《数据库系统实验》实验报告

题目	实验6
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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. **模拟 create_student_table()实现创建 SC 表或 Course 表。即实现 create_sc_table()或 create_course_table()子程序的功能。**

   代码:

```cpp
#include <iostream>
#include <mysql.h>
#include <string>
using namespace std;

#define DO_QUERY(a,b) if(mysql_query(a,b)) throw string(mysql_error(a))

int main() {
    //一些常量定义，数据库账户密码等
    int num = 0;
    char fu[2];
    char host[] = "localhost";
    char account[] = "root";
    char key[] = "B1ack@917";
    char database[] = "jxgl";
    int port = 3306;
    MYSQL mysql;
    try {
        //使用mysql_init初始化MYSQL结构
        if(!mysql_init(&mysql))
            throw string("Initialize MYSQL Failed");
        //使用account,key连接到数据库
        if (!mysql_real_connect(&mysql, host, account, key, database, port,
0, 0))
            throw string("Connect To " + string(database) + " Failed");
        cout << "Connect to " << database << " Succeed" << endl;
        //设置GBK编码以显示汉字
        DO_QUERY(&mysql, "SET NAMES gbk;");
        if (mysql_list_tables(&mysql, "sc")->row_count) {
            //检测是否已经存在sc表
```

```
                cout << "SC Table Already Exists, Dropping" << endl;
                //如果存在，删除sc表
                DO_QUERY(&mysql, "drop table sc;");
                cout << "Dropped SC Table" << endl;
            }
            //创建sc表
            DO_QUERY(&mysql, "create table sc(sno char(16), cno char(16), grade
int);");
            cout << "Create SC Table" << endl;
        }
        catch (string& errorMessage) {
            cout << errorMessage << endl;
        }
        return 0;
    }
```
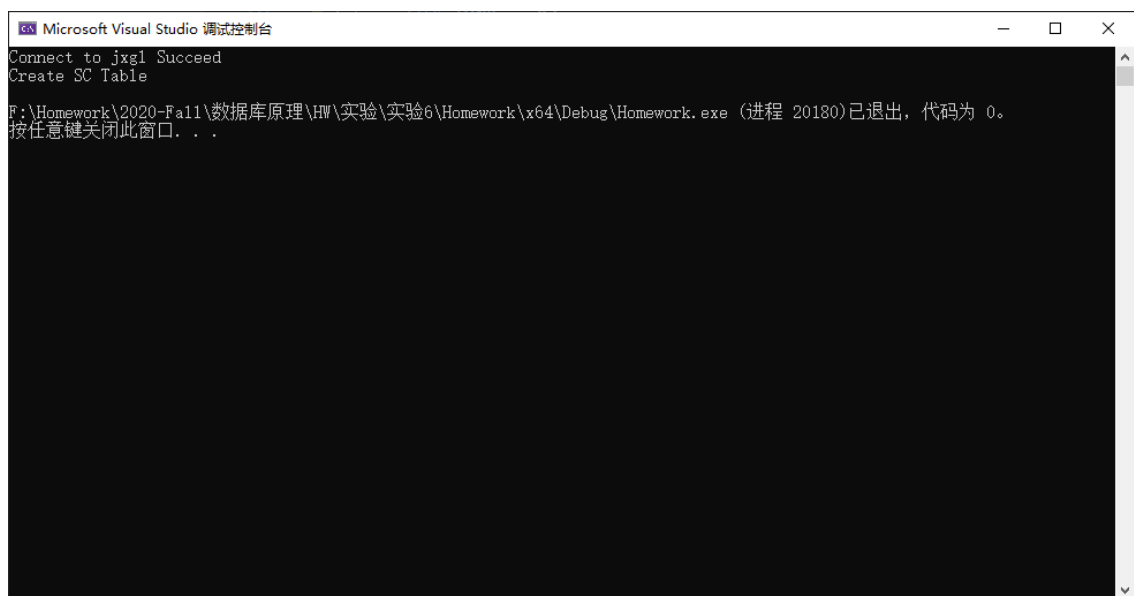
运行结果:

图1-1 jxgl中不存在sc表
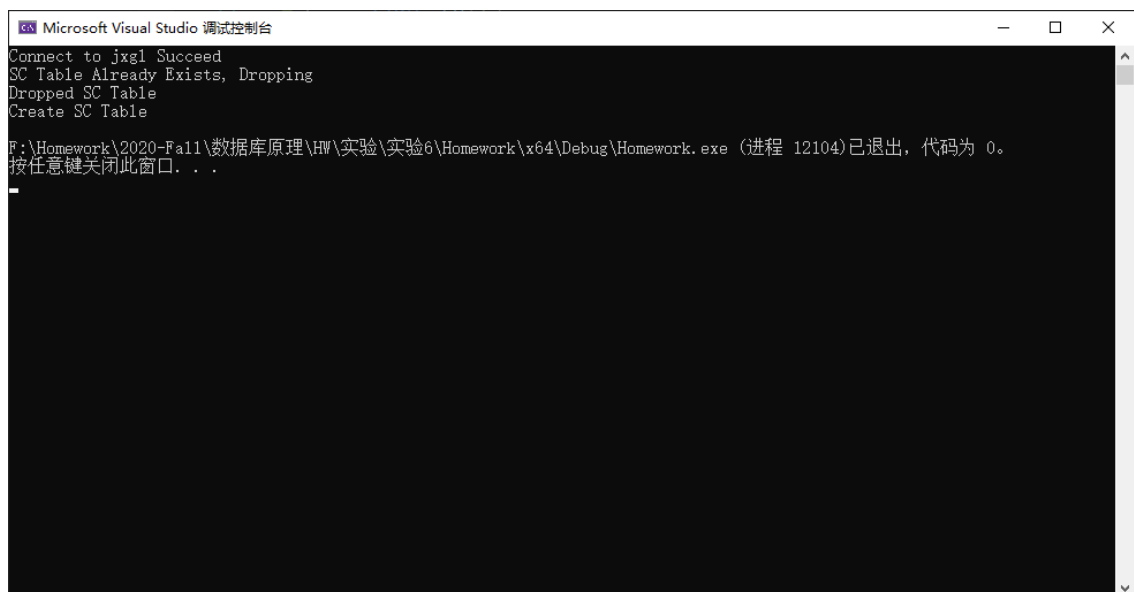

图1-2 jxgl中已存在sc表

2. **模拟 insert_rows_into_student_table()实现对 SC 表或 Course 表的记录添加。即实现 insert_rows_into_sc_table()或 insert_rows_into_course_table()子程序的功能。**

代码:

```cpp
#include <iostream>
#include <mysql.h>
#include <string>
using namespace std;

#define DO_QUERY(a,b) if(mysql_query(a,b)) throw string(mysql_error(a))

//显示sc表
void show_sc_table(MYSQL & mysql) {
    DO_QUERY(&mysql, "select * from sc");
    //获取查询结果
    MYSQL_RES* result = mysql_store_result(&mysql);
    //获取总行数
    uint64_t row_num = mysql_num_rows(result);
    //获取总列数
    int num_fields = mysql_num_fields(result);
    //获取每一列名称
    MYSQL_FIELD* fields = mysql_fetch_fields(result);
    //显示表头
    for (auto i = 0; i < num_fields; i++)
        cout << fields[i].name << "\t";
    cout << endl;
    //依次输出每一行
    for (auto i = 0;i < row_num;++i) {
        MYSQL_ROW row = mysql_fetch_row(result);
        for (auto j = 0;j < num_fields;++j)
            cout << row[j] << "\t";
        cout << endl;
    }
}

void insert_rows_into_sc_table(MYSQL& mysql) {
    string query_head = "insert into sc value";
    string new_query = "";
    string sno, cno, grade;
    char c;
    cout << "Ready To Insert Value Into SC Table" << endl;
    while (1) {
        //读入参数
        new_query = query_head;
        cout << "Please input sno (eg:10086): ";
        cin >> sno;
        cout << "Please input cno (eg:001): ";
        cin >> cno;
        cout << "Please input grade (eg:78): ";
        cin >> grade;
        //构造语句
        new_query += "('" + sno + "','" + cno + "'," + grade + ");";
        //执行插入
        DO_QUERY(&mysql, new_query.c_str());
        //显示sc表
        show_sc_table(mysql);
        cout << "Insert again? y:yes,n:no\t";
        cin >> c;
        if (c == 'n')
            break;
    }
```

```cpp
    }

int main() {
    //一些常量定义，数据库账户密码等
    int num = 0;
    char host[] = "localhost";
    char account[] = "root";
    char key[] = "B1ack@917";
    char database[] = "jxgl";
    int port = 3306;
    MYSQL mysql;
    try {
        //使用mysql_init初始化MYSQL结构
        if (!mysql_init(&mysql))
            throw string("Initialize MYSQL Failed");
        //使用account,key连接到数据库
        if (!mysql_real_connect(&mysql, host, account, key, database, port,
0, 0))
            throw string("Connect To " + string(database) + " Failed");
        cout << "Connect to " << database << " Succeed" << endl;
        //设置GBK编码以显示汉字
        DO_QUERY(&mysql, "SET NAMES gbk;");
        if (mysql_list_tables(&mysql, "sc")->row_count) {
            //检测是否已经存在sc表
            cout << "SC Table Already Exists, Dropping" << endl;
            //如果存在，删除sc表
            DO_QUERY(&mysql, "drop table sc;");
            cout << "Dropped SC Table" << endl;
        }
        //创建sc表
        DO_QUERY(&mysql, "create table sc(sno char(16), cno char(16), grade
int);");
        cout << "Create SC Table" << endl;
        insert_rows_into_sc_table(mysql);
    }
    catch (string& errorMessage) {
        cout << errorMessage << endl;
    }
    return 0;
}
```

运行截图：

```
Microsoft Visual Studio 调试控制台                                         —    □    ×
Connect to jxg1 Succeed
SC Table Already Exists, Dropping
Dropped SC Table
Create SC Table
Ready To Insert Value Into SC Table
Please input sno (eg:10086): 00001
Please input cno (eg:001): 001
Please input grade (eg:78): 86
sno     cno     grade
00001   001     86
Insert again? y:yes,n:no          y
Please input sno (eg:10086): 10086
Please input cno (eg:001): 035
Please input grade (eg:78): 99
sno     cno     grade
00001   001     86
10086   035     99
Insert again? y:yes,n:no          y
Please input sno (eg:10086): 09876
Please input cno (eg:001): 077
Please input grade (eg:78): 77
sno     cno     grade
00001   001     86
10086   035     99
09876   077     77
Insert again? y:yes,n:no          n

F:\Homework\2020-Fall\数据库原理\HW\实验\实验6\Homework\x64\Debug\Homework.exe（进程 19296）已退出，代码为 0。
按任意键关闭此窗口. . .
```

图2 执行3次插入