Problem Descriptions

Problems from the national competition[1] in programming are taken from the following url:

https://dms.rs/informatika-osnovne-skole/

Original descriptions of problems are given with test examples and all contain some interesting semantics.[2]

Short descriptions of problems used in our evaluation (excluding most of the unnecessary semantics) follows:

PLES (dancing) Write a program that reads height of three friends (given as three different integers, representing centimetres) and sorts them in descending order.

OBUKA (training) Given two integer numbers representing the hour when the first person entered and exited the room, and two integer numbers representing the same for the second person, calculate how many hours have they spent together in the room.

ZBIR (sum) Calculate the sum of squares of all odd digits in a decimal representation of a given integer.

DELIOCI (dividers) A next element in a recurrent sequence of natural numbers is calculated by increasing the previous number by the number of its proper divisors. Given the first element of the sequence, and the number N, calculate the N-th.

DZEPARAC (pocket money) During five days a girl has been given her daily allowance (each day a different amount). Write the name of the day and the amount that has been maximal during that week.

SLIKA (picture) Find the area of the intersection of two given rectangles (each given by integer coordinates of its two opposite vertices).

KVIZ (quiz) Given a digit and a series of natural numbers with all different digits, count how many of those natural numbers contain that given digit (in their decimal representation).

STATUSI (status) Given a series of different valid dates, write the program to calculate the length of the longest increasing subseries (of consecutive elements).

GLUMCI (actors) Given a series of intervals of the number line (given by their two integer coordinates) calculate their intersection (or write that it is empty).

STOLICE (chairs) On each square meter of a room a chair or a table can be put. Around each table eight chairs can be put, and each chair must have a corresponding table. Given the dimensions of the room calculate the maximal number of chairs that can be put in the room. For example, the following is one valid arrangement (with two tables and 10 chairs) with the maximal number of chairs.

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[1] National competition was organized by Mathematical Society of Serbia (url: https://dms.rs/), member of European Mathematical Society (url: http://euro-math-soc.eu/corporate/mathematical-society-serbia).

[2] Original problem descriptions from the second stage can be found here https://dms.rs/wp-content/uploads/2017/04/Okruzno2017OS-FinalnaFormulacija.pdf.