

# Aggregating Data

**TRAINSIGNAL**  
THE GLOBAL STANDARD IN PROFESSIONAL COMPUTER TRAINING



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## Aggregates

```
SELECT <columns>  
FROM <tables>  
WHERE <conditions>  
GROUP BY <columns>  
HAVING <conditions>  
ORDER BY <columns>
```

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## Using Aggregate Functions

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## Using Aggregate Functions

Aggregation Concepts  
Aggregate Rules  
Aggregate Functions

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## Aggregation Concepts

Used to perform calculations on data

Examples

- Average sales per region
- Highest priced product per category
- Best performing sales person per department

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## Aggregate Rules

**NULL** values are ignored

All columns on select line must be in aggregate

- **GROUP BY** line for all columns not in aggregate

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## Aggregate Functions

Several functions built-in to SQL Server 2012  
New ones can be created with .NET assemblies

Common aggregate functions

- `SUM(column)`
- `COUNT(column)`
  - Does not count null values for provided column
- `COUNT(*)`
  - Counts all rows
- `MAX(column)`
- `MIN(column)`
- `AVG(column)`

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## GROUP BY and HAVING

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## GROUP BY and HAVING

Using GROUP BY  
Using HAVING  
HAVING vs. WHERE

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## Using GROUP BY

**GROUP BY** is required for all columns not in aggregate

Used for "by" or "for each" in user requests

- Total sales by product category
- Average sale for each customer
- Profit margin broken down by manufacturer

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## Using HAVING

**HAVING** filters groups

Used to find results that meet criteria

- Customers that have spent at least \$100,000
- Sales people more than 30% under their quota

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## HAVING vs. WHERE

**WHERE** filters rows

**HAVING** filters groups

- **HAVING** can use aggregate functions

Region	Sales
North	1,000
North	2,000
South	1,500
South	1,250
West	3,000
West	2,500
West	1,250

WHERE Region IN ('North', 'South')

Region	Sales
North	1,000
North	2,000
South	1,500
South	1,250

SUM(Sales)

Region	Sales
North	3,000
South	2,750

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## Data Rollups

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### Data Rollups

ROLLUP  
CUBE  
GROUPING SET  
GROUPING and GROUPING\_ID Functions

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### ROLLUP

ROLLUP provides totals using order of GROUP BY

Provided GROUP BY Category, Subcategory, Product  
Totals provided:

- Category, Subcategory and Product
- Category, Subcategory
- Category

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## CUBE

Provides totals for all combinations of columns on **GROUP BY**

Provided **GROUP BY** Category, Subcategory, Product

Totals provided:

- Category, Subcategory and Product
- Category, Subcategory
- Category, Product
- Subcategory, Product
- Category
- Subcategory
- Product

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## GROUPING SETS

Control totals provided

Provided **GROUP BY** Category, Subcategory, Product

Desired totals

- Category, Subcategory
- Category
- Subcategory

Syntax:

```
GROUPING SETS (Category, Subcategory)
               , (Category)
               , (Subcategory)
```

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## GROUPING and GROUPING\_ID

**GROUPING** identifies a column/row being used for a total

- Returns the number 1 whenever that column/row is a total

**GROUPING\_ID** accepts column parameters

- Uses a bitmap to identify which columns are being used for total
  - From the right
    - 1 for the first column
    - 2 for the second
    - 4 for the third
    - Etc.

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## GROUPING\_ID Example

Provided

**GROUPING\_ID**(Category, Subcategory, Product)

1. Product
2. Subcategory
3. Subcategory & Product
4. Category
5. Category & Product
6. Category & Subcategory
7. Category & Subcategory & Product

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