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# Driver and Vehicle Routing Problem

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## Abstract

We introduce a combinatorial optimization problem that consists of finding the optimal set of routes that must be performed by vehicles and drivers to minimize the overall performance cost. We model it as a vehicle routing problem with two depots. There are two types of routes. The drivers' routes start and end at the same depot. The routes of the vehicles start at a depot and end at the other one. All the routes must be performed by a driver and a vehicle at the same time. An important aspect of the problem is the synchronization of drivers and vehicles. The drivers can make a vehicle change only in a particular set of nodes. We propose a mixed integer programming formulation and design a branch-and-cut algorithm to solve the problem.

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