

# 实验报告

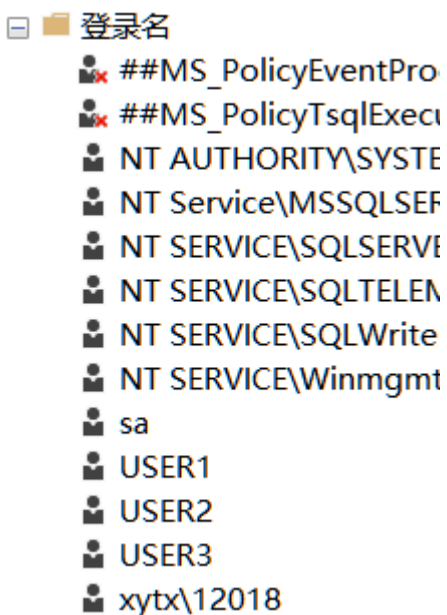
姓名：胡瑞康

学号：22336087

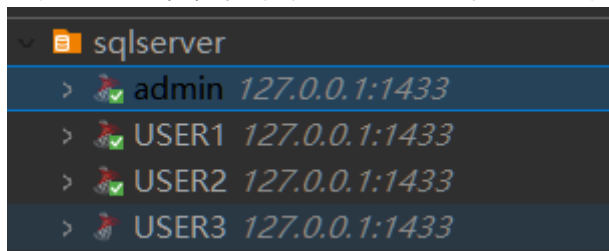
## 数据库表结构

- **students (sid, sname, email, grade)**  
学生表，包含学生的编号、姓名、邮箱和年级。
- **teachers (tid, tname, email, salary)**  
教师表，包含教师的编号、姓名、邮箱和薪水。
- **courses (cid, cname, hour)**  
课程表，包含课程的编号、名称和课时。
- **choices (no, sid, tid, cid, score)**  
选课表，包含选课记录的编号、学生编号、教师编号、课程编号和成绩。

## 前置操作



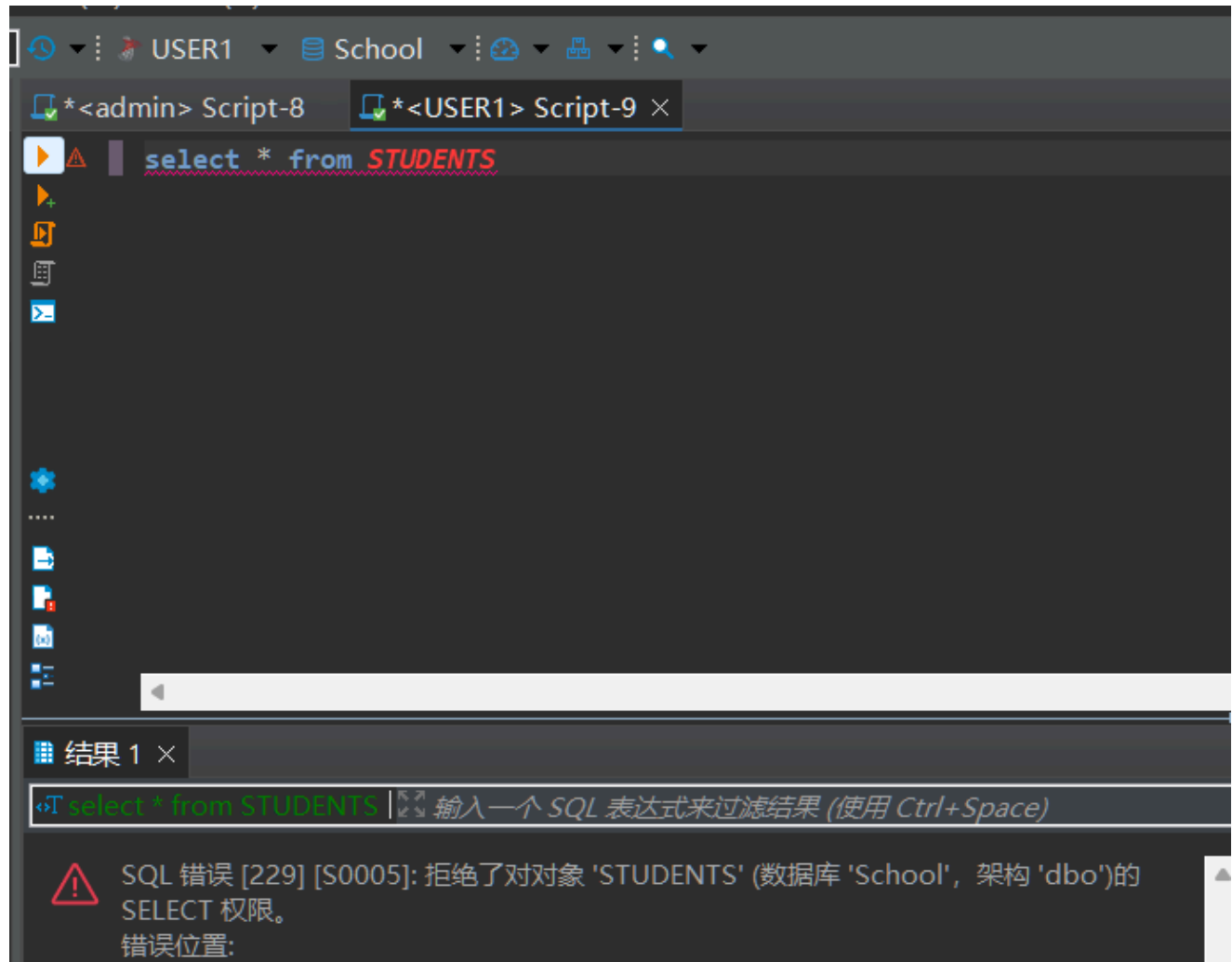
创建USER1,2,3, 以及在Dbeaver设置三个用户的链接



## (1)授予所有用户对表 STUDENTS的查询权限

```
select * from STUDENTS
```

授予权限之前：无法查询



授予权限使用管理员账号执行下面的sql

```
GRANT SELECT ON STUDENTS TO USER1,USER2,USER3;
```

\*<admin> Script-8 ×    \*<USER1> Script-9

```
GRANT SELECT ON STUDENTS TO USER1,USER2,USER3;
```

统计 1 ×

Name	Value
Updated Rows	-1
Query	GRANT SELECT ON STUDENTS TO USER1,USER2,USER3
Start time	Mon Oct 14 16:47:50 CST 2024
Finish time	Mon Oct 14 16:47:50 CST 2024

切换到USER，发现可以查询了

\*<admin> Script-8    \*<USER1> Script-9 ×

```
select * from STUDENTS
```

结果 1 ×

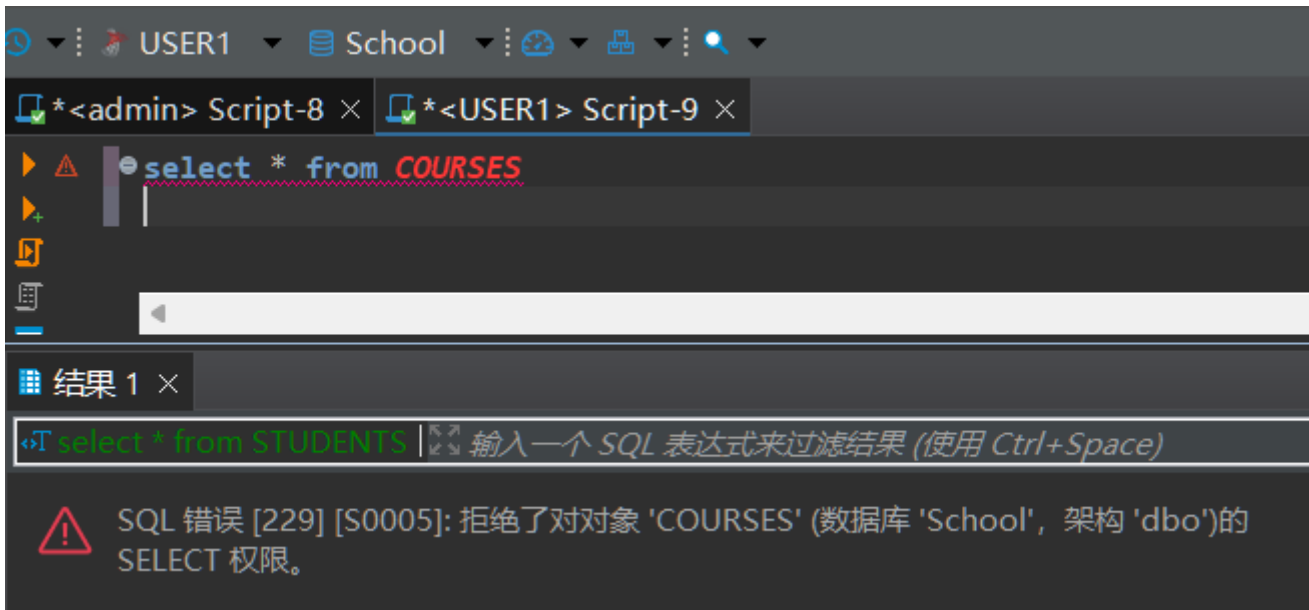
select \* from STUDENTS | 输入一个 SQL 表达式来过滤结果 (使用 Ctrl+Space)

	A-Z sid	A-Z sname	A-Z email	123 grade
1	60000001	Lily	[NULL]	2,001
2	800001216	gfrgs	hhce4@qhldj.gov	1,992
3	800002933	vnbqzsv	pvhxd4l@zqur.org	2,002
4	800005753	wagci	hlhq0h8@jdba.gov	1,992

## (2)授予所有用户对表 COURSES 的查询和更新权限

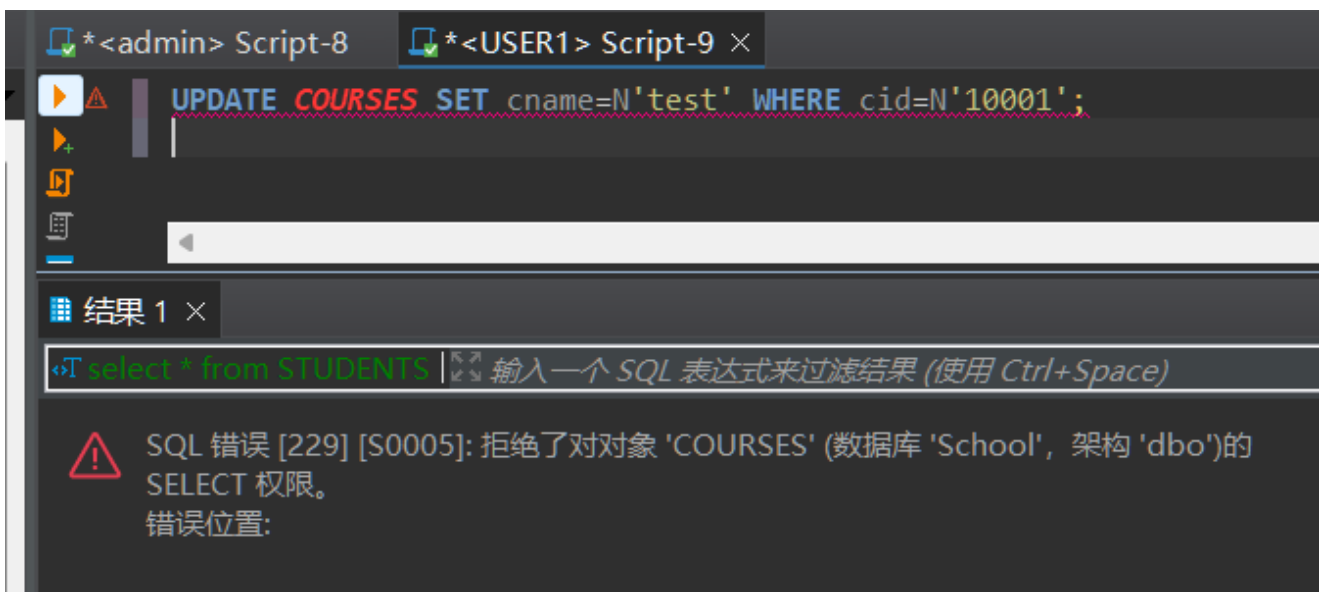
授予权限之前：用户无法查询

```
select * from COURSES
```



也无法更新

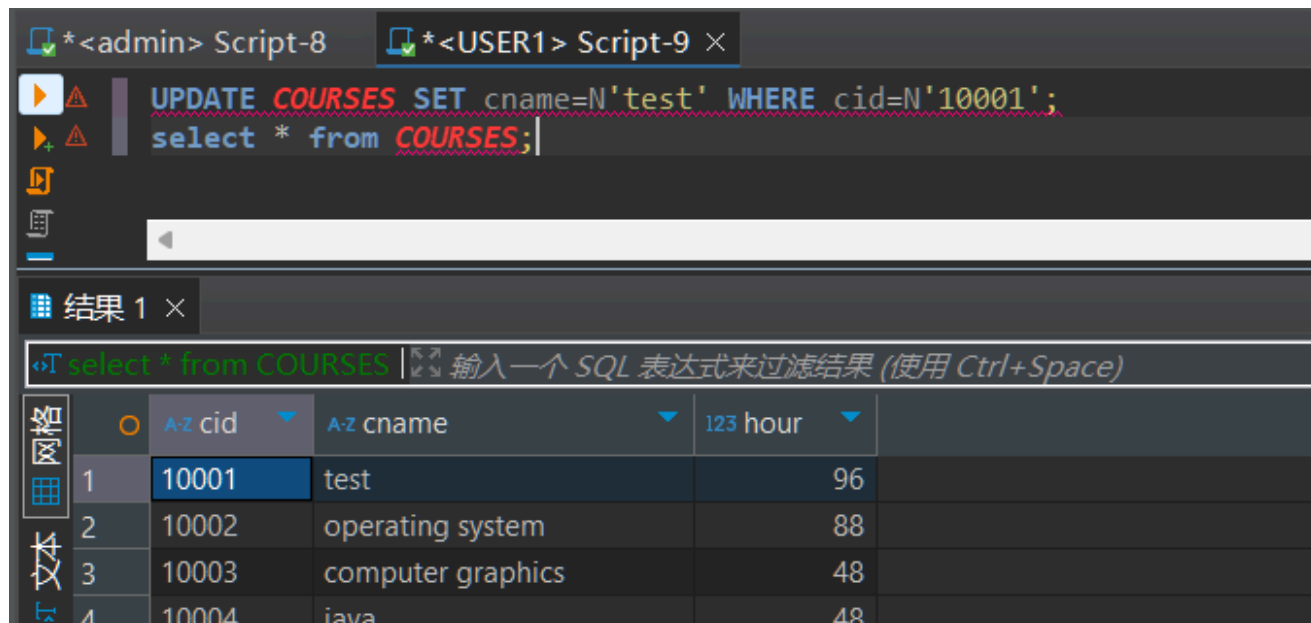
```
UPDATE COURSES SET cname=N'test' WHERE cid=N'10001';
```



授予权限使用管理员账号执行下面的sql

```
GRANT SELECT,UPDATE ON COURSES TO USER1,USER2,USER3;
```

用户可以执行更新和查询：



The screenshot shows a SQL IDE interface. At the top, there are two tabs: '\*<admin> Script-8' and '\*<USER1> Script-9'. The active tab is '\*<USER1> Script-9', which contains the following SQL code:

```
UPDATE COURSES SET cname=N'test' WHERE cid=N'10001';
select * from COURSES;
```

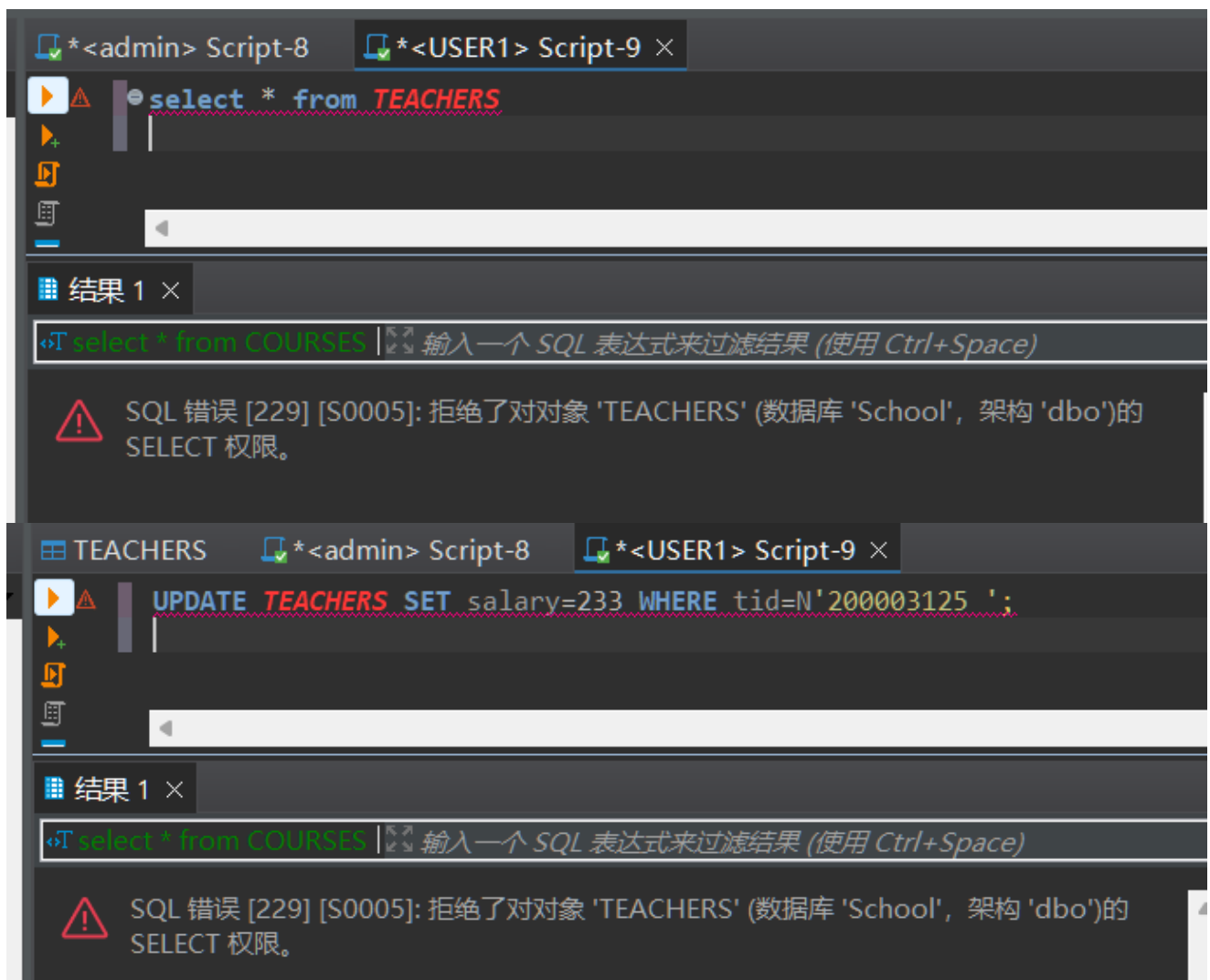
Below the script window, there is a results window titled '结果 1'. It shows the output of the 'select \* from COURSES' query. The results are displayed in a table with the following columns: 'cid', 'cname', and 'hour'. The table contains four rows of data:

	cid	cname	hour
1	10001	test	96
2	10002	operating system	88
3	10003	computer graphics	48
4	10004	java	48

### (3)授予USER1对表 TEACHERS的查询,更新工资的权限,且允许 USER11可以传播这些权限

授予权限之前：用户无法查询或者更新工资

```
select * from TEACHERS;
UPDATE TEACHERS SET salary=233 WHERE tid=N'200003125 ';
```



授予权限使用管理员账号执行下面的sql

```
GRANT SELECT, UPDATE (salary) ON TEACHERS TO USER1 WITH GRANT OPTION;
```

用户可以修改工资列以及查询

The screenshot shows the SQL Server Enterprise Manager interface. The top pane displays the query: `UPDATE TEACHERS SET salary=233 WHERE tid=N'200003125 ';`. The bottom pane shows the execution results for '统计 1' (Statistics 1).

Name	Value
Updated Rows	1
Query	UPDATE TEACHERS SET salary=233 WHERE tid=N'200003125 '
Start time	Mon Oct 14 17:05:52 CST 2024
Finish time	Mon Oct 14 17:05:52 CST 2024

Below the statistics, the '结果 1' (Results 1) pane shows the query: `select * from TEACHERS;`. The results are displayed in a table with columns: tid, tname, email, salary.

	tid	tname	email	salary
1	200003125	fqmmmyi	wcjcg@glq.net	233
2	200005322	udjom	qd5l8@ppmlf.gov	873

但是不能修改其他列

```
UPDATE TEACHERS SET tname=N'233' WHERE tid=N'200003125 ';
```

The screenshot shows the SQL Server Enterprise Manager interface. The top pane displays the query: `UPDATE TEACHERS SET tname=N'233' WHERE tid=N'200003125 ';`. The bottom pane shows the execution results for '结果 1' (Results 1).

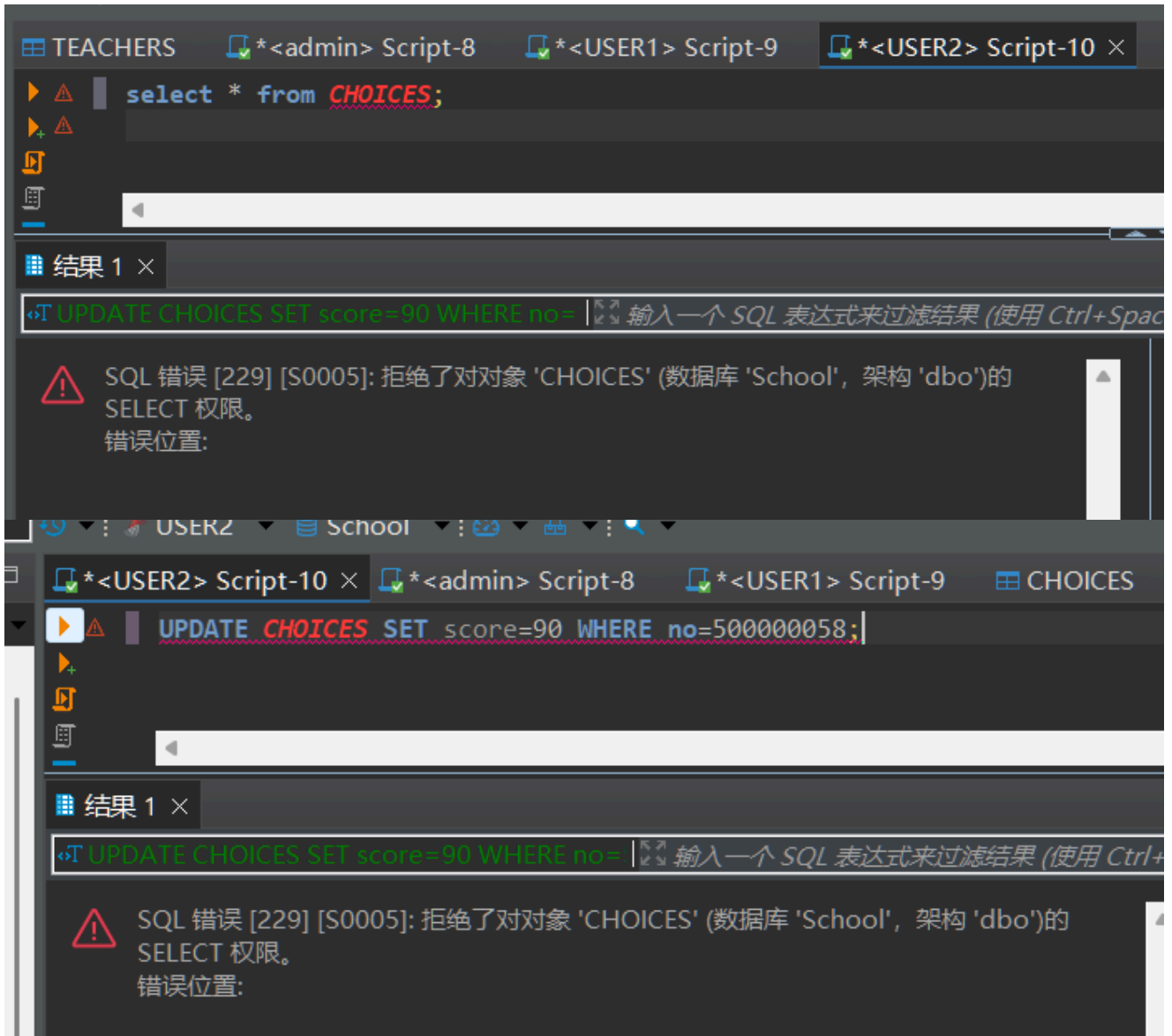
The results pane displays an error message:

SQL 错误 [230] [S0001]: 拒绝了对对象“TEACHERS”(数据库“School”，架构“dbo”)的列“tname”的 UPDATE 权限。  
错误位置:

## (4)授予USER2对表 CHOICES的查询,更新成绩的权限

授予权限之前：USER2无法查询或更新成绩

```
select * from CHOICES;  
UPDATE CHOICES SET score=90 WHERE no=500000058;
```

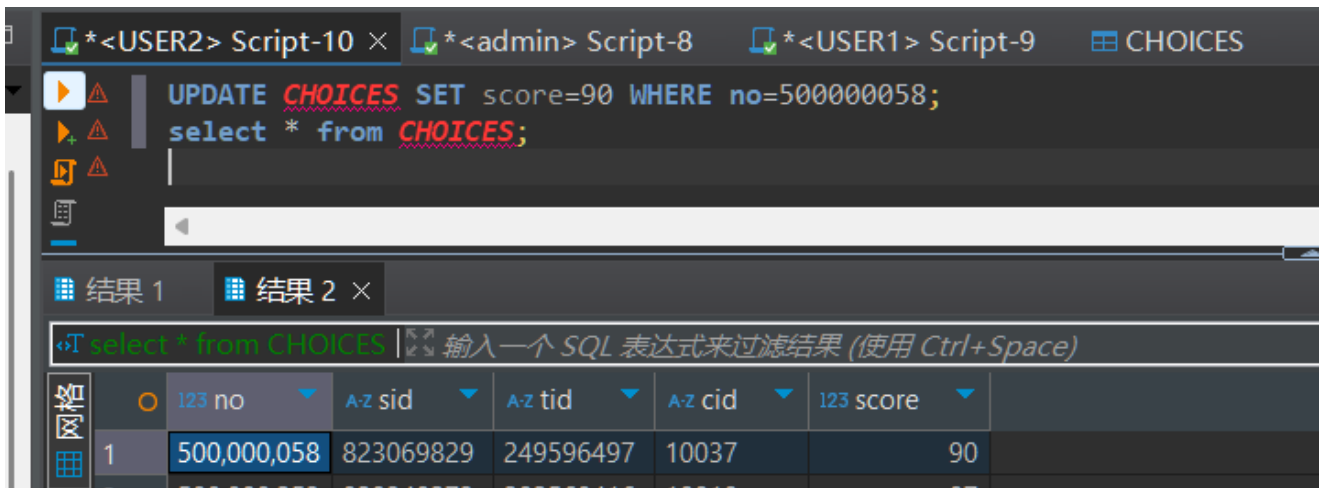


授予权限使用管理员账号执行以下SQL：

```
GRANT SELECT, UPDATE (score) ON CHOICES TO USER2;
```

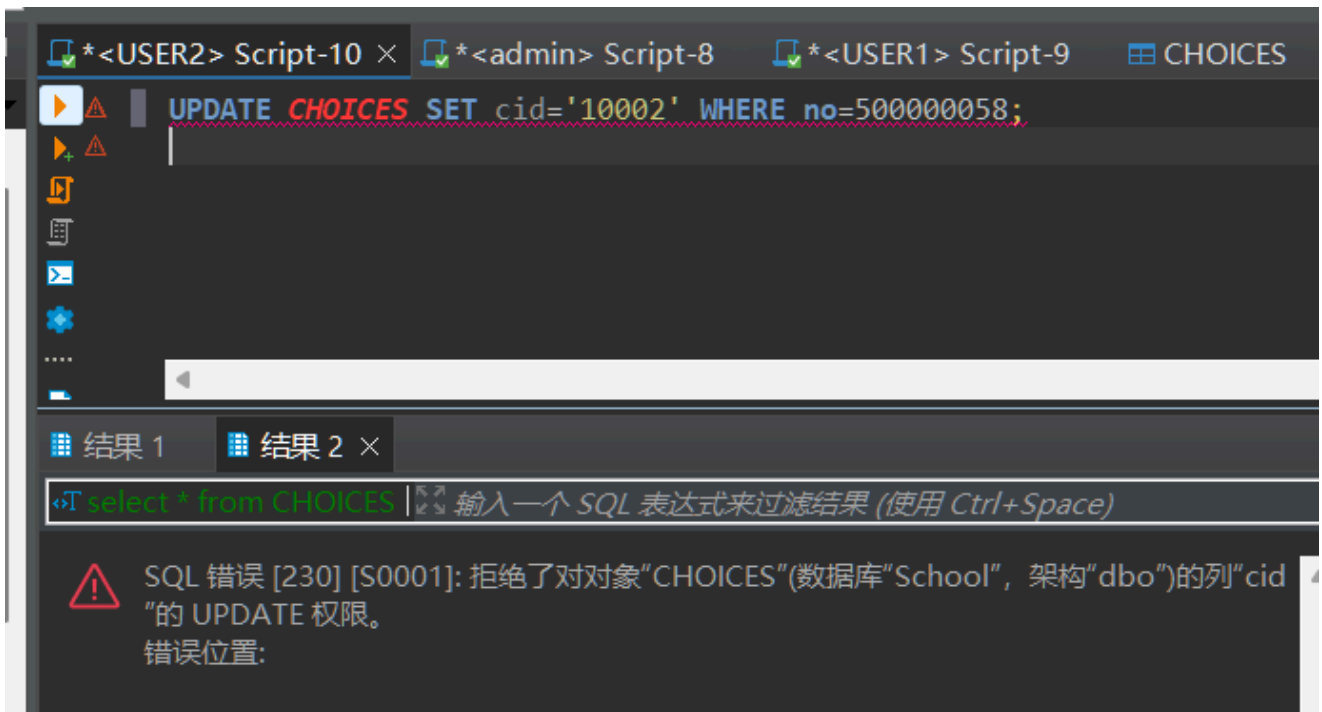
授予权限后，切换到USER2账号，可以查询和更新成绩了：





但是USER2不能修改其他列:

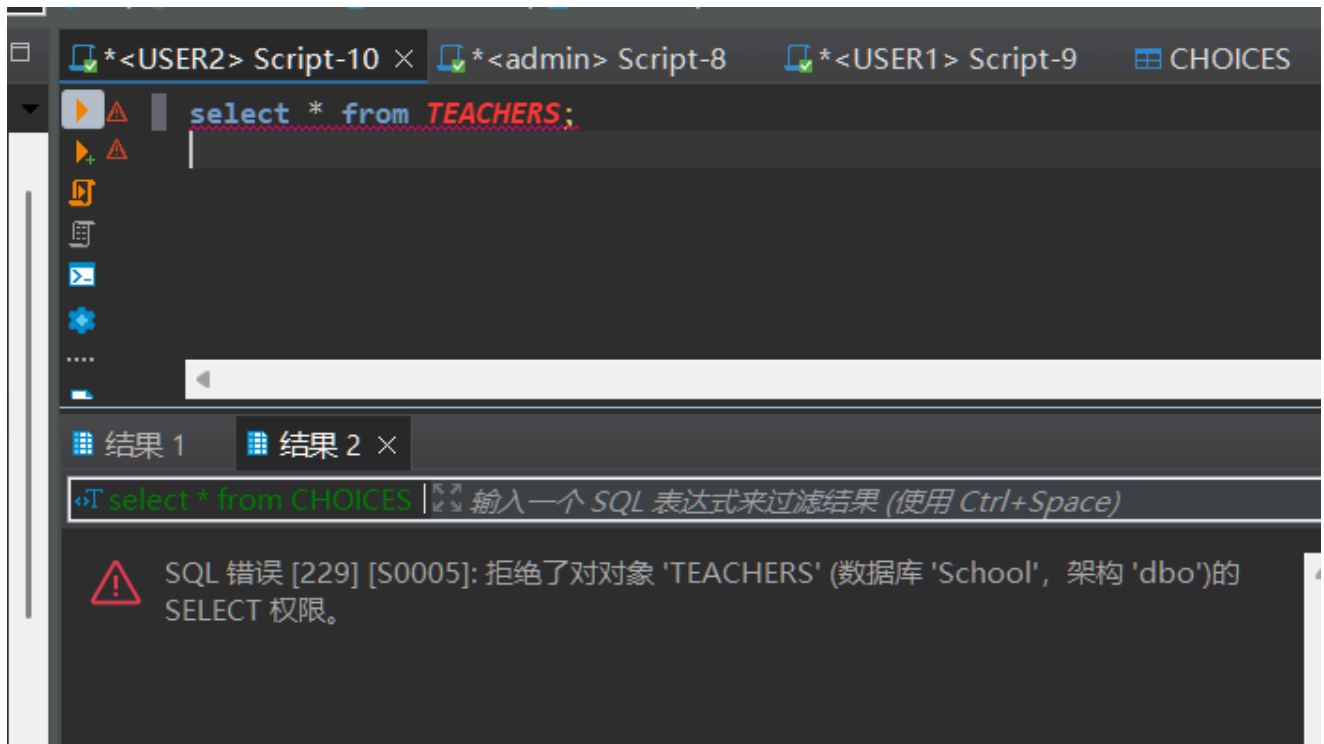
```
UPDATE CHOICES SET cid='10002' WHERE no=500000058;
```



## (5)由USER1授予USER2对表 TEACHERS的查询权限和传播的此项权限的权利

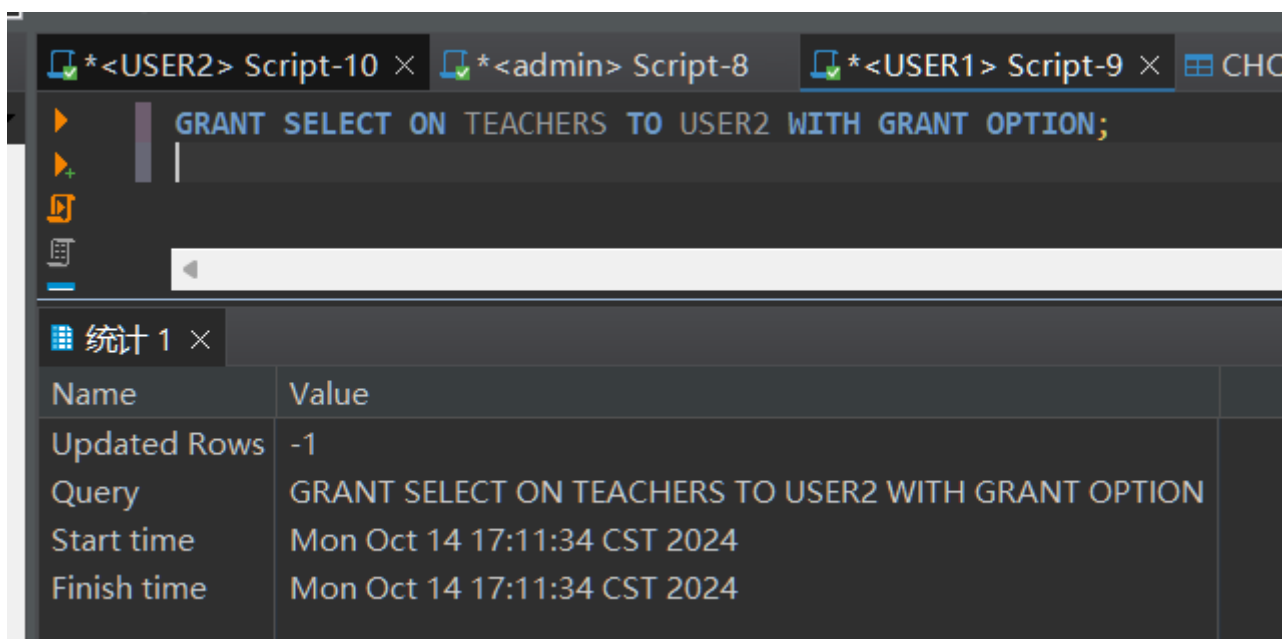
授予权限之前: USER2无法查询

```
select * from TEACHERS;
```

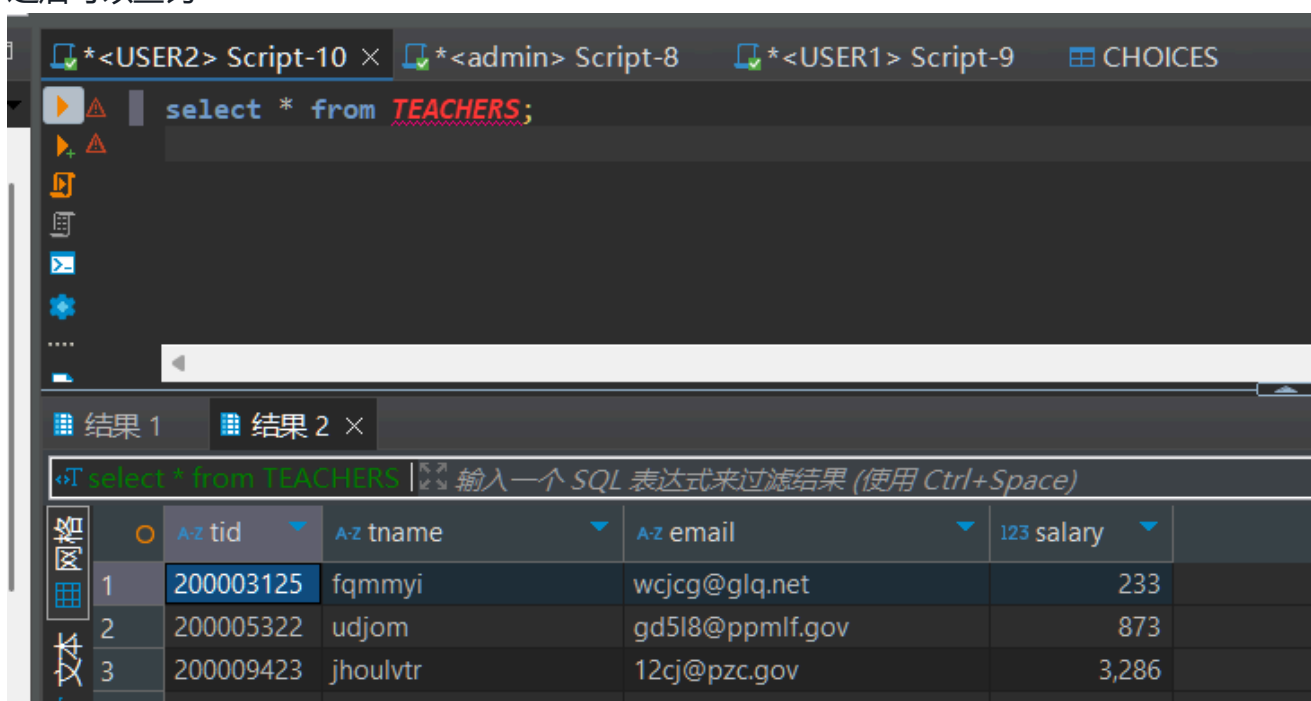


授予权限使用USER1执行以下SQL:

```
GRANT SELECT ON TEACHERS TO USER2 WITH GRANT OPTION;
```



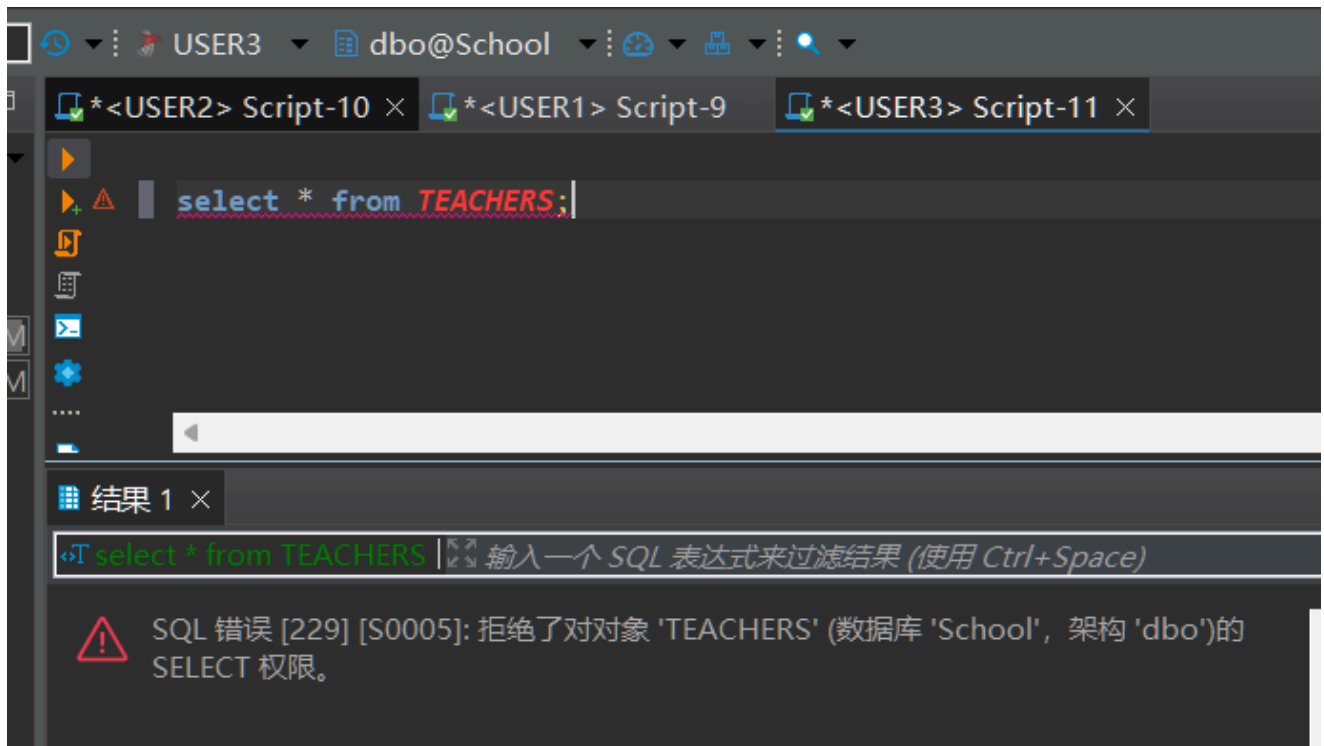
之后可以查询



**(6)由USER2授予USER3对表 TEACHERS的查询权限, 和传播的此项权限的权利。**

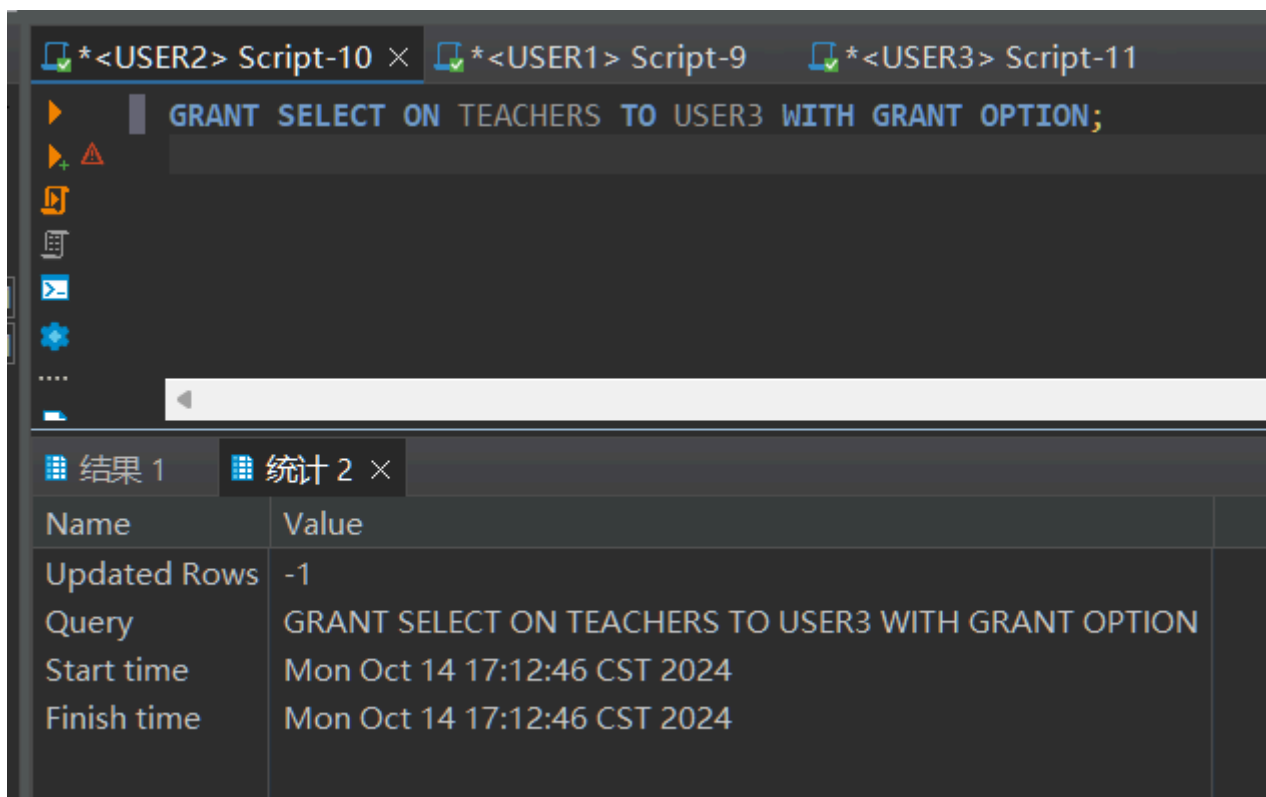
授予权限之前: USER3无法查询

```
select * from TEACHERS;
```

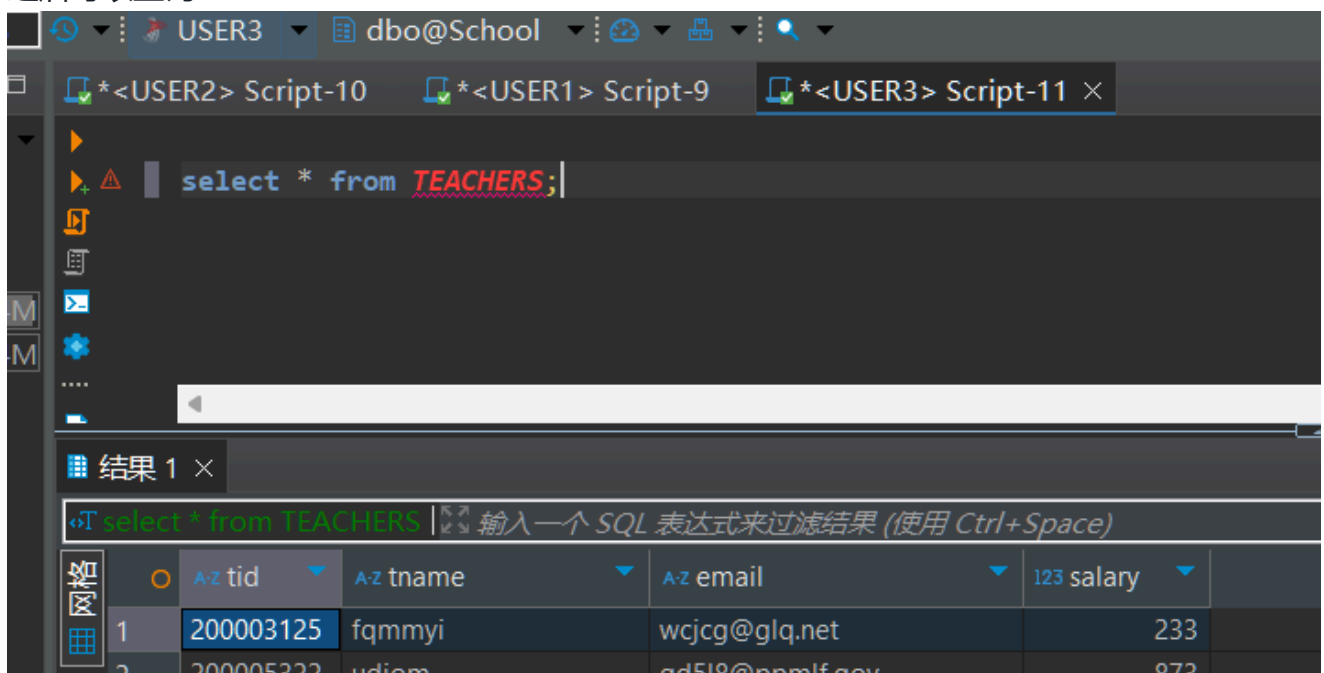


授予权限使用USER2执行以下SQL:

```
GRANT SELECT ON TEACHERS TO USER3 WITH GRANT OPTION;
```



之后可以查询

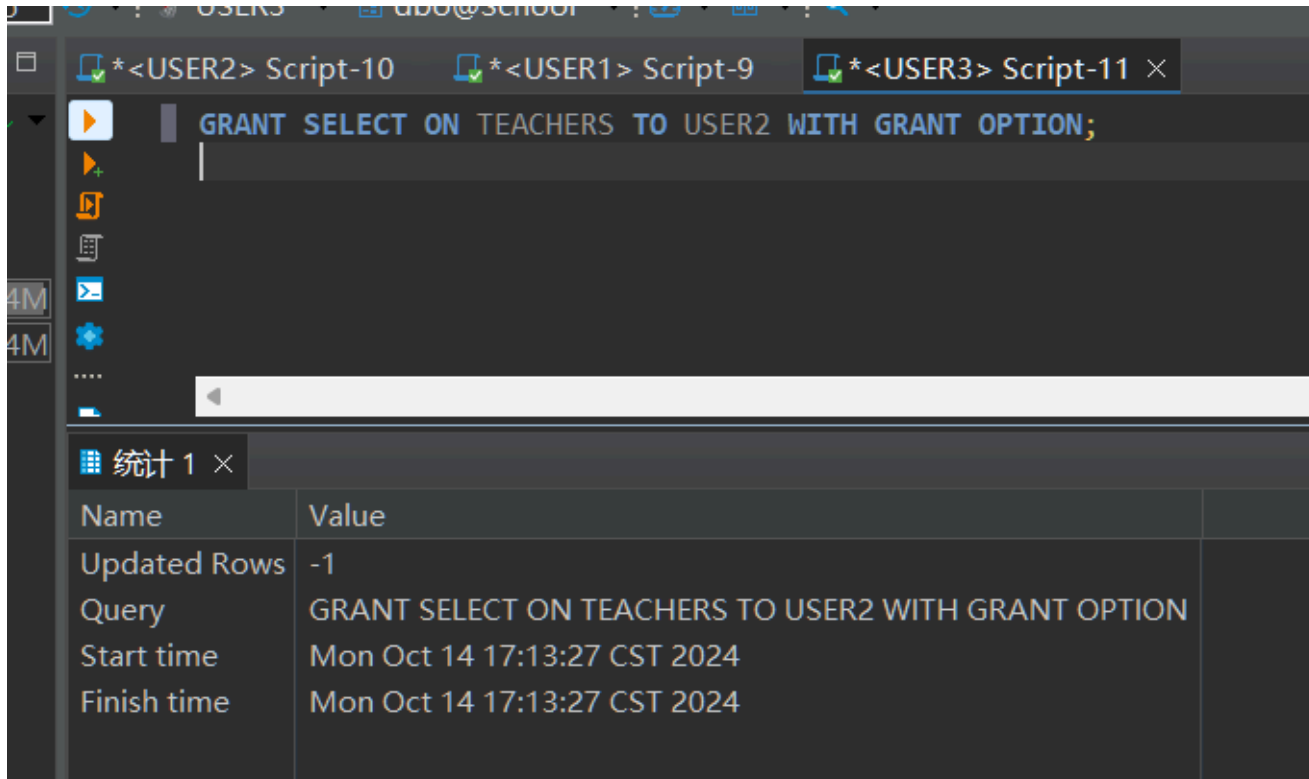


再由USER3授予USER2上述权限,这样的SQL语句能否成功得到执行?

尝试构建sql

```
GRANT SELECT ON TEACHERS TO USER2 WITH GRANT OPTION;
```

可以执行



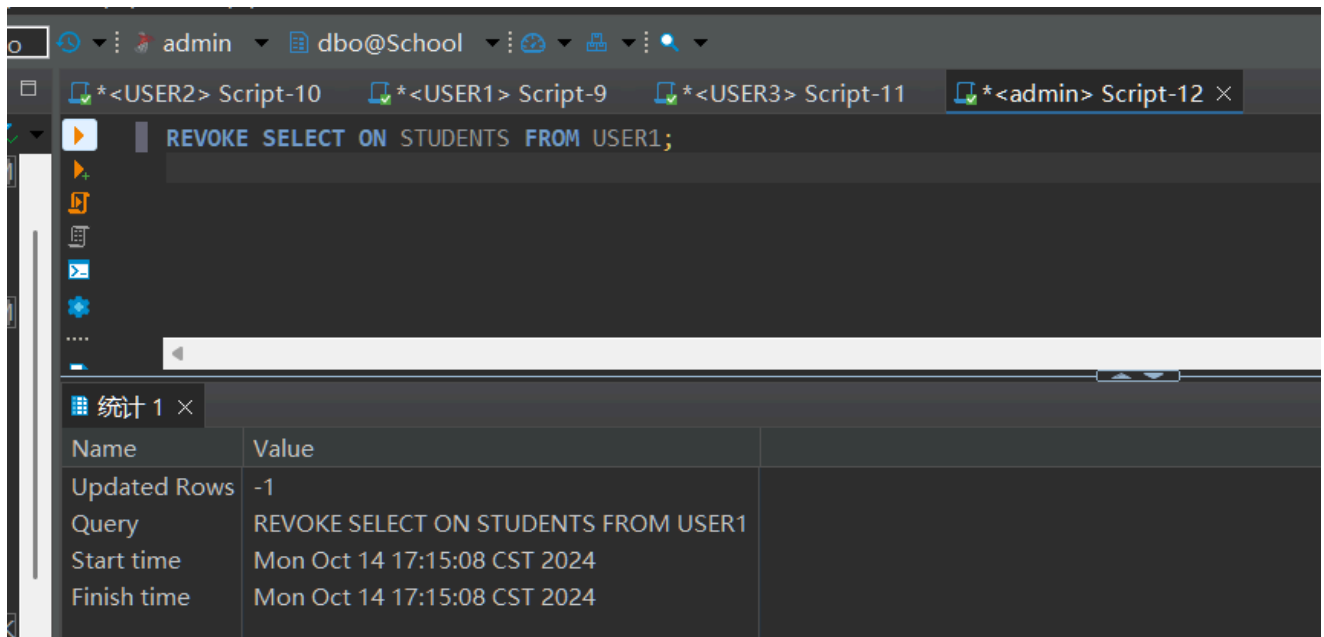
The screenshot shows a SQL Server Enterprise Manager interface. At the top, there are three tabs: '\*<USER2> Script-10', '\*<USER1> Script-9', and '\*<USER3> Script-11'. The active tab is '\*<USER3> Script-11'. Below the tabs, a script is being executed: `GRANT SELECT ON TEACHERS TO USER2 WITH GRANT OPTION;`. Below the script, a '统计 1' (Statistics 1) window is open, showing the execution results.

Name	Value
Updated Rows	-1
Query	GRANT SELECT ON TEACHERS TO USER2 WITH GRANT OPTION
Start time	Mon Oct 14 17:13:27 CST 2024
Finish time	Mon Oct 14 17:13:27 CST 2024

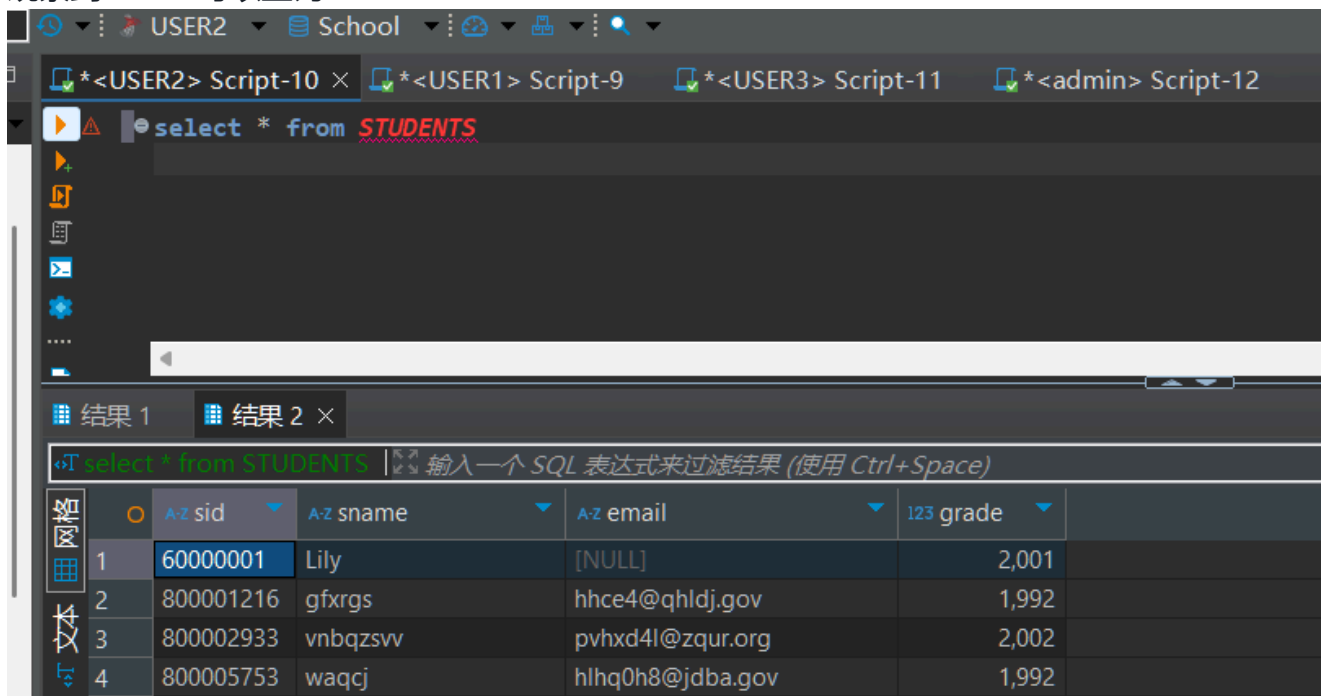
**(7)取消USER1对表 STUDENTS的查询权限,考虑由USER2的身份对表 STUDENTS 进行查询,操作能否成功?为什么?**

执行下面sql取消:

```
REVOKE SELECT ON STUDENTS FROM USER1;
```



观察到USER2可以查询



原因可能是：

USER2的查询权限是由管理员直接授予的，而不是通过USER1传递过来的。

权限传播的撤销通常只会影响通过该用户传递的权限，而不会影响直接赋予用户的权限。

## (8)取消USER1和USER2的关于表 COURSES的权限

执行下面sql取消：

```
REVOKE SELECT,UPDATE ON COURSES FROM USER1,USER2;
```

admin | dbo@School

\*<USER2> Script-10   \*<USER1> Script-9   \*<USER3> Script-11   \*<admin> Script-12 ×

```
REVOKE SELECT,UPDATE ON COURSES FROM USER1,USER2;
```

统计 1 ×

Name	Value
Updated Rows	-1
Query	REVOKE SELECT,UPDATE ON COURSES FROM USER1,USER2
Start time	Mon Oct 14 17:23:10 CST 2024
Finish time	Mon Oct 14 17:23:10 CST 2024

之后USER1和USER2无法查询和更新

```
select * from COURSES;  
UPDATE COURSES SET cname=N'test' WHERE cid=N'10001';
```



