

Retail Analysis

Project Overview:

This project involves performing an in-depth retail analysis to gain actionable insights into customer behaviour, product performance, and sales trends. Using the provided ER diagram and answering specific exploratory data analysis (EDA) and Power BI questions, the goal is to identify opportunities to optimize business performance.

Objectives:

- Analyze sales, customer behavior, and product performance.
- Identify high-value customers and strategies to target similar audiences.
- Provide actionable insights to optimize sales, profitability, and marketing strategies.

Data Schema Overview:

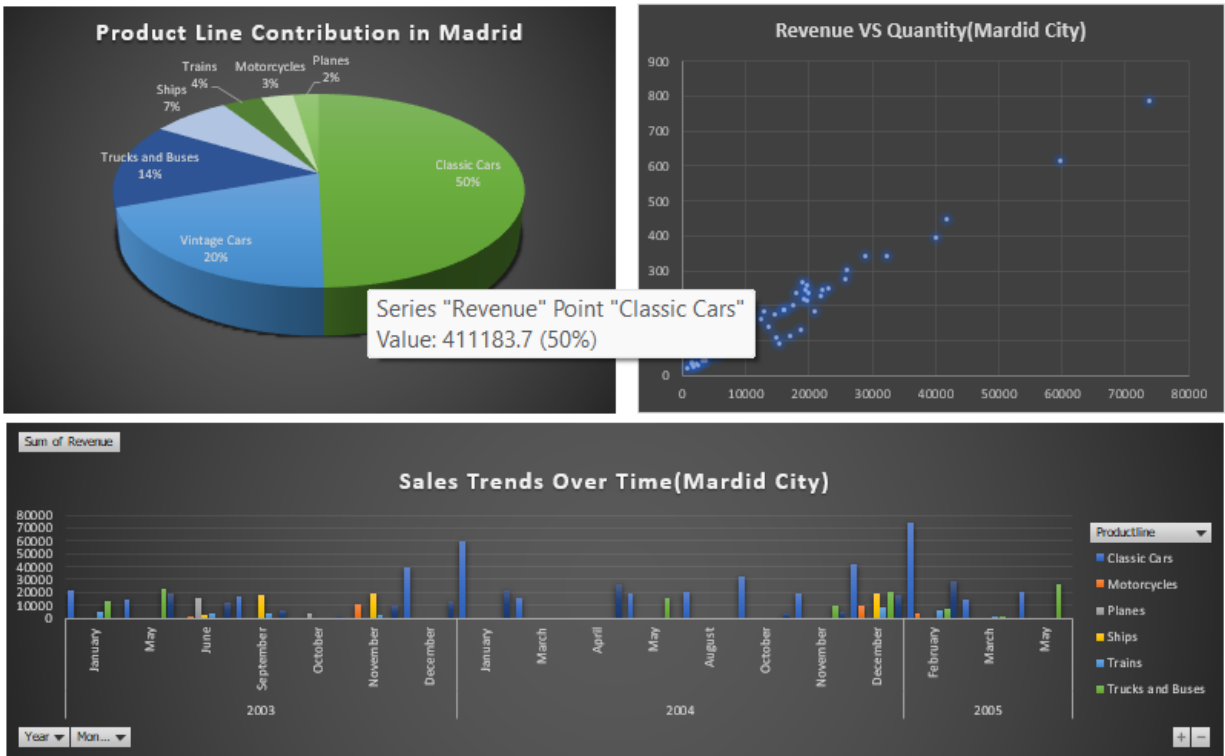
- 1. Offices:**
 - Attributes: addressLine1, addressLine2, city, country, officeCode, phone, postalCode, state, territory
 - Key Usage: Tracks regional office locations.
- 2. Customers:**
 - Attributes: customerNumber, customerName, contactFirstName, contactLastName, phone, addressLine1, addressLine2, city, state, postalCode, country, salesRepEmployeeNumber, creditLimit
 - Key Usage: Stores customer details and sales representative information.
- 3. Products:**
 - Attributes: ProductCode, ProductName, ProductLine, ProductScale, ProductVendor, productDescription, quantityInStock, buyPrice, MSRP
 - Key Usage: Tracks product details and inventory levels.
- 4. Product Lines:**
 - Attributes: productLine, textDescription, htmlDescription, image
 - Key Usage: Categorizes products into broader lines.
- 5. Orders:**
 - Attributes: orderNumber, orderDate, requiredDate, shippedDate, status, comments, customerNumber
 - Key Usage: Tracks order-level details.
- 6. OrderDetails:**
 - Attributes: orderNumber, productCode, quantityOrdered, priceEach, orderLineNumber
 - Key Usage: Tracks item-level details within orders.
- 7. Payments:**
 - Attributes: customerNumber, checkNumber, paymentDate, amount
 - Key Usage: Tracks customer payments.
- 8. Employees:**
 - Attributes: employeeNumber, lastName, firstName, extension, email, officeCode, reportsTo, jobTitle
 - Key Usage: Tracks employee details and hierarchies.

MECE Breakdown:



EDA Questions:

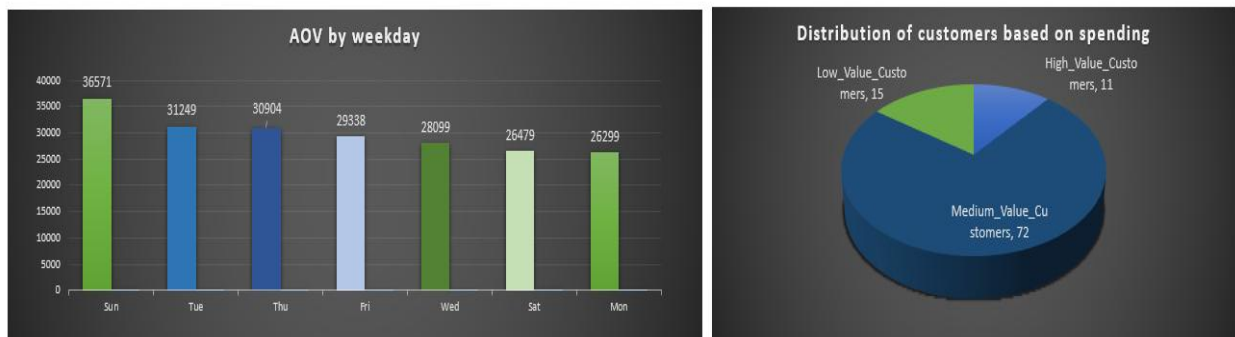
1. Which factors contribute to the highest sales in a particular region?

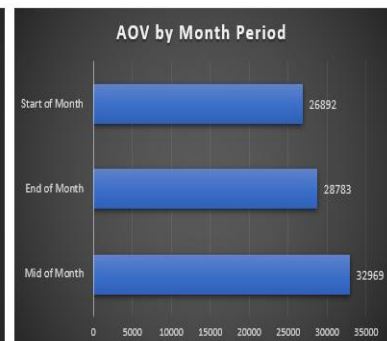


Factors contributed to the highest sales in Madrid city:

1. Classic Cars are the leading product line and the primary revenue driver for Madrid.
2. There is a clear relationship between quantity sold and revenue, although higher-priced products like Classic Cars or Vintage Cars might generate significant revenue with fewer units.
3. Seasonality plays a role in driving sales, especially during the end-of-year months, making these periods critical for maximizing revenue.

2. How can customer purchasing patterns be influenced to increase average order value?





Conclusion:

1. Day-wise Analysis:

Monday and Saturday have the lowest AOV, so focus on Monday and Saturday with targeted discounts or bundled offers to encourage higher spending. Investigate why Sunday has the highest AOV and replicate similar conditions (e.g., product availability, promotions) on other days.

2. Monthly Trends:

Use months with historically high AOV (e.g., Feb, Aug) to analyze successful strategies and replicate them in months with dips. Introduce periodic campaigns to smooth fluctuations and ensure steady growth.

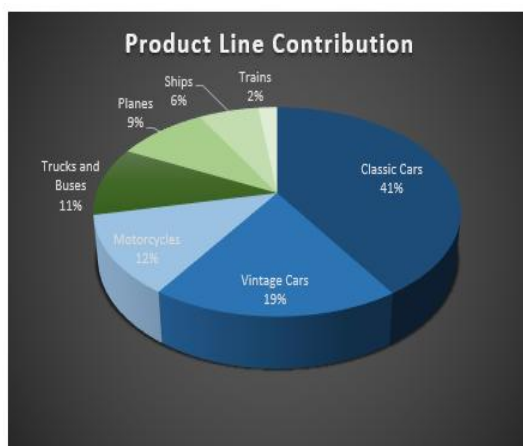
3. Customer Segmentation:

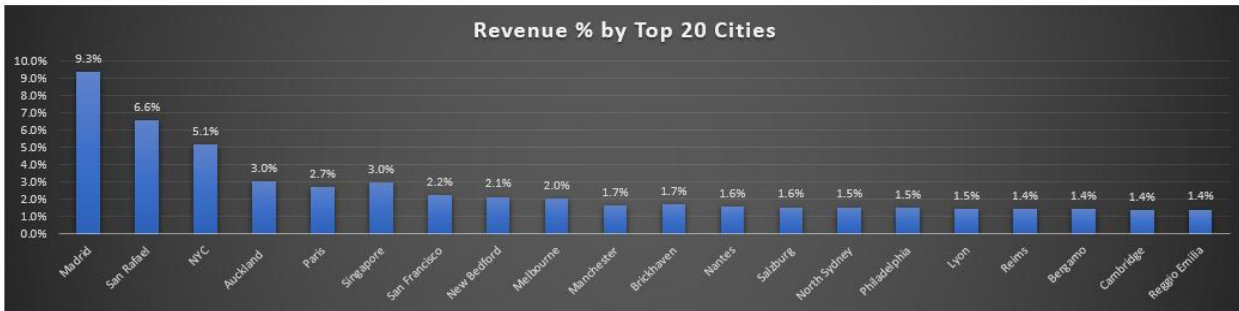
Focus on medium value customers with exclusive deals or loyalty bonuses, reinforcing existing behavior and encouraging higher spending.

4. Month Period Analysis:

Mid-month orders have the highest AOV compared to the Start and End of the month.

3. What are the key drivers of sales growth, and how can they be leveraged for future success?





Key Drivers of Sales Growth:

1. Product Line Performance:

Classic Cars contribute significantly (41%) to overall sales. They are the primary driver of revenue, followed by Vintage Cars (19%) and Motorcycles (12%). This indicates a strong preference for specific high-value products.

2. Top Customers:

The Top 20 customers generate a considerable portion of revenue. Repeat customers or high-value customers are critical for sustained growth.

3. Revenue and Profit Trends:

Significant peaks occur during October and December, suggesting seasonal demand.

To leverage the key drivers of sales growth for future success, here are actionable strategies:

1. Leveraging Product Line Contribution:

Classic Cars (41%) are the largest contributor to revenue. Consider expanding the product range of classic cars, introducing new models, or offering exclusive features.

2. Leveraging Top Customers' Contribution:

The Top 20 customers contribute significantly to revenue, but their individual share is small. Targeting them more effectively can lead to higher repeat sales. Create exclusive offers for these high-revenue customers, such as personalized deals, VIP customer programs, or loyalty rewards.

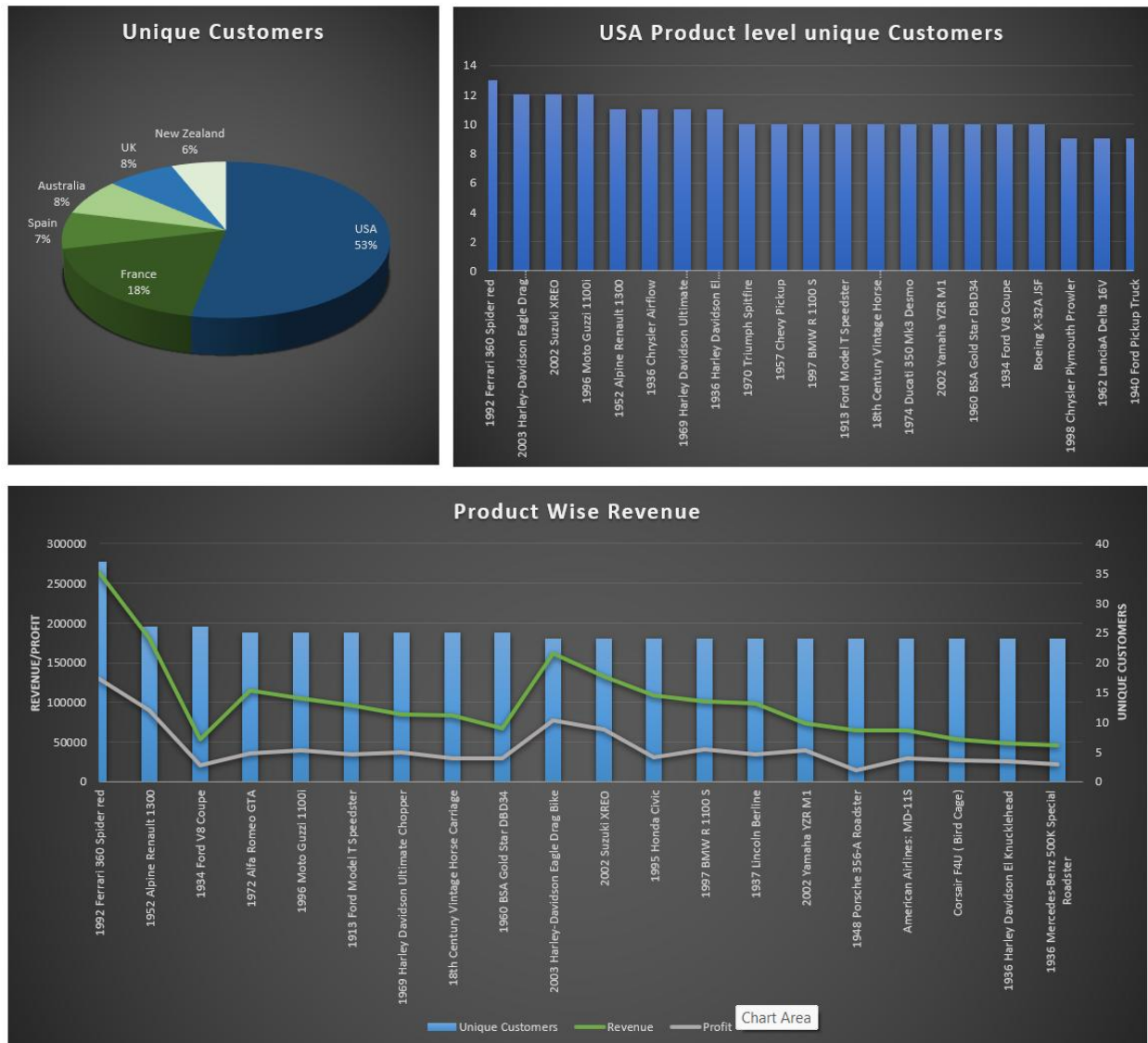
3. Leveraging Seasonal Revenue and Profit Trends:

The Revenue and Profit Trend shows peaks in specific months (e.g., October and December). Leverage this data to plan marketing campaigns and inventory stock levels ahead of time to meet demand during these high-sales months. Introduce seasonal discounts, limited-time offers, and exclusive products during peak months to attract more customers and increase revenue.

3. Leveraging City-Based Revenue Insights:

Cities like Madrid, San Rafael, and NYC contribute a significant share of the revenue. Focus expansion efforts in these regions by increasing product availability, local partnerships, or creating region-specific marketing campaigns.

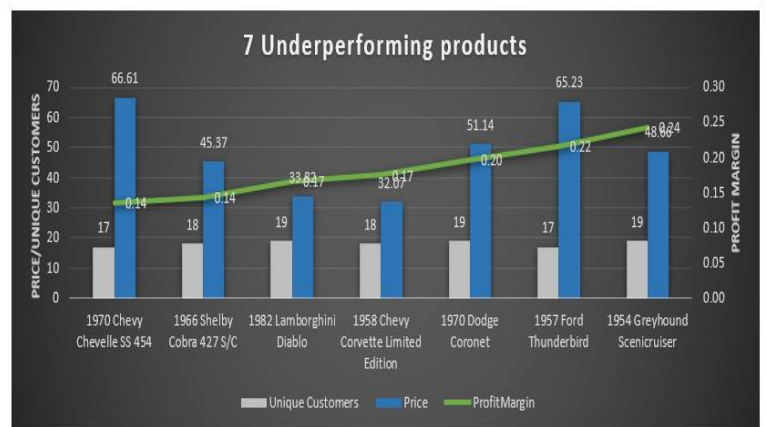
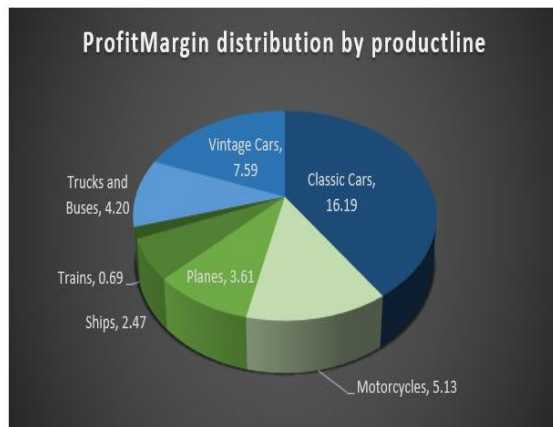
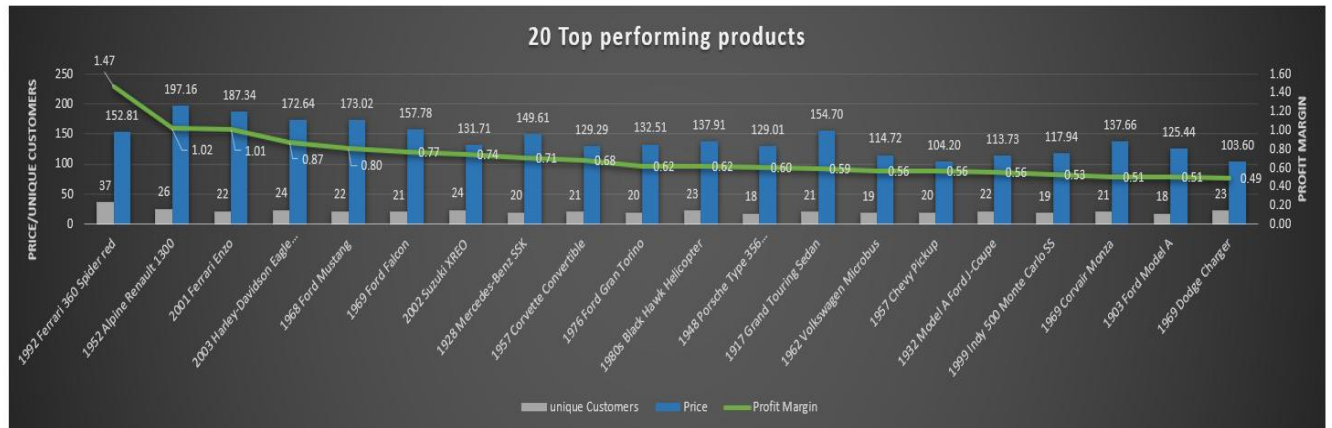
4. Which product features or attributes are most appealing to customers?



The most appealing product features include:

- Luxury and exclusivity:**
High-priced, premium vintage models attract affluent customers.
- Brand value and legacy:**
Iconic brands and models resonate with collectors and enthusiasts.
- Revenue and Profit Trends:**
Significant peaks occur during October and December, suggesting seasonal demand.
- Unique or rare products:**
Products with limited availability or historical significance are in high demand.

5. How can the product mix be optimized to cater to changing market demands?



Conclusion:

1. Leverage Top-Performing Products:

Capitalize on top-performing products (e.g., those with higher Profit Margins and Unique Customers) through targeted marketing, price optimization, and expanding reach into new markets.

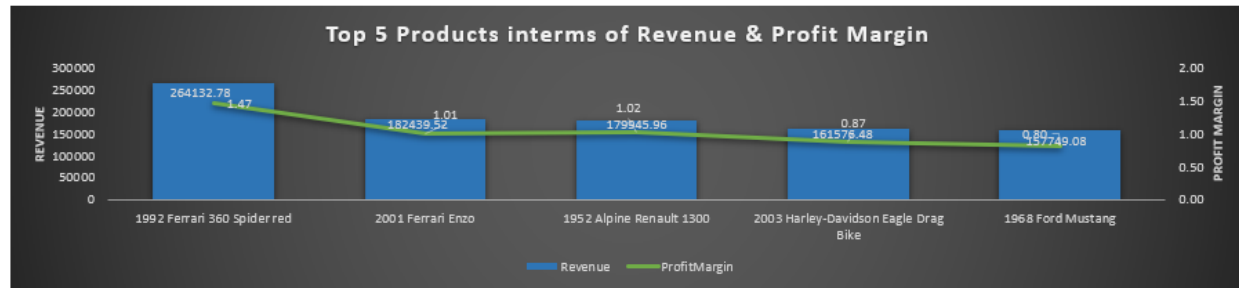
2. Improve Underperforming Products:

Products like the 1970 Chevy Chevelle SS 454, 1966 Shelby Cobra 427 S/C and 1982 Lamborghini Diablo etc show low performance in both Unique Customers and Profit Margins. Consider actions such as repositioning, discounts, or improving product features to better align with customer demands.

3. Optimize Product Lines:

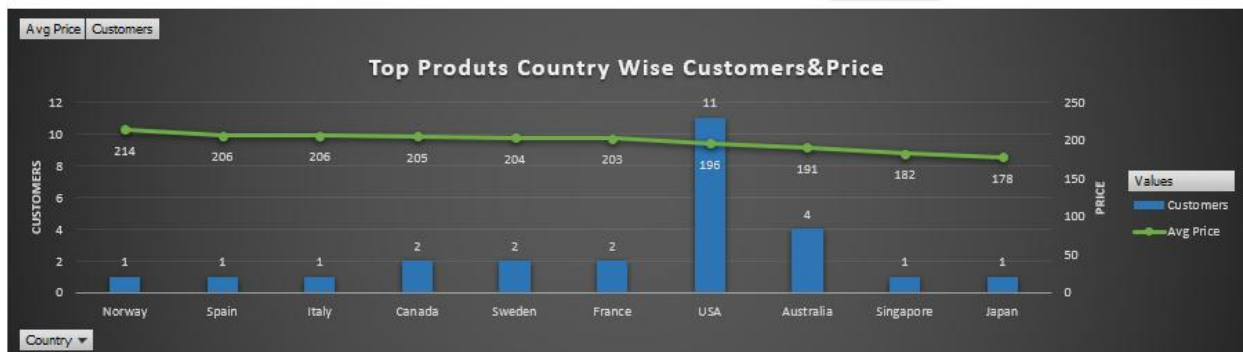
The profit margin distribution highlights that Classic Cars and Motorcycles perform well, while Planes and Ships contribute less. Focus resources on high-margin lines and assess the feasibility of underperforming product lines.

6. Are there any specific market segments where a particular product is underperforming, and how can it be improved?



Product_name

1952 Alpine Renault 1300 1968 Ford Mustang 1992 Ferrari 360 Spider red 2001 Ferrari Enzo 2003 Harley-Davidson Eag...



Analysis of Market Segments for Under performance:

1. 1952 Alpine Renault 1300:

Performs exceptionally well in the USA with both high revenue and profit margins.
Underperforms in Norway.

2. 1968 Ford Mustang:

Performs exceptionally well in the USA with both high revenue and profit margins.
Underperforms in Spain.

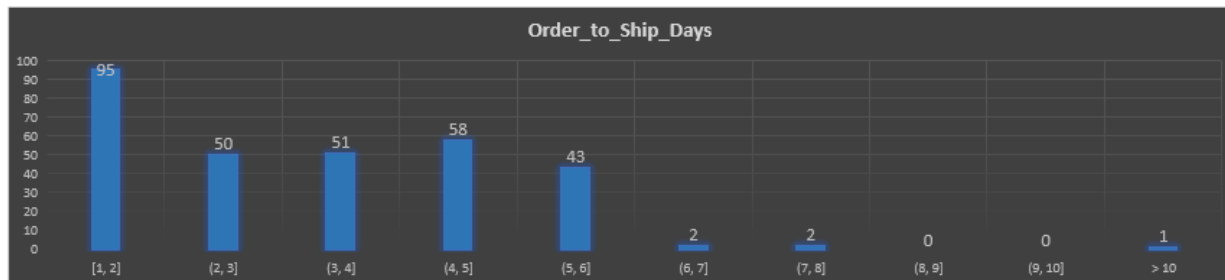
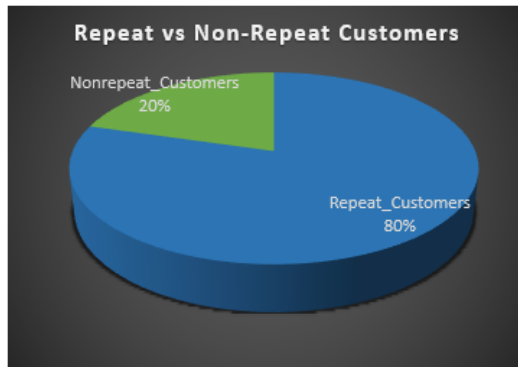
3. 1992 Ferrari 360 Spider Red:

Performs exceptionally well in the USA with both high revenue and profit margins.
Underperforms in the UK.

Suggestions for Improvement in under-performance countries:

1. Host events, test drives, or exhibitions in under-performing regions to boost interest.
2. Offer introductory discounts in under-performing regions to attract new customers.
3. Consider dynamic pricing models based on regional demand and competition.

7. What are the main factors that influence customer loyalty and repeat purchases?



Key Factors Influencing Customer Loyalty:

1. Efficient Delivery:

Early or on-time deliveries positively influence customer satisfaction and loyalty.

2. Quick Order Processing:

Orders shipped within 1-2 days are most common and likely contribute to repeat purchases.

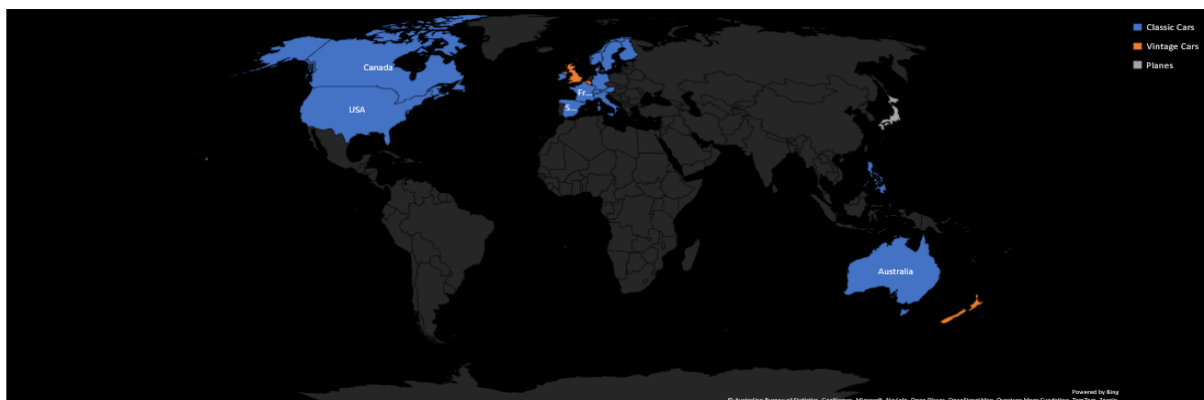
3. Minimizing Late Deliveries:

The low number of late deliveries ensures trust and reliability in the service.

4. Product Quality:

High-quality products often result in repeat purchases and brand loyalty.

8. How do customer preferences differ based on geographic location, and how can marketing campaigns be customized accordingly?



Conclusion:

1. For High-Performing Markets (e.g., USA, Spain, France):

Highlight premium features of Classic Cars through social media, email marketing, and ads. Offer loyalty programs or discounts for repeat purchases in these regions.

2. For Markets with Vintage Car Demand (e.g., New Zealand, UK):

Showcase rare or collector-edition vintage cars. Run seasonal promotions or discounts on Vintage Cars during festivals or events.

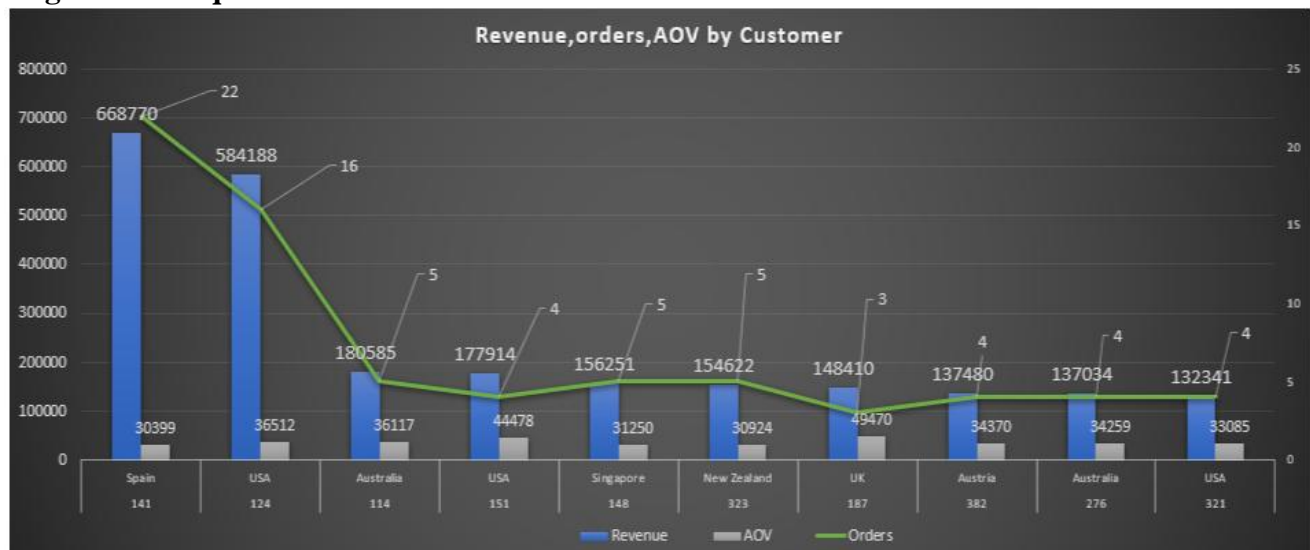
2. For Emerging Markets (e.g., Japan, Hong Kong):

Focus on promoting affordable and functional planes in these regions.

4. For Low-Performing Markets (e.g., Ireland, Sweden):

Introduce small-scale promotions to build interest, such as free shipping or low introductory prices.

9. What are the characteristics of high-value customers, and how can similar customers be targeted for acquisition?



Characteristics of High-Value Customers:

1. Geographic Location:

The USA appears prominently with 3 out of the top 10 customers, contributing significantly to revenue. Other high-value customers are from Spain, Australia, Singapore, New Zealand, the UK, and Austria, indicating a global spread.

2. High AOV:

AOV is a significant indicator, with top customers consistently having AOV above \$30,000.

3. Frequent or Bulk Purchases:

Some high-value customers prefer frequent small orders, while others prefer fewer, larger purchases.

4. Loyalty:

Customers with a high number of orders may exhibit brand or product loyalty, making them repeat buyers.

Recommendations for Targeting Similar Customers:

1. Geographic Expansion:

Focus marketing efforts in regions like the USA, Spain, and Australia, which are proven markets for high-value customers.

2. Promote Premium Products:

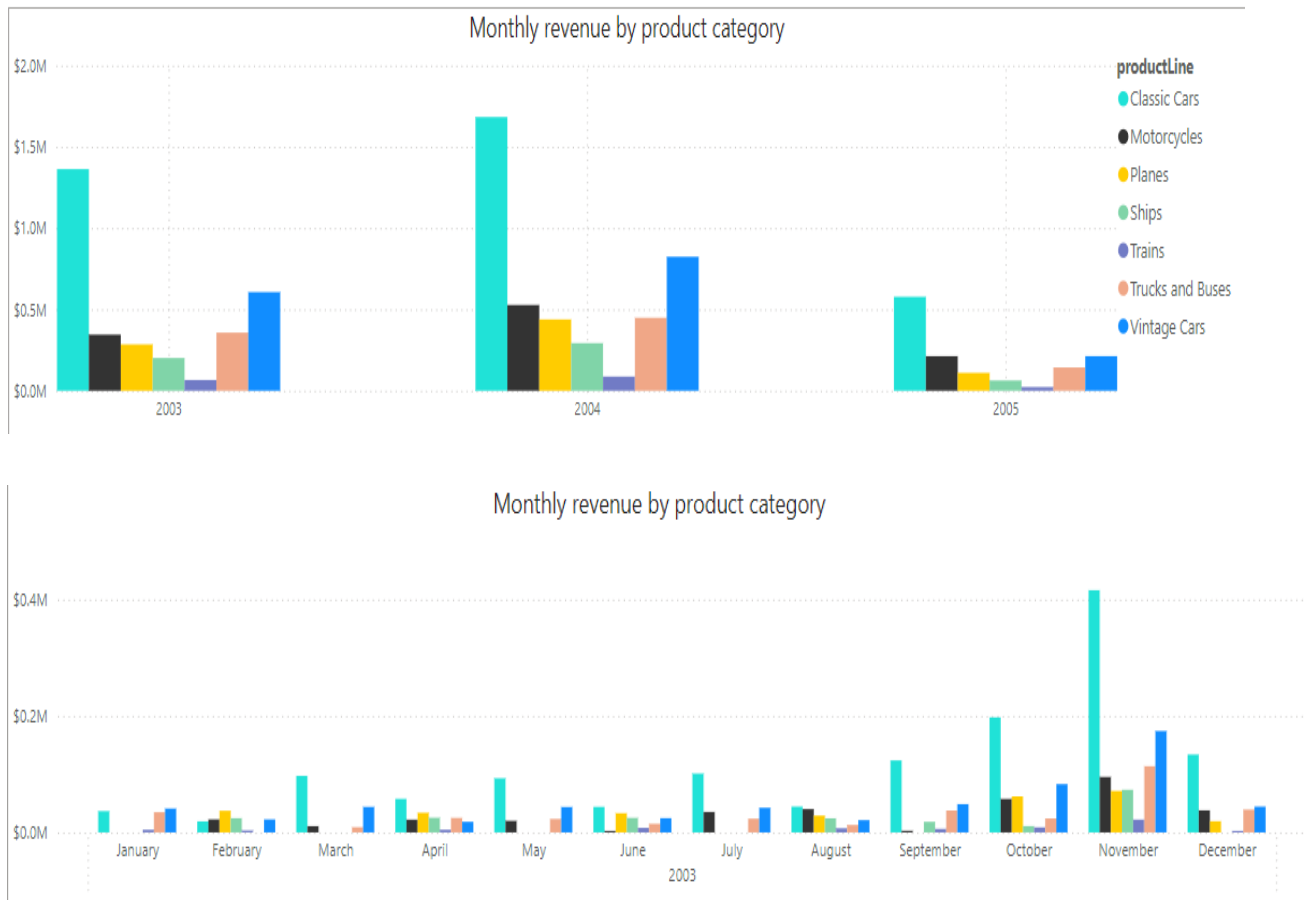
Highlight premium or high-value products in marketing campaigns, as these products likely appeal to customers with high AOV.

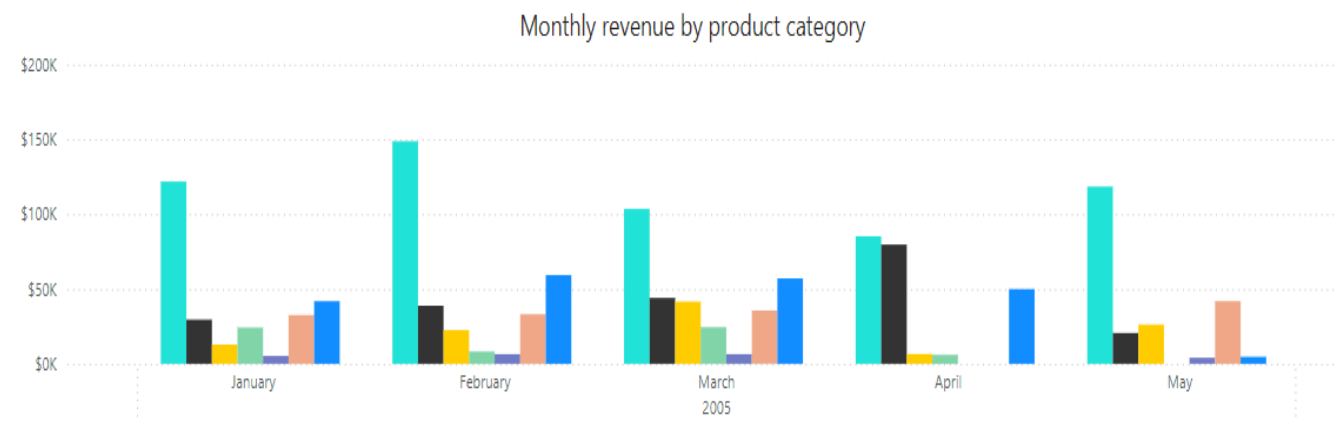
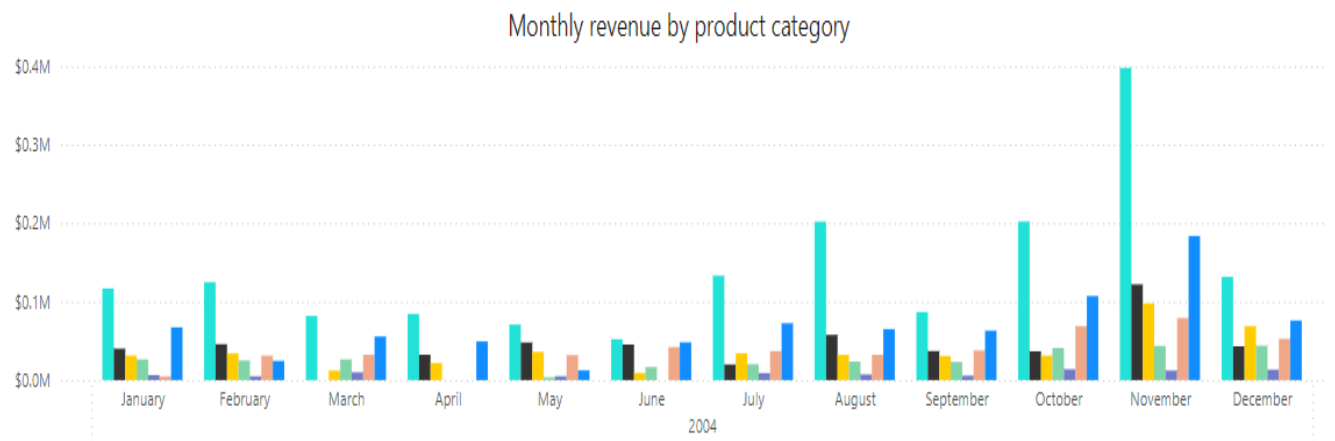
3. Loyalty Programs:

Offer loyalty rewards for frequent buyers to encourage repeat purchases, particularly for customers with higher order frequency.

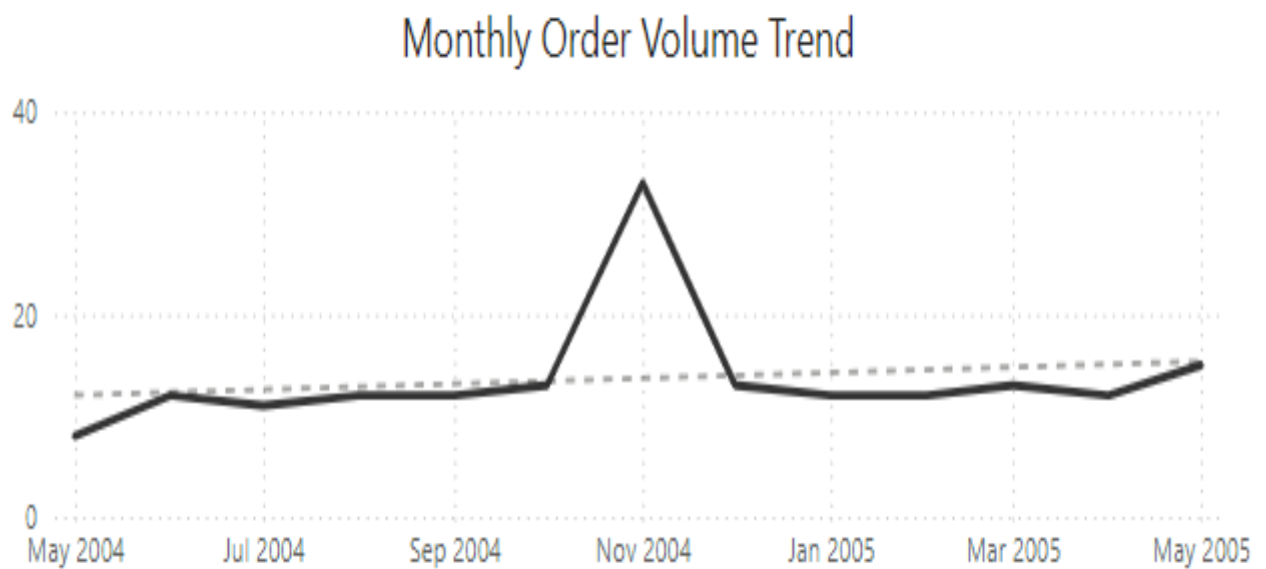
Power Bi Questions:

1. How does monthly revenue vary across different product categories?

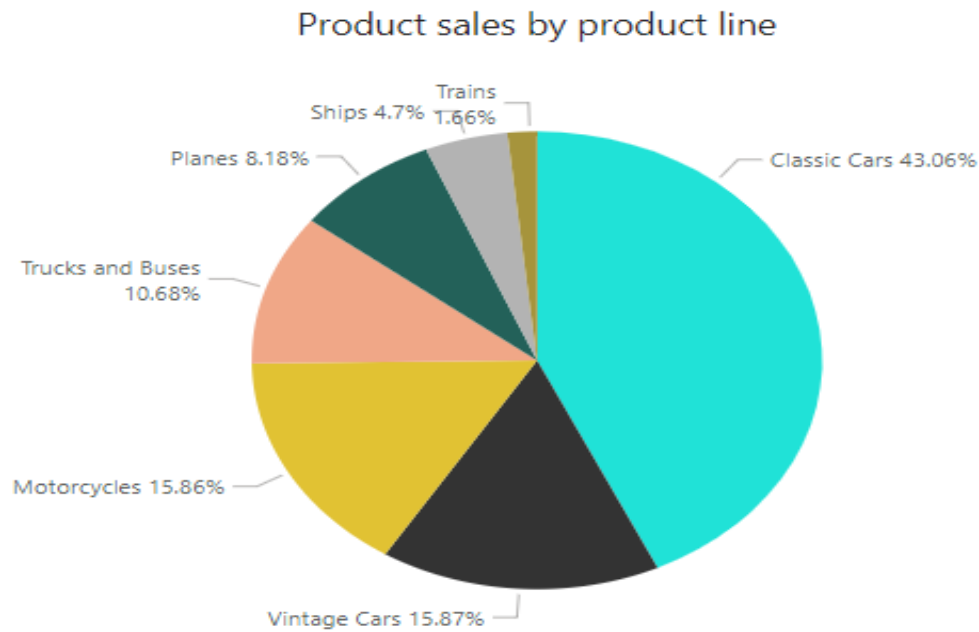




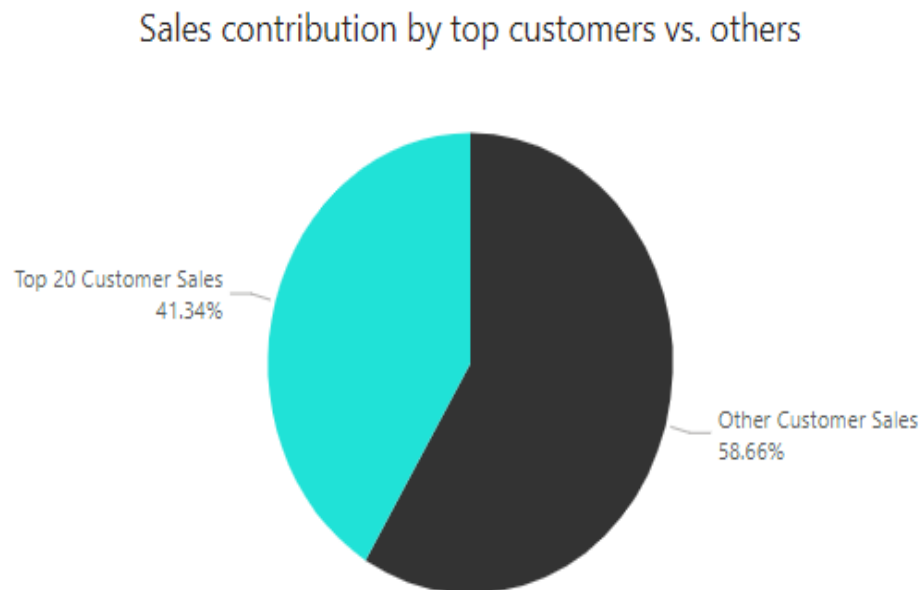
2. What is the trend in customer order volume over the past year?



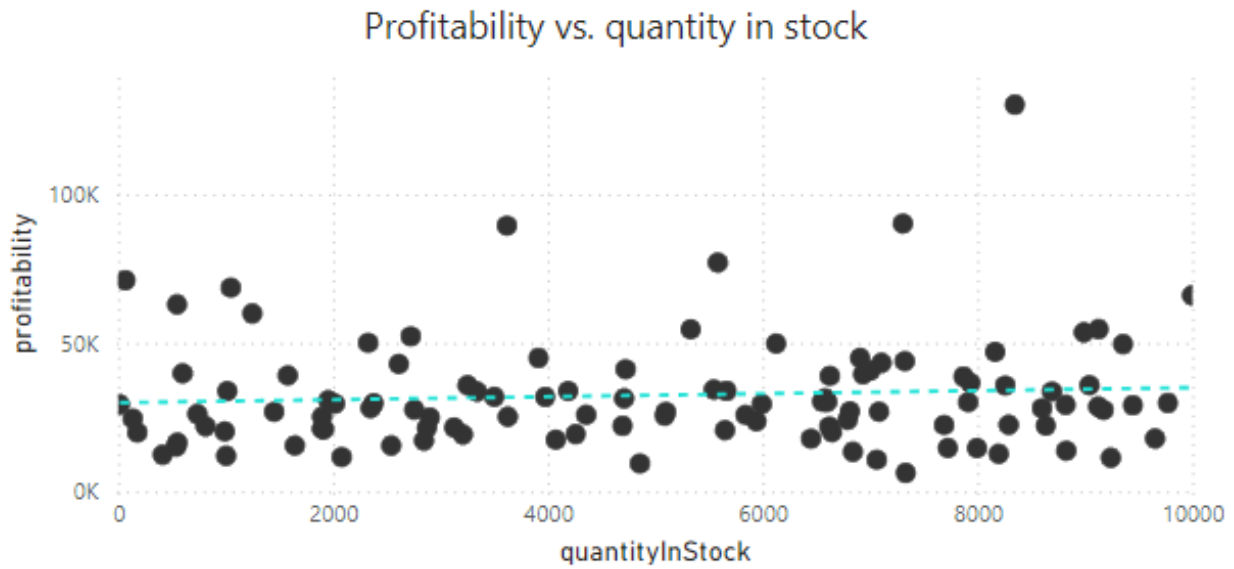
3. What is the distribution of product sales across different product lines?



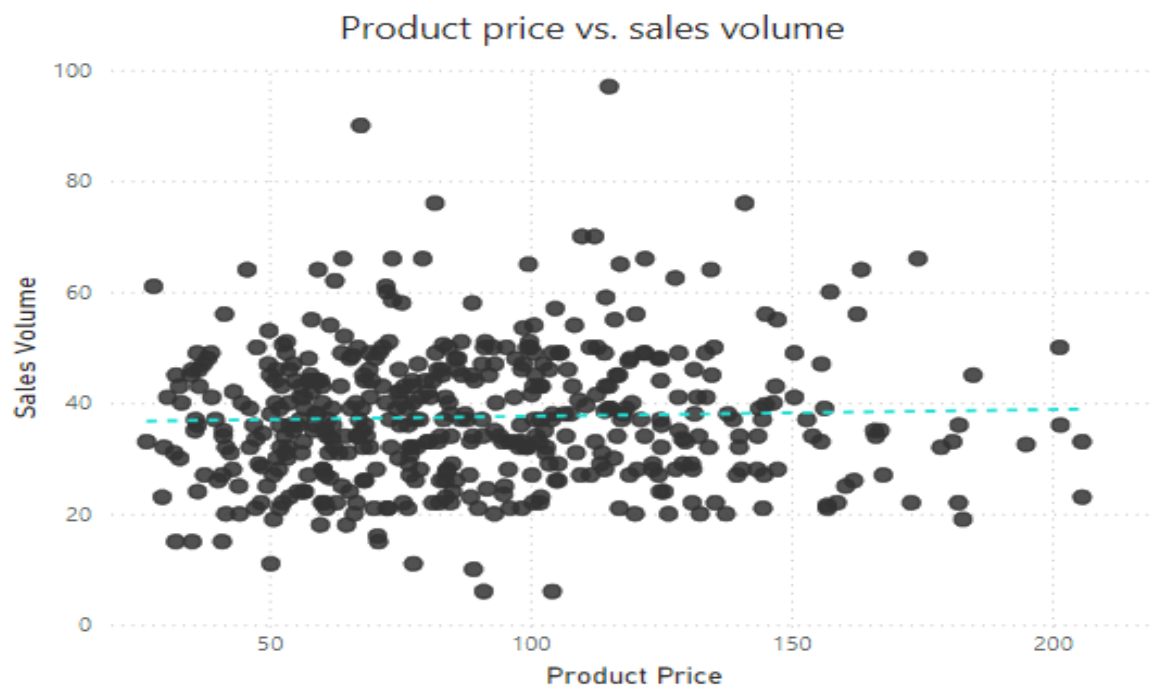
4. How does the sales performance of top customers compare to the rest?



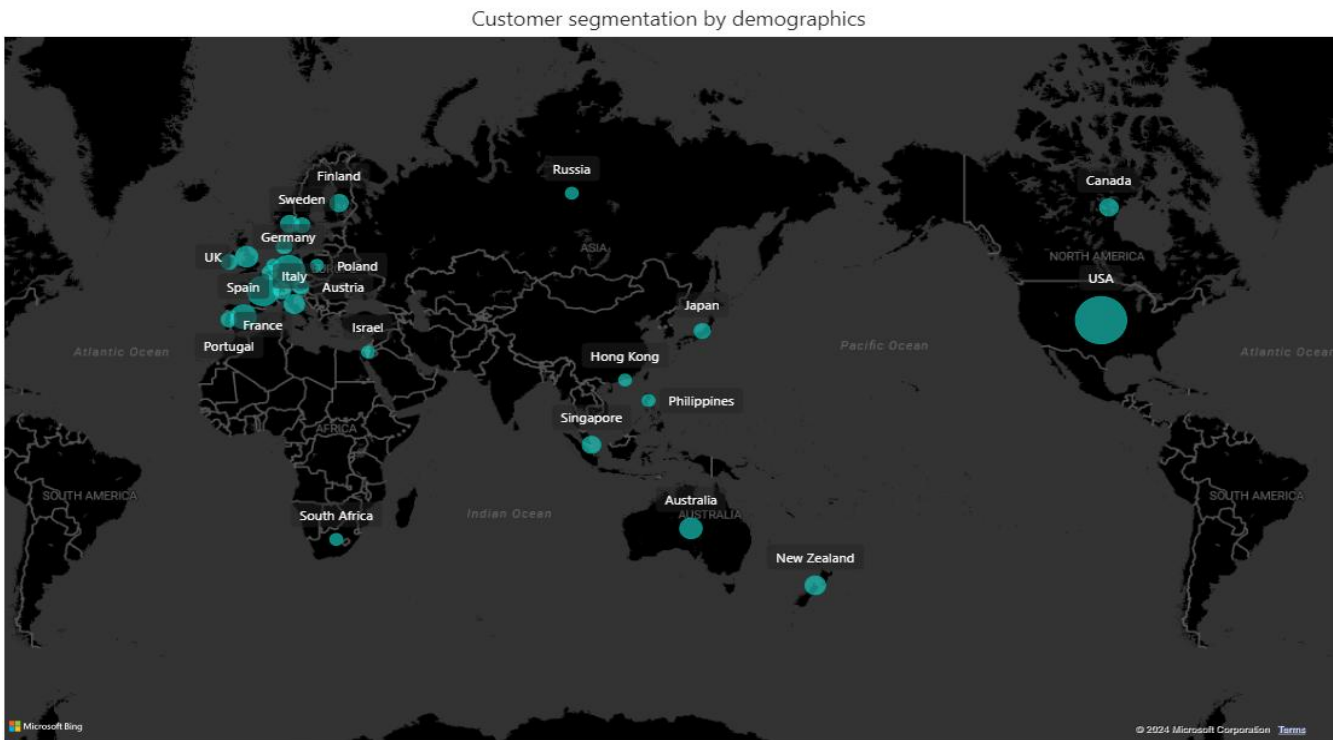
5. How does the profitability of different products compare based on their quantity in stock?



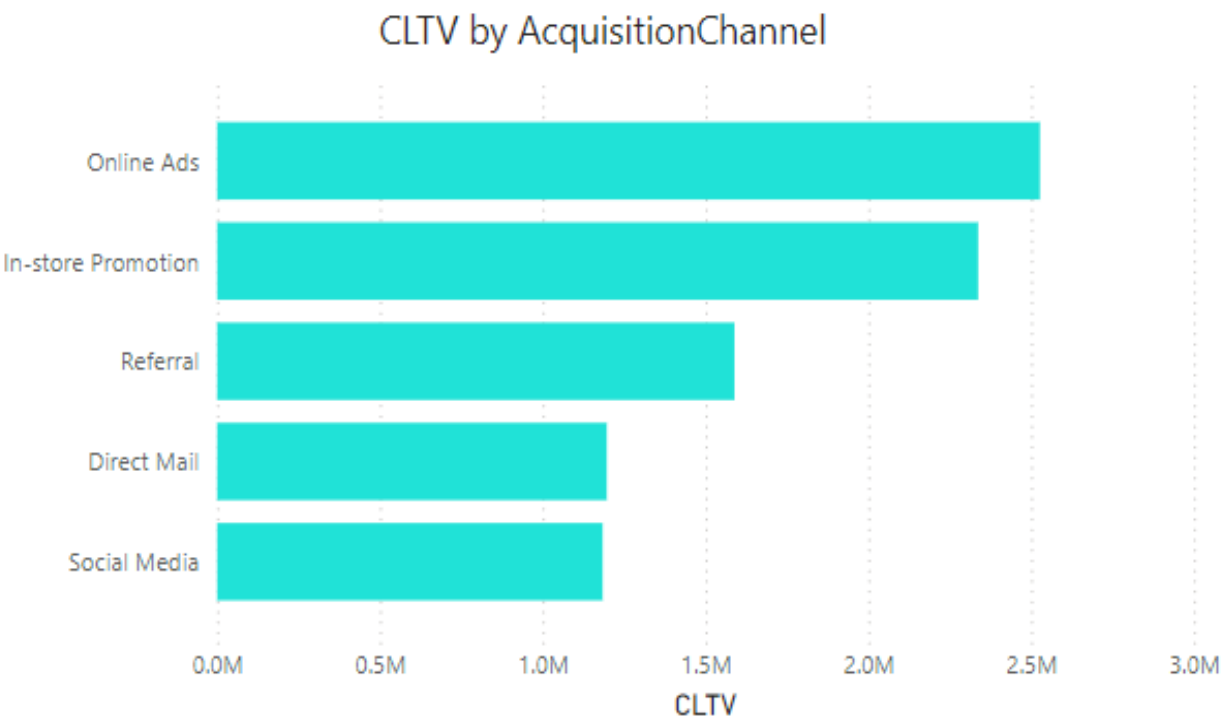
6. How does product pricing impact sales volume?



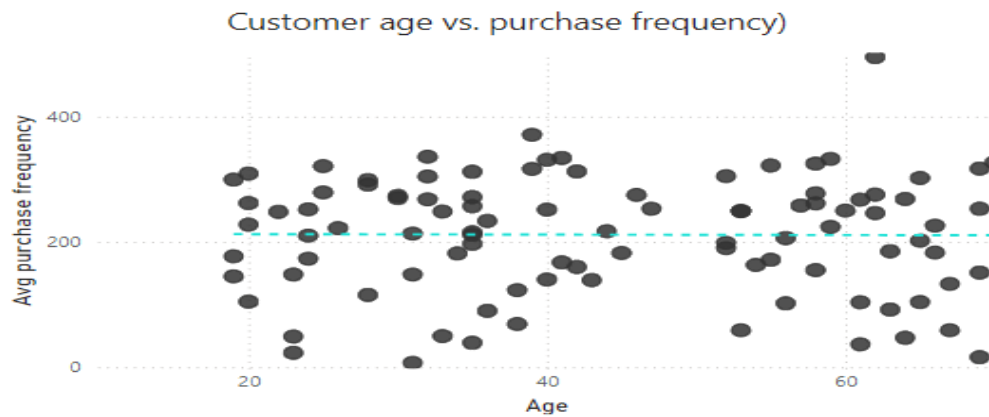
7. What is the distribution of customers across different demographic segments?



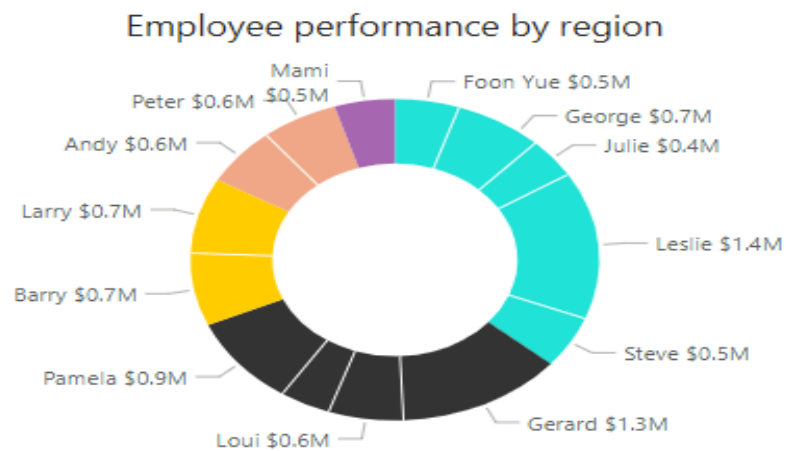
8. How does customer lifetime value vary for different customer acquisition channels?



9. What is the correlation between customer age and purchase frequency?



10. How does the performance of sales employees vary across different regions?



11. What are the top regions in terms of sales revenue?



12. What is the correlation between customer demographics and purchase frequency?



Assumptions:

1. Order Status:

- Only orders with the status "shipped" were considered for the analysis. Other statuses (e.g., "pending", "cancelled") were excluded to focus on completed transactions.

2. Customer Age and Acquisition Channel:

- The given dataset did not include data on customer age or acquisition channels.
- A new table was created with hypothetical values for customerID, customerAge, and acquisitionChannel to facilitate relevant analyses.

Tools Used:

- SQL: Data extraction and aggregation.
- Excel: Initial data exploration and validation.
- Power BI: Dashboard creation and visualization.

Deliverables:

1. EDA Findings:

- Summary of key insights for each question.
- Supporting charts and visuals.

2. Power BI Dashboard:

- Interactive dashboard answering Power BI questions.
- Filters for time, product category, and region.
