

SALES_DATA_REPORT

INTRODUCTION

This report delves into the sales data to uncover key insights into sales trends, top-selling products, and customer behaviour. The aim is to provide a comprehensive analysis of sales patterns and identify actionable trends to support strategic decision-making.

OBJECTIVE

The primary goal of this analysis is to gain insights into sales patterns and customer behaviour. We aim to understand how sales fluctuate over time and identify the top-performing products across different countries. By examining monthly sales data, we seek to uncover trends and seasonal patterns, assess the quantity of products ordered, and evaluate customer activity. This analysis will help in identifying key products that drive sales, understanding regional preferences, and making data-driven decisions to optimize sales strategies and inventory management.

DATASET DESCRIPTION

The dataset consists of several key columns: **Invoice No** is an alphanumeric field typically 6 to 10 characters long, uniquely identifying each transaction. **Stock Code** is an alphanumeric code, usually 6 to 8 characters, that specifies each product. **Description** provides textual details about the product, with varying lengths. **Quantity** is a numerical field representing the quantity of items sold in each transaction. **Invoice Date** is a datetime field capturing the date and time of the transaction. **Unit Price** indicates the price per unit of the product, typically formatted as a floating-point number. **Customer ID** is an alphanumeric identifier for each customer, generally 5 to 8 characters long. **Country** provides the name of the country where the transaction took place, with textual entries of varying lengths.

DATA PRE-PROCESSING

In the preprocessing phase, columns with null values, particularly the **Customer ID** column, were carefully managed. Since **Customer ID** is crucial for customer-specific analysis, rows with missing **Customer ID** were excluded from analyses where customer data is essential. However, for other types of analysis, such as product sales trends and overall transaction volumes, the data with missing **Customer ID** was retained.

Additionally, the **Invoice Date** column was processed to enhance the analysis. This involved extracting and creating new columns for date, week, month, and year from the **Invoice Date**. These additional columns facilitate more granular temporal analysis, allowing for better insights into sales patterns over different time periods.

GAINED INSIGHTS

- **Unique Customers:** There are 4,368 distinct customers identified through customer IDs.
- **Total Transactions:** The dataset comprises a total of 541,463 transactions.
- **Product Variety:** A total of 4,070 different products were sold during the analyzed period.
- **Countries Served:** Sales data includes transactions from 37 unique countries.
- **Average Transactions per Country:** On average, each country contributed approximately 14,634 transactions.
- **Total Revenue:** The overall revenue generated from sales amounts to \$9,742,998.14.
- **Average Transactions per Customer:** Each customer made an average of 5.08 transactions.
- **Average Spend per Customer:** The average expenditure per customer is \$1,899.59.

TOP TEN PRODUCTS SOLD

STOCK CODE	DESCRIPTION	TOTAL REVENUE
Dot	Dotcom Postage	206245.48
22423	Regency Cakestand 3 Tier	164736.69
47566	Party Bunting	98302.98
85123a	White Hanging Heart T-Light Holder	97715.99
85099b	Jumbo Bag Red Retrospot	92356.03
23084	Rabbit Night Light	66729.55
Post	Postage	66230.64
22086	Paper Chain Kit 50's Christmas	63791.94
84879	Assorted Colour Bird Ornament	58922.55
79321	Chilli Lights	53768.06

REVENUE GENERATED PER MONTH

Year	Month	Revenue
2010	12	748957
2011	1	560000.3
2011	2	498062.7
2011	3	683267.1
2011	4	492908
2011	5	722277.6
2011	6	690937.3
2011	7	679874.7
2011	8	682149.5
2011	9	1019401
2011	10	1070705
2011	11	1460791
2011	12	433668

TOP TEN CUSTOMERS AND THEIR COUNTRY

CustomerID	Revenue	Country
14646	279489	Netherlands
18102	256438.5	United Kingdom
17450	187482.2	United Kingdom
14911	132572.6	EIRE
12415	123725.5	Australia
14156	113384.1	EIRE
17511	88125.38	United Kingdom
16684	65892.08	United Kingdom
13694	62653.1	United Kingdom
15311	59419.34	United Kingdom

COUNTRIES WITH SIGNIFICANT GROWTH

Australia	436.992	Canada	39.255
Channel Islands	52.372	Denmark	562.125
EIRE	39.090	European Community	22.635
Finland	282.870	France	30.331
Israel	86.235	Italy	227.705
Netherlands	12758.814	Norway	169.559
Poland	46.860	Portugal	36.669
Spain	40.596	Sweden	129.407
Switzerland	34.689		

COUNTRIES WITH SIGNIFICANT DECLINE

Austria	399.830
Bahrain	47.213
Cyprus	87.944
Czech Republic	81.513
Japan	895.868
Malta	20.458

STATISTICAL SUMMARY

The following statistical summary provides insights into the dataset's key metrics: Quantity, UnitPrice, and CustomerID. These statistics help to understand the distribution and range of values for each metric.

1. Quantity

- Count: 541,463
- Mean: 9.55
- Standard Deviation: 218.17
- Minimum: -80,995
- 25th Percentile: 1.00
- Median (50th Percentile): 3.00
- 75th Percentile: 10.00
- Maximum: 80,995

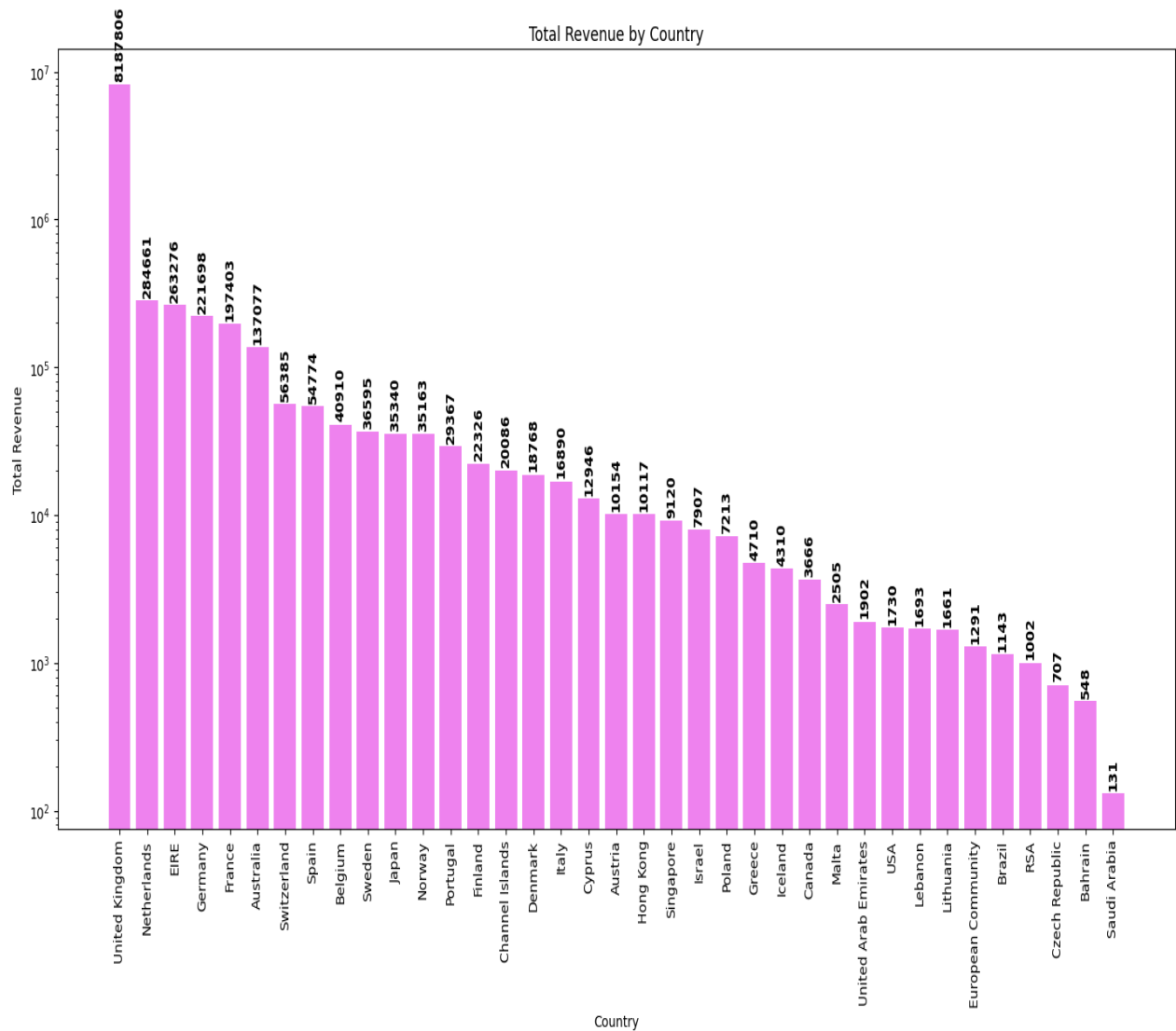
2. UnitPrice

- Count: 541,463
- Mean: 4.61
- Standard Deviation: 96.80
- Minimum: -11,062.06
- 25th Percentile: 1.25
- Median (50th Percentile): 2.08
- 75th Percentile: 4.13
- Maximum: 38,970.00

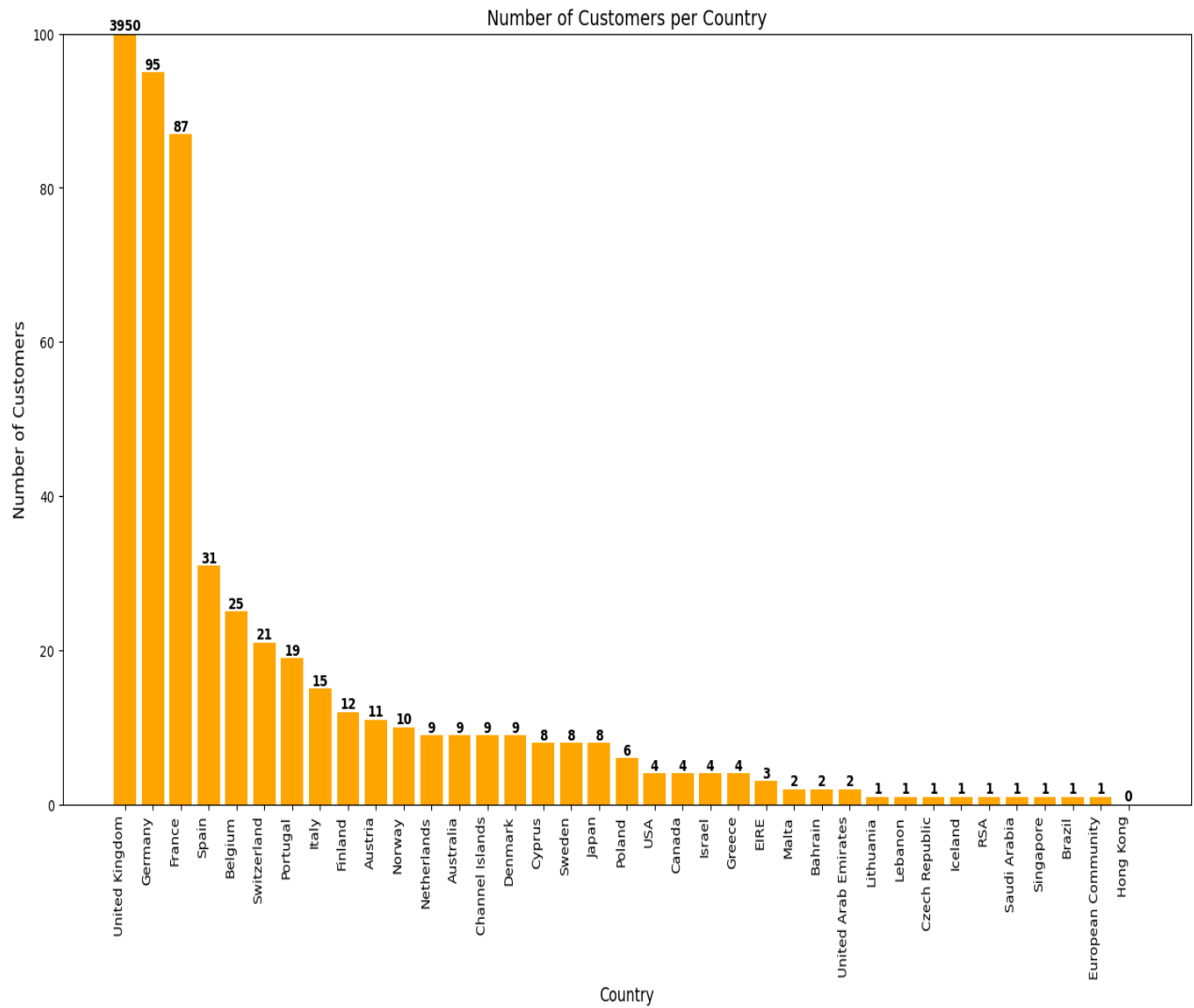
3. CustomerID

- Count: 406,585
- Mean: 15,288.63
- Standard Deviation: 1,713.28
- Minimum: 12,346
- 25th Percentile: 13,956
- Median (50th Percentile): 15,152
- 75th Percentile: 16,791
- Maximum: 18,287

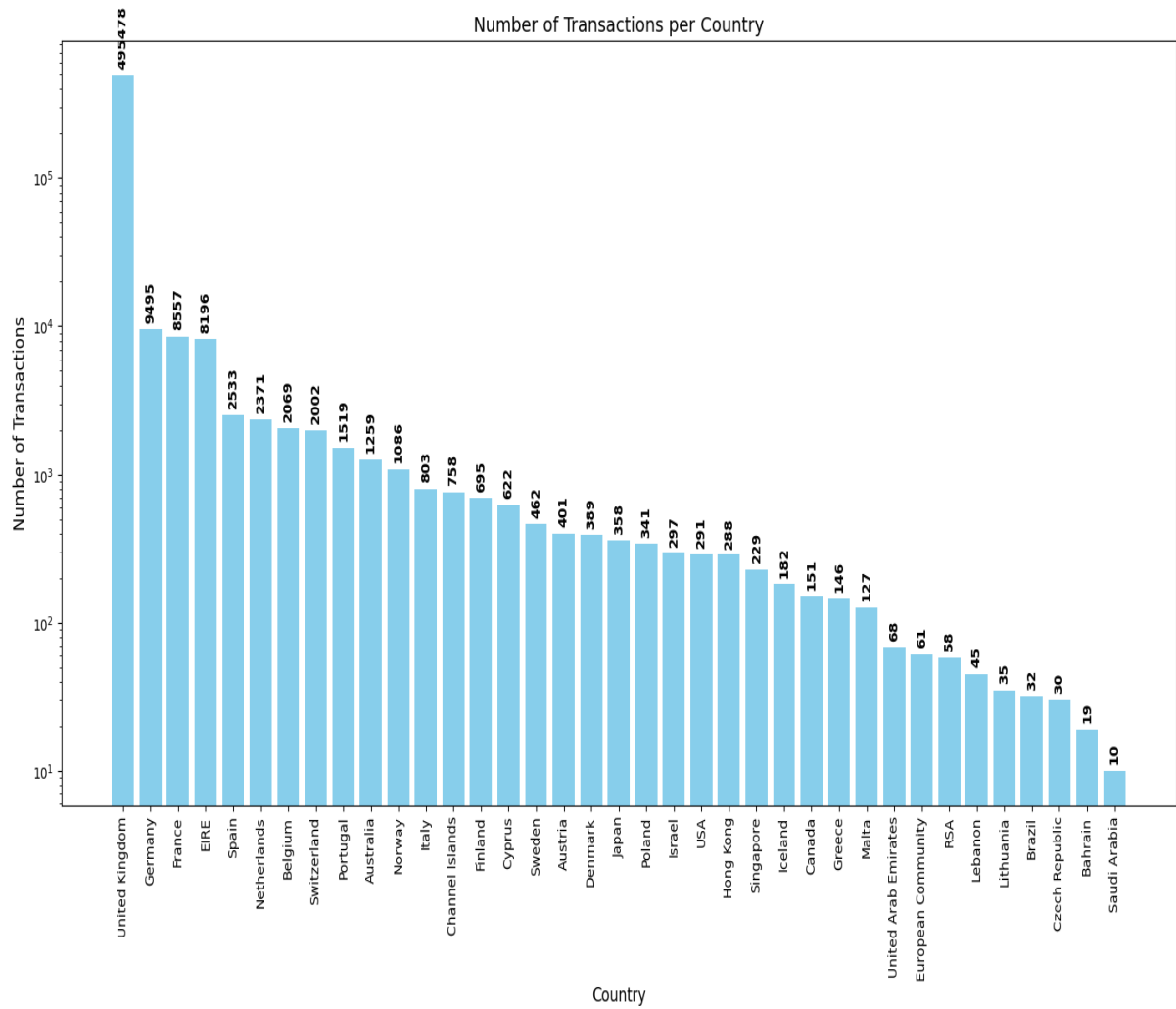
VISUALIZATIONS



- This graph shows the **Total revenue** generated from sales in each country, highlighting the revenue contributions of different regions.
- It allows for a clear comparison of revenue across countries, identifying key markets and revenue trends.

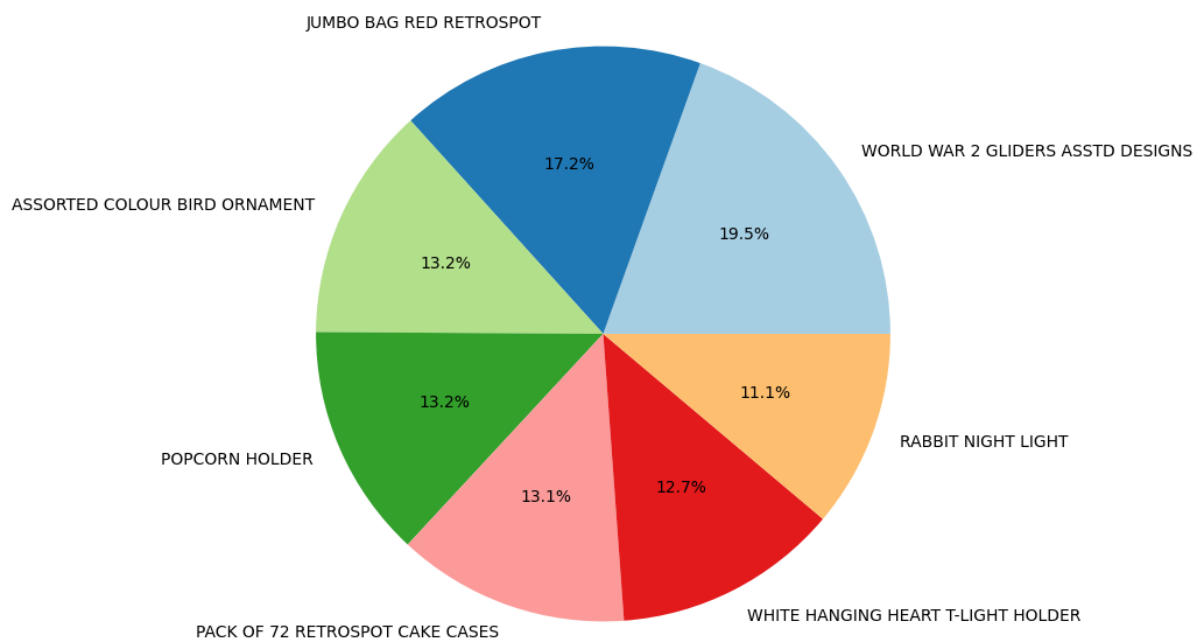


- This graph displays the **Total number of unique customers** for each country, providing insights into customer distribution across different regions.
- It helps identify which countries have higher customer engagement and allows for comparisons between regions to understand market reach.

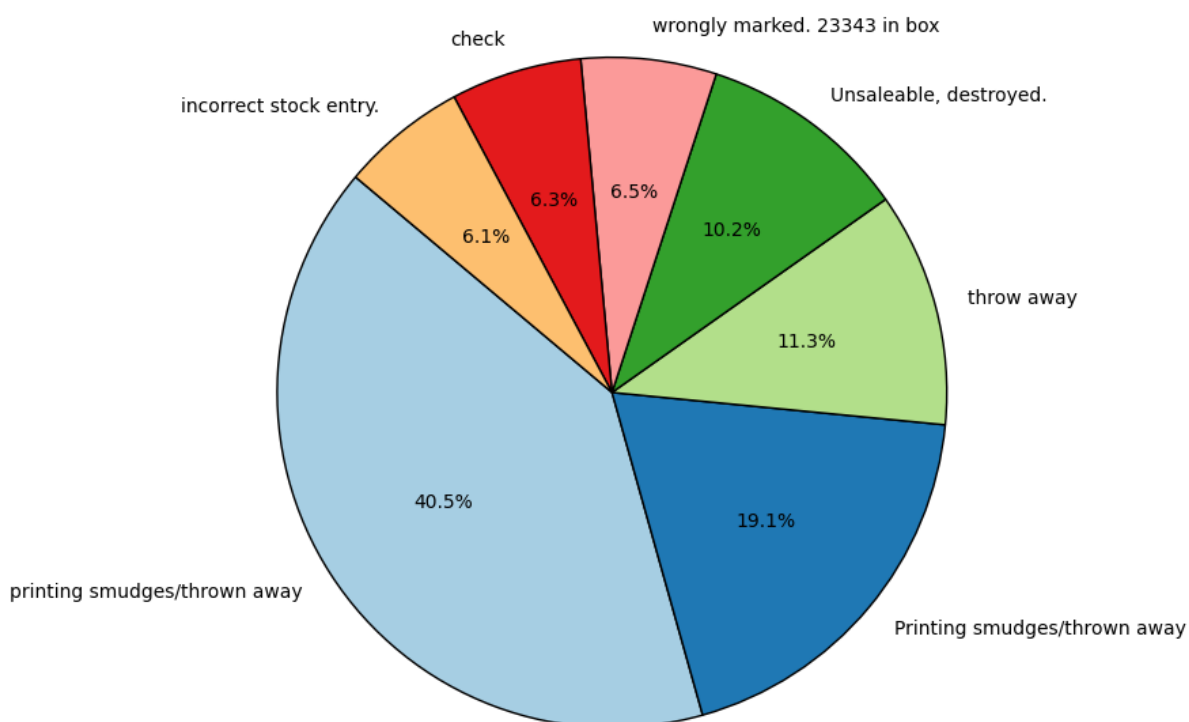


- This graph illustrates the **Total number of transactions** conducted in each country, highlighting the volume of sales activity across different regions.
- It provides a clear view of transaction distribution, enabling comparison between countries to assess which regions have higher or lower sales volumes.

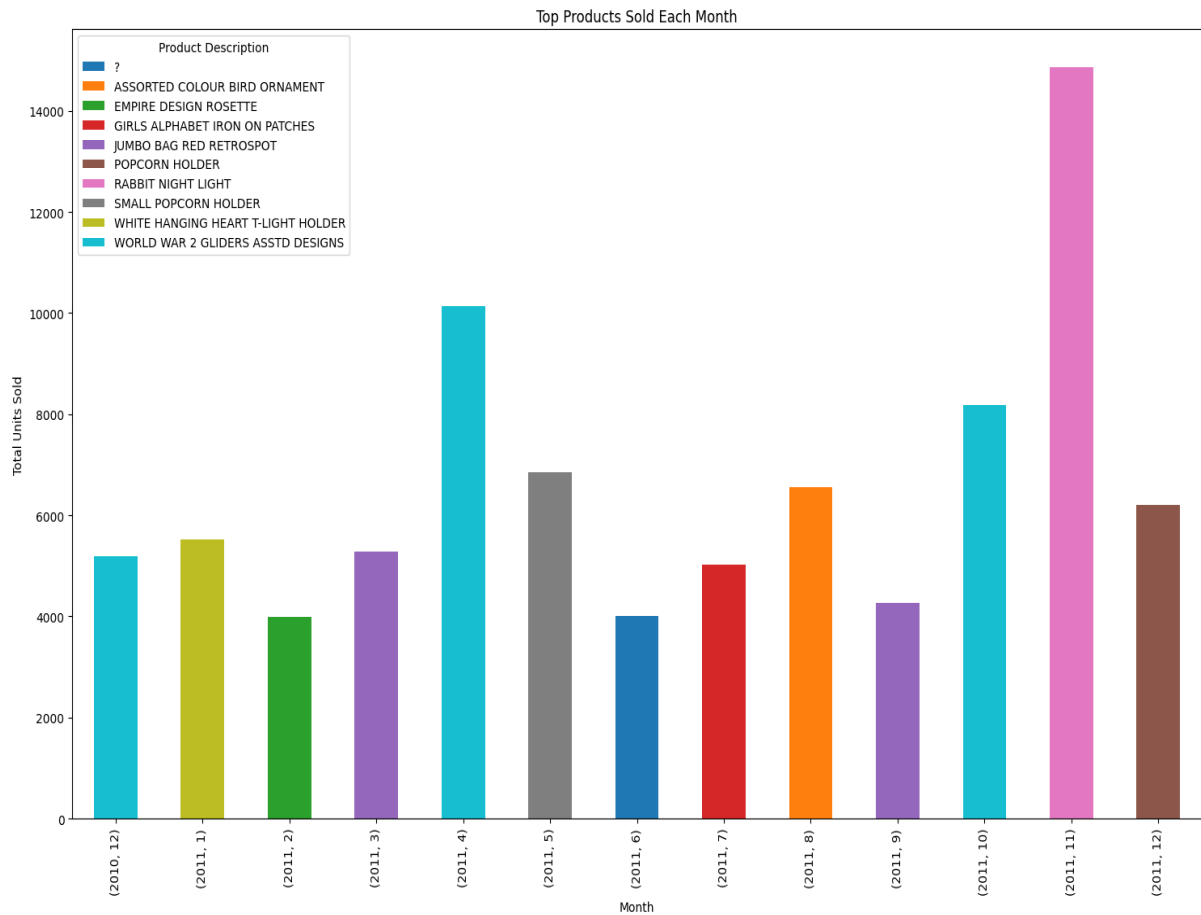
Top 7 Most Ordered Products by Quantity



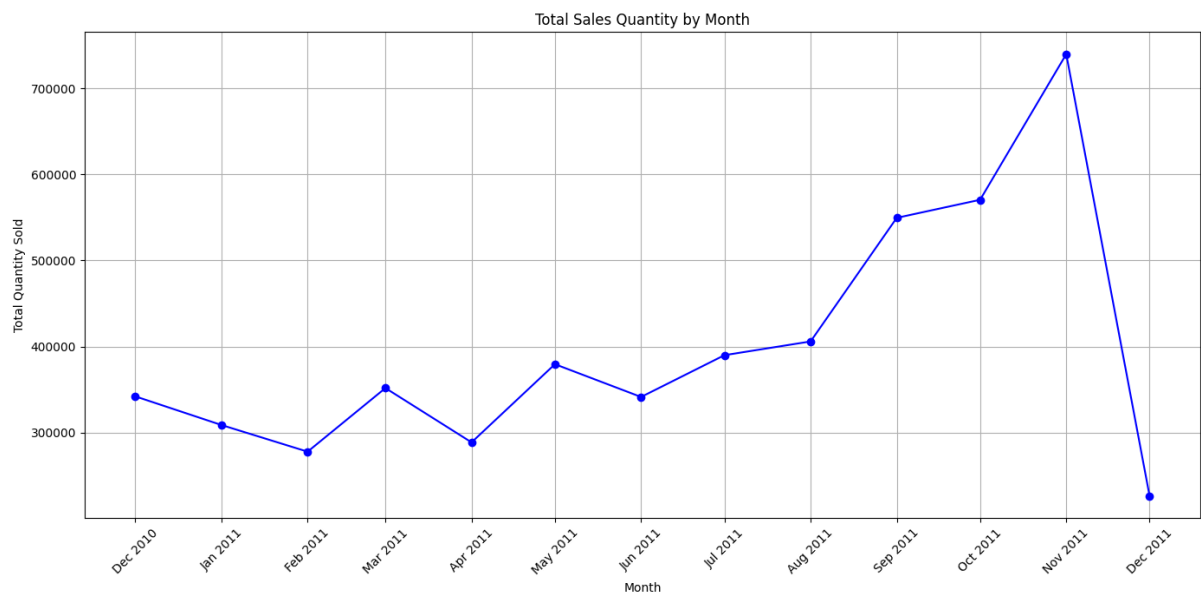
7 Products with the Smallest Quantities Sold



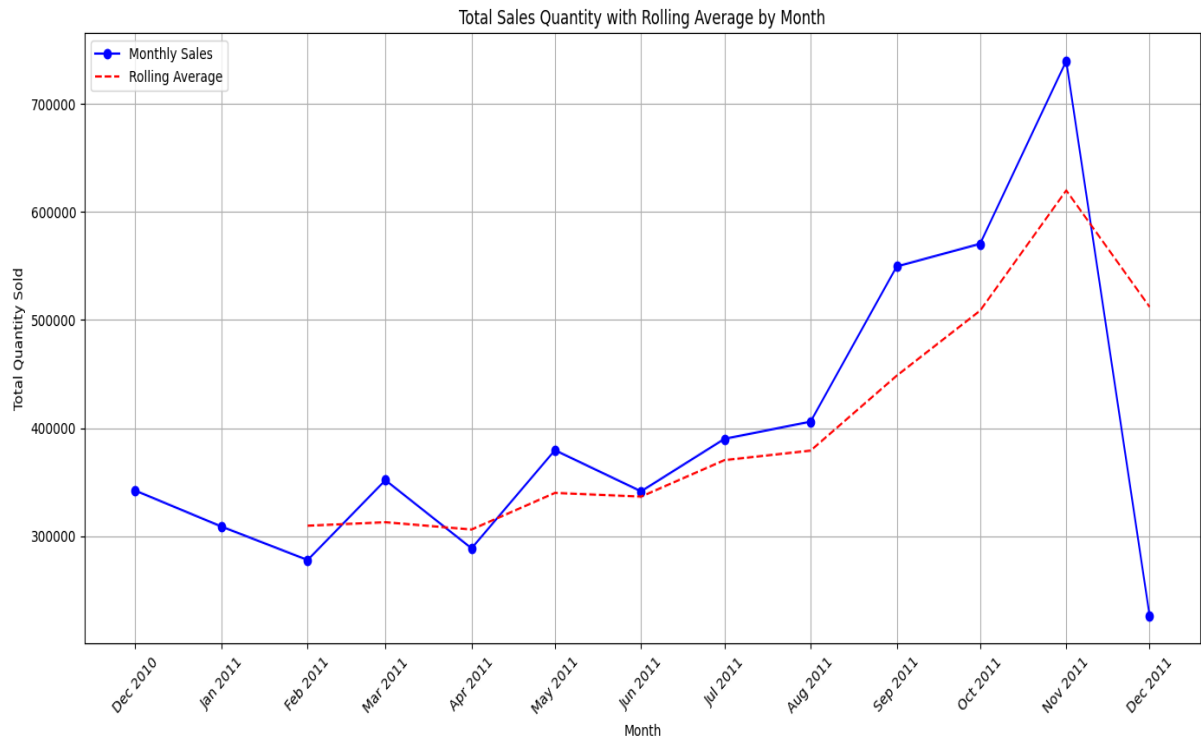
This visualization highlights the **seven products with the highest and lowest** total quantities ordered, showcasing the most popular and unpopular items based on sales volume.



- This visualization illustrates the leading products sold each month, emphasizing which products have consistently high sales performance throughout the year.
- It helps identify monthly sales trends and product popularity, providing insights into seasonal demand patterns and aiding inventory and marketing strategies.



- This visualization displays the **Total quantity of products sold each month**, highlighting fluctuations in sales volume over time.
- It provides a clear view of overall sales performance trends and seasonality, enabling better forecasting and inventory management.



- This graph illustrates the **Total sales quantity per month alongside a rolling average**, smoothing out short-term fluctuations and revealing underlying trends.
- The rolling average helps in identifying longer-term trends and seasonal patterns, providing a clearer picture of overall sales performance.

RECOMMENDATIONS

1. Enhance Product Availability and Distribution:

- Improve the efficiency of supply chains and ensure consistent product availability.
- Address any supply chain issues and enhance inventory management to minimize product shortages. Strengthen distribution networks to ensure that products are readily available during peak season times and in high demand areas.

2. Boost Marketing and Customer Engagement:

- Increase sales in underperforming regions with targeted marketing efforts.
- Launch focused marketing campaigns and promotions tailored to specific regions. Use customer data to personalize offers and increase brand visibility where sales are currently low.

3. Utilize Promotions and Monitor Effectiveness:

- Drive sales with strategic promotions and track their success.
- Implement special offers or discounts to attract more customers.
Continuously monitor the performance of these promotions and adjust strategies based on the results to optimize sales growth.

Note: Due to page constraints, I have included only the most important graphs and points in the report. However, all detailed information and additional graphs are available in the accompanying code.