# SQL Server ORDER BY Clause

**Introduction**
The `ORDER BY` clause is used in SQL Server to sort the result set of a query by one or more columns.

**Syntax**
```
SELECT
   select_list
FROM
   table_name
ORDER BY
   column_name | expression [ASC | DESC];
```

**Key Points**
**1. Column Specification:**
   You can specify one or more columns or expressions in the `ORDER BY` clause to determine the sort order.
   If multiple columns are specified, the sort occurs in the order the columns are listed.

**2. Sort Order:**
   Use the `ASC` keyword for ascending order (default) and the `DESC` keyword for descending order.
   Example:
     Ascending: `ORDER BY column_name;` (default is `ASC`)
     Descending: `ORDER BY column_name DESC;`

**3. NULL Handling:**
   SQL Server treats NULL values as the lowest value, so they appear first when sorting in ascending order.

**4. Processing Order:**
   The `ORDER BY` clause is processed last in the query execution sequence.

**Examples**

**1. Sort by One Column (Ascending):**
```
   SELECT first_name, last_name
 FROM sales.customers
 ORDER BY first_name;
```

**2. Sort by One Column (Descending):**
```
   SELECT first_name, last_name
 FROM sales.customers
 ORDER BY first_name DESC;
```

**3. Sort by Multiple Columns:**
```
   SELECT city, first_name, last_name
 FROM sales.customers
 ORDER BY city, first_name;
```

**4. Sort by Multiple Columns with Different Orders:**
    SELECT city, first_name, last_name
   FROM sales.customers
   ORDER BY city DESC, first_name ASC;

**5. Sort by a Column Not in the Select List:**
    SELECT city, first_name, last_name
   FROM sales.customers
   ORDER BY state;

**6. Sort by an Expression:**
    SELECT first_name, last_name
   FROM sales.customers
   ORDER BY LEN(first_name) DESC;

**7. Sort by Ordinal Positions:**
    SELECT first_name, last_name
   FROM sales.customers
   ORDER BY 1, 2;  -Sorts by first_name and then last_name
**Best Practice:** It's recommended to use column names instead of ordinal positions to avoid errors during modifications.

**Summary**
1.   Use the `ORDER BY` clause to sort results by specified columns in either ascending or descending order.
2.   Utilize `ASC` for ascending and `DESC` for descending order.
3.   Always reference column names explicitly for clarity and maintainability.