Pr0ras invests again

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

The only difference between the easy and hard version of the problem is the sign of the x^2 coefficient and the constraints

Pr0ras want to get rich quick to decides to invest in the stock market. There are n stocks in which he can invest some non-negative integer amount. The profit by stock i is given by a quadratic function:

$$a_i x_i^2 + b_i x_i$$

where x_i is an integer amount of money he invests in stock i. Pr0ras has B coins to invest. What is the maximum amount of money Pr0ras can make?

Note: It is not allowed to invest fractional amount of money in a stock. You can decide to invest less than B coins as well but note that the left over coins are not included in the profit.

Input

The first line contains the number of stocks $1 \leq n \leq 10^5$ and $1 \leq B \leq 10^5$.

The next n lines contains $-1000 \leq a_i \leq -1$ and $1 \leq b_i \leq 1000$

Output

Print a single integer p where p is the maximum profit Pr0ras can make.

Example

standard input	standard output
2 3 -1 5 -2 10	16