The Off-line Group Seat Reservation Problem

In this paper we address the problem of assigning seats in a train for a group of people traveling together. We consider two variants of the problem. One is a special case of two-dimensional knapsack where we consider the train as having fixed size and the objective is to maximize the utilization of the seats in the train. The second is a special case of two-dimensional bin packing where all requests must be accommodated while trying to minimize the number of passenger cars needed. For both variants of the problem we present a number of bounds and develop exact algorithms. Computational results are presented for various instances based on realistic data, and from the packing literature adapted to the problems addressed.

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