

Approach:

Based on business model of e-commerce company which provided the data and feature available, the follow approach was adopted to measure the metrics Average CLV, Churn rate and Retention rate for customers acquired by e-commerce company in March 2017. This document provides detailed insight on steps followed in to calculate metrics using SQL. Steps followed:

1. Data Exploration: Not just customers acquired in March 2017 data was given, as the data has records from year 2014.

General Observations:

- Every order shipped has a contribution margin value
- Before 1st March 2017, there are 3,548 entries and 1,413 distinct customer_ids. From 1st March 2017 until 28th Feb 2018, there are 31,430 entries and 6,452 distinct customer_ids. However, from 1st March 2018 until 28th Feb 2019: there are 8,750 entries and 1,612 distinct customer_ids.

2. First the customers acquired in March 2017 are to be identified.

Notes:

- Total transactions in March 2017 are 16,212.
- 5,597 new customers were acquired in March 2017 with 14,656 entries.

3. Subset main database to retrieve data corresponding to customers acquired in March 2017.

Notes:

- There are 39,140 records related to customers acquired in March 2017.
- After grouping, there are 19,570 records.

4. Calculate Churn Rate (to computing Average Customer Lifetime Value):

Notes:

- Considering the data provided for the case study and since e-commerce company does not follow Subscription Business Model, hence an attempt was made to calculate Churn Rate as ratio of number of orders cancelled to the number of orders confirmed. Churn Percentage observed was approximately 26%.
- Alternatively, the above could be performed on each customer_id to capture Churn Rate for each customer individually.

- In case, the company was to follow Subscription based model, Annual Churn Rate could be measured using following procedure:

To calculate Churn Rate for 1 period, say March 2017 to February 2018,

- $\text{Customers Lost} / \text{Total customers at the start of time period} \times 100$
- Customers Lost: People who are subscribed in March 2017 but are not in February 2018.
- Total customers at the start of time period: distinct customers in March 2017
- SQL query of this is also shared (File Name: Churn_rate_Subcr) which suggested 95% as Churn percentage which appears unnatural considering e-commerce company's business model. This would result in Average Customer Lifetime Value as 62.94.

5. Calculate Average Customer Lifetime Value:

Notes:

- This was measured as, Average of Contribution Margin divided by Churn Rate, answering the 1st question of this case study.
- Average Customer Lifetime Value obtained was 229.858

6. Calculate Retention Rate:

Notes:

- Retention Rate was calculated as 1-Churn Rate, answering the 2nd question of this case study. Retention Rate = $1 - 0.26 = 0.74$ (appx.)
- Retention rate for subscription model could be calculated as:

$$((C_e - C_n) / C_s) \times 100$$

- C_e = Number of customers at the end of a given period (in case of subscription model, distinct customers in Feb 2018 if measured annually).
- C_n = Number of new customers acquired during a given period (in case of subscription model, Distinct customers acquired from March 2017 to Feb 2018).
- C_s = Number of customers at the beginning of a given period (in case of subscription model, Distinct customers in March 2017).
- As sample query for C_n was shown in shared query file (File Name: Churn_rate_Subcr)

* This approach was inspired by the hyperlinked [article](#).