

Brothers' Candles Data Visualization Case Study Solution File

This file provides screenshots and analysis for tasks 1-8, as well as sample memo analysis. The Tableau solution file is available upon request; please email btrnka@csbsju.edu or kprestby@uscb.edu to request a copy.

Task 1a: What is the total quantity of candles sold over the entire time period? How does this compare with the sum of candles sold per the "Brothers' Candles Sales Table" Excel source file?

Q1a - Total Candles Sold

7,904

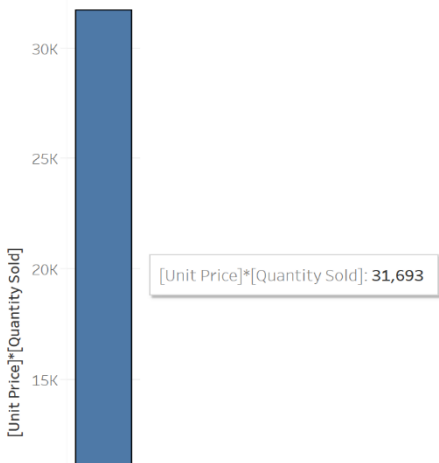
Task 1b: How many different types of candles does Brothers' Candles sell? How does this compare to the number of products included in the inventory table tab of the Excel source file?

Q1b - Types of Candles

24

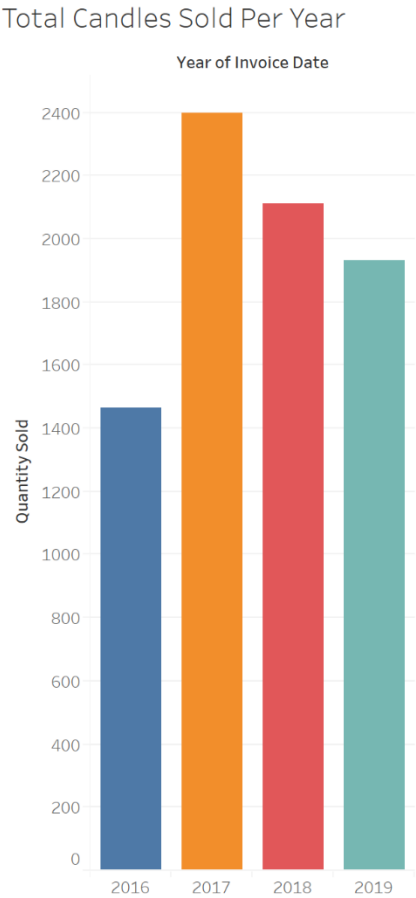
Task 1c: What is the total amount customers have paid for the candles? How does this compare to the sum of Amount Paid per the Sales Invoice tab of the Excel data file?

Q1c - Total Amount Paid by Customers



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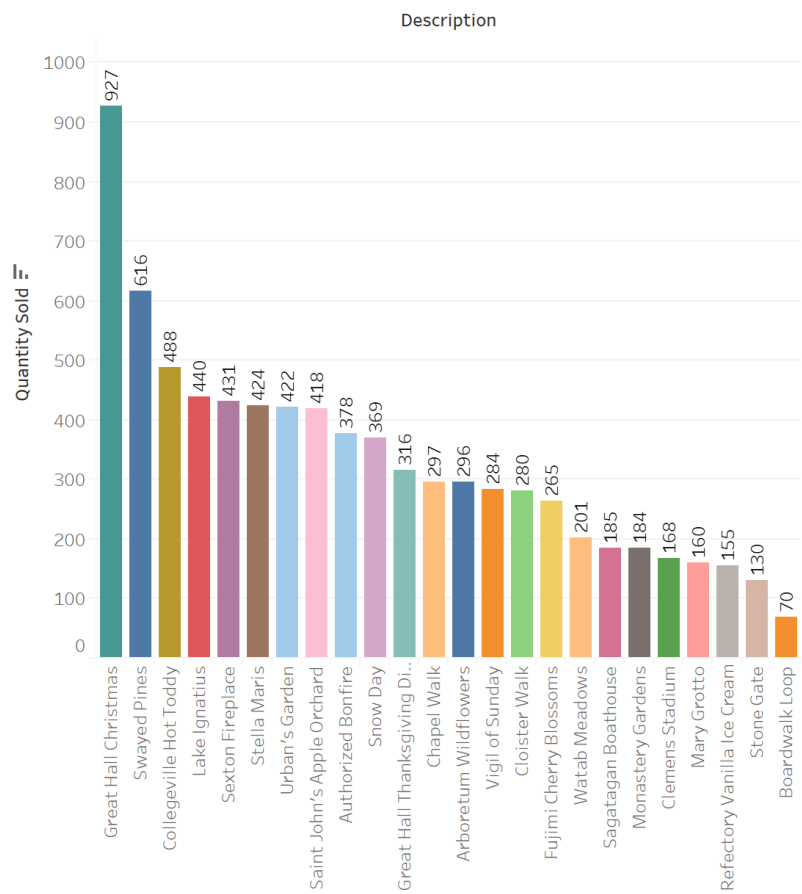
Task 2a: Show total quantity of candles sold per year



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Task 2b: Show total quantity sold by candle, for all year. Add a filter so users can easily change the years included

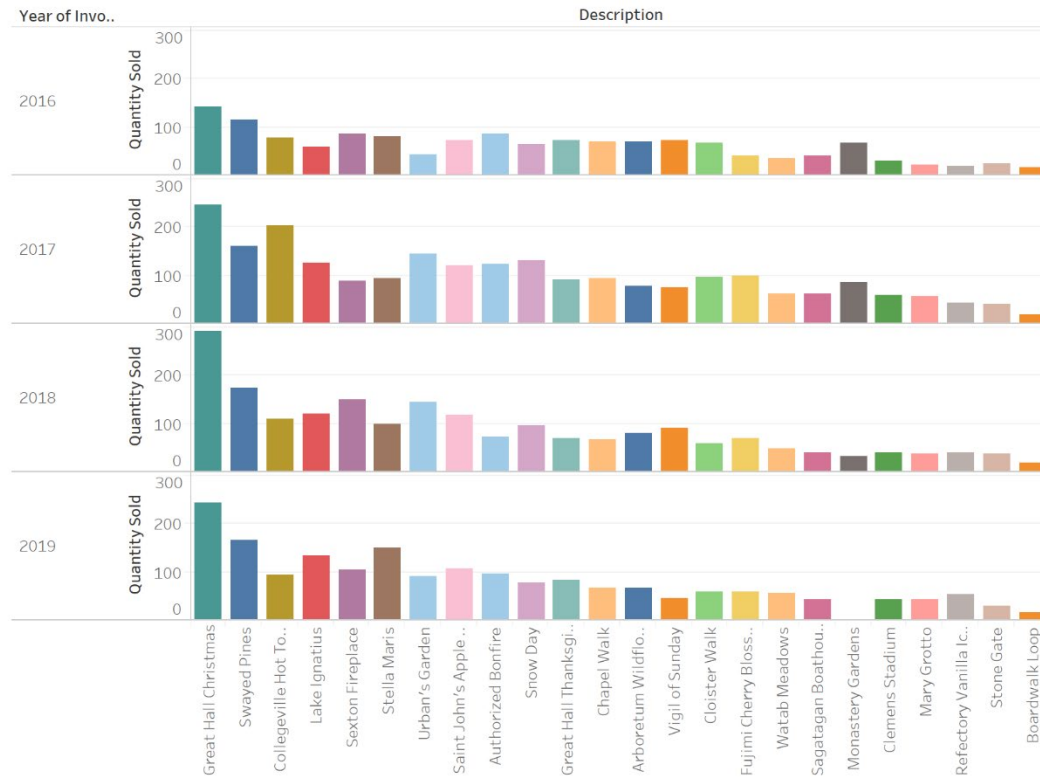
Total Product Sales Over All Years



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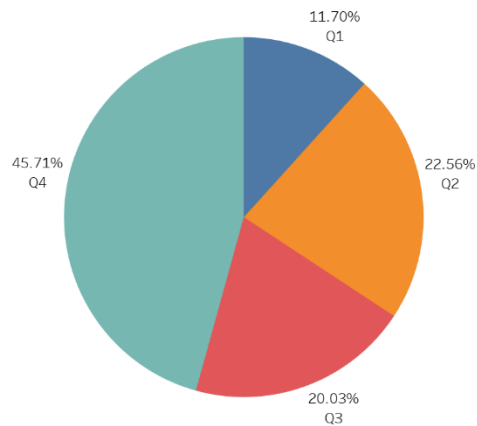
Task 2c: Show total candles sold each year, broken out on the individual candle level

Yearly Unit Product Sales by Inventory Item



Task 3a: Total candles sold (for all years combined) broken out by quarter, displaying the percentage sold in each quarter

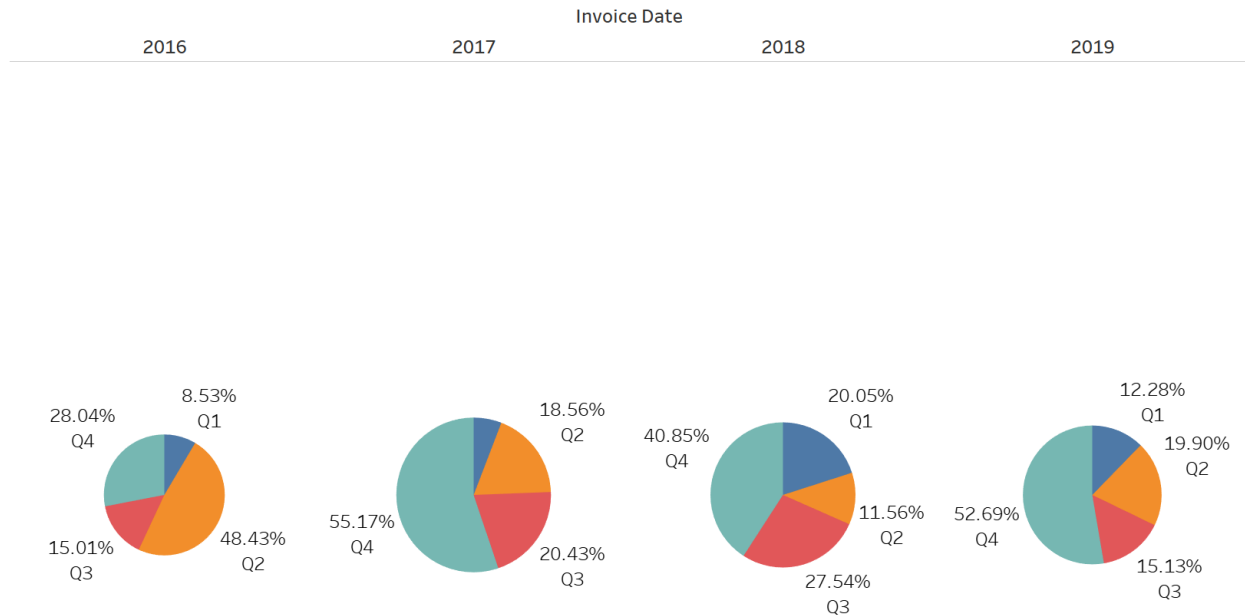
Total Candles Sold by Quarter



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Task 3b: Show candles sold by quarter for each individual year

Total Candles Sold by Quarter



Total Candles Sold by Quarter - CrossTab Analysis

Quarter of Invoice..		Invoice Date			
		2016	2017	2018	2019
Q1	% of Total Quantity Sold along Quarter of Invoice Date	8.53%	5.84%	20.05%	12.28%
	Quantity Sold	125	140	423	237
Q2	% of Total Quantity Sold along Quarter of Invoice Date	48.43%	18.56%	11.56%	19.90%
	Quantity Sold	710	445	244	384
Q3	% of Total Quantity Sold along Quarter of Invoice Date	15.01%	20.43%	27.54%	15.13%
	Quantity Sold	220	490	581	292
Q4	% of Total Quantity Sold along Quarter of Invoice Date	28.04%	55.17%	40.85%	52.69%
	Quantity Sold	411	1,323	862	1,017

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Task 4: Create a visual that will allow the Board of Directors to see how each candle performed in each quarter

Units of Candles Sold by Quarter

Description	Invoice Date			
	Q1	Q2	Q3	Q4
Arboretum Wildflowers	42	100	64	90
Authorized Bonfire	38	94	80	166
Boardwalk Loop	12	21	20	17
Chapel Walk	54	83	46	114
Clemens Stadium	22	47	44	55
Cloister Walk	29	57	75	119
Collegeville Hot Toddy	35	130	63	260
Fujimi Cherry Blossoms	54	68	37	106
Great Hall Christmas	35	93	141	658
Great Hall Thanksgiving Dinner	12	77	47	180
Lake Ignatius	59	97	59	225
Mary Grotto	12	32	64	52
Monastery Gardens	41	53	48	42
Refectory Vanilla Ice Cream	26	38	25	66
Sagatagan Boathouse	28	57	41	59
Saint John's Apple Orchard	50	120	102	146
Sexton Fireplace	37	90	114	190
Snow Day	54	67	61	187
Stella Maris	50	86	110	178
Stone Gate	32	36	24	38
Swayed Pines	75	130	111	300
Urban's Garden	48	94	84	196
Vigil of Sunday	46	61	80	97
Watab Meadows	34	52	43	72

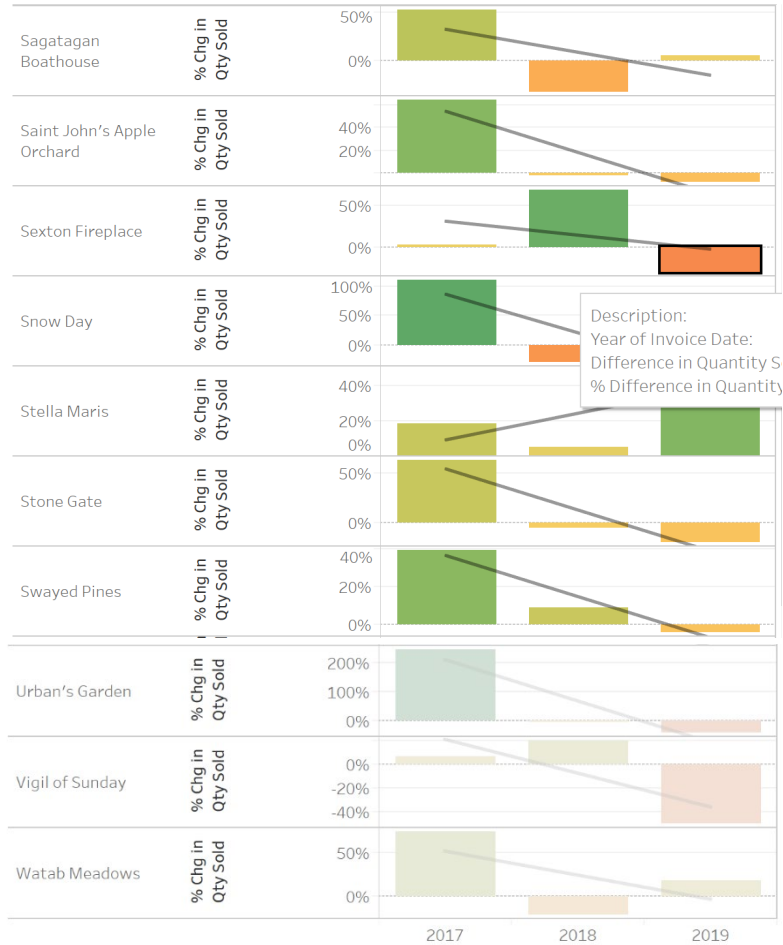
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Task 5: Create a visual that shows year over year growth/decrease for each candle. Include a trend line for easier viewing

Year over Year Sales by Candle



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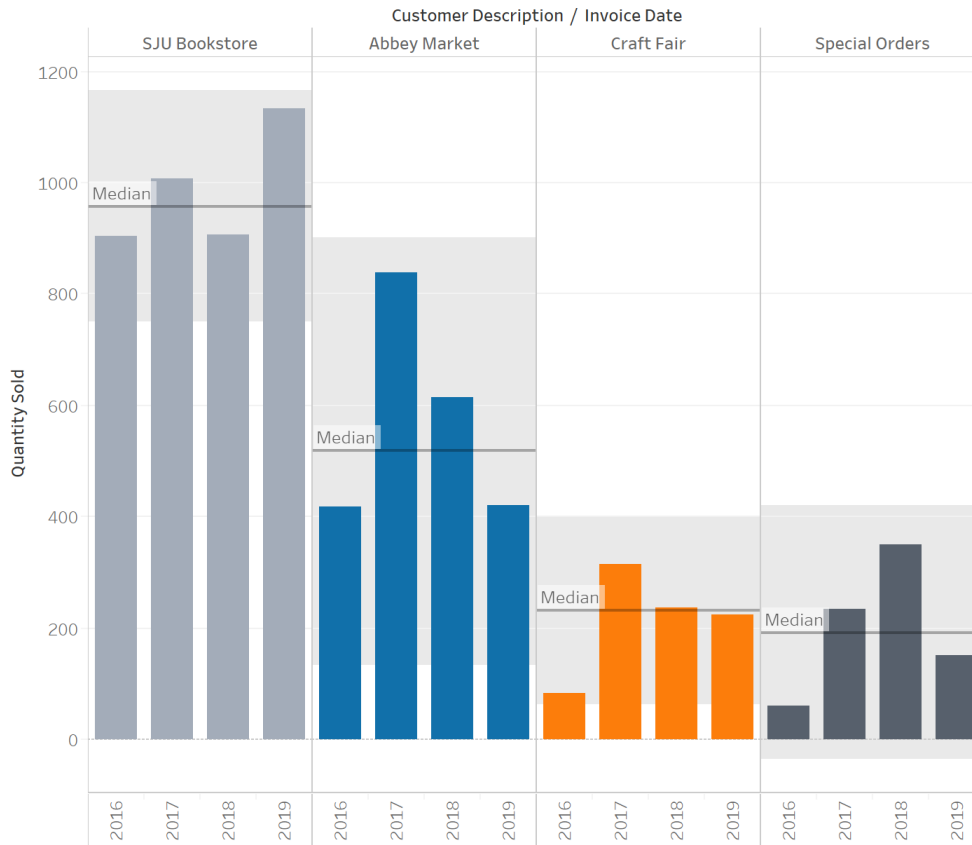
Analysis

Most candles declined from 2017 to 2018, which matches expectations based on the sales decline shown in visual 2a. Positively, 9 candles improved from 2018-2019. Stella Maris has been consistently improving while overall candles sales are decreasing, so there must be something consumers like about that fragrance. One possible recommendation based on this visual is to consider adding additional fragrances that are similar to Stella Maris.

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Task 6: Create a basic visualization to display the annual quantity of candles sold for each customer type. Include a median line for each pane.

Sales by Customer Type - Basic



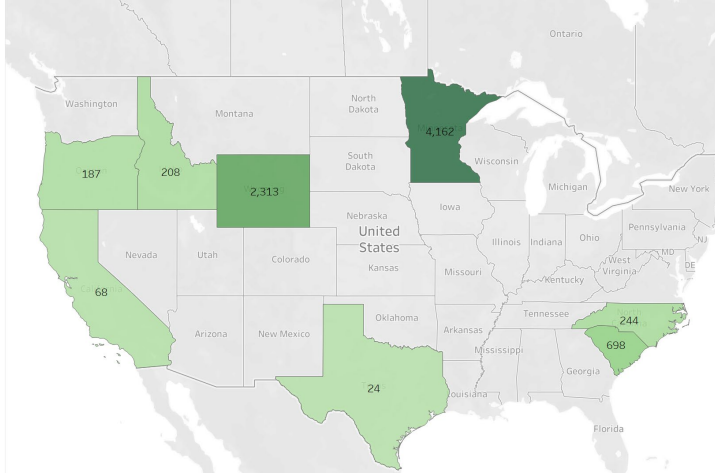
Analysis

Given the overall decline in sales, we see that bookstore sales increased over the same time period. Brothers' Candles may want to consider expanding to bookstores at other universities. The candles may provide an excellent value for both students and alumni at an appropriate price point. Additionally, craft fairs and special orders could drive renewed sales growth. Craft fairs provide an additional market that doesn't cannibalize bookstore or abbey market sales, and special orders could easily expand to new events, such as weddings. The abbey market should be looked at more closely to better understand the decrease. If abbey market sales continue to decline, it might make sense to focus energies on other areas of growth.

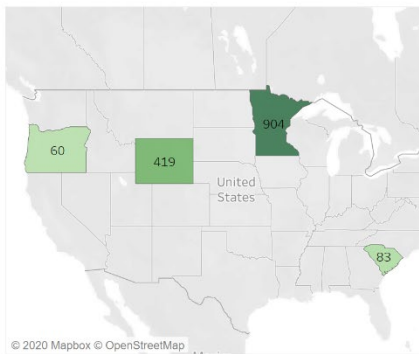
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Task 7: Use the mapping feature of Tableau to create a visual which shows the states in which sales occur. Add filtering to be able to see how sales in those locations has changed over time. Make sure to include a measure that indicates the quantity of sales in each state.

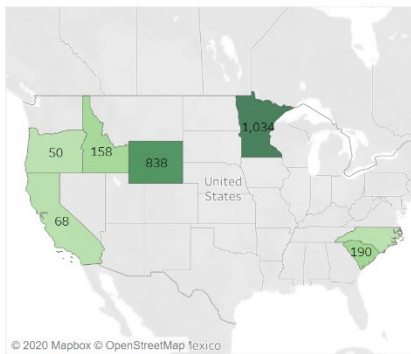
Unit Sales by Location Map - All Years



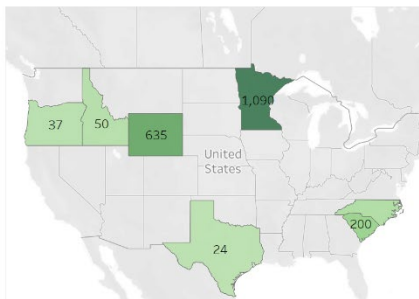
Sales by Location - 2016



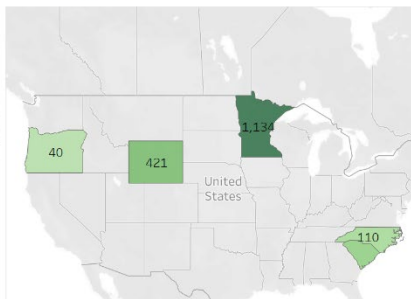
Sales by Location - 2017



Sales by Location - 2018



Sales by Location - 2019

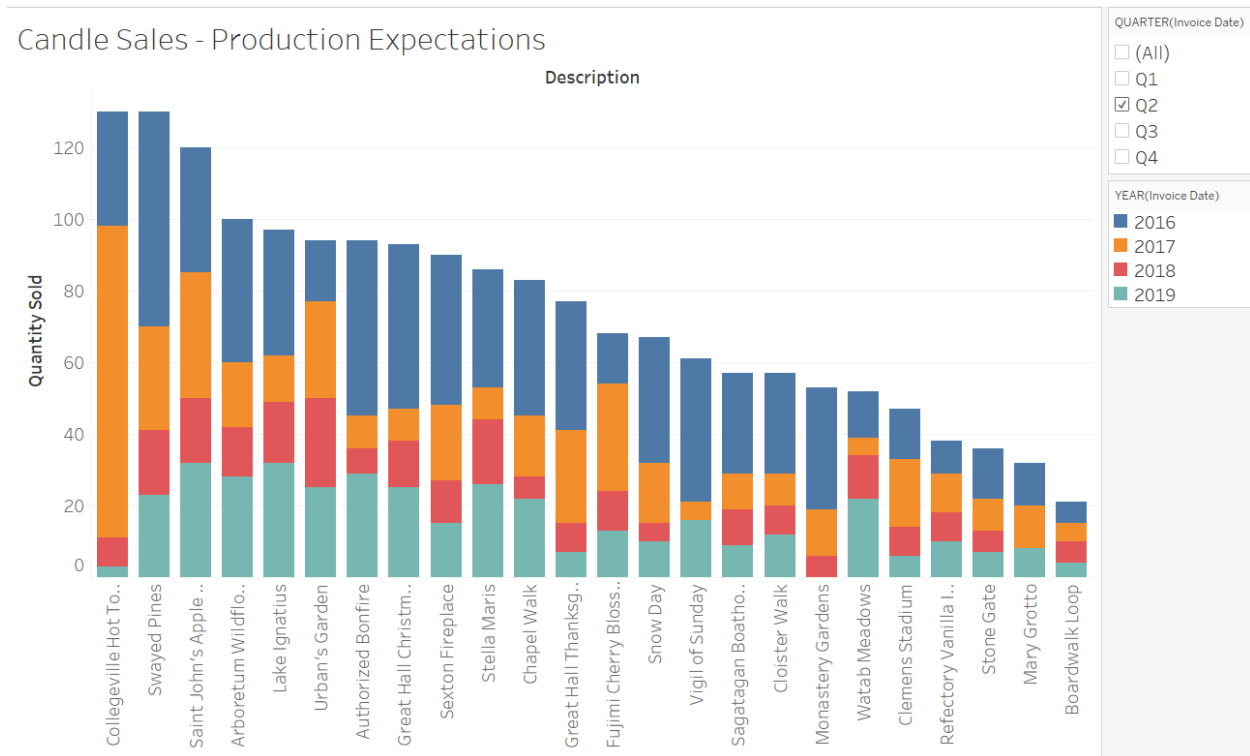


Analysis

Minnesota sales have increased each year despite the overall sales decrease. Brothers' Candles should consider focusing on the Minnesota market to drive further sale increases. On the other hand, Idaho sales have decreased from a 2017 peak of 158 candles to none in 2019. Brothers' Candles should investigate to determine the reason for the steep decline. Finally, Texas and California appear as potential emerging markets with small sales in 2017 and 2018. Management should consider expanding in these states as potential growth opportunities.

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Task 8: Develop a chart, based on the four years of data, that will help management determine which candles to produce for a coming period. For example, in Q1 management would like to see which candles to produce for Q2.



Analysis

Initial planning indicates Brothers Candles should focus production on Collegeville Hot Toddy and Swayed Pines in Q2. However, further analysis shows the large total for Collegeville Hot Toddy is a result of abnormally large 2017 Q2 sales. In 2018 and 2019, 8 and 3 candles were sold, respectively. In Tableau, drilling down to view the data for 2017 shows that Collegeville Hot Toddy sales were driven by two large special orders. Instead, candle production should focus on Saint John's Apple Orchard, Lake Ignatius, and Urban's Garden. All three of these candles have fruity fragrances which are more popular in Q2.

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MEMO

There are many potential “correct” memo solutions. Stronger memos will include the analysis provided to tasks 5-8 while also providing comprehensive recommendations across visuals. Some examples of potential comprehensive recommendations are included below.

Example 1

As identified in the Q7 dashboard, Minnesota is the only state that has experienced consistent year-over-year growth. When looking further into Minnesota sales by customer type, the reason for the growth is the strong performance in sales at bookstores. Brothers' Candles should apply this lesson to Texas and California, which represent potential emerging markets with small unit sales in 2017 and 2018 and no sales in 2019. Thus, Brothers' Candles should contact bookstores in Texas and California, both states with large university systems, as a way to establish a presence in those states. Additionally, management should further investigate the reason for the steep decline in Idaho sales by analyzing the 2017 Idaho sales by customer type.

Example 2

The sales by customer type visual indicates Brothers' Candles has an opportunity to improve sales by expanding through craft fairs and special orders. Additionally, the seasonality analyses summarized in the Q3 dashboard indicate Brothers' Candles has additional capacity in Q1 and Q3. Matching these two findings, Brothers' Candles should identify and market its products at craft fairs in Q1. Q3 represents peak season for both weddings and farmers' markets. Brothers' Candles could expand craft fair sales by attending a few local farmers' markets during Q3. Focusing on weddings during Q3, Brothers' Candles could provide customized candles for the engaged couple to provide as wedding favors. Alternatively, Brothers' Candles could provide fragrance free candles to be used as table centerpieces.

Example 3

Brothers' Candles is aware that candle consumers have many different preferences, as evidenced by the company's offering of 24 different candles. Now, with four years of sales data as evidence, Brothers' Candles should reevaluate the fragrances offered. Specifically, visual Q2b indicates that the bottom eight selling candles should be shelved. To still offer a broad assortment that appeals to many consumers, Brothers Candles can replace these fragrances to match changing preferences. Visual Q5 shows Stella Maris is the only fragrance to consistently increase annual unit sales. Visual Q5 also indicates eight additional candles that improved from 2018-2019. Brothers Candles should look to replace the bottom eight selling candles with fragrances that are similar to the candles that improved from 2018-2019.

Example 4

Brothers' Candles should perform additional deeper analysis to better identify its target market. Specifically, the seasonality analysis seen in the Q3 dashboard should be analyzed together with the Q6 customer type visual and the Q7 dashboard. This combined analysis would provide Brothers' Candles with a clear picture of the customer types and locations that drive sales in each quarter, and Brothers' Candles could then focus efforts on expanding sales by applying these lessons to new and emerging markets.