7517 Even or Odd?

After hearing about old magnetic tapes and information being stored on them, Filip decided to replicate the idea by creating a long paper strip with a sequence of numbers. So far so good, but what to do with it? Reading it over and over stopped being fun. Fortunately, he remembered that in school they learned about odd and even numbers. He tried to cut the paper strip into contiguous segments so that in each segment the sum of its numbers is even. Then he tried to cut a different paper strip into contiguous segments with odd sums. But wait! In how many different ways can he cut the paper strip into such segments?

All the numbers are nonnegative integers and Filip cannot cut through a number to split it into two numbers.

Input

The first line contains k, the number of paper strips. Each strip is described on two lines.

The first line contains three integers $n > 0$, $p \in \{0, 1\}$ and $q > 0$, where n stands for the number of numbers in the sequence on the strip, $p = 0$ if Filip wants even sums and $p = 1$ for odd sums, and q is the modulus to be used to output the answer. The second line describes the sequence — it contains n nonnegative integers. Each of these integers, as well as n, is not larger than 10,000,000.

Output

The output contains k lines. The i-th line corresponds to the i-th paper strip. Let C_i be the number of ways in which the paper strip can be cut into sequences with even sums for $p = 0$ or odd sums for $p = 1$. Since C_i might be too large, the i-th line contains C_i mod q (that is, the remainder after dividing C_i by q).

Explanation:

For the first sample input, we can cut the sequence in the following ways into even-sum segments: 1 7 / 2 / 3 5, or 1 7 2 / 3 5, or 1 7 / 2 3 5, or 1 7 2 3 5 (the last choice is just one segment). Therefore, there are 4 ways to cut the sequence into even-sum segments. Since 4 mod 10 = 4, we output 4.

For the second sample input, it is impossible to cut the sequence into even-sum segments.

For the third sample input, we can cut it into odd-sum segments as follows: 1 / 7 2 3 5, or 1 / 7 / 2 3 / 5, or 1 / 7 2 / 3 / 5, or 1 7 2 3 / 5. Therefore, the number of ways is 4 and the output is 4 mod 3 = 1.

Sample Input

```
3
5 0 10
1 7 2 3 5
3 0 10
1 7 3
5 1 3
1 7 2 3 5
```

Sample Output

```
4
```

```
0
1
```