



Module 31: Data Type Conversion Functions

Why Convert Data Types?

In SQL, data sometimes needs to be **converted from one type to another**, such as:

- Numbers → Strings
- Strings → Dates
- Decimals → Integers
- Money → Text, etc.

SQL provides two main functions for type conversion:

- `CAST()`
 - `CONVERT()`
-

`CAST()` Function

Definition:

`CAST()` is used to **convert a value from one data type to another**.

It is **ANSI-standard SQL**, and it works on most databases.

Syntax:

`CAST(expression AS target_data_type)`

Examples:

1. Convert decimal to integer:

```
SELECT CAST(45.8765 AS INT);  
-- Output: 45
```

2. Convert string to datetime:

```
SELECT CAST('2025-03-05' AS SMALLDATETIME) AS DATE_TIME;  
-- Output: 2025-03-05 00:00:00
```

3. Convert number to string:

```
SELECT CAST(45.87 AS VARCHAR) AS Casted_Val;  
-- Output: '45.87'
```

```
SELECT CAST(45.8765 AS INT);
SELECT CAST('2025-03-05' AS SMALLDATETIME) AS DATE_TIME;
SELECT CAST(45.87 AS VARCHAR) AS Casted_Val;
```

	(No column name)
1	45

	DATE_TIME
1	2025-03-05 00:00:00

	Casted_Val
1	45.87

2 CONVERT() Function

✓ Definition:

`CONVERT()` is used to **convert a value from one data type to another**, just like `CAST()`, but it also **allows style formatting**, especially for date and money conversions.

✓ Syntax:

`CONVERT(target_data_type, expression [, style])`

📌 Examples:

1. Convert string to datetime:

```
SELECT CONVERT(SMALLDATETIME, '2025-03-05') AS DATE_TIME;
-- Output: 2025-03-05 00:00:00
```

2. Convert number to string:

```
SELECT CONVERT(VARCHAR, 45.87);
-- Output: '45.87'
```

3. Convert money to a formatted string:

```
SELECT CONVERT(VARCHAR(30), $120, 2);
-- Output: '120.00'
```

Explanation:

- `$120` is treated as **money**, and style code `2` formats it to **2 decimal places**, then the result is converted to a `varchar(30)` string.

The screenshot shows three queries in the query editor and their corresponding results in the results pane.

Query 1:

```
SELECT CONVERT(SMALLDATETIME, '2025-03-05') AS DATE_TIME;
```

Query 2:

```
SELECT CONVERT(VARCHAR, 45.87);
```

Query 3:

```
SELECT CONVERT(VARCHAR(30), $120, 2);
```

Results:

	DATE_TIME
1	2025-03-05 00:00:00

	(No column name)
1	45.87

	(No column name)
1	120.0000

◆ Example with a Variable:

```
DECLARE @price MONEY = 120.4567;
SELECT CAST(@price AS VARCHAR) AS CastedPrice,
       CONVERT(VARCHAR, @price, 1) AS ConvertedPrice;
```



`CAST` gives a plain string, while `CONVERT` with style (e.g., `1`) adds formatting like commas or decimal styling.

The screenshot shows a query in the query editor and its results in the results pane.

Query:

```
DECLARE @price MONEY = 120.4567;

SELECT
    CAST(@price AS VARCHAR) AS CastedPrice,
    CONVERT(VARCHAR, @price, 1) AS ConvertedPrice;
```

Results:

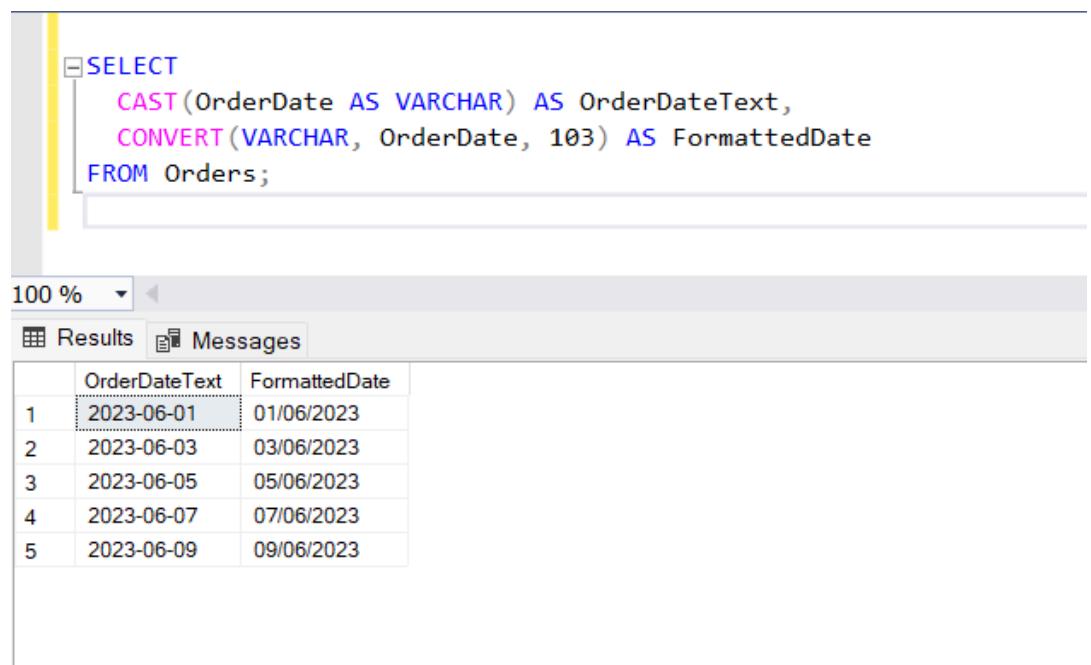
	CastedPrice	ConvertedPrice
1	120.46	120.46

◆ Example with a Column:

If you have a column like `OrderDate` in a table `Orders` (Reference Table in Module 24):

```
SELECT
    CAST(OrderDate AS VARCHAR) AS OrderDateText,
    CONVERT(VARCHAR, OrderDate, 103) AS FormattedDate
FROM Orders;
```

✓ Style `103` returns date in `dd/mm/yyyy` format.



The screenshot shows a SQL query being run in SSMS. The query is:

```
SELECT
    CAST(OrderDate AS VARCHAR) AS OrderDateText,
    CONVERT(VARCHAR, OrderDate, 103) AS FormattedDate
FROM Orders;
```

The results pane displays the output of the query:

	OrderDateText	FormattedDate
1	2023-06-01	01/06/2023
2	2023-06-03	03/06/2023
3	2023-06-05	05/06/2023
4	2023-06-07	07/06/2023
5	2023-06-09	09/06/2023

🧠 Expression in CAST/CONVERT Can Be:

Expression Type	Example
Literal	<code>CAST(45.67 AS INT)</code>
Column	<code>CONVERT(VARCHAR, OrderDate, 103)</code>
Variable	<code>CAST(@price AS VARCHAR)</code>

★ Key Points to Remember

Point	Explanation
<code>CAST()</code>	ANSI standard, portable across most SQL systems
<code>CONVERT()</code>	SQL Server-specific, supports style formatting
Use for	Changing data types , preparing output, formatting reports
Styles	Only supported in <code>CONVERT()</code> (especially for dates, money)
Common types	<code>int</code> , <code>varchar</code> , <code>datetime</code> , <code>float</code> , <code>money</code>
Errors	If conversion isn't possible (e.g., text to int), SQL will throw an error

⌚ Quick Reference Table

Function	From → To	Example
<code>CAST()</code>	Float → Int	<code>CAST(45.87 AS INT)</code> → 45
<code>CAST()</code>	String → Date	<code>CAST('2025-03-05' AS DATE)</code> → 2025-03-05
<code>CONVERT()</code>	Money → String	<code>CONVERT(VARCHAR, \$120, 2)</code> → '120.00'
<code>CONVERT()</code>	Date Format Style	<code>CONVERT(VARCHAR, GETDATE(), 103)</code> → 31/05/2025