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REDUNDANCY AND LINEAR PROGRAMS

Mathematical Centre Tracts, 137,
Mathematische Centrum, Amsterdam, 1981.

The book is a revised version of a monograph drawn up in 1979 at the University Erasmus in Rotterdam, to which there were added problems of computation complexity in linear programming and Khachian's algorithm which solves these problems in polynomial time.

Such problems as: "how must be defined a problem of linear programming" and "can a given linear programming problem be replaced by a simpler one?" are dealt with in the first part of the book. A charcateristic of linear programming problems is the number of constraints, and if this characteristic can be reduced, then we deal with constraint system's redundance. In this part of the book, the notion of minimal representation of a system is introduced, and an efficient method is given for identifying the redundance constraints.

In the second part of the book, questions are put of the kind "how complicated is a linear programming problem in comparison with other problems?" and "which is the relation between linear programming problem dimension and the necessary quantity of computation for its solving"?.

These aspects are dealt with under the denomination of "computation complexity".

The results obtained in the first part of the book are applied in the second part, by simplifying certain proofs.

The second part shows that the linear programming problem is equivalent to the constraint redundance identification problem, and this is why the complexity results for linear programming problems are also valid for the theoretical complexity of the redundance problem.

The work is concise, clearly formulated and contains a rich references.

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