Global QCQP Solver

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QKP

The quadratic knapsack problem

$$\begin{aligned} \text{Maximize} \quad & x^T Q x + 2 q^T x \\ \text{s.t.} \quad & a_i^T x \leq b_i, \forall i \\ & 0 \leq x \leq e \end{aligned} \tag{1}$$

Adopt SDP: Method-I, add $\mathsf{diag}(Y) = x$

- record Gurobi integer solutions as gurobi
- for a *max* problem, Gurobi relaxation gurobi_rel and SDP relaxation sdp_qcqp1 should produce upper bounds.
- gurobi_rel itself uses branch-and-bound, so the optimal solution is somewhere in $[L^{\text{gurobi\_rel}}, U^{\text{gurobi\_rel}}]$ where L, U is the lower bound and upper bound, respectively