

## Predicting and taking actions to retain customers

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A telephone services company wants to predict the customer who is going to switch to another company or service provider, and then take actions (discount, coupons, extra data, privilege) to retain that customer. It kept a record of all historical data, and this data is available for analysis and reuse. In the dataset, the customers which left within the last month are recorded as churn. The churn analysis is crucial for telephone services companies because the cost of retaining an existing customer is far less than acquiring a new one. Companies from these sectors often have customer service branches which attempt to win back defecting clients, because recovered long term customers can be worth much more to a company than newly recruited clients.

However, the budget to retain the potential left-tendency customer is limited. The company must decide:

- Which customer should they choose to retain.
- Which action (discount, coupons, extra data, privilege) should they take?
- How will a customer be contacted? There are different ways, with different costs and efficiency.
- How long should they keep their action? The action effect will decrease as time pass by.
- How can they optimally use the limited budget?
- Will such campaigns be profitable?

From the data, we can train a machine learning classification model using python on customer profile (tenure, contract, monthly charges, ...) to assess their propensity of risk to churn. Since these models generate a small prioritized list of potential defectors, they are effective at focusing customer retention marketing programs on the subset of the customer base who are most vulnerable to churn.

Based on this classification model, we decide which action to take, how long, and to whom. We will use the IBM Decision Optimization CPLEX Modeling for Python to optimization the company's profit.

At the end, we will see directly that how machine learning model and IBM Decision Optimization CPLEX Modeling will help the telephone company make the best choice and make a profit.