
Polyhedral study of the Symmetrically Weighted Matrix Knapsack problem

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Abstract

The Symmetrically Weighted Matrix Knapsack problem (SWMK) is a knapsack with M groups of N ordered items. Precedence constraints are such that an item can only be selected in a feasible solution if the previous one in the same group is selected. Item i of any group has the same weight, thus the knapsack being symmetrically weighted.

With the use of a structure called Patterns, necessary and sufficient conditions, that can be verified in polynomial time, are described for a set of facet defining inequalities for the SWMK.

More recent work aim to generalize these conditions to a larger set of facet defining inequalities.

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