

METAHEURISTICS FOR THE FACILITY LOCATION AND PRICING PROBLEM¹

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We consider the bilevel mixed integer location and pricing problem which is determined by upper level and lower level problems. The upper level problem describes location and pricing process. The lower level problem simulates customer reaction on the upper level actions. First, the company opens p own facilities and defines prices on the uniform product in open facilities. After that, every customer chooses such a facility in which his total costs (product price and transportation cost) are minimal and purchases the product if his costs don't exceed his budget. The target is to find such location and pricing that the profits of the company are maximized.

It's known that this problem is NP-hard in the strong sense. We show that it belongs to the *Poly-APX*. We present two hybrid algorithms based on local search method, variable neighborhood search (VNS) and genetic algorithm. Computational experiments were conducted on instances from the "Discrete location problems" library [1]. Developed algorithms were compared with algorithms from [2] and *CPLEX* software and shown their competitiveness.

REFERENCES

1. <http://math.nsc.ru/AP/benchmarks/Pricing/price.html>
2. Z. Diakova, Yu. Kochetov. *A double VNS heuristic for the facility location and pricing problem* // Electronic Notes in Discrete Mathematics. 2012. Vol. 39. P. 29–34

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