DB LAB2

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实验目的：熟悉sql操作

实验平台：mysql workbench 8.0 on macos

实验内容和要求

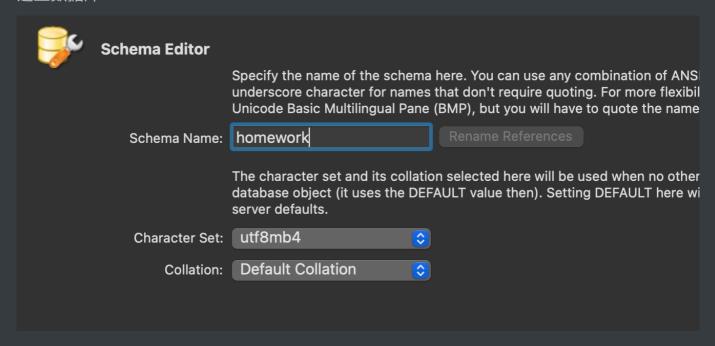1. 建立数据库
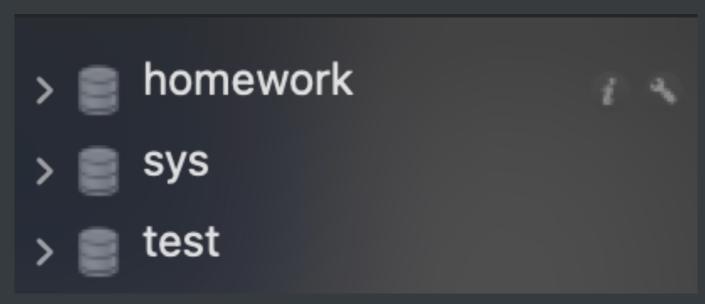2. 数据定义：建立/修改/删除表格，建立/删除索引,建立/删除视图
3. 数据更新:插入/更新/删除数据
4. 数据查询，单表/多表/嵌套子查询
5. 视图操作，通过视图查询/修改数据

实验过程：
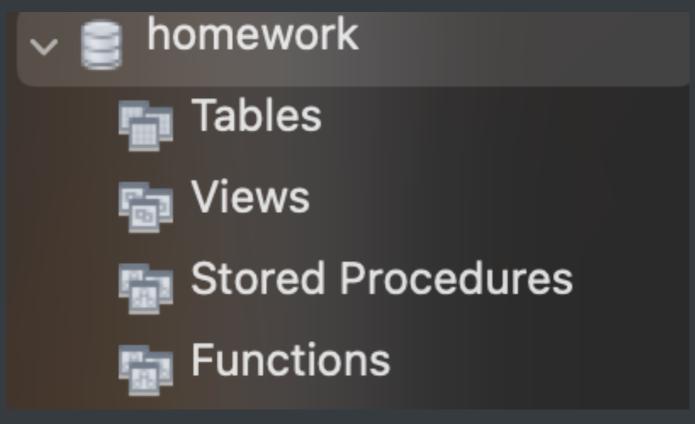
1. 建立数据库

2. 数据定义

2.1 表的建立

一开始数据库中还没有表，使用以下语句创建表

```
1  use homework;
2
3  create table student(
4      studentID varchar(5) primary key,
5      name varchar(20) not null,
6      dept_name varchar(20)
7  );
```

现在数据库中多了一张表
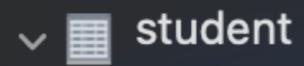
2.2 表的修改
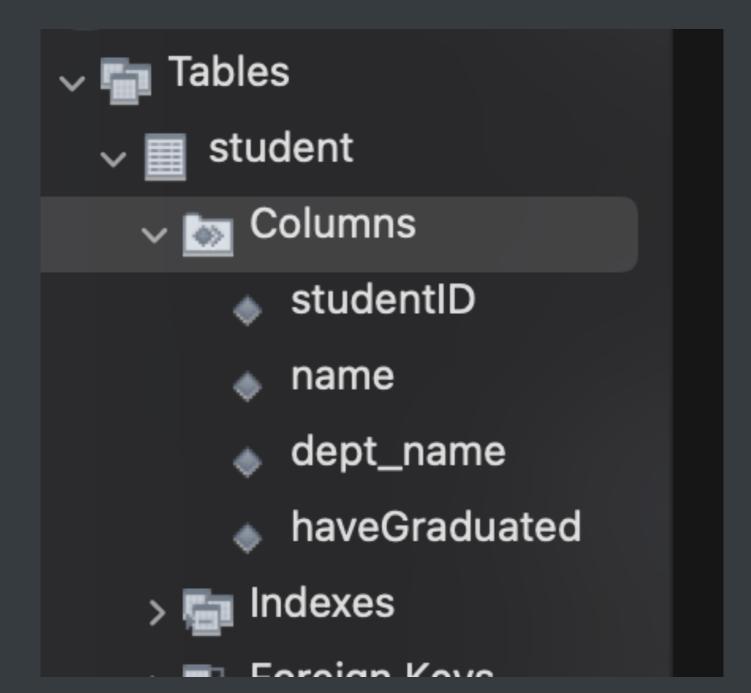
```
1  alter table student add haveGraduated boolean;
```

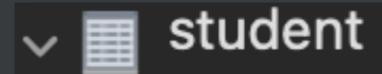以下是修改前后的变化

- Tables
  - student
    - Columns
      - studentID
      - name
      - dept_name
    - Indexes

2.3 表的删除
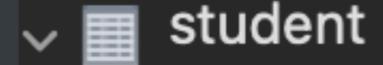
```sql
drop table student;
```

2.4 索引的建立

```
create index nameIndex on student(name);
```

- student
  - **Columns**
  - Indexes
    - PRIMARY

- student
  - Columns
  - Indexes
    - PRIMARY
    - nameIndex

2.5 索引的删除

```
1  drop index nameIndex on student;
```

2.6 创建视图

```
1  create view phyStudent
2  as select * from student where dept_name = 'Physics'
```


2.7 删除视图

```
1  drop view phystudent
```

3. 数据更新

3.1 插入数据

```
1  insert into student values('12345','john','Physics',0);
2  insert into student values('85625','alice','Physics',0);
3  insert into student values('52807','cris','Physics',0);
4  insert into student values('47928','tom','computer science',0);
5  insert into student values('24292','jerry','Physics',0);
6  insert into student values('49605','gg','Physics',0);
7  insert into student values('91079','andy','math',0);
8  insert into student values('85001','joe biden','law',0);
9  select * from student
```

结果：

studentID	name	dept_name	haveGraduated	
▶ 12345	john	Physics	0	
24292	jerry	Physics	0	
47928	tom	computer science	0	
49605	gg	Physics	0	
52807	cris	Physics	0	
85001	joe biden	law	0	
85625	alice	Physics	0	
91079	andy	math	0	
NULL	NULL	NULL	NULL	

3.2 修改数据

```
1  update student
2  set haveGraduated = 1
3  where name = andy;
```

91079	andy	math	1	
NULL	NULL	NULL	NULL	

可以看到andy的毕业属性被修改为1

3.3 删除数据

```
1  delete from student
2  where name = 'andy';
```

studentID	name	dept_name	haveGraduated
▶ 12345	john	Physics	0
24292	jerry	Physics	0
47928	tom	computer science	0
49605	gg	Physics	0
52807	cris	Physics	0
85001	joe biden	law	0
85625	alice	Physics	0
NULL	NULL	NULL	NULL

可以看到,andy相关的数据被删除了

4. 数据查询

4.1 单表查询

```sql
select studentId,name from student where dept_name = 'Physics';
```

studentld	name	
12345	john	
24292	jerry	
49605	gg	
52807	cris	
85625	alice	

4.2 多表查询

```sql
# 建立另一个表
create table takes(
id int primary key auto_increment,
sid varchar(5) not null,
cid varchar(5) not null,
gpa double
);

insert into takes(sid,cid,gpa) values(12345,1,5.0);
insert into takes(sid,cid,gpa) values(12345,2,4.8);
insert into takes(sid,cid,gpa) values(85625,2,3.0);
insert into takes(sid,cid,gpa) values(52807,3,2.0);
insert into takes(sid,cid,gpa) values(49605,2,3.4);
```

```
14  insert into takes(sid,cid,gpa) values(47928,4,1.1);
15  insert into takes(sid,cid,gpa) values(47928,3,2.2);
16  insert into takes(sid,cid,gpa) values(91079,5,4.3);
17  insert into takes(sid,cid,gpa) values(49605,2,5.0);
18  insert into takes(sid,cid,gpa) values(85625,3,4.5);
19  insert into takes(sid,cid,gpa) values(49605,2,3.0);
20  # 多表查询
21  select studentID,name,gpa
22  from student, takes
23  where student.studentID = takes.sid;
```

studentID	name	gpa	
12345	john	5	
12345	john	4.8	
85625	alice	3	
52807	cris	2	
49605	gg	3.4	
47928	tom	1.1	
47928	tom	2.2	
49605	gg	5	
85625	alice	4.5	

4.3 嵌套子查询

```
1  select name,sid,gpa from (select sid,gpa from takes where cid = 2) as e,
   student where e.sid = student.studentID order by gpa desc limit 1;
```

name	sid	gpa	
▶ gg	49605	5	

5. 视图操作

5.1 视图数据查询

```
1  select * from phyStudent;
```

	studentID	name	dept_name	haveGraduated	
▶	12345	john	Physics	0	
	24292	jerry	Physics	0	
	49605	gg	Physics	0	
	52807	cris	Physics	0	
	85625	alice	Physics	0	

5.2 视图数据修改

```
1  update phyStudent
2  set haveGraduated = 1
3  where name = john;
```

studentID	name	dept_name	haveGraduated
12345	john	Physics	1
24292	jerry	Physics	0
49605	gg	Physics	0
52807	cris	Physics	0
85625	alice	Physics	0

可以发现，john的数据信息被更新