

# Data Spark: Illuminating Insights for Global Electronics

## Project Overview

**Domain:** Retail Analytics in the Electronics Industry

**Skills Utilized:** Data Cleaning, Preprocessing, Exploratory Data Analysis (EDA), Python, SQL, Power BI/Tableau

## Problem Statement

Global Electronics, a leading retailer of consumer electronics, provided several datasets containing information on customers, products, sales, stores, and currency exchange rates. The goal of this project was to conduct a comprehensive **Exploratory Data Analysis (EDA)** to extract meaningful insights that would:

- Enhance customer satisfaction
- Optimize operations
- Improve sales forecasting
- Drive overall business growth

## Business Use Cases

By analysing customer, product, sales, and store data, the following objectives were achieved:

- Identifying key customer demographics and purchasing behaviours
- Optimizing inventory management
- Improving marketing strategies and promotions
- Assessing store performance and expansion opportunities
- Analysing currency exchange rates' impact on sales

## Approach

### 1. Data Cleaning and Preparation

- Checked for missing values and handled them appropriately
- Converted data types where necessary (e.g., dates, numerical values)
- Merged datasets for comprehensive analysis (e.g., linking sales data with product and customer data)

### 2. Data Loading

- Inserted the pre-processed data into an **SQL database** by creating structured tables
- Used **SQL INSERT** statements to load the data

### 3. Power BI/Tableau Visualization

- Connected the SQL database to **Power BI/Tableau**
- Created interactive dashboards for insights visualization

#### 4. SQL Query Development

- Developed **10 SQL queries** to extract critical insights supporting business decisions

#### Analysis Steps and Findings

##### Customer Analysis

- **Demographics:** Segmented customers based on **age, gender, and location**
- **Purchase Patterns:** Identified average order values, purchase frequency, and preferred products
- **Customer Segmentation:** Grouped customers based on demographics and purchasing behaviours

##### Sales Analysis

- **Overall Sales Performance:** Identified sales trends and seasonal patterns
- **Product Sales:** Evaluated best-selling products based on revenue and quantity sold
- **Store Sales:** Assessed sales performance across different store locations
- **Currency Impact:** Analysed the effect of exchange rates on international sales

##### Product Analysis

- **Product Popularity:** Determined top-performing and least popular products
- **Profitability:** Calculated profit margins for different product categories
- **Category Performance:** Analysed sales distribution across product categories

##### Store Analysis

- **Store Performance:** Assessed sales volume, store size, and operational efficiency
- **Geographical Insights:** Identified high-performing regions for potential expansion

#### Results and Deliverables

- **Comprehensive EDA Report** with detailed insights and actionable recommendations
- **Clean and Integrated Datasets**
- **Interactive Visualizations** in Power BI/Tableau
- **SQL Queries** addressing key business questions
- **Final Project Report** summarizing findings and recommendations

#### Project Deliverables

- **Data Cleaning & Preparation:** Ensured data quality and integration
- **Exploratory Data Analysis (EDA):** Conducted in-depth analysis to uncover patterns
- **Visualizations:** Created dashboards to effectively present insights
- **Final Report:** Summarized key findings and business recommendations

## Conclusion

Through this project, actionable insights were provided to **enhance marketing strategies, optimize inventory management, and improve sales forecasting**. The analysis and recommendations will help **Global Electronics** make informed business decisions that **boost customer satisfaction and revenue growth**.

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