

Amazon Sales Analysis

1. Define

- Annual Sale Date Selection

Sales play a crucial role in attracting more customers, which in turn helps to produce more income.

In this case, we aim to identify the time frame to launch the 3-day annual sale.

KPI: Sales over some time.

CTQ: Both company and customers of the company.

- Warehouse Enhancement

Optimal Location of Warehouses and management of items in the warehouse according to the demand in the area will lead to faster delivery of items leading to better customer experience,

KPI: Quantity of items ordered in the location.

CTQ: Cost-efficient to the company and a pleasant experience for the customers.

- Association / Recommendation

Recommending customers appropriate items according to the items they are ordering leads to customers buying the recommendations as well.

KPI: Quantity of Products ordered matched by same Order IDs.

CTQ: Company will benefit most as they will be able to sell more products.

2. Measure

This study is done on Amazon 2019 Sales Data which was provided by the Asian Academy of Film and Television (AAFT).

The data include the following features:

- Order ID: The order ID is a special identification number given to each placed order. If multiple items are ordered in a single order, then their Order ID will be the same.
- Product: The Name of the product ordered.
- Quantity Ordered: The number of units of that specific item ordered.
- Price Each: The price of each item
- Order Date: The Date and time of the order placed.
- Purchase Address: The address of the buyer where the order would be delivered.

	Order ID	Product	Quantity Ordered	Price Each	Order Date	Purchase Address
0	295665	Macbook Pro Laptop	1	1700	12/30/19 00:01	136 Church St, New York City, NY 10001
1	295666	LG Washing Machine	1	600.0	12/29/19 07:03	562 2nd St, New York City, NY 10001
2	295667	USB-C Charging Cable	1	11.95	12/12/19 18:21	277 Main St, New York City, NY 10001
3	295668	27in FHD Monitor	1	149.99	12/22/19 15:13	410 6th St, San Francisco, CA 94016
4	295669	USB-C Charging Cable	1	11.95	12/18/19 12:38	43 Hill St, Atlanta, GA 30301
...
186845	259353	AAA Batteries (4-pack)	3	2.99	09/17/19 20:56	840 Highland St, Los Angeles, CA 90001
186846	259354	iPhone	1	700	09/01/19 16:00	216 Dogwood St, San Francisco, CA 94016
186847	259355	iPhone	1	700	09/23/19 07:39	220 12th St, San Francisco, CA 94016
186848	259356	34in Ultrawide Monitor	1	379.99	09/19/19 17:30	511 Forest St, San Francisco, CA 94016
186849	259357	USB-C Charging Cable	1	11.95	09/30/19 00:18	250 Meadow St, San Francisco, CA 94016

186850 rows × 6 columns

A closer look revealed that the data had missing values. After further examination, it came to notice that the whole row was missing. So, we removed all such rows. We also generated some new columns with the help of existing columns in the data. The columns are listed below:

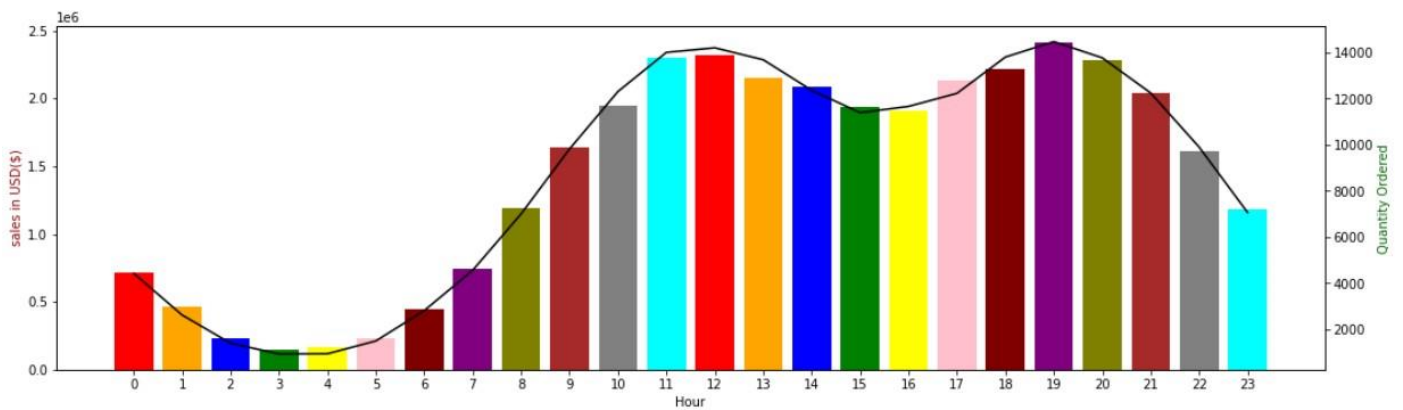
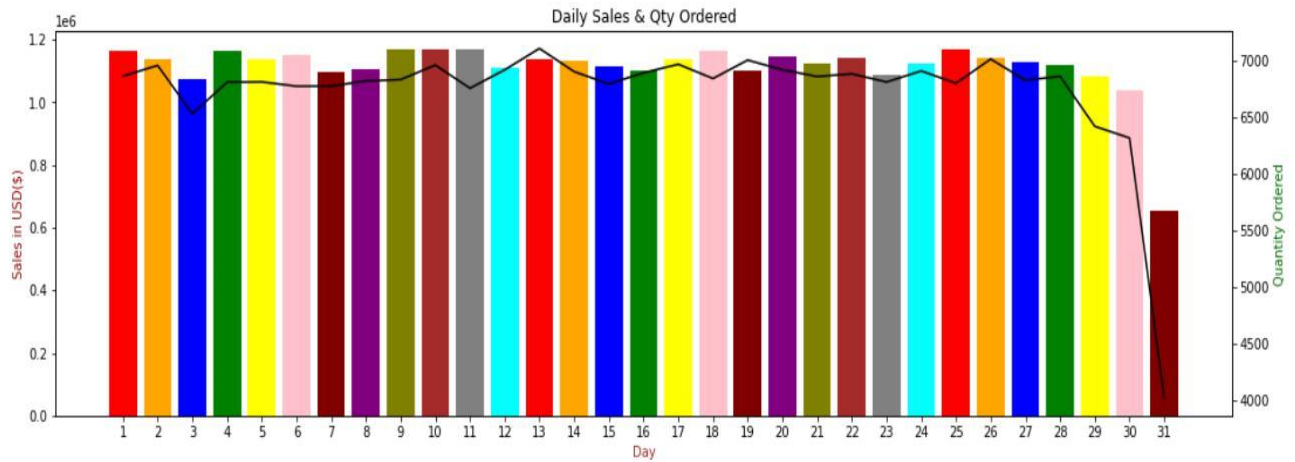
- Sales: This column was generated by multiplying concurrent values present in Quantity Ordered and Price Each column
- Month: Month of the ordered place. It was generated from the “Order Date” column.
- Day: The day of the month. Again, it was generated from the “Order Date” column.
- Hour: The particular hour at which the order was placed. The “Order Date” column was used.

	Order ID	Product	Quantity Ordered	Price Each	Order Date	Purchase Address	Sales	Month	Day	Hour	Day Name
169892	274550	AAA Batteries (4-pack)	1	2.990000	2019-10-07 19:16:00	353 8th St, New York City, NY 10001	2.990000	10	7	19	Monday
74551	148241	Apple AirPods Headphones	1	150.000000	2019-01-17 16:24:00	40 Spruce St, Boston, MA 02215	150.000000	1	17	16	Thursday
175869	249641	34in Ultrawide Monitor	1	379.989990	2019-09-22 23:29:00	853 Hill St, San Francisco, CA 94016	379.989990	9	22	23	Sunday
64549	159435	Lightning Charging Cable	1	14.950000	2019-02-04 20:12:00	997 Lake St, Austin, TX 73301	14.950000	2	4	20	Monday
88364	233945	USB-C Charging Cable	1	11.950000	2019-07-03 21:06:00	307 Jackson St, San Francisco, CA 94016	11.950000	7	3	21	Wednesday
159294	264391	Wired Headphones	1	11.990000	2019-10-21 17:41:00	997 Jackson St, Los Angeles, CA 90001	11.990000	10	21	17	Monday
94296	212886	Vareebadd Phone	1	400.000000	2019-06-24 13:29:00	378 8th St, Boston, MA 02215	400.000000	6	24	13	Monday
7474	302830	Google Phone	1	600.000000	2019-12-28 20:58:00	57 Jefferson St, Los Angeles, CA 90001	600.000000	12	28	20	Saturday
10190	305430	27in FHD Monitor	1	149.990005	2019-12-21 18:34:00	528 Lincoln St, New York City, NY 10001	149.990005	12	21	18	Saturday
46992	240254	AAA Batteries (4-pack)	2	2.990000	2019-08-15 12:52:00	357 Adams St, Los Angeles, CA 90001	5.980000	8	15	12	Thursday

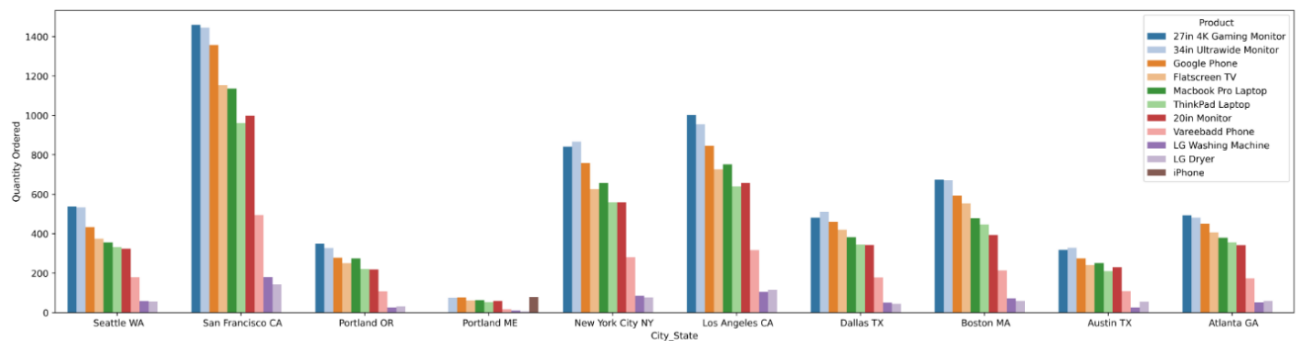
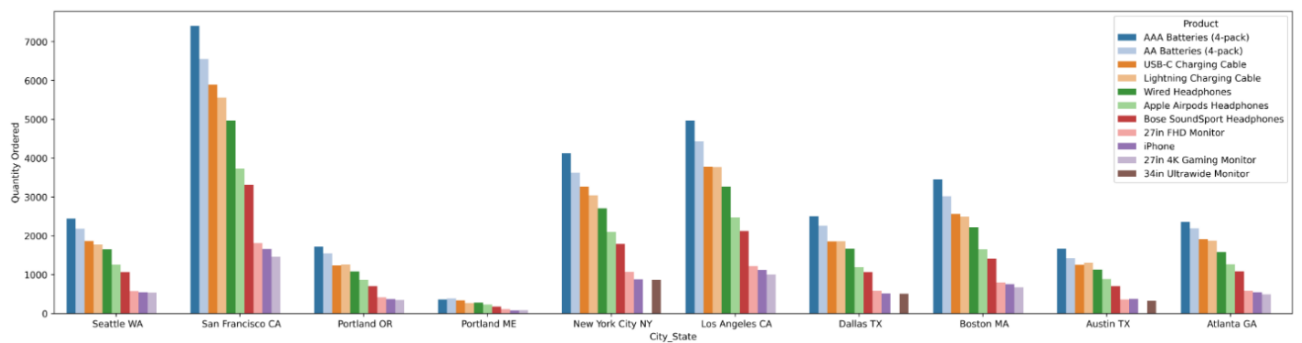
3. Analyze

- Finding the most appropriate month, day, and time for a three-day annual campaign was our first problem. We have created three visualizations of the highest sales and quantity ordered to find the appropriate month, day, and hour.

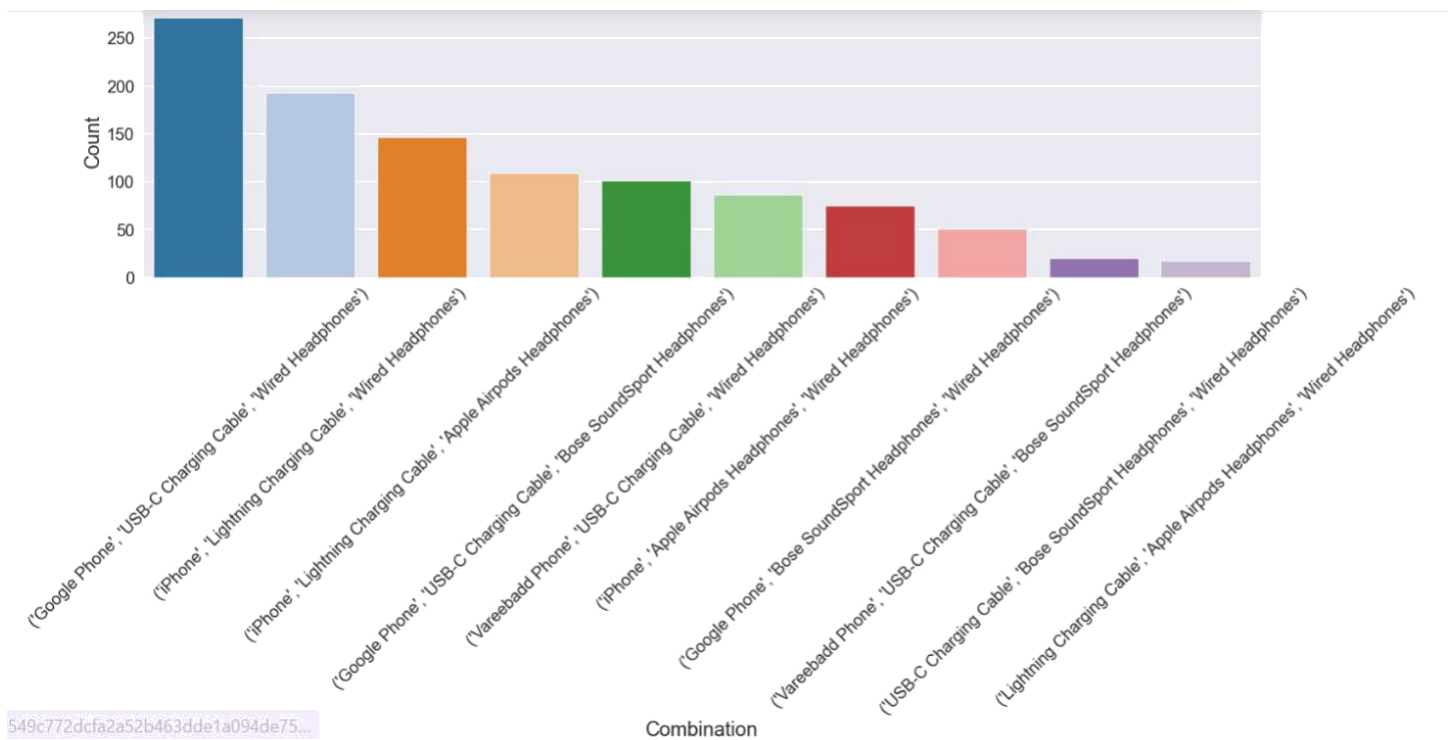
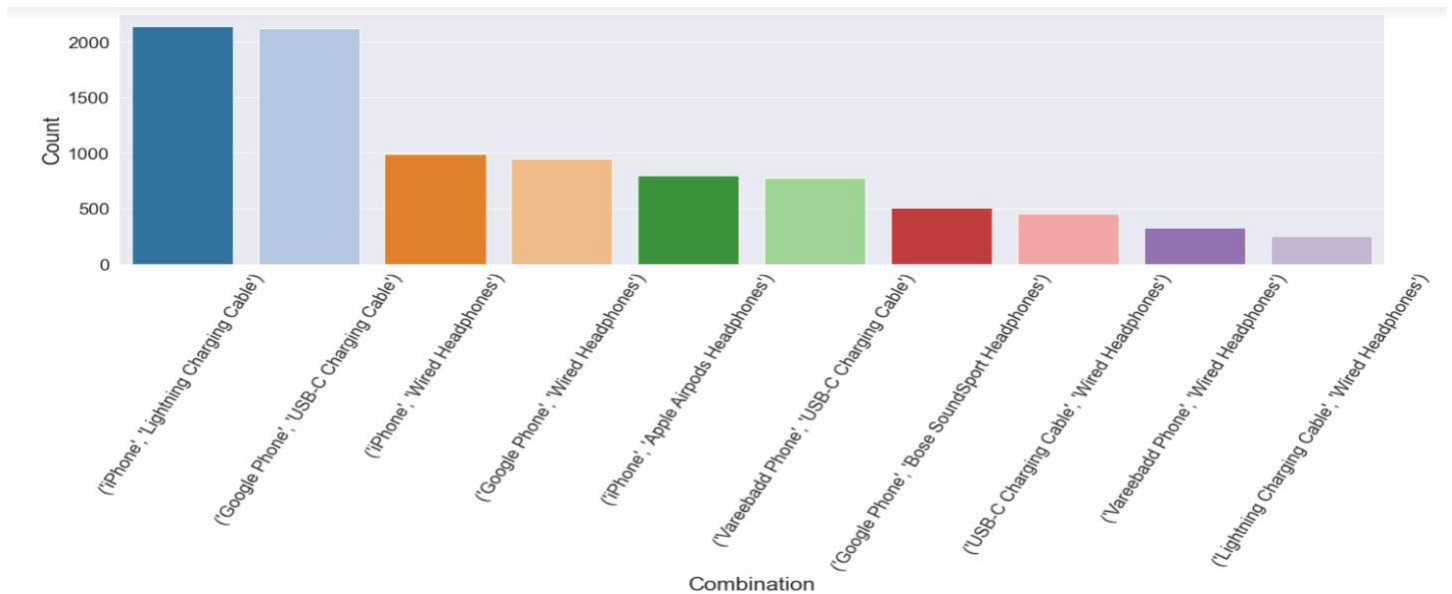




- Enhancing the location of warehouses and supply chain management was our second problem. To solve this problem, we analyzed the number of products ordered state-wide. We created two visualizations to show the top 5 products and bottom 5 products in terms of sales in each state.



- Our last problem was dealing with enhancing the recommendations made to customers based on the product they are buying. To solve this problem, we created a group of items ordered by people together by matching the Order IDs. Two visualizations are generated displaying the purchases made by customers in a set of 2 and 3 items together.



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4. Improve

- According to our first analysis by the visualizations, Month of December, Dates 9th,10th,11th and from the 10th hour the sales are at peak. But we cannot miss 25th December as it's a crucial day and we the company can expect a lot of buyers at Christmas Season. So 23rd-25th December would be the most appropriate dates to conduct the sale. The Sale can begin on 23rd December at 10am.
- According to our second analysis by the visualizations, In San Francisco the sale of all items is very high so the company should establish a warehouse there with availability of stocks for all products. Secondly states with not that much sales like Seattle WA, Portland OR, Dallas TX, Atlanta GA should have a common warehouse at place equidistant from all these states. Portland ME has very low sales compared to all other states; hence company should implement various ways to boost sales in that area and then plan for setting up a warehouse in the future.
- According to our Third Analysis, we found out that people who buy Google Phones also buy USB-C charging cable and wired headphones similarly iPhone buyers lightning charging cable and wired headphones. So we can recommend people charging cables and headphones to people who are buying phones, so that they buy all these items together from the company itself.