

Book Selection

Edited by RICHARD EGLESE and MIKE PIDD

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S.K. GUPTA: <i>Linear Programming and Network Models</i>	561

Theory of Linear and Integer Programming

ALEXANDER SCHRIJVER

John Wiley & Sons, Chichester, 1986. 471 pp.

ISBN 0 471 90854 1

Some books are destined to be the classical treatment of their subject. This seems to be one of them. The reader is presented with a thorough, up-to-date, lucid study of the theory of linear and integer programming. It is a book for the mathematically inclined, with an obvious place on the library shelves of researchers and their organizations. Well, perhaps not on the shelves, but on the desks, because this will be a book to refer to frequently.

The book is in four parts. After opening remarks on preliminaries (NP-completeness and the theory of algorithms), the first two parts give the context for linear equations and their study, with linear algebra, lattices and Diophantine equations. The next 150 pages present linear-programming theory and methods. So it is only in Chap. 11 of this 24-chapter book that the simplex method is described. Recent progress in linear-programming theory follows: Khachiyan's method, Karmarkar's algorithm and Megiddo's approach. Besides a presentation of the theory of these, we read of the implications and computational consequences of them.

The final part (about one-third of the book) is devoted to a very comprehensive study of integer linear-programming theory. Schrijver devotes considerable space to unimodular matrices and their relevance to optimization, before his discussion of cutting planes and a final chapter on further methods. This last seems less strong than the rest of the book; branch and bound methods and Lagrangean decomposition deserve more space than they have received in a work of this stature.

Among the many excellent features, the historical notes and the thorough list of references are particularly noteworthy. Each part of the book includes several pages of historical study showing the development of the material through the mathematics of the past four millennia (there really are references to the mathematical knowledge of the ancient Egyptians as well as the Greek mathematicians of the classical era!). Many 18th and 19th century authors are cited (some in their original French and German). Such treatment is of great value, and the author is to be applauded for his skill in putting the context across so well. Seventy pages (about 1000 references) cover the literature of this theory, and the whole text is supplied with copious citations. Finally, the index is clear and helpful for reference use.

DAVID K. SMITH

Linear Programming and Network Models

S.K. GUPTA

Affiliated East-West Press Pvt Ltd, New Delhi, 1985. 232 + viii pp. 39.50 rupees

This introduction to linear programming is intended for a student readership, and assumes a reasonable level of mathematical ability. It presents the material rigorously, using matrix notation. The author has deliberately avoided the commonly