

Sales Performance Analysis Report

Introduction

To analyze retail sales data and extract meaningful insights on products, time trends, and customer behavior to drive strategic improvements in sales performance.

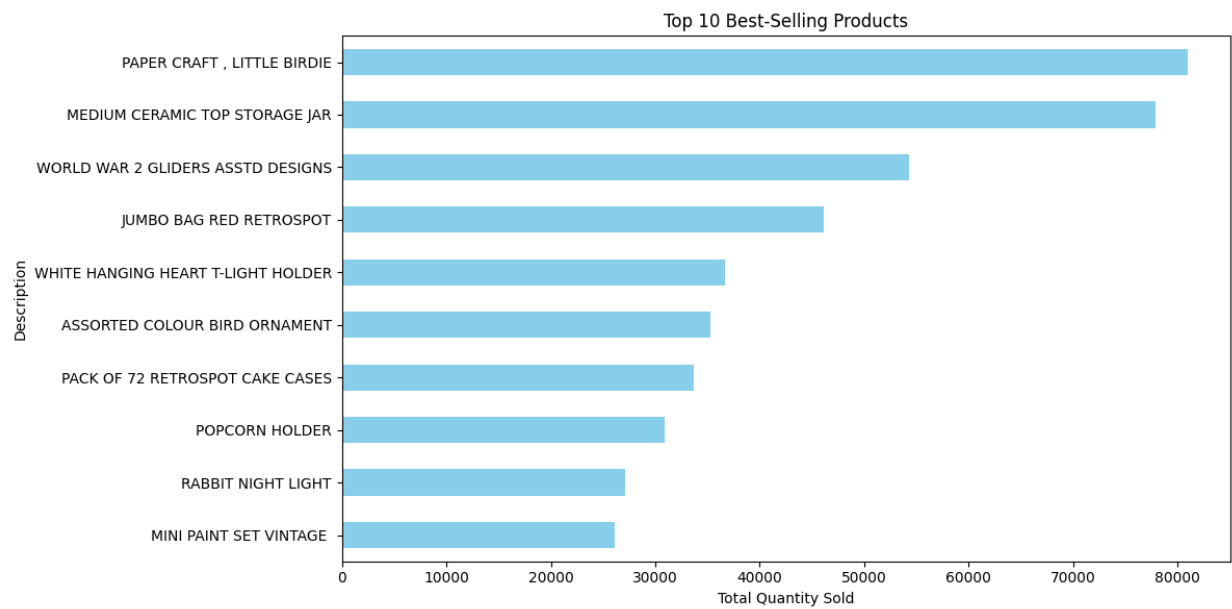
Data Preprocessing

To ensure high-quality and reliable analysis, the sales dataset was carefully cleaned and preprocessed. The following steps were carried out:

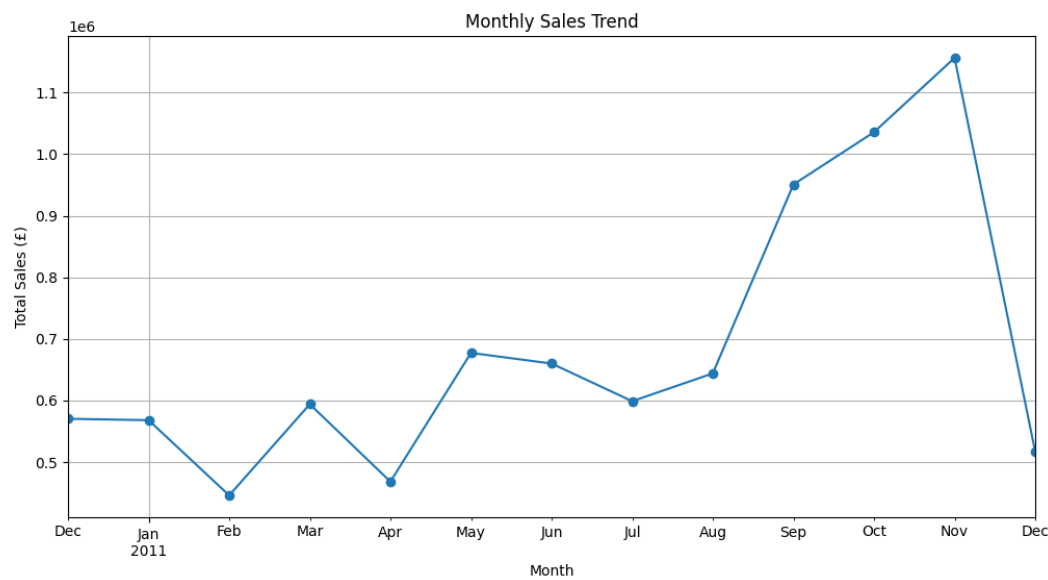
- **Handling Missing Values**
Removed rows with missing `CustomerID` as customer identification was essential for analysis.
- **Removing Duplicates**
Identified and removed duplicate rows to avoid data redundancy and incorrect aggregations.
- **Filtering Invalid Transactions**
Removed records where `Quantity` or `UnitPrice` were less than or equal to zero, as these likely represented returns or input errors.
- **Data Type Conversion**
Converted the `InvoiceDate` column to `datetime` format for time-based analysis.
- **Feature Engineering**
Created a new column `TotalPrice` = `Quantity × UnitPrice` to measure transaction value.
Extracted date-based features:
 - > `InvoiceMonth` (Monthly trend)
 - > `DayOfWeek` (Weekly trend)
 - > `Hour` (Hourly trend)
- **Saved Cleaned Dataset**
Stored the cleaned dataset as `cleaned_sales_data.csv` for further analysis and visualization.

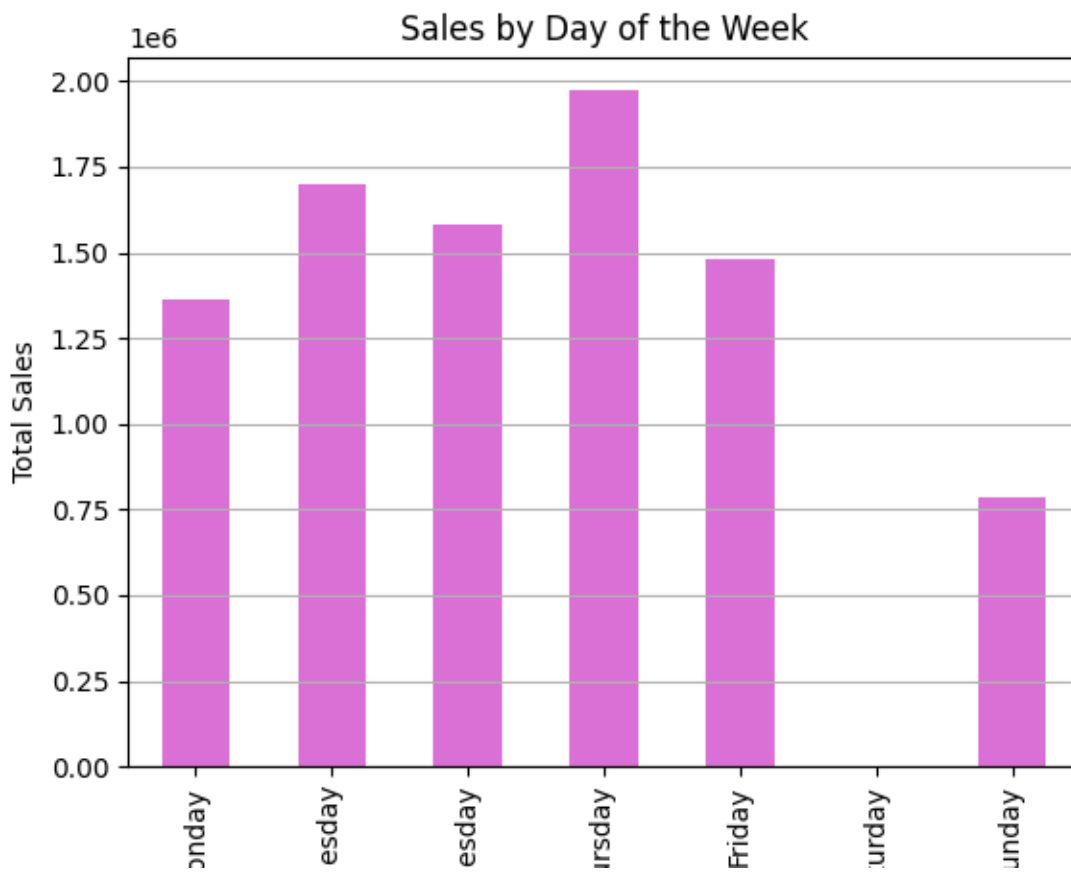
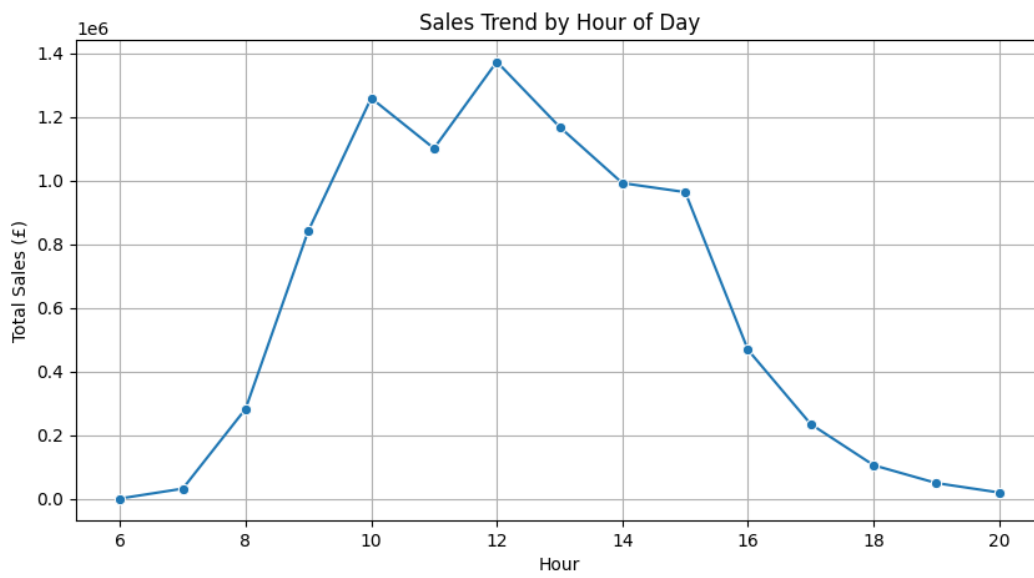
Exploratory Data Analysis

- Top Products



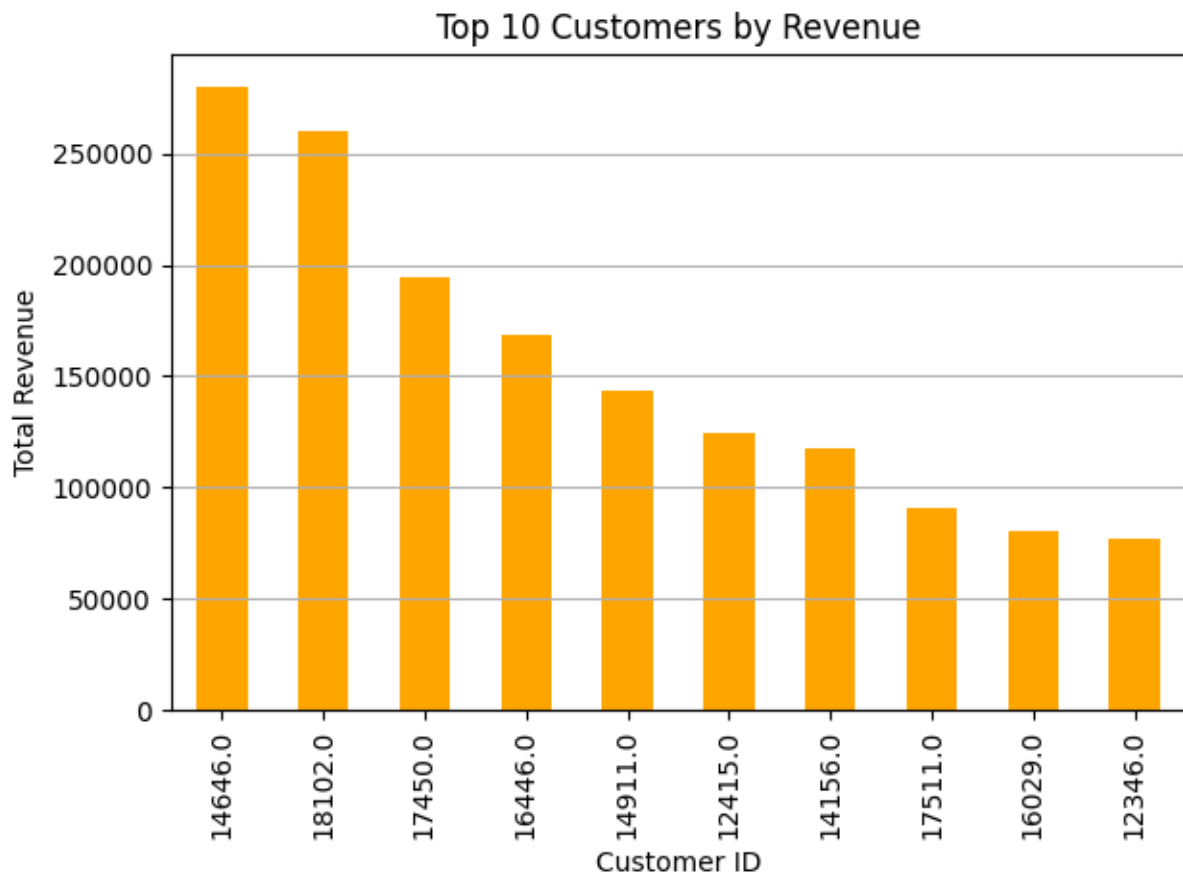
- Sales by Time

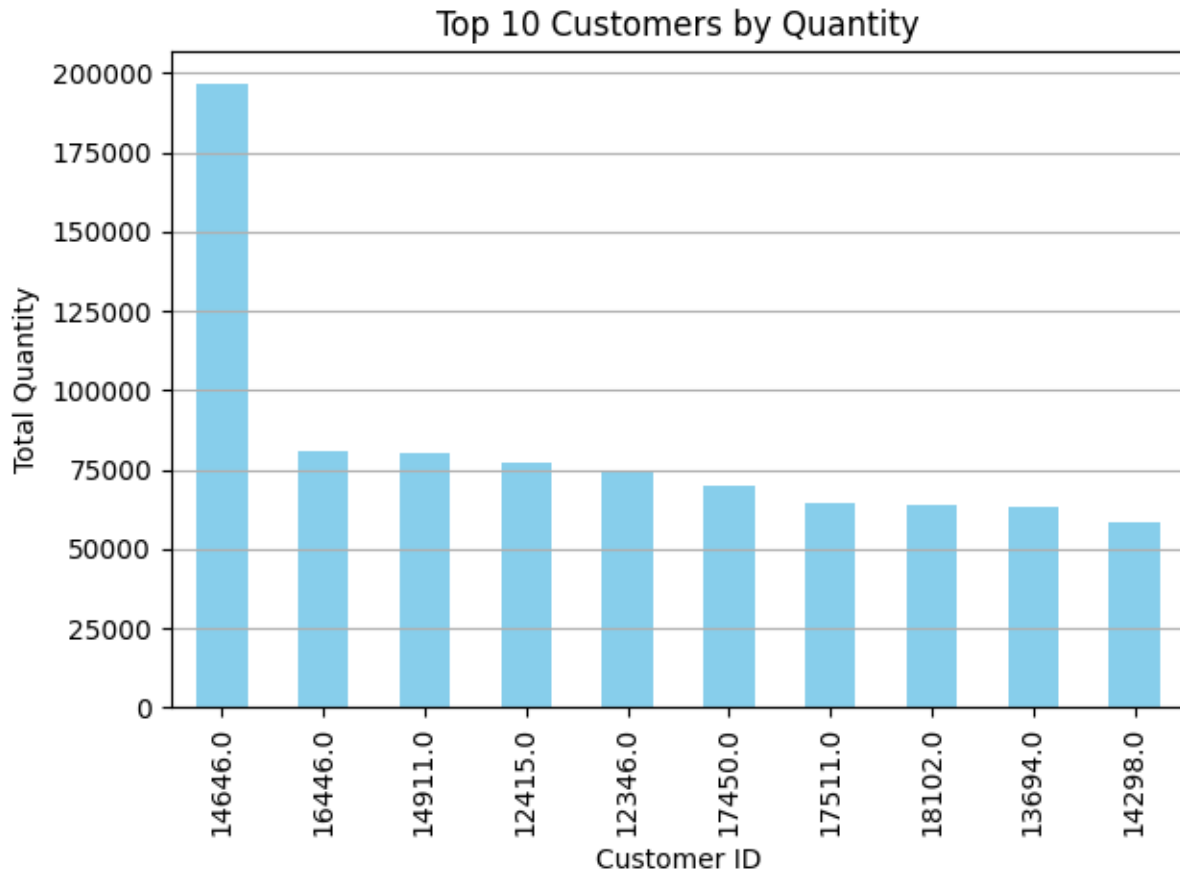




Customer Analysis

- Total customers: 4,338
- Avg spend: ₹2,048
- Top 10 customers by revenue & quantity





Strategic Insights

Based on the observation:

1. The products are Paper craft, Little Birdie which is sold nearly 80000 products and Medium ceramic top storage jar which is sold more than 70000 products.
2. Sales peaked during November and October.
3. Most sales are happened at 10am and 12pm.
4. On weekly basis, Thursday and Tuesday has the vast amount of purchases.
5. Number of total unique customers is 4330 and their average revenue was 2048.

Business Recommendation:

- Stock up inventory before October and November, and run promotional offers aligned with festive trends.
- Run email and social media campaigns around 10 AM – 12 PM to match peak buying hours.

- Launch limited-time weekday offers every Tuesday and Thursday to leverage customer engagement.
- Pair top-selling products with underperforming items to boost overall sales.
- Reward high-revenue customers with loyalty points, exclusive discounts, or early access to new arrivals.

Conclusion

This sales performance analysis project provided valuable insights into customer purchasing behavior, product performance, and sales trends over time. By cleaning and exploring the dataset, key performance indicators such as top-selling products, peak sales hours, and high-revenue customers were identified.