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Applied Mathematical Programming Applied Mathematical Programming for Engineering and Production Management Applied Mathematical Programming for Business and Economics Mathematical Programming with Data Perturbations Mathematical Programming with Data Perturbations II, Second Edition Building and Solving Mathematical Programming Models in Engineering and Science Mathematical Programming Algorithmic Principles of Mathematical Programming Mathematical Programming with Data Perturbations I Introduction to Optimization Integer Programming Self-Regularity Mathematical Programming Via Augmented Lagrangians Applied Mathematics and Parallel Computing Mathematical Programming with Data Perturbations II, Second Edition Mathematical Programming for Industrial Engineers Cooperative and Noncooperative Multi-Level Programming Interior-point Polynomial Algorithms in Convex Programming Nonlinear Programming Introduction to Mathematical Programming Decomposition Techniques in Mathematical Programming Building and Solving Mathematical Programming Models in Engineering and Science Quadratic Programming with Computer Programs Applied Integer Programming Mathematical Programming and Financial Objectives for Scheduling Projects Model Building in Mathematical Programming Methods and Models in Mathematical Programming Semi-Infinite Programming Decision Making and Programming Applications of Stochastic Programming Model Building in Mathematical Programming Advances in Optimization and Approximation Optimization and Nonsmooth Analysis Mathematical Optimization and Economic Theory Maxima and Minima with Applications The Sharpest Cut Stable Parametric Programming Mathematical Programming The State of the Art Uncertain Programming Introduction to Mathematical Optimization

Applied Mathematical Programming Jun 18 2024 Mathematical programming: an overview; solving linear programs; sensitivity analysis; duality in linear programming; mathematical programming in practice; integration of strategic and tactical planning in the aluminum industry; planning the mission and composition of the U.S. merchant Marine fleet; network models; integer programming; design of a naval tender job shop; dynamic programming; large-scale systems; nonlinear programming; a system for bank portfolio planning; vectors and matrices; linear programming in matrix form; a labeling algorithm for the maximun-flow network problem.
Integer Programming Aug 08 2023 A practical, accessible guide to optimization problems with discrete or integer variables Integer Programming stands out from other textbooks by explaining in clear and simple terms how to construct custom-made algorithms or use existing commercial software to obtain optimal or near-optimal solutions for a variety of real-world problems, such as airline timetables, production line schedules, or electricity production on a regional or national scale. Incorporating recent developments that have made it possible to solve difficult optimization problems with greater accuracy, author Laurence A. Wolsey presents a number of state-of-the-art topics not covered in any other textbook. These include improved modeling, cutting plane theory and algorithms, heuristic methods, and branch-and-cut and integer programming decomposition algorithms. This self-contained text: Distinguishes between good and bad formulations in integer programming problems Applies lessons learned from easy integer programs to more difficult problems Demonstrates with applications theoretical and practical aspects of problem solving Includes useful notes and end-of-chapter exercises Offers tremendous flexibility for tailoring material to different needs Integer Programming is an ideal text for courses in integer/mathematical programming-whether in operations research, mathematics, engineering, or computer science departments. It is also a valuable reference for industrial users of integer programming and researchers who would like to keep up with advances in the field.

Mathematical Programming and Financial Objectives for Scheduling Projects May 25 2022 Mathematical Programming and Financial Objectives for Scheduling Projects focuses on decision problems where the performance is measured in terms of money. As the title suggests, special attention is paid to financial objectives and the relationship of financial objectives to project schedules and scheduling. In addition, how schedules relate to other decisions is treated in detail. The book demonstrates that scheduling must be combined with project selection and financing, and that scheduling helps to give an answer to the planning issue of the amount of resources required for a project. The author makes clear the relevance of scheduling to cutting budget costs. The book is divided into six parts. The first part gives a brief introduction to project management. Part two examines scheduling projects in order to maximize their net present value. Part three considers capital rationing. Many decisions on selecting or rejecting a project cannot be made in isolation and multiple projects must be taken fully into account. Since the requests for capital resources depend on the schedules of the projects, scheduling taken on more complexity. Part four studies the resource usage of a project in greater detail. Part five discusses cases where the processing time of an activity is a decision to be made. Part six summarizes the main results that have been accomplished.
The Sharpest Cut Jun 13 2021 This title is written in honor of Manfred Padberg, who has made fundamental contributions to both the theoretical and computational sides of integer programming and combinatorial optimization. This outstanding collection presents recent results in these areas that are closely connected to Padberg's research. His deep commitment to the geometrical approach to combinatorial optimization can be felt throughout this volume; his search for increasingly better and computationally efficient cutting planes gave rise to its title. The peer-reviewed papers contained here are based on invited lectures given at a workshop held in October 2001 to celebrate Padberg's 60th birthday. Grouped by topic (packing, stable sets, and perfect graphs; polyhedral combinatorics; general polytopes; semidefinite programming; computation), many of the papers set out to solve challenges set forth in Padberg's work. The book also shows how Padberg's ideas on cutting planes have influenced modern commercial optimization software.
Mathematical Programming The State of the Art Apr 11 2021 In the late forties, Mathematical Programming became a scientific discipline in its own right. Since then it has experienced a tremendous growth. Beginning with economic and military applications, it is now among the most important fields of applied mathematics with extensive use in engineering, natural sciences, economics, and biological sciences. The lively activity in this area is demonstrated by the fact that as early as 1949 the first "Symposium on Mathe matical Programming" took place in Chicago. Since then mathematical programmers from all over the world have gath ered at the intfrnational symposia of the Mathematical Programming Society roughly every three years to present their recent research, to exchange ideas with their colleagues and to learn about the latest developments in their own and related fields. In 1982, the XI. International Symposium on Mathematical Programming was held at the University of Bonn, W. Germany, from August 23 to 27. It was organized by the Institut fUr Okonometrie und Operations Re search of the University of Bonn in collaboration with the Sonderforschungs bereich 21 of the Deutsche Forschungsgemeinschaft. This volume constitutes part of the outgrowth of this symposium and docu ments its scientific activities. Part I of the book contains information about the symposium, welcoming addresses, lists of committees and sponsors and a brief review about the Ful kerson Prize and the Dantzig Prize which were awarded during the opening ceremony.
Introduction to Mathematical Programming Oct 30 2022 This text presents current and classical mathematical programming techniques at an introductory level. It provides case problems to stimulate interest and is aimed for undergraduate courses in management science, operations and decision research, and applied mathematics.
Model Building in Mathematical Programming Apr 23 2022 The 5th edition of Model Building in Mathematical Programmingdiscusses the general principles of model building in mathematicalprogramming and demonstrates how they can be applied by usingseveral simplified but practical problems from widely differentcontexts. Suggested formulations and solutions are given togetherwith some computational experience to give the reader a feel forthe computational difficulty of solving that particular type ofmodel. Furthermore, this book illustrates the scope and limitationsof mathematical programming, and shows how it can be applied toreal situations. By emphasizing the importance of the building andinterpreting of models rather than the solution process, the authorattempts to fill a gap left by the many works which concentrate onthe algorithmic side of the subject. In this article, H.P. Williams explains his originalmotivation and

objectives in writing the book, how it has beenmodified and updated over the years, what is new in this editionand why it has maintained its relevance and popularity over theyears: ahref="http://www.statisticsviews.com/details/feature/4566481/Model-Building-in-Mathematical-Programming-published-in-fifth-edition.html"http://www.statisticsviews.com/details/feature/4566481/Model-Building-in-Mathematical-Programming-published-in-fifth-edition.html/a

Quadratic Programming with Computer Programs Jul 27 2022 Quadratic programming is a mathematical technique that allows for the optimization of a quadratic function in several variables. QP is a subset of Operations Research and is the next higher lever of sophistication than Linear Programming. It is a key mathematical tool in Portfolio Optimization and structural plasticity. This is useful in Civil Engineering as well as Statistics.

Maxima and Minima with Applications Jul 15 2021 This new work by Wilfred Kaplan, the distinguished author of influential mathematics and engineering texts, is destined to become a classic. Timely, concise, and content-driven, it provides an intermediate-level treatment of maxima, minima, and optimization. Assuming only a background in calculus and some linear algebra, Professor Kaplan presents topics in order of difficulty. In four short chapters, he describes basic concepts and geometric aspects of maxima and minima, progresses to problems with side conditions, introduces optimization and programming, and concludes with an in-depth discussion of research topics involving the duality theorems of Fenchel and Rockafellar. Throughout the text, the subject of convexity is gradually developed-from its theoretical underpinnings to problems, and finally, to its role in applications. Other features include: * A strong emphasis on practical applications of maxima and minima * An impressive array of supporting topics such as numerical analysis * An ample number of examples and problems * More than 60 illustrations highlighting the text * Algorithms to reinforce concepts * An appendix reviewing the prerequisite linear algebra Maxima and Minima with Applications is an ideal text for upper-undergraduate and graduate students taking courses in operations research, management, general engineering, and applied mathematics. It can also be used to supplement courses on linear and nonlinear optimization. This volume's broad scope makes it an excellent reference for professionals wishing to learn more about cutting-edge topics in optimization and mathematical programming.

Applied Mathematics and Parallel Computing May 05 2023 The authors of this Festschrift prepared these papers to honour and express their friendship to Klaus Ritter on the occasion of his sixtieth birthday. Be cause of Ritter's many friends and his international reputation among math ematicians, finding contributors was easy. In fact, constraints on the size of the book required us to limit the number of papers. Klaus Ritter has done important work in a variety of areas, especially in var ious applications of linear and nonlinear optimization and also in connection with statistics and parallel computing. For the latter we have to mention Rit ter's development of transputer workstation hardware. The wide scope of his research is reflected by the breadth of the contributions in this Festschrift. After several years of scientific research in the U.S., Klaus Ritter was ap pointed as full professor at the University of Stuttgart. Since then, his name has become inextricably connected with the regularly scheduled conferences on optimization in Oberwolfach. In 1981 he became full professor of Applied Mathematics and Mathematical Statistics at the Technical University of Mu nich. In addition to his university teaching duties, he has made the activity of applying mathematical methods to problems of industry to be centrally important.

Methods and Models in Mathematical Programming Mar 23 2022 This book focuses on mathematical modeling, describes the process of constructing and evaluating models, discusses the challenges and delicacies of the modeling process, and explicitly outlines the required rules and regulations so that the reader will be able to generalize and reuse concepts in other problems by relying on mathematical logic.Undergraduate and postgraduate students of different academic disciplines would find this book a suitable option preparing them for jobs and research fields requiring modeling techniques. Furthermore, this book can be used as a reference book for experts and practitioners requiring advanced skills of model building in their jobs.

Decision Making and Programming Jan 21 2022 The problem of selection of alternatives or the problem of decision making in the modern world has become the most important class of problems constantly faced by business people, researchers, doctors and engineers.The fields that are almost entirely focused on conflicts, where applied mathematics is successfully used, are law, military science, many branches of economics,

sociology, political science, and psychology. There are good grounds to believe that medicine and some branches of biology and ethics can also be included in this list. Modern applied mathematics can produce solutions to many tens of classes of conflicts differing by the composition and structure of the participants, specific features of the set of their objectives or interests, and various characteristics of the set of their actions, strategies, behaviors, controls, and decisions as applied to various principles of selection or notions of decision optimization.The current issues of social and economic systems involve the necessity to coordinate and jointly optimize various lines of development and activities of modern society. For this reason, the decision problems arising in investigation of such systems are versatile, which shows up not only in the multiplicity of participants, their interests and complexity of reciprocal effects, but also in the laborious development of social utility criteria for a variety of indices and versatile objectives. The efficient decision methods for such complex systems can be developed only the basis of specially developed mathematical tools.

Mathematical Programming with Data Perturbations II, Second Edition Feb 14 2024 This book presents theoretical results, including an extension of constant rank and implicit function theorems, continuity and stability bounds results for infinite dimensional problems, and the interrelationship between optimal value conditions and shadow prices for stable and unstable programs.

Uncertain Programming Mar 11 2021 An up-to-date, authoritative, comprehensive look at optimization theory in uncertain environments Real-life management decisions, such as buy/sell decisions in the stock market, are almost always made in uncertain environments. Is it possible to make model decision problems to fit these circumstances? Once constructed, can these models be solved? In Uncertain Programming, Baoding Liu answers both of these questions in the affirmative and goes on to lay a solid foundation for optimization in generally uncertain environments. Uncertain Programming describes the basic concepts of mathematical programming, provides a genetic algorithm for optimization problems, and introduces the techniques of stochastic and fuzzy simulation. After examining some basic results of expected value models, the book moves on to explore chance-constrained programming with stochastic parameters and illustrate applications of chance-constrained programming models. Dr. Liu discusses dependent-chance programming in stochastic environments and extends both chance-constrained and dependent-chance programming from stochastic to fuzzy environments. He then constructs a theoretical framework for fuzzy programming with fuzzy rather than crisp decisions. This remarkable and revolutionary book: * Lays a foundation for optimization theory in uncertain environments * Provides a unifying principle for dealing with stochastic and fuzzy programming * Incorporates the most recent developments in the field * Emphasizes modeling ideas, evolutionary computation, and applications of uncertain programming Uncertain Programming is a reliable, authoritative, and eye-opening guide for researchers and engineers in operations research, management science, business management, information and systems science, and computer science.

Nonlinear Programming Nov 30 2022 Analyzes the 'central' or 'dual' trajectory used by modern path following and primal/dual methods for convex / general linear programming.

Building and Solving Mathematical Programming Models in Engineering and Science Aug 28 2022 Fundamental concepts of mathematical modeling Modeling is one of the most effective, commonly used tools in engineering and the applied sciences. In this book, the authors deal with mathematical programming models both linear and nonlinear and across a wide range of practical applications. Whereas other books concentrate on standard methods of analysis, the authors focus on the power of modeling methods for solving practical problems-clearly showing the connection between physical and mathematical realities-while also describing and exploring the main concepts and tools at work. This highly computational coverage includes: * Discussion and implementation of the GAMS programming system * Unique coverage of compatibility * Illustrative examples that showcase the connection between model and reality * Practical problems covering a wide range of scientific disciplines, as well as hundreds of examples and end-of-chapter exercises * Real-world applications to probability and statistics, electrical engineering, transportation systems, and more Building and Solving Mathematical Programming Models in Engineering and Science is practically suited for use as a professional reference for mathematicians, engineers, and applied or industrial scientists, while also tutorial and illustrative enough for advanced students in mathematics or engineering.

Optimization and Nonsmooth Analysis Sep 16 2021 This book has appeared in Russian translation and has been praised both for its lively exposition and its fundamental contributions. The author first develops a general theory of nonsmooth analysis and geometry which, together with a set of associated techniques, has

had a profound effect on several branches of analysis and optimization. Clarke then applies these methods to obtain a powerful, unified approach to the analysis of problems in optimal control and mathematical programming. Examples are drawn from economics, engineering, mathematical physics, and various branches of analysis in this reprint volume.

Applied Mathematical Programming for Engineering and Production Management May 17 2024

Semi-Infinite Programming Feb 19 2022 Semi-infinite programming (SIP) deals with optimization problems in which either the number of decision variables or the number of constraints is finite. This book presents the state of the art in SIP in a suggestive way, bringing the powerful SIP tools close to the potential users in different scientific and technological fields. The volume is divided into four parts. Part I reviews the first decade of SIP (1962-1972). Part II analyses convex and generalised SIP, conic linear programming, and disjunctive programming. New numerical methods for linear, convex, and continuously differentiable SIP problems are proposed in Part III. Finally, Part IV provides an overview of the applications of SIP to probability, statistics, experimental design, robotics, optimization under uncertainty, production games, and separation problems. Audience: This book is an indispensable reference and source for advanced students and researchers in applied mathematics and engineering.

Applications of Stochastic Programming Dec 20 2021 Consisting of two parts, this book presents papers describing publicly available stochastic programming systems that are operational. It presents a diverse collection of application papers in areas such as production, supply chain and scheduling, gaming, environmental and pollution control, financial modeling, telecommunications, and electricity.

Self-Regularity Jul 07 2023 Research on interior-point methods (IPMs) has dominated the field of mathematical programming for the last two decades. Two contrasting approaches in the analysis and implementation of IPMs are the so-called small-update and large-update methods, although, until now, there has been a notorious gap between the theory and practical performance of these two strategies. This book comes close to bridging that gap, presenting a new framework for the theory of primal-dual IPMs based on the notion of the self-regularity of a function. The authors deal with linear optimization, nonlinear complementarity problems, semidefinite optimization, and second-order conic optimization problems. The framework also covers large classes of linear complementarity problems and convex optimization. The algorithm considered can be interpreted as a path-following method or a potential reduction method. Starting from a primal-dual strictly feasible point, the algorithm chooses a search direction defined by some Newton-type system derived from the self-regular proximity. The iterate is then updated, with the iterates staying in a certain neighborhood of the central path until an approximate solution to the problem is found. By extensively exploring some intriguing properties of self-regular functions, the authors establish that the complexity of large-update IPMs can come arbitrarily close to the best known iteration bounds of IPMs. Researchers and postgraduate students in all areas of linear and nonlinear optimization will find this book an important and invaluable aid to their work.

Building and Solving Mathematical Programming Models in Engineering and Science Jan 13 2024 Fundamental concepts of mathematical modeling Modeling is one of the most effective, commonly used tools in engineering and the applied sciences. In this book, the authors deal with mathematical programming models both linear and nonlinear and across a wide range of practical applications. Whereas other books concentrate on standard methods of analysis, the authors focus on the power of modeling methods for solving practical problems-clearly showing the connection between physical and mathematical realities-while also describing and exploring the main concepts and tools at work. This highly computational coverage includes: * Discussion and implementation of the GAMS programming system * Unique coverage of compatibility * Illustrative examples that showcase the connection between model and reality * Practical problems covering a wide range of scientific disciplines, as well as hundreds of examples and end-of-chapter exercises * Real-world applications to probability and statistics, electrical engineering, transportation systems, and more Building and Solving Mathematical Programming Models in Engineering and Science is practically suited for use as a professional reference for mathematicians, engineers, and applied or industrial scientists, while also tutorial and illustrative enough for advanced students in mathematics or engineering.

Introduction to Mathematical Optimization Feb 07 2021 This book strives to provide a balanced coverage of efficient algorithms commonly used in solving mathematical optimization problems. It covers both the convectional algorithms and modern heuristic and metaheuristic methods. Topics include gradient-based algorithms such as Newton-Raphson method, steepest descent method, Hooke-Jeeves pattern search,

Lagrange multipliers, linear programming, particle swarm optimization (PSO), simulated annealing (SA), and Tabu search. Multiobjective optimization including important concepts such as Pareto optimality and utility method is also described. Three Matlab and Octave programs so as to demonstrate how PSO and SA work are provided. An example of demonstrating how to modify these programs to solve multiobjective optimization problems using recursive method is discussed.

Introduction to Optimization Sep 09 2023 This undergraduate textbook introduces students of science and engineering to the fascinating field of optimization. It is a unique book that brings together the subfields of mathematical programming, variational calculus, and optimal control, thus giving students an overall view of all aspects of optimization in a single reference. As a primer on optimization, its main goal is to provide a succinct and accessible introduction to linear programming, nonlinear programming, numerical optimization algorithms, variational problems, dynamic programming, and optimal control. Prerequisites have been kept to a minimum, although a basic knowledge of calculus, linear algebra, and differential equations is assumed.

Cooperative and Noncooperative Multi-Level Programming Feb 02 2023 To derive rational and convincible solutions to practical decision making problems in complex and hierarchical human organizations, the decision making problems are formulated as relevant mathematical programming problems which are solved by developing optimization techniques so as to exploit characteristics or structural features of the formulated problems. In particular, for resolving con?ict in decision making in hierarchical managerial or public organizations, the multi level formula tion of the mathematical programming problems has been often employed together with the solution concept of Stackelberg equilibrium. However,weconceivethatapairoftheconventionalformulationandthesolution concept is not always suf?cient to cope with a large variety of decision making situations in actual hierarchical organizations. The following issues should be taken into consideration in expression and formulation of decision making problems. Informulationofmathematicalprogrammingproblems,itistacitlysupposedthat decisions are made by a single person while game theory deals with economic be havior of multiple decision makers with fully rational judgment. Because two level mathematical programming problems are interpreted as static Stackelberg games, multi level mathematical programming is relevant to noncooperative game theory; in conventional multi level mathematical programming models employing the so lution concept of Stackelberg equilibrium, it is assumed that there is no communi cation among decision makers, or they do not make any binding agreement even if there exists such communication. However, for decision making problems in such as decentralized large ?rms with divisional independence, it is quite natural to sup pose that there exists communication and some cooperative relationship among the decision makers.

Mathematical Programming with Data Perturbations II, Second Edition Apr 04 2023

Decomposition Techniques in Mathematical Programming Sep 28 2022 Optimization plainly dominates the design, planning, operation, and c- trol of engineering systems. This is a book on optimization that considers particular cases of optimization problems, those with a decomposable str- ture that can be advantageously exploited. Those decomposable optimization problems are ubiquitous in engineering and science applications. The book considers problems with both complicating constraints and complicating va- ables, and analyzes linear and nonlinear problems, with and without in- ger variables. The decomposition techniques analyzed include Dantzig-Wolfe, Benders, Lagrangian relaxation, Augmented Lagrangian decomposition, and others. Heuristic techniques are also considered. Additionally, a comprehensive sensitivity analysis for characterizing the solution of optimization problems is carried out. This material is particularly novel and of high practical interest. This book is built based on many clarifying, illustrative, and compu- tional examples, which facilitate the learning procedure. For the sake of cl- ity, theoretical concepts and computational algorithms are assembled based on these examples. The results are simplicity, clarity, and easy-learning. We feel that this book is needed by the engineering community that has to tackle complex optimization problems, particularly by practitioners and researchersinEngineering,OperationsResearch,andAppliedEconomics.The descriptions of most decomposition techniques are available only in complex and specialized mathematical journals, di?cult to understand by engineers. A book describing a wide range of decomposition techniques, emphasizing problem-solving, and appropriately blending theory and application, was not previously available.

Stable Parametric Programming May 13 2021 Optimality and stability are two important notions in applied mathematics. This book is a study of these notions and their relationship in linear and convex parametric programming models. It begins with a survey of basic optimality conditions in nonlinear programming. Then

new results in convex programming, using LFS functions, for single-objective, multi-objective, differentiable and non-smooth programs are introduced. Parametric programming models are studied using basic tools of point-to-set topology. Stability of the models is introduced, essentially, as continuity of the feasible set of decision variables under continuous perturbations of the parameters. Perturbations that preserve this continuity are regions of stability. It is shown how these regions can be identified. The main results on stability are characterizations of locally and globally optimal parameters for stable and also for unstable perturbations. The results are straightened for linear models and bi-level programs. Some of the results are extended to abstract spaces after considering parameters as `controls'. Illustrations from diverse fields, such as data envelopment analysis, management, von Stackelberg games of market economy, and navigation problems are given and several case studies are solved by finding optimal parameters. The book has been written in an analytic spirit. Many results appear here for the first time in book form. Audience: The book is written at the level of a first-year graduate course in optimization for students with varied backgrounds interested in modeling of real-life problems. It is expected that the reader has been exposed to a prior elementary course in optimization, such as linear or non-linear programming. The last section of the book requires some knowledge of functional analysis.

Algorithmic Principles of Mathematical Programming Nov 11 2023 Algorithmic Principles of Mathematical Programming investigates the mathematical structures and principles underlying the design of efficient algorithms for optimization problems. Recent advances in algorithmic theory have shown that the traditionally separate areas of discrete optimization, linear programming, and nonlinear optimization are closely linked. This book offers a comprehensive introduction to the whole subject and leads the reader to the frontiers of current research. The prerequisites to use the book are very elementary. All the tools from numerical linear algebra and calculus are fully reviewed and developed. Rather than attempting to be encyclopedic, the book illustrates the important basic techniques with typical problems. The focus is on efficient algorithms with respect to practical usefulness. Algorithmic complexity theory is presented with the goal of helping the reader understand the concepts without having to become a theoretical specialist. Further theory is outlined and supplemented with pointers to the relevant literature. The book is equally suited for self-study for a motivated beginner and for a comprehensive course on the principles of mathematical programming within an applied mathematics or computer science curriculum at advanced undergraduate or graduate level. The presentation of the material is such that smaller modules on discrete optimization, linear programming, and nonlinear optimization can easily be extracted separately and used for shorter specialized courses on these subjects.

Mathematical Programming with Data Perturbations Mar 15 2024 Presents research contributions and tutorial expositions on current methodologies for sensitivity, stability and approximation analyses of mathematical programming and related problem structures involving parameters. The text features up-to-date findings on important topics, covering such areas as the effect of perturbations on the performance of algorithms, approximation techniques for optimal control problems, and global error bounds for convex inequalities.

Advances in Optimization and Approximation Oct 18 2021 This book is a collection of research papers in optimization and approximation dedicated to Professor Minyi Yue of the Institute of Applied Mathematics, Beijing, China. The papers provide a broad spectrum of research on optimization problems, including scheduling, location, assignment, linear and nonlinear programming problems as well as problems in molecular biology. The emphasis of the book is on algorithmic aspects of research work in optimization. Special attention is paid to approximation algorithms, including heuristics for combinatorial approximation problems, approximation algorithms for global optimization problems, and applications of approximations in real problems. The work provides the state of the art for researchers in mathematical programming, operations research, theoretical computer science and applied mathematics.

Applied Mathematical Programming for Business and Economics Apr 16 2024 This introductory/intermediate level textbook focuses on mathematical programming and its applications. It introduces basic linear programming -- the easiest form of mathematical programming with emphasis on economic interpretation of the model solution. Well-known applications of linear programming to problems in business and agriculture are presented.The text then extends into more advanced forms of mathematical programming including quadratic and integer programming. These models include the introduction of risk and uncertainty into decision-making and a class of models known as price endogenous models in which

market equilibrium analyses can be modelled. Integer programming includes conditional decision-making model, machinery selection, and a class of models known as supply chain models.Supplements are provided to assist solution of the models using either GAMS or Excel, the two most widely used software packages for solution of mathematical programming models.

Mathematical Optimization and Economic Theory Aug 16 2021 A classic account of mathematical programming and control techniques and their applications to static and dynamic problems in economics.

Mathematical Programming with Data Perturbations I Oct 10 2023 Basic results; Applications and interfaces.

Mathematical Programming Via Augmented Lagrangians Jun 06 2023

Interior-point Polynomial Algorithms in Convex Programming Jan 01 2023 Specialists working in the areas of optimization, mathematical programming, or control theory will find this book invaluable for studying interior-point methods for linear and quadratic programming, polynomial-time methods for nonlinear convex programming, and efficient computational methods for control problems and variational inequalities. A background in linear algebra and mathematical programming is necessary to understand the book. The detailed proofs and lack of "numerical examples" might suggest that the book is of limited value to the reader interested in the practical aspects of convex optimization, but nothing could be further from the truth. An entire chapter is devoted to potential reduction methods precisely because of their great efficiency in practice.

Model Building in Mathematical Programming Nov 18 2021 The 5th edition of Model Building in Mathematical Programming discusses the general principles of model building in mathematical programming and demonstrates how they can be applied by using several simplified but practical problems from widely different contexts. Suggested formulations and solutions are given together with some computational experience to give the reader a feel for the computational difficulty of solving that particular type of model. Furthermore, this book illustrates the scope and limitations of mathematical programming, and shows how it can be applied to real situations. By emphasizing the importance of the building and interpreting of models rather than the solution process, the author attempts to fill a gap left by the many works which concentrate on the algorithmic side of the subject. In this article, H.P. Williams explains his original motivation and objectives in writing the book, how it has been modified and updated over the years, what is new in this edition and why it has maintained its relevance and popularity over the years: http://www.statisticsviews.com/details/feature/4566481/Model-Building-in-Mathematical-Programming-published-in-fifth-edition.html

Mathematical Programming Dec 12 2023 This book serves as an introductory text in mathematical programming and optimization for students having a mathematical background that includes one semester of linear algebra and a complete calculus sequence. It includes computational examples to aid students develop computational skills.

Applied Integer Programming Jun 25 2022 An accessible treatment of the modeling and solution of integer programming problems, featuring modern applications and software In order to fully comprehend the algorithms associated with integer programming, it is important to understand not only how algorithms work, but also why they work. Applied Integer Programming features a unique emphasis on this point, focusing on problem modeling and solution using commercial software. Taking an application-oriented approach, this book addresses the art and science of mathematical modeling related to the mixed integer programming (MIP) framework and discusses the algorithms and associated practices that enable those models to be solved most efficiently. The book begins with coverage of successful applications, systematic modeling procedures, typical model types, transformation of non-MIP models, combinatorial optimization problem models, and automatic preprocessing to obtain a better formulation. Subsequent chapters present algebraic and geometric basic concepts of linear programming theory and network flows needed for understanding integer programming. Finally, the book concludes with classical and modern solution approaches as well as the key components for building an integrated software system capable of solving large-scale integer programming and combinatorial optimization problems. Throughout the book, the authors demonstrate essential concepts through numerous examples and figures. Each new concept or algorithm is accompanied by a numerical example, and, where applicable, graphics are used to draw together diverse problems or approaches into a unified whole. In addition, features of solution approaches found in today's commercial software are identified throughout the book. Thoroughly classroom-tested, Applied Integer Programming is an excellent

book for integer programming courses at the upper-undergraduate and graduate levels. It also serves as a well-organized reference for professionals, software developers, and analysts who work in the fields of applied mathematics, computer science, operations research, management science, and engineering and use integer-programming techniques to model and solve real-world optimization problems.

Mathematical Programming for Industrial Engineers Mar 03 2023 Setting out to bridge the gap between the theory of mathematical programming and the varied, real-world practices of industrial engineers, this work introduces developments in linear, integer, multiobjective, stochastic, network and dynamic programing. It details many relevant industrial-engineering applications.;College or university bookstores may order five or more copies at a special student price, available upon request from Marcel Dekker, Inc.

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