1. Record Nr. UNINA9910876981603321

Titolo	Operational research and networks / / edited by Gerd Finke
Pubbl/distr/stampa	London, : ISTE Hoboken, NJ, : J. Wiley & Sons, 2008
ISBN	1-118-61749-5 1-282-16546-1 9786612165467 0-470-61175-8 0-470-61026-3
Descrizione fisica	1 online resource (282 p.)
Collana	Geographical information systems series
Altri autori (Persone)	FinkeGerd
Disciplina	658.4/032
Soggetti	Network analysis (Planning) Operations research
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Operations Research and Networks; Table of Contents; Introduction; Chapter 1. Linear Programming; 1.1. Fundamental concepts; 1.2. Software; 1.3. Indivisible units; 1.4. Modeling with integer variables; 1.5. Conclusion; 1.6. Bibliography; Chapter 2. Graphs and Networks; 2.1. The concept of a graph; 2.2. Sub-structures and exploration; 2.3. Edge- and vertex-connectivity; 2.4. Directed graphs; 2.5. Valued graphs and networks; 2.5.1. The shortest spanning tree problem in a connected graph; 2.5.2. The shortest path; 2.6. Assignment and coloring; 2.6.1. Matchings; 2.6.2. Vertex colorings 2.7. Flow in networks2.8. Conclusion; 2.9. Bibliography; Chapter 3. Classical Combinatorial Problems and Solution Techniques; 3.1. Introduction; 3.2. Classical optimization problems; 3.2.1. Introduction; 3.2.2. Combinatorial optimization problems in graph theory; 3.2.3. Assignment Problems; 3.2.4. Transportation problems; 3.2.5. Location problems; 3.2.6. Scheduling problems; 3.3. Complexity; 3.4. Solution of hard problems; 3.4.1. Introduction; 3.4.2. Relaxations; 3.4.3. Heuristic methods of construction; 3.4.4. Improvement methods; 3.4.5. Exact methods; 3.5. Conclusion; 3.6. Bibliography

Chapter 4. Project Scheduling4.1. Presentation; 4.1.1. Conducting a project; 4.1.2. Definitions; 4.1.3. Scheduling methods; 4.2. Scheduling and graphs without cycles; 4.3. Fundamental problem; 4.3.1. Calculation of the earliest dates; 4.3.2. Calculation of the latest dates; 4.3.3. Margins; 4.4. Visualizations; 4.4.1. Representation on the graph PERT/CPM; 4.4.2. Gantt chart; 4.5. Probabilistic PERT; 4.5.1. Analytic solution; 4.5.2. Solution by simulation; 4.6. Sequencing with disjunctive constraints; 4.7. Sequencing with cumultative constraints: serial methods; 4.8. Time-cost trade-off problem
4.9. Conclusion4.10. Bibliography; Chapter 5. Operations Management in Transportation Networks; 5.1. Introduction; 5.1.1. A bit of history; 5.1.2. University-industry: a winning partnership; 5.2. Fundamental notions; 5.2.1. A common structure; 5.2.2. The shortest path problem with time windows; 5.2.3. Some mathematics; 5.2.4. A generic algorithm; 5.3. A mechanism of decomposition; 5.3.1. Local restrictions and global constraints; 5.3.2. The column generation method; 5.3.3. Solutions satisfying the integrality constraints; 5.4. Diversity of the local restrictions
5.4.1. A few words on the extension functions5.4.2. Modeling examples; 5.5. Applications in large transportation networks; 5.5.1. Urban transportation; 5.5.2. Air transportation; 5.5.3. Rail transportation; 5.6. What does the future look like?; 5.7. Bibliography; Chapter 6. Pickup and Delivery Problems with Services on Nodes or Arcs of a Network; 6.1. Introduction; 6.2. Node routing problems; 6.2.1. The traveling salesman problem; 6.2.2. Vehicle tours with capacity constraints; 6.3. Arc routing problems; 6.3.1. The Chinese postman problem; 6.3.2. The rural postman problem
6.3.3. Arc routing problems with capacity constraints

Sommario/riassunto

This book presents the principal concepts of operations research (OR) as tools for the planning, support, and management of various types of networks, including both physical and logical networks. It analyzes real problems, and offers a collection of models for many application areas, together with the corresponding solution techniques. Following this, important application areas are addressed, such as project scheduling, distribution networks, telecommunication networks, and planning of satellite imaging. Anyone involved in the theory or practice in this field will find this a vital resource.