Assignment no. 1

due: March 14th, 2011

The letter **(p)** after the exercise number indicates that this exercise has a programming component.

The marking **(p2)** after the exercise number indicates that this exercise has a programming component, and that you can work on it and submit it in *pairs*.

Exercise 1.1 (p) Write a program that solves Oskar's cube. In the course's website there is a link, where you will find the input matrices that describe the faces of the cube. You will also find there the specifications how to output a solution path from start to goal such that the output of your program can then be run by the graphical program at the site—this way you can verify the correctness of your solution.

Exercise 1.2 We are given a convex polygonal robot P with m vertices that is free to translate inside a convex polygonal room Q with n vertices. The only obstacles to the motion of P are Q's walls. What is the maximum combinatorial complexity of the free space in this case? Describe an efficient algorithm to compute it.

Exercise 1.3 (p2) Implement a solution of Exercise 1.2.