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A dynamic programming algorithm for the discounted \(0 - 1\) knapsack problem with setup. (Chinese. English summary) [Zbl 07404443]

Summary: Aiming at the problem of choosing different production machines and molds for the several types of products, we propose an extended model of the discount \(0 - 1\) knapsack problem \((D\{0-1\}KP)\), that is, the discount \(0 - 1\) knapsack problem with setup \((D\{0-1\}KPS)\). Firstly, this paper analyzes the theory of \(D\{0 - 1\}KPS\), and constructs its sub-model. Then based on the recursive formula for solving the problem, we give a dynamic programming algorithm for solving \(D\{0 - 1\}KPS\). Finally, we found through an example that it is a valid and feasible algorithm.

MSC:
90C27 Combinatorial optimization
90C39 Dynamic programming

Keywords:
discounted \(0 - 1\) knapsack problem; dynamic programming