

ACM International Collegiate Programming Contest

C. Maria Keet

Department of Computer Science, University of Cape Town, South Africa
mkeet@cs.uct.ac.za

Introduction, July 28, 2014

Outline

- 1 ICPC
- 2 Solving the problems
- 3 To do

Outline

- 1 ICPC
- 2 Solving the problems
- 3 To do

What is the ACM ICPC?

- Team competition: 3 students from the same university
- Usually 8-10 programming problems
- 5 hours to solve as many of them as you can!
- Problems can be solved in Java or C/C++ (and possibly Python as well, not decided yet)

Competition structure

- Southern African regional
 - Around 60 university teams from SA
 - About 30 teams from rest of Africa
 - Compete at local sites
- World Finals
 - About 120 teams from round the world
 - On site, in Morocco in 2015
 - Winning team from regional goes (if a UCT team wins, UCT will pay for your trip)

Competition structure

- Southern African regional
 - Around 60 university teams from SA
 - About 30 teams from rest of Africa
 - Compete at local sites
- World Finals
 - About 120 teams from round the world
 - On site, in Morocco in 2015
 - Winning team from regional goes (if a UCT team wins, UCT will pay for your trip)





Why participate?

- Having fun solving puzzles!
- Learn about problem solving and programming along the way
- The challenge
- Great on CV if you do well
- Overseas trip if you win

Eligibility

- In short: “undergraduate”, meaning in SA system BSc and honours students
- Basic requirements, with, a.o.: Willingness to go to the Finals if you win the regionals (More detailed description: <http://icpc.baylor.edu/regionals/rules#HTeamComposition>)
- Eligibility period:
 - Began post-secondary studies in 2010 or later is eligible to compete,
 - Was born in 1991 or later is eligible to compete.
 - Can be extended, but has to be motivated (e.g.: illness, work/studies, or personal reasons)

Eligibility

- In short: “undergraduate”, meaning in SA system BSc and honours students
- Basic requirements, with, a.o.: Willingness to go to the Finals if you win the regionals (More detailed description: <http://icpc.baylor.edu/regionals/rules#HTeamComposition>)
- Eligibility period:
 - Began post-secondary studies in 2010 or later is eligible to compete,
 - Was born in 1991 or later is eligible to compete.
 - Can be extended, but has to be motivated (e.g.: illness, work/studies, or personal reasons)

Outline

- 1 ICPC
- 2 Solving the problems
- 3 To do

Problems (1/2)

- They are diverse: some require a bit of maths, many are algorithmic in nature
- Real problem to solve is always 'dressed up' in a little story; e.g.:
 - Sorting luggage going to different destinations
 - Making a beautiful necklace with coloured beads in symmetry
 - Wires crossing on a circuit
 - John and Mary with some fitness programme

Problems (1/2)

- They are diverse: some require a bit of maths, many are algorithmic in nature
- Real problem to solve is always 'dressed up' in a little story; e.g.:
 - Sorting luggage going to different destinations
 - Making a beautiful necklace with coloured beads in symmetry
 - Wires crossing on a circuit
 - John and Mary with some fitness programme

Problems (2/2)

- In some cases, a clearer task is described in such a text, e.g.:
 - Find the largest prime in a list of numbers up to 2^{32}
 - Find the first digit of B^N , given $1 \leq B \leq 10$ and $1 < N < 10000$
- In other case, underlying problem to solve, a.o.:
 - Graph traversal
 - Sorting
 - String matching/manipulation

Problems (2/2)

- In some cases, a clearer task is described in such a text, e.g.:
 - Find the largest prime in a list of numbers up to 2^{32}
 - Find the first digit of B^N , given $1 \leq B \leq 10$ and $1 < N < 10000$
- In other case, underlying problem to solve, a.o.:
 - Graph traversal
 - Sorting
 - String matching/manipulation

Scoring

- Submissions automatically marked
- Judges response is one of: Correct, Wrong answer, Format Error, Time-limit exceeded, Runtime error, Compile error
- Correct answer gets you a color-coded balloon
- Note: Just one test case wrong gets you an incorrect answer! you'll get a time penalty for that
- Teams ranked by number of problems solved
- Ties broken using "time penalty"

Teams

- Your team overall needs to have several skills: problem solving, designing, coding
- Only one computer per team!
- This leaves lots of room for interesting team make-up and team strategy
- Choosing which problems to solve first, splitting up the problems among the members, not all focusing on the same problem at once, etc requires a team strategy
- Being able to solve those problems, recognising basic algorithms and repurposing them for the task, and programming are skills that require practice

Teams

- Your team overall needs to have several skills: problem solving, designing, coding
- Only one computer per team!
- This leaves lots of room for interesting team make-up and team strategy
- Choosing which problems to solve first, splitting up the problems among the members, not all focusing on the same problem at once, etc requires a team strategy
- Being able to solve those problems, recognising basic algorithms and repurposing them for the task, and programming are skills that require practice

Outline

- 1 ICPC
- 2 Solving the problems
- 3 To do**

Way forward

- There will be training days to help you prepare for the regionals (next slide)
- Find team mates with some overlapping and some complementary skills
- Bookmark <http://acm.cs.uct.ac.za/> (where you also can register)
- Chat with the previous contestants

Scheduled training dates

- Aug 2: 9:30-15:30
- Aug 16: 9:30-15:30
- Aug 30: 9:30-15:30
- Sept 13: 9:30-15:30
- Sept 20 or 27: 9:30-15:30
- Date of the regionals: TBD (“some Saturday between mid Sept and end Oct”)

Questions?