



# CHAPTER 9: DATA TYPES

2023

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## Content:

1. Integer data types
2. Decimal data types
3. Date data types
4. Character data types

# DATA TYPES

A data type is an attribute associated with a piece of data that tells a computer system how to interpret its value.

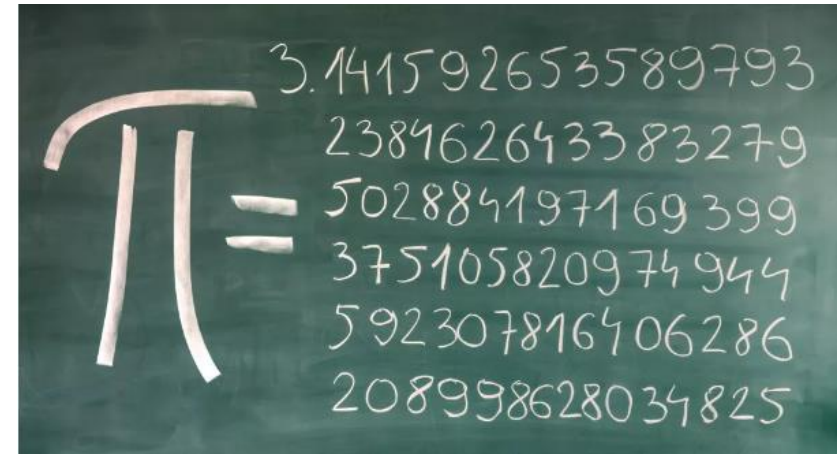
Understanding data types ensures that data is collected in the preferred format and the value of each property is as expected.

Here are some data types you might have come across or will come across in the course:

DATA TYPE	FROM	TO
bigint	-9,223,372,036,854,775,808	9,223,372,036,854,775,807
int	-2,147,483,648	2,147,483,647
smallint	-32,768	32,767
tinyint	0	255
bit	0	1
decimal	$-10^{38} + 1$	$10^{38} - 1$
numeric	$-10^{38} + 1$	$10^{38} - 1$
money	-922,337,203,685,477.5808	+922,337,203,685,477.5807
smallmoney	-214,748.3648	+214,748.3647

# DATA TYPES

DATA TYPE	FROM	TO
float	-1.79E + 308	1.79E + 308
real	-3.40E + 38	3.40E + 38



Real numbers are numbers that include both rational and irrational numbers. Rational numbers such as integers (-2, 0, 1), fractions ( $1/2$ , 2.5) and irrational numbers such as  $\sqrt{3}$ ,  $\pi$  (22/7), etc., are all real numbers

DATA TYPE	FROM	TO
datetime	Jan 1, 1753	Dec 31, 9999
smalldatetime	Jan 1, 1900	Jun 6, 2079
date	Stores a date like June 30, 1991	
time	Stores a time of day like 12:30 P.M.	

# DATA TYPES

DATA TYPE	FROM	TO
char	char	Maximum length of 8,000 characters. <i>Fixed length non – Unicode characters</i>
varchar	varchar	Maximum of 8,000 characters. <i>Variable – length non – Unicode data.</i>
varchar <sub>max</sub>	varchar <sub>max</sub>	Maximum length of 231 characters, Variable-length non-Unicode data <i>SQL Server 2005 only.</i>
text	text	Variable-length non-Unicode data with a maximum length of 2,147,483,647 characters.

# DATA TYPES

DATA TYPE	Description
nchar	Maximum length of 4,000 characters
nvarchar	Maximum length of 4,000 characters
nvarcharmax	Maximum length of 231characters <i>SQLServer2005only</i> .
ntext	Maximum length of 1,073,741,823 characters.

DATA TYPE	Description
binary	Maximum length of 8,000 bytes
varbinary	Maximum length of 8,000 bytes.
varbinarymax	Maximum length of 231 bytes <i>SQLServer2005only</i> .
image	Maximum length of 2,147,483,647 bytes.

# DATA TYPES

DATA TYPE	Description
sql_variant	Stores values of various SQL Server-supported data types, except text, ntext, and timestamp.
timestamp	Stores a database-wide unique number that gets updated every time a row gets updated
uniqueidentifier	Stores a globally unique identifier <i>GUID</i>
xml	Stores XML data. You can store xml instances in a column or a

# Practice DATA TYPES

Create an EMP database

Create employees table with the following columns first names, last name , email address, Hire date , Salary, Employment, date of birth and notes. Consider the following:

1. The characters for firstname and lastname should be 25 or less without using adding constraint to datatype
2. Email address should not be greater than 100 characters
3. Hire date should be only be date
4. Employment contract which can be either permanent fixed-term casual zero hours or independent contract
5. Ensure the notes column is an appropriate data type
6. Each employee earns a salary of max 6 digits.