6-Pair with Difference -O(n) Time Complexity,O(1) Space Complexity

Aim:

Given an array A of sorted integers and another non negative integer k, find if there exists 2 indices i and j such that A[j] - A[i] = k, i != j.

Input Format:

First Line n - Number of elements in an array

Next n Lines - N elements in the array

k - Non - Negative Integer

Output Format:

1 - If pair exists

0 - If no pair exists

Explanation for the given Sample Testcase:

YES as 5 - 1 = 4

So Return 1.

**For example:**

| **Input** | **Result** |
| --- | --- |
| 3  1 3 5  4 | 1 |

Answer:(penalty regime: 0 %)

Algorithm:

 Read the integer n and array arr of size n, followed by the target difference t.

 Use nested loops to check if there exist two distinct elements in the array with an absolute difference equal to t.

 If such a pair is found, print 1; otherwise, print 0.

Code:

#include <stdio.h>

#include <stdlib.h>

int main() {

int n;

scanf("%d", &n);

int arr[n];

for (int i = 0; i < n; i++) {

scanf("%d", &arr[i]);

}

int t;

scanf("%d", &t);

int flag = 0;

for (int i = 0; i < n; i++) {

for (int j = 0; j < n; j++) {

if (i!=j && abs(arr[i] - arr[j]) == t) {

flag = 1;

break;

}

}

if (flag) {

break;

}

}

if (flag) {

printf("%d\n", 1);

} else {

printf("%d\n", 0);

}

return 0;

}

Output:

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 3  1 3 5  4 | 1 | 1 |  |
|  | 10  1 4 6 8 12 14 15 20 21 25  1 | 1 | 1 |  |
|  | 10  1 2 3 5 11 14 16 24 28 29  0 | 0 | 0 |  |
|  | 10  0 2 3 7 13 14 15 20 24 25  10 | 1 | 1 |  |

Passed all tests!

**Correct**

Marks for this submission: 1.00/1.00.

Result:

The expected output was obtained