ISSN: 2081-8858
Vol 28, no. 2, 2018, 5-21

OPERATIONS RESEARCH AND DECISIONS
No. 2
DOI: 10.5277/ord180201
2018

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ISSN. 2081-8858

BRANCH AND BOUND ALGORITHM FOR A DISCRETE MULTILEVEL LINEAR FRACTIONAL PROGRAMMING PROBLEM

An algorithm is proposed to find an integer solution for bilevel linear fractional programming problem with discrete variables. The method develops a cut that removes the integer solutions which are not bilevel feasible. The proposed method is extended from bilevel to multilevel linear fractional programming problems with discrete variables. The solution procedure for both the algorithms is elucidated in the paper.

Keywords: *linear fractional programming problem, bilevel programming, multilevel programming, discrete variables, integer solution, branch and bound cut*

1. Introduction

A multilevel programming model deals with decision making problems in a hierarchical system with interactive levels. In a multiple level hierarchical organization, the players at each level optimize their objective functions keeping in mind the actions of the players at other levels. Candler and Norton [7] first used the terms bilevel and multilevel programming. In 1982, Bard and Falk [1] developed an explicit solution to the multilevel programming problem. A multilevel programming model is used for analysing and planning many situations in real life. Candler and Norton [7] presented a version of this problem in the context of economic policy. In 1998, Migdalas et al. [20] published a book on multilevel optimization which is part of a series on non-convex opti-

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