# B. Friends

time limit per test: 6 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You have $n$ friends and you want to take $m$ pictures of them. Exactly two of your friends should appear in each picture and no two pictures should contain the same pair of your friends. So if you have $n = 3$ friends you can take $3$ different pictures, each containing a pair of your friends.

Each of your friends has an attractiveness level which is specified by the integer number $a_i$ for the $i$-th friend. You know that the attractiveness of a picture containing the $i$-th and the $j$-th friends is equal to the exclusive-or ($xor$ operation) of integers $a_i$ and $a_j$.

You want to take pictures in a way that the total sum of attractiveness of your pictures is maximized. You have to calculate this value. Since the result may not fit in a 32-bit integer number, print it modulo $1000000007$ $(10^9 + 7)$.

## Input

The first line of input contains two integers $n$ and $m$ — the number of friends and the number of pictures that you want to take.

Next line contains $n$ space-separated integers $a_1, a_2, ..., a_n$ $(0 \le a_i \le 10^9)$ — the values of attractiveness of the friends.

## Output

The only line of output should contain an integer — the optimal total sum of attractiveness of your pictures.

### Examples

| input |
| --- |
| 3 1<br>1 2 3 |

| output |
| --- |
| 3 |

| input |
| --- |
| 3 2<br>1 2 3 |

| output |
| --- |
| 5 |

| input |
| --- |
| 3 3<br>1 2 3 |

| output |
| --- |
| 6 |