

Efficient Approximation Method for Multi-Product Production Planning with Grade Transition

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In this study, we develop an efficient approximation method for solving the problem that is computationally intractable in rigorous MILP approach with hundreds of products. The approximation method consists of three stages of MILP model: 1) problem breaking out model which decomposes a huge original problem to reasonable sizes of sub-problems 2) sub-problem model which is same as the rigorous MILP model 3) final sequencing model which links the sub-problem solution and generate the final solution of the original problem. To prove efficient of the proposed approach, we compare solutions of the proposed approach to the optimal solution of the rigorous MILP formulation as well as computational time for computationally tractable sizes of examples. The proposed approach is also applied to solve a problem with 500 grades that cannot be solved by a rigorous MILP approach.