



RETAIL: SALES OUTLETS' PERFORMANCE

ANALYSIS AND RECOMMENDATIONS FOR BUSINESS



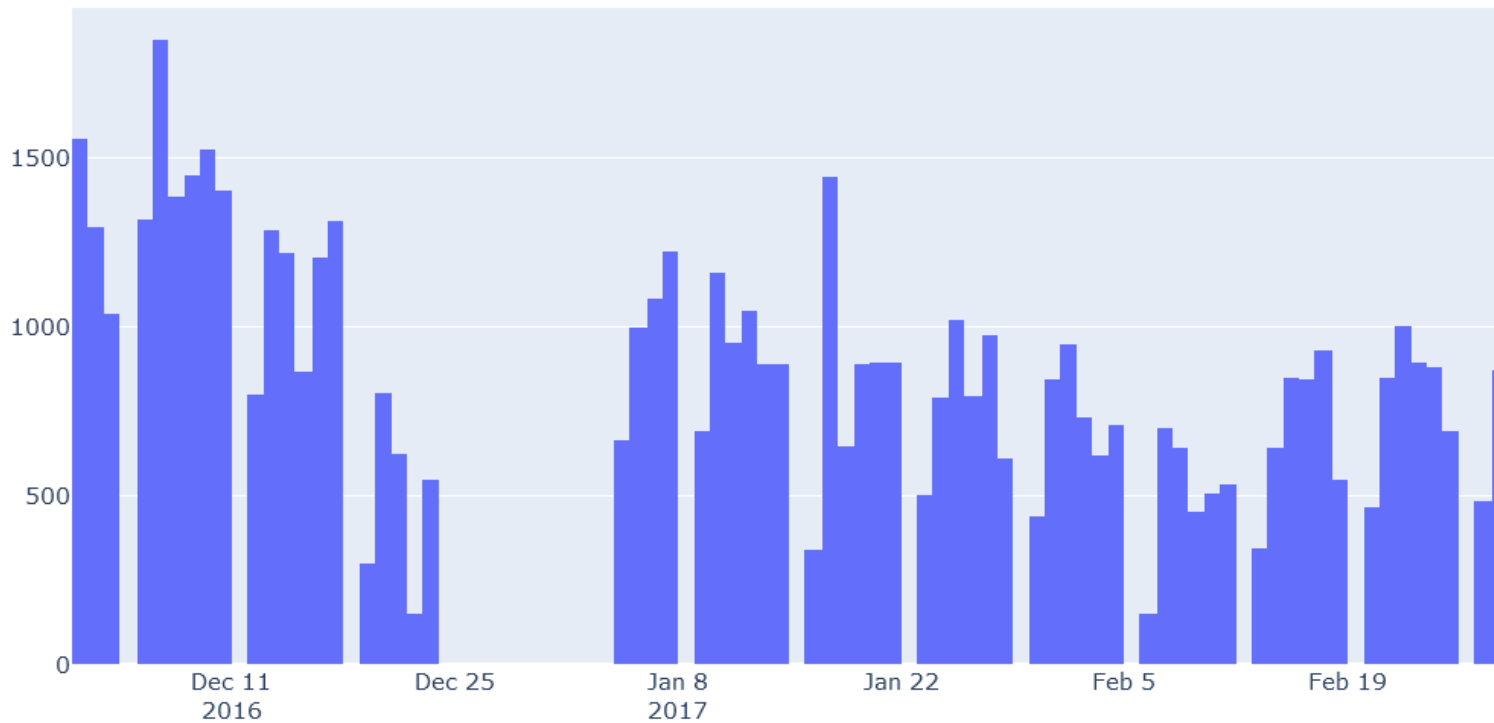
GENERAL CONCLUSIONS

- Average purchase description: price 2-2.4 dollars per item in quantity from 70 to 120, and the average total per cheque varies from 140 to 180. The biggest influencer on the revenue is quantity of items.
- There are 276 items that were purchased only once, their selling strategy needs to be revised.
- Only 20% of our customers bring about 70% of the revenue. This group of customers is very important to our chain and their behavior can be model behavior and a key to elevating profits.
- Loyalty program is ineffective. 33% of customers participate in loyalty program paying 20\$ monthly, but only 10% of loyal customers bring almost all of the revenue from purchases of this group. Loyal customers perform generally worse than non-loyal: less number of purchases by customer and smaller revenue.
- Shop 0 is an online shop, its behavior is different from all regular shops: has the biggest number of purchases, the smallest number of loyal customers, pretty low average number of items per purchase, and one of the lowest average totals per purchase. Still thanks to the amount of purchases it has best cumulative revenue performance.
- There are 10 shops performing better than average: Shop 15, Shop 5, Shop 4, Shop 13, Shop 20, Shop 25, Shop 30, Shop 26, Shop 29 and Shop 0. Shop 5 is especially remarkable, it has several instances of leaps in cumulative revenue on the timeline, has biggest number of purchases and greatest number of unique customers. It can be a role model for all other regular shops.

During this analysis we've encountered several anomalies in data: minus and 0 values in quantity variable, 0 values in prices per item, rows with non-product related items, duplicated rows, which origin we couldn't confirm. All of these rows had to be dropped and the remaining data was 56% of the original size.

ANALYSIS OF TIME PERIOD

Distribution of timestamp



- We have data for 3 months: from 1.12.2016 till 28.02.2017.
- Each Saturday and Sunday are days off for all of the shops. There also was a period of winter holidays when all the shops were closed: 24.12.2016-03.01.2017. By 4th of January they resumed work.
- After the winter holidays number of purchases in all shops dropped.
- Each Monday has lowest number of purchases made throughout the week, while the highest number of purchases is made in the middle of the week.
- The day with highest number of purchases is December, the 6th.

GENERAL INFORMATION

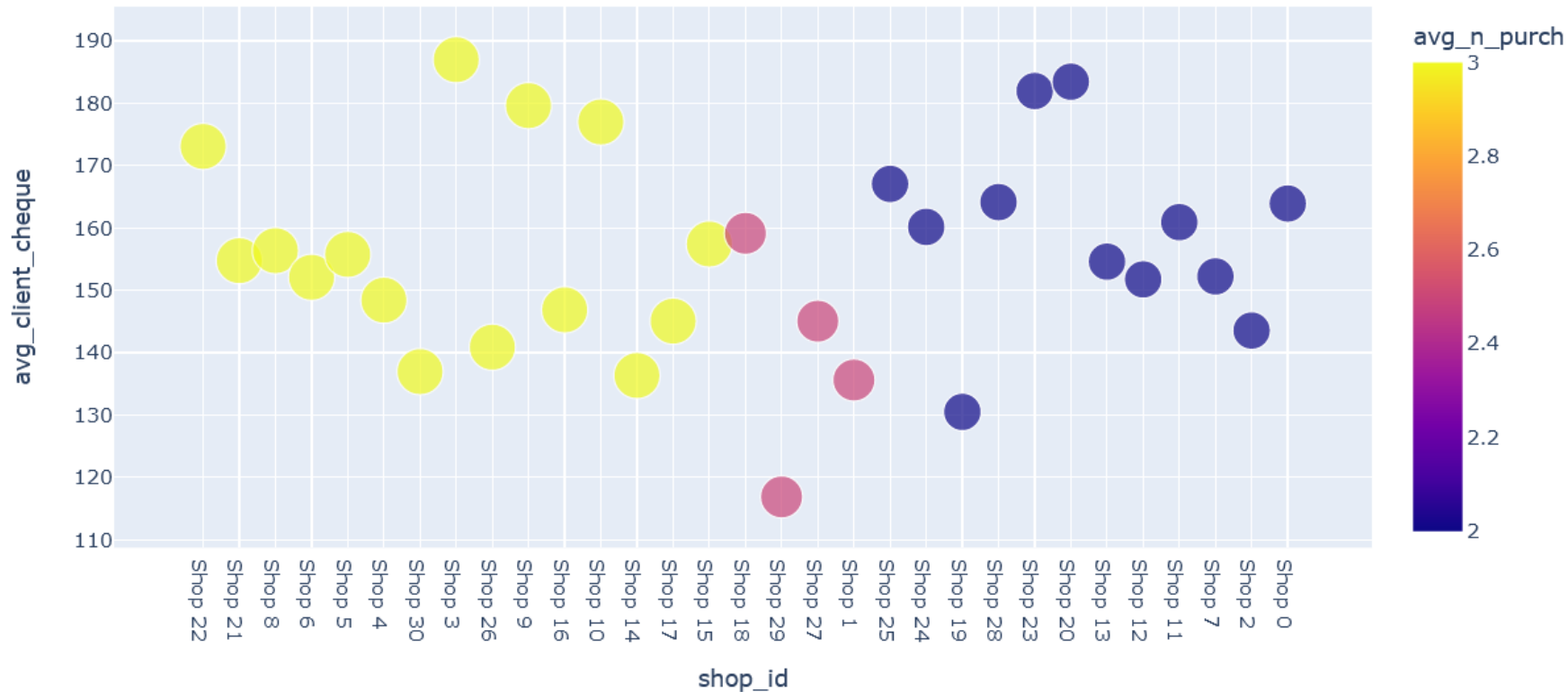
Number of purchases per shop



- There are 31 shops.
- `Shop 0` stands out the most by the number of purchases and other traits, because it is an online shop.
- All other shops have 85 to 120 purchases, and overall perform more or less similarly.
- Among regular shops `Shop 5` has the greatest number of purchases – 120. While `Shop 3` has the smallest – 85.
- The range of prices per item is on average 2 to 2.4.
- Average quantity of all items in purchase varies from 70 up to 128.

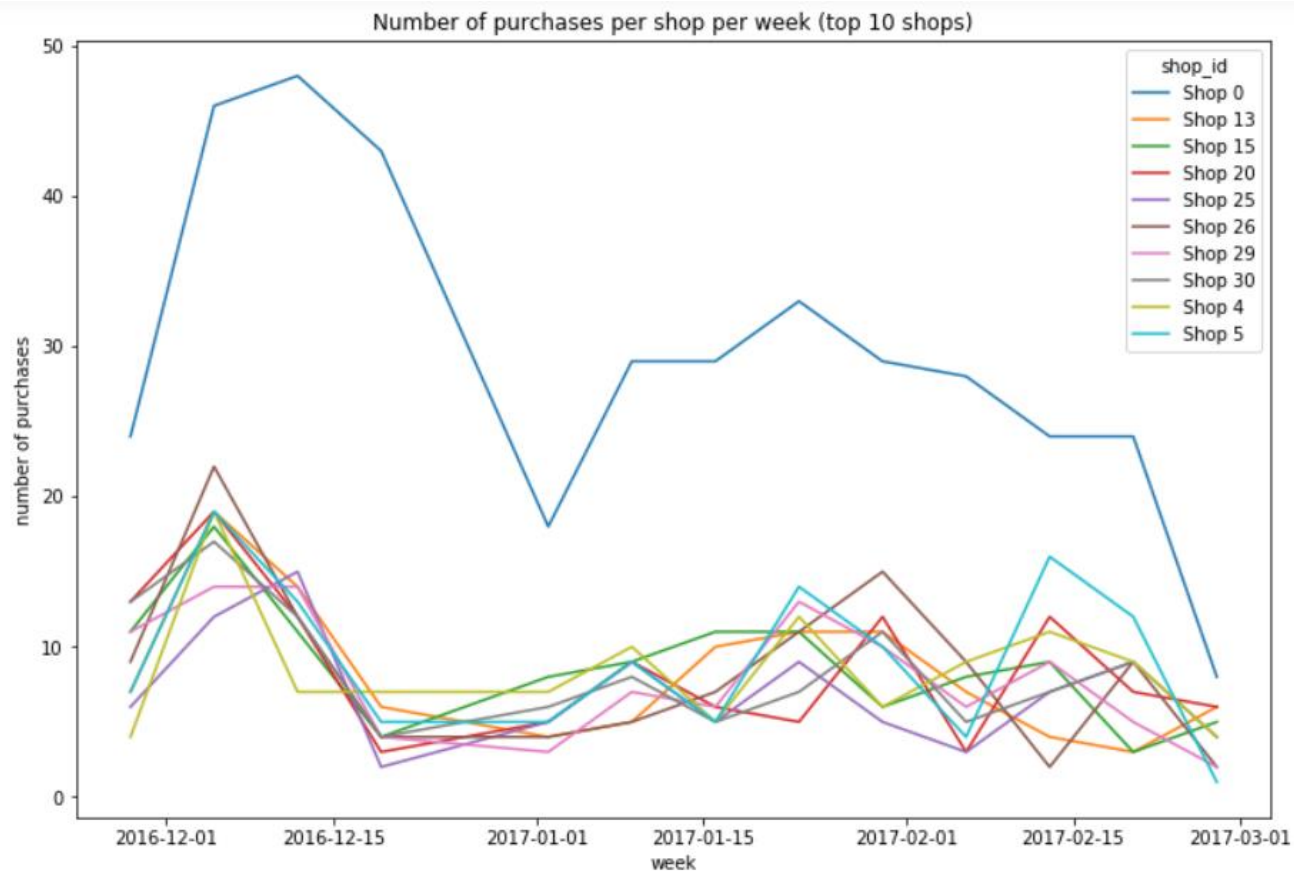
PER SHOP ANALYSIS: NUMBER OF PURCHASES AND AVERAGE TOTAL PER CUSTOMER

Number of purchases & average total per client



- Average revenue per customer doesn't depend on number of purchases, which varies from 2 to 3, and majority of values lies between 130-160\$ per customer.
- Shop 3 has the highest average revenue per customer - 187, but as we saw earlier it has lowest number of purchases, while Shop 29 has the lowest average - 117.

PER SHOP ANALYSIS: NUMBER OF PURCHASES PER WEEK

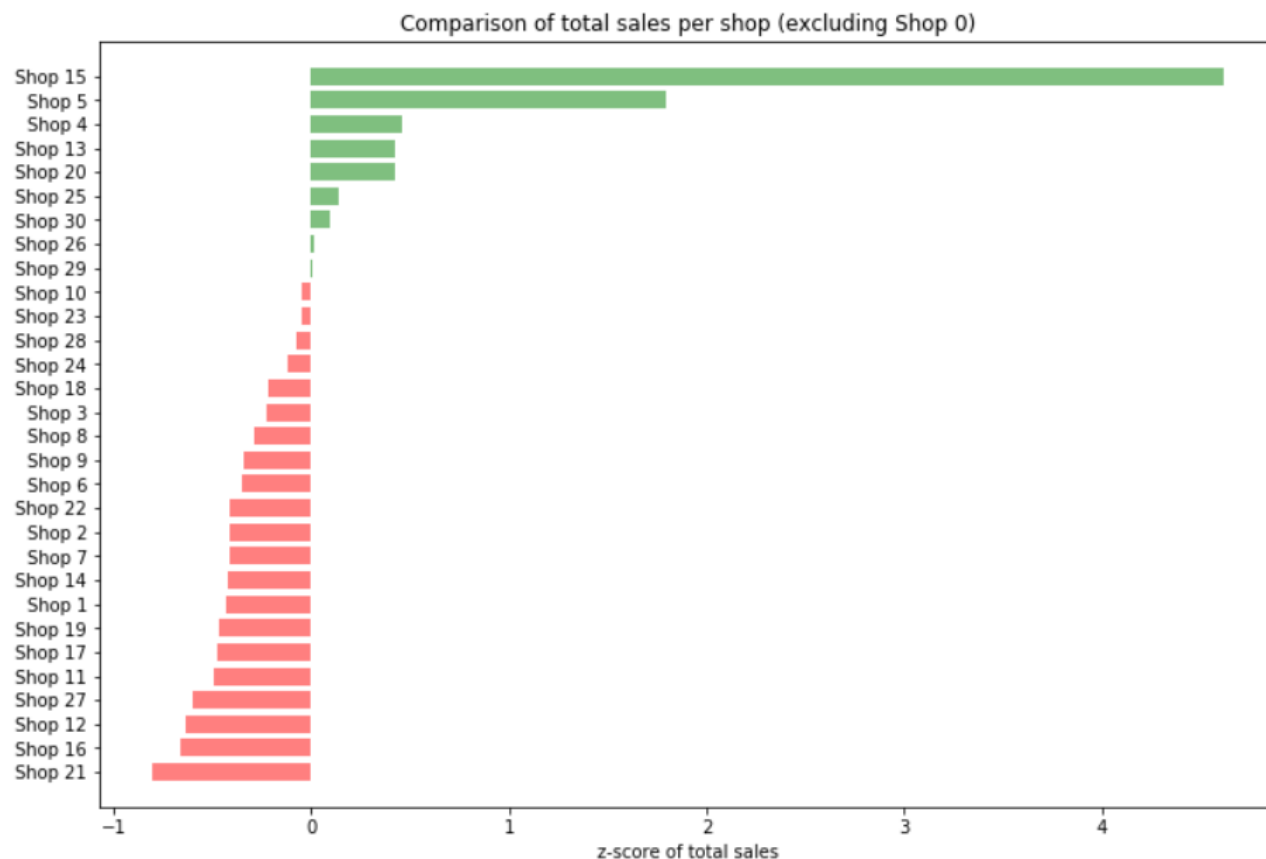


In the beginning of December Shop 0 jumps from 25 to almost 50 purchases per week, and because of the Holidays in the second part of the month the number drops to less than 20. In January it goes up to 25-30 purchases and holds for a month, then drops again in the later part of February. The behavior of Shop 0 differs from all other shops.

Generally other shops have similar number of purchases and behavior. The number of purchases in all regular shops is less than 15, for the most part less than 10.

Shop 5 stands out among regular shops, having 2 highest peaks: in the second part of January and in the middle of February.

PER SHOP ANALYSIS: REVENUE

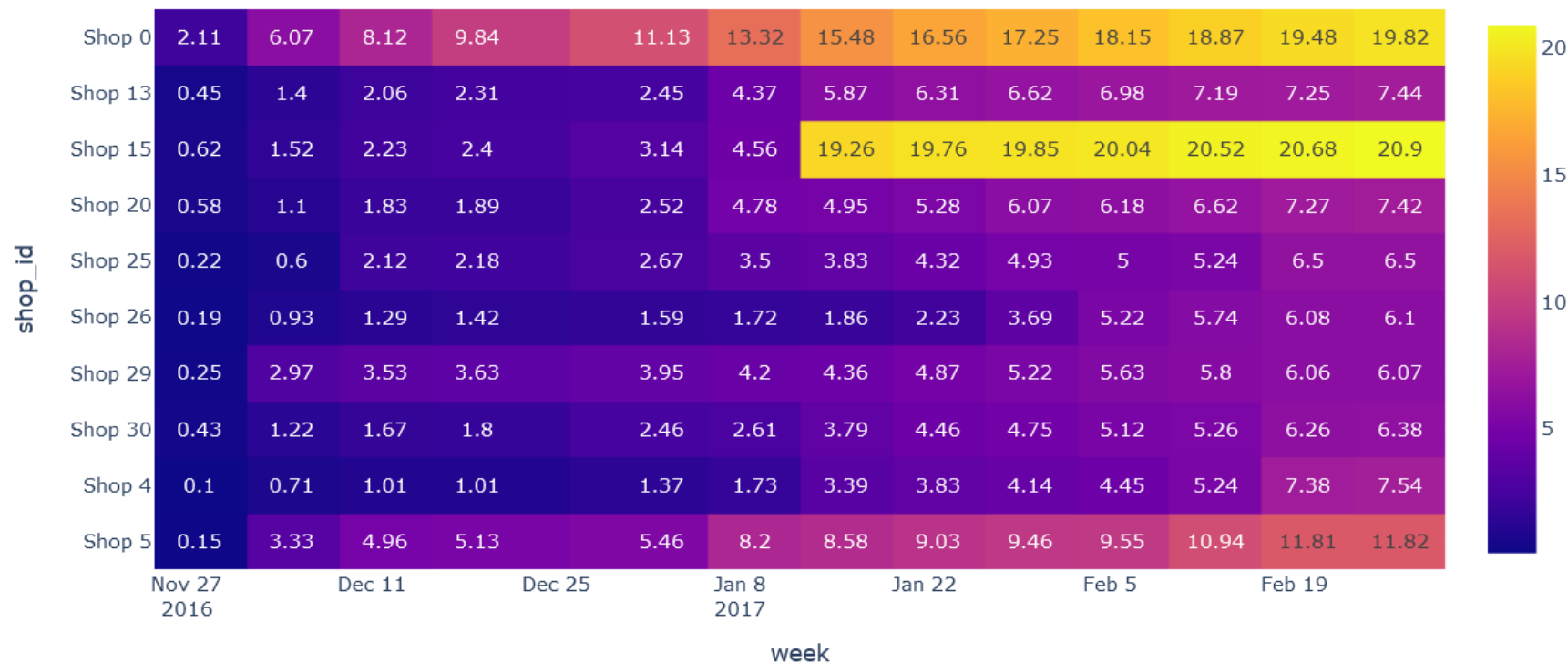


- The shops performing better than average : Shop 15, Shop 5, Shop 4, Shop 13, Shop 20, Shop 25, Shop 30, Shop 26, Shop 29. Shop 0 can also be considered part of this list.
- The shops that perform worse than average are not that far from the average, meaning that we don't have any major problems with their performance and revenue.

Shop 15 is top1 on the graph due to one huge purchase made in this shop, but overall it's performance is mediocre. On the other hand Shop 5, that is top2 on the graph, has best performance throughout the whole period.

PER SHOP ANALYSIS: CUMULATIVE REVENUE

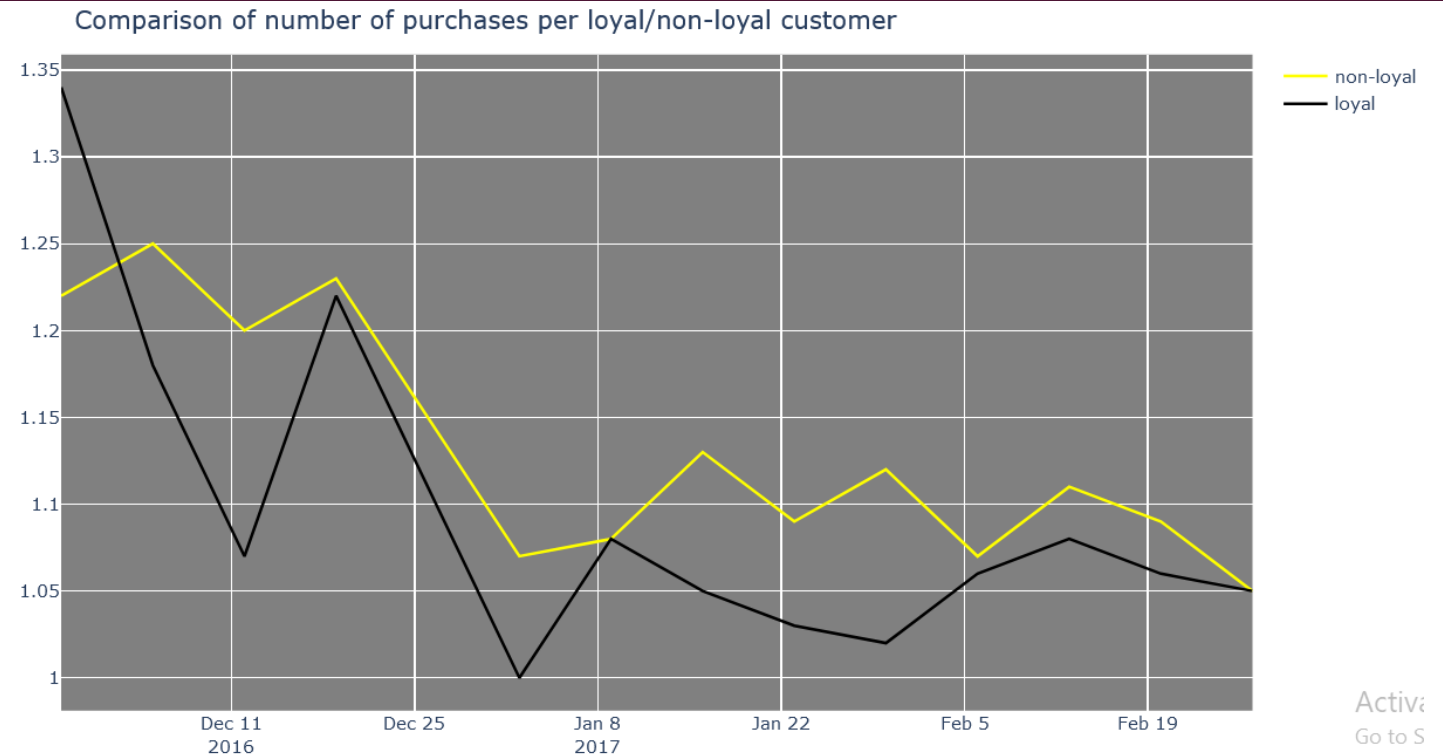
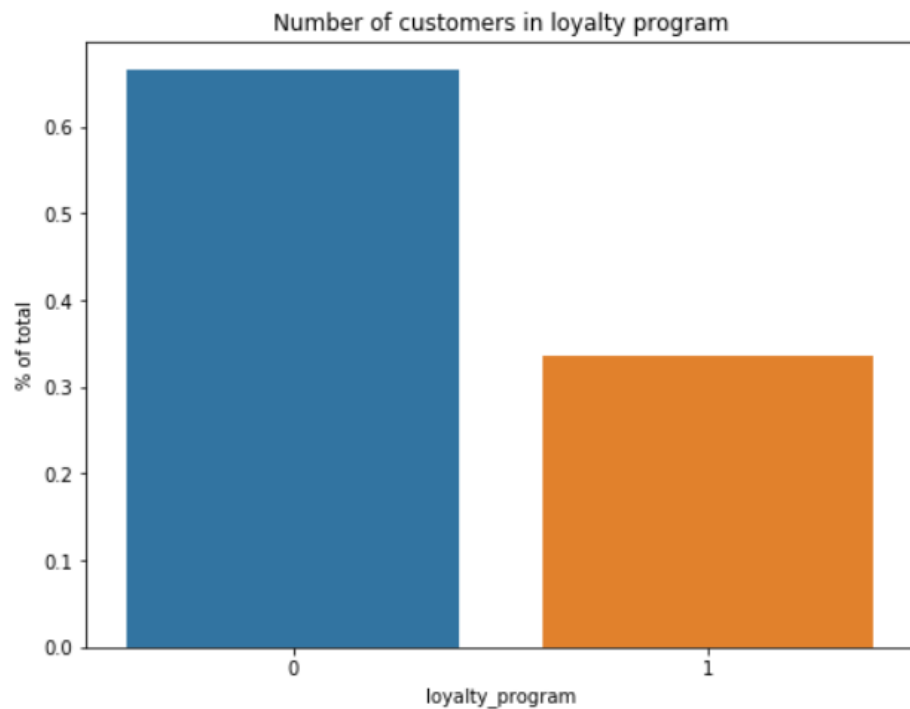
Cumulative revenue per shop



Shops 0, 15 and 5 stand out the most.

- Shop 0 has different behavior from the very beginning, as it has wider audience and much greater number of purchases than all other shops.
- Shop 15 has had it's biggest purchase in the middle of January, beside that we can see that it's performance isn't outstanding.
- Shop 5 shows best performance out of all regular shops. We also know that it has greatest number of purchases. This shop has model behavior.

PER CUSTOMER ANALYSIS. LOYALTY PROGRAM – PART I



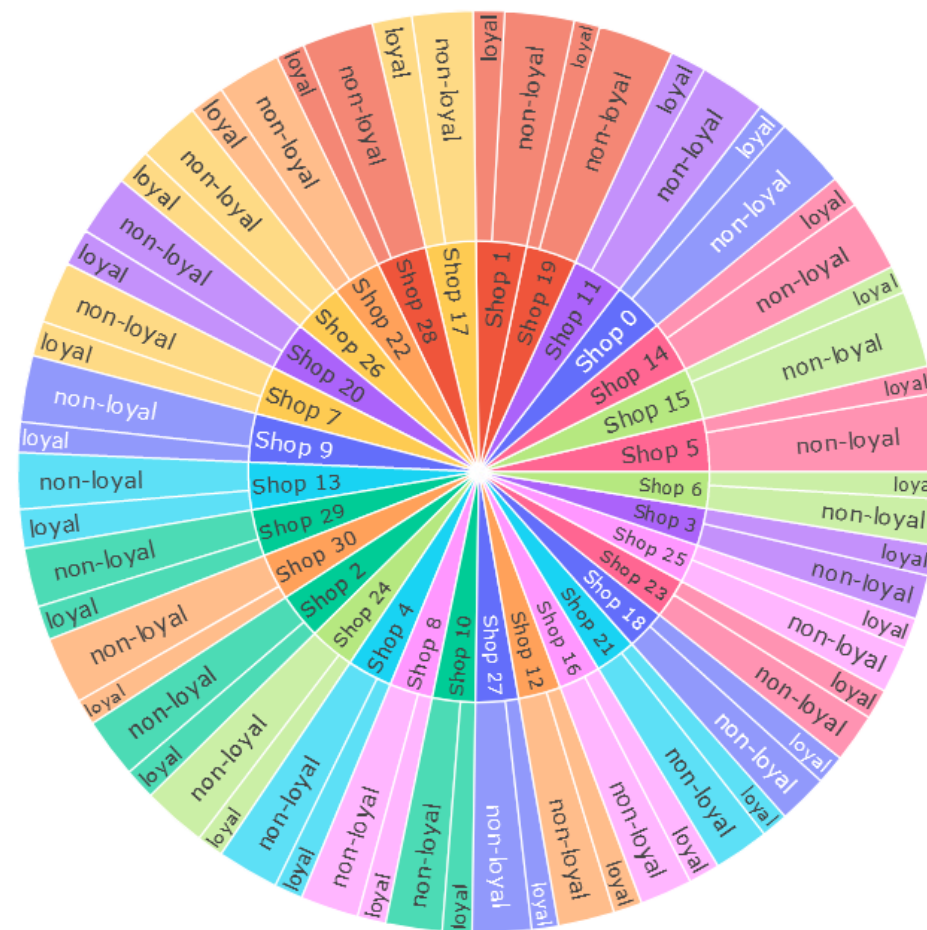
- 33% of our customers are participating in loyalty program.
- Loyal customers generally show worse performance than non-loyal, even if it is a small difference in number of purchases per week.

PER CUSTOMER ANALYSIS: LOYALTY PROGRAM – PART II

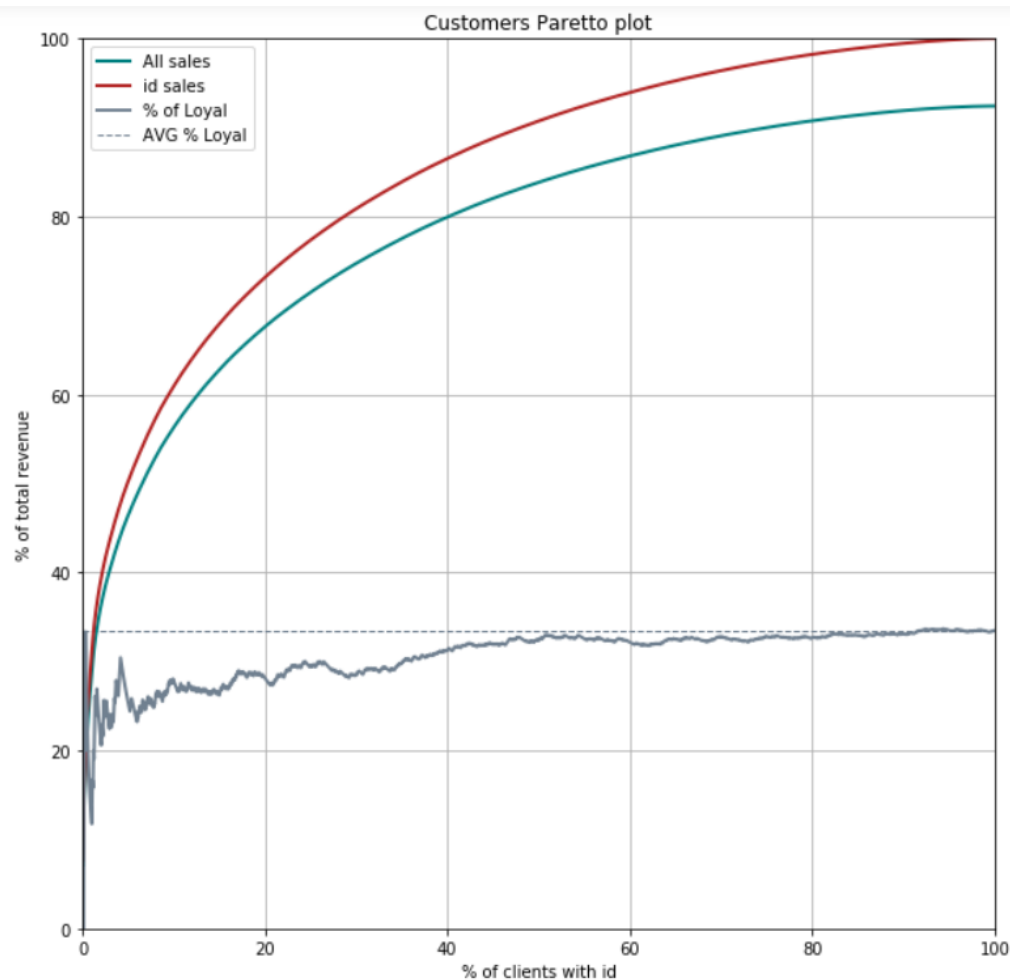
Distribution of loyalty membership among shops

- The chain received revenue from 3 months of loyalty membership fee - 33240\$.
- There are 84 to 114 unique customers per shop.
- Shop 5 attracted the greatest number of clients among regular shops.
- We can't know for sure how many customers there are in Shop 0 as it has too many purchases with missing customer id.
- 95% of purchases by loyal customers have total below 650 and the average total is 132, while 95% of purchases of non-loyal customers have total below 890, and the average total is 166.

It is important to note that we have missing customer ids in the data. 8% of all purchases have missing customer id, and only 5 shops have this problem: Shop 0, Shop 6, Shop 25, Shop 21 and Shop 23. All of the missing ids belong to non-loyal customers.



PER CUSTOMER ANALYSIS. LOYALTY PROGRAM – PART III



Out of all clients only 20% bring about 70% of their total revenue, and about 30% of customers bring 80% of their total revenue.

From this plot we see that loyalty program isn't effective: 20% of loyal customers already bring almost all of their revenue. Meaning only a very small part of loyal customers is profitable.

We've found that there is evidence of difference in average total per purchase between loyal and non-loyal customers, as well as in number of purchases.

RECOMMENDATIONS FOR BUSINESS

- Revise “Loyalty program”, it is ineffective. About 90% of loyal customers bring almost no revenue at all except for their monthly fee. Our tests showed that there's evidence that loyal customers have smaller average revenue and make less purchases on average than non-loyal. It shows that loyal customers are generally uninterested in our products which will eventually make them leave.
- Check membership cards issued in 5 shops/the system that reads the cards: `Shop 0`, `Shop 6`, `Shop 25`, `Shop 21` and `Shop 23`. These shops have purchases with missing customer ids.
- Check how could there be minus and 0 values in “quantity”(missing or erroneous data can significantly twist revenue analysis, it is very important to fix it).
- Only 20% of our customers bring about 70% of whole revenue. We recommend to make an additional research of customer behavior of this segment to create a strategy of churn prevention and attracting them more to our stores.
- We have 276 items that were sold only once during this whole period. They need another selling strategy.
- Among all shops we want to note `Shop 5`, it's performance is outstanding. Perhaps the stuff deserves some kind of gratitude, and can share their experience with other shops' teams.
- `Shop 0` is analyzed separately being online shop. We want to note that it has more purchases than any other shop, but it's total per cheque is one of the lowest. This shop represents the chain on the Internet and has the greatest potential because of it's huge audience. Elevating it's average even a bit will bring great profit to the chain.