Heiner Müller—Merbach

OPTIMALE REIHENFOLGEN

(Optimal successions)

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The optimal successions problems, belonging to the operational research field, found a series of practical applications, more particularly after 1960. The merit of the author, Prof. Dr. Heiner Müller-Merbach, is that he succeds in presenting in this book various methods, procedures and recent practical applications of optimal succession problems. In this work the author gathers problems containing elements to be ordered in an optimal succession. As examples we indicate: the minimum distance determination between a certain number of localities (the known Traveling Salesman Problem); optimum loading of machines (ordinancing); finding the optimum path between vertexes in a linear, finite, n—dimensional space. It is supposed that, for the numerous successions which can be done, purpose functions will be computed, and that succession whose purpose function value will be either maximum, or minimum, shall be the optimal one.

The author pays everytime attention to the formulation of an algorithm, to its discussion from various viewpoints, showing also the computer programming possibilities. A series of new procedures, as concerns solving of "optimal succession problems" have been tested and the results obtained are thoroughly analyzed.

As the majority of the problems dealt with in this work have a structure similar to a graph, and as some solving methods are based upon the graph theory, the author explains a series of notions of the graph theory, which are subsequently used whithin the chapters regarding "optimal paths in networks", as well as the most important optimal succession computation methods.

The most important part of the work is devoted to the Traveling Salesman Problem, which, as the author shows, often appears as synonymous with the "optimal succession" problem.

Further on the so-called "Chinese Postman" Problem, whose study was initiated in 1960, by Mei-Ko Kwan, is presented. Unlike the Traveling Salesman Problem, consisting of finding out the optimal path in a graph, the condition being to reach every node a single time, in the Chinese Postman Problem that path is to be found out which contains every graph arc at least one time (this problem is similar to that of the Königsberg bridges, formulated by Euler in 1736).

Dealing with the optimal machine loading problems, the author pays special attention to establishing priority rules. Johnson's classical problem (Job Shop Scheduling Problem) is also presented, the author insisting on its practical applications.

Prof. Dr. Heiner Müller-Merbach's book applies to both theorists and practitioners, as it allows all interested people to get fairly quickly acquainted with the optimal-succession problems structure and with their solving manner.

CAMELIA RAȚIU-SUCIU