

Task 1: Exploratory Data Analysis (EDA) and Business Insights

Business Insights Report

Executive Summary:

This report examines sales information to determine significant trends and patterns, offering actionable business decision-making insights. Among the key findings are top-performing products, daily sales trends with projections, and regional sales performance.

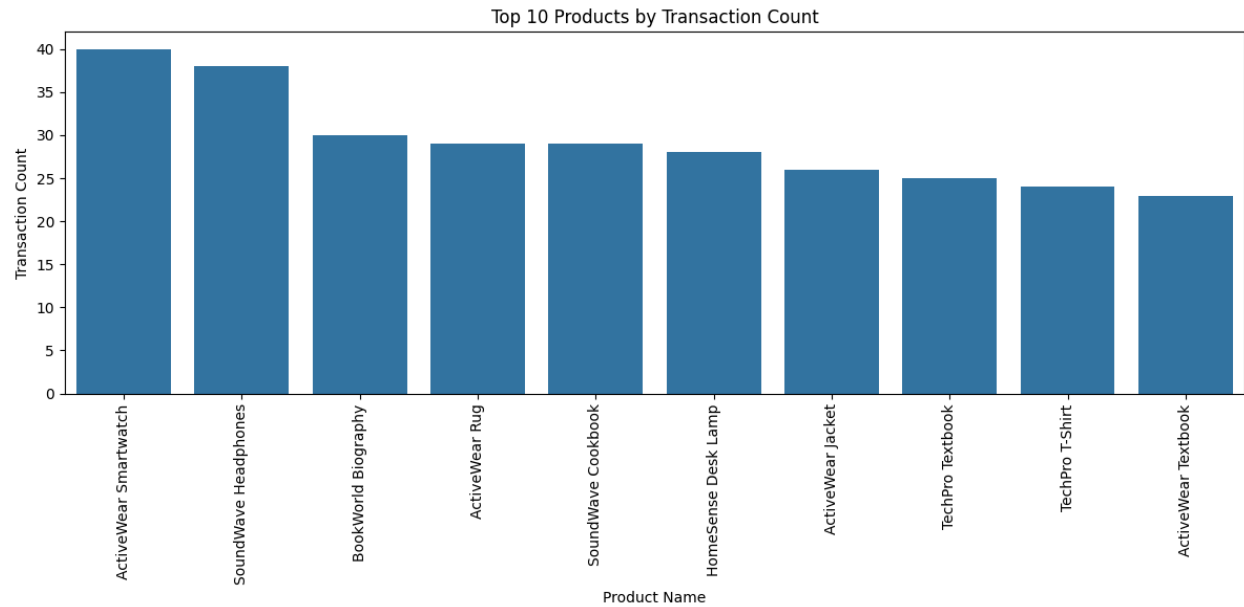
Data Overview:

The analysis draws on sales transaction data, combined with customer and product data. The main measures are transaction date, price, product name, region, and customer demographics. Quantile analysis of the price data and data quality checks were undertaken to validate the accuracy of the analysis. Suspected outliers were detected and their effect on the analysis was avoided using robust tools such as boxplots and IQR calculations.

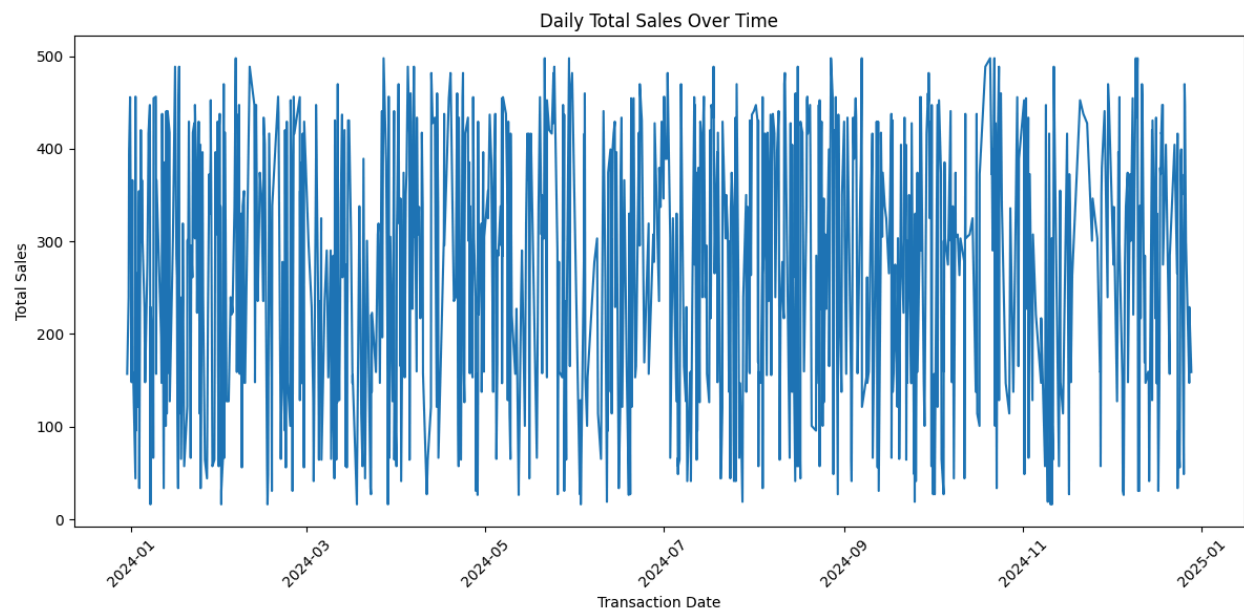
Key Findings:

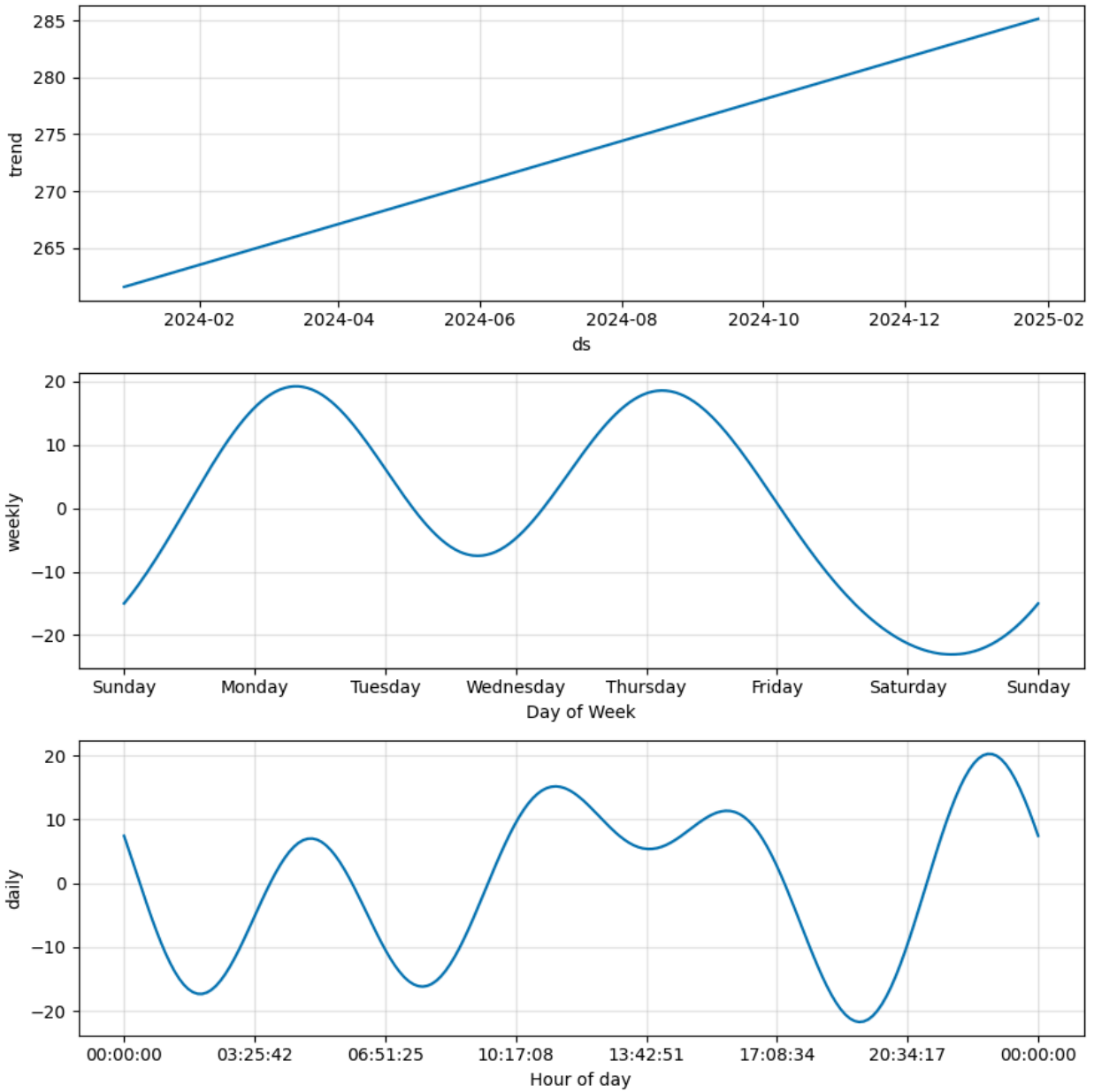
1. Best-Selling Products: The bar chart of the top 10 products by number of transactions is important data for inventory control and marketing strategy. Prioritizing these best-selling items can maximize stock levels, and focused marketing campaigns targeting these products can increase sales.

The individual products must be described in more detail in a subsequent report (with product names specified).

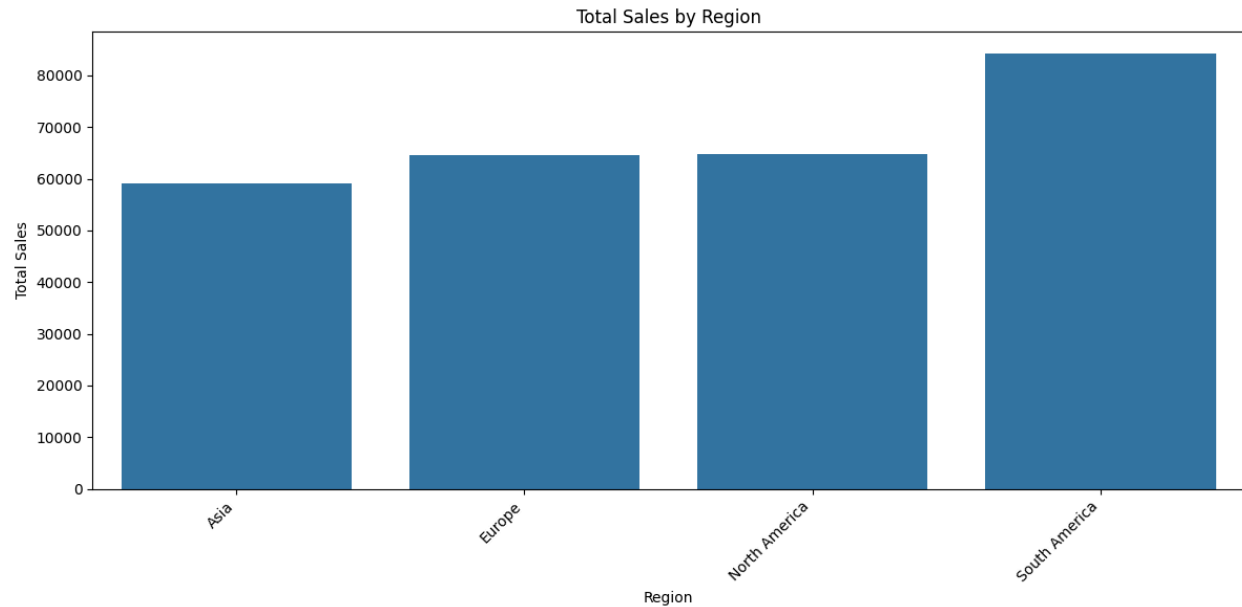


2. Daily Sales Trends & Forecasting: The daily sales time series analysis shows seasonality and trends in sales activity. The Prophet model predicts future sales with useful insights into anticipated demand. This prediction helps in resource planning, inventory management, and strategic staffing and promotional activities decisions. The trend components and forecast plot will assist us in understanding the seasonal effect and future anticipated sales.





3. Regional Sales Performance: The bar chart representing overall sales per region indicates which areas are performing and underperforming. With this information, specific marketing efforts can be conducted in low-performing areas and resources managed effectively in top-performing areas. With the knowledge of sales differences on a regional level, strategies can be tailored to get the maximum reach and sales per area. The details of the numbers on the regional level should also be given in the next report.



Recommendations:

- * Inventory Optimization: Optimize inventory levels on the best-selling products to minimize storage expenses and avoid stockouts.
- * Targeted Marketing: Conduct targeted marketing campaigns on best-selling items and areas that have below-average sales.
- * Resource Allocation: Rebalance staff and advertising budgets according to projected sales patterns.
- * Region-Specific Strategies: Create region-specific sales and marketing strategies to maximize performance in various geographic areas.
- * Deeper Analysis: Explore customer segmentation and customer demographics, product preference, and regional trend correlation in greater detail. Determine the drivers of customer purchase behavior to better target future marketing and product development initiatives.

What's Next:

- * In-depth report with individual products and regional sales.
- * Customer segmentation analysis.
- * Further exploration of outliers in the price data.