**Smooth Array**

Akash bought an array of integers of size N and he did some unique operations with it and called them as smooth array based on some following assumptions . An array is called smooth if its first, last and middle elements are equal. Given an array arr, determine if it is smooth or not.  
We define the middle of the array arr as follows:  
    1)if arr contains an odd number of elements, there is only one middle number;  
    2)if arr contains an even number of elements, there are two middle elements, the sum of the two elements is considered as the middle element.  
  
Given an aray of integers of length N, write a program to help find Akash if the array is smooth or not.  
  
**Input format:**  
First input is an integer that denotes N, the size of the array. 1<=N<=100.  
Second input consists of series of integers seperated by space that denotes the array values.  
  
**Output format:**  
First line of the output consists of three integers, which correspond to first element, middle element and last element respectively.  
Second line of the output is a string, print "True" if its a smooth number else print "False".  
  
**Sample Input 1:**  
6  
7 2 2 5 10 7  
**Sample Output 1:**  
7 7 7  
True  
  
**Sample Input 2:**  
5  
1 3 4 6 8  
**Sample Output 2:**  
1 4 8  
False

**Additional Sample TestCases**

**Sample Input and Output 1 :**

**Sample Input and Output 2 :**

**Abundant Number**

Amit was listening to the teacher's lecture and she was teaching on the topic divisors of a number. When she gave a homework to find the divisors of a number, he found that for some numbers, the sum of its divisors is greater than the number itself. Given a range from X to Y, write a program to print all the abundant numbers within it. An abundant number or excessive number is a number for which the sum of its proper divisors is greater than the number itself. If there are no abundant numbers within the given range then print "-1".  
  
**Note :**  
    Range X to Y denotes all numbers between X and Y, including X and excluding Y. The minimum value of X is 1 and the maximum value of Y is 500 and always X<Y.   
  
**Input format:**   
First input is an integer that denotes the X value.  
Second input is an integer that denotes the Y value.   
  
**Output format:**   
Output is a series of integers separated by a comma.   
  
**Sample Input 1:**   
1  
50   
**Sample Output 1:**   
12,18,20,24,30,36,40,42,48   
  
**Sample Input 2:**   
1  
10   
**Sample Output 2:**   
-1

**Additional Sample TestCases**

**Sample Input and Output 1 :**

**Triangular Integers**

Ramu and Goku are doing their first year in CS department. Ramu is good in analytical skills and Goku is good in Programming. They  have been given with an assignment that has to be solved and programmed.   
The assignment is as follows:  
Given a number X, determine whether it is a Triangular Number  or not. A Triangular Number X, is a positive integer that can be represented as the sum of all integers from 1 up to some n. Write a program to help Ramu and Goku.  
  
**Input format**  
First input is an integer that denotes the X value.  
  
**Output format:**  
Output is a string, "True" if its Triangular else "False".  
If "True", print the 'n' value.  
Else, print the two 'n' values. The first 'n' value creates the triangular number that is immediately left to X, and the other 'n' value creates the triangular number that is immediately right to X.  
  
**Sample Input 1:**  
10  
**Sample Output 1:**  
True  
4  
**Explanation :**  
X = 10.  
1 + 2 + 3 + 4 = 10. Therefore, X is a triangular number, and the 'n' value is **4**.  
  
**Sample Input 2:**  
11  
**Sample Output 2:**  
False  
4 5  
**Explanation :**  
X = 11  
1 + 2 + 3 + 4 = 10.  
and 1 + 2 + 3 + 4 + 5 = 15.  
Therefore X is not a Triangular Number, and the two 'n' values are **4** and **5**.

**Additional Sample TestCases**

**Sample Input and Output 1 :**

**Sample Input and Output 2 :**

**Matrix Difference**

In Mary 's class her teacher taught her the concept of left diagonal and right diagonal of a matrix. On seeing a 2D matrix, she came up with an idea to implement that concept in the matrix. Given a 2D matrix of size N\*N, write a program to find the difference between the sum of the diagonals and sum of the rest of the  elements.  
  
**Input Format:**  
First input is an integer that denotes the N value,row and column size of the matrix.  
Next 'N' lines of inputs consists of series of integers seperated by space that denotes the matrix values.  
  
**Output Format:**  
Output is an integer that denotes the difference between the sum of the elements of the diagonals andsum of rest of the elements.  
  
**Sample Input 1:**  
3  
1 6 3  
2 1 2  
3 6 1  
**Sample Output 1:**  
-7  
  
**Explanation:**  
Sum of diagonal elements = [1+1+1+3+3] = 9  
Sum of the remaining elements = [6+6+2+2] = 16  
Difference =  9-16 = -7.  
  
**Sample Input 2:**  
4  
1 2 3 4  
4 3 2 1  
7 8 9 6  
6 5 4 3  
**Sample Output 2:**   
4

**Additional Sample TestCases**

**Sample Input and Output 1 :**

**Sample Input and Output 2 :**

**Unique Numbers**

Balaji is a young smart boy who likes to play with numbers. One day he accidentally found some special numbers and called them as unique numbers. Given two positive integers M and N, write a program to find whether the given numbers are unique Numbers.

1)If 'yes', print all the factors of the two numbers in each line.

           2)If 'no', print the difference between the sum of factors of those two  numbers  
**Note:**  
Unique numbers are pair of numbers whose divisors sum up to another number and vice versa.  
For example 220 and 284 are unique numbers.  
  
**Input format:**  
First input is an integer that denotes the M value.  
Second input is an integer that denotes the N value.  
  
**Output format:**  
Output is a string, print "Yes" if the given numbers are unique numbers else print "No".  
  
**Sample Input 1:**  
220  
284  
**Sample Output 1:**  
Yes  
1 2 4 5 10 11 20 22 44 55 110   
1 2 4 71 142  
  
**Explanation:**  
First we find the proper divisors of 220:

1, 2, 4, 5, 10, 11, 20, 22, 44, 55, 110  
If you add up all of these numbers you will see that they sum to 284.  
Now find the proper divisors of 284:  
1, 2, 4, 71, 142  
These sum to 220, and therefore 220 & 284 are unique numbers.

**Sample Input 2:**  
578  
688  
**Sample Output 2:**  
No  
333  
  
**Explanation:**  
Sum of factors of 578 = 343   
Sum of factors of 688 = 676  
Their absolute difference is = 333 .  
                                                                

**Additional Sample TestCases**

**Sample Input and Output 1 :**

**Sample Input and Output 2 :**

**Unique Product of digits in an array**

Shwetha bought an array and she thought to reduce it. Instead of simply rejecting the numbers she decided to find the unique product of digits in it. Product of digits is found by multiplying each of the digits of the given numbers in the array. After finding the products, the unique product values are counted. Given an array of integers of length N, write a program to check the number of unique digits in it .  
  
**Input format:**  
First input is an integer that denotes the N value, size of the array. 1<=N<=100.  
Second line of the input is a series of integers separated by a space that denotes the array values.  
  
**Output format:**  
Output is an integer that denotes the number of unique product of digits in the input array..  
  
**Sample Input 1:**  
6  
2 8 121 43 222 29  
**Sample Output 1:**  
4  
  
**Explanation:**  
For a = [2, 8, 121, 43, 222, 29], the output should be  
uniqueDigitProducts(a) = 4.  
  
Here are the products of the array's elements:  
  
    2: product(2) = 2;  
    8: product(8) = 8;  
    121: product(121) = 1 \* 2 \* 1 = 2;  
    43: product(42) = 4 \* 3 = 12;  
    222: product(222) = 2 \* 2 \* 2 = 8;  
    29: product(23) = 2 \* 9 = 18.  
  
As you can see, there are only 4 different products: 2,8 ,12 and 18.  
  
**Sample Input 2:**  
5  
3 4 1 5 2  
**Sample Output 2:**  
5