Actionable Insights

Team 14 - Root It: Optimization of Bidding Strategy for Online Ad Rankings

Problem Statement

Online advertisements have become one of the principal ways that companies market themselves in today's economy. Instead of marketing to desirable regions or metropolitan areas, ads can now be tailored right down to the individual customer. It is increasingly vital that companies understand how effective their advertisements are in attracting new customers, and how their performance can be improved in competitive marketplaces. The goal of our project was thus to understand the bidding data provided by Root Insurance and determine how to optimize efficiency with limited information under uncertainty.

Analysis

Early analysis showed that click-thru rates on ads were heavily dependent on the ad's ranking for the customer: the difference of a single place in the rankings could mean a nearly 50% reduction in click-thru rate. On the other hand, does an increase in ranking provide enough additional sales to offset the additional cost? In order to market efficiently to customers, we would need to bid strategically higher for those customers who are already more likely to ultimately purchase a policy.

When attempting to optimize bids for cost per policy sold, we found that it was more efficient to bid less across the board: even if you bid $0.01 for every customer and always appear ranked 5th, the ad will still have about a 2% click rate, and some of those clicks will result in policy sales at nearly no cost, albeit very few sales. We found that for each 100 additional customers acquired per 10,000, the cost per policy increased by $2.90, meaning that each additional sale becomes more expensive.

Proposed Solution

To maximize sales efficiency, our solution found that we should bid contrary to our competitors. People insuring three or more vehicles are highly sought after by other companies. Our model predicts competitors bid as high as $60 on average for such customers. As such, it is not cost effective to outbid our competitors. Instead, we should seek to bid higher and improve our ranking for other low cost customers. Our model found the most valuable customers are those with previously unknown insurance status, and those looking to insure only one or two vehicles.

Value

The original bidding strategy of flat $10 has a cost of $18,780, with 783 policies sold at $23.98 per policy. Our bidding strategy has an expected cost of $5,321 with 406 policies sold at $13.10 per policy. Even if we were to double the number of desired policies to 800, our optimized expected cost is only $18,390, still lower than the original cost while selling more policies.