A Heuristic Approach for A Stochastic Transportation-Location Problem With Cross Decomposition

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Abstract

Many integer programming problems have both easy-to-solve primal and dual subproblems when price directive decomposition and resource directive decomposition are applied. This is the case where the discrete stochastic transportation-location problem is at issue. In a discrete stochastic transportation-location problem, Kuhn-Tucker conditions can be used as a heuristic guide to determining which proposed sites should be opened, and cross decomposition can be used to solve the stochastic transportation subproblems. The majority of solution time involves the solution procedure of the stochastic transportation subproblems. The cross decomposition method is designed to exploit the primal and the dual structure of this subproblem simultaneously and used to reduce the computational difficulty by incorporating Benders decomposition and Lagrangean relaxation into a single framework. This paper proposes a heuristic algorithm based on Kuhn-Tucker conditions and cross decomposition. Computational results are quite satisfactory and encouraging.

Keywords: Integer Programming, Transportation-Location Problem, Cross Decomposition.