



课程名称:	数据库系统
实验名称:	SQL安全性
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## 一、实验目的:

## 熟悉通过SQL进行安全性控制的方法。

## 二、实验内容和要求:

- ### 1. 建立表，考察表的生成者拥有该表的哪些权限。

**表的生成者默认拥有该表的所有权限，可以执行任何操作。**

```
mysql> CREATE TABLE my-table (
->     id INT PRIMARY KEY,
->     name VARCHAR(50),
->     salary DECIMAL(10, 2)
-> );
Query OK, 0 rows affected (0.05 sec)

mysql> SHOW GRANTS FOR CURRENT_USER();
+-----+
| Grants for root@localhost |
+-----+
|                             |
+-----+
```



```

C:\Users\杨吉祥>mysql -u user1 -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.41 MySQL Community Server - GPL

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

mysql> SELECT * FROM my_table;
ERROR 1046 (3D000): No database selected
mysql> use test;
Database changed
mysql> SELECT * FROM my_table;
+----+-----+-----+
| id | name  | salary |
+----+-----+-----+
| 1  | Alice | 50000.00 |
| 2  | Bob   | 60000.00 |
| 3  | Charlie | 70000.00 |
+----+-----+-----+
3 rows in set (0.01 sec)

mysql>

```

- 授予user2 INSERT权限并进行验证:

```

mysql> GRANT INSERT ON my_table TO user2;
Query OK, 0 rows affected (0.01 sec)

```

```

C:\Users\杨吉祥>mysql -u user2 -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.41 MySQL Community Server - GPL

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

mysql> use test;
Database changed
mysql> INSERT INTO my_table (id, name, salary)
-> VALUES (4, 'David', 80000);
Query OK, 1 row affected (0.01 sec)

mysql>

```

- 尝试未授权的操作:
  - user1 尝试插入数据:

```

C:\Users\杨吉祥>mysql -u user1 -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 8.0.41 MySQL Community Server - GPL

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owners.

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

mysql> INSERT INTO my_table (id, name, salary)
      -> VALUES (5, 'Eve', 90000);
ERROR 1046 (3D000): No database selected
mysql> use test;
Database changed
mysql> INSERT INTO my_table (id, name, salary)
      -> VALUES (5, 'Eve', 90000);
ERROR 1142 (42000): INSERT command denied to user 'user1'@'localhost' for table 'my_table'
mysql>

```

- user2 尝试查询数据:

```

C:\Users\杨吉祥>mysql -u user2 -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.41 MySQL Community Server - GPL

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owners.

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

mysql> use test;
Database changed
mysql> INSERT INTO my_table (id, name, salary)
      -> VALUES (4, 'David', 80000);
Query OK, 1 row affected (0.01 sec)

mysql> SELECT * FROM my_table;
ERROR 1142 (42000): SELECT command denied to user 'user2'@'localhost' for table 'my_table'

```

- 收回权限并验证

- 收回 user1 的 SELECT 权限并进行验证:

```

Database changed
mysql> REVOKE SELECT ON my_table FROM user1;
Query OK, 0 rows affected (0.01 sec)

```

```

C:\Users\杨吉祥>mysql -u user1 -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 13
Server version: 8.0.41 MySQL Community Server - GPL

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owners.

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

mysql> use test;
ERROR 1044 (42000): Access denied for user 'user1'@'%' to database 'test'
mysql>

```

- 收回 user2 的 INSERT 权限并进行验证:

```
mysql> REVOKE INSERT ON my_table FROM user2;
Query OK, 0 rows affected (0.01 sec)
```

```
C:\Users\杨吉祥>mysql -u user2 -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 14
Server version: 8.0.41 MySQL Community Server - GPL

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

mysql> use test;
ERROR 1044 (42000): Access denied for user 'user2'@'%' to database 'test'
mysql>
```

- 通过以上操作，我们可以清楚地看到：

#### 授权：

- 使用 `GRANT` 命令授予用户特定权限后，用户可以执行相应的操作（如 `SELECT`、`INSERT` 等）。

#### 权限验证：

- 用户只能执行被授权的操作，未授权的操作会失败。

#### 收回权限：

- 使用 `REVOKE` 命令收回权限后，用户无法再执行相应的操作。

### 3. 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。

- 创建一个视图，仅显示 `my_table` 表中的 `id` 和 `name` 列：

```
C:\Users\杨吉祥>mysql -u root -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 15
Server version: 8.0.41 MySQL Community Server - GPL

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

mysql> use test;
Database changed
mysql> CREATE VIEW my_view AS
  -> SELECT id, name
  -> FROM my_table;
Query OK, 0 rows affected (0.02 sec)

mysql>
```

- 授予用户 `user1` 对视图 `my_view` 的 `SELECT` 权限：

```
mysql> GRANT SELECT ON my_view TO user1;
Query OK, 0 rows affected (0.01 sec)

mysql>
```

- 用户 user1 可以查询视图:

```
C:\Users\杨吉祥>mysql -u user1 -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 16
Server version: 8.0.41 MySQL Community Server - GPL

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owners.

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

mysql> use test;
Database changed
mysql> SELECT * FROM my_view;
+----+-----+
| id | name  |
+----+-----+
|  1 | Alice |
|  2 | Bob   |
|  3 | Charlie |
|  4 | David |
+----+-----+
4 rows in set (0.00 sec)
```

- 用户 user1 无法直接访问 my\_table 表:

```
mysql> SELECT * FROM my_table;
ERROR 1142 (42000): SELECT command denied to user 'user1'@'localhost' for table 'my_table'
mysql> |
```