

Problem B. XXOR

Time limit 2000 ms

Mem limit 1048576 kB

Problem Statement

You are given N non-negative integers A_1, A_2, \dots, A_N and another non-negative integer K .

For a integer X between 0 and K (inclusive), let $f(X) = (X \text{ XOR } A_1) + (X \text{ XOR } A_2) + \dots + (X \text{ XOR } A_N)$.

Here, for non-negative integers a and b , $a \text{ XOR } b$ denotes the bitwise exclusive OR of a and b .

Find the maximum value of f .

► What is XOR?

Constraints

- All values in input are integers.
- $1 \leq N \leq 10^5$
- $0 \leq K \leq 10^{12}$
- $0 \leq A_i \leq 10^{12}$

Input

Input is given from Standard Input in the following format:

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N K
A1 A2 ... AN
```

Output

Print the maximum value of f .

Sample 1

Input	Output
3 7 1 6 3	14

The maximum value is: $f(4) = (4 \text{ XOR } 1) + (4 \text{ XOR } 6) + (4 \text{ XOR } 3) = 5 + 2 + 7 = 14$.

Sample 2

Input	Output
4 9 7 4 0 3	46

Sample 3

Input	Output
1 0 10000000000000	100000000000000