Problem L. Bitvzhuh

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 mebibytes

Daniyar recently learned a new spell called "Bitvzhuh". Although it is a very high level spell, Daniyar was able to master it completely and unlock its deepest secrets.

"Bitvzhuh", when cast on a set of integers, transforms the set into a new set which contains the XORs of all pairs in the initial set.

Formally, say you have a set $A = \{a_1, a_2, \ldots, a_n\}$ of size n. After one "Bitvzhuh", A turns into the set $\{a_i \oplus a_j \mid 1 \leq i < j \leq n\}$, where $\oplus$ denotes the bitwise XOR operation.

Given the initial set and the number k, find out if Daniyar can apply "Bitvzhuh" a certain **non-zero** number of times so that the resulting set will contain each integer in the range $[1, 2^k - 1]$.

Input

The first line contains two integers n and k ($3 \leq n \leq 10^6$, $2 \leq k \leq 62$): the size of the initial set and the parameter.

The second line contains n distinct integers $a_1, a_2, \ldots, a_n$ ($1 \leq a_i < 2^k$): the elements of the initial set.

Output

Print a single line with the word "`Yes`" if the set will contain each integer in the range $[1, 2^k - 1]$ after a certain **non-zero** number of casts of "Bitvzhuh". Otherwise, print a single line with the word "`No`".

Examples

standard input	standard output
4 3 1 2 3 4	Yes
4 3 1 2 4 7	No

Note

In the first example, the answer is achieved after two casts:

$\{1, 2, 3, 4\} \rightarrow \{1, 2, 3, 5, 6, 7\} \rightarrow \{1, 2, 3, 4, 5, 6, 7\}$.

In the second example, the first cast turns the set $\{1, 2, 4, 7\}$ into $\{3, 5, 6\}$, and it never changes after.