Problem D
XOR

Time Limit: 1 seconds

Memory Limit: 512 megabytes

XOR (eXclusive OR) is a Boolean logic operation that compares two input bits and generates one output bit. The logic is simple. If the bits are the same, the result is 0. If the bits are different, the result is 1. To compute the XOR of two integers, they are first converted to binary representations, then their bits are XOR-ed in order.

The Chinese magicians were looking to craft an item that consisted of a mixture of 2 of the N magic ingredients. However, the magicians were unable to perfectly fuse these two materials, resulting in the strength of the finished product being equal to the strength of material A XOR with the strength of material B.

From these N materials, magicians can craft $N \times (N-1)/2$ different products. The magicians wanted to know the strength of the weakest K of these variants.

Input

The first line contains two integers N and K.

In the next N lines, each line consist of an integer A_i indicating the strength of the ith material.

Constraints:

- $N <= 10^5$
- $K <= min(25000, N \times (N-1)/2)$
- $A_i < 2^{31}$

Output

The output contains K numbers in ascending order indicating the strength of the weakest K products.

Sample Input

Sample Input	Sample Output
4 5 1 1 3 4	0 2 2 5 5

Explanation

In the sample input we have 4 numbers: $1, 1, 3, 4$. Therefore, there are $(4 \times 3)/2 = 6$ pairwise XOR's. These XOR's are:

$$1 \; xor \; 1 \; = \; 0 \; (A_1 \; xor \; A_2)$$
$$1 \; xor \; 3 \; = \; 2 \; (A_1 \; xor \; A_3)$$
$$1 \; xor \; 4 \; = \; 5 \; (A_1 \; xor \; A_4)$$
$$1 \; xor \; 3 \; = \; 2 \; (A_2 \; xor \; A_3)$$
$$1 \; xor \; 4 \; = \; 5 \; (A_2 \; xor \; A_4)$$
$$3 \; xor \; 4 \; = \; 7 \; (A_3 \; xor \; A_4)$$

If we sort these numbers we will obtain the sequence: $0, 2, 2, 5, 5, 7$. The first 5 numbers are: $0, 2, 2, 5, 5$.