SQL DATE Type
Type Conversion
MySQL Edition

SQL DATE Type

MySQL offers three data types to represent date and time values: `DATE`, `TIME` and `DATETIME`.

MySQL expects values of these three types to be represented as *string constants* in specific formats. The default formats of data for each data type are specified below.

MySQL Type	Default expected format
`DATE`	'YYYY-MM-DD' 'YYYY/MM/DD'
`TIME`	'HH:MM:SS'
`DATETIME`	'YYYY-MM-DD HH:MM:SS'

Here, the following format abbreviations are used:

Abbreviation	Explanation	Examples
`YYYY`	Four digit year	1999, 2015
`MM`	Two-digit month number	`01, 02,..., 12`
`DD`	Two-digit day of month	`01, 02, ..., 31`
`HH`	Two-digit hour of day	`00, 01, 02, ..., 23`
`MM`	Two-digit minute of the hour	`00, 01, ..., 59`
`SS`	Two-digit second of the minute	00, 01, ..., 59

In general, MySQL is *strict* about the order of components in the `DATE`, `TIME` and `DATETIME` types, but is *relaxed* about the delimiters between the components. Under most circumstances, any delimeter symbol can be consistently used in a date.

Example. Here are some date formats and MySQL's interpretation of them.

```
mysql> CREATE TABLE dtest ( id INT PRIMARY KEY, day DATE, t TIME, dt DATETIME );
Query OK, 0 rows affected (0.00 sec)

mysql> INSERT INTO dtest VALUES(1, '1999-12-20', '12:34:23', '1999-12-20 12:34:23');
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO dtest VALUES(2, '1999:12:20', '12:34:23', '1999:12:20 12%34%23');
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO dtest VALUES(3, '1999/12/20', '12:34:23', '1999/12/20 12-34-23');
Query OK, 1 row affected (0.00 sec)

mysql> select * from dtest;
+----+------------+----------+---------------------+
| id | day        | t        | dt                  |
+----+------------+----------+---------------------+
|  1 | 1999-12-20 | 12:34:23 | 1999-12-20 12:34:23 |
|  2 | 1999-12-20 | 12:34:23 | 1999-12-20 12:34:23 |
|  3 | 1999-12-20 | 12:34:23 | 1999-12-20 12:34:23 |
+----+------------+----------+---------------------+
3 rows in set (0.00 sec)
```

Date and Time Built-in Functions

MySQL has a wide range of built-in functions available for manipulation of values of types `DATE`, `TIME` and `DATETIME`. Some of these functions are discussed below.

`DATE_FORMAT(date, format)` : format the date according to the format string. The format string can use the following specifiers (all specifiers must be prefaced with the '%' character.

specification	explanation	examples
%m	Numeric month	01, . . . , 12
%c	Numeric month	1, . . . , 12
%M	Full month name	'January',. . . ,'December'
%d	Day of the month	01,. . . , 31
%e	Day of the month	1,. . . , 31
%Y	4-digit year	. . . , 1998, 1999, 2000, 2001, . . .
%y	Last 2 digits of the year	01,. . . , 99
RR	Like YY, but the two digits are "rounded" to a year	01,. . . , 99
%h	Twelve-hour hour of day	01,. . . ,12
%H	Twenty-four-hour hour of day	00,. . . ,23
%i	Minute	0,. . . ,59
%S, %s	Second	0,. . . ,59
%p	Meridian indicator	'AM', 'PM'
%T	time, 24 hour (hh:mm:ss)	'15:34:23'
%f	Microseconds	000000,...999999
%W	Day of week	'Monday',. . . ,'Sunday'
%w	numeric day of week	0 (Sunday),. . . 6 (Saturday)
%a	Abbreviated day of week	'Mon',..., 'Sun'
%b	Abbreviated month name	'Jan',..., 'Dec'

Examples.

```
mysql> SELECT DATE_FORMAT('1999-12-20', '%d/%m/%Y'), DATE_FORMAT('1999-12-20', '%M %e, %Y');
+--------------------------------------+---------------------------------------+
| DATE_FORMAT('1999-12-20', '%d/%m/%Y') | DATE_FORMAT('1999-12-20', '%M %e, %Y') |
+--------------------------------------+---------------------------------------+
| 20/12/1999                           | December 20, 1999                     |
+--------------------------------------+---------------------------------------+
```

This function is applicable to `DATE` and `DATETIME` values only. For `TIME` values, use `TIME_FORMAT(time, format)` function, which can only contain format information for hours, minutes, seconds, milliseconds and the meredian.

```
mysql> SELECT TIME_FORMAT('12:34:23', '%H h %i m %S s'), TIME_FORMAT('12:34:23', '%h:%i %p');
+-----------------------------------------+-----------------------------------+
| TIME_FORMAT('12:34:23', '%H h %i m %S s') | TIME_FORMAT('12:34:23', '%h:%i %p') |
+-----------------------------------------+-----------------------------------+
| 12 h 34 m 23 s                          | 12:34 PM                          |
+-----------------------------------------+-----------------------------------+
```

`CURRENT_DATE()` : returns current date.

```
mysql> SELECT CURRENT_DATE(), DATE_FORMAT(CURRENT_DATE(), '%d, %m, %y');
+----------------+--------------------------------------------+
| CURRENT_DATE() | DATE_FORMAT(CURRENT_DATE(), '%d, %m, %y') |
+----------------+--------------------------------------------+
| 2015-02-10     | 10, 02, 15                                 |
+----------------+--------------------------------------------+
```

This function also has synonyms: `CURDATE()` and `CURRENT_DATE`.

`CURRENT_TIME(), CURRENT_TIME, CURTIME()`: all these functions return current time.

```
mysql> SELECT CURRENT_TIME(), CURTIME(), CURRENT_TIME;
+----------------+-----------+--------------+
| CURRENT_TIME() | CURTIME() | CURRENT_TIME |
+----------------+-----------+--------------+
| 16:11:45       | 16:11:45  | 16:11:45     |
+----------------+-----------+--------------+
```

`NOW()` : returns current date and time as a `DATETIME` value.

```
mysql> SELECT NOW();
+---------------------+
| NOW()               |
+---------------------+
| 2015-02-10 16:17:24 |
+---------------------+
```

`DATEDIFF(date1, date2)` : returns the difference between two dates (`date1 - date2`) in *days*.

```
mysql> SELECT DATEDIFF('2015-02-15', '2015-02-14'), DATEDIFF('2015-02-14','2015-02-15');
+---------------------------------------+---------------------------------------+
| DATEDIFF('2015-02-15', '2015-02-14') | DATEDIFF('2015-02-14','2015-02-15') |
+---------------------------------------+---------------------------------------+
|                                     1 |                                    -1 |
+---------------------------------------+---------------------------------------+
1 row in set (0.00 sec)

mysql> SELECT DATEDIFF('2015-02-15', '2014-08-12');
+--------------------------------------+
| DATEDIFF('2015-02-15', '2014-08-12') |
+--------------------------------------+
|                                  187 |
+--------------------------------------+
```