# CUSTOMER LIFETIME VALUE EXERCISE SESSION

## Exercise 1 – Bar Milano

Andrea has just moved to Milan for a project with a two-year work contract. Immediately he became a regular customer at the bar next to his office. Usually, he goes there once a week and has 2 drinks. The average drink price is 7€, and the bar's gross margin is 70%.

Assume 4 weeks per month and a monthly discount rate of 1%.

*Your tasks:*

a) *Calculate Andrea's CLV to the bar over a two-year horizon.*

Two years have passed, and Andrea would like to explore new places, and probably he would not go to the same bar as regularly as before.

b) *If he has a 95% chance of going to the same bar in the following month, how long can the bar expect Andrea to be its customer?*

c) *Considering an infinite time horizon, what would be his CLV?*

only if stated go infinite!

sometime for the t we need to start from 0 or 1 based on the case
if 0 it means it's happening at the present, when we have money from the first period at the beginging

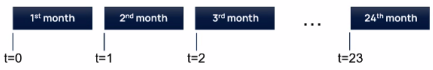
in the exercise we should write the assumption. if nothing indicated, go with zero and write it

$$CLV = \sum_{t=0}^{\infty} \frac{M_t * RR^t}{(1 + DR)^t}$$

**Exercise 1 – Bar Milano**

$$CLV = \sum_{t=0}^{\infty} \frac{M_t * RR^t}{(1 + DR)^t}$$

Time horizon: 24 months → **t = [0, 1, …, 23]**




**Assumption:** we model the problem as if the customer paid at the beginning of the month (e.g., subscription-based modeling) → Andrea decides to renew its loyalty to Bar Milano at the beginning of each month. → t=0

## Exercise 2 – Segmentation assessment

A telecommunication company analyzed its customer base and identified three segments:

- Basic segment, with a subscription to basic services. The customers in the basic segment are very likely to be attracted by lower price offerings of competitors, therefore has the highest churn rate. The monthly retention rate of this segment is 97%, and monthly revenue is €12 per customer with a 20% margin.

- Plus segment, with a subscription to more comprehensive services. The customers often have accepted cross-sale and up-sale offers during their lifetime and have multiple service packages. The monthly retention rate of plus-segment is 99%, monthly revenue is €25 per customer with a 22% margin.

- Premium segment, with high-level services and various add-ons. These customers usually are the most loyal and have made multiple upgrades. The monthly retention rate of this segment is 99,5%, monthly revenue is €50 per customer with a 25% margin.

The **monthly** discount rate is 0,8%. The approximation coefficients based on **yearly** retention and **yearly** discount rate is as follows:

| **AC** | | **RR** | | | | |
|---|---|---|---|---|---|---|
| | | **0,7** | **0,8** | **0,9** | **0,95** | **0,99** |
| **DR** | **5%** | 90% | 80% | 60% | 45% | 25% |
| | **7%** | 90% | 80% | 60% | 50% | 35% |
| | **9%** | 90% | 80% | 65% | 55% | 40% |
| | **10%** | 95% | 85% | 70% | 55% | 45% |
| | **15%** | 95% | 85% | 75% | 65% | 55% |

IMPORTANT: this table always shows yearly plans

*Your task:*

*Calculate the CLV in the first five years of a customer in basic-, plus-, and premium-segment, respectively*

2 – Segmentation assessment

! THE APPROXIMATION COEFFICIENT IS CALCULATED ON A YEARLY BASE.

$$CLV_{approx} = AC * \left( M * \frac{RR}{(1 + DR - RR)} \right)$$

## Exercise 3 – Pricing assessment

A SaaS (software-as-a-service) startup offers its service with the following pricing scheme:

- Free account: cost of service provided free of charge is €0,5 per month
- Basic account: €10 per month to be paid at the beginning of the month, 30% profit margin
- Premium account: €15 per month to be paid at the beginning of the month, 40% profit margin

A campaign aiming at acquiring customers has been performed. In one month, about 5.000 users have signed up for the service directly from the campaign, among which 3.500 registered a free account, 1,100 registered for a basic account, and 400 for a premium account.

Assume that the retention rate of paying customers (basic and premium) is 98% per **month**. Free account users rarely delete their accounts officially, regardless they are actively using the service or not. Therefore, for what concerns the cost estimation, free account users could be considered of 100% retention. However, it is known when the free account users upgrade to basic or premium accounts, ending their status as free account users.

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| **AC** | | **RR** | | | | |
|---|---|---|---|---|---|---|
| | | **0,8** | **0,85** | **0,9** | **0,95** | **0,99** |
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| | **15%** | 85% | 80% | 75% | 65% | 55% |

a) What is the CLV in the first five years of a basic account customer and a premium account customer, who are acquired during this campaign, respectively?
b) Consider it the first month when a user signs up for the service. In the following five months, among the free account users acquired during the campaign, 10, 20, 70, 200, and 250 users upgraded from free to basic account; 0, 0, 10, 10, and 20 users upgraded from free to a premium account. What is the ROI of the campaign by the end of six months, considering a budget for the campaign of €10.000 on social media advertising?

## Exercise 4 – Telco

A Telco operator which currently has 2,5 million customers in Italy launches its new offer with the following characteristics:

- Price: 20€ / month (paid in advance at the beginning of the month)
- Margin on full price: 40%
- Contract length: 23 months
- 20% discount on the first two months
- Last month for free if the contract is still active

The expected retention rate varies across the duration of the contract:

- From beginning to 7th month: 99%
- 8th to 13th month: 95%
- 14th to 19th month: 90%
- 20th and 21st month: 92%
- 22nd month: 98%

In case of anticipated interruption by the customer, he/she will have to pay back the 50% of the remaining fees on full price (including the 23rd month).

The company also has a contact centre for customer service. It outsources it at a cost of 3,5€/call. Based on the estimation of past data, the probability of receiving a call by customers under such a contract is estimated as follows:

- From beginning to 6th month: 1,5%
- 7th to 15th month: 0,2%
- After 15th month: 0,4%

Assume a monthly discount rate of 1%.

a) *What is the CLV of an acquired customer?*

b) *Compute the CLV on a monthly base of the customer whose life is the 25th percentile.*

The company is planning a campaign to support the launch of this new offer. There are two possible segments:

- Segment A: composed of 100.000 customers. The cost per contact is 10€. Response likelihood is 20%.
- Segment B: composed of 300.000 customers. The cost per contact is 8€. Response likelihood is 15%.

c) *Which segment would you choose to be the target of the campaign?*