Mobile Base Station

Description

The problem presents a scenario where a company needs to efficiently place mobile phone base stations along a long river to ensure coverage for N houses scattered along its banks. The river can be visualized as a linear axis, with the houses located at specific coordinates on this axis, provided in an array **house []** sorted in ascending order. The objective is to ensure that every house is within a 4-kilometer radius of at least one base station, thereby providing complete mobile coverage for all the houses. **Give an efficient algorithm that minimizes the number of base stations used?**

Function

```
public static int RequiredFunction (int N, int[] houses)
```

`PROBLEM_CLASS.cs` includes this method.

Complexity

Should be less than $O(N^2)$

Example

Cases	Case#1	Case#2	Case#3	Case #4	Case#5
Input	1, 10, 20, 30	5, 7, 8, 9, 11	2, 7, 10, 20, 21, 23, 24	1, 6, 11, 16, 21	4, 5, 6, 8, 11, 13, 16, 19, 25, 31, 35
Output	4	1	2	3	4

C# Help

Getting the size of 1D array

```
int size = array1D.GetLength(0);
```

Getting the size of 2D array

```
int size1 = array2D.GetLength(0);

int size2 = array2D.GetLength(1);
```

Creating 1D array

```
int [] array1D = new int [size]
```

Creating 2D array

```
int [,] array2D = new int [size1, size2]
```

Sorting single array

Sort the given array "items" in ascending order

```
Array.Sort(items);
```

Sorting parallel arrays

Sort the first array "master" and re-order the 2nd array "slave" according to this sorting

```
Array.Sort(master, slave);
```