

# Exploratory Data Analysis (EDA) and Business Insights

## Introduction:

The eCommerce Transactions dataset consists of three files: Customers.csv, Products.csv, and Transactions.csv. This analysis aims to explore customer behavior, product trends, and transaction patterns to generate actionable business insights that enhance decision-making.

## Business Insights:

### 1. Top-Selling Products

- The **ActiveWear Smartwatch** is the best-selling product with a total quantity of **100 units sold**, followed by the **SoundWave Headphones** with **97 units sold**.
- **ActiveWear** and **SoundWave** products dominate the top-selling list, accounting for most of the popular items.  
**Actionable Insight:** Focus marketing efforts on the top-selling product lines, especially **ActiveWear** and **SoundWave**, to maintain and grow their market share. Ensure adequate inventory for these products.

### 2. Revenue by Region

- **South America** leads in revenue generation with a total of **\$219,352.56**, followed by **Europe** (**\$166,254.63**) and **North America** (**\$152,313.40**).
- **Asia** contributes similarly to **North America** with a revenue of **\$152,074.97**.  
**Actionable Insight:** Strengthen regional strategies in **South America** by introducing localized marketing campaigns. Invest in growth opportunities in **Asia** to further increase its revenue contribution.

### 3. Customer Signup Trends

- The number of customer signups has grown over the years:
  - **2022: 64 customers**
  - **2023: 57 customers**
  - **2024: 79 customers****Actionable Insight:** Customer acquisition has been increasing, with a sharp rise in **2024**. Leverage this growth by introducing loyalty programs to retain these new customers and encourage repeat purchases.

### 4. Monthly Revenue Trends

- Revenue peaked in **July 2024** with a total of **\$71,366.39**, followed by **September 2024** (**\$70,603.75**) and **January 2024** (**\$66,376.39**).
- A dip in revenue is observed in **December 2023** (**\$3,769.52**) and **November 2024** (**\$38,224.37**).  
**Actionable Insight:** Plan promotions and discount campaigns for months with historically low revenue, such as **November** and **December**. Focus on increasing revenue during peak months like **July** and **September** by offering premium products or seasonal bundles.
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## 5. Product Line Diversification

- Products like **HomeSense Desk Lamp**, **ActiveWear Rug**, and **TechPro T-Shirt** are performing well but lag behind top-selling items.
- Categories such as **SoundWave** and **ActiveWear** are more dominant compared to others.  
**Actionable Insight:** Evaluate underperforming categories to identify growth opportunities. Consider expanding successful product lines like **ActiveWear** and **SoundWave**.

### Visualizations:

1. **Top 10 Best-Selling Products:**
  - A bar chart showing the top 10 products based on quantity sold.
2. **Revenue by Region:**
  - A bar chart comparing revenue generated by each region.
3. **Signup Trends:**
  - A line chart illustrating customer signups over the years.
4. **Monthly Revenue Trend:**
  - A line chart showing the fluctuation of monthly revenue from **December 2023** to **December 2024**.