《数据库原理与设计》实验报告

年级、专业、班级	2023 级软件工程 01		姓名	
实验题目		实验 9 数据库安全性控制		
实验时间	2024/11/5	实验地点		DS1501
实验成绩		实验性质	√验证性 □设计性 □综合性	

教师评价：

□算法/实验过程正确；   □源程序/实验内容提交   □程序结构/实验步骤合理；

□实验结果正确；   □语法、语义正确；   □报告规范；

其他：

评价教师签名：

一、实验目的
- [1] 理解数据库安全的重要性；
- [2] 理解 MySQL 用户管理、角色管理和权限管理；
- [3] 掌握创建、更名、修改登录账户口令和删除登录帐户的方法；
- [4] 掌握创建、激活、将用户添加为角色成员、删除角色的方法；
- [5] 掌握授予和撤销数据库权限的方法。

二、实验项目内容
1. 用 SQL 语句创建一个 MySQL 用户账户 sqlteacher，并将其设置允许对数据库 library 查询，对表 book 进行插入、删除和修改操作，并进行验证。
2. 用图形界面工具创建一个 MySQL 用户账户 sqladmin，并将其设置允许对数据库 library 查询，对表进行插入、修改、删除操作，并进行验证。
3. 用 SQL 语句更改用户账户 sqlteacher 的口令为"t123"。
4. 用 SQL 语句撤销用户 sqlteacher 对数据库 library 的查询权限，并进行验证。
5. 用 SQL 语句创建一个角色 librrole，并将用户 sqlteacher 加入到该角色中。
6. 用 SQL 语句赋予角色 librrole 对数据库 library 的查询权限，验证 sqlteacher 是否对数据库 library 具有查询权限。
7. 用 SQL 语句撤销角色 librrole 对数据库 library 的查询权限，验证 sqlteacher 是否对数据库 library 具有查询权限。
8. 用 SQL 语句删除用户 sqladmin。
9. 用 SQL 语句删除角色 librrole。

报告创建时间：

三、实验过程或算法（源程序）

1.
```
create user 'sqlteacher' @'localhost' ;
grant select on library.*to 'sqlteacher'@'localhost' with grant option;
grant select,delete,update on library.book to 'sqlteacher'@'localhost';
```
验证：
```
select * from book where bno='b11';
delete from book    where bno='b11';
update book set btitle='雨里' where bno='b10';
```

2.
验证：
```
update book set btitle='雨里' where bno='b09';
```

3.
```
Set password for 'sqlteacher'@localhost'='t123'
```

4.
```
revoke select on library.* from 'sqlteacher'@'localhost';
```
验证：
```
select * from book where bno='b11';
```

5.
```
create role 'librrole'@'localhost';
grant 'librrole'@'localhost'to 'sqlteacher'@'localhost';
```

6.
```
grant select on library.* to 'librrole'@'localhost';
SET GLOBAL activate_all_roles_on_login = ON;
```

7.
```
revoke select on library.* from 'librrole'@'localhost';
```

8.
```
drop user 'sqladmin' @'localhost'
```

9.
```
drop role 'librrole'@'localhost';
```

四、实验结果及分析和（或）源程序调试过程

1.

MySQL Workbench


```
1 ●   select * from book where bno='b11';
2     delete from book  where bno='b11';
3     update book set btitle='雨里' where bno='b10';
4
```

bno	btitle	bauthor	bprice
B11	雨里	王小明	88.80
NULL	NULL	NULL	NULL

book 2 ×

Output

Action Output

#	Time	Action	Message
✔ 1	19:47:49	select * from book where bno='b11'	1 row(s) returned
✔ 2	19:47:49	delete from book where bno='b11'	1 row(s) affected
✔ 3	19:47:49	update book set btitle='雨里' where bno='b10'	0 row(s) affected Rows matched: 0 ...

2.

User	From Host
mysql.infoschema	localhost
mysql.session	localhost
mysql.sys	localhost
root	localhost
sqladmin	localhost
sqlteacher	localhost

Login | Account Limits | Administrative Roles | Schema Privileges

Login Name: sqladmin

You may create multiple accounts with the same name to connect from different hosts.

Authentication Type: Standard

For the standard password and/or host based authentication, select 'Standard'.

Limit to Hosts Matching: localhost — % and _ wildcards may be used

Password: ****************** — Type a password to reset it.

Consider using a password with 8 or more characters with mixed case letters, numbers and punctuation marks.

Confirm Password: ****************** — Enter password again to confirm.

Expire Password

Standard (TC

Advanced

127.0.0.1

sqladmin

Store in Va

MySQL Workbench

ℹ️ **Successfully made the MySQL connection**

Information related to this connection:

Host: 127.0.0.1
Port: 3306
User: sqladmin
SSL: enabled with TLS_AES_128_GCM_SHA256

A successful MySQL connection was made with the parameters defined for this connection.

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it later.

Schema and Host fields may use % and _ wildcards.
The server will match specific entries before wildcarded ones.

The user 'sqladmin'@'localhost' will have the following access rights to the schema 'library':

Revoke All Privileges | Delete Entry | Add Entry...

Object Rights
- ☑ SELECT
- ☑ INSERT
- ☑ UPDATE
- ☐ DELETE
- ☐ EXECUTE
- ☐ SHOW VIEW
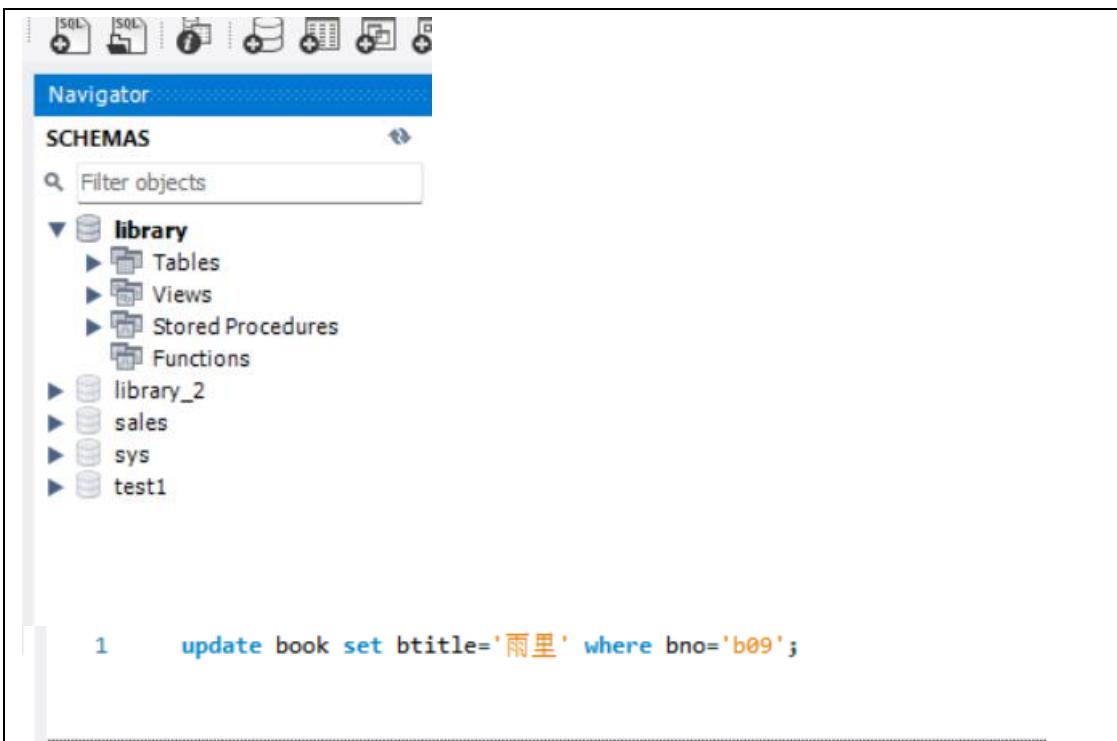
DDL Rights
- ☐ CREATE
- ☐ ALTER
- ☐ REFERENCES
- ☐ INDEX
- ☐ ALTER ROUTINE
- ☐ EVENT
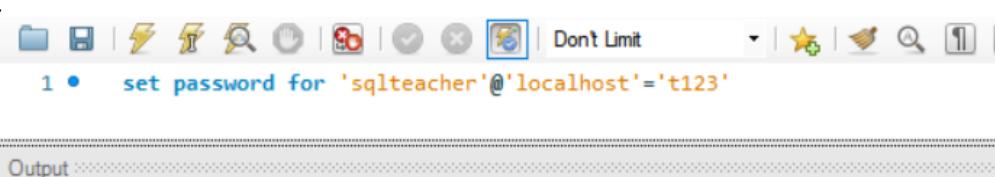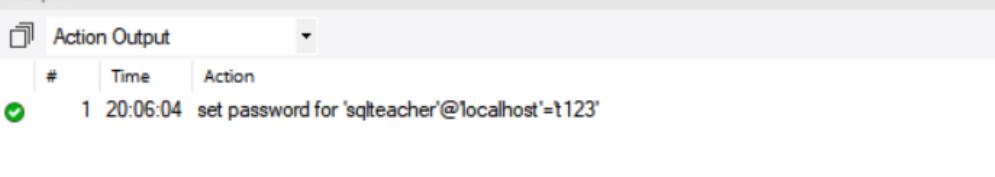
Other Rights
- ☐ GRANT OPTION
- ☐ CREATE TEMPORARY TABLES
- ☐ LOCK TABLES

The LOCK TABLES privilege enables the use of explicit LOCK TABLES statements to lock tables fo
This includes the use of write locks, which prevents other sessions from reading the locked table

Revert | Apply

```
1    update book set btitle='雨里' where bno='b09';
```

Output

Action Output ▾

#	Time	Action
✓	1 20:02:34	update book set btitle='雨里' where bno='b09'

3.

```
1 ●   set password for 'sqlteacher'@'localhost'='t123'
```

Output

Action Output ▾

#	Time	Action
✓	1 20:06:04	set password for 'sqlteacher'@'localhost'='t123'

4.

```
1    revoke select on library.* from 'sqlteacher'@'localhost';
```

Output

Action Output

#	Time	Action
❌	1 20:11:20	revoke select on library from 'sqlteacher'@'localhost'
❌	2 20:14:10	revoke select on library from 'sqlteacher'@'localhost'
✅	3 20:14:19	revoke select on library.book from 'sqlteacher'@'localhost'
✅	4 20:15:43	revoke select on library.* from 'sqlteacher'@'localhost'

```
1 •  select * from book where bno='b11';
2
```

Output

Action Output

#	Time	Action	Message
⊅	1 20:18:50	select * from book where bno='b11'	Error Code: 1142. SELECT command denied to user 'sqlteacher'@'localhost' for table 'book'

5.

```
1    create role 'librrole'@'localhost';
2 •  grant 'librrole'@'localhost'to 'sqlteacher'@'localhost';
3
4
```

Automatic con...
disabled. Use th...
manually get h...
current caret p...

Context Help   Snippets

Output

Action Output

#	Time	Action	Message	D
✅	1 20:23:38	create role 'librrole'@'localhost'	0 row(s) affected	0.0
✅	2 20:23:38	grant 'librrole'@'localhost'to 'sqlteacher'@'localhost'	0 row(s) affected	0.0

6.

在 sqlteacher 中验证：

```
1
2 •    select * from book where bno='b01';
```

Result Grid   Filter Rows: Edit: Export/Import:

bno	btitle	bauthor	bprice
B01	数据结构	赵武	25.00
NULL	NULL	NULL	NULL

7.

在 sqlteacher 中验证：

```
2 •  select * from book where bno='b01';
```

#	Time	Action	Message
❌ 1	20:36:51	select * from book where bno='b01'	Error Code: 1142. SELECT command denied to user 'sqlteacher'@'localhost' for table 'book'

8.

```
1    drop user 'sqladmin' @'localhost'
```

#	Time	Action	Message
✅ 1	20:38:51	drop role 'librrole'@'localhost'	0 row(s) affected
✅ 2	20:40:25	drop user 'sqladmin' @'localhost'	0 row(s) affected

9.

```
1 •  drop role 'librrole'@'localhost';
```

#	Time	Action	Message
✅ 1	20:38:51	drop role 'librrole'@'localhost'	0 row(s) aff