Data Analytics and Data Visualization

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Github Link: https://github.com/Crystalllia3/Tableau-retail-analysis

Introduction

Modecraft is a global e-commerce retailer specializing in a diverse range of household products, including mugs, cabinets, and lanterns. With over 500,000 orders processed worldwide, Modecraft has established a significant footprint in the online retail market. As the company prepares for its next stage of growth, it seeks to leverage its rich operational and marketing data to make informed, strategic decisions.

To support this objective, we have been engaged as consultants to conduct a comprehensive analysis of Modecraft's business performance. Our role is to examine key operational and marketing metrics, identify areas of strength, and uncover opportunities for improvement. By translating data into actionable insights, we aim to help Modecraft optimize revenue generation, improve customer engagement, and strengthen operational efficiency.

This report presents the findings of our analysis, highlights the business areas performing well, and offers data-driven recommendations to support Modecraft's strategic planning for the upcoming year. Through this datathon initiative, we intend to

contribute meaningful insights that can propel Modecraft toward sustained success in an increasingly competitive ecommerce landscape.
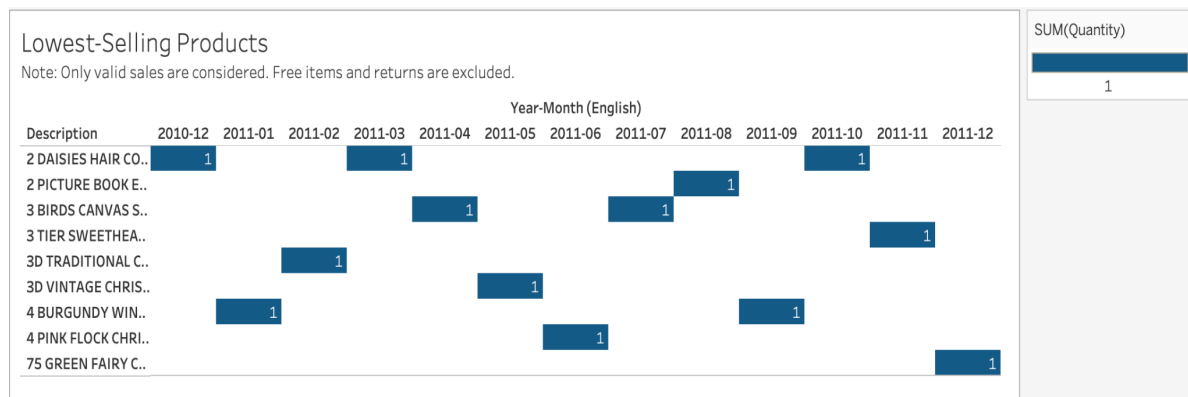
Visualizations

Monthly Best Selling Product
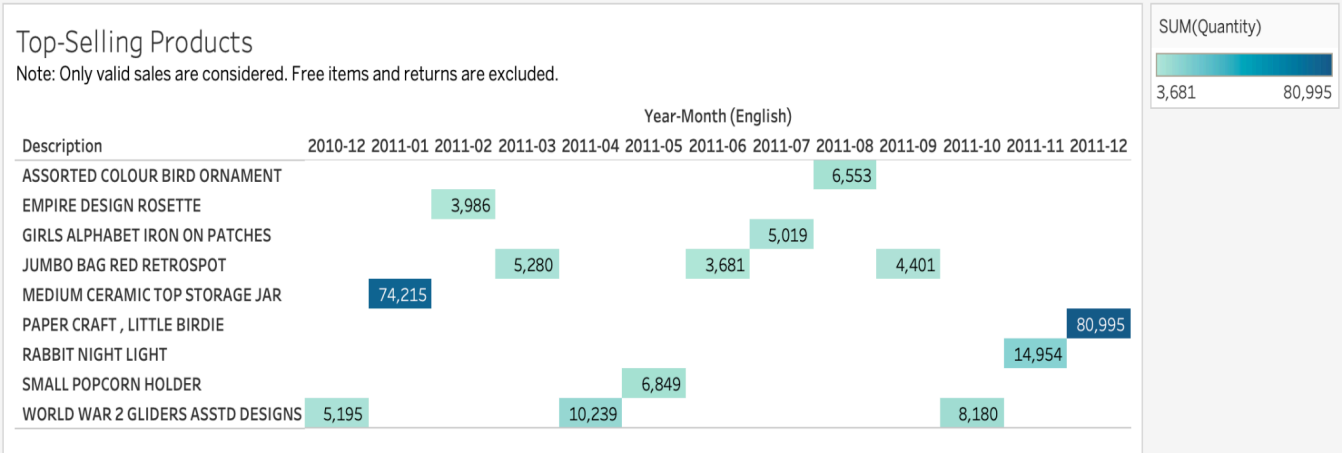
The chart highlights the company's top-selling products over time, with "Medium Ceramic Top Storage Jar" and "Paper Craft" showing the highest sales volumes, particularly in December 2010 and December 2011 respectively. Sales spikes are concentrated around year-end months, suggesting strong seasonal demand, likely tied to holiday shopping. To maximize revenue, the company should prioritize stocking and promoting top-performing products ahead of the holiday season and consider expanding similar popular product lines to leverage this seasonal buying behavior.

Lowest-Selling Products

Lowest-Selling Products
Note: Only valid sales are considered. Free items and returns are excluded.

SUM(Quantity)

| Description	2010-12	2011-01	2011-02	2011-03	2011-04	2011-05	2011-06	2011-07	2011-08	2011-09	2011-10	2011-11	2011-12
2 DAISIES HAIR CO..	1			1							1		
2 PICTURE BOOK E..									1				
3 BIRDS CANVAS S..					1			1					
3 TIER SWEETHEA..												1	
3D TRADITIONAL C..			1										
3D VINTAGE CHRIS..						1							
4 BURGUNDY WIN..		1								1			
4 PINK FLOCK CHRI..							1						
75 GREEN FAIRY C..													1

The chart identifies products with the lowest sales, each selling only one unit across different months. These items show little to no market demand and likely occupy unnecessary inventory space. To optimize resources, the company should consider discontinuing these underperforming products or reassessing their marketing and pricing strategies if there is potential to revive demand.

Top Revenue-Generated Products

Top Revenue-Generating Products
Note:
Only valid sales are considered. Free items and returns are excluded.

SUM(Revenue)
11,009   168,470

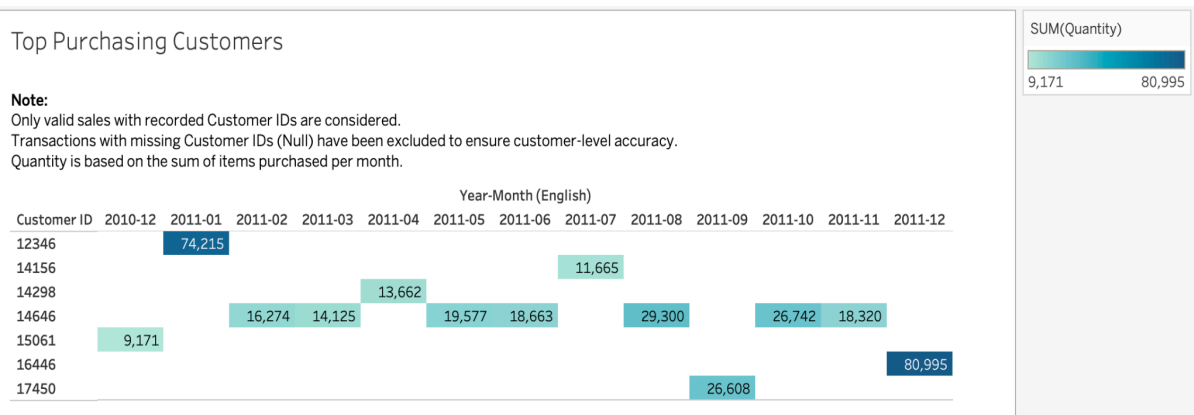| Description	2010-12	2011-01	2011-02	2011-03	2011-04	2011-05	2011-06	2011-07	2011-08	2011-09	2011-10	2011-11	2011-12
DOTCOM POSTAGE									13,401	15,177		36,905	
Manual											21,549		
MEDIUM CERAMIC TOP STORAGE JAR			77,184										
PAPER CRAFT , LITTLE BIRDIE													168,470
PARTY BUNTING						19,148		14,577					
PICNIC BASKET WICKER 60 PIECES							39,620						
REGENCY CAKESTAND 3 TIER	27,870		11,009	18,372	14,813								

The chart highlights the products that generated the most revenue, with "Paper Craft" and "Medium Ceramic Top Storage Jar" leading by a large margin. Revenue peaks are concentrated toward the end of the year, especially in December, indicating strong seasonal effects. To further boost profits, the company should prioritize inventory and marketing for top-performing products during peak months and explore opportunities to replicate their success across similar product categories.
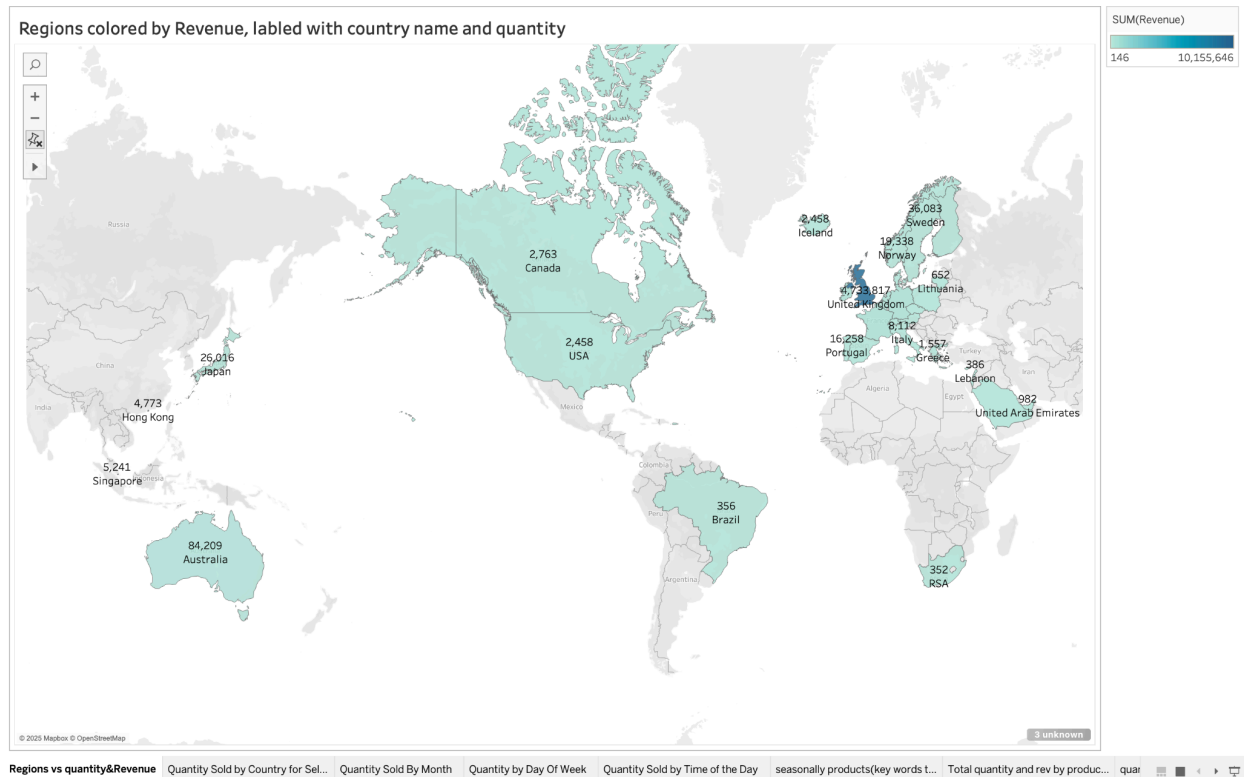
Lowest Revenue-Generated Products
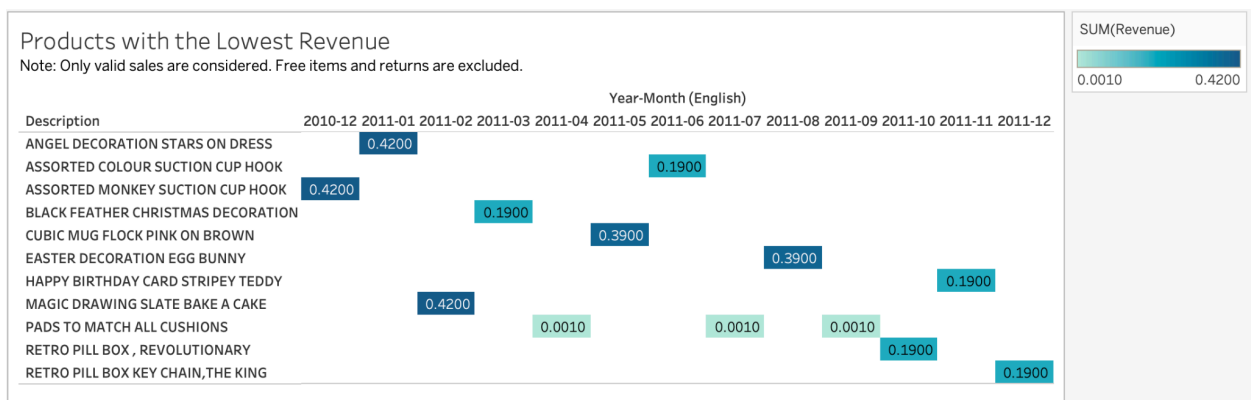
The chart highlights products that generated the least revenue, with all items contributing minimal sales across various months. The extremely low revenue values suggest that these products either have little market appeal or face significant pricing issues. To optimize profitability, the company should consider phasing out these underperforming products or repositioning them with better marketing or bundled promotions if they fit broader sales strategies.

Top Purchasing Customers

Top Purchasing Customers

Note:
Only valid sales with recorded Customer IDs are considered.
Transactions with missing Customer IDs (Null) have been excluded to ensure customer-level accuracy.
Quantity is based on the sum of items purchased per month.

SUM(Quantity)
9,171 — 80,995

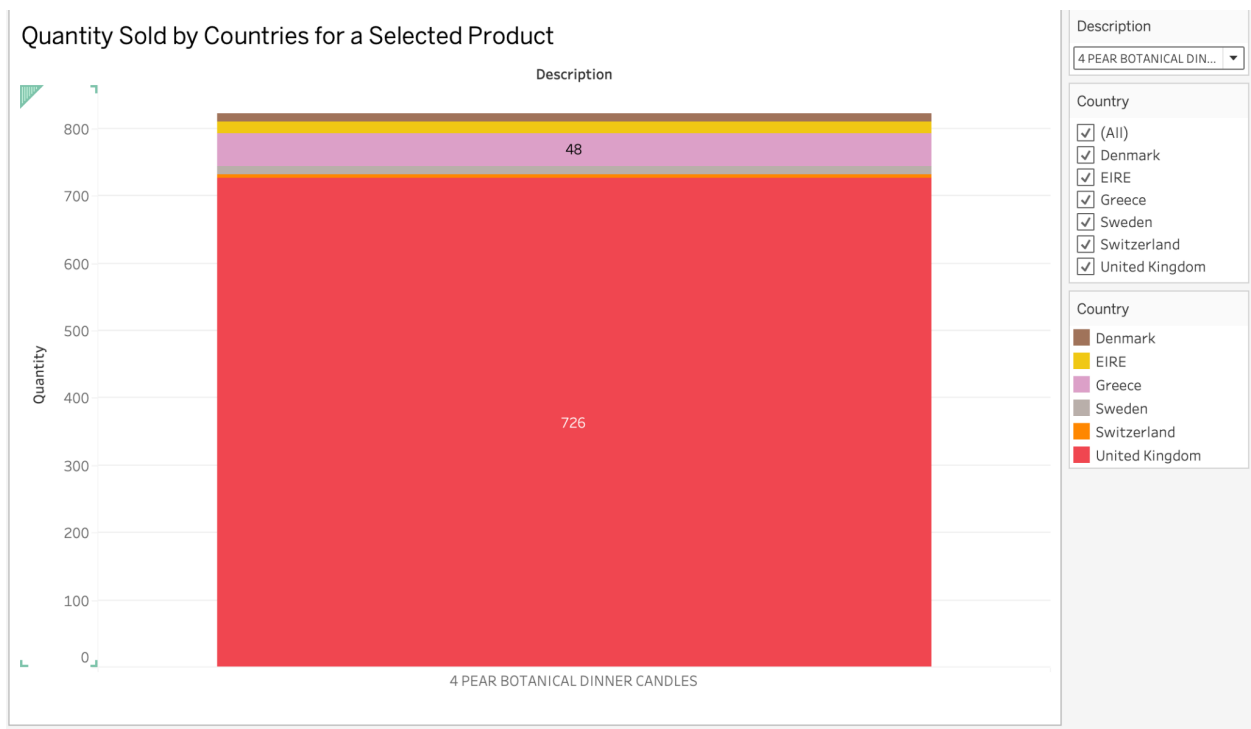| Customer ID	2010-12	2011-01	2011-02	2011-03	2011-04	2011-05	2011-06	2011-07	2011-08	2011-09	2011-10	2011-11	2011-12
12346		74,215											
14156								11,665					
14298					13,662								
14646			16,274	14,125		19,577	18,663		29,300		26,742	18,320	
15061	9,171												
16446													80,995
17450										26,608			

Year-Month (English)

The chart highlights the customers who purchased the most items, with a few key customers contributing significantly higher quantities than others, particularly in December 2010 and December 2011. This indicates a strong reliance on a small group of high-volume buyers. To sustain growth, the company should strengthen relationships with these top customers through loyalty programs or personalized offers, while also working to expand the broader customer base to reduce revenue concentration risk.
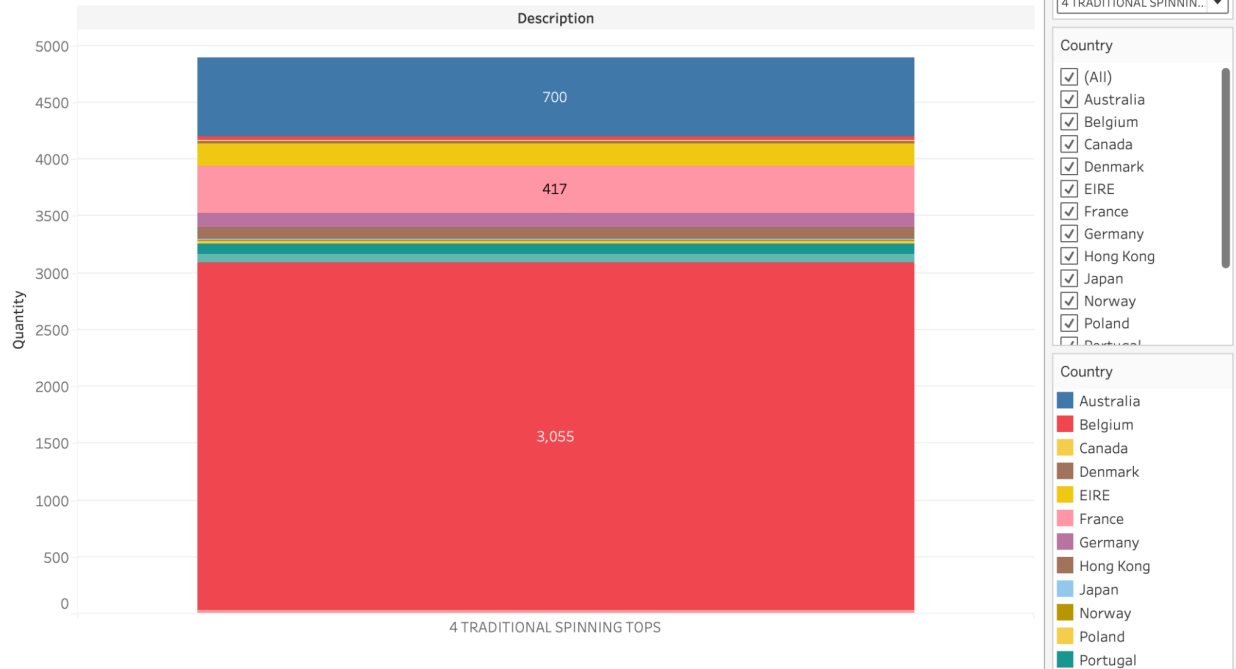
Revenue and Sales Volume Across Countries

Regions colored by Revenue, labled with country name and quantity

SUM(Revenue)
146   10,155,646

2,458 Iceland
36,083 Sweden
19,338 Norway
652 Lithuania
4,733,817 United Kingdom
8,112 Italy
16,258 Portugal
1,557 Greece
386 Lebanon
982 United Arab Emirates
2,763 Canada
2,458 USA
26,016 Japan
4,773 Hong Kong
5,241 Singapore
84,209 Australia
356 Brazil
352 RSA

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3 unknown

Regions vs quantity&Revenue | Quantity Sold by Country for Sel... | Quantity Sold By Month | Quantity by Day Of Week | Quantity Sold by Time of the Day | seasonally products(key words t... | Total quantity and rev by produc... | quar

The map shows that Australia, the United Kingdom, and Sweden are the top regions in terms of total revenue, while countries like Brazil and South Africa generate significantly lower sales. The store should focus on strengthening sales in high-revenue regions and reassess its strategy for lower-performing markets. The client can use the below visualization to filter by country and quickly identify key opportunities and inefficiencies. For instance, Australia's outstanding revenue suggests that further investment could be highly profitable, whereas low sales in Brazil and South Africa indicate potential areas to scale back. To maximize profitability, the store should either 1. prioritize top-performing markets or 2. reevaluate pricing, marketing, and logistics strategies in regions where sales remain low.
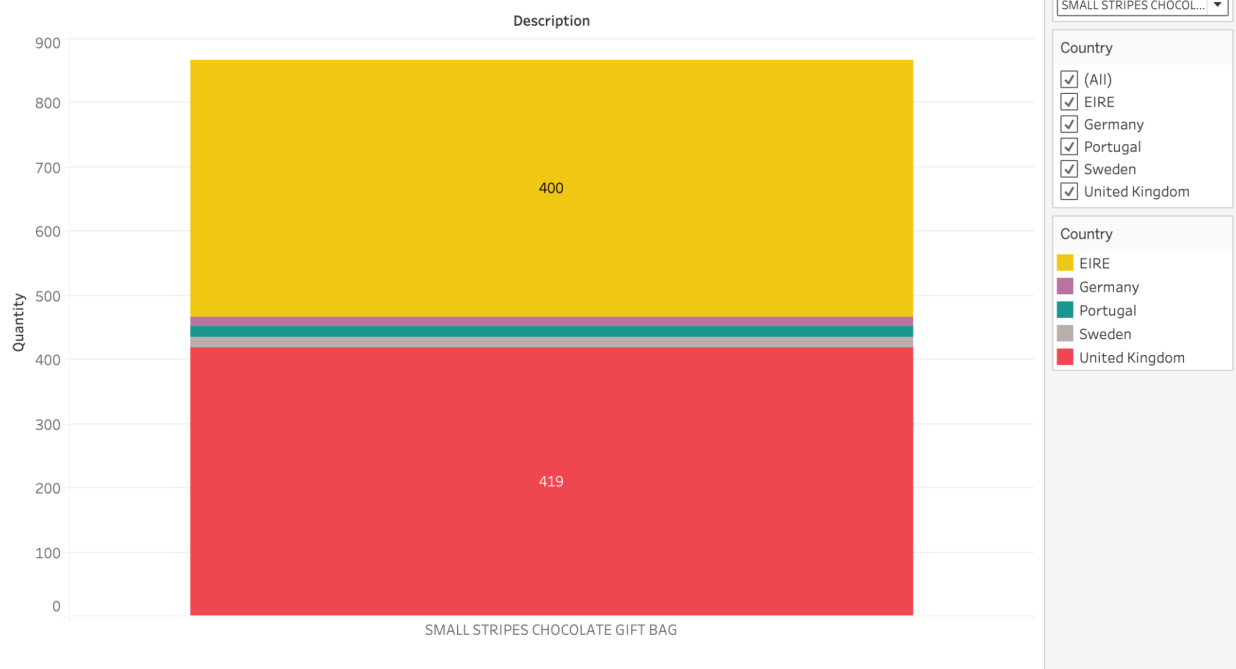
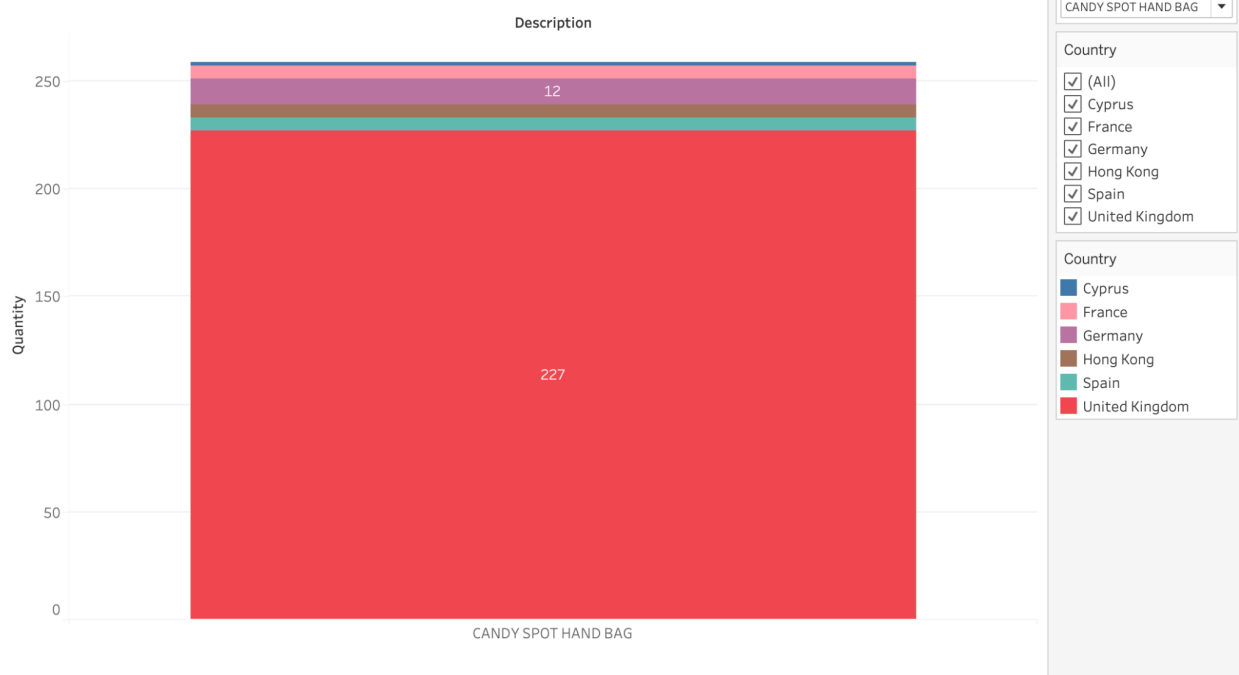# Product Sales Quantity By Countries

Quantity Sold by Countries for a Selected Product

Description

Description
4 PEAR BOTANICAL DIN... ▼

Country
- ☑ (All)
- ☑ Denmark
- ☑ EIRE
- ☑ Greece
- ☑ Sweden
- ☑ Switzerland
- ☑ United Kingdom

Country
- ■ Denmark
- ■ EIRE
- ■ Greece
- ■ Sweden
- ■ Switzerland
- ■ United Kingdom

Quantity Sold by Countries for a Selected Product

Description

4 TRADITIONAL SPINNING TOPS

Quantity Sold by Countries for a Selected Product

Description

SMALL STRIPES CHOCOLATE GIFT BAG

Quantity Sold by Countries for a Selected Product

The selected products can be grouped into four main categories: fashion accessories, gifts, toys, and home decor. Quantity sold varies significantly across these categories and countries, with the United Kingdom consistently showing the highest demand across all items. The client can use this categorization to tailor marketing strategies based on product type — for example, promoting fashion and gift packaging items during peak holiday seasons, while emphasizing home decor products during traditional dining occasions. Toys, with their wider appeal across regions, suggest potential for international market expansion if supported by targeted promotions.

Monthly Quantity Sold for Selected Product

Quantity Sold By Month for selected product

Description

ALARM CLOCK BAKELIKE... ▼
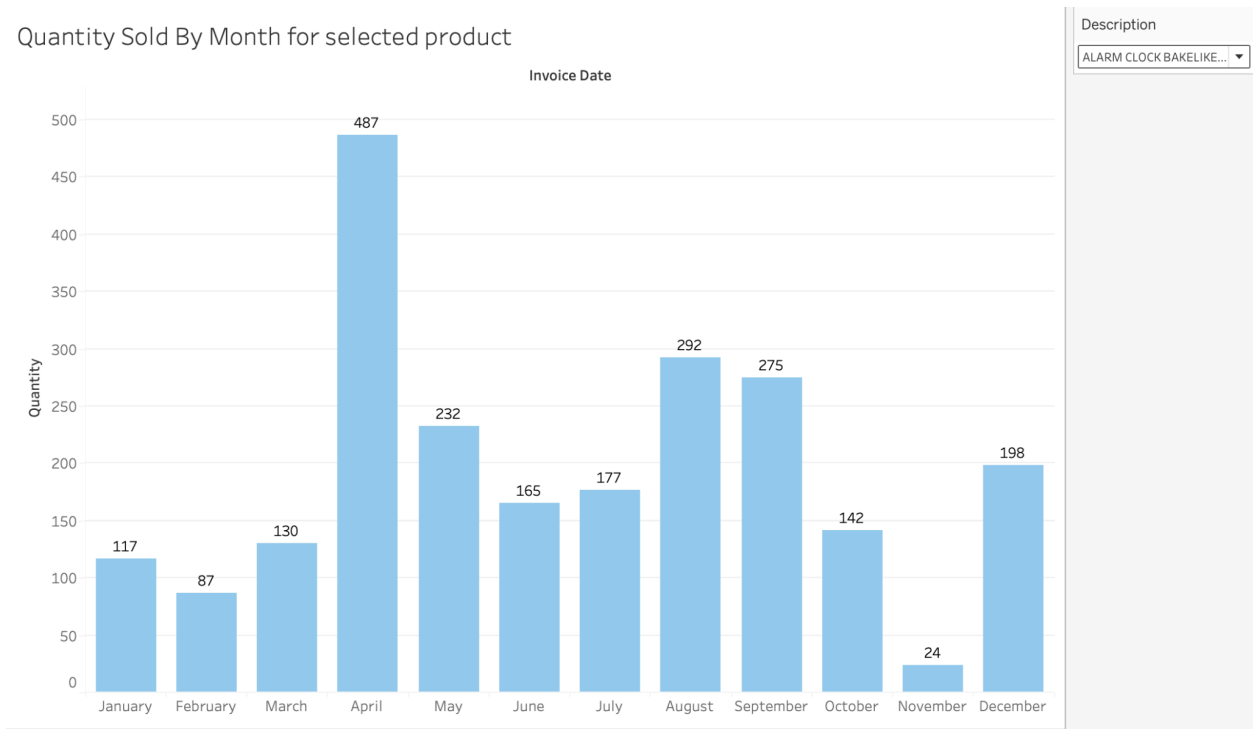
This chart shows the monthly quantity sold across all products in the company to analyze overall seasonal sales trends. For example, sales of the Alarm Clock Bakelike product show clear seasonality, with a sharp peak in April and strong performance during the summer months of August and September. Sales significantly dropped in November but rebounded moderately in December, possibly due to holiday shopping. To maximize profitability, the client should plan inventory boosts before April and the late summer months, while implementing promotional strategies to stimulate demand during traditionally weaker months like February and November.

When Customers Buy: Quantity Sold by Time of Day

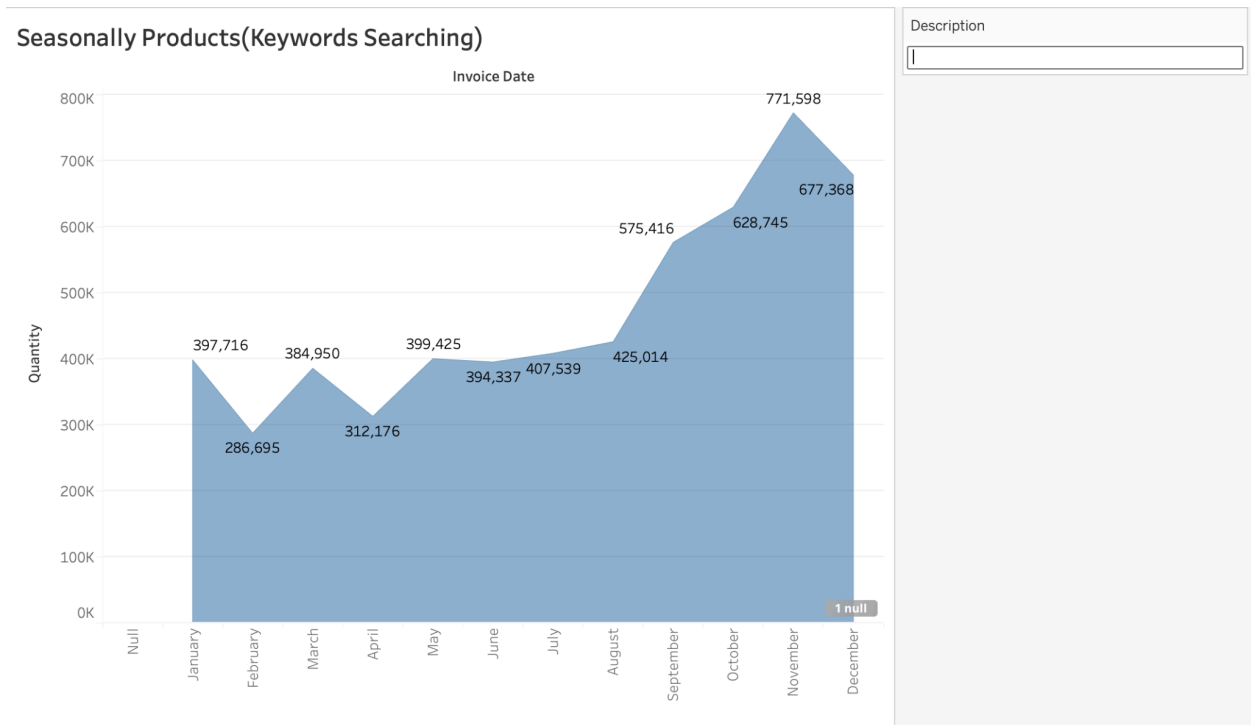**Quantity Sold by Time of Day**
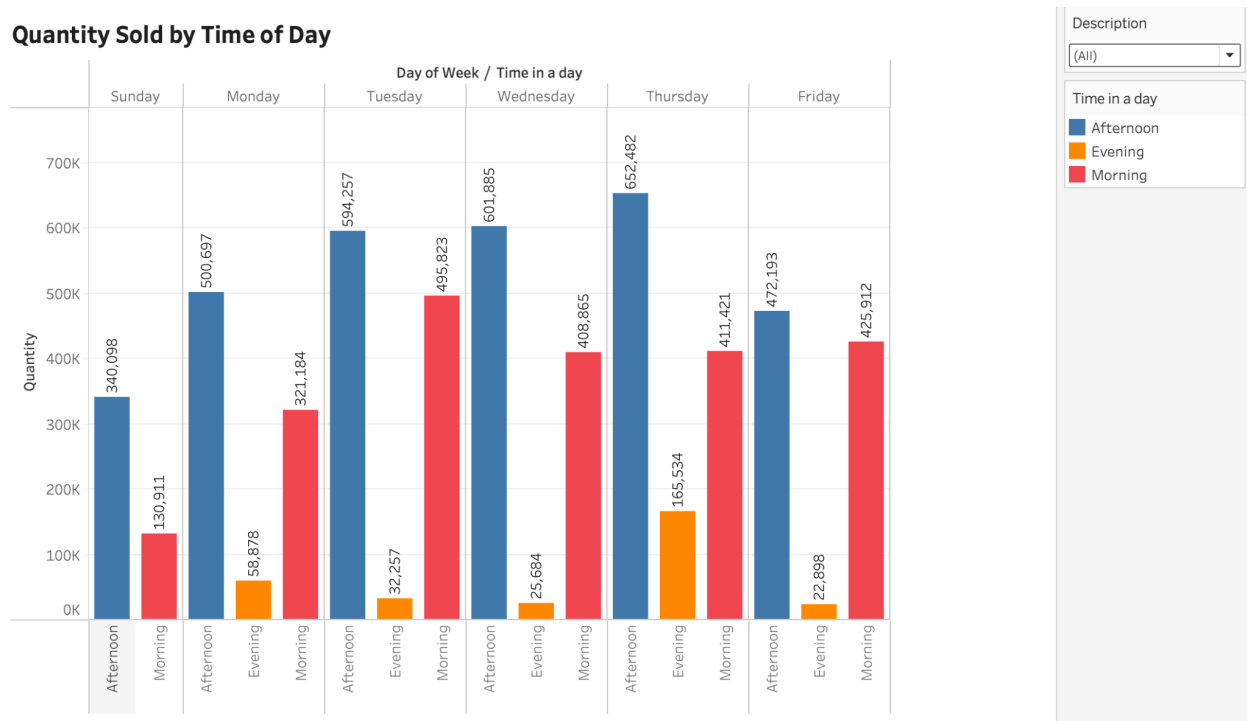
The chart shows that most purchases occur in the afternoon across all weekdays, with Thursday afternoon reaching the highest sales quantity. Morning sales remain consistently strong but lower than afternoon levels, while evening sales are minimal throughout the week. This pattern suggests that the company should prioritize promotional activities and marketing efforts during afternoon hours, especially mid-week, to maximize sales. Additionally, optimizing staffing and customer support during afternoon peaks could further enhance operational efficiency and customer experience.
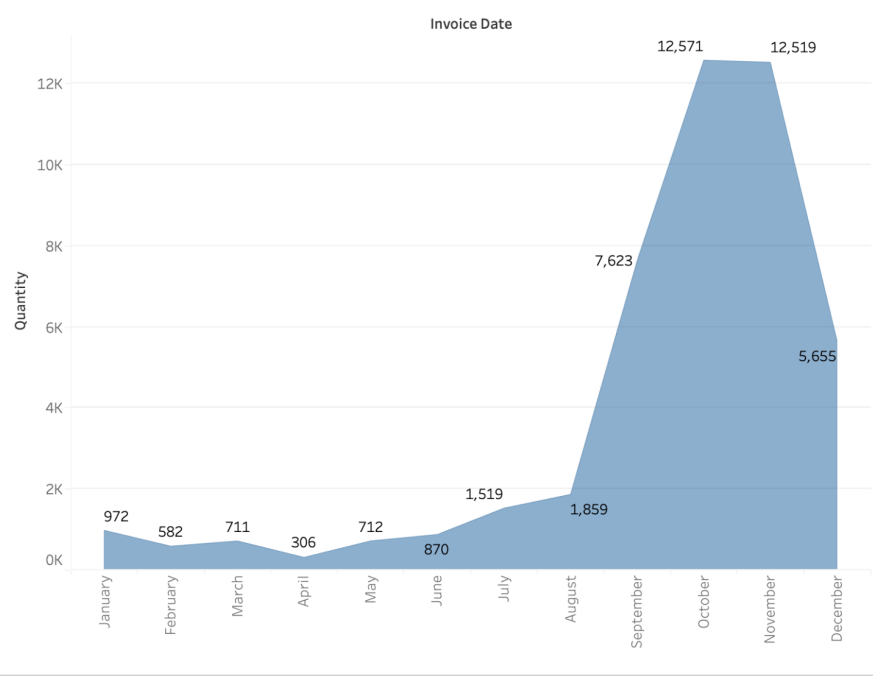
Results & Analysis

Question 1:

Is there any seasonality in purchases for certain products?

(Quantity Trends for All Products)
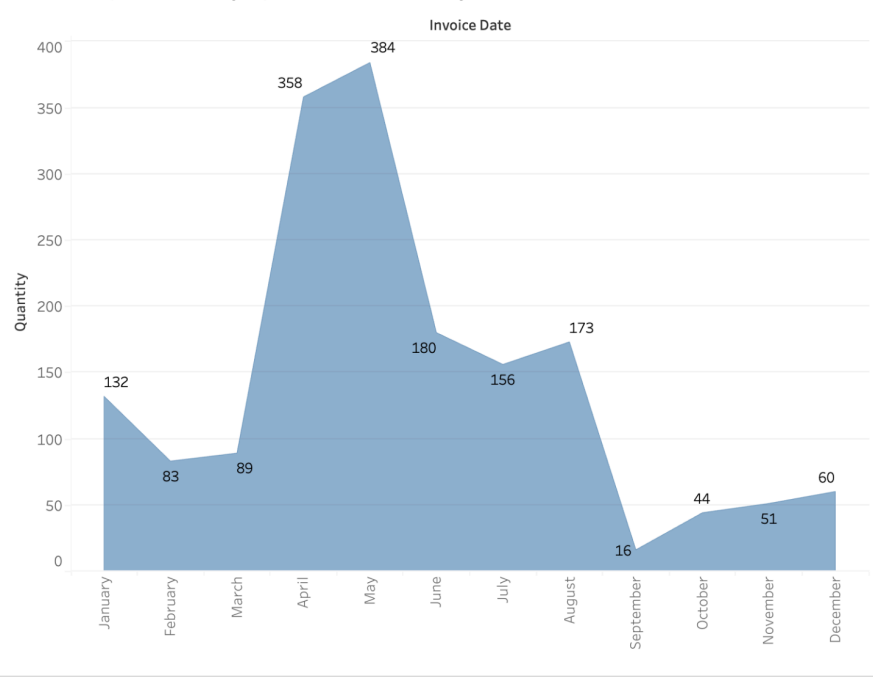
Seasonally Products(Keywords Searching)

Invoice Date

12,571	12,519

Quantity

7,623

5,655

972 582 711 306 712 1,519
          870 1,859

12K
10K
8K
6K
4K
2K
0K

January February March April May June July August September October November December

(Quantity Trends for products related to "Tree")

Seasonally Products(Keywords Searching)

Invoice Date

384
358

180 173
156

132
83 89

44
16   51   60

400
350
300
250
200
150
100
50
0

Quantity

January February March April May June July August September October November December

(Quantity Trends for products related to "Beach")

Seasonally Products(Keywords Searching)

Description
plate ✕

Invoice Date

Month	Quantity
January	3,589
February	2,981
March	3,567
April	2,227
May	8,336
June	7,657
July	5,324
August	3,690
September	4,395
October	4,080
November	3,349
December	4,534
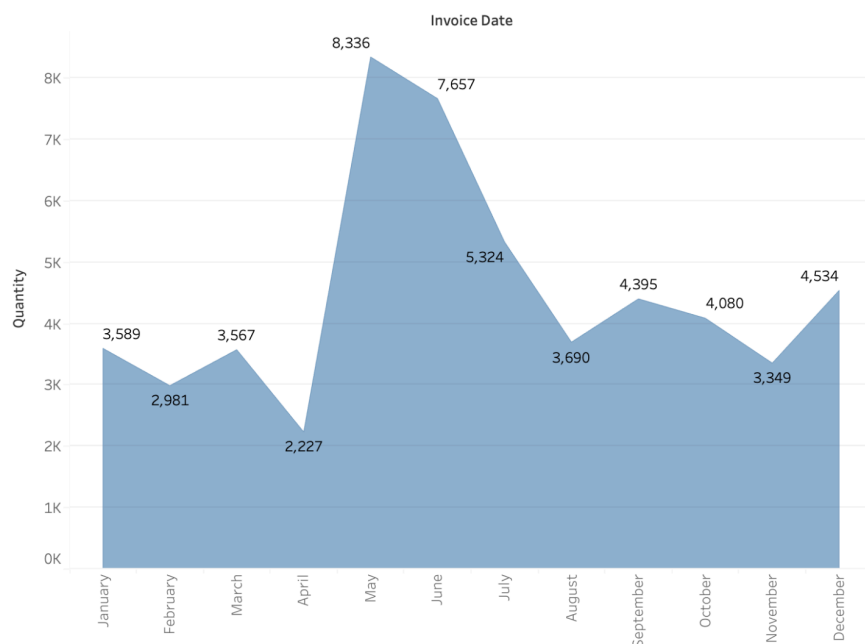
(Quantity Trends Related to "Plate")

Seasonally Products(Keywords Searching)

Description
pencil ✕

Invoice Date

| Month	Quantity
January	2,909
February	3,054
March	4,832
April	3,544
May	3,536
June	9,387
July	8,131
August	7,137
September	9,270
October	14,141
November	16,776
December	6,265
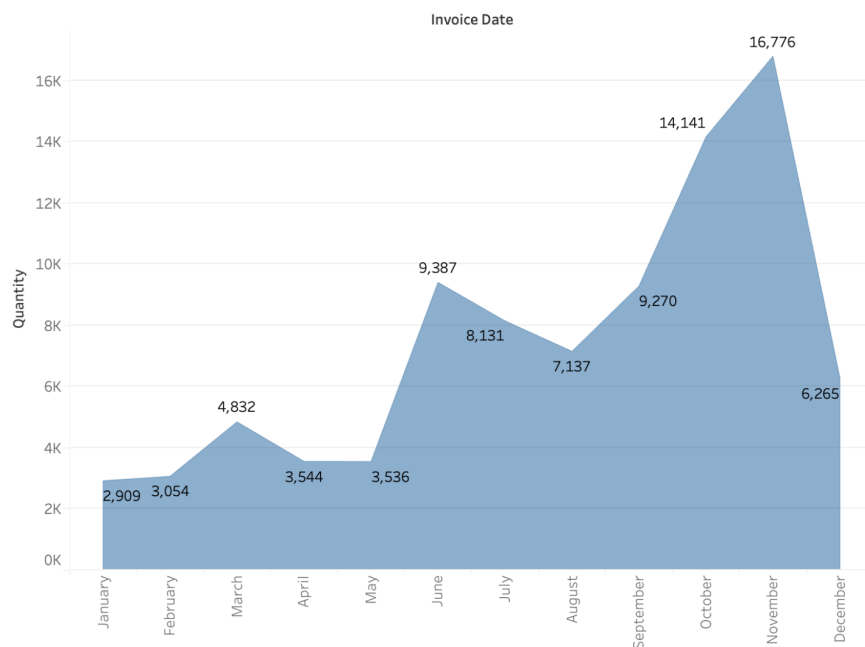
(Quantity Trends Related to "Pencil")

Yes, there is clear seasonality in purchases for certain products. The overall sales across all products show a steady increase toward the end of the year, peaking in October and November. Holiday-related products exhibit a strong seasonal spike in sales from September to November, reflecting holiday shopping patterns. Outdoor products peak in spring and early summer, aligning with seasonal outdoor activities. Kitchenware products see higher sales during late spring and early summer, likely driven by social gatherings and events. Stationery products show steady demand throughout the year but rise sharply in September and October, coinciding with back-to-school seasons. These patterns suggest that product category and timing play a significant role in purchasing behavior.

Question 2:

What trends do you notice for the website with respect to time?

Average Basket Size Over Time
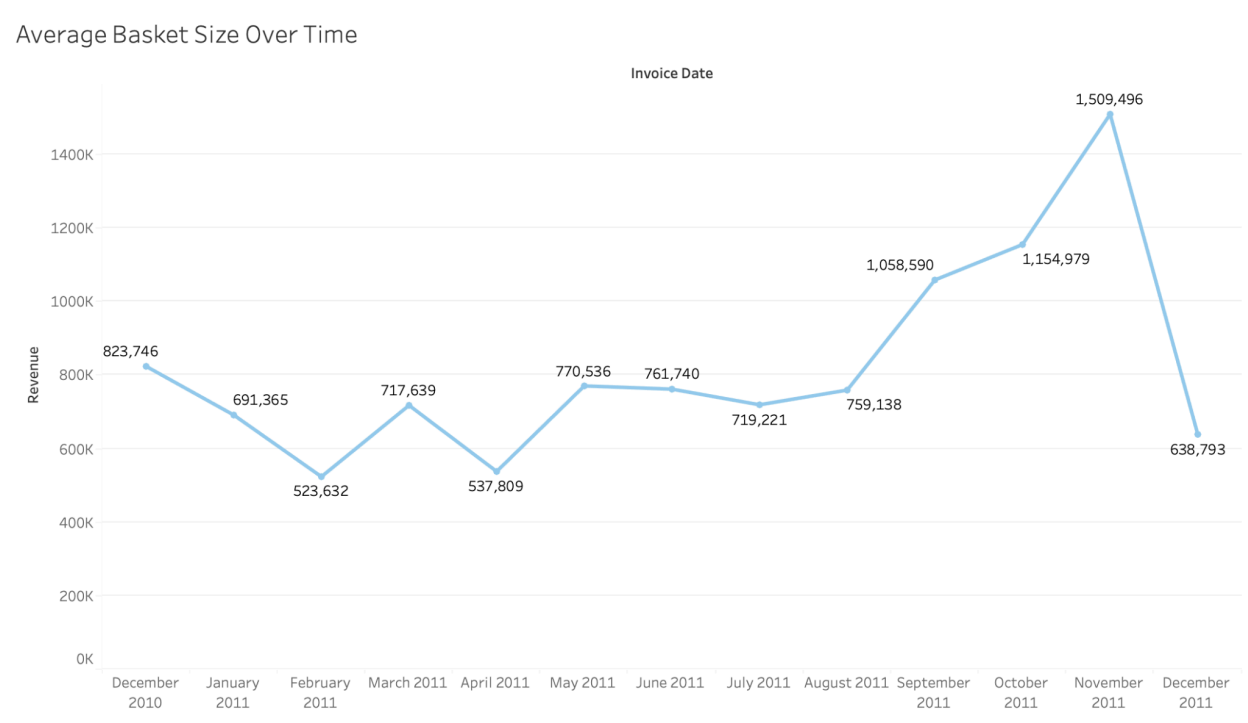
Over time, the website's average basket size (revenue) shows a generally increasing trend, especially from August 2011 onward. There is a sharp rise between August and November 2011, peaking in November, likely due to seasonal factors such as holiday shopping. Earlier months show more fluctuation without a strong upward pattern, but the second half of 2011 indicates significant growth in average basket size, suggesting improved customer spending behavior or effective promotional strategies.
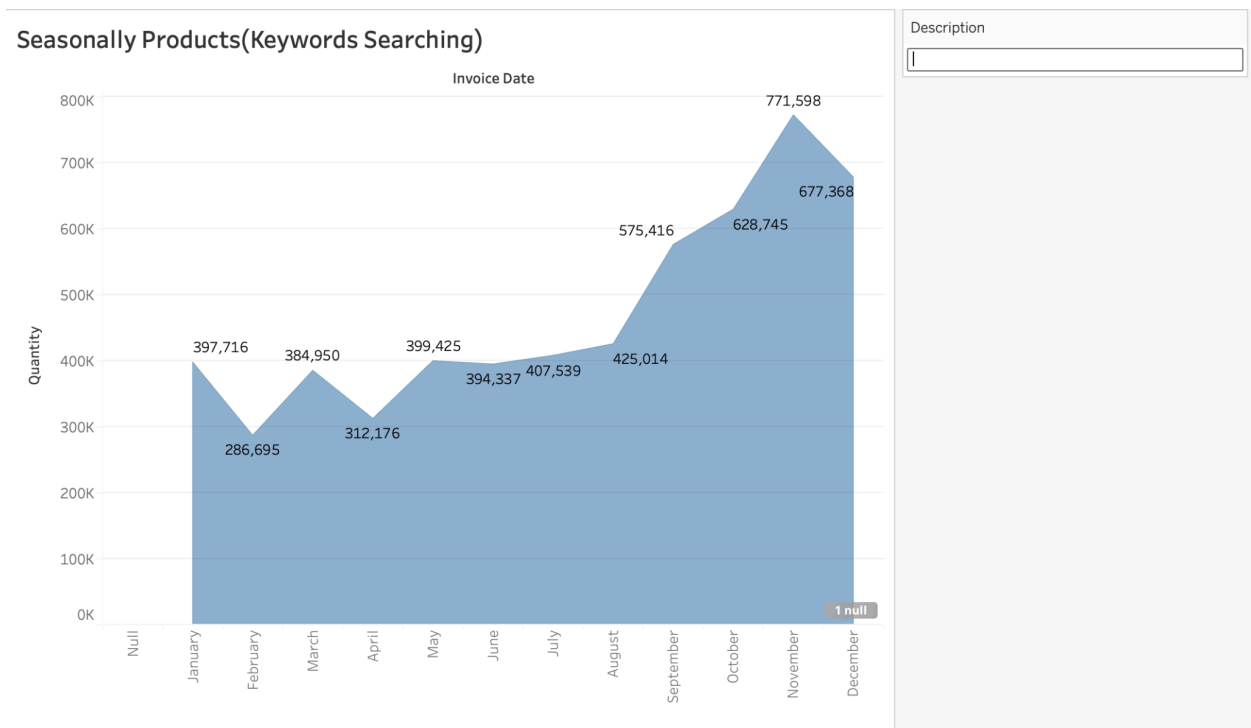
Question 3:

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

Trends in Basket Size Over Time

Year-Month (English)
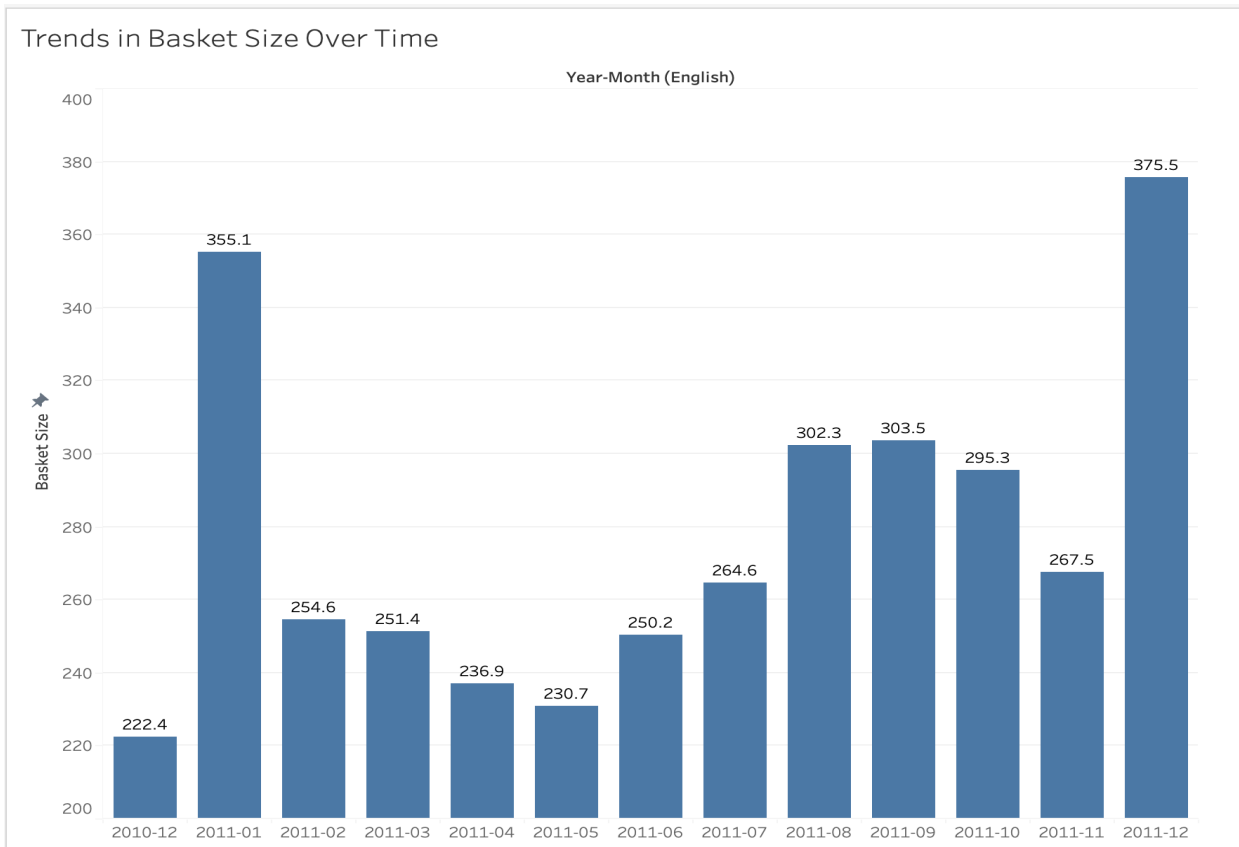
The basket size, representing the total number of items per receipt, fluctuates throughout the year but shows two major peaks — one in January 2011 and a sharper one in December 2011. After a dip in mid-2011, basket sizes gradually recovered and significantly increased at the end of the year, suggesting that customers tend to buy more items per transaction during the holiday seasons.
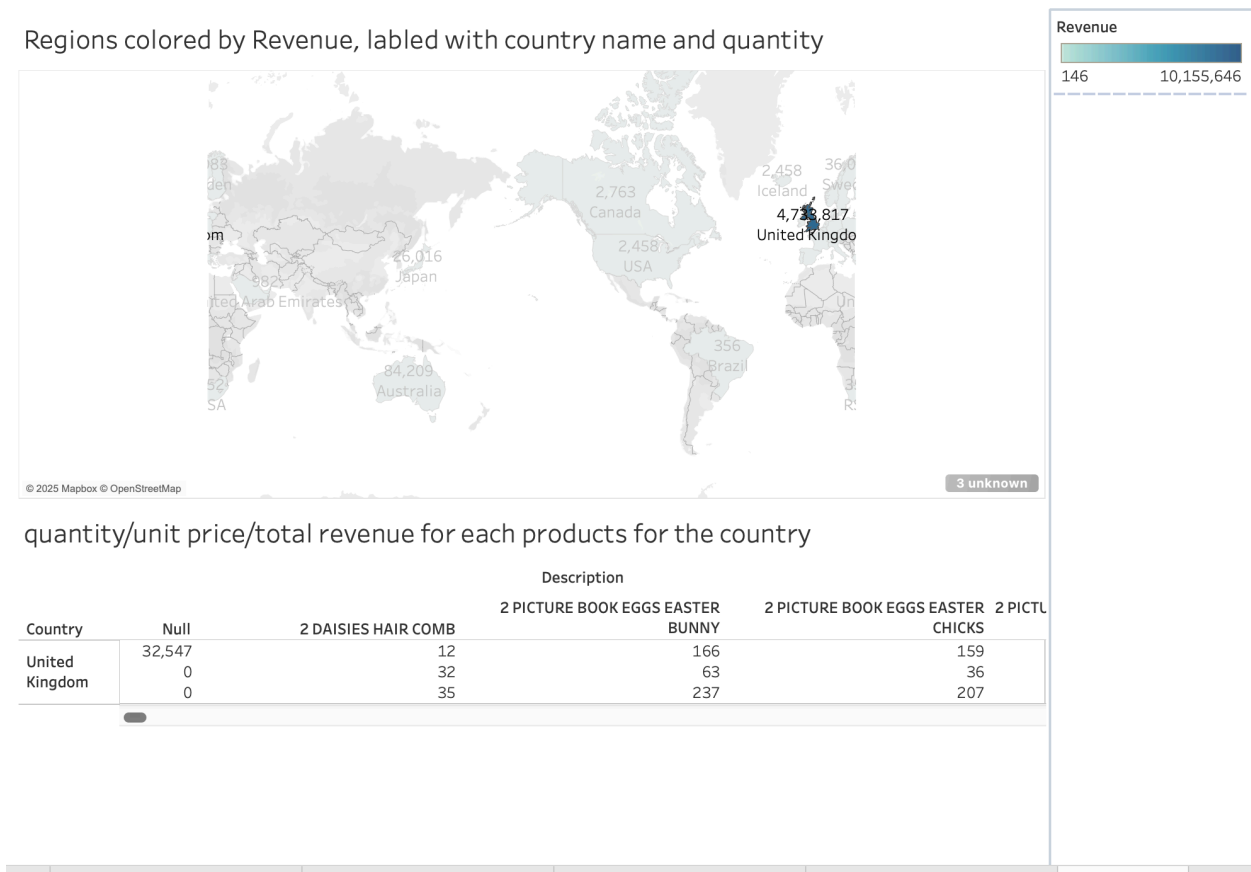
Question 4:

What are the peak sales periods for the business?

Seasonally Products(Keywords Searching)

Invoice Date

Quantity (Y-axis): 0K to 800K

- January: 397,716
- February: 286,695
- March: 384,950
- April: 312,176
- May: 399,425
- June: 394,337
- July: 407,539
- August: 425,014
- September: 575,416
- October: 628,745
- November: 771,598
- December: 677,368
- December: 1 null

Description

The peak sales periods for the business occur between September and November, with October showing the highest sales volume. This pattern suggests strong seasonal demand during the fall months, likely driven by holiday-related shopping activities.

Interactive data visualization

Regions colored by Revenue, labled with country name and quantity

© 2025 Mapbox © OpenStreetMap

Revenue

| 146 | 10,155,646 |

quantity/unit price/total revenue for each products for the country

Country	Null	2 DAISIES HAIR COMB	2 PICTURE BOOK EGGS EASTER BUNNY	2 PICTURE BOOK EGGS EASTER CHICKS	2 PICTU...
United Kingdom	32,547	12	166	159	
	0	32	63	36	
	0	35	237	207	

This interactive dashboard visualizes global sales by coloring countries based on total revenue and allows users to drill down into individual country-level product sales details, including quantity sold, unit price, and total revenue per product. The United Kingdom is colored the darkest shade on the map, indicating the highest total revenue among all countries.

Conclusions & Recommendations

1. Inventory Management & Seasonal Planning

Modecraft should boost inventory before the September–November peak, focusing on holiday and home decor items. Managing key categories by season and clearing low-demand products will optimize warehouse space and improve efficiency.

2. Product Strategy

Modecraft should prioritize promoting top-selling products like the Medium Ceramic Top Storage Jar and Rabbit Night Light, expand successful categories such as toys with international potential, and phase out or bundle low-revenue products to drive sales growth.

3. Customer Segmentation & Loyalty Programs

Modecraft should launch VIP programs and loyalty rewards for high-value customers, increase basket size through bundled deals and seasonal promotions, and offer holiday-exclusive product bundles to capture peak seasonal demand.

4. Time-Based Marketing Optimization

Modecraft should focus marketing efforts on afternoon hours, especially Thursdays when sales peak, and run flash sales during slower periods such as mornings and evenings to stimulate demand.

5. Geographical Strategy

Modecraft should invest more in high-revenue regions such as the United Kingdom, Australia, and Sweden, while reassessing or optimizing strategies for lower-performing markets like South Africa and Brazil.

6. Website and User Experience Enhancements

Modecraft should continue improving average basket size through cross-sells, upsells, and seasonal pages, enhance category navigation and search functionality, and implement personalized product recommendations based on customer purchasing behavior to boost repeat sales.