

# Task 1: Exploratory Data Analysis (EDA) and Business Insights

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## Exploratory Data Analysis (EDA)

In this task, we perform an exploratory analysis of the provided dataset to identify key trends, patterns, and potential business insights. The dataset contains various product categories, including Books, Electronics, Clothing, and Home Decor, across different regions. The analysis includes examining the distribution of sales, pricing trends, seasonal variations, and regional differences.

### Price Analysis

The median price of electronics, books, and other items is quite similar. This indicates that despite the varying categories, the central tendency of the prices remains consistent across different product types.

### Sales Trends

- The sales of home decor were very low in October and November, with an immediate jump in December and a high in January and February. This can be attributed to the festive season in December (Christmas, New Year) and the Valentine's Week in February, leading to higher sales.
- Electronics sales peak in July and March, corresponding to significant sales events such as Black Friday and seasonal transitions. After these spikes, sales gradually decline as the season changes.
- Book sales experience higher demand at the start of the year, especially in January and July, coinciding with the start of new semesters. However, March and April show a dip in sales, as these months are generally a transitional period.

### Region-based Insights

- South America has the highest number of book purchases compared to other regions, with a strong preference for textbooks. In contrast, Asia

shows the lowest book sales, particularly in the textbook category, where tech books and novels dominate.

- Clothing sales are higher in Asia, with activewear and t-shirts being the most popular, while Europe shows relatively lower performance in the clothing category.
- Electronics sales also show regional patterns, with major players dominating each continent. In Europe, the market is more competitive, with a diverse range of products, including Chromebooks and wireless devices.
- North America is largely dominated by books, with biographies and fiction genres being the most popular.
- In terms of home decor, the market is quite seasonal, with a noticeable spike in demand during December, coinciding with holidays and festive seasons.

## **Data Consistency**

An interesting observation from the dataset is the consistency of sales figures throughout the year. Unlike real-world data, where sales tend to fluctuate due to festivals, holidays, and seasonal events, this dataset appears to be more synthetic in nature, with regular sales patterns that do not exhibit significant seasonal variability.

## **Distribution of Sold Items and Total Value**

The distribution of the number of items sold and the total value received is quite similar across different product categories. This indicates that the price of individual items is comparable across the various categories, including books, electronics, and clothing, with the price of electronics being typically higher.

## **Top Selling Days and Categories**

Books are consistently the most sold item on Wednesdays, suggesting a trend in consumer behavior for mid-week purchases. On the other hand, electronics maintain a strong presence over three days of the week, further supporting their dominance in the market.

## **Conclusion**

In conclusion, the exploratory analysis reveals valuable insights into seasonal sales patterns, regional preferences, and category-specific trends. These insights can help businesses optimize their marketing strategies, stock management, and sales promotions based on regional demand and seasonal fluctuations.