

Aggregates

SELECT <columns>

FROM <tables>

WHERE <conditions>

GROUP BY <columns>
HAVING <conditions>

ORDER BY <columns>

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Using Aggregate Functions

Using Aggregate Functions	
Aggregation Concepts Aggregate Rules	
Aggregate Functions	
TRAIN SIGNAL	
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) TRAINSIGNAL **GROUP BY and HAVING GROUP BY and HAVING** Using GROUP BY

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

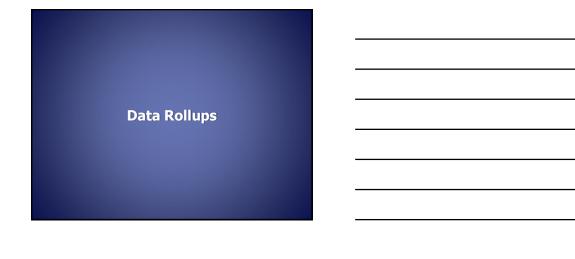
HAVING filters groups

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 North 1,000 WHERE Region IN ('North', 'South') North 1,000 2,000 North 2,000 1,500 1,500 South 1,250 South 1,250 SUM(Sales) West 3,000 West 2,500 Region Sales West 1,250 North 3,000 South 2,750 TRAINSIGNAL



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 ProductCategory, 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 TRAINSIGNAL **GROUPING SETS** Control totals provided Provided GROUP BY Category, Subcategory, Product Desired totals Category, Subcategory Category Subcategory Syntax: GROUPING SETS (Category, Subcategory) , (Category) , (Subcategory) TRAINSIGNAL **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 thirdEtc.

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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 TRAINSIGNAL