Hackerland Radio Transmitters

locked

by nabila_ahmed

Hackerland is a one-dimensional city with n houses, where each house i is located at some x_i on the x-axis. The Mayor wants to install radio transmitters on the roofs of the city's houses. Each transmitter has a range, k, meaning it can transmit a signal to all houses $\leq k$ units of distance away.

Given a map of Hackerland and the value of k, can you find and print the minimum number of transmitters needed to cover every house in the city? (Every house must be covered by at least one transmitter) Each transmitter *must* be installed on top of an existing house.

Input Format

The first line contains two space-separated integers describing the respective values of n (the number of houses in Hackerland) and k (the range of each transmitter).
The second line contains n space-separated integers describing the respective locations of each house (i.e., $x_1, x_2, \ldots, x_n$).

Constraints

- $1 \leq n, k \leq 10^5$
- $1 \leq x_i \leq 10^5$
- There may be more than one house at the same location.

Subtasks

- $1 \leq n \leq 1000$ for 50% of the maximum score.

Output Format

Print a single integer denoting the minimum number of transmitters needed to cover all the houses.

Sample Input 0

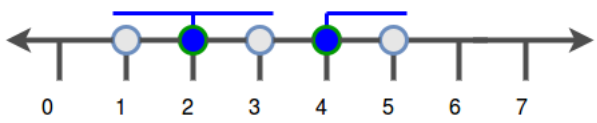
```
5 1
1 2 3 4 5
```

Sample Output 0

```
2
```

Explanation 0

The diagram below depicts our map of Hackerland:



We can cover the entire city by installing transmitters on houses at locations 2 and 4. Thus, we print 2 on a new line.

Sample Input 1

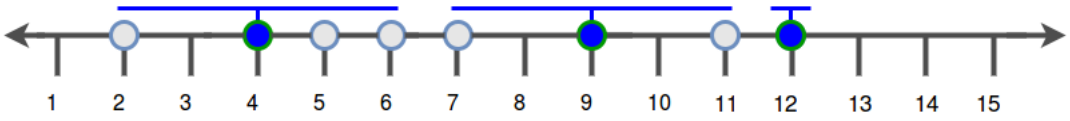
```
8 2
7 2 4 6 5 9 12 11
```

Sample Output 1

```
3
```

Explanation 1

The diagram below depicts our map of Hackerland:



We can cover the entire city by installing transmitters on houses at locations **4**, **9**, and **12**. Thus, we print **3** on a new line.

Submissions: 3410
Max Score: 15
Difficulty: Easy

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```
using System;
using System.Collections.Generic;
using System.IO;
using System.Linq;
class Solution {

    static void Main(String[] args) {
        string[] tokens_n = Console.ReadLine().Split(' ');
        int n = Convert.ToInt32(tokens_n[0]);
        int k = Convert.ToInt32(tokens_n[1]);
        string[] x_temp = Console.ReadLine().Split(' ');
        int[] x = Array.ConvertAll(x_temp,Int32.Parse);


        Array.Sort(x);
        int answer = 0;
        int medio = 0;
        for (int i = 0; i < x.Length; i++)
        {
            answer++;
            int mas_a_la_izq = x[i];
            while (i + 1 < x.Length && x[i + 1] - k <= mas_a_la_izq)
            {
                i++;
            }
            medio = i;
            while (i + 1 < x.Length && x[i + 1] <= x[medio] + k)
            {
                i++;
            }
        }
        Console.WriteLine(answer);
    }
}

```

Line: 27 Col: 42

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