Fractional Knapsack

Time limit: 1 sec

You have a bag that can hold several items of total weight **W**. There are **N** items, numbered from 1 to **N**. Item #i weights $\mathbf{w_i}$ and has a price of $\mathbf{v_i}$. We have to select some of these items such that the summation of the weight of the selected item does not exceed **W** and the summation of their price is maximum.

In this problem, we can select a "fraction" of an item. Let $\mathbf{x_i}$ be the fraction of the item #i that we selected, $\mathbf{x_i}$ can take any real value between 0 to 1, inclusively. A value of 0 means that we does not choose any of that item while a value of 0.75 means that we takes only 75% of that item. We define the price we get as $\mathbf{x_i v_i}$

Formally, we want to find $\mathbf{x_i}$ such that $\sum_{i=1}^{N} x_i v_i$ is maximum and $\sum_{i=1}^{N} x_i w_i \leq W$.

Your task is to find maximum $\sum_{i=1}^{N} x_i v_i$.

Input

- The first line of input contains two numbers **W** and **N** where **W** is a real number while **N** is an integer (1 <= W,N <= 100,000)
- The next lines contains **N** real numbers that give $\mathbf{v_i}$, starting from $\mathbf{v_1}$ to $\mathbf{v_n}$
- The next lines contains **N** real numbers that give $\mathbf{w_i}$, starting from $\mathbf{w_1}$ to $\mathbf{w_n}$

Output

The output must contain exactly one line containing the summation of selected price. We suggest output of 4 fractional digits. The judge will accept any solution that differs from the best answer less than 0.00001%

Example

Input	Output
6 3 5 3 3 4 3 3	7.0000
5.5 4 2 3 4 5 1 2 3 4	8.3333