

Day 14: Scope

Objective

Today we're discussing *scope*. Check out the [Tutorial](#) tab for learning materials and an instructional video!

The *absolute difference* between two integers, a and b , is written as $|a - b|$. The *maximum absolute difference* between two integers in a set of positive integers, *elements*, is the largest absolute difference between any two integers in `__elements`.

The *Difference* class is started for you in the editor. It has a private integer array (*elements*) for storing N non-negative integers, and a public integer (*maximumDifference*) for storing the maximum absolute difference.

Task

Complete the *Difference* class by writing the following:

- A class constructor that takes an array of integers as a parameter and saves it to the `__elements` instance variable.
- A *computeDifference* method that finds the maximum absolute difference between any 2 numbers in `__elements` and stores it in the *maximumDifference* instance variable.

Input Format

You are not responsible for reading any input from stdin. The locked *Solution* class in the editor reads in 2 lines of input. The first line contains N , the size of the elements array. The second line has N space-separated integers that describe the `__elements` array.

Constraints

- $1 \leq N \leq 10$
- $1 \leq \text{__elements}[i] \leq 100$, where $0 \leq i \leq N - 1$

Output Format

You are not responsible for printing any output; the *Solution* class will print the value of the *maximumDifference* instance variable.

Sample Input

```
STDIN  Function
-----
3      __elements[] size N = 3
1 2 5  __elements = [1, 2, 5]
```

Sample Output

4

Explanation

The scope of the `__elements` array and `maximumDifference` integer is the entire class instance. The class constructor saves the argument passed to the constructor as the `__elements` instance variable (where the `computeDifference` method can access it).

To find the maximum difference, `computeDifference` checks each element in the array and finds the maximum difference between any 2 elements: $|1 - 2| = 1$

$$|1 - 5| = 4$$

$$|2 - 5| = 3$$

The maximum of these differences is 4, so it saves the value 4 as the `maximumDifference` instance variable. The locked stub code in the editor then prints the value stored as `maximumDifference`, which is 4.