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Title: A Novel Initialization Procedure for the Simplex Algorithm

Abstract: This paper addresses the computation of a starting basis for the simplex algorithm. We propose six algorithms for constructing an initial basis. We give the initial bases as input to the CPLEX solver and compare the performance of the primal and dual simplex algorithm using the proposed algorithms against CPLEX advanced starting basis and crash procedures. The best algorithm results in 7% and 6% average reduction of the execution time of CPLEX's primal and dual simplex algorithm, respectively. Taking into account only the hard instances, the proposed algorithm results in 23% and 32% average reduction of the execution time of CPLEX's primal and dual simplex algorithm, respectively.