

Sales and Profit Analysis

This project focuses on analyzing sales and profit trends over time, identifying top-performing categories and sub-categories, and deriving actionable insights for business growth. Using Python and libraries like pandas, matplotlib, and seaborn, we explore data-driven solutions to improve decision-making. 1. What is the trend of sales and profit over time? 2. Which regions and markets contribute the most to sales and profit? 3. Which cities and states are the most profitable? 4. Which products are the most popular (highest quantity sold)? 5. What is the sales and profit distribution across different markets?

Key Features

Data Cleaning and Preparation:

- Handled missing values, date conversions, and ensured data consistency.

Sales and Profit Trends:

- Analyzed sales and profit trends over time using time-series analysis.

Top Categories and Sub-Categories:

- Identified the best-performing categories and sub-categories by sales and profit.

Negative Value Handling:

- Replaced negative profit values with the overall mean to ensure accuracy.

Interactive Visualizations:

- Created Boxplots, Bar Chart, Pie Chart, Stacked Bar Charts and Line charts for better data understanding.

Tools and Libraries

Programming Language:

- Python

Libraries:

- `pandas` for data manipulation
- `matplotlib` and `seaborn` for data visualization
- `numpy` for numerical operations

Insights Derived

1. What is the trend of sales and profit over time?

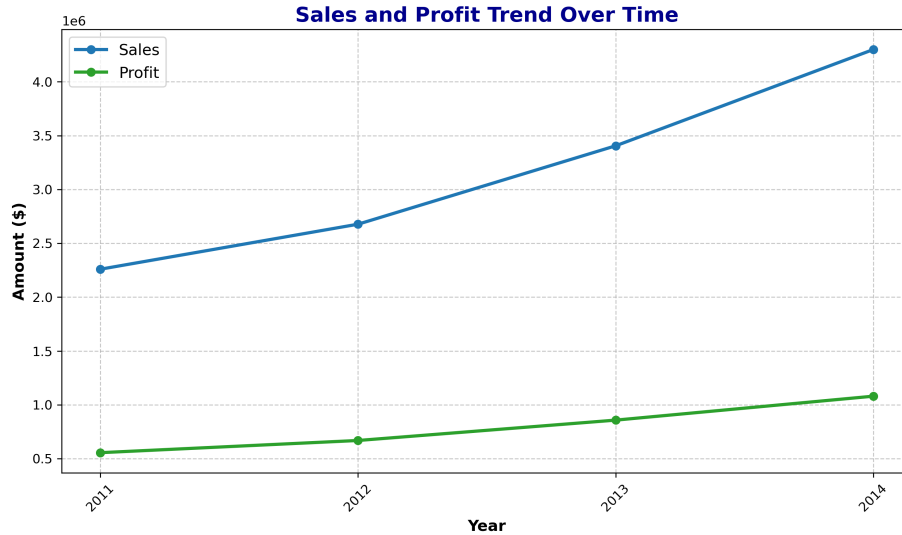


Figure 1: chart

This chart illustrates the trend of sales and profit over time, using a line chart for clear comparison. The blue line represents sales, and the green line represents profit. The chart effectively visualizes the financial performance across different years, highlighting key trends and fluctuations. Sales and Profit: The lines track sales and profit values over time, with markers indicating data points. Time Period: The x-axis shows the years, and the y-axis represents the monetary value in dollars. This visualization helps in understanding how sales and profit have evolved, enabling better forecasting and strategy planning.

2. Which regions and markets contribute the most to sales and profit?

This visualization uses stacked bar charts to display the top regions and markets by sales and profit. Top Regions by Sales and Profit: The first chart visualizes the top-performing regions in terms of sales and profit, represented in stacked bars. The blue section indicates sales, and the green section shows profit. Top Markets by Sales and Profit: The second chart highlights the top-performing markets based on sales and profit, also represented by stacked bars. The use of stacked bars allows easy comparison between sales and profit for each region and market. This visual is crucial for identifying the best-performing areas for strategic business decisions.

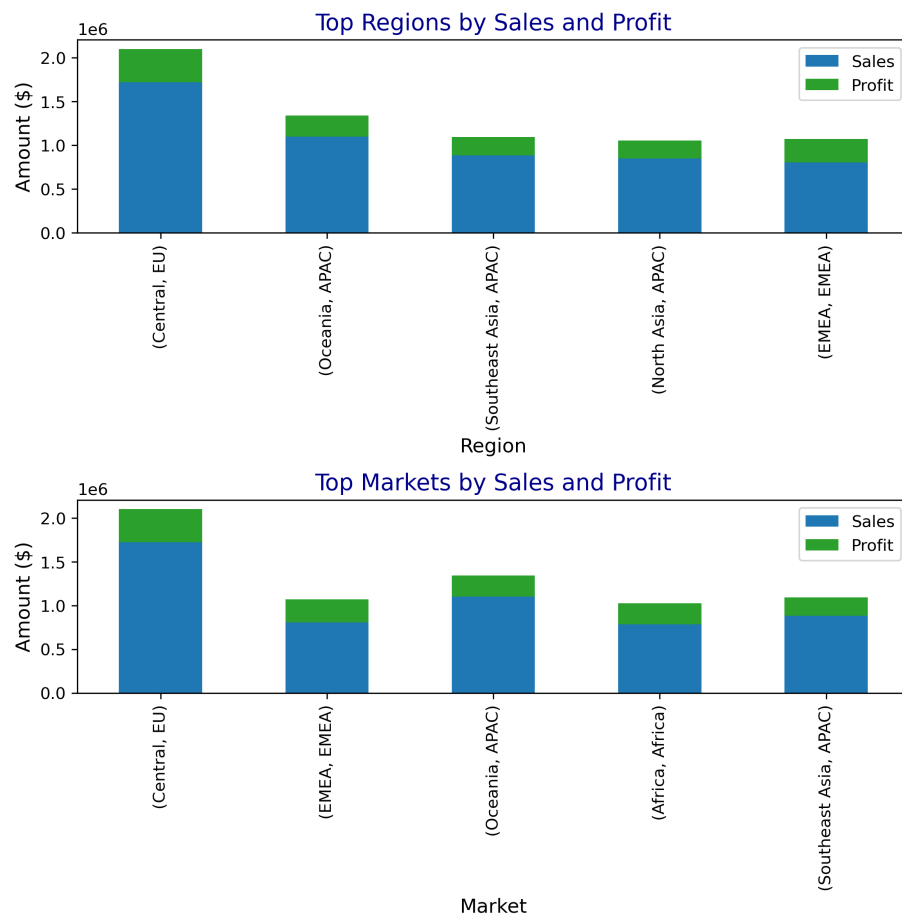


Figure 2: chart1

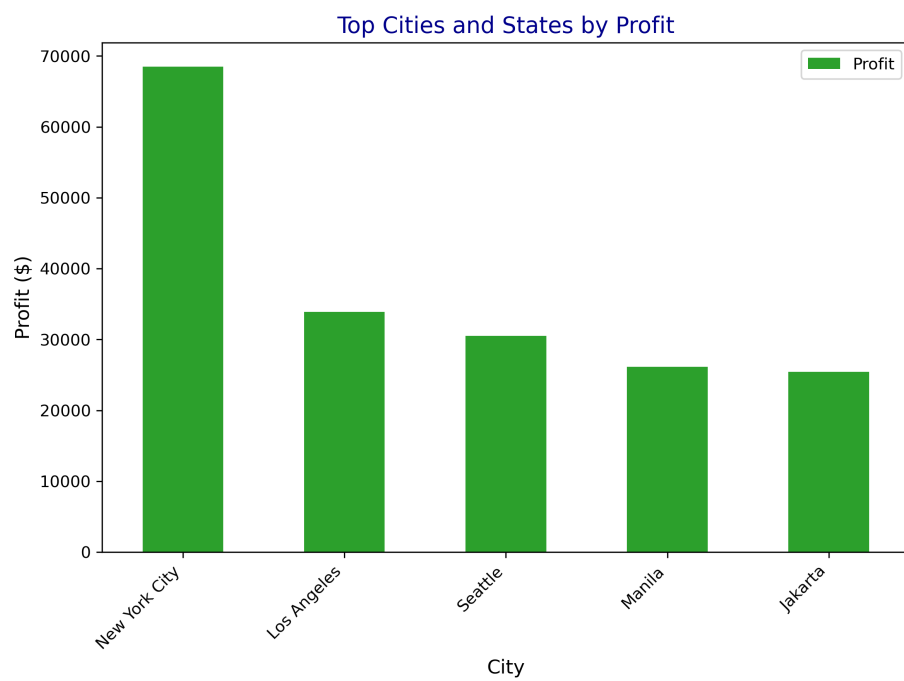


Figure 3: chart2

3. Which cities and states are the most profitable?

This bar chart highlights the top cities and states based on profit. Top Cities and States by Profit: The chart ranks cities and states with the highest profit, with each bar representing profit in dollars. Visualization Features: The green color represents the profit, making it easy to identify the most profitable locations. The x-axis displays the cities, and the y-axis shows the corresponding profit. This visualization is useful for identifying the areas where business strategies can be optimized to boost profitability.

4. Which products are the most popular (highest quantity sold)?

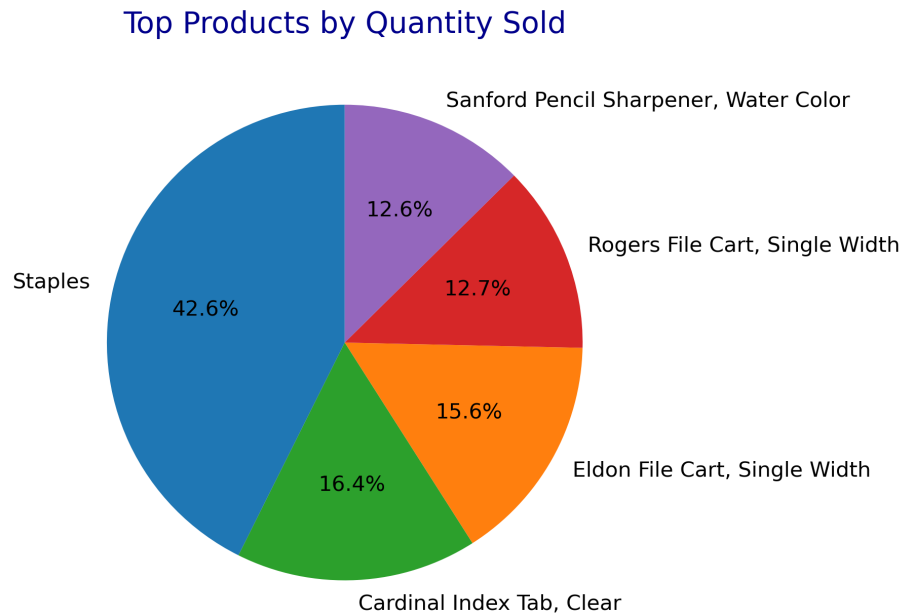


Figure 4: chart3

This pie chart visualizes the top products based on the quantity sold. Top Products by Quantity Sold: The chart displays the products with the highest sales quantities, with each slice representing the quantity sold for a specific product. Color Scheme: Each product is represented by a distinct color for clear differentiation. The chart includes percentages for easy comparison of product popularity. Visualization Features: The title is in dark blue, highlighting the focus on top products, and the chart provides insights into which products contribute the most in terms of quantity. This chart is effective for identifying best-selling products and can help businesses focus on their most popular items.

5. What is the sales and profit distribution across different markets?

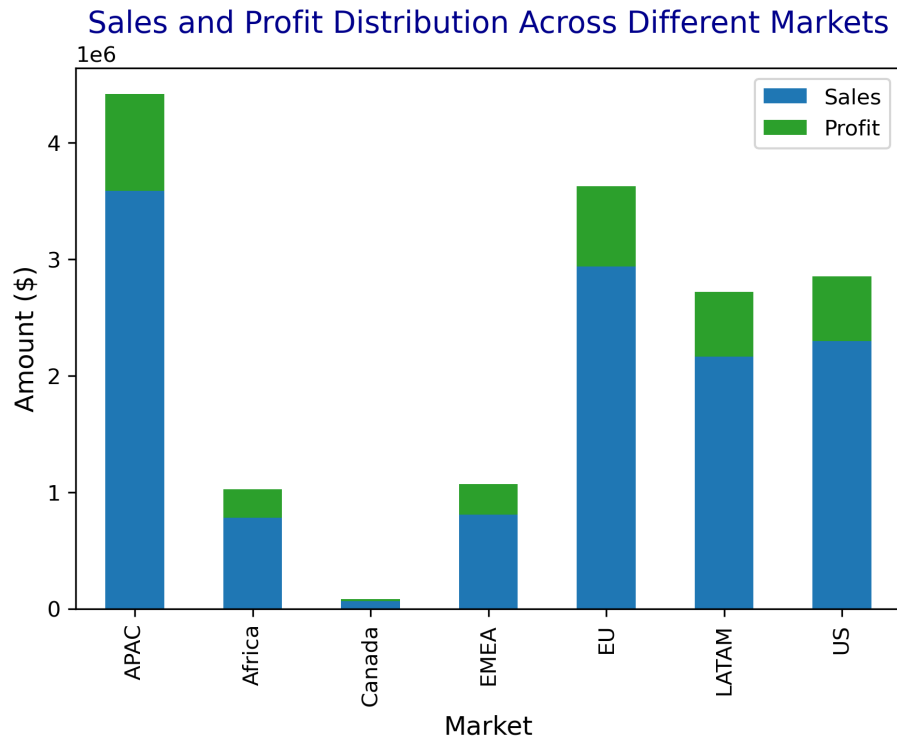


Figure 5: chart4

This bar chart illustrates the Sales and Profit Distribution Across Different Markets using a stacked bar chart format. Sales and Profit Representation: Each bar represents a market, with the stacked portions indicating the sales and profit. Sales are represented by the color #1f77b4, and profit is represented by the color #2ca02c. Color Scheme: The two contrasting colors make it easy to distinguish between sales and profit values for each market. Insights: This chart helps to identify which markets are performing well in both sales and profit, providing a clear view of the financial distribution across different markets. This type of visualization is useful for comparing the contributions of sales and profit across markets at a glance.