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### A Linear Programming Manual

This manual, *Linear Programming Primer*, presents a lucid and useful introduction to linear programming and discusses the use of a computer (the Univac 1108) to solve linear programming problems. The manual can be understood by readers familiar with mathematics at a high school algebra level.

The first part introduces vector spaces and convex sets and presents those elements of matrix algebra used to solve a system of simultaneous linear equations.

The second part introduces the linear programming (LP) problem. Several examples (such as the diet problem, which seeks the most economical way to get a minimum requirement of vitamins A, C, and D from a diet of milk, beef, and eggs) are followed through in stages. The problems are restated in a useful form; the equations and matrices are set up; the solutions are analyzed; and the simplex method is used to obtain the "best" solutions. Restraints, slack variables, and maximized and minimized solutions are also explained in this discussion.

The third and last part of the manual explains how to use a computer to solve the same problems which were discussed in "long-hand" in Part Two. Only the most elementary knowledge of computers is needed to under-

stand the presentation. In this section, the dual problem, reduced cost analysis, ranges, and error analysis are also presented.

The entire manual presents a practical view of linear programming. It avoids excursions into theory and concentrates on providing the background needed to understand and solve most LP problems.

#### Note:

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Reference: TSP72-10671

Source: Richard C. Tuey of  
Informatics, TISCO, Inc.  
under contract to  
NASA Headquarters  
(HQN-10743)

Category 09