* MySQL is an open-source relational database management system. Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language
* Semicolon is the standard way to separate each SQL statement in database systems that allow more than one SQL statement to be executed in the same call to the server.
* SQL is a query language, whereas MySQL is a relational database that uses SQL to query a database. You can use **SQL to access, update, and manipulate the data stored in a database**. However, MySQL is a database that stores the existing data in a database in an organized manner.
* Date formats - MySQL comes with the following data types for storing a date or a date/time value in the database:
* DATE - format YYYY-MM-DD
* DATETIME - format: YYYY-MM-DD HH:MI:SS
* TIMESTAMP - format: YYYY-MM-DD HH:MI:SS
* YEAR - format YYYY or YY

String Data Types

|  |  |
| --- | --- |
| **Data type** | **Description** |
| CHAR(size) | A FIXED length string (can contain letters, numbers, and special characters). The *size* parameter specifies the column length in characters - can be from 0 to 255. Default is 1 |
| VARCHAR(size) | A VARIABLE length string (can contain letters, numbers, and special characters). The *size* parameter specifies the maximum column length in characters - can be from 0 to 65535 |
| BINARY(size) | Equal to CHAR(), but stores binary byte strings. The *size* parameter specifies the column length in bytes. Default is 1 |
| VARBINARY(size) | Equal to VARCHAR(), but stores binary byte strings. The *size* parameter specifies the maximum column length in bytes. |
| TINYBLOB | For BLOBs (Binary Large OBjects). Max length: 255 bytes |
| TINYTEXT | Holds a string with a maximum length of 255 characters |
| TEXT(size) | Holds a string with a maximum length of 65,535 bytes |
| BLOB(size) | For BLOBs (Binary Large OBjects). Holds up to 65,535 bytes of data |
| MEDIUMTEXT | Holds a string with a maximum length of 16,777,215 characters |
| MEDIUMBLOB | For BLOBs (Binary Large OBjects). Holds up to 16,777,215 bytes of data |
| LONGTEXT | Holds a string with a maximum length of 4,294,967,295 characters |
| LONGBLOB | For BLOBs (Binary Large OBjects). Holds up to 4,294,967,295 bytes of data |
| ENUM(val1, val2, val3, ...) | A string object that can have only one value, chosen from a list of possible values. You can list up to 65535 values in an ENUM list. If a value is inserted that is not in the list, a blank value will be inserted. The values are sorted in the order you enter them |
| SET(val1, val2, val3, ...) | A string object that can have 0 or more values, chosen from a list of possible values. You can list up to 64 values in a SET list |

Numeric Data Types

|  |  |
| --- | --- |
| **Data type** | **Description** |
| BIT(*size*) | A bit-value type. The number of bits per value is specified in *size*. The *size* parameter can hold a value from 1 to 64. The default value for *size* is 1. |
| TINYINT(*size*) | A very small integer. Signed range is from -128 to 127. Unsigned range is from 0 to 255. The *size* parameter specifies the maximum display width (which is 255) |
| BOOL | Zero is considered as false, nonzero values are considered as true. |
| BOOLEAN | Equal to BOOL |
| SMALLINT(*size*) | A small integer. Signed range is from -32768 to 32767. Unsigned range is from 0 to 65535. The *size* parameter specifies the maximum display width (which is 255) |
| MEDIUMINT(*size*) | A medium integer. Signed range is from -8388608 to 8388607. Unsigned range is from 0 to 16777215. The *size* parameter specifies the maximum display width (which is 255) |
| INT(*size*) | A medium integer. Signed range is from -2147483648 to 2147483647. Unsigned range is from 0 to 4294967295. The *size* parameter specifies the maximum display width (which is 255) |
| INTEGER(*size*) | Equal to INT(size) |
| BIGINT(*size*) | A large integer. Signed range is from -9223372036854775808 to 9223372036854775807. Unsigned range is from 0 to 18446744073709551615. The *size* parameter specifies the maximum display width (which is 255) |
| FLOAT(*size*, *d*) | A floating point number. The total number of digits is specified in *size*. The number of digits after the decimal point is specified in the *d* parameter. This syntax is deprecated in MySQL 8.0.17, and it will be removed in future MySQL versions |
| FLOAT(*p*) | A floating point number. MySQL uses the *p* value to determine whether to use FLOAT or DOUBLE for the resulting data type. If *p* is from 0 to 24, the data type becomes FLOAT(). If *p* is from 25 to 53, the data type becomes DOUBLE() |
| DOUBLE(*size*, *d*) | A normal-size floating point number. The total number of digits is specified in *size*. The number of digits after the decimal point is specified in the *d* parameter |
| DOUBLE PRECISION(*size*, *d*) |  |
| DECIMAL(*size*, *d*) | An exact fixed-point number. The total number of digits is specified in *size*. The number of digits after the decimal point is specified in the *d* parameter. The maximum number for *size* is 65. The maximum number for *d* is 30. The default value for *size* is 10. The default value for *d* is 0. |
| DEC(*size*, *d*) | Equal to DECIMAL(size,d) |

Date and Time Data Types

|  |  |
| --- | --- |
| **Data type** | **Description** |
| DATE | A date. Format: YYYY-MM-DD. The supported range is from '1000-01-01' to '9999-12-31' |
| DATETIME(*fsp*) | A date and time combination. Format: YYYY-MM-DD hh:mm:ss. The supported range is from '1000-01-01 00:00:00' to '9999-12-31 23:59:59'. Adding DEFAULT and ON UPDATE in the column definition to get automatic initialization and updating to the current date and time |
| TIMESTAMP(*fsp*) | A timestamp. TIMESTAMP values are stored as the number of seconds since the Unix epoch ('1970-01-01 00:00:00' UTC). Format: YYYY-MM-DD hh:mm:ss. The supported range is from '1970-01-01 00:00:01' UTC to '2038-01-09 03:14:07' UTC. Automatic initialization and updating to the current date and time can be specified using DEFAULT CURRENT\_TIMESTAMP and ON UPDATE CURRENT\_TIMESTAMP in the column definition |
| TIME(*fsp*) | A time. Format: hh:mm:ss. The supported range is from '-838:59:59' to '838:59:59' |
| YEAR |  |

## **MySQL String Functions**

|  |  |
| --- | --- |
| **Function** | **Description** |
| [ASCII](https://www.w3schools.com/mySQl/func_mysql_ascii.asp) | Returns the ASCII value for the specific character |
| [CHAR\_LENGTH](https://www.w3schools.com/mySQl/func_mysql_char_length.asp) | Returns the length of a string (in characters) |
| [CHARACTER\_LENGTH](https://www.w3schools.com/mySQl/func_mysql_character_length.asp) | Returns the length of a string (in characters) |
| [CONCAT](https://www.w3schools.com/mySQl/func_mysql_concat.asp) | Adds two or more expressions together |
| [CONCAT\_WS](https://www.w3schools.com/mySQl/func_mysql_concat_ws.asp) | Adds two or more expressions together with a separator |
| [FIELD](https://www.w3schools.com/mySQl/func_mysql_field.asp) | Returns the index position of a value in a list of values |
| [FIND\_IN\_SET](https://www.w3schools.com/mySQl/func_mysql_find_in_set.asp) | Returns the position of a string within a list of strings |
| [FORMAT](https://www.w3schools.com/mySQl/func_mysql_format.asp) | Formats a number to a format like "#,###,###.##", rounded to a specified number of decimal places |
| [INSERT](https://www.w3schools.com/mySQl/func_mysql_insert.asp) | Inserts a string within a string at the specified position and for a certain number of characters |
| [INSTR](https://www.w3schools.com/mySQl/func_mysql_instr.asp) | Returns the position of the first occurrence of a string in another string |
| [LCASE](https://www.w3schools.com/mySQl/func_mysql_lcase.asp) | Converts a string to lower-case |
| [LEFT](https://www.w3schools.com/mySQl/func_mysql_left.asp) | Extracts a number of characters from a string (starting from left) |
| [LENGTH](https://www.w3schools.com/mySQl/func_mysql_length.asp) | Returns the length of a string (in bytes) |
| [LOCATE](https://www.w3schools.com/mySQl/func_mysql_locate.asp) | Returns the position of the first occurrence of a substring in a string |
| [LOWER](https://www.w3schools.com/mySQl/func_mysql_lower.asp) | Converts a string to lower-case |
| [LPAD](https://www.w3schools.com/mySQl/func_mysql_lpad.asp) | Left-pads a string with another string, to a certain length |
| [LTRIM](https://www.w3schools.com/mySQl/func_mysql_ltrim.asp) | Removes leading spaces from a string |
| [MID](https://www.w3schools.com/mySQl/func_mysql_mid.asp) | Extracts a substring from a string (starting at any position) |
| [POSITION](https://www.w3schools.com/mySQl/func_mysql_position.asp) | Returns the position of the first occurrence of a substring in a string |
| [REPEAT](https://www.w3schools.com/mySQl/func_mysql_repeat.asp) | Repeats a string as many times as specified |
| [REPLACE](https://www.w3schools.com/mySQl/func_mysql_replace.asp) | Replaces all occurrences of a substring within a string, with a new substring |
| [REVERSE](https://www.w3schools.com/mySQl/func_mysql_reverse.asp) | Reverses a string and returns the result |
| [RIGHT](https://www.w3schools.com/mySQl/func_mysql_right.asp) | Extracts a number of characters from a string (starting from right) |
| [RPAD](https://www.w3schools.com/mySQl/func_mysql_rpad.asp) | Right-pads a string with another string, to a certain length |
| [RTRIM](https://www.w3schools.com/mySQl/func_mysql_rtrim.asp) | Removes trailing spaces from a string |
| [SPACE](https://www.w3schools.com/mySQl/func_mysql_space.asp) | Returns a string of the specified number of space characters |
| [STRCMP](https://www.w3schools.com/mySQl/func_mysql_strcmp.asp) | Compares two strings |
| [SUBSTR](https://www.w3schools.com/mySQl/func_mysql_substr.asp) | Extracts a substring from a string (starting at any position) |
| [SUBSTRING](https://www.w3schools.com/mySQl/func_mysql_substring.asp) | Extracts a substring from a string (starting at any position) |
| [SUBSTRING\_INDEX](https://www.w3schools.com/mySQl/func_mysql_substring_index.asp) | Returns a substring of a string before a specified number of delimiter occurs |
| [TRIM](https://www.w3schools.com/mySQl/func_mysql_trim.asp) | Removes leading and trailing spaces from a string |
| [UCASE](https://www.w3schools.com/mySQl/func_mysql_ucase.asp) | Converts a string to upper-case |
| [UPPER](https://www.w3schools.com/mySQl/func_mysql_upper.asp) | Converts a string to upper-case |

## **MySQL Numeric Functions**

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| --- | --- |
| **Function** | **Description** |
| [ABS](https://www.w3schools.com/mySQl/func_mysql_abs.asp) | Returns the absolute value of a number |
| [ACOS](https://www.w3schools.com/mySQl/func_mysql_acos.asp) | Returns the arc cosine of a number |
| [ASIN](https://www.w3schools.com/mySQl/func_mysql_asin.asp) | Returns the arc sine of a number |
| [ATAN](https://www.w3schools.com/mySQl/func_mysql_atan.asp) | Returns the arc tangent of one or two numbers |
| [ATAN2](https://www.w3schools.com/mySQl/func_mysql_atan2.asp) | Returns the arc tangent of two numbers |
| [AVG](https://www.w3schools.com/mySQl/func_mysql_avg.asp) | Returns the average value of an expression |
| [CEIL](https://www.w3schools.com/mySQl/func_mysql_ceil.asp) | Returns the smallest integer value that is >= to a number |
| [CEILING](https://www.w3schools.com/mySQl/func_mysql_ceiling.asp) | Returns the smallest integer value that is >= to a number |
| [COS](https://www.w3schools.com/mySQl/func_mysql_cos.asp) | Returns the cosine of a number |
| [COT](https://www.w3schools.com/mySQl/func_mysql_cot.asp) | Returns the cotangent of a number |
| [COUNT](https://www.w3schools.com/mySQl/func_mysql_count.asp) | Returns the number of records returned by a select query |
| [DEGREES](https://www.w3schools.com/mySQl/func_mysql_degrees.asp) | Converts a value in radians to degrees |
| [DIV](https://www.w3schools.com/mySQl/func_mysql_div.asp) | Used for integer division |
| [EXP](https://www.w3schools.com/mySQl/func_mysql_exp.asp) | Returns e raised to the power of a specified number |
| [FLOOR](https://www.w3schools.com/mySQl/func_mysql_floor.asp) | Returns the largest integer value that is <= to a number |
| [GREATEST](https://www.w3schools.com/mySQl/func_mysql_greatest.asp) | Returns the greatest value of the list of arguments |
| [LEAST](https://www.w3schools.com/mySQl/func_mysql_least.asp) | Returns the smallest value of the list of arguments |
| [LN](https://www.w3schools.com/mySQl/func_mysql_ln.asp) | Returns the natural logarithm of a number |
| [LOG](https://www.w3schools.com/mySQl/func_mysql_log.asp) | Returns the natural logarithm of a number, or the logarithm of a number to a specified base |
| [LOG10](https://www.w3schools.com/mySQl/func_mysql_log10.asp) | Returns the natural logarithm of a number to base 10 |
| [LOG2](https://www.w3schools.com/mySQl/func_mysql_log2.asp) | Returns the natural logarithm of a number to base 2 |
| [MAX](https://www.w3schools.com/mySQl/func_mysql_max.asp) | Returns the maximum value in a set of values |
| [MIN](https://www.w3schools.com/mySQl/func_mysql_min.asp) | Returns the minimum value in a set of values |
| [MOD](https://www.w3schools.com/mySQl/func_mysql_mod.asp) | Returns the remainder of a number divided by another number |
| [PI](https://www.w3schools.com/mySQl/func_mysql_pi.asp) | Returns the value of PI |
| [POW](https://www.w3schools.com/mySQl/func_mysql_pow.asp) | Returns the value of a number raised to the power of another number |
| [POWER](https://www.w3schools.com/mySQl/func_mysql_power.asp) | Returns the value of a number raised to the power of another number |
| [RADIANS](https://www.w3schools.com/mySQl/func_mysql_radians.asp) | Converts a degree value into radians |
| [RAND](https://www.w3schools.com/mySQl/func_mysql_rand.asp) | Returns a random number |
| [ROUND](https://www.w3schools.com/mySQl/func_mysql_round.asp) | Rounds a number to a specified number of decimal places |
| [SIGN](https://www.w3schools.com/mySQl/func_mysql_sign.asp) | Returns the sign of a number |
| [SIN](https://www.w3schools.com/mySQl/func_mysql_sin.asp) | Returns the sine of a number |
| [SQRT](https://www.w3schools.com/mySQl/func_mysql_sqrt.asp) | Returns the square root of a number |
| [SUM](https://www.w3schools.com/mySQl/func_mysql_sum.asp) | Calculates the sum of a set of values |
| [TAN](https://www.w3schools.com/mySQl/func_mysql_tan.asp) | Returns the tangent of a number |
| [TRUNCATE](https://www.w3schools.com/mySQl/func_mysql_truncate.asp) | Truncates a number to the specified number of decimal places |

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| --- | --- |
| **Function** | **Description** |
| [ADDDATE](https://www.w3schools.com/mySQl/func_mysql_adddate.asp) | Adds a time/date interval to a date and then returns the date |
| [ADDTIME](https://www.w3schools.com/mySQl/func_mysql_addtime.asp) | Adds a time interval to a time/datetime and then returns the time/datetime |
| [CURDATE](https://www.w3schools.com/mySQl/func_mysql_curdate.asp) | Returns the current date |
| [CURRENT\_DATE](https://www.w3schools.com/mySQl/func_mysql_current_date.asp) | Returns the current date |
| [CURRENT\_TIME](https://www.w3schools.com/mySQl/func_mysql_current_time.asp) | Returns the current time |
| [CURRENT\_TIMESTAMP](https://www.w3schools.com/mySQl/func_mysql_current_timestamp.asp) | Returns the current date and time |
| [CURTIME](https://www.w3schools.com/mySQl/func_mysql_curtime.asp) | Returns the current time |
| [DATE](https://www.w3schools.com/mySQl/func_mysql_date.asp) | Extracts the date part from a datetime expression |
| [DATEDIFF](https://www.w3schools.com/mySQl/func_mysql_datediff.asp) | Returns the number of days between two date values |
| [DATE\_ADD](https://www.w3schools.com/mySQl/func_mysql_date_add.asp) | Adds a time/date interval to a date and then returns the date |
| [DATE\_FORMAT](https://www.w3schools.com/mySQl/func_mysql_date_format.asp) | Formats a date |
| [DATE\_SUB](https://www.w3schools.com/mySQl/func_mysql_date_sub.asp) | Subtracts a time/date interval from a date and then returns the date |
| [DAY](https://www.w3schools.com/mySQl/func_mysql_day.asp) | Returns the day of the month for a given date |
| [DAYNAME](https://www.w3schools.com/mySQl/func_mysql_dayname.asp) | Returns the weekday name for a given date |
| [DAYOFMONTH](https://www.w3schools.com/mySQl/func_mysql_dayofmonth.asp) | Returns the day of the month for a given date |
| [DAYOFWEEK](https://www.w3schools.com/mySQl/func_mysql_dayofweek.asp) | Returns the weekday index for a given date |
| [DAYOFYEAR](https://www.w3schools.com/mySQl/func_mysql_dayofyear.asp) | Returns the day of the year for a given date |
| [EXTRACT](https://www.w3schools.com/mySQl/func_mysql_extract.asp) | Extracts a part from a given date |
| [FROM\_DAYS](https://www.w3schools.com/mySQl/func_mysql_from_days.asp) | Returns a date from a numeric datevalue |
| [HOUR](https://www.w3schools.com/mySQl/func_mysql_hour.asp) | Returns the hour part for a given date |
| [LAST\_DAY](https://www.w3schools.com/mySQl/func_mysql_last_day.asp) | Extracts the last day of the month for a given date |
| [LOCALTIME](https://www.w3schools.com/mySQl/func_mysql_localtime.asp) | Returns the current date and time |
| [LOCALTIMESTAMP](https://www.w3schools.com/mySQl/func_mysql_localtimestamp.asp) | Returns the current date and time |
| [MAKEDATE](https://www.w3schools.com/mySQl/func_mysql_makedate.asp) | Creates and returns a date based on a year and a number of days value |
| [MAKETIME](https://www.w3schools.com/mySQl/func_mysql_maketime.asp) | Creates and returns a time based on an hour, minute, and second value |
| [MICROSECOND](https://www.w3schools.com/mySQl/func_mysql_microsecond.asp) | Returns the microsecond part of a time/datetime |
| [MINUTE](https://www.w3schools.com/mySQl/func_mysql_minute.asp) | Returns the minute part of a time/datetime |
| [MONTH](https://www.w3schools.com/mySQl/func_mysql_month.asp) | Returns the month part for a given date |
| [MONTHNAME](https://www.w3schools.com/mySQl/func_mysql_monthname.asp) | Returns the name of the month for a given date |
| [NOW](https://www.w3schools.com/mySQl/func_mysql_now.asp) | Returns the current date and time |
| [PERIOD\_ADD](https://www.w3schools.com/mySQl/func_mysql_period_add.asp) | Adds a specified number of months to a period |
| [PERIOD\_DIFF](https://www.w3schools.com/mySQl/func_mysql_period_diff.asp) | Returns the difference between two periods |
| [QUARTER](https://www.w3schools.com/mySQl/func_mysql_quarter.asp) | Returns the quarter of the year for a given date value |
| [SECOND](https://www.w3schools.com/mySQl/func_mysql_second.asp) | Returns the seconds part of a time/datetime |
| [SEC\_TO\_TIME](https://www.w3schools.com/mySQl/func_mysql_sec_to_time.asp) | Returns a time value based on the specified seconds |
| [STR\_TO\_DATE](https://www.w3schools.com/mySQl/func_mysql_str_to_date.asp) | Returns a date based on a string and a format |
| [SUBDATE](https://www.w3schools.com/mySQl/func_mysql_subdate.asp) | Subtracts a time/date interval from a date and then returns the date |
| [SUBTIME](https://www.w3schools.com/mySQl/func_mysql_subtime.asp) | Subtracts a time interval from a datetime and then returns the time/datetime |
| [SYSDATE](https://www.w3schools.com/mySQl/func_mysql_sysdate.asp) | Returns the current date and time |
| [TIME](https://www.w3schools.com/mySQl/func_mysql_time.asp) | Extracts the time part from a given time/datetime |
| [TIME\_FORMAT](https://www.w3schools.com/mySQl/func_mysql_time_format.asp) | Formats a time by a specified format |
| [TIME\_TO\_SEC](https://www.w3schools.com/mySQl/func_mysql_time_to_sec.asp) | Converts a time value into seconds |
| [TIMEDIFF](https://www.w3schools.com/mySQl/func_mysql_timediff.asp) | Returns the difference between two time/datetime expressions |
| [TIMESTAMP](https://www.w3schools.com/mySQl/func_mysql_timestamp.asp) | Returns a datetime value based on a date or datetime value |
| [TO\_DAYS](https://www.w3schools.com/mySQl/func_mysql_to_days.asp) | Returns the number of days between a date and date "0000-00-00" |
| [WEEK](https://www.w3schools.com/mySQl/func_mysql_week.asp) | Returns the week number for a given date |
| [WEEKDAY](https://www.w3schools.com/mySQl/func_mysql_weekday.asp) | Returns the weekday number for a given date |
| [WEEKOFYEAR](https://www.w3schools.com/mySQl/func_mysql_weekofyear.asp) | Returns the week number for a given date |
| [YEAR](https://www.w3schools.com/mySQl/func_mysql_year.asp) | Returns the year part for a given date |
| [YEARWEEK](https://www.w3schools.com/mySQl/func_mysql_yearweek.asp) | Returns the year and week number for a given date |

## **MySQL Advanced Functions**

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| --- | --- |
| **Function** | **Description** |
| [BIN](https://www.w3schools.com/mySQl/func_mysql_bin.asp) | Returns a binary representation of a number |
| [BINARY](https://www.w3schools.com/mySQl/func_mysql_binary.asp) | Converts a value to a binary string |
| [CASE](https://www.w3schools.com/mySQl/func_mysql_case.asp) | Goes through conditions and return a value when the first condition is met |
| [CAST](https://www.w3schools.com/mySQl/func_mysql_cast.asp) | Converts a value (of any type) into a specified datatype |
| [COALESCE](https://www.w3schools.com/mySQl/func_mysql_coalesce.asp) | Returns the first non-null value in a list |
| [CONNECTION\_ID](https://www.w3schools.com/mySQl/func_mysql_connection_id.asp) | Returns the unique connection ID for the current connection |
| [CONV](https://www.w3schools.com/mySQl/func_mysql_conv.asp) | Converts a number from one numeric base system to another |
| [CONVERT](https://www.w3schools.com/mySQl/func_mysql_convert.asp) | Converts a value into the specified datatype or character set |
| [CURRENT\_USER](https://www.w3schools.com/mySQl/func_mysql_current_user.asp) | Returns the user name and host name for the MySQL account that the server used to authenticate the current client |
| [DATABASE](https://www.w3schools.com/mySQl/func_mysql_database.asp) | Returns the name of the current database |
| [IF](https://www.w3schools.com/mySQl/func_mysql_if.asp) | Returns a value if a condition is TRUE, or another value if a condition is FALSE |
| [IFNULL](https://www.w3schools.com/mySQl/func_mysql_ifnull.asp) | Return a specified value if the expression is NULL, otherwise return the expression |
| [ISNULL](https://www.w3schools.com/mySQl/func_mysql_isnull.asp) | Returns 1 or 0 depending on whether an expression is NULL |
| [LAST\_INSERT\_ID](https://www.w3schools.com/mySQl/func_mysql_last_insert_id.asp) | Returns the AUTO\_INCREMENT id of the last row that has been inserted or updated in a table |
| [NULLIF](https://www.w3schools.com/mySQl/func_mysql_nullif.asp) | Compares two expressions and returns NULL if they are equal. Otherwise, the first expression is returned |
| [SESSION\_USER](https://www.w3schools.com/mySQl/func_mysql_session_user.asp) | Returns the current MySQL user name and host name |
| [SYSTEM\_USER](https://www.w3schools.com/mySQl/func_mysql_system_user.asp) | Returns the current MySQL user name and host name |
| [USER](https://www.w3schools.com/mySQl/func_mysql_user.asp) | Returns the current MySQL user name and host name |
| [VERSION](https://www.w3schools.com/mySQl/func_mysql_version.asp) | Returns the current version of the MySQL database |