



Hackerland Radio Transmitters

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Problem

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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, \dots, 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

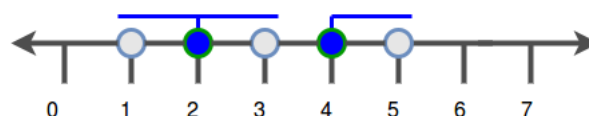
```
5 1
1 2 3 4 5
```

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

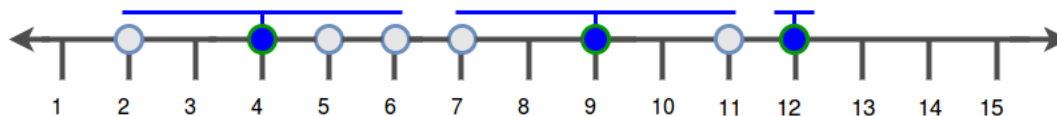
```
8 2
7 2 4 6 5 9 12 11
```

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.

f t in

Submissions: [11261](#)

Max Score: 25

Difficulty: Medium

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Java 7

```
1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         Scanner in = new Scanner(System.in);
11         int n = in.nextInt();
12         int k = in.nextInt();
13         int[] x = new int[n];
14         for(int x_i=0; x_i < n; x_i++){
15             x[x_i] = in.nextInt();
16         }
17     }
18 }
19
```

Line: 1 Col: 1

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

Run Code

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