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Nota di bibliografia	Includes bibliographical references and index at the end of each chapters.
Nota di contenuto	Cover; Title Page; Copyright; Contents; Preface; Chapter 1: Airline Crew Pairing Optimization; 1.1. Introduction; 1.2. Definition of the problem; 1.2.1. Constructing subnetworks; 1.2.2. Pairing costs; 1.2.3. Model; 1.2.4. Case without resource constraints; 1.3. Solution approaches; 1.3.1. Decomposition principles; 1.3.2. Column generation, master problem and subproblem; 1.3.3. Branching methods for finding integer solutions; 1.4. Solving the subproblem for column generation; 1.4.1. Mathematical formulation; 1.4.2. General principle of effective label generation 1.4.3. Case of one single resource: the bucket method 1.4.4. Case of many resources: reduction of the resource space; 1.4.4.1. Reduction principle; 1.4.4.2. Approach based on the Lagrangian relaxation; 1.4.4.3. Approach based on the surrogate relaxation; 1.5. Conclusion; 1.6. Bibliography; Chapter 2: The Task Allocation Problem; 2.1. Presentation; 2.2. Definitions and modeling; 2.2.1. Definitions; 2.2.2. The processors; 2.2.3. Communications; 2.2.4. Tasks; 2.2.5. Allocation types; 2.2.5.1. Static allocation; 2.2.5.2. Dynamic allocation; 2.2.5.3. With or without pre-emption 2.2.5.4. Task duplication 2.2.6. Allocation/scheduling; 2.2.7. Modeling; 2.2.7.1. Modeling costs; 2.2.7.2. Constraints; 2.2.7.3. Objectives of the allocation; 2.2.7.3.1. Minimizing the execution duration; 2.2.7.3.2.

Minimizing the global execution and communication cost; 2.2.7.3.3. Load balancing; 2.3. Review of the main works; 2.3.1. Polynomial cases; 2.3.1.1. Two-processor cases; 2.3.1.2. Tree case; 2.3.1.3. Other structures; 2.3.1.4. Restrictions on the processors or the tasks; 2.3.1.5. Minmax objective; 2.3.2. Approximability; 2.3.3. Approximate solution; 2.3.3.1. Heterogenous processors 2.3.3.2. Homogenous processors 2.3.4. Exact solution; 2.3.5. Independent tasks case; 2.4. A little-studied model; 2.4.1. Model; 2.4.2. A heuristic based on graphs; 2.4.2.1. Transformation of the problem; 2.4.2.2. Modeling; 2.4.2.3. Description of the heuristic; 2.5. Conclusion; 2.6. Bibliography; Chapter 3: A Comparison of Some Valid Inequality Generation Methods for General 0-1 Problems; 3.1. Introduction; 3.2. Presentation of the various techniques tested; 3.2.1. Exact separation with respect to a mixed relaxation; 3.2.2. Approximate separation using a heuristic 3.2.3. Restriction + separation + relaxed lifting (RSRL) 3.2.4. Disjunctive programming and the lift and project procedure; 3.2.5. Reformulation-linearization technique (RLT); 3.3. Computational results; 3.3.1. Presentation of test problems; 3.3.2. Presentation of the results; 3.3.3. Discussion of the computational results; 3.4. Bibliography; Chapter 4: Production Planning; 4.1. Introduction; 4.2. Hierarchical planning; 4.3. Strategic planning and productive system design; 4.3.1. Group technology; 4.3.2. Locating equipment; 4.4. Tactical planning and inventory management 4.4.1. A linear programming model for medium-term planning

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## Sommario/riassunto

Combinatorial optimization is a multidisciplinary scientific area, lying in the interface of three major scientific domains: mathematics, theoretical computer science and management. The three volumes of the Combinatorial Optimization series aim to cover a wide range of topics in this area. These topics also deal with fundamental notions and approaches as with several classical applications of combinatorial optimization. Concepts of Combinatorial Optimization, is divided into three parts:- On the complexity of combinatorial optimization problems, presenting basics about worst-case and randomi

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