

# The multi-route location-routing problem and zone price decision-making using a tabu and variable neighborhood search algorithm

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## Abstrak

### **ABSTRACT**

Zone pricing is one of the most important pricing policies that are prevalently used by very companies. This paper considers integrating zone pricing and location-routing problems for profit maximization. Hence, a node-based model is proposed as mixed integer nonlinear programming to solve the problem. In order to handle the nonlinearity elements and change the model to a mixed integer linear programming, a piecewise linearization method is employed to approximate the problem. Moreover, we introduce a new heuristic variable neighborhood search (VNS) and tabu search algorithm for large-scale problems. The proposed algorithms consist of four intra-tour and seven inter-tour operators in its local search. Finally, some test instances with 20, 200, 400, and 600 nodes are solved and the results of them confirm the efficiency of the proposed algorithms and comparative superiority of the VNS algorithm over the tabu search algorithm.