Minimum Absolute Difference in an Array ☆

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Consider an array of integers, $arr = [arr[0], arr[1], \ldots, arr[n-1]]$. We define the absolute difference between two elements, $a[i]$ and $a[j]$ (where $i \neq j$), to be the absolute value of $a[i] - a[j]$.

Given an array of integers, find and print the minimum absolute difference between any two elements in the array. For example, given the array $arr = [-2, 2, 4]$ we can create 3 pairs of numbers: $[-2, 2], [-2, 4]$ and $[2, 4]$. The absolute differences for these pairs are $|(-2) - 2| = 4$, $|(-2) - 4| = 6$ and $|2 - 4| = 2$. The minimum absolute difference is 2.

Function Description

Complete the minimumAbsoluteDifference function in the editor below. It should return an integer that represents the minimum absolute difference between any pair of elements.

minimumAbsoluteDifference has the following parameter(s):

- n: an integer that represents the length of arr
- arr: an array of integers

Input Format

The first line contains a single integer n, the size of arr.
The second line contains n space-separated integers $arr[i]$.

Constraints

- $2 \leq n \leq 10^5$
- $-10^9 \leq arr[i] \leq 10^9$

Output Format

Print the minimum absolute difference between any two elements in the array.

Sample Input 0

```
3
3 -7 0
```

Sample Output 0

```
3
```

Explanation 0

With $n = 3$ integers in our array, we have three possible pairs: $(3, -7)$, $(3, 0)$, and $(-7, 0)$. The absolute values of the differences between these pairs are as follows:

- $|3 - -7| \Rightarrow 10$
- $|3 - 0| \Rightarrow 3$

- $|-7 - 0| \Rightarrow 7$

Notice that if we were to switch the order of the numbers in these pairs, the resulting absolute values would still be the same. The smallest of these possible absolute differences is 3.

Sample Input 1

```
10
-59 -36 -13 1 -53 -92 -2 -96 -54 75
```

Sample Output 1

```
1
```

Explanation 1

The smallest absolute difference is $|-54 - -53| = 1$.

Sample Input 2

```
5
1 -3 71 68 17
```

Sample Output 2

```
3
```

Explanation 2

The minimum absolute difference is $|71 - 68| = 3$.

Change Theme   C++

```cpp
1    #include <bits/stdc++.h>
2
3    using namespace std;
4
5    vector<string> split_string(string);
6
7    // Complete the minimumAbsoluteDifference function below.
8    int minimumAbsoluteDifference(vector<int> arr) {
9        int n= arr.size();
10       sort(arr.begin(), arr.end());
11       int res= abs(arr[0]-arr[1]);
12       for(int i=1; i<n-1;i++){
13           int temp=abs(arr[i]-arr[i+1]);
14           if(temp<res) res=temp;
15       }
16       return res;
17   }
18
19   int main()
20   {
21       ofstream fout(getenv("OUTPUT_PATH"));
22
23       int n;
24       cin >> n;
25       cin.ignore(numeric_limits<streamsize>::max(), '\n');
```

Line: 10 C

⬆ Upload Code as File   ☐ Test against custom input   **Run Code**   Submit Code

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⊘ **Test case 0**	Compiler Message
⊘ **Test case 1**	Success
⊘ **Test case 2** 🔒	
⊘ **Test case 3** 🔒	Input (stdin) **Download**
⊘ **Test case 4** 🔒	1 3
⊘ **Test case 5** 🔒	2 3 -7 0
⊘ **Test case 6** 🔒	
	Expected Output **Download**
	1 3

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