D2. Magic Powder - 2

time limit per test: 1 second
memory limit per test: 256 megabytes

The term of this problem is the same as the previous one, the only exception — increased restrictions.

Input

The first line contains two positive integers n and k ($1 \le n \le 100\,000$, $1 \le k \le 10^9$) — the number of ingredients and the number of grams of the magic powder.

The second line contains the sequence $a_1, a_2, ..., a_n$ ($1 \le a_i \le 10^9$), where the i-th number is equal to the number of grams of the i-th ingredient, needed to bake one cookie.

The third line contains the sequence $b_1, b_2, ..., b_n$ ($1 \le b_i \le 10^9$), where the i-th number is equal to the number of grams of the i-th ingredient, which Apollinaria has.
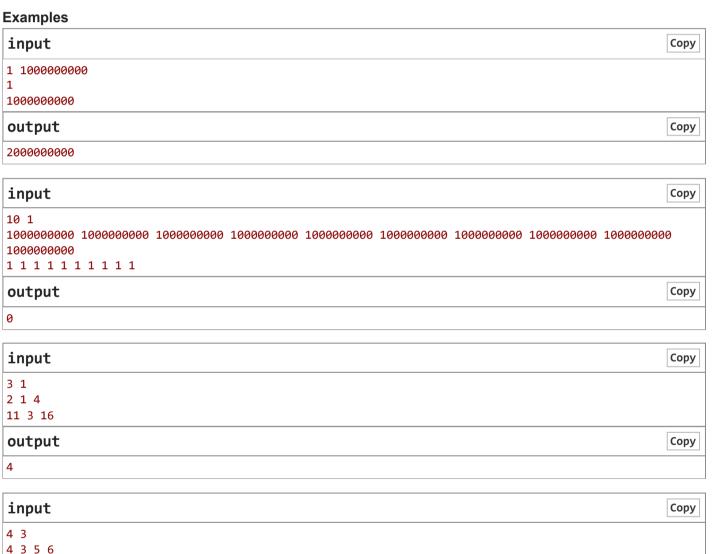
Output

Print the maximum number of cookies, which Apollinaria will be able to bake using the ingredients that she has and the magic powder.

Examples

input	Copy
1 1000000000 1 1000000000	

output	Copy
2000000000	

input	Copy
10 1 1000000000 1000000000 1000000000 1000000000 1000000000 1000000000 1000000000 1000000000 1000000000 1000000000 1 1 1 1 1 1 1 1 1 1	

output	Copy
0	

input	Copy
3 1 2 1 4 11 3 16	

output	Copy
4	

input	Copy
4 3 4 3 5 6 11 12 14 20	

output	Copy
3	

→ **Problem tags**

binary search   implementation   *1500
No tag edit access

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