Hackerland Radio Transmitters ☆

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Problem Solving ★★★★★★

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Hackerland is a one-dimensional city with houses aligned at integral locations along a road. The Mayor wants to install radio transmitters on the roofs of the city's houses. Each transmitter has a fixed range meaning it can transmit a signal to all houses within that number of units distance away.

Given a map of Hackerland and the transmission range, determine the minimum number of transmitters so that every house is within range of at least one transmitter. Each transmitter must be installed on top of an existing house.

For example, assume houses are located at $x = [1, 2, 3, 5, 9]$ and the transmission range $k = 1$. 3 antennae at houses 2 and 5 and 9 would provide complete coverage. There is no house at location 7 to cover both 5 and 9. Ranges of coverage, are $[1, 2, 3]$, $[5]$, and $[9]$.

Function Description

Complete the hackerlandRadioTransmitters function in the editor below. It must return an integer that denotes the minimum number of transmitters to install.

hackerlandRadioTransmitters has the following parameter(s):

- x: integer array that denotes the locations of houses
- k: an integer that denotes the effective range of a transmitter

Input Format

The first line contains two space-separated integers n and k, the number of houses in Hackerland and the range of each transmitter.
The second line contains n space-separated integers describing the respective locations of each house $x[i]$.

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 of the houses.

Sample Input 0

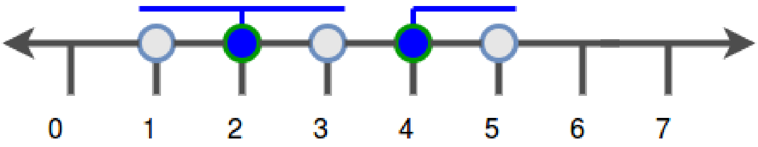
```
5 1
1 2 3 4 5
```

Sample Output 0

```
2
```

Explanation 0

The diagram below depicts our map of Hackerland:



We can cover the entire city by installing 2 transmitters on houses at locations 2 and 4.

Sample Input 1

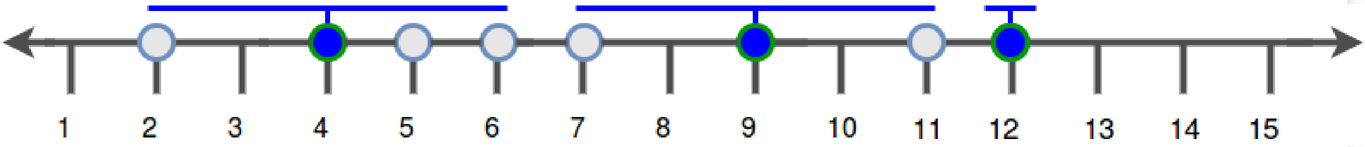
```
8 2
7 2 4 6 5 9 12 11
```

Sample Output 1

```
3
```

Explanation 1

The diagram below depicts our map of Hackerland:



We can cover the entire city by installing 3 transmitters on houses at locations 4, 9, and 12.

Current Buffer (saved locally, editable) Java 7

```
import java.util.Arrays;
import java.util.Scanner;

public class Solution {

    static int hackerlandRadioTransmitters(int[] locationsOfHouses, int rangeOfTransmitter) {
        int minNumberOfTransmitters = 0;
        int currentDistance = 0;
        Arrays.sort(locationsOfHouses);
        for (int i = 1; i < locationsOfHouses.length; i++) {
            currentDistance += locationsOfHouses[i] - locationsOfHouses[i - 1];
            if (currentDistance > rangeOfTransmitter) {
                minNumberOfTransmitters++;

                currentDistance = locationsOfHouses[i] - locationsOfHouses[i - 1];

                while (currentDistance <= rangeOfTransmitter) {
                    if (i < locationsOfHouses.length - 1) {
                        i++;
                        currentDistance += locationsOfHouses[i] - locationsOfHouses[i - 1];
                    } else {
                        break;
                    }
                }


                currentDistance = 0;
            }

        }
        if (minNumberOfTransmitters == 0) {
            minNumberOfTransmitters = 1;
        }
        return minNumberOfTransmitters;
    }

    public static void main(String[] args) {

        Scanner reader = new Scanner(System.in);
        int numberOfHouses = reader.nextInt();
        int rangeOfTransmitter = reader.nextInt();
        int[] locationsOfHouses = new int[numberOfHouses];

        for (int i = 0; i < numberOfHouses; i++) {
            locationsOfHouses[i] = reader.nextInt();
        }
        reader.close();

        int result = hackerlandRadioTransmitters(locationsOfHouses, rangeOfTransmitter);
        System.out.println(result);
    }
}
```

Line: 12 Col: 34

Upload Code as File

□ Test against custom input

Run Code

Submit Code

15 test cases failed :(

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✗ Testcase 0 ✗ Testcase 1 ✗ Testcase 2 ✓ Testcase 3 ✓ Testcase 4

✓ Testcase 5 ✓ Testcase 6 ✗ Testcase 7 ✓ Testcase 8 ✗ Testcase 9

✗ Testcase 10 ✓ Testcase 11 ✗ Testcase 12 ✗ Testcase 13

✓ Testcase 14 ✗ Testcase 15 ✗ Testcase 16 ✗ Testcase 17

✗ Testcase 18 ✓ Testcase 19 ✗ Testcase 20 ✓ Testcase 21

✓ Testcase 22 ✗ Testcase 23 ✓ Testcase 24 ✓ Testcase 25

✓ Testcase 26 ✓ Testcase 27 ✗ Testcase 28 ✓ Testcase 29

✓ Testcase 30

Input (stdin) Download

```
788 63
54735 54198 44495 83777 6793 7
6269 67930 58266 34294 49369 3
```

Expected Output Download

```
494
```

Compiler Message

```
Wrong Answer
```

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