

Business Insights from Exploratory Data Analysis (EDA)

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Customer segmentation based on region

- The analysis looked at how customers are distributed across different regions.
 - The plot showed that South America had the highest number of customers, with 300 in total.
 - This suggests that South America is the most populated region in the dataset.
 - It could mean that businesses have more customers there, possibly due to good marketing or popular products.
 - The count plot helped identify regions with the highest number of customers, which is useful for businesses.
 - Understanding why South America has the highest count can help improve strategies like marketing or product offerings in that region.
 - To make better decisions, businesses could study what makes customers in South America more engaged and try to apply those insights to other regions.
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Analysing monthly sales trends for better visibility

- The analysis looked at total sales for each month using TransactionDate and TotalValue.
 - The Month column was created by extracting the month and year from the TransactionDate.
 - The total sales for each month were then calculated by grouping the data by month.
 - July 2024 had the highest sales at 71,000, while December 2023 had the lowest sales at 5,000.
 - July 2024 likely had a sales boost due to seasonal demand, promotions, or effective marketing strategies.
 - December 2023 had low sales, possibly due to reduced demand, market conditions, or the holiday season affecting customer behaviour.
 - This monthly sales trend analysis helps businesses understand which months see the highest and lowest sales, allowing for better planning.
 - Businesses can replicate successful strategies during high-sales months and find ways to improve performance during low-sales months.
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Identifying top spending customers

Here are the top 10 spending customers based on their total purchase value:

- C0141: 10,673.87
- C0054: 8,040.39

- C0065: 7,663.70
- C0156: 7,634.45
- C0082: 7,572.91
- C0188: 7,111.32
- C0059: 7,073.28
- C0028: 6,819.57
- C0099: 6,715.72
- C0165: 6,708.10

Key Insights:

- C0141 is the highest spender with a total purchase value of 10,673.87, significantly outspending other customers.
 - The top 10 customers have a wide range of spending, from 6,700 to over 10,000, showing a varied customer base.
 - Focusing on these high-value customers can help with retention strategies, such as offering loyalty programs or personalized promotions.
 - Understanding the buying patterns of these top spenders can guide product recommendations, marketing efforts, and future sales campaigns.
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Product popularity

Here are the top 10 most popular products based on the total quantity sold:

- P059: 46 units
- P054: 46 units
- P029: 45 units
- P079: 43 units
- P061: 43 units
- P057: 43 units
- P048: 43 units
- P062: 39 units
- P020: 38 units
- P028: 38 units

Key Insights:

- P059 and P054 are the most popular products, each selling 46 units, showing high demand.
- Products like P079, P061, and P057 also had significant sales, with 43 units sold.
- The top 10 products sold between 38 and 46 units, indicating that these products have a steady demand among customers.
- Identifying popular products helps businesses optimize inventory and ensure they meet demand. It also helps in targeting marketing efforts toward products with the highest customer interest.

- The popularity of these products can provide insights into customer preferences and guide future product offerings or promotions.
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Price optimization analysis using histogram

Key Insights:

- The histogram shows the frequency of products at different price points, helping to understand where most products fall within the price range.
 - The **kde (kernel density estimate)** curve overlay helps to visualize the smooth distribution of prices, indicating whether certain price ranges are more common than others.
 - By identifying peaks in the histogram, businesses can see which price ranges have the highest concentration of products, which may suggest popular pricing tiers for customers.
 - The analysis can guide businesses in optimizing their product pricing by adjusting prices to fall within the most favourable ranges, increasing the chances of higher sales volume.
 - Additionally, the visualization can highlight any potential outliers (very high or very low-priced products), which may require price adjustments for better market alignment.
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