

# 《数据库系统实验》

## 实验报告

题目	(实验 9)
姓名	TRY
学号	
班级	计科 X 班

### 一. 实验环境:

操作系统: windows

图形界面: mysql3.7.31, mysql workbench

### 二. 实验内容与完成情况:

本次实验在以前建立的教学管理系统 (jxgl) 的基础上完成。

2.1 在 sc 表中创建 insert,update 触发器 TR\_SC\_IN\_SNO, 要求插入选课记录或修改选课表学生学号时, 检查该学号是否为 student 表中的学号, 若无则不许插入选课记录或修改选课表学生学号。

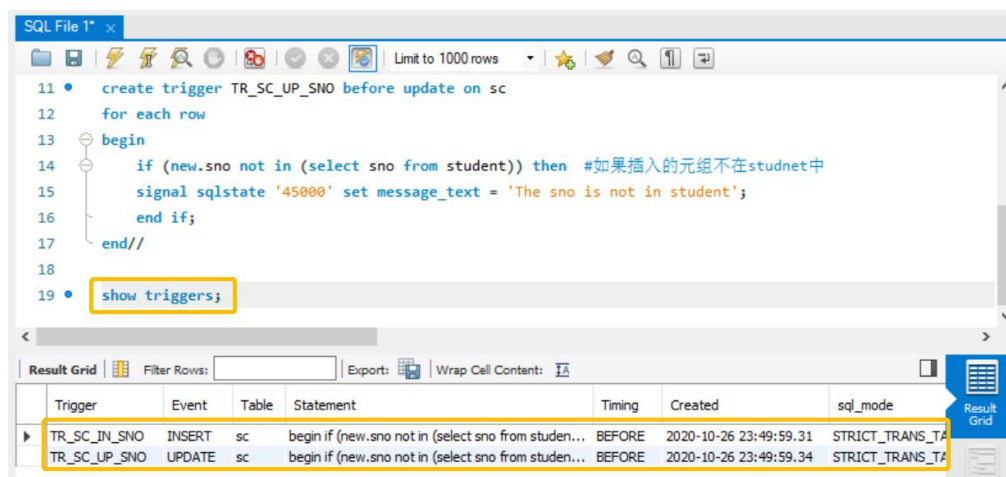
代码:

```
delimiter //
create trigger TR_SC_IN_SNO before insert on sc
for each row
begin
    if (new.sno not in (select sno from student)) then    #如果插入的元组不在 student 中
        signal sqlstate '45000' set message_text = 'The sno is not in student';
    end if;
end//

delimiter //
create trigger TR_SC_UP_SNO before update on sc
for each row
begin
    if (new.sno not in (select sno from student)) then    #如果更新的元组不在 student 中
        signal sqlstate '45000' set message_text = 'The sno is not in student';
    end if;
end//
```

运行结果:

使用 show triggers 命令发现有触发器如下:



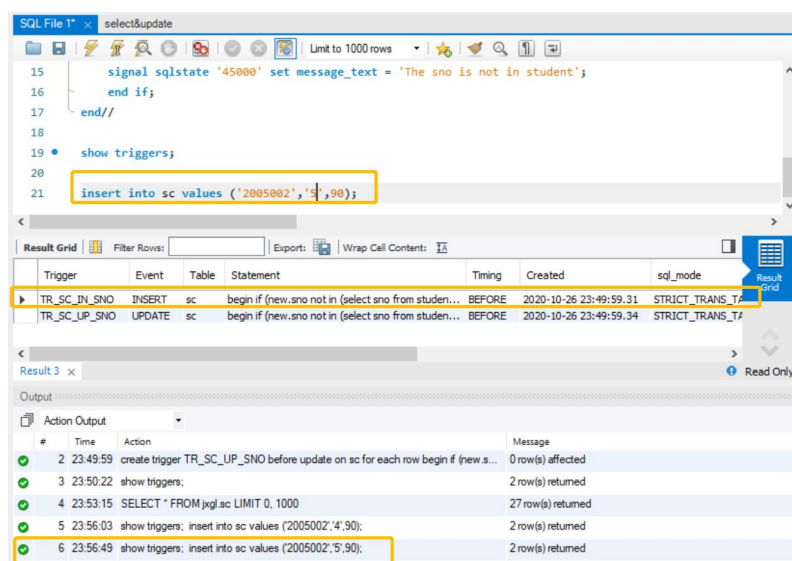
2.2 在 sc 表中录入或修改实验数据，查看触发器的执行情况。

代码：

- (1) insert into sc values ('2005002','5','90');
- (2) insert into sc values ('2005006','5','90');
- (3) update sc set sno='2005003' where sno='2005001' and cno='4';
- (4) update sc set sno='2005006' where sno='2005002' and cno='4';

运行结果：

(1) 正常运行触发器。



(2) 触发器报错，提示 “The sno is not in student” 的语句。

```

10 delimiter //
11 • create trigger TR_SC_UP_SNO before update on sc
12 for each row
13 begin
14     if (new.sno not in (select sno from student)) then #如果插入的元组不在student中
15         signal sqlstate '45000' set message_text = 'The sno is not in student';
16     end if;
17 end//
18
19
20 • show triggers;
21
22 insert into sc values ('2005002','5',90);
23 insert into sc values ('2005006','5',90);

```

#	Time	Action	Message
6	23:56:49	show triggers; insert into sc values (2005002,'5',90);	2 row(s) returned
7	23:57:50	SELECT * FROM jxgl.sc LIMIT 0, 1000	29 row(s) returned
8	23:58:10	show triggers; insert into sc values (2005002,'5',90); insert into ...	2 row(s) returned
9	23:58:10	show triggers; insert into sc values (2005002,'5',90); insert into ...	Error Code: 1062 Duplicate entry '2005002-5' for key 'PRIMARY'
10	23:58:33	insert into sc values (2005006,'5',90)	Error Code: 1644. The sno is not in student

(3) 运行前&运行后：正常运行

sno	cno	grade
2005001	1	87
2005001	2	77
2005001	3	90
2005001	4	77
2005001	7	98
2005002	2	94
2005002	3	NULL
2005002	4	90
2005002	5	90
2005003	3	88
2005003	7	NULL
2005004	3	90

#	Time	Action	Message
6	14:21:41	insert into sc values ('2005006','5',90)	Error Code: 1644. The sno is not in student
7	14:21:51	update sc set grade=77 where sno=2005007 and cno=5'	0 row(s) affected Rows matched: 0 Changed: 0 Warnings: 0
8	14:55:22	update sc set sno=2005003 where sno=2005001' and cno=4'	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0

(4) 触发器报错：提示 “The sno is not in student” 的语句。

trigger\* x select&update

Limit to 1000 rows

```
9
10 delimiter //
11 • create trigger TR_SC_UP_SNO before update on sc
12 for each row
13 begin
14     if (new.sno not in (select sno from student)) then #如果更新的元组不在student中
15         signal sqlstate '45000' set message_text = 'The sno is not in student';
16     end if;
17 end//
18
19
20 • show triggers;
21
22 insert into sc values ('2005002','5',90);
23 insert into sc values ('2005006','5',90);
24 update sc set sno='2005003' where sno='2005001' and cno='4';
25 update sc set sno='2005006' where sno='2005002' and cno='4';
```

Output

Action Output

#	Time	Action	Message
8	14:55:22	update sc set sno='2005003' where sno='2005001' and cno='4'	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0
9	14:58:10	update sc set sno='2005006' where sno='2005002' and cno='4'	Error Code: 1644. The sno is not in student