Preprocessing in Linear Fractional Programming

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Preprocessing is very important for solving large optimization problems irrespectively of using interior point or simplex algorithm. Most of the professionally developed solvers automatically use preprocessing techniques to maintain numerical stability and improve performance. Even though computers have become even faster, the real-world models have increased in size. The reason can be the complexity and the model generators too. The aim of preprocessing is to reduce the problem size and to find redundancy and the unbounded or infeasible problems. In this paper we describe the main results of our investigations connected with preprocessing techniques in Linear-Fractional Programming (LFP). Our investigations are based on the use of well-known preprocessing techniques of linear programming and we adapt them to LFP Problems. Some of these techniques can be used in LFP without any changes, but the others have to be adapted. Sometimes this adaptation is not so obvious. Not only the preprocessing but also the postsolve techniques are different in nonlinear environment. The paper presents some preprocessing techniques with its postsolve operations based on [1], [2] and gives an overview its adaptation into LFP.

References

[1] Cs. Mészaros, U. H. Suhl. Advanced preprocessing techniques for linear and quadratic programming, *OR Spectrum vol. 25, p575-595. 2003.*

[2] E. D. Andersen, K. D. Andersen. Presolving in linear programming, *Mathematical Programming vol. 71, p221-245. 1995.*