On Solving Large-Scale Instances of the Knapsack Problem with Setup by means of an Iterated Greedy Algorithm

Resum

This paper proposes a modified iterated greedy algorithm for solving an NP-hard knapsack problem known as the knapsack problem with setup. In contrast to the classical 0-1 knapsack problem, items belong to different classes, and choosing at least one item from a specific class causes a class setup capacity to be consumed and a reduction of the total profit in terms of a penalty that has to be paid. The performance of our technique was compared with those of both a sophisticated, tree-search based, heuristic from the literature and the application of CPLEX to the respective ILP model. Experimental results show that the proposed technique outperforms the heuristic from the literature and yields better performance than CPLEX for medium and large size problem instances.

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