📘 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()`

1️⃣ `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:

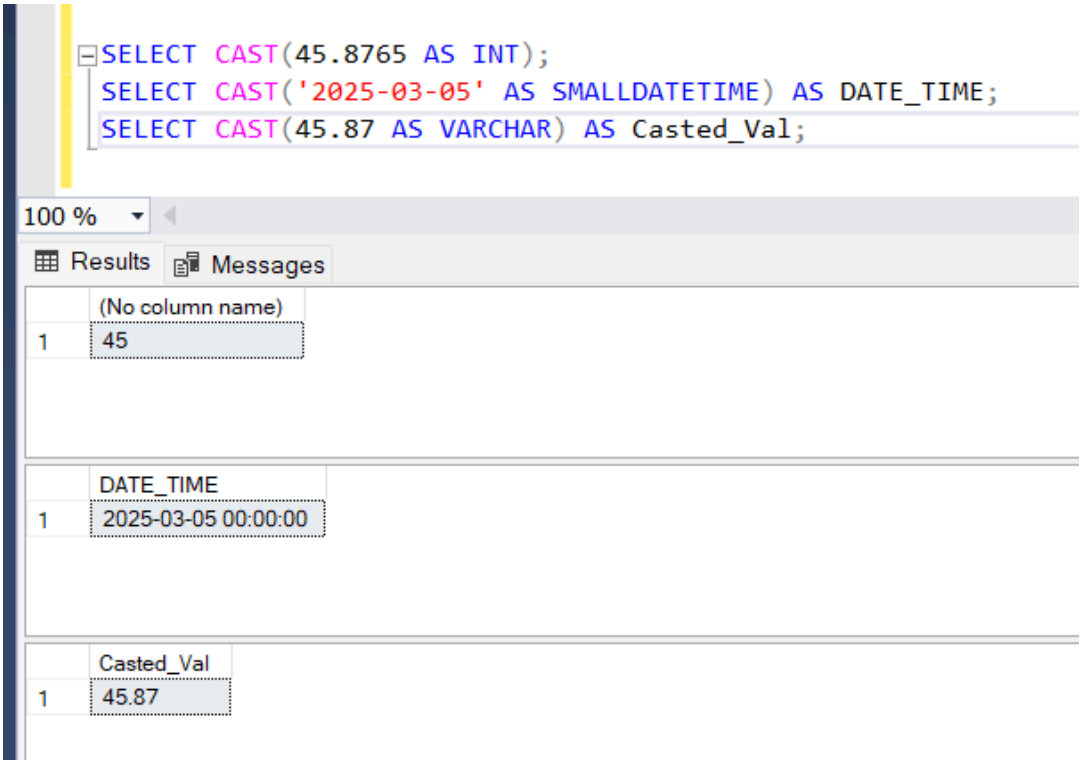
```
SELECT CAST(45.8765 AS INT);
-- Output: 45
```

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'
```



2️⃣ `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:

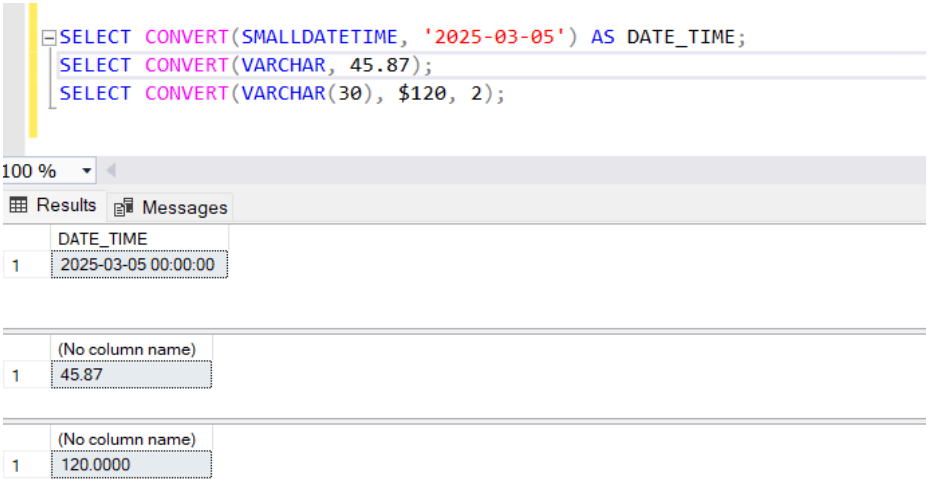
SELECT CONVERT(VARCHAR, 45.87);
-- Output: '45.87'

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.

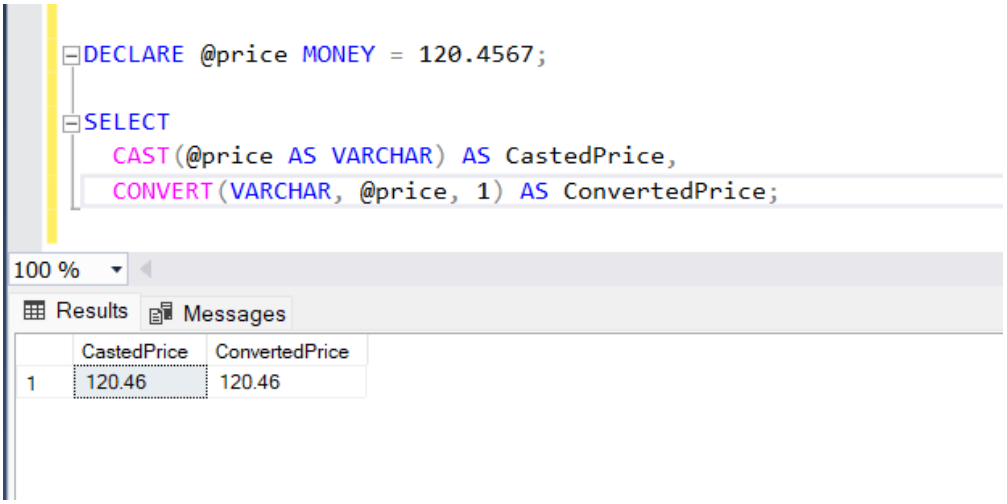


🔷 Example with a Variable:

```
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.

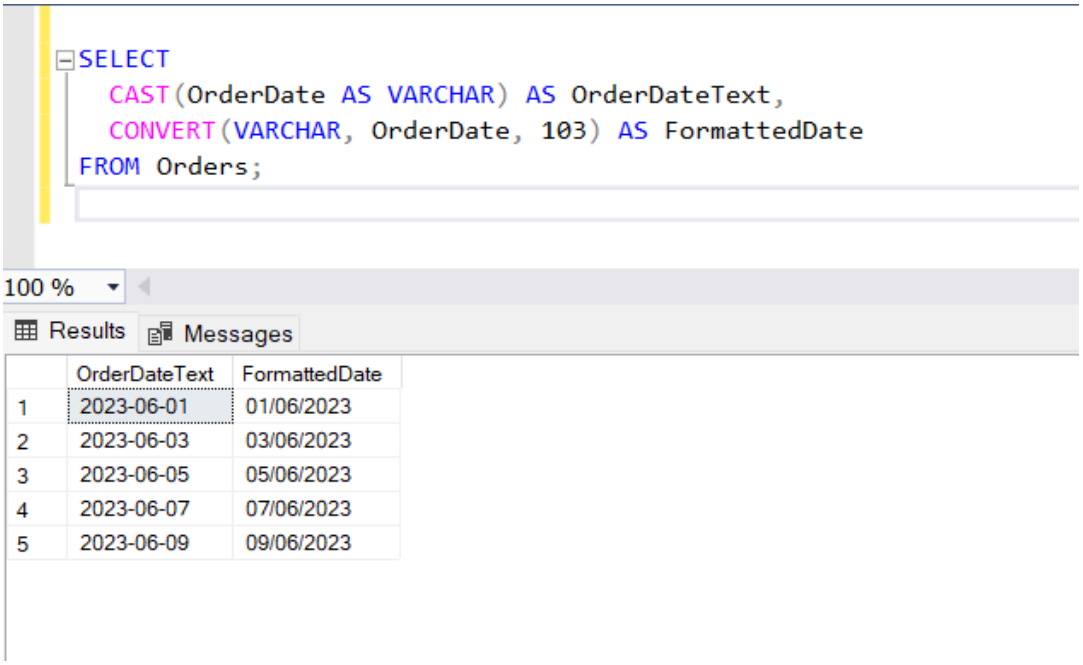


🔷 Example with a Column:

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.



🧠 Expression in CAST/CONVERT Can Be:

Expression Type	Example
Literal	`CAST(45.67 AS INT)`
Column	`CONVERT(VARCHAR, OrderDate, 103)`
Variable	`CAST(@price AS VARCHAR)`

⭐ Key Points to Remember

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

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🔄 Quick Reference Table

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