Logical Processing Order of SELECT

1. **FROM** table
2. **ON** join condition
3. **JOIN** table
4. **WHERE** clauses
5. **GROUP BY** columns
6. **WITH CUBE / WITH ROLLUP**
7. **HAVING** condition
8. **SELECT** columns
9. **DISTINCT**
10. **ORDER BY** columns
11. **TOP %** or number

The steps above show the logical processing order, or binding order, for a SELECT statement. This order determines when the objects defined in one step are made available to the clauses in subsequent steps.

CTEs

```
; WITH cteName ( columnList )
AS ( SELECT statement )
SELECT columns
FROM cteName
INNER JOIN table ON condition
```

Below, is a list of those statements and/or clauses that cannot be used in ANY CTE.

- › COMPUTE or COMPUTE BY
- › ORDER BY (except when a TOP clause is specified)
- › INTO
- › OPTION clause with query hints
- › FOR XML
- ✔ FOR BROWSE

Recusrsive CTEs

```
; WITH cteName ( columnList )
AS ( -- Anchor statement:
    SELECT columns FROM table…
    UNION ALL
    -- Recursion statement:
    SELECT columns FROM table…
    INNER JOIN cteName ON …
    )
SELECT columns
FROM cteName
```

Here are the statements and/or clauses that cannot be used in a recursive CTE:

- › SELECT DISTINCT
- › GROUP BY
- › HAVING
- › Scalar aggregation (meaning you can't use min or max)
- › TOP
- › LEFT, RIGHT, OUTER JOIN (INNER JOIN is allowed)

EXCEPT/INTERSECT

```
SELECT col1, col2 FROM Table1
EXCEPT
SELECT col3, col4 FROM Table2

SELECT col1, col2 FROM Table1
INTERSECT
SELECT col3, col4 FROM Table2
```

INTERSECT, EXCEPT and UNION

MERGE

```
DECLARE @Changes
   TABLE(Change VARCHAR(20))
; MERGE INTO DestTable
 USING
 ( SELECT from sourceTable
 ) AS Source ( columnList )
 ON DestTable.ID = Source.ID

 WHEN MATCHED THEN
   Action on destination
   -- E.g., UPDATE SET col1 = 1
   WHEN NOT MATCHED BY TARGET|SOURCE
    Action on destination
   -- E.g., INSERT (col1) VALUES(1)
 OUTPUT $action INTO @Changes
SELECT * FROM @Changes
```

MERGE Statement Generator

Generate SQL MERGE statements with Table data

OVER and PARTITION BY

```
/* Aggregate functions include COUNT, MIN,
MAX, AVG, ROW_COUNT(), etc. */
SELECT
   agg_func(col1) OVER(),
   agg_func(col1)
      OVER(PARTITION BY col2),
columns
FROM table…
```

OVER allows you to get aggregate information without using a GROUP BY. In other words, you can retrieve detail rows, and get aggregate data alongside it.

Using PARTITION BY the result set is broken into into partitions.

XML Trick: List of Details

```
/* Table2 holds detail rows for Table1; e.g., order details to order
headers. */
SELECT columns,
    colname = STUFF(
   ( SELECT ','
      + Name
      FROM Table2
      WHERE Table1.ID = Table2.ID
      ORDER BY Name
      FOR XML PATH('')
   ), 1, 1, '')
FROM   Table2
```

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