(T9)討論DateTime2、SmallDateTime，比較語法EoMonth、DateFromParts、DateTime2FromParts  
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(T9)討論DateTime2、SmallDateTime，比較語法EoMonth、DateFromParts、DateTime2FromParts  
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0. Summary

1. EoMonthFunction

2. DateTime V.S. SmallDateTime V.S. DateTime2

3. DateFromPartsFunction V.S. DateTime2FromPartsFunction  
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0. Summary

1.

DateTime V.S. SmallDateTime V.S. DateTime2

1.1.

DateTime

1.1.1.

Date Range :

January 1, 1753, through December 31, 9999

1.1.2.

Time Range :

00:00:00 through 23:59:59.997

1.1.3.

Accuracy :

3.33 Milli-seconds

1.1.4.

Size :

8 Bytes

1.1.5.

Default value :

1900-01-01 00:00:00

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1.2.

SmallDateTime

1.2.1.

Date Range :

January 1, 1900, through June 6, 2079

1.2.2.

Time Range :

00:00:00 through 23:59:59

1.2.3.

Accuracy :

1 Minute

1.2.4.

Size :

4 Bytes

1.2.5.

Default value :

1900-01-01 00:00:00

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1.3.

DateTime2 Syntax:

--DateTime2[(FractionalSecondsPrecision)]

1.3.1.

Date Range :

January 1, 0001, through December 31, 9999

1.3.2.

Time Range :

00:00:00 through 23:59:59.9999999

1.3.3.

Accuracy :

100 nanoseconds

1.3.4.

Size :

FractionalSecondsPrecision is optional parameter

and can be 0 to 7 digits.

The default is DateTime2(7).

DateTime2(0) to DateTime2(2) take 6 bytes.

DateTime2(3) to DateTime2(4) take 7 bytes

DateTime2(5) to DateTime2(7) take 8 bytes

1.3.5.

Default value :

1900-01-01 00:00:00

------------------------------------------------------------------

2.

EoMonth Syntax

--EOMONTH(datetime [,monthToAdd])

Reference:

<https://docs.microsoft.com/en-us/sql/t-sql/functions/eomonth-transact-sql>

EoMonth means End of Month.

It returns the last date of the month.

3.

--DATEFROMPARTS(year,month,day)

--DATETIME2FROMPARTS ( year, month, day, hour, minute, seconds, fractions, precision )

--SMALLDATETIMEFROMPARTS ( year, month, day, hour, minute )

--TIMEFROMPARTS( hour, minute, seconds, fractions, precision )

--DATETIMEOFFSETFROMPARTS ( year, month, day, hour, minute, seconds, fractions, hour\_offset, minute\_offset, precision )

Reference:

<https://docs.microsoft.com/en-us/sql/t-sql/functions/datefromparts-transact-sql>

The function with invalid argument valuse will return an error.

If any of the arguments are NULL, then the function returns null.

3.1.

DateFromParts Syntax :

--DATEFROMPARTS(year,month,day)

Returns a date value.

3.2.

DatetimeFromParts Syntax :

--DATETIME2FROMPARTS ( year, month, day, hour, minute, seconds, fractions, precision )

Returns a datetime2 value.

3.3.

SmallDateTimeFromParts Syntax :

--SMALLDATETIMEFROMPARTS ( year, month, day, hour, minute )

Returns a SmallDateTime value.

3.4.

TimeFromParts Syntax :

--TIMEFROMPARTS( hour, minute, seconds, fractions, precision )

Returns a Time value.

3.5.

DateTimeOffsetFromParts Syntax :

--DATETIMEOFFSETFROMPARTS ( year, month, day, hour, minute, seconds, fractions, hour\_offset, minute\_offset, precision )

Returns a DateTimeOffset value.

1. EoMonthFunction

--==========================================================================

--T009\_01\_EoMonthFunction

--==========================================================================

/\*

--EOMONTH(datetime [,monthToAdd])

End of Month Syntax

It returns the last date of the month.

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--==========================================================================

--T009\_01\_01

--EOMONTH(datetime [,monthToAdd])

--Last day of the Month of the LEAP year

SELECT  EOMONTH('2/15/2016') AS [EoMonth];

--2016-02-29

DECLARE @EoMonth1 DATETIME = EOMONTH('2/15/2016');

PRINT @EoMonth1;

--Feb 29 2016 12:00AM

GO -- Run the previous command and begins new batch

--==========================================================================

--T009\_01\_02

--EOMONTH(datetime [,monthToAdd])

--Last day of the Month of the NON-LEAP year

SELECT  EOMONTH('2/15/2015') AS [EoMonth];

--2015-02-28

DECLARE @EoMonth1 DATETIME = EOMONTH('2/15/2015');

PRINT @EoMonth1;

--Feb 28 2015 12:00AM

GO -- Run the previous command and begins new batch

--==========================================================================

--T009\_01\_03

--EOMONTH(datetime [,monthToAdd])

--Add (monthToAdd) Months and return last day of that month.

SELECT  EOMONTH('2/15/2015', 2) AS [EoMonth];

--2015-04-30

DECLARE @EoMonth1 DATETIME = EOMONTH('2/15/2015', 2);

PRINT @EoMonth1;

--Apr 30 2015 12:00AM

GO -- Run the previous command and begins new batch

--==========================================================================

--T009\_01\_04

--EOMONTH(datetime [,monthToAdd])

--Add (monthToAdd) Months and return last day of that month.

SELECT  EOMONTH('2/15/2015', -2) AS [EoMonth];

--2014-12-31

DECLARE @EoMonth1 DATETIME = EOMONTH('2/15/2015', -2);

PRINT @EoMonth1;

--Dec 31 2014 12:00AM

GO -- Run the previous command and begins new batch

--==========================================================================

--T009\_01\_05

--EOMONTH(datetime [,monthToAdd]) return the last date of the month.

--DATEPART(DD,EOMONTH(DateOfBirth [,monthToAdd]))  returns the last day.

---------------------------------------------------------------------

--T009\_01\_05\_01

--SELECT...

SELECT  EOMONTH('2/15/2016') AS [EoMonth];

--2016-02-29

SELECT  DATEPART(DD, EOMONTH('2/15/2016')) AS [EoMonth];

--29

SELECT  EOMONTH('2/15/2015') AS [EoMonth];

--2015-02-28

SELECT  DATEPART(DD, EOMONTH('2/15/2015')) AS [EoMonth];

--28

SELECT  EOMONTH('2/15/2015', 2) AS [EoMonth];

--2015-04-30

SELECT  DATEPART(DD, EOMONTH('2/15/2015', 2)) AS [EoMonth];

--30

SELECT  EOMONTH('2/15/2015', -2) AS [EoMonth];

--2014-12-31

SELECT  DATEPART(DD, EOMONTH('2/15/2015', -2)) AS [EoMonth];

--31

GO -- Run the previous command and begins new batch

---------------------------------------------------------------------

--T009\_01\_05\_02

--PRINT...

DECLARE @EoMonth1 DATETIME = EOMONTH('2/15/2016');

PRINT @EoMonth1;

--Feb 29 2016 12:00AM

DECLARE @EoMonthStr1 NVARCHAR(20) = DATEPART(DD, EOMONTH('2/15/2016'));

PRINT @EoMonthStr1

--29

DECLARE @EoMonth2 DATETIME = EOMONTH('2/15/2015');

PRINT @EoMonth2;

--Feb 28 2015 12:00AM

DECLARE @EoMonthStr2 NVARCHAR(20) = DATEPART(DD, EOMONTH('2/15/2015'));

PRINT @EoMonthStr2

--28

DECLARE @EoMonth3 DATETIME = EOMONTH('2/15/2015', 2);

PRINT @EoMonth3;

--Apr 30 2015 12:00AM

DECLARE @EoMonthStr3 NVARCHAR(20) = DATEPART(DD, EOMONTH('2/15/2015', 2));

PRINT @EoMonthStr3

--30

DECLARE @EoMonth4 DATETIME = EOMONTH('2/15/2015', -2);

PRINT @EoMonth4;

--Dec 31 2014 12:00AM

DECLARE @EoMonthStr4 NVARCHAR(20) = DATEPART(DD, EOMONTH('2/15/2015', -2));

PRINT @EoMonthStr4

--31

GO -- Run the previous command and begins new batch

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2. DateTime V.S. SmallDateTime V.S. DateTime2

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--T009\_02\_DateTime V.S. SmallDateTime V.S. DateTime2

--==========================================================================

--==========================================================================

--T009\_02\_01

--SmallDateTime Range is between January 1, 1900 and June 6, 2079

-----------------------------------------------------------------------------

--T009\_02\_01\_01

DECLARE @SmallDateTime1 SMALLDATETIME = CONVERT(SMALLDATETIME, '01/01/1990')

PRINT @SmallDateTime1

GO -- Run the previous command and begins new batch

--Jan  1 1990 12:00AM

-----------------------------------------------------------------------------

--T009\_02\_01\_02

DECLARE @SmallDateTime1 SMALLDATETIME = CONVERT(SMALLDATETIME, '06/05/2079')

PRINT @SmallDateTime1

GO -- Run the previous command and begins new batch

--Jun  5 2079 12:00AM

-----------------------------------------------------------------------------

--T009\_02\_01\_03

DECLARE @SmallDateTime1 SMALLDATETIME = CONVERT(SMALLDATETIME, '06/06/2079')

PRINT @SmallDateTime1

GO -- Run the previous command and begins new batch

--Jun  6 2079 12:00AM

-----------------------------------------------------------------------------

--T009\_02\_01\_04

DECLARE @SmallDateTime1 SMALLDATETIME = CONVERT(SMALLDATETIME, '12/31/1899')

PRINT @SmallDateTime1

GO -- Run the previous command and begins new batch

/\*

Error

--Msg 242, Level 16, State 3, Line 200

--The conversion of a varchar data type to a smalldatetime data type resulted in an out-of-range value.

\*/

-----------------------------------------------------------------------------

--T009\_02\_01\_05

DECLARE @SmallDateTime1 SMALLDATETIME = CONVERT(SMALLDATETIME, '06/07/2079')

PRINT @SmallDateTime1

GO -- Run the previous command and begins new batch

/\*

Error

--Msg 242, Level 16, State 3, Line 210

--The conversion of a varchar data type to a smalldatetime data type resulted in an out-of-range value.

\*/

--==========================================================================

--T009\_02\_02

--DateTime Range is between January 1, 1753 and December 31, 9999

-----------------------------------------------------------------------------

--T009\_02\_02\_01

DECLARE @DateTime1 DateTime = CONVERT(DateTime, '01/01/1753')

PRINT @DateTime1

GO -- Run the previous command and begins new batch

--Jan  1 1753 12:00AM

-----------------------------------------------------------------------------

--T009\_02\_02\_02

DECLARE @DateTime1 DateTime = CONVERT(DateTime, '12/31/9999')

PRINT @DateTime1

GO -- Run the previous command and begins new batch

--Dec 31 9999 12:00AM

-----------------------------------------------------------------------------

--T009\_02\_02\_03

DECLARE @DateTime1 DateTime = CONVERT(DateTime, '12/31/1752')

PRINT @DateTime1

GO -- Run the previous command and begins new batch

/\*

Error

--Msg 242, Level 16, State 3, Line 270

--The conversion of a varchar data type to a datetime data type resulted in an out-of-range value.

\*/

-----------------------------------------------------------------------------

--T009\_02\_02\_04

DECLARE @DateTime1 DateTime = CONVERT(DateTime, '01/01/10000')

PRINT @DateTime1

GO -- Run the previous command and begins new batch

/\*

Error

--Msg 241, Level 16, State 1, Line 281

--Conversion failed when converting date and/or time from character string.

\*/

--==========================================================================

--T009\_02\_03

--DateTime2 Range is between January 1, 0001 and December 31, 9999

-----------------------------------------------------------------------------

--T009\_02\_03\_01

DECLARE @DateTime2 DateTime2 = CONVERT(DateTime2, '01/01/0001')

PRINT @DateTime2

GO -- Run the previous command and begins new batch

--0001-01-01 00:00:00.0000000

-----------------------------------------------------------------------------

--T009\_02\_03\_02

DECLARE @DateTime2 DateTime2 = CONVERT(DateTime2, '12/31/9999')

PRINT @DateTime2

GO -- Run the previous command and begins new batch

--9999-12-31 00:00:00.0000000

--==========================================================================

--T009\_02\_04

--DateTime2[(FractionalSecondsPrecision)]

-----------------------------------------------------------------------------

--T009\_02\_04\_01

DECLARE @DateTime2 DATETIME2(0) = CONVERT(DATETIME2(0), '12/15/2017 21:21:21.1234567')

DECLARE @DataLength INT = DATALENGTH(@DateTime2)

PRINT @DateTime2

PRINT CONVERT(NVARCHAR(10), @DataLength) + ' Bytes'

GO -- Run the previous command and begins new batch

--2017-12-15 21:21:21

--6 Bytes

-----------------------------------------------------------------------------

--T009\_02\_04\_02

DECLARE @DateTime2 DATETIME2(1) = CONVERT(DATETIME2(1), '12/15/2017 21:21:21.1234567')

DECLARE @DataLength INT = DATALENGTH(@DateTime2)

PRINT @DateTime2

PRINT CONVERT(NVARCHAR(10), @DataLength) + ' Bytes'

GO -- Run the previous command and begins new batch

--2017-12-15 21:21:21.1

--6 Bytes

-----------------------------------------------------------------------------

--T009\_02\_04\_03

DECLARE @DateTime2 DATETIME2(2) = CONVERT(DATETIME2(2), '12/15/2017 21:21:21.1234567')

DECLARE @DataLength INT = DATALENGTH(@DateTime2)

PRINT @DateTime2

PRINT CONVERT(NVARCHAR(10), @DataLength) + ' Bytes'

GO -- Run the previous command and begins new batch

--2017-12-15 21:21:21.12

--6 Bytes

-----------------------------------------------------------------------------

--T009\_02\_04\_04

DECLARE @DateTime2 DATETIME2(3) = CONVERT(DATETIME2(3), '12/15/2017 21:21:21.1234567')

DECLARE @DataLength INT = DATALENGTH(@DateTime2)

PRINT @DateTime2

PRINT CONVERT(NVARCHAR(10), @DataLength) + ' Bytes'

GO -- Run the previous command and begins new batch

--2017-12-15 21:21:21.123

--7 Bytes

-----------------------------------------------------------------------------

--T009\_02\_04\_05

DECLARE @DateTime2 DATETIME2(4) = CONVERT(DATETIME2(4), '12/15/2017 21:21:21.1234567')

DECLARE @DataLength INT = DATALENGTH(@DateTime2)

PRINT @DateTime2

PRINT CONVERT(NVARCHAR(10), @DataLength) + ' Bytes'

GO -- Run the previous command and begins new batch

--2017-12-15 21:21:21.1235

--7 Bytes

-----------------------------------------------------------------------------

--T009\_02\_04\_06

DECLARE @DateTime2 DATETIME2(5) = CONVERT(DATETIME2(5), '12/15/2017 21:21:21.1234567')

DECLARE @DataLength INT = DATALENGTH(@DateTime2)

PRINT @DateTime2

PRINT CONVERT(NVARCHAR(10), @DataLength) + ' Bytes'

GO -- Run the previous command and begins new batch

--2017-12-15 21:21:21.12346

--8 Bytes

-----------------------------------------------------------------------------

--T009\_02\_04\_07

DECLARE @DateTime2 DATETIME2(6) = CONVERT(DATETIME2(6), '12/15/2017 21:21:21.1234567')

DECLARE @DataLength INT = DATALENGTH(@DateTime2)

PRINT @DateTime2

PRINT CONVERT(NVARCHAR(10), @DataLength) + ' Bytes'

GO -- Run the previous command and begins new batch

--2017-12-15 21:21:21.123457

--8 Bytes

-----------------------------------------------------------------------------

--T009\_02\_04\_08

DECLARE @DateTime2 DATETIME2(7) = CONVERT(DATETIME2(7), '12/15/2017 21:21:21.1234567')

DECLARE @DataLength INT = DATALENGTH(@DateTime2)

PRINT @DateTime2

PRINT CONVERT(NVARCHAR(10), @DataLength) + ' Bytes'

GO -- Run the previous command and begins new batch

--2017-12-15 21:21:21.1234567

--8 Bytes

==================================================

3. DateFromPartsFunction V.S. DateTime2FromPartsFunction

--==========================================================================

--T009\_03\_DateFromPartsFunction V.S. DateTime2FromPartsFunction

--==========================================================================

/\*

1.

--DATEFROMPARTS(year,month,day)

--DATETIME2FROMPARTS ( year, month, day, hour, minute, seconds, fractions, precision )

--SMALLDATETIMEFROMPARTS ( year, month, day, hour, minute )

--TIMEFROMPARTS( hour, minute, seconds, fractions, precision )

--DATETIMEOFFSETFROMPARTS ( year, month, day, hour, minute, seconds, fractions, hour\_offset, minute\_offset, precision )

Reference:

<https://docs.microsoft.com/en-us/sql/t-sql/functions/datefromparts-transact-sql>

The function with invalid argument valuse will return an error.

If any of the arguments are NULL, then the function returns null.

1.1.

DateFromParts Syntax :

--DATEFROMPARTS(year,month,day)

Returns a date value.

1.2.

DatetimeFromParts Syntax :

--DATETIME2FROMPARTS ( year, month, day, hour, minute, seconds, fractions, precision )

Returns a datetime2 value.

1.3.

SmallDateTimeFromParts Syntax :

--SMALLDATETIMEFROMPARTS ( year, month, day, hour, minute )

Returns a SmallDateTime value.

1.4.

TimeFromParts Syntax :

--TIMEFROMPARTS( hour, minute, seconds, fractions, precision )

Returns a Time value.

1.5.

DateTimeOffsetFromParts Syntax :

--DATETIMEOFFSETFROMPARTS ( year, month, day, hour, minute, seconds, fractions, hour\_offset, minute\_offset, precision )

Returns a DateTimeOffset value.

\*/

--==========================================================================

--T009\_03\_01

--DATEFROMPARTS(year,month,day)

-----------------------------------------------------------------------------

--T009\_03\_01\_01

--DATEFROMPARTS(year,month,day)

--Valid argument

--Returns a date value for the specified year, month, and day.

SELECT DATEFROMPARTS(2015, 2, 15) AS [DATEFROMPARTS]

--2015-02-15

DECLARE @DateTime1 DATETIME = DATEFROMPARTS(2015, 2, 15);

PRINT @DateTime1;

--Feb 15 2015 12:00AM

GO -- Run the previous command and begins new batch

-----------------------------------------------------------------------------

--T009\_03\_01\_02

--DATEFROMPARTS(year,month,day)

--Invalid argument for Month

--The function with invalid argument valuse will return an error.

SELECT DATEFROMPARTS(2015, 15, 15) AS [DATEFROMPARTS]

/\*

Error

--Msg 289, Level 16, State 1, Line 225

--Cannot construct data type date, some of the arguments have values which are not valid.

\*/

DECLARE @DateTime1 DATETIME = DATEFROMPARTS(2015, 15, 15);

PRINT @DateTime1;

/\*

Error

--Msg 289, Level 16, State 1, Line 231

--Cannot construct data type date, some of the arguments have values which are not valid.

\*/

GO -- Run the previous command and begins new batch

-----------------------------------------------------------------------------

--T009\_03\_01\_03

--DATEFROMPARTS(year,month,day)

--NULL argument

--If any of the arguments are NULL, then the function returns null.

SELECT DATEFROMPARTS(2015, NULL, 15) AS [DATEFROMPARTS]

--NULL

GO -- Run the previous command and begins new batch

--==========================================================================

--T009\_03\_02

----DATETIME2FROMPARTS ( year, month, day, hour, minute, seconds, fractions, precision )

-----------------------------------------------------------------------------

--T009\_03\_02\_01

--DATETIME2FROMPARTS ( year, month, day, hour, minute, seconds, fractions, precision )

--Valid argument

--Returns a date value for the specified year, month, and day.

SELECT DATETIME2FROMPARTS(2015, 2, 15, 15,59,59,0,0) AS [DATETIME2FROMPARTS]

--2015-02-15 15:59:59

DECLARE @DateTime1 DATETIME2 = DATETIME2FROMPARTS(2015, 2, 15, 15,59,59,0,0);

PRINT @DateTime1;

--2015-02-15 15:59:59.0000000

GO -- Run the previous command and begins new batch

-----------------------------------------------------------------------------

--T009\_03\_02\_02

--DATETIME2FROMPARTS ( year, month, day, hour, minute, seconds, fractions, precision )

--Invalid argument for Month

--The function with invalid argument valuse will return an error.

SELECT DATETIME2FROMPARTS(2015, 15, 15, 15,59,59,0,0) AS [DATETIME2FROMPARTS]

/\*

Error

--Msg 289, Level 16, State 5, Line 294

--Cannot construct data type datetime2, some of the arguments have values which are not valid.

\*/

DECLARE @DateTime1 DATETIME = DATETIME2FROMPARTS(2015, 15, 15, 15,59,59,0,0);

PRINT @DateTime1;

/\*

Error

--Msg 289, Level 16, State 5, Line 300

--Cannot construct data type datetime2, some of the arguments have values which are not valid.

\*/

GO -- Run the previous command and begins new batch

-----------------------------------------------------------------------------

--T009\_03\_02\_03

--DATETIME2FROMPARTS ( year, month, day, hour, minute, seconds, fractions, precision )

--NULL argument

--If any of the arguments are NULL, then the function returns null.

SELECT DATETIME2FROMPARTS(2015, NULL, 15, 15,59,59,0,0) AS [DATETIME2FROMPARTS]

--NULL

GO -- Run the previous command and begins new batch