UW Madison
ICPC
Organizational Meeting

Dieter van Melkebeek

What is ICPC?

International Collegiate Programming Contest

Overview

- algorithm/programming contest
- 3 people per team, single computer
- 5 hours
- 10-15 problems
- 3 tiers yearly

Sample Problem

Problem 4: The Fence Builder

A fence builder has been given a strange task. Provided with *N* (between 3 and 100) pieces of straight fencing, each having an arbitrary length, the builder is to enclose as large a region as possible. The customer wants to know the area of the region that can be enclosed by the fence before it is built. There is only one constraint on the construction: each piece of fencing is connected only at its endpoints to exactly two other different pieces of fencing. That is, after completion, the fence will look like a (possibly irregular) polygon with *N* sides. The customer has guaranteed the builder that the fencing provided will allow for a region with a non-zero area to be enclosed.

Input

There will be multiple cases in the input. For each case, the input begins with the number of pieces of fencing (an integer, *N*). There then follow *N* positive, non-zero real numbers giving the lengths of the fence pieces. A single integer zero follows the last case in the input.

Output

For each case, display the case number (starting with 1) and the maximum area that can be enclosed by the provided fencing materials. Show three fractional digits in each answer. Use the format shown below in displaying the results.

Sample Input

```
3 2.0 2.0 2.0
4 1.0 1.0 1.0 1.0
4 5.0 5.0 3.0 11.0
0
```

Expected Output

```
Case 1: maximum area = 1.732
Case 2: maximum area = 1.000
Case 3: maximum area = 21.000
```

Judging and Scoring

- Verdict
  - Accepted
  - Compilation Error (CE)
  - Runtime Error (RE)
  - Wrong Answer (WA)
  - Time Limit Exceed (TLE)

- Every rejected submission costs 20 minutes time penalty.

Scoreboard

First to solve · Solved · Attempted · Pending judgement

	TEAM	SLV.	TIME	A	B	C	D	E	F	G	H	I	J
1	debug with cout	8	889	1 35 min	5 291 min	1 34 min	2 202 min	1 5 min	1 14 min	1 16 min	2 172 min		
2	GOOD	8	918	2 63 min	1 195 min	1 40 min	1 255 min	2 44 min	1 21 min	1 56 min	1 164 min		2 -
3	Kotlinaughts	7	603	1 35 min	1 -	2 88 min	2 175 min	1 16 min	1 25 min	2 51 min	1 133 min		
4	Team Golden Gophers	7	645	1 90 min	1 -	1 109 min	2 255 min	1 13 min	1 18 min	2 28 min	2 72 min		
5	NonAutomatic Automaton	7	751	1 64 min	7 -	1 45 min		1 5 min	1 12 min	1 19 min	1 285 min	4 241 min	
6	Team Maroon	6	291	1 13 min	2 101 min	1 52 min	2 -	1 21 min	1 25 min	2 39 min			3 -
7	it's okke	5	229	1 49 min		1 76 min		1 31 min	1 38 min	1 35 min			

Topics

- Algorithmic Paradigms
  - Basic Graph Algorithm
  - Greed
  - Dynamic Programming
  - Divide and Conquer
- Advanced Topics
  - Data Structures
  - Math
  - Network Flow
  - Computational Geometry

Non-Topics

- System
- Optimization
- App Development
- Data Science
- etc

Eligibility

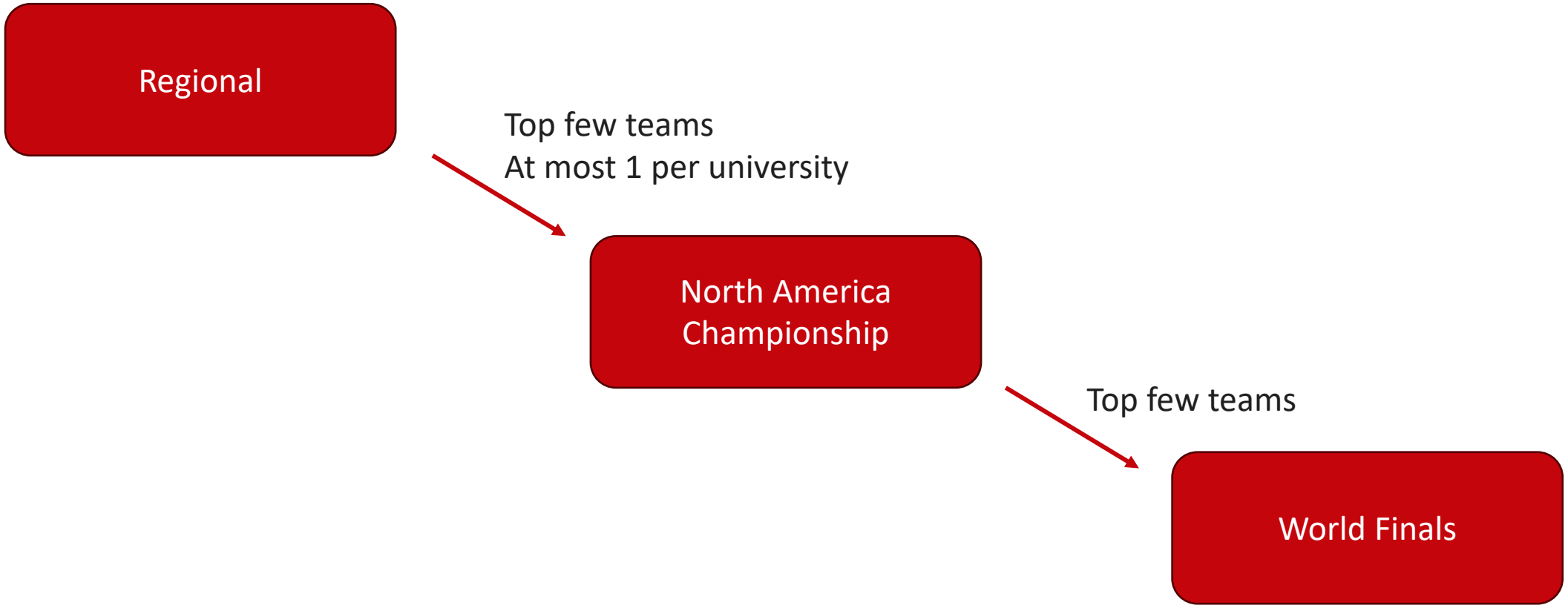
Period:

- Began post-secondary education no earlier than 2020
- Or born in year 2001 or after

Limitations:

- Can compete in at most 5 regionals (2020-21 does not count)
- Can compete in at most 2 world finals (Moscow 2020 does not count)

Tiers


Regional
Top few teams
At most 1 per university
North America Championship
Top few teams
World Finals

Regional

- North Central North America (NCNA)
- Date: November 9
- Location: Epic Systems in Verona, WI

North America Championship (NAC)

- At some US university, likely UCF in Orlando, FL
- Expected to be Feb-Mar
- Usually 5-6 day camp

World Finals

- At some university worldwide
- 5-6 day camp

Awards Ceremony 2024 Luxor

Recent World Finals Locations

2024 Luxor

2021 Moscow

2022 Dhaka

2019 Porto

UW Madison Performance

- Topped the regional contest for the past 5 years
- Advanced from regional to next level every year since 2001
- Advanced to world finals from 2001 to 2022 consecutively (North American record)
- Silver medal at world finals last year

Training

- Regular meetings: T 6-7pm in CS 1221
- North America Qualifier (NAQ): Oct 5, online
- Regional: Nov 9 on Epic campus
- Schedule:
  https://pages.cs.wisc.edu/~dieter/ICPC/24-25
- Communication: Piazza
  https://piazza.com/wisc/fall2024/cs578
  access code: vj6cdqpactm

Team Formation

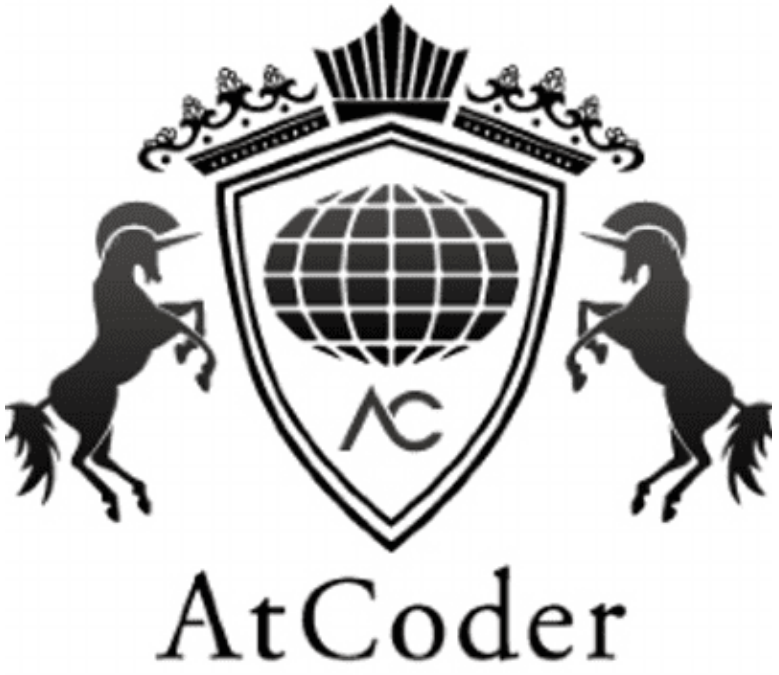
- Based on performance during training, NAQ, and possible additional individual placement test.
- Want to make our top teams as strong as possible.
- Other teams can be formed as you wish.

Resource Recommendations

- Check out links on our web site
- Kattis problem archive

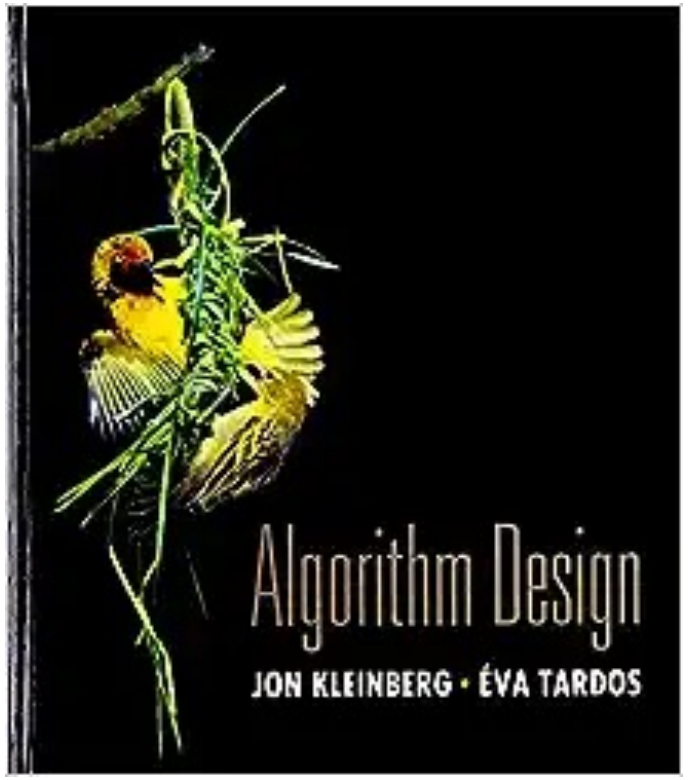
Resource Recommendations

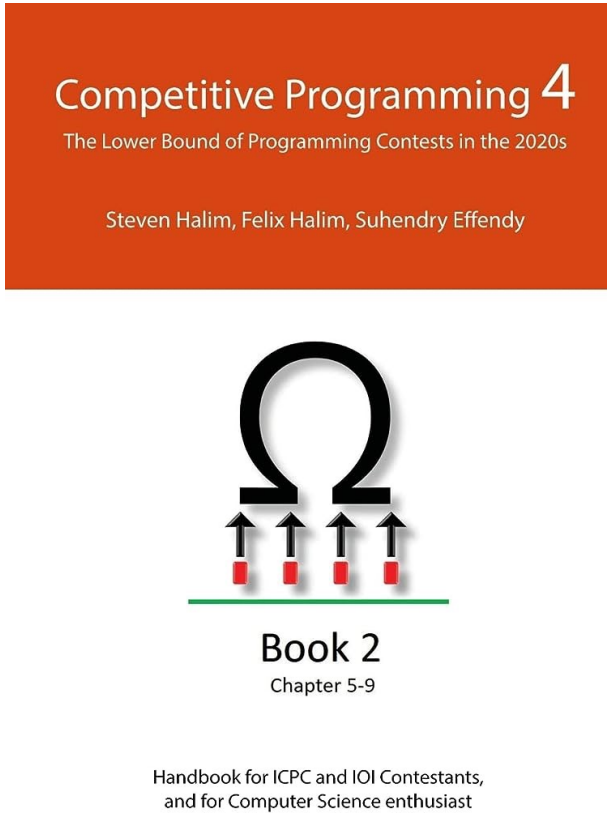
- Codeforces, Atcoder



Resource Recommendations

- Textbooks
- Algorithm Design
- Competitive Programing 4





Point of Contact

- Dieter van Melkebeek
- dieter@cs.wisc.edu

Questions?

Your Turn!

Introduce Yourself

- Name
- Year
- Competitive programming experience
- Anything you want to say, really.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