

Basic p-Hub Location Model

$$\text{Min} \sum_{j \in J} \sum_{i \in I} h_{ij} \left(\sum_{k \in N} c_{ik} y_{ij} + \sum_{m \in N} c_{jm} y_{jm} + \alpha \sum_{l \in N} \sum_{n \in N} c_{ln} y_{li} y_{jn} \right) \quad (33)$$

$$\text{s.t.} \sum_{j \in N} x_j = p \quad (34)$$

$$\sum_{i \in I} y_{ij} = 1 \quad \forall i \in I \quad (35)$$

$$y_{ij} - x_j \leq 0 \quad \forall i \in I, \forall j \in J \quad (36)$$

$$x_j \in \{0,1\} \quad \forall j \in J \quad (37)$$

$$y_{ij} \in \{0,1\} \quad \forall i \in I, \forall j \in J \quad (38)$$

- (33) Minimizes sum of cost of moving items between a non-hub node and the hub to which the node is assigned, the cost of moving from the final hub to the destination of the flow, and the interhub movement cost which is discounted by a factor of α .
- (34) through (38) identical to constraints for p-median model
- (35) each node should be assigned to exactly one hub

Hub Location Problems Chapter 1

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Mathematical Methods on Optimization in Transportation Systems M. Pursula, Jarko Niittymäki, 2013-12-14 This book contains selected papers from the presentations given at the 7th EURO Working Group Meeting on Transportation which took place at the Helsinki University of Technology HUT Finland during August 2-4 1999. Altogether 31 presentations were given and 14 full papers have been selected in this publication through a peer review process coordinated by the editors. The papers in this book cover a wide range of transportation problems from the simulation of railway traffic to optimum congestion tolling and mode choice modeling with stated preference data. In general, the variety of papers clearly demonstrates the wide areas of interest of people who are involved in the research of transportation systems and their operation. They also well demonstrate the importance and possibilities of modeling and theoretical approaches in the analysis of transportation systems and problem solving. Most of the papers are purely theoretical in nature, that is, they present a theoretical model with only a hypothetical example of application. There are, however, some papers which are closer to the practice or describe applications of and give interesting results of studies made by known methodologies. It is especially noteworthy that half of the accepted papers deal with planning and operation of public transport.

Facility Location Reza Zanjirani Farahani, Masoud Hekmatfar, 2009-07-09 Location problems establish a set of facilities/resources to minimize the cost of satisfying a set of demands/customers with respect to a set of constraints. This book deals with location problems. It considers the relationship between location problems and other areas such as supply chains.

Handbook of Research on Applied Optimization Methodologies in Manufacturing Systems Faruk Yılmaz, Ömer Tüfekçi, Süleyman, 2017-11-30 Today's manufacturing systems are undergoing significant changes in the aspects of planning, production, execution, and delivery. It is imperative to stay up to date on the latest trends in optimization to efficiently create products for the market. The Handbook of Research on Applied Optimization Methodologies in Manufacturing Systems is a pivotal reference source including the latest scholarly research on heuristic models for solving manufacturing and supply chain related problems. Featuring exhaustive coverage on a broad range of topics such as assembly ratio, car sequencing, and color constraints, this publication is ideally designed for practitioners seeking new comprehensive models for problem solving in manufacturing and supply chain management.

Uncertainty in Facility Location Problems H. A. Eiselt, Vladimir Marianov, 2023-09-20 This book deals with an often neglected feature of location problems, namely uncertainty, by combining two related fields: location theory and optimization. Written by leading researchers and practitioners in these fields, each chapter examines one aspect of the location process in different contexts such as supply chains, location decisions under congestion, disaster management, design of resilient facilities, uncertainty in the health sector, and facility location in the retail sector under uncertainty. The book also addresses methodological aspects such as chance-constrained approaches, heuristic algorithms, scenario approaches, and simulation. As such, it provides decision makers with essential methods, tools, and approaches to help them

deal with these uncertainties It is mainly intended for graduate students in the fields of operations research and logistics as well as professionals in logistics and supply chain management *Facility Location* Zvi Drezner,Horst W.

Hamacher,2004-05-03 The book covers both theory and applications of locational analysis LocAn The reader will see the power of LocAn models in various real world contexts varying from communication design to robotics and mail delivery It is divided into two parts The first part contains an overview of some of the LocAn methodologies The second part describes in thorough detail some selected applications The text provides researchers with an excellent and well thought out review of available location models **Artificial Neural Nets. Problem Solving Methods** José Mira,José R. Alvarez,2003-08-03 The two volume set LNCS 2686 and LNCS 2687 constitute the refereed proceedings of the 7th International Work Conference on Artificial and Natural Neural Networks IWANN 2003 held in Ma 3 Menorca Spain in June 2003 The 197 revised papers presented were carefully reviewed and selected for inclusion in the book and address the following topics mathematical and computational methods in neural modelling neurophysiological data analysis and modelling structural and functional models of neurons learning and other plasticity phenomena complex systems dynamics cognitive processes and artificial intelligence methodologies for net design bio inspired systems and engineering and applications in a broad variety of fields nbsp

Freight Transport and Distribution Tolga Bektas,2017-06-19 This book serves as a primer on freight transportation and logistics providing a general and broad coverage of concepts mathematical models and methodologies available for freight transportation planning at strategic tactical and operational levels It is aimed at graduate students and is also a reference book for practitioners in the field The book includes preliminaries such as mathematical modeling and optimisation algorithms The book also features case studies and practical real life examples to illustrate applications of the concepts and models covered and to encourage a hands on and a practical approach The author has taught and published extensively in the field and draw on state of the art scientific research He has also been part of a number of practical research projects which underpin the real life examples in the book **Network Optimization** Julia Pahl,Torsten Reinert,Stefan Voß,2011-09-15 This book constitutes the refereed proceedings of the 5th International Conference on Network Optimization INOC 2011 held in Hamburg Germany in June 2011 The 65 revised full papers presented were carefully reviewed and selected from numerous submissions The papers highlight recent developments in network optimization and are organized in the following topical sections theoretical problems uncertainty graph theory and network design network flows routing and transportation and further optimization problems and applications energy oriented network design telecom applications location maritime shipping and graph theory Intelligent Computing Kohei Arai,Supriya Kapoor,Rahul Bhatia,2020-07-03 This book focuses on the core areas of computing and their applications in the real world Presenting papers from the Computing Conference 2020 covers a diverse range of research areas describing various detailed techniques that have been developed and implemented The Computing Conference 2020 which provided a venue for academic and industry

practitioners to share new ideas and development experiences attracted a total of 514 submissions from pioneering academic researchers scientists industrial engineers and students from around the globe Following a double blind peer review process 160 papers including 15 poster papers were selected to be included in these proceedings Featuring state of the art intelligent methods and techniques for solving real world problems the book is a valuable resource and will inspire further research and technological improvements in this important area

Bioinspired Heuristics for Optimization El-Ghazali Talbi, Amir Nakib, 2018-08-18 This book presents recent research on bioinspired heuristics for optimization Learning based and black box optimization exhibit some properties of intrinsic parallelization and can be used for various optimizations problems Featuring the most relevant work presented at the 6th International Conference on Metaheuristics and Nature Inspired Computing held at Marrakech Morocco from 27th to 31st October 2016 the book presents solutions methods algorithms case studies and software It is a valuable resource for research academics and industrial practitioners

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