C. Geometry Horse

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Vasya plays the Geometry Horse.

The game goal is to destroy geometric figures of the game world. A certain number of points is given for destroying each figure depending on the figure type and the current factor value.

There are n types of geometric figures. The number of figures of type k_i and figure cost c_i is known for each figure type. A player gets $c_i \cdot f$ points for destroying one figure of type i, where f is the current factor. The factor value can be an integer number from 1 to $t+1$, inclusive. At the beginning of the game the factor value is equal to 1. The factor is set to $i+1$ after destruction of p_i $(1 \le i \le t)$ figures, so the (p_i+1)-th figure to be destroyed is considered with factor equal to $i+1$.

Your task is to determine the maximum number of points Vasya can get after he destroys all figures. Take into account that Vasya is so tough that he can destroy figures in any order chosen by him.

Input

The first line contains the only integer number n $(1 \le n \le 100)$ — the number of figure types.

Each of the following n lines contains two integer numbers k_i and c_i $(1 \le k_i \le 10^9, 0 \le c_i \le 1000)$, separated with space — the number of figures of the i-th type and the cost of one i-type figure, correspondingly.

The next line contains the only integer number t $(1 \le t \le 100)$ — the number that describe the factor's changes.

The next line contains t integer numbers p_i $(1 \le p_1 < p_2 < ... < p_t \le 10^{12})$, separated with spaces.

Please, do not use the `%lld` specificator to read or write 64-bit integers in C++. It is preferred to use `cin`, `cout` streams or the `%I64d` specificator.

Output

Print the only number — the maximum number of points Vasya can get.

Examples

input
1 5 10 2 3 6

output
70

input
2 3 8 5 10 1 20

output
74

Note

In the first example Vasya destroys three figures first and gets $3 \cdot 1 \cdot 10 = 30$ points. Then the factor will become equal to 2 and after destroying the last two figures Vasya will get $2 \cdot 2 \cdot 10 = 40$ points. As a result Vasya will get 70 points.

In the second example all 8 figures will be destroyed with factor 1, so Vasya will get $(3 \cdot 8 + 5 \cdot 10) \cdot 1 = 74$ points.