Linear and linear-fractional programming: comparative analysis of optimal solutions

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Like a linear programming (LP) problem, linear-fractional programming (LFP) problem can be usefully applied in a wide range of real-world applications. In the last few decades (starting from the pioneer paper of B. Martos in 1960's) a lot of research papers and monographs were published throughout the world where authors (mainly mathematicians) investigated different theoretical and algorithmical aspects of LFP problems in various forms. In contrast with keen interest of mathematical community, economists and practitioners unfortunately do not demonstrate any considerable interest towards LFP. Moreover there is an opinion widespread in certain groups of economists and practitioners that LFP is "superfluous" in general.
In this paper we consider these two approaches to optimization (based on linear and linear-fractional objective functions on the same feasible set) and compare the results they lead to. We show that in certain cases both approaches are closely connected with one another and may be fruitfully utilized simultaneously.

Keywords: linear programming, linear-fractional programming, comparative analysis