

Israel: The Regional and National Competitions

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The Israeli NOI 2011

NEW!

Stage	#Students	#Days	Activity
Regional	1442	1	Written Exam
National	668	1	Written Exam
Advanced	50	7+Homework	Programming
Team	4 (+3)	7+Homework	Programming

Population of Israel: 7,000,000 people

The Regional Stage

- Pen & Paper
- 2 hours
- 110 schools (20%)
- 1442 students
- Algorithmic tasks
- Answer by computing (Burton 2010, Kubica & Radoszewski 2010)

Example Question (Q2)

- Section 1 (Kubica & Radoszewski):
 - What is the lowest integer that cannot be generated by adding numbers of the following set: {4, 97, 357, 29, 22, 7, 14, 377, 1, 80, 331, 2, 320, 401, 258} ?
- Advantage:
 - Doesn't require experience in describing algorithms
- Drawbacks:
 - Calculation mistakes
 - Doesn't distinguish between an *intuitive understanding* and a *full insight*.

Addressing the drawbacks

- Addressing calculation mistakes:
 - A “hint” is added to Section 1, such as:
 - “The sum of the digits of the answer is 14”
 - Hint helps to verify the answer
 - Hint does not help to solve the question
- Distinguishing levels of understanding:
 - A second, more subtle, section is added:
 - Is there an integer in the set, whose replacement with its doubled value will yield a larger result in Section 1? (if so, which integer?)

Statistics

- Can we trust “answer by computing” exams?
 - We asked each student to explain his/her method of computation.
 - #Students: 1442
 - Section 1:
 - #(Correct number): 443
 - #(Wrong number, correct method): 13
 - Section 2:
 - #(Correct number): 203

The National Stage

- Who is invited:
 - Anyone who got a 80+ in the regional
 - Anyone who fully answered Q2, Q3 or Q4 in the regional
 - The 2 highest scoring students from each school
 - Anyone else who asks for an invitation

The National Stage

- An example task (Q3):
 - Given a $2 \times N$ matrix, randomly colored black and white, and an operator that switches the colors of the cells in a given rectangle of cells; output a minimal sequence of invocations of the operator to turn the matrix into a chessboard coloring.