Mr. Furion is a math teacher. His students are very lazy and they do not like to do their homework. One day, Mr. Furion decides to give them a special problem in order to see whether his students are talents in math or they are just too lazy to do their homework. The problem is:

Given an integer k, n integers m_1, $m_2...m_n$, and a formula below:

X_1 xor X_2 xor X_3 ... xor $X_n = k$

Please figure out that how many integral solutions of the formula can satisfy:

$0 \leq X_i \leq m_i (i = 1...n)$

Input

There are at most 100 test cases.

The first line of each test case contains two integers n and k. The second line of each test contains n integers: m_1, $m_2...m_n$. The meaning of n,k, m_1, $m_2...m_n$ are described above. $(1 \leq n \leq 50, 0 \leq k, m_1, m_2...m_n \leq 2^{31} - 1)$

The input is ended by ``0 0"

Output

You should output a integer for each test case, which is the number of solutions. As the number might be very large, you should only output the number modulo 1000000003.

Sample Input

```
11 2047
1024 512 256 128 64 32 16 8 4 2 1
10 2047
1024 512 256 128 64 32 16 8 4 2
0 0
```

Sample Output

```
1
0
```

Fuzhou 2010-2011