

1. 创建一个备份设备
2. 完整备份实验数据库到备份设备

```
mysqldump -u root -p test > test.sql
```

3. 向实验数据库中某个表插入若干条记录

```
INSERT INTO test.student  
(student_id, name)  
VALUES(5, 'e');
```

The screenshot shows a MySQL Workbench interface on the left and a Windows PowerShell window on the right.

MySQL Workbench (Left):

- Database: localhost
- Schema: student
- Table: student
- Data grid:

	student_id	name
1	1	a
2	2	b
3	3	c
4	4	d

Windows PowerShell (Right):

```
Windows PowerShell  
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安装最新的 PowerShell，了解新功能和改进！  
PS C:\Users\Echokovo> mysql  
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)  
PS C:\Users\Echokovo> mysql -u root -p  
Enter password: *  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 42  
Server version: 8.0.42 MySQL Community Server - GPL  
  
Copyright (c) 2000, 2025, Oracle and/or its  
affiliates. Other names may be trademarks of  
its owners.  
  
Type 'help;' or '\h' for help. Type '\c' to  
clear the current statement.  
  
mysql> use test  
Database changed  
mysql> INSERT INTO test.student  
->     (student_id, name)  
->     VALUES(5, 'e');
```

4. 备份数据库事务日志到备份设备，并查看日志格式

```
mysqlbinlog --no-defaults --database=test --base64-output=decode-rows -v "C:\ProgramData\My
```

```
实验-备份和恢复.mdb log.sql > db > log.sql
122 #250525 18:49:24 server id 1 end_log_pos 2097 CRC32 0xfe57e28b    Write_rows: table id 125 flags: STMT_END_F
123 ### INSERT INTO `test`.`student`  

124 ### SET  

125 ### @1=2  

126 ### @2='b'  

127 # at 2097
128 #250525 18:49:24 server id 1 end_log_pos 2128 CRC32 0x68bc35ef    Xid = 96
129 COMMIT/*!*/;
130 # at 2128
131 #250525 18:58:53 server id 1 end_log_pos 2207 CRC32 0xc6e1a714    Anonymous_GTID last_committed=7 sequence_number=8
132 /*!50718 SET TRANSACTION ISOLATION LEVEL READ COMMITTED/*!*/;
133 # original_commit_timestamp=1748170733106242 (2025-05-25 18:58:53.106242 中国标准时间)
134 # immediate_commit_timestamp=1748170733106242 (2025-05-25 18:58:53.106242 中国标准时间)
135 /*!80001 SET @@session.original_commit_timestamp=1748170733106242/*!*/;
136 /*!80014 SET @@session.original_server_version=80042/*!*/;
137 /*!80014 SET @@session.immediate_server_version=80042/*!*/;
138 SET @@SESSION.GTID_NEXT= 'ANONYMOUS'/*!*/;
139 # at 2207
140 #250525 18:58:53 server id 1 end_log_pos 2282 CRC32 0x4ed2cab3    Query thread_id=19 exec_time=0 error_code=0
141 SET TIMESTAMP=1748170733/*!*/;
142 BEGIN
143 /*!*/;
144 # at 2282
145 #250525 18:58:53 server id 1 end_log_pos 2343 CRC32 0xd325811f    Table_map: `test`.`student` mapped to number 125
146 # has_generated_invisible_primary_key=0
147 # at 2343
148 #250525 18:58:53 server id 1 end_log_pos 2386 CRC32 0x59aac124    Write_rows: table id 125 flags: STMT_END_F
149 ### INSERT INTO `test`.`student`  

150 ### SET  

151 ### @1=3  

152 ### @2='c'  

153 # at 2386
154 #250525 18:58:53 server id 1 end_log_pos 2417 CRC32 0xdad45cd7    Xid = 781
155 COMMIT/*!*/;
156 SET @@SESSION.GTID_NEXT= 'AUTOMATIC' /* added by mysqlbinlog */ /*!*/;
157 DELIMITER ;
158 # End of log file
159 /*!50003 SET COMPLETION_TYPE=@OLD_COMPLETION_TYPE*/;
160 /*!50530 SET @@SESSION.PSEUDO_SLAVE_MODE=0*/;
161
```

5. 利用第 2 步所得的完整备份，恢复到插入记录前的状态

```
source test.sql
```

student x *<localhost> Script-3

属性 数据 图

student 输入一个SQL表达式来过滤结果(使用

	student_id	name
1	1	a
2	2	b
3	3	c
4	4	d
5	5	e

```
Windows PowerShell
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安装最新的 PowerShell，了解新功能和改进！https://
PS C:\Users\Echokovo> mysql
ERROR 1045 (28000): Access denied for user 'ODBC'
PS C:\Users\Echokovo> mysql -u root -p
Enter password: *****
Welcome to the MySQL monitor. Commands end with
Your MySQL connection id is 42
Server version: 8.0.42 MySQL Community Server -
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Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of the
owners.

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

mysql> use test
Database changed
mysql> INSERT INTO test.student
    ->     (student_id, name)
    ->     VALUES(5, 'e');
Query OK, 1 row affected (0.00 sec)

mysql> source test.sql|
```

	student_id	name
1	1	a
2	2	b
3	3	c
4	4	d

```
Query OK, 0 rows affected (0.00 sec)

Query OK, 0 rows affected (0.00 sec)

Query OK, 0 rows affected (0.00 sec)

Query OK, 3 rows affected (0.00 sec)
Records: 3  Duplicates: 0  Warnings: 0

Query OK, 0 rows affected (0.00 sec)

mysql> |
```

6. 利用第 4 步所得的事务日志，恢复到插入记录后的状态

```
source log.sql
```

student <localhost> Script-3

属性 数据 图

student 输入一个SQL表达式来过滤

	student_id	name
1	1	a
2	2	b
3	3	c
4	4	d
5	5	e