Numerical Experience with Modified Barrier Functions Method for Linear Programming

David L. Jensen

Department of Mathematical Sciences
IBM T.J. Watson Research Center
P.O. Box 218
Yorktown Heights, NY 10598 U.S.A.

Roman Polyak

Department of Mathematical Sciences
IBM T.J. Watson Research Center
P.O. Box 218
Yorktown Heights, NY 10598 U.S.A.

Rina Schneur

Department of Mathematical Sciences
IBM T.J. Watson Research Center
P.O. Box 218
Yorktown Heights, NY 10598 U.S.A.

Abstract: In this paper we describe some numerical results which were obtained at the IBM T.J. Watson Research Center by using Modified Barrier Functions (MBF) for solving Linear Programming problems.

The results obtained coincide with the spirit of the MBF theory (see [9]-[10]). In particular for every problem that was solved by dual Newton MBF method, we observed the so-called "hot start" phenomenon.

The "hot start" phenomenon means only a few, and from some point on, only one Newton step is required between two successive Lagrange multipliers update. Each Lagrange multipliers update leads to a decrease in the primal-dual gap by a factor which is independent of the size of the problem.

The numerical results obtained show that the number of Newton steps required to obtain both primal and dual solution with accuracy $10^{-10} - 10^{-14}$ is practically independent of the size of the problem.

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