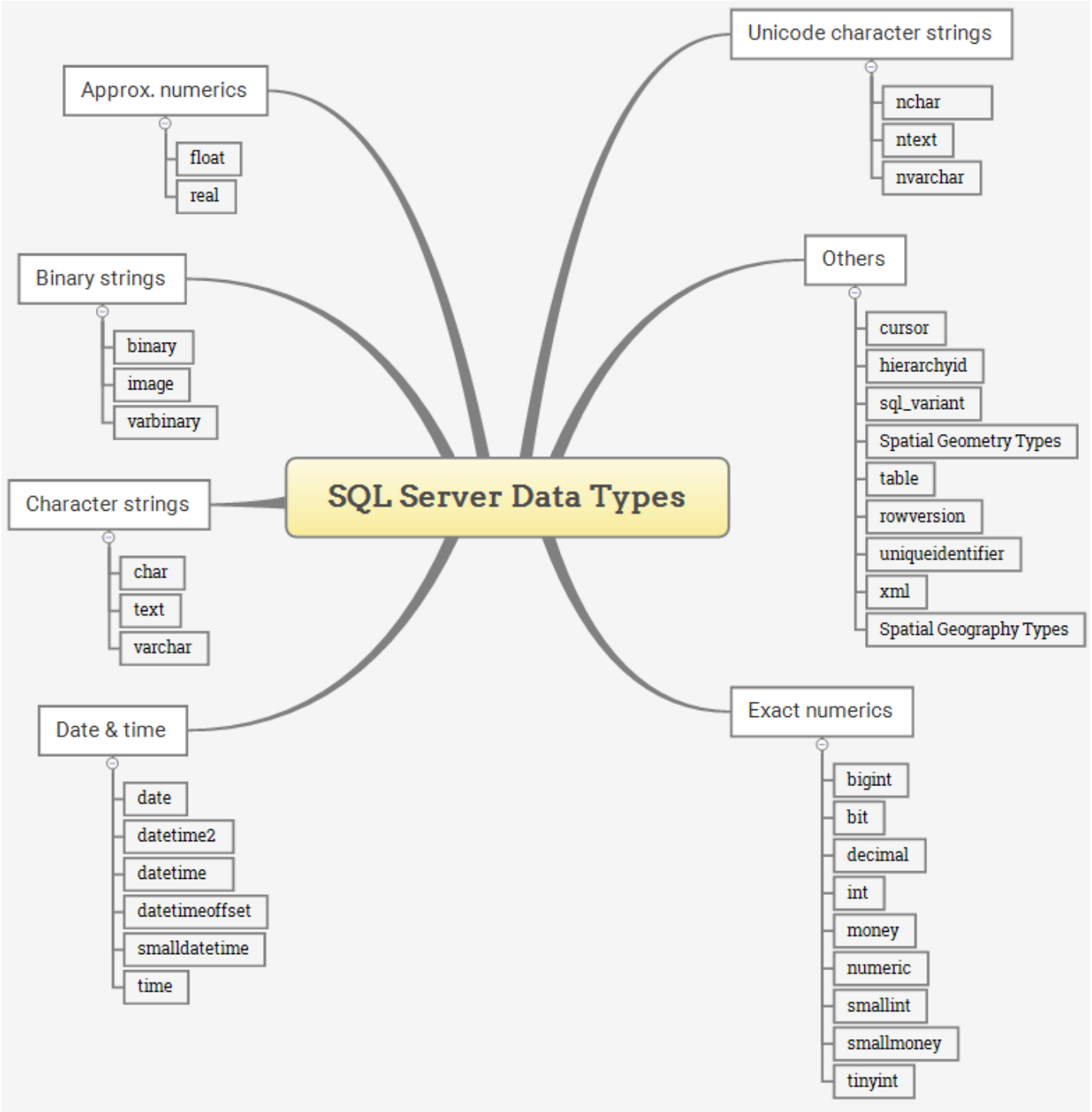

> Notice that SQL Server will remove **ntext**, **text**, and **image** data types in its future version. Therefore, you should avoid using these data types and use **nvarchar(max)**, **varchar(max)**, and **varbinary(max)** data types instead.

Exact numeric data types

Exact numeric data types store exact numbers such as integer, decimal, or monetary amount.

- The bit store one of three values 0, 1, and NULL
- The int, bigint, smallint, and tinyint data types store integer data.
- The decimal and numeric data types store numbers that have fixed precision and scale. Note that decimal and numeric are synonyms.
- The money and smallmoney data type store currency values.

The following table illustrates the characteristics of the exact numeric data types:

Data Type	Lower limit	Upper limit	Memory
bigint	-2^63 (-9,223,372, 036,854,775,808)	2^63-1 (-9,223,372, 036,854,775,807)	8 bytes
int	-2^31 (-2,147, 483,648)	2^31-1 (-2,147, 483,647)	4 bytes
smallint	-2^15 (-32,767)	2^15 (-32,768)	2 bytes
tinyint	0	255	1 byte
bit	0	1	1 byte/8bit column
decimal	-10^38+1	10^381-1	5 to 17 bytes
numeric	-10^38+1	10^381-1	5 to 17 bytes
money	-922,337, 203, 685,477.5808	+922,337, 203, 685,477.5807	8 bytes
smallmoney	-214,478.3648	+214,478.3647	4 bytes

Approximate numeric data types

The approximate numeric data type stores floating point numeric data. They are often used in scientific calculations.

Data Type	Lower limit	Upper limit	Memory	Precision
float(n)	−1.79E+308	1.79E+308	Depends on the value of n	7 Digit
real	−3.40E+38	3.40E+38	4 bytes	15 Digit

Date & Time data types

The date and time data types store data and time data, and the date time offset.

Data Type	Storage size	Accuracy	Lower Range	Upper Range
datetime	8 bytes	Rounded to increments of .000, .003, .007	1753-01-01	9999-12-31
smalldatetime	4 bytes, fixed	1 minute	1900-01-01	2079-06-06
date	3 bytes, fixed	1 day	0001-01-01	9999-12-31
time	5 bytes	100 nanoseconds	00:00:00.0000000	23:59:59.9999999
datetimeoffset	10 bytes	100 nanoseconds	0001-01-01	9999-12-31
datetime2	6 bytes	100 nanoseconds	0001-01-01	9999-12-31

If you develop a new application, you should use the **time**, **date**, **datetime2** and **datetimeoffset** data types. Because these types align with the SQL Standard and more portable. In addition, the **time**, **datetime2** and **datetimeoffset** have more seconds precision and **datetimeoffset** supports time zone.

Character strings data types

Character strings data types allow you to store either fixed-length (char) or variable-length data (varchar). The text data type can store non-Unicode data in the code page of the server.

Data Type	Lower limit	Upper limit	Memory
char	0 chars	8000 chars	n bytes
varchar	0 chars	8000 chars	n bytes + 2 bytes
varchar (max)	0 chars	2^31 chars	n bytes + 2 bytes
text	0 chars	2,147,483,647 chars	n bytes + 4 bytes

Unicode character string data types

Unicode character string data types store either fixed-length (nchar) or variable-length (nvarchar) Unicode character data.

Data Type	Lower limit	Upper limit	Memory
nchar	0 chars	4000 chars	2 times n bytes
nvarchar	0 chars	4000 chars	2 times n bytes + 2 bytes
ntext	0 chars	1,073,741,823 char	2 times the string length

Binary string data types

The binary data types stores fixed and variable length binary data.

Data Type	Lower limit	Upper limit	Memory
binary	0 bytes	8000 bytes	n bytes
varbinary	0 bytes	8000 bytes	The actual length of data entered + 2 bytes
image	0 bytes	2,147,483,647 bytes	

Other data types

Data Type	Description
cursor	for variables or stored procedure OUTPUT parameter that contains a reference to a cursor
rowversion	expose automatically generated, unique binary numbers within a database.
hierarchyid	represent a tree position in a tree hierarchy
uniqueidentifier	16-byte GUID
sql_variant	store values of other data types
XML	store XML data in a column, or a variable of XML type
Spatial Geometry type	represent data in a flat coordinate system.
Spatial Geography type	store ellipsoidal (round-earth) data, such as GPS latitude and longitude coordinates.
table	store a result set temporarily for processing at a later time

In this tutorial, you have learned about the brief overview of SQL Server data types. We will examine each data type in detail in the next tutorials.