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Day 14: Scope ■



Tutorial Problem

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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 N 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 your editor reads in **2** lines of input; the first line contains **N**, and the second line describes the **elements** array.

Constraints

- $1 \le N \le 10$
- ullet $1 \leq elements[i] \leq 100$, 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

3 1 2 5

Sample Output

4

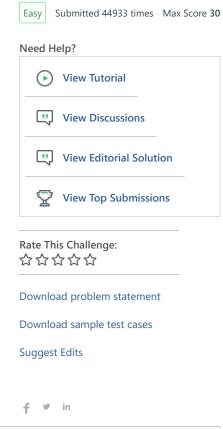
Explanation

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**.



```
Current Buffer (saved locally, editable) &
                                                                                     Java 8
 1 ▶ import ↔;
 7
 8
    class Difference {
 9
       private int[] elements;
10
        public int maximumDifference;
11
         // Add your code here
12
13 ▼
         Difference(int[] elements) {
14
             this.elements = elements;
15
16
17
         public void computeDifference() {
18
             // compute max difference
19 ▼
             for (int i = 0; i < elements.length; i++) {</pre>
                 for (int j = 0; j < elements.length; <math>j++) {
20 ▼
                      Math.abs(elements[i] - elements[j]);
21 •
22
                      if (Math.abs(elements[i] - elements[j]) > maximumDifference) {
23
                          maximumDifference = Math.abs(elements[i] - elements[j]);
24
25
26
             }
27
28
29
   } // End of Difference class
31 ▼ public class Solution {
```

```
32
        public static void main(String[] args) {
33 ▼
            Scanner sc = new Scanner(System.in);
34
35
             int n = sc.nextInt();
36 ▼
             int[] a = new int[n];
             for (int i = 0; i < n; i++) {
37 ▼
38 ▼
                 a[i] = sc.nextInt();
39
40
             sc.close();
41
42
            Difference difference = new Difference(a);
43
44
            difference.computeDifference();
45
46
            System.out.print(difference.maximumDifference);
47
48 }
                                                                                                                  Line: 40 Col: 20
                      Test against custom input
                                                                                                        Run Code
                                                                                                                     Submit Code
1 Upload Code as File
```

Testcase 0 ✓ Testcase 1 ✓ Testcase 2 ✓

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