

## Title: Exploratory Data Analysis on eCommerce Transactions Dataset

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### 1. Overview of the Dataset

The provided dataset consists of three files:

- **Customers.csv:** Contains customer details (ID, name, region, signup date).
  - **Products.csv:** Contains product details (ID, name, category, price).
  - **Transactions.csv:** Contains transaction details (ID, customer ID, product ID, transaction date, quantity, total value).
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### 2. Data Cleaning and Preprocessing

- **Missing Values:** After inspection, there were no major missing values in the dataset.
  - **Data Types:** All data types were appropriately formatted, but we made some adjustments for consistent date formats.
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### 3. Exploratory Data Analysis (EDA)

- **Customer Distribution by Region:**
  - Insights: The highest number of customers are from North America, followed by Europe and Asia.
  - Visual: Bar plot displaying customer counts per region.
- **Top-Selling Products:**
  - Insights: Products in the "Electronics" category dominate sales volume.
  - Visual: Bar plot showing the top 10 best-selling products based on quantity sold.
- **Top Spending Customers:**
  - Insights: A small group of high-value customers make up a significant portion of total sales.
  - Visual: Bar plot of top 10 customers by total spend.
- **Monthly Transaction Trend:**
  - Insights: A steady increase in transaction volume, with a spike during the holiday season (November–December).
  - Visual: Line plot showing monthly sales trends.
- **Price vs Quantity:**
  - Insights: Higher prices are often associated with lower quantities purchased, but products in high demand remain popular even at higher prices.

- Visual: Scatter plot showing the relationship between price and quantity.
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#### 4. Business Insights

1. **Customer Distribution Insight:** North America accounts for the highest customer base, indicating that region-specific marketing strategies could be beneficial.
  2. **Product Category Insight:** Electronics and apparel are the top-selling categories, highlighting areas for product promotions.
  3. **Customer Value Insight:** A small percentage of customers generate the majority of revenue. Personalized marketing could be focused on this segment.
  4. **Seasonal Trends:** Increased sales around holiday months suggest the need for better seasonal inventory and promotions.
  5. **Purchase Behavior Insight:** High-value products with lower quantities sold indicate that while premium customers may purchase less, they contribute significantly to revenue.
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