Yet Another Contest 8 P2 - No More Modern Art

Time limit: 2.0s **Memory limit:** 256M

Josh has a wall of colour X. However, last night, people graffitied the entire wall! Josh now needs to obtain a large amount of paint of colour X so that he can repaint the wall, covering up the modern art.

In his storeroom, Josh finds N buckets of paint. The i-th bucket has paint of colour a_i. Josh can repeatedly perform the following operation:

- First, select one bucket of paint.
- Then, evenly divide the paint in this bucket amongst the remaining buckets. The chosen bucket is then discarded.
- If paint of colour X was poured into a bucket of paint of colour Y, then the bucket will now contain paint of colour $X \oplus Y$, due to the mysterious chemical properties of the paint.

Here, $\oplus$ denotes the bitwise XOR operator.

Can you help Josh determine whether he can end up with exactly one bucket, with this bucket containing paint of colour X?

Constraints

$2 \leq N \leq 10^6$

$0 \leq X, a_i < 2^{30}$

Subtask 1 [20%]

$2 \leq N \leq 9$

Subtask 2 [50%]

$2 \leq N \leq 2000$

Subtask 3 [30%]

No additional constraints.

Input Specification

The first line contains two space-separated integers, N and X.

The second line contains N space-separated integers, $a_1, a_2, \ldots, a_N$.

Output Specification

On a single line, output `YES` if Josh can end up with a single bucket containing paint of colour X, and `NO` otherwise.

Sample Input 1

```
3 1
1 2 3
```

Sample Output 1

```
YES
```

Explanation for Sample Output 1

Initially, there are three buckets, containing paint of colours 1, 2 and 3 respectively. Even though Josh already has paint of colour 1, he wants a single bucket of colour X, with no other buckets.

First, Josh can pour the paint in bucket 1 into the other two buckets. The bucket which initially contained paint of colour 2 now contains paint of colour $1 \oplus 2 = 3$. The bucket which initially contained paint of colour 3 now contains paint of colour $1 \oplus 3 = 2$.

At this point, Josh has two buckets, containing paint of colours 3 and 2 respectively. If he pours the paint in the first bucket into the second bucket, he will end up with a single bucket containing paint of colour $3 \oplus 2 = 1$.

Sample Input 2

```
3 4
1 2 3
```

Sample Output 2

```
NO
```