

Analysing Target Sales Operations: Insights from  
Customer Behaviour, Sales, and Product

# Data Analysis Report



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# CONTENTS

- 1. About Target**
- 2. Agenda**
- 3. Problem Statement**
- 4. Research Objectives**
- 5. Hypotheses**
- 6. Data Overview**
- 7. Analysis and Findings**
- 8. Conclusion and Recommendations**

# About Company

**Target is a globally recognized brand and a leading retailer in the United States, known for offering exceptional value, inspiration, innovation, and a unique shopping experience.**



## About Dataset:

This dataset focuses on Target's operations in Brazil, covering 100,000 orders placed between 2016 and 2018. It includes detailed information on order status, pricing, payment and shipping performance, customer locations, product attributes, and customer reviews.

# Agenda

The goal of this project is to analyze Target's operations dataset to provide actionable insights on customer demographics, order trends, sales performance, and customer retention rates. Using this information, we aim to uncover patterns and provide recommendations for optimizing Target's Brazilian business operations.

# Problem Statement

Target operates extensively in Brazil and seeks to understand key aspects of its operations, including customer behavior, sales trends, and product performance. The challenge is to derive meaningful insights from a comprehensive dataset containing over 100,000 orders from 2016 to 2018, covering multiple attributes such as order status, payment information, customer locations, product details, and seller data.

**Key questions that this analysis aims to address include:**

1. What are the geographic distribution patterns of customers?
2. How do product categories contribute to total revenue?
3. What are the factors that drive customer retention?
4. How does customer order behavior vary over time?

# Research Objectives

1. To identify the unique cities and states where customers are located and analyze their distribution.
2. To determine sales trends and patterns, such as the total sales per category and seasonal variations.
3. To study customer retention rates and identify the top-performing customers by revenue.
4. To evaluate the impact of pricing strategies on product sales.
5. To analyze seller performance based on revenue contribution and rank them accordingly.

# Hypotheses

The analysis is driven by several hypotheses:

- 1. Geographical Contribution:** Major cities like São Paulo and Rio de Janeiro account for the bulk of sales.
- 2. Installment Payments:** A significant percentage of orders are paid through installment plans, which may indicate a preference for spreading payments.
- 3. Product-Price Sensitivity:** There is little to no significant relationship between product price and the frequency of purchases, indicating that factors other than price, such as product quality, customer preferences, or marketing efforts, are likely to have a stronger influence on purchase behavior.
- 4. Customer Retention:** The retention rate within 6 months is low, suggesting an opportunity for customer engagement strategies.
- 5. Revenue Concentration:** A small percentage of customers contribute disproportionately to annual revenue.

# Data Overview

The dataset consists of 8 CSV files, containing a variety of information:

1. **customers.csv**: Customer demographic data such as city, state, and zip code.
2. **sellers.csv**: Seller information, including their location.
3. **order\_items.csv**: Detailed information about each order item, such as product ID, price, and seller ID.
4. **geolocation.csv**: Geographical data linked to customer and seller locations.
5. **payments.csv**: Payment information, including installment payments and payment types.
6. **orders.csv**: Order details such as order status, timestamps, and customer IDs.
7. **products.csv**: Product attributes including categories, dimensions, and weights.
8. **reviews.csv**: Customer review data for orders, reflecting satisfaction and product quality.

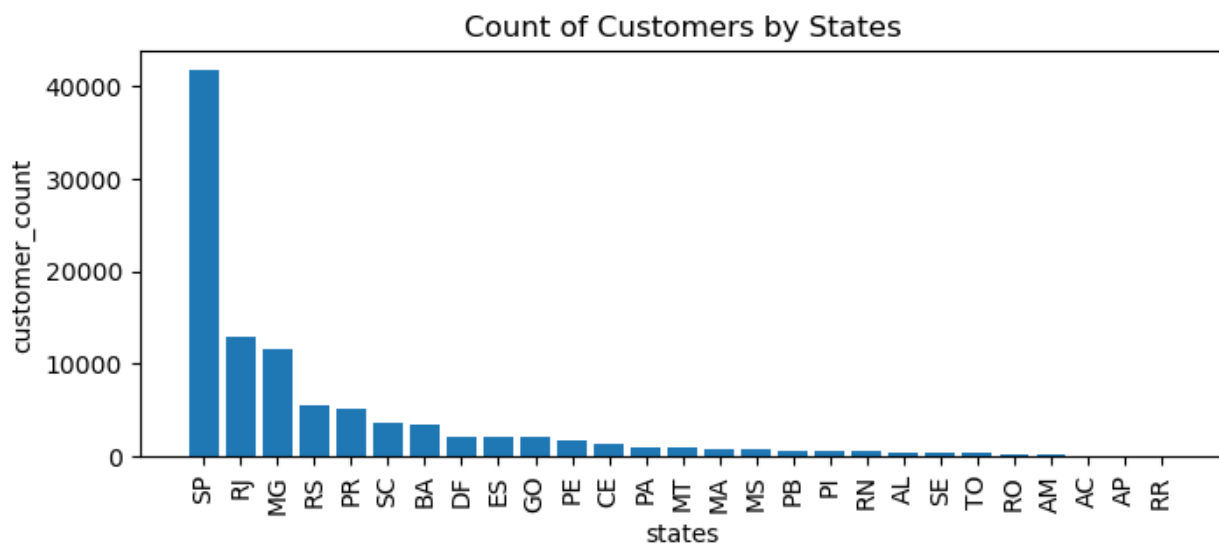


# Analysis and Findings

## Basic Analysis:

### 1. Unique Cities and States:

- The dataset includes customers from 411 unique cities spread across 27 states in Brazil.
- Major cities like São Paulo, Rio de Janeiro, and Belo Horizonte are the largest contributors to the customer base.



- The graph above illustrates that São Paulo (SP), Rio de Janeiro (RJ), and Minas Gerais (MG) are the top three states by customer count.

## 2. Orders Placed in 2017:

- A total of 45101 orders were placed in 2017, showing growth compared to previous years.



## 3. Total Sales Per Category:

- Categories like Furniture, Home Appliances and Automotive generated the most revenue, indicating these as top-performing segments.

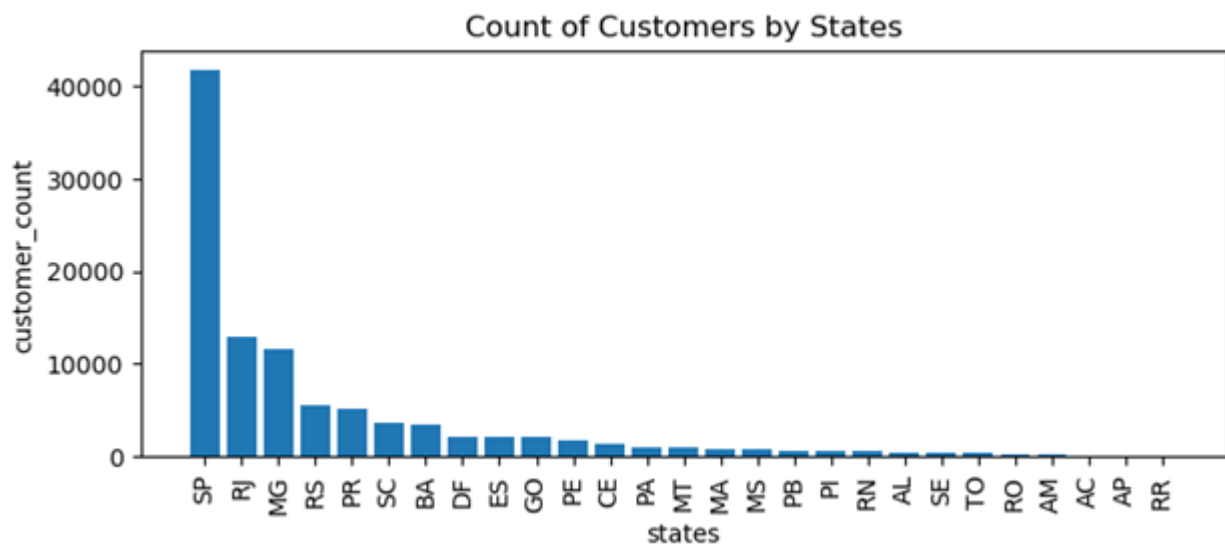
## 4. Installment Payments:

- Considering even a single payment paid through installment then about 99.9% of all orders were paid through installment plans, which is a substantial portion.

- Excluding one payment through installment then 49.41 % of orders were paid through installment plans.

#### 5. Customer Count by State:

- São Paulo state had the highest number of customers, followed by Minas Gerais and Rio de Janeiro.

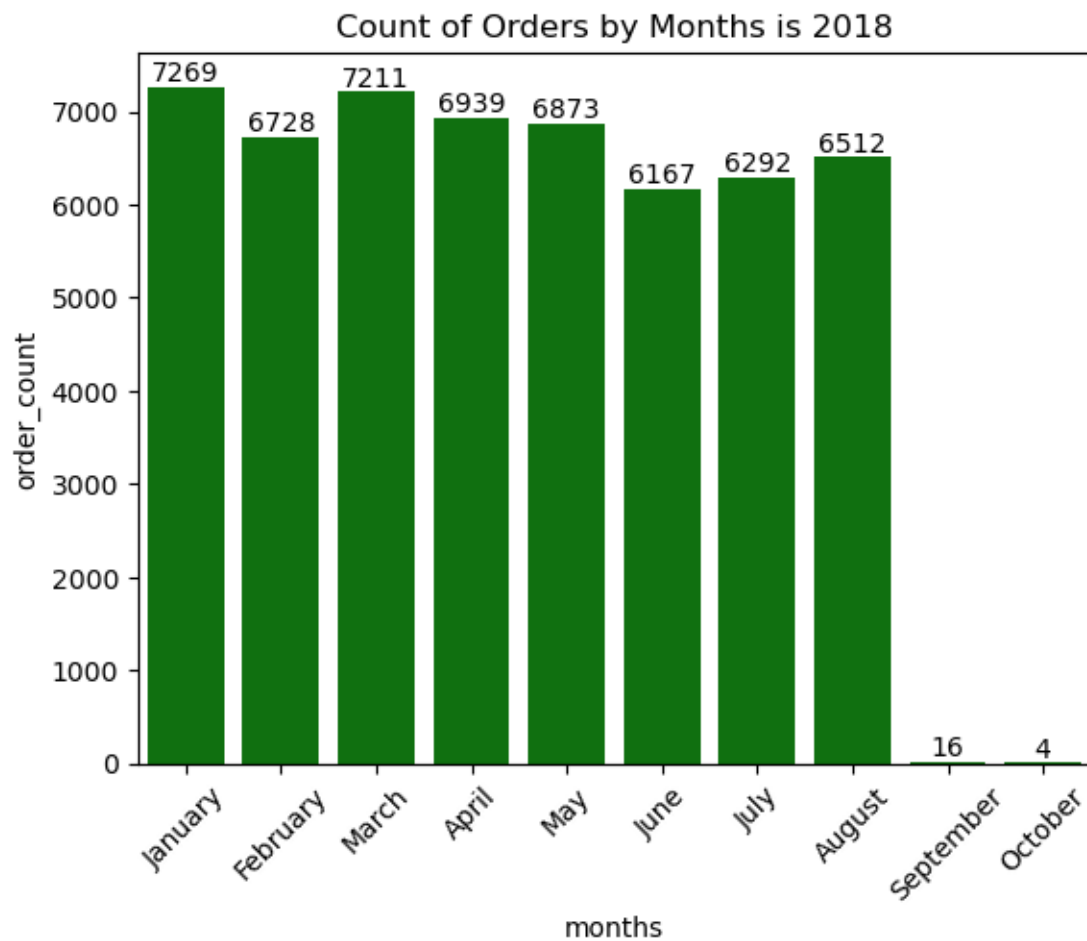


- The graph above illustrates that São Paulo (SP), Rio de Janeiro (RJ), and Minas Gerais (MG) are the top three states by customer count.

## Intermediate Analysis:

### 1.Orders Per Month in 2018:

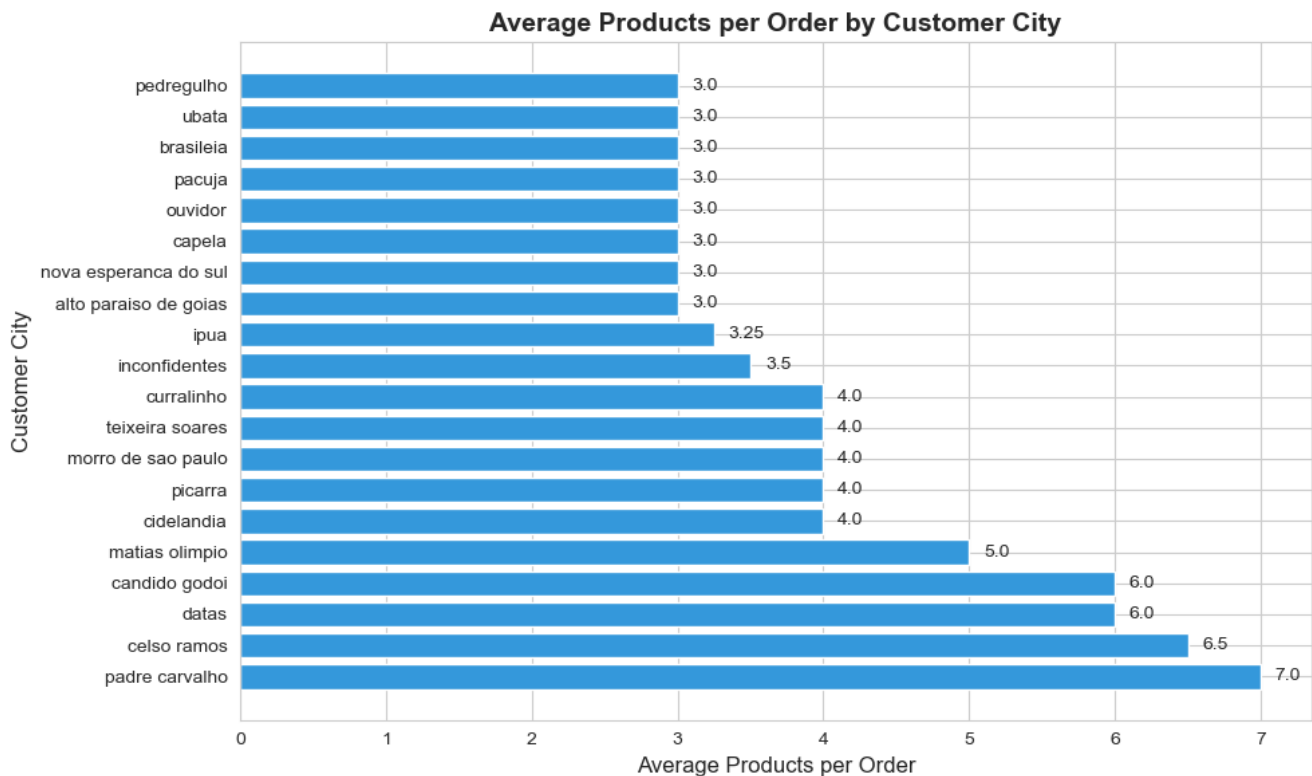
- Sales peaked in January 2018 with a high volume in the first quarter, showing strong performance during the start of the year.



- The graph above shows that most months in 2018 had strong order counts, with January and March leading.

## 2. Average Products Per Order by City:

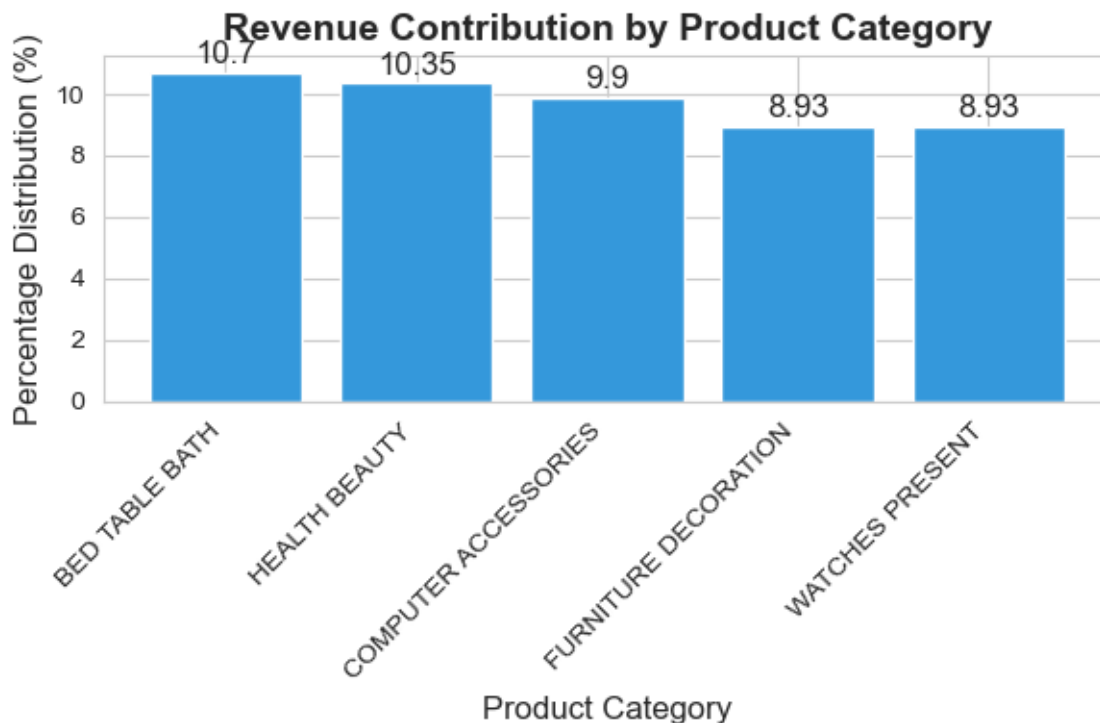
- The cities with the highest average number of products ordered per order are Padre Carvalho with an average of 7.00 products per order and Celso Ramos with 6.50 products per order. Other cities, such as Datas and Candido Godoi, have an average of 6.00 products per order.



Graph above shows the top 20 cities average number of products per order.

### 3. Revenue Contribution by Product Category:

- The distribution suggest that revenues are fairly balanced across multiple categories, with no single category dominating.

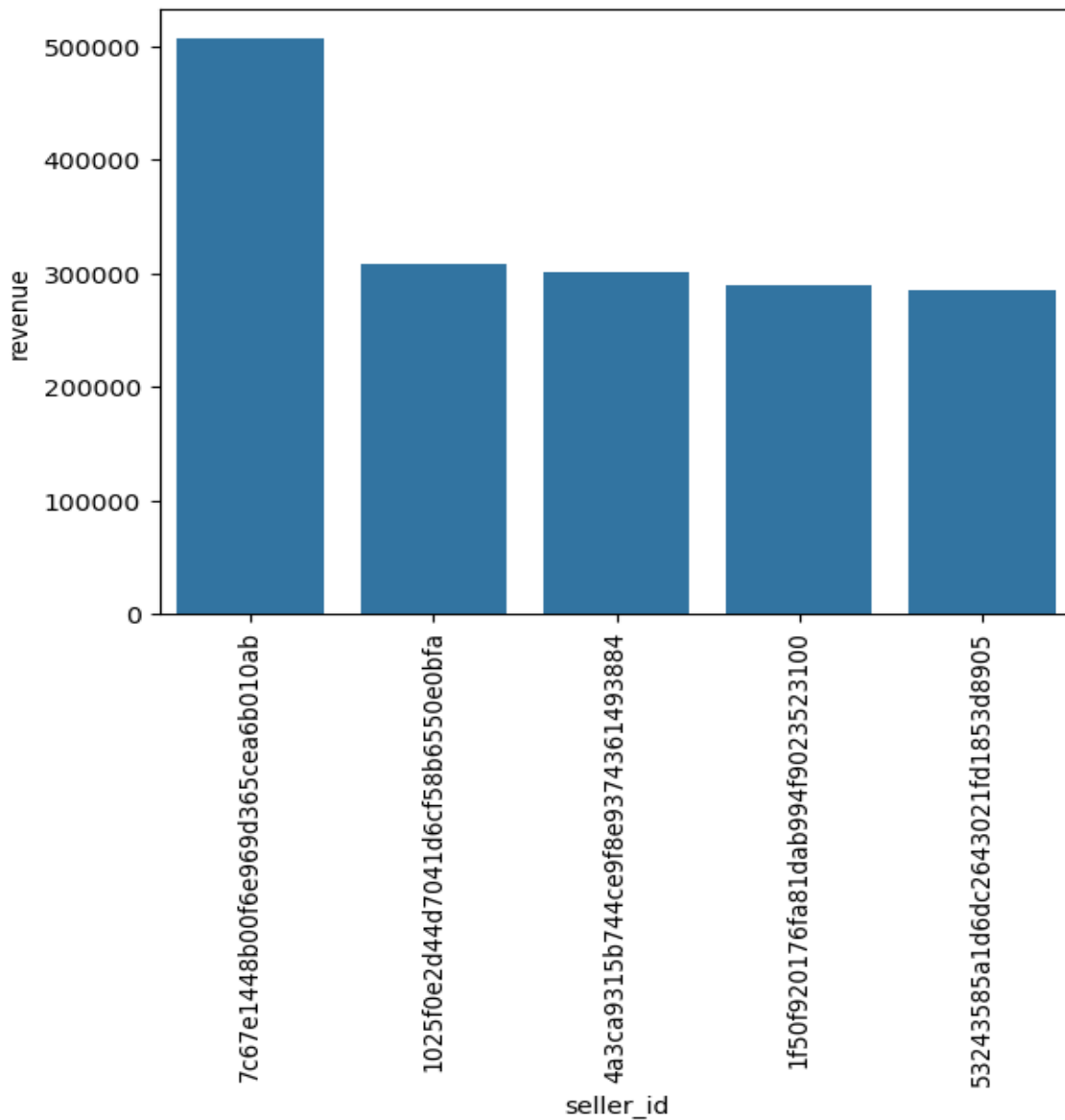


### 4. Correlation Between Price and Purchase Count:

- There is a weak negative correlation between price and purchase count.
- This weak correlation suggests that price is not a major factor influencing how frequently a product is purchased.

5. Total revenue generated by each seller and ranking of top 5 sellers:

- Seller ID\_6b010ab is the top seller, generated highest revenue, which is significantly larger than the others, surpassing 500,000 units.



- The graph above shows the top 5 sellers based on total revenue generated, highlighting the dominance of the top performer.

## **Advanced Analysis:**

### **1. Moving Average of Order Values:**

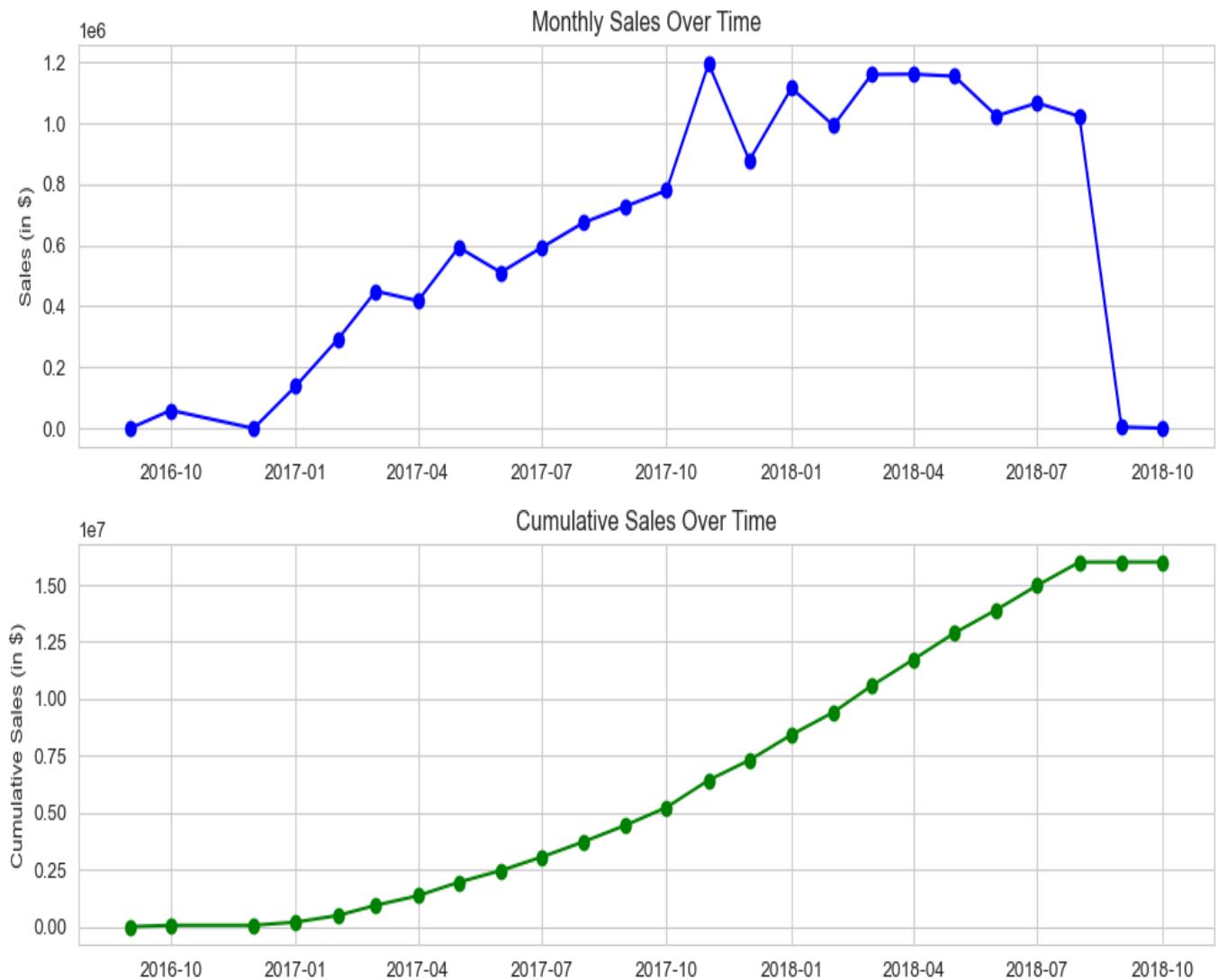
- Calculated the moving average of order values for each customer. This will show the:

- **Spending Trends:** the moving average allows us to see how a customer's spending evolves over time. If it's increasing or decreasing, it can give insights into their purchasing habits.
- **Customer-specific insights:** we can identify high-value customer's, detect if a customer's spending is decreasing over time, or spot potential churn (e.g., lower payments or gaps in order frequency)

### **2. Cumulative Sales Per Month:**

- **High Sales months:** November and January are key months that contribute significantly to the total sales.
- **Growing revenue trend:** Sales are steady growing from 2016 to 2018.
- **Seasonality:** The spikes in late 2017 and early 2018 indicate some seasonality in customer purchasing behavior. This is the key factor for inventory planning, marketing strategies, and sales forecasting.





### 3. Year-Over-Year Growth:

- 1) **Explosive Growth in 2017:** The YoY growth rate of 12112.7% from 2016 to 2017 likely reflects a major operational change, such as scaling up the business or launching in new markets.

- 2) **Stabilization in 2018:** The YoY growth rate of 20% from 2017 to 2018 suggests that the business growth stabilized. After the rapid expansion in 2017, the business is still growing but at a more sustainable rate.
- 3) **Potential Further Analysis:** Investigating factors like customer acquisition strategies, product diversity, or new service offerings between these years could shed more light on the drivers behind these growth figures.

4. Customer Retention Rate:

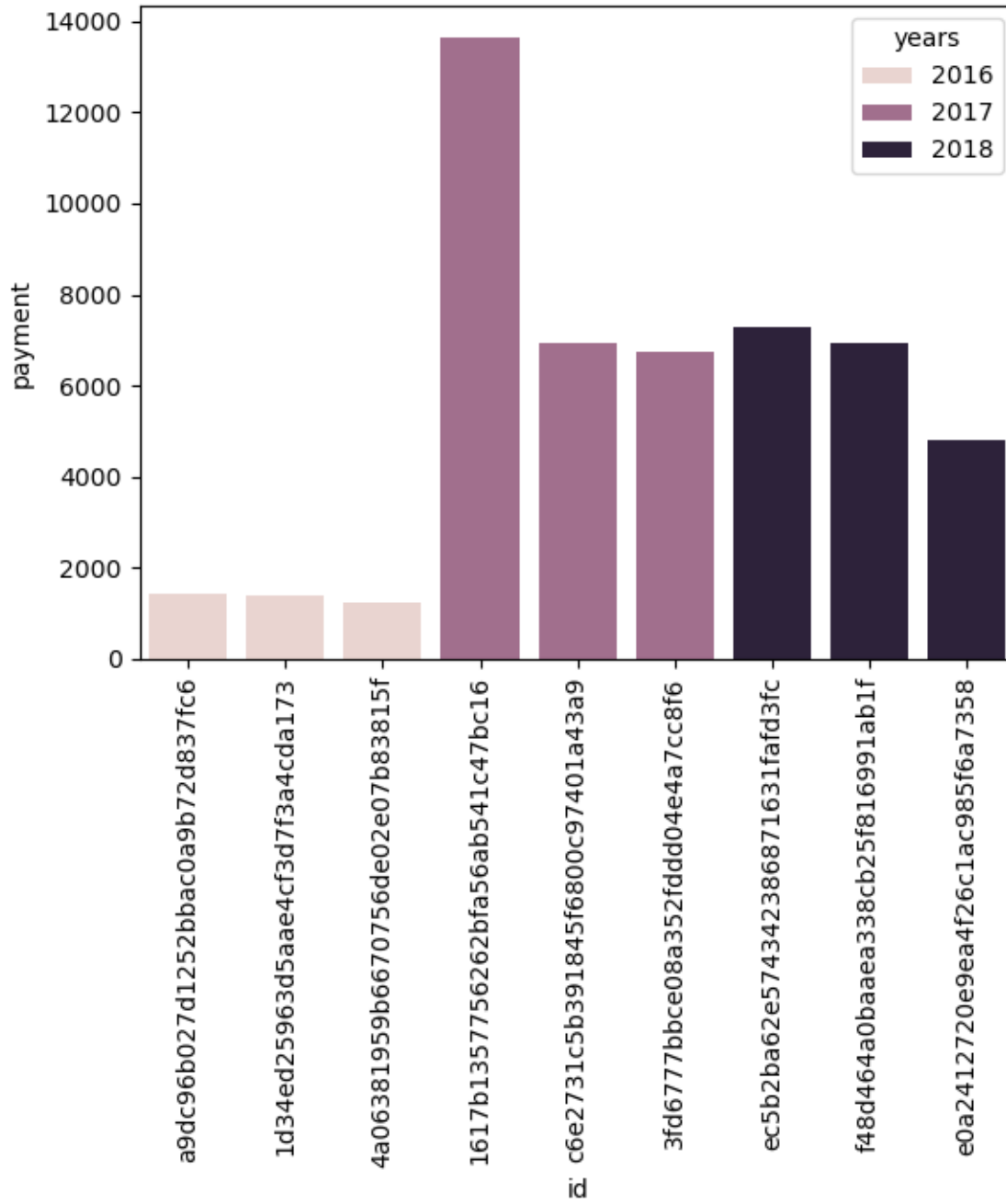
Note: Retention rate of customers, defined as the percentage of customers who make another purchase within 6 months of their first purchase.

- No customers made another purchase within 6 months of their first purchase, as the retention rate is 0% for this scenario of time period of 6 month.

5. Top 3 Customers by Year:

- Identified top 3 customers in each year, with the highest spending customer generating.

The graph below shows the top 3 customer with their highest spending each year.



# Key Insights:

## 1. Customer Demographics:

- Large cities contribute significantly to total sales, suggesting that marketing efforts should focus on these regions.

## 2. Installment Plans:

- The high percentage of installment payments reflects a strong preference for flexible payment options, especially for high-priced items.

## 3. Product Performance:

- Weak correlation suggests that price is not a major factor influencing how frequently a product is purchased. Other factors might play a more significant role in the influencing product purchases, such as brand, product quality, customer preferences, or marketing strategies.

## 4. Retention Strategy:

- The low retention rate suggests an opportunity to improve customer loyalty through targeted campaigns, discount for repeat customers, or loyalty programs.

## 5. Seller Performance:

- A small number of sellers contribute a majority of revenue, which underscores the importance of maintaining strong relationships with top sellers.

# Recommendations:

## 1. Focus on High-Revenue Cities:

- Implement location-specific marketing and promotions targeting top-performing cities like São Paulo and Rio de Janeiro.

## 2. Enhance Payment Option:

- Continue promoting installment plans and explore new payment options to cater to different customer segments

## 3. Customer Retention Programs:

- Introduce loyalty programs to improve retention and increase the percentage of repeat customers.

## 4. Expand Seller Network:

- Expand partnerships with top-performing sellers and provide them with more support to increase product variety and sales volume.

***This report outlines a comprehensive analysis of Target's Brazilian operations, providing insights that can be leveraged to optimize business strategies and enhance profitability. Further deep dives into customer satisfaction and product-level analysis could yield even more specific recommendations for growth.***