Problem B. XXOR

Time limit 2000 ms
Mem limit 1048576 kB

Problem Statement

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

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

Here, for non-negative integers a and b, a 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:

```
N K
A_1 A_2 ... A_N
```

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 1000000000000	1000000000000