

Advanced Data Aggregations

TRAINSIGNAL
THE GLOBAL STANDARD IN PROFESSIONAL COMPUTER TRAINING



Common Table Expressions (CTEs)

CTE Concepts

Inline view or temporary table

Uses:

- Breakdown complex queries
- Avoid subqueries
- Simplify certain syntax

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CTE Syntax

```
WITH <Name> [(columns)]
AS (
  <SELECT Statement>
)
-- CTE can be used as a table
```

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PIVOT and UNPIVOT

PIVOT

Convert row data into columns

Region	Year	Sales		Region	2011	2012
North	2011	\$5,000	PIVOT →	North	\$5,000	\$6,000
North	2012	\$6,000		South	\$4,000	\$4,500
South	2011	\$4,000				
South	2012	\$4,500				

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UNPIVOT

Convert columns back to row data

Does not perform a full reverse of a pivot statement

Region	Year	Sales
North	2011	\$5,000
North	2012	\$6,000
South	2011	\$4,000
South	2012	\$4,500
South	2012	\$1,000

PIVOT

Region	2011	2012
North	\$5,000	\$6,000
South	\$4,000	\$5,500

UNPIVOT

Region	Year	Sales
North	2011	\$5,000
North	2012	\$6,000
South	2011	\$4,000
South	2012	\$5,500

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PIVOT Syntax

```
SELECT <NonPivot>
    , <FirstPivotedColumn>
    , ...
FROM <Table containing data>
    PIVOT (FUNCTION(<data column>)
        FOR <List of pivoted columns>
        AS <alias>
```

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UNPIVOT Syntax

```
SELECT <Columns>
FROM <PivotedTable>
    UNPIVOT (<AggregatedColumn>
        FOR <NewColumn>
        IN (<ColumnList>)) AS UPVT
```

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EXCEPT and INTERSECT

EXCEPT and INTERSECT

Behaves like a **UNION** statement

- Same number of columns
- Data types must be compatible

INTERSECT returns rows from top query that match bottom query

EXCEPT returns rows from top query that **don't** match bottom query

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Sorting Data

ORDER BY

ORDER BY controls which columns will be used to sort output

- If no ORDER BY is provided, no order is guaranteed

Can sort by multiple columns

- Uses columns in order
 - For example: FirstName and then LastName

ORDER BY executes last in a **SELECT** statement

- Can use column aliases
- Can also use column number
 - **Never** use this syntax

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TOP

Used to limit number of rows returned

Can specify a number of rows or percent

TOP is typically used with **ORDER BY**

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Ranking Functions

ROW_NUMBER

- Returns the row number

RANK

- Returns ranking based on **ORDER BY** statement
- Ties skip to the next number

DENSE_RANK

- Returns ranking based on **ORDER BY** statement
- Ties don't advance the rank number

NTILE(x)

- Breaks rows into equal sections
- x is the number of sections

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Paging

Used to retrieve portions of data

FETCH and **OFFSET**

- **FETCH** indicates the number of rows to retrieve
- **OFFSET** indicates the number of rows to skip

Restrictions

- ORDER BY is required
- TOP is not allowed

SELECT <columns>

FROM <tables>

ORDER BY <columns>

OFFSET x

FETCH NEXT 5 ROWS ONLY;

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DISTINCT Statement

Removes duplicate values

The entire row must be a duplicate

Will cause a sort of the data

- Impacts performance

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