免费电子书

学习

MySQL

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#mysql

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1: MySQL

MySQLRDBMSOracle Corporation。

MySQL LinuxOS XWindows。 API CC ++JavaLua.NetPerlPHPPythonRuby。

MariaDBMySQL 。 MySQL。

1.0	1995-05-23
3.19	1996-12-01
3.20	1997-01-01
3.21	1998-10-01
3.22	1999-10-01
3.23	2001122
4	2003-03-01
4.1	2004-10-01
5	2005-10-01
5.1	2008-11-27
5.5	2010-11-01
5.6	201321
5.7	2015101

Examples

MySQL

```
CREATE DATABASE mydb;
```

OK10.05

---

mydb

```
USE mydb;
```

MySQL

```
CREATE TABLE mytable
(
  id              int unsigned NOT NULL auto_increment,
  username        varchar(100) NOT NULL,
  email           varchar(100) NOT NULL,
  PRIMARY KEY     (id)
);
```

CREATE TABLE mytablemytable。

id int unsigned NOT NULL auto_incrementidIDid MySQLid1。

OK00.10

MySQL

```
INSERT INTO mytable ( username, email )
VALUES ( "myuser", "myuser@example.com" );
```

10.06

varchar aka strings

```
INSERT INTO mytable ( username, email )
VALUES ( 'username', 'username@example.com' );
```

MySQL

```
UPDATE mytable SET username="myuser" WHERE id=8
```

10.06

int。 '" 。

MySQL

```
DELETE FROM mytable WHERE id=8
```

10.06

id8。

MySQL

```
SELECT * FROM mytable WHERE username = "myuser";
```

```
+----+----------+---------------------+
| id | username | email               |
+----+----------+---------------------+
|  1 | myuser   | myuser@example.com  |
+----+----------+---------------------+
```

10.00

```
SHOW databases;
```

```
+--------------------+
| Databases          |
+--------------------+
| information_schema|
| mydb               |
+--------------------+
```

20.00

“information_schema”“”。

```
SHOW tables;
```

```
+----------------+
| Tables_in_mydb |
+----------------+
| mytable        |
+----------------+
```

10.00

```
DESCRIBE databaseName.tableName;
```

```
DESCRIBE tableName;
```

```
+-----------+----------------+--------+---------+-------------------+-------+
| Field     | Type           | Null   | Key     | Default           | Extra |
+-----------+----------------+--------+---------+-------------------+-------+
| fieldname | fieldvaluetype | NO/YES | keytype | defaultfieldvalue |       |
+-----------+----------------+--------+---------+-------------------+-------+
```

Extraauto_increment◦

Key◦ PRIUNI.....

n0.00

n◦

/◦ ◦

```
CREATE USER 'user'@'localhost' IDENTIFIED BY 'some_password';
```

◦

```
CREATE USER 'user'@'%' IDENTIFIED BY 'some_password';
```

◦

00.00

```
GRANT SELECT, INSERT, UPDATE ON databaseName.* TO 'userName'@'localhost';
```

```
GRANT ALL ON *.* TO 'userName'@'localhost' WITH GRANT OPTION;
```

. databaseName.*◦ databaseName.tableName◦

WITH GRANT OPTION ◦

```
ALL
```

◦

```
SELECT
INSERT
UPDATE
DELETE
CREATE
DROP
```

SQL◦ tablefirst name ◦

``"◦

```
CREATE TABLE `table`
(
   `first name` VARCHAR(30)
);
```

```
SELECT `first name` FROM `table` WHERE `first name` LIKE 'a%';
```

PROCESSLIST

。

```
SELECT * FROM information_schema.PROCESSLIST ORDER BY INFO DESC, TIME DESC;
```

```
SELECT ID, USER, HOST, DB, COMMAND,
TIME as time_seconds,
ROUND(TIME / 60, 2) as time_minutes,
ROUND(TIME / 60 / 60, 2) as time_hours,
STATE, INFO
FROM information_schema.PROCESSLIST ORDER BY INFO DESC, TIME DESC;
```

Stored Procedures◦

```
SELECT * FROM information_schema.ROUTINES WHERE ROUTINE_DEFINITION LIKE '%word%';
```

MySQL https://riptutorial.com/zh-CN/mysql/topic/302/mysql

2: ENUM

Examples

ENUM

ENUM。 。

```
reply ENUM('yes', 'no')
gender ENUM('male', 'female', 'other', 'decline-to-state')
```

```
INSERT ... VALUES ('yes', 'female')
SELECT ... --> yes female
```

TINYINT

```
type ENUM('fish','mammal','bird')
```

```
type TINYINT UNSIGNED
```

```
CREATE TABLE AnimalTypes (
    type TINYINT UNSIGNED NOT NULL AUTO_INCREMENT,
    name VARCHAR(20) NOT NULL  COMMENT "('fish','mammal','bird')",
    PRIMARY KEY(type),
    INDEX(name)
) ENGINE=InnoDB
```

。

ENUM

- INSERT`type`
- SELECTJOINENUM
- 。 ENUMALTER TABLE。
- 2551。
- `TINYINT`;`ENUM`SQL。 `TINYINT`/。 `FOREIGN KEY`s。

VARCHAR

```
type ENUM('fish','mammal','bird')
```

```
type VARCHAR(20)  COMENT "fish, bird, etc"
```

。

ENUM

- INSERT
- INSERT
- SELECT
-

```
ALTER TABLE tbl MODIFY COLUMN type ENUM('fish','mammal','bird','insect');
```

- MODIFY COLUMN`NOT NULL`。
- 256`ALTER`。 。 MySQL。

NULLNOT NULL

NULL'bad-value'。`+0`。

```
CREATE TABLE enum (
    e     ENUM('yes', 'no')   NOT NULL,
    enull ENUM('x', 'y', 'z')     NULL
        );
INSERT INTO enum (e, enull)
    VALUES
        ('yes', 'x'),
        ('no',  'y'),
        (NULL,  NULL),
        ('bad-value', 'bad-value');
Query OK, 4 rows affected, 3 warnings (0.00 sec)
Records: 4  Duplicates: 0  Warnings: 3

mysql>SHOW WARNINGS;
+---------+------+-------------------------------------------+
| Level   | Code | Message                                   |
+---------+------+-------------------------------------------+
| Warning | 1048 | Column 'e' cannot be null                 |
| Warning | 1265 | Data truncated for column 'e' at row 4    |
| Warning | 1265 | Data truncated for column 'enull' at row 4 |
+---------+------+-------------------------------------------+
3 rows in set (0.00 sec)
```

。“+0”。

```
mysql>SELECT e, e+0 FROM enum;
+-----+-----+
| e   | e+0 |
+-----+-----+
| yes |   1 |
| no  |   2 |
|     |   0 |  -- NULL
|     |   0 |  -- 'bad-value'
+-----+-----+
4 rows in set (0.00 sec)

mysql>SELECT enull, enull+0 FROM enum;
+-------+---------+
| enull | enull+0 |
```

```
+-------+---------+
| x     |       1 |
| y     |       2 |
| NULL  |    NULL |
|       |       0 |  -- 'bad-value'
+-------+---------+
4 rows in set (0.00 sec)
```

ENUM https://riptutorial.com/zh-CN/mysql/topic/4425/enum

3: JOINS3id。

Examples

3

```
CREATE TABLE Table1 (
    id INT UNSIGNED NOT NULL,
    created_on DATE NOT NULL,
    PRIMARY KEY (id)
)
CREATE TABLE Table2 (
    id INT UNSIGNED NOT NULL,
    personName VARCHAR(255) NOT NULL,
    PRIMARY KEY (id)
)
CREATE TABLE Table3 (
    id INT UNSIGNED NOT NULL,
    accountName VARCHAR(255) NOT NULL,
    PRIMARY KEY (id)
)
```

selectid

```
SELECT
    t1.id AS table1Id,
    t2.id AS table2Id,
    t3.id AS table3Id
FROM Table1 t1
LEFT JOIN Table2 t2 ON t2.id = t1.id
LEFT JOIN Table3 t3 ON t3.id = t1.id
```

JOINS3id。 https://riptutorial.com/zh-CN/mysql/topic/9921/joins-3id-

4: JSON

MySQL 5.7.8MySQLJSONJSONJavaScript Object Notation。
https://dev.mysql.com/doc/refman/5.7/en/json.html

MySQL 5.7.8MySQLJSON。JSONJSON。。

Examples

JSON

```
CREATE TABLE table_name (
    id INT NOT NULL AUTO_INCREMENT,
    json_col JSON,
    PRIMARY KEY(id)
);
```

JSON

```
INSERT INTO
    table_name (json_col)
VALUES
    ('{"City": "Galle", "Description": "Best damn city in the world"}');
```

JSON。。

JSON。

json。

```
INSERT INTO myjson(dict)
VALUES('{"opening":"Sicilian","variations":["pelikan","dragon","najdorf"]}');
```

。。

JSON

JSON。`variations`。

```
UPDATE
    myjson
SET
    dict=JSON_ARRAY_APPEND(dict,'$.variations','scheveningen')
WHERE
    id = 2;
```

1. json`$.variations`。$json。mysqljsonhttps://dev.mysql.com/doc/refman/5.7/en/json-path-

syntax.html

2. json。

```
SELECT * FROM myjson
```

```
+----+-------------------------------------------------------------------------------------
-+
| id | dict
|
+---+--------------------------------------------------------------------------------------
+
| 2  | {"opening": "Sicilian", "variations": ["pelikan", "dragon", "najdorf", "scheveningen"]}
|
+----+-------------------------------------------------------------------------------------
-+
1 row in set (0.00 sec)
```

CASTJSON

jsonMySQL JSON

```
 SELECT CAST('[1,2,3]' as JSON) ;
 SELECT CAST('{"opening":"Sicilian","variations":["pelikan","dragon","najdorf"]}' as JSON);
```

Json

`JSON_OBJECT`JSON

```
 SELECT JSON_OBJECT('key1',col1 , 'key2',col2 , 'key3','col3') as myobj;
```

`JSON_ARRAY`JSON

```
 SELECT JSON_ARRAY(col1,col2,'col3') as myarray;
```

myobj.key3myarray [2]“col3”。

JSON

```
 SELECT JSON_OBJECT("opening","Sicilian",
"variations",JSON_ARRAY("pelikan","dragon","najdorf") ) as mymixed ;
```

JSON https://riptutorial.com/zh-CN/mysql/topic/2985/json

5: MyISAM

InnoDBMyISAM。MyISAM。

MyISAMInnoDB23。

InnoDBMyISAM。XtraDB5.6InnoDBMyISAM“”。

InnoDBInnoDBMyISAM。

Examples

ENGINE = MyISAM

```
CREATE TABLE foo (
      ...
) ENGINE=MyISAM;
```

MyISAM https://riptutorial.com/zh-CN/mysql/topic/4710/myisam

6: MySQL LOCK TABLE

- LOCK TABLES table_name [READ |]; //
- ; //

。 。 。

READ LOCK - 。

WRITE LOCK - 。

WRITE LOCK。 READ LOCKREAD LOCK WRITE LOCK 。

InnoDBMySQL。

InnoDBMySQL。

Examples

Mysql

ENGINE=MyISAMENGINE=InnoDB。 *InnoDB。*

MySQL。 。 。

。 。

```
LOCK TABLES table_name READ|WRITE;
```

;

READ LOCK

```
LOCK TABLES table_name READ;
```

WRITE LOCK

```
LOCK TABLES table_name WRITE;
```

```
SHOW OPEN TABLES;
```

/

```
UNLOCK TABLES;
```

```
LOCK TABLES products WRITE:
INSERT INTO products(id,product_name) SELECT id,old_product_name FROM old_products;
UNLOCK TABLES;
```

```
LOCK TABLES products READ:
INSERT INTO products(id,product_name) SELECT id,old_product_name FROM old_products;
UNLOCK TABLES;
```

InnoDBMySQL。

。

SELECT ... FOR UPDATE。

1

```
START TRANSACTION;
SELECT ledgerAmount FROM accDetails WHERE id = 1 FOR UPDATE;
```

1SELECT ... FOR UPDATE。

2

```
UPDATE accDetails SET ledgerAmount = ledgerAmount + 500 WHERE id=1;
```

21innodb_lock_wait_timeout50。

```
Error Code: 1205. Lock wait timeout exceeded; try restarting transaction
```

SHOW ENGINE INNODB STATUS

```
---TRANSACTION 1973004, ACTIVE 7 sec updating
mysql tables in use 1, locked 1
LOCK WAIT 2 lock struct(s), heap size 360, 1 row lock(s)
MySQL thread id 4, OS thread handle 0x7f996beac700, query id 30 localhost root update
UPDATE accDetails SET ledgerAmount = ledgerAmount + 500 WHERE id=1
------- TRX HAS BEEN WAITING 7 SEC FOR THIS LOCK TO BE GRANTED:
```

2

```
UPDATE accDetails SET ledgerAmount = ledgerAmount + 250 WHERE id=2;
1 row(s) affected
```

2。

1

```
UPDATE accDetails SET ledgerAmount = ledgerAmount + 750 WHERE id=1;
COMMIT;
1 row(s) affected
```

1。

2

```
UPDATE accDetails SET ledgerAmount = ledgerAmount + 500 WHERE id=1;
1 row(s) affected
```

12。

MySQL LOCK TABLE https://riptutorial.com/zh-CN/mysql/topic/5233/mysql-lock-table

7: MySQL

- mysql [OPTIONS] [database_name]

-D --database=name	
--delimiter=str	◦ ';'
-e --execute='command'	
-h --host=name	
-p --password=name	*-p*
-p	
-P --port=#	
-s --silent	◦ \t
-ss	-s
-S --socket=path	UnixWindows
--skip-column-names	
-u --user=name	
-U --safe-updates --i-am-a-dummy	sql_safe_updates=ON◦ DELETEUPDATE
-V --version	

Examples

MySQL

```
mysql --user=username --password=pwd --host=hostname test_db
```

```
mysql -u username -p password -h hostname test_db
```

passwordMySQL◦ password “”

```
mysql -u=username -p -h=hostname test_db
```

--socket

```
mysql --user=username --password=pwd --host=localhost --socket=/path/to/mysqld.sock test_db
```

socket◦ ◦

◦ shell◦

```
$ mysql -uroot -proot test -e'select * from people'

+----+-------+--------+
| id | name  | gender |
+----+-------+--------+
|  1 | Kathy | f      |
|  2 | John  | m      |
+----+-------+--------+
```

--silent

```
$ mysql -uroot -proot test -s -e'select * from people'

id      name    gender
1       Kathy   f
2       John    m
```

```
$ mysql -uroot -proot test -ss -e'select * from people'

1       Kathy   f
2       John    m
```

```
$ mysql -uroot -proot test < my_script.sql
```

```
$ mysql -uroot -proot test -e'source my_script.sql'
```

```
$ mysql -uroot -proot test < my_script.sql > out.txt

$ mysql -uroot -proot test -s -e'select * from people' > out.txt
```

MySQL https://riptutorial.com/zh-CN/mysql/topic/5619/mysql

8: Mysql

Examples

MySQL -

1. wherewhere。 - *user_id> 2000. user_idatlot。。
2. limit。Ex - *。20Ex - LIMIT 20*。
3. 。Ex - *。。 - ID。
4. whereNULL。SELECT * FROM tbl_name WHERE key_col IS NULL;key_col。

InnoDB

1. InnoDBPRIMARY KEY。。AUTO_INCREMENT。
2. VARCHARCHARNULL。NULLCHARNN。I / O.

   COMPACTInnoDButf8sjisCHARNN。

3. COMPRESSED。I / O.COMPRESSEDCOMPACT。21COMPRESSED。
4. OPTIMIZE TABLE。I / O。。OPTIMIZE TABLE。。InnoDBB +。

   OPTIMIZE TABLE。。。。。。

。。

- =WHERE。INDEX(a,b,...)WHERE a=12 AND b='xyz' ...
- IN;。
- “”x BETWEEN 3 AND 9 name LIKE 'J%'。
- GROUP BY
- ORDER BY。ASCDESC8.0。
- 。
- 。
- WHEREGROUP BY。
- ORDER BYWHERE。
- “”DATE(x) = ...x。
- " text_col(99) ;。

。

Mysql https://riptutorial.com/zh-CN/mysql/topic/5752/mysql

9: MySQL

Examples

root

```
mysqladmin -u root -p'old-password' password 'new-password'
```

```
mysqladmin -u[username] -p[password] drop [database]
```

。

DROPSQLDROP

```
DROP DATABASE database_name
```

```
DROP SCHEMA database_name
```

Atomic RENAME

```
RENAME TABLE t TO t_old, t_copy TO t;
```

RENAME TABLE。

Atomic RenameDELETE

```
CREATE TABLE new LIKE real;
load `new` by whatever means - LOAD DATA, INSERT, whatever
RENAME TABLE real TO old, new TO real;
DROP TABLE old;
```

MySQL https://riptutorial.com/zh-CN/mysql/topic/2991/mysql

10: MySQL

- SELECT column_namesFROM table1 UNION SELECT column_namesFROM table2;
- SELECT column_namesFROM table1 UNION ALL SELECT column_namesFROM table2;
- SELECT column_namesFROM table1 WHERE col_name =“XYZ”UNION ALL SELECT column_namesFROM table2 WHERE col_name =“XYZ”;

UNION DISTINCTUNION;UNION ALL◦ DISTINCTALL ◦

Examples

UNIONSELECT ◦

:(“”“”

```
SELECT City FROM Customers
UNION
SELECT City FROM Suppliers
ORDER BY City;
```

```
Number of Records: 10

City
------
Aachen
Albuquerque
Anchorage
Annecy
Barcelona
Barquisimeto
Bend
Bergamo
Berlin
Bern
```

ALL

UNION ALL“”“”◦

```
SELECT City FROM Customers
UNION ALL
SELECT City FROM Suppliers
ORDER BY City;
```

```
Number of Records: 12

City
-------
Aachen
Albuquerque
```

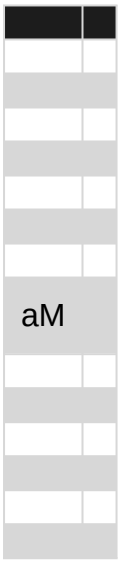
```
Anchorage
Ann Arbor
Annecy
Barcelona
Barquisimeto
Bend
Bergamo
Berlin
Berlin
Bern
```

UNION ALLWHERE

UNION ALL“”“”。 `Country="Germany"`where。

```
SELECT City, Country FROM Customers
WHERE Country='Germany'
UNION ALL
SELECT City, Country FROM Suppliers
WHERE Country='Germany'
ORDER BY City;
```

```
Number of Records: 14
```



MySQL https://riptutorial.com/zh-CN/mysql/topic/5376/mysql

11: SSL

Examples

Debian

MySQLsudo ◦

CASSL

OpenSSL

```
apt-get -y install openssl
apt-get -y install libssl-dev
```

SSL

```
mkdir /home/ubuntu/mysqlcerts
cd /home/ubuntu/mysqlcerts
```

CA

```
openssl genrsa 2048 > ca-key.pem
openssl req -new -x509 -nodes -days 3600 -key ca-key.pem -out ca.pem
```

◦ CA

```
openssl req -newkey rsa:2048 -days 3600 -nodes -keyout server-key.pem -out server-req.pem
openssl rsa -in server-key.pem -out server-key.pem

openssl x509 -req -in server-req.pem -days 3600 -CA ca.pem -CAkey ca-key.pem -set_serial 01 -
out server-cert.pem
```

```
openssl req -newkey rsa:2048 -days 3600 -nodes -keyout client-key.pem -out client-req.pem
openssl rsa -in client-key.pem -out client-key.pem
openssl x509 -req -in client-req.pem -days 3600 -CA ca.pem -CAkey ca-key.pem -set_serial 01 -
out client-cert.pem
```

```
openssl verify -CAfile ca.pem server-cert.pem client-cert.pem
```

MySQL

MySQL ◦

```
vim /etc/mysql/mysql.conf.d/mysqld.cnf
```

```
[mysqld]
```

```
ssl-ca = /home/ubuntu/mysqlcerts/ca.pem
ssl-cert = /home/ubuntu/mysqlcerts/server-cert.pem
ssl-key = /home/ubuntu/mysqlcerts/server-key.pem
```

MySQL。

```
service mysql restart
```

SSL

ssl-ca ssl-certssl-key key。 cd /home/ubuntu/mysqlcerts

```
mysql --ssl-ca=ca.pem --ssl-cert=client-cert.pem --ssl-key=client-key.pem -h 127.0.0.1 -u
superman -p
```

```
superman@127.0.0.1 [None]> SHOW VARIABLES LIKE '%ssl%';
+---------------+-----------------------------------------+
| Variable_name | Value                                   |
+---------------+-----------------------------------------+
| have_openssl  | YES                                     |
| have_ssl      | YES                                     |
| ssl_ca        | /home/ubuntu/mysqlcerts/ca.pem          |
| ssl_capath    |                                         |
| ssl_cert      | /home/ubuntu/mysqlcerts/server-cert.pem |
| ssl_cipher    |                                         |
| ssl_crl       |                                         |
| ssl_crlpath   |                                         |
| ssl_key       | /home/ubuntu/mysqlcerts/server-key.pem  |
+---------------+-----------------------------------------+
```

```
superman@127.0.0.1 [None]> STATUS;
...
SSL:                    Cipher in use is DHE-RSA-AES256-SHA
...
```

SSL

GRANT REQUIRE SSL

```
GRANT ALL PRIVILEGES ON *.* TO 'superman'@'127.0.0.1' IDENTIFIED BY 'pass' REQUIRE SSL;
FLUSH PRIVILEGES;
```

superman SSL。

◦ MySQL

```
vim /etc/mysql/mysql.conf.d/mysqld.cnf
```

[client]

```
ssl-ca = /home/ubuntu/mysqlcerts/ca.pem
ssl-cert = /home/ubuntu/mysqlcerts/client-cert.pem
ssl-key = /home/ubuntu/mysqlcerts/client-key.pem
```

superman SSL

```
mysql -h 127.0.0.1 -u superman -p
```

Python。Python

```
import MySQLdb
ssl = {'cert': '/home/ubuntu/mysqlcerts/client-cert.pem', 'key':
'/home/ubuntu/mysqlcerts/client-key.pem'}
conn = MySQLdb.connect(host='127.0.0.1', user='superman', passwd='imsoawesome', ssl=ssl)
```

- https://www.percona.com/blog/2013/06/22/setting-up-mysql-ssl-and-secure-connections/
- https://lowendbox.com/blog/getting-started-with-mysql-over-ssl/
- http://xmodulo.com/enable-ssl-mysql-server-client.html
- https://ubuntuforums.org/showthread.php?t=1121458

CentOS7 / RHEL7

1. dbserver
2. appclient

FWIWSELinux。

dbserver

。

```
mkdir /root/certs/mysql/ && cd /root/certs/mysql/
```

```
openssl genrsa 2048 > ca-key.pem
openssl req -sha1 -new -x509 -nodes -days 3650 -key ca-key.pem > ca-cert.pem
openssl req -sha1 -newkey rsa:2048 -days 730 -nodes -keyout server-key.pem > server-req.pem
openssl rsa -in server-key.pem -out server-key.pem
openssl x509 -sha1 -req -in server-req.pem -days 730  -CA ca-cert.pem -CAkey ca-key.pem -
set_serial 01 > server-cert.pem
```

/ etc / pki / tls / certs / mysql /

CentOSRHEL

```
mkdir /etc/pki/tls/certs/mysql/
```

◦ mysql◦

```
chown -R mysql:mysql /etc/pki/tls/certs/mysql
```

MySQL / MariaDB

```
# vi /etc/my.cnf
# i
[mysqld]
bind-address=*
ssl-ca=/etc/pki/tls/certs/ca-cert.pem
ssl-cert=/etc/pki/tls/certs/server-cert.pem
ssl-key=/etc/pki/tls/certs/server-key.pem
# :wq
```

```
systemctl restart mariadb
```

appclientIP 1.2.3.4

```
firewall-cmd --zone=drop --permanent --add-rich-rule 'rule family="ipv4" source
address="1.2.3.4" service name="mysql" accept'
# I force everything to the drop zone.  Season the above command to taste.
```

firewalld

```
service firewalld restart
```

dbservermysql

```
mysql -uroot -p
```

◦ GRANTREQUIRE SSL◦

```
GRANT ALL PRIVILEGES ON *.* TO 'iamsecure'@'appclient' IDENTIFIED BY 'dingdingding' REQUIRE
SSL;
FLUSH PRIVILEGES;
# quit mysql
```

/ root / certs / mysql◦ ◦

```
openssl req -sha1 -newkey rsa:2048 -days 730 -nodes -keyout client-key.pem > client-req.pem
openssl rsa -in client-key.pem -out client-key.pem
openssl x509 -sha1 -req -in client-req.pem -days 730 -CA ca-cert.pem -CAkey ca-key.pem -
set_serial 01 > client-cert.pem
```

。 。

/ root / certs / mysql /

CA

```
cat server-cert.pem client-cert.pem > ca.pem
```

```
cat ca.pem
```

○

```
ssh appclient
```

```
mkdir /etc/pki/tls/certs/mysql/
```

dbserverappclient。 scp。

```
scp dbserver
# copy files from dbserver to appclient
# exit scp
```

。 mysql。

```
chown -R mysql:mysql /etc/pki/tls/certs/mysql
```

mysql

```
/etc/pki/tls/certs/mysql/ca.pem
/etc/pki/tls/certs/mysql/client-cert.pem
/etc/pki/tls/certs/mysql/client-key.pem
```

`[client]`appclientMariaDB / MySQL。

```
vi /etc/my.cnf
# i
[client]
ssl-ca=/etc/pki/tls/certs/mysql/ca.pem
ssl-cert=/etc/pki/tls/certs/mysql/client-cert.pem
ssl-key=/etc/pki/tls/certs/mysql/client-key.pem
# :wq
```

appclientmariadb

```
systemctl restart mariadb
```

---

ssl TRUE

```
mysql --ssl --help
```

appclientmysql

```
mysql -uroot -p
```

YES

```
show variables LIKE '%ssl';
    have_openssl    YES
    have_ssl              YES
```

```
 have_openssl NO
```

mariadb.log

SSL'/etc/pki/tls/certs/mysql/client-cert.pem'

rootclient-cert.pem。 / etc / pki / tls / certs / mysql /mysql。

```
chown -R mysql:mysql /etc/pki/tls/certs/mysql
```

mariadb

appclient

dbservermysql。

```
mysql -h dbserver -u iamsecure -p
# enter password dingdingding (hopefully you changed that to something else)
```

。

SSLMariaDB / MySQL

```
\s
```

```
Connection id:        4
Current database:
Current user:        iamsecure@appclient
SSL:            Cipher in use is DHE-RSA-AES256-GCM-SHA384
Current pager:        stdout
Using outfile:        ''
Using delimiter:    ;
```

```
Server:            MariaDB
Server version:         5.X.X-MariaDB MariaDB Server
Protocol version:    10
Connection:        dbserver via TCP/IP
Server characterset:    latin1
Db     characterset:    latin1
Client characterset:    utf8
Conn.  characterset:    utf8
TCP port:        3306
Uptime:            42 min 13 sec
```

GRANT'。

SSL。

RHEL7CentOS7。。

。

SSL https://riptutorial.com/zh-CN/mysql/topic/7563/ssl

12: TRIGGERS

- CREATE [DEFINER = {user | CURRENT_USER}] TRIGGER trigger_name trigger_time trigger_event ON tbl_name FOR EACH ROW [trigger_order] trigger_body
- trigger_time{BEFORE |}
- trigger_event{INSERT ||}
- trigger_order{FOLLOWS | PRECEDES} other_trigger_name

DB

`FOR EACH ROW`

Oracle。

MySQL`CREATE OR REPLACE`

MySQL

```
DELIMITER $$

DROP TRIGGER IF EXISTS myTrigger;
$$
CREATE TRIGGER myTrigger
-- ...

$$
DELIMITER ;
```

- `CREATE`
- `DROPCREATELOCK TABLES myTable WRITE;UNLOCK TABLES;CREATE`

Examples

```
mysql> CREATE TABLE account (acct_num INT, amount DECIMAL(10,2));
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> CREATE TRIGGER ins_sum BEFORE INSERT ON account
    -> FOR EACH ROW SET @sum = @sum + NEW.amount;
Query OK, 0 rows affected (0.06 sec)
```

CREATE TRIGGERins_sum。

@sumINSERT

```
mysql> SET @sum = 0;
mysql> INSERT INTO account VALUES(137,14.98),(141,1937.50),(97,-100.00);
```

```
mysql> SELECT @sum AS 'Total amount inserted';
+----------------------+
| Total amount inserted |
+----------------------+
| 1852.48              |
+----------------------+
```

INSERT@sum14.98 + 1937.50 - 1001852.48。

```
mysql> DROP TRIGGER test.ins_sum;
```

。

- BEFOREBEFORE
- AFTERAFTER。

- INSERT
- UPDATE
- DELETE

Insert

```
DELIMITER $$

CREATE TRIGGER insert_date
    BEFORE INSERT ON stack
    FOR EACH ROW
BEGIN
        -- set the insert_date field in the request before the insert
    SET NEW.insert_date = NOW();
END;

$$
DELIMITER ;
```

Update

```
DELIMITER $$

CREATE TRIGGER update_date
    BEFORE UPDATE ON stack
    FOR EACH ROW
BEGIN
        -- set the update_date field in the request before the update
    SET NEW.update_date = NOW();
END;

$$
DELIMITER ;
```

```
DELIMITER $$

CREATE TRIGGER deletion_date
    AFTER DELETE ON stack
    FOR EACH ROW
BEGIN
        -- add a log entry after a successful delete
    INSERT INTO log_action(stack_id, deleted_date) VALUES(OLD.id, NOW());
END;

$$
DELIMITER ;
```

TRIGGERS https://riptutorial.com/zh-CN/mysql/topic/3069/triggers

13: UPDATE

- UPDATE [LOW_PRIORITY] [IGNORE] tableName SET column1 = expression1column2 = expression2... [WHERE conditions]; //
- UPDATE [LOW_PRIORITY] [IGNORE] tableName SET column1 = expression1column2 = expression2... [WHERE conditions] [ORDER BY[ASC | DESC]] [LIMIT row_count]; //order by limit
- UPDATE [LOW_PRIORITY] [IGNORE] table1table2... SET column1 = expression1column2 = expression2... [WHERE conditions]; //

Examples

```
UPDATE customers SET email='luke_smith@email.com' WHERE id=1
```

customersemailluke_smith@email.com id1.

customers

id	firstname	lastname	email
1	Luke	Smith	luke@example.com
2	Anna	Carey	anna@example.com
3	Todd	Winters	todd@example.com

customers

id	firstname	lastname	email
1	Luke	Smith	luke_smith@email.com
2	Anna	Carey	anna@example.com
3	Todd	Winters	todd@example.com

```
UPDATE customers SET lastname='smith'
```

customerslastname。

customers

id	firstname	lastname	email
1	Luke	Smith	luke@example.com
2	Anna	Carey	anna@example.com
3	Todd	Winters	todd@example.com

customers

id	firstname	lastname	email
1	Luke	Smith	luke@example.com
2	Anna	Smith	anna@example.com
3	Todd	Smith	todd@example.com

UPDATEWHERE。。customerslastnameSmith。

Join Pattern

questions_mysqliwtQuestions LOAD DATA INFILECSV。。

。

```
UPDATE questions_mysql q -- our real table for production
join iwtQuestions i -- imported worktable
ON i.qId = q.qId
```

```
SET q.closeVotes = i.closeVotes,
q.votes = i.votes,
q.answers = i.answers,
q.views = i.views;
```

qi。 。

qId StackoverflowID。 。

ORDER BYLIMIT

SQLORDER BY ORDER BY。

SQLLIMIT。 LIMIT。

ORDER BYLIMIT。

ORDER BYLIMITMySQL UPDATE

```
UPDATE [ LOW_PRIORITY ] [ IGNORE ]
tableName
SET column1 = expression1,
    column2 = expression2,
    ...
[WHERE conditions]
[ORDER BY expression [ ASC | DESC ]]
[LIMIT row_count];

---> Example
UPDATE employees SET isConfirmed=1 ORDER BY joiningDate LIMIT 10
```

joiningDate10。

UPDATE 。 。

UPDATE ORDER BYLIMIT 。

UPDATE

```
UPDATE [LOW_PRIORITY] [IGNORE]
table1, table2, ...
    SET column1 = expression1,
        column2 = expression2,
        ...
    [WHERE conditions]
```

productssalesOrders 。 。 products。 SQL。

```
UPDATE products, salesOrders
  SET salesOrders.Quantity = salesOrders.Quantity - 5,
      products.availableStock = products.availableStock + 5
WHERE products.productId = salesOrders.productId
  AND salesOrders.orderId = 100 AND salesOrders.productId = 20;
```

“5”salesOrdersWHEREproducts◦

◦

```
UPDATE people
SET name =
  (CASE id WHEN 1 THEN 'Karl'
           WHEN 2 THEN 'Tom'
           WHEN 3 THEN 'Mary'
   END)
WHERE id IN (1,2,3);
```

◦ WHERE◦

UPDATE https://riptutorial.com/zh-CN/mysql/topic/2738/update

14:

1M。

1M1M'one''many''many'“”。

1M 。

。 EMP_ID。 EMP_ID。

。 EMPLOYEESMGR_ID。 。

Examples

。

EMP_ID			MGR_ID
E01			M02
E02		Macklemore	M01
E03			M03
E04		Sonswan	M01

MGR_ID		
M01		
M02		
M03		

```
SELECT e.emp_id , e.first_name , e.last_name FROM employees e INNER JOIN managers m ON m.mgr_id
= e.mgr_id WHERE m.mgr_id = 'M01' ;
```

EMP_ID		
E02		Macklemore
E04		Sonswan

1。

。

```
SELECT m.mgr_id , m.first_name , m.last_name FROM managers m INNER JOIN employees e ON e.mgr_id
= m.mgr_id WHERE e.emp_id = 'E03' ;
```

MGR_ID		
M03		

。

https://riptutorial.com/zh-CN/mysql/topic/9600/

15:

Examples

◦ MySQL3.23◦

◦ ◦

◦

```
--->Basic temporary table creation
CREATE TEMPORARY TABLE tempTable1(
       id INT NOT NULL AUTO_INCREMENT,
       title VARCHAR(100) NOT NULL,
       PRIMARY KEY ( id )
    );

--->Temporary table creation from select query
CREATE TEMPORARY TABLE tempTable1
    SELECT ColumnName1,ColumnName2,... FROM table1;
```

```
CREATE TEMPORARY TABLE tempTable1
        ( PRIMARY KEY(ColumnName2) )
    SELECT ColumnName1,ColumnName2,... FROM table1;
```

IF NOT EXISTS“”◦ ◦

```
CREATE TEMPORARY TABLE IF NOT EXISTS tempTable1
    SELECT ColumnName1,ColumnName2,... FROM table1;
```

Drop Temporary Table◦

```
DROP TEMPORARY TABLE tempTable1

DROP TEMPORARY TABLE IF EXISTS tempTable1
```

IF EXISTS

https://riptutorial.com/zh-CN/mysql/topic/5757/

16:

Examples

SQLselectinsertupdatedelete。

。 。

。 。 SQL

1.
2.
3.

。

ACID

- ;。
- 。
- 。
- 。

START TRANSACTIONBEGIN WORKCOMMITROLLBACK。 SQL。

```
START TRANSACTION;
SET @transAmt = '500';
SELECT @availableAmt:=ledgerAmt FROM accTable WHERE customerId=1 FOR UPDATE;
UPDATE accTable SET ledgerAmt=ledgerAmt-@transAmt WHERE customerId=1;
UPDATE accTable SET ledgerAmt=ledgerAmt+@transAmt WHERE customerId=2;
COMMIT;
```

START TRANSACTION COMMITROLLBACK。 。

FOR UPDATE。

。

- SQLBEGIN WORKSTART TRANSACTION 。
- SQL。
- 。
- COMMITROLLBACK。
- Galera / PXCCOMMIT。

COMMITROLLBACKAUTOCOMMIT

AUTOCOMMIT

MySQL。 UPDATE DELETEINSERTBEGINSTART TRANSACTION。

AUTOCOMMIT*true* 。

```
--->To make autcommit false
SET AUTOCOMMIT=false;
--or
SET AUTOCOMMIT=0;

--->To make autcommit true
SET AUTOCOMMIT=true;
--or
SET AUTOCOMMIT=1;
```

AUTOCOMMIT

```
SELECT @@autocommit;
```

AUTOCOMMITfalse。

COMMIT。

1

```
--->Before making autocommit false one row added in a new table
mysql> INSERT INTO testTable VALUES (1);

--->Making autocommit = false
mysql> SET autocommit=0;

mysql> INSERT INTO testTable VALUES (2), (3);
mysql> SELECT * FROM testTable;
+-----+
| tId |
+-----+
|   1 |
|   2 |
|   3 |
+-----+
```

2

```
mysql> SELECT * FROM testTable;
+-----+
| tId |
+-----+
|   1 |
+-----+
---> Row inserted before autocommit=false only visible here
```

1

```
mysql> COMMIT;
--->Now COMMIT is executed in connection 1
```

```
mysql> SELECT * FROM testTable;
    +-----+
    | tId |
    +-----+
    |   1 |
    |   2 |
    |   3 |
    +-----+
```

2

```
mysql> SELECT * FROM testTable;
    +-----+
    | tId |
    +-----+
    |   1 |
    |   2 |
    |   3 |
    +-----+
--->Now all the three rows are visible here
```

ROLLBACK

ROLLBACK◦

```
--->Before making autocommit false one row added in a new table
mysql> INSERT INTO testTable VALUES (1);

--->Making autocommit = false
mysql> SET autocommit=0;

mysql> INSERT INTO testTable VALUES (2), (3);
mysql> SELECT * FROM testTable;
+-----+
| tId |
+-----+
|   1 |
|   2 |
|   3 |
+-----+
```

ROLLBACK

```
--->Rollback executed now
mysql> ROLLBACk;

mysql> SELECT * FROM testTable;
+-----+
| tId |
+-----+
|   1 |
+-----+
--->Rollback removed all rows which all are not committed
```

COMMIT ROLLBACK

```
mysql> INSERT INTO testTable VALUES (2), (3);
mysql> SELECT * FROM testTable;
mysql> COMMIT;
+-----+
| tId |
+-----+
|   1 |
|   2 |
|   3 |
+-----+

--->Rollback executed now
mysql> ROLLBACk;

mysql> SELECT * FROM testTable;
+-----+
| tId |
+-----+
|   1 |
|   2 |
|   3 |
+-----+
--->Rollback not removed any rows
```

AUTOCOMMIT*true* COMMITROLLBACK

JDBC

JDBC。JDBCMySQL

MySQLJDBC

JDBC

```
Class.forName("com.mysql.jdbc.Driver");
Connection con = DriverManager.getConnection(DB_CONNECTION_URL,DB_USER,USER_PASSWORD);
--->Example for connection url "jdbc:mysql://localhost:3306/testDB");
```

SQL。。

。

```
jdbc:mysql://localhost:3306/testDB?useUnicode=true&amp;characterEncoding=utf8
```

AUTOCOMMIT*true false*。

```
con.setAutoCommit(false);
```

setAutoCommit()。

START TRANSACTIONBEGIN WORK。 START TRANSACTIONBEGIN WORK AUTOCOMMIT *false* 。 。

。JDBC。

```
package jdbcTest;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.SQLException;


public class accTrans {

    public static void doTransfer(double transAmount,int customerIdFrom,int customerIdTo) {

        Connection con = null;
        PreparedStatement pstmt = null;
        ResultSet rs = null;

        try {
            String DB_CONNECTION_URL =
"jdbc:mysql://localhost:3306/testDB?useUnicode=true&amp;characterEncoding=utf8";

            Class.forName("com.mysql.jdbc.Driver");
            con = DriverManager.getConnection(DB_CONNECTION_URL,DB_USER,USER_PASSWORD);

            --->set auto commit to false
            con.setAutoCommit(false);
            ---> or use con.START TRANSACTION / con.BEGIN WORK

            --->Start SQL Statements for transaction
            --->Checking availability of amount
            double availableAmt    = 0;
            pstmt = con.prepareStatement("SELECT ledgerAmt FROM accTable WHERE customerId=?
FOR UPDATE");
            pstmt.setInt(1, customerIdFrom);
            rs = pstmt.executeQuery();
            if(rs.next())
                availableAmt    = rs.getDouble(1);

            if(availableAmt >= transAmount)
            {
                ---> Do Transfer
                ---> taking amount from cutomerIdFrom
                pstmt = con.prepareStatement("UPDATE accTable SET ledgerAmt=ledgerAmt-? WHERE
customerId=?");
                pstmt.setDouble(1, transAmount);
                pstmt.setInt(2, customerIdFrom);
                pstmt.executeUpdate();

                ---> depositing amount in cutomerIdTo
                pstmt = con.prepareStatement("UPDATE accTable SET ledgerAmt=ledgerAmt+? WHERE
customerId=?");
                pstmt.setDouble(1, transAmount);
                pstmt.setInt(2, customerIdTo);
                pstmt.executeUpdate();

                con.commit();
            }
            --->If you performed any insert,update or delete operations before
            ----> this availability check, then include this else part
            /*else { --->Rollback the transaction if availability is less than required
                con.rollback();
            }*/
```

```
        } catch (SQLException ex) {
            ---> Rollback the transaction in case of any error
            con.rollback();
        } finally {
            try {
                if(rs != null)  rs.close();
                if(pstmt != null) pstmt.close();
                if(con != null) con.close();
            }
        }
    }

    public static void main(String[] args) {
        doTransfer(500, 1020, 1021);
        -->doTransfer(transAmount, customerIdFrom, customerIdTo);
    }
}
```

JDBCSQLSQL。

https://riptutorial.com/zh-CN/mysql/topic/5771/

17: JSON

MySQL 5.7.8+JSON。json。

`JSON_EXTRACT ->->>`。

- JSON_EXTRACTjson_doc[...]
- JSON_EXTRACTjson_doc
- JSON_EXTRACTjson_doc12

json_doc	JSON

MySQL 5.7

-
  - 。
- `NULL`
  - argemuntNULL
  -

  NULLNULL。

Examples

JSON

@myjsonJSON

```
SET @myjson = CAST('["A","B",{"id":1,"label":"C"}]' as JSON) ;
```

`SELECT`

```
SELECT
  JSON_EXTRACT( @myjson , '$[1]' ) ,
  JSON_EXTRACT( @myjson , '$[*].label') ,
  JSON_EXTRACT( @myjson , '$[1].*' ) ,
  JSON_EXTRACT( @myjson , '$[2].*')
;
-- result values:
'\"B\"', '[\"C\"]', NULL, '[1, \"C\"]'
-- visually:
"B", ["C"], NULL, [1, "C"]
```

JSON

->->>path ->>UNQUOTED

```
SELECT
  myjson_col->>'$[1]' , myjson_col->'$[1]' ,
  myjson_col->>'$[*].label' ,
  myjson_col->>'$[1].*' ,
  myjson_col->>'$[2].*'
FROM tablename ;
 -- visuall:
    B, "B" , ["C"], NULL, [1, "C"]
 --^^^ ^^^
```

col->>pathJSON_UNQUOTE(JSON_EXTRACT(col,path))

- > - >>EXPLAIN

```
mysql> EXPLAIN SELECT c->>'$.name' AS name
    ->     FROM jemp WHERE g > 2\G
*************************** 1. row ***************************
           id: 1
  select_type: SIMPLE
        table: jemp
   partitions: NULL
         type: range
possible_keys: i
          key: i
      key_len: 5
          ref: NULL
         rows: 2
     filtered: 100.00
        Extra: Using where
1 row in set, 1 warning (0.00 sec)

mysql> SHOW WARNINGS\G
*************************** 1. row ***************************
  Level: Note
   Code: 1003
Message: /* select#1 */ select
json_unquote(json_extract(`jtest`.`jemp`.`c`,'$.name')) AS `name` from
`jtest`.`jemp` where (`jtest`.`jemp`.`g` > 2)
1 row in set (0.00 sec)
```

+

JSON https://riptutorial.com/zh-CN/mysql/topic/9042/json

18: MyISAMInnoDB

Examples

```
ALTER TABLE foo ENGINE=InnoDB;
```

。 。 。

```
SET @DB_NAME = DATABASE();

SELECT  CONCAT('ALTER TABLE `', table_name, '` ENGINE=InnoDB;') AS sql_statements
FROM    information_schema.tables
WHERE   table_schema = @DB_NAME
AND     `ENGINE` = 'MyISAM'
AND     `TABLE_TYPE` = 'BASE TABLE';
```

`DATABASE()`NULL。 mysql。

SQL`MyISAM`。

SQL。

MyISAMInnoDB https://riptutorial.com/zh-CN/mysql/topic/3135/myisaminnodb

19: root

Examples

rootrootsockethttp

rootmySQL

```
sudo systemctl stop mysql
```

mySQL

```
sudo mysqld_safe --skip-grant-tables
```

```
mysql -u root
```

SQL shell

```
select User, password,plugin FROM mysql.user ;
```

null

```
update mysql.user set password=PASSWORD('mypassword'), plugin = NULL WHERE User = 'root';
exit;
```

Unix shellmySQL

```
sudo service mysql stop
sudo service mysql start
```

root https://riptutorial.com/zh-CN/mysql/topic/9973/root

20: Docker-ComposeMysql

Examples

docker-compose

dockermysql

1.-**docker-compose.yml**

HOME_PATHPATH。**docker**。

```
version: '2'
services:
  cabin_db:
    image: mysql:latest
    volumes:
      - "./.mysql-data/db:/var/lib/mysql"
    restart: always
    ports:
      - 3306:3306
    environment:
      MYSQL_ROOT_PASSWORD: rootpw
      MYSQL_DATABASE: cabin
      MYSQL_USER: cabin
      MYSQL_PASSWORD: cabinpw
```

2.-

```
cd PATH_TO_DOCKER-COMPOSE.YML
docker-compose up -d
```

3.-

```
mysql -h 127.0.0.1 -u root -P 3306 -p rootpw
```

4.-

```
docker-compose stop
```

Docker-ComposeMysql https://riptutorial.com/zh-CN/mysql/topic/4458/docker-composemysql

21: mysqldump

- mysqldump -u [username] -p [password] [] db_name> dumpFileName.sql ///
- mysqldump -u [username] -p [password] [] db_name [tbl_name1 tbl_name2 tbl_name2 ...]> dumpFileName.sql ///
- mysqldump -u [username] -p [password] [] --databases db_name1 db_name2 db_name3 ...> dumpFileName.sql ///
- mysqldump -u [username] -p [password] [] --all-databases> dumpFileName.sql ///MySQL

-	#Server
-h -- --host	IP。 localhost 127.0.0.1 -h localhost
-u -- --user	MySQL
-p - --password	MySQL。 -p 。 -pMyPassword
-	
--add-drop-database	CREATE DATABASEDROP DATABASE CREATE DATABASE。 。
--add-drop-table	CREATE TABLEDROP TABLE CREATE TABLE。 。
--no-create-db	CREATE DATABASE。 。
-t -- --no-create-info	CREATE TABLE。 /。
-d -- --no-data	。 CREATE TABLE。 “”
-R - --routines	/。
-K - --disable-keys	。 MyISAM。

mysqldumpMySQLSQL。 mysqldump ed。

- DROP
- CREATE
- --no-data
  - LOCK
  - INSERT
- UNLOCK TABLES
-
- DROP
- CREATE
-

CREATEDROPmysqldump。

Examples

```
mysqldump [options] db_name > filename.sql
```

```
mysqldump [options] --databases db_name1 db_name2 ... > filename.sql
mysqldump [options] --all-databases > filename.sql
```

```
mysqldump [options] db_name table_name... > filename.sql
```

```
mysqldump [options] db_name --ignore-table=tbl1 --ignore-table=tbl2 ... > filename.sql
```

.sql◦ ◦

```
> mysqldump -u username -p [other options]
Enter password:
```

-p

```
> mysqldump -u username -ppassword [other options]
```

shell /◦

```
> mysqldump --user=username --password=password [other options]
```

◦

```
mysql [options] db_name < filename.sql
```

- db_name;
- filename.sql;
- .sql◦ ◦
- ◦ filename.sql◦

MySQL source

```
source filename.sql
```

```
\. filename.sql
```

mysqldump

--compress--compressmysqldump ◦

```
mysqldump -h db.example.com -u username -p --compress dbname > dbname.sql
```

--lock-tables=false ◦ ◦

gzip ◦

```
mysqldump -h db.example.com -u username -p --compress dbname | gzip --stdout > dbname.sql.gz
```

gzipmysqldump

```
gunzip -c dbname.sql.gz | mysql dbname -u username -p
```

-cstdout◦

Amazon S3

MySqlAmazon S3◦ DB

```
mysqldump -u root -p --host=localhost --opt --skip-lock-tables --single-transaction \
        --verbose --hex-blob --routines --triggers --all-databases |
    gzip -9 | s3cmd put - s3://s3-bucket/db-server-name.sql.gz
```

◦

MySQLMySQL

1

1.
2.
3.

```
mysqldump [options] > dump.sql
```

```
mysql [options] < dump.sql
```

2

```
mysqldump [options to connect to the source server] | mysql [options]
```

◦ 1◦

mysqldump--routines -R

```
mysqldump -u username -p -R db_name > dump.sql
```

--routinesmysql.proc◦

mysqldump https://riptutorial.com/zh-CN/mysql/topic/604/mysqldump

22: Un-Pivot

Examples

BI /。

。

```
create table rawdata

(
 PersonId VARCHAR(255)
,Question1Id INT(11)
,Question2Id INT(11)
,Question3Id INT(11)
)
```

rawdataETL。 。

rawdata

	PersonId	Question1Id	Question2Id	Question3Id
	Giannaros	1	3	1
▶	Patra	2	4	3

MYSQLUNION ALL

```
create table unpivoteddata

(

 PersonId VARCHAR(255)
,QuestionId VARCHAR(255)
,QuestionValue INT(11)

);

INSERT INTO unpivoteddata SELECT PersonId, 'Question1Id' col, Question1Id
FROM rawdata
UNION ALL
SELECT PersonId, 'Question2Id' col, Question2Id
FROM rawdata
UNION ALL
SELECT PersonId, 'Question3Id' col, Question3Id
FROM rawdata;
```

QuestionId。 。 GROUP_CONCAT“int”。 GROUP_CONCATSELECT。

```
set @temp2 = null;

SELECT GROUP_CONCAT(' SELECT ', 'PersonId',',','''',COLUMN_NAME,'''', ' col
',',',COLUMN_NAME,' FROM rawdata' separator ' UNION ALL' ) FROM     INFORMATION_SCHEMA.COLUMNS
```

```
WHERE table_name = 'rawdata' AND DATA_TYPE = 'Int' INTO     @temp2;

select @temp2;
```

```
DATA_TYPE = 'Int'
```

```
COLUMN_NAME LIKE 'Question%'
```

ETL。

```
set @temp3 = null;

select concat('INSERT INTO unpivoteddata',@temp2) INTO @temp3;

select @temp3;

prepare stmt FROM @temp3;
execute stmt;
deallocate prepare stmt;
```

unpivoteddata

```
SELECT * FROM unpivoteddata
```

PersonId	QuestionId	QuestionValue
Giannaros	Question1Id	1
Patra	Question1Id	2
Giannaros	Question2Id	3
Patra	Question2Id	4
Giannaros	Question3Id	1
Patra	Question3Id	3

。

Un-Pivot https://riptutorial.com/zh-CN/mysql/topic/6491/un-pivot

23:

Examples

1. SET

   EXSET @var_string ='my_var'; SET @var_num ='2'SET @var_date ='2015-07-20';

2. =select

   EX@var='123'; =SETselectupdate ...“=””...”=“”SET“。

3. INTOselect

EXSET @start_date ='2015-07-20'; SET @end_date ='2016-01-31';

```
#this gets the year month value to use as the partition names
SET @start_yearmonth = (SELECT EXTRACT(YEAR_MONTH FROM @start_date));
SET @end_yearmonth = (SELECT EXTRACT(YEAR_MONTH FROM @end_date));

#put the partitions into a variable
SELECT GROUP_CONCAT(partition_name)
FROM information_schema.partitions p
WHERE table_name = 'partitioned_table'
AND SUBSTRING_INDEX(partition_name,'P',-1) BETWEEN @start_yearmonth AND @end_yearmonth
INTO @partitions;

#put the query in a variable. You need to do this, because mysql did not recognize my variable
as a variable in that position. You need to concat the value of the variable together with the
rest of the query and then execute it as a stmt.
SET @query =
CONCAT('CREATE TABLE part_of_partitioned_table (PRIMARY KEY(id))
SELECT partitioned_table.*
FROM partitioned_table PARTITION(', @partitions,')
JOIN users u USING(user_id)
WHERE date(partitioned_table.date) BETWEEN ', @start_date,' AND ', @end_date);

#prepare the statement from @query
PREPARE stmt FROM @query;
#drop table
DROP TABLE IF EXISTS tech.part_of_partitioned_table;
#create table using statement
EXECUTE stmt;
```

Select

table `team_person`

```
+======+===========+
| team |    person |
+======+===========+
|   A  |      John |
+------+-----------+
```

```
|   B  |     Smith |
+------+-----------+
|   A  |    Walter |
+------+-----------+
|   A  |     Louis |
+------+-----------+
|   C  | Elizabeth |
+------+-----------+
|   B  |     Wayne |
+------+-----------+


CREATE TABLE team_person AS SELECT 'A' team, 'John' person
UNION ALL  SELECT 'B' team,  'Smith' person
UNION ALL  SELECT 'A' team,  'Walter' person
UNION ALL  SELECT 'A' team,  'Louis' person
UNION ALL  SELECT 'C' team,  'Elizabeth' person
UNION ALL  SELECT 'B' team,  'Wayne' person;
```

row_numberteam_person

```
SELECT @row_no := @row_no+1 AS row_number, team, person
FROM team_person, (SELECT @row_no := 0) t;
```

```
SET @row_no := 0;
SELECT  @row_no := @row_no + 1 AS row_number, team, person
FROM team_person;
```

```
+============+======+============+
| row_number | team |    person |
+============+======+============+
|          1 |   A  |      John |
+------------+------+------------+
|          2 |   B  |     Smith |
+------------+------+------------+
|          3 |   A  |    Walter |
+------------+------+------------+
|          4 |   A  |     Louis |
+------------+------+------------+
|          5 |   C  | Elizabeth |
+------------+------+------------+
|          6 |   B  |     Wayne |
+------------+------+------------+
```

teamrow_number

```
SELECT @row_no := IF(@prev_val = t.team, @row_no + 1, 1) AS row_number
   ,@prev_val := t.team AS team
   ,t.person
FROM team_person t,
  (SELECT @row_no := 0) x,
  (SELECT @prev_val := '') y
ORDER BY t.team ASC,t.person DESC;

+============+======+============+
| row_number | team |    person |
+============+======+============+
```

```
|          1 |   A  |    Walter |
+------------+------+-----------+
|          2 |   A  |     Louis |
+------------+------+-----------+
|          3 |   A  |      John |
+------------+------+-----------+
|          1 |   B  |     Wayne |
+------------+------+-----------+
|          2 |   B  |     Smith |
+------------+------+-----------+
|          1 |   C  | Elizabeth |
+------------+------+-----------+
```

https://riptutorial.com/zh-CN/mysql/topic/5013/

24: UTF-8。

Examples

12utf8

```
# -*- coding: utf-8 -*-
```

```
db = MySQLdb.connect(host=DB_HOST, user=DB_USER, passwd=DB_PASS, db=DB_NAME,
        charset="utf8mb4", use_unicode=True)
```

```
<meta charset="utf-8" />
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
```

PHP

php.iniPHP 5.6

```
default_charset UTF-8
```

```
header('Content-type: text/plain; charset=UTF-8');
```

MySQL

```
(for mysql:)   Do not use the mysql_* API!
(for mysqli:)  $mysqli_obj->set_charset('utf8mb4');
(for PDO:)     $db = new PDO('dblib:host=host;dbname=db;charset=utf8', $user, $pwd);
```

。

```
<form accept-charset="UTF-8">
```

JSON`\uxxxx`

```
$t = json_encode($s, JSON_UNESCAPED_UNICODE);
```

UTF-8。 https://riptutorial.com/zh-CN/mysql/topic/7332/utf-8-

25:

MySQL。`。

。

-
-
-
-
-
-
-
- ASC
- ASENSITIVE
-
-
- BIGINT
- BINARY
- BLOB
-
-
-
-
-
-
-
- CHAR
-
-
- COLLATE
-
-
-
-
-
-
-
-
-
-
- CURRENT_TIMESTAMP
-
-
-
- DATABASES
- DAY_HOUR
- DAY_MICROSECOND
- DAY_MINUTE
- DAY_SECOND
- DEC
- DECIMAL
-

-
-
-
- DESC
-
-
-
- DISTINCTROW
- DIV
-
-
-
-
-
- ELSEIF
- ENCLOSED
- ESCAPED
- EXISTS
-
-
-
-
-
- FLOAT4
- float8
-
-
-
-
-
- GENERATED
-
- GRANT
-
- HAVING
- HIGH_PRIORITY
- HOUR_MICROSECOND
- HOUR_MINUTE
- HOUR_SECOND
-
-
-
-
- INFILE
-
-
- INSENSITIVE
-
- INT
- INT1
- INT2

- INT3
- INT4
- INT8
-
-
- INTO
- IO_AFTER_GTIDS
- IO_BEFORE_GTIDS
- IS
-
-
-
- KEYS
-
-
-
-
-
-
- LINEAR
- LINES
-
-
- LOCALTIMESTAMP
-
-
- LONGBLOB
- LONGTEXT
-
-
- MASTER_BIND
- MASTER_SSL_VERIFY_SERVER_CERT
-
- MAXVALUE
- MEDIUMBLOB
- MEDIUMINT
- MEDIUMTEXT
- MIDDLEINT
- MINUTE_MICROSECOND
- MINUTE_SECOND
- MOD
- MODIFIES
-
-
- NO_WRITE_TO_BINLOG
-
-
-
- OPTIMIZE
- OPTIMIZER_COSTS
-

- OPTIONALLY
-
-
- OUT
-
- OUTFILE
-
-
-
-
-
-
-
-
- READS
- READ_WRITE
-
-
- REGEXP
-
-
-
-
-
-
- RESIGNAL
-
-
-
-
- RLIKE
- SCHEMA
- SCHEMAS
- SECOND_MICROSECOND
-
-
-
-
-
-
-
- SMALLINT
-
-
- SQL
- SQLEXCEPTION
- SQLSTATE
- SQLWARNING
- SQL_BIG_RESULT
- SQL_CALC_FOUND_ROWS
- SQL_SMALL_RESULT
- SSL
-
- STORED

- STRAIGHT_JOIN
-
- TERMINATED
-
- TINYBLOB
- TINYINT
- TINYTEXT
-
- TRAILING
-
-
- UNDO
-
-
-
- UNSIGNED
- UPDATE
-
-
-
- UTC_DATE
- UTC_TIME
- UTC_TIMESTAMP
- VALUES
- VARBINARY
- VARCHAR
- VARCHARACTER
-
-
-
-
-
- WITH
-
- XOR
- YEAR_MONTH
- ZEROFILL
- GENERATED
- OPTIMIZER_COSTS
- STORED
-

Examples

`order`

```
select * from order
```

1064。SQL;MySQL1“order”

MySQL `

```
select * from `order`
```

。

MySQL 。

https://riptutorial.com/zh-CN/mysql/topic/1398/

26:

MySQLFULLTEXT。 。

FULLTEXT。 。 。 MySQL。

FULLTEXT。 WHERE column LIKE 'text%'。

FULLTEXTMyISAM。 MySQL 5.6.4InnoDB。

Examples

FULLTEXT

```
    SET @searchTerm= 'Database Programming';
 SELECT MATCH (Title) AGAINST (@searchTerm IN NATURAL LANGUAGE MODE) Score,
        ISBN, Author, Title
   FROM book
  WHERE MATCH (Title) AGAINST (@searchTerm IN NATURAL LANGUAGE MODE)
  ORDER BY MATCH (Title) AGAINST (@searchTerm IN NATURAL LANGUAGE MODE) DESC;
```

bookISBN 'Title''Author''Database Programming'。 。

Title

```
ALTER TABLE book ADD FULLTEXT INDEX Fulltext_title_index (Title);
```

BOOLEAN

```
    SET @searchTerm= 'Database Programming -Java';
 SELECT MATCH (Title) AGAINST (@searchTerm IN BOOLEAN MODE) Score,
        ISBN, Author, Title
   FROM book
  WHERE MATCH (Title) AGAINST (@searchTerm IN BOOLEAN MODE)
  ORDER BY MATCH (Title) AGAINST (@searchTerm IN BOOLEAN MODE) DESC;
```

bookISBN TitleAuthor 'Database''Programming''Database''Java'。

Title

```
ALTER TABLE book ADD FULLTEXT INDEX Fulltext_title_index (Title);
```

FULLTEXT

```
    SET @searchTerm= 'Date Database Programming';
 SELECT MATCH (Title, Author) AGAINST (@searchTerm IN NATURAL LANGUAGE MODE) Score,
        ISBN, Author, Title
```

```
 FROM book
WHERE MATCH (Title, Author) AGAINST (@searchTerm IN NATURAL LANGUAGE MODE)
ORDER BY MATCH (Title, Author) AGAINST (@searchTerm IN NATURAL LANGUAGE MODE) DESC;
```

book`ISBN TitleAuthor` 'Date Database Programming'。 。 CJ Date。

The Date Doctor 。 FULLTEXT。

TitleAuthor

```
ALTER TABLE book ADD FULLTEXT INDEX Fulltext_title_author_index (Title, Author);
```

https://riptutorial.com/zh-CN/mysql/topic/8759/

27:

- PREPARE stmt_name FROM preparable_stmt
- EXECUTE stmt_name [@var_name [@ var_name] ...]
- {DEALLOCATE | DROP} PREPARE stmt_name

Examples

DEALLOCATE PREPARE

PREPARE

EXECUTE

DEALLOCATE PREPARE

```
SET @s = 'SELECT SQRT(POW(?,2) + POW(?,2)) AS hypotenuse';
PREPARE stmt2 FROM @s;
SET @a = 6;
SET @b = 8;
EXECUTE stmt2 USING @a, @b;
```

```
+-------------+
| hypotenuse |
+-------------+
|          10 |
+-------------+
```

```
DEALLOCATE PREPARE stmt2;
```

- @variables`FROM @s` @sDECLAREd
- Prepare“”。

`CONCAT SELECT` +。 @variablesDECLAREd - 。

```
SET v_column_definition := CONCAT(
  v_column_name
  ,' ',v_column_type
  ,' ',v_column_options
);

SET @stmt := CONCAT('ALTER TABLE ADD COLUMN ', v_column_definition);

PREPARE stmt FROM @stmt;
EXECUTE stmt;
DEALLOCATE PREPARE stmt;
```

https://riptutorial.com/zh-CN/mysql/topic/2603/

28:

- **RANGE** 。 。
- 。 RANGE。
- **HASH** 。 。 MySQL。 `LINEAR HASH` 。
- **KEY** 。 HASHMySQL。 MySQL。 `LINEAR KEY` 。

Examples

。 `VALUES LESS THAN`。 20120

```
CREATE TABLE employees (
    id INT NOT NULL,
    fname VARCHAR(30),
    lname VARCHAR(30),
    hired DATE NOT NULL DEFAULT '1970-01-01',
    separated DATE NOT NULL DEFAULT '9999-12-31',
    job_code INT NOT NULL,
    store_id INT NOT NULL
);
```

。 `store_id`。 `PARTITION BY RANGE`4`PARTITION BY RANGE`

```
ALTER TABLE employees PARTITION BY RANGE (store_id) (
    PARTITION p0 VALUES LESS THAN (6),
    PARTITION p1 VALUES LESS THAN (11),
    PARTITION p2 VALUES LESS THAN (16),
    PARTITION p3 VALUES LESS THAN MAXVALUE
);
```

`MAXVALUE`。

MySQL 。

。 RANGE。 。 。 `PARTITION BY LIST(expr)exprVALUES IN (value_list)value_list`。

`CREATE TABLE`

```
CREATE TABLE employees (
    id INT NOT NULL,
    fname VARCHAR(30),
    lname VARCHAR(30),
    hired DATE NOT NULL DEFAULT '1970-01-01',
    separated DATE NOT NULL DEFAULT '9999-12-31',
    job_code INT,
    store_id INT
);
```

420。

	ID
	3,5,6,9,17
	1,2,10,11,19,20
	4,12,13,14,18
	7,8,15,16

```
ALTER TABLE employees PARTITION BY LIST(store_id) (
    PARTITION pNorth VALUES IN (3,5,6,9,17),
    PARTITION pEast VALUES IN (1,2,10,11,19,20),
    PARTITION pWest VALUES IN (4,12,13,14,18),
    PARTITION pCentral VALUES IN (7,8,15,16)
);
```

MySQL 。

HASH

HASH。;MySQL。

store_id4

```
CREATE TABLE employees (
    id INT NOT NULL,
    fname VARCHAR(30),
    lname VARCHAR(30),
    hired DATE NOT NULL DEFAULT '1970-01-01',
    separated DATE NOT NULL DEFAULT '9999-12-31',
    job_code INT,
    store_id INT
)
PARTITION BY HASH(store_id)
PARTITIONS 4;
```

PARTITIONS1。

MySQL 。

https://riptutorial.com/zh-CN/mysql/topic/5128/

29:

- {| SCHEMA} [IF NOT EXISTS] db_name [create_specification] ///
- DROP {DATABASE | SCHEMA} [IF EXISTS] db_name ///

	CREATE DATABASE
create_specification	create_specificationCHARACTER SETCOLLATE

Examples

◦ SCHEMA◦

```
CREATE DATABASE Baseball; -- creates a database named Baseball
```

1007◦

```
CREATE DATABASE IF NOT EXISTS Baseball;
```

```
DROP DATABASE IF EXISTS Baseball; -- Drops a database if it exists, avoids Error 1008
DROP DATABASE xyz; -- If xyz does not exist, ERROR 1008 will occur
```

DDLIF EXISTS ◦

CHARACTER SET◦

```
CREATE DATABASE Baseball CHARACTER SET utf8 COLLATE utf8_general_ci;

SHOW CREATE DATABASE Baseball;
+----------+-----------------------------------------------------------------+
| Database | Create Database                                                 |
+----------+-----------------------------------------------------------------+
| Baseball | CREATE DATABASE `Baseball` /*!40100 DEFAULT CHARACTER SET utf8 */ |
+----------+-----------------------------------------------------------------+
```

```
SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| ajax_stuff         |
| Baseball           |
+--------------------+
```

```
USE Baseball; -- set it as the current database
```

```
SELECT @@character_set_database as cset,@@collation_database as col;
+------+-----------------+
| cset | col             |
+------+-----------------+
| utf8 | utf8_general_ci |
+------+-----------------+
```

CHARACTER SETCollation。

```
CREATE USER 'John123'@'%' IDENTIFIED BY 'OpenSesame';
```

John123%。'OpenSesame'。

```
CREATE USER 'John456'@'%' IDENTIFIED BY 'somePassword';
```

mysql

```
SELECT user,host,password from mysql.user where user in ('John123','John456');
+---------+------+-------------------------------------------+
| user    | host | password                                  |
+---------+------+-------------------------------------------+
| John123 | %    | *E6531C342ED87 .....................      |
| John456 | %    | *B04E11FAAAE9A .....................      |
+---------+------+-------------------------------------------+
```

Baseball。

。John123BaseballSELECT

```
GRANT ALL ON Baseball.* TO 'John123'@'%';
GRANT SELECT ON Baseball.* TO 'John456'@'%';
```

```
SHOW GRANTS FOR 'John123'@'%';
+-------------------------------------------------------------------------------------------------
-----------+
| Grants for John123@%
|
+-------------------------------------------------------------------------------------------------
-----------+
| GRANT USAGE ON *.* TO 'John123'@'%' IDENTIFIED BY PASSWORD '*E6531C342ED87
.....................        |
| GRANT ALL PRIVILEGES ON `baseball`.* TO 'John123'@'%'
|
+-------------------------------------------------------------------------------------------------
-----------+

SHOW GRANTS FOR 'John456'@'%';
+-------------------------------------------------------------------------------------------------
-----------+
| Grants for John456@%
|
+-------------------------------------------------------------------------------------------------
-----------+
| GRANT USAGE ON *.* TO 'John456'@'%' IDENTIFIED BY PASSWORD '*B04E11FAAAE9A
.....................        |
```

```
| GRANT SELECT ON `baseball`.* TO 'John456'@'%'
|
+-----------------------------------------------------------------------------------------------
-----------+
```

GRANT USAGE。 。

MyDatabase

write。 。

```
CREATE DATABASE my_db;
USE my_db;
CREATE TABLE some_table;
INSERT INTO some_table ...;
```

my_db.some_table 。

MySQL。 SELECT INSERT / UPDATE / DELETE 。 。

- mysql - GRANT。
- information_schema - “”。 。
- performance_schema - ?? []
- MariaDBGaleraTokuDB

。

```
mysql> CREATE DATABASE menagerie;
```

UnixSQLmenagerieMenagerieMENAGERIE。 。 Windows。 。 。

;。

```
mysql> USE menagerie
Database changed
```

mysql。 USE。 mysql。 。

```
shell> mysql -h host -u user -p menagerie
Enter password: ********
```

https://riptutorial.com/zh-CN/mysql/topic/600/

30:

MySQL

```
SELECT User,Host FROM mysql.user;
```

Examples

MySQL

1rootMySQL

```
$ mysql -u root -p
```

2mysql

```
mysql> CREATE USER 'my_new_user'@'localhost' IDENTIFIED BY 'test_password';
```

permissions permissions

```
mysql> GRANT ALL PRIVILEGES ON my_db.* TO 'my_new_user'@'localhost' identified by
'my_password';
```

```
mysql> CREATE USER 'my_new_user'@'localhost' IDENTIFIED BY 'test_password';
```

PASSWORDPASSWORD()

```
mysql> select PASSWORD('test_password'); -- returns *4414E26EDED6D661B5386813EBBA95065DBC4728
mysql> CREATE USER 'my_new_user'@'localhost' IDENTIFIED BY PASSWORD
'*4414E26EDED6D661B5386813EBBA95065DBC4728';
```

```
grant all privileges on schema_name.* to 'new_user_name'@'%' identified by 'newpassword';
```

root

```
rename user 'user'@'%' to 'new_name`@'%';
```

https://riptutorial.com/zh-CN/mysql/topic/3508/

31:

- [LOW_PRIORITY] [QUICK] [IGNORE] FROM[WHERE] [ORDER BY[ASC | DESC]] [LIMIT number_rows]; ///

	LOW_PRIORITY
	IGNORE
	◦
ORDER BY	ORDER BY
	◦ number_rows◦

Examples

Where

```
DELETE FROM `table_name` WHERE `field_one` = 'value_one'
```

field_one'value_one'

WHEREselect> < <>LIKE◦

WHERELIKE◦ ◦

```
DELETE FROM table_name ;
```

◦ ◦ WHERE DELETE◦

```
DELETE FROM `table_name` WHERE `field_one` = 'value_one' LIMIT 1
```

“Where”◦

◦ ◦

MySQLDELETEJOIN◦ ◦

```
create table people
(    id int primary key,
    name varchar(100) not null,
    gender char(1) not null
);
```

```
insert people (id,name,gender) values
(1,'Kathy','f'),(2,'John','m'),(3,'Paul','m'),(4,'Kim','f');

create table pets
(    id int auto_increment primary key,
    ownerId int not null,
    name varchar(100) not null,
    color varchar(100) not null
);
insert pets(ownerId,name,color) values
(1,'Rover','beige'),(2,'Bubbles','purple'),(3,'Spot','black and white'),
(1,'Rover2','white');
```

ID		
1		F
2		
3		
4		F

ID	OWNERID		
1	1		
2	2		
4	1	Rover2	

```
DELETE p2
FROM pets p2
WHERE p2.ownerId in (
    SELECT p1.id
    FROM people p1
    WHERE p1.name = 'Paul');
```

```
DELETE p2    -- remove only rows from pets
FROM people p1
JOIN pets p2
ON p2.ownerId = p1.id
WHERE p1.name = 'Paul';
```

1
SpotPets

p1p2◦

```
DELETE p1, p2     -- remove rows from both tables
FROM people p1
JOIN pets p2
ON p2.ownerId = p1.id
```

```
WHERE p1.name = 'Paul';
```

2
SpotPets

DELETEforeing◦ `pets`

```
ALTER TABLE pets ADD CONSTRAINT `fk_pets_2_people` FOREIGN KEY (ownerId) references people(id)
ON DELETE CASCADE;
```

petspeople

```
ERROR 1451 (23000): Cannot delete or update a parent row: a foreign key constraint fails
(`test`.`pets`, CONSTRAINT `pets_ibfk_1` FOREIGN KEY (`ownerId`) REFERENCES `people` (`id`))
```

peopleInnoDBON DELETE

```
DELETE FROM people
WHERE name = 'Paul';
```

2

Spot

```
SET foreign_key_checks = 0;
DELETE p1, p2 FROM people p1 JOIN pets p2 ON p2.ownerId = p1.id WHERE p1.name = 'Paul';
SET foreign_key_checks = 1;
```

```
DELETE FROM `myTable` WHERE `someColumn` = 'something'
```

WHERE◦

DELETETRUNCATE

```
TRUNCATE tableName;
```

AUTO_INCREMENT◦ DELETE FROM tableName◦ /◦

SQL Server◦ `innodb_file_per_table=OFF`◦

MySQL

```
    -- remove only the employees
    DELETE e
    FROM Employees e JOIN Department d ON e.department_id = d.department_id
    WHERE d.name = 'Sales'
```

```
-- remove employees and department
DELETE e, d
FROM Employees e JOIN Department d ON e.department_id = d.department_id
WHERE d.name = 'Sales'
```

```
-- remove from all tables (in this case same as previous)
DELETE
FROM Employees e JOIN Department d ON e.department_id = d.department_id
WHERE d.name = 'Sales'
```

https://riptutorial.com/zh-CN/mysql/topic/1487/

32:

- INNEROUTER。
- MySQLFULL 。
- “commajoin” FROM a,b WHERE ax=by ;FROM a JOIN b ON ax=by 。
- FROM a JOIN b ON ax = by。
- FROM LEFT JOIN b ON ax = byabNULLs 。

Examples

db

```
CREATE TABLE `user` (
`id` smallint(5) unsigned NOT NULL AUTO_INCREMENT,
`name` varchar(30) NOT NULL,
`course` smallint(5) unsigned DEFAULT NULL,
PRIMARY KEY (`id`)
) ENGINE=InnoDB;

CREATE TABLE `course` (
`id` smallint(5) unsigned NOT NULL AUTO_INCREMENT,
`name` varchar(50) NOT NULL,
PRIMARY KEY (`id`)
) ENGINE=InnoDB;
```

InnoDBuser.coursecourse.id

```
ALTER TABLE `user`
ADD CONSTRAINT `FK_course`
FOREIGN KEY (`course`) REFERENCES `course` (`id`)
ON UPDATE CASCADE;
```

```
SELECT user.name, course.name
FROM `user`
INNER JOIN `course` on user.course = course.id;
```

“”

```
SELECT x, ...
    FROM ( SELECT y, ... FROM ... ) AS a
    JOIN tbl  ON tbl.x = a.y
    WHERE ...
```

JOINtbl 。

5.6。

```
SELECT ...
    FROM ( SELECT y, ... FROM ... ) AS a
    JOIN ( SELECT x, ... FROM ... ) AS b  ON b.x = a.y
    WHERE ...
```

5.6。 "。

```
SELECT
        @n := @n + 1,
        ...
    FROM ( SELECT @n := 0 ) AS initialize
    JOIN the_real_table
    ORDER BY ...
```

CROSS JOIN ON。 the_real_tablenthe_real_table。

-

```
SELECT c.CustomerName, o.OrderID
    FROM Customers AS c
    INNER JOIN Orders AS o
        ON c.CustomerID = o.CustomerID
    ORDER BY c.CustomerName, o.OrderID;
```

```
SELECT c.CustomerName, COUNT(*) AS 'Order Count'
    FROM Customers AS c
    INNER JOIN Orders AS o
        ON c.CustomerID = o.CustomerID
    GROUP BY c.CustomerID;
    ORDER BY c.CustomerName;
```

```
SELECT  c.CustomerName,
        ( SELECT COUNT(*) FROM Orders WHERE CustomerID = c.CustomerID ) AS 'Order Count'
    FROM Customers AS c
    ORDER BY c.CustomerName;
```

。

```
SELECT  c.CustomerName,
    FROM Customers AS c
    WHERE EXISTS ( SELECT * FROM Orders WHERE CustomerID = c.CustomerID )
    ORDER BY c.CustomerName;
```

MySQLFULL OUTER JOIN。

```
-- ----------------------------
-- Table structure for `owners`
-- ----------------------------
DROP TABLE IF EXISTS `owners`;
CREATE TABLE `owners` (
```

```
`owner_id` int(11) NOT NULL AUTO_INCREMENT,
`owner` varchar(30) DEFAULT NULL,
PRIMARY KEY (`owner_id`)
) ENGINE=InnoDB AUTO_INCREMENT=10 DEFAULT CHARSET=latin1;

-- ----------------------------
-- Records of owners
-- ----------------------------
INSERT INTO `owners` VALUES ('1', 'Ben');
INSERT INTO `owners` VALUES ('2', 'Jim');
INSERT INTO `owners` VALUES ('3', 'Harry');
INSERT INTO `owners` VALUES ('6', 'John');
INSERT INTO `owners` VALUES ('9', 'Ellie');
-- ----------------------------
-- Table structure for `tools`
-- ----------------------------
DROP TABLE IF EXISTS `tools`;
CREATE TABLE `tools` (
`tool_id` int(11) NOT NULL AUTO_INCREMENT,
`tool` varchar(30) DEFAULT NULL,
`owner_id` int(11) DEFAULT NULL,
PRIMARY KEY (`tool_id`)
) ENGINE=InnoDB AUTO_INCREMENT=11 DEFAULT CHARSET=latin1;
-- ----------------------------
-- Records of tools
-- ----------------------------
INSERT INTO `tools` VALUES ('1', 'Hammer', '9');
INSERT INTO `tools` VALUES ('2', 'Pliers', '1');
INSERT INTO `tools` VALUES ('3', 'Knife', '1');
INSERT INTO `tools` VALUES ('4', 'Chisel', '2');
INSERT INTO `tools` VALUES ('5', 'Hacksaw', '1');
INSERT INTO `tools` VALUES ('6', 'Level', null);
INSERT INTO `tools` VALUES ('7', 'Wrench', null);
INSERT INTO `tools` VALUES ('8', 'Tape Measure', '9');
INSERT INTO `tools` VALUES ('9', 'Screwdriver', null);
INSERT INTO `tools` VALUES ('10', 'Clamp', null);
```

◦

UNION◦ LEFT JOIN◦ ◦

RIGHT JOIN◦ NULL ◦ WHERE -clauseowners.owner_id IS NULL◦

UNION ALL ◦

```
SELECT `owners`.`owner`, tools.tool
FROM `owners`
LEFT JOIN `tools` ON `owners`.`owner_id` = `tools`.`owner_id`
UNION ALL
SELECT `owners`.`owner`, tools.tool
FROM `owners`
RIGHT JOIN `tools` ON `owners`.`owner_id` = `tools`.`owner_id`
WHERE `owners`.`owner_id` IS NULL;

+-------+--------------+
| owner | tool         |
+-------+--------------+
| Ben   | Pliers       |
| Ben   | Knife        |
```

```
| Ben   | Hacksaw      |
| Jim   | Chisel       |
| Harry | NULL         |
| John  | NULL         |
| Ellie | Hammer       |
| Ellie | Tape Measure |
| NULL  | Level        |
| NULL  | Wrench       |
| NULL  | Screwdriver  |
| NULL  | Clamp        |
+-------+--------------+
12 rows in set (0.00 sec)
```

3

。

- 。
-
-

“”

ID		reg_date	
1		201688	....

“”

ID	
1	yennefer
2	

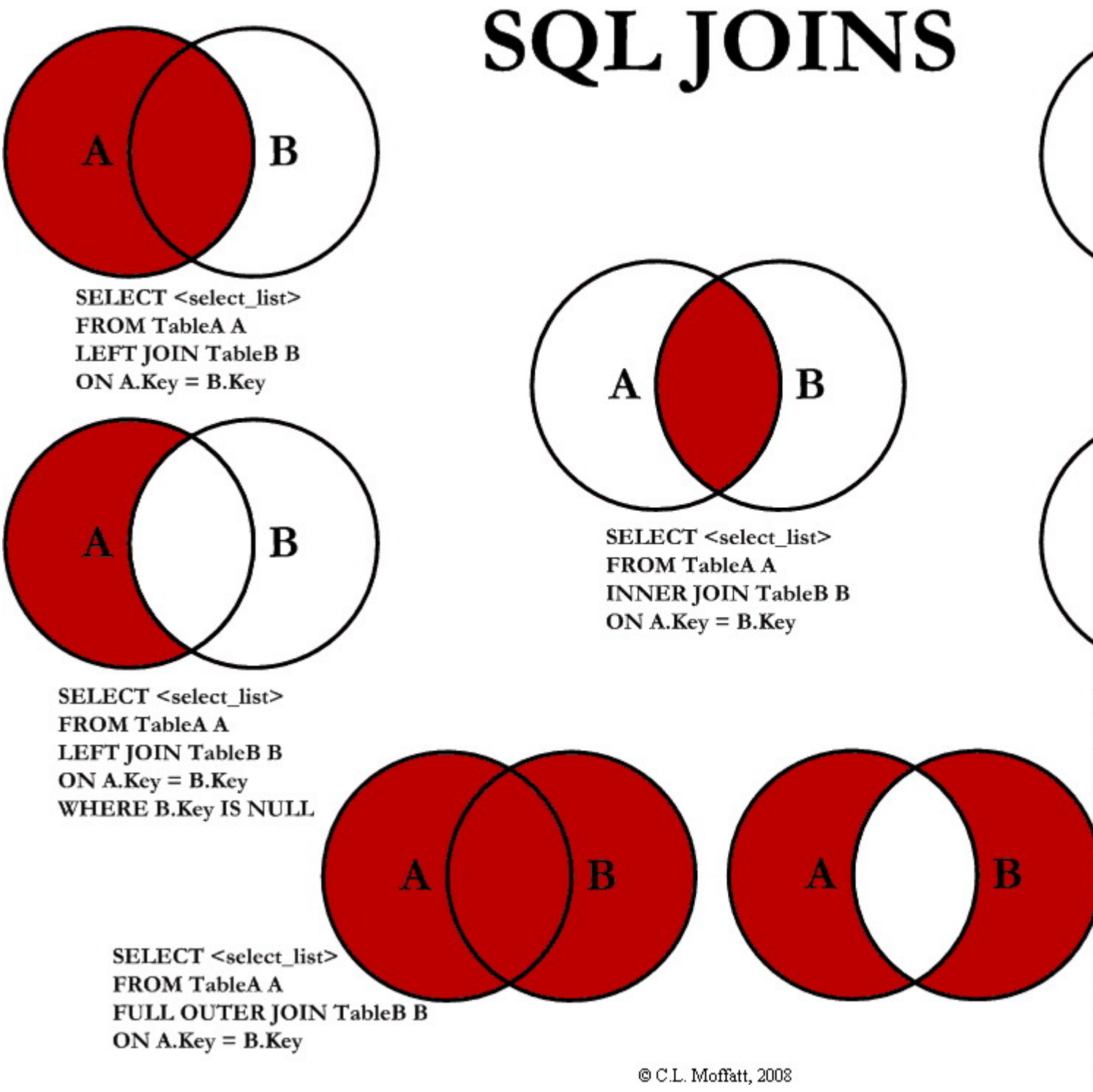
“tags_meta”

POST_ID	TAG_ID
1	2

```
SELECT videogame.id,
    videogame.title,
    videogame.reg_date,
    tags.name,
    tags_meta.post_id
FROM tags_meta
INNER JOIN videogame ON videogame.id = tags_meta.post_id
INNER JOIN tags ON tags.id = tags_meta.tag_id
WHERE tags.name = "elizabeth"
ORDER BY videogame.reg_date
```

“#elizabeth”

MySQL`JOIN` ◦



https://riptutorial.com/zh-CN/mysql/topic/2736/

33:

1. [LOW_PRIORITY | CONCURRENT] [LOCAL] INFILE'file_name'
2. INTO TABLE tbl_name
3. [CHARACTER SET charset]
4. [{FIELDS | COLUMNS} ['string'] [[OPTIONALL]'char']]
5. [LINES [STARTING BY'string'] [TERMINATED BY'string']]
6. [IGNORE{LINES | ROWS}]
7. [col_name_or_user_var...]
8. [SET col_name = expr...]

Examples

LOAD DATA INFILE

';' - CSV。

```
1;max;male;manager;12-7-1985
2;jack;male;executive;21-8-1990
.
.
.
1000000;marta;female;accountant;15-6-1992
```

。

```
CREATE TABLE `employee` ( `id` INT NOT NULL ,
                          `name` VARCHAR NOT NULL,
                          `sex` VARCHAR NOT NULL ,
                          `designation` VARCHAR NOT NULL ,
                          `dob` VARCHAR NOT NULL   );
```

。

```
LOAD DATA INFILE 'path of the file/file_name.txt'
INTO TABLE employee
FIELDS TERMINATED BY ';' //specify the delimiter separating the values
LINES TERMINATED BY '\r\n'
(id,name,sex,designation,dob)
```

。

```
1;max;male;manager;17-Jan-1985
2;jack;male;executive;01-Feb-1992
.
.
.
1000000;marta;female;accountant;25-Apr-1993
```

dob。

```
LOAD DATA INFILE 'path of the file/file_name.txt'
INTO TABLE employee
FIELDS TERMINATED BY ';' //specify the delimiter separating the values
LINES TERMINATED BY '\r\n'
(id,name,sex,designation,@dob)
SET date = STR_TO_DATE(@date, '%d-%b-%Y');
```

LOAD DATA INFILE。

LOAD DATA INFILE。

CSVMySQL

CSVMySQLCSV。

```
load data infile '/tmp/file.csv'
into table my_table
fields terminated by ','
optionally enclosed by '"'
escaped by '"'
lines terminated by '\n'
ignore 1 lines; -- skip the header row
```

LOAD DATA INFILE。 。

。 。

```
LOAD DATA LOCAL INFILE 'path of the file/file_name.txt'
INTO TABLE employee
```

LOAD DATA INFILE'fname'

replace

```
LOAD DATA INFILE 'path of the file/file_name.txt'
REPLACE INTO TABLE employee
```

LOAD DATA INFILE'fname'IGNORE

REPLACE。 LOCAL 。 。

```
LOAD DATA INFILE 'path of the file/file_name.txt'
IGNORE INTO TABLE employee
```

◦ ◦ ◦

```
INSERT INTO employee SELECT * FROM intermediary WHERE ...
```

```
SELECT a,b,c  INTO OUTFILE 'result.txt' FIELDS TERMINATED BY ',' OPTIONALLY ENCLOSED BY '"'
LINES TERMINATED BY '\n' FROM table;
```

```
LOAD DATA INFILE 'result.txt' INTO TABLE table;
```

https://riptutorial.com/zh-CN/mysql/topic/2356/

34:

Examples

`` 。

“ *MySQL* ”。 PHPmyAdmin“ *MySQL* ”。

“ `group` ”。

```
SELECT student_name, AVG(test_score) FROM student GROUP BY group
```

```
SELECT student_name, AVG(test_score) FROM student GROUP BY `group`
```

。 JOIN。

```
SELECT `users`.`username`, `groups`.`group` FROM `users`
```

。

```
select student_name, AVG(test_score) from student group by group
select `student_name`, AVG(`test_score`) from `student` group by `group`
```

MySQL。 R。 。 。

https://riptutorial.com/zh-CN/mysql/topic/5208/

35:

MySQLTIMESTAMP。

。 VARCHAR64。 。 America/Edmonton 。 Asia/KolkataAustralia/NSW 。 WordPress.org。

JavaphpDBMSSQL

```
SET SESSION time_zone='(whatever tz string the user gave you)'
```

。 TIMESTAMP。

UTC。 NOWCURDATE。 TIMESTAMPDATETIMEDATE。

MySQLUTC。 。 MySQL。

Examples

。

NOW()NOW()NOW()UTC。

```
SELECT NOW();
SET time_zone='Asia/Kolkata';
SELECT NOW();
SET time_zone='UTC';
SELECT NOW();
```

`DATE``DATETIME`。

DATEDATETIME MySQL。 。 CONVERT_TZ()。 。

```
SELECT CONVERT_TZ(date_sold,'UTC','America/Los_Angeles') date_sold_local
  FROM sales
 WHERE state_sold = 'CA'
```

`TIMESTAMP`

。 TIMESTAMPtime_zone。

```
SET SESSION time_zone='America/Los_Angeles';
SELECT timestamp_sold
  FROM sales
 WHERE state_sold = 'CA'
```

TIMESTAMPUNIX time_t 。 UNIX1970-01-01 00:00:00 UTC1970-01-01 00:00:00 。

`TIMESTAMP`。 `DATE`、`DATETIME`。

time_zone。

```
SELECT @@time_zone
```

`SYSTEM` MySQL。

UTC。

```
CREATE TEMPORARY TABLE times (dt DATETIME, ts TIMESTAMP);
SET time_zone = 'UTC';
INSERT INTO times VALUES(NOW(), NOW());
SET time_zone = 'SYSTEM';
SELECT dt, ts, TIMESTAMPDIFF(MINUTE, dt, ts)offset FROM times;
DROP TEMPORARY TABLE times;
```

。 `DATETIME` `TIMESTAMP`UTC。 time_zoneUTC`INSERT`/。

time_zoneSELECT。 `TIMESTAMP`UTCSELECT。 `DATETIME`。 `TIMESTAMPDIFF(MINUTE...)`。

time_zone

MySQLtime_zone。

```
SELECT mysql.time_zone_name.name
```

Paul EggertZoneInfo 。 600。

UnixLinuxBSDMac OS。 MySQL/。

Windows。 ZoneInfo。

https://riptutorial.com/zh-CN/mysql/topic/7849/

36:

Examples

NULL

MySQLSQL `NULL`。

。 NULL

```
CREATE TABLE example
(`applicant_id` INT, `company_name` VARCHAR(255), `end_date` DATE);

+--------------+-----------------+------------+
| applicant_id | company_name    | end_date   |
+--------------+-----------------+------------+
|            1 | Google          | NULL       |
|            1 | Initech         | 2013-01-31 |
|            2 | Woodworking.com | 2016-08-25 |
|            2 | NY Times        | 2013-11-10 |
|            3 | NFL.com         | 2014-04-13 |
+--------------+-----------------+------------+
```

2016-01-01NULL。

```
SELECT * FROM example WHERE end_date > '2016-01-01';
```

NULL

```
+--------------+-----------------+------------+
| applicant_id | company_name    | end_date   |
+--------------+-----------------+------------+
|            2 | Woodworking.com | 2016-08-25 |
+--------------+-----------------+------------+
```

MySQL <>=<>`NULL`TRUEFALSE。 `NULL` end_date2016-01-012016-01-01。

IS NULL

```
SELECT * FROM example WHERE end_date > '2016-01-01' OR end_date IS NULL;

+--------------+-----------------+------------+
| applicant_id | company_name    | end_date   |
+--------------+-----------------+------------+
|            1 | Google          | NULL       |
|            2 | Woodworking.com | 2016-08-25 |
+--------------+-----------------+------------+
```

`MAX()` `GROUP BY`NULL。 applicant_id

```
SELECT applicant_id, MAX(end_date) FROM example GROUP BY applicant_id;

+--------------+---------------+
| applicant_id | MAX(end_date) |
+--------------+---------------+
|            1 | 2013-01-31    |
|            2 | 2016-08-25    |
|            3 | 2014-04-13    |
+--------------+---------------+
```

NULL◦ CASE WHENNULL

```
 SELECT
    applicant_id,
    CASE WHEN MAX(end_date is null) = 1 THEN 'present' ELSE MAX(end_date) END
    max_date
FROM example
GROUP BY applicant_id;

+--------------+------------+
| applicant_id | max_date   |
+--------------+------------+
|            1 | present    |
|            2 | 2016-08-25 |
|            3 | 2014-04-13 |
+--------------+------------+
```

example

```
SELECT
  data.applicant_id,
  data.company_name,
  data.max_date
FROM (
  SELECT
    *,
    CASE WHEN end_date is null THEN 'present' ELSE end_date END max_date
  FROM example
) data
INNER JOIN (
 SELECT
   applicant_id,
   CASE WHEN MAX(end_date is null) = 1 THEN 'present' ELSE MAX(end_date) END max_date
 FROM
   example
 GROUP BY applicant_id
) j
ON data.applicant_id = j.applicant_id AND data.max_date = j.max_date;

+--------------+-----------------+------------+
| applicant_id | company_name    | max_date   |
+--------------+-----------------+------------+
|            1 | Google          | present    |
|            2 | Woodworking.com | 2016-08-25 |
|            3 | NFL.com         | 2014-04-13 |
+--------------+-----------------+------------+
```

MySQLNULL◦

https://riptutorial.com/zh-CN/mysql/topic/5866/

37:

[Backup]MySQLMySQL。

Master - MySQL

Slave - MySQLMaster

MySQL。 。 。

。

SBR - SQL。 masterSQL。 SQL。

RBR - 。 。 。

MBR 。 。 。

5.7.7MySQL。 MySQL 5.7.7。

Examples

-

2MySQLMasterSlave。

Master。 SlaveMaster。

Master。 SlaveMaster。

```
CREATE USER 'user_name'@'%' IDENTIFIED BY 'user_password';
GRANT REPLICATION SLAVE ON *.* TO 'user_name'@'%';
FLUSH PRIVILEGES;
```

`user_nameuser_password` 。

`my.inf` Linuxmy.cnf。 [mysqld]。

```
server-id = 1
log-bin = mysql-bin.log
binlog-do-db = your_database
```

MySQLID。

MySQL。 Linux`log-bin = /home/mysql/logs/mysql-bin.log` 。 MySQL。

。 `your_database` 。

`skip-networking`MySQLMaster

`my.inf`Slave。[mysqld]。

```
server-id = 2
master-host = master_ip_address
master-connect-retry = 60

master-user = user_name
master-password = user_password
replicate-do-db = your_database

relay-log = slave-relay.log
relay-log-index = slave-relay-log.index
```

MySQLID。ID。

IP。IP

。

SlaveMaster。

。

`relay-log`relay-log-index。

`skip-networking`MySQLSlave

MasterMaster。Master。

```
FLUSH TABLES WITH READ LOCK;
```

。

`mysqldump`Master

```
mysqldump your_database -u root -p > D://Backup/backup.sql;
```

`your_database`。 backup.sql。

```
CREATE DATABASE `your_database`;
```

Slave MySQL。

```
mysql -u root -p your_database  <D://Backup/backup.sql
--->Change `your_database` and backup directory according to your setup
```

Master。Master

```
SHOW MASTER STATUS;
```

```
+---------------------+----------+------------------------------+------------------+
| File                | Position | Binlog_Do_DB                 | Binlog_Ignore_DB |
+---------------------+----------+------------------------------+------------------+
| mysql-bin.000001    | 130      | your_database                |                  |
+---------------------+----------+------------------------------+------------------+
```

Slave

```
SLAVE STOP;
CHANGE MASTER TO MASTER_HOST='master_ip_address', MASTER_USER='user_name',
   MASTER_PASSWORD='user_password', MASTER_LOG_FILE='mysql-bin.000001', MASTER_LOG_POS=130;
SLAVE START;
```

◦ Master◦ MASTER_LOG_FILEMASTER_LOG_POS SHOW MASTER STATUS◦

MASTER_HOSTIP◦

◦

```
SHOW SLAVE STATUS;
```

MasterFLUSH TABLES WITH READ LOCK

```
UNLOCK TABLES;
```

MasterSlaveMaster◦ MasterSlave◦

MySQL◦ ◦

```
SET GLOBAL sql_slave_skip_counter = N;
```

N◦ ◦ ◦

```
STOP SLAVE;
SET GLOBAL sql_slave_skip_counter=1;
START SLAVE;
```

◦ ◦

my.cnf◦

```
1062 | Error 'Duplicate entry 'xyz' for key 1' on query
```

my.cnf

```
slave-skip-errors = 1062
```

。

```
slave-skip-errors=[err_code1,err_code2,...|all]

slave-skip-errors=1062,1053
slave-skip-errors=all
slave-skip-errors=ddl_exist_errors
```

https://riptutorial.com/zh-CN/mysql/topic/7218/

38:

- AUTO_INCREMENT ID - PK"PK;◦
- MEDIUMINT - INTs⇒◦ ◦
- UNSIGNED - INT
- NOT NULL -
- InnoDB - MyISAMPRIMARY KEYInnoDB◦
- INDEX(y_id, x_id) - PRIMARY KEY;◦ UNIQUE ;INSERTs◦
- INDEX(y_id)x_id ◦ “”◦

;◦ ◦

FOREIGN KEY◦

Examples

```
CREATE TABLE XtoY (
    # No surrogate id for this table
    x_id MEDIUMINT UNSIGNED NOT NULL,   -- For JOINing to one table
    y_id MEDIUMINT UNSIGNED NOT NULL,   -- For JOINing to the other table
    # Include other fields specific to the 'relation'
    PRIMARY KEY(x_id, y_id),            -- When starting with X
    INDEX      (y_id, x_id)             -- When starting with Y
) ENGINE=InnoDB;
```

◦

https://riptutorial.com/zh-CN/mysql/topic/4857/

39:

ASCII	
BIN	
BIT_LENGTH	
CHAR	
CHAR_LENGTH	
CHARACTER_LENGTH	CHAR_LENGTH
CONCAT	
CONCAT_WS	
ELT	
EXPORT_SET	on
FIND_IN_SET	
FROM_BASE64	base-64
HEX	
INSTR	
LCASE	LOWER
LOAD_FILE	
LPAD	
LTRIM	
MAKE_SET	

REGEXP	REGEXP
OCTET_LENGTH	LENGTH
ORD	
	LOCATE
	SQL
REGEXP	
RLIKE	REGEXP
RPAD	
RTRIM	
SOUNDEX	soundex
STRCMP	
SUBSTR	
SUBSTRING	
SUBSTRING_INDEX	
TO_BASE64	base-64
UCASE	UPPER
UNHEX	
WEIGHT_STRING	

Examples

```
SELECT FIND_IN_SET('b','a,b,c');
```

2

```
SELECT FIND_IN_SET('d','a,b,c');
```

0

STR_TO_DATE -

`my_date_field` [string] `07/25/2016` `STR_TO_DATE`

```
SELECT STR_TO_DATE(my_date_field, '%m/%d/%Y') FROM my_table;
```

`WHERE`◦

LOWER/ LCASE

LOWERstr

```
LOWER('fOoBar') -- 'foobar'
LCASE('fOoBar') -- 'foobar'
```

REPLACEstrfrom_strto_str

```
REPLACE('foobarbaz', 'bar', 'BAR') -- 'fooBARbaz'
REPLACE('foobarbaz', 'zzz', 'ZZZ') -- 'foobarbaz'
```

SUBSTRING

SUBSTRINGSUBSTR

`SUBSTRING(str, start_position)`

```
SELECT SUBSTRING('foobarbaz', 4); -- 'barbaz'
SELECT SUBSTRING('foobarbaz' FROM 4); -- 'barbaz'

-- using negative indexing
SELECT SUBSTRING('foobarbaz', -6); -- 'barbaz'
SELECT SUBSTRING('foobarbaz' FROM -6); -- 'barbaz'
```

`SUBSTRING(str, start_position, length)`

```
SELECT SUBSTRING('foobarbaz', 4, 3); -- 'bar'
SELECT SUBSTRING('foobarbaz', FROM 4 FOR 3); -- 'bar'

-- using negative indexing
SELECT SUBSTRING('foobarbaz', -6, 3); -- 'bar'
SELECT SUBSTRING('foobarbaz' FROM -6 FOR 3); -- 'bar'
```

UPPER/ UCASE

UPPERstr

```
UPPER('fOoBar') -- 'FOOBAR'
UCASE('fOoBar') -- 'FOOBAR'
```

◦ CHAR_LENGTH

LENGTHstr

```
LENGTH('foobar') -- 6
LENGTH('fööbar') -- 8 -- contrast with CHAR_LENGTH(...) = 6
```

CHAR_LENGTH

CHAR_LENGTHstr

```
CHAR_LENGTH('foobar') -- 6
CHAR_LENGTH('fööbar') -- 6 -- contrast with LENGTH(...) = 8
```

HEXSTR

◦ ◦

```
HEX('fööbar') -- 66F6F6626172 -- in "CHARACTER SET latin1" because "F6" is hex for ö
HEX('fööbar') -- 66C3B6C3B6626172  -- in "CHARACTER SET utf8 or utf8mb4" because "C3B6" is hex
for ö
```

https://riptutorial.com/zh-CN/mysql/topic/1399/

40:

Examples

```
CREATE TABLE foo ( ...
    name CHARACTER SET utf8mb4
    ... );
```

MySQL。

```
SET NAMES utf8mb4;
```

PHPPythonJava...`SET NAMES`。

`SET NAMES utf8mb4 CHARACTER SET latin1` -latin1utf8mb4`INSERTingSELECTing`。

。 。 `SHOW COLLATION;SHOW COLLATION;` 。

4`CHARACTER SETs`

```
ascii -- basic 7-bit codes.
latin1 -- ascii, plus most characters needed for Western European languages.
utf8 -- the 1-, 2-, and 3-byte subset of utf8.  This excludes Emoji and some of Chinese.
utf8mb4 -- the full set of UTF8 characters, covering all current languages.
```

。 utf8utf8mb4。

...

- utf8mb4`TEXTVARCHAR`。
- UUIDMD5country_codepostal_codeasciilatin1。

utf8mb45.5.3utf8。

MySQL “UTF8”MySQLutf8mb4MySQLutf8。

charset`_ci`“case and accent insensitive”`_bin`“。

“”utf8mb4`utf8mb4_unicode_520_ci` Unicode 5.20。 `utf8mb4_polish_ci` 。

`CHARACTER SETCHARSET`

```
CREATE TABLE Address (
    `AddressID`   INTEGER NOT NULL PRIMARY KEY,
    `Street`      VARCHAR(80) CHARACTER SET ASCII,
    `City`        VARCHAR(80),
    `Country`     VARCHAR(80) DEFAULT "United States",
    `Active`      BOOLEAN DEFAULT 1,
```

```
) Engine=InnoDB default charset=UTF8;
```

CityCountryUTF8 ◦ StreetASCII ◦

◦

https://riptutorial.com/zh-CN/mysql/topic/4569/

41:

◦	
	RETURN◦

◦

CALL◦

◦

Examples

INT12 ◦

```
DELIMITER ||
CREATE FUNCTION functionname()
RETURNS INT
BEGIN
    RETURN 12;
END;
||
DELIMITER ;
```

DELIMITER || ;;CREATE◦

CREATE FUNCTION; DELIMITER ; ◦

```
SELECT functionname();
+----------------+
| functionname() |
+----------------+
|             12 |
+----------------+
```

```
DELIMITER $$
CREATE FUNCTION add_2 ( my_arg INT )
  RETURNS INT
BEGIN
  RETURN (my_arg + 2);
END;
$$
DELIMITER ;

SELECT add_2(12);
+-----------+
| add_2(12) |
+-----------+
```

```
|        14 |
+-----------+
```

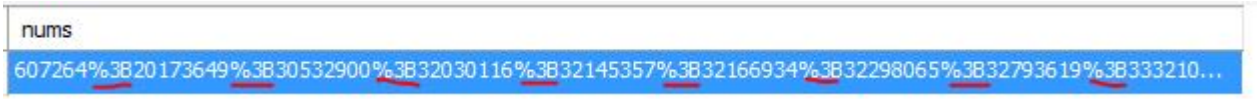
DELIMITER◦ CREATE\\ ||$$ ◦

GUI◦

```
DROP PROCEDURE if exists displayNext100WithName;
DELIMITER $$
CREATE PROCEDURE displayNext100WithName
(    nStart int,
    tblName varchar(100)
)
BEGIN
    DECLARE thesql varchar(500); -- holds the constructed sql string to execute

    -- expands the sizing of the output buffer to accomodate the output (Max value is at least
4GB)
    SET session group_concat_max_len = 4096; -- prevents group_concat from barfing with error
1160 or whatever it is

    SET @thesql=CONCAT("select group_concat(qid order by qid SEPARATOR '%3B') as nums ","from
(    select qid from ");
    SET @thesql=CONCAT(@thesql,tblName," where qid>? order by qid limit 100 )xDerived");
    PREPARE stmt1 FROM @thesql; -- create a statement object from the construct sql string to
execute
    SET @p1 = nStart; -- transfers parameter passed into a User Variable compatible with the
below EXECUTE
    EXECUTE stmt1 USING @p1;

    DEALLOCATE PREPARE stmt1; -- deallocate the statement object when finished
END$$
DELIMITER ;
```

DELIMITER◦

```
call displayNext100WithName(1,"questions_mysql");
```



%3B

INOUTINOUT

```
DELIMITER $$

DROP PROCEDURE IF EXISTS sp_nested_loop$$
CREATE PROCEDURE sp_nested_loop(IN i INT, IN j INT, OUT x INT, OUT y INT, INOUT z INT)
BEGIN
    DECLARE a INTEGER DEFAULT 0;
    DECLARE b INTEGER DEFAULT 0;
    DECLARE c INTEGER DEFAULT 0;
    WHILE a < i DO
        WHILE b < j DO
            SET c = c + 1;
```

```
            SET b = b + 1;
        END WHILE;
        SET a = a + 1;
        SET b = 0;
    END WHILE;
    SET x = a, y = c;
    SET z = x + y + z;
END $$
DELIMITER ;
```

CALL

```
SET @z = 30;
call sp_nested_loop(10, 20, @x, @y, @z);
SELECT @x, @y, @z;
```

```
+------+------+------+
|  @x  |  @y  |  @z  |
+------+------+------+
|  10  |  200 |  240 |
+------+------+------+
```

IN◦ ◦

OUT◦ NULL◦

INOUT◦

http //dev.mysql.com/doc/refman/5.7/en/create-procedure.html

◦ DECLARESQL

```
DECLARE student CURSOR FOR SELECT name FROM studend;
```

◦ ◦

```
CREATE TABLE product
(
  id   INT(10) UNSIGNED NOT NULL AUTO_INCREMENT PRIMARY KEY,
  type VARCHAR(50)      NOT NULL,
  name VARCHAR(255)     NOT NULL

);
CREATE TABLE product_type
(
  name VARCHAR(50) NOT NULL PRIMARY KEY
);
CREATE TABLE product_type_count
(
  type  VARCHAR(50)      NOT NULL PRIMARY KEY,
  count INT(10) UNSIGNED NOT NULL DEFAULT 0
);

INSERT INTO product_type (name) VALUES
```

```
  ('dress'),
  ('food');

INSERT INTO product (type, name) VALUES
  ('dress', 'T-shirt'),
  ('dress', 'Trousers'),
  ('food', 'Apple'),
  ('food', 'Tomatoes'),
  ('food', 'Meat');
```

```
DELIMITER //
DROP PROCEDURE IF EXISTS product_count;
CREATE PROCEDURE product_count()
  BEGIN
    DECLARE p_type VARCHAR(255);
    DECLARE p_count INT(10) UNSIGNED;
    DECLARE done INT DEFAULT 0;
    DECLARE product CURSOR FOR
      SELECT
        type,
        COUNT(*)
      FROM product
      GROUP BY type;
    DECLARE CONTINUE HANDLER FOR SQLSTATE '02000' SET done = 1;

    TRUNCATE product_type;

    OPEN product;

    REPEAT
      FETCH product
      INTO p_type, p_count;
      IF NOT done
      THEN
        INSERT INTO product_type_count
        SET
          type  = p_type,
          count = p_count;
      END IF;
    UNTIL done
    END REPEAT;

    CLOSE product;
  END //
DELIMITER ;
```

```
CALL product_count();
```

product_type_count

```
type   | count
---------------
dress  |   2
food   |   3
```

CURSOR

```
INSERT INTO product_type_count
        (type, count)
    SELECT type, COUNT(*)
        FROM product
        GROUP BY type;
```

。

ResultSet

SELECT Stored Procedure。 PerlPHPCALL。

```
DELIMITER $$
CREATE
    DEFINER=`db_username`@`hostname_or_IP`
    FUNCTION `function_name`(optional_param data_type(length_if_applicable))
    RETURNS data_type
BEGIN
    /*
    SQL Statements goes here
    */
END$$
DELIMITER ;
```

RETURNS data_typeMySQL。

https://riptutorial.com/zh-CN/mysql/topic/1351/--

42:

。

Examples

REGEXP / RLIKE

REGEXP RLIKE 。

employee

```
+-------------+-------------+-------------+--------------+----------+
| EMPLOYEE_ID | FIRST_NAME  | LAST_NAME   | PHONE_NUMBER | SALARY   |
+-------------+-------------+-------------+--------------+----------+
|         100 | Steven      | King        | 515.123.4567 | 24000.00 |
|         101 | Neena       | Kochhar     | 515.123.4568 | 17000.00 |
|         102 | Lex         | De Haan     | 515.123.4569 | 17000.00 |
|         103 | Alexander   | Hunold      | 590.423.4567 |  9000.00 |
|         104 | Bruce       | Ernst       | 590.423.4568 |  6000.00 |
|         105 | David       | Austin      | 590.423.4569 |  4800.00 |
|         106 | Valli       | Pataballa   | 590.423.4560 |  4800.00 |
|         107 | Diana       | Lorentz     | 590.423.5567 |  4200.00 |
|         108 | Nancy       | Greenberg   | 515.124.4569 | 12000.00 |
|         109 | Daniel      | Faviet      | 515.124.4169 |  9000.00 |
|         110 | John        | Chen        | 515.124.4269 |  8200.00 |
+-------------+-------------+-------------+--------------+----------+
```

^

FIRST_NAME**N**。

```
SELECT * FROM employees WHERE FIRST_NAME REGEXP '^N'
-- Pattern start with----------------------------^
```

$ **

PHONE_NUMBER**4569**。

```
SELECT * FROM employees WHERE PHONE_NUMBER REGEXP '4569$'
-- Pattern end with-----------------------------------^
```

REGEXP

FIRST_NAME **N**。

```
SELECT * FROM employees WHERE FIRST_NAME NOT REGEXP '^N'
```

```
-- Pattern does not start with---------------^
```

LAST_NAME FIRST_NAMEa ◦

```
SELECT * FROM employees WHERE FIRST_NAME REGEXP 'a' AND LAST_NAME REGEXP 'in'
-- No ^ or $, pattern can be anywhere ------------------------------------^
```

[]

FIRST_NAME**ABC**◦

```
SELECT * FROM employees WHERE FIRST_NAME REGEXP '^[ABC]'
-------------------------------------------------^^---^
```

|

FIRST_NAME**ABCr ei**◦

```
SELECT * FROM employees WHERE FIRST_NAME REGEXP '^[ABC]|[rei]$'
-- ------------------------------------------------^^---^^^---^^
```

```
SELECT FIRST_NAME, FIRST_NAME REGEXP '^N' as matching FROM employees
```

FIRST_NAME REGEXP '^N'*10*FIRST_NAME^N◦

```
SELECT
FIRST_NAME,
IF(FIRST_NAME REGEXP '^N', 'matches ^N', 'does not match ^N') as matching
FROM employees
```

```
SELECT
IF(FIRST_NAME REGEXP '^N', 'matches ^N', 'does not match ^N') as matching,
COUNT(*)
FROM employees
GROUP BY matching
```

https://riptutorial.com/zh-CN/mysql/topic/9444/

43:

- SELECTDISTINCTGROUP BY。
- OFFSET“”。
- WHEREab=22,33。
- UNIONALLDISTINCT - ALLDISTINCT。
- SELECT *TEXTBLOB。 tmp。
- GROUP BYORDER BY。
- FORCE INDEX;。

ORDER BYLIKEREGEXP。 。

。

Examples

“”。

“”。

```
INDEX(last_name, first_name)
```

```
WHERE last_name = '...'
WHERE first_name = '...' AND last_name = '...'   -- (order in WHERE does not matter)
```

```
WHERE first_name = '...'   -- order in INDEX _does_ matter
WHERE last_name = '...' OR first_name = '...'   -- "OR" is a killer
```

`innodb_buffer_pool_size`70。

```
x IN ( SELECT ... )
```

`JOIN`

`OR` 。

“”`WHERE DATE(x) = ...` ;`WHERE x = ...`

`WHERE LCASE(name1) = LCASE(name2)` 。

OFFSET“”“”。

SELECT * ...。

Maria DelevaBarrankaBatsu;。/。

。/。

- InnoDBMyISAM。
- PARTITIONing;。
- query_cache_size100M。
- my.cnf“”。
- “”INDEX(foo(20))。
- OPTIMIZE TABLE。 。

。

```
WHERE a = 12  --> INDEX(a)
WHERE a > 12  --> INDEX(a)

WHERE a = 12 AND b > 78  --> INDEX(a,b) is more useful than INDEX(b,a)
WHERE a > 12 AND b > 78  --> INDEX(a) or INDEX(b); no way to handle both ranges

ORDER BY x  --> INDEX(x)
ORDER BY x, y  --> INDEX(x,y) in that order
ORDER BY x DESC, y ASC  --> No index helps - because of mixing ASC and DESC
```

。

```
WHERE DATE(dt) = '2000-01-01'
```

INDEX(dt)

```
WHERE dt = '2000-01-01'  -- if `dt` is datatype `DATE`
```

DATE DATETIME TIMESTAMP DATETIME(6)

```
WHERE dt >= '2000-01-01'
  AND dt  < '2000-01-01' + INTERVAL 1 DAY
```

OR。

```
WHERE a = 12 OR b = 78
```

INDEX(a,b) “”INDEX(a), INDEX(b)。。

```
WHERE x = 3 OR x = 5
```

```
WHERE x IN (3, 5)
```

x◦

◦ “”“”◦ ◦ ◦

◦ 1◦ LEFT JOIN◦

```
SELECT a, b, ( SELECT ... FROM t WHERE t.x = u.x ) AS c
    FROM u ...
SELECT a, b, ( SELECT MAX(x) ... ) AS c
    FROM u ...
SELECT a, b, ( SELECT x FROM t ORDER BY ... LIMIT 1 ) AS c
    FROM u ...
```

```
SELECT ...
    FROM ( SELECT ... ) AS a
    JOIN b ON ...
```

FROM-SELECT

- 1◦
- “1”(SELECT @n := 0) `@variable◦
- JOIN(SELECT ...)◦ 5.6CROSS JOIN ; 5.6+SELECT◦

+ GROUP BY

```
SELECT ...
    FROM a
    JOIN b  ON ...
    WHERE ...
    GROUP BY a.id
```

JOIN;GROUP BY whittlesa ◦

◦ JOINSELECT◦ GROUP BY ◦

https://riptutorial.com/zh-CN/mysql/topic/4292/

44: MySQL 5.7+root

MySQL 5.7MySQLrootroot。 mysqld.log。 。

rootMySQL 5.7+

Examples

- 。
- SSL。
- validate_password。
- “root”@“localhost”。 。

root

“root”

```
shell> sudo grep 'temporary password' /var/log/mysqld.log
```

root

```
shell> mysql -uroot -p

mysql> ALTER USER 'root'@'localhost' IDENTIFIED BY 'MyNewPass5!';
```

MySQLvalidate_password。8。

UNIX“/ var / run / mysqld”root

。

```
$ mysql -u root -p
```

ERROR 104528000'root'@'localhost'YES

```
$ systemctl status mysql.service
```

mysql.service - MySQL/lib/systemd/system/mysql.service;;2017-06-08 14:31:33 IST; 38s ago

```
mysqld_safe --skip-grant-tables &
```

mysqld_safe UNIX'/ var / run / mysqld'。

```
$ systemctl stop  mysql.service
$ ps -eaf|grep mysql
$ mysqld_safe --skip-grant-tables &
```

```
$ mkdir -p /var/run/mysqld
$ chown mysql:mysql /var/run/mysqld
```

```
mysqld_safe --skip-grant-tables &
```

mysqld_safe/ var / lib / mysqlmysqld

```
$ mysql -u root
```

5.7.18-0ubuntu0.16.04.1Ubuntu

c2000,2017Oracle/。。

OracleOracle Corporation/。。

'help;"\ h'。'\ c'。

MySQL>

```
mysql> use mysql
mysql> describe user;
```

-A

```
mysql> FLUSH PRIVILEGES;
mysql> SET PASSWORD FOR root@'localhost' = PASSWORD('newpwd');
```

mysql root

```
UPDATE mysql.user SET Password=PASSWORD('newpwd') WHERE User='root';
```

```
   USE mysql
   UPDATE user SET Password = PASSWORD('newpwd')
   WHERE Host = 'localhost' AND User = 'root';
```

root

```
 USE mysql
 UPDATE user SET Password = PASSWORD('newpwd')
 WHERE Host = '%' AND User = 'root';`enter code here
```

`quit` mysql/

```
FLUSH PRIVILEGES;
sudo /etc/init.d/mysql stop
sudo /etc/init.d/mysql start
```

`mysql -u root -p'

MySQL>

MySQL 5.7+root https://riptutorial.com/zh-CN/mysql/topic/9563/mysql-5-7plusroot

45:

- DROP TABLE table_name;
- DROP TABLE IF EXISTS table_name; -
- DROP TABLE t1t2t3; - DROP
- DROP TEMPORARY TABLE t; - CREATE TEMPORARY TABLE...

	◦ DROP TABLE◦
	◦ DROP TABLE◦

Examples

Drop Table◦

tbl

```
CREATE TABLE tbl(
    id INT NOT NULL AUTO_INCREMENT,
    title VARCHAR(100) NOT NULL,
    author VARCHAR(40) NOT NULL,
    submission_date DATE,
    PRIMARY KEY (id)
);
```

```
DROP TABLE tbl;
```

◦

DROP TABLE Database.table_name

https://riptutorial.com/zh-CN/mysql/topic/4123/

46:

1. INSERT [LOW_PRIORITY || HIGH_PRIORITY] [IGNORE] [INTO] tbl_name [PARTITION partition_name...] [col_name...] {VALUES | VALUE}{expr | DEFAULT}..... [ON DUPLICATE KEY UPDATE col_name = expr [col_name = expr] ...]

2. INSERT [LOW_PRIORITY || HIGH_PRIORITY] [IGNORE] [INTO] tbl_name [PARTITION partition_name...] SET col_name = {expr | DEFAULT}... [ON DUPLICATE KEY UPDATE col_name = expr [col_name = expr] ...]

3. INSERT [LOW_PRIORITY | HIGH_PRIORITY] [IGNORE] [INTO] tbl_name [PARTITION partition_name...] [col_name...] SELECT ... [ON DUPLICATE KEY UPDATE col_name = expr [col_name = expr] ...]

4. expr。 col2col1
   INSERT INTO tbl_namecol1col2VALUES15col1 * 2;

5. VALUESINSERT。 。
   INSERT INTO tbl_nameabcVALUES1,2,34,5,67,8,9;

6. 。
   INSERT INTO tbl_nameabcVALUES1,2,3,4,5,6,7,8,9;

7. INSERT ... SELECT
   INSERT [LOW_PRIORITY | HIGH_PRIORITY] [IGNORE] [INTO] tbl_name [PARTITION partition_name...] [col_name...] SELECT ... [ON DUPLICATE KEY UPDATE col_name = expr...]

8. INSERT ... SELECT。
   INSERT INTO tbl_temp2fld_idSELECT tbl_temp1.fld_order_id FROM tbl_temp1 WHERE tbl_temp1.fld_order_id> 100;

INSERT

Examples

```
INSERT INTO `table_name` (`field_one`, `field_two`) VALUES ('value_one', 'value_two');
```

table_name field_onefield_two value_onevalue_twofield_onefield_two。

INSERTON DUPLICATE KEY UPDATE

```
INSERT INTO `table_name`
    (`index_field`, `other_field_1`, `other_field_2`)
    VALUES
    ('index_value', 'insert_value', 'other_value')
    ON DUPLICATE KEY UPDATE
```

```
        `other_field_1` = 'update_value',
        `other_field_2` = VALUES(`other_field_2`);
```

INSERTtable_nameother_field_1◦

VALUES()INSERT◦ INSERTUPDATE◦ other_field_1insert_valueINSERTupdate_valueUPDATEother_field_2

other_value ◦

IODKU◦ ◦ ◦

```
INSERT INTO `my_table` (`field_1`, `field_2`) VALUES
    ('data_1', 'data_2'),
    ('data_1', 'data_3'),
    ('data_4', 'data_5');
```

INSERT◦

“”◦ 10010◦

◦ INSERT IGNORE◦

```
SELECT * FROM `people`;
--- Produces:
+----+------+
| id | name |
+----+------+
|  1 | john |
|  2 | anna |
+----+------+


INSERT IGNORE INTO `people` (`id`, `name`) VALUES
    ('2', 'anna'), --- Without the IGNORE keyword, this record would produce an error
    ('3', 'mike');

SELECT * FROM `people`;
--- Produces:
+----+--------+
| id |  name  |
+----+--------+
|  1 |  john  |
|  2 |  anna  |
|  3 |  mike  |
+----+--------+
```

*INSERT IGNORE*Mysql

IGNORE◦ IGNORE>;◦

- ◦

INSERT

```
INSERT INTO `my_table` VALUES
        ('data_1', 'data_2'),
```

```
        ('data_1', 'data_3'),
        ('data_4', 'data_5');
```

INSERT SELECT

SELECT。

```
INSERT INTO `tableA` (`field_one`, `field_two`)
   SELECT `tableB`.`field_one`, `tableB`.`field_two`
   FROM `tableB`
   WHERE `tableB`.clmn <> 'someValue'
   ORDER BY `tableB`.`sorting_clmn`;
```

`SELECT * FROM tableAtableB` 。

`AUTO_INCREMENTINSERT` with `VALUES`。

。

AUTO_INCREMENT + LAST_INSERT_IDINSERT

`AUTO_INCREMENT PRIMARY KEY` 。 ID。

```
CREATE TABLE t (
    id SMALLINT UNSIGNED AUTO_INCREMENT NOT NULL,
    this ...,
    that ...,
    PRIMARY KEY(id) );

INSERT INTO t (this, that) VALUES (..., ...);
SELECT LAST_INSERT_ID() INTO @id;
INSERT INTO another_table (..., t_id, ...) VALUES (..., @id, ...);
```

`LAST_INSERT_ID()`ID。

API`LAST_INSERT_ID()SELECT@variable`MySQL`@variable` 。 。

IODKU“”`UNIQUEAUTO_INCREMENT PRIMARY KEY`“”。 。 `id`INSERT。

```
CREATE TABLE iodku (
    id INT AUTO_INCREMENT NOT NULL,
    name VARCHAR(99) NOT NULL,
    misc INT NOT NULL,
    PRIMARY KEY(id),
    UNIQUE(name)
) ENGINE=InnoDB;

INSERT INTO iodku (name, misc)
    VALUES
    ('Leslie', 123),
    ('Sally', 456);
Query OK, 2 rows affected (0.00 sec)
Records: 2  Duplicates: 0  Warnings: 0
```

```
+----+--------+------+
| id | name   | misc |
+----+--------+------+
|  1 | Leslie |  123 |
|  2 | Sally  |  456 |
+----+--------+------+
```

IODKU“”`LAST_INSERT_ID()id`

```
INSERT INTO iodku (name, misc)
    VALUES
    ('Sally', 3333)            -- should update
    ON DUPLICATE KEY UPDATE    -- `name` will trigger "duplicate key"
    id = LAST_INSERT_ID(id),
    misc = VALUES(misc);
SELECT LAST_INSERT_ID();       -- picking up existing value
+------------------+
| LAST_INSERT_ID() |
+------------------+
|                2 |
+------------------+
```

IODKU“”`LAST_INSERT_ID()id`

```
INSERT INTO iodku (name, misc)
    VALUES
    ('Dana', 789)          -- Should insert
    ON DUPLICATE KEY UPDATE
    id = LAST_INSERT_ID(id),
    misc = VALUES(misc);
SELECT LAST_INSERT_ID();   -- picking up new value
+------------------+
| LAST_INSERT_ID() |
+------------------+
|                3 |
+------------------+
```

```
SELECT * FROM iodku;
+----+--------+------+
| id | name   | misc |
+----+--------+------+
|  1 | Leslie |  123 |
|  2 | Sally  | 3333 |  -- IODKU changed this
|  3 | Dana   |  789 |  -- IODKU added this
+----+--------+------+
```

AUTO_INCREMENT ID

“”“”ID。InnoDB

```
CREATE TABLE Burn (
    id SMALLINT UNSIGNED AUTO_INCREMENT NOT NULL,
    name VARCHAR(99) NOT NULL,
    PRIMARY KEY(id),
    UNIQUE(name)
```

```
        ) ENGINE=InnoDB;

INSERT IGNORE INTO Burn (name) VALUES ('first'), ('second');
SELECT LAST_INSERT_ID();          -- 1
SELECT * FROM Burn ORDER BY id;
  +----+--------+
  |  1 | first  |
  |  2 | second |
  +----+--------+

INSERT IGNORE INTO Burn (name) VALUES ('second');  -- dup 'IGNOREd', but id=3 is burned
SELECT LAST_INSERT_ID();          -- Still "1" -- can't trust in this situation
SELECT * FROM Burn ORDER BY id;
  +----+--------+
  |  1 | first  |
  |  2 | second |
  +----+--------+

INSERT IGNORE INTO Burn (name) VALUES ('third');
SELECT LAST_INSERT_ID();           -- now "4"
SELECT * FROM Burn ORDER BY id;    -- note that id=3 was skipped over
  +----+--------+
  |  1 | first  |
  |  2 | second |
  |  4 | third  |    -- notice that id=3 has been 'burned'
  +----+--------+
```

◦ auto_increment◦ ID◦

◦ MAX(id) ◦ IDIDDELETEsID◦

INSERT REPLACE DELETE + INSERT ID◦ InnoDBinnodb_autoinc_lock_mode◦

“”AUTO INCREMENT id ◦ INT◦

https://riptutorial.com/zh-CN/mysql/topic/866/

47:

Examples

/

```
select '123' * 2;
```

2 MySQL 123。

246

。 0

```
select '123ABC' * 2
```

246

```
select 'ABC123' * 2
```

0

VARCHAR255 -

len

ASCII。 CHARACTER SET ascii latin1

```
UUID CHAR(36) CHARACTER SET ascii -- or pack into BINARY(16)
country_code CHAR(2) CHARACTER SET ascii
ip_address CHAR(39) CHARACTER SET ascii -- or pack into BINARY(16)
phone VARCHAR(20) CHARACTER SET ascii -- probably enough to handle extension
postal_code VARCHAR(20) CHARACTER SET ascii -- (not 'zip_code') (don't know the max

city VARCHAR(100) -- This Russian town needs 91:
    Poselok Uchebnogo Khozyaystva Srednego Professionalno-Tekhnicheskoye Uchilishche Nomer
Odin
country VARCHAR(50) -- probably enough
name VARCHAR(64) -- probably adequate; more than some government agencies allow
```

255255。

- SELECT UNION GROUP BYMEMORYRAM。 VARCHARsCHAR 。 VARCHAR(255) CHARACTER SET utf8mb41020。
  。
- InnoDBCREATE TABLE 。

VARCHARTEXT

*TEXT CHARVARCHAR

- TINYTEXT 。
- CHAR - ;CHARACTER SETutf8mb44/。
- CHAR CHARACTER SET ascii 。
- VARCHAR(n)n ; TEXT。
- *TEXT *TEXT SELECTs 。

INTAUTO_INCREMENT

INTAUTO_INCREMENT 。 UNSIGNED。

“” AUTO_INCREMENT ID。 。 INSERT IGNOREREPLACE 。 id。InnoDB。

“FLOATDOUBLEDECIMAL”“ENUM”。 - “”“”

- INT
- FLOATDOUBLEDECIMAL
- CHARTEXT
- BINARYBLOB
- DATETIMETIMESTAMP
- ENUMSET
-
- JSON MySQL 5.7.8+
- Money“”

- ALTERing
-
- MySQL
- PRIMARY KEY
-
-

“”。

MySQL。

	INTEGER INT SMALLINT TINYINT MEDIUMINT BIGINT
	DECIMAL NUMERIC
	FLOAT DOUBLE
	BIT

0。

TINYINT	1	-2 7 -128	2 7 -1 127	2 8 -1 255
SMALLINT	2	-2 15 -32,768	2 15 -1 32,767	2 16 -1 65,535
MEDIUMINT	3	-2 23 -8,388,608	2 23 -1 8,388,607	2 24 -1 16,777,215
INT	4	-2 31 2,147,483,648	2 31 -1 2,147,483,647	2 32 -1 4,294,967,295
BIGINT	8	-2 63 - 9,223,372,036,854,775,808	2 63 -1 9,223,372,036,854,775,807	2 64 -1 18,446,744,073,709,551,615

MySQLDECIMALNUMERIC。 。

。

Precision。

```
salary DECIMAL(5,2)
```

5precision 2scale。 -999.99 to 999.99

scale0

65。

DECIMAL(M,N) M/2 。

FLOATDOUBLE。

	4	23/ ~7	10 ^ + / - 38
	8	53/ ~16	10 ^ + / - 308

REALFLOAT。 DOUBLE PRECISIONDOUBLE 。

MySQLMD。 MDMD。 ;。

。 FLOATDOUBLE。

BIT。 BIT(M)MM1 to 64

bit value。

```
b'111'      -> 7
b'10000000' -> 128
```

'shift'(1 << 7)128。

NDBBIT4096。

CHARN

CHAR(n)n 。 CHARACTER SET utf8mb4 4*n 。

CHAR(n)CHARACTER SET ascii 。 latin1。

```
country_code CHAR(2) CHARACTER SET ascii,
postal_code  CHAR(6) CHARACTER SET ascii,
uuid    CHAR(39) CHARACTER SET ascii,  -- more discussion elsewhere
```

DATEDATETIMETIMESTAMPYEARTIME

DATE。 'YYYY-MM-DD' '1000-01-01''9999-12-31'。

DATETIME“YYYY-MM-DD HHMMSS”。'1000-01-01 00:00:00''9999-12-31 23:59:59'。

TIMESTAMP“1970-01-01 00:00:01”UTC“2038-01-19 03:14:07”UTC。

YEAR19012155。

TIME'HHMMSS''-8385959''8385959'。

```
|-----------|--------------------|----------------------------------------|
| Data Type | Before MySQL 5.6.4 | as of MySQL 5.6.4                      |
|-----------|--------------------|----------------------------------------|
| YEAR      |      1 byte        |  1 byte                                |
| DATE      |      3 bytes       |  3 bytes                               |
| TIME      |      3 bytes       |  3 bytes + fractional seconds storage  |
| DATETIME  |      8 bytes       |  5 bytes + fractional seconds storage  |
| TIMESTAMP |      4 bytes       |  4 bytes + fractional seconds storage  |
|-----------|--------------------|----------------------------------------|
```

5.6.4

```
|-----------------------------|------------------|
| Fractional Seconds Precision | Storage Required |
|-----------------------------|------------------|
|              0              |      0 bytes     |
|              1,2            |      1 byte      |
|              3,4            |      2 byte      |
|              5,6            |      3 byte      |
```

```
|-----------------------------|-----------------|
```

MySQLDATEDATETIMETIMESTAMP 。

https://riptutorial.com/zh-CN/mysql/topic/4137/

48:

Examples

- - - VARIABLE general_log
- - long_query_time - slow_query_log_file
- Binlog - - log_bin_basename
- -
- - mysqld.err
- / - mysql.log - log_error
- InnoDB - iblog *

`basedirdatadir`

VARIABLES/。 。

。

Windows* nix。 。

`long_query_time`。 10。

```
SELECT @@long_query_time;
+-------------------+
| @@long_query_time |
+-------------------+
|         10.000000 |
+-------------------+
```

`my.cnfmy.ini`GLOBAL。 。 010。

- 10;
- 2;
- 0.5;
- 0;。

。 。

```
SELECT @@slow_query_log; -- Is capture currently active? (1=On, 0=Off)
SELECT @@slow_query_log_file; -- filename for capture. Resides in datadir
SELECT @@datadir; -- to see current value of the location for capture file

SET GLOBAL slow_query_log=0; -- Turn Off
-- make a backup of the Slow Query Log capture file. Then delete it.
SET GLOBAL slow_query_log=1; -- Turn it back On (new empty file is created)
```

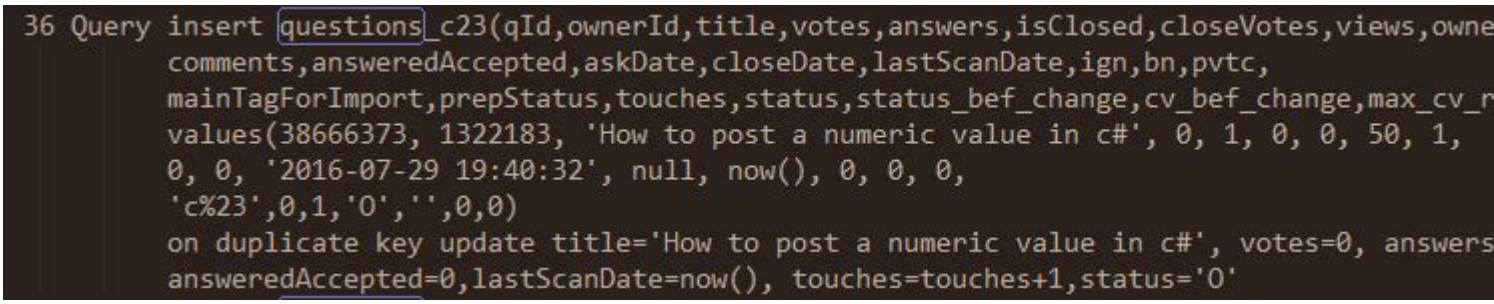
MySQL

/slowlog5.6;。

“”

```
long_query_time=...
turn on the slowlog
run for a few hours
turn off the slowlog (or raise the cutoff)
run pt-query-digest to find the 'worst' couple of queries.  Or mysqldumpslow -s t
```

。 。




```
SELECT @@general_log; -- 1 = Capture is active; 0 = It is not.
```

```
SELECT @@general_log_file; -- Full path to capture file
```

datadir 。

Windows

```
+-----------------------------------------------------------+
| @@general_log_file                                        |
+-----------------------------------------------------------+
| C:\ProgramData\MySQL\MySQL Server 5.7\Data\GuySmiley.log |
+-----------------------------------------------------------+
```

Linux

```
+-----------------------------------+
| @@general_log_file                |
+-----------------------------------+
| /var/lib/mysql/ip-ww-xx-yy-zz.log |
+-----------------------------------+
```

general_log_file GLOBALdatadir 。 。

general_log_filedatadir@@hostname .log。

。 /。 。 。 。 ON。

```
/LogBackup/GeneralLog_20160802_1520_to_20160802_1815.log
```

。

Windows。

```
SELECT @@general_log; -- 0. Not being captured
SELECT @@general_log_file; -- C:\ProgramData\MySQL\MySQL Server 5.6\Data\GuySmiley.log
SELECT @@datadir; -- C:\ProgramData\MySQL\MySQL Server 5.7\Data\
SET GLOBAL general_log_file='GeneralLogBegin_20160803_1420.log'; -- datetime clue
SET GLOBAL general_log=1; -- Turns on actual log capture. File is created under `datadir`
SET GLOBAL general_log=0; -- Turn logging off
```

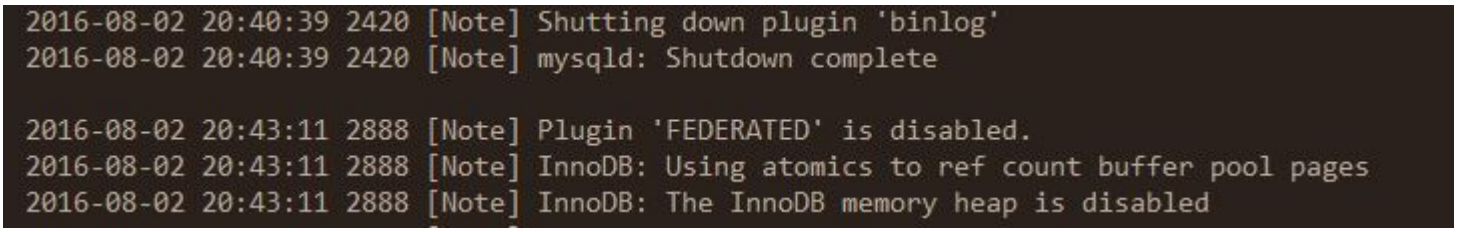
Linux。 。 。

```
[mysqld]
general_log_file = /path/to/currentquery.log
general_log      = 1
```

TABLElog_output FILE。 。

MySQL“”。

。



log_error。

log_errordatadir@@hostname .err。 log_error。 cnfiniManual Page“”。

。 。 。

GLOBALlog_warnings。

```
SELECT @@log_warnings; -- make a note of your prior setting
SET GLOBAL log_warnings=2; -- setting above 1 increases output (see server version)
```

log_warnings。

cnfini。

```
[mysqld]
log_error        = /path/to/CurrentError.log
log_warnings     = 2
```

MySQL 5.7.23GLOBAL log_error_verbosity。 5.7.2。 cnfini。

MySQL 5.7.2

```
[mysqld]
log_error           = /path/to/CurrentError.log
log_warnings        = 2
log_error_verbosity = 3
```

MySQL`log_warningserror_log_verbosity`。

https://riptutorial.com/zh-CN/mysql/topic/5102/

49:

Examples

```
Select Now();
```

。

```
Update `footable` set mydatefield = Now();
```

mydatefield

```
'2016-07-21 12:00:00'
```

```
NOW() + INTERVAL 1 DAY  -- This time tomorrow

CURDATE() - INTERVAL 4 DAY -- Midnight 4 mornings ago
```

310180600mysql

```
SELECT qId,askDate,minuteDiff
FROM
(   SELECT qId,askDate,
    TIMESTAMPDIFF(MINUTE,askDate,now()) as minuteDiff
    FROM questions_mysql
) xDerived
WHERE minuteDiff BETWEEN 180 AND 600
ORDER BY qId DESC
LIMIT 50;

+----------+---------------------+------------+
| qId      | askDate             | minuteDiff |
+----------+---------------------+------------+
| 38546828 | 2016-07-23 22:06:50 |        182 |
| 38546733 | 2016-07-23 21:53:26 |        195 |
| 38546707 | 2016-07-23 21:48:46 |        200 |
| 38546687 | 2016-07-23 21:45:26 |        203 |
| ...      |                     |            |
+----------+---------------------+------------+
```

`TIMESTAMPDIFF()` MySQL。

`CURDATE() + 1`MySQL。 Oracle。 `CURDATE() + INTERVAL 1 DAY`。

`BETWEEN ... AND ...`。

```
WHERE x >= '2016-02-25'
  AND x  < '2016-02-25' + INTERVAL 5 DAY
```

- BETWEEN"。
- DATETIME23 23:59:59。
- 。
- xDATE DATETIMETIMESTAMP 。

SYSDATENOWCURDATE

```
  SELECT SYSDATE();
```

'YYYY-MM-DD HH:MM:SS'YYYYMMDDHHMMSS。 。

```
  SELECT NOW();
```

SYSDATE()。

```
  SELECT CURDATE();
```

'YYYY-MM-DD'YYYYMMDD。 。

```
SELECT DATE('2003-12-31 01:02:03');
```

```
2003-12-31
```

DATETIMETIMESTAMP。 WHERE。 201691。

```
 WHERE DATE(x) = '2016-09-01'   /* slow! */
```

DATE() - 。 MySQLx。

```
 WHERE x >= '2016-09-01'
   AND x <  '2016-09-01' + INTERVAL 1 DAY
```

x < 。

x。 X。 DATE(x) = '2016-09-01。

。

```
  WHERE x BETWEEN '2016-09-01' AND '2016-09-01' + INTERVAL 1 DAY  /*  wrong! */
```

x201692。

https://riptutorial.com/zh-CN/mysql/topic/1882/

50:

MySQL 5.6.4。

`DATETIME(3) TIMESTAMP(6)`* nix。

http //dev.mysql.com/doc/refman/5.7/en/fractional-seconds.html

`NOW(3)`MySQL。

MySQL* 0.001IEEE754。

Examples

```
SELECT NOW(3)
```

。

Javascript。

JavascriptUNIX `time_t1970-01-01 00:00:00` UTC。

Javascript。 time_zone。

```
 ROUND(UNIX_TIMESTAMP(NOW(3)) * 1000.0, 0)
```

`TIMESTAMP`UNIX_TIMESTAMPJavascript。

```
  SELECT ROUND(UNIX_TIMESTAMP(column) * 1000.0, 0)
```

`DATETIME`Javascript。

。

```
CREATE TABLE times (
     dt DATETIME(3),
     ts TIMESTAMP(3)
 );
```

/。

```
 INSERT INTO times VALUES (NOW(3), NOW(3));
```

`NOW()`。

```
INSERT INTO times VALUES ('2015-01-01 16:34:00.123','2015-01-01 16:34:00.128');
```

。

NOW(3)NOW() 。

/。

%fDATE_FORMAT。

```
SELECT DATE_FORMAT(NOW(3), '%Y-%m-%d %H:%i:%s.%f')
```

2016-11-19 09:52:53.248000 。 NOW(3) 0。

JavascriptTIMESTAMP

Javascript1478960868932 MySQL

```
FROM_UNIXTIME(1478960868932 * 0.001)
```

JavascriptMySQL。

```
INSERT INTO table (col) VALUES (FROM_UNIXTIME(1478960868932 * 0.001))
```

。

https://riptutorial.com/zh-CN/mysql/topic/7850/

51:

Examples

LinuxMySQL root

MySQLroot

1MySQL。

- UbuntuDebian
  `sudo /etc/init.d/mysql stop`
- CentOSFedoraRed Hat Enterprise Linux
  `sudo /etc/init.d/mysqld stop`

2MySQL。

```
sudo mysqld_safe --skip-grant-tables &
```

`mysqld_safe`

```
sudo mysqld --skip-grant-tables &
```

3MySQL。

```
mysql -u root
```

4root。

5.7

```
FLUSH PRIVILEGES;
ALTER USER 'root'@'localhost' IDENTIFIED BY 'new_password';
FLUSH PRIVILEGES;
exit;
```

5.7

```
FLUSH PRIVILEGES;
SET PASSWORD FOR 'root'@'localhost' = PASSWORD('new_password');
FLUSH PRIVILEGES;
exit;
```

`ALTER USER`MySQL 5.7.6。

5MySQL。

- UbuntuDebian
  `sudo /etc/init.d/mysql stop`

```
sudo /etc/init.d/mysql start
```

- CentOSFedoraRed Hat Enterprise Linux

```
sudo /etc/init.d/mysqld stop
sudo /etc/init.d/mysqld start
```

WindowsMySQL root

Windowsroot

1

Perss `Crtl+R`Goto `Start Menu > Run cmd`Enter

2`MYSQL`

```
C:\> cd C:\mysql\bin
```

3`mysql`

```
C:\mysql\bin> mysql -u root mysql
```

4`root`

```
mysql> SET PASSWORD FOR root@localhost=PASSWORD('my_new_password');
```

1. MySQLmysqld/。
2. MySQL--skip-grant-tables `mysqld_safe --skip-grant-tables &`
3. rootMySQL `mysql -u root`
4.

- 5.7.6 `ALTER USER 'root'@'localhost' IDENTIFIED BY 'new-password';`
- 5.7.5MariaDB `SET PASSWORD FOR 'root'@'localhost' = PASSWORD('new-password'); flush privileges; quit;`

5. MySQL。

。

http //dev.mysql.com/doc/refman/5.7/en/resetting-permissions.html

https://riptutorial.com/zh-CN/mysql/topic/2761/

52:

- ALTER [IGNORE] TABLE tbl_name [**alter_specification** [alter_specification] ...] [partition_options]

```
    alter_specification: table_options
      | ADD [COLUMN] col_name column_definition [FIRST | AFTER col_name ]
      | ADD [COLUMN] (col_name column_definition,...)
      | ADD {INDEX|KEY} [index_name] [index_type] (index_col_name,...) [index_option] ...
      | ADD [CONSTRAINT [symbol]] PRIMARY KEY [index_type] (index_col_name,...) [index_option]
...
      | ADD [CONSTRAINT [symbol]] UNIQUE [INDEX|KEY] [index_name] [index_type]
(index_col_name,...) [index_option] ...
      | ADD FULLTEXT [INDEX|KEY] [index_name] (index_col_name,...) [index_option] ...
      | ADD SPATIAL [INDEX|KEY] [index_name] (index_col_name,...) [index_option] ...
      | ADD [CONSTRAINT [symbol]] FOREIGN KEY [index_name] (index_col_name,...)
reference_definition
      | ALGORITHM [=] {DEFAULT|INPLACE|COPY}
      | ALTER [COLUMN] col_name {SET DEFAULT literal | DROP DEFAULT}
      | CHANGE [COLUMN] old_col_name new_col_name column_definition [FIRST|AFTER col_name]
      | LOCK [=] {DEFAULT|NONE|SHARED|EXCLUSIVE}
      | MODIFY [COLUMN] col_name column_definition [FIRST | AFTER col_name]
      | DROP [COLUMN] col_name
      | DROP PRIMARY KEY
      | DROP {INDEX|KEY} index_name
      | DROP FOREIGN KEY fk_symbol
      | DISABLE KEYS
      | ENABLE KEYS
      | RENAME [TO|AS] new_tbl_name
      | RENAME {INDEX|KEY} old_index_name TO new_index_name
      | ORDER BY col_name [, col_name] ...
      | CONVERT TO CHARACTER SET charset_name [COLLATE collation_name]
      | [DEFAULT] CHARACTER SET [=] charset_name [COLLATE [=] collation_name]
      | DISCARD TABLESPACE
      | IMPORT TABLESPACE
      | FORCE
      | {WITHOUT|WITH} VALIDATION
      | ADD PARTITION (partition_definition)
      | DROP PARTITION partition_names
      | DISCARD PARTITION {partition_names | ALL} TABLESPACE
      | IMPORT PARTITION {partition_names | ALL} TABLESPACE
      | TRUNCATE PARTITION {partition_names | ALL}
      | COALESCE PARTITION number
      | REORGANIZE PARTITION partition_names INTO (partition_definitions)
      | EXCHANGE PARTITION partition_name WITH TABLE tbl_name [{WITH|WITHOUT} VALIDATION]
      | ANALYZE PARTITION {partition_names | ALL}
      | CHECK PARTITION {partition_names | ALL}
      | OPTIMIZE PARTITION {partition_names | ALL}
      | REBUILD PARTITION {partition_names | ALL}
      | REPAIR PARTITION {partition_names | ALL}
      | REMOVE PARTITIONING
      | UPGRADE PARTITIONING
   index_col_name: col_name [(length)] [ASC | DESC]
   index_type: USING {BTREE | HASH}
   index_option: KEY_BLOCK_SIZE [=] value
      | index_type
      | WITH PARSER parser_name
      | COMMENT 'string'
```

table_options: table_option [[,] table_option] ... (see CREATE TABLE options)

partition_options: (see CREATE TABLE options)

MySQL 5.7/ ... / ALTER TABLE/ 14.1.8 ALTER TABLE

Examples

;;file_per_table

t1InnoDBInnoDB

```
ALTER TABLE t1 ENGINE = InnoDB;
```

InnoDBOPTIMIZE TABLE。 。

innodb_file_per_table1file_per_table。

```
CREATE DATABASE stackoverflow;

USE stackoverflow;

Create table stack(
    id_user int NOT NULL,
    username varchar(30) NOT NULL,
    password varchar(30) NOT NULL
);

ALTER TABLE stack ADD COLUMN submit date NOT NULL; -- add new column
ALTER TABLE stack DROP COLUMN submit; -- drop column
ALTER TABLE stack MODIFY submit DATETIME NOT NULL; -- modify type column
ALTER TABLE stack CHANGE submit submit_date DATETIME NOT NULL; -- change type and name of
column
ALTER TABLE stack ADD COLUMN mod_id INT NOT NULL AFTER id_user; -- add new column after
existing column
```

ALTERINDEX

```
ALTER TABLE TABLE_NAME ADD INDEX `index_name` (`column_name`)
```

```
ALTER TABLE TABLE_NAME ADD INDEX `index_name` (`col1`,`col2`)
```

AUTO_INCREMENT。

。 AUTO_INCREMENTMAX100。 。

```
ALTER TABLE your_table_name AUTO_INCREMENT = 101;
```

```
ALTER TABLE fish_data.fish DROP PRIMARY KEY;
```

```
ALTER TABLE fish_data.fish MODIFY COLUMN fish_id DECIMAL(20,0) NOT NULL PRIMARY KEY;
```

。

dbdb

```
users (
    firstname varchar(20),
    lastname varchar(20),
    age char(2)
)
```

agecharint

```
ALTER TABLE users CHANGE age age tinyint UNSIGNED NOT NULL;
```

```
ALTER TABLE table_name CHANGE column_name new_column_definition
```

MySQL

MySQL

```
mysqladmin -uroot -p<password> create <new name>
mysqldump -uroot -p<password> --routines <old name> | mysql -uroot -pmypassword <new name>
mysqladmin -uroot -p<password> drop <old name>
```

1. 。
2. <old name> <new name><password>+root。
3. MySQL“bin”“y”。

dbdb。

```
RENAME TABLE `<old db>`.`<name>` TO  `<new db>`.`<name>`;
```

```
SELECT CONCAT('RENAME TABLE old_db.', table_name, ' TO ',
                          'new_db.', table_name)
    FROM information_schema.TABLES
    WHERE table_schema = 'old_db';
```

。 。 MyISAMInnoDB。 “”InnoDB。 DROPping InnoDBPARTITION“”。 。

MySQL

MySQL <db1><db2>

```
mysqladmin -uroot -p<password> create swaptemp
mysqldump -uroot -p<password> --routines <db1> | mysql -uroot -p<password> swaptemp
mysqladmin -uroot -p<password> drop <db1>
```

```
mysqladmin -uroot -p<password> create <db1>
mysqldump -uroot -p<password> --routines <db2> | mysql -uroot -p<password> <db1>
mysqladmin -uroot -p<password> drop <db2>
mysqladmin -uroot -p<password> create <db2>
mysqldump -uroot -p<password> --routines swaptemp | mysql -uroot -p<password> <db2>
mysqladmin -uroot -p<password> drop swaptemp
```

1. ◦
2. <db1> <db2><password>+root◦
3. MySQL“bin”“y”◦

MySQL

```
RENAME TABLE `<old name>` TO `<new name>`;
```

```
ALTER TABLE `<old name>` RENAME TO `<new name>`;
```

ALTER TABLE◦

1. <old name><new name>◦ *dbname*◦ *tablename<old name>*/*<new name>*◦
2. MySQLMySQL Workbench◦ *ALTERDROPCREATEINSERT*◦

MySQL

“”◦

```
ALTER TABLE `<table name>` CHANGE `<old name>` `<new name>` <column definition>;
```

1. MySQLMySQL Workbench◦
2. SHOW CREATE TABLE <table name>; <table name>◦
3. ◦
4. <old name> <new name><column definition>◦

https://riptutorial.com/zh-CN/mysql/topic/2627/

53:

	。 。
SESSION	。 。

Examples

SHOW VARIABLES

SQLPHPMyAdminMySQL CLI

```
SHOW VARIABLES;
```

```
SHOW SESSION VARIABLES;
```

```
SHOW GLOBAL VARIABLES;
```

SQLLIKE

```
SHOW [GLOBAL | SESSION] VARIABLES LIKE 'max_join_size';
```

```
SHOW [GLOBAL | SESSION] VARIABLES LIKE '%size%';
```

WHERESHOW

```
SHOW [GLOBAL | SESSION] VARIABLES WHERE VALUE > 0;
```

PHPMyAdminSQLMySQL CLI。

```
SHOW STATUS;
```

SESSIONGLOBAL

```
SHOW SESSION STATUS;
```

```
SHOW GLOBAL STATUS;
```

SQLLIKE

```
SHOW [GLOBAL | SESSION] STATUS LIKE 'Key%';
```

Where

```
SHOW [GLOBAL | SESSION] STATUS WHERE VALUE > 0;
```

GLOBALSESSIONGLOBALSESSION。

https://riptutorial.com/zh-CN/mysql/topic/9924/

54:

Examples

SQLMysqlEVENTcron。 。 。

。

```
SHOW VARIABLES WHERE variable_name='event_scheduler';
+-----------------+-------+
| Variable_name   | Value |
+-----------------+-------+
| event_scheduler | OFF   |
+-----------------+-------+
```

。

```
SET GLOBAL event_scheduler = ON;
```

```
create table theMessages
(   id INT AUTO_INCREMENT PRIMARY KEY,
    userId INT NOT NULL,
    message VARCHAR(255) NOT NULL,
    updateDt DATETIME NOT NULL,
    KEY(updateDt)
);

INSERT theMessages(userId,message,updateDt) VALUES (1,'message 123','2015-08-24 11:10:09');
INSERT theMessages(userId,message,updateDt) VALUES (7,'message 124','2015-08-29');
INSERT theMessages(userId,message,updateDt) VALUES (1,'message 125','2015-09-03 12:00:00');
INSERT theMessages(userId,message,updateDt) VALUES (1,'message 126','2015-09-03 14:00:00');
```

。 2。

21102

。 INTERVAL。

```
DROP EVENT IF EXISTS `delete7DayOldMessages`;
DELIMITER $$
CREATE EVENT `delete7DayOldMessages`
  ON SCHEDULE EVERY 1 DAY STARTS '2015-09-01 00:00:00'
  ON COMPLETION PRESERVE
DO BEGIN
   DELETE FROM theMessages
   WHERE datediff(now(),updateDt)>6; -- not terribly exact, yesterday but <24hrs is still 1
day

  -- Other code here
```

```
END$$
DELIMITER ;
```

...

```
DROP EVENT IF EXISTS `Every_10_Minutes_Cleanup`;
DELIMITER $$
CREATE EVENT `Every_10_Minutes_Cleanup`
  ON SCHEDULE EVERY 10 MINUTE STARTS '2015-09-01 00:00:00'
  ON COMPLETION PRESERVE
DO BEGIN
   DELETE FROM theMessages
   WHERE TIMESTAMPDIFF(HOUR, updateDt, now())>168; -- messages over 1 week old (168 hours)

   -- Other code here
END$$
DELIMITER ;
```

```
SHOW EVENTS FROM my_db_name; -- List all events by schema name (db name)
SHOW EVENTS;
SHOW EVENTS\G; -- <--------- I like this one from mysql> prompt

*************************** 1. row ***************************
                  Db: my_db_name
                Name: delete7DayOldMessages
             Definer: root@localhost
           Time zone: SYSTEM
                Type: RECURRING
          Execute at: NULL
      Interval value: 1
      Interval field: DAY
              Starts: 2015-09-01 00:00:00
                Ends: NULL
              Status: ENABLED
          Originator: 1
character_set_client: utf8
collation_connection: utf8_general_ci
  Database Collation: utf8_general_ci
*************************** 2. row ***************************
                  Db: my_db_name
                Name: Every_10_Minutes_Cleanup
             Definer: root@localhost
           Time zone: SYSTEM
                Type: RECURRING
          Execute at: NULL
      Interval value: 10
      Interval field: MINUTE
              Starts: 2015-09-01 00:00:00
                Ends: NULL
              Status: ENABLED
          Originator: 1
character_set_client: utf8
collation_connection: utf8_general_ci
  Database Collation: utf8_general_ci
2 rows in set (0.06 sec)
```

```
DROP EVENT someEventName; -
```

ON COMPLETION PRESERVE - ON COMPLETION PRESERVE ◦ ◦

◦ ◦ ◦ ◦

```
quantity {YEAR | QUARTER | MONTH | DAY | HOUR | MINUTE |
          WEEK | SECOND | YEAR_MONTH | DAY_HOUR | DAY_MINUTE |
          DAY_SECOND | HOUR_MINUTE | HOUR_SECOND | MINUTE_SECOND}
```

◦ DDLDML◦ “”MySQL◦

https://riptutorial.com/zh-CN/mysql/topic/4319/

55: mysqlimport

--delete -D
--fields-optionally-enclosed-by
--fields-terminated-by
--ignore -i
--lines-terminated-by
--password -p
--port -P
--replace -r
--user -u
--where -w

mysqlimport。

Examples

employee.txt

1 \t
2 \t
3 \t Zaphod Beeblebrox

```
$ mysql --user=user --password=password mycompany -e 'CREATE TABLE employee(id INT, name
VARCHAR(100), PRIMARY KEY (id))'

$ mysqlimport --user=user --password=password mycompany employee.txt
```

employee.txt

1 | Arthur Dent
2 |
3 | Zaphod Beeblebrox

```
$ mysqlimport --fields-terminated-by='|' mycompany employee.txt
```

Windows

```
$ mysqlimport --lines-terminated-by='\r\n' mycompany employee.txt
```

Employee

ID	
3	Yooden Vranx

employee.txt

1 \t
2 \t
3 \t Zaphod Beeblebrox

--ignore

```
$ mysqlimport --ignore mycompany employee.txt
```

ID	
1	
2	
3	Yooden Vranx

--replace

```
$ mysqlimport --replace mycompany employee.txt
```

ID	
1	
2	
3	Zaphod Beeblebrox

```
$ mysqlimport --where="id>2" mycompany employee.txt
```

CSV

```
$ mysqlimport
    --fields-optionally-enclosed-by='"'
    --fields-terminated-by=,
    --lines-terminated-by="\r\n"
    mycompany employee.csv
```

mysqlimport https://riptutorial.com/zh-CN/mysql/topic/5215/mysqlimport

56:

Examples

NULL

- - `end_date rating`
- - `middle_initial`
- 0/0 - 。
- NULL“”0。
-

NULL

- `IS NULL` / `IS NOT NULL` - `= NULL`。
- `x <=> y`“”。

`LEFT JOINab` 。

```
SELECT ...
    FROM a
    LEFT JOIN b ON ...
    WHERE b.id IS NULL
```

https://riptutorial.com/zh-CN/mysql/topic/6757/

57:

MySQL64IEEE 754。

。

- RAND()。

Examples

MySQL

+		SELECT 3+5; - > 8 SELECT 3.5+2.5; - > 6.0 SELECT 3.5+2; - > 5.5
-		SELECT 3-5; - > -2
*		SELECT 3 * 5; - > 15
/		SELECT 20 / 4; - > 5 SELECT 355 / 113; - > 3.1416 SELECT 10.0 / 0; - > NULL
DIV		SELECT 5 DIV 2; - > 2
%MOD		SELECT 7 % 3; - > 1 SELECT 15 MOD 4 - > 3 SELECT 15 MOD -4 - > 3 SELECT -15 MOD 4 - > -3 SELECT -15 MOD -4 - > -3 SELECT 3 MOD 2.5 - > 0.5

BIGINT

MySQLBIGINT 64。

select (1024 * 1024 * 1024 * 1024 *1024 * 1024) + 1 - > 1,152,921,504,606,846,977

select (1024 * 1024 * 1024 * 1024 *1024 * 1024 * 1024 - > BIGINT

MySQL64IEEE 754 。 。

PI6。 DOUBLE;

```
SELECT PI();    -> 3.141593
```

SINCOS

。 IEEE 754 64。 εepsilon 。 ;。

DECIMAL。

X

```
SELECT SIN(PI()); -> 1.2246063538224e-16
```

XX

```
SELECT COS(PI()); -> -1
```

X。 。 ε。

```
SELECT TAN(PI());   -> -1.2246063538224e-16
```

X-1 to 1X

```
SELECT ACOS(1);    -> 0
SELECT ACOS(1.01); -> NULL
```

X-1 to 1X

```
SELECT ASIN(0.2); -> 0.20135792079033
```

ATAN(x)。

```
SELECT ATAN(2); -> 1.1071487177941
```

ATAN2(X, Y)XY。 Y / X。 Xt。

ATAN2()ATAN()。

```
 ATAN2(1,1);    -> 0.7853981633974483 (45 degrees)
 ATAN2(1,-1);   -> 2.356194490192345  (135 degrees)
 ATAN2(0, -1);  -> PI  (180 degrees)  don't try ATAN(-1 / 0)... it won't work
```

X

```
SELECT COT(12); -> -1.5726734063977
```

```
SELECT RADIANS(90) -> 1.5707963267948966
SELECT SIN(RADIANS(90)) -> 1
SELECT DEGREES(1), DEGREES(PI()) -> 57.29577951308232, 180
```

ROUNDFLOORCEIL

DECIMAL 5。 4。

```
SELECT ROUND(4.51) -> 5
SELECT ROUND(4.49) -> 4
SELECT ROUND(-4.51) -> -5
```

DOUBLE ROUND()C;ROUND()

```
SELECT ROUND(45e-1) -> 4  -- The nearest even value is 4
SELECT ROUND(55e-1) -> 6  -- The nearest even value is 6
```

CEIL()CEILING()

```
SELECT CEIL(1.23)    -> 2
SELECT CEILING(4.83) -> 5
```

FLOOR()

```
SELECT FLOOR(1.99) -> 1
```

FLOORCEIL/-infinity

```
SELECT FLOOR(-1.01), CEIL(-1.01) -> -2 and -1
SELECT FLOOR(-1.99), CEIL(-1.99) -> -2 and -1
```

。

```
SELECT ROUND(1234.987, 2) -> 1234.99
SELECT ROUND(1234.987, -2) -> 1200
```

“5”。

POW

xy POW()POWER()

```
SELECT POW(2,2); => 4
SELECT POW(4,2); => 16
```

SQRT

SQRT()。 NULL

```
SELECT SQRT(16); -> 4
SELECT SQRT(-3); -> NULL
```

01RAND()

```
SELECT i, RAND() FROM t;
```

	RAND
1	0.6191438870682
2	0.93845168309142
3	0.83482678498591

a <= n <= b

```
FLOOR(a + RAND() * (b - a + 1))
```

712

```
SELECT FLOOR(7 + (RAND() * 6));
```

```
SELECT * FROM tbl ORDER BY RAND();
```

。

MySQL。MySQLMySQL。

ABSSIGN

```
SELECT ABS(2);   -> 2
SELECT ABS(-46); -> 46
```

sign0。

-1	n <0	SELECT SIGN(42); - > 1
0	n = 0	SELECT SIGN(0); - > 0
1	n> 0	SELECT SIGN(-3); - > -1

```
SELECT SIGN(-423421); -> -1
```

https://riptutorial.com/zh-CN/mysql/topic/4516/

58:

- -

  CREATE INDEX *index_name* ON *table_name* *column_name1* [*column_name2* ...]

- -

  CREATE UNIQUE INDEX *index_name* ON *table_name* *column_name1* [*column_name2* ...]

- -

  DROP INDEX **index_name** ON **tbl_name** [**algorithm_option** | **lock_option**] .....

  algorithm_option ALGORITHM [=] {DEFAULT | INPLACE | COPY}

  lock_option LOCK [=] {DEFAULT | NONE | SHARED | EXCLUSIVE}

MySQL。

。“”。 113-120,231354。 。

-

- “”1-59,61-290292-400。 。 “”。
- 10105 - 10。
- - “L”。

Examples

```
-- Create an index for column 'name' in table 'my_table'
CREATE INDEX idx_name ON my_table(name);
```

。 NULL NULLNULL

```
-- Creates a unique index for column 'name' in table 'my_table'
CREATE UNIQUE INDEX idx_name ON my_table(name);
```

```
-- Drop an index for column 'name' in table 'my_table'
DROP INDEX idx_name ON my_table;
```

key `mystringmydatetimeWHERE`。

```
CREATE INDEX idx_mycol_myothercol ON my_table(mycol, myothercol)
```

`WHERE`

◦ WHEREmycolWHEREmyothercol mycol ◦ ◦

BTREE◦ DATETIMEWHERE datecol > '2016-01-01 00:00:00' ◦ BTREE◦

AUTO_INCREMENT

```
CREATE TABLE (
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,
    ...
    PRIMARY KEY(id),
    ...  );
```

- INSERT11NULL ◦
- ID.....
- id◦

- 'next'"MAX(id)+1 ◦
- id id◦ *auto_increments* ;◦
- auto_increment_offsetauto_increment_increment ◦
- PRIMARY KEYINDEX(id) ◦ ◦
- AUTO_INCREMENT“ PARTITION”;◦
- “”◦ INSERT IGNORE dup REPLACE DELETEINSERT ◦ ROLLBACKID◦
- ID◦ idInnoDBCOMMIT◦

https://riptutorial.com/zh-CN/mysql/topic/1748/

59:

- UNION DISTINCT - SELECT
- UNION ALL -
- UNION - DISTINCT
- SELECT ... UNION SELECT ... - `ORDER BY`
- SELECT ...UNIONSELECT ...ORDER BY ... -

UNIONCPU。

UNION*。 *5.7.3 / MariaDB 10.1UNIONtmp。

Examples

SELECTUNION

`UNION`。

`authorseditorsUNION`

```
select name, email, phone_number
from authors

union

select name, email, phone_number
from editors
```

`union`。 `ALL` `UNION ALL` 。

UNION

```
( SELECT ... )
UNION
( SELECT ... )
ORDER BY
```

ORDER BYSELECT。

OFFSET

UNIONLIMIT

```
( SELECT ... ORDER BY x  LIMIT 10 )
UNION
( SELECT ... ORDER BY x  LIMIT 10 )
ORDER BY x  LIMIT 10
```

“10”SELECT10ORDER BYLIMIT。

104

```
( SELECT ... ORDER BY x  LIMIT 40 )
UNION
( SELECT ... ORDER BY x  LIMIT 40 )
ORDER BY x  LIMIT 30, 10
```

SELECT4UNIONOFFSET。

```
SELECT name, caption as title, year, pages FROM books
UNION
SELECT name, title, year, 0 as pages FROM movies
```

2。

UNION ALLUNION

1,22,44 UNION SELECT 2,33,55

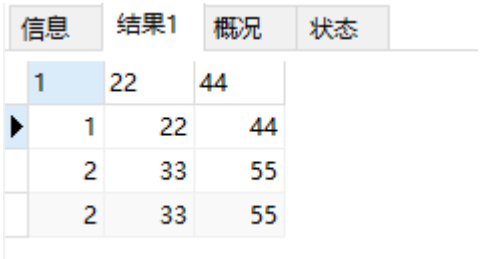
1	22	44
1	22	44
2	33	55

SELECT 1,22,44 UNION SELECT 2,33,55 UNION SELECT 2,33,55

。

UNION ALL

SELECT 1,22,44 UNION SELECT 2,33,55 UNION ALL SELECT 2,33,55



1	22	44
1	22	44
2	33	55
2	33	55

MySQL

UNION ALL

```
SELECT YEAR(date_time_column), MONTH(date_time_column), MIN(DATE(date_time_column)),
MAX(DATE(date_time_column)), COUNT(DISTINCT (ip)), COUNT(ip), (COUNT(ip) / COUNT(DISTINCT
(ip))) AS Ratio
```

```
FROM (
    (SELECT date_time_column, ip FROM server_log_1 WHERE state = 'action' AND log_id = 150)
UNION ALL
    (SELECT date_time_column, ip FROM server_log_2 WHERE state = 'action' AND log_id = 150)
UNION ALL
    (SELECT date_time_column, ip FROM server_log_3 WHERE state = 'action' AND log_id = 150)
UNION ALL
    (SELECT date_time_column, ip FROM server_log WHERE state = 'action' AND log_id = 150)
) AS table_all
GROUP BY YEAR(date_time_column), MONTH(date_time_column);
```

https://riptutorial.com/zh-CN/mysql/topic/3847/

60:

Examples

“MySQL Cluster”.....

- NDB - 。 。
- Galera ClusterPercona XtraDBPXCGariraMariaDB。 - MySQL;。

“”。

“”`PRIMARY KEY`。

https://riptutorial.com/zh-CN/mysql/topic/5130/

61: PS1

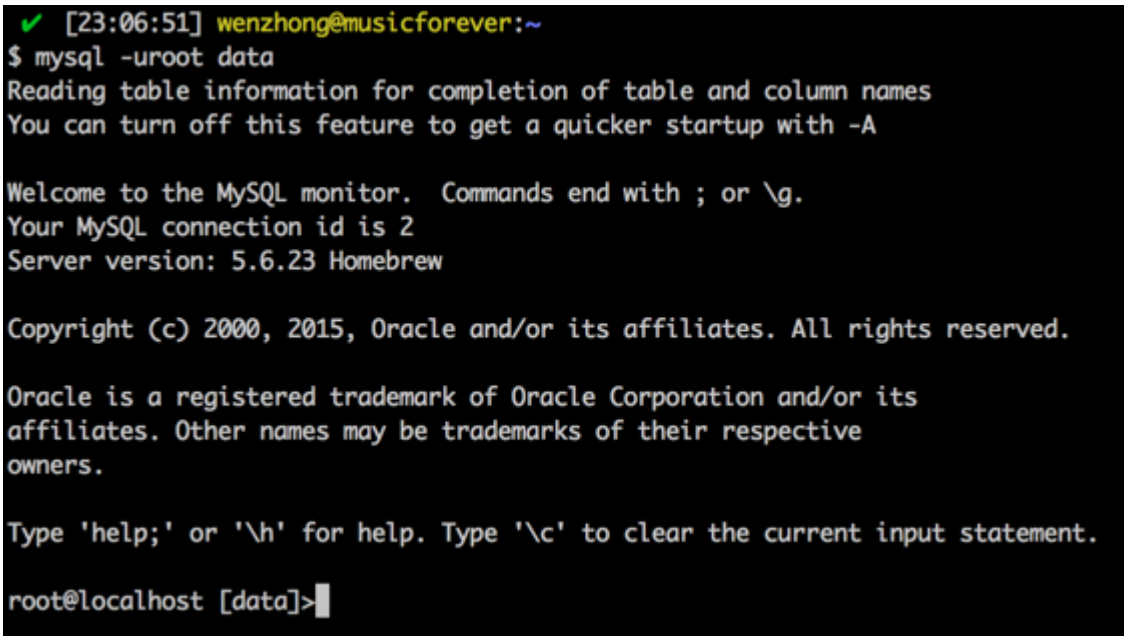
Examples

MySQL PS1

.bashrc.bash_profile

```
export MYSQL_PS1="\u@\h [\d]>"
```

MySQLPROMPT@[]。



MySQLPS1

mysqld.cnf

```
[mysql]
prompt = '\u@\h [\d]> '
```

.bashrc。

PS1 https://riptutorial.com/zh-CN/mysql/topic/5795/ps1

62:

- CREATE TABLE table_namecolumn_name1 data_typesizecolumn_name2 data_typesize column_name3 data_typesize....; //
- CREATE TABLE table_name [IF NOT EXISTS]column_name1 data_typesizecolumn_name2 data_typesizecolumn_name3 data_typesize....; //
- CREATE [TEMPORARY] TABLE table_name [IF NOT EXISTS]column_name1 data_type sizecolumn_name2 data_typesizecolumn_name3 data_typesize....; //
- CREATE TABLE new_tbl [AS] SELECT * FROM orig_tbl; //SELECT

`CREATE TABLEENGINE`

```
CREATE TABLE table_name ( column_definitions ) ENGINE=engine;
```

- `InnoDB` :(5.5.5ACID。 。
- `MyISAM` :(5.5.5。 。
- `Memory` RAM。

。

Examples

`CREATE TABLE`MySQL。

```
CREATE TABLE Person (
    `PersonID`      INTEGER NOT NULL PRIMARY KEY,
    `LastName`      VARCHAR(80),
    `FirstName`     VARCHAR(80),
    `Address`       TEXT,
    `City`          VARCHAR(100)
) Engine=InnoDB;
```

1. 。 `-chars。 fieldnamespace-chars。
2. []`CHARVARCHAR` 。
3. `NULL` | `NOT NULL NOT NULL NULL`。
4.

`Engine=...`。 InnoDBMyISAM。

`DEFAULT`

```
CREATE TABLE Address (
    `AddressID`    INTEGER NOT NULL PRIMARY KEY,
    `Street`       VARCHAR(80),
```

```
    `City`        VARCHAR(80),
    `Country`     VARCHAR(80) DEFAULT "United States",
    `Active`      BOOLEAN DEFAULT 1,
) Engine=InnoDB;
```

StreetNULL。 Country “”。

BLOB TEXT GEOMETRYJSON。

```
CREATE TABLE Person (
    PersonID     INT UNSIGNED NOT NULL,
    LastName     VARCHAR(66) NOT NULL,
    FirstName    VARCHAR(66),
    Address      VARCHAR(255),
    City         VARCHAR(66),
    PRIMARY KEY (PersonID)
);
```

NOT NULL。 NOT NULL MySQL。

PRIMARY KEY。 InnoDBMySQL 。

AUTO_INCREMENT INT“”。 11。

。

INTTRUNCATE TABLE。

PRIMARY KEY

```
CREATE TABLE Person (
    PersonID     INT UNSIGNED NOT NULL PRIMARY KEY,
    LastName     VARCHAR(66) NOT NULL,
    FirstName    VARCHAR(66),
    Address      VARCHAR(255),
    City         VARCHAR(66)
);
```

。

。 。 PRIMARY KEY。 PRIMARY KEY inline。

```
CREATE TABLE invoice_line_items (
    LineNum      SMALLINT UNSIGNED NOT NULL,
    InvoiceNum   INT UNSIGNED NOT NULL,
    -- Other columns go here
    PRIMARY KEY (InvoiceNum, LineNum),
    FOREIGN KEY (InvoiceNum) REFERENCES -- references to an attribute of a table
);
```

。

I / O.。 InnoDB“”PRIMARY KEY。

```
CREATE TABLE Account (
    AccountID     INT UNSIGNED NOT NULL,
    AccountNo     INT UNSIGNED NOT NULL,
    PersonID    INT UNSIGNED,
    PRIMARY KEY (AccountID),
    FOREIGN KEY (PersonID) REFERENCES Person (PersonID)
) ENGINE=InnoDB;
```

FK。 FK。 FK。 。

。 FOREIGN KEY。 。 TEMPORARY。

。 。 。 。

InnoDBMyISAMMEMORY。 CREATE TABLE。 MySQLInnoDB 。

```
CREATE TABLE ClonedPersons LIKE Persons;
```

。

```
CREATE TABLE ClonedPersons SELECT * FROM Persons;
```

SELECT

```
CREATE TABLE ModifiedPersons
SELECT PersonID, FirstName + LastName AS FullName FROM Persons
WHERE LastName IS NOT NULL;
```

SELECT。

```
CREATE TABLE ModifiedPersons (PRIMARY KEY (PersonID))
SELECT PersonID, FirstName + LastName AS FullName FROM Persons
WHERE LastName IS NOT NULL;
```

SELECT

CREATE TABLESELECTCREATE TABLE

```
CREATE TABLE stack (
    id_user INT,
    username VARCHAR(30),
    password VARCHAR(30)
);
```

```
-- create a table from another table in the same database with all attributes
CREATE TABLE stack2 AS SELECT * FROM stack;
```

```
-- create a table from another table in the same database with some attributes
CREATE TABLE stack3 AS SELECT username, password FROM stack;
```

```
-- create a table from another table from another database with all attributes
CREATE TABLE stack2 AS SELECT * FROM second_db.stack;

-- create a table from another table from another database with some attributes
CREATE TABLE stack3 AS SELECT username, password FROM second_db.stack;
```

NB

```
FROM NAME_DATABASE.name_table
```

```
SHOW CREATE TABLE child; -- Option 1

CREATE TABLE `child` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `fullName` varchar(100) NOT NULL,
  `myParent` int(11) NOT NULL,
  PRIMARY KEY (`id`),
  KEY `mommy_daddy` (`myParent`),
  CONSTRAINT `mommy_daddy` FOREIGN KEY (`myParent`) REFERENCES `parent` (`id`)
      ON DELETE CASCADE ON UPDATE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

mysql

```
SHOW CREATE TABLE child \G
```

```
mysql> CREATE TABLE Tab1(id int, name varchar(30));
Query OK, 0 rows affected (0.03 sec)

mysql> DESCRIBE Tab1; -- Option 2

+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| id    | int(11)     | YES  |     | NULL    |       |
| name  | varchar(30) | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
```

DESCRIBEDESC。

DESCRIBE 。

TimeStamp

TIMESTAMP。

```
CREATE TABLE `TestLastUpdate` (
    `ID` INT NULL,
```

```
    `Name` VARCHAR(50) NULL,
    `Address` VARCHAR(50) NULL,
    `LastUpdate` TIMESTAMP NULL DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP
)
COMMENT='Last Update'
;
```

https://riptutorial.com/zh-CN/mysql/topic/795/

63:

- CREATE VIEW view_name AS SELECT column_namesFROM table_name WHERE condition; ///
- CREATE [OR REPLACE] [ALGORITHM = {UNDEFINED || TEMPTABLE}] [DEFINER = {user | CURRENT_USER}] [SQL SECURITY {DEFINER | INVOKER}] VIEW view_name [column_list] AS select_statement [WITH [CASCADED | LOCAL] CHECK OPTION]; ///
- DROP VIEW [IF EXISTS] [db_name。] view_name; ///

VIEW_NAME	
SELECT	SQL。SELECT。

。。

- SELECT。 SELECTFROM。
- SELECT。

。

- “Sales” - “Sales”。。

。 VIEWs。。“”。 MySQL 5.7.6Optimizer。 VIEW。

Examples

CREATE VIEWCREATE VIEWSELECT。SELECTSELECT。OR REPLACEDROP。 CREATE VIEWSUPERDEFINER。

。

。。

db_name.view_name

```
mysql> CREATE VIEW test.v AS SELECT * FROM t;
```

-。

- SELECT
-
- UNION
- SELECT

```
mysql> CREATE TABLE t (qty INT, price INT);
mysql> INSERT INTO t VALUES(3, 50);
mysql> CREATE VIEW v AS SELECT qty, price, qty*price AS value FROM t;
mysql> SELECT * FROM v;
+------+-------+-------+
| qty  | price | value |
+------+-------+-------+
|    3 |    50 |   150 |
+------+-------+-------+
```

- MySQL 5.7.7SELECTFROM。
- SELECT。
- SELECT。
- SELECT。
- 。
  。 。 CHECK TABLE。
- TEMPORARY
  TEMPORARY。
- 。
- 64SELECT
  256。
- VIEWSELECT。 。

。

```
CREATE VIEW myview AS
SELECT a.*, b.extra_data FROM main_table a
LEFT OUTER JOIN other_table b
ON a.id = b.id
```

mysql。 SELECT * FROM myview mysqlLEFT JOIN。

VIEW

VIEW。 UPDATE。 SELECTUPDATE。

GROUP BY UNION HAVING DISTINCT。

-。

```
CREATE VIEW few_rows_from_t1 AS SELECT * FROM t1 LIMIT 10;
DROP VIEW few_rows_from_t1;
```

-。

```
CREATE VIEW table_from_other_db AS SELECT x FROM db1.foo WHERE x IS NOT NULL;
DROP VIEW table_from_other_db;
```

https://riptutorial.com/zh-CN/mysql/topic/1489/

64:

Examples

SELECT

```
SELECT ... FROM ... WHERE ... GROUP BY ... HAVING ...
    ORDER BY ...  -- goes here
    LIMIT ... OFFSET ...;

( SELECT ... ) UNION ( SELECT ... ) ORDER BY ...  -- for ordering the result of the UNION.

SELECT ... GROUP_CONCAT(DISTINCT x ORDER BY ... SEPARATOR ...) ...

ALTER TABLE ... ORDER BY ... -- probably useful only for MyISAM; not for InnoDB
```

x

x◦

- NULLsNULLs◦
- ASC
- VARCHARCOLLATION
- ENUMs◦

```
ORDER BY x ASC  -- same as default
ORDER BY x DESC  -- highest to lowest
ORDER BY lastname, firstname  -- typical name sorting; using two columns
ORDER BY submit_date DESC  -- latest first
ORDER BY submit_date DESC, id ASC  -- latest first, but fully specifying order.
```

- ASC = ASCENDING DESC = DESCENDING
- DESC NULLs◦
- INDEX(x) INDEX(lastname, firstname) INDEX(submit_date)◦

.....ASCDESC◦ INDEX(submit_date DESC, id ASC) - “ DESC ”INDEX◦

```
ORDER BY FIND_IN_SET(card_type, "MASTER-CARD,VISA,DISCOVER") -- sort 'MASTER-CARD' first.
ORDER BY x IS NULL, x  -- order by `x`, but put `NULLs` last.
```

```
SELECT * FROM some_table WHERE id IN (118, 17, 113, 23, 72)
ORDER BY FIELD(id, 118, 17, 113, 23, 72);
```

id◦

ID	...
118	...

ID	...
17	...
113	...
23	...
72	...

id。

https://riptutorial.com/zh-CN/mysql/topic/5469/

65: Mysql

-- SQL ◦

Examples

```
 # This comment continues to the end of line

-- This comment continues to the end of line

/* This is an in-line comment */

/*
This is a
multiple-line comment
*/
```

```
SELECT * FROM t1; -- this is comment

CREATE TABLE stack(
    /*id_user int,
    username varchar(30),
    password varchar(30)
    */
    id int
);
```

----◦

```
#This comment works
/*This comment works.*/
--This comment does not.
```

```
CREATE TABLE menagerie.bird (
    bird_id INT NOT NULL AUTO_INCREMENT,
    species VARCHAR(300) DEFAULT NULL COMMENT 'You can include genus, but never subspecies.',
    INDEX idx_species (species) COMMENT 'We must search on species often.',
    PRIMARY KEY (bird_id)
) ENGINE=InnoDB COMMENT 'This table was inaugurated on February 10th.';
```

COMMENT=◦

SHOW CREATE TABLEinformation_schema◦

Mysql https://riptutorial.com/zh-CN/mysql/topic/2337/mysql

66:

SELECT◦

- SELECT DISTINCT [] FROM TableName [WHERE]; ///
- SELECT DISTINCTab ...SELECT DISTINCT ab...
- [| DISTINCT | DISTINCTROW] [HIGH_PRIORITY] [STRAIGHT_JOIN] [SQL_SMALL_RESULT | SQL_BIG_RESULT] [SQL_BUFFER_RESULT] [SQL_CACHE | SQL_NO_CACHE] [SQL_CALC_FOUND_ROWS]FROM[WHERE] [GROUP BY] [HAVING] [ORDER BY[ASC | DESC]] [LIMIT [offset_value] number_rows | LIMIT number_rows OFFSET offset_value] [PROCEDURE procedure_name] [INTO [OUTFILE'file_name'options | DUMPFILE'file_name'| @ variable1@ variable2... @variable_n] [FOR UPDATE |]; ///

MySQLSELECTMySQL Docs ◦

Examples

```
CREATE TABLE stack(
    id INT,
    username VARCHAR(30) NOT NULL,
    password VARCHAR(30) NOT NULL
);

INSERT INTO stack (`id`, `username`, `password`) VALUES (1, 'Foo', 'hiddenGem');
INSERT INTO stack (`id`, `username`, `password`) VALUES (2, 'Baa', 'verySecret');
```

```
SELECT id FROM stack;
```

```
+------+
| id   |
+------+
|    1 |
|    2 |
+------+
```

*

```
SELECT * FROM stack;
```

```
+------+----------+----------+
| id   | username | password |
+------+----------+----------+
|    1 | admin    | admin    |
|    2 | stack    | stack    |
+------+----------+----------+
2 rows in set (0.00 sec)
```

```
SELECT stack.* FROM stack JOIN Overflow ON stack.id = Overflow.id;
```

* ADD / DROP /。 MySQL。

1. /`SELECT *`
2.
3. `SELECT *` -usage

1. 。 200kVARBINARY。 - `SELECT *`102MB
2.
3.
4. - @vinodadhikary
5.
6. SELECT *
7.
8. `TEXT`

WHERE

```
SELECT * FROM stack WHERE username = "admin" AND password = "admin";
```

```
+------+----------+----------+
| id   | username | password |
+------+----------+----------+
|    1 | admin    | admin    |
+------+----------+----------+
1 row in set (0.00 sec)
```

WHERESELECT

`WHERESELECT`。 "

。

```
SELECT title FROM books WHERE author_id = (SELECT id FROM authors WHERE last_name = 'Bar' AND
first_name = 'Foo');
```

```
SELECT * FROM stack WHERE username IN (SELECT username FROM signups WHERE email IS NULL);
```

。

SELECT with LIKE

```
CREATE TABLE stack
(  id int AUTO_INCREMENT PRIMARY KEY,
   username VARCHAR(100) NOT NULL
);
```

```
INSERT stack(username) VALUES
('admin'),('k admin'),('adm'),('a adm b'),('b XadmY c'), ('adm now'), ('not here');
```

“adm”

```
SELECT * FROM stack WHERE username LIKE "%adm%";
+----+-----------+
| id | username  |
+----+-----------+
|  1 | admin     |
|  2 | k admin   |
|  3 | adm       |
|  4 | a adm b   |
|  5 | b XadmY c |
|  6 | adm now   |
+----+-----------+
```

“adm”

```
SELECT * FROM stack WHERE username LIKE "adm%";
+----+----------+
| id | username |
+----+----------+
|  1 | admin    |
|  3 | adm      |
|  6 | adm now  |
+----+----------+
```

“adm”

```
SELECT * FROM stack WHERE username LIKE "%adm";
+----+----------+
| id | username |
+----+----------+
|  3 | adm      |
+----+----------+
```

LIKE% _◦

```
SELECT * FROM stack WHERE username LIKE "adm_n";
+----+----------+
| id | username |
+----+----------+
|  1 | admin    |
+----+----------+
```

username

- LIKE 'adm'`='adm' LIKE 'adm'
- BETWEEN..AND.. LIKE 'adm%“”BETWEEN..AND..◦
- LIKE '%adm' ◦ ◦ ◦
- RLIKE REGEXP LIKE◦
- MySQLFULLTEXTFULLTEXTLIKE◦

SELECT with AliasAS

SQL。 。

```
SELECT username AS val FROM stack;
SELECT username val FROM stack;
```

AS。

```
+-------+
| val   |
+-------+
| admin |
| stack |
+-------+
2 rows in set (0.00 sec)
```

LIMITSELECT

```
 SELECT *
   FROM Customers
  ORDER BY CustomerID
  LIMIT 3;
```

ID						
1	Alfreds Futterkiste		Obere Str。 57		12209	
2	Ana Trujillo Emparedadoshelados		AVDA。 delaConstitución2222	DF	05021	
3	AntonioMorenoTaquería		Mataderos 2312	DF	05023	

LIMITORDER BY ;。

```
 SELECT *
   FROM Customers
  ORDER BY CustomerID
  LIMIT 2,1;
```

LIMITLIMIT offset,count 。 。

ID						
3	AntonioMorenoTaquería		Mataderos 2312	DF	05023	

LIMIT;。

DISTINCT

SELECTDISTINCT。

```
CREATE TABLE `car`
(   `car_id` INT UNSIGNED NOT NULL PRIMARY KEY,
    `name` VARCHAR(20),
    `price` DECIMAL(8,2)
);

INSERT INTO CAR (`car_id`, `name`, `price`) VALUES (1, 'Audi A1', '20000');
INSERT INTO CAR (`car_id`, `name`, `price`) VALUES (2, 'Audi A1', '15000');
INSERT INTO CAR (`car_id`, `name`, `price`) VALUES (3, 'Audi A2', '40000');
INSERT INTO CAR (`car_id`, `name`, `price`) VALUES (4, 'Audi A2', '40000');

SELECT DISTINCT `name`, `price` FROM CAR;
+---------+----------+
| name    | price    |
+---------+----------+
| Audi A1 | 20000.00 |
| Audi A1 | 15000.00 |
| Audi A2 | 40000.00 |
+---------+----------+
```

DISTINCT。 SQL。 。 “Audi A1”。

MySQL DISTINCTORDER BY。 ONLY_FULL_GROUP_BYMySQLMySQL GROUP OF GROUP BY 。

LIKE_

LIKE_。

```
SELECT username FROM users WHERE users LIKE 'admin_';
```

```
+----------+
| username |
+----------+
| admin1   |
| admin2   |
| admin-   |
| adminA   |
+----------+
```

CASEIF

```
SELECT st.name,
       st.percentage,
       CASE WHEN st.percentage >= 35 THEN 'Pass' ELSE 'Fail' END AS `Remark`
FROM student AS st ;
```

```
+--------------------------------+
|   name   | percentage | Remark |
+--------------------------------+
```

```
|   Isha   |     67     |  Pass  |
|   Rucha  |     28     |  Fail  |
|   Het    |     35     |  Pass  |
|   Ansh   |     92     |  Pass  |
+--------------------------------+
```

IF

```
SELECT st.name,
       st.percentage,
       IF(st.percentage >= 35, 'Pass', 'Fail') AS `Remark`
FROM student AS st ;
```

NB

```
IF(st.percentage >= 35, 'Pass', 'Fail')
```

st.percentage> = 35**TRUE**`'Pass'` Pass'ELSE`'Fail'`

BETWEEN

BETWEEN“”。

```
+----+-----------+
| id | username  |
+----+-----------+
|  1 | admin     |
|  2 | root      |
|  3 | toor      |
|  4 | mysql     |
|  5 | thanks    |
|  6 | java      |
+----+-----------+
```

```
SELECT * FROM stack WHERE id >= 2 and id <= 5;
```

BETWEEN

```
SELECT * FROM stack WHERE id BETWEEN 2 and 5;
```

```
+----+-----------+
| id | username  |
+----+-----------+
|  2 | root      |
|  3 | toor      |
|  4 | mysql     |
|  5 | thanks    |
+----+-----------+
4 rows in set (0.00 sec)
```

BETWEEN>=<= >< 。

NOT BETWEEN

NOT ◦

```
SELECT * FROM stack WHERE id NOT BETWEEN 2 and 5;
```

```
+----+-----------+
| id | username  |
+----+-----------+
|  1 | admin     |
|  6 | java      |
+----+-----------+
2 rows in set (0.00 sec)
```

NOT BETWEEN><>=<= WHERE id NOT BETWEEN 2 and 5WHERE (id < 2 OR id > 5) ◦

BETWEENMySQL◦

```
SELECT ... WHERE dt >= '2017-02-01'
             AND dt  < '2017-02-01' + INTERVAL 1 MONTH
```

BETWEEN23:59:59◦

-
- BETWEEN'235959'◦
- DATE TIMESTAMP DATETIME DATETIME(6) ◦
- ◦
- BETWEEN◦

https://riptutorial.com/zh-CN/mysql/topic/3307/

67:

MySQL`GROUP_CONCAT()`。 pivot`group_concat_max_len`

```
set session group_concat_max_len = 1024 * 1024; -- This should be enough for most cases
```

Examples

MySQL。 。

`tbl_values`

ID			
1			10
2			20
3			10

`NameValue`; `Group Name`。

```
-- 1. Create an expression that builds the columns
set @sql = (
    select group_concat(distinct
        concat(
            "sum(case when `Group`='", Group, "' then `Value` end) as `", `Group`, "`"
        )
    )
    from tbl_values
);

-- 2. Complete the SQL instruction
set @sql = concat("select Name, ", @sql, " from tbl_values group by `Name`");

-- 3. Create a prepared statement
prepare stmt from @sql;

-- 4. Execute the prepared statement
execute stmt;
```

	10	
	10	20

```
deallocate prepare stmt;
```

SQL

https://riptutorial.com/zh-CN/mysql/topic/3074/

68: ...

1. SELECT expression1expression2... expression_n
2. aggregate_function
3. FROM
4. []
5. GROUP BY expression1expression2... expression_n;

expression1expression2... expression_n	GROUP BY。
aggregate_function	SUMCOUNTMINMAXAVG。
	。 FROM。
	。 。

MySQL GROUP BYSELECT。

ONLY_FULL_GROUP_BY。 SELECT。 5.7.5。 DBMS。

Examples

GROUP BYSUM

```
SELECT product, SUM(quantity) AS "Total quantity"
FROM order_details
GROUP BY product;
```

MIN

name departmentsalary。

```
SELECT department, MIN(salary) AS "Lowest salary"
FROM employees
GROUP BY department;
```

。 name。 “groupwise max”。

GROUP BYCOUNT

```
SELECT department, COUNT(*) AS "Man_Power"
FROM employees
GROUP BY department;
```

GROUP BYHAVING

```
SELECT department, COUNT(*) AS "Man_Power"
FROM employees
GROUP BY department
HAVING COUNT(*) >= 10;
```

GROUP BY ... HAVINGSELECT ... WHERE。

HAVING Man_Power >= 10HAVING“”。

Group Concat

Group ConcatMySQL。 Name(1):Score(*)

	A +
	-
	C +
	D-
	-

```
SELECT Name, GROUP_CONCAT(Score ORDER BY Score desc SEPERATOR ' ') AS Grades
FROM   Grade
GROUP BY Name
```

```
+------+------------+
| Name | Grades     |
+------+------------+
| Adam | C+ B A- A+ |
| Bill | D-         |
| John | A-         |
+------+------------+
```

AGGREGATEGROUP BY

```
+---------+------------+----------+-------+--------+
| orderid | customerid | customer | total | items  |
+---------+------------+----------+-------+--------+
|       1 |          1 | Bob      |  1300 |     10 |
|       2 |          3 | Fred     |   500 |      2 |
|       3 |          5 | Tess     |  2500 |      8 |
|       4 |          1 | Bob      |   300 |      6 |
|       5 |          2 | Carly    |   800 |      3 |
|       6 |          2 | Carly    |  1000 |     12 |
|       7 |          3 | Fred     |   100 |      1 |
```

```
|       8 |          5 | Tess     | 11500 |     50 |
|       9 |          4 | Jenny    |   200 |      2 |
|      10 |          1 | Bob      |   500 |     15 |
+---------+------------+----------+-------+--------+
```

-

WHERE ◦

◦

```
SELECT customer, COUNT(*) as orders
FROM orders
GROUP BY customer
ORDER BY customer
```

```
+----------+--------+
| customer | orders |
+----------+--------+
| Bob      |      3 |
| Carly    |      2 |
| Fred     |      2 |
| Jenny    |      1 |
| Tess     |      2 |
+----------+--------+
```

-

◦

◦

```
SELECT customer, SUM(total) as sum_total, SUM(items) as sum_items
FROM orders
GROUP BY customer
ORDER BY customer
```

```
+----------+-----------+-----------+
| customer | sum_total | sum_items |
+----------+-----------+-----------+
| Bob      |      2100 |        31 |
| Carly    |      1800 |        15 |
| Fred     |       600 |         3 |
| Jenny    |       200 |         2 |
| Tess     |     14000 |        58 |
+----------+-----------+-----------+
```

- **AVG**

◦

◦

```
SELECT customer, AVG(total) as avg_total
FROM orders
GROUP BY customer
ORDER BY customer
```

```
+----------+-----------+
| customer | avg_total |
+----------+-----------+
| Bob      |       700 |
| Carly    |       900 |
| Fred     |       300 |
| Jenny    |       200 |
| Tess     |      7000 |
+----------+-----------+
```

- **MAX**

◦

◦

```
SELECT customer, MAX(total) as max_total
FROM orders
GROUP BY customer
ORDER BY customer
```

```
+----------+-----------+
| customer | max_total |
+----------+-----------+
| Bob      |      1300 |
| Carly    |      1000 |
| Fred     |       500 |
| Jenny    |       200 |
| Tess     |     11500 |
+----------+-----------+
```

- **MIN**

◦

◦

```
SELECT customer, MIN(total) as min_total
FROM orders
GROUP BY customer
ORDER BY customer
```

```
+----------+-----------+
| customer | min_total |
+----------+-----------+
| Bob      |       300 |
| Carly    |       800 |
| Fred     |       100 |
| Jenny    |       200 |
```

```
| Tess     |      2500 |
+----------+-----------+
```

... https://riptutorial.com/zh-CN/mysql/topic/3523/---

69: GRANTs

Examples

rootSUPER

```
GRANT ... TO root@localhost ...
```

。SUPER。SUPER。

```
GRANT ... ON dbname.* ...
```

dbname。

```
GRANT SELECT ON dname.* ...    -- "read only"
GRANT ... ON dname.tblname ... -- "just one table"
```

readonly"

```
GRANT SELECT, CREATE TEMPORARY TABLE ON dname.* ...    -- "read only"
```

。 。 。

root。 SECURITY DEFINER root“”。 SP。

@

“”IP。 。

```
GRANT SELECT ON db.* TO sam@'my.domain.com' IDENTIFIED BY 'foo';
```

```
localhost -- the same machine as mysqld
'my.domain.com' -- a specific domain; this involves a lookup
'11.22.33.44' -- a specific IP address
'192.168.1.%' -- wild card for trailing part of IP address.  (192.168.% and 10.% and 11.% are
"internal" ip addresses.)
```

localhost。 localhostroot。 0.0.0.1::1。

GRANTs https://riptutorial.com/zh-CN/mysql/topic/5131/grants

70:

3

-
- `my.cnf`
-

`mysqld --long-parameter-name=value --another-parameter◦ my.conf◦` MySQL◦ ◦

`-_ ◦ =◦ K M G◦ ◦`

`ON 1OFF0 ◦ ◦`

`my.cnf [mysqld]◦` mysqlmy.cnf◦

Examples

InnoDB

my.cnf◦ MySQL'lite'◦

```
innodb_buffer_pool_size
```

RAM704GBRAM;VM◦ InnoDB ENGINE◦ InnoDB◦

max_allowed_packet = 10M

MMbGGbKKb

group_concat

`group_concatgroup ◦ group_concat_max_len`

```
SET [GLOBAL | SESSION] group_concat_max_len = val;
```

`GLOBALSESSION◦`

InnoDB

InnoDBMySQL◦ InnoDB◦ `DROP◦` SSDSDD◦

```
default_storage_engine = InnoDB
query_cache_type = 0
innodb_file_per_table = 1
innodb_flush_neighbors = 0
```

`innodb_thread_concurrency`infinity04;InnoDB。

```
innodb_thread_concurrency = 0
innodb_read_io_threads = 64
innodb_write_io_threads = 64
```

MySQLIOPScapacity_max。200HDDSSDIOPS。IOPS。 *MySQL* 。。

```
innodb_io_capacity = 2500
innodb_io_capacity_max = 3000
```

RAM

MySQLRAM。70-80MySQLRAM。 RAM。

```
innodb_buffer_pool_size = 10G
```

MySQL

`aes-128-ecb`ECB。

```
block_encryption_mode = aes-256-cbc
```

https://riptutorial.com/zh-CN/mysql/topic/3134/

71: 1055ONLY_FULL_GROUP_BYGROUP BY ...

MySQL1055。 。 MySQLGROUP BY。

MySQLGROUP BY。 GROUP BY。

GROUP BYSELECT *GROUP BY。 。

。 https://dev.mysql.com/doc/refman/5.7/en/group-by-handling.html

MySQL。 5.7.5ONLY_FULL_GROUP_BYsql_mode。 。 MySQL5.7.14。

1055

1. SQL。
2. MySQL。
3. sql_modeONLY_FULL_GROUP_BY。

SET。

```
SET  sql_mode =
'STRICT_TRANS_TABLES,NO_ZERO_IN_DATE,NO_ZERO_DATE,ERROR_FOR_DIVISION_BY_ZERO,NO_AUTO_CREATE_USER,NO_ENG
```

MySQL。

MySQLinit sql_mode=ONLY_FULL_GROUP_BY 。

Examples

GROUP BY

```
 SELECT item.item_id, item.name,     /* not SQL-92 */
        COUNT(*) number_of_uses
  FROM item
  JOIN uses ON item.item_id, uses.item_id
 GROUP BY item.item_id
```

itemuses。 SQL-92。

GROUP BYSELECTORDER BY

1. GROUP BY
2. COUNT() MIN()。

SELECTitem.name 。 SQLONLY_FULL_GROUP_BY MySQL 5.6。

GROUP BYSQL-92。

```
SELECT item.item_id, item.name,
       COUNT(*) number_of_uses
  FROM item
  JOIN uses ON item.item_id, uses.item_id
 GROUP BY item.item_id, item.name
```

DBMSSQL-99SELECT。 item.nameitem.item_id SQL-99。 MySQL5.7 。 ONLY_FULL_GROUP_BY ONLY_FULL_GROUP_BY 。

GROUP BY

```
SELECT item.item_id, uses.category,   /* nonstandard */
       COUNT(*) number_of_uses
  FROM item
  JOIN uses ON item.item_id, uses.item_id
 GROUP BY item.item_id
```

itemuses。 uses.category。

MySQLONLY_FULL_GROUP_BY。 MySQLGROUP BY 。

usesJOINONMySQLcategory。 。 MySQL。

。 。 。 MySQL 。 MySQL。 。 。 。

MySQL。 5.7MySQLONLY_FULL_GROUP_BYsql_mode。 MySQL1055。

GROUP BYSELECT *。

SELECT* 。

```
 SELECT item.*,     /* nonstandard */
        COUNT(*) number_of_uses
  FROM item
  JOIN uses ON item.item_id, uses.item_id
 GROUP BY item.item_id
```

ONLY_FULL_GROUP_BY。

GROUP BYitem_idnumber_of_uses。 uses。

```
                              SELECT item_id, COUNT(*) number_of_uses
                                FROM  uses
                               GROUP BY item_id
```

item。

```
 SELECT item.*, usecount.number_of_uses
```

```
    FROM item
    JOIN (
                                SELECT item_id, COUNT(*) number_of_uses
                                  FROM  uses
                                 GROUP BY item_id
          ) usecount ON item.item_id = usecount.item_id
```

GROUP BY*。

*。 。

ANY_VALUE

```
  SELECT item.item_id, ANY_VALUE(uses.tag) tag,
         COUNT(*) number_of_uses
   FROM item
   JOIN uses ON item.item_id, uses.item_id
  GROUP BY item.item_id
```

itemuses。

ANY_VALUE()。 MySQL。 1055。

ANY_VALUE()。

SURPRISE_ME() 。 GROUP BY。 。 MySQL。 。

。 。 RAM。

。

1055ONLY_FULL_GROUP_BYGROUP BY... https://riptutorial.com/zh-CN/mysql/topic/8245/1055-only-full-group-by-group-by---

72:

Examples

1064

```
select LastName, FirstName,
from Person
```

1064。SQL;MySQL2“”。

MySQL“1064”。。

MySQL。MySQL`from Person`。`from Person`。MySQL`SELECT`

`... near '...'`。。。

`... near '';`。MySQL。`'"`。

`DELIMITER`。

1064。。

1064。

1175

`KEYWHERE`。

-

```
SET SQL_SAFE_UPDATES = 0;
```

-

```
SET SQL_SAFE_UPDATES = 1;
```

1215

`FK`。

```
CREATE TABLE `gtType` (
  `type` char(2) NOT NULL,
  `description` varchar(1000) NOT NULL,
  PRIMARY KEY (`type`)
) ENGINE=InnoDB;
```

```
CREATE TABLE `getTogethers` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `type` char(2) NOT NULL,
  `eventDT` datetime NOT NULL,
  `location` varchar(1000) NOT NULL,
  PRIMARY KEY (`id`),
  KEY `fk_gt2type` (`type`), -- see Note1 below
  CONSTRAINT `gettogethers_ibfk_1` FOREIGN KEY (`type`) REFERENCES `gtType` (`type`)
) ENGINE=InnoDB;
```

1FKKEY。KEY。 someOther 。

。

```
CREATE TABLE `someOther` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `someDT` datetime NOT NULL,
  PRIMARY KEY (`id`),
  CONSTRAINT `someOther_dt` FOREIGN KEY (`someDT`) REFERENCES `getTogethers` (`eventDT`)
) ENGINE=InnoDB;
```

1215。

getTogethersgetTogetherseventDT 。 。

```
CREATE INDEX `gt_eventdt` ON getTogethers (`eventDT`);
```

getTogetherssomeOther。

MySQLFOREIGN KEY

MySQL。 。 。

。 。 。 。

InnoDB。 。

。

```
SHOW CREATE TABLE someOther;
```

- INTINT UNSIGNED 。
- KEYS。

1045

“GRANT”“root”。

1236“”

Master`sync_binlog`OFF。 SlavebinlogMaster`CHANGE MASTER to POS=0` 。

binlog`sync_binlog=OFF` MasterSlave。 Slavebinlog。 MasterbinlogCHANGEingbinlog。

I / O`sync_binlog=ON` 。

GTID.....

20022003

3306。

/

-
- “service firewalld stop”“systemctl disable firewalld”
- telnet master 3306
- `bind-address`
- `skip-name-resolve`
- 。

1067,1292,1366,1411 -

1067`TIMESTAMP`。 `TIMESTAMP defaults` 。

1292/1366 DOUBLE / Integer。 ;`VARCHAR`。

1292 DATETIME。 23。 `+00`。

1292 VARIABLE`SETVARIABLE`。

1292 LOAD DATA“”。 。 。

1411 STR_TO_DATE

126,127,134,144,145

MySQL。 MySQL。

```
MySQL error code 126 = Index file is crashed
MySQL error code 127 = Record-file is crashed
MySQL error code 134 = Record was already deleted (or record file crashed)
MySQL error code 144 = Table is crashed and last repair failed
MySQL error code 145 = Table was marked as crashed and should be repaired
```

MySQL。 。 。 MySQL。

`MyISAM CHECK TABLE REPAIR TABLE` 。

InnoDB。

```
CHECK TABLE <table name> ////To check the extent of database corruption
REPAIR TABLE <table name> ////To repair table
```

139

139。

-
-
-

1366

。 .....

126,1054,1146,1062,24

450。

"。

24

open_files_limitOS。 table_open_cache。

- DEALLOCATE PREPARE 。
- innodb_file_per_table = ONPARTITIONed。50。 “Native Partitions”。

ulimit/etc/security/limits.confsysctl.conf kern.maxfileskern.maxfilesperproc。 open_files_limit table_open_cache 。

5.6.8 open_files_limitmax_connections。

1062 -

1. - Error Code: 1062. Duplicate entry '12' for key 'PRIMARY'

   。 。

   AUTO_INCREMENT 。 NULL。

```
CREATE TABLE userDetails(
  userId INT(10) NOT NULL AUTO_INCREMENT,
  firstName VARCHAR(50),
  lastName VARCHAR(50),
  isActive INT(1) DEFAULT 0,
  PRIMARY KEY (userId) );

--->and now while inserting
INSERT INTO userDetails VALUES (NULL ,'John', 'Doe', 1);
```

2. - `Error Code: 1062. Duplicate entry 'A' for key 'code'`

   ◦

   `INSERT IGNOREINSERT ◦` MySQL◦ `IGNORE◦`

```
INSERT IGNORE INTO userDetails VALUES (NULL ,'John', 'Doe', 1);
```

https://riptutorial.com/zh-CN/mysql/topic/895/

73:

- SELECT column_1 [column_2]
  table_1
  ORDER BY order_column
  LIMIT row_count [OFFSET row_offset]
- SELECT column_1 [column_2]
  table_1
  ORDER BY order_column
  LIMIT [row_offset] row_count

“”“”。

“”row

Examples

users

ID	
1	1
2	2
3	3
4	4
	5

SELECT LIMIT。

LIMIT

```
SELECT * FROM users ORDER BY id ASC LIMIT 2
```

ID	
1	1
2	2

0 。

ORDER BY。

LIMIT

LIMIT

- - ◦ 0◦
- ◦

```
SELECT * FROM users ORDER BY id ASC LIMIT 2, 3
```

ID	
3	3
4	4
	5

offset0 LIMIT◦ 2

```
SELECT * FROM users ORDER BY id ASC LIMIT 0, 2

SELECT * FROM users ORDER BY id ASC LIMIT 2
```

ID	
1	1
2	2

OFFSET

LIMITOFFSET

```
SELECT * FROM users ORDER BY id ASC LIMIT 2 OFFSET 3
```

ID	
3	3
4	4

- ;
- ◦

https://riptutorial.com/zh-CN/mysql/topic/548/

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