Given a string S, compress the string by its character and its count as specified in the sample input and output.

**Boundary Condition:**  
1<= Length of S <= 10000

**Input Format:**  
The first line contains the string S.

**Output Format:**  
The first line contains the compressed string format.

**Sample Input/Output 1:  
Input:**  
aaabbbbcc

**Output:**  
a3b4c2

**Sample Input/Output 2:  
Input:**  
abc

**Output:**  
a1b1c1

Given an array of integer of size N, print the elements for which the sum of all elements present to it's left is equal to the sum of all elements present to it's right.

**Boundary Condition:**  
1<= N <= 10000

**Input Format:**  
The first line contains N.  
The second line contains N integers separated by space.

**Output Format:**  
The first line contains the output as specified.

**Sample Input/Output 1:  
Input:**  
4  
2 1 5 3

**Output:**  
5

**Sample Input/Output 2:  
Input:**  
6  
1 4 -2 2 2 1

**Output:**  
-2 2

Given an integer a matrix of size M x N, print the elements of the matrix in zig zag order from bottom.

**Boundary Condition:**  
1<= M, N <= 100

**Input Format:**  
The first line contains the integer M and N separated by space.  
The next M lines contain the matrix values.

**Output Format:**  
The first line contains all the elements in zig zag order from bottom.

**Sample Input/Output 1:  
Input:**  
3 3  
1 2 3  
4 5 6  
7 8 9

**Output:**  
9 6 8 7 5 3 2 4 1

**Sample Input/Output 2:  
Input:**  
3 5  
1 2 3 4 5  
6 7 8 9 10  
11 12 13 14 15

**Output:**  
15 10 14 13 9 5 4 8 12 11 7 3 2 6 1

Given an integer N, print the smallest possible integer that can be formed using all the digits of N.

**Boundary Condition:**  
1<= N <= 9999999999

**Input Format:**  
The first line contains N.

**Output Format:**  
The first line contains the smallest possible integer that can be formed using all the digits of N.

**Sample Input/Output 1:  
Input:**  
45223

**Output:**  
22345

**Sample Input/Output 2:  
Input:**  
48903012

**Output:**  
10023489

Given a string S with multiple words, print only the words which are not palindrome. **The palindrome check is case insensitive (That is MALAyalam is a palindrome).**

**Boundary Condition:**  
1 <= Length of S <= 10000

**Input Format:**  
The first line contains the string S.

**Output Format:**  
The first line contains the string with words which are not palindromes.

**Sample Input/Output 1:**  
Hi madam how can I help you?

**Output:**  
Hi how can help you?

**Sample Input/Output 2:**  
I am not Anna

**Output:**  
am not

Given an integer matrix of size MxN and indices which forms a rectangle within the matrix, print the sum of integers present inside the rectangle.

**Boundary Condition:**  
1<= M,N <= 100

**Input Format:**  
The first line contains M and N separated by space.  
The next M lines contain the matrix.  
The **(M+2)th** line contains the indices of the rectangle (top left and botton right corners) separated by space.

**Output Format:**  
The first line contains the sum of all elements in the rectangle.

**Sample Input/Output 1:**  
3 3  
1 2 3  
4 5 6  
7 8 9  
1 0 2 2

**Output:**  
39

**Sample Input/Output 2:**  
4 5  
33 46 11 49 79   
91 38 32 26 77   
53 93 70 65 72   
76 69 1 2 50   
1 1 2 2

**Output:**  
233

Given a sliding window of size K from a array of size N (N >= K), the program must print the maximum of the K numbers present for all possible sliding windows.

**Input Format:**  
The first line will contain the value of K  
The second line will contain the value of N  
The third line will contain N values separated by a space.

**Output Format:**  
The maximum of the numbers in each sliding window.

**Constraints:**  
1 <= N <= 1000  
1 <= K <= 1000  
K <= N

**Example Input/Output 1:**  
Input:  
3  
9  
3 2 7 6 5 1 2 3 4

Output:  
7 7 7 6 5 3 4

Explanation:  
The sliding windows (as K=3) are 3 2 7, 2 7 6, 7 6 5, 6 5 1, 5 1 2, 1 2 3, 2 3 4  
The maximum values in these windows are 7 7 7 6 5 3 4

**Example Input/Output 2:**  
Input:  
2  
3  
100 200 300

Output:  
200 300

Explanation:  
The sliding windows are 100 200, 200 300  
The maximum values in these windows are 200 300

Given two numbers A and B, the program must find the square numbers which lie between A and B(inclusive) and print them as output.

**Input Format:**  
The first line will contain A  
The second line will contain B

**Output Format:**  
The square numbers which lie between A and B separated by a comma

**Constraints:**  
1 <= A <= 1000000  
1 <= B <= 1000000  
A <= B

**Example Input/Output 1:**  
Input:  
18  
100

Output:  
25,36,49,64,81,100

**Example Input/Output 2:**  
Input:  
1  
1

Output:  
1

The below program must print the given array of numbers in the given format for a given size N. The values of N can be 3, 6, 10, 15, 21 and so on.

**Input Format:**  
The first line will contain N comma separated integer values.

**Output Format:**  
The desired pattern as given below.

**Constraints:**  
N = 3, 6, 10, 15, 21, 28, 36, .... but less than 10000.  
3 <= Length of input string <= 10000000

**Example Input/Output 1:**  
Input:  
11,12,13,14,15,16

Output:  
11  
12 14  
13 15 16

**Example Input/Output 2:**  
Input:  
11,12,13,14,15,16,17,18,19,20

Output:  
11  
12 15  
13 16 18  
14 17 19 20

**Example Input/Output 3:**  
Input:  
100,201,555

Output:  
100  
201 555

Write a program to find if a given number N can be expressed as a sum of two prime numbers.

**Note: YOU MUST OPTIMIZE the logic to find whether a number is prime or not, as very large prime numbers are provided as input. If the logic is not optimized your program will NOT get executed within the given time limit.**

**Input Format:**  
First line contains total number of test cases, denoted by T  
Next T lines will contain the value of N for each testcase.

**Output Format:**  
T lines containing either yes or no

**Boundary Conditions / Constraints:**  
1 <= T <= 25  
3 <= N <= 10^9

**Example Input/Output 1:**  
Input:  
5  
20  
12  
23  
34  
16

Output:  
yes  
yes  
no  
yes  
yes

Explanation:  
20 can be expressed as 17+3  
12 can be expressed as 7+5  
23 cannot be expressed as sum of two primes  
34 can be expressed as 31+3 or 11+23 or 17+17  
16 can be expressed as 11+5

Orlando wants to print the count of substrings in a digit string value S (which contains only digits 0 to 9) based on the condition that the given substring cannot contain two consecutive digits repeated.

**Input Format:**  
First line contains total number of test cases, denoted by T  
Next T lines will contain the value of S.

**Output Format:**  
The count of the substrings which do not contain two consecutive digits repeated.

**Boundary Conditions / Constraints:**  
1 <= T <= 25  
1 <= Length of S <= 100000

**Example Input/Output 1:**  
Input:  
3  
14886  
1056  
776

Output:  
9  
10  
4

Explanation:  
For 14886, the possible 9 substrings are 1,4,8,8,6,14,48,86,148  
For 1056, the possible 10 substrings are 1,0,5,6,10,05,56,105,056,1056  
For 776, the possible 4 substrings are 7,7,6,76

Given a number N, the program must print the pattern as described below.

**Input Format:**  
The first line contains the value of the N which represent the number N.

**Boundary Conditions:**  
2 <= N <= 9

**Output Format:**  
The pattern as described below in the Example Input/Output

**Example Input/Output 1:**  
Input:  
4

Output:  
4444444  
4333334  
4322234  
4321234  
4322234  
4333334  
4444444

**Example Input/Output 2:**  
Input:  
3

Output:  
33333  
32223  
32123  
32223  
33333

**Example Input/Output 3:**  
Input:  
7

Output:  
7777777777777  
7666666666667  
7655555555567  
7654444444567  
7654333334567  
7654322234567  
7654321234567  
7654322234567  
7654333334567  
7654444444567  
7655555555567  
7666666666667  
7777777777777

**Friend requests in social network**

In a social network, a person can invite friends of his/her friend. John wants to invite and add new friends. Complete the program below so that it prints the names of the persons to whom John can send a friend request.

**Input Format:**  
The first line contains the value of the N which represent the number of friends.  
Next N lines contain the name of the friend F followed by the number of friends of F and finally their names separated by space.

**Boundary Conditions:**  
2 <= N <= 10

**Output Format:**  
The names to which John can send a friend request.

**Example Input/Output 1:**  
Input:  
3  
Mani 3 Ram Raj Guna  
Ram 2 Kumar Kishore  
Mughil 3 Praveen Naveen Ramesh

Output:  
Raj Guna Kumar Kishore Praveen Naveen Ramesh

Explanation:  
Ram is not present in the output as Ram is already John's friend.

**Example Input/Output 2:**  
Input:  
4  
Arjun 3 Bhuvana Ramya Rajesh  
Naveen 2 Arjun Sangeetha  
Rajesh 3 Narmada Madan Suresh  
Suresh 2 Pawan Adhil

Output:  
Bhuvana Ramya Sangeetha Narmada Madan Pawan Adhil

**Alternate Sorting of Numbers**

Given an array of N integers, rearrange the array in such a way that the first element is first maximum, second element is first minimum, third element is second maximum, fourth element is second minimum and so on.

**Input Format:**  
The first line contains the value of the N integers separated by one or more spaces.

**Boundary Conditions:**  
4 <= N <= 100

**Output Format:**  
The N numbers alternately sorted as per the given instructions.

**Example Input/Output 1:**  
Input:  
1 2 3 4 5 6 7

Output:  
7 1 6 2 5 3 4

**Example Input/Output 2:**  
Input:  
10 99 44 22 56 63

Output:  
99 10 63 22 56 44

**Example Input/Output 3:**  
Input:  
9 5 6 9 3 2 5

Output:  
9 2 9 3 6 5 5