实验四 数据库安全

- **实验目的**

1）熟悉通过 SQL 进行数据完整性控制的方法。
2）熟悉数据库中登录，用户，权限的概念和作用

- **实验内容**

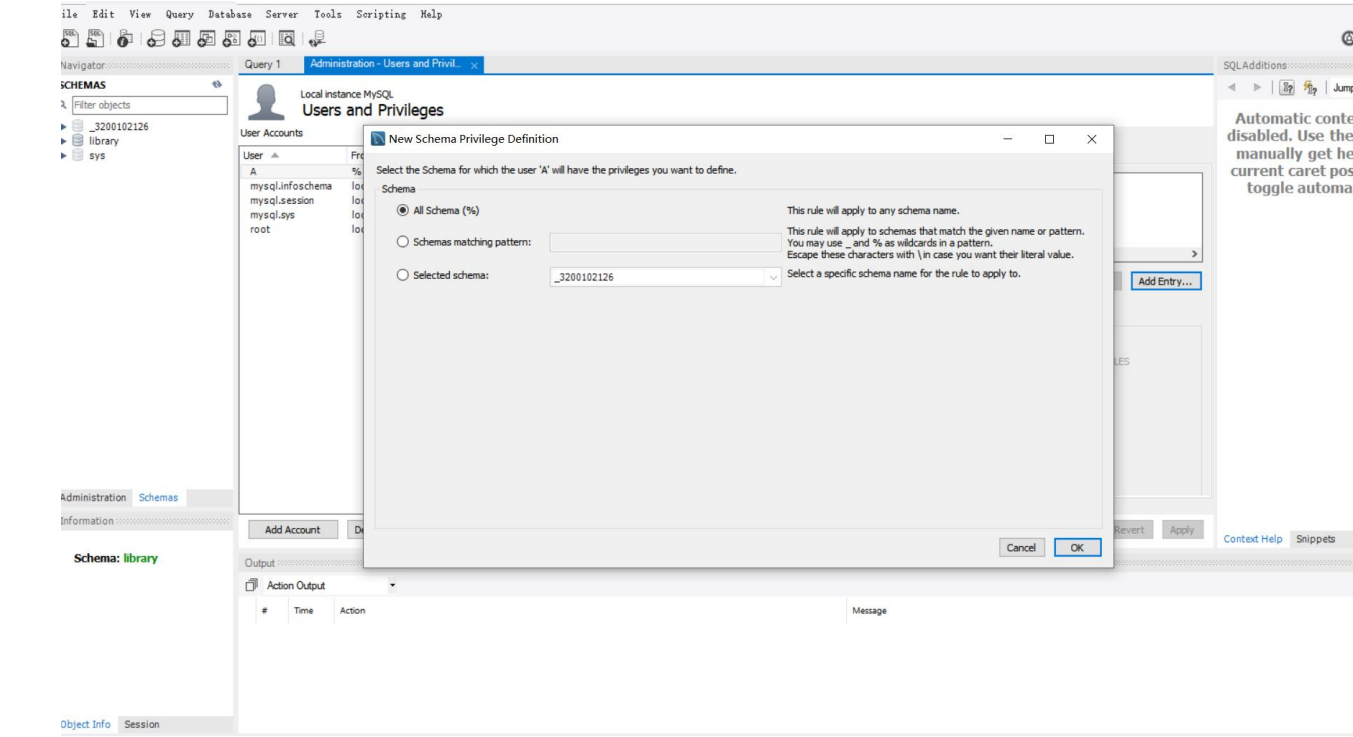
  - 建立表，考察表的生成者拥有该表的哪些权限。
  - 使用 SQL 的 grant 和 revoke 命令对其他用户进行授权和权力回收，考察相应的作用。
  - 建立视图，并把该视图的查询权限授予其他用户，考察通过视图进行权限控制的作用。
  - 建立新的角色，并为其赋予权限（create table，view，procedure 等），给用户添加角色
  - 完成实验报告。

作业要求：本次作业可使用 sql 语句完成，也可直接图形化界面操作。请把实验过程截图。

参考资料：
https://www.cnblogs.com/keme/p/10288168.html
https://www.cnblogs.com/xiao-lan-mao/p/6875423.html

- **实验步骤**

1. 基于上一次实验的 library 数据库的 book 表。先用 root 账户登录，创建一个账户 A，并授予 A 在 library 数据库上的“All”和“grant option”权限。


File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
_3200102126
library
sys
Query 1
Administration - Users and Privil...
Local instance MySQL
Users and Privileges
User Accounts
User
A
mysql.infoschema
mysql.session
mysql.sys
root
New Schema Privilege Definition
Select the Schema for which the user 'A' will have the privileges you want to define.
Schema
All Schema (%)
This rule will apply to any schema name.
Schemas matching pattern:
This rule will apply to schemas that match the given name or pattern.
You may use _ and % as wildcards in a pattern.
Escape these characters with \ in case you want their literal value.
Selected schema:
_3200102126
Select a specific schema name for the rule to apply to.
Cancel
OK
Add Account
Add Entry...
Revert
Apply
Administration
Schemas
Information
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Object Info
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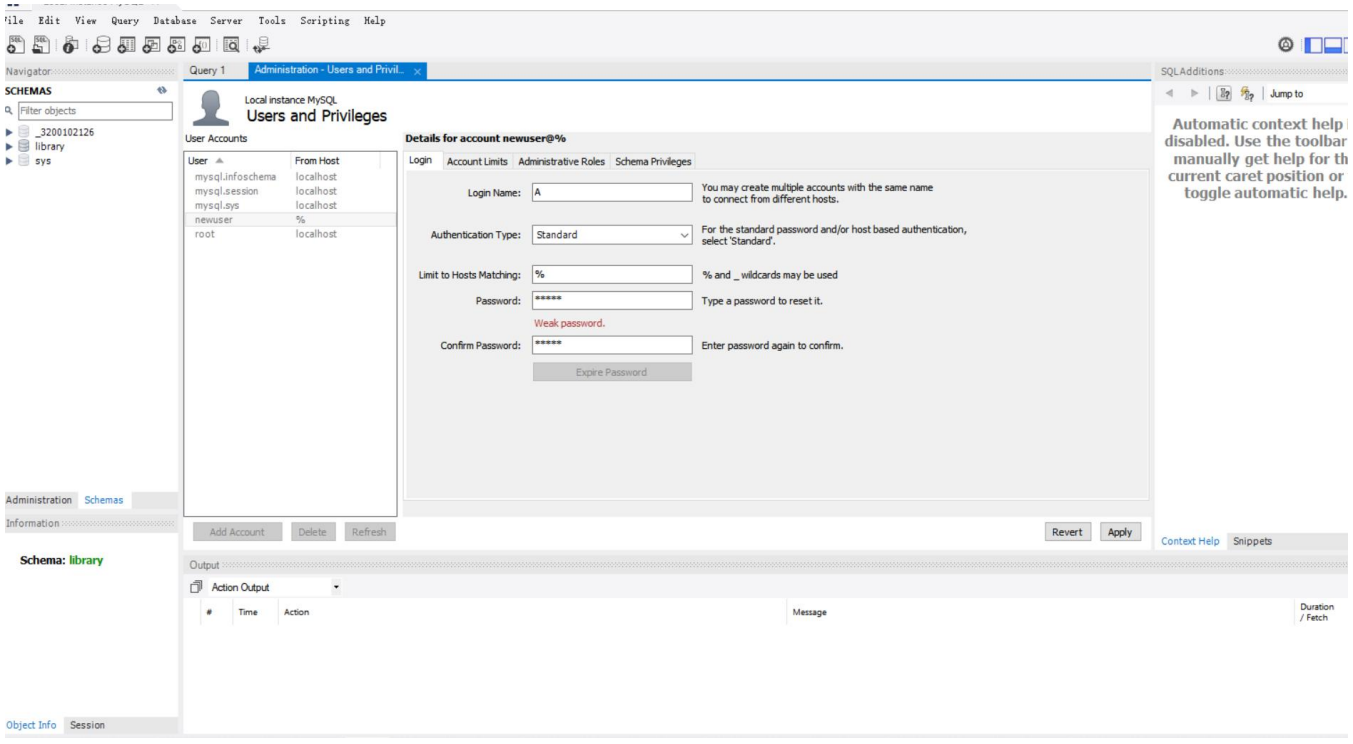
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
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library
sys
Query 1
Administration - Users and Privil...
Local instance MySQL
Users and Privileges
User Accounts
User
From Host
mysql.infoschema
localhost
mysql.session
localhost
mysql.sys
localhost
newuser
%
root
localhost
Details for account newuser@%
Login
Account Limits
Administrative Roles
Schema Privileges
Login Name:
A
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:
%
% and _ wildcards may be used
Password:
Type a password to reset it.
Weak password.
Confirm Password:
Enter password again to confirm.
Expire Password
Add Account
Delete
Refresh
Revert
Apply
Administration
Schemas
Information
Schema: library
Object Info
Session
Output
Action Output
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Time
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Message
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SQLAdditions
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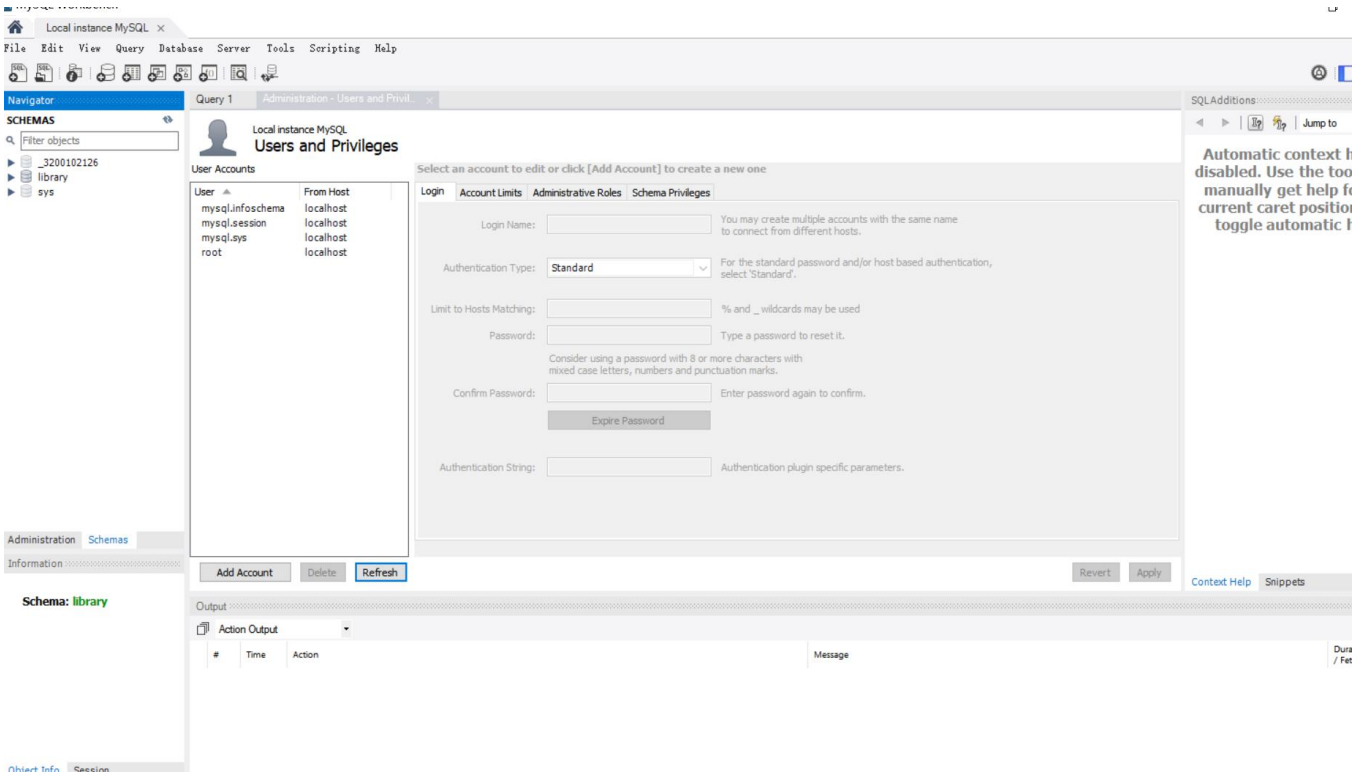
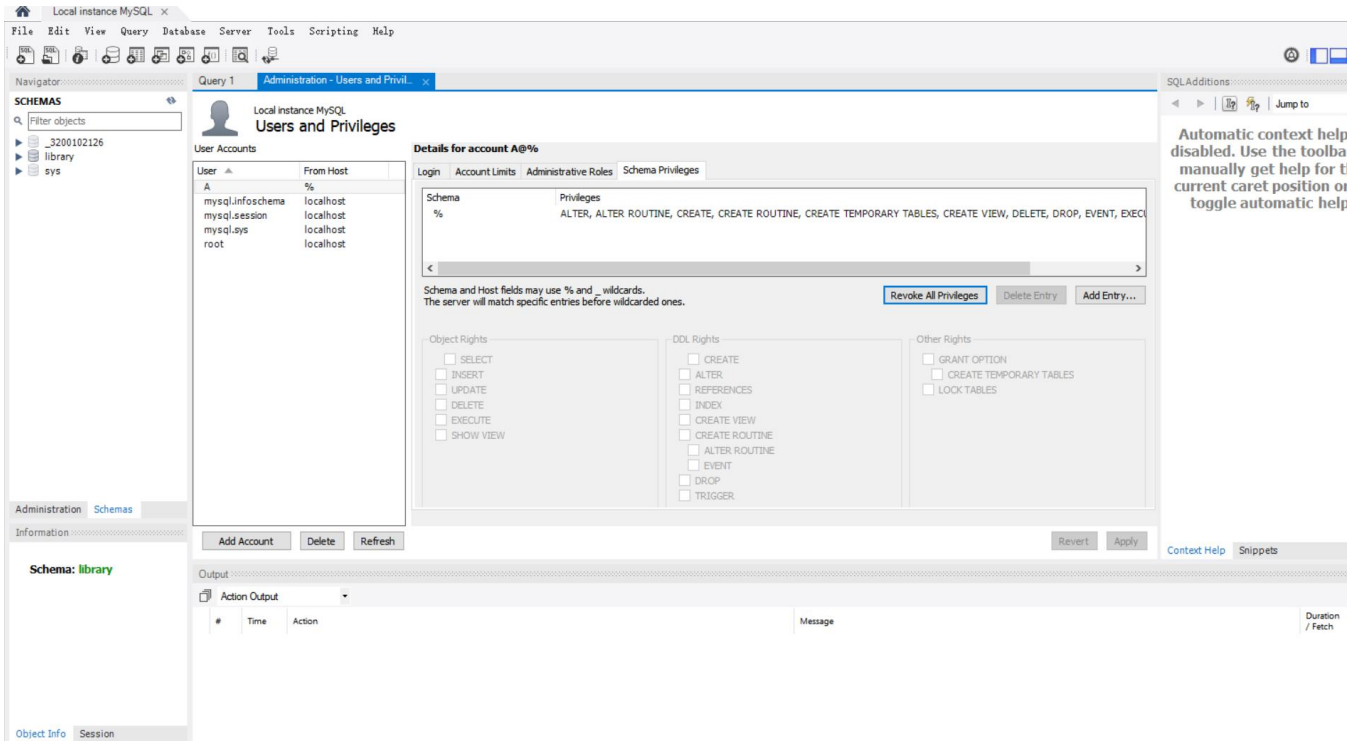
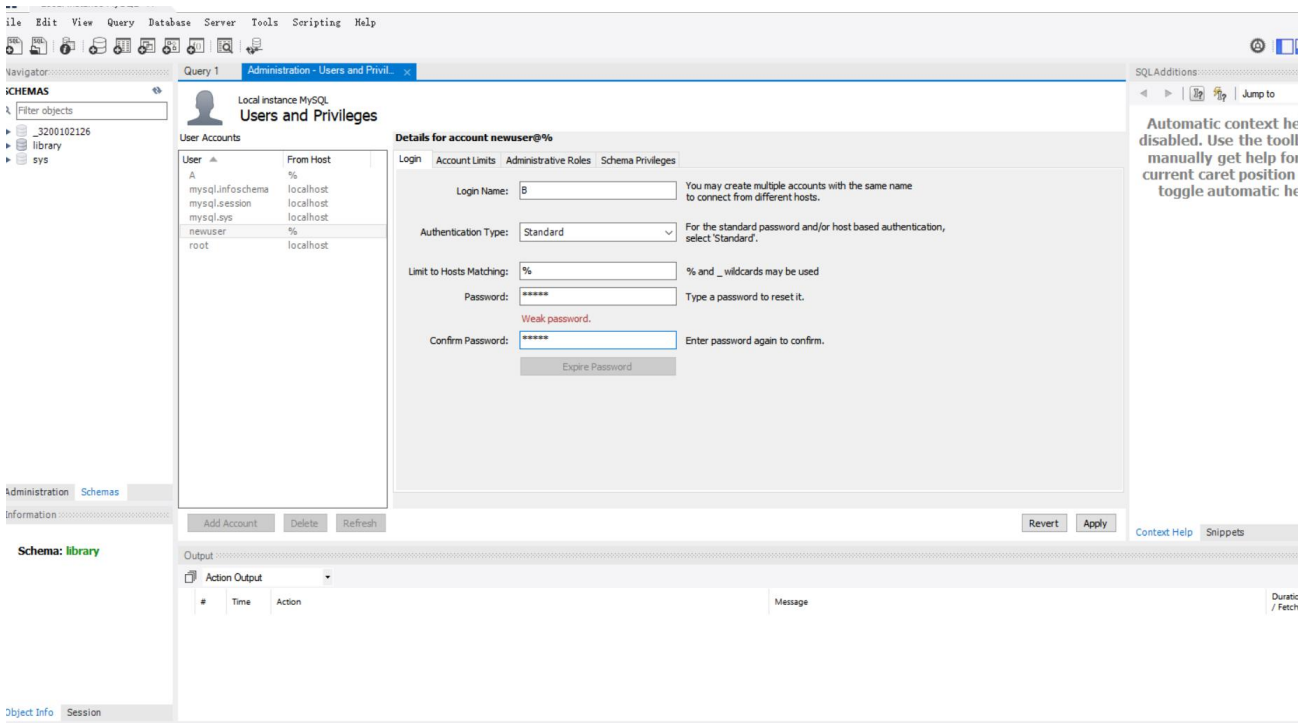
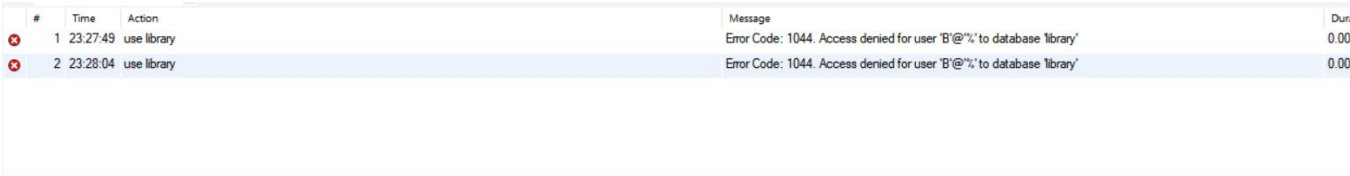
current caret position or
toggle automatic help.
Context Help
Snippets





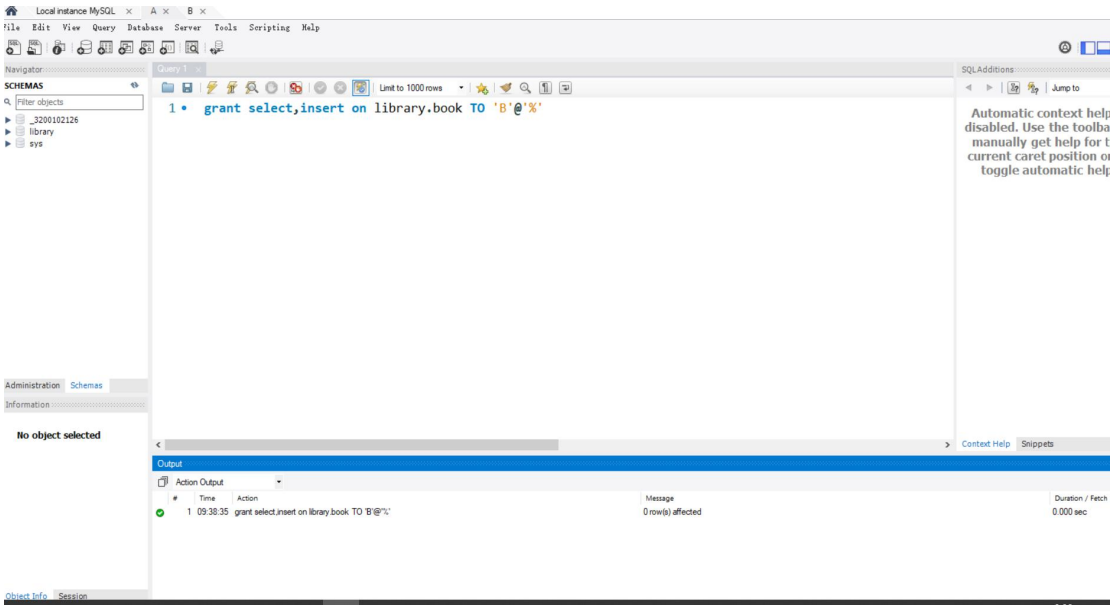
2. 创建 B，不授予权限。以账户 B 登录，测试 B 能否对 book 表进行 CRUD（增、删、改、查）操作。



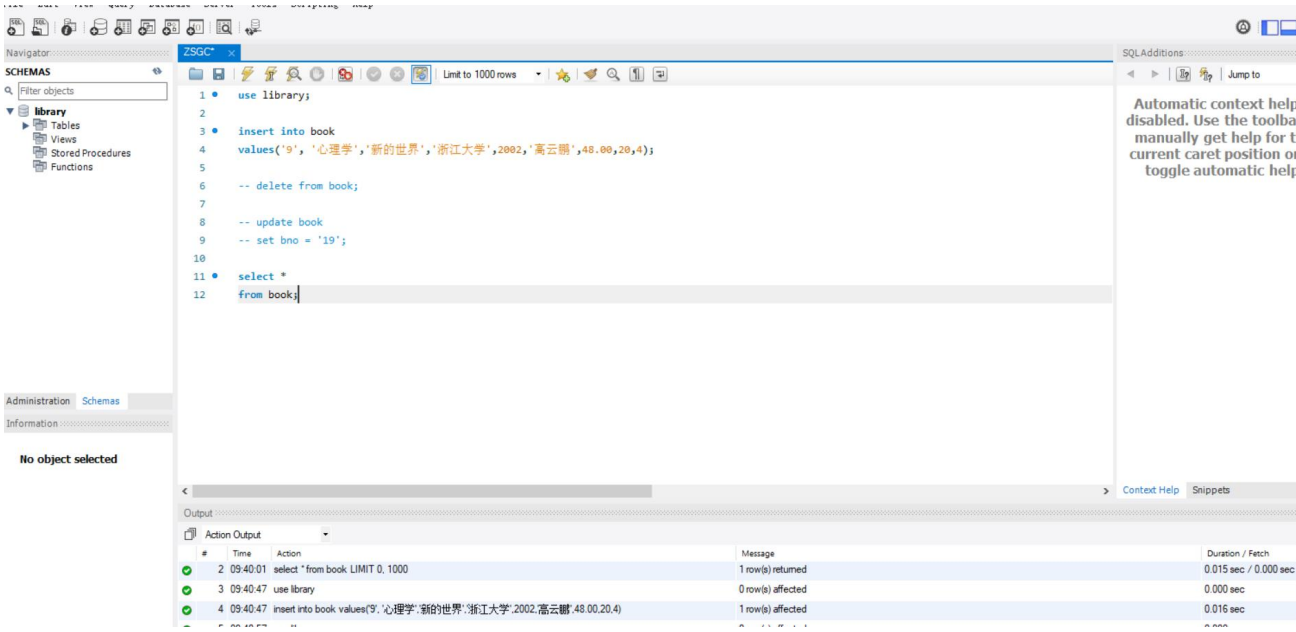


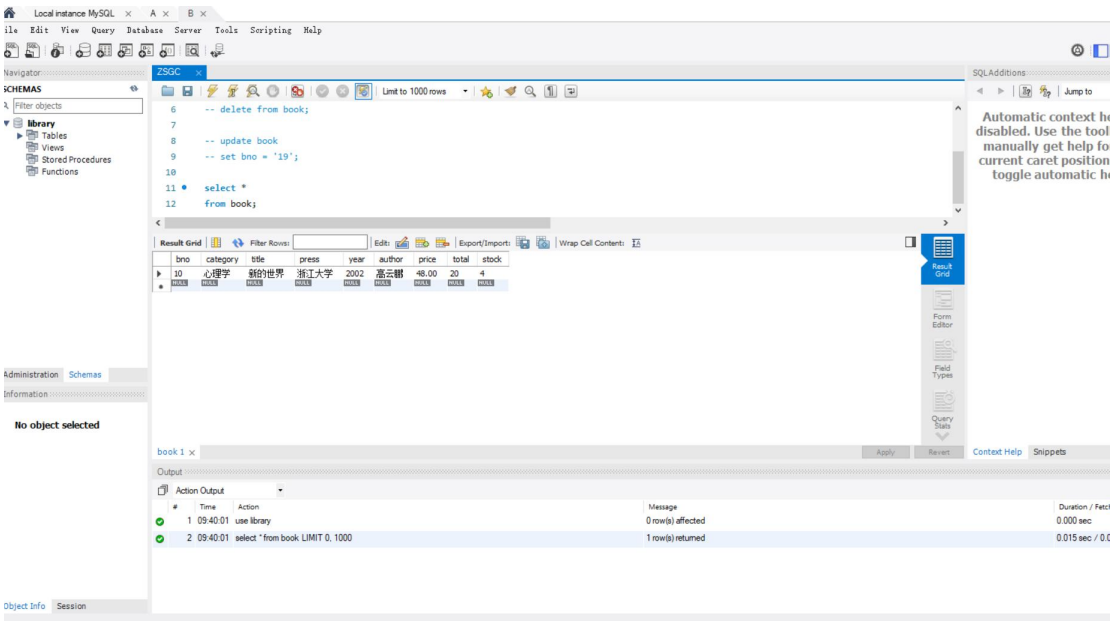
无法进行任何操作

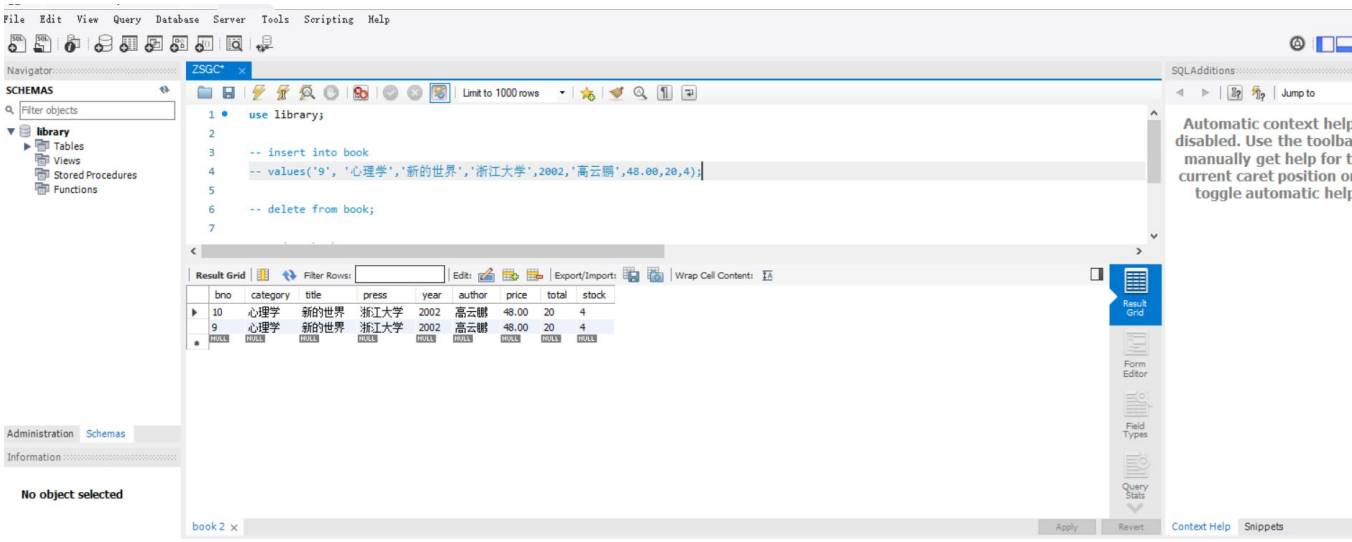
3. 用 A 登录，利用 grant 语句赋给 B 对于 Book 表的查询和插入的权限。



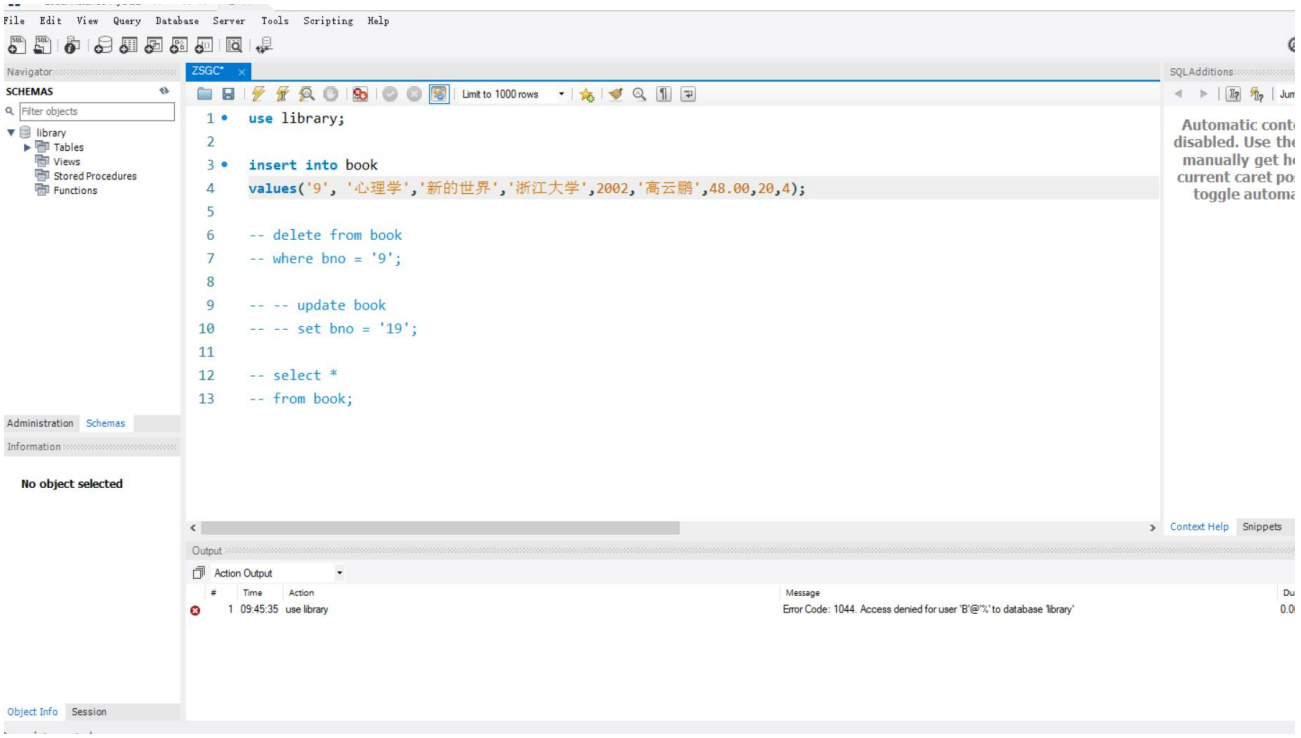
4. 用 B 登录测试是否具有相应的权限。

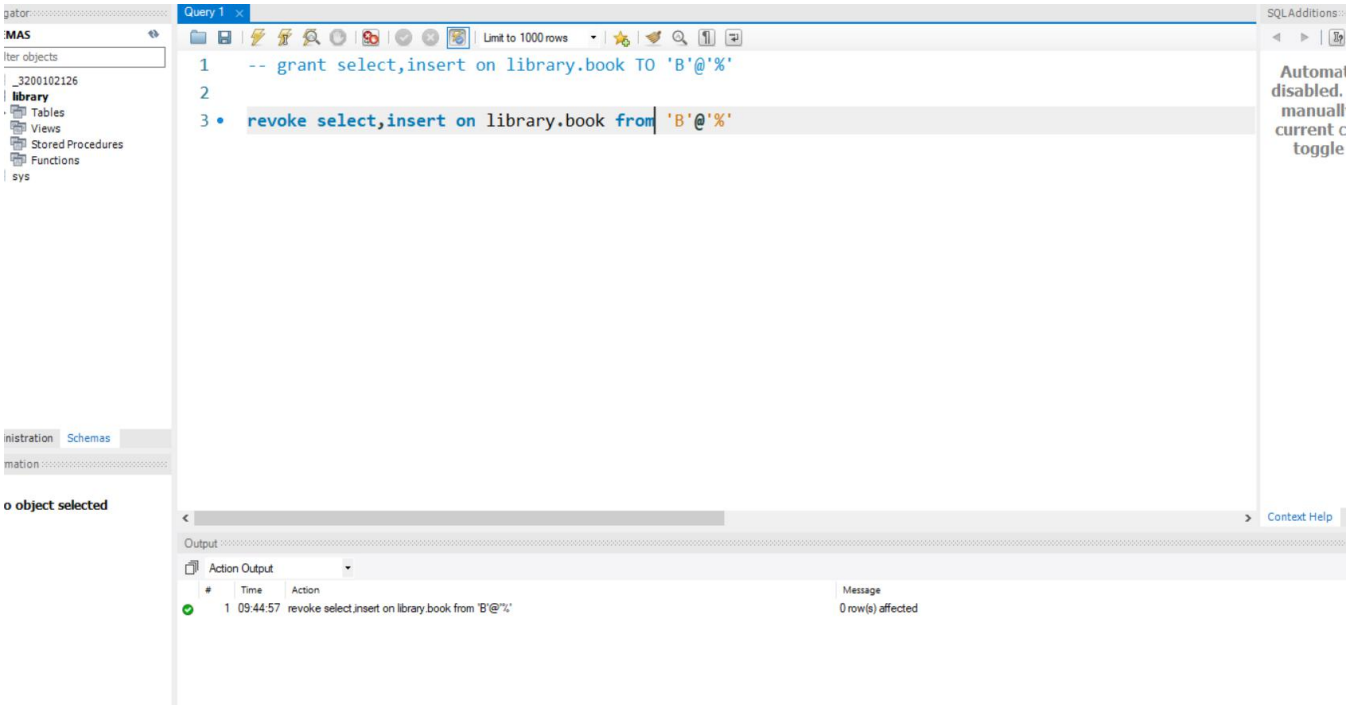

use library;
insert into book
values('9', '心理学','新的世界','浙江大学',2002,'高云鹏',48.00,20,4);
-- delete from book;
-- update book
-- set bno = '19';
select *
from book;
No object selected
1 row(s) returned
0 row(s) affected
0.015 sec / 0.000 sec
0.000 sec
0.016 sec

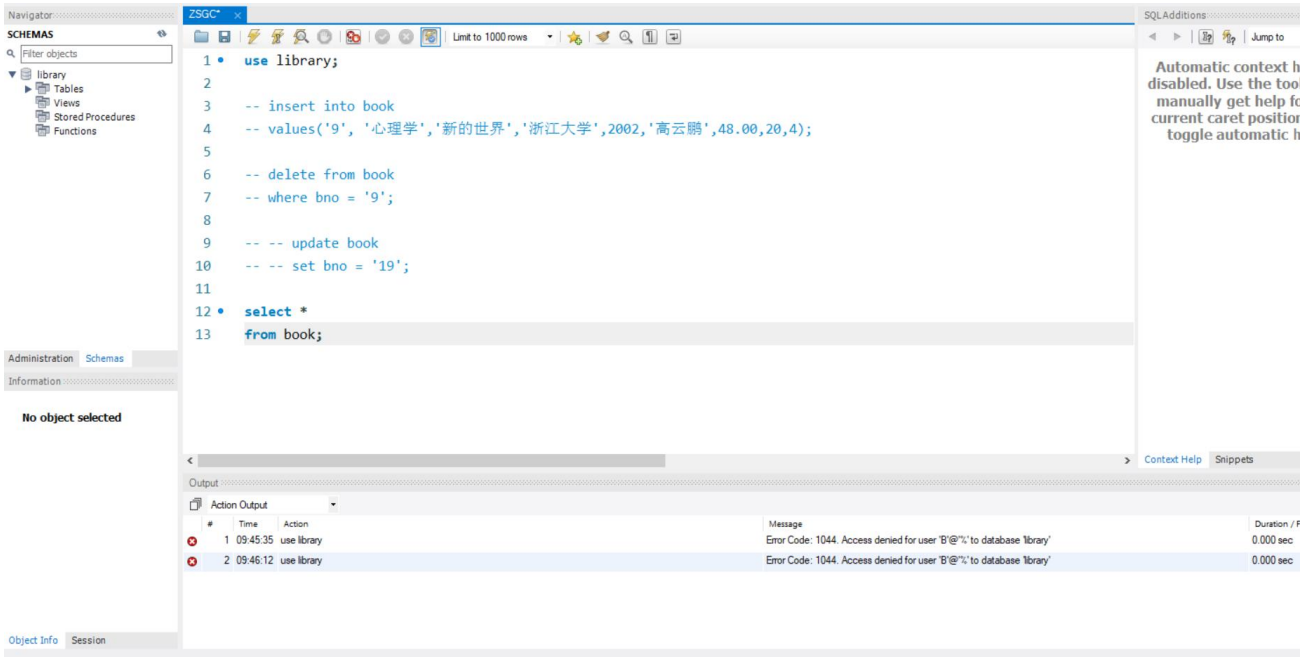

No object selected
0 row(s) affected
1 row(s) returned
0.000 sec
0.015 sec


use library;
-- insert into book
-- values('9', '心理学','新的世界','浙江大学',2002,'高云鹏',48.00,20,4);
-- delete from book;
No object selected

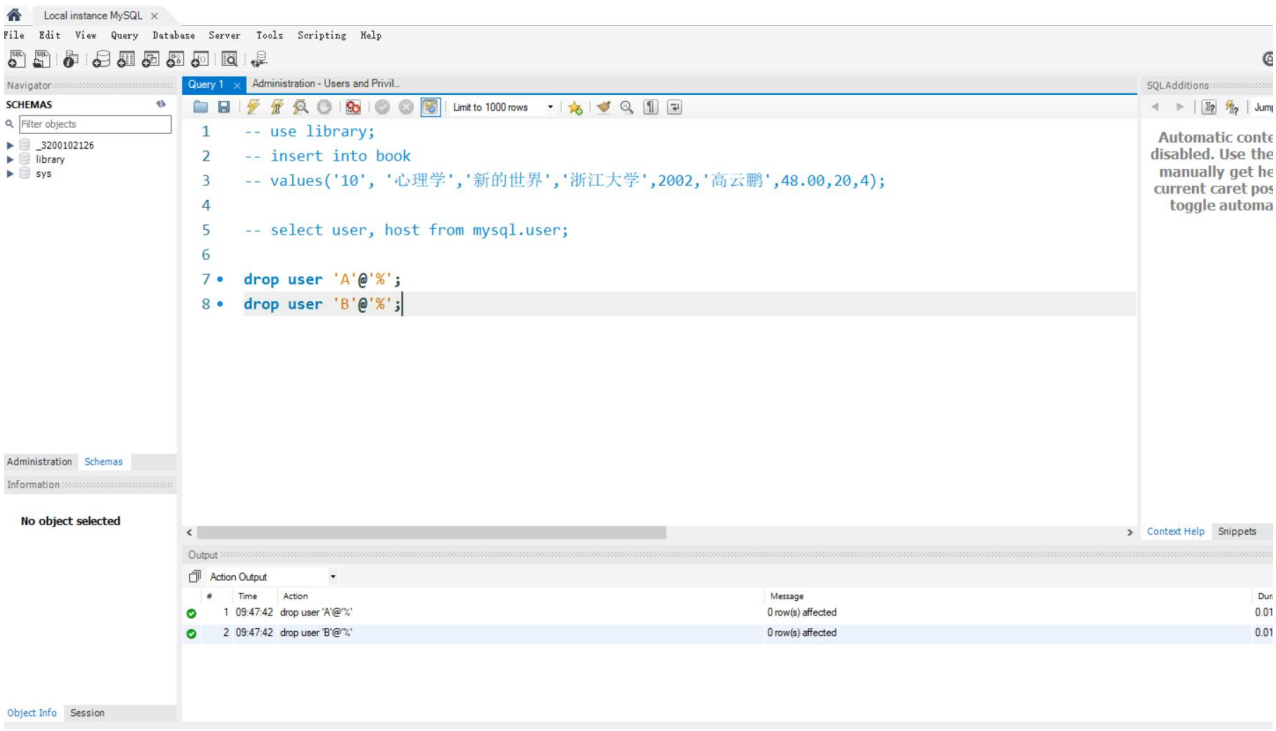
5. 用 A 登录，利用 revoke 语句收回 B 的 book 表的操作权限，再登录 B 测试 B 是否有相应权限。


File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
library
Tables
Views
Stored Procedures
Functions
ZSGC*
Limit to 1000 rows
1 use library;
3 insert into book
4 values('9', '心理学','新的世界','浙江大学',2002,'高云鹏',48.00,20,4);
6 -- delete from book
7 -- where bno = '9';
9 -- -- update book
10 -- -- set bno = '19';
12 -- select *
13 -- from book;
SQL Additions
Automatic cont
disabled. Use the
manually get h
current caret po
toggle automa
Administration Schemas
Information
No object selected
Context Help Snippets
Output
Action Output
Time Action Message
1 09:45:35 use library Error Code: 1044. Access denied for user 'B'@'%' to database 'library'
Object Info Session


Query 1
Limit to 1000 rows
1 -- grant select,insert on library.book TO 'B'@'%'
3 revoke select,insert on library.book from 'B'@'%'
SQL Additions
Automat
disabled.
manuall
current c
toggle
_3200102126
library
Tables
Views
Stored Procedures
Functions
sys
Schemas
o object selected
Context Help
Output
Action Output
Time Action Message
1 09:44:57 revoke select,insert on library.book from 'B'@'%' 0 row(s) affected



6. 用 root 登录数据库，删除账户 A 和账户 B。



7. 实验总结及思考

本次实验主要是进行用户权限相关的操作，用户权限在数据库中是一个非常重要的部分，涉及到数据库的安全问题，对于不同用户给与不同的权限也是一个非常现实的问题。Mysql 对权限的划分主要是从全部，数据库，表几个层级进行划分的，在数据库和表中又有不同的操作权限，比如在给表进行权限管理的时候就需要注明究竟是哪些操作（select, insert, update, delete 等），同时也需要注明是

对哪些数据库的权限。当然仅仅是实验中的一系列操作还是不够的，在进行权限分配的时候还有更多需要细化的地方。