

Basis Update on Simplex Type Algorithms

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ABSTRACT

Linear Programming is a significant and well-studied optimization problem. The computation of the basis inverse is a crucial step in simplex type algorithms. Hence, many basis update methods have been proposed in the literature. In this paper, we review and compare three basis update methods, namely: (i) MATLAB's built-in method `inv`, (ii) Product Form of the Inverse, and (iii) Modification of the Product Form of the Inverse. We incorporate these methods on the exterior and the revised simplex algorithm in order to highlight the significance of the choice of the basis update method in simplex type algorithms and the reduction that can offer to the solution time. Finally, we perform a computational comparison in which the basis inverse is computed with the aforementioned updating methods. The Netlib set of LPs was used in the computational experiments. All these algorithms and methods have been implemented with MATLAB.

Keywords: Linear Programming, Exterior Point Simplex Algorithm, Revised Simplex Algorithm, Basis Inverse.