Health Insurance CLV

Mehdi Farhangian

Definition of CLV

CLV is typically defined as the net present value that is the difference between revenue (R) and cost of services (c) multiplied by retention probability (p).

By using and example, I introduce a comprehensive model to measure CLV in Health Insurance. Let's start with the definition of CLV.

So, we need to add three values in the above formula which are:

- CF = Cash Flow for the next year
- r= Retention Rate
- d = discount rate

Also, in the above formula, i represents each individual and t represents the time unit (here is year). In this example, we use Markov Chain approach. So, cash flow and retention rate can be calculated together.

CASH FLOW (CF)

Cash flow has tow components:

- Cash In
  - Cross-Sell
  - Up-Sell
- Cash Out
  - Claim cost
  - Acquisition and Retention Cost

CASH-IN FOR HEALTH INSURANCE

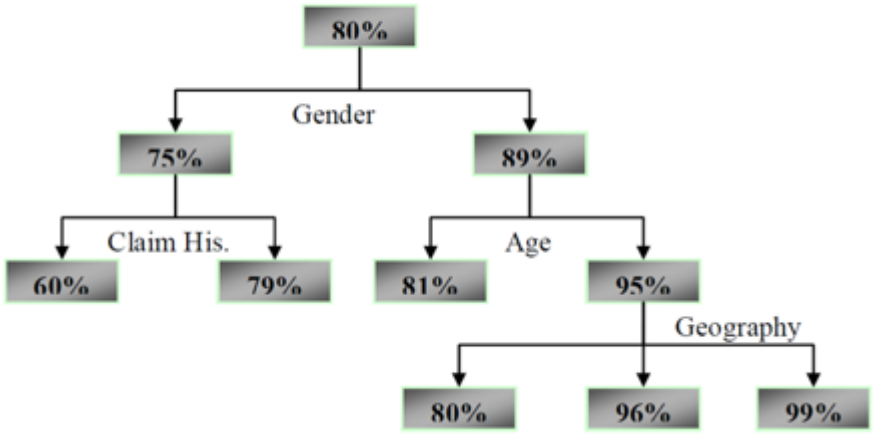
- Subscription: In this case subscription contains two values that are cross-sell and up-sell, and both can be measured by using a Markov chain approach. The values in the transition probability can be calculated using random forest or local segmentation approach.

To measure the transition probability in Markov Chain, we use a decision tree approach:

Each of the probability in the transition probability measured using the decision tree approach. ## Cross-selling

For this example, we have 4 products that are [HI Car Home Pet Travel]
Our current customer has two products which are HI and Pet Insurance. The transition probability of customers in t=1 has been calculated as follows:

$$CLV_i = \sum_{t=0}^{\infty} \frac{CF_t \times r(t)}{(1+d)^t}$$


80%
Gender
75%
89%
Claim His.
Age
60%
79%
81%
95%
Geography
80%
96%
99%