

# Binary Strings

## Problem ID: binarystrings

Let's define a function  $f$  over  $k$  binary strings of the same length  $m$  ( $k$  must be odd):

- The result is a binary string of length  $m$ ;
- Consider the  $i^{\text{th}}$  bits of  $k$  binary strings:
  - Let  $c_0$  be the number of strings whose  $i$ -th bit equal to 0,
  - Let  $c_1$  be the number of strings whose  $i$ -th bit equal to 1.
  - If  $c_0 > c_1$ , the  $i$ -th bit of the result is 0,
  - Otherwise, the  $i$ -th bit of the result is 1.

An example of function  $f$  over 3 binary strings:  $f(100, 111, 010) = 110$

You are given a set  $S$  of  $n$  binary strings, all of which have the same length  $m$ , and an odd integer  $k$ . Your task is to check if  $S$  is  $k$ -beautiful or not.

A set is considered  $k$ -beautiful iff for any selections of  $k$  strings  $x_1, x_2, \dots, x_k$  in  $S$ ,  $f(x_1, x_2, \dots, x_k)$  is also a string in  $S$ . Note that a string from  $S$  can be selected **multiple times**.

### Input

The first line contains 3 integers  $n, m, k$  ( $1 \leq k \leq n \leq 300, 1 \leq m \leq 300, k$  is odd). Then,  $n$  lines follow, each consists of a binary string of length  $m$ . It is guaranteed that all  $n$  strings are pair-wise distinct.

### Output

Print YES if  $S$  is  $k$ -beautiful, and NO otherwise.

Sample Input 1	Sample Output 1
3 3 3 100 111 010	NO
Sample Input 2	Sample Output 2
4 2 3 00 01 10 11	YES