

Lexicographical polytopes

Abstract

Within a fixed integer box of \mathbb{R}^n , lexicographical polytopes are the convex hulls of the integer points that are lexicographically between two given integer points. We provide their descriptions by means of linear inequalities. By exhibiting the link between lexicographical and superdecreasing knapsack polytopes, our results give alternative, significantly simpler and shorter proofs of the main results of [A. Gupte, Convex hulls of superincreasing knapsacks and lexicographic orderings, Optimization Online]. This is a joint work with Roland Grappe, Mathieu Lacroix and Clément Pira