# Cube and Rollup

## Differences between CUBE and Rollup

1. CUBE generates a result set that shows aggregates for all combinations of values in the selected columns.

2. ROLLUP generates a result set that shows aggregates for a hierarchy of values in the selected columns..

Here is a sample aggregate and group by query with a CUBE

Query1.

SELECT TickerSymbol, Industry, SUM(Volume) AS BigVolume

FROM StockData

GROUP BY TickerSymbol, Industry WITH Cube

TickerSymbol Industry BigVolume

------------ ---------- ---------------

NULL NULL 1372010146757

NULL Advertisin 15469017658

NULL Aerospace 15273576893

NULL Automotive 149321041997

NULL Beverages 30002320235

NULL Chemicals 3592254029

NULL Electric 146915135620

NULL Entertainm 71799889430

NULL Food 93118383516

NULL Gas/Oil 67229406167

NULL Healthcare 4046135691

NULL Hotels and 27590345118

NULL Hotels/Res 9967517155

NULL Household 32882769147

NULL Internet S 26189230030

NULL Money 146440136017

NULL Oil and Ga 27033703476

NULL Retail 135829657253

NULL Tech 335915313204

AAPL NULL 72347119419

AAPL Tech 72347119419

AMZN NULL 26189230030

AMZN Internet S 26189230030

BBY NULL 22494692849

BBY Retail 22494692849

Here is the same sample aggregate and group by query with a ROLLUP

Query2

SELECT TickerSymbol, Industry, SUM(Volume) AS BigVolume

FROM StockData

GROUP BY TickerSymbol, Industry WITH ROLLUP

TickerSymbol Industry BigVolume

------------ ---------- --------------

AAPL Tech 72347119419

AAPL NULL 72347119419

AMZN Internet S 26189230030

AMZN NULL 26189230030

BBY Retail 22494692849

BBY NULL 22494692849

XOM Gas/Oil 63418200070

XOM NULL 63418200070

NULL NULL 1372010146757

(81 row(s) affected)

Here is a sample aggregate and group by query with a CUBE but where we GROUP BY three attributes.

Query 3

SELECT TickerSymbol, Industry, TradeDate, SUM(Volume) AS BigVolume

FROM StockData

GROUP BY TickerSymbol, Industry, TradeDate WITH CUBE

XOM NULL 2000-01-03 13455800

XOM NULL 2000-01-04 14392000

…

XOM NULL 2013-06-17 12031697

XOM NULL 2013-06-18 10679837

XOM NULL NULL 63418200070

…

XOM Gas/Oil NULL 63418200070

Here is a sample aggregate and group by query with a ROLLUP but where we GROUP BY three attributes.

Query 4

SELECT TickerSymbol, Industry, TradeDate, SUM(Volume) AS BigVolume

FROM StockData

GROUP BY TickerSymbol, Industry, TradeDate WITH ROLLUP

TickerSymbol Industry TradeDate BigVolume

------------ ---------- ----------------------- ------------

…

XOM Gas/Oil 2013-06-18 10679837

XOM Gas/Oil NULL 63418200070

XOM NULL NULL 63418200070

NULL NULL NULL 1372010146757

Microsoft Notes: These features will be removed in future versions of SQL Server:

ROLLUP ( ) - Generates the simple GROUP BY aggregate rows, plus subtotal or super-aggregate rows, and also a grand total row. The number of groupings that is returned equals the number of expressions in the <composite element list> plus one. For example, consider the following statement.

SELECT a, b, c, SUM ( <expression> )

FROM T

GROUP BY ROLLUP (a,b,c);

One row with a subtotal is generated for each unique combination of values of (a, b, c), (a, b), and (a). A grand total row is also calculated. Columns are rolled up from right to left. The column order affects the output groupings of ROLLUP and can affect the number of rows in the result set.

CUBE ( ) - Generates simple GROUP BY aggregate rows, the ROLLUP super-aggregate rows, and cross-tabulation rows. CUBE outputs a grouping for all permutations of expressions in the <composite element list>.

The number of groupings that is generated equals (2n), where n = the number of expressions in the <composite element list>. For example, consider the following statement.