Competitive programming workshop

@UniTn

Trento (online), July 10th 2020

What is competitive programming?

- You are given a set of algorithmic problems to solve
- You need to code the solution! (C++, Python, Java, ..?)
- You have limited time (few hours)
- Contest environments like the CMS
- Team or individual competitions
- Difficulty of the problems ranging from very easy to.. the sky is the limit.

Why competitive programming?

- It's fun! 😁
- Develops creativity, speed, programming and debugging skills, (team work)
- Good points to mention in your CV
- You can get to visit nice cities (onsite competitions)
- You get lots of t-shirts
- Companies usually have some rounds of algorithmic interviews (mostly the "important" ones)

Main competitions

- Hashcode
- Codeflows
- Google Code Jam / Kick start
- Codeforces
- Kaggle
- **INTERNAL COMPETITION UNITN (ITACPC?)**
- **ICPC**

Internal competition (ITACPC?)

- ITACPC: Italian Collegiate Programming Content (who knows)
- Usually..
  - Local competition
  - Teams (3 students)
  - Your team in this contest will be your team at the finals (hopefully)
  - X problems in Y hours
  - UniTn usually has 3 teams in the finals
    - Qualification based on the final standings
    - But one reserved place

ICPC - SWERC 2020 (Paris, 25-26 Jan), ~400 students, 98 teams

ICPC

- 2 step: regional competition (Europe) and World Finals
- 10/12 problems to solve in 5 hours
- Languages: C, C++, Java, Python, Kotlin
- Make sure to check the requirements to participate in the ICPC competition!

Workshops

- We organize workshops @ UniTN, open to all interested students!
- Tutors took part in several competitions and are willing to share insights and tricks
- Hands-on tutorial on algorithm techniques
- Exercises are evaluated in a competitive arena

Tentative calendar and topics

10 / 07 / 2020 | 1600 - 1800 | Presentation, warm-up contest

15 / 07 / 2020 | 1600 - 1800 | Using C++ for competitive programming, UFDS

23 / 07 / 2020 | 1600 - 1800 | Algorithms on graphs, chap. 1

29 / 07 / 2020 | 1600 - 1800 | Algorithms on graphs, chap. 2

06 / 08 / 2020 | 1600 - 1800 | Dynamic Programming, chap. 1

12 / 08 / 2020 | 1600 - 1800 | Dynamic Programming, chap. 2

20 / 08 / 2020 | 1600 - 1800 | Network flow

26 / 08 / 2020 | 1600 - 1800 | Problems mashup

Anatomy of a problem

Cold-puter Science

We're not going to sugar-coat it: Chicago's winters can be rough. The temperatures sometimes dip to uncomfortable levels and, after last year's "polar vortex", the University of Chicago Weather Service wants to find out exactly how bad the winter was. More specifically, they are interested in knowing the total number of days in which the temperature was below zero degrees Celsius.

Anatomy of a problem

Input

The input is composed of two lines. The first line contains a single positive integer n ($1 \leq n \leq 100$) that specifies the number of temperatures collected by the University of Chicago Weather Service. The second line contains n temperatures, each separated by a single space. Each temperature is represented by an integer t ($-1\,000\,000 \leq t \leq 1\,000\,000$)

Anatomy of a problem

Output

You must print a single integer: the number of temperatures strictly less than zero.

Sample Input 1

```
3
5 -10 15
```

Sample Output 1

```
1
```

Sample Input 2

```
5
-14 -5 -39 -5 -7
```

Sample Output 2

```
5
```

Anatomy of a problem

Problem ID: cold

CPU Time limit: 1 second

Memory limit: 1024 MB

Difficulty: 1.3

Download:

Sample data files

So.. let’s start!

- https://open.kattis.com/contests/jho53n

Thanks!

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Join our Telegram group!