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Knapsack Problems McGraw Hill Professional

Supply Chain Optimization captures the latest results in a segment of current research activity in supply chain management. This research area focuses on applying optimization techniques to supply chain management problems. The research papers that make up the volume provide a snapshot of state-of-the-art optimization methods within the field. This book presents rigorous modelling approaches for supply chain operations problems with a goal of improving supply chain performance (or the performance of some segment thereof). It contains high-quality works from leading researchers in the field whose expertise fits within this scope. The book provides a diverse blend of research topics and novel modelling and solution approaches for difficult classes of supply chain operations, planning, and design problems.

Application of Mathematics and Optimization in Construction Project Management Springer

Delineating the proper design, layout, and location of facilities, this book strikes a healthy balance between theory and practice. It provides an understanding of the practical aspects of implementing preliminary designs development through analytical models. The third edition of a bestseller, it features updated multimedia tools, new software, an

Springer Nature

Inventory and Production Management in Supply Chains CRC Press

Flow Shop Lot Streaming John Wiley & Sons

Volumes of the Topical Issues in Pain series are now a common sight in Physiotherapy departments and practices throughout the UK. More and more students are using them to learn clinical skills and as key references for study and research. The accolades the series has received from within and outside the profession are both moving and cheering for Physiotherapy. This 5th volume energetically moves the boundaries of Physiotherapy on, divided into 5 sections, it considers some of the most important issues and challenges facing clinicians and society today. The section on return to work (3) examines the financial and human costs of work absence, the difficulties that surround and often prevent people in pain from returning to work and finally details practical ways of helping patients actually get there. It is becoming increasingly clear that the traditional treatments being offered for common and benign pain states, whether by therapists, Drs or Surgeons, are ineffective when measured in terms of return to work and confident function - why is this? The answers most likely lie in the broader, multidimensional, understanding of pain biology (section 5) that is embraced in the principles and practice of cognitive-behavioural therapies and approaches (section 4), especially when they are used alongside physical rehabilitation programmes (sections 1, 2, 3 & 4). Vitrally, these proven approaches are patient-orientated requiring highly trained experts in listening, explaining and communicating (sections 1 & 2). This book acknowledges that there no simple 'fix' that takes a hurting human being from a state of vulnerability back to one of physical confidence and full working potential. What it is does though, is breathe a breath of optimism into the current state-of-the-art of the physical pain-management process that, when skilfully applied, actually does help a great deal. The Topical Issues in Pain series derives from the work, study days and seminars of the Physiotherapy Pain Association and is written by clinicians for clinicians.

Control and Dynamic Systems V46: Manufacturing and Automation Systems: Techniques and Technologies McGraw-Hill Science, Engineering & Mathematics

This book deals with complex variants of Travelling Salesman Problem (TSP) and Vehicle Routing Problem (VRP) within the manufacturing and service industries. The objective is to develop heuristics for these supply chain problems in order to offer practical solutions to improve operational efficiency. These heuristics are evaluated using benchmark and derived data-sets. Case studies pertaining to logistics in different industries including textile machinery manufacturing and banking are also included to demonstrate the created heuristics. High competition in today's global market has forced the organizations to invest in and focus on their logistics system. The critical function of logistics is the transportation within and across various supply chain entities. Both supply and distribution procedure require effective transportation management. A small improvement in routing problems can lead to huge logistics savings in absolute terms. This book should appeal to executives, researchers and consultants seeking supply chain management solutions.

Best Approximation in Normed Linear Spaces by Elements of Linear Subspaces iUniverse

Vehicle routing problems, among the most studied in combinatorial optimization, arise in many practical contexts (freight distribution and collection, transportation, garbage collection, newspaper delivery, etc.). Operations researchers have made significant developments in the algorithms for their solution, and Vehicle Routing: Problems, Methods, and Applications, Second Edition reflects these advances. The text of the new edition is either completely new or significantly revised and provides extensive and complete state-of-the-art coverage of vehicle routing by those who have done most of the innovative research in the area; it emphasizes methodology related to specific classes of vehicle routing problems and, since vehicle routing is used as a benchmark for all new solution techniques, contains a complete overview of current solutions to combinatorial optimization problems. It also includes several chapters on important and emerging applications, such as disaster relief and green vehicle routing.

Advanced Topics in Just-in-time Management Springer Science & Business Media

This volume contains the communications and discussions of the First International Symposium on Basic Environmental Problems of Man in Space, which was held 29 October - 2 November 1962 at Unesco House, Paris, under the joint sponsorship of the International Astronautical Federation (IAF) and the International Academy of Astronautics (IAA) with the cooperation and support of Unesco, the International Atomic Energy Agency (IAEA) and the World Health Organization (WHO). At this Symposium 31 communications were presented, 8 of which were from the USSR, 8 from the USA, and 15 from other countries, all by special invitation. The presentations, which included three general review papers, were made in ten half-day working sessions by a distinguished international group. The proceedings were not restricted to the acute professional aspects of man in space. In fact, the majority of the vast store of material contained in this volume deals with the more scientific aspects, i. e. with problems of the future, which are contributed mainly by conventional areas of

physiology and psychophysiology, including the technical research activities pertaining to the acquisition, analysis and control of biomedical data.

Integer Programming and Related Areas Springer Nature

This book discusses the process of "Lot Streaming" and how it can significantly improve the overall performance of a production process, and thereby, make the operation of a manufacturing system lean. It provides a complete introduction to the Flow Shop Lot Streaming Problem and provides a historical perspective. It further presents algorithms for a variety of lot streaming problems with numerical illustrations for ease of understanding and implementation.

Evolutionary Computation in Combinatorial Optimization Jossey-Bass

Semiannual, with semiannual and annual indexes. References to all scientific and technical literature coming from DOE, its laboratories, energy centers, and contractors. Includes all works deriving from DOE, other related government-sponsored information, and foreign nonnuclear information. Arranged under 39 categories, e.g., Biomedical sciences, basic studies; Biomedical sciences, applied studies; Health and safety; and Fusion energy. Entry gives bibliographical information and abstract. Corporate, author, subject, report number indexes.

Metaheuristics for Scheduling in Industrial and Manufacturing Applications Springer

This book constitutes the thoroughly refereed post-conference proceedings of the 4th International Symposium on Combinatorial Optimization, ISCO 2016, held in Vietri sul Mare, Italy, in May 2016. The 38 revised full papers presented in this book were carefully reviewed and selected from 98 submissions. They present original research on all aspects of combinatorial optimization, such as algorithms and complexity; mathematical programming; operations research; stochastic optimization; and graphs and combinatorics.

Journal of International Students 2015 Vol 5 Issue 4 Springer

The Quantum Mechanical Three-Body Problem deals with the three-body problem in quantum mechanics. Topics include the two- and three-particle problem, the Faddeev equations and their solution, separable potentials, and variational methods. This book has eight chapters; the first of which introduces the reader to the quantum mechanical three-body problem, its difficulties, and its importance in nuclear physics. Scattering experiments with three-particle breakup are presented. Attention then turns to some concepts of quantum mechanics, with emphasis on two-particle scattering and the Hamiltonian for three particles. The chapters that follow are devoted to the Faddeev equations, including those for scattering states and transition operators, and how such equations can be solved in practice. The solution of the Faddeev equations for separable potentials and local potentials is presented, along with the use of Padé approximation to solve the Faddeev equations. This book concludes with an appraisal of variational methods for bound states, elastic and rearrangement scattering, and the breakup reaction. A promising variational method for solving the Faddeev equations is described. This book will be of value to students interested in three-particle physics and to experimentalists who want to understand better how the theoretical data are derived.

Supply Chain Optimization Springer

Computational Issues in High Performance Software for Nonlinear Research brings together in one place important contributions and up-to-date research results in this important area. Computational Issues in High Performance Software for Nonlinear Research serves as an excellent reference, providing insight into some of the most important research issues in the field.

Historical Studies of Wartime Problems Springer Science & Business Media

The third edition of this handbook is designed to provide a broad coverage of the concepts, implementations, and applications in metaheuristics. The book's chapters serve as stand-alone presentations giving both the necessary underpinnings as well as practical guides for implementation. The nature of metaheuristics invites an analyst to modify basic methods in response to problem characteristics, past experiences, and personal preferences, and the chapters in this handbook are designed to facilitate this process as well. This new edition has been fully revised and features new chapters on swarm intelligence and automated design of metaheuristics from flexible algorithm frameworks. The authors who have contributed to this volume represent leading figures from the metaheuristic community and are responsible for pioneering contributions to the fields they write about. Their collective work has significantly enriched the field of optimization in general and combinatorial optimization in particular. Metaheuristics are solution methods that orchestrate an interaction between local improvement procedures and higher level strategies to create a process capable of escaping from local optima and performing a robust search of a solution space. In addition, many new and exciting developments and extensions have been observed in the last few years. Hybrids of metaheuristics with other optimization techniques, like branch-and-bound, mathematical programming or constraint programming are also increasingly popular. On the front of applications, metaheuristics are now used to find high-quality solutions to an ever-growing number of complex, ill-defined real-world problems, in particular combinatorial ones. This handbook should continue to be a great reference for researchers, graduate students, as well as practitioners interested in metaheuristics.

Inventory and Production Management in Supply Chains CRC Press

This book provides the latest up-to-date documentation on the scope of research in Group Technology (GT) and Cellular Manufacturing (CM). It is a comprehensive listing of the methodologies, techniques, algorithms and tools used for practical implementation of the concepts of GT and CM.

Fundamentals of Supply Chain Theory Greenwood Publishing Group

Comprehensively teaches the fundamentals of supply chain theory This book presents the methodology and foundations of supply chain management and also demonstrates how recent developments build upon classic models. The authors focus on strategic, tactical, and operational aspects of supply chain management and cover a broad range of topics from forecasting, inventory management, and facility location to transportation, process flexibility, and auctions. Key mathematical models for optimizing the design, operation, and evaluation of supply chains are presented as well as models currently emerging from the research frontier. Fundamentals of Supply Chain Theory, Second Edition contains new chapters on transportation (traveling salesman and vehicle routing problems), integrated supply chain models, and applications of supply chain theory. New sections have also been added throughout, on topics including machine learning models for forecasting, conic optimization for facility location, a multi-supplier model for supply uncertainty, and a game-theoretic analysis of auctions. The second edition also contains case studies for each chapter that illustrate the real-world implementation of the models presented. This edition also contains nearly 200 new homework problems, over 60 new worked examples, and over 140 new illustrative figures. Plentiful teaching supplements are available, including an Instructor's Manual and PowerPoint slides, as well as MATLAB programming assignments that require students to code algorithms in an effort to provide a deeper understanding of the material. Ideal as a textbook for upper-undergraduate and graduate-level courses in supply chain management in engineering and business schools, Fundamentals of Supply Chain Theory, Second Edition will also appeal to anyone interested in quantitative approaches for studying supply chains.

Facilities Design CRC Press

Latest developments in the world-class strategy for business operations, JIT, presented in an easily accessed format for production and other operations executives.

New Trends in Emerging Complex Real Life Problems Springer Science & Business Media

This book gathers the contributions of the international conference "Optimization and Decision Science" (ODS2018), which was held at the Hotel Villa Diodoro, Taormina (Messina), Italy on September 10 to 13, 2018, and was organized by AIRO, the Italian Operations Research Society, in

cooperation with the DMI (Department of Mathematics and Computer Science) of the University of Catania (Italy). The book offers state-of-the-art content on optimization, decisions science and problem solving methods, as well as their application in industrial and territorial systems. It highlights a range of real-world problems that are both challenging and worthwhile, using models and methods based on continuous and discrete optimization, network optimization, simulation and system dynamics, heuristics, metaheuristics, artificial intelligence, analytics, and multiple-criteria decision making. Given its scope of coverage, it will benefit not only researchers and practitioners working in these areas, but also the operations research community as a whole.

Applications of Evolutionary Computing Lulu.com

Learn how to solve physics problems the right way How to Solve Physics Problems will prepare you for physics exams by focusing on problem-solving. You will learn to solve physics problems naturally and systematically--and in a way that will stick with you. Not only will it help you with your homework, it will give you a clear idea of what you can expect to encounter on exams. 400 physics problems thoroughly illustrated and explained Math review for the right start New chapters on quantum physics; atoms, molecules, and solids; and nuclear physics

Facilities Design Springer

This textbook teaches the basic concepts and methods of project management but also explains how to convert them to useful results in practice. Project management offers a promising working area for theoretical and practical applications, and developing software and decision support systems (DSS). This book specifically focuses on project planning and control, with an emphasis on mathematical modeling. Models and algorithms establish a good starting point for students to study the relevant literature and support pursuing academic work in related fields. The book provides an introduction to theoretical concepts, and it also provides detailed explanations, application examples, and case studies that deal with real-life problems. The chapter topics include questions that underlie critical thinking, interpretation, analytics, and making comparisons. Learning outcomes are defined and the content of the book is structured following these goals. Chapter 1 begins by introducing the basic concepts, methods, and processes of project management. This Chapter constitutes the base for defining and modeling project management problems. Chapter 2 explores the fundamentals of organizing and managing projects from an organization's perspective. Issues related to project team formation, the role of project managers, and organization types are discussed. Chapter 3 is devoted to project planning and network modeling of projects, covering fundamental concepts such as project scope, Work Breakdown Structure (WBS), Organizational Breakdown Structure (OBS), Cost Breakdown Structure (CBS), project network modeling, activity duration, and cost estimating, activity-based costing (ABC), data and knowledge management. Chapter 4 introduces deterministic scheduling models, which can be used in constructing the time schedules. Models employing time-based and finance-based objectives are introduced. The CPM is covered. The unconstrained version of maximizing Net Present Value (NPV) is also treated here together with the case of time-dependent cash flows. Chapter 5 focuses on the time/cost trade-off problem, explaining how to reduce the duration of some of the activities and therefore reduce the project duration at the expense of additional costs. This topic is addressed for both continuous and discrete cases. Chapter 6 discusses models and methods of scheduling under uncertain activity durations. PERT is introduced for minimizing the expected project duration and extended to the PERT-Costing method for minimizing the expected project cost. Simulation is presented as another approach for dealing with the uncertainty in activity durations and costs. To demonstrate the use of the PERT, a case study on constructing an earthquake-resistant residential house is presented. Classifications of resource and schedule types are given in Chapter 7, and exact and heuristic solution procedures for the single- and multi-mode resource constrained project scheduling problem (RCPSP) are presented. The objective of maximizing NPV under resource constraints is addressed, and the capital-constrained project scheduling model is introduced. In Chapter 8, resource leveling, and further resource management problems are introduced. Total adjustment cost and resource availability cost problems are introduced. Various exact models are investigated. A heuristic solution procedure for the resource leveling problem is presented in detail. Also, resource portfolio management policies and the resource portfolio management problem are discussed. A case study on resource leveling dealing with the annual audit project of a major corporation is presented. Project contract types and payment schedules constitute the topics of Chapter 9. Contracts are legal documents reflecting the results of some form of client-contractor negotiations and sometimes of a bidding process, which deserve closer attention. Identification and allocation of risk in contracts, project control issues, disputes, and resolution management are further topics covered in this Chapter. A bidding model is presented to investigate client-contractor negotiations and the bidding process from different aspects. Chapter 10 focuses on processes and methods for project monitoring and control. Earned Value Management is studied to measure the project performance throughout the life of a project and to estimate the expected project time and cost based on the current status of the project. How to incorporate inflation into the analysis is presented. In Chapter 11, qualitative and quantitative techniques including decision trees, simulation, and software applications are introduced. Risk phases are defined and building a risk register is addressed. An example risk breakdown structure is presented. The design of risk management processes is introduced, and risk response planning strategies are discussed. At the end of the Chapter, the quantitative risk analysis is demonstrated at the hand of a team discussion case study. Chapter 12 covers several models and approaches dealing with various stochastic aspects of the decision environment. Stochastic models, generation of robust schedules, use of reactive and fuzzy approaches are presented. Sensitivity and scenario analysis are introduced. Also, simulation analysis, which is widely used to analyze the impacts of uncertainty on project goals, is presented. Chapter 13 addresses repetitive projects that involve the production or construction of similar units in batches such as railway cars or residential houses. Particularly in the construction industry repetitive projects represent a large portion of the work accomplished in this sector of the economy. A case study on the 50 km section of a motorway project is used for demonstrating the handling of repetitive project management. How best to select one or more of a set of candidate projects to maintain a project portfolio is an important problem for project-based organizations with limited resources. The project selection problem is inherently a multi-objective problem and is treated as such in Chapter 14. Several models and solution techniques are introduced. A multi-objective, multi-period project selection and scheduling model is presented. A case study that addresses a project portfolio selection and scheduling problem for the construction of a set of dams in a region is presented. Finally, Chapter 15 discusses three promising research areas in project management in detail: (i) Sustainability and Project Management, (ii) Project Management in the Era of Big Data, and (iii) the Fourth Industrial Revolution and the New Age Project Management. We elaborate on the importance of sustainability in project management practices, discuss how developments in data analytics might impact project life cycle management, and speculate how the infinite possibilities of the Fourth Industrial Revolution and the new technologies will transform project management practices.

Swarm, Evolutionary, and Memetic Computing Springer Science & Business Media

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