The results of happy cow analysis

Questions asked:

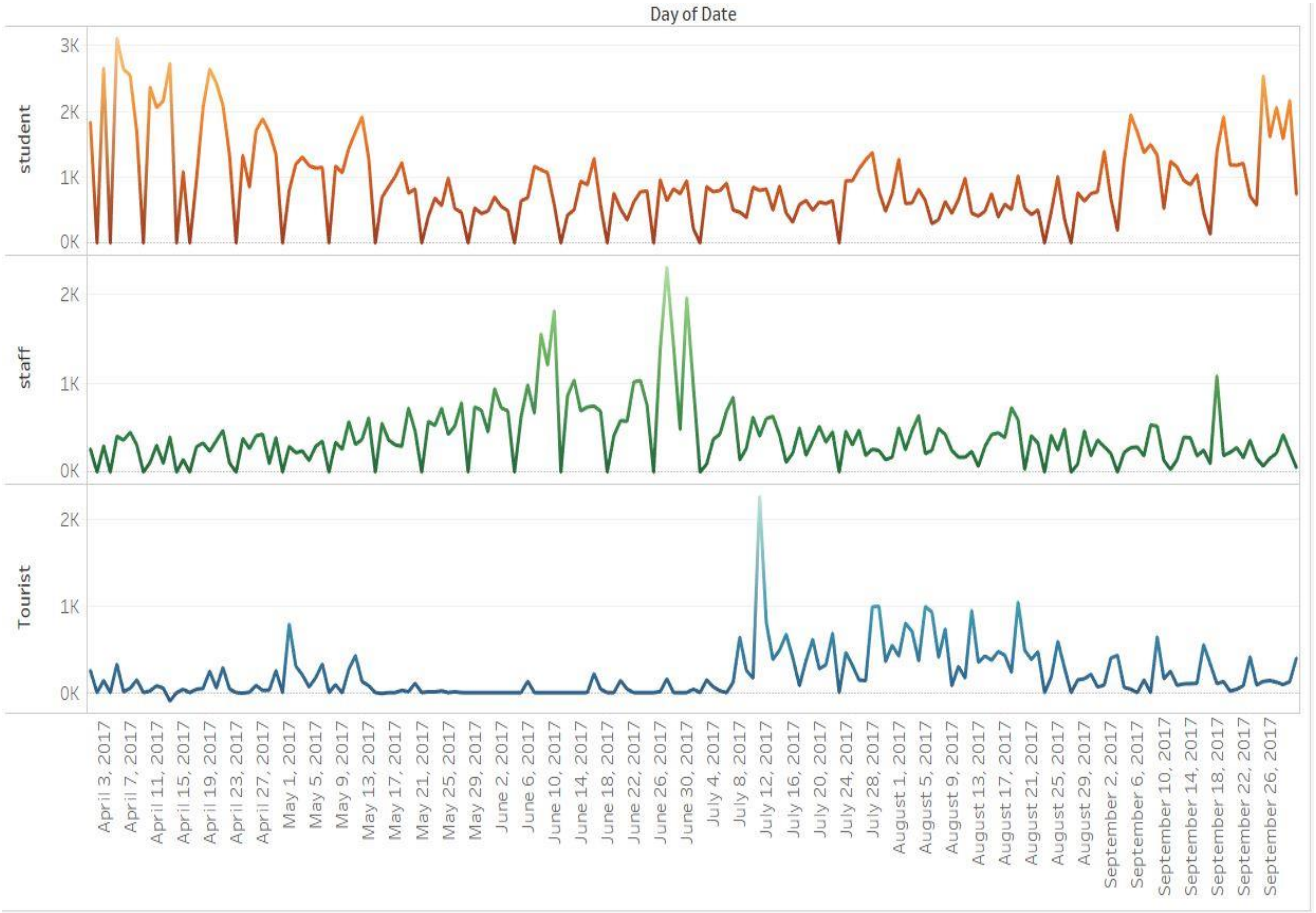
1. Explore and visualise (in Tableau) the sales performance of the three consumer groups (students, staff and tourists).
2. Sales staff believe that different groups of flavours sell better at different times of the year. Explore if the data backs this up (or not). Identify appropriate flavour groupings and visualise them to generate insights into the ice cream sales.
3. Analyse if grouping the flavours gives a better level of analysis than individual flavours? If so, what groups do you suggest?
4. What outliers can be identified from the daily sales? Describe the outliers and give possible explanations.
5. Create a written report of 500-1000 words, including visuals and explanation in each case, in answer to each question.

1st question

1. Explore and visualise (in Tableau) the sales performance of the three consumer groups (students, staff and tourists).

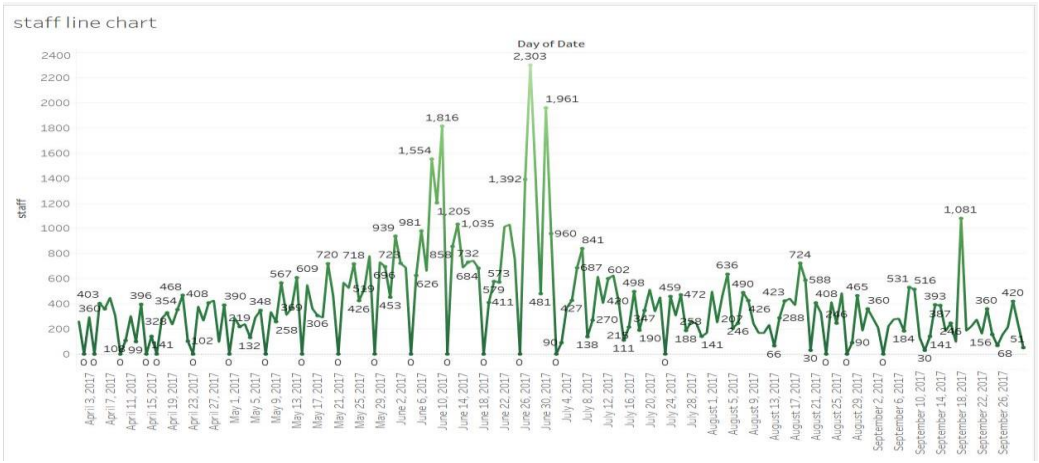
I encountered a problem with date column in the first visualization because I needed to convert the string type object (date) from string format to date format to make it easier for Tableau to deal with and to help me in further investigation of day/week/month/quarter analysis , the interpreter of Tableau didn't deal well with the date column so I used python in jupyter notebook to convert the string type object (date) to date type object , I'll list the code I used here too.

- First I made a time series by day to day visualization for every type of consumer (student-staff-tourist)

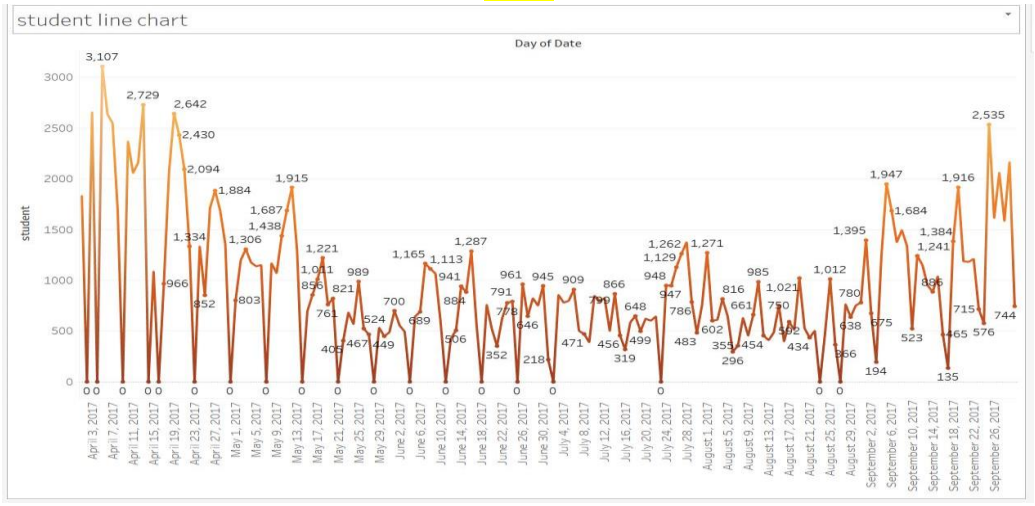


- Then I made a single visualization for every one of them with label numbers on top of each data point

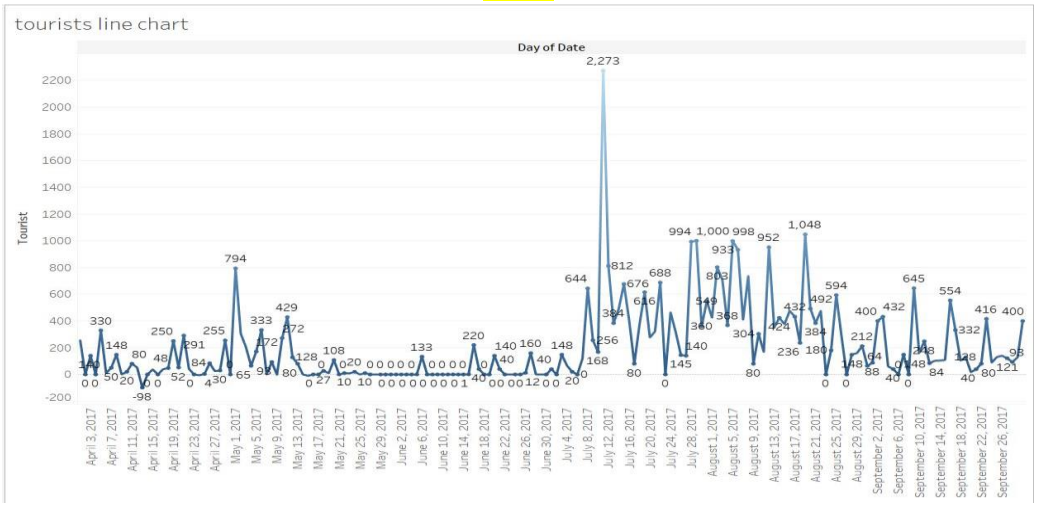
staff



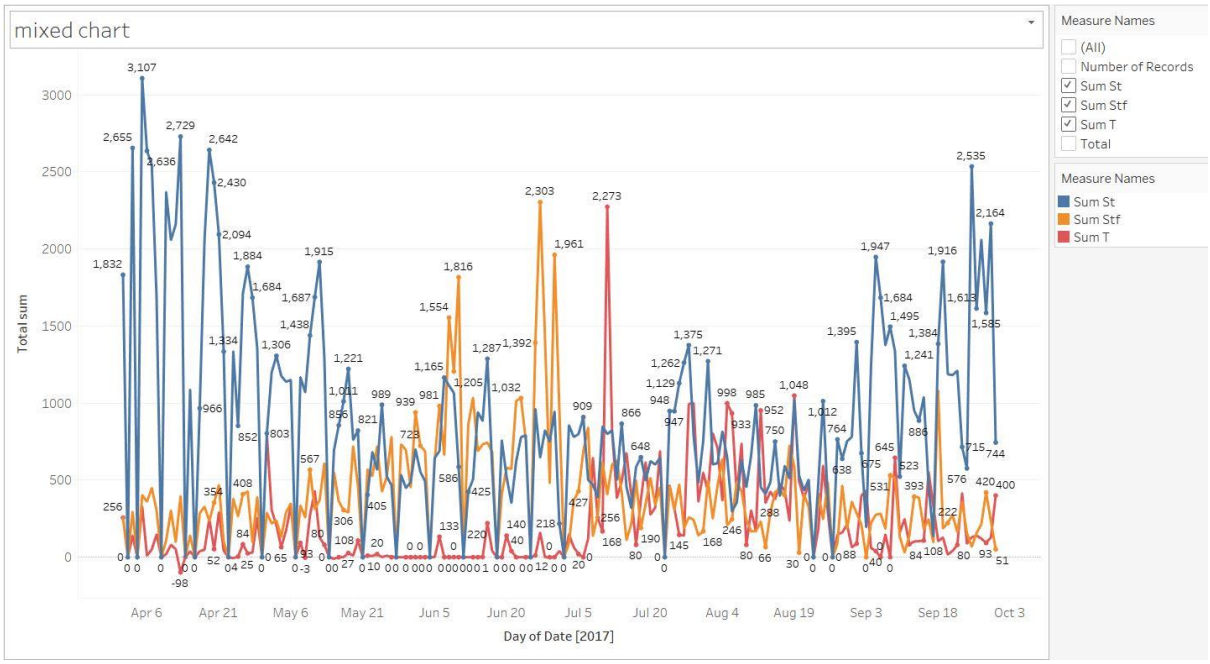
student



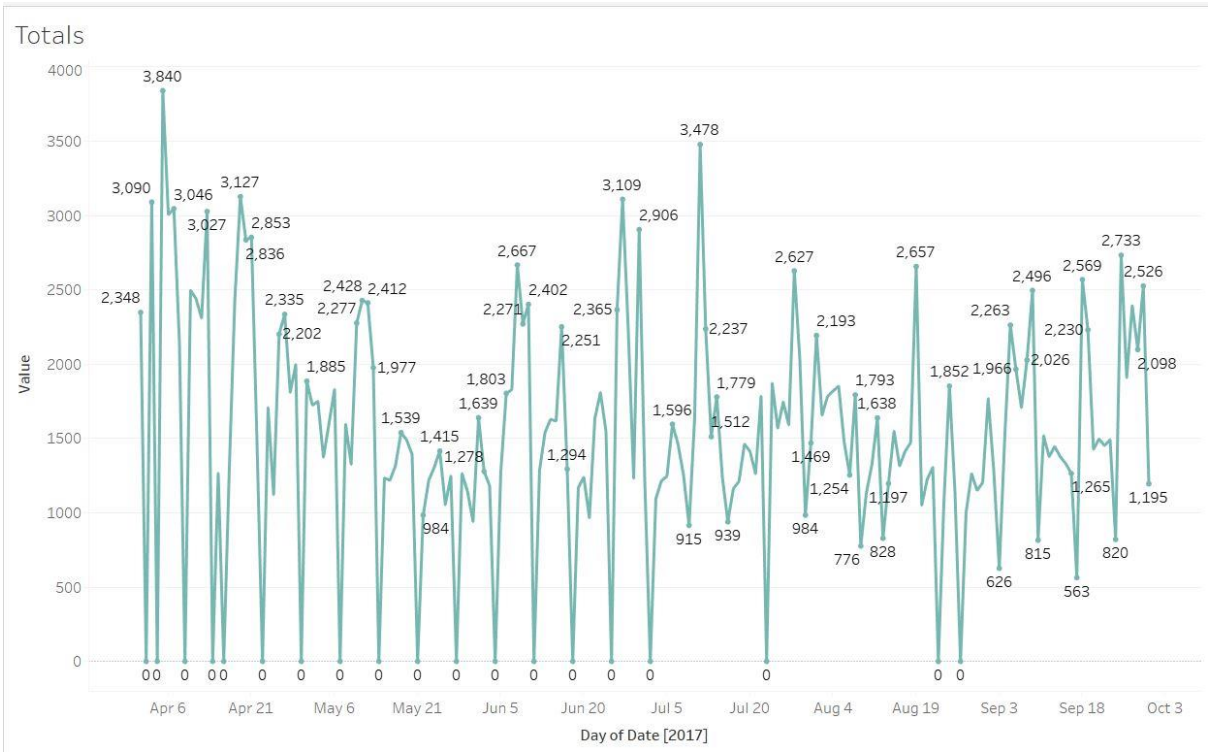
tourists



- Then I made a visualization for them together on one axis with labels and data points



- Then I made a total sum of sales for the 3 groups combined on a day time frame



- Here is my python code for date time

```
In [3]:  1  import pandas as pd

In [4]:  1  df = pd.read_csv(r'D:\cow stuff\sum_c.csv')

In [5]:  1  df.loc[0:1,'Date']

Out[5]: 0    Sat 1st Apr 2017
        1    Sun 2nd Apr 2017
        Name: Date, dtype: object

In [6]:  1  df['Date']=pd.to_datetime(df['Date'])

In [12]: 1  df['Date'].tail()

Out[12]: 178   2017-09-26
         179   2017-09-27
         180   2017-09-28
         181   2017-09-29
         182   2017-09-30
         Name: Date, dtype: datetime64[ns]

In [17]: 1  df.to_excel('sum_with_date.xlsx')
```

2nd question

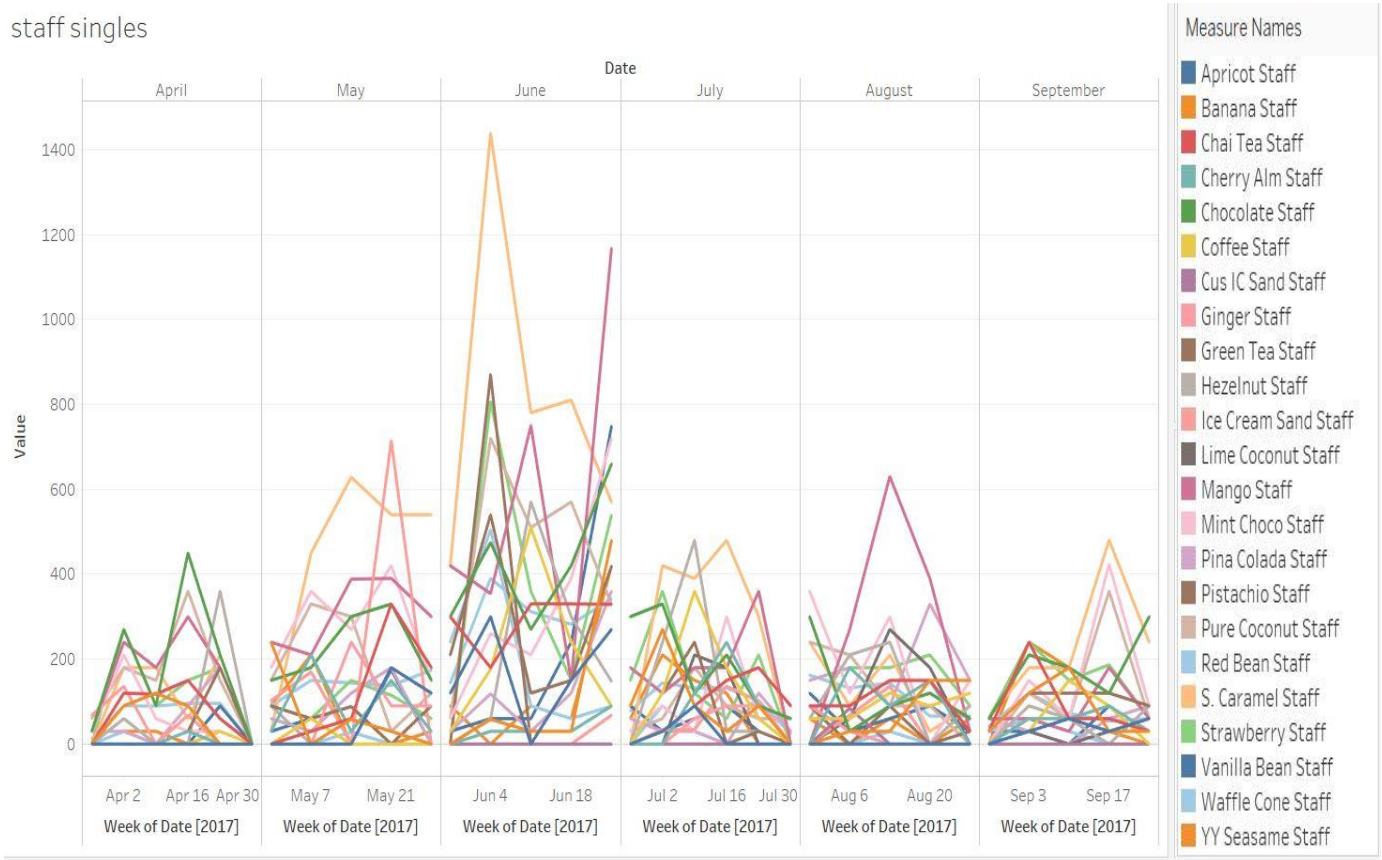
2. Sales staff believe that different groups of flavours sell better at different times of the year. Explore if the data backs this up (or not). Identify appropriate flavour groupings and visualise them to generate insights into the ice cream sales.

Yes, different groups of flavours sell better at different times of the year , I'll approach this question on two aspects of time frames (week/month)

The week would give us a detailed view of sales groups , while the month time frame would give us an outer picture of the sales grouping and I'll both here with grouping.

Staff

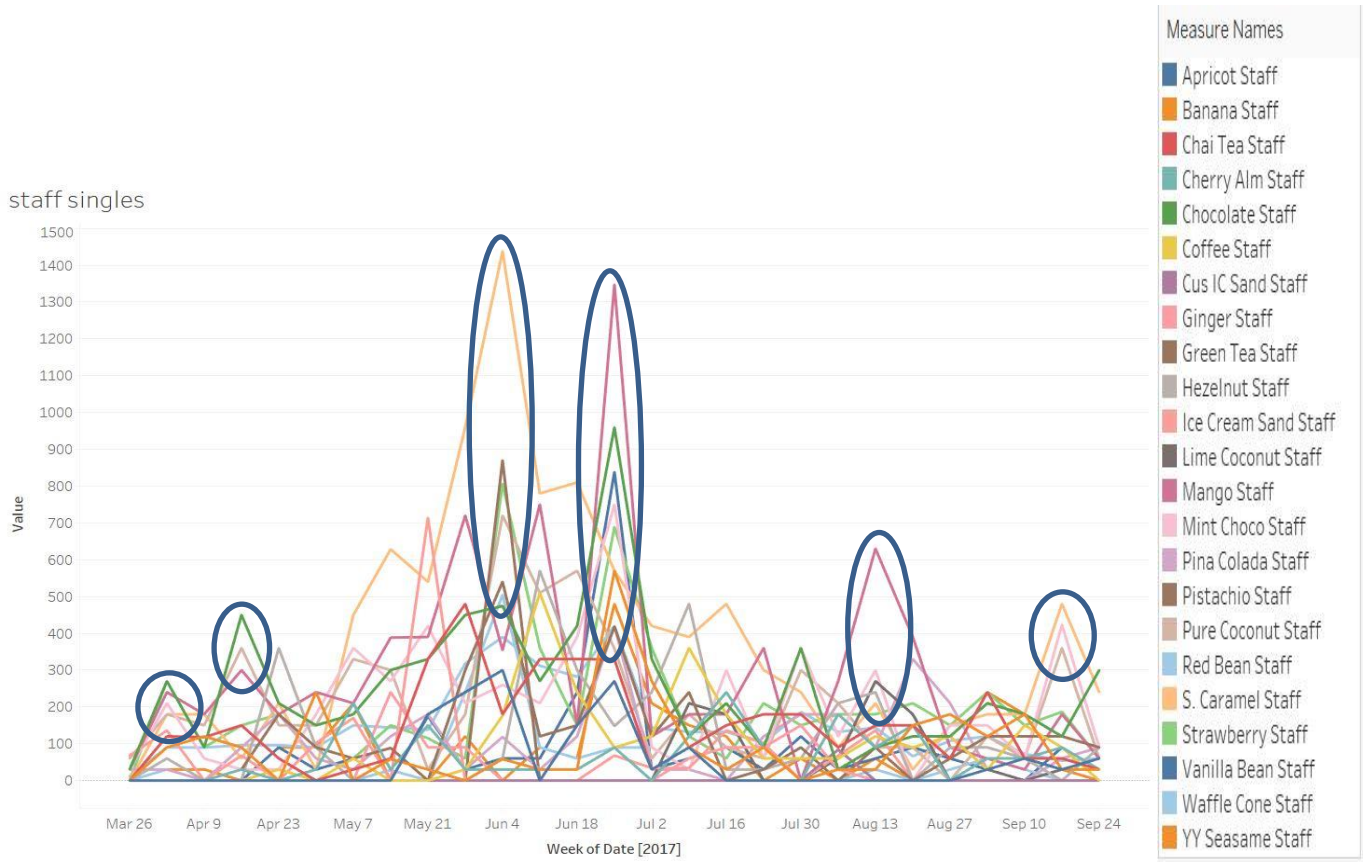
Months segmentation



april	• Chocolate • Pure coconut • hazelnut
may	• ice cream sand • s.caramel • mint choco
june	• s.caramel • mango • pistachio
july	• hazelnuts • s.caramel • strawberry / coffee / mango (all have a value of 360 in revenue)
august	• mango • pina colada • mint choco
September	• s.caramel • mint choco • pure coconut

Staff

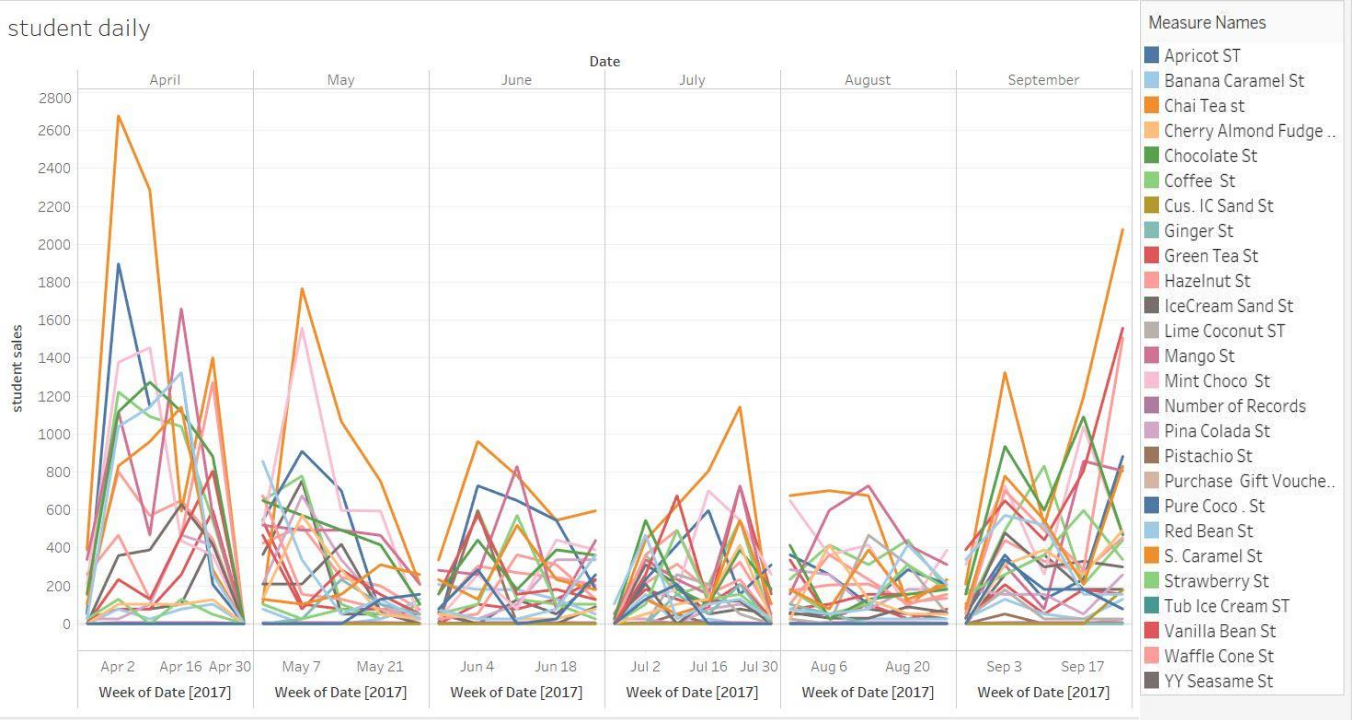
weeks segmentation



I’ve marked the different correlation groups in the previous chart in blue circles.

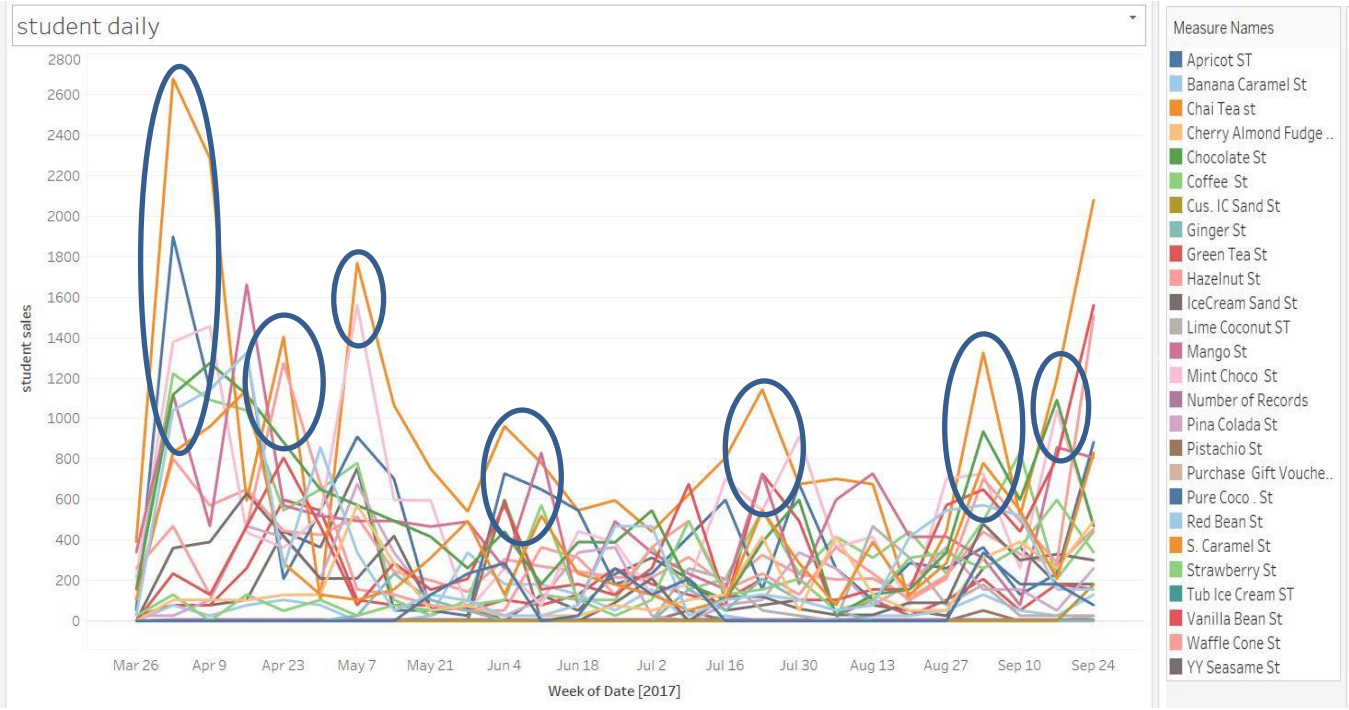
Students

Months segmentation



april	• s.caramel • pure coco • mango
may	• s.caramel • mint choco • pure coco
june	• s.caramel • Mango • Pure coco
july	• S.caramel • Vanilla bean / mango (both 728 in revenue) • Mint choco
august	• Mango • S.caramel • Lime coconut
September	• S.caramel • Green tea • hazelnut

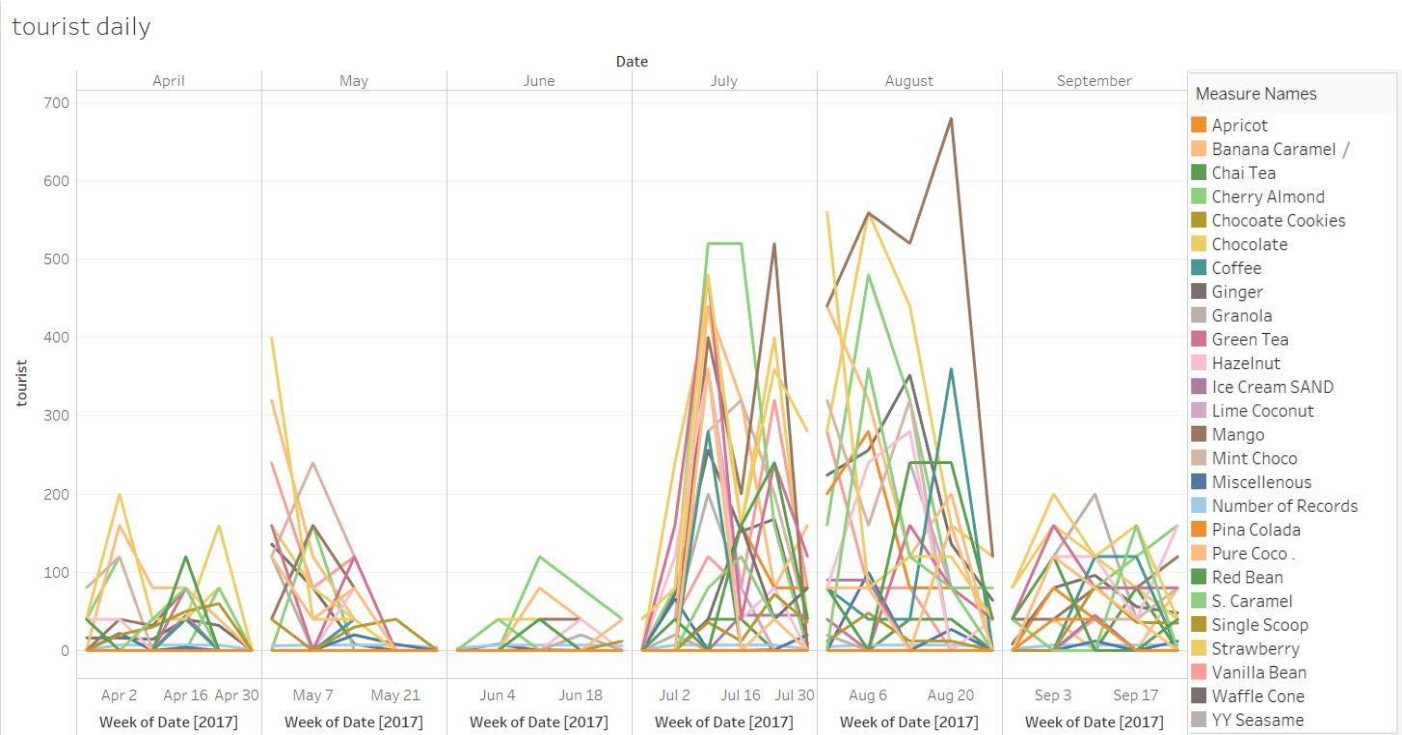
Students
weeks segmentation



I’ve marked the different correlation groups in the previous chart in blue circles.

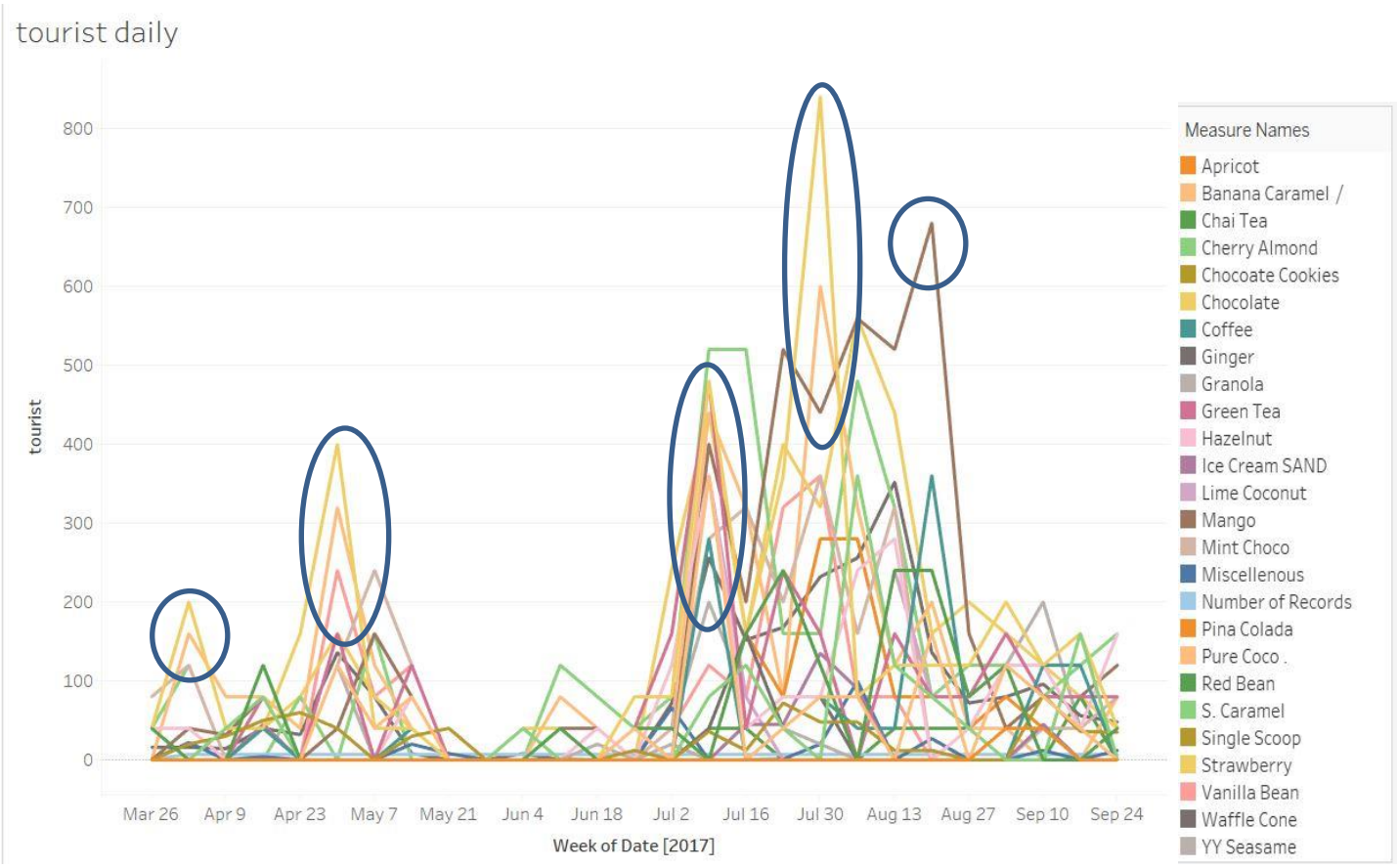
Tourists

Months segmentation



april	• chocolate • pure coco • chai tea
may	• chocolate • pure coco • vanilla bean
june	• s.caramel • pure coco • cherry almond / chocolate / mango (all have a value of 40 in revenue)
july	• s.caramel / mango (both have a value of 520 in revenue) • chocolate • green tea
august	• mango • chocolate / strawberry (both have a value of 560) • s.caramel
September	• chocolate / sesame (both have a value of 200) • green tea / strawberry / chocolate / cherry almond / s.caramel / hazelnut (all of them have a value of 160)

Tourists
weeks segmentation



3rd question

3. Analyse if grouping the flavours gives a better level of analysis than individual flavours? If so, what groups do you suggest ?

- In this section my approach in question 2 has answered this.
- grouping gives a better understanding for each customer group (students-staff-tourists) and how they behave on different flavours.
- you now have an understanding of what groups of customers (students-staff-tourists) like at different time frames.

staff

april	• Chocolate • Pure coconut • hazelnut
may	• ice cream sand • s.caramel • mint choco
june	• s.caramel • mango • pistachio
july	• hazelnuts • s.caramel • strawberry / coffee / mango (all have a value of 360 in revenue)
august	• mango • pina colada • mint choco
September	• s.caramel • mint choco • pure coconut

students

april	• s.caramel • pure coco • mango
may	• s.caramel • mint choco • pure coco
june	• s.caramel • Mango • Pure coco
july	• S.caramel • Vanilla bean / mango (both 728 in revenue) • Mint choco
august	• Mango • S.caramel • Lime coconut
September	• S.caramel • Green tea • hazelnut

Tourists

april	• chocolate • pure coco • chai tea
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august	• mango • chocolate / strawberry (both have a value of 560) • s.caramel
September	• chocolate / sesame (both have a value of 200) • green tea / strawberry / chocolate / cherry almond / s.caramel / hazelnut (all of them have a value of 160)

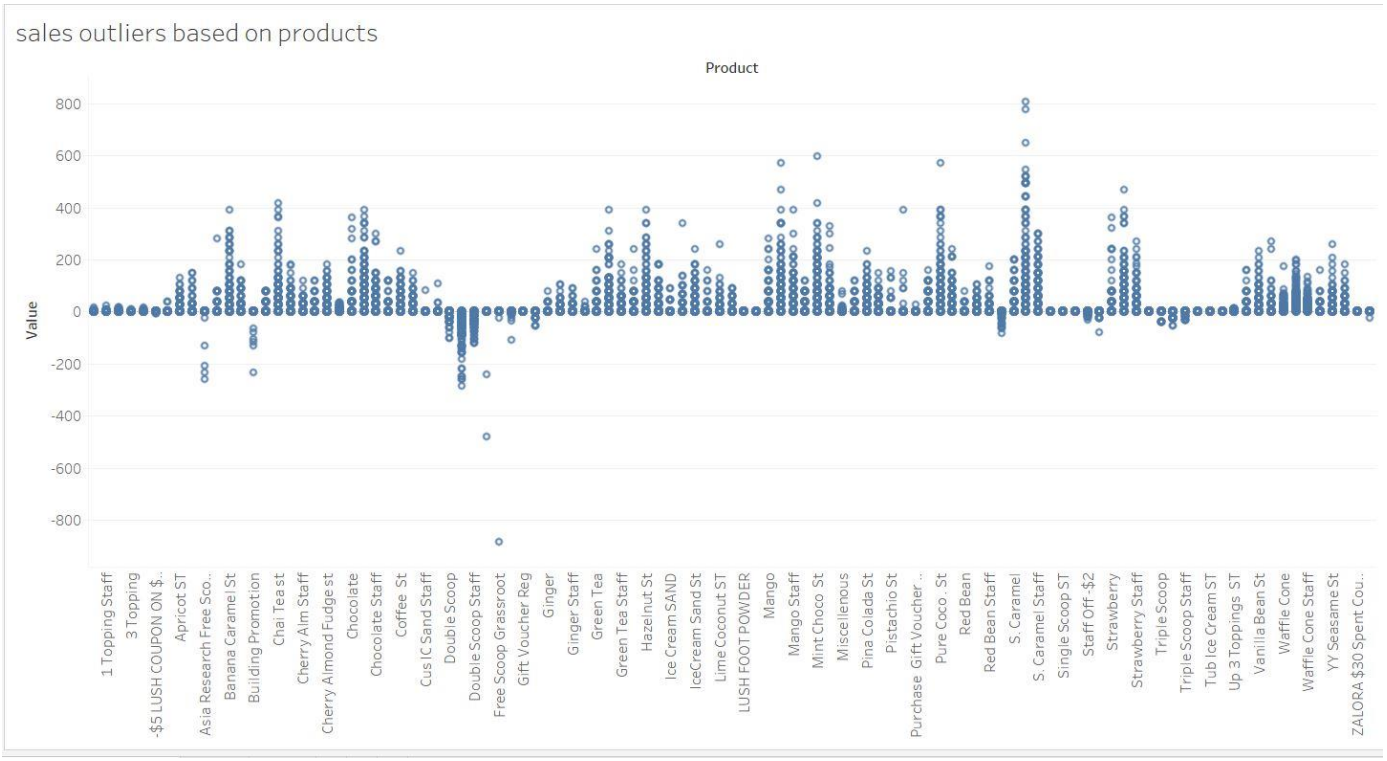
4th question

4. What outliers can be identified from the daily sales? Describe the outliers and give possible explanations, and find the most effective products in revenue and give a recommendation.

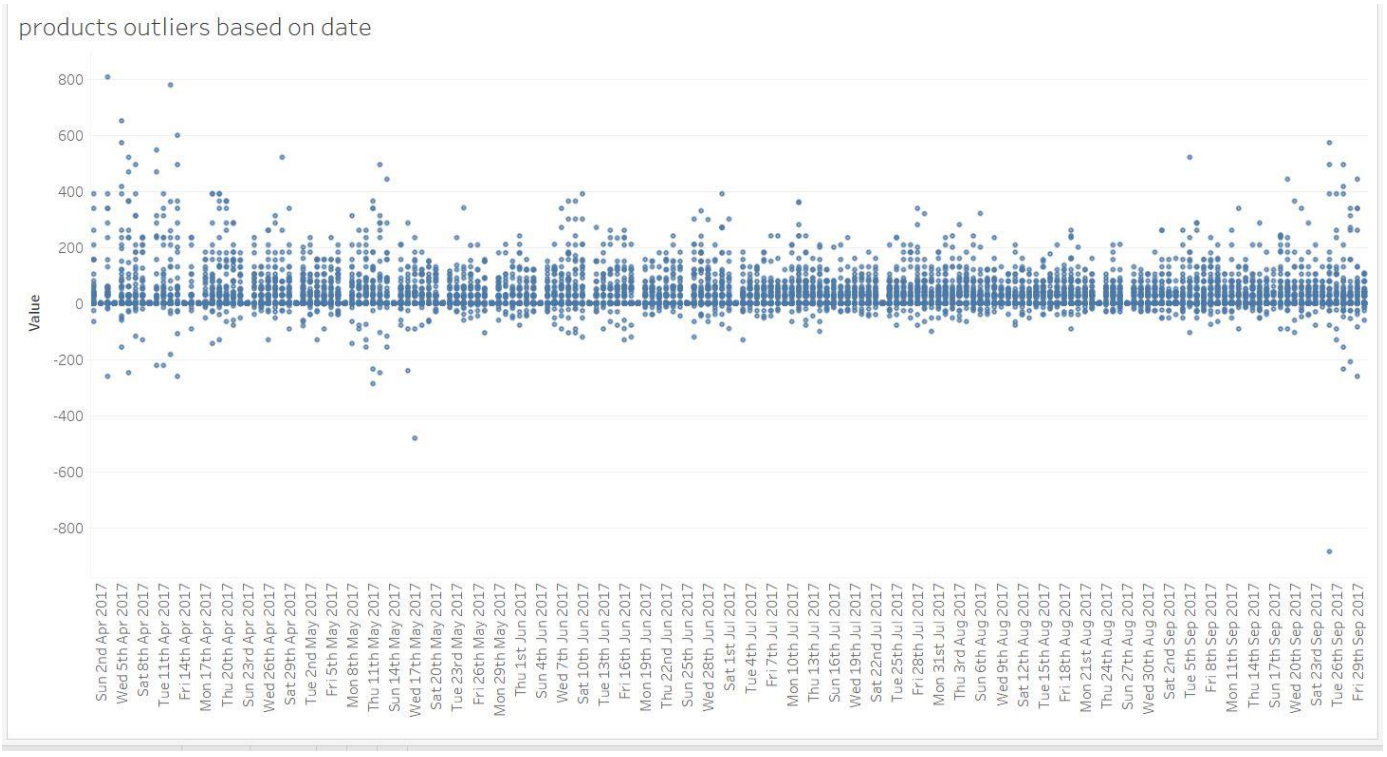
We will discuss outliers on two aspects here :

1- Outliers based on products
2- Outliers based on date

Outliers based on products

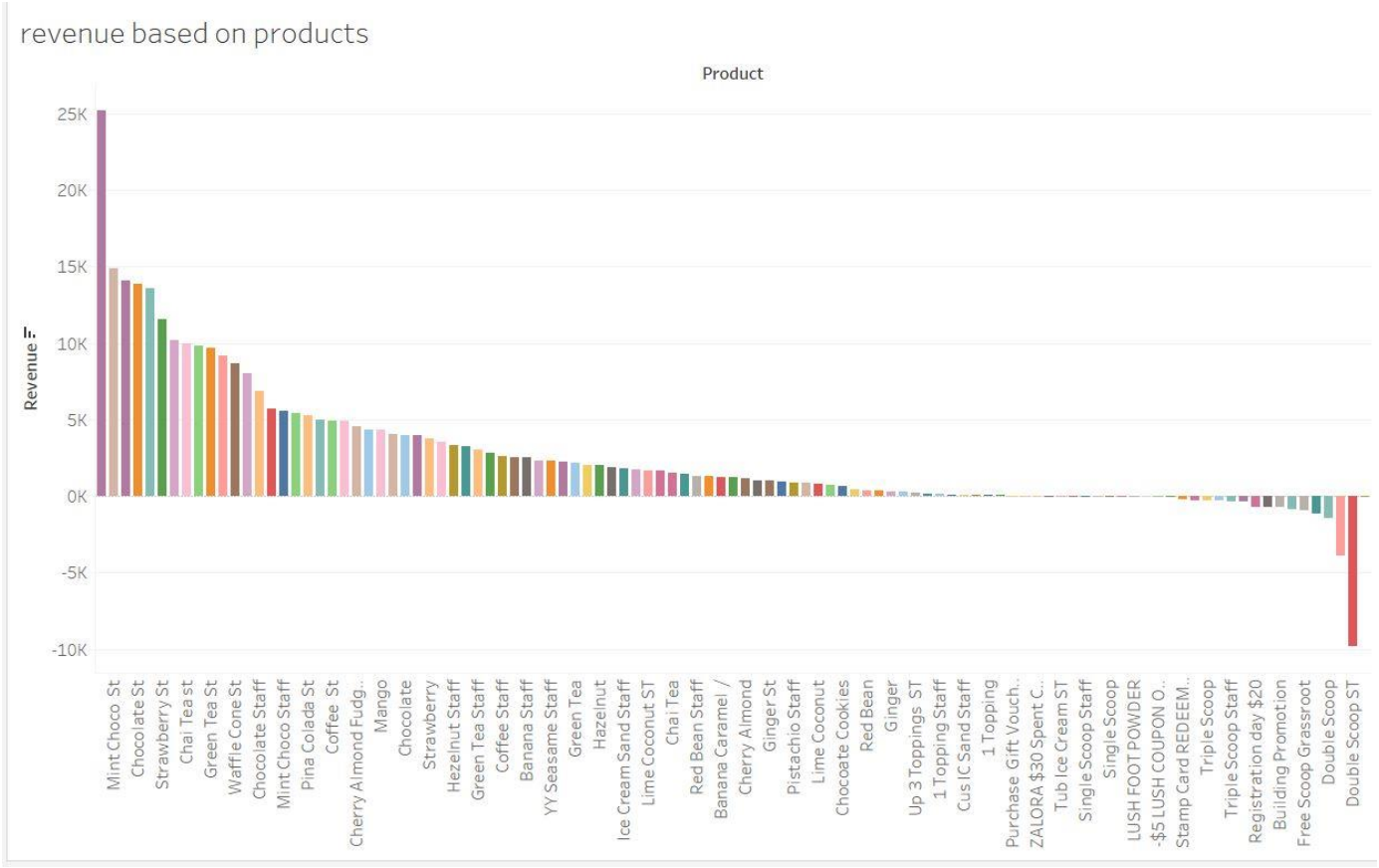


Outliers based on date



Revenue of products :

In this section I'll discuss the products that affects most of the client revenue



recommendation : we can focus on the highest revenue products and increase the sales with various ways like vouchers and offers with our time frame.