

A PIVOTING RULE THAT REDUCES TOTAL INFEASIBILITY FOR LINEAR PROGRAMMING

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ABSTRACT

This research presents a new pivoting rule for solving linear programming problems. The simplex method involves searching among the basic and primal-feasible solutions without leaving the primal-feasible region. Our pivoting rule focuses on reducing the absolute value of the sum of primal infeasibility and dual infeasibility as much as possible in every pivoting iteration. Entering and leaving variables are selected according to this criterion. The new pivoting rule requires neither primal nor dual feasibility to start the search process, and may very well pivot into a basic solution that is neither primal-feasible nor dual-feasible. This method appears to take fewer iterations to reach the optimal solution than the simplex method for the linear programming problems in our empirical studies. An example is given to illustrate the method. The efficiency and convergence of the new pivoting rule are subjects of future research.

Keywords: *Simplex method, pivoting rule, entering variable, leaving variable, primal infeasibility, dual infeasibility*