A Hybrid Method for the production routing problem with transshipment

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Abstract

The production routing problem (PRP) combines two well-known optimization problems, vehicle routing problem and lot-sizing problem. The aim of solving the PRP is to jointly optimize the production, inventory, distribution and routing decisions, which typically arises in vendor managed inventory systems. In this study, we extend the classical version of the PRP by considering transshipments, either from supplier to retailers or between retailers, to further reduce the total cost. In order to solve the problem, we develop a hybrid solution technique that integrates mixed integer linear programming with constraint programming. The algorithm is applied to a set of randomly generated problem instances. The performance of the developed algorithm is evaluated according to the computational results.

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