LAB - NVARCHAR Data Type

In this lab, you will learn how to use the SQL Server `NVARCHAR` data type to store variable-length, Unicode string data.

SQL Server `NVARCHAR` data type is used to store variable-length, Unicode string data. The following shows the syntax of `NVARCHAR`:

```
NVARCHAR(n)
```

In this syntax, n defines the string length that ranges from 1 to 4,000. If you don't specify the string length, its default value is 1.

Another way to declare a `NVARCHAR` column is to use the following syntax:

```
NVARCHAR(max)
```

In this syntax, max is the maximum storage size in bytes which is 2^31-1 bytes (2 GB).

In general, the actual storage size in bytes of a `NVARCHAR` value is two times the number of characters entered plus 2 bytes.

The `ISO` synonyms of `NVARCHAR` are `NATIONAL CHAR VARYING` or `NATIONAL CHARACTER VARYING`, so you can use them interchangeably in the variable declaration or column data definition.

VARCHAR vs. NVARCHAR

The following table illustrates the main differences between `VARCHAR` and `NVARCHAR` data types:

	VARCHAR	NVARCHAR
Character Data Type	Variable-length, non-Unicode characters	Variable-length, both Unicode and non-Unicode characters such as Japanese, Korean, and Chinese.
Maximum Length	Up to 8,000 characters	Up to 4,000 characters
Character Size	Takes up 1 byte per character	Takes up 2 bytes per Unicode/Non-Unicode character
Storage Size	Actual Length (in bytes)	2 times Actual Length (in bytes)
Usage	Used when data length is variable or variable length columns and if actual data is always way less than capacity	Due to storage only, used only if you need Unicode support such as the Japanese Kanji or Korean Hangul characters.

Example

The following statement creates a new table that contains one `NVARCHAR` column:

```
CREATE TABLE sql_server_nvarchar (
    val NVARCHAR NOT NULL
);
```

In this example, the string length of the `NVARCHAR` column is one by default.

To change the string length of the `val` column, you use the `ALTER TABLE ALTER COLUMN` statement:

```
ALTER TABLE sql_server_Nvarchar
ALTER COLUMN val NVARCHAR (10) NOT NULL;
```

The following statement inserts a new string into the `val` column of the `test.sql_server_nvarchar` table:

```
INSERT INTO sql_server_varchar (val)
VALUES
    (N'こんにちは');
```

The statement worked as expected because the string value has a length that is less than to the string length defined in the column definition.

The following statement attempts to insert a new string data whose length is greater than the string length of the `val` column:

```
INSERT INTO sql_server_nvarchar (val)
VALUES
    (N'ありがとうございました');
```

SQL Server issued an error and terminated the statement:

```
String or binary data would be truncated.
The statement has been terminated.
```

To find the number of characters and the storage size in bytes of the values stored in the `NVARCHAR` column, you use the `LEN` and `DATALENGTH` functions as follows:

```
SELECT
    val,
    LEN(val) len,
    DATALENGTH(val) data_length
FROM
    sql_server_nvarchar;
```

In this lab, you have learned how to use the SQL Server `NVARCHAR` data type to store variable-length, Unicode data in the database.