☆ Maximum Difference in an Array

The *maximum difference* between elements in some array, *a*, is defined as the largest difference between any *a[i]* and *a[j]* where *i* < *j* and *a[i]* < *a[j]*. For example, if *a* = *[4, 1, 2, 3]*, the maximum difference would be *a[3] − a[1] = 3 − 1 = 2* because this is the largest difference between any two elements satisfying the aforementioned criteria.

Complete the *maxDifference* function in the editor below. It has *1* parameter: an array of integers, *a*. It must return an integer denoting the maximum difference between any pair of elements in *a*; if no such number exists (e.g., if *a* is in descending order and all *a[j]* < *a[i]*), return *−1* instead.

Input Format

Locked stub code in the editor reads the following input from stdin and passes it to the function:
The first line contains a single integer, *n*, denoting the number of elements in array *a*.
Each line *i* of the *n* subsequent lines (where $0 \le i < n$) contains a single integer describing element *a[i]*.

Constraints

- $1 \le n \le 10^6$
- $-10^6 \le a[i] \le 10^6 \ \forall i \in [0, n-1]$

Output Format

The function must return an integer denoting the maximum difference in *a*. This is printed to stdout by locked stub code in the editor.

Sample Input 0

```
7
2
3
10
2
4
8
1
```

Sample Output 0

```
8
```

As *a[2] = 10* is largest element in the array, we must find the smallest *a[i]* where $0 \le i < 2$. This ends up being *2* at index *i = 0*.
We then calculate the difference between the two elements: *a[2] − a[0] = 10 − 2 = 8*, and return the result (*8*).

Note: While the largest difference between any two numbers in this array is *9* (between *a[2] = 10* and *a[6] = 1*), this cannot be the maximum difference because the element having the smaller value (*a[6]*) must be of a lesser index than the element having the higher value (*a[2]*). As *j = 2* is not less than *i = 6*, these elements cannot be used to calculate the maximum difference.

Sample Input 1

```
6
7
9
5
6
3
2
```

Sample Output 1

```
2
```

Explanation 1

n = 6, a = [7, 9, 5, 6, 3, 2]
The maximum difference returned by the function is *a[1] − a[0] = 9 − 7 = 2*, because *2* is the largest difference between any *a[i]* and *a[j]* satisfying the conditions that *a[i] < a[j]* and *i < j*.

YOUR ANSWER

We recommend you take a quick tour of our editor before you proceed. The timer will pause up to 90 seconds for the tour. Start tour

Original code | C#

```
using System.Linq;
class Solution {

/*
 * Complete the function below.
 */
    static int maxDifference(int[] a) {


    }


    static void Main(String[] args) {↔}
}
```

Line: 11 Col: 1

Test against custom input

Run Code

Submit code & Continue

(You can submit any number of times)

Download sample test cases *The input/output files have Unix line endings. Do not use Notepad to edit them on windows.*