CUBE in SQL Server

CUBE is an extension of GROUP BY that generates all possible combinations of subtotals, along with the grand total. Generates subtotals for all possible combinations of the specified columns (a "data cube"). The order of columns does not matter.

In nut-shell CUBE = **Detail rows + all subtotals + grand total**

Syntax

SELECT column1, column2, aggregate_function(column)

FROM table_name

GROUP BY CUBE (column1, column2);

Example

```
CREATE TABLE Sales
(
    CustomerName VARCHAR(30),
    ProductName VARCHAR(30),
    Amount INT
);

INSERT INTO Sales VALUES
('Ravi',   'Laptop',   50000),
('Ravi',   'Mouse',     2000),
('Ravi',   'Keyboard',  3000),
('Neha',   'Laptop',   52000),
('Neha',   'Mouse',     2500),
('Amit',   'Laptop',   48000);
```

CUBE on Sales

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

Results | Messages

	CustomerName	ProductName	TotalAmount
1	NULL	NULL	157500
2	NULL	Keyboard	3000
3	NULL	Laptop	150000
4	NULL	Mouse	4500
5	Amit	NULL	48000
6	Amit	Laptop	48000
7	Neha	NULL	54500
8	Neha	Laptop	52000
9	Neha	Mouse	2500
10	Ravi	NULL	55000
11	Ravi	Keyboard	3000
12	Ravi	Laptop	50000
13	Ravi	Mouse	2000

CUBE with GROUPING() for Clear Labels

```sql
SELECT
    CASE
        WHEN GROUPING(CustomerName) = 1 THEN 'All Customers'
        ELSE CustomerName
    END AS Customer,

    CASE
        WHEN GROUPING(ProductName) = 1 THEN 'All Products'
        ELSE ProductName
    END AS Product,

    SUM(Amount) AS TotalAmount
FROM Sales
GROUP BY CUBE (CustomerName, ProductName)
ORDER BY GROUPING(CustomerName), GROUPING(ProductName), Customer;
```

Results   Messages

	Customer	Product	TotalAmount
1	Amit	Laptop	48000
2	Neha	Laptop	52000
3	Neha	Mouse	2500
4	Ravi	Mouse	2000
5	Ravi	Laptop	50000
6	Ravi	Keyboard	3000
7	Amit	All Products	48000
8	Neha	All Products	54500
9	Ravi	All Products	55000
10	All Customers	Keyboard	3000
11	All Customers	Laptop	150000
12	All Customers	Mouse	4500
13	All Customers	All Products	157500