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Database Design & Development
CS225 Week6 Ponder Assignment

Report on Data Generation, Manipulation, and Conversion in SQL Queries

While a chart was not required, it simplifies the explanation by grouping all the text types with their descriptions and size. Please refer to chart as needed throughout the report.

	MySQL	Oracle DB	SQL Server
CHAR **(fixed-length, blank-padded strings)**	255 characters	2,000 characters	8,000 characters
VARCHAR **(variable-length strings)**	65,535 characters	4,000 characters (varchar2 type)	8,000 characters
TEXT **(very large variable-length strings (documents))**	Up to 4GB (via tinytext, text, mediumtext, longtext)	128 TB (via clob)	2 GB (single text type) (v.2005 includes varchar(max) type, recommends use instead of text type)

Inevitably, a database must store more than numbers, especially in the age of cloud computing. Text information ranging from single words to entire documents is stored using CHAR, VARCHAR, and TEXT types. Inserting a string of any type into a character column utilizes INSERT INTO tablename (tablecols) VALUES ('I am a string'). Be mindful of the length of the string; if the length exceeds the max size for the character type, the server throws an exception. While it is possible to configure the server to truncate the string instead, it is better to set the upper limit of a column high enough when creating the table. As wasteful as that sounds, the server only allocates enough space for the inputted string. The assigned character limit is merely an indication of possible capacity.

Because strings are marked by single quotes, when a string contains single quotes or apostrophes they need to be 'escaped' or rendered unnoticeable by the server. Adding another single quote before does the trick; in MySQL and Oracle Database the user can also use escape a single quote by adding a backslash character before it. While there are cases where escaping quotes is not necessary, it is prudent to do so since it ensures that every string remains complete and readable.

The below table offers a brief overview of related built-in functions. Besides these, there are a number of temporal functions that bear looking into.

	Function Description	Usable In	Exceptions
Quote()	• places outer quotes, any necessary escapes to string • useful when exporting user-input data	MYSQL OracleDB SQL Server	**N/A**

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Char()	• build strings from the 255 characters in the ASCII character set • can be used with concat() to combine existing strings with char()-built • can be used with a variety of character sets • enables user to work with any Roman language without accented/special character-enabled keyboard	MYSQL OracleDB SQL Server	N/A
Ascii()	• provides ASCII equivalent of provided character • enables user to work with any Roman language without accented/special character-enabled keyboard	MYSQL OracleDB SQL Server	N/A
Length()	• returns number of characters in a string • removes trailing spaces from char data when retrieved regardless type of column stored in	MYSQL OracleDB	SQL Server: use len()
Position()	• finds location of substring within string • If substring not found, returns 0 indicating 'not found' instead of first position	MYSQL	OracleDB: use instr() with 2 or 3 arguments SQL Server: use charindx() with 2 or 3 arguments
Locate()	• Similar to position() • Allows optional 3rd parameter to define search start position	MYSQL	OracleDB: use instr() with 2 or 3 arguments SQL Server: use charindx() with 2 or 3 arguments
Strcmp()	• Takes two strings as arguments • Returns numbers indicating result • -1, 1st string 1st in sort order • 0, strings identical • 1, 1st string 2nd in sort order	MYSQL	OracleDB: no analog, similar results by building case expressions SQL Server: no analog, similar results by building case expressions MYSQL: case-insensitive
Concat()	• Add one string to another • Replace data stored in character column • Build string from individual pieces of data • Convert numbers and dates to string format	MYSQL	SQL Server: OracleDB: use concatenation operator (||) SQL Server: use concatenation operator (+)

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Insert()	• Takes four arguments: original string, start position, number of characters to replace, replacement string • Depending on value of 3rd argument, may be used to replace characters in a string • If 3rd argument is 0, replacement string is inserted with trailing characters pushed to the right		OracleDB: use replace() SQL Server: use replace() or stuff()
Substring()	• Extract substring from string • Arguments: pertinent string, start position, length of substring	OracleDB SQL Server MYSQL	MYSQL: use substr()
Float()	• Rounds to whole number	OracleDB SQL Server MYSQL	N/A
Mod()	• Calculates remainder when one number divided into another number • Typically used with integer arguments	MYSQL OracleDB	MYSQL: can use real numbers SQL Server: use modulo operator (%)
Pow()	• Determine exact number of bytes in specic amount of memory	MYSQL OracleDB SQL Server	N/A
Ceil() **Floor()** **Round()** **Truncate()**	• Round up to closest integer • Round down to closest integer • Rounds up or down from the midpoint between two integers, allows optional 3rd argument (if present and nonzero, number to be truncated instead), allows negative value for 2nd argument (numbers to left of decimal place rounded), positive second argument specifies how many digits to the right of the decimal place to round to • Discards unwanted digits without rounding, allows optional second argument to specify number of digits to right of decimal, allows negative value for 2nd argument (numbers to left of decimal place truncated)	MYSQL OracleDB SQL Server	OracleDB: use trunc() SQL Server: use ceiling(), no truncate() so round() has optional 3rd argument (if present and nonzero, number truncated, no rounding)
Sign()	• Returns -1 if number is negative, 0 if the number is zero, 1 if number is positive	MYSQL OracleDB SQL Server	N/A
Abs()	• Returns absolute value of number	MYSQL OracleDB SQL Server	N/A