Problem 1 (warmup)

Given a list of n numbers, all of which are one or zero, print YES if any of the numbers are 1 and NO otherwise.

The first line of input will be the number n, and the second will be the list of numbers separated by spaces.

Example 1:
Input:
4
0 1 0 1

Output:
YES

Example 2:
Input:
5
0 0 0 0 0

Output:
NO

Problem 2 (USACO)

This is a USACO problem from last year, but it's pretty approachable.

http://usaco.org/index.php?page=viewproblem2&cpid=1059

Problem 3

Given a string and a pattern, your task is to count the number of positions where the pattern occurs in the string.

Input

The first input line has a string of length n, and the second input line has a pattern of length m. Both of them consist of characters a–z.

Output

Print one integer: the number of occurrences.

Example

Input:
saippuakauppias
pp

Output:
2

Problem 4

Given a string, your task is to reorder its letters in such a way that it becomes a palindrome (i.e., it reads the same forwards and backwards).

Input

The only input line has a string of length n consisting of characters A–Z.

Output

Print a palindrome consisting of the characters of the original string. You may print any valid solution. If there are no solutions, print "NO SOLUTION".

Example

Input:
AAAACACBA

Output:
AACABACAA

(Hint: What has to be true for the letters to be rearranged into a palindrome?)

Problem 5 (UNH 2021)

Ask the user for n (ask for n >= 0) distinct integers separated by spaces. (You do not need to check that the numbers are distinct.) Divide the list into 2 equal parts where the original ordering is preserved. The elements in the first list must be smaller than all of the elements in the second list. If there are an odd number of elements, divide the list into 3 parts where the middle part has exactly 1 element.

Formatting: Separate elements with a single space and sublists with two hyphens (--).

Example 1:
n? 4
Enter Numbers? 4 5 1 9
Result: 4 1 -- 5 9

Example 2:
n? 1
Enter Numbers? 0
Result: -- 0 --

Example 3:
n? 7
Enter Numbers? 8 3 9 2 5 1 7
Result: 3 2 1 -- 5 -- 8 9 7

(Hint: You can sort an array from least to highest in Java using Collections.sort()).

```java
package programmingTeam;

import java.util.Scanner;
public class week5Problem1 {
    public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      int t = sc.nextInt();
      String output = "";
      for(int i = 0; i < t; i++){
          int num = sc.nextInt();
          if(num == 1){
              output = "YES";
          }
      }
      if(output.equals("")) output = "NO";
      System.out.println(output);
    }
}
```

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

public class week5Problem2 {
    public static int charSum(String in) {
        int sum = 0;
        for(int i = 0; i < in.length(); i++) {
            sum+= (int)in.charAt(i);
        }
        return sum;
    }


    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String str =  sc.nextLine();
        String inputString[] = str.split(" ");
        //System.out.println(Arrays.toString(inputString));
        int[] input = new int[inputString.length];

        for(int i = 0; i < inputString.length; i++) {
            String str1 = inputString[i];
            input[i] = Integer.parseInt(str1);
        }

        Arrays.sort(input);
        //System.out.println(Arrays.toString(input));

        int c = 0;

        int a = input[0];
        int b = input[1];

        for(int i = 2; i < input.length; i++) {
            c = input[i];
            String output = a+" "+b+" "+c+" "+(a+b)+" "+(b+c)+" "+(c+a)+" "+(a+b+c);
            if(charSum(output) == charSum(str)){
                System.out.println(a+" "+b+" "+c);
            }
        }

    }
}
```

```java
package programmingTeam;
import java.util.Scanner;


public class week5Problem4 {

    public static boolean isPalindrome(String str) {
        int len = str.length();
        if(len % 2 ==0) {
            int out = str.substring(0, len/2+1).compareTo(str.substring(len/2-1, len));
            if(out == 0) {
                return true;
            }
        }

        else {
            System.out.println(0+" "+ (len/2+1));
            System.out.println((len/2+2)+" "+ len);
            int out = str.substring(0,len/2).compareTo(str.substring(len/2+2, len));
            if(out == 0) {
                return true;
            }
        }

        return false;

    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String in = sc.next();
        int len = in.length();

        System.out.println(isPalindrome("AACABACAA"));
    }
}
```