Programming Assignment (optional[1])

due: 1 Jan 1997

Choose **one** of the following topics:

- Kd-tress for orthogonal range queries
- Linear programming by a randomized incremental algorithm

For either choice, write a program that solves the problem in any small dimension d. You may assume $d \leq 10$. The program should produce graphic output for the case $d = 2$. Conduct and report experiments to measure the running time in practice as a function of both n and d (where n is the number of points or of constraint halfspaces). Write in your favorite programming language among C, C++, Pascal and Java.

The submission should include:

- a brief description of the program, its input and output; no need to describe the algorithm here but any modification of the original algorithm or special decisions made in your implementation should be explained,
- a well-documented source listing,
- examples of input and output, including graphic output of 2D instances,
- report on experiments.

For the kd-trees program, experiment also with different size box (rectangle) queries. For the LP option, your program should also support queries whether a simple polygon is star-shaped (if yes it should give a witness point).

Make sure you can demonstrate the program on a computer in the school.

The grade of this assignment is 20% of the final grade, and it will be taken into consideration only if it improves the final grade.

[1] TARGIL RESHUT