

创建视图用来记录
每个学生每学期选修的总学分数，
拿到的总学分数，
该学期获得的平均绩点。
并说明改视图是否可以更新，说明理由。

C组

先完成基本语句

```
create view disscusion_test as
select s.student_id, s.stu_name, semester,
sum(credit), avg(score)
from course
      join course_selection cs on
course.course_id = cs.course_id
      join student s on s.student_id =
cs.student_id
group by s.student_id, semester
order by s.student_id, semester;
```

- 三表链接
- Group by分组
- Order by排序
- 聚合函数

	student_id	stu_name	semester	sum(credit)	avg(score)
1	1101	李明	201201	4	104.0000
2	1101	李明	201202	20	<null>
3	1101	李明	201301	6	<null>
4	1101	李明	201302	3	<null>
5	1102	刘晓明	201201	4	90.0000
6	1102	刘晓明	201202	12	85.0000
7	1102	刘晓明	201301	6	<null>
8	1102	刘晓明	201302	3	<null>
9	1103	张颖	201201	7	71.0000
10	1103	张颖	201202	12	84.5000
11	1103	张颖	201301	10	<null>
12	1104	刘晶晶	201201	4	81.0000
13	1104	刘晶晶	201202	20	<null>
14	1104	刘晶晶	201301	6	<null>
15	1104	刘晶晶	201302	3	<null>
16	1105	刘成刚	201201	4	<null>
17	1105	刘成刚	201202	20	<null>

试试UPDATE吧！

	🔍 student_id ⚙	🔍 stu_name ⚙	🔍 semester ⚙	🔍 sum(credit) ⚙	🔍 avg(score) ⚙
25	1107	张晓峰	201202	20	82.0000
26	1107	张晓峰	201301	6	<null>
27	1107	张晓峰	201302	3	<null>
28	1108	王二一	201201	4	<null>
29	1108	王二一	201202	20	<null>
30	1108	王二一	201301	10	<null>
31	1108	王二一	201302	3	<null>
32	1109	陈二二	201201	4	<null>
33	1109	陈二二	201202	20	<null>
34	1109	陈二二	201301	10	<null>
35	1109	陈二二	201302	3	<null>
36	1110	测试	201303	20	100.0000

[HY000][1288] The target table t of the UPDATE is not updatable

Details ×

向视图discussion_test中
插入一条新记录试试

但是…失败啦！

那DELETE呢？

	student_id	stu_name	semester	sum(credit)	avg(score)
24	1107	张晓峰	201201	4	94.0000
25	1107	张晓峰	201202	20	82.0000
26	1107	张晓峰	201301	6	<null>
27	1107	张晓峰	201302	3	<null>
28	1108	王二一	201201	4	<null>
29	1108	王二一	201202	20	<null>
30	1108	王二一	201301	10	<null>
31	1108	王二一	201302	3	<null>
32	1109	陈二二	201201	4	<null>
33	1109	陈二二	201202	20	<null>
34	1109	陈二二	201301	10	<null>
35	1109	陈二二	201302	3	<null>

[HY000][1288] The target table disscusion_test of the DELETE is not updatable

Details [row:35] ×

不出所料，同样的报错

MySQL Error Code

[HY000][1288] The target table disscusion_test of the DELETE is not updatable

删除操作报错信息

[HY000][1288] The target table t of the UPDATE is not updatable

更新操作报错信息

MySQL报错码

Each server error message includes an error code, SQLSTATE value, and message string, as described in [Error Message Sources and Elements](#). These elements are available as described in [Error Information Interfaces](#).

MySQL官方文档具体解释[HY000][1288]

- Error number: 1288; Symbol: ER_NON_UPDATABLE_TABLE; SQLSTATE: HY000 两个%s分别指代表名、语句名

Message: The target table %s of the %s is not updatable






Source: <https://dev.mysql.com/doc/mysql-errors/8.0/en/server-error-reference.html>

MySQL环境下的View存在哪里？

```
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.01 sec)
```

MySQL中的四个默认database:

- Information_schema
- Mysql
- Performance_schema
- sys

>  TRIGGERS
>  USER_ATTRIBUTES
>  VIEW_ROUTINE_USAGE
>  VIEW_TABLE_USAGE
>  **VIEWS**

99	def	sys	x\$session
100	def	sys	session_ssl_status
101	def	Teach_Yourself_SQL	productcustomers
102	def	Teach_Yourself_SQL	customerswithorders
103	def	school	zpcj
104	def	school	disscusion_test

- View中的创建信息存放在了默认database中Information_schema的VIEWS表中，其实也就是一条记录，从中查看TABLE_NAME和IS_UPDATABLE

让我看看！

```
SELECT TABLE_NAME, IS_UPDATABLE
FROM
    information_schema.views
WHERE
    table_schema = 'school';
```

	TABLE_NAME	IS_UPDATABLE
1	zpcj	YES
2	disssusion_test	NO

- View中的创建信息存放在了默认database中Information_schema的VIEWS表中，其实也就是一条记录，从中查看TABLE_NAME和IS_UPDATABLE
- 结果为此处的VIEW不可更新

MySQL View更新规则

25.5.3 Updatable and Insertable Views

Some views are updatable and references to them can be used to specify tables to be updated in data change statements. That is, you can use them in statements such as UPDATE, DELETE, or INSERT to update the contents of the underlying table. Derived tables and common table expressions can also be specified in multiple-table UPDATE and DELETE statements, but can only be used for reading data to specify rows to be updated or deleted. Generally, the view references must be updatable, meaning that they may be merged and not materialized. Composite views have more complex rules.

For a view to be updatable, there must be a one-to-one relationship between the rows in the view and the rows in the underlying table. There are also certain other constructs that make a view nonupdatable. To be more specific, a view is not updatable if it contains any of the following:

- Aggregate functions or window functions (SUM(), MIN(), MAX(), COUNT(), and so forth)
- `DISTINCT`
- `GROUP BY`
- `HAVING`
- UNION or UNION ALL
- Subquery in the select list

Nondependent subqueries in the select list fail for INSERT, but are okay for UPDATE, DELETE. For dependent subqueries in the select list, no data change statements are permitted.

- Certain joins (see additional join discussion later in this section)
- Reference to nonupdatable view in the `FROM` clause
- Subquery in the `WHERE` clause that refers to a table in the `FROM` clause
- Refers only to literal values (in this case, there is no underlying table to update)
- `ALGORITHM = TEMPTABLE` (use of a temporary table always makes a view nonupdatable)
- Multiple references to any column of a base table (fails for INSERT, okay for UPDATE, DELETE)

- 视图的行与基础表的行必须一一对应
- 不允许修改的情况
 - 聚合函数
 - 子查询
 - `GROUP BY`, `HAVING`, `UNION`, `DISTINCT`
 - `CROSS JOIN`, `LEFT JOIN`
 - `UNION`, `UNION ALL`

Source: <https://dev.mysql.com/doc/refman/8.0/en/view-updatability.html>

SQL Server View更新规则

Updatable Views

You can modify the data of an underlying base table through a view, as long as the following conditions are true:

- Any modifications, including UPDATE, INSERT, and DELETE statements, must reference columns from only one base table.
- The columns being modified in the view must directly reference the underlying data in the table columns. The columns cannot be derived in any other way, such as through the following:
 - An aggregate function: AVG, COUNT, SUM, MIN, MAX, GROUPING, STDEV, STDEVP, VAR, and VARP.
 - A computation. The column cannot be computed from an expression that uses other columns. Columns that are formed by using the set operators UNION, UNION ALL, CROSSJOIN, EXCEPT, and INTERSECT amount to a computation and are also not updatable.
- The columns being modified are not affected by GROUP BY, HAVING, or DISTINCT clauses.
- TOP is not used anywhere in the *select_statement* of the view together with the WITH CHECK OPTION clause.

- 任何修改，包括 UPDATE、INSERT 和 DELETE 语句，都必须仅引用一个基表中的列。
- 在视图中修改的列必须直接引用表列中的基础数据。这些列不能以任何其他方式派生，例如通过以下方式：
 - 聚合函数：AVG, COUNT, SUM, MIN, MAX, GROUPING, STDEV, STDEVP, VAR, VARP
 - 计算表达式。不能从使用其他列的表达式计算该列。使用集合运算符 UNION、UNION ALL、CROSSJOIN、EXCEPT 和 INTERSECT 形成的列相当于一个计算，并且也是不可更新的。
- 被修改的列不受 GROUP BY、HAVING 或 DISTINCT 子句的影响。
- TOP 没有在视图的 *select_statement* 中的任何地方与 WITH CHECK OPTION 子句一起使用。

Source: <https://learn.microsoft.com/en-us/sql/t-sql/statements/create-view-transact-sql?view=sql-server-ver16#updatable-views>

谢谢观看

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