

Problem D. Jelly Babies

Input file: **standard input**
Output file: **standard output**
Time limit: **1 second**
Memory limit: **256 megabytes**

Scientists have discovered that when jelly babies are placed in a bioreactor they explode producing more jelly babies and sometimes some jelly tots. Furthermore, the colour of the jelly baby determines what it produces when it explodes. Jelly tots, however, are inert and never explode.

The scientists have decided to make use of the discovery by using jelly babies to produce jelly tots. There are N different jelly baby colours, and the scientists start with s_i jelly babies of colour i . For each colour, the scientists know what is produced after the jelly baby explodes. For example, when a red jelly baby explodes it produces 2 green jelly babies and 1 jelly tot, and when a green jelly baby explodes it produces 3 jelly tots.

For safety reasons, the scientists can only extract the jelly tots out of the bioreactor once all the jelly babies have exploded. This is important because some jelly babies lead to reactions that never stop exploding. For example, the yellow jelly baby explodes into a yellow jelly baby and a jelly tot. After the first yellow jelly baby explodes, the next yellow jelly baby will explode, and then the next and the next and the next... In this situation, the scientists will never be able to extract the potentially infinite jelly tots produced, and so the total jelly tots produced will be 0.

Given the starting number of jelly babies placed in the reactor, as well as the formulas describing what the jelly babies produce, output the number of jelly tots the scientists will extract from the bioreactor.

Input

The first line of input contains a single integer N ($1 \leq N \leq 100$) the number of jelly baby colours.

The next line contains N space-separated integers s_i ($1 \leq s_i \leq 10^9$), where s_i is the number of jelly babies of colour i initially placed into the bioreactor.

The next N lines each contain $N + 1$ space-separated integers x_{ij} ($0 \leq x_{ij} \leq 10^9$). The i th line describes the jelly babies and jelly tots produced when a jelly baby of colour i explodes, specifically for $j \leq N$. The integer x_{ij} is the number of jelly babies of colour j produced and x_{iN} is the number of jelly tots produced.

Output

Output a single integer T , the number of jelly tots the scientists can collect from the bioreactor.

As explained in the task statement, if the reaction never ends the number of jelly tots collected is $T = 0$. Your program must output 0 as well.

It is guaranteed that $0 \leq T \leq 2^{60}$, that is the answer is guaranteed to fit into a signed 64 bit integer but may not fit into a standard signed 32 bit integer. This means for each of the respective languages you should be using the following types

Delphi/Pascal: Use **Int64** instead of **Integer**.

Java: Use **long** instead of **int**.

C/C++: Use **long long** instead of **int**.

Python: You don't have to worry. Normal integers will work.

Scoring

Subtask 1: (0 points) Examples.

Subtask 2: (30 points) It is guaranteed that the jelly babies will eventually stop exploding after at most 100 000 explosions.

Subtask 3: (30 points) It is guaranteed that the jelly babies will eventually stop exploding.

Subtask 4: (40 points) No further restrictions.

Examples

standard input	standard output
2 2 1 0 2 1 0 0 3	17
2 1 1 0 1 0 1 0 1	0

Note

Explanation of example 1 We start off with 2 jelly babies of colour 1, and 1 jelly baby of colour 2. A jelly baby of colour 1 explodes into 2 jelly babies of colour 2 and 1 jelly tot. A jelly baby of colour 2 explodes into 3 jelly tots.

The 2 jelly babies of colour 1 will explode into 4 jelly babies of colour 2, and two jelly tots. We will then have 5 jelly babies of colour 2, which will explode into $5 \times 3 = 15$ jelly tots. This gives us a total of $2 + 15 = 17$ jelly tots.

Explanation of example 2 Notice the jelly baby of colour 1 explodes into a jelly baby of colour 2, and a jelly baby of colour 2 explodes into a jelly baby of colour 1 and a jelly tot. This means that the jelly babies will never stop exploding, so no jelly tots can be collected from the bioreactor.