Gasoline Stations (gasoline)

After many days of uninterrupted studying, William needs to take a break: a romantic trip with his girlfriend from Milan to Pordenone, to visit the famous Saint Valentine Park!

During the travel, he will encounter N gas stations where he can buy some fuel for his car. William knows the price-per-liter P_i of each station and he has already estimated how much gasoline G_i at minimum he has to have at each station in order to reach the next one (and, at the last station, to arrive in Pordenone) safely. Being very wise, he brought with him many tanks so that he can buy as much gasoline as he wants.

Figure 1: To fill or not to fill, that is the question.

Help William plan how much he has to spend at *minimum*, knowing that he starts the journey from the first gas station without any fuel in the tanks.

> ☞ Among the attachments of this task you may find a template file `gasoline.*` with a sample incomplete implementation.

Input

The first line contains the only integer N. The second line contains N integers P_i, the price-per-liter at the i-th station. The third line contains N integers G_i, the amount of liters William has to have in the tanks to reach the next station (or Pordenone) from the i-th station.

Output

You need to write a single line with an integer: the minimum amount of money needed for the whole trip.

Constraints

- $1 \leq N \leq 1\,000\,000$.
- $1 \leq P_i, G_i \leq 1\,000$ for each $i = 0 \ldots N-1$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (10 points) $N \leq 10$.

– **Subtask 3** (10 points) All P_i are equal.

– **Subtask 4** (10 points) All G_i are equal.

– **Subtask 5** (30 points) $N \leq 1000$.

– **Subtask 6** (40 points) No additional limitations.

Examples

input	output
5 30 25 30 10 10 5 6 4 2 4	460
5 10 30 20 10 15 7 10 100 20 3	1400

Explanation

In the **first sample case**, an optimal solution is:

- Buy 5 liters at the first station spending $5 \cdot 30 = 150$.
- Buy 10 liters at the second station spending $10 \cdot 25 = 250$.
- Don't buy anything at the next station.
- Buy 6 liters at the next station $6 \cdot 10 = 60$.
- Don't buy anything at the last station.

The total amount is $150 + 250 + 60 = 460$.

In the **second sample case**, an optimal solution is to buy all the gasoline needed at the first station spending $140 \cdot 10 = 1400$.