Various Methods for Solving the Tents Game

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The Problem

We are given an $n \times n$ grid with trees in some cells and two lists of $n$ integers, specifying the number of tents in each row and column. Our goal is to place tents on the map such that:

- Every tree has exactly 1 tent associated and adjacent (not diagonally) to it.
- Each tent must be associated with a single tree.
- There are no adjacent tents – no two tents in vertically, horizontally or diagonally neighboring cells.
- Each row and column contains tents according to the specified number.

Solving The Problem

We have solved the problem in two ways:

- Translating the instance to a CNF formula whose solution describes a legal solution to the problem, and using a SAT solver.
- Reducing the instance to finding a solution to a system of linear inequalities in integer variables, and using an ILP solver.

Smart Map Generation

- Generating solvable maps in polynomial time.
- Statistical analysis of tree coverage in generated maps.
- Constructed maps with a large number of solutions.

Bibliography