Problem J. XOr

Input file:	stdin
Output file:	stdout
Time limit:	1 second
Memory limit:	512 megabytes

bobo has a sequence of integers $a_1, a_2, \ldots, a_n$. He decides to divide the sequence into exactly m consecutive parts.

The cost of each part is its xor sum (bitwise exclusive-or), while the cost of division is bitwise or-sum of its parts' costs.

Help bobo find the minimum cost.

Input

The first line contains 2 integers n, m ($1 \le n \le 200000, 1 \le m \le n$).

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($0 \le a_i \le 10^9$).

Output

A single integer denotes the minimum cost.

Sample input and output

stdin	stdout
3 2 1 3 2	1
4 3 1 2 0 2	3