Project title: E-Commerce Sales Analysis Dashboard

Objective

The goal of this project was to analyze e-commerce sales data to uncover key trends, evaluate product performance, assess regional sales insights, and understand customer purchasing behavior. The ultimate objective was to provide actionable business insights that could drive revenue growth, optimize product strategies, and identify high-performing cities and time periods to enhance decision-making.

Approach and Results

The project began with thorough data preparation, which involved cleaning the dataset to remove duplicates, invalid entries, and unnecessary columns. The `Order Date` column was formatted into the correct datetime structure, and additional features such as Month and Time of Day were extracted to enable granular analysis. Following this, exploratory data analysis (EDA) was conducted to identify key sales patterns and trends.

Monthly sales trends revealed significant seasonal variations, with December achieving peak sales of $4.61M, highlighting the impact of the holiday season. Analysis of product performance showed that the **Laptops and Computers** category generated the highest revenue, totaling $10M, followed by **Phones and Accessories**. Regional analysis identified **San Francisco** as the top-performing city, contributing $8.25M in total sales, with Los Angeles and New York City closely following. Additionally, customer purchasing patterns highlighted that 70% of sales occurred during the afternoon and evening, providing key insights into customer behavior.

To visualize these findings, an interactive Tableau dashboard was created. The dashboard featured key performance indicators (KPIs) such as Total Revenue ($34.47M), Average Order Value ($193.2), and Total Sales Quantity (208,812). It also included visualizations for monthly sales trends, regional sales performance, top-selling product categories, and sales distribution by time of day, offering users a comprehensive view of e-commerce performance.

Business Insight:

The analysis provided several actionable business insights. Firstly, December was identified as the highest sales month due to the holiday season, emphasizing the need to focus marketing campaigns during Q4 to maximize revenue. The **Laptops and Computers** and **Phones and Accessorie**s categories emerged as the most profitable, highlighting the importance of investing in inventory management and promotional efforts for these products. Regional analysis revealed that San Francisco was the top-performing city, suggesting an opportunity to expand marketing and logistics operations in this area, followed by Los Angeles and New York City.

Customer purchasing patterns showed that the afternoon and evening were peak sales times, accounting for the majority of revenue. This insight suggests that advertisements and promotional activities should be scheduled during these hours to maximize customer engagement. Additionally, categories such as **Audio Devices** and **Entertainment Devices** showed potential for growth, indicating that bundling offers, or targeted discounts could help boost sales in these areas.

Recommendations

Based on the analysis, the following recommendations are proposed:

1. **Seasonal Marketing Campaigns:**
   Focus advertising and promotional efforts during the holiday season, particularly in Q4, to capitalize on peak sales in December. Introduce holiday-specific deals and bundles to attract more customers.

2. **Inventory Optimization:**
   Prioritize inventory for high-performing categories such as Laptops and Computers and Phones and Accessories. Ensure adequate stock availability to meet increased demand during peak months.

3. **Regional Expansion:**
   Invest in marketing and logistics operations in high-revenue cities like San Francisco, Los Angeles, and New York City. Consider region-specific campaigns to further boost sales in these areas.

4. **Time-Based Advertising:**
   Schedule advertisements and promotional offers during the afternoon and evening, as these are the times when customer activity is highest. Use targeted email campaigns and social media ads to reach customers during these peak periods.

5. **Growth Strategies for Emerging Categories:**
   Explore opportunities to grow sales in categories like Audio Devices and Entertainment Devices. Introduce discounts, bundle offers, or cross-promotions with related products to increase demand.

6. **Data-Driven Decision Making:**
   Regularly update and monitor the Tableau dashboard to track sales trends and performance metrics. Use insights from the dashboard to make informed decisions on pricing, promotions, and resource allocation.

7. **Customer Engagement:**

Use loyalty programs or special offers for repeat customers in top-performing cities. Enhance customer engagement through personalized marketing strategies based on regional and time-of-day preferences.

Conclusion

The E-Commerce Sales Analysis Dashboard provided valuable insights into key performance drivers, seasonal trends, regional opportunities, and customer behavior. By implementing the recommendations, businesses can optimize their strategies, enhance customer engagement, and maximize revenue. The interactive dashboard serves as a powerful tool for stakeholders to explore data, identify opportunities, and monitor performance effectively.

Dashboard
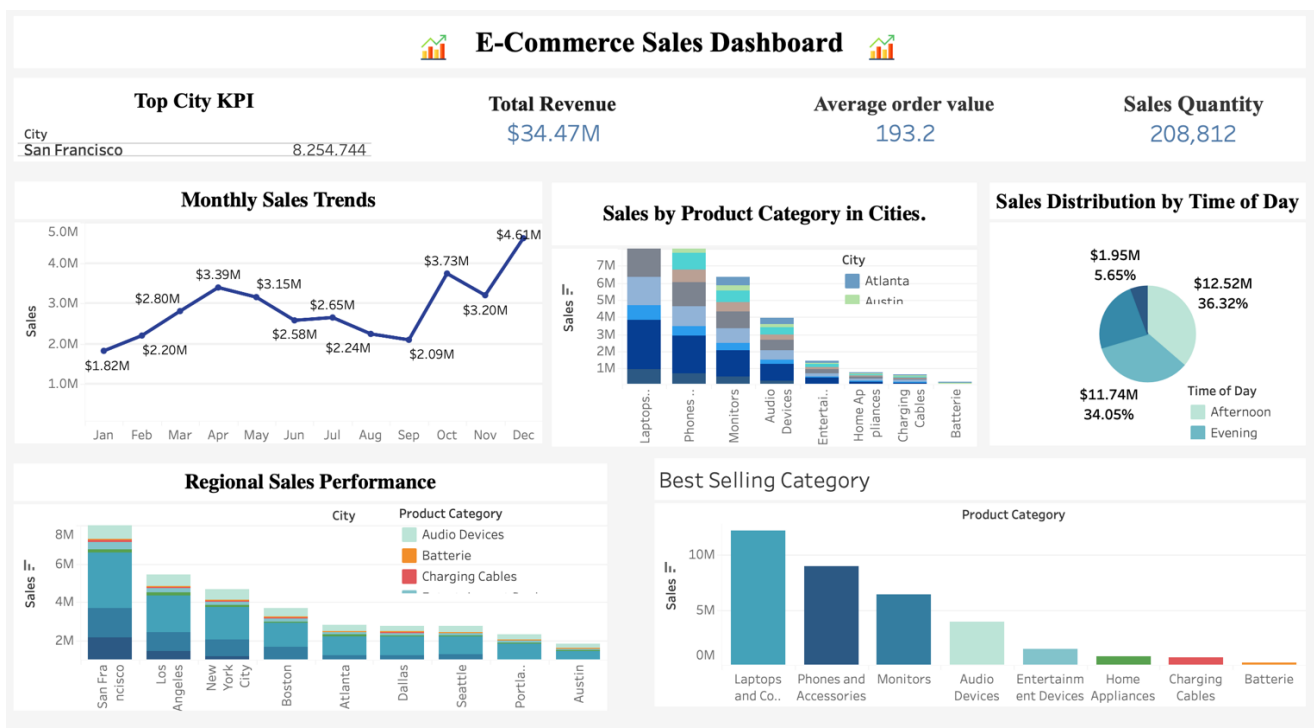
Here is the dashboard link:

https://public.tableau.com/app/profile/sumaiya.rage/viz/SalesData_1733293591770/E-commerceSalesDashboard?publish=yes