

16[3.25].—SAUL I. GASS, *Linear Programming: Methods and Applications* (4th Edition), McGraw-Hill, New York, 1975, x + 406 pp., 24 cm. Price \$18.50.

Linear Programming is an elegant multifaceted subject and, nowadays, of much practical importance. It permits much flexibility in its manner of presentation, each alternative approach emphasizing a different aspect of the subject.

Dr. Gass' book, now in its fourth edition (earlier editions appearing in 1958, 1964 and 1969) has become established as one of the standard classroom texts. It is a book worth possessing. In format this edition follows the previous one; and in accordance with historical development in this area, it emphasizes practical aspects and computational procedures. Applications of Linear Programming are dealt with substantively (in a chapter expanded at the expense of some material on L.P. and the Theory of Games), as are the various forms of the Simplex Method. Perhaps less emphasis than one might hope for is placed on theorems of the alternative and the elegant theory of duality, and the nice cleavage that this provides between algorithms, namely, that the primal simplex method maintains primal feasibility and complementary slackness and seeks dual feasibility, the dual simplex method maintains dual feasibility and complementary slackness and seeks primal feasibility, while Dantzig-Wolfe decomposition techniques maintain primal and dual feasibility of the original system and seek complementary slackness. In contrast to previous editions, the revised Simplex Method is now presented before the chapter on duality.

Parametric Linear Programming, degeneracy procedures and advanced computational techniques which include new material on Generalized Upper Bounding, are dealt with at length. Many new problems have been added to each chapter, and in several cases there is new explanatory material.

Some of the more recent developments in the area of stable implementations of the Simplex Method using matrix factorizations and other numerically sound techniques of computational linear algebra are not discussed, and hopefully these will appear in the next edition. In general, this book does not deal with computer codes and the extensive interface that Linear Programming shares with Computer Science.

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