

Linear and Integer Optimization

Programming Exercise 1

Inofficial English Translation

Implement the IDEALIZED ELLIPSOID ALGORITHM to decide if a given polyhedron $P = \{x \in \mathbb{R}^n \mid Ax \leq b\}$ has a volume that is smaller than a given value ϵ . If the volume is not smaller than ϵ , a vector in P is to be returned. You do not have to take rounding errors into account for this implementation. You are invited to extend your program so that it actually solves linear programming, but this is not necessary for the exercise. The program must be written in C or C++. It is recommended to use C++. You may include parts of the C++ standard library if necessary. Other external libraries may not be used. The program must work correctly and compile without error messages. The code must work on a common Linux system. Also make sure that you provide your program with sufficient comments.

The program is to be started by a command line call and read a text file whose name is passed to the program as a first argument. The second argument passed to the program is the value ϵ . The input format is the same as for the first programming exercise.

(20 points)

Due date: Thursday, June 30, before the lecture. The submission is done via e-mail to your tutor.