

A Matheuristic Approach for the High School Timetabling Problem

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The school timetabling is a classic optimization problem that consists of scheduling a set of class-teacher meetings in a prefixed period of time, satisfying requirements of different types. Due to the combinatorial nature of this problem, solving medium and large instances of timetabling to optimality is a challenging task. When resources are tight, it is often difficult to find even a feasible solution. In this study, we propose a matheuristic approach for the high school timetabling problem that combines a fix-and-optimize heuristic with a variable neighborhood descent method. The experimental results show that our approach provides high quality feasible solutions in a short computational time when compared with results obtained with the mixed integer programming solver CPLEX. In addition, we have improved best known solutions of 7 out of 12 instances from the literature. Among them, three are new optimal solutions for classical instances that have been available since 2000.

Keywords High School Timetabling · Matheuristics · Fix-and-optimize · Variable Neighborhood Descent

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