

PVA Machine Learning

Executive Summary

1. Objective

Optimize our fundraising campaign.

2. Situation

We are a national veterans' organization that seeks to better target our solicitations for donation. The solicitations involve sending a small gift to an individual and requesting a donation. Gifts to donors include mailing labels and greeting cards. The average cost of sending a request with a gift is 2\$ and our margin when a donation is given is 3\$. Also, we have around 106546 prospects.

3. Complication

Sending a gift to potential donors is a strategy can have benefits by making a good impression on potential donors by showing that we care because we try to put more efforts into our campaign than just sending automatic emails. On the other hand, this strategy can backfire because we could end up gaining less money then we usually do because of the cost of the campaign, or even worse, we could eventually lose money because of the campaign.

4. Resolution

We could use the data that was previously collected in the past for a similar campaign to optimize our strategy by only sending the letters and the gifts to the customers that are statistically more inclined to respond positively to our solicitation. To do so, we will use and compare several machine learning models (decision tree, logistic regression, gradient boosting, neural network). Our target will be a binary variable that tells us whether the person donated or not, and our predictors will include several variables such as age, gender, income and home value.

5. Results

Our best machine learning model was the gradient boosting with a KS (Youden) of 0.3405. This index is acceptable because it allows us to filter some of the people who are less likely to donate. In the excel file that we linked to this report, in the Lift tab, we were able to use the information from our model to calculate a theoretical ROI and we concluded that the maximum ROI (9521) is reached when we only send letters and gifts to the top 20% of prospects that are the most likely to donate.

