

The Scheduled Joint Replenishment Problem

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We focus on a stochastic Joint Replenishment Problem setting with a single item, one warehouse and multiple retailers. The novel aspect of this setting is that the retailers' opportunities for replenishment are constrained by cyclical schedules. We model the underlying Markov Decision Process and determine the optimal joint replenishment policy for small instances via a value iteration approach. Our numerical analysis investigates the influence of the schedule on the structure of the final solution and the performance of classical heuristic solution structures in the scheduled setting. We propose an adaptation of the can-order policy as a heuristic procedure and design a Genetic Algorithm to efficiently obtain well-performing parameters.