

Combinatorial optimization: packing and covering

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Abstrak

This monograph presents new and elegant proofs of classical results and makes difficult results accessible. The integer programming models known as set packing and set covering have a wide range of applications. Sometimes, owing to the special structure of the constraint matrix, the natural linear programming relaxation yields an optimal solution that is integral, thus solving the problem. Sometimes, both the linear programming relaxation and its dual have integral optimal solutions. Under which conditions do such integrality conditions hold? This question is of both theoretical and practical interest. Min-max theorems, polyhedral combinatorics, and graph theory all come together in this rich area of discrete mathematics. This monograph presents several of these beautiful results as it introduces mathematicians to this active area of research.