

Challenges in Running a Computer Olympiad in South Africa

Bruce Merry¹ Marco Gallotta² Carl Hultquist²

¹ARM Ltd

²Department of Computer Science
University of Cape Town

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- ICT infrastructure in SA schools
 - Affluent suburbs
 - Computers with Internet common
 - Computer Studies classes available at some schools
 - Poorer areas
 - Lack the most basic of facilities
 - No computers or Internet



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Representative Computer Olympiad

- Aim:
 - Involve as many students as possible
 - Foster interest in CS amongst talented students
- But how can one run a computer olympiad for students with no access to computers?
- Size of South Africa
- Reliable Internet access
- Coordinating and marking becomes problematic



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 - Pen-and-paper round
 - Programming round at schools
 - On-site finals
- Followed by training and IOI



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First Round

- Aim: involve as many students as possible
- Pen-and-paper round
- Similar to mathematics olympiads, but focus on logic and programming
 - Beaver contest



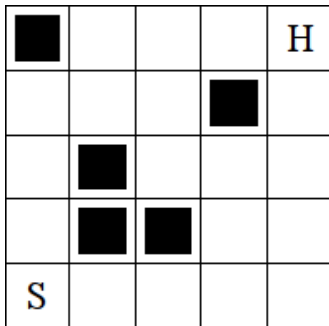
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First Round: Sample Problem

Sally (S) wants to go home (H). She can only move up or right one square each time. She is not allowed to go through black squares. How many paths can she pick from to go home?



First Round: Logistics

- Question paper mailed to schools via postal service
- School teachers admister and mark submissions
- Answers designed to be objective
 - Multiple choice or a unique correct answer
 - Teachers do not require any computer knowledge



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First Round: Divisions

- Senior division
 - Aimed at grades 10–12
 - Career choices
- Junior division
 - Restricted to grade 9 and lower
 - Subject choices
- Same paper used for both divisions
- Distinguish only in rankings
- Broaden the difficulty of the questions as much as possible



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- To gather and collate all results would be an enormous task
- Instead, rankings only within schools
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First Round: Statistics

- First introduced in 2003
 - 11 123 participants
- Junior division introduced in 2006
 - Immediate increase to 31 926 participants



Second Round

- Second round of the SACO requires a computer
- Open to anyone, regardless of participation in the first round
- Problems algorithmic with specific answers like the IOI
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Second Round: Marking

- Test data included in the problem description
- Students submit both their source code and printouts of test runs on these test cases
- Minimises work required by teachers marking
- Automated marking is infeasible
- Re-mark top papers centrally
 - Few points allocated for programming style
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Second Round: Start Division

- Start division offered for grades 10 and below
- Change of age group due to programming being introduced
- Participants not eligible for the third round
- Some problems shared with Open division



Second Round: Statistics

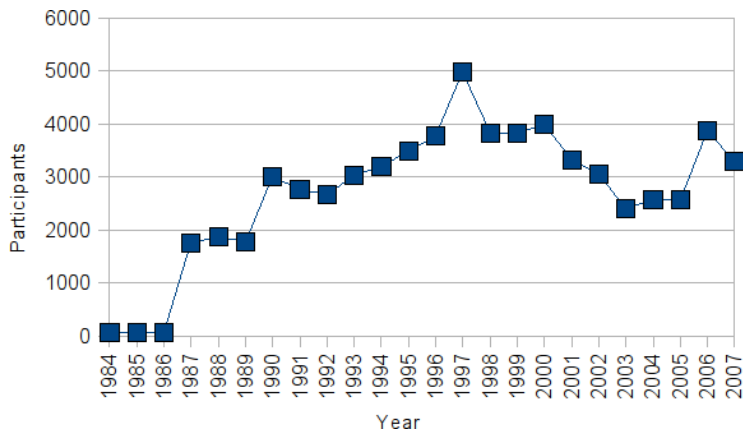


Figure: SACO Second Round participation



Third Round

- Top fifteen or so contestants invited to final round
- On-site event hosted at the University of Cape Town
- Format follows the IOI quite closely with two five hour contests



Third Round: Languages Offered

- C, C++, Pascal, Java and Python
- Java is the main language taught in SA schools
- Python added due to the backing of a sponsor
- Large prizes offered for the top Python users
- Extremely popular as it is easy to learn and powerful
- Different time limits for Python



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Third Round: Junior Division

- Judging of the final round is as strict and impartial as the IOI
- Limits its use as a training opportunity
- Semi-official junior division of the final round added
- For-fun event with no prizes, but judges can provide hints
- Several junior contestants have returned as regular final-round contestants



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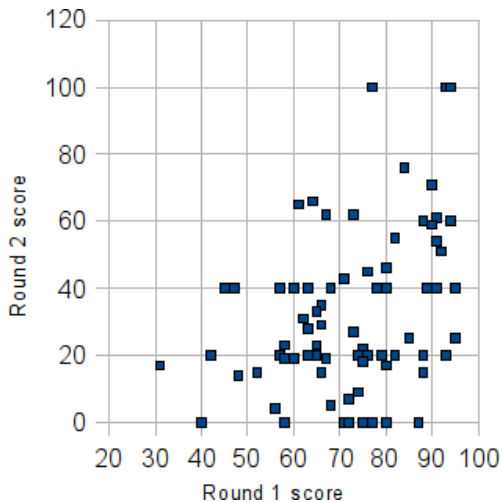


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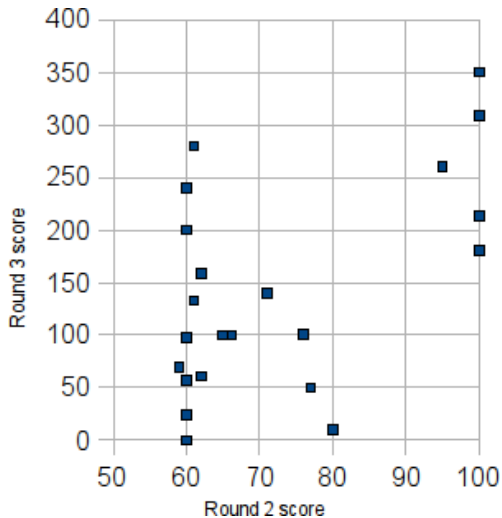
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Statistics: Scores in Round 2 Against Round 1



Statistics: Scores in Round 3 Against Round 2



Questions?

- Bruce Merry (bmerry@gmail.com)
- Marco Gallotta (marco@gallotta.co.za)
- Carl Hultquist (chultquist@gmail.com)

