

Customer Lifetime Value (CLV) Analysis

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1 Background

Customer Lifetime Value (CLV) is a metric that equals the total worth of a certain customer to a certain business over their life. It is calculated by the summation of all money paid by the customer to the business over their lifetime.

We were provided with a list of ~13,000 transactions of a certain business. Each transaction included the following dimensions: Customer ID No., Date of Transaction, Payment Value, and Area of Purchase (e.g. Books, Electronics, Food, etc.).

The aim of our investigation was to discover any general relationships among the overall Frequency, Recency, Monetary, and CLV distribution, as well as to test the compatibility of a certain CLV model to the data we were given.

2 Methods

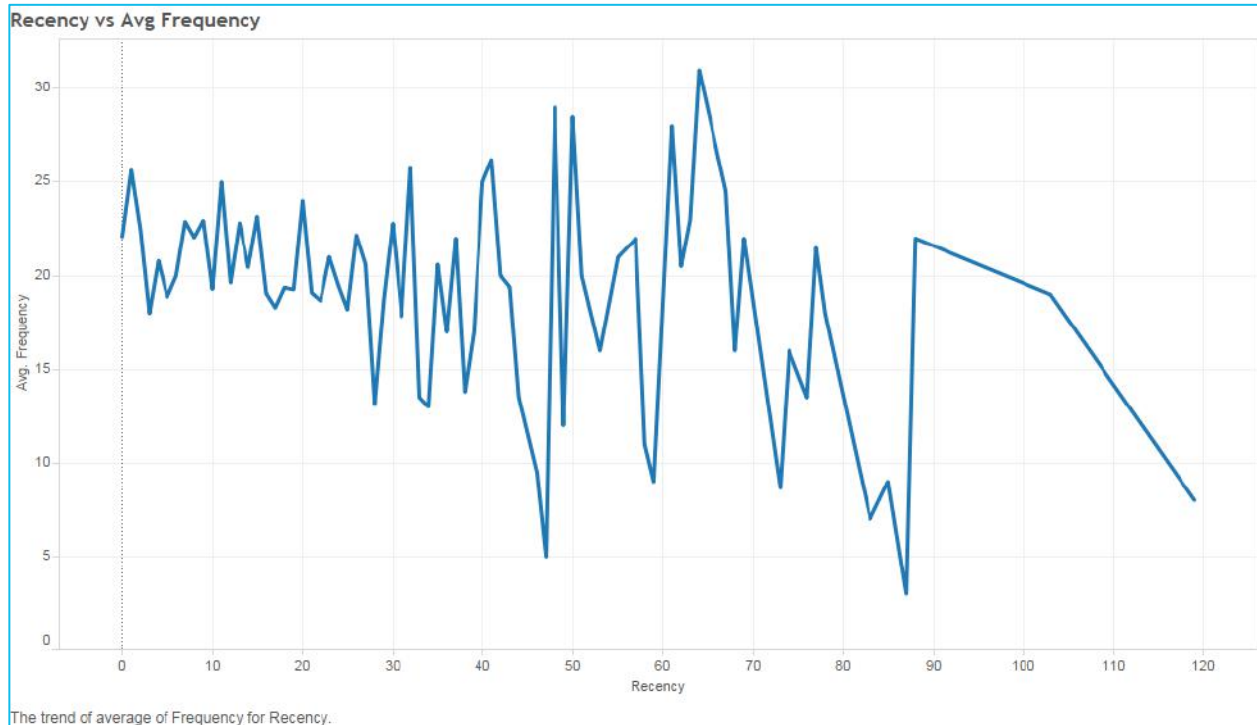
We utilized an R program that calculated each customer's Frequency, Recency, and Monetary metrics. Frequency was not a measure of true "frequency;" that is, "Frequency" was simply a count of the overall number of transactions each customer had made. The customer's Recency was made equivalent to the difference of days between the date of the customer's last transaction and June 30th, 2016. The customer's Monetary value was equal to the total of each transaction cost divided by the customer's Frequency value.

Each customer's CLV was calculated using a complicated function of Frequency, Recency, Monetary, discount rate, retention rate, and customer transaction cost sum that will not be reproduced here.

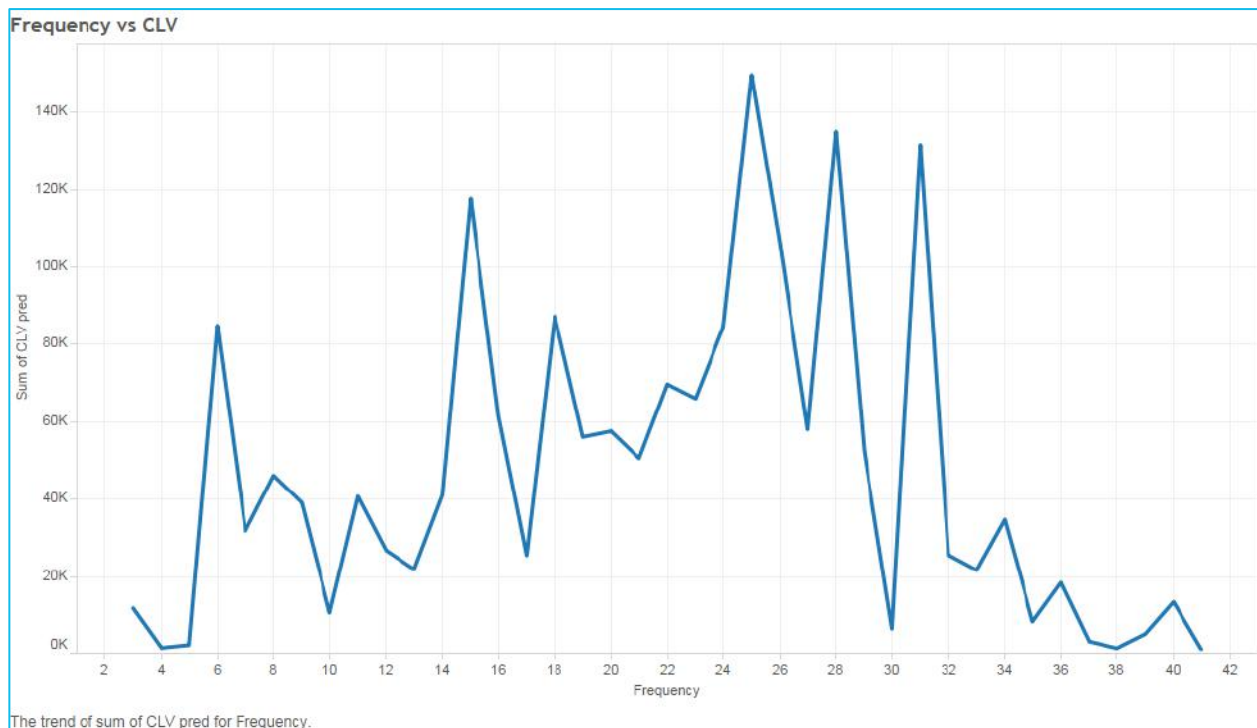
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3 Visuals



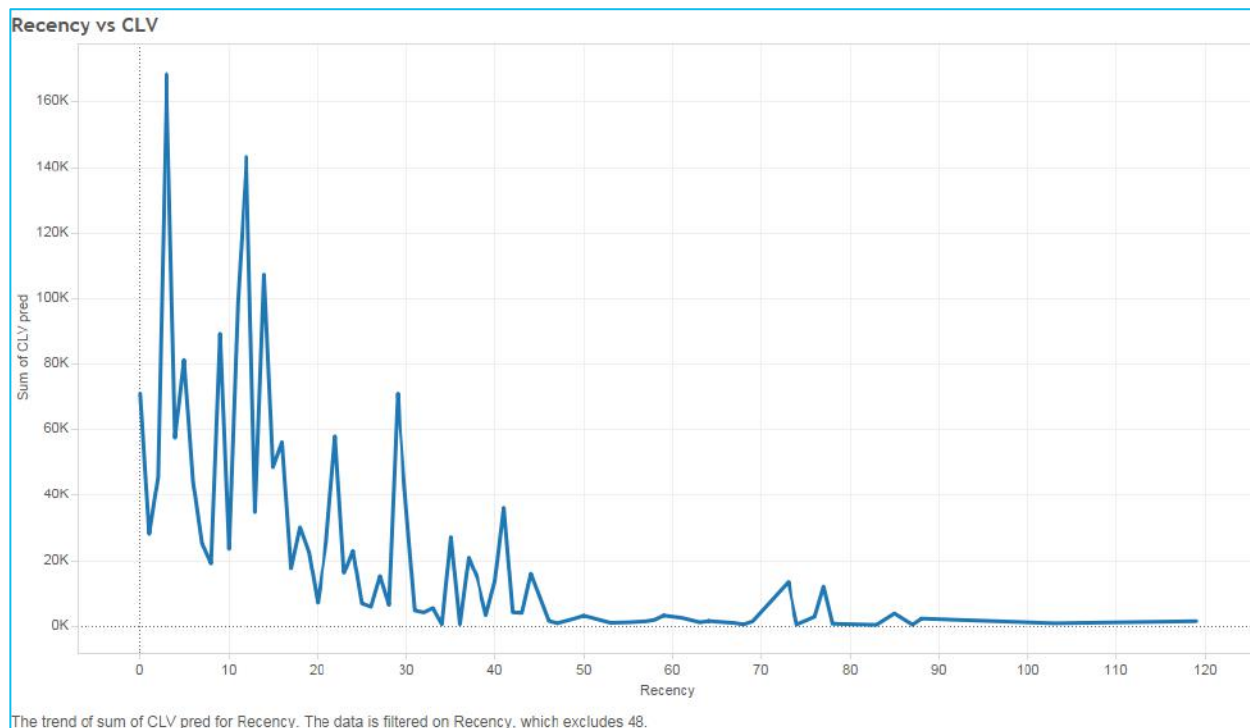
Graph A – Average Frequency vs. Recency



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Graph B – CLV vs. Frequency



Graph C – CLV vs. Recency

4 Insights

We can see a general negative trend of the data in Graph A: as Recency increases, Frequency decreases. That is, customers who have very recently bought from the business are “consistently” buying from the business, and customers who have not bought anything in a while are not as “devoted” to the business. This makes sense, considering that “loyal” customers are constantly buying from the firm, making their Recency low, and that some customers who bought once or twice a long time ago have high Recency and low Frequency.

From Graph B it may be observed that there is a “sweet spot” of Frequency with regard to CLV. CLV slowly increases over the Frequency interval [0, 25] and reaches its peak at a Frequency of around 27-28, after which it begins consistently decreasing. From this we can make the case for a set of customers who buy lots of items from the business with lesser worth, making their CLV low but their Frequency high. The business may want to target the customers with Frequency 25-30, who seem to be the most profitable among the userbase.

Finally, we can intuitively expect the inverse relationship between Recency and CLV observable in Graph C; customers with low Recency have much higher CLVs than those with high Recency. We can expand the concept of “loyal” customers from the analysis of Graph A by stating that these loyal customers who keep buying products from the business have CLVs more significant than those who buy just one or two products.

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However, all of these trends are basic general insights; we were not able to make more detailed and specific insights since it seems our model was not so applicable to the data, as can be seen in the vigorous ups and downs in the Graphs. We may need to refine our model based on these observations.

5 Conclusion

Overall, we found that the CLV model was not very accurate when applied to this data; the jagged lines observable in the above graphs are testament to the relative incompatibility of our model to our data. We were not able to discover any acute insights by exploring the graphs, although we were able to observe general trends like the inverse relationship between Recency and CLV, the “sweet spot” of Frequency with relation to CLV, and the negatively sloped Recency-Avg Frequency graph.