | sname         |
+-------+---------------+
| 00002 | 狗俊锋        |
| 00004 | 狗俊锋3号     |
| 00006 | 狗俊锋5号     |
+-------+---------------+
```

(2) 检索至少选修一门课程的女学生姓名

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

```
mysql> select distinct student.sno,sname
    -> from student,sc
    -> where student.sno = sc.sno and ssex = '女' ;
+-------+---------------+
| sno   | sname         |
+-------+---------------+
| 00003 | 狗俊锋2号     |
| 00005 | 狗俊锋4号     |
+-------+---------------+
```

(3) 检索王林不学的课程的课程号

```
1. 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'
);
```

```
mysql> 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'
    -> );
+-----+
| cno |
+-----+
| 03  |
| 05  |
| 06  |
| 07  |
| 08  |
+-----+
```

(4) 检索至少选修两门课程的学生学号

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

```
mysql> select student.sno
    -> from student,sc
    -> where student.sno = sc.sno
    -> group by sc.sno
    -> having count(*) >= 2 ;
+--------+
| sno    |
+--------+
| 00001  |
| 00002  |
| 00003  |
| 00004  |
| 00005  |
| 00006  |
+--------+
```

(5) 检索全部学生都选修的课程的课程号和课程名

```
select course.cno,cname
```

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

```
mysql> select course.cno,cname
    -> from course,sc
    -> where course.cno = sc.cno
    -> group by sc.cno
    -> having count(*)=
    ->     (
    ->     select count(*)
    ->     from student
    ->     );
+-----+----------------------+
| cno | cname                |
+-----+----------------------+
| 02  | 中单的自我修养       |
+-----+----------------------+
```

(6) 检索选修了所有 3 学分课程的学生平均成绩

```
select avg(grade)
    from course join sc using(cno)
    where sno in (
        select distinct sno
            from course join sc using(cno)
            where credit=3
            group by sno
            having count(cno)=(
                select count(cno)
                    from course
                    where credit=3
                )
            )
    group by sno;
```

```
mysql> select avg(grade)
    ->     from course join sc using(cno)
    ->     where sno in (
    ->         select distinct sno
    ->             from course join sc using(cno)
    ->             where credit=3
    ->             group by sno
    ->             having count(cno)=(
    ->                 select count(cno)
    ->                     from course
    ->                     where credit=3
    ->                 )
    ->             )
    ->     group by sno;
+------------+
| avg(grade) |
+------------+
|    70.3333 |
|    77.0000 |
+------------+
```

2. 基于 jxgl 数据库，使用 SQL 语句表达以下查询

(1) 统计有学生选修的课程门数

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

```
mysql> select count(*)
    -> from course
    -> where course.cno
    -> in
    ->     (
    ->     select sc.cno
    ->     from sc
    ->     );
+----------+
| count(*) |
+----------+
|        8 |
+----------+
1 row in set (0.00 sec)
```

(2) 求选修 4 号课程的学生的平均年龄

```sql
select avg(sage)
from student,sc
where student.sno = sc.sno and sc.cno = '04' ;
```

```
mysql> select avg(sage)
    -> from student,sc
    -> where student.sno = sc.sno and sc.cno = '04' ;
+-----------+
| avg(sage) |
+-----------+
|   23.0000 |
+-----------+
```

(3) 求学分为 3 的每门课程的学生平均成绩

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

```
mysql> select cname,avg( grade )
    -> from course,sc
    -> where credit = 3 and course.cno = sc.cno
    -> group by cname;
+--------------------------+--------------+
| cname                    | avg( grade ) |
+--------------------------+--------------+
| 中单的自我修养           |      80.3333 |
| 如何成为外卖骑手         |      65.0000 |
+--------------------------+--------------+
```

(4) 统计每门课程的学生选修人数，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

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

```
mysql> select cno,count(cno)
    -> from sc
    -> group by cno
    -> having count(cno) > 3
    -> order by count(cno) desc,cno asc;
+-----+------------+
| cno | count(cno) |
+-----+------------+
| 02  |          6 |
| 01  |          4 |
+-----+------------+
```

(5) 检索学号比'王林'同学大而年龄比他小的学生姓名

```sql
select X.sname
```

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

```
mysql> 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;
+---------------+
| sname         |
+---------------+
| 狗俊锋2号     |
| 狗俊锋4号     |
+---------------+
```

(6) 检索姓名以'王'开头的所有学生的姓名和年龄

```
1.  select sname,sage
2.  from student
3.  where sname like '王%';
```

```
mysql> select sname,sage
    -> from student
    -> where sname like '王%';
+--------+------+
| sname  | sage |
+--------+------+
| 王林   |   25 |
+--------+------+
```

(7) 在 sc 表中检索成绩为空值的学生的学号和课程号

```
1.  select sno,cno
2.  from sc
3.  where grade is null;
```

```
mysql> select sno,cno
    -> from sc
    -> where grade is null;
+-------+-----+
| sno   | cno |
+-------+-----+
| 00006 | 04  |
+-------+-----+
```

(8) 求年龄大于女学生平均年龄的男学生的姓名和年龄

```
1.  select sname,sage
2.  from student
3.  where ssex='男' and sage>
4.      (
```

```
    select avg(sage)
    from student
    group by (ssex)
    having ssex='女'
    );
```

```
mysql> select sname,sage
    -> from student
    -> where ssex='男' and sage>
    ->     (
    ->     select avg(sage)
    ->     from student
    ->     group by (ssex)
    ->     having ssex='女'
    ->     );
+--------------+------+
| sname        | sage |
+--------------+------+
| 王林         |   25 |
| 狗俊锋       |   31 |
| 狗俊锋3号    |   26 |
| 狗俊锋5号    |   35 |
+--------------+------+
```

(9) 求年龄大于所有女学生年龄的男学生的姓名和年龄

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

```
mysql> select sname,sage
    -> from student
    -> where ssex='男' and sage>all
    ->     (
    ->     select sage
    ->     from student
    ->     where ssex='女'
    ->     );
+--------------+------+
| sname        | sage |
+--------------+------+
| 王林         |   25 |
| 狗俊锋       |   31 |
| 狗俊锋3号    |   26 |
| 狗俊锋5号    |   35 |
+--------------+------+
```

(10) 检索选修 4 门以上课程的学生总成绩（不统计不及格课程），并要求按总成绩的降序

排列出来

```
1. select sno,sum(grade)
2. from sc
3. where grade>=60
4. group by sno
5. having count(grade)>=4
6. order by sum(grade) desc;
```