

## Task 1 - Exploratory Data Analysis

### Business Insights:

1. Customer sign-up by region:
  - South America has the highest number of customer sign-ups at approximately 60. This indicates a strong market presence in the region, suggesting that marketing efforts and resources effectively reach potential customers there.
  - Europe follows closely with around 50 sign-ups. This region also shows significant potential, and efforts to increase brand awareness and customer engagement could further boost sign-up numbers.
  - Both North America and Asia have around 45 sign-ups each. This suggests a balanced performance across these regions.
2. Customer sign-ups over time:
  - There is a noticeable peak in customer signups during certain months, particularly in January and June. This indicates that marketing campaigns or promotions during these months are highly effective in attracting new customers.
  - The significant peak in January could be attributed to New Year's resolutions, post-holiday spending, or seasonal promotions. This highlights the importance of planning marketing activities to coincide with the post-holiday season.
  - The spike in June may indicate a successful mid-year promotion or an event that drives customer interest. Understanding the reasons behind this increase can help replicate the success in future campaigns.
3. Product Price:
  - The most frequent product prices fall within the ₹100 to ₹200 range, indicating that this price range is popular among customers. It suggests a high demand for products priced within this range.
  - There are a significant number of products priced below ₹100, which may cater to budget-conscious customers.
  - The histogram shows a steady number of products priced between ₹200 and ₹400. This indicates that mid-range products have a stable market presence.
  - There are fewer products priced above ₹400, suggesting that high-priced items are less frequent but may offer higher profit margins.
4. Products by category:
  - The categories of Books and Electronics have the highest number of products, each with around 25 products. This indicates a strong focus on these categories, suggesting that they are popular among customers and may contribute significantly to revenue.
  - Although Clothing and Home Decor have fewer products compared to Books and Electronics, they still have a significant presence. Exploring opportunities to expand these categories could attract new customers and boost overall sales.
5. Transaction amounts:
  - The majority of transactions fall around the ₹250 mark, with over 100 occurrences. This indicates that a significant portion of customers are making low-value purchases, suggesting a preference for affordable products or smaller purchases.
  - The histogram is right-skewed, with a higher frequency of lower transaction values and a gradual decrease as the transaction values increase.

- The distribution highlights the importance of maintaining a range of low-priced products to meet customer demand.
6. Transactions over time:
- There's a significant increase in transactions in January 2024. This peak likely results from post-holiday shopping or New Year's promotions, indicating that customers are highly active during this period.
  - Transactions dropped sharply in February following the January peak. This suggests a post-holiday lull, where customer spending decreases significantly.
  - The graph shows fluctuations in transactions from March to September, with notable dips in certain months.
  - From October to December 2024, the number of transactions remains relatively stable, with a slight increase in December.