Title: Product selection in the presence of selectivity bias

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Abstract:

In many circumstances it is desirable to select the banking product for a new customer to yield the greatest profit. If we regard the assignment of each available product to the customer as an action then the task is to compare the utility between available actions and select an optimal one. In this talk, we assume two actions are available.

The utility for each action is estimated using information from customers who were previously assigned the corresponding product. If previous customers were randomly assigned to each action, the utility function can be estimated from information available without bias. However, typically, previous product assignments were not made randomly.
That is, the product selection for all previous customers was deterministically related to customer descriptors. In such situations selectivity bias might occur and result in biased estimation. Biased estimation has the potential to lead to sub-optimal product selection for new customers.

We first demonstrate situations where such bias occurs and then describe standard adjustment methods. The performance of these methods is limited by an arbitrary assumption. Such arbitrary assumption, e.g. assume normality distribution form of customer descriptors, is especially not favoured in credit scoring. We introduce two adjustment approaches that overcome this problem and further improve the performance.