



Minimum Absolute Difference in an Array



159 more points to get your next star!

Rank: 19524 | Points: 2041/2200

**You have successfully solved Minimum Absolute Difference in an Array**[Share](#)[Tweet](#)

You are now 159 points away from the 6th star for your problem solving badge.

[Try the next challenge](#) | [Try a Random Challenge](#)

Problem

Submissions

Leaderboard

Editorial

RATE THIS CHALLENGE



Consider an array of integers, $arr = [arr[0], arr[1], \dots, arr[n-1]]$. 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 $|71 - 68| = 3$.

C++14



```
1  #include <algorithm>
2  #include <cmath>
3  #include <iostream>
4  #include <iterator>
5  #include <limits>
6  #include <set>
7
8  using int64 = long long int;
9
10 template<typename T, const T& default_val = 0>
11 int64_t minAbsDiff(const T& arr, const T& default_val) {
12     if (arr.size() < 2) return default_val;
13     set<T> s(arr.begin(), arr.end());
14     T prev = *s.begin();
15     for (auto it = s.begin(); it != s.end(); ++it) {
16         T cur = *it;
17         int64_t diff = abs(cur - prev);
18         if (diff < default_val) default_val = diff;
19         prev = cur;
20     }
21     return default_val;
22 }
```



```
12 // following is not working with GCC
13 // using Type = typename std::decay<typename
14 // std::iterator_traits<Iterator>::difference_type>::type;
15 // static_assert(std::is_same<Type, int64>::value, "wrong types"); // to make
16 // sure
17 using Type = int64;
18 Type ans{std::numeric_limits<Type>::max()};
19
20 for (auto iter = std::next(begin); iter != end; ++iter) {
21     ans = std::min(ans, std::abs(*iter - *std::prev(iter)));
22 }
23 return ans;
24 }
25
26 int main() {
27     std::ios_base::sync_with_stdio(0);
28     std::cin.tie(0);
29     std::cout.tie(0);
30
31     int64 n{};
32     std::cin >> n;
33
34     std::multiset<int64> mySet;
35     while (n--) {
36         int64 temp{};
37         std::cin >> temp;
38         mySet.insert(temp);
```

Line: 42 Col: 2

[Upload Code as File](#) ☐ [Test against custom input](#)[Run Code](#)[Submit Code](#)

Congratulations

You solved this challenge. Would you like to challenge your friends?

[Next Challenge](#)**Test case 0** ✓**Test case 1** ✓**Test case 2** ✓**Test case 3** ✓**Test case 4** ✓**Test case 5** ✓**Test case 6** ✓

Compiler Message

Success

Input (stdin)

3
3 -7 0[Download](#)

Expected Output

3[Download](#)

[Contest Calendar](#) | [Blog](#) | [Scoring](#) | [Environment](#) | [FAQ](#) | [About Us](#) | [Support](#) | [Careers](#) | [Terms Of Service](#) | [Privacy Policy](#) | [Request a Feature](#)

