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.

Write a function that 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.

Constraints

* *1 ≤ n ≤ 106 where n is the number of elements in an array*
* *−106 ≤ a[i] ≤ 106 ∀ i ∈ [0, n − 1]*

Output Format

The function must return an integer denoting the maximum difference in *a*.

Sample Input 0  
2  
3  
10  
2  
4  
8  
1

Sample Output

8

Explanation

*n = 7, a = [2, 3, 10, 2, 4, 8, 1]*

As *a[2] = 10* is largest element in the array, we must find the smallest *a[i]* where *0 ≤ 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  
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*.