

Combinatorial optimization problems in planning and decision making: Theory and applications

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Abstrak

The book focuses on the next fields of computer science: combinatorial optimization, scheduling theory, decision theory, and computer-aided production management systems. It also offers a quick introduction into the theory of PSC-algorithms, which are a new class of efficient methods for intractable problems of combinatorial optimization. A PSC-algorithm is an algorithm which includes: sufficient conditions of a feasible solution optimality for which their checking can be implemented only at the stage of a feasible solution construction, and this construction is carried out by a polynomial algorithm (the first polynomial component of the PSC-algorithm); an approximation algorithm with polynomial complexity (the second polynomial component of the PSC-algorithm); also, for NP-hard combinatorial optimization problems, an exact subalgorithm if sufficient conditions were found, fulfilment of which during the algorithm execution turns it into a polynomial complexity algorithm. Practitioners and software developers will find the book useful for implementing advanced methods of production organization in the fields of planning (including operative planning) and decision making. Scientists, graduate and master students, or system engineers who are interested in problems of combinatorial optimization, decision making with poorly formalized overall goals, or a multiple regression construction will benefit from this book.