

Retail Loyalty Program Analysis

Home World a Building Material Retailer

Practicum Final Project - Main
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Project Outline

Project:

- Evaluate the new Loyalty Program to see if it has lead to an increase in average purchase size and number of items.
- The results and recommendations will be submitted to the Project Manager of the Customer Loyalty Program

Project Outline:

- Carry out data analysis
- Evaluate the Customer Loyalty Program
- Consider the following hypothesis:
 - Customers who participate in the Loyalty Program make larger purchases by price on average
 - Customers who participate in the Loyalty Program buy more items on average
- Present conclusions and recommendations

[Dashboard Link](#)



About the Data

- Contains 2 files:
 - information on purchases
 - product codes/prices
- Covers 3 months of purchases: December 1, 2016 - February 28, 2017
- 3296 purchases (after anomalies removed)
 - 31% in Loyalty Program (1031)
 - 69% not in Loyalty Program (2265)
 - Anomalies removed:
 - Top 5% of purchase prices ≥ 866.27
 - Top 5% of number of items per purchase ≥ 669 items



Hypotheses to investigate

1. Customers who participate in the Loyalty Program make larger purchases on average
2. Customers who participate in the Loyalty Program buy more items on average



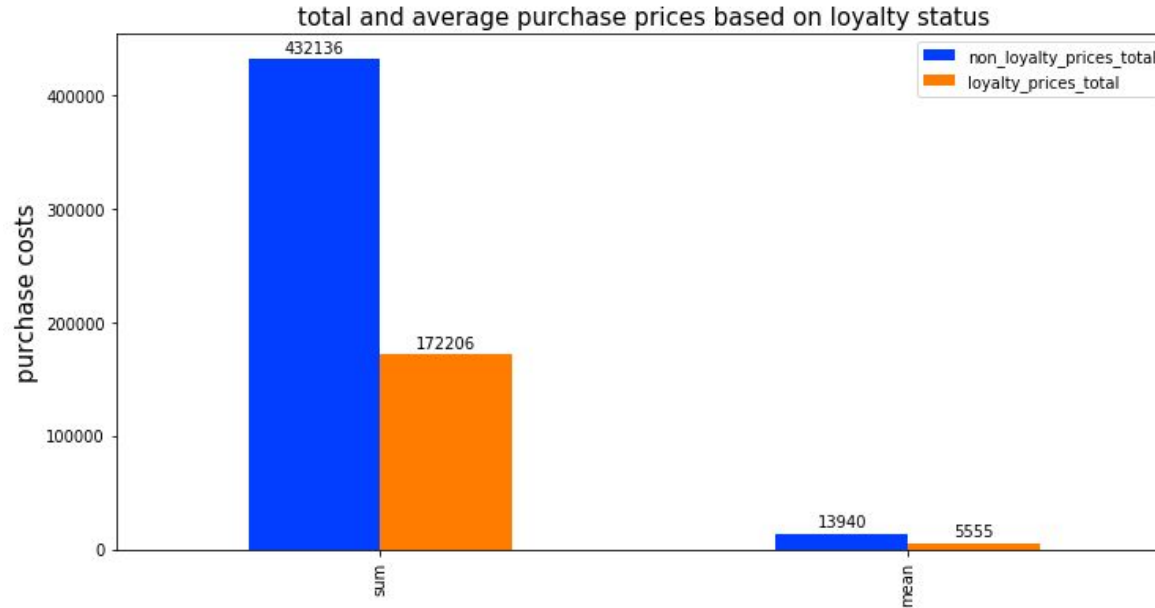
Distribution of Purchase Price



- There is a similar trend in purchase price for loyalty vs non-loyalty members
- Most purchases cost under 200

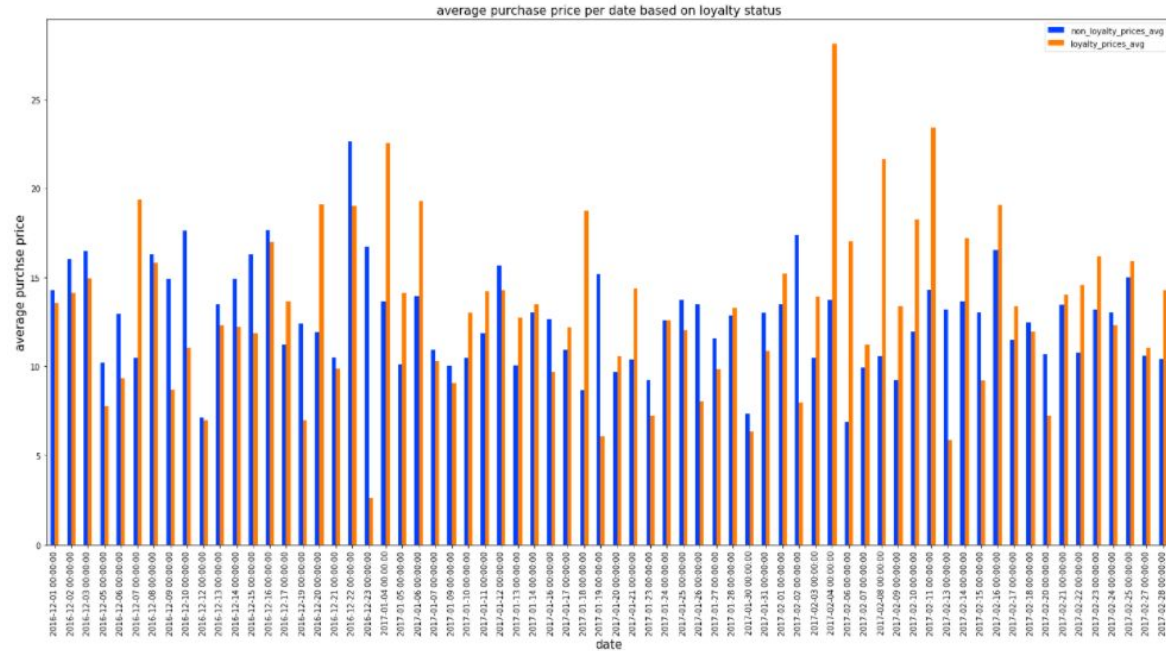


Total and Average Purchase Price



- Non-loyalty members make higher priced purchases total and on average compared to loyalty members

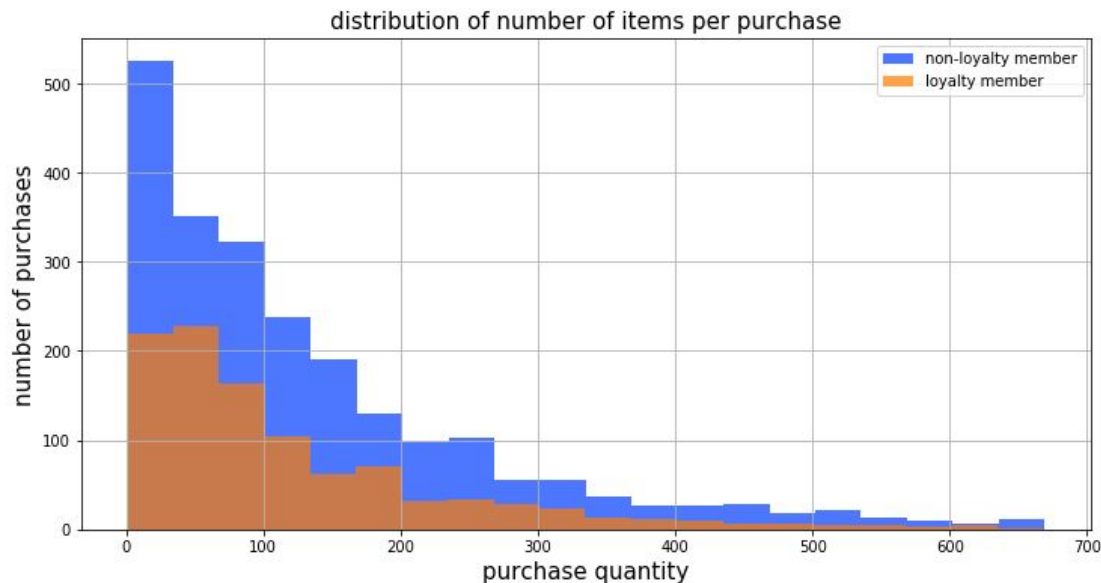
Average Purchase Price per Date



- On average the purchase price per day varies day to day based on loyalty status, some days loyalty members make larger purchases on average, sometimes the non-loyalty members make larger purchases on average



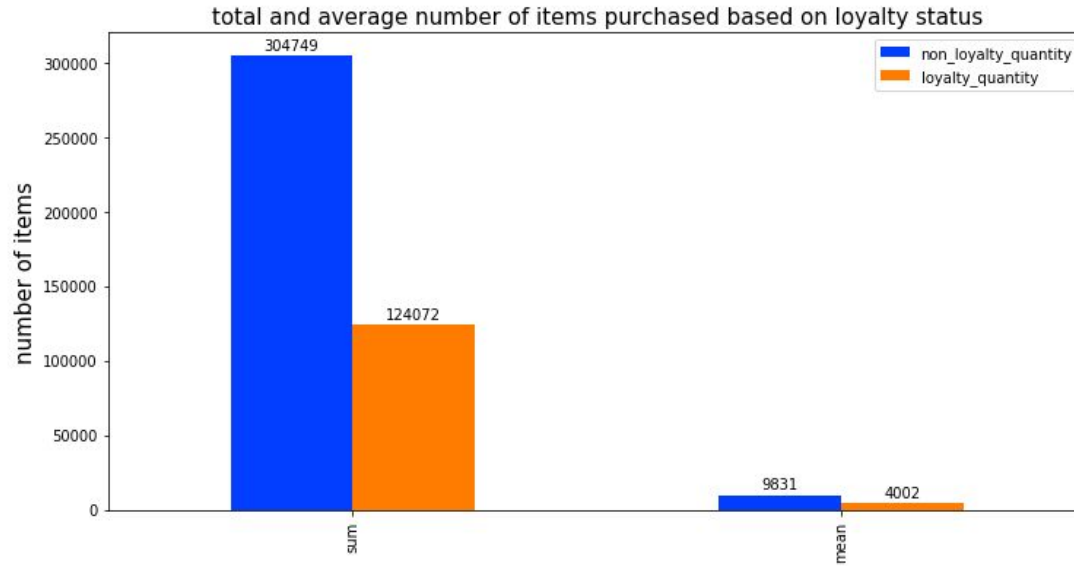
Distribution of Number of Items per Purchase



- There is a similar trend in the number of items purchased for loyalty vs non-loyalty members
- Most purchases have 200 items or less

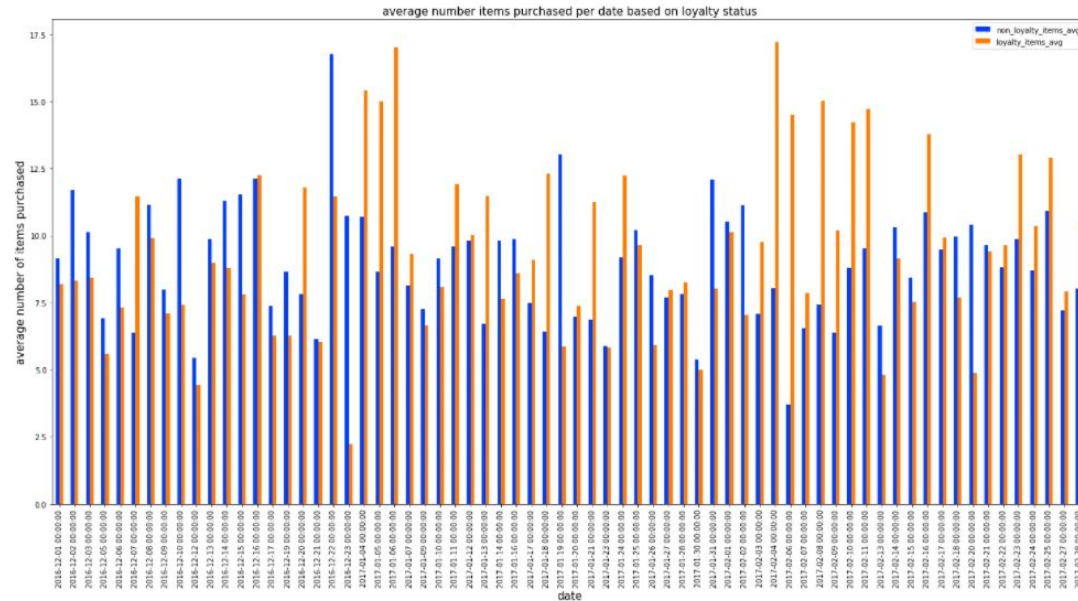


Total and Average Number of Items per Purchase



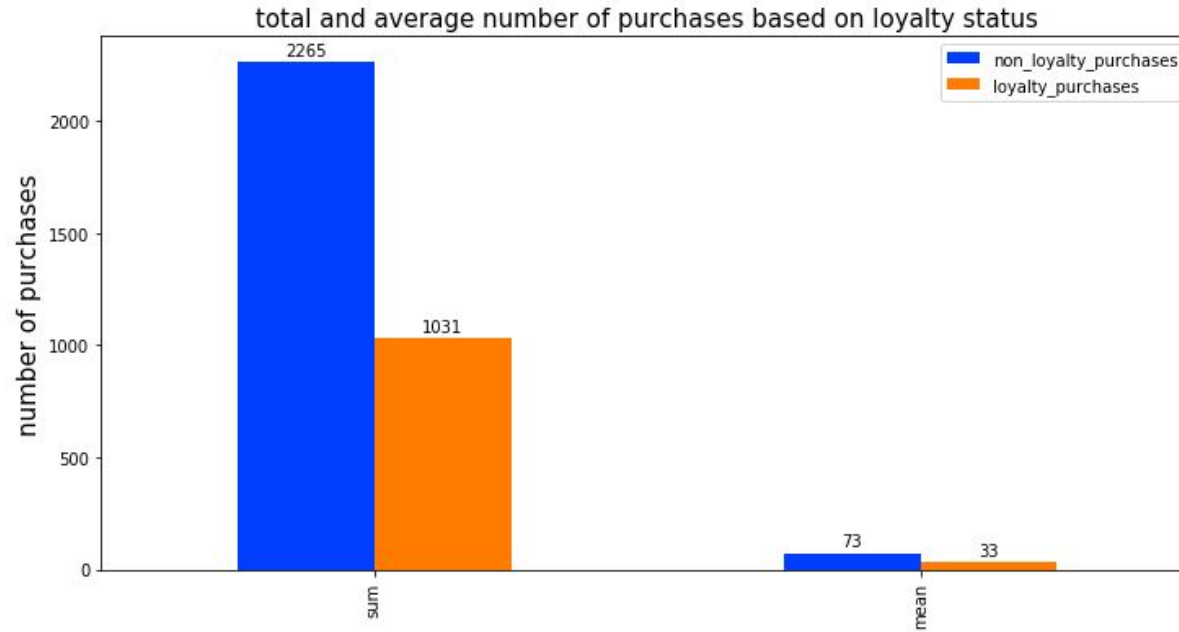
- Non-loyalty members purchase more items total and on average compared to loyalty members

Average Number of Items per Purchase per Date



- On average the number of items purchased per day varies day to day based on loyalty status, some days loyalty members purchase more items on average, sometimes the non-loyalty members purchase more items on average

Total and Average Number of Purchases



- Non-loyalty members make more purchases total and on average compared to loyalty members



Hypothesis 1: Customers who participate in the loyalty program make larger purchases on average

- Tested with: The Independent Samples t-Test compares the means of two independent groups in order to determine whether there is statistical evidence that the associated population means are significantly different.
- Null hypothesis: The average purchase prices are statistically the same for all customers regardless of participation in loyalty program
- Alternative hypothesis: The average purchase prices are statistically different for customers that do versus those that do not participate in the loyalty program
- **Results: The null hypothesis is rejected and the alternative hypothesis is true: The average purchase prices are statistically different for customers that do versus those that do not participate in the loyalty program**
 - The average purchase price is different between loyalty and non-loyalty members, however based on the bar graphs non-loyalty members make larger purchases by price compared to loyalty members



Hypothesis 2: Customers who participate in the loyalty program buy more items on average

- Tested with: The Independent Samples t-Test compares the means of two independent groups in order to determine whether there is statistical evidence that the associated population means are significantly different.
- Null hypothesis: The average number of items purchased is statistically the same for all customers regardless of participation in the loyalty program
- Alternative hypothesis: The average number of items purchased is statistically different for customers that do versus those that do not participate in the loyalty program
- Results: The null hypothesis is rejected and the alternative hypothesis is true: The average number of items purchased is statistically different for customers that do versus those that do not participate in the loyalty program
 - The average number of items purchased is different between loyalty and non-loyalty members, however based on the bar graphs non-loyalty members purchase more items compared to loyalty members



Conclusions

- On average non-loyalty members make larger purchases, purchase more items, and make more purchases compared to loyalty members
 - However if you look at each date individually, on average the purchase prices and number of items purchased varies day to day, some days loyalty members are more on average, some days the non-loyalty members are more on average
- Possible reasons for this include:
 - loyalty members make lower priced purchases because the loyalty program has allowed them to maximize discounts and special offers
 - loyalty members purchase less items and make fewer purchases because in general they are savers - this may be why they signed up for the loyalty program in the first place
 - perhaps the promotions and specials are too restrictive, as in purchase limits and this is preventing the loyalty members from buying more items because then they will be full price



Recommendations

- To increase the number of items and purchase sizes, take a look at the way the discounts, specials, deals, promos, etc. are advertised, perhaps the requirements are too restrictive, for example, there is a limit to the number of items that can be used for that coupon and so this is preventing the loyalty member from buying more than the coupon allows.
- To increase the number of members using the loyalty program, re-evaluate the price of the program or increase advertisement along with its benefits



Other Recommendations

- Due to the large number of anomalies there is likely a default in the data collection system and the inventory system. The appropriate teams should be notified that negative and 0 orders are being made/collected and that some items have a price of 0, perhaps this is a typo or the items are discontinued and need to be removed from the inventory list.
- Roughly 34% of customer ids entries are missing from the original data, this could be a valuable metric to use in the future for many different evaluations