MySQL Data Types - Quick Reference

Accurately defining table attributes is essential for overall database performance and optimization. It is important to use only the data type and size of attribute/field that is necessary. For example, do not define an attribute with 8 characters, if only 2 characters are required.

MySQL uses various data types, generally organized into three categories: numeric, date/time, and string types. The following types are the most common.

Numeric Data Types:

Notes: M indicates the maximum display width for integer types. The maximum legal display width is 255. Display width is unrelated to the range of values a type can contain. For floating-point and fixed-point types, M is the total number of digits that can be stored.

If you specify ZEROFILL for a numeric column, MySQL automatically adds the UNSIGNED attribute to the column.

•**TINYINT**[(M)] [UNSIGNED] [ZEROFILL]
A very small integer. The signed range is -128 to 127. The unsigned range is 0 to 255.

•**BOOL**, **BOOLEAN**
These types are synonyms for TINYINT(1). A value of zero is considered false. Nonzero values are considered true. However, values TRUE and FALSE are just aliases for 1 and 0.

•**SMALLINT**[(M)] [UNSIGNED] [ZEROFILL]
A small integer. The signed range is -32768 to 32767. The unsigned range is 0 to 65535.

•**MEDIUMINT**[(M)] [UNSIGNED] [ZEROFILL]
A medium-sized integer. The signed range is -8388608 to 8388607. The unsigned range is 0 to 16777215.

•**INT**[(M)] [UNSIGNED] [ZEROFILL]
A normal-size integer. The signed range is -2147483648 to 2147483647. The unsigned range is 0 to 4294967295.

•**BIGINT**[(M)] [UNSIGNED] [ZEROFILL]
A large integer. The signed range is -9223372036854775808 to 9223372036854775807. The unsigned range is 0 to 18446744073709551615.

•**FLOAT**[(M,D)] [UNSIGNED] [ZEROFILL]
A small (single-precision) floating-point number. Permissible values are -3.402823466E+38 to -1.175494351E-38, 0, and 1.175494351E-38 to 3.402823466E+38. These are the theoretical limits, based on the IEEE standard. The actual range might be slightly smaller depending on hardware or operating system.

M is the total number of digits and **D** is the number of digits following the decimal point. If M and D are omitted, values are stored to the limits permitted by the hardware. A single-precision floating-point number is accurate to approximately 7 decimal places. UNSIGNED, if specified, disallows negative values.

Note: Using FLOAT might give some unexpected problems because all calculations in MySQL are done with double precision.

•**DOUBLE**[(M,D)] [UNSIGNED] [ZEROFILL]
A normal-size (double-precision) floating-point number. Permissible values are -1.7976931348623157E+308 to -2.2250738585072014E-308, 0, and 2.2250738585072014E-308 to 1.7976931348623157E+308. These are the theoretical limits, based on the IEEE standard. The actual range might be slightly smaller depending on hardware or operating system.

M is the total number of digits and **D** is the number of digits following the decimal point. If M and D are omitted, values are stored to the limits permitted by the hardware. A double-precision floating-point number is accurate to approximately 15 decimal places.
UNSIGNED, if specified, disallows negative values.

•**DECIMAL**[(M[,D])] [UNSIGNED] [ZEROFILL]
An "exact" fixed-point number. **M** is the total number of digits (the precision) and **D** is the number of digits after the decimal point (the scale). The decimal point and (for negative numbers) the "-" sign are not counted in M. If D is 0, values have no decimal point or fractional part. The maximum number of digits (M) for DECIMAL is 65. The maximum number of supported decimals (D) is 30. If D is omitted, the default is 0. If M is omitted, the default is 10.
UNSIGNED, if specified, disallows negative values.
All basic calculations (+, -, *, /) with DECIMAL columns are done with a precision of 65 digits. **Use DECIMAL for currency attributes!**

Date and Time Types:

•**DATE**
Displays DATE values in 'YYYY-MM-DD' format.

•**DATETIME**
A date and time combination. Displays DATETIME values in 'YYYY-MM-DD HH:MM:SS' format.

•**TIME**
Displays TIME values in 'HH:MM:SS' format.

•**YEAR**[(2|4)]
A year in two-digit or four-digit format. The default is four-digit format. Displays YEAR values in YYYY format.

String Types:
Most data stored will be in string format. This list describes the common MySQL string datatypes.

MySQL interprets length specifications in character column definitions in character units. This applies to CHAR, VARCHAR, and the TEXT types.

•**CHAR**[(M)]
A **fixed-length** string that is always right-padded with spaces to the specified length when stored. **M** represents the column length in characters. The range of M is 0 to 255. If M is omitted, the length is 1.

•**VARCHAR**(M)
A variable-length string. **M** represents the maximum column length in characters. The range of M is 0 to 65,535.

MySQL stores VARCHAR values as a one-byte or two-byte length prefix plus data. The length prefix indicates the number of bytes in the value. A VARCHAR column uses one length byte if values require no more than 255 bytes, two length bytes if values may require more than 255 bytes.

•**TEXT**[(M)]
A TEXT column with a maximum length of 65,535 characters. The effective maximum length is less if the value contains multi-byte characters. Each TEXT value is stored using a two-byte length prefix that indicates the number of bytes in the value.
An optional length M can be given for this type. If this is done, MySQL creates the column as the smallest TEXT type large enough to hold values M characters long.

•**ENUM**('value1','value2',...)
An enumeration. A string object that can have only one value, chosen from the list of values 'value1', 'value2', ..., NULL or the special '' error value. An ENUM column can have a maximum of 65,535 distinct values. ENUM values are represented internally as integers.

References

http://dev.mysql.com/doc/refman/5.1/en/index.html

http://dev.mysql.com/doc/refman/5.0/en/data-types.html

http://dev.mysql.com/doc/refman/5.0/en/data-type-overview.html

http://dev.mysql.com/doc/refman/5.1/en/data-types.html

http://dev.mysql.com/doc/refman/5.1/en/data-type-overview.html

http://www.tutorialspoint.com/cgi-bin/printversion.cgi?tutorial=mysql&file=mysql-data-types.htm

http://bytes.com/serversidescripting/mysql/tutorials/introductiontomysql/page1.html

http://www.w3schools.com/sql/sql_datatypes.asp

http://kimbriggs.com/computers/computer-notes/mysql-notes/mysql-data-types-50.file

http://www.tech-evangelist.com/2007/12/09/mysql-data-types/

SQL Syntax:

http://dev.mysql.com/doc/refman/5.0/en/sql-syntax.html

http://dev.mysql.com/doc/refman/5.1/en/sql-syntax.html