Mathematical Programming for Product Identification, Diversification, and Trade-Off

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Abstract

If a product line can be expanded as a function of the mix of inputs, then the product set is a variable as well as the volume of the product. the decision will be multi-dimensional: what members(s) of the family should be included in the subset to be produced and what quantity each should be. The proposed model is developed using a modification of the technology matrix and objective function coefficients as found in the traditional linear programming formulation. A linear form of change is adopted in technology matrix, while both additibe and multiplicative forms are considered for the objective function coefficients. The resulting model is a nonlinear programming problem which can be solved by the GRG2 computer codes. Numerical examples and interpretation are provided to illustrate the applications.

Keywords: Linear programming, Non-linear programming, Technology matrix