

Theoretische Informatik (Kernfach) SS 2004
Exercise Set 10

Exercise 1

Formulate the problem of finding a Hamilton cycle in an undirected graph G as an integer programming problem, improving the ideas from exercise 3 of exercise set 9. That is, given G , construct an integer program from whose solution one can read off whether G has a Hamilton cycle.

Exercise 2

Assume a linear programming algorithm is available as a black box. How can it be used to solve the following geometric problems:

- (a) Given points p_1, p_2, \dots, p_n and q_1, q_2, \dots, q_m in the plane, decide if there is a line l such that all the p_i 's are on one side of l (strictly) and all the q_i 's are on the other side.
- (b) Let P and Q be convex polygons in the plane. Find the largest $\lambda > 0$ such that P contains a translated copy of λQ (Q scaled by the factor λ).
- (c) Let P be a convex polygon in the plane. Find the largest $r > 0$ such that P contains a disc of radius r .

Exercise 3

Exercise 2.1 from chapter 'Point Location'.

Exercise 4

Exercise 2.3 from chapter 'Point Location'.