Comprehensive Sales Database for Amul Products

The project focuses on developing a Comprehensive Sales Database for Amul Products, designed to efficiently manage and analyze the sales data of various Amul products across multiple store locations. Below is an in-depth summary of the database structure, its components, and the analytical capabilities it offers.

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- Categories Table: This table categorizes products into distinct groups, such as Dairy, Snacks, and Beverages, facilitating organized inventory management.
- Products Table: Each product is recorded with relevant details including its name, category, and price. A total of 100 products are included in this table, featuring popular items like Amul Butter and Amul Ice Cream.
- Stores Table: This table lists various store locations where the products are sold, covering major cities like Mumbai, Delhi, and Chennai.
- Sales Table: This crucial table tracks sales transactions, linking products to stores and recording details such as sale date, quantity sold, and total revenue generated

```sql
CREATE TABLE Categories (
    CategoryID INT PRIMARY KEY,
    CategoryName VARCHAR(100)
);
```

```sql
CREATE TABLE Products (
    ProductID INT PRIMARY KEY,
    ProductName VARCHAR(100),
    CategoryID INT,
    Price DECIMAL(10, 2),
    CONSTRAINT FK_Category FOREIGN KEY (CategoryID) REFERENCES Categories(CategoryID)
);
```

```sql
CREATE TABLE Stores (
    StoreID INT PRIMARY KEY,
    StoreName VARCHAR(100),
    Location VARCHAR(100)
);
```

```sql
CREATE TABLE Sales (
    SaleID INT PRIMARY KEY,
    ProductID INT,
    StoreID INT,
    SaleDate DATE,
    Quantity INT,
    TotalAmount DECIMAL(10, 2),
    CONSTRAINT FK_Product FOREIGN KEY (ProductID) REFERENCES Products(ProductID),
    CONSTRAINT FK_Store FOREIGN KEY (StoreID) REFERENCES Stores(StoreID)
);
```

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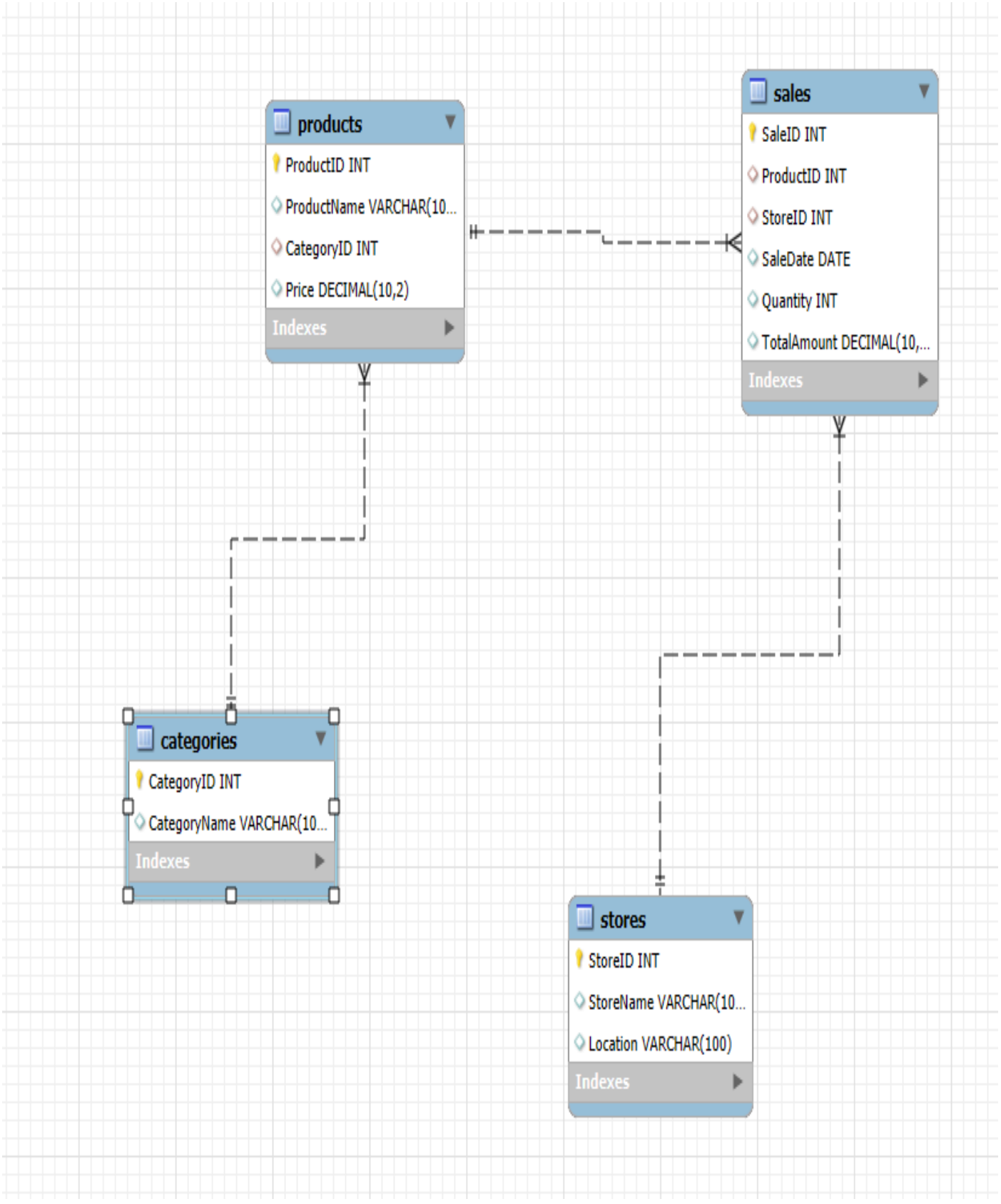

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1. Top-Selling Products by Revenue

This analysis identifies the highest revenue-generating products within the Amul product range. By aggregating total sales amounts for each product, businesses can focus on promoting and stocking their best-sellers. The SQL query for this analysis is as follows:

```sql
-- Top-Selling Products by Revenue
SELECT P.ProductName, SUM(S.TotalAmount) AS TotalRevenue
FROM Sales S
JOIN Products P ON S.ProductID = P.ProductID
GROUP BY P.ProductName
ORDER BY TotalRevenue DESC
LIMIT 10;
```

ProductName	TotalRevenue
Amul Pizza Cheese	5600.00
Amul Mithai Mate	4500.00
Amul Mozzarella Cheese	4400.00
Amul Roasted Almonds	4200.00
Amul Ghee	4000.00
Amul Mango Bar	3750.00
Amul Rasgulla	3600.00
Amul Spiced Cheese	3500.00
Amul Cashew Bar	3360.00
Amul Greek Yogurt	3250.00

This query provides a list of the top ten products based on total revenue, allowing stakeholders to understand which items contribute most significantly to overall sales

2. Monthly Sales Trend Analysis

This capability analysis sales performance over different months, helping to identify seasonal trends and fluctuations in consumer demand. The SQL query used for this analysis is:

```
-- Monthly Sales Trend Analysis
SELECT DATE_FORMAT(S.SaleDate, '%Y-%m') AS Month, SUM(S.TotalAmount) AS TotalRevenue
FROM Sales S
GROUP BY Month
ORDER BY Month;
```

Month	TotalRevenue
2023-01	44374.00
2023-02	46430.00
2023-03	56252.00
2023-04	15185.00

By examining monthly sales data, businesses can adjust inventory and marketing strategies to align with peak sales periods.

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3. Product Performance by Store

This analysis evaluates how different products perform across various store locations. It helps identify regional preferences and product popularity. The corresponding SQL query is:

```
-- Product Performance by Store
SELECT T.StoreName, P.ProductName, SUM(S.Quantity) AS TotalQuantitySold, SUM(S.TotalAmount) AS TotalRevenue
FROM Sales S
JOIN Products P ON S.ProductID = P.ProductID
JOIN Stores T ON S.StoreID = T.StoreID
GROUP BY T.StoreName, P.ProductName
ORDER BY T.StoreName, TotalRevenue DESC;
```

StoreName	ProductName	TotalQuantitySold	TotalRevenue
Store A	Amul Mozzarella Cheese	22	4400.00
Store A	Amul Coffee	25	3000.00
Store A	Amul Whipping Cream	15	3000.00
Store A	Amul Health Bar	30	3000.00
Store A	Amul Shrikhand	25	2750.00
Store A	Amul Paneer	12	2400.00
Store A	Amul Chocolate Fudge	25	2375.00
Store A	Amul Berry Yogurt	25	2000.00
Store A	Amul Multigrain Biscuits	28	1960.00
Store A	Amul Cream	16	1920.00
Store A	Amul Makhana	30	1800.00
Store A	Amul Almond Milk	22	1760.00
Store A	Amul Pea Snacks	22	1760.00
Store A	Amul Trail Mix	22	1540.00
Store A	Amul Protein Shake	25	1500.00
Store A	Amul Milk Powder	5	1500.00
Store A	Amul Honey	30	1500.00
Store A	Amul Salted Snacks	20	1400.00
Store A	Amul Spinach Chips	28	1400.00
Store A	Amul Herbal Drink	22	1080.00
Store A	Amul Chocolate	15	1050.00
Store A	Amul Oats	30	1050.00
Store A	Amul Pista Kulfi	18	900.00
Store A	Amul Choco Chips	18	900.00
Store A	Amul Noodles	22	880.00
Store A	Amul Badam Drink	24	840.00
Store A	Amul Butter Cookies	20	800.00
Store A	Amul Lemonade	18	720.00

This query provides insights into which products are performing well in specific stores, guiding inventory decisions.

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4. Category-Wise Sales Distribution

This feature provides insights into sales across different product categories (e.g., Dairy, Snacks, Beverages). Understanding category performance enables better strategic planning and marketing efforts. The SQL query is:

```
-- Category-Wise Sales Distribution
SELECT C.CategoryName, SUM(S.Quantity) AS TotalQuantitySold, SUM(S.TotalAmount) AS TotalRevenue
FROM Sales S
JOIN Products P ON S.ProductID = P.ProductID
JOIN Categories C ON P.CategoryID = C.CategoryID
GROUP BY C.CategoryName
ORDER BY TotalRevenue DESC;
```

CategoryName	TotalQuantitySold	TotalRevenue
Dairy	667	74391.00
Snacks	691	53355.00
Beverages	741	34495.00

This analysis highlights which categories are driving sales and where there may be opportunities for growth.

5. Daily Sales Analysis

This capability tracks daily sales revenue and quantities sold, providing a granular view of sales performance. The SQL query for this analysis is:

```
-- Daily Sales Analysis
SELECT S.SaleDate, SUM(S.TotalAmount) AS TotalRevenue, SUM(S.Quantity) AS TotalQuantitySold
FROM Sales S
GROUP BY S.SaleDate
ORDER BY S.SaleDate;
```

SaleDate	TotalRevenue	TotalQuantitySold
2023-01-16	700.00	14
2023-01-17	450.00	18
2023-01-18	2200.00	22
2023-01-19	1050.00	30
2023-01-20	2750.00	25
2023-01-21	1960.00	28
2023-01-22	1440.00	32
2023-01-23	375.00	15
2023-01-24	1920.00	12
2023-01-25	1750.00	14
2023-01-26	880.00	22
2023-01-27	750.00	30
2023-01-28	540.00	18
2023-01-29	840.00	24
2023-01-30	5600.00	28
2023-01-31	990.00	22
2023-02-01	3000.00	25
2023-02-02	750.00	30
2023-02-03	1440.00	18
2023-02-04	3000.00	15
2023-02-05	1260.00	14
2023-02-06	1700.00	20
2023-02-07	900.00	18
2023-02-08	660.00	22
2023-02-09	2100.00	14
2023-02-10	2375.00	25
2023-02-11	1080.00	18
2023-02-12	770.00	14

Daily insights allow businesses to monitor trends and make timely adjustments to operations or promotions.

6. Top Performing Stores

Identifying stores with the highest total revenue helps in recognizing successful locations and understanding what drives their success. The SQL query is:

```sql
-- Top Performing Stores
SELECT T.StoreName, SUM(S.TotalAmount) AS TotalRevenue
FROM Sales S
JOIN Stores T ON S.StoreID = T.StoreID
GROUP BY T.StoreName
ORDER BY TotalRevenue DESC
LIMIT 5;
```

StoreName	TotalRevenue
Store C	55455.00
Store B	54211.00
Store A	52575.00

This analysis can guide resource allocation and marketing efforts to replicate success in other stores.

7. Sales Growth Rate Analysis

Calculating growth rates in sales revenue month-over-month provides insights into overall business performance and market trends. The SQL query for this analysis is:

```sql
-- Sales Growth Rate Analysis
SELECT
    DATE_FORMAT(S.SaleDate, '%Y-%m') AS Month,
    SUM(S.TotalAmount) AS TotalRevenue,
    LAG(SUM(S.TotalAmount), 1) OVER (ORDER BY DATE_FORMAT(S.SaleDate, '%Y-%m')) AS PreviousMonthRevenue,
    ((SUM(S.TotalAmount) - LAG(SUM(S.TotalAmount), 1) OVER (ORDER BY DATE_FORMAT(S.SaleDate, '%Y-%m'))) / LAG(SUM(S.TotalAmount), 1)
    OVER (ORDER BY DATE_FORMAT(S.SaleDate, '%Y-%m')) * 100) AS GrowthRate
FROM Sales S
GROUP BY Month
ORDER BY Month;
```

Month	TotalRevenue	PreviousMonthRevenue	GrowthRate
2023-01	44374.00	NULL	NULL
2023-02	46430.00	44374.00	4.633344
2023-03	56252.00	46430.00	21.154426
2023-04	15185.00	56252.00	-73.005404

This analysis helps stakeholders understand whether sales are increasing or declining over time.

8. Seasonal Sales Trends

Analyzing seasonal sales trends helps businesses anticipate demand fluctuations based on seasonal factors. The SQL query used is:

```sql
-- Seasonal Sales Trends
SELECT DATE_FORMAT(S.SaleDate, '%Y-%m') AS Month, SUM(S.TotalAmount) AS TotalRevenue
FROM Sales S
GROUP BY Month
ORDER BY SUM(S.TotalAmount) DESC;
```

Month	TotalRevenue
2023-03	56252.00
2023-02	46430.00
2023-01	44374.00
2023-04	15185.00

This information can inform promotional strategies tailored to specific seasons.

9. Peak Sales Hours

Determining the hours during which sales are highest allows businesses to optimize staffing and inventory levels during peak times. The SQL query is:

```
-- Peak Sales Hours
SELECT HOUR(S.SaleDate) AS SaleHour, SUM(S.TotalAmount) AS TotalRevenue
FROM Sales S
GROUP BY SaleHour
ORDER BY TotalRevenue DESC;
```

SaleHour	TotalRevenue
0	162241.00

Understanding peak hours can lead to improved customer service and operational efficiency.

10. Product Sales in Different Regions

Comparing product performance across various geographical locations provides insights into regional preferences and market dynamics. The SQL query is:

```sql
-- Product Sales in Different Regions
SELECT T.Location, P.ProductName, SUM(S.TotalAmount) AS TotalRevenue
FROM Sales S
JOIN Products P ON S.ProductID = P.ProductID
JOIN Stores T ON S.StoreID = T.StoreID
GROUP BY T.Location, P.ProductName
ORDER BY TotalRevenue DESC;
```

Location	ProductName	TotalRevenue
Delhi	Amul Pizza Cheese	5600.00
Chennai	Amul Mithai Mate	4500.00
Mumbai	Amul Mozzarella Cheese	4400.00
Chennai	Amul Roasted Almonds	4200.00
Chennai	Amul Ghee	4000.00
Delhi	Amul Mango Bar	3750.00
Chennai	Amul Rasgulla	3600.00
Delhi	Amul Spiced Cheese	3500.00
Delhi	Amul Cashew Bar	3360.00
Chennai	Amul Greek Yogurt	3250.00
Chennai	Amul Ice Cream	3000.00
Mumbai	Amul Whipping Cream	[illegible]
Mumbai	Amul Coffee	3000.00
Mumbai	Amul Health Bar	3000.00
Delhi	Amul Tomato Ketchup	2940.00
Mumbai	Amul Shrikhand	2750.00
Chennai	Amul Dark Chocolate	2700.00
Delhi	Amul Strawberry Ice Cream	2520.00
Mumbai	Amul Paneer	2400.00
Mumbai	Amul Chocolate Fudge	2375.00
Delhi	Amul Choco Spread	2250.00
Delhi	Amul Mango Lassi	2200.00
Chennai	Amul Protein Bar	2200.00
Delhi	Amul Fruit & Nut	2200.00
Chennai	Amul Green Tea	2125.00
Delhi	Amul Vitamin Drink	2125.00
Chennai	Amul Tiramisu	2100.00
Delhi	Amul Malai Paneer	2000.00

This analysis can guide targeted marketing campaigns and inventory distribution strategies.

Conclusion

The analytical capabilities of the Comprehensive Sales Database for Amul Products empower stakeholders with valuable insights into sales performance across multiple dimensions—product popularity, store effectiveness, seasonal trends, and more. By leveraging these analyses through well-structured SQL queries, Amul can enhance its operational efficiency and strategic planning efforts while responding effectively to market demands.

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