Analysis on

Amazon sales

Amazon is an e-commerce company that sells a wide variety of products through its online platform. Amazon sales refer to the revenue that the company generates from the sale of these products. Amazon's sales have grown significantly over the years, and the company is now one of the largest retailers in the world.

Amazon's sales come from a variety of sources, including its retail operations, cloud computing services, and advertising. For predicting the sales for amazon here we had done a project that is described below.

DEFINE

For defining there are two aspects for better understanding is

- KPI (key performance indicator): It is a measurable value that shows how successfully a business is reaching important business goals.

- CTQ (critical to quality): It is a product's quality or service that helps to satisfy the customers.

1) Date selection for the sale

Sales perform an important role in generating more revenue and also attracting more customers for the company. so there is a big task to select an appropriate date for advertising and helps to connect with more customers.

- KPI: In this case, ‘sales’ is the key performance indicator because past year’s sales help that in which month, day, and time most customers are active to join the sale.
- CTQ: Customers get discounts and the company satisfies customers which helps to connect with More.

2) Supply chain management

Warehousing plays the most important role in the company. It helps to meet urgent demand and to secure the product. for providing products to the customer at a relevant time to make customer satisfaction and make a strong trust and belief between a company and the customer.

- KPI: It depends on the quantity of a product.

- CTQ: Both customer and company because if a customer has a bad experience with the product then the company also loses their customers which affects their upcoming sales.

3) Recommendation / Association

The purpose of this analysis is mainly focus on the purchase of a combination of products so we can recommend products according to their customer's Buying products.

- KPI: Product and quantity ordered perform as a key performance indicator in this case.
- CTQ: It is mainly advantageous for the company because it helps to sell more products and increasing more revenue.

MEASURE

We had done an analysis of the year 2019 amazon sales data which was provided by our institute Asian Academy of Film and Television (AAFT). This data contains 6 different features which are described below

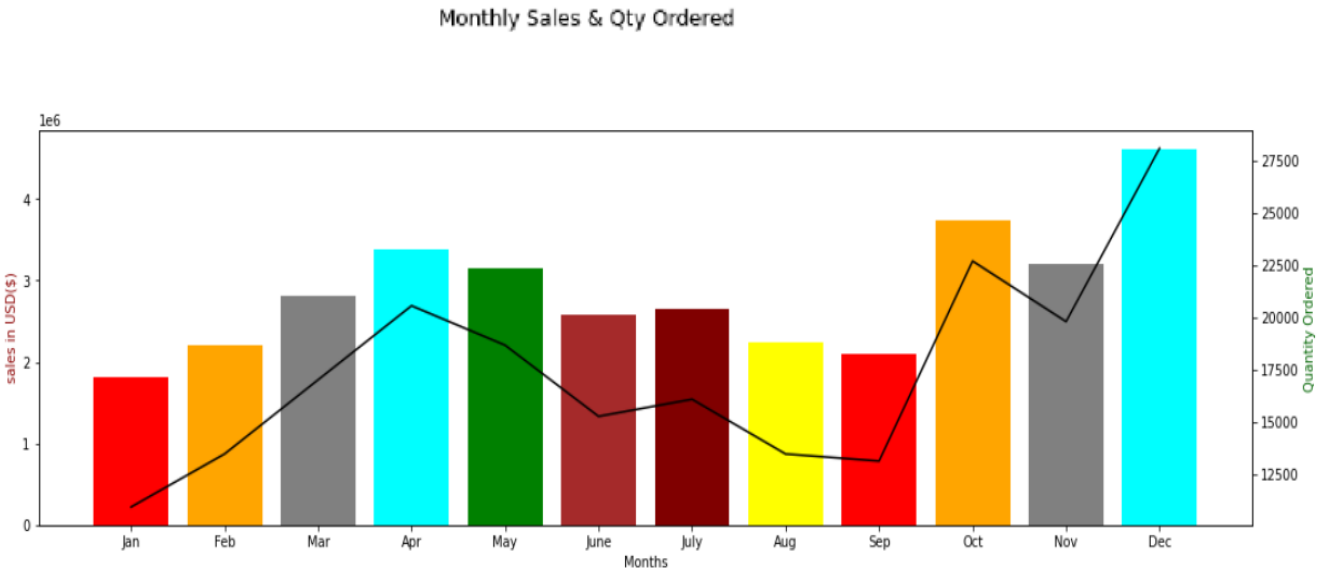
- **Order ID:** order id is the unique identity of the customer and it remains the same if the customer buys multiple products.
- **Product:** This feature contains selling items
- **Quantity ordered:** This contains the total count of a specific product ordered by the same ID in a single order.
- **Price each:** The price of each product.
- **Order date:** It shows the date on which the order was placed.
- **Purchase address:** This is the address detail of the buyer where the order has to be delivered.

Now after analyzing these features we need some more features to predict the sale so here we created some more features with the help of existing features that are needed for our further analysis.

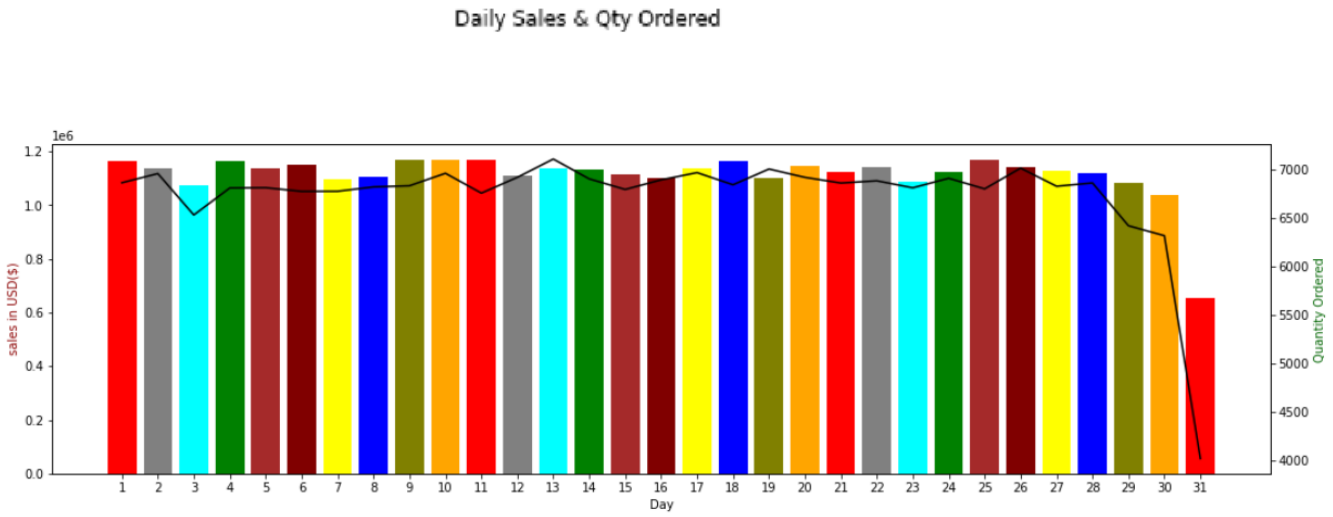
- **Sales:** Sales are the total income generated over an item. This was calculated by multiplying the total quantity ordered by the price of a product.
- **Month:** This feature shows the ordered product placed in which month. It is created using the column "Order Date".
- **Day:** The day on which the order was placed. It is also extracted from the "Order Date" column.
- **Hour:** This shows the timing in which the order was placed. It is also extracted from the "Order Date" column.

ANALYZE

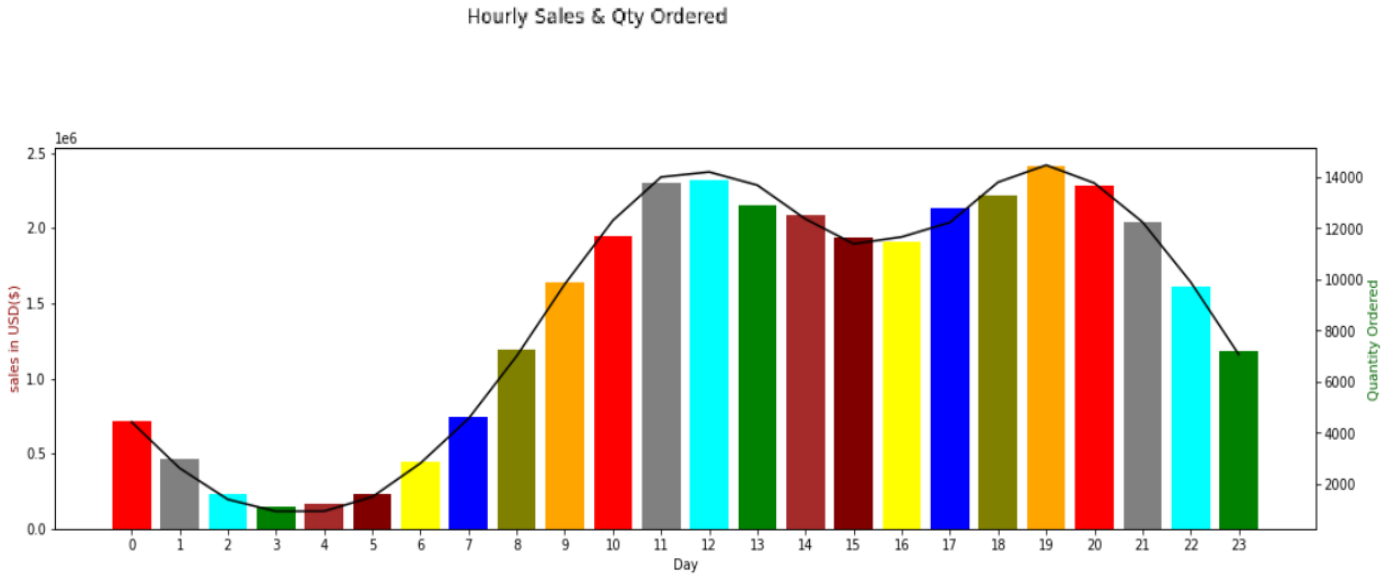
- Now our first problem is to select the appropriate date for the sale. In that case month, day and time are important for fixing the 3 days annual sale. so for this, we simply plot 3 different graphs in which we show the best month from the whole year that is suitable for our sales as you can see below there is a plot that shows the months on the basis of monthly sales and quantity ordered. you can see the month of December contains more quantity ordered as well as generated higher income so with the help of this analysis December is the month which is appropriate for the sale.



Now here is another plot that shows the productive days for sales in a December month in which days most of the customers are buying the products. here both are the attributes matter quantity ordered and sales according to the below graph we had to select only those days in which both the features are performed well.

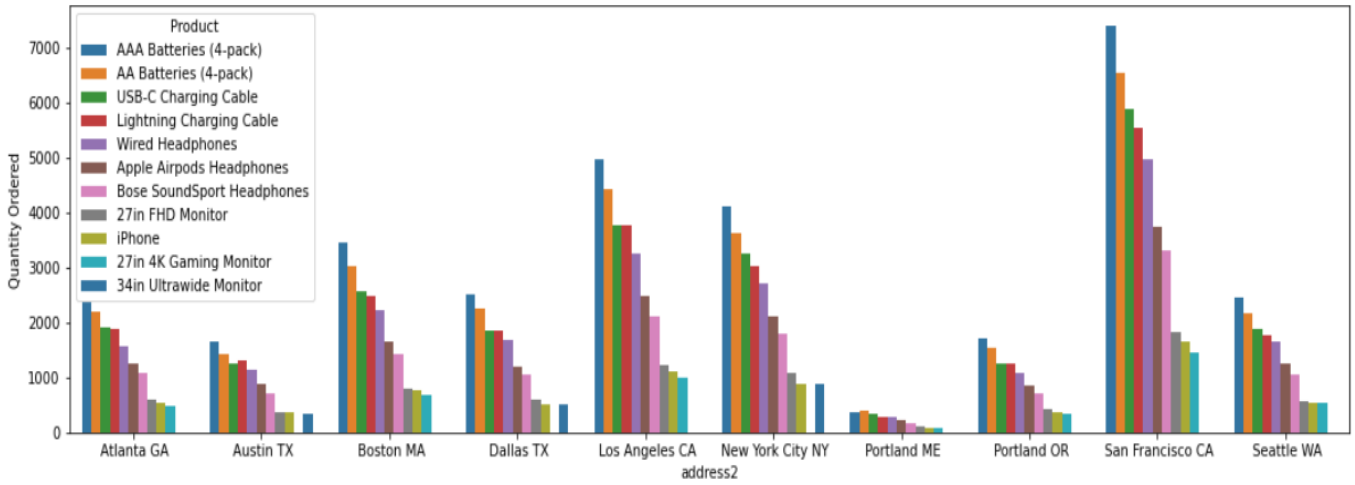


Now another one is for time for finding the best time for sale we plotted a graph that represents that in which time customers start purchasing items frequently.

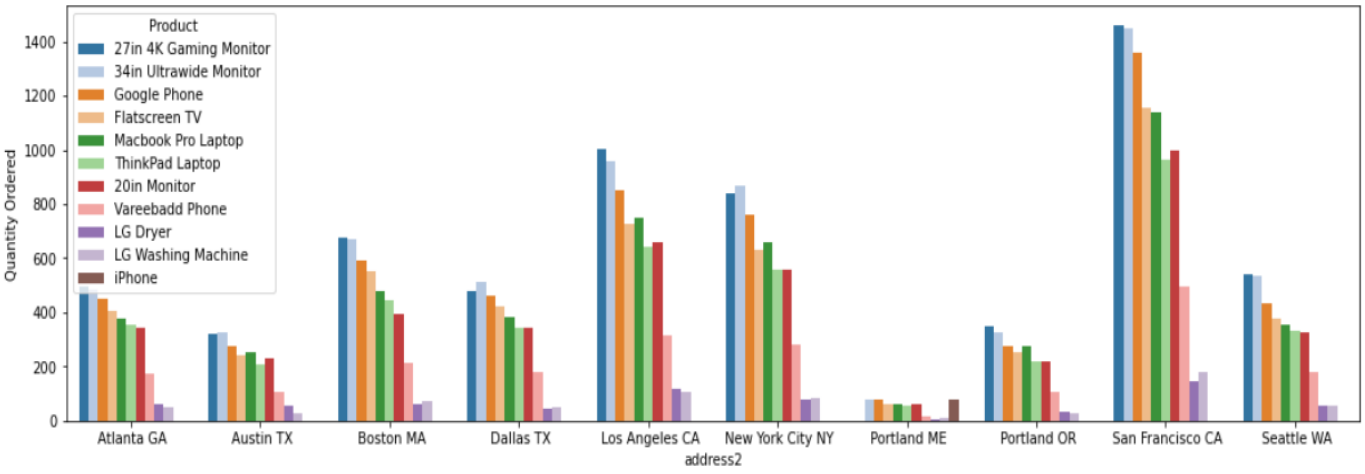


- Supply chain management and warehousing in this case we had done analysis by plotting two different graphs in which we selected the top 5 products and the bottom 5 product in each state.

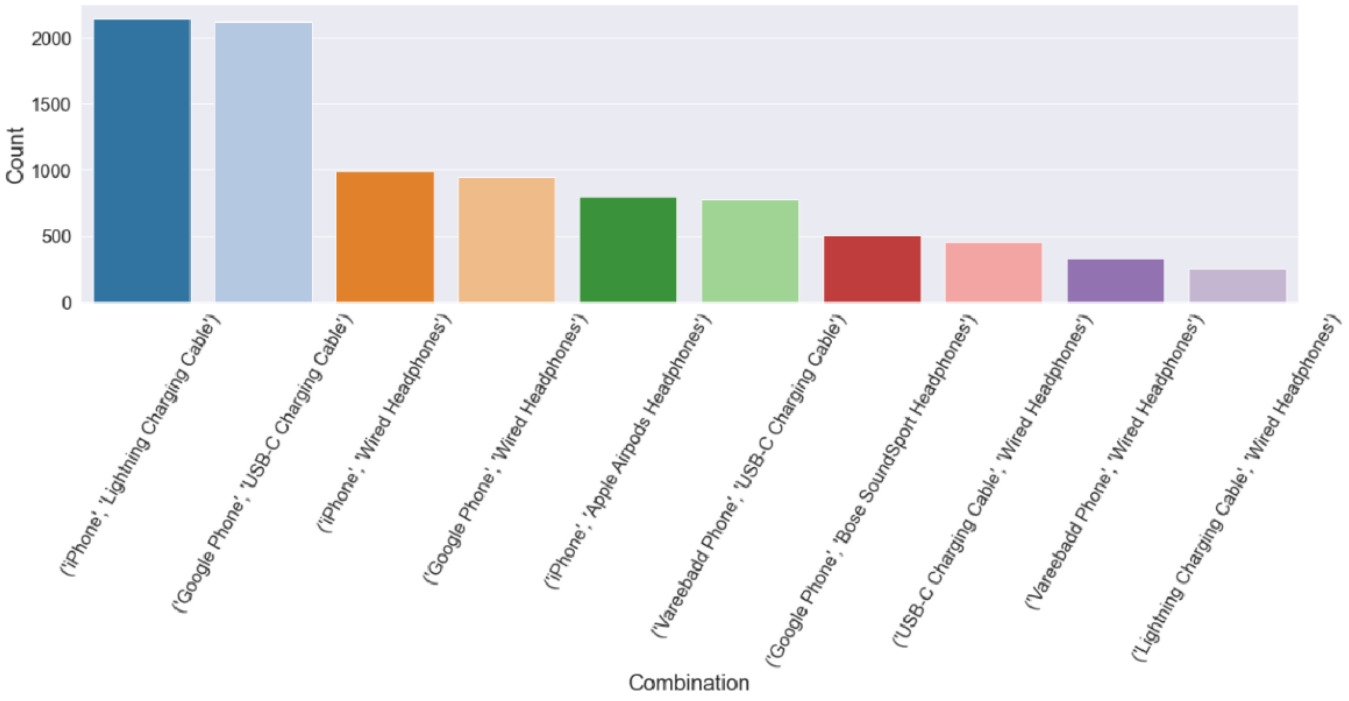
In the below graph, we selected the top 5 products in each state in which we analyze the demanding products in the state that help us to resolve the problem of warehousing.

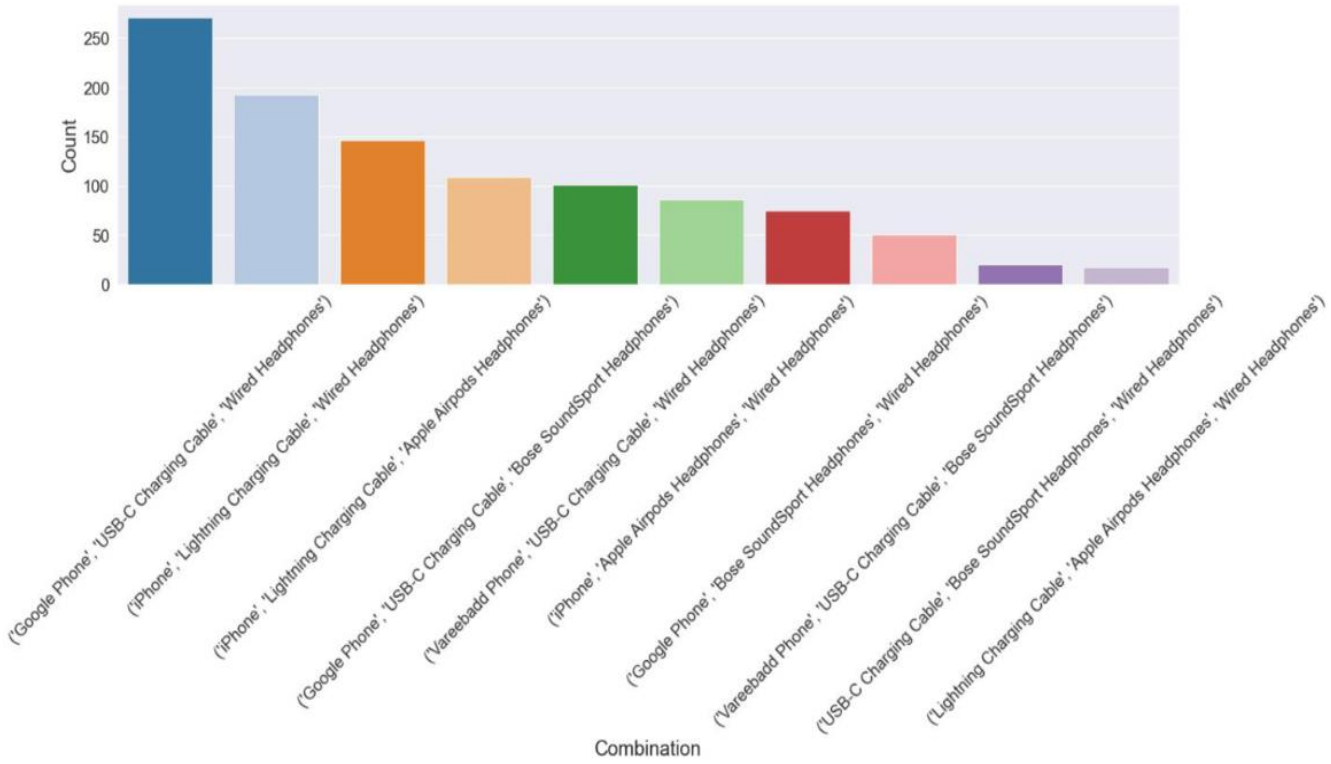


Same as the other graph shows the bottom products in that same state. In this plot, we can also see that those products aren't considered which comes already in the top products.



- Enhancing the recommendation is the last problem which is resolved by plotting two different graphs in which we combine 2 different products purchased with the same order ID and the same as with another by taking 3 different products together with same order ID.





IMPROVE

- As per our first problem we need to predict the date in which month, day, and time as we selected the 10^{th},11^{th}, and 12^{th} day. but we can't ignore the 25^{th} because of Christmas on that day mostly people are excited but after the 25^{th} company has a risk of wastage of products but they want more and more customers. so according to this scenario, we need to put sales before 25^{th}. According to our analysis 23rd – 25^{th} is the best day for the sale and the time must be around 9 am or 10 am which is the perfect raising time for the sale.

- According to our second analysis we can see that San Francisco has a strong demand in comparison to other states for top 10 products so in that state we need to build more warehouses for maintaining those demands. Whereas some countries have the least demand for some products so we have to replace those products with the demanding products and store them in the same warehouses in that state.

- As we can see in our third analysis people are buying iPhones with lightning charging cables and google phones with USB charging so we can recommend more similar products to the customers. Like we recommend wireless headphones who are buying smartphones and wireless mouse to those who purchase laptop, computers.