**Task4**

**Develop the queries to retrieve information from the OLAP operations performed and to gain a deeper understanding of the sales data through different dimensions, aggregations, and filters.**

**Project: OLAP Operations (using Redshift or PostgreSQL)**

**Objective: Perform OLAP operations (Drill Down, Rollup, Cube, Slice, and Dice) on the "sales\_sample" table to analyze sales data. The project will include the following tasks:**

**1. Database Creation**

**Create a database to store the sales data (Redshift or PostgreSQL).**

CREATE DATABASE sales\_data;

**Create a table named "sales\_sample" with the specified columns:**

* **Product\_Id (Integer)**
* **Region (varchar(50))-like East, West etc**
* **Date (Date)**
* **Sales\_Amount (int/numeric)**

CREATE TABLE sales\_sample (

Product\_Id INTEGER,

Region VARCHAR(50),

Date DATE,

Sales\_Amount NUMERIC

);

**2. Data Creation**

**Insert 10 sample records Into the "sales\_sample" table, representing sales data.**

INSERT INTO sales\_sample (Product\_Id, Region, Date, Sales\_Amount)

VALUES

(1, 'East', '2024-01-15', 1500.00),

(2, 'West', '2024-02-20', 2500.00),

(3, 'North', '2024-03-10', 1800.00),

(4, 'South', '2024-04-05', 2200.00),

(5, 'East', '2024-05-25', 1700.00),

(6, 'West', '2024-06-30', 2600.00),

(7, 'North', '2024-07-15', 2000.00),

(8, 'South', '2024-08-20', 2400.00),

(9, 'East', '2024-09-05', 1900.00),

(10, 'West', '2024-10-10', 2800.00);

select \* from sales\_sample;

**3. Perform OLAP operations**

**a) Drill Down-Analyze sales data at a more detailed level. Write a query to perform drill down from region to product level to understand sales performance.**

SELECT

Region,

Product\_Id,

SUM(Sales\_Amount) AS Total\_Sales

FROM

sales\_sample

GROUP BY

Region, Product\_Id

ORDER BY

Region, Product\_Id;

**b) Rollup- To summarize sales data at different levels of granularity. Write a query to perform roll up from product to region level to view total sales by region.**

-- Roll up sales data from product level to regional level

WITH ProductLevelSales AS (

SELECT

Region,

Product\_Id,

SUM(Sales\_Amount) AS Total\_Sales\_Per\_Product

FROM

sales\_sample

GROUP BY

Region, Product\_Id

)

SELECT

Region,

SUM(Total\_Sales\_Per\_Product) AS Total\_Sales\_By\_Region

FROM

ProductLevelSales

GROUP BY

Region

ORDER BY

Region;

**c)Cube - To analyze sales data from multiple dimensions simultaneously. Write a query to Explore sales data from different perspectives, such as product, region, and date.**

-- Using CUBE to analyze sales data from multiple dimensions

SELECT

Product\_Id,

Region,

Date,

SUM(Sales\_Amount) AS Total\_Sales

FROM

sales\_sample

GROUP BY

CUBE (Product\_Id, Region, Date)

ORDER BY

Product\_Id, Region, Date;

**d) Slice- To extract a subset of data based on specific criteria. Write a query to slice the data to view sales for a particular region or date range.**

SELECT

Product\_Id,

Region,

Date,

Sales\_Amount

FROM

sales\_sample

WHERE

Region = 'East'

AND Date BETWEEN '2024-01-01' AND '2024-06-30'

ORDER BY

Product\_Id, Date;

**e) Dice - To extract data based on multiple criteria. Write a query to view sales for specific combinations of product, region, and date**

-- Dice operation to view sales for specific combinations of product, region, and date

SELECT

Product\_Id,

Region,

Date,

Sales\_Amount

FROM

sales\_sample

WHERE

Product\_Id IN (1, 2)

AND Region IN ('East', 'West')

AND Date BETWEEN '2024-01-01' AND '2024-06-30'

ORDER BY

Product\_Id, Region, Date;