

20 Years of IOI Competition Tasks

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Major Periods in the Evolution of IOI Tasks

	1st Lustrum 1989 – 1993	2nd Lustrum 1994 – 1998	2nd Decennium 1999 – 2008
Hours per day	4	5	
Tasks per day	1	3	
Scoring principle	Partly subjective	Based on test runs only	
Grading method	Manual	Automatic	
Present at grading	Evaluator, leader, and contestant		No-one
Grading platform	Contestant computers		Central Linux server
Task types added	Batch	Interactive	Output-only
Preparation	Host SC only		ISC supervision

Classification Criteria

- **Task type:** **B**atch, **I**nteractive, **O**utput only, **T**heoretical

- **Relative difficulty level** (if possible):

Easy = 40%–100% of contestants score $\geq 90\%$

Medium = 10%– 40% of contestants score $\geq 90\%$

Hard = 0%– 10% of contestants score $\geq 90\%$

- **Technical features:**

1. given context and input
2. computational task and output
3. algorithmic ingredients of good solutions

Classification Examples

1. IOI 1989, Pravetz, Bulgaria

[Exchanging Boxes]	B	M	Seq; Srt, Opt; iGr, BFS
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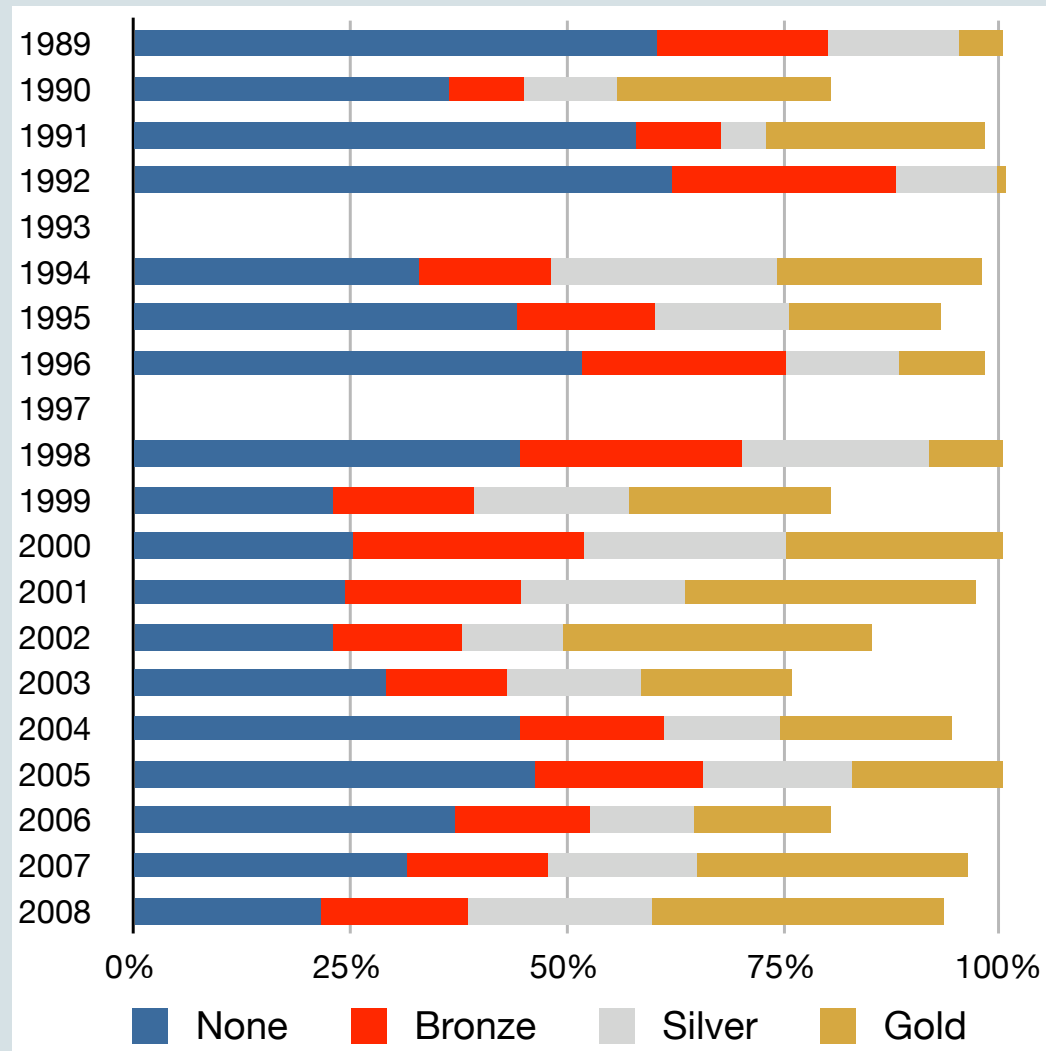
7. IOI 1995, Eindhoven, The Netherlands

Packing Rectangles	B	M	2d CG, Rect; Area, Opt, Enum; ES
Shopping Offers	B	M	Constraints; Comb Opt; DP
Printing	T	M	Program analysis & modification
Letter Game	B	E	String list; Opt, Enum; ES
Street Race	B	M	Gr; Vertex Cnt, Enum; P
Wires and Switches	I	M	Find mapping; BS

13. IOI 2001, Tampere, Finland

Mobile Phones	I	H	2d Grid; Rect Cnt; Binary Tree
Ioiwari Game	I	M	2p Gm; Win; iGr, minimax
Twofive	B	H	String, Num, iSeq; (un)Rank; MI, Pc, DP
Score	I	M	2p Gm, Labeled Gr; Win; DFS, minimax
Double Crypt	O	M	Crypto func; Find keys; Hash, MM
Depot	B	H	2d Grid, Num Seq; Inverse, Enum; BT

Relative Cut-off Scores for Medals



Conclusion

- 101 IOI competition tasks in 20 years
- We should (better) preserve our historic record:
computing platforms, constraints, results per task per contestant,
test data & motivation, checkers, problem analyses, exemplary
pseudo code, documented program texts
- The relative difficulty of the task sets has increased (too much)
`olympiads.win.tue.nl/ioi/sc/documents/statistics-summary.txt`
- Call for correction, refinement, and extension of the gathered data
- Put this data on-line