

SHORT-TERM REVENUE MANAGEMENT: OPTIMAL TARGETING OF CUSTOMERS FOR A LAST-MINUTE OFFER

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We study a short-term revenue optimization problem that involves the optimal targeting of customers for a promotional sale in which a finite number of perishable items are offered on a last-minute offer. The goal is to select the subset of customers to whom the offer will be made available, maximizing the expected return. Each client replies with a certain probability and reports a specific value that depends on the customer type, so that the selected subset has to balance the risk of not selling all the items with the risk of assigning an item to a low value customer.

Selecting all those clients with values above a certain optimal threshold may fail to achieve the maximal revenue. However, using a linear programming relaxation, we prove that such threshold strategies attain a constant factor of the optimal value. The achieved factor is $\frac{1}{2}$ when a single item is to be sold, and approaches 1 as the number of available items grows to infinity. Furthermore, for the single item case, we propose an upper bound based on an exponential size linear program that allows us to get a threshold strategy achieving at least $\frac{2}{3}$ of the optimal revenue. Computational experiments with random instances show a significantly better performance than the theoretical predictions.

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