A comparative analysis of mixed-integer linear formulations for the multi-family capacitated lot-sizing problem / Andrea L. Arias, Ricardo A. Gatica

Andrea L. Arias, author

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Abstrak

ABSTRACT
Despite having a very broad spectrum of applicability in practice, the multi family capacitated lot sizing problem (M FCLSP) has been scarcely studied. The MFCLSP is an extension of the capacitated Iot sizing problem with setup times (CLST) in which items are organized into families based on similar setup structures. In this paper, we propose three formulations for the MFCLSP (MF TRAD, MF ARBNET, and MF EXREQ), and develop a comprehensive comparative analysis to evaluate their performance using a generic solver (CPLEX). Solving large scale problems to optimality has been shown to consume a great amount of computational time, which is very impractical for real life applications. Because of that, this study focuses on analyzing the performance of these formulations in a limited, and reasonable, amount of time. The results show the MF EXREQ model outperforms the other two models in both the time to the first feasible solution and the quality of the solutions generated throughout the solving process.