

实验2 SQL数据定义和操作

实验目的：

1. 掌握关系数据库语言SQL的使用。
2. 使所有的SQL作业都能上机通过。

实验平台：

1. 数据库管理系统：MySQL

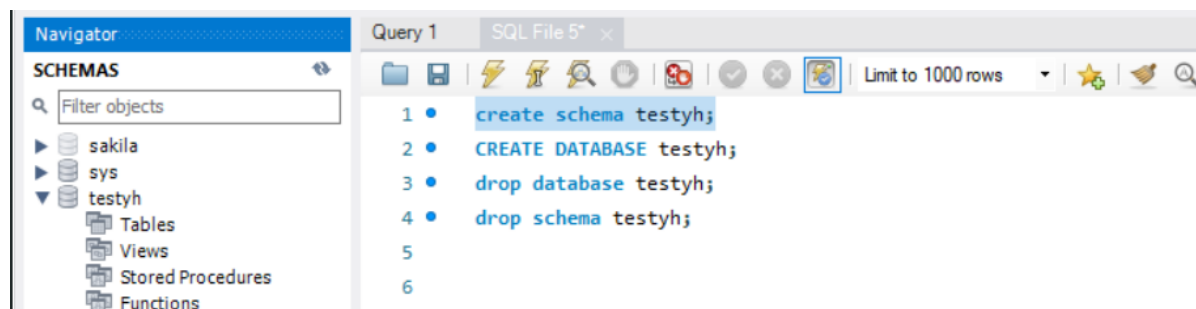
实验内容和要求：

1. 建立数据库。
2. 数据定义：表的建立/删除/修改;索引的建立/删除；视图的建立/删除
3. 数据更新：用insert/delete/update命令插入/删除/修改表数据。
4. 数据查询：单表查询，多表查询，嵌套子查询等。
5. 视图操作：通过视图的数据查询和数据修改
6. 所有的SQL作业都上机通过。

实验过程：

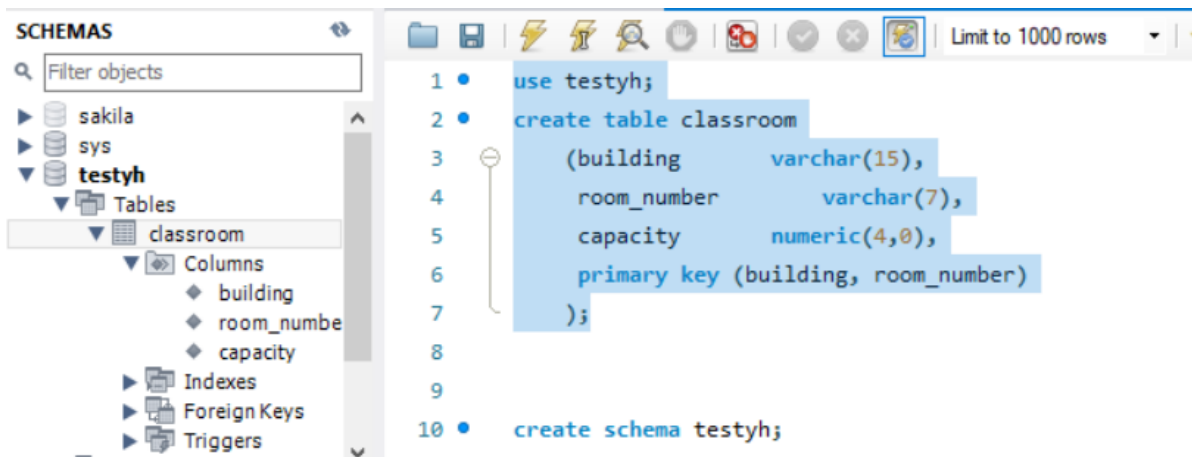
1. 建立新数据库：在标签页中写入以下代码并执行，刷新后看到新的空模式。

```
1 create schema testyh;  
2 create database testyh;  
3 #两者均可，在MySQL中效果相同
```



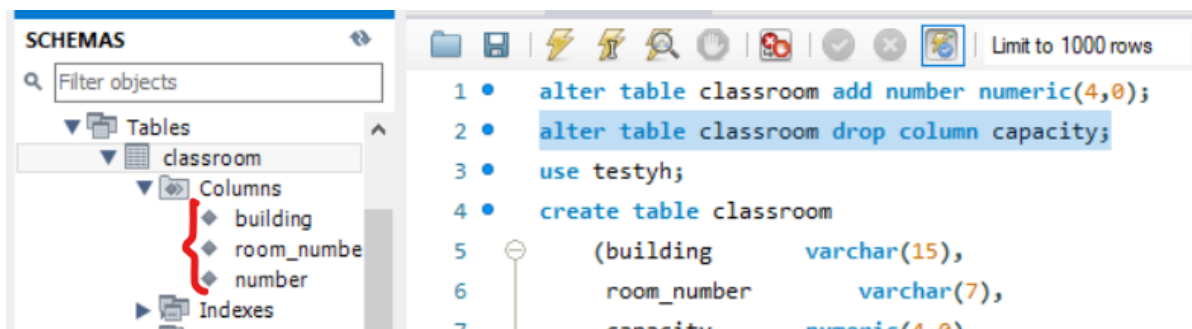
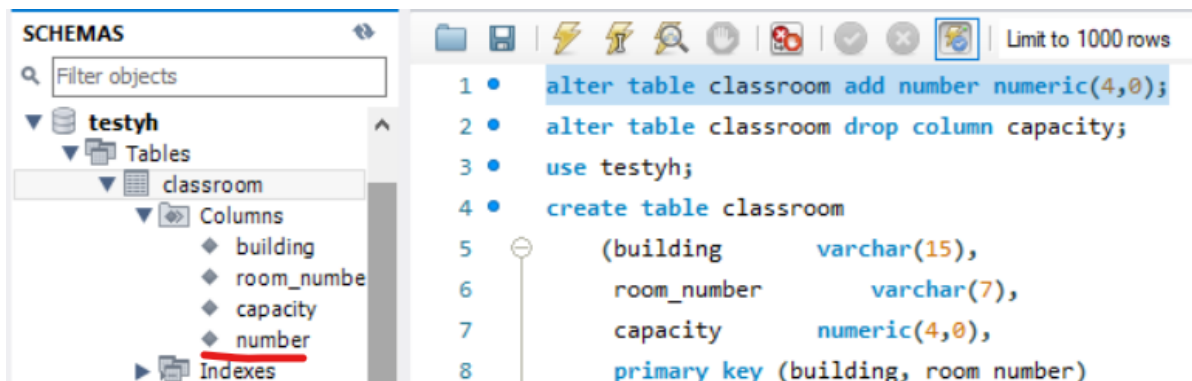
2. 表的建立：执行代码并刷新。

```
1 use testyh;  
2 create table classroom  
3     (building      varchar(15),  
4      room_number   varchar(7),  
5      capacity       numeric(4,0),  
6      primary key (building, room_number)  
7  );
```



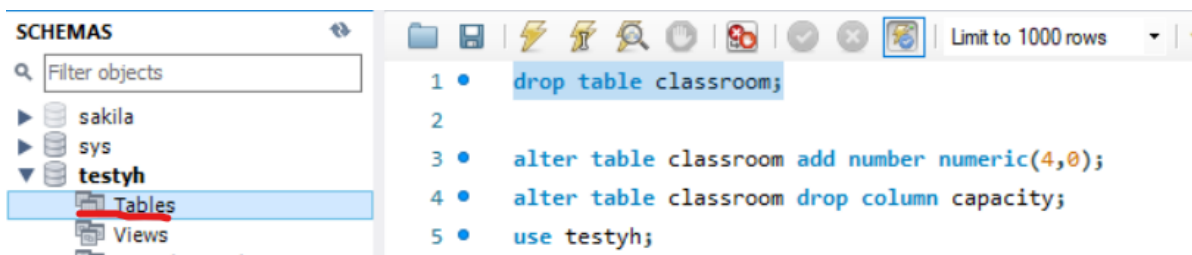
3. 表的修改：增加/删除属性。依次执行增加、删除并看结果。

```
1 alter table classroom add number numeric(4,0);#增加number属性
2 alter table classroom drop column capacity;#删除capacity属性
```

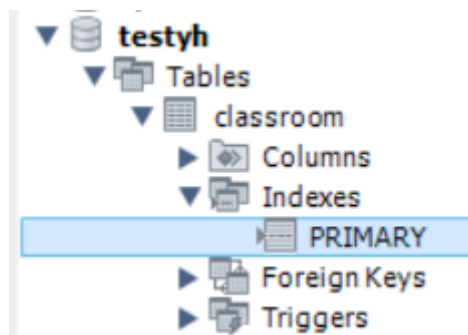


4. 表的删除：执行代码后可见模式中已经无classroom的表了。

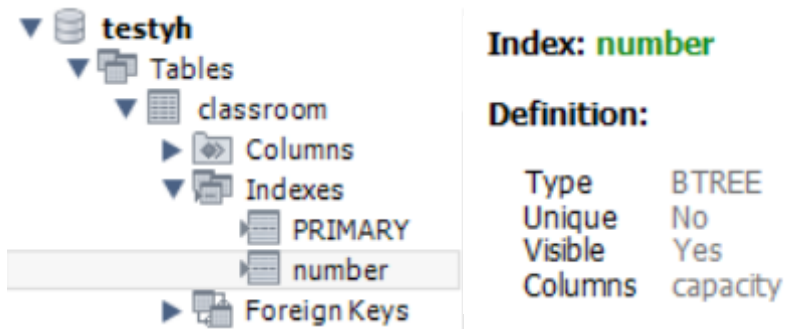
```
1 drop table classroom;
```



5. 建立索引：先重新建好表，索引列中只有系统自动为primary key建立的索引。

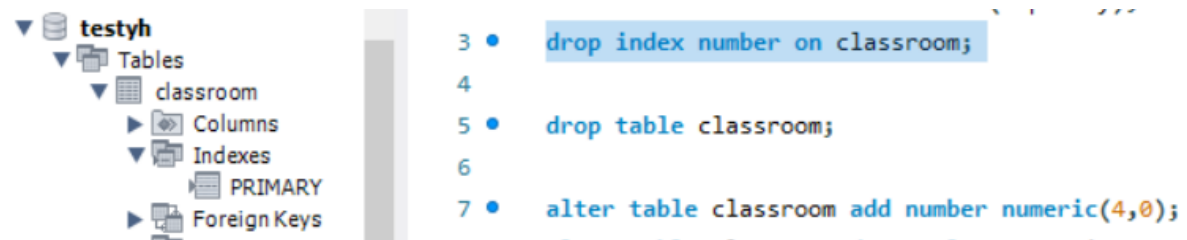


```
1 create index number on classroom(capacity);
```



6. 索引删除:

```
1 drop index number on classroom;
```

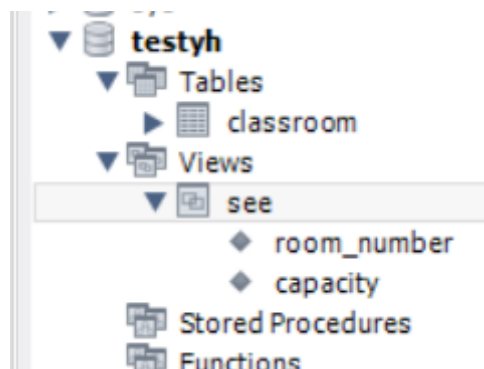


7. 视图的建立:

```

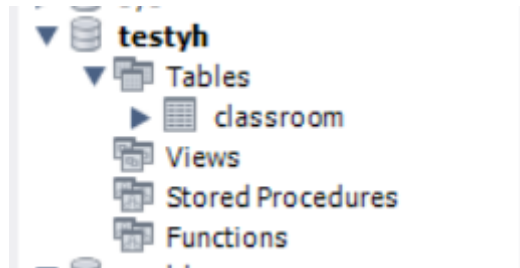
1 create view see
2 as
3 select room_number, capacity from classroom where building =
   'Lamberton';

```



8. 视图删除

```
1 drop view see;
```



9. 向表中插入数据，执行选择语句，可以从跳出的界面中看到结果。

```
1 insert into classroom values('Lamberton', 134, 10);
2 insert into classroom values('Chandler', 375, 10);
3 insert into classroom values('Fairchild', 145, 27);
4 insert into classroom values('Nassau', 45, 92);
5 insert into classroom values('Grace', 40, 34);
6 insert into classroom values('Whitman', 134, 120);
7 insert into classroom values('Lamberton', 143, 10);
8 #插入语句
9 select * from classroom;
10 #选择语句
```

| | building | room_number | capacity |
|---|-----------|-------------|----------|
| ▶ | Chandler | 375 | 10 |
| | Fairchild | 145 | 27 |
| | Grace | 40 | 34 |
| | Lamberton | 134 | 10 |
| | Lamberton | 143 | 10 |
| | Nassau | 45 | 92 |
| | Whitman | 134 | 120 |
| * | NULL | NULL | NULL |

10. 修改数据

```
1 update classroom set building = 'Lamberton' where
  room_number=145;
2 #更新失败，安全模式?
3 update classroom set building = 'Lamberton' where building
  = 'Fairchild';
4 #更新成功
```

| | building | room_number | capacity |
|---|-----------|-------------|----------|
| ▶ | Chandler | 375 | 10 |
| | Grace | 40 | 34 |
| | Lamberton | 134 | 10 |
| | Lamberton | 143 | 10 |
| | Lamberton | 145 | 27 |
| | Nassau | 45 | 92 |
| | Whitman | 134 | 120 |
| • | NULL | NULL | NULL |

11. 删除数据

```
1 delete from classroom where building = 'Grace';
```

| | building | room_number | capacity |
|---|-----------|-------------|----------|
| ▶ | Chandler | 375 | 10 |
| | Lamberton | 134 | 10 |
| | Lamberton | 143 | 10 |
| | Lamberton | 145 | 27 |
| | Nassau | 45 | 92 |
| | Whitman | 134 | 120 |
| • | NULL | NULL | NULL |

12. 单表查询:

```
1 select room_number ,capacity
2 from classroom
3 where building = 'Lamberton';
```

| | room_number | capacity |
|---|-------------|----------|
| ▶ | 134 | 10 |
| | 143 | 10 |
| | 145 | 27 |

13. 多表查询: 先建立多个表并插入数据。

```
1 #建立新的表
2 create table course
3 (
4     name          varchar(20),
5     building      varchar(15),
6     room_number   varchar(7),
7     time          varchar(4),
8     primary key (name)
9 );
10 insert into course values('C program','Lamberton', 134, 2);
11 insert into course values('physics','Chandler', 375, 4);
12 insert into course values('database','Fairchild', 145, 6);
```

```

12 insert into course values('ADS','Nassau', 45, 8);
13 insert into course values('fds','Grace', 40, 10);
14 insert into course values('OOP','Whitman', 134, 12);
15 insert into course values('ennnn','Lamberton', 143, 14);

```

```

1 #查询语句
2 select name,time
3 from classroom, course
4 where classroom.building = course.building and
5         classroom.room_number = course.room_number and
6         time > 8;
7 #由于Grace在第11步已经删除，表中只有两项数据。

```

| | name | time |
|---|-------|------|
| ▶ | ennnn | 14 |
| | OOP | 12 |

14. 嵌套子查询

```

1 select avg(capacity) as number
2 from (select name,S.building,capacity
3        from course as S,classroom
4        where classroom.building = S.building and
5              classroom.room_number = S.room_number)
6        as T
7 where T.building = 'Lamberton';
8 #结果为最初两个Lamberton的容量的平均即10，后改的一个Lamberton由于房间号无法对上被筛去。

```

| | number |
|---|---------|
| ▶ | 10.0000 |

15. 视图数据查询：先重新建立视图，再查询

```

1 create view seetime
2 as
3 select name,time from course ;#建立
4
5 select time from seetime;#查询

```

| | time |
|---|------|
| ▶ | 8 |
| | 2 |
| | 6 |
| | 14 |
| | 10 |
| | 12 |
| | 4 |

16. 视图数据修改：在视图中修改后再从course中查询，执行后看到课程'C program'时间已经是11了。

```

1 update seetime
2 set time = 11
3 where name = 'C program';
4
5 select * from course;

```

| | name | building | room_number | time |
|---|------------------|-----------|-------------|-----------|
| ▶ | ADS | Nassau | 45 | 8 |
| | <u>C program</u> | Lamberton | 134 | <u>11</u> |
| | database | Fairchild | 145 | 6 |
| | ennnn | Lamberton | 143 | 14 |
| | fds | Grace | 40 | 10 |
| | OOP | Whitman | 134 | 12 |
| | physics | Chandler | 375 | 4 |
| • | NULL | NULL | NULL | NULL |