TASK – 1
EXPLORATORY DATA ANALYSIS

BUSINESS INSIGHTS

The major business insights obtained from EDA are:

1. **Regional Focus for Product Strategy**
   South America and Europe are the key regions driving customer acquisition, with South America being the dominant market. Books and Electronics lead in revenue generation across these regions, suggesting a strong core product offering in these categories. Businesses should prioritize regional marketing campaigns and tailor product offerings to align with the preferences of these key markets.

2. **Optimizing Price Range and Customer Segmentation**
   The product price range spans from budget-friendly items to premium offerings, with a concentration of transactions between $200 and $500. By leveraging this pricing tier, businesses can create targeted promotions for mid-range products while maintaining premium offerings to attract high-value customers. A more granular understanding of price sensitivity could improve sales conversions.

3. **Limited Purchase Quantities Suggest Inventory Optimization Needs**
   Customers typically purchase between 2 to 4 units per transaction, with no purchases exceeding 4. This indicates a preference for small-batch buying rather than bulk purchasing. Introducing volume discounts or bundle deals can encourage larger orders. Additionally, analyzing whether inventory constraints limit higher quantity purchases can identify opportunities to optimize stock levels.

4. **Seasonal and Transaction Timing Optimization**
   Significant fluctuations in transaction values and customer activity throughout the year suggest key seasonal trends. Peak periods, such as January 2024 and late 2024, provide opportunities for targeted sales campaigns. Additionally, mid-afternoon hours (14:00 and 16:00) experience the highest transaction volumes, which could guide staffing and marketing strategies during these peak periods.

5. **Product Category Leadership and Brand Loyalty**
   Books and Electronics dominate sales, with "ActiveWear Smartwatch" and "Soundwave Headphones" as bestsellers. Consistent demand for these brands suggests strong customer loyalty. Exclusive partnerships, early-access deals, and bundled product offers can strengthen brand

retention. Lower-performing categories like Home Decor may require strategic pricing adjustments or cross-category promotions to increase visibility.

6. **High-Value Transactions Drive Revenue**
The average transaction value is $689.99, with 75% of transactions exceeding $1011.66. This suggests that customers prefer bulk purchases or high-priced items. Upselling strategies and exclusive discounts on premium products can further enhance revenue. Additionally, offering financing options or bundling deals may encourage customers to increase their purchase value.

7. **Peak Sales Hours Indicate Customer Behavior Patterns**
Transactions peak at 2 PM and 4 PM, with sustained activity across the day, including early morning and late-night sales. This suggests a globally distributed customer base or high engagement from professionals shopping during lunch breaks. Time-based promotions, such as flash sales or limited-time discounts during peak hours, can boost conversions.

8. **Spikes in Transaction Values on Specific Dates Suggest Targeted Event-Based Sales**
Certain dates see significantly higher average transaction values, indicating that special promotions, paydays, or major sales events drive large purchases. Analyzing these high-spend days and replicating their success through targeted campaigns, limited-time bundles, and exclusive discounts can increase revenue consistency.

9. **High-Value Customers and Spending Patterns**
A small group of high-value customers (e.g., C0141 and C0054) significantly contributes to overall revenue. This highlights the importance of retaining and nurturing these high-spending customers. At the same time, there is consistent spending from a broader group of customers, suggesting that personalized marketing campaigns could drive additional value from this diverse customer base.

10. **Outlier Product Pricing and Demand**
Products at both the low and high extremes of the price range (e.g., $16.08 and $497.76) might represent outliers. The low-priced products could be budget items, while the high-priced items might be premium offerings. Further analysis could reveal if these extreme-priced products are performing well, or if they represent an opportunity to either improve or phase out specific items to streamline the product portfolio.