Lesson 1

"Art of Thinking"

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UTEC

Introduction to CP

What is Competitive Programming?

1. It's a sport... **a mind sport**
2. Participants are given problems and they have to create computer programs to solve them as quickly as they can
3. There are many type of problems that we will learn *later*...

We will see in the course ...

1. Asymptotic Analysis
2. Standard Template Library (STL)
3. Brute Force
4. Divide and Conquer
5. Searching in Graphs
6. Single Source Shortest Path (SSSP)
7. All Pair Shortest Path (ASPSP)
8. Minimum Spanning Tree (MST)

Virtual Judges

Problem Structure

- Title and limitations
- Description
- Input and Output (I/O)
- Examples

Example of Problem

Problem: You're given **n** numbers and you'd like to find a pair of numbers with the greatest sum.

Constraints

- $2 \leq n \leq 10^8$
- Time limit: 1000 ms

Input

The first line of each input a single integer n denoting the number of values. The next lines containg the n values.

Output

The greatest sum

Example

10

3 4 2 30 104 1 35 104 239 -1

2

3 0

Results:

343

3

Programming Languages

Why C++ is the best?

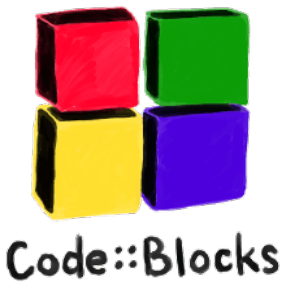
- Lower Level $\rightarrow$ More control.
- It's faster.
- Makes better use of memory.
- The **STL Library** is extremaly powerful.
- Almost all learning resources are oriented to C++.
- It has a strong community.

Errors - Verdict information

- **AC - Accepted**
- **WA - Wrong Answer**
- **TLE - Time Limit Exceeded**
- **RE - Runtime Error**

Others: `https://icpcarchive.ecs.baylor.edu/index.php?option=com_content&task=view&id=14&Itemid=30`

Setup - IDEs



Announcements

1. Item