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نمره	تمرین عملی سری اول		
	<p><b>Football</b></p> <p>Petya loves football very much. One day, as he was watching a football match, he was writing the players' current positions on a piece of paper. To simplify the situation, he depicted it as a string consisting of zeroes and ones. A zero corresponds to players of one team; a one corresponds to players of another team. If there are at least 7 players of some team standing one after another, then the situation is considered dangerous. For example, the situation 0010011011111101 is dangerous and 11110111011101 is not. You are given the current situation. Determine whether it is dangerous or not.</p> <p><b>Input Format:</b> The first input line contains a non-empty string consisting of characters "0" and "1", which represents players. The length of the string does not exceed 100 characters. There's at least one player from each team present on the field.</p> <p><b>Output Format:</b> Print "YES" if the situation is dangerous. Otherwise, print "NO".</p> <p><b>Input:</b> 001001</p> <p><b>Output:</b> NO</p> <p><b>Input:</b> 1000000001</p> <p><b>Output:</b> YES</p>		

	<p><b>Translation</b></p> <p>The translation from the Berland language into the Birland language is not an easy task. Those languages are very similar: a berlandish word differs from a birlandish word with the same meaning a little: it is spelled (and pronounced) reversely. For example, a Berlandish word <i>code</i> corresponds to a Birlandish word <i>edoc</i>. However, it's easy to make a mistake during the «translation». Vasya translated word <i>s</i> from Berlandish into Birlandish as <i>t</i>. Help him: find out if he translated the word correctly.</p> <p><b>Input Format:</b> The first line contains word <i>s</i>, the second line contains word <i>t</i>. The words consist of lowercase Latin letters. The input data do not consist unnecessary spaces. The words are not empty and their lengths do not exceed 100 symbols.</p> <p><b>Output Format:</b> If the word <i>t</i> is a word <i>s</i>, written reversely, print YES, otherwise print NO.</p> <p><b>Input:</b>  code  edoc  <b>Output:</b>  YES</p> <p><b>Input:</b>  abb  aba  <b>Output:</b>  NO</p>	<p>2</p>
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### Gravity Flip

Little Chris is bored during his physics lessons (too easy), so he has built a toy box to keep himself occupied. The box is special, since it has the ability to change gravity.

There are  $n$  columns of toy cubes in the box arranged in a line. The  $i$ -th column contains  $a_i$  cubes. At first, the gravity in the box is pulling the cubes downwards. When Chris switches the gravity, it begins to pull all the cubes to the right side of the box. The figure shows the initial and final configurations of the cubes in the box: the cubes that have changed their position are highlighted with orange.



Given the initial configuration of the toy cubes in the box, find the amounts of cubes in each of the  $n$  columns after the gravity switch!

**Input Format:** The first line of input contains an integer  $n$  ( $1 \leq n \leq 100$ ), the number of the columns in the box. The next line contains  $n$  space-separated integer numbers. The  $i$ -th number  $a_i$  ( $1 \leq a_i \leq 100$ ) denotes the number of cubes in the  $i$ -th column.

**Output Format:** Output  $n$  integer numbers separated by spaces, where the  $i$ -th number is the amount of cubes in the  $i$ -th column after the gravity switch.

**Input:**

4

3 2 1 2

**Output:**

1 2 2 3

**Input:**

3

2 3 8

**Output:**

2 3 8

	<p><b>Vanya and Lanterns</b></p> <p>Vanya walks late at night along a straight street of length <math>l</math>, lit by <math>n</math> lanterns. Consider the coordinate system with the beginning of the street corresponding to the point 0, and its end corresponding to the point <math>l</math>. Then the <math>i</math>-th lantern is at the point <math>a_i</math>. The lantern lights all points of the street that are at the distance of at most <math>d</math> from it, where <math>d</math> is some positive number, common for all lanterns.</p> <p>Vanya wonders: what is the minimum light radius <math>d</math> should the lanterns have to light the whole street?</p> <p><b>Input Format:</b> The first line contains two integers <math>n, l</math> (<math>1 \leq n \leq 1000, 1 \leq l \leq 10^9</math>) — the number of lanterns and the length of the street respectively.</p> <p>The next line contains <math>n</math> integers <math>a_i</math> (<math>0 \leq a_i \leq l</math>). Multiple lanterns can be located at the same point. The lanterns may be located at the ends of the street.</p> <p><b>Output Format:</b> Print the minimum light radius <math>d</math>, needed to light the whole street. The answer should have exactly ten decimal places just like the given example</p> <p><b>Input:</b>  7 15  15 5 3 7 9 14 0</p> <p><b>Output:</b>  2.5000000000</p> <p><b>Input:</b>  2 5  2 5</p> <p><b>Output:</b>  2.0000000000</p> <p><b>Note</b>  Consider the second sample. At <math>d = 2</math> the first lantern will light the segment <math>[0, 4]</math> of the street, and the second lantern will light segment <math>[3, 5]</math>. Thus, the whole street will be lit.</p>	<p>۴</p>
<p>۱۰</p>	<p><b>Insertion Sort</b></p> <p>Implement <i>insertion sort</i> with the following interface</p> <p><i>Sort</i>(<math>l</math>:Array, <i>descending</i>=False) -&gt; Array: receive an array and return the sorted version of the array using insertion sort if the ascending flag is given sort based on its value.</p> <p><i>Is_Sorted</i>(<math>l</math>:Array, <i>descending</i>=False) -&gt; Boolean: check if the given array is sorted based on ascending flag's value</p> <p><i>GetMax</i>(<math>l</math>:Array) -&gt; Int: return maximum value of the array</p> <p><i>AppendSorted</i>(<math>l</math>:Array, <math>e</math>:Int) -&gt; Array: append the new value to a sorted array and return a sorted array (Do not append and sort the array again. The Given Array is already sorted try to append the value in the correct position)</p>	<p>۵</p>

*GetHistogram(l:Array, bins:Int) -> Array*: return the number of point in each bins in ascending order, for instance, if the array is (-5,12,15,18),bins=3 then the intervals is calculated by:

interval length =  $\text{ceil}((\text{max}-\text{min})/\text{bins}) \Rightarrow \text{interval length} = \text{ceil}((18-(-5))/3) = 8$

Hence, we have following intervals  
[-5,3],[3,11],[11,19]

And the resulted array would be  
1,0,3

Since the first interval only contains -5 and there is no data point in second interval and final interval contains the other three data points.

**Input Format:** First you get the number of queries n and each query consists of two parts: first the operation to be applied and second the array. Any parameters needed for the operation will be given in the same line separated by space.

**Output Format:** For each query print the result if its Boolean print “YES” if the result is true and “NO” otherwise. In case of result being array print the numbers separated by space like “1 5 10 13”

**Input:**  
5  
SORT  
1 -2 13 24 -100  
IS\_SORTED ASCENDING  
12 11 15 13 26  
APPEND 13  
1 2 3 4 5 6 7 8  
GET\_HISTOGRAM 3  
-5 12 15 18  
SORT DESCENDING  
1 2 3 5 6

**Output:**  
-100 -2 1 13 24  
NO  
1 2 3 4 5 6 7 8 13  
1 0 3  
6 5 3 2 1

**Note:** implementation details matter in this question so try to follow the given guideline. Time and Space complexity of your function will impact your mark. Using any third-party modules that will make the answer trivial is forbidden.