Data Visualization Using Tableau

Final Project

About the Data:

This file contains information about sales and promotions from a sample of retailers over 156 weeks, from January 2009 to December 2011. The top 5 goods from each of the top 3 brands in each category—mouthwash, pretzels, frozen pizza, and boxed cereal—have the following sales data. Additionally, the MSA datafile consists of all the city and State code which I have used with the combination of 3 datasheets.

The workbook offers a comprehensive visualization solution based on a sizable dataset. The dataset you'll need for the implementation is attached.
The dataset is a three-worksheet Excel document, each of which contains a dataset. Given that all of the datasets are interconnected, I utilized combiner to use all of the datasets. The glossary worksheet can be used to get more information about the data set.

The following **variables** are part of the Dataset's data dictionary:

- ADDRESS_CITY_NAME - city
- ADDRESS_STATE_PROV_CODE - state
- AVG_WEEKLY_BASKETS - average weekly baskets sold in the store
- BASE_PRICE - base price of item
- MANUFACTURER - manufacturer
- CATEGORY - category of product
- DESCRIPTION - prodcut description
- DISPLAY - product was a part of in-store promotional display
- FEATURE - product was in in-store circular
- HHS - # of purchasing households
- MSA_CODE - (Metropolitan Statistical Area) geographic region with a high core population density and close economic ties throughout the surrounding areas
- PARKING_SPACE_QTY - number of parking spaces in the store parking lot
- PRICE - actual amount charged for the product at shelf
- WEEK_END_DATE - week ending date
- SALES_AREA_SIZE_NUM - square footage of store

- STORE_APPEAL - Retailer's designated store appeal
- SPEND - total spend (i.e., $ sales)
- STORE_NUM - store number
- SUB_CATEGORY - sub-category of product
- TPR_ONLY - temporary price reduction only (i.e., shelf tag only, product was reduced in price but not on display or in an advertisment)
- UNITS - units sold
- UPC - (Universal Product Code) product specific identifier
- VISITS - number of unique purchases (baskets) that included the product
- PRODUCT_SIZE - package size or quantity of product

The Key Objectives of the Project were:-

1. Analysis of exploratory data.
2. Examine historical sales and revenue patterns for a variety of demographics, including categories, locations, etc.
3. Create a visualization that would reveal any notable trends in the data and pinpoint the variables that might have an impact on sales and income figures.
4. Provide the top 3 suggestions that would permit business growth over the ensuing years based on the visualizations and research, along with a brief explanation of why.

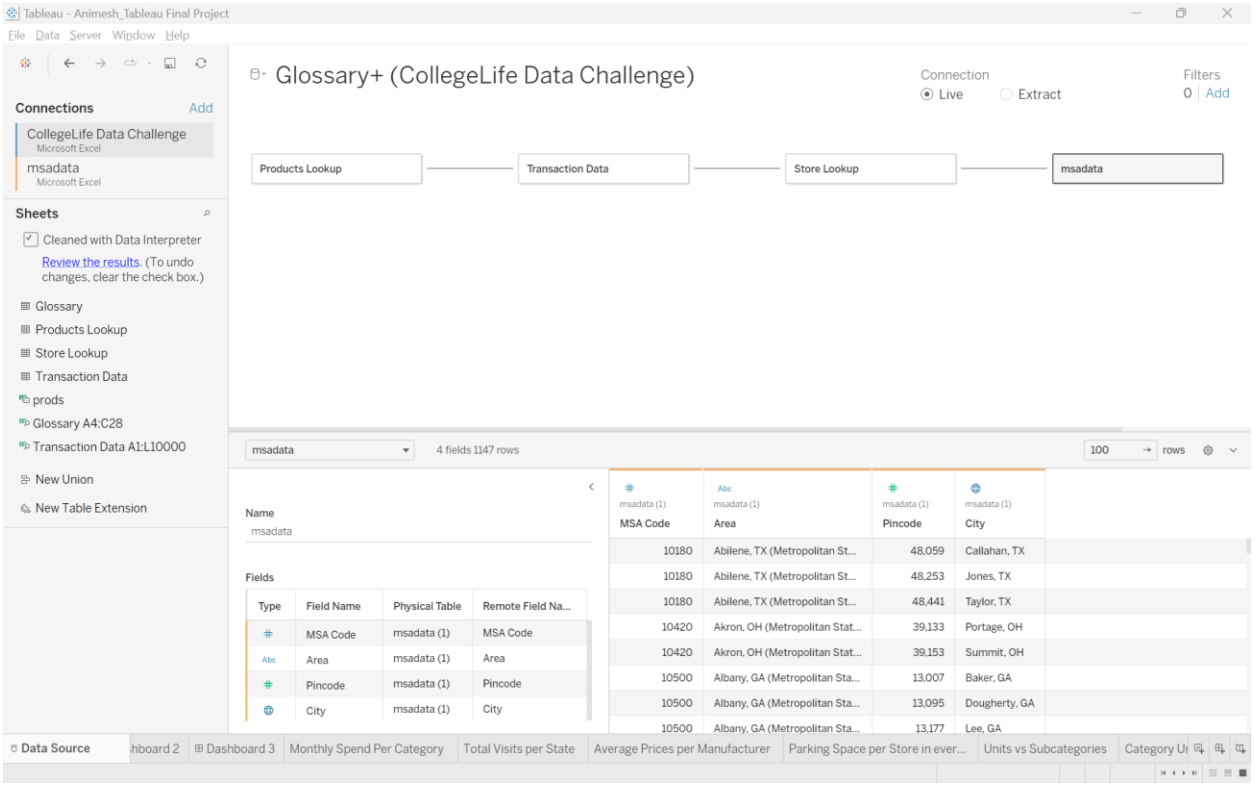
Task 1:

Combining all the Data sheets into one single file and linking the additional dataset msa_data in order to begin all the required operations.

I was able to do the following by :-

1. Dragging any of the datasheets in to the blank area.
2. In this case I started with Products Lookup.
3. After doing so I kept linking the other sheets via adding relations.
4. For example UPC in Transaction data and Products Lookup.

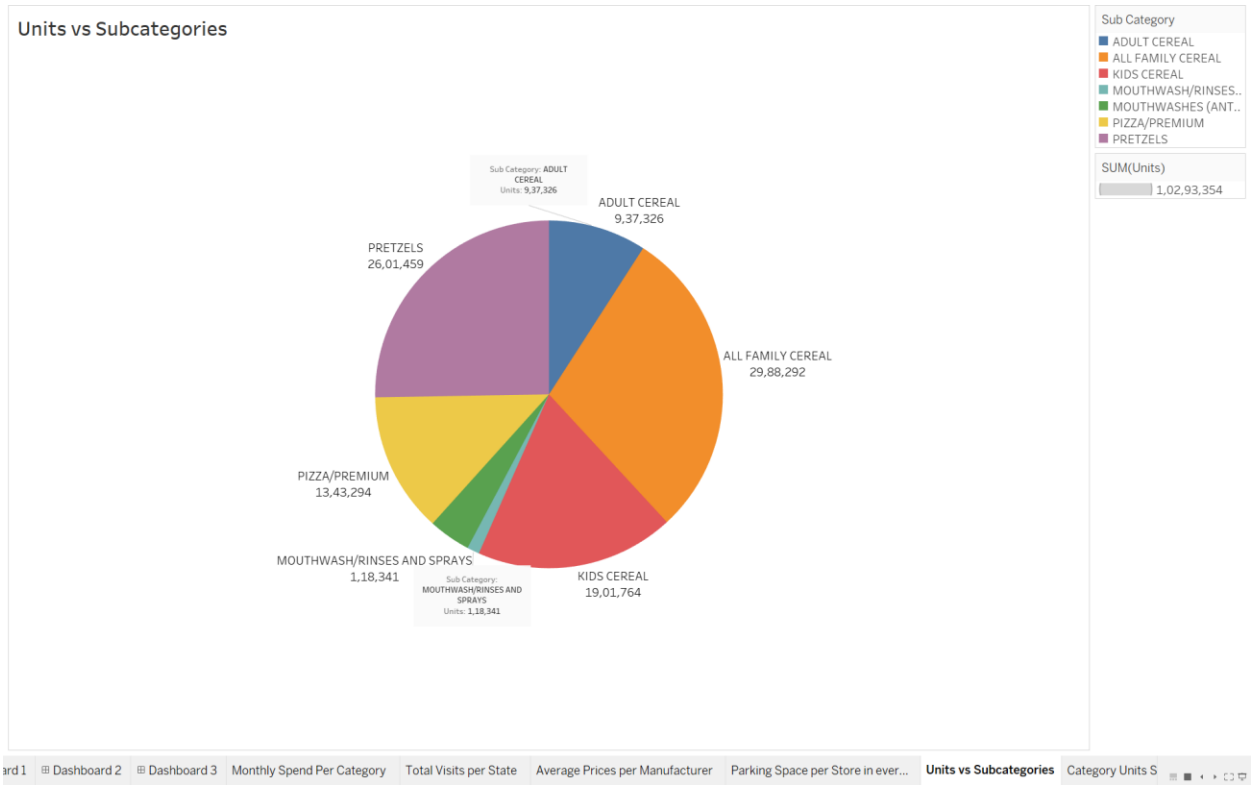
5. Similarly with Store Lookup (in this case Store Number from Transaction data and Store ID from Store Lookup) .
6. Lastly, the additional data from msadata via MSA and MSA Code.



Task2:

After doing the required procedure I was able to plot and perform the necessary visualizations.

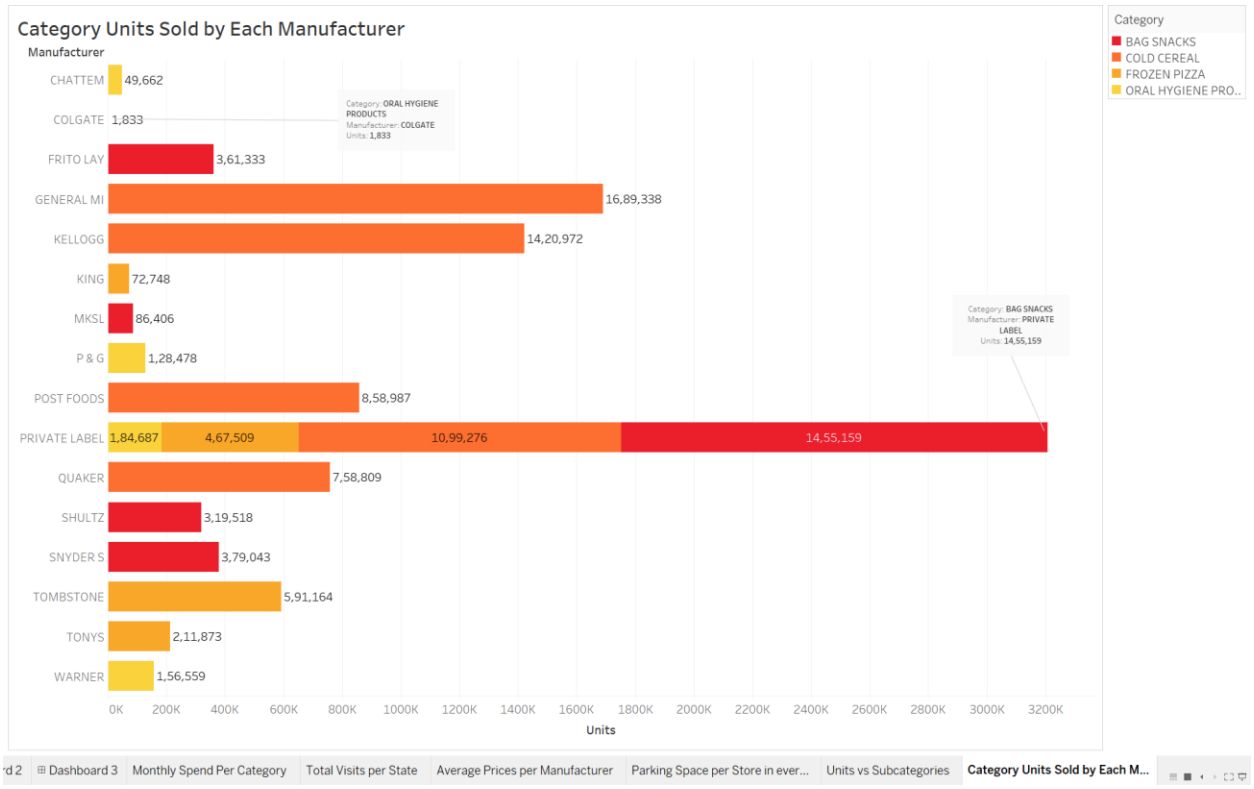
I was able to plot the Units that were sold from each subcategory.



From this we got to know that All Family Cereal was sold the most according to the data and the least that was sold was mouthwash /rinses and sprays.

Task 3:

In the next, we are able to understand the amounts of units sold per category by each manufacture.

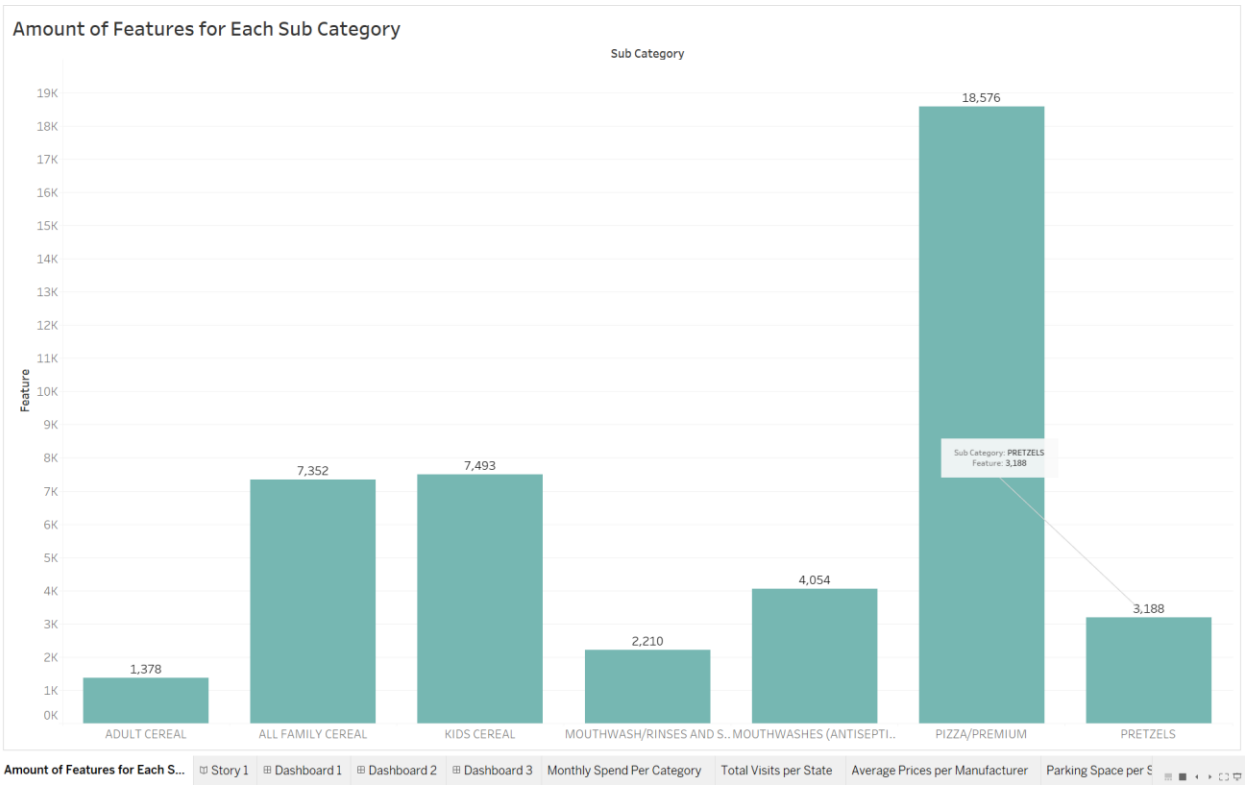


Colgate sold the least amount of oral hygiene Products among all and General MI sold the highest amount of Cold Cereal when compared to the units sold.

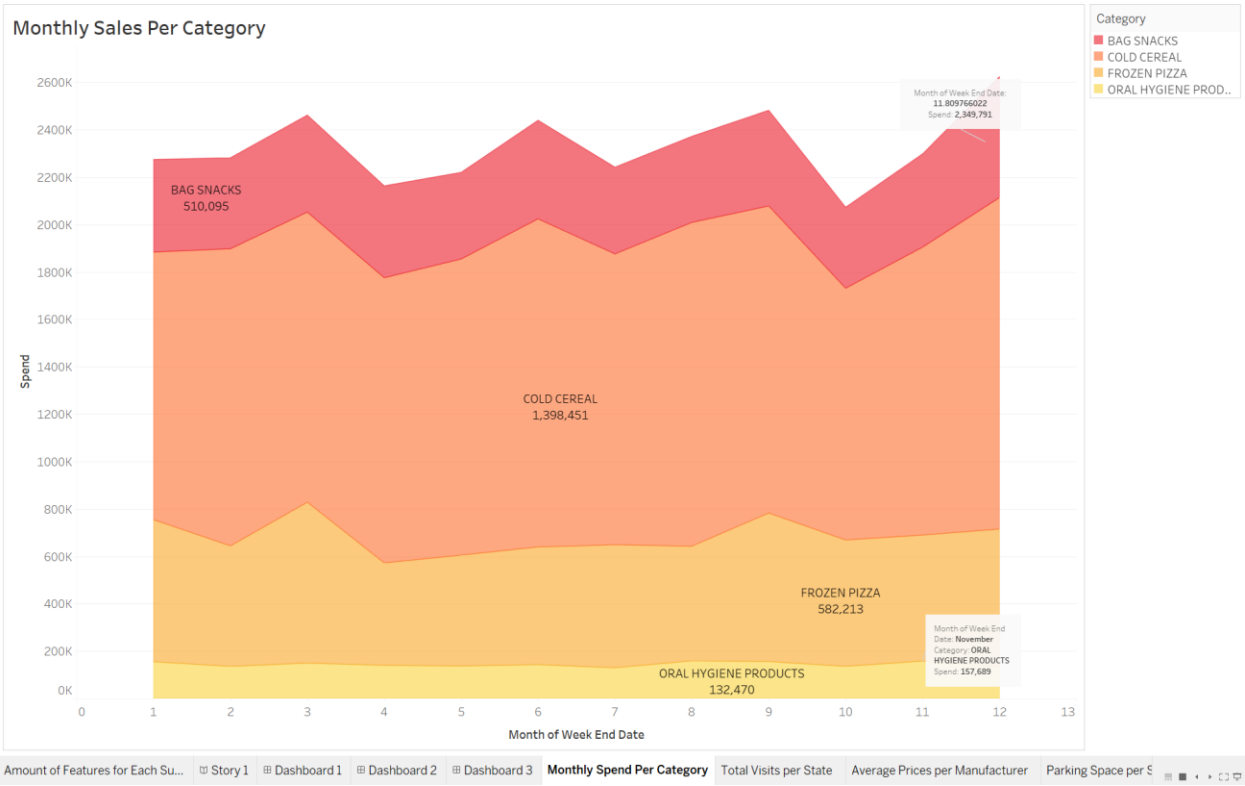
We were able to estimate which Manufacturer sold the most in what category.

Task 4:

We were able to understand the amount of sales of Pizza as the most number of features were for Pizza and the least were for Adult Cereal.


Amount of Features for Each Sub Category
Sub Category
Feature
19K
18K
17K
16K
15K
14K
13K
12K
11K
10K
9K
8K
7K
6K
5K
4K
3K
2K
1K
0K
1,378
7,352
7,493
2,210
4,054
18,576
3,188
ADULT CEREAL
ALL FAMILY CEREAL
KIDS CEREAL
MOUTHWASH/RINSES AND S..
MOUTHWASHES (ANTISEPTI..
PIZZA/PREMIUM
PRETZELS
Sub Category: PRETZELS
Feature: 3,188
Amount of Features for Each S...
Story 1
Dashboard 1
Dashboard 2
Dashboard 3
Monthly Spend Per Category
Total Visits per State
Average Prices per Manufacturer
Parking Space per S

Task 5:

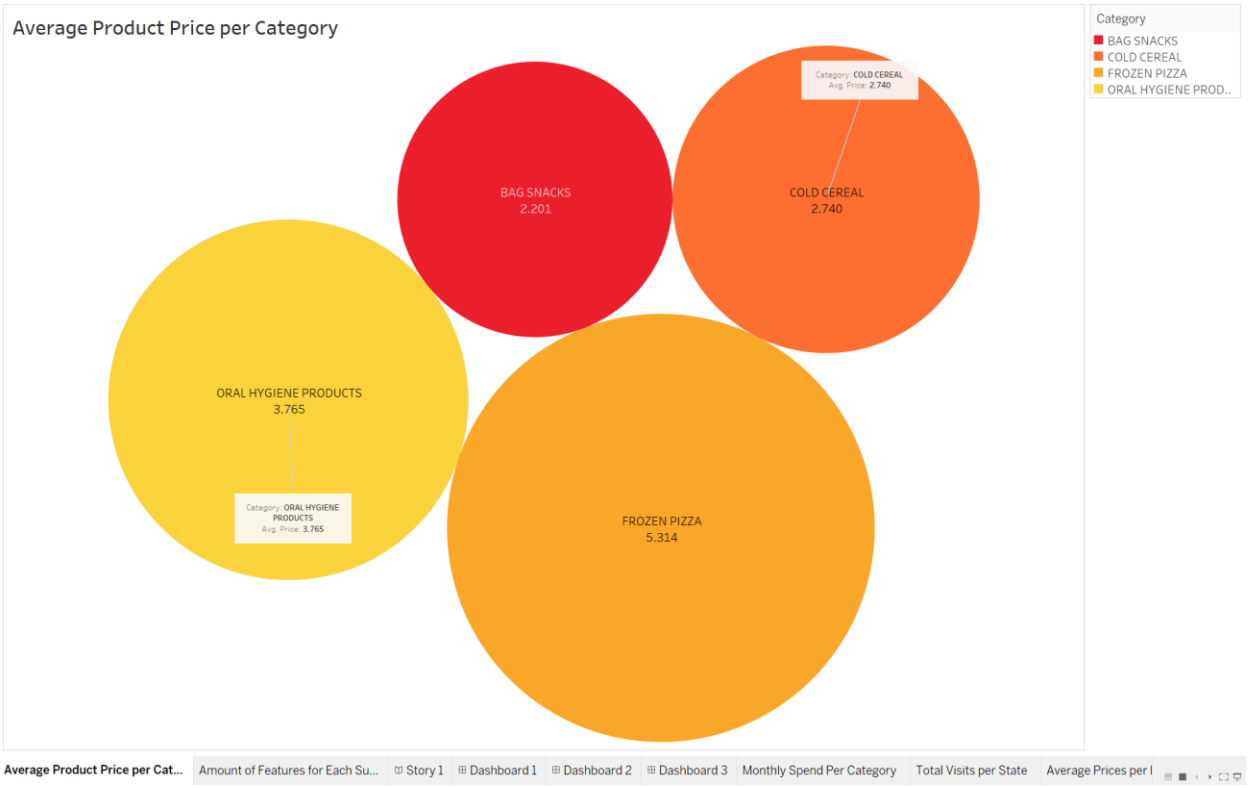

Monthly Sales Per Category
Category
BAG SNACKS
COLD CEREAL
FROZEN PIZZA
ORAL HYGIENE PROD..
Spend
2600K
2400K
2200K
2000K
1800K
1600K
1400K
1200K
1000K
800K
600K
400K
200K
0K
BAG SNACKS
510,095
COLD CEREAL
1,398,451
FROZEN PIZZA
582,213
ORAL HYGIENE PRODUCTS
132,470
Month of Week End Date:
11.809766022
Spend: 2,349,791
Month of Week End Date: November
Category: ORAL HYGIENE PRODUCTS
Spend: 157,689
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Month of Week End Date
Amount of Features for Each Su...
Story 1
Dashboard 1
Dashboard 2
Dashboard 3
Monthly Spend Per Category
Total Visits per State
Average Prices per Manufacturer
Parking Space per S

The amount of sales monthly for each category was plotted and we can see that most of the sales spiked during the 3rd month i.e March and during the month of December.

This might be because of the holiday season and the need of Food Products increases.

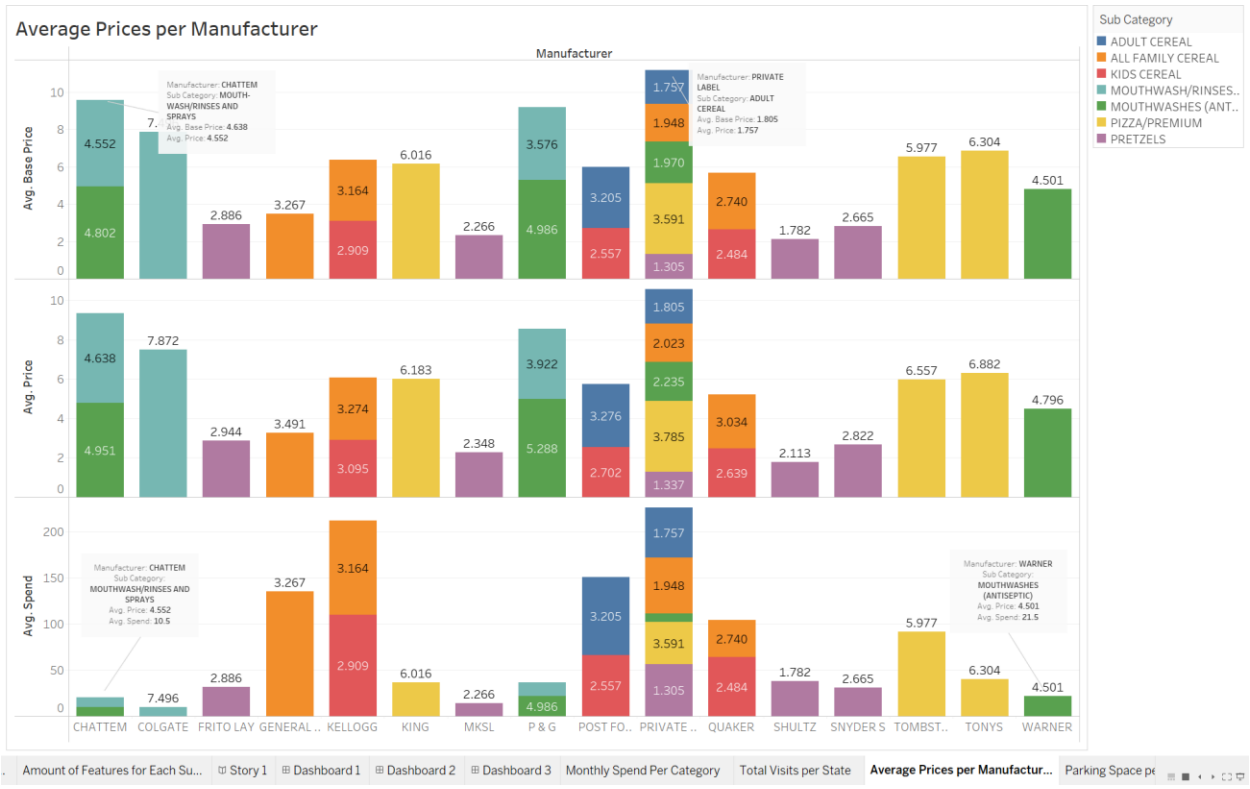
Whereas, the Oral Hygiene Product category sales remained similar throughout the year as this might be because the category belongs to regular usage and would not affect more from Holidays but more after discounts in prices.

Task 6:



After successfully plotting the pie charts we can view that the average Product price was highest for Frozen Pizzas as compared to the least Bag Snacks.

Task 7:



The Average Sales, Average Prices and Average Base Prices were plotted according to each Manufacturer.

I was able to find out and compare what every Manufacturer should focus on in order to generate more revenue.

We could do so by comparing the average sales and the average prices of each categories.

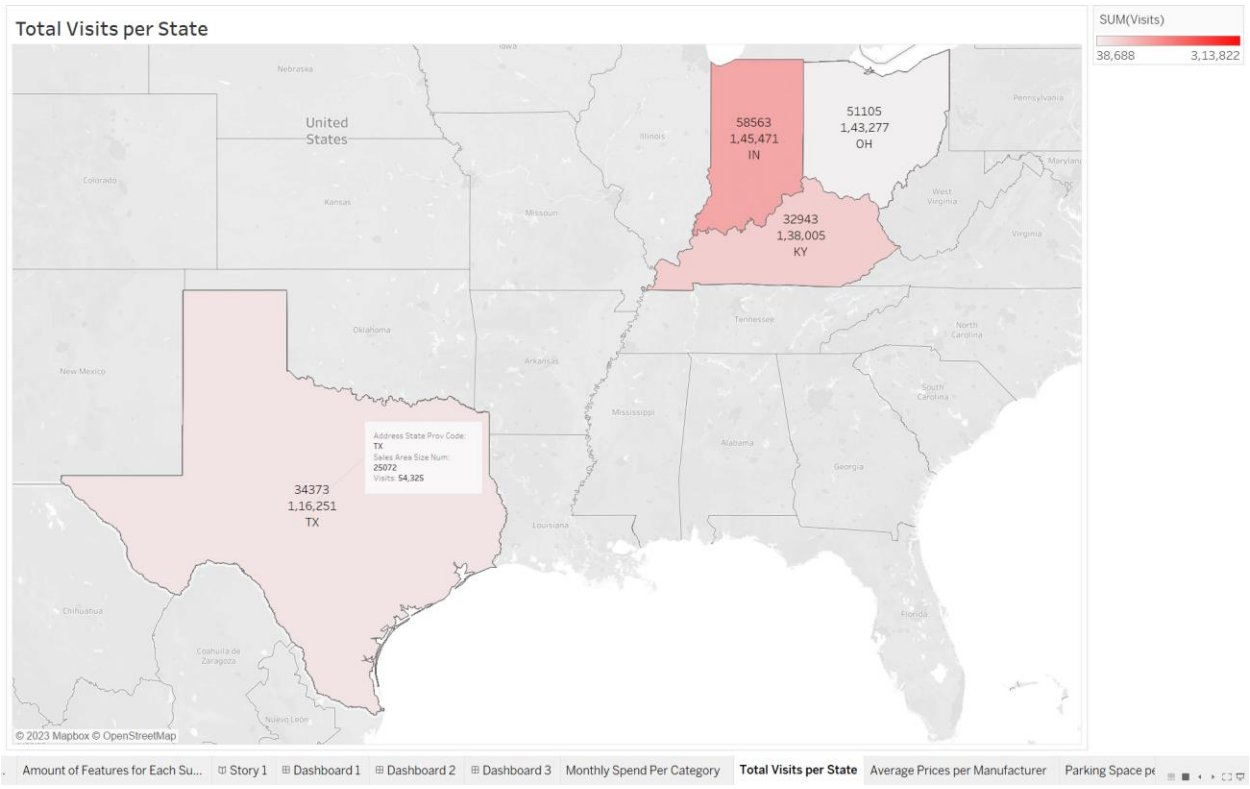
For example, the average sales by Private Label in mouthwashes is way less than all Family Cereal this might be because of the prices as Cereals have a lower average price than Mouthwashes.

Task 8:

We were able to view that Indiana had both the biggest stores among all and the most number of visits than any other states.

Followed by Ohio then Kentucky and lastly Texas.

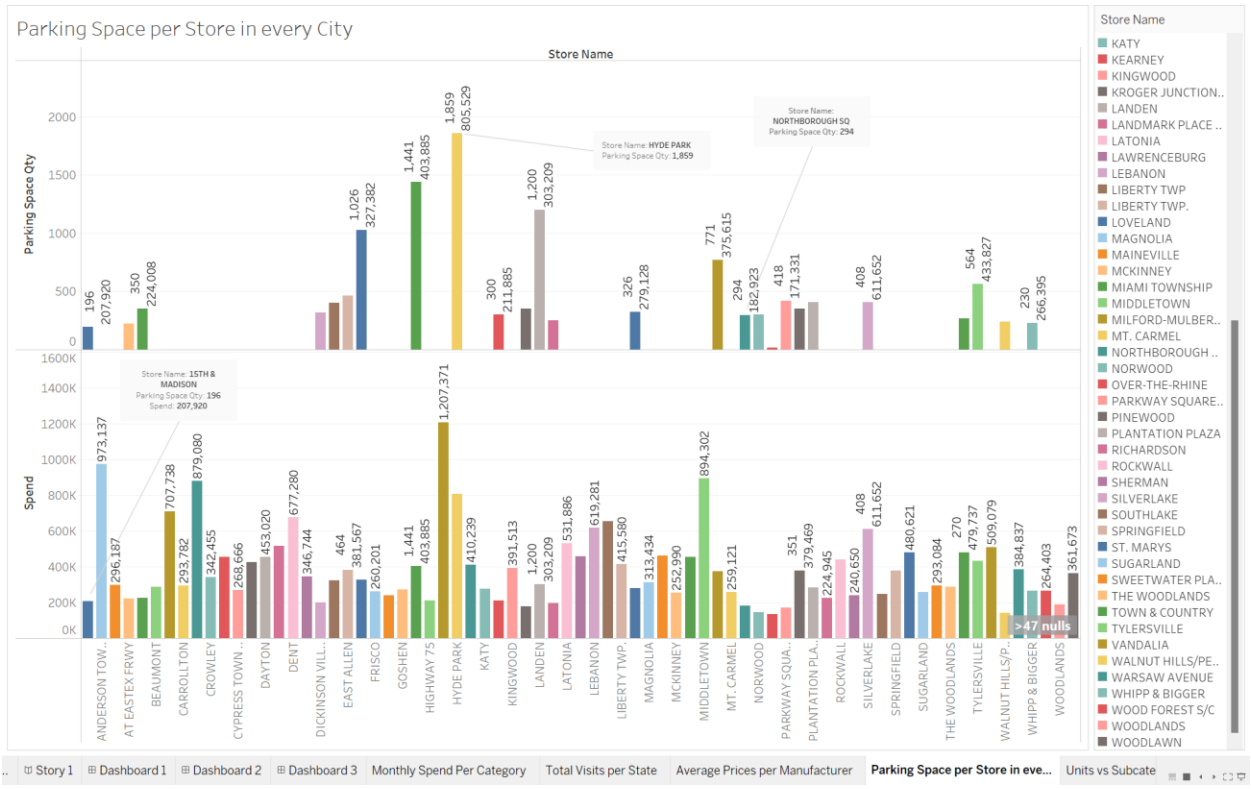
Texas though has a bigger geographic area has the least stores and also the least number of visitors.

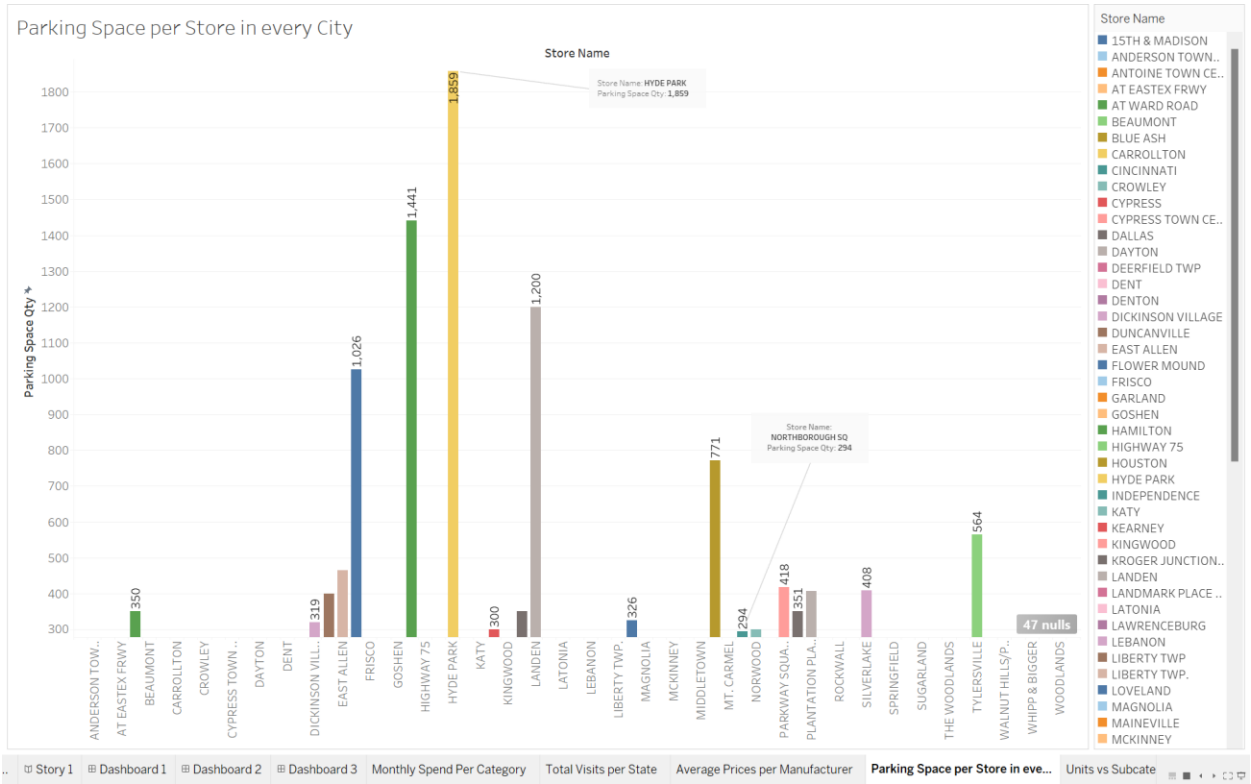


Task 9:

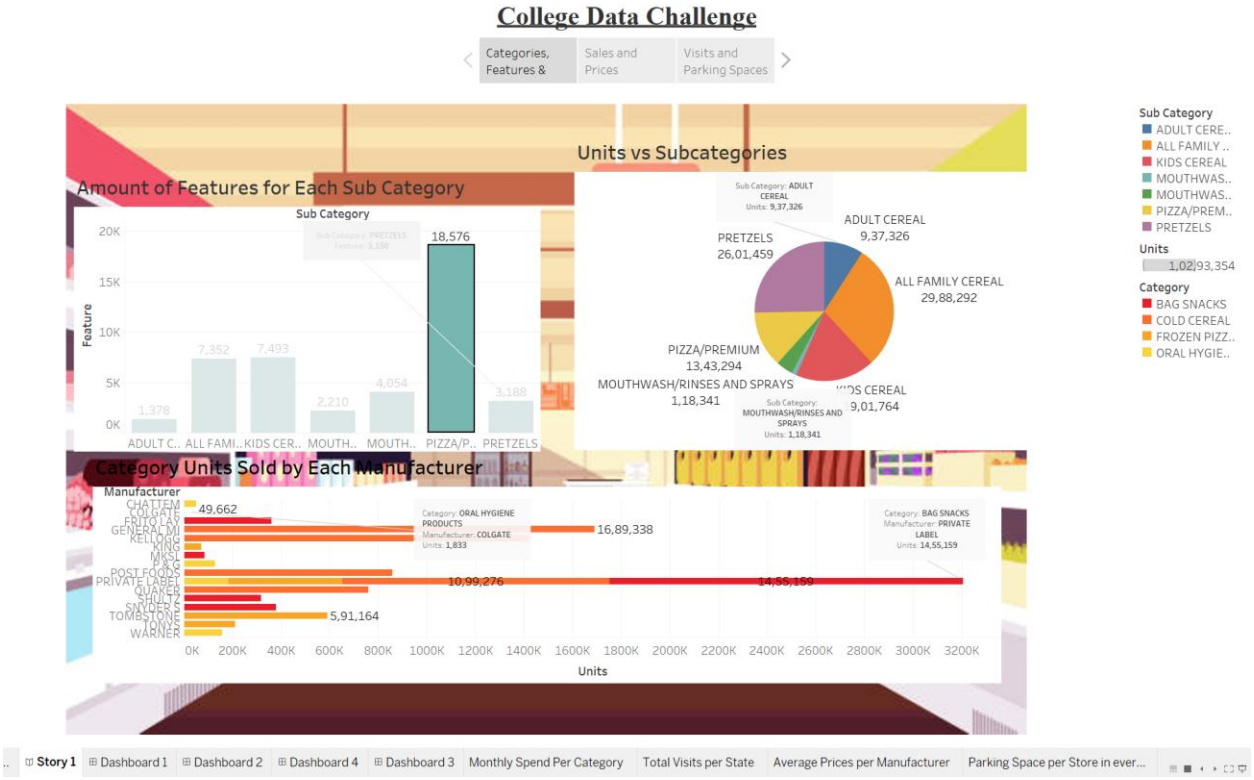
To provide more detailed information, It was necessary to plot the amount of Parking Spaces which were alotted by Each Store as to know the reason behind the amount of visits.

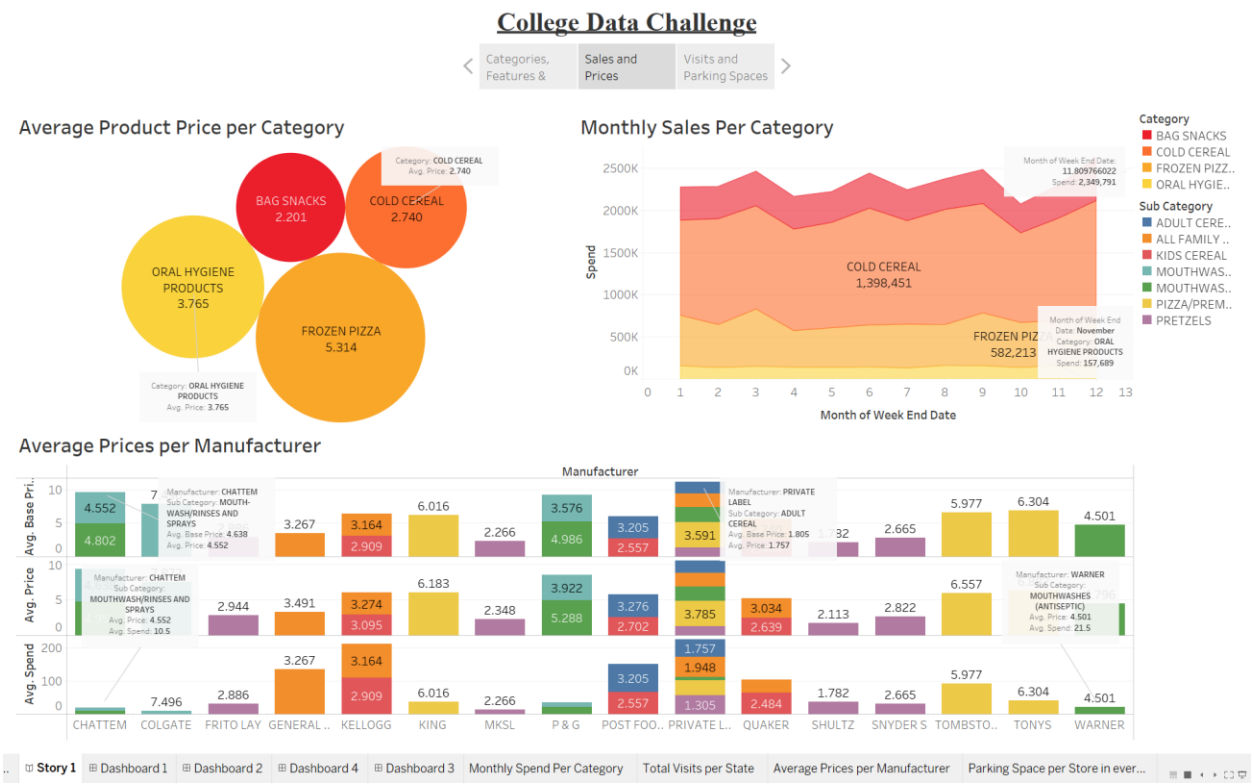
The Bar graph suggests that one of the reason can be due the parking spaces and sales could be affected by so.


Parking Space per Store in every City
Store Name
Parking Space Qty
Spend
Store Name: HYDE PARK
Parking Space Qty: 1,859
Store Name: NORTHBOROUGH SQ
Parking Space Qty: 294
Store Name: 15TH & MADISON
Parking Space Qty: 196
Spend: 207,920
>47 nulls
Store Name
KATY
KEARNEY
KINGWOOD
KROGER JUNCTION..
LANDEN
LANDMARK PLACE ..
LATONIA
LAWRENCEBURG
LEBANON
LIBERTY TWP
LIBERTY TWP.
LOVELAND
MAGNOLIA
MAINEVILLE
MCKINNEY
MIAMI TOWNSHIP
MIDDLETOWN
MILFORD-MULBER..
MT. CARMEL
NORTHBOROUGH ..
NORWOOD
OVER-THE-RHINE
PARKWAY SQUARE..
PINEWOOD
PLANTATION PLAZA
RICHARDSON
ROCKWALL
SHERMAN
SILVERLAKE
SOUTHLAKE
SPRINGFIELD
ST. MARYS
SUGARLAND
SWEETWATER PLA..
THE WOODLANDS
TOWN & COUNTRY
TYLERSVILLE
VANDALIA
WALNUT HILLS/PE..
WARSAW AVENUE
WHIPP & BIGGER
WOOD FOREST S/C
WOODLANDS
WOODLAWN
Story 1
Dashboard 1
Dashboard 2
Dashboard 3
Monthly Spend Per Category
Total Visits per State
Average Prices per Manufacturer
Parking Space per Store in eve...
Units vs Subcate


Parking Space per Store in every City
Store Name
Parking Space Qty
Store Name: HYDE PARK
Parking Space Qty: 1,859
Store Name: NORTHBOROUGH SQ
Parking Space Qty: 294
47 nulls
Store Name
15TH & MADISON
ANDERSON TOWN..
ANTOINE TOWN CE..
AT EASTEX FRWY
AT WARD ROAD
BEAUMONT
BLUE ASH
CARROLLTON
CINCINNATI
CROWLEY
CYPRESS
CYPRESS TOWN CE..
DALLAS
DAYTON
DEERFIELD TWP
DENT
DENTON
DICKINSON VILLAGE
DUNCANVILLE
EAST ALLEN
FLOWER MOUND
FRISCO
GARLAND
GOSHEN
HAMILTON
HIGHWAY 75
HOUSTON
HYDE PARK
INDEPENDENCE
KATY
KEARNEY
KINGWOOD
KROGER JUNCTION..
LANDEN
LANDMARK PLACE ..
LATONIA
LAWRENCEBURG
LEBANON
LIBERTY TWP
LIBERTY TWP.
LOVELAND
MAGNOLIA
MAINEVILLE
MCKINNEY
Story 1
Dashboard 1
Dashboard 2
Dashboard 3
Monthly Spend Per Category
Total Visits per State
Average Prices per Manufacturer
Parking Space per Store in eve...
Units vs Subcate

Stories:


College Data Challenge
Categories, Features &
Sales and Prices
Visits and Parking Spaces
Units vs Subcategories
Amount of Features for Each Sub Category
Sub Category
Feature
20K
15K
10K
5K
0K
1,378
7,352
7,493
2,210
4,054
18,576
3,188
ADULT C..
ALL FAMI..
KIDS CER..
MOUTH..
MOUTH..
PIZZA/P..
PRETZELS
ADULT CEREAL 9,37,326
ALL FAMILY CEREAL 29,88,292
KIDS CEREAL 9,01,764
PIZZA/PREMIUM 13,43,294
MOUTHWASH/RINSES AND SPRAYS 1,18,341
PRETZELS 26,01,459
Sub Category
ADULT CERE..
ALL FAMILY ..
KIDS CEREAL
MOUTHWAS..
MOUTHWAS..
PIZZA/PREM..
PRETZELS
Units
1,02,93,354
Category
BAG SNACKS
COLD CEREAL
FROZEN PIZZ..
ORAL HYGIE..
Category Units Sold by Each Manufacturer
Manufacturer
CHATTEM
COLGATE
FRITO LAY
GENERAL MI
KELLOGG
KING
MKSL
P & G
POST FOODS
PRIVATE LABEL
QUAKER
SHULTZ
SNYDER S
TOMBSTONE
TONYS
WARNER
49,662
16,89,338
10,99,276
14,55,159
5,91,164
0K 200K 400K 600K 800K 1000K 1200K 1400K 1600K 1800K 2000K 2200K 2400K 2600K 2800K 3000K 3200K
Units
Story 1
Dashboard 1
Dashboard 2
Dashboard 4
Dashboard 3
Monthly Spend Per Category
Total Visits per State
Average Prices per Manufacturer
Parking Space per Store in ever...


College Data Challenge
Categories, Features &
Sales and Prices
Visits and Parking Spaces
Average Product Price per Category
BAG SNACKS 2.201
COLD CEREAL 2.740
ORAL HYGIENE PRODUCTS 3.765
FROZEN PIZZA 5.314
Monthly Sales Per Category
Spend
2500K
2000K
1500K
1000K
500K
0K
COLD CEREAL 1,398,451
FROZEN PIZ 582,213
0 1 2 3 4 5 6 7 8 9 10 11 12 13
Month of Week End Date
Category
BAG SNACKS
COLD CEREAL
FROZEN PIZZ..
ORAL HYGIE..
Sub Category
ADULT CERE..
ALL FAMILY ..
KIDS CEREAL
MOUTHWAS..
MOUTHWAS..
PIZZA/PREM..
PRETZELS
Average Prices per Manufacturer
Manufacturer
Avg. Base Pri..
Avg. Price
Avg. Spend
CHATTEM
COLGATE
FRITO LAY
GENERAL ..
KELLOGG
KING
MKSL
P & G
POST FOO..
PRIVATE L..
QUAKER
SHULTZ
SNYDER S
TOMBSTO..
TONYS
WARNER
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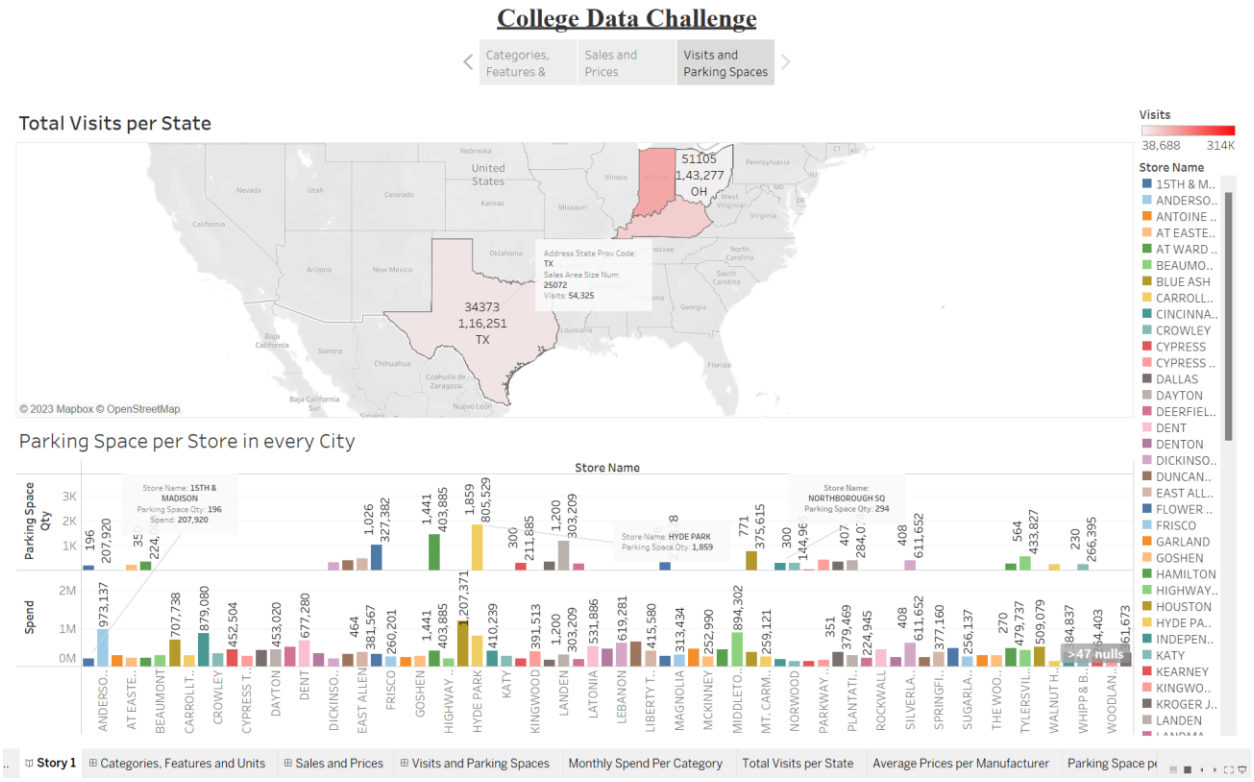

Recommendations:

- Keep the store size large enough to accommodate more consumers since customer visits are somewhat dependent on the size of the store.
- Retailers should spend less on advertising and more on cutting down prices and giving discounts especially in the months where sales have been the least such as after March and except holiday season.
- Keep the store size large enough to accommodate more consumers and a lot more parking spaces to every store in order to increase the amount of visitors.
- There should be enough amount of All Family cereals as in order to be in stock as it has been sold the most.
- The premium subcategories consequently sell more than other subcategories within the same category as customers are more concerned with a product's quality than its price, even if it is more expensive or available in fewer quantities.