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Branch-and-Cut Algorithms for the Split Delivery Vehicle Routing Problem

In this work we consider two exact branch-and-cut algorithms for the Split Delivery Vehicle Routing Problem (SDVRP) based on two relaxed formulations that provide lower bounds to the optimum. Procedures to obtain feasible solutions to the SDVRP from a feasible solution to the relaxed formulations are proposed. The computational results were run on 4 classes of benchmark instances. The new approach is able to prove the optimality of 21 new instances with the first relaxed formulation and of 15 new instances with the second one. In particular, the branch-and-cut algorithm based on the first relaxed formulation is able to solve most of the instances with up to 50 customers and two instances with 75 and 100 customers.