《数据库系统原理》实验报告（1）

题目：交互式 SQL (1)

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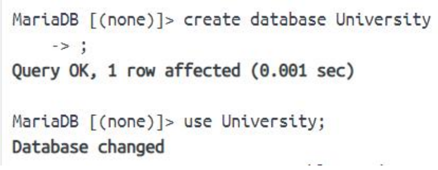
实验环境：基于 docker 的 mariadb 数据库的自己创建的 mariadb_demo 容器。

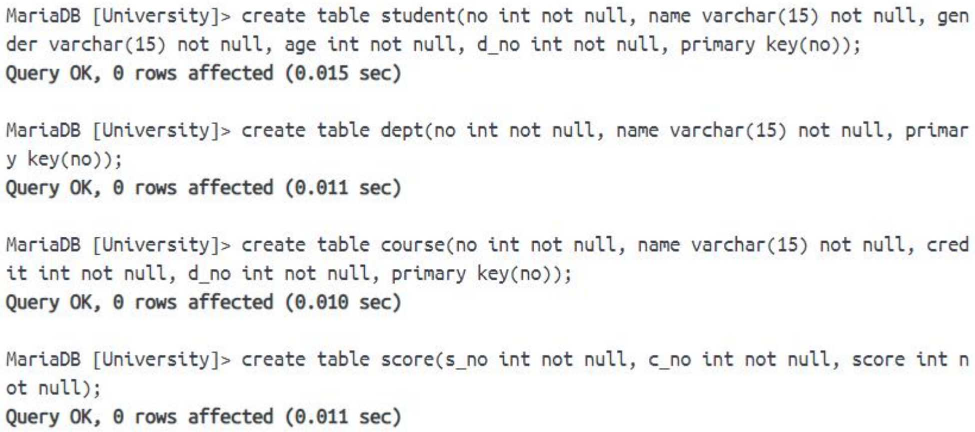
实验步骤及结果截图：

（1）建立数据库：



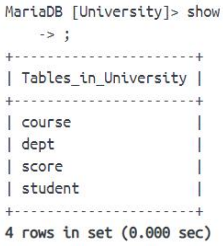
```
MariaDB [(none)]> create database University
    -> ;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> use University;
Database changed
```

（2）建立数据表：

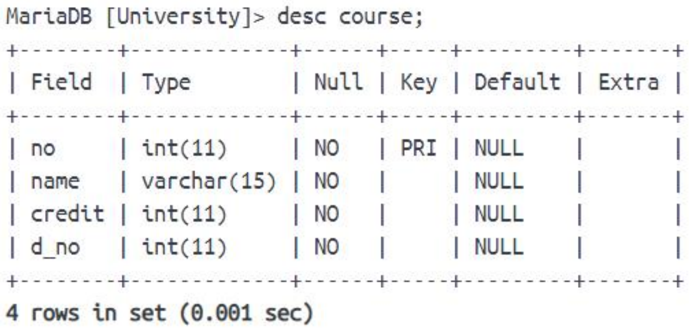


```
MariaDB [University]> create table student(no int not null, name varchar(15) not null, gen
der varchar(15) not null, age int not null, d_no int not null, primary key(no));
Query OK, 0 rows affected (0.015 sec)

MariaDB [University]> create table dept(no int not null, name varchar(15) not null, primar
y key(no));
Query OK, 0 rows affected (0.011 sec)

MariaDB [University]> create table course(no int not null, name varchar(15) not null, cred
it int not null, d_no int not null, primary key(no));
Query OK, 0 rows affected (0.010 sec)

MariaDB [University]> create table score(s_no int not null, c_no int not null, score int n
ot null);
Query OK, 0 rows affected (0.011 sec)
```

展示：

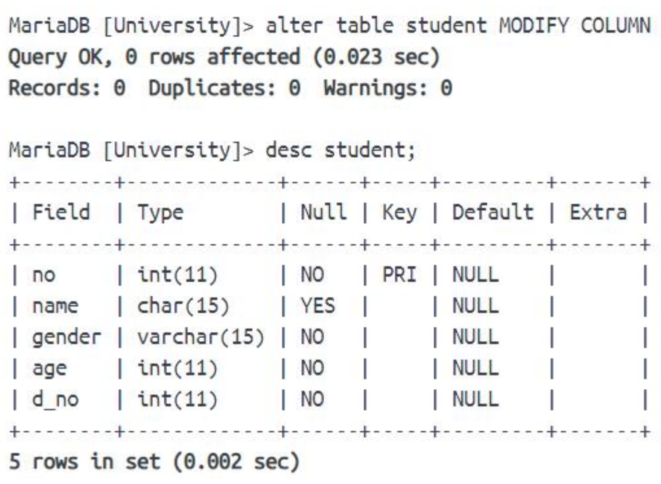


```
MariaDB [University]> show tables
    -> ;
+----------------------+
| Tables_in_University |
+----------------------+
| course               |
| dept                 |
| score                |
| student              |
+----------------------+
4 rows in set (0.000 sec)
```



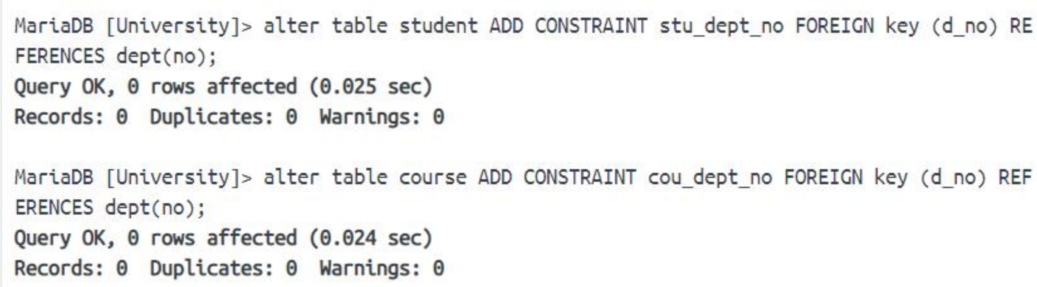
```
MariaDB [University]> desc course;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| no     | int(11)     | NO   | PRI | NULL    |       |
| name   | varchar(15) | NO   |     | NULL    |       |
| credit | int(11)     | NO   |     | NULL    |       |
| d_no   | int(11)     | NO   |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
4 rows in set (0.001 sec)
```

（3）修改 student 表中 name 列，将其从 varchar(15)变为 char(15)



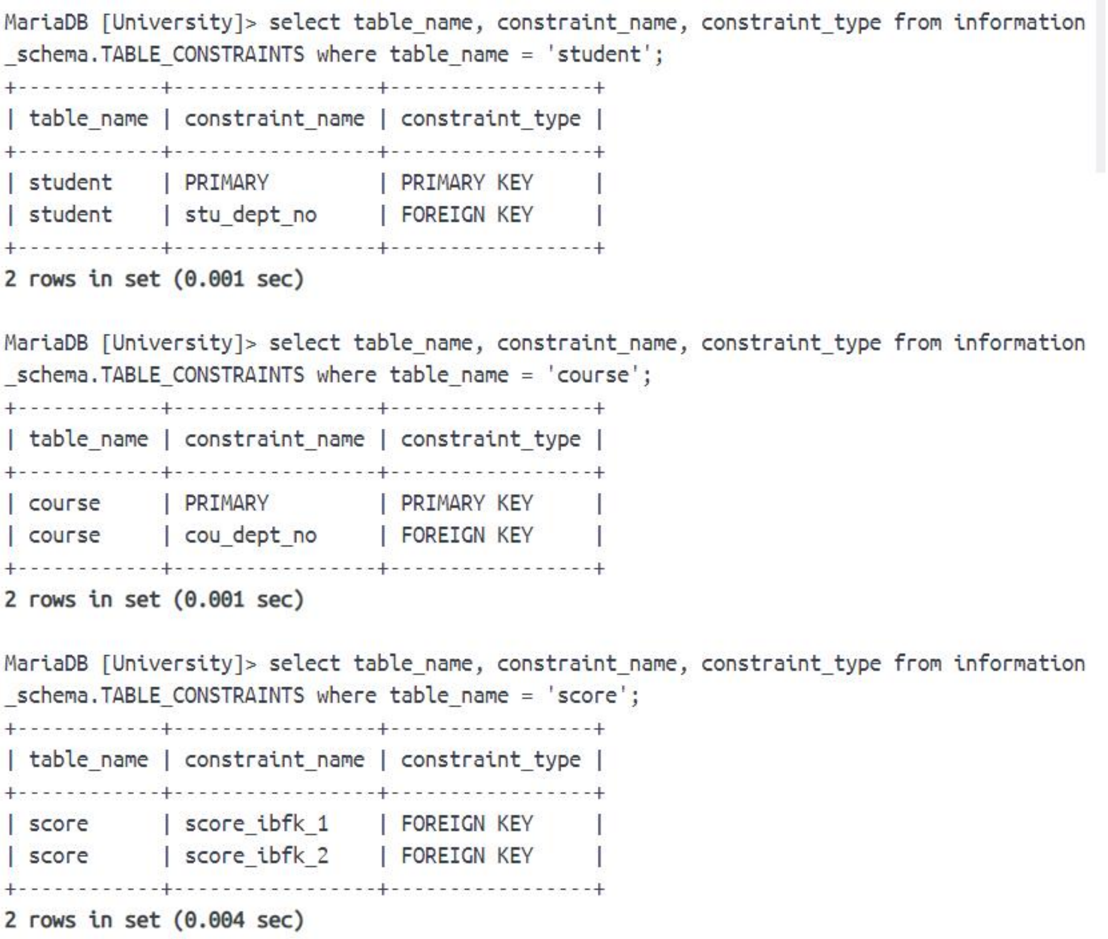
```
MariaDB [University]> alter table student MODIFY COLUMN name char(15);
Query OK, 0 rows affected (0.023 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [University]> desc student;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| no     | int(11)     | NO   | PRI | NULL    |       |
| name   | char(15)    | YES  |     | NULL    |       |
| gender | varchar(15) | NO   |     | NULL    |       |
| age    | int(11)     | NO   |     | NULL    |       |
| d_no   | int(11)     | NO   |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
5 rows in set (0.002 sec)
```

（4）添加外键约束：



```
MariaDB [University]> alter table student ADD CONSTRAINT stu_dept_no FOREIGN key (d_no) RE
FERENCES dept(no);
Query OK, 0 rows affected (0.025 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [University]> alter table course ADD CONSTRAINT cou_dept_no FOREIGN key (d_no) REF
ERENCES dept(no);
Query OK, 0 rows affected (0.024 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

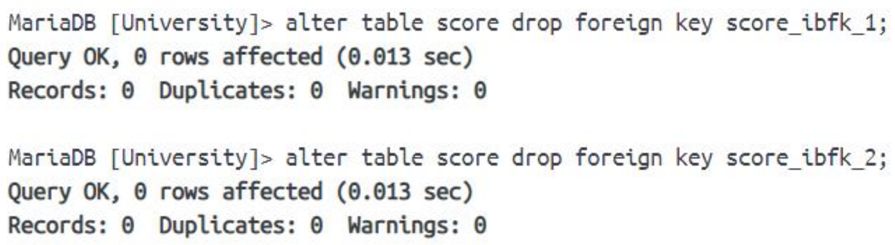
展示：



```
MariaDB [University]> select table_name, constraint_name, constraint_type from information
_schema.TABLE_CONSTRAINTS where table_name = 'student';
+------------+-----------------+-----------------+
| table_name | constraint_name | constraint_type |
+------------+-----------------+-----------------+
| student    | PRIMARY         | PRIMARY KEY     |
| student    | stu_dept_no     | FOREIGN KEY     |
+------------+-----------------+-----------------+
2 rows in set (0.001 sec)

MariaDB [University]> select table_name, constraint_name, constraint_type from information
_schema.TABLE_CONSTRAINTS where table_name = 'course';
+------------+-----------------+-----------------+
| table_name | constraint_name | constraint_type |
+------------+-----------------+-----------------+
| course     | PRIMARY         | PRIMARY KEY     |
| course     | cou_dept_no     | FOREIGN KEY     |
+------------+-----------------+-----------------+
2 rows in set (0.001 sec)

MariaDB [University]> select table_name, constraint_name, constraint_type from information
_schema.TABLE_CONSTRAINTS where table_name = 'score';
+------------+-----------------+-----------------+
| table_name | constraint_name | constraint_type |
+------------+-----------------+-----------------+
| score      | score_ibfk_1    | FOREIGN KEY     |
| score      | score_ibfk_2    | FOREIGN KEY     |
+------------+-----------------+-----------------+
2 rows in set (0.004 sec)
```

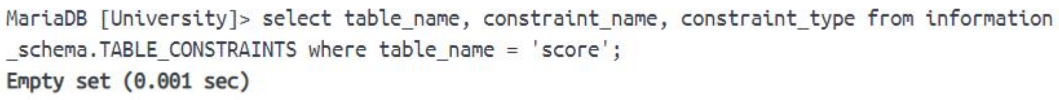
（5）score 表中所有约束删除后再建立一次。

删除约束：



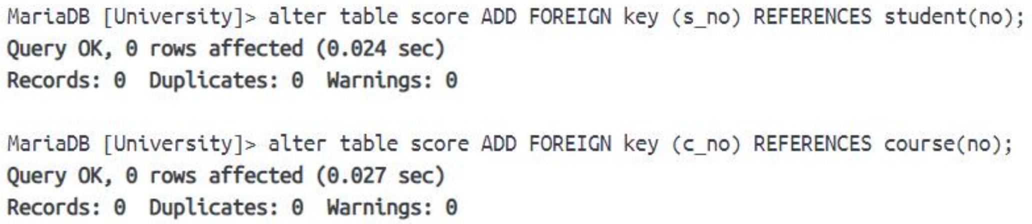
```
MariaDB [University]> alter table score drop foreign key score_ibfk_1;
Query OK, 0 rows affected (0.013 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [University]> alter table score drop foreign key score_ibfk_2;
Query OK, 0 rows affected (0.013 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

展示：



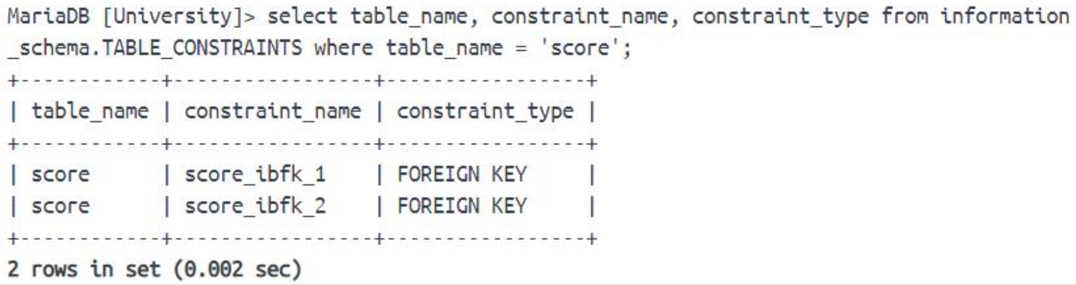
```
MariaDB [University]> select table_name, constraint_name, constraint_type from information
_schema.TABLE_CONSTRAINTS where table_name = 'score';
Empty set (0.001 sec)
```

重新建立：



```
MariaDB [University]> alter table score ADD FOREIGN key (s_no) REFERENCES student(no);
Query OK, 0 rows affected (0.024 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [University]> alter table score ADD FOREIGN key (c_no) REFERENCES course(no);
Query OK, 0 rows affected (0.027 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

展示：



```
MariaDB [University]> select table_name, constraint_name, constraint_type from information
_schema.TABLE_CONSTRAINTS where table_name = 'score';
+------------+-----------------+-----------------+
| table_name | constraint_name | constraint_type |
+------------+-----------------+-----------------+
| score      | score_ibfk_1    | FOREIGN KEY     |
| score      | score_ibfk_2    | FOREIGN KEY     |
+------------+-----------------+-----------------+
2 rows in set (0.002 sec)
```

出现的问题：

在整个实验过程中并未出现比较大的问题，主要问题就是对于一些内容不太确定，比如在其中 alter 中的修改选项就有很多，这些在上课并未学到，用起来不是特别的得心应手，需要查找一下资料才能进一步完成。

还有一个问题就是，在使用的过程我们对于语句 select table_name, constraint_name, constraint_type from information_schema.TABLE_CONSTRAINTS where table_name = 'course';并不是特别了解，以为其中要替换的东西很多，不知道怎么替换，经过查找资料之后，确定只需要替换最后的 table_name 就可以了。

解决方案：

以上出现的问题都不是比较严重的问题，通过在网上查找资料，比如 CSDN、百度等众多的学习工具，就可以顺利的解决了。