

08 | Grouping Sets and Pivoting Data



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Module Overview

- Grouping Sets
- ROLLUP and CUBE
- Identifying Groupings in Results
- Pivoting Data
- Using PIVOT and UNPIVOT

Grouping Sets

Syntax

- GROUPING SETS subclause builds on GROUP BY clause
- Allows multiple groupings to be defined in same query

```
SELECT <column list with aggregate(s)>
FROM <source>
GROUP BY
GROUPING SETS
(
    <column_name> , -- one or more columns
    <column_name> , -- one or more columns
    () -- empty parentheses if aggregating all rows
);
```

Grouping Sets

Example

```
SELECT EmployeeID, CustomerID, SUM(Amount) AS TotalAmount
FROM Sales.SalesOrder
GROUP BY
GROUPING SETS(EmployeeID, CustomerID,());
```

	EmployeeID	CustomerID	TotalAmount
Total for all sales {	<i>NULL</i>	<i>NULL</i>	256.23
	<i>NULL</i>	1	49.99
Subtotals for each customer {	<i>NULL</i>	2	107.49
	<i>NULL</i>	3	98.75
	1	<i>NULL</i>	107.49
Subtotals for each employee {	2	<i>NULL</i>	148.74

ROLLUP and CUBE

- ROLLUP provides shortcut for defining grouping sets with combinations that assume input columns form a hierarchy

```
SELECT StateProvince, City, COUNT(CustomerID) AS Customers  
FROM Sales.vCustomerDetails  
GROUP BY ROLLUP(StateProvince, City)  
ORDER BY StateProvince, City;
```

- CUBE provides shortcut for defining grouping sets in which all possible combinations of grouping sets created

```
SELECT SalesPersonName, CustomerName, SUM(Amount) AS TotalAmount  
FROM Sales.vSalesOrders  
GROUP BY CUBE(SalesPersonName, CustomerName)  
ORDER BY SalesPersonName, CustomerName;
```

Identifying Groupings in Results

- Multiple grouping sets present a problem in identifying the source of each row in the result set
- NULLs could come from the source data or could be a placeholder in the grouping set
- The GROUPING_ID function provides a method to mark a row with a 1 or 0 to identify which grouping set for the row

```
SELECT GROUPING_ID(SalesPersonName) AS SalesPersonGroup,  
       GROUPING_ID(CustomerName) AS CustomerGroup,  
       SalesPersonName, CustomerName, SUM(Amount) AS TotalAmount  
FROM Sales.vSalesOrders  
GROUP BY CUBE(SalesPersonName, CustomerName)  
ORDER BY SalesPersonName, CustomerName;
```

DEMO

Grouping Sets

Pivoting Data

- Pivoting data is rotating data from a rows-based orientation to a columns-based orientation
- Distinct values from a single column are projected across as headings for other columns—may include aggregation

OrderID	ProductID	Category	Revenue
1023	1	Bikes	1078.75
1023	15	Accessories	52.00
1023	21	Accessories	124.90
1024	1	Bikes	2491.00
1025	3	Bikes	1067.49
1025	15	Accessories	125.99
1025	35	Clothing	26.57
1025	36	Clothing	5.78

OrderID	Bikes	Accessories	Clothing
1023	1078.75	176.90	<i>NULL</i>
1024	2491.00	<i>NULL</i>	<i>NULL</i>
1025	1067.49	125.99	32.35



```
SELECT OrderID, Bikes, Accessories, Clothing
FROM
    (SELECT OrderID, Category, Revenue FROM Sales.SalesDetails) AS sales
PIVOT (SUM(Revenue) FOR Category IN([Bikes], [Accessories], [Clothing])) AS pvt
```


Unpivoting Data

- Unpivoting data is rotating data from a columns-based orientation to a rows-based orientation
- Spreads or splits values from one source row into one or more target rows
- Each source row becomes one or more rows in result set based on number of columns being pivoted

OrderID	Bikes	Accessories	Clothing
1023	1078.75	176.90	NULL
1024	2491.00	NULL	NULL
1025	1067.49	125.99	32.35

```
SELECT OrderID, Category, Revenue
FROM
    (SELECT OrderID, Bikes, Accessories, Clothing FROM Sales.SalesByCat) AS pvt
UNPIVOT (Revenue FOR Category IN([Bikes], [Accessories], [Clothing])) AS unpvt
```

OrderID	Category	Revenue
1023	Bikes	1078.75
1023	Accessories	176.90
1024	Bikes	2491.00
1025	Bikes	1067.49
1025	Accessories	125.99
1025	Clothing	32.35

DEMO

Pivoting and Unpivoting Data

Grouping and Pivoting Data

- Grouping Sets
- ROLLUP and CUBE
- Identifying Groupings in Results
- Pivoting Data
- Unpivoting Data

- Lab: Grouping and Pivoting Data



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