

DB Lab02

实验目的

1. 掌握关系数据库语言SQL的使用。
2. 使所有的SQL作业都能上机通过。

实验平台

MySQL: 8.0.32-arm64

OS: macOS Ventura 13.2.1

实验内容和要求

建立数据库

首先连接数据库，使用root用户，连接到MySQL server：

```
$ mysql -u root -p [pwd]
```

```
# jly @ jianglinyideMacBook-Air in ~ [22:08:07]
$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.32 MySQL Community Server - GPL

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```

创建一个名为lab02的数据库

```
create database lab02;
```

```
mysql> create database lab02;
Query OK, 1 row affected (0.00 sec)
```

选择我们刚建好的数据库：

```
use lab02;
```

```
mysql> use lab02;  
Database changed
```

数据定义

表的建立

建立一个student表：

```
create table student (  
    ID char(12),  
    name varchar(80),  
    total_cre numeric(3,0),  
    primary key (ID)  
);
```

```
mysql> create table student (  
    -> ID char(12),  
    -> name varchar(80),  
    -> total_cre numeric(3,0),  
    -> primary key (ID)  
    -> );  
Query OK, 0 rows affected (0.01 sec)
```

表的删除

新建一个tmp表，然后删除：

```
create table tmp (  
    ID varchar(2),  
    primary key (ID)  
);  
drop table tmp;
```

```
mysql> create table tmp (  
-> ID varchar(2),  
-> primary key (ID)  
-> );  
Query OK, 0 rows affected (0.01 sec)  
  
mysql> drop table tmp;  
Query OK, 0 rows affected (0.01 sec)
```

表的修改

为student表新加入一个属性，并删除它：

```
alter table student add age int;  
alter table student drop age;
```

```
mysql> alter table student add age int;  
Query OK, 0 rows affected (0.01 sec)  
Records: 0 Duplicates: 0 Warnings: 0  
  
mysql> alter table student drop age;  
Query OK, 0 rows affected (0.01 sec)  
Records: 0 Duplicates: 0 Warnings: 0
```

索引的建立和删除

在student表上以name列为索引：

```
create index tmpidx on student (name);  
drop index tmpidx on student;
```

```
mysql> create index tmpidx on student (name);  
Query OK, 0 rows affected (0.01 sec)  
Records: 0  Duplicates: 0  Warnings: 0  
  
mysql> drop index tmpidx on student;  
Query OK, 0 rows affected (0.01 sec)  
Records: 0  Duplicates: 0  Warnings: 0
```

视图的建立和删除

student表上, select *:

```
create view tmpview  
as select * from student;  # 建立视图  
  
select * from tmpview;  # 通过视图查数据  
  
describe tmpview;  # 查询视图  
  
drop view tmpview;  # 删除视图
```

```
mysql> create view tmpview
-> as select * from student;
Query OK, 0 rows affected (0.01 sec)

mysql> select * from tmpview;
Empty set (0.00 sec)

mysql> describe tmpview
-> ;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ID         | char(12)      | NO   |     | NULL    |       |
| name       | varchar(80)   | YES  |     | NULL    |       |
| total_cre  | decimal(3,0)  | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)

mysql> drop view tmpview;
Query OK, 0 rows affected (0.01 sec)

mysql> describe tmpview;
ERROR 1146 (42S02): Table 'lab02.tmpview' doesn't exist
```

数据更新

插入

首先，多insert几条，方便之后操作

```
insert into student
(ID, name, total_cre)
values
(114514, 'master', 114);
insert into student
(ID, name, total_cre)
values
('98123892', 'haha', 14);
insert into student
(ID, name, total_cre)
values
('ksa10', 'test', 98);
```

```
mysql> insert into student
-> (ID, name, total_cre)
-> values
-> (114514, 'master', 114);
Query OK, 1 row affected (0.00 sec)
```

```
mysql> insert into student
-> (ID, name, total_cre)
-> values
-> ('98123892', 'haha', 14);
Query OK, 1 row affected (0.01 sec)
```

```
mysql> insert into student
-> (ID, name, total_cre)
-> values
-> ('ksa10', 'test', 98);
Query OK, 1 row affected (0.00 sec)
```

```
mysql> select * from student;
+-----+-----+-----+
| ID      | name  | total_cre |
+-----+-----+-----+
| 114514   | master | 114      |
| 98123892 | haha   | 14       |
| ksa10    | test   | 98       |
```

删除

删除haha这个人的数据:

```
delete from student where name = 'haha';
```

```
mysql> delete from student where name = 'haha';  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> select * from student;  
+-----+-----+-----+  
| ID      | name   | total_cre |  
+-----+-----+-----+  
| 114514  | master |          114 |  
| ksa10   | test   |          98  |  
+-----+-----+-----+  
2 rows in set (0.00 sec)
```

更新

更新数据, master的ID不好, 我们修改为其他的:

```
update student set ID = 'newid' where name = 'master';
```

```
mysql> update student set ID = 'newid' where name = 'master';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql> select * from student;
+-----+-----+-----+
| ID      | name    | total_cre |
+-----+-----+-----+
| ksa10   | test    | 98        |
| newid   | master  | 114       |
+-----+-----+-----+
2 rows in set (0.00 sec)
```

数据查询

单表查询

为了更好地查询，我们先多插入几条记录：

```
mysql> select * from student;
+-----+-----+-----+
| ID          | name      | total_cre |
+-----+-----+-----+
| 090         | your_son  | 19        |
| 1231230     | asda      | 999       |
| hellokitty  | bob       | 765       |
| ksa10       | test      | 98        |
| newid       | master    | 114       |
| where       | kasha     | 23        |
+-----+-----+-----+
6 rows in set (0.00 sec)
```

查询总学分大于20的所有同学的姓名：


```
select distinct ID
from student
where total_cre > 20;
```

```
mysql> select distinct ID
-> from student
-> where total_cre > 20;

+-----+
| ID          |
+-----+
| 1231230     |
| hellokitty  |
| ksa10       |
| newid       |
| where       |
+-----+
5 rows in set (0.00 sec)
```

多表查询

建立一个奖学金表：

```
create table money (
  m_name varchar(80),
  total_mon numeric(5,0),
  primary key (m_name)
);
```

给奖学金表插入几条数据：

```
insert into money
(m_name, total_mon)
values
('your_son', 10000);
insert into money
(m_name, total_mon)
values
```

```

('bob', 34340);
insert into money
(m_name, total_mon)
values
('kasha', 90000);
insert into money
(m_name, total_mon)
values
('asda', 50000);

```

接下来，我们要查询：总学分大于30，且获得了20000以上奖学金的学生的ID：

```

select distinct ID
from student as s, money as m
where s.name = m.m_name
and s.total_cre > 30
and m.total_mon > 20000;

```

```

mysql> select distinct ID
      -> from student as s, money as m
      -> where s.name = m.m_name
      -> and s.total_cre > 30
      -> and m.total_mon > 20000;

+-----+
| ID          |
+-----+
| 1231230     |
| hellokitty  |
+-----+
2 rows in set (0.00 sec)

```

嵌套查询

查询student表里，比test的credit更高的学生的id和name：

```
select ID, name
from student
where total_cre > (
    select total_cre
    from student
    where name = 'test'
);
```

```
mysql> select ID, name
-> from student
-> where total_cre > (
-> select total_cre
-> from student
-> where name = 'test'
-> );
```

```
+-----+-----+
| ID          | name    |
+-----+-----+
| 1231230     | asda    |
| hellokitty  | bob     |
| newid       | master  |
+-----+-----+
3 rows in set (0.01 sec)
```

视图操作

建立视图：

```
create view stu_view
as select * from student;
```

查看视图：

```
describe stu_view;
```

```
mysql> describe stu_view;
```

Field	Type	Null	Key	Default	Extra
ID	char(12)	NO		NULL	
name	varchar(80)	YES		NULL	
total_cre	decimal(3,0)	YES		NULL	

3 rows in set (0.01 sec)

查询视图:

```
select *  
from stu_view  
where name = 'test';
```

```
mysql> select *  
-> from stu_view  
-> where name = 'test';  
+-----+-----+-----+  
| ID    | name | total_cre |  
+-----+-----+-----+  
| ksa10 | test |          98 |  
+-----+-----+-----+  
1 row in set (0.00 sec)
```

插入视图:

```
insert stu_view  
values  
('sad!', 'Keria', 666);
```

```
mysql> insert stu_view  
-> values  
-> ('sad!', 'Keria', 666);  
Query OK, 1 row affected (0.01 sec)
```

通过视图删除：

```
delete from stu_view  
where name = 'kasha';
```

```
mysql> delete from stu_view  
-> where name = 'kasha';  
Query OK, 1 row affected (0.00 sec)
```

修改：

```
update stu_view  
set total_cre = 957  
where ID = '090';
```

```
mysql> update stu_view  
-> set total_cre = 957  
-> where ID = '090'  
-> ;  
Query OK, 1 row affected (0.00 sec)  
Rows matched: 1 Changed: 1 Warnings: 0
```

最终结果：

修改前：

```
mysql> select * from student;
```

ID	name	total_cre
090	your_son	19
1231230	asda	999
hellokitty	bob	765
ksa10	test	98
newid	master	114
where	kasha	23

```
6 rows in set (0.00 sec)
```

修改后:

```
mysql> select * from student;
```

ID	name	total_cre
090	your_son	957
1231230	asda	999
hellokitty	bob	765
ksa10	test	98
newid	master	114
sad!	Keria	666

```
6 rows in set (0.00 sec)
```