

Task No: 3	Perform Data Cube Operations (OLAP Operations) using SQL Queries Rollup, Rolldown, Slicing, Dicing Database: MySQL	
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AIM

To Perform Data Cube Operations (OLAP Operations) using SQL Queries Rollup, Roll down, Slicing, Dicing

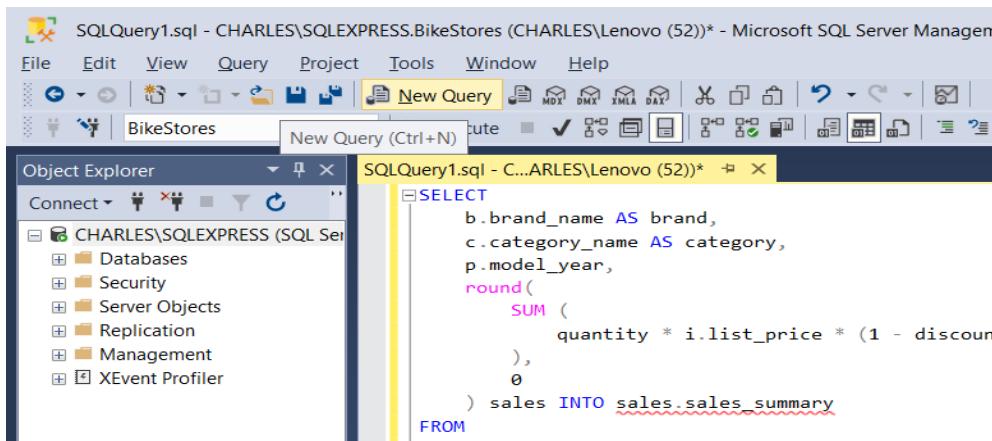
PROCEDURE

- 1) create the sales.sales_summary table by using the following query:

```

SELECT
    b.brand_name AS brand,
    c.category_name AS category,
    p.model_year,
    round(
        SUM (
            quantity * i.list_price * (1 - discount)
        ),
        0
    ) sales INTO sales.sales_summary
FROM
    sales.order_items i
INNER JOIN production.products p ON p.product_id = i.product_id
INNER JOIN production.brands b ON b.brand_id = p.brand_id
INNER JOIN production.categories c ON c.category_id = p.category_id
GROUP BY
    b.brand_name,
    c.category_name,
    p.model_year
ORDER BY
    b.brand_name,
    c.category_name,
    p.model_year;

```



2) CUBE:

Refer task 2a:

The CUBE is a subclause of the GROUP BY clause that allows you to generate multiple grouping sets. The following illustrates the general syntax of the CUBE:

```
SELECT
    d1,
    d2,
    d3,
    aggregate_function (c4)
FROM
    table_name
GROUP BY
    d1,
    CUBE (d2, d3);
```

Example:

```
SELECT
    brand,
    category,
    SUM (sales) sales
FROM
    sales.sales_summary
GROUP BY
    CUBE(brand, category);
```

3) ROLLUP

Refer task 2a:

SQL Server ROLLUP syntax

The general syntax of the SQL Server ROLLUP is as follows:

```
SELECT
    d1,
    d2,
    d3,
    aggregate_function(c4)
FROM
    table_name
GROUP BY
    ROLLUP (d1, d2, d3);
```

Upload and configure the sample data warehouse (refer task2a)

Select the New Query, then new query tab will be opened.

ROLLUP Query

```
SELECT  
    brand,  
    category,  
    SUM (sales) sales  
FROM  
    sales.sales_summary  
GROUP BY  
    ROLLUP(brand, category);
```

4) DRILLDOWN

This is a reverse of the ROLL UP operation. The data is aggregated from a higher level summary to a lower level summary/detailed data.

```
SELECT  
    brand,  
    category,  
    SUM (sales) sales  
FROM  
    sales.sales_summary  
GROUP BY  
    ROLLUP(brand, category)  
HAVING SUM (sales) > 20000;
```

5) SLICING:

A slice in a multidimensional array is a column of data corresponding to a single value for one or more members of the dimension. It helps the user to visualize and gather the information specific to a dimension.

```
SELECT  
    *  
FROM  
    sales.customers  
WHERE  
    state = 'CA';
```

6) DICING:

Dicing is similar to slicing, but it works a little bit differently. Dicing, on the other hand, is more of a zoom feature that selects a subset over all the dimensions, but for specific values of the dimension.

```
SELECT  
    city,  
    COUNT (*)  
FROM
```

```
sales.customers
WHERE
    state = 'CA'
GROUP BY
    city
HAVING
    COUNT (*) > 10
ORDER BY
    city;
```

7) PIVOT

The steps to make a query a pivot table:

- 1) First, select a base dataset for pivoting.
- 2) Second, create a temporary result by using a derived table or common table expression (CTE)
- 3) Third, apply the PIVOT operator.

- First, select category name and product id from the production.products and production.categories tables as the base data for pivoting:

```
SELECT
    category_name,
    product_id
FROM
    production.products p
    INNER JOIN production.categories c
        ON c.category_id = p.category_id
```

- Second, create a temporary result set using a derived table:

```
SELECT * FROM (
    SELECT
        category_name,
        product_id
    FROM
        production.products p
        INNER JOIN production.categories c
            ON c.category_id = p.category_id
) t
```

- Third, apply the PIVOT operator:

```
SELECT * FROM
(
    SELECT
        category_name,
        product_id
    FROM
        production.products p
        INNER JOIN production.categories c
            ON c.category_id = p.category_id
) t
```

```
PIVOT(  
    COUNT(product_id)  
    FOR category_name IN (  
        [Children Bicycles],  
        [Comfort Bicycles],  
        [Cruisers Bicycles],  
        [Cyclocross Bicycles],  
        [Electric Bikes],  
        [Mountain Bikes],  
        [Road Bikes])  
    ) AS pivot_table;
```

RESULT:

Thus the Data Cube Operations (OLAP Operations) using SQL Queries Rollup, Roll down, Slicing, Dicing, Pivot was executed using SSMS and SQL Server.