

TSQL functions

This is a collection of 123 TSQL functions for professional, academic or learning purposes. There are many conversions hexadecimal/octal/binary/Roman numerals, mathematical functions such as hyperbolic, logic and trigonometric. Combinatorial functions such as combinations, permutations (factorial), arrangements. Other interesting functions include turning a number into plain English, Morse code, EBCDIC and vice-versa, Levenshtein Distance (linguistics), encryption, infinite precision division and number theory functions: primes, deficient, perfect, abundant, golden numbers. Validation: valid email, IP, ZIP code and many others. There are some useful string functions to count occurrences of a string within another, find a character position in a string from the end of the string, wrap, rewrap, unwrap a string, etc...

Some functions are clones from Microsoft Access or VBA(IIF, date, time, IsNull, IsEmpty), others from Oracle (INITCAP, TRANSLATE, RPAD, LPAD, ADD_MONTHS, MONTHS_BETWEEN, LAST_DAY, NEXT_DAY).

Base conversion(10)+Combinatorial(6)+Algebra(9)+Numeric(14)+String(24)+Date(8)
Comparison, validation(27)+Logic(11)+Trigonometric(5)+Hyperbolic(9)=123 total

Levenshtein Distance algorithm-original developer: Michael Gilleland (thank you for allowing me to translate the code to TSQL ☺) <http://www.merriampark.com/ld.htm>

Tested on Microsoft SQL Server 2000, BigInt should be replaced with int, in order to work with other versions of Microsoft SQL Server or Sybase.

Developed or translated to TSQL by Joseph Gama.

Base conversion

DECTON(i1, i2) Converts a decimal number i1 to base i2. Input: INT, INT; Output: VARCHAR(255)
DECTOHEX(i) Converts a decimal number i to hexadecimal. Input: INT; Output: VARCHAR(255)
DECTOBIN(i) Converts a decimal number i to binary. Input: INT; Output: VARCHAR(255)
DECTOOCT(i) Converts a decimal number i to octal. Input: INT; Output: VARCHAR(255)
NTODEC(s, i) Converts a number s on base i to decimal. Input: VARCHAR(255), INT; Output: INT
HEXTODEC(s) Converts an hexadecimal number to decimal. Input: VARCHAR(255); Output: INT
BINTODEC(s) Converts a binary number to decimal. Input: VARCHAR(255); Output: INT
OCTTODEC(s) Converts an octal number to decimal. Input: VARCHAR(255); Output: INT
A2ROMAN(i) Converts an arabic numeral to roman, as a string. Input: INT; Output: VARCHAR(20)
ROMAN2A(s) Converts an roman numeral to arabic. Input: VARCHAR(20); Output: INT

Combinatorial

COMBIN(b1, b2) Returns the number of combinations for a given number of objects. Input: BIGINT, BIGINT; Output: BIGINT
ARR(b1, b2) Returns the number of arrangements for a given number of objects. Input: BIGINT, BIGINT; Output: BIGINT
FACT(b) Returns the factorial of a number. Input: BIGINT; Output: BIGINT
FACTDOUBLE(f) Returns the double factorial of a number. Input: FLOAT; Output: FLOAT
SUMSEQ(b) Returns the nth triangle number which is the summation from 1 to b. Input: BIGINT; Output: BIGINT
FIBONACCI(b) Returns the nth Fibonacci series for a given number b. Input: BIGINT; Output: BIGINT

Algebra

LOGN(f1, f2) Returns the logarithm (base f2) of f1. Input: FLOAT, FLOAT; Output: FLOAT
LOG2(f) Returns the logarithm (base 2) of f. Input: FLOAT; Output: FLOAT
GCD(i1, i2) Returns the greatest common divisor of 2 numbers. Input: INT, INT; Output: INT
LCM(i1, i2) Returns the least common multiple of 2 numbers. Input: INT, INT; Output: INT

CUBE(f) Returns the cube of the given expression. Input: FLOAT; Output: FLOAT
NROOT(f1, f2) Returns the root f2 of a number f1. Input: FLOAT, FLOAT; Output: FLOAT
SQRTPI(f) Returns the square root of (f * Pi). Input: FLOAT; Output: FLOAT
DISTANCE(f1,f2,f3,f4) Returns the distance between 2 points P(f1, f2) to T(f3, f4). Input: FLOAT, FLOAT, FLOAT, FLOAT; Output: FLOAT
SLOPE(f1,f2,f3,f4) Returns the slope of a line define by 2 points P(f1, f2) and T(f3, f4). Input: FLOAT, FLOAT, FLOAT, FLOAT; Output: FLOAT

Numeric

DIVI(i1, i2, i3) Returns the result of the division of i1 by i2 with precision i3 (Infinite precision division). Input: INT, INT, INT; Output: VARCHAR(5000)
NINT(f) Rounds a number to the nearest integer. Input: FLOAT; Output: INT
TRUNC(f) Returns a number truncated to an integer. Input: FLOAT; Output: INT
FRAC(f) Returns the decimal part of a number. Input: FLOAT; Output: FLOAT
MIN2(i1, i2) Returns the smallest of 2 numbers. Input: INT, INT; Output: INT
MIN3(i1, i2, i3) Returns the smallest of 3 numbers. Input: INT, INT, INT; Output: INT
MAX2(i1, i2) Returns the largest of 2 numbers. Input: INT, INT; Output: INT
MAX3(i1, i2, i3) Returns the largest of 3 numbers. Input: INT, INT, INT; Output: INT
INC(i) Returns a number incremented by 1. Input: INT; Output: INT
DEC(i) Returns a number decremented by 1. Input: INT; Output: INT
PHI() Returns phi, the "golden ratio". Output: FLOAT
E() Returns e, Natural Logarithmic Base. Output: FLOAT
PERFNUMBER(i) Returns the nth perfect number. Input: INT; Output: INT
SUMALIQUOT(i) Returns the sum of all aliquots from i. Input: INT; Output: INT

String

INITCAP(s) Returns a string with the first letter of each word in uppercase, all other letters in lowercase (capitalize first character). Input: VARCHAR(255); Output: VARCHAR(255)
PROPERCASE(s) Returns a string with the first letter of each word at the beginning of a sentence in uppercase, all other letters in lowercase. Input: VARCHAR(255); Output: VARCHAR(255)
INCLUDED(s1,s2) Returns how many times a string s1 is included (occurs) into s2. Input: VARCHAR(255), VARCHAR(255); Output: INT
TRANSLATE(s1, s2, s3) Returns a string with all occurrences of each character in another one replaced by its corresponding character in a third one. Input: VARCHAR(255), VARCHAR(255), VARCHAR(255); Output: VARCHAR(255)
RPAD(s1, I, s2) Returns a string s1 right-padded to length i with a sequence of characters s2. Input: VARCHAR(255), INT, VARCHAR(255); Output: VARCHAR(255)
LPAD(s1, I, s2) Returns a string s1 left-padded to length i with a sequence of characters s2. Input: VARCHAR(255), INT, VARCHAR(255); Output: VARCHAR(255)
VAL(s) Returns a numeric value from a string, it is the opposite of STR. Input: VARCHAR(255); Output: FLOAT
NUMBERTOWORDS(i) Returns the number as English words. Input: INT; Output: VARCHAR(255)
MORSE(s) Returns the morse code corresponding to string s. Input: VARCHAR(255); Output: VARCHAR(255)
FROMMORSE(s) Returns the text corresponding to a morse code string s. Input: VARCHAR(255); Output: VARCHAR(255)
CHARINDEXREV(s1, s2) Returns the position of an occurrence of string s2 within s1, from the end of string. Input: VARCHAR(255), VARCHAR(255); Output: INT
EBCDIC2ASCII(s) Converts a string from EBCDIC to ASCII. Input: VARCHAR(255); Output: VARCHAR(255)
ASCII2EBCDIC(s) Converts a string from ASCII to EBCDIC. Input: VARCHAR(255); Output: VARCHAR(255)
TRIM(s) Returns a string removing spaces at both ends. Input: VARCHAR(255); Output: VARCHAR(255)
WRAP(s, i) Returns a string s wrapped in blocks of i characters. Input: VARCHAR(255), INT; Output: VARCHAR(255)

UNWRAP(s) Returns a string removing all wrapping. Input: VARCHAR(255); Output: VARCHAR(255)

REWRAP(s, i) Returns a string s wrapped in blocks of i characters , removing previous wrapping. Input: VARCHAR(255), INT; Output: VARCHAR(255)

LEVENSHTTEIN(s1, s2) Returns the Levenshtein Distance between strings s1 and s2. Input: VARCHAR(255), VARCHAR(255); Output: INT

STRIPL(s) Returns the left side of half of the string. Input: VARCHAR(255); Output: VARCHAR(255)

STRIPR(s) Returns the right side of half of the string. Input: VARCHAR(255); Output: VARCHAR(255)

XORCHAR(s,t) Returns a string encrypted/decrypted with numeric key t, 0<t<255 (XOR encryption). Input: VARCHAR(255), TINYINT; Output: VARCHAR(255)

CRYPTX8 (s1,s2) Returns a string s1 encrypted/decrypted with key s2, up to 8 chars (XOR encryption). Input: VARCHAR(1024), VARCHAR(8); Output: VARCHAR(1024)

IPOCTECT(s, I) Returns an octect i (1-4) from an IP. Input: VARCHAR(15), INT; Output: VARCHAR(3)

WORDCOUNT(s) Returns the number of words from string s. Input: VARCHAR(255); Output: INT

Date

ADD_MONTHS(d, i) Returns the date d plus i months. Input: DATETIME, INT; Output: DATETIME

MONTHS_BETWEEN(d1, d2) Returns number of months between dates d1 and d2. Input: DATETIME, DATETIME; Output: INT

LAST_DAY(d) Returns the date of the last day of the month that contains d. Input: DATETIME; Output: DATETIME

NEXT_DAY(d, i) Returns the date of the first weekday named by n (Sunday = 1, Saturday = 7) that is later than the date d. Input: DATETIME, INT; Output: DATETIME

DDATE(d) Returns the date from d. Input: DATETIME; Output: VARCHAR(255)

DTIME(d) Returns the time from d. Input: DATETIME; Output: VARCHAR(255)

GREGORIAN2HIJRI(d) Returns the date FROM Gregorian into Hijri calendar. Input: DATETIME; Output: NCHAR

HIJRI2GREGORIAN(d) Returns the date FROM Hijri into Gregorian calendar. Input: DATETIME; Output: DATETIME

Comparison, validation

IIF(b, v1, v2) Returns one of two parts, depending on the evaluation of an expression. Input: BIT, SQL_VARIANT, SQL_VARIANT; Output: SQL_VARIANT

VALIDIP(s) Returns true if the string is a valid IP. Input: VARCHAR(15); Output: BIT

VALIDEMAIL(s) Returns true if the string is a valid email address. Input: VARCHAR(255); Output: BIT

VALIDZIP(s) Returns true if the string is a valid zip code. Input: VARCHAR(255); Output: BIT

VALIDZIP9(s) Returns true if the string is a valid zip code 5+4. Input: VARCHAR(255); Output: BIT

ISBIN(s) Returns true if the string is a valid binary number. Input: VARCHAR(255); Output: BIT

ISHEX(s) Returns true if the string is a valid hexadecimal number. Input: VARCHAR(255); Output: BIT

ISOCT(s) Returns true if the string is a valid octal number. Input: VARCHAR(255); Output: BIT

ISROMAN(s) Returns true if the string is a valid Roman numeral. Input: VARCHAR(255); Output: BIT

ISINTNUMBER(s) Returns true if the string is a valid integer number. Input: VARCHAR(255); Output: BIT

ISINTPOSNUMBER(s) Returns true if the string is a valid positive integer number. Input: VARCHAR(255); Output: BIT

ISNUMBER(s) Returns true if the string is a valid number. Input: VARCHAR(255); Output: BIT

ISPOSNUMBER(s) Returns true if the string is a valid positive number. Input: VARCHAR(255); Output: BIT

ISLETTER(s) Returns true if the string has only letters. Input: VARCHAR(255); Output: BIT

ISALPHA(s) Returns true if the string has valid alphanumeric characters. Input: VARCHAR(255); Output: BIT

ISITNULL(v) Returns true if the input is null. Input: SQL_VARIANT; Output: BIT

ISEMPTY(v) Returns true if the input is an empty string. Input: SQL_VARIANT; Output: BIT

ISEVEN(i) Returns true if the number is even. Input: INT; Output: BIT

ISODD(i) Returns true if the number is odd. Input: INT; Output: BIT

ISNEG(i) Returns true if the number is negative. Input: INT; Output: BIT

PALINDROME(i) Returns true if the number is a palindrome. Input: INT; Output: BIT

PALINDROMEW(s) Returns true if the string is a palindrome. Input: VARCHAR(255); Output: BIT

PENTIUMBUG() Returns true if the Pentium (early versions) bug is present. Output: BIT

ISPERFNUM(i) Returns true if the number is perfect. Input: INT; Output: BIT

ISDEFNUM(i) Returns true if the number is deficient. Input: INT; Output: BIT

ISABUNDNUM(i) Returns true if the number is abundant. Input: INT; Output: BIT

ISPRIME(i) Returns true if the number is prime. Input: INT; Output: BIT

Logical

SHIFTLEFT(i1, i2) Returns a number shifted to the left. Input: INT, INT; Output: INT

SHIFTRIGHT(i1, i2) Returns a number shifted to the right. Input: INT, INT; Output: INT

GETBIT(i1, i2) Returns the value of a certain bit. Input: INT, INT; Output: INT

SETBIT(i1, i2) Sets the value of a certain bit. Input: INT, INT; Output: INT

RESETBIT(i1, i2) Resets the value of a certain bit. Input: INT, INT; Output: INT

IMPLIES(i1, i2) Returns the result of a logical formal implication. Input: INT, INT; Output: INT

EQUIVALENT(i1, i2) Returns the result of a logical formal equivalence. Input: INT, INT; Output: INT

COMPLEMENT1(i) Returns a number's one's complement. Input: INT; Output: INT

COMPLEMENT2(i) Returns a number's two's complement. Input: INT; Output: INT

NAND(i1, i2) Returns the result of a logical negated AND. Input: INT, INT; Output: INT

NOR(i1, i2) Returns the result of a logical negated OR. Input: INT, INT; Output: INT

Trigonometric

SEC(f) Returns the trigonometric secant of the given angle (in radians) in the given expression. Input: FLOAT; Output: FLOAT

COSEC(f) Returns the trigonometric cosecant of the given angle (in radians) in the given expression. Input: FLOAT; Output: FLOAT

ACOT(f) Returns the angle in radians whose cotangent is the given float expression (also called arccotangent). Input: FLOAT; Output: FLOAT

ASEC(f) Returns the angle in radians whose secant is the given float expression (also called arcsecant). Input: FLOAT; Output: FLOAT

ACOSEC(f) Returns the angle in radians whose cosecant is the given float expression (also called arccosecant). Input: FLOAT; Output: FLOAT

Hyperbolic

SINH(f) Returns the hyperbolic sine of a number. Input: FLOAT; Output: FLOAT

COSH(f) Returns the hyperbolic cosine of a number. Input: FLOAT; Output: FLOAT

TANH(f) Returns the hyperbolic tangent of a number. Input: FLOAT; Output: FLOAT

SECH(f) Returns the hyperbolic secant of a number. Input: FLOAT; Output: FLOAT

COSECH(f) Returns the hyperbolic cosecant of a number. Input: FLOAT; Output: FLOAT

COTH(f) Returns the hyperbolic cotangent of a number. Input: FLOAT; Output: FLOAT

ASINH(f) Returns the inverse hyperbolic sine of a number. Input: FLOAT; Output: FLOAT

ACOSH(f) Returns the inverse hyperbolic cosine of a number. Input: FLOAT; Output: FLOAT

ATANH(f) Returns the inverse hyperbolic tangent of a number. Input: FLOAT; Output: FLOAT