实验二 SQL数据定义和操作

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一、实验目的

1. 掌握关系数据库语言SQL的使用。
2. 面向某个应用定义数据模式和操作数据。

二、实验环境

Windows11；

DBMS: MySQL

三、实验过程

3.1 建立数据库

建立一个名为lab2的数据库，如图所示

```
mysql> CREATE DATABASE LAB2
    -> ;
Query OK, 1 row affected (0.02 sec)

mysql> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| lab2               |
| mysql              |
| performance_schema |
| sys                |
| test1              |
| test2              |
+--------------------+
7 rows in set (0.03 sec)
```

3.2 数据定义

1. 创建了一个数据表

```
mysql> use lab2;
Database changed
mysql> create table student(
    -> id varchar(10),
    -> name varchar(20),
    -> birthday date,
    -> major varchar(20)
    -> );
Query OK, 0 rows affected (0.04 sec)
```

2. 设置主键

```
mysql> alter table student
    -> add primary key(id);
Query OK, 0 rows affected (0.07 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

3. 建立另一张表并做相同操作

```
mysql> create table dorm(
    -> part varchar(10),
    -> number int,
    -> name varchar(20)
    -> );
Query OK, 0 rows affected (0.04 sec)

mysql> alter table dorm
    -> add primary key(name);
Query OK, 0 rows affected (0.06 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

4. 插入数据（数据更新段落中就不体现了）

```
mysql> insert into student
    -> values('3220100000','Caijiawei','2004-05-17','SE');
Query OK, 1 row affected (0.02 sec)
```

```
mysql> insert into student
    -> values('3220300000','Myfriend','2004-01-01','CS');
Query OK, 1 row affected (0.02 sec)

mysql> select * from student;
+------------+-----------+------------+-------+
| id         | name      | birthday   | major |
+------------+-----------+------------+-------+
| 3220100000 | Caijiawei | 2004-05-17 | SE    |
| 3220300000 | Myfriend  | 2004-01-01 | CS    |
+------------+-----------+------------+-------+
```

```
mysql> select * from dorm;
+--------+--------+-----------+
| part   | number | name      |
+--------+--------+-----------+
| 紫云5   |    601 | Applepen  |
| 碧峰1   |    111 | Caijiawei |
+--------+--------+-----------+
2 rows in set (0.00 sec)
```

5. 增加字段和删除

```
mysql> alter table student
    -> add sex char(1);
Query OK, 0 rows affected (0.03 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> describe student;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| id       | varchar(10) | NO   | PRI | NULL    |       |
| name     | varchar(20) | YES  |     | NULL    |       |
| birthday | date        | YES  |     | NULL    |       |
| major    | varchar(20) | YES  |     | NULL    |       |
| sex      | char(1)     | YES  |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
5 rows in set (0.02 sec)

mysql> alter table student
    -> drop sex;
Query OK, 0 rows affected (0.02 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

6. 建立视图和删除

```
mysql> create view myview as select id,name,major from student;
Query OK, 0 rows affected (0.01 sec)

mysql> select * from myview;
+------------+-----------+-------+
| id         | name      | major |
+------------+-----------+-------+
| 3220100000 | Caijiawei | SE    |
| 3220300000 | Myfriend  | CS    |
+------------+-----------+-------+
2 rows in set (0.00 sec)
```

7. 建立索引和删除

```
mysql> create index myindex
    -> on student(id);
Query OK, 0 rows affected (0.05 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> alter table student drop index myindex;
Query OK, 0 rows affected (0.02 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

3.3 数据更新

1. delete/update命令删除/修改表数据

```
mysql> select * from student;
+------------+-----------+------------+-------+
| id         | name      | birthday   | major |
+------------+-----------+------------+-------+
| 3220100000 | Caijiawei | 2004-05-17 | SE    |
| 3220300000 | Myfriend  | 2004-01-01 | CS    |
+------------+-----------+------------+-------+
2 rows in set (0.00 sec)

mysql> delete from student where name ='Myfriend';
Query OK, 1 row affected (0.01 sec)

mysql> select * from student;
+------------+-----------+------------+-------+
| id         | name      | birthday   | major |
+------------+-----------+------------+-------+
| 3220100000 | Caijiawei | 2004-05-17 | SE    |
+------------+-----------+------------+-------+
1 row in set (0.00 sec)
```

```
mysql> select * from student;
+------------+-----------+------------+-------+
| id         | name      | birthday   | major |
+------------+-----------+------------+-------+
| 3220100000 | Caijiawei | 2004-05-17 | SE    |
+------------+-----------+------------+-------+
1 row in set (0.00 sec)

mysql> update student set id='3220104519' where name='Caijiawei';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from student;
+------------+-----------+------------+-------+
| id         | name      | birthday   | major |
+------------+-----------+------------+-------+
| 3220104519 | Caijiawei | 2004-05-17 | SE    |
+------------+-----------+------------+-------+
1 row in set (0.00 sec)
```

3.4 数据查询

1. 单表查询

```
mysql> select distinct name from student;
+-----------+
| name      |
+-----------+
| ta        |
| Caijiawei |
+-----------+
2 rows in set (0.01 sec)

mysql> select id as xuehao from student;
+------------+
| xuehao     |
+------------+
| 3220101234 |
| 3220104519 |
+------------+
2 rows in set (0.00 sec)
```

2. 多表查询

```
mysql> select name from student,dorm where student.name='Caijiawei';
ERROR 1052 (23000): Column 'name' in field list is ambiguous
mysql> select dorm.number from student,dorm where student.name=dorm.name and
student.major='SE';
+--------+
| number |
+--------+
|    111 |
+--------+
```

3. 嵌套查询

```
mysql> select student.major from student where student.name in (select studen
t.name from student where student.id='3220104519');
+-------+
| major |
+-------+
| SE    |
+-------+
1 row in set (0.01 sec)
```

3.5 视图操作

```
mysql> select * from myview;
+------------+------------+-------+
| id         | name       | major |
+------------+------------+-------+
| 3220101234 | ta         | NULL  |
| 3220104519 | Caijiawei  | SE    |
+------------+------------+-------+
2 rows in set (0.00 sec)

mysql> select * from myview where name='ta';
+------------+------+-------+
| id         | name | major |
+------------+------+-------+
| 3220101234 | ta   | NULL  |
+------------+------+-------+
1 row in set (0.00 sec)
```

对name进行更新，发现student表也进行了修改

```
mysql> update myview set name='Caijianwei' where id='3220101234';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from myview;
+------------+------------+-------+
| id         | name       | major |
+------------+------------+-------+
| 3220101234 | Caijianwei | NULL  |
| 3220104519 | Caijiawei  | SE    |
+------------+------------+-------+
2 rows in set (0.00 sec)

mysql> select * from student;
+------------+------------+------------+-------+
| id         | name       | birthday   | major |
+------------+------------+------------+-------+
| 3220101234 | Caijianwei | 2003-01-01 | NULL  |
| 3220104519 | Caijiawei  | 2004-05-17 | SE    |
+------------+------------+------------+-------+
2 rows in set (0.00 sec)
```

四、总结

本次实验我进一步学习了关系数据库语言SQL的基本操作。不过结合作业和实验报告的完成，我对SELECT语句使用还不够熟练，尤其是嵌套查询和多表查询。后续需要加强这方面的练习。