Fruits

SEASON 7 – ROUND FOUR

Lora finally decided to quit her job and do something more interesting – selling fruits.

Currently she has **N** fruits numbered from 1 to N, which she wants to sell. Unfortunately, her new workplace is so narrow that she can only put up one fruit for sale at a time. To make her life simpler, she just puts the fruits in order – **i.e. fruit number i must be sold not later than fruit number i+1.**

The price of fruit number **i** at day 0 is A_i. Every day each fruit ripens and hence the price of fruit number **i** increases by B_i each day. However, if fruit number **i** is not sold by day K_i, it rots and has to be thrown away (i.e. sold for price of 0). Formally stated, the price of fruit number **i** at day **d** is:

$A_i + d*B_i$ if $d<K_i$

0 if $d \geq K_i$

Lora can sell as many fruits as she wants in a single day, as long as she keeps the order, or she could decide to not sell any fruits in a single day. She is now wondering what the maximum profit she can get is.

Note: The days are counted starting from 0. If a certain fruit rots at day 0, then it can never be sold for a price different than 0.

Input

The first line of the input file `fruits.in` contains a single integer **N** – the amount of fruits.

The second line contains N space-separated integers – the prices of each fruit at day 0 (i.e. the array A).

The third line contains N space-separated integers – the price increases of each fruit for a day (i.e. the array B)

The last line contains N space-separated integers – the days at which each fruit rots (i.e. array K).

Output

On a single line of the output file `fruits.out` print a single number – the maximum profit Lora can achieve, considering the given constraints.

Constraints

$1 \leq N \leq 5\ 000$

$0 \leq K_i \leq 10\ 000$

$0 \leq A_i,\ B_i \leq 1\ 000\ 000\ 000$

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Time limit: 0.6 sec
Memory limit: 256 MB

Sample test

Input (fruits.in)	Output (fruits.out)
3 1 2 3 6 4 2 2 1 3	14

Clarifications

The optimal solution is to sell the first fruit at day 1 for 1+1*6=7. Thus the second fruit rots, since it cannot be sold earlier than the first. We then sell the third fruit at day 2 for 3+2*2=7. The total profit is 7+7=14.