Polynomials (polynomials)

Given two numbers \( n \) and \( k \) we consider a polynomial \textit{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 \( a_0 \ a_1 \ldots \ a_{n-1} \ a_n \).
Then the polynomial \( P(x) = \sum_{i=0}^{n} a_i \cdot x^i = a_0 + a_1 \cdot x + \ldots + a_{n-1} \cdot x^{n-1} + a_n \cdot x^n \) 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 \textit{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 \( a_0 \ a_1 \ldots \ a_{n-1} \ a_n \) the coefficients

Your program must read the input data from \texttt{stdin} and write the output data into \texttt{stdout}.

\texttt{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 \( a_0 \ a_1 \ldots \ a_{n-1} \ a_n \) of the polynomial.

\texttt{stdout} consists of only one line:

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

No additional output should be printed.
Constraints

- $1 \leq n \leq 100$.
- $1 \leq k \leq 10000$.
- 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 $k \leq 10000$.

Examples

<table>
<thead>
<tr>
<th>stdin</th>
<th>stdout</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 12</td>
<td>2</td>
</tr>
<tr>
<td>10 -9 -3 5</td>
<td></td>
</tr>
</tbody>
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