



The Bulgarian Teams



In 2008 the Bulgarian IOI team returned from Cairo with two silver and two bronze medals. Three of the contestants - Momchil Tomov, Rumen Hristov, and Stefan Avramov - will take part in the big competition this year as well.

Bulgaria - 1st Team

Bulgaria - The Homeland of International...

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With teams of six students, which was the case in IMO, it would have been difficult for organizers to ensure support for local expenses of participants and to provide the necessary number of computers (APPLE II compatibles or IBM PC/XT/AT/ compatibles) for all contestants. Another deviation from the practice of IMO was that, while doing the preliminary assessment of the papers, the team-leader had the right to talk to the participant and to ask for explanations of his/her work. This helped significantly the process of marking the papers. At the end of the competition each team leader, accompanied by a member of the Coordinating Commission, collected the solutions from the members of the respective team. The work of each student (the final version of the solution) was copied on two floppy disks. One remained with the team leader and the other stayed with the Coordinating Commission. The program of each student was run with a set of preliminary prepared (and approved by the Jury) Test Examples.

Thirteen countries sent teams to the first IOI. These were (alphabetically): Bulgaria, Cuba, Czechoslovakia, Federal Republic of Germany, German Democratic Republic, Greece, Hungary, Peoples Republic of China (PRC), Poland, Soviet Union (, Vietnam (V), Yugoslavia (YU) and Zimbabwe (Z). The teams from Hungary and from Yugoslavia had two students each. Bulgaria participated with two teams, and the Soviet Union with three teams. Thus, altogether, there were 46 students distributed in 16 teams. The International Jury consisting of Chairman (Petar S. Kenderov), Deputy Chairman (Nelly Maneva) and the team leaders gathered on Wednesday morning (May 17, 1989) to select a problem for the competition. A special Scientific Commission had prepared in advance six problems based on suggestions made by team-leaders before the IOI. The International Jury selected one of those six problems, which was originally proposed by China. Then the problem was refined and formulated in the official languages of the Olympiad: English and Russian. The

team-leaders translated the problem into the respective languages understandable for their students. The competition itself started in the afternoon of May 17th, 1989. The students had four hours to solve the problem. Each student had a microcomputer at his/her disposal. According to the personal preferences of participants, most computers were IBM PC compatible. They were provided by the organizers. The team from the Federal Republic of Germany and one of the teams from the Soviet Union participated in IOI with their own equipment.

Here is the problem given at the first IOI (by default N stands for an arbitrary positive integer):

Given $2N$ boxes in line, side by side; two adjacent boxes are empty, and the other boxes contain $N - 1$ symbols „A“ and $N - 1$ symbols „B“.

Example for $N = 5$.

A B B A A B A B

Exchanging rule:

The contents of any two adjacent non-empty boxes can be moved into the two empty ones, preserving their order.

Aim:

Obtain a configuration where all A's are placed to the left of all B's, no matter where the empty boxes are.

Problem:

Write a program that:

1. Inputs from the keyboard the initial state as a sequence of A's and B's and zeros (for the empty boxes), and models the exchanging.

2. For a given initial state finds at least one exchanging plan, which reaches the aim or reports that such a plan does not exist. The output should contain the initial state, the intermediate states after each step, and the final state.

3. Finds a plan reaching the aim with a minimal number of steps.

Results:

Present at least one solution for the example mentioned above.

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