







Data types (Transact-SQL)

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Applies to:  [SQL Server](#)  [Azure SQL Database](#)  [Azure SQL Managed Instance](#)
 [Azure Synapse Analytics](#)  [Analytics Platform System \(PDW\)](#)  [Warehouse in Microsoft Fabric](#)

In SQL Server, each column, local variable, expression, and parameter has a related data type. A data type is an attribute that specifies the type of data that the object can hold: integer data, character data, monetary data, date and time data, binary strings, and so on.

SQL Server supplies a set of system data types that define all the types of data that can be used with SQL Server. You can also define your own data types in Transact-SQL or the Microsoft .NET Framework. Alias data types are based on the system-supplied data types. For more information about alias data types, see [CREATE TYPE \(Transact-SQL\)](#). User-defined types obtain their characteristics from the methods and operators of a class that you create by using one of the programming languages supported by the .NET Framework.

When two expressions that have different data types, collations, precision, scale, or length are combined by an operator, the characteristics of result are determined by the following:

- The data type of the result is determined by applying the rules of data type precedence to the data types of the input expressions. For more information, see [Data Type Precedence \(Transact-SQL\)](#).
- The collation of the result is determined by the rules of collation precedence when the result data type is **char**, **varchar**, **text**, **nchar**, **nvarchar**, or **ntext**. For more information, see [Collation Precedence \(Transact-SQL\)](#).
- The precision, scale, and length of the result depend on the precision, scale, and length of the input expressions. For more information, see [Precision, Scale, and Length \(Transact-SQL\)](#).

SQL Server provides data type synonyms for ISO compatibility. For more information, see [Data Type Synonyms \(Transact-SQL\)](#).

Note

For more specific information on data types in Azure Synapse Analytics, see [Table data types in Synapse SQL](#). For more specific information on data types in

Microsoft Fabric, see [Data type](#).

Data type categories

Data types in SQL Server are organized into the following categories:

Exact numerics

Unicode character strings

Approximate numerics

Binary strings

Date and time

Other data types

Character strings

In SQL Server, based on their storage characteristics, some data types are designated as belonging to the following groups:

- Large value data types: **varchar(max)**, and **nvarchar(max)**
- Large object data types: **text**, **ntext**, **image**, **varbinary(max)**, and **xml**

⚠ Note

`sp_help` returns -1 as the length for the large-value and **xml** data types.

Exact numerics

[bigint](#)

[numeric](#)

[bit](#)

[smallint](#)

decimal

smallmoney

int

tinyint

money

Approximate numerics

float

real

Date and time

date

datetimeoffset

datetime2

smalldatetime

datetime

time

Character strings

char

varchar

text

Unicode character strings

[nchar](#)

[nvarchar](#)

[ntext](#)

Binary strings

[binary](#)

[varbinary](#)

[image](#)

Other data types

[cursor](#)

[rowversion](#)

[hierarchyid](#)

[uniqueidentifier](#)

[sql_variant](#)

[xml](#)

[Spatial Geometry Types](#)

[Spatial Geography Types](#)

[table](#)

See also

[CREATE PROCEDURE \(Transact-SQL\)](#)

[CREATE TABLE \(Transact-SQL\)](#)

[DECLARE @local_variable \(Transact-SQL\)](#) [EXECUTE \(Transact-SQL\)](#)

[Expressions \(Transact-SQL\)](#)

[Functions \(Transact-SQL\)](#)

[LIKE \(Transact-SQL\)](#)

[sp_droptype \(Transact-SQL\)](#)

[sp_help \(Transact-SQL\)](#)

[sp_rename \(Transact-SQL\)](#)

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