Sales data analysis (E commerce case study)

**Objective:**

The objective of the sales data analysis using an e-commerce case study is to:

1. Analyze monthly sales: Examine the sales trends and patterns over a specific time period (e.g., month, quarter, or year) to identify the highest and lowest sales periods. This analysis will help understand seasonal variations, identify potential growth opportunities, and optimize inventory management and marketing strategies.

2. Conduct maximum order hour analysis: Determine the peak hours or time slots during which the highest number of orders are placed. This analysis will provide insights into customer behavior and preferences, enabling better resource allocation, staffing decisions, and targeted promotional activities during those hours.

3. Analyze the most sold product: Identify the top-selling product(s) based on sales volume or revenue. This analysis will help understand customer preferences, market demand, and potential cross-selling or upselling opportunities. Additionally, examining the factors contributing to the success of these products will aid in improving product assortment, pricing strategies, and inventory management.

By accomplishing these objectives, the sales data analysis will provide valuable insights to enhance decision-making, optimize operations, and drive revenue growth in the e-commerce business.

* Started with importing messy data, cleaning data, merging, concatenating, grouping and aggregating data and analyzing.
* The sales data analysis process starts with collecting the data, followed by cleaning and pre-processing to ensure data quality. Data visualization techniques are then employed to gain visual insights, and finally, data analysis techniques are applied to extract meaningful information and draw actionable conclusions from the sales data.
* Tools used: python, pandas, matplotlib , seaborn, plotly, numpy
* **Insights:**

Based on the given statements, we can draw several insights and conclusions:

* 1. December is the best month for sales: This indicates a strong seasonal trend, possibly driven by holiday shopping and increased consumer spending. Businesses can leverage this insight to plan marketing campaigns, promotions, and inventory management strategies to maximize sales during this peak period.
* 2. San Francisco and Los Angeles have the highest number of orders: This suggests that these two cities are significant markets for the business. By understanding the customer base in these locations, companies can tailor their marketing efforts, distribution channels, and customer service to cater specifically to these regions and capitalize on the demand.
* 3. Between 12 pm and 7 pm is the best time to advertise: This finding highlights a specific time window when customers are more likely to make product purchases. Businesses can allocate their advertising budgets to target these hours and optimize their marketing efforts during this period to increase visibility, engagement, and conversions.
* 4. AAA batteries followed by AA batteries are the most sold products: This implies that there is a high demand for batteries, particularly AAA and AA sizes. Companies can capitalize on this trend by ensuring sufficient stock availability, offering competitive pricing, and cross-promoting related products to boost sales and customer satisfaction.
* 5. The top-selling product is 'AAA Batteries': This indicates that AAA batteries are the best-selling individual product. Understanding the factors contributing to its success, such as competitive pricing, quality, or marketing strategies, can help inform decisions on product assortment, pricing, and promotional efforts to replicate or expand on this success.
* 6. Price correlates with the quantity ordered: The statement suggests that there is a correlation between product price and quantity ordered. This insight can guide pricing strategies and product positioning. Companies can consider adjusting prices based on market demand and target different customer segments with varying price points to optimize sales and profitability.
* 7. iPhone, lightning charger, and headphones are the most sold products together: This suggests that there is a bundle or association between these products, potentially indicating a customer preference for purchasing them together. Businesses can leverage this insight to create bundled offers, marketing campaigns, or cross-selling strategies to encourage customers to purchase these products as a set.
* Overall, these insights provide valuable information about sales patterns, customer preferences, and market trends. Businesses can utilize these findings to make data-driven decisions, optimize their sales strategies, and enhance overall business performance.