Issue 5, Monday, August 22nd

Nowy Sącz, POLAND 2005
The 17-th International
Olympiad in Informatics

NEWSLETTER

of the 17th International Olympiad in Informatics, Poland 2005

Happened on this day

1864: formation of The International Red Cross
1911: the famous Mona-Lisa painting by Leonardo da Vinci stolen from Louvre (Paris)
1939: aerosol spray was patented

A problem leaked out!!

The procedures that prevent the problems from leaking out before the contest are not as good as we thought. Last night we came across one of the tasks for today in a litter bin. In order to make odds even we decided to publish it. Unfortunately the text was only available in Nahiri, but we hope you will manage.

In order to advertise the technology invented in the Construction LTD, the factory issued a puzzle. The puzzle consists of boxes of blocks. A block is a sequence of black and white cubes glued to form a segment. A box contains exactly 2 blocks (their order is important). There are n types of boxes numbered 1,...,n. All boxes of the same type are identical. You have an unlimited number of boxes of each type. To solve the puzzle you should build two identical, nonempty walls (sequences) of cubes, by repeating the following procedure. In each step you choose one box of some type and use the first block from this box to augment the first wall and the second block to augment the second wall. Once the two walls built become identical, the problem is solved. You must not flip the blocks.

For example, suppose there are three types of boxes: (wbb, w) is type 1, (w, bbw) is type 2, (b, bbb) is type 3.
Choosing 1,1,3 as the sequence of types we get two walls: the first one is wbbwbbb and the other wbbbb.
Choosing 1,2 we get the wall sequences wbbw and wbbw. In this case they are identical.

Your task is to write a program that reads from the standard input the number n and the contents of n types of boxes and computes the minimum number of steps described above needed to make two equal walls.

SECOND CONTEST DAY

CONTESTANTS

7.00 - 8.15	breakfast
8.30 - 13.30	contest
13.30 - 15.30	lunch
15.30 - 17.00	results, appeals
18.30 - 19.45	dinner

LEADERS

8.30 - 9.45	breakfast, GA Meeting 6, Q&A session
13.30 - 15.30	lunch
15.30 - 17.00	results, appeals
18.30 - 19.45	dinner
20.00 - 21.30	GA Meeting 7

GUESTS

7.30 - 8.30	breakfast
8.30 - 22.30	Tatra Mts. and Zakopane excursion

WWW — Sport

When	Where	What
13.30- -22.00	Campus, next to building G	various sports
all day	Dormitories at John Paul II Street - basement	Table tennis
19.15 or 20.15	Swimming pool, booking required. Call: 0-501-247-872 to book. Forty entries for each hour. Meeting next to building G.	

WEATHER FORECAST

Sunny with minor clouds

morning	**18°C / 64°F**
afternoon	**22°C / 72°F**
evening	**18°C / 64°F**

Quotation of the day:

If the computers get too powerful, we can organize them into a committee — that will do them in.

While the leaders and guests were rafting on the Dunajec river, the contestants went to Wieliczka and Cracow. The editors were among those who visited the salt mine before going to the city.

Deep under the ground

Everyone likes it here

We thought the time zones had changed yesterday as we were entering the salt mine in Wieliczka. Why? Because we entered the shaft almost an hour later than the itinerary said. It was, however, worth waiting for.

'Will these stairs ever end?' — asked the participants as we were going down the endless staircase. They ended indeed, after 380 steps and about 50 left turnings, which caused slight dizziness. Afterwards there was only the salt. Salt to lick from the walls, eat and inhale. The salty potato chips in the underground bar were too much for us. 'Please do not consume more than 5 kg of salt from the walls' — said our guide. No one did, some even claimed that the salt straight from the mine was less salty than the usual one. Have you ever tried milk straight from the cow?

It took us two hours to see everything. It was really impressive. Maksud from Azerbaijan was positively surprised: 'I was afraid there might be nothing interesting in a place like this, yet it is really amazing. But it's really cold down there!'. It was chilly indeed. St. Kinga's chapel, the biggest underground chapel in the world, won our quick survey for the most attractive feature of the tourist route. Raphael from Brasilia had not expected to find such a large chamber 100 meters underground. He especially liked the sculptures (guess what they were made of).

The French team was most excited to see the underground lakes, which contain over 30% of... guess what, dissolved in the water. It was not allowed to swim in there, even though one cannot drown anyway. Another curiosity of the mine was that all the construction supporting the mine was made of wood, which preserves for long ages, and even strengthens thanks to the... you know what.

At the end of the route there was a large chamber used as a conference room. On behalf of the IOI Organizers we recommend it as a great location for one of the future contests. There is enough room for the contestants, and the air-conditioning is not a problem at all. Other chambers would be appropriate for the GA, technical staff etc.

We only saw one element that needed to be fixed. This... ugh... mineral whose name we avoid to mention, is not very tasty in large amounts. Next year we suggest a trip to a sugar mine instead. Is there one in Mexico?

In Cracow there was time to eat, walk and admire. The buses emptied quickly and everyone spread around the Old Town. It was time to see as much as possible during the short stay there.

Who is who

Christopher Chen from Australia and **Javid Mahmud-zade** from Azerbaijan, the youngest contestants of IOI'2005

Basketball players would be upset

Some have it worse than computer scientists

Today: the final tasks

Have you had enough rest during the yesterday's excursion? Do you miss the contest atmosphere after a one day break? If both answers are yes, welcome to the contest day two. No matter how you did on Saturday, try to do your best today. We wish you scores even higher than the previous ones. And remember: the main goal of the competition is to have fun.

Good luck today!

How do they work? — part 1

The Olympiad means not only the contestants, but also lots of people supporting it. Here is a short guide of who they are and how they work.

Guides

As you well know their work day is longer than yours. Some of them are assigned to the teams or leaders, others supervise the trips. They are virtually everywhere and look after you all the time. They get up earlier than you — on the contest days, for example, when they have to wake you. Can they finally get some rest when you are busy with the tasks? No, not exactly. They are responsible for watching you in the rooms and hallways then. They also deliver your clarification requests (we saw them in a hurry).

All guides have a briefing each day, during which they learn all the organizational details, so that you don't have to bother with that. Example: getting on the right bus at the right moment. Despite all these duties most of the guides we talked to were enthusiastic about their teams. 'We like our teams a lot. They are very nice people. The time we spend with the contestants is a sheer pleasure for us' - says one of them.

Secretariat

These are the first people to appear at the campus in the morning, and the last ones to go to bed in the evening. Their task is to keep everything under control. How they handle it remains a secret - we guess it is thanks to their skills and involvement. Multiple workstations, printouts, copies, e-mails and telephones to be answered, arranging and scheduling events, trips and buses, other planning, preparing badges, web page maintenance, distributing information, handling unexpected situations. Uff...

Technical staff

The men in black. Their working hours are irregular - either they are very busy and sleep 3 hours a day, or they have nothing to do for long hours. It all depends on what is currently happening and how much attention the equipment requires. Their periods of sleep get dramatically shorter before the contest days, when they assist the translators the whole night until early morning and then supervise the competition. Afterwards you can find them catching a short nap in unusual places.

ENTERTAINMENT

Long, long time ago...

‘I think there is a world market for maybe five computers.’
Thomas Watson, chairman of IBM, 1943

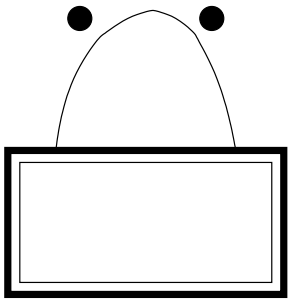
‘Computers in the future may weigh no more than 1.5 tons.’
Popular Mechanics, forecasting the relentless march of science, 1949

‘But what ... is it good for?’
Engineer at the Advanced Computing Systems Division of IBM, 1968, commenting on the microchip.

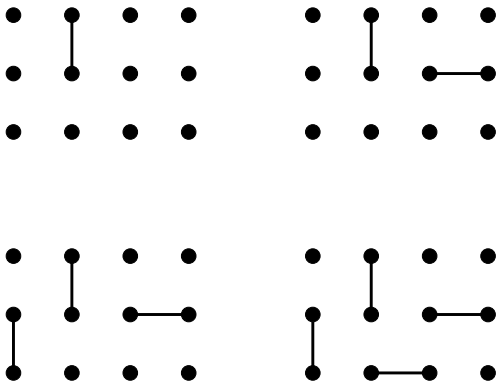
‘There is no reason anyone would want a computer in their home.’
Ken Olson, president, chairman and founder of Digital Equipment Corp., 1977

Puzzle: Hanging a picture

There is a picture with a string attached to it, used to hang the picture on a wall. There are two nails in the wall. Your task is to figure out the way of hanging the picture on the wall (that is arranging the string around the nails) in such a way that removing any of the nails will cause the picture to fall on the floor.



Pencil & Paper game: Stop Gate



The ‘horizontal’ player wins

It is a game for two players. The board is a rectangular grid of dots (it can be of any size). The first player draws a horizontal or vertical line connecting two adjacent (horizontally or vertically) dots. The player will use this direction during the game, while his/her opponent will use the other one. Each move consists of connecting two adjacent (in the appropriate direction) dots, none of them being an endpoint of any already existing connection.

The player who is not able to make a move loses the game.

Solutions to yesterday’s logic puzzles: John: Consider asking the following questions:
a) Is John lying? (if the answer is 'no' then you are talking to John)
b) Are you John? (if the answer is 'no' then John is lying)
If you do not believe it, you can test these questions for all 4 possibilities (you are talking with John or his brother, John is lying or not).
Prisoners: One prisoner is chosen to be a supervisor. All the others will have to notify the supervisor that they have been to the room. Each of them will have to make the notification exactly once. The supervisor counts these messages and when he gets a suitable number of notifications he notifies the wardens.
But how can the prisoners make the notifications? One of the switches (let us call it ‘A’) is used for making notifications and the other one (‘B’) is used when the prisoner wants to take no action. A prisoner notifies the supervisor by moving switch A ‘on’ (if the switch is already in that position, the prisoner waits with making notification until his next visit in that room). The supervisor moves switch A ‘off’ after each notification.

Rush hour

This is the Rush hour task No 5.

Submit your *Rush hour - The challenge* entries to the editors until 5p.m. (room 016B). You may also submit the entries at the reception desk or ask the guides to pass them to us.

Today’s puzzle comes from www.g5.dk/bilspil/cargame.asp

Polish your Polish

a computer - **komputer**
a mouse - **mysz**
a keyboard - **klawiatura**
a screen - **ekran**
a room supervisor - **salowy**
my computer doesn’t work! -
- mój komputer nie działa!