

10-th Bulgarian National Olympiad in Informatics

March, 1994

Senior students (15-19 years old)

Let us consider a set P containing points with integer coordinates (x,y) for which $0 < x < a$, $0 < y < b$, for some integers a and b . Write a program, that solves the following problems:

Problem 1. Input the data from text file PTS . TXT containing the coordinates of the points of P . The file has the following structure:

row 1:	$a\ b$
row 2:	$x_1\ x_2$
...	...
Last $(k+1)$ -th row	$x_k\ y_k$

The number of points is not known before reading the data from the file.

Your program should render on the computer screen the points of P .

Problem 2. Every point of P should be colored in blue or red, so that the difference of numbers of blue and red points located on any straight line, which is parallel to one of the coordinate lines, should not be greater than 1. Your program should render on the computer screen no more than two coloring of points of P .

Problem 3. Construct a rectangle, which satisfies simultaneously the following two conditions:

- a) Its vertices have integer coordinates and its sides are parallel to the coordinate lines;
- b) The number of points of P , which are within the rectangle are equal to the number of points, which are outside the rectangle.

Remark: The points located on the sides of the rectangle are neither inner, nor outer to the rectangle.

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