Retail

DATA Analysis:

- **The questions below can be attempted by both data analysis and data visualization members**
  - Were there any significant changes in the purchasing habits of the customers over the years?

Through Annual Total Sales and Annual Number of Unique Orders, we can see that sales trends and fluctuations are very obvious, with both growth and decline periods. The continuous growth of Annual Total Sales and Annual Number of Unique Orders from 2013 to 2018 indicates that Urban Edge Apparel has implemented effective marketing to enhance brand awareness and attract customers. The decline from 2018 to 2020 is very likely because the COVID-19 epidemic has significantly impacted the global economy, leading to reduced consumer spending and disruption of brand supply chains. From 2020 to 2022, the sales volume rebounded to the bottom and reached the peak of Annual Total Sales. The sales volume rebounded significantly with the promotion of the COVID-19 vaccine and the recovery of economic activities. However, from 2022 to 2024, annual total sales and annual numbers of unique orders have been downward, which may be affected by economic recession, intensified market competition, unstable supply chains, and other factors.

  - Is there any seasonality in purchases for certain products?

Through the line chart and heat map, we can see that there is indeed seasonality in the sales of certain products. For example, Prod_1000 and Prod_1009 sell well in spring and early summer, Prod_1140 sells well in summer and autumn, and Prod_2015 and Prod_2024 sell well in summer. Overall, all product sales remained relatively stable in the first few months of the year, gradually increasing from March and reaching a peak from May to July. The product sells well in spring and summer, with peak sales periods, which may be related to seasonal needs, specific events, and brand style. Urban Edge Apparel can develop more targeted marketing strategies based on these seasonal trends. Increase inventory and promotional activities during peak sales periods to maximize sales.

  - Which products have seen a significant increase or decrease in quantity ordered over the years?

Prod_1009 significantly increased product quantity between 2016 and 2018, followed by a sharp decrease in product quantity from 2018 to 2020. After a brief increase, it dropped to 5826 product quantities in 2024. The product quantity of Prod_1140 significantly increased between 2017 and 2018 and gradually decreased after 2018. The annual quantity of other products is relatively stable, with no significant growth or decrease trend. The product quantity of Prod_1009 and Prod_1140 significantly increased from 2016 to 2018 and 2021 to 2022, showing significant year-on-year growth. They showed negative year-on-year growth from 2018 to 2020 and 2023 to 2024. For products like Prod1009 and Prod1140, which have significantly increased product quantity in specific years, the company should analyze the reasons for the surge in sales and consider increasing production and inventory. At the same time, the company needs to analyze the reasons for the significant decrease in product quantity and take corresponding measures. In addition, stable products can serve as a reliable source of revenue for the company.

- ○ What trends do we notice in the basket size (total items in one receipt)?

From 2013 to 2020, the size of baskets increased from 2.58 to 16.33, showing an overall growth trend, indicating that the number of products purchased by customers is increasing yearly. This may reflect an increase in customer purchasing power or demand for Urban Edge Apparel products. After 2020, the size of baskets has fluctuated and declined, possibly due to intensified market competition, fluctuations in economic conditions, and changes in consumer behavior. The company needs to analyze the reasons further, understand the shopping habits and changing needs of different customer groups, and develop strategies such as launching more aggressive promotional activities during a declining basket to encourage customers to increase their purchase volume.

- ○ What trends do you notice for the store with respect to time?

On the annual sales trend, from 2013 to 2018, the total sales and order quantity showed an overall growth trend, but there were fluctuations from 2018 to 2020 due to the epidemic's impact, and it continued to decline after 2022.

Certain products experience a seasonal purchasing trend on the monthly sales trend, with most products experiencing a significant increase in sales in spring and summer. The size of shopping baskets has shown an overall growth trend from 2013 to 2022 but has continued to decline slightly in the past two years.

- ○ **What are the peak sales periods?** May to July.
- ○ **Report**
  - ■ The highest-selling products by month and category:

	Order Month	Product ID	total_quantity
898	January	Prod_1009	13536
690	February	Prod_1009	16048
1599	March	Prod_1009	20366
5	April	Prod_1009	23804
1829	May	Prod_1009	30173
1353	June	Prod_1009	24123
1128	July	Prod_1140	23578
256	August	Prod_1140	19595
2548	September	Prod_1009	16657
2313	October	Prod_1009	15706
2072	November	Prod_1009	13170
492	December	Prod_1140	7481

- The least selling products by month and category

	Order Month	Product ID	total_quantity
912	January	Prod_1076	1
696	February	Prod_10201	1
1606	March	Prod_10201	1
8	April	Prod_10160	1
1973	May	Prod_5909	1
1356	June	Prod_10160	1
1140	July	Prod_132	1
248	August	Prod_105	1
2563	September	Prod_1085	1
2326	October	Prod_1028	1
2092	November	Prod_1085	1
587	December	Prod_5401	1

- Orders, Revenue, Quantity by Month
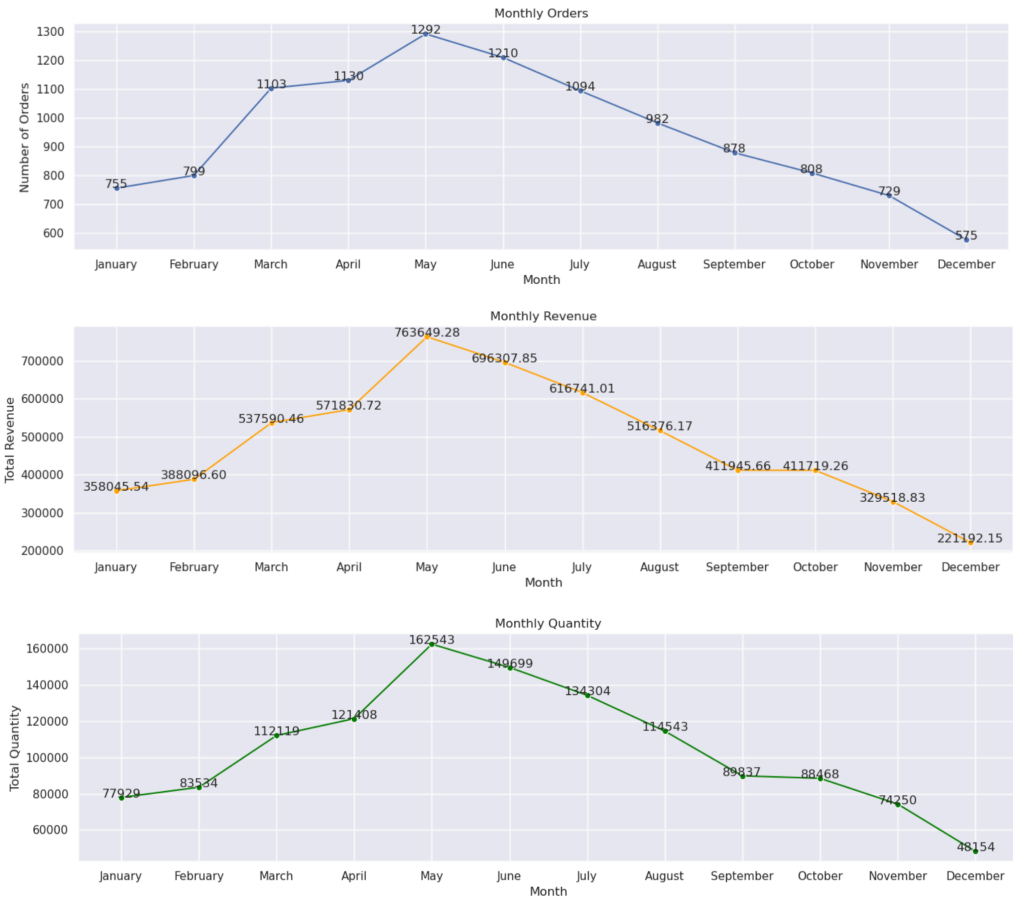
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Monthly Orders

Monthly Revenue

Monthly Quantity

- ■ In what ways can the store can increase revenue?
  - ○ **Customer Insights:**
    - ■ Develop customer segmentation based on purchase behavior and visualize the results.

High-value customers typically place a large number of orders, ranging from 15 to 115. Their total revenue is also relatively high, ranging from $10k to $60k. Since high-value customers contribute the most to the company's revenue, the company should focus on them and develop targeted service and marketing plans to maintain and increase their loyalty and purchase frequency.

The total orders and total revenue generated by medium-value customers are at a moderate level, with orders mainly concentrated between 15 and 55 and total revenue mostly ranging from $5k to $10k. The company can transform medium-value customers into high-value customers as much as possible by improving product quality and enhancing their purchasing experience and satisfaction.

The number of orders and total revenue for low-value customers are relatively low, with most orders below 25 and total revenue mainly below $5000. The company can maintain contact with

them, maintain their customer base, and try to increase their purchase frequency and order size through low-cost marketing and service strategies.

- ■ Illustrate the relationship between the number of orders and the total revenue generated per customer.

The total orders are positively correlated with total revenue. Usually, the more orders there are, the higher the total revenue. This is particularly evident in the purchasing behavior of high-value customers. The small range of low-value customer orders and total revenue indicates that their purchasing behavior is relatively stable. The relationship between the number of orders and total revenue for medium-value customers is relatively scattered, suggesting a certain degree of diversity in their purchasing behavior.

- ○ **Geographical Analysis:**
  - ■ Visualize the distribution of sales across different cities, states, and countries.
 - ■ Identify top-performing regions and potential areas for expansion

The United States has the highest sales in the national sales distribution, reaching $5599736, indicating that this is the main market for Urban Edge Apparel. The lower sales in some countries in Europe, Australia, and Africa indicate a certain demand for the company's products. States with high sales, such as Georgia and Connecticut, and cities like Alpharetta and Charlotte, show high product demand. So the company can further consolidate its market position by increasing marketing and sales efforts, optimizing supply chains, and improving customer satisfaction. It also can conduct market research on other countries, states, and cities with lower sales, understand local market demands, and develop targeted marketing strategies. More modern methods, such as cross-border e-commerce for cross-border trade and brand promotion, can enhance global market influence and exposure. At the same time, the company can open up more markets in other countries, such as Asia, which has a large population base and huge market potential.
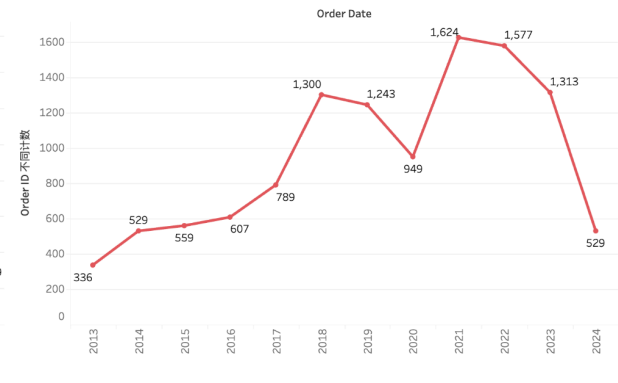
Data Visualization:

- ● **The questions below can be attempted by both data analysis and data visualization members**
  - ○ Were there any significant changes in the purchasing habits of the customers over the years?

Changes in Customer Purchasing Habits Over the Years

Annual Total Sales
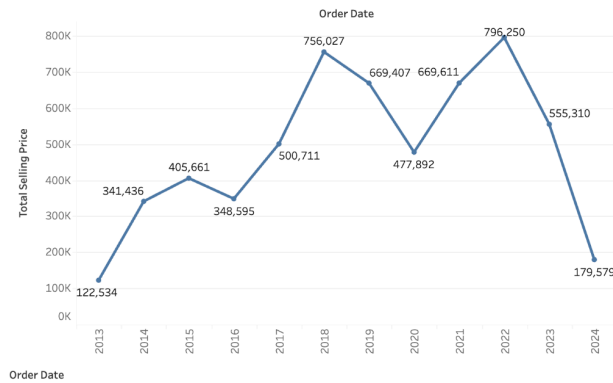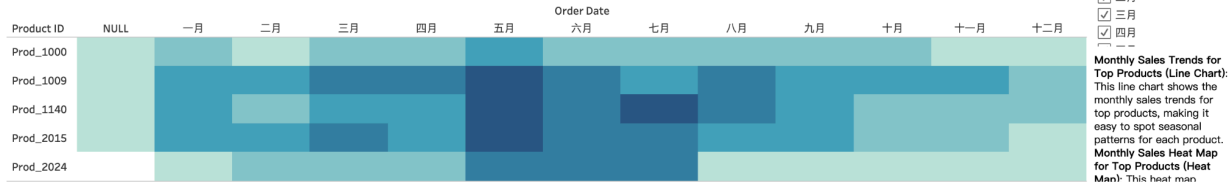

Annual Number of Unique Orders

○ Is there any seasonality in purchases for certain products?

Seasonality in Purchases for Top Products

### Monthly Sales Trends for Top Products

Monthly Sales Heat Map for Top Products

Monthly Sales Trends for Top Products (Line Chart): This line chart shows the monthly sales trends for top products, making it easy to spot seasonal patterns for each product.
Monthly Sales Heat Map for Top Products (Heat Map): This heat map

○ Which products have seen a significant increase or decrease in quantity ordered over the years?

Trends in Quantity Ordered for Top Products

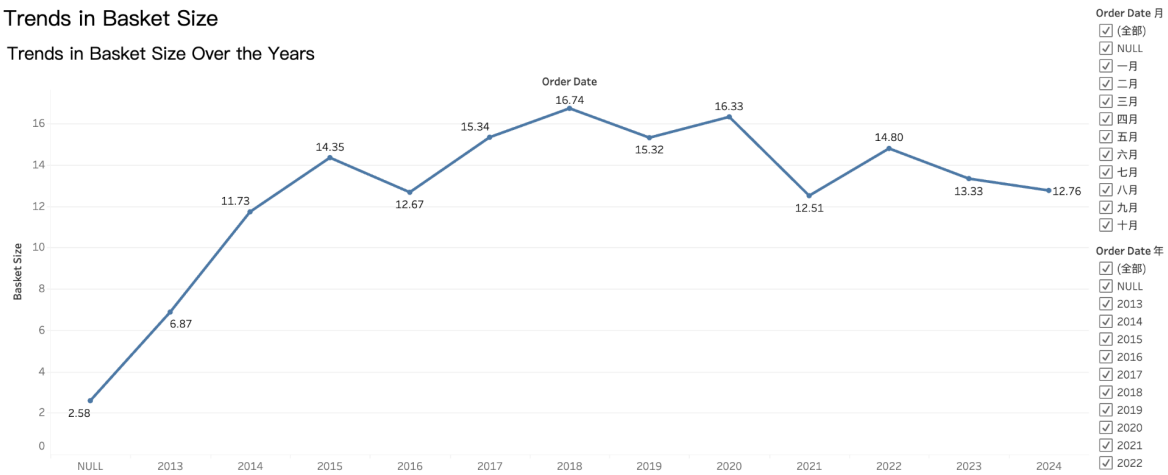### Annual Quantity Ordered Trends for Top Products
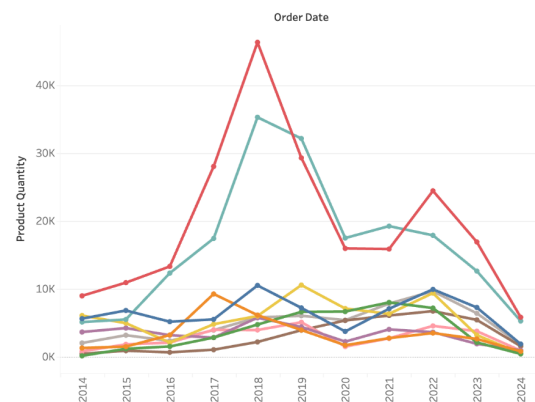
Year–over–Year Change in Quantity Ordered for Top Products

○ What trends do we notice in the basket size (total items in one receipt)?
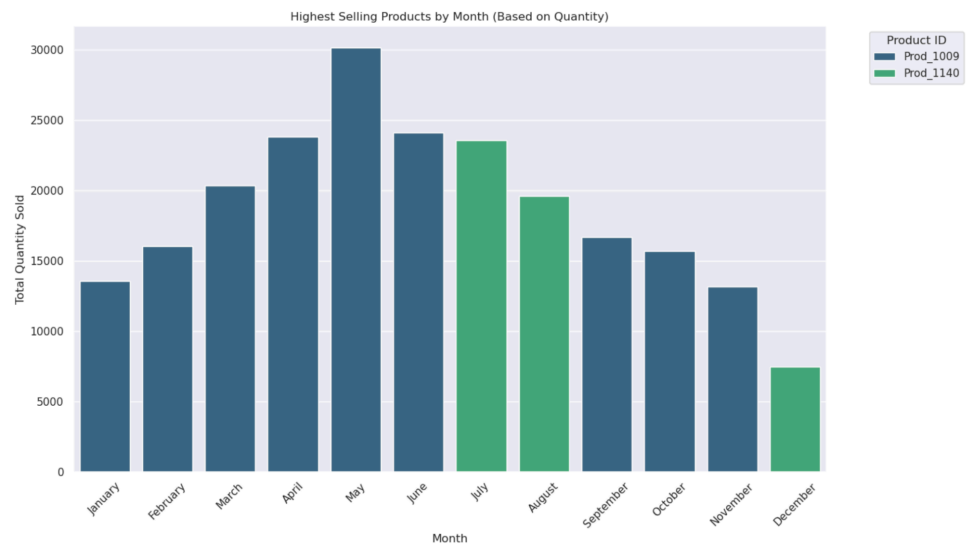
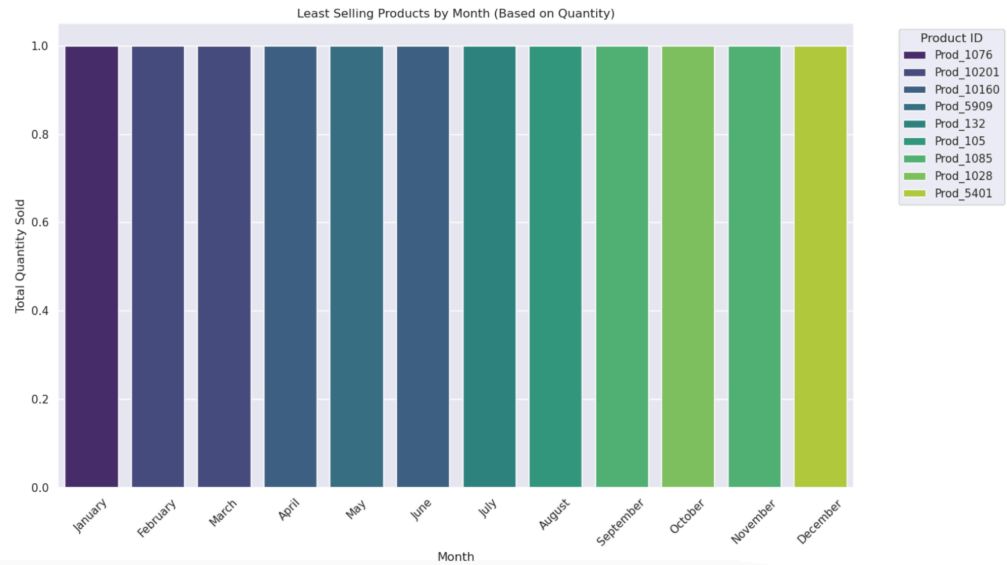**Trends in Basket Size**

Trends in Basket Size Over the Years

○ What trends do you notice for the store with respect to time?
○ **What are the peak sales periods?**
○ **Report**

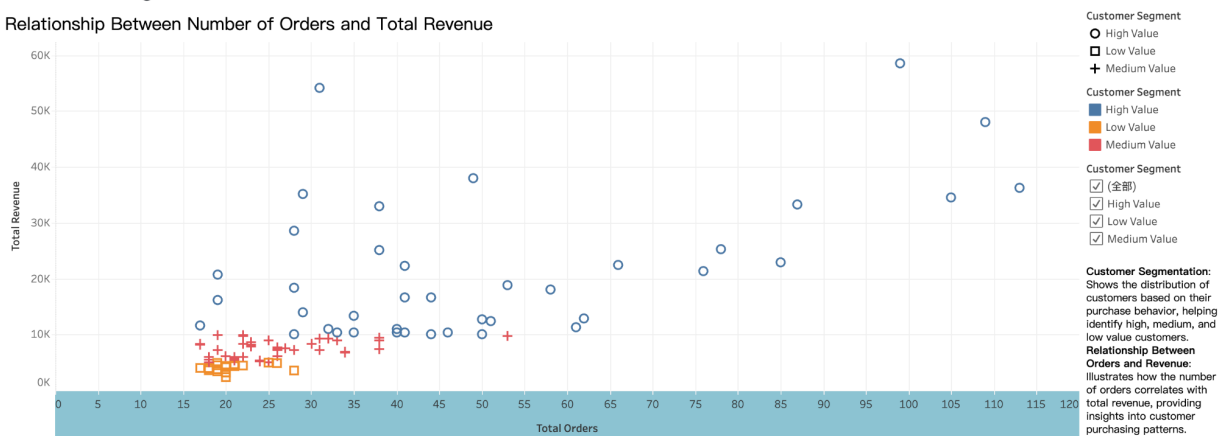■ The highest-selling products by month and category

■ The least selling products by month and category

Least Selling Products by Month (Based on Quantity)

- Orders, Revenue, Quantity by Month

- In what ways can the store can increase revenue?

○ **Customer Insights:**

- Develop customer segmentation based on purchase behavior and visualize the results.
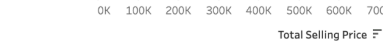

Customer Insights

- Illustrate the relationship between the number of orders and the total revenue generated per customer.

○ **Geographical Analysis:**

- Visualize the distribution of sales across different cities, states, and countries.

Geographical Sales Analysis Dashboard

Distribution of Sales by Country

© 2024 Mapbox © OpenStreetMap

Distribution of Sales by State

Total Selling Price
15 — 5,599,736

Total Selling Price
2 — 882,193

Shipping ..

Georgia
Connecticut
Florida
North Carolina
New York
New Jersey
California
Pennsylvania
Alabama
Texas
Massachusetts
Virginia 74,756
Illinois
Michigan 68,482
Tennessee
Louisiana
Minnesota 41,090
Maryland
Washington
Missouri

952,097

0K 100K 200K 300K 400K 500K 600K 700K 800K 900K 1000K

Total Selling Price

Distribution of Sales by City

Shipping ..

Alpharetta
Charlotte
Stratford
Vancouver
Aventura
Kumaandra / Ira
Hialeah
Paramus
Miami 128,814
Brooklyn
New York
Staten Island
Doral 59,307
Yonkers
Vacaville 51,394
Memphis
Mahiten
San Antonio 44,156
White Plains
Greensboro

882,193

0K 100K 200K 300K 400K 500K 600K 700K 800K 900K 1000K

Total Selling Price

■ Identify top-performing regions and potential areas for expansion

● https://public.tableau.com/app/profile/mandy.zhang4182/viz/datathon_17160547673090/ChangesinCustomerPurchasingHabitsOvertheYears?publish=yes