HBR – HAPPY COW ICE CREAM

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1.1 CASE STUDY QUESTIONS

1.1.1 Explore the sales performance of the three consumer groups (students, staff, and tourists).

The below figure showcases the sales performance of the three consumer groups: students (Orange), staff (Blue), and tourists (Red). A lot of sales variations observed for all of three consumer groups.

For the students, the sales was on higher end for month of April and September and lowest from May to July. In case of staff, the sales were on peak in month of June and on an average of 4K for given time period. The highest sales due to tourists were observed from July to August and remained low for first 6 months (Feb- July).
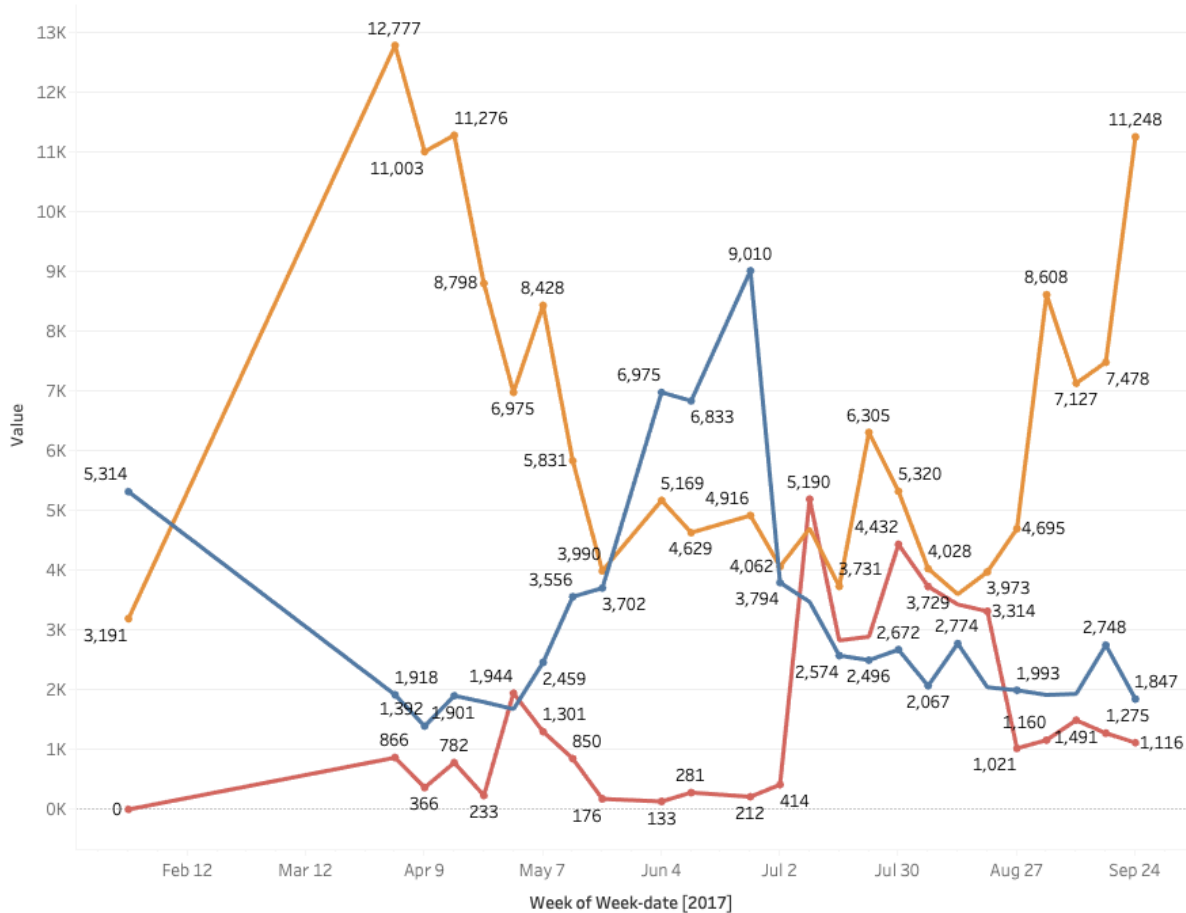

Figure 1 Sales Performance

1.1.2 Both Mary and Prem, the senior sales assistant, believe that different groups of flavors sell better at different times of the year. Do the data back this up? Please propose your groupings and visualize them to generate insights into the ice cream sales. Regarding flavor groups, does grouping give a better level of analysis than individual flavors?

The analysis indicates that there is a variation in sales for all flavors in all 3 type of customers (students, staff and tourists) and the data pattern shows that different groups of flavors sell better at different times of the year.

The below figure shows that for students, sales for certain popular from June to august flavors decreases however the total demand remains higher. If we group these flavors as per sales number, the similar trend is followed. Hence instead of tracking down the sales numbers for individual flavors, the grouping will be beneficial for financial analysis.
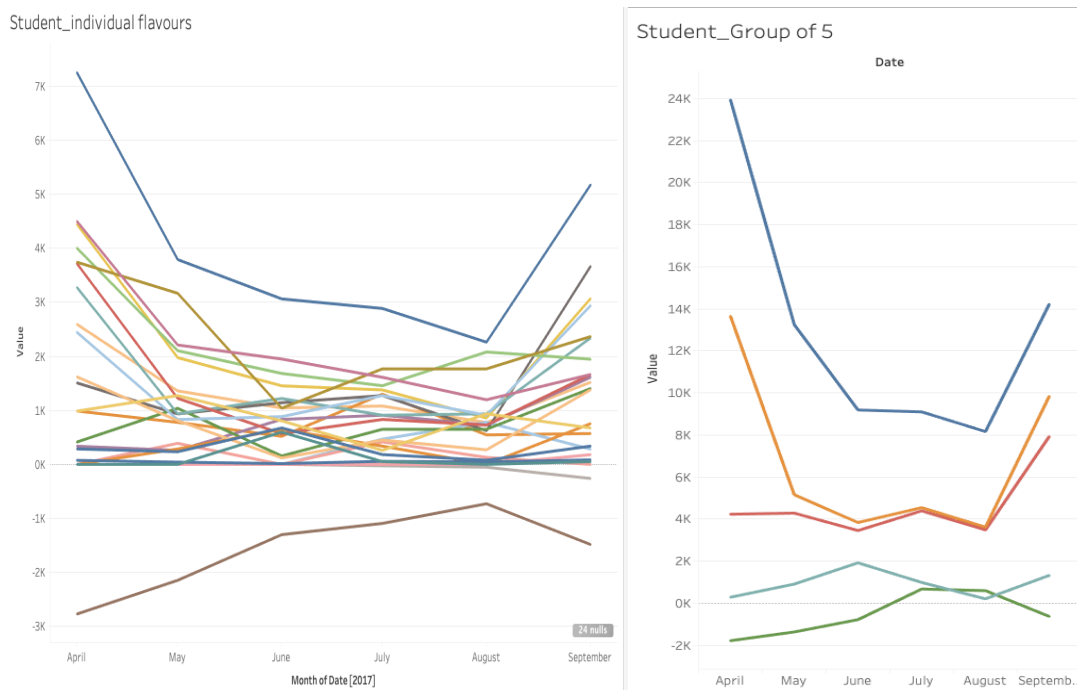
Figure 2 Students Daily Sales Data

In case of staffs, the sales are at peak for most of the flavors except 4 flavors in month of June. For further analysis, if we group these flavors as per sales number, the similar trend is followed. Hence instead of tracking down the sales numbers for individual flavors, the grouping will be beneficial for financial analysis.
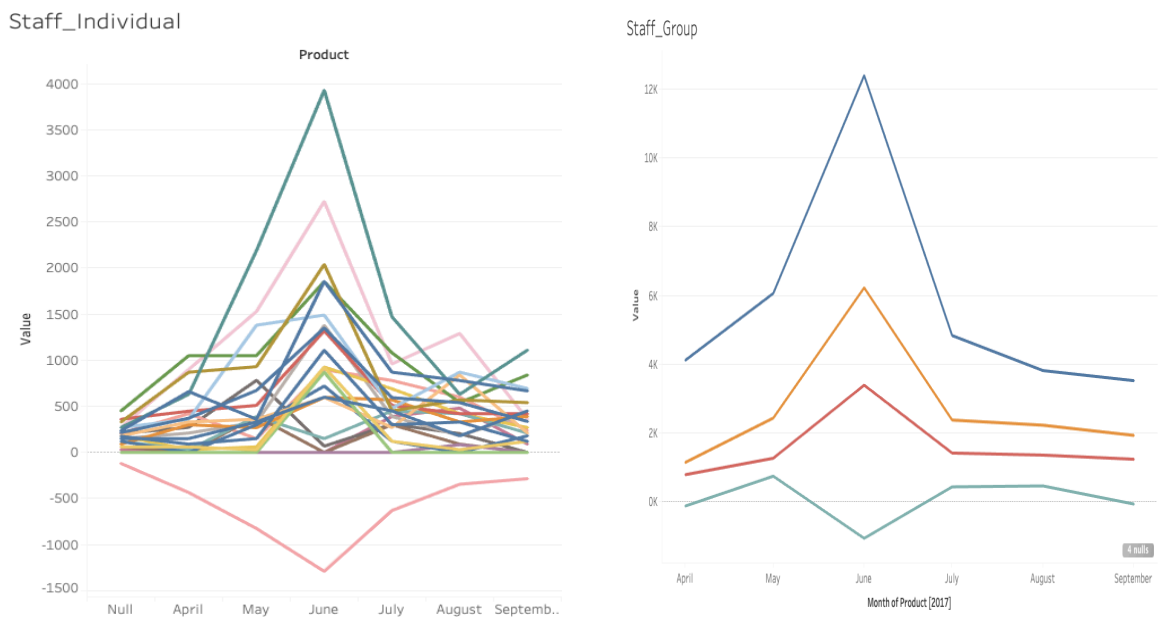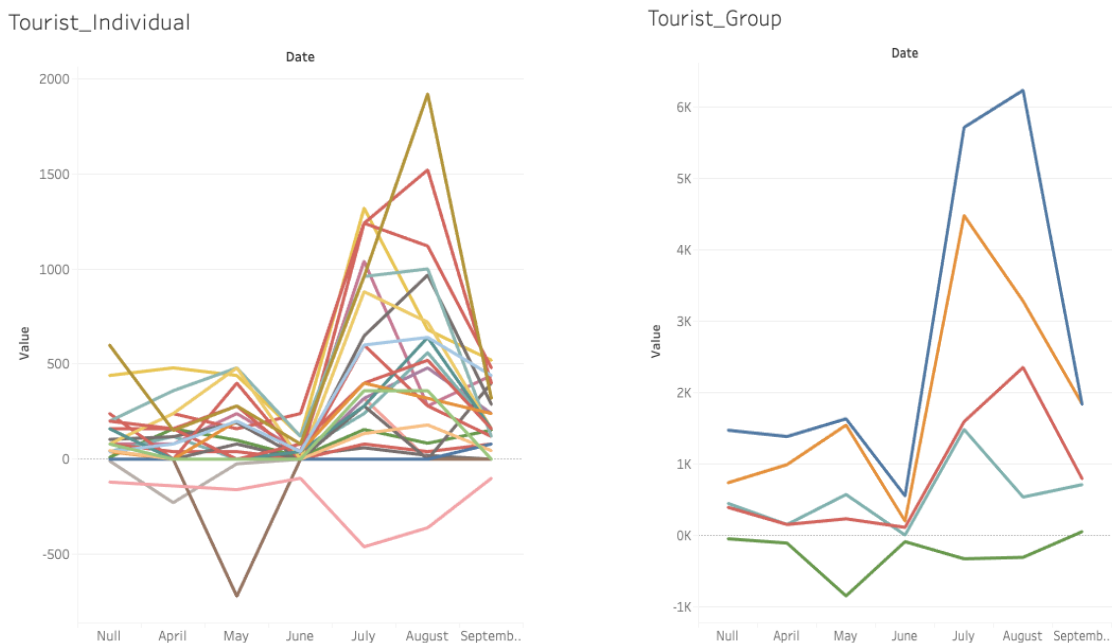
Figure 3 Staff Daily Sales Data

For tourist type customers, there is lot of variations in sales number and there is no fixed trend/ pattern observed among any flavours. Hence grouping the flavours using any criterian will be difficult and we may miss important highlights. Hence instead of tracking down the grouped sales numbers for flavors, the individual tracking will be beneficial for financial analysis.


Figure 4 Tourist Daily Sales Data

1.1.3 What outliers can be identified from the daily sales of Happy Cow? Please define the outliers and explain how to address them.

An outliers can be defined as an observation or records that lies an abnormal distance (which is defined by analysts) from other values in a random sample from a population. The effective way to track down the outliers is by using the interquartile range (IQR).

In case of dataset: the daily sales of Happy Cow, several outliers about daily sales records found for each flavors. For example, below figure shows the outlier dates on which the sales records were out of normal range for S. Caramel flavor for given period of time.
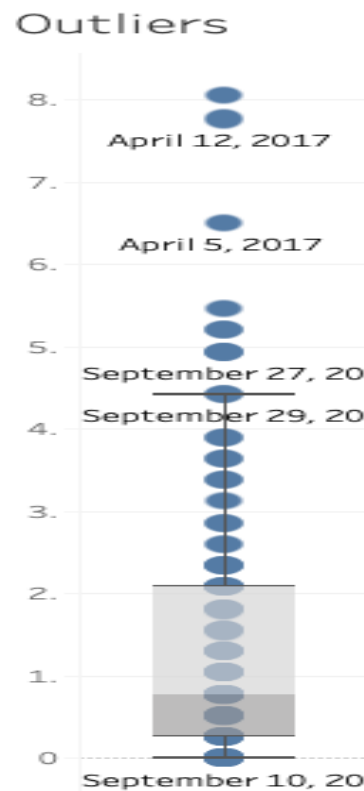
Figure 5 Outlier Detection: S. Caramel Flavor

There are several methods to handle the outliers. Some of them are:

i)   Transform the data using regression analysis
ii)   Use of bootstrapping techniques for resampling the data

1.1.4 Given the characteristics of the Happy Cow dataset, what are the purposes of time series analysis (i.e. predictive versus descriptive)?

The primary purpose of time series analysis is to identify the nature of the phenomenon represented by the sequence of observations, and forecasting the values of desired variables.

The four components of time series data are :

- Secular trend, to showcase the movement along the time period
- Seasonal variations to indicate seasonal changes
- Cyclical fluctuations, which are periodical but not seasonal
- Irregular variations

In short, a descriptive model takes the past data that are stored in databases to provide the insights. For example, in case of daily sales, the descriptive analytics include KPIs such as year-on-year percentage sales growth for each store. In a Predictive model, it identifies patterns found in past and transactional data to find risks and future outcomes. For example, in case of daily sales, the predictive analytics include KPIs such as demand for specific flavors for next month.

Descriptive	Predictive
Uses historical data	Uses historical data
Reconfigures data into easy-to read format	Fills in gaps in available data
Describes the state of your business operations	Creates data models
Learns from the past	Forecasts potential future outcomes
Answer **What** question	Answer **What might happen** question

Table 1 Descriptive Vs Predictive Analysis