Minimum Distances

by Shafaet

Consider an array of n integers, $A = [a_0, a_1, \ldots, a_{n-1}]$. The distance between two indices, i and j, is denoted by $d_{i,j} = |i - j|$.

Given A, find the *minimum* $d_{i,j}$ such that $a_i = a_j$ and $i \neq j$. In other words, find the minimum distance between any pair of equal elements in the array. If no such value exists, print -1.

Note: $|a|$ denotes the absolute value of a.

Input Format

The first line contains an integer, n, denoting the size of array A.
The second line contains n space-separated integers describing the respective elements in array A.

Constraints

- $1 \leq n \leq 10^3$
- $1 \leq a_i \leq 10^5$

Output Format

Print a single integer denoting the minimum $d_{i,j}$ in A; if no such value exists, print -1.

Sample Input

```
6
7 1 3 4 1 7
```

Sample Output

```
3
```

Explanation
Here, we have two options:

- a_1 and a_4 are both 1, so $d_{1,4} = |1 - 4| = 3$.
- a_0 and a_5 are both 7, so $d_{0,5} = |0 - 5| = 5$.

The answer is $min(3, 5) = 3$.

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Current Buffer (saved locally, editable) C++14

```cpp
#include <iostream>
#include <vector>
#include <limits>
#include <algorithm>
#include <iterator>
#include <cmath>
int main()
{
    int n; std::cin>>n;

    std::vector<std::pair<int,int>> vec;
    vec.reserve(n);
    for(int i=0; i<n; ++i)
    {
        int temp; std::cin>>temp;
        vec.emplace_back(std::make_pair(temp, i));
    }
    std::sort(vec.begin(),vec.end());
    int answer = std::numeric_limits<int>::max();
    for(auto itr = vec.cbegin(); itr != vec.cend()-1; ++itr)
        if( (*itr).first == (*(itr+1)).first )
            answer = std::min(answer, abs((*itr).second - (*(itr+1)).second));

    (answer==std::numeric_limits<int>::max()) ?
        std::cout << "-1" << std::endl :
        std::cout << answer << std::endl;
    return 0;
}

```

Line: 29 Col: 1

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