

# Linear and Integer Optimization: Theory and Practice, Third Edition (Advances in Applied Mathematics)

Gerard Sierksma, Yori Zwols



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Presenting a strong and clear relationship between theory and practice, **Linear and Integer Optimization: Theory and Practice** is divided into two main parts. The first covers the theory of linear and integer optimization, including both basic and advanced topics. Dantzig's simplex algorithm, duality, sensitivity analysis, integer optimization models, and network models are introduced.

More advanced topics also are presented including interior point algorithms, the branch-and-bound algorithm, cutting planes, complexity, standard combinatorial optimization models, the assignment problem, minimum cost flow, and the maximum flow/minimum cut theorem.

The second part applies theory through real-world case studies. The authors discuss advanced techniques such as column generation, multiobjective optimization, dynamic optimization, machine learning (support vector machines), combinatorial optimization, approximation algorithms, and game theory.

Besides the fresh new layout and completely redesigned figures, this new edition incorporates modern examples and applications of linear optimization. The book now includes computer code in the form of models in the GNU Mathematical Programming Language (GMPL). The models and corresponding data files are available for download and can be readily solved using the provided online solver.

This new edition also contains appendices covering mathematical proofs, linear algebra, graph theory, convexity, and nonlinear optimization. All chapters contain extensive examples and exercises. This textbook is ideal for courses for advanced undergraduate and graduate students in various fields including mathematics, computer science, industrial engineering, operations research, and management science.



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