(T11)討論 MathFunction，包括 ABS、CEILING、FLOOR、POWER、RAND、SQUARE、SQRT、ROUND
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(T11)討論 MathFunction，包括 ABS、CEILING、FLOOR、POWER、RAND、SQUARE、SQRT、ROUND
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0. What to learn
1. ABS(numeric_expression)
2. CEILING(numeric_expression) and FLOOR(numeric_expression)
3. POWER(f1,n)
4. RAND([seed])
5. ROUND(numeric_expression , length [,function])
==========

0. What to learn

What to learn
1.
ABS(numeric_expression)
2.
CEILING(numeric_expression) and FLOOR(numeric_expression)
3.
POWER(f1,n), f1 to the Power of n
SQUARE(f1), Square of the f1
SQRT(f1), Square root of the f1.
4.
RAND(1);
FLOOR(RAND() * 100), 0 <= IntNumber < 100
FLOOR(RAND()*(b-a)+a), a <= IntNumber < b
5.
ROUND(numeric_expression,length[,function])
Rounds the given numeric expression based on the given length.
5.1.
numeric_expression :
numeric expression except for the bit data type.
5.2.
length int(precision length int):
If precision length int > 0 ,
then ROUND() is applied for the decimal part. (to the right)
If precision length int < 0 ,
then ROUND() is applied to the number before the decimal. (to the left)
5.3.
function (operation options):
Zero as default means operating rounding.
Non-Zero is truncated which means truncate anything after the precision length.

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1. ABS(numeric_expression)

```
PRINT ABS(-123.4);
```

```
/*
ABS(numeric_expression)
Reference:
https://docs.microsoft.com/en-us/sql/t-sql/functions/abs-transact-sql
returns the absolute (positive) value of the specified numeric expression
-PRINT ABS(-123.4);
Output  :  123.4
*/
```

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2. CEILING(numeric_expression) and FLOOR(numeric_expression)

```
--================================================================================
--T011_02_CEILING(numeric_expression)  and  FLOOR(numeric_expression)
--================================================================================
PRINT CEILING(26.2);
--Output  :  27
PRINT CEILING(-26.2);
--Output  :  -26
PRINT FLOOR(26.2);
--Output  :  26
PRINT FLOOR(-26.2);
--Output  :  -27
/*
1.
CEILING(numeric_expression)
Reference:
https://docs.microsoft.com/en-us/sql/t-sql/functions/ceiling-transact-sql
Returns the smallest integer greater than, or equal to,
the specified numeric expression.
2.
FLOOR(numeric_expression)
Reference:
https://docs.microsoft.com/en-us/sql/t-sql/functions/floor-transact-sql
Returns the largest integer less than or equal to
the specified numeric expression.
*/
```

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3. POWER(f1,n)

```
--================================================================================
--T011_03_POWER(f1,n)
--================================================================================
--POWER(f1,n)  , F1 to the Power of n
PRINT POWER(2, 4);
--Output  :  16
--2 to the power of 4 = 2*2*2*2 = 16
PRINT POWER(8, 2);
--Output  :  64
--8 to the power of 2 = 8*8 = 64
PRINT SQUARE(8);
```

```
--SQUARE(f1)  , Square of the f1
--Output  :  64
--Square of the 8 = 8*8 = 64
PRINT SQRT(64);
--SQRT(f1)  , Square root of the f1.
--Output  :  8
--Square root of the 64 = 8
PRINT SQRT(5);
--Output  :  2.23607
--Square root of the 5 = 2.23607
/*
1.
POWER(float_expression,y)
Reference:
https://docs.microsoft.com/en-us/sql/t-sql/functions/power-transact-sql
Returns the value of the specified float expression to the specified power, y.
--POWER(f1,n)
F1 to the Power of n
2.
SQUARE(float_expression)
Reference:
https://docs.microsoft.com/en-us/sql/t-sql/functions/square-transact-sql
Returns the square of the specified float value.
--SQUARE(f1)
Square of the f1.
3.
SQRT(float_expression)
Reference:
https://docs.microsoft.com/en-us/sql/t-sql/functions/sqrt-transact-sql
Returns the square root of the specified float value.
--SQRT(f1)
Square root of the f1.
*/


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```

4. RAND([seed])

```
--============================================================================
--T011_04_RAND([seed])
--============================================================================
PRINT RAND(1);
--Same seed always returns the same RAND([seed]) value.
PRINT RAND();
--0 <= FloatNumber < 1
PRINT FLOOR(RAND() * 100);
--0 <= IntNumber < 100
PRINT FLOOR(RAND() * ( 25 - 10 ) + 10);
--10 <= IntNumber < 25
--PRINT FLOOR(RAND()*(b-a)+a);
--a <= IntNumber < b
DECLARE @Counter INT;
SET @Counter = 1;
WHILE ( @Counter <= 10 )
    BEGIN
        PRINT FLOOR(RAND() * 100);
        SET @Counter += 1;
    END;
--Return 10 random int value.
--and 0 <= IntNumber < 100
```

```
/*
1.
RAND([seed])
Reference:
https://docs.microsoft.com/en-us/sql/t-sql/functions/rand-transact-sql
https://www.w3schools.com/sql/func_mysql_rand.asp
Returns a pseudo-random float value from 0 through 1, exclusive.
0 <= ReturnNumber < 1
Same seed always returns the same RAND([seed]) value.
2.
FLOOR(RAND()*(b-a)+a);
Where a is the smallest number and b is the largest number that you want to generate a random number for.
Reference:
https://www.techonthenet.com/sql_server/functions/rand.php
PRINT FLOOR(RAND()*(25-10)+10);
10 <= IntNumber < 25
*/

==================================================
```

5. ROUND(numeric_expression , length [,function])

```
--================================================================================
--T011_05_ROUND( numeric_expression , length [,function] )
--================================================================================
PRINT ROUND(123.44500, 2);
--Output  :  123.45000
--Round to 2 places after the decimal point. (to the right)
PRINT ROUND(123.44400, 2);
--Output  :  123.44000
--Round to 2 places after the decimal point. (to the right)
PRINT ROUND(123.44500, 2, 0);
--Output  :  123.45000
--Round to 2 places after the decimal point. (to the right)
PRINT ROUND(123.44500, 2, 1);
--Output  :  123.44000
--Truncate anything after 2 places, after the decimal point. (to the right)
PRINT ROUND(123.45000, 1);
--Output  :  123.50000
--Round to 1 places after the decimal point. (to the right)
PRINT ROUND(123.44000, 1, 0);
--Output  :  123.40000
--Round to 1 places after the decimal point. (to the right)
PRINT ROUND(123.44000, 1, 1);
--Output  :  123.40000
--Truncate anything after 1 places, after the decimal point. (to the right)
PRINT ROUND(455.44500, -2);
--500.00000
--Round the last 2 places before the decimal point. (to the left)
PRINT ROUND(445.44500, -2);
-- 400.00000
--Round the last 2 places before the decimal point. (to the left)
PRINT ROUND(455.44500, -1);
-- 460.00000
--Round the last 1 places before the decimal point. (to the left)
PRINT ROUND(454.44500, -1);
-- 450.00000
--Round the last 1 places before the decimal point. (to the left)
/*
1.
```

```
ROUND(numeric_expression,length[,function])
Reference:
https://docs.microsoft.com/en-us/sql/t-sql/functions/round-transact-sql
Rounds the given numeric expression based on the given length.
1.1.
numeric_expression :
numeric expression except for the bit data type.
1.2.
length int(precision length int):
If precision length int > 0 ,
then ROUND() is applied for the decimal part. (to the right)
If precision length int < 0 ,
then ROUND() is applied to the number before the decimal. (to the left)
1.3.
function (operation options):
Zero as default means operating rounding.
Non-Zero is truncated which means truncate anything after the precision length.
*/
```