DataSpark: Illuminating Insights for Global Electronics

"This project, titled 'DataSpark: Illuminating Insights for Global Electronics,' is a retail analytics project aimed at uncovering business insights using exploratory data analysis (EDA). It focuses on customer behavior, sales performance, product profitability, and store-level analysis using real-world-style datasets from a global electronics retailer."

Problem Statement

The business problem was to help Global Electronics optimize marketing, inventory, pricing, and store operations using their sales, customer, product, and currency data. The company wanted actionable insights to boost customer satisfaction and business performance.

Approach

➤ Data Collection:

I received datasets related to customers, sales, products, stores, and exchange rates. I explored schema and checked for completeness.

➤ Data Cleaning & Preprocessing:

I handled missing values, converted date and currency columns, removed outliers, and merged the datasets using common keys.

➤ SQL Database Integration:

I structured the cleaned data into SQL tables and ran 10+ queries to extract key business insights like top-selling products, customer purchase frequency, and store-wise performance.

➤ EDA & Visualizations:

Using Python (Pandas, Seaborn), I explored purchase patterns, customer demographics, product trends, and regional sales distributions.

➤ Dashboard in Power BI:

I connected Power BI to the SQL database to create interactive dashboards showcasing time-series sales, customer segmentation, and store heatmaps.

Insights Found

Customer Analysis:

In my analysis, I segmented customers by age, gender, and location. I discovered that urban women aged 25–34 had the highest average order value. This suggested that they are more inclined to purchase higher-value items. Based on this, we recommended targeted marketing strategies for premium products toward this segment to maximize revenue potential.

Product Insights:

During my product performance analysis, I observed a Pareto pattern — the top 10% of SKUs were responsible for nearly 70% of revenue. This insight helped to prioritize inventory and stocking decisions, ensuring these high-impact products are always available to meet demand and avoid lost sales.

Store Analysis:

I analyzed store performance across regions and found that large-format stores in metro areas consistently generated the highest sales, likely due to better foot traffic and product availability. However, one store in a low-footfall zone showed persistent underperformance. We recommended a deep-dive analysis to either optimize operations or consider closure, depending on long-term viability.

Sales Analysis:

In my global sales analysis, I noticed that exchange rate volatility significantly impacted international sales volume and profitability. To address this, I proposed a dynamic pricing strategy that adapts to currency fluctuations. This would help maintain price competitiveness, protect margins, and create consistency for customers across regions.

Technical Execution

The code was written in a modular Python format following PEP-8 standards, and version-controlled using GitHub. I used SQL for querying and Power BI for visual storytelling. The entire repo has a structured README and is publicly hosted.

Business Impact & Recommendations

Based on my analysis, I delivered targeted recommendations for customer segmentation, inventory optimization, and regional expansion. These were designed to enhance forecasting accuracy, ensure efficient product distribution, and minimize operational expenses. The insights offer a strategic path to drive revenue growth and operational efficiency if implemented effectively.

Technical Experience & Skill Development

This project allowed me to manage the full data pipeline—from ingesting and cleaning raw retail data to performing SQL-based analysis and visualizing insights in dashboards. It helped me improve both my technical skills and my ability to draw and communicate business-relevant conclusions, especially in areas like customer targeting, inventory management, and regional store planning.