F. Snow sellers

time limit per test: 10 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

The New Year celebrations in Berland last n days. Only this year the winter is snowless, that's why the winter celebrations' organizers should buy artificial snow. There are m snow selling companies in Berland. Every day the i-th company produces w_i cubic meters of snow. Next day the snow thaws and the company has to produce w_i cubic meters of snow again. During the celebration new year discounts are on, that's why the snow cost decreases every day. It is known that on the first day the total cost of all the snow produced by the i-th company is equal to c_i bourles. Every day this total cost decreases by a_i bourles, i.e. on the second day it is equal to c_i - a_i,and on the third day — to c_i - $2a_i$, and so on. It is known that for one company the cost of the snow produced by it does not get negative or equal to zero. You have to organize the snow purchase so as to buy every day exactly W snow cubic meters. At that it is not necessary to buy from any company all the snow produced by it. If you buy n_i cubic meters of snow ($0 \le n_i \le w_i$, the number n_i is not necessarily integer!) from the i-th company at one of the days when the cost of its snow is equal to s_i, then its price will total to bourles. During one day one can buy the snow from several companies. In different days one can buy the snow from different companies. It is required to make the purchases so as to spend as little money as possible. It is guaranteed that the snow produced by the companies will be enough.

Input

The first line contains integers n, m and W ($1 \le n \le 100$, $1 \le m \le 500000$, $1 \le W \le 10^9$) which represent the number of days, the number of companies and the amount of snow that needs to be purchased on every one of the n days. The second line contains m integers w_i. The third line contains m integers c_i. The fourth line contains m integers a_i. All the numbers are strictly positive and do not exceed 10^9. For all the i the inequation c_i - $(n - 1)a_i > 0$ holds true.

Output

Print a single number — the answer to the given problem. Print the answer in the format with the decimal point (even if the answer is integer, it must contain the decimal point), without "e" and without leading zeroes. The answer should differ with the right one by no more than 10^{-9}.

Examples

input
2 3 10 4 4 4 5 5 8 1 2 5
output
22.000000000000000

input
100 2 1000000000 999999998 999999999 1000000000 1000000000 1 1
output
99999995149.999995249999991