

Problem A. Square Sum

Input file: `standard input`
Output file: `standard output`
Time limit: 2 seconds
Memory limit: 256 megabytes

You're given an integer m and a sequence of integers $z_1, \dots, z_n$.

For each z_i , calculate the number of integers x, y ($0 \leq x, y < m$) such that

$$x^2 + y^2 \equiv z_i \pmod{m}.$$

Input

First line of input contains two integers m ($1 \leq m \leq 10^9$) and n ($1 \leq n \leq 10^5$).

The second line contains n integers z_i ($0 \leq z_i < m$).

Output

For each z_i , output the number of pairs x, y ($0 \leq x, y < m$) such that $x^2 + y^2 \equiv z_i \pmod{m}$.

Examples

standard input	standard output
3 3 0 1 2	1 4 4
4 4 0 1 2 3	4 8 4 0
5 1 3	4