



Polynomials (polynomials)

Given two numbers n and k we consider a polynomial *valid* if its degree is n and its coefficients are all integers not exceeding k by the absolute values.

More formally, denote the coefficients with $a_0 a_1 \dots a_{n-1} a_n$.

Then the polynomial $P(x) = \sum_{i=0}^n a_i \cdot x^i = a_0 + a_1 \cdot x + \dots + a_{n-1} \cdot x^{n-1} + a_n \cdot x^n$ is valid if:

- a_i is integer for every i .
- $|a_i| \leq k$ for every i .
- $a_n \neq 0$.

Given a valid polynomial $P(X)$, such that $P(2) \neq 0$, we want to count in how many ways we can change only one coefficient to get a *valid* polynomial $Q(x)$ of degree n such that $Q(2) = 0$.

Example

Given $n = 3$ and $k = 12$ and the polynomial $P(x) = 10 - 9x - 3x^2 + 5x^3$.

Where $P(2) = 10 - 18 - 12 + 40 = 20 \neq 0$.

We can change one coefficient of $P(X)$ only in two different ways:

- $a_0 = -10$, then $Q(x) = -10 - 9x - 3x^2 + 5x^3$ and $Q(2) = 0$
- $a_2 = -8$, then $Q(x) = 10 - 9x - 8x^2 + 5x^3$ and $Q(2) = 0$

Thus the solution is 2.

Implementation

You should submit a single file, with either a `.c`, `.cpp`, `.java` or `.py` extension.

More formally, denote with $a_0 a_1 \dots a_{n-1} a_n$ the coefficients

Your program must read the input data from `stdin` and write the output data into `stdout`.

`stdin` consists of 2 lines:

- Line 1: Two space-separated integers n and k , the degree of the polynomial and the limit for absolute values of coefficients.
- Line 2: $n + 1$ space-separated integers, the coefficients $a_0 a_1 \dots a_{n-1} a_n$ of the polynomial.

`stdout` consists of only one line:

- Line 1: The number of ways to change one coefficient to get a *valid* polynomial $Q(X)$ with $Q(2) = 0$.

No additional output should be printed.

Constraints

- $1 \leq n \leq 100$.
- $1 \leq k \leq 10\,000$.
- The given polynomial is always valid and $P(2) \neq 0$.

Scoring

Your program will be tested on several test cases grouped in subtask.

To achieve the score of a subtask, you need to correctly solve all of its test cases.

- **Subtask 1 [40 points]:** $n \leq 100$ and $k \leq 100$.
- **Subtask 2 [60 points]:** $n \leq 100$ and $k \leq 10\,000$.

Examples

stdin	stdout
3 12 10 -9 -3 5	2