# 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 $m$ $(1 \le n \le 5 \cdot 10^4;\ 0 \le m \le \frac{n \cdot (n-1)}{2})$ — 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 Copy
```
3 1
1 2 3
```
output Copy
```
3
```

input Copy
```
3 2
1 2 3
```
output Copy
```
5
```

input Copy
```
3 3
1 2 3
```
output Copy
```
6
```

### → Attention

Package for this problem was not updated by the problem writer or Codeforces administration after we've upgraded the judging servers. To adjust the time limit constraint, solution execution time will be multiplied by 2. For example, if your solution works for 400 ms on judging servers, then value 800 ms will be displayed and used to determine the verdict.

**Bayan 2012-2013 Elimination Round (ACM ICPC Rules, English statements)**

Finished

Practice

### → Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

### → Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

### → Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

### → Submit?

Language: GNU G++11 5.1.0

Choose file: 选择文件 未选择任何文件

Submit

### → Problem tags

binary search | bitmasks | data structures | math | *2700

No tag edit access

## → Contest materials

- Announcement #1 (en)
- Announcement #2 (ru)