Three-level models of competitive pricing

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In this paper we consider the three-level model of competitive pricing described in [1]. The model is formulated as a Stackelberg leader–follower–clients game, where two companies (the leader and the follower) assign prices in own facilities successively to service the clients. Each facility produces a homogeneous product. Each client has a budget and a single demand. He selects the facility with minimal total payment (price and transportation cost) and purchase the product if his payment does not exceed his budget.

We assume two spatial pricing strategies: uniform pricing and discriminatory pricing. Under uniform pricing each facility charges identical price. In contrast, under discriminatory pricing each client may be charged a different price. We present exact polynomial-time algorithms to solve the problem with the following pricing cases:
1) the leader and the follower use uniform or discriminatory pricing strategy simultaneously;
2) the leader applies uniform pricing, in contrast, the follower applies discriminatory pricing.
In addition, we discuss some open problems.

This work is supported by the Russian Science Foundation (project 17-11-01021).

References

1. A. Plyasunov, A. Panin. On Three-level problem of competitive pricing // AIP Conference Proceedings. Numerical Computations: Theory and Algorithms (NUMTA2016) Vol. 1776 P. 050007-1- 050007-5 DOI: 10.1063/1.4965327.