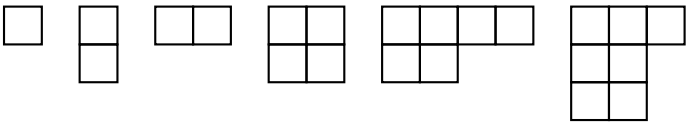
D - Diagrams & Tableaux

A *Young diagram* is an arrangement of boxes in rows and columns conforming to the following rules:

- the boxes in each row and each column are contiguous,
- the left borders of all rows are aligned, and
- each row is not longer than the one above.

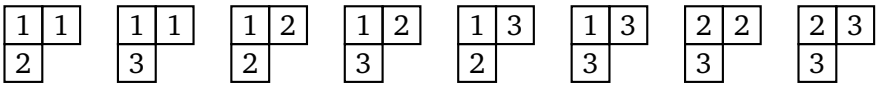
Here are some examples of Young diagrams:



A *semi-standard Young tableau* for a given number N is a Young diagram that has its boxes filled according to the following rules:

- Each box contains a single integer between 1 and N, inclusive,
- each integer is greater than or equal to the integer in the box to its left, and
- each integer is strictly greater than the integer in the box above.

Here is a list of all semi-standard Young tableaux for $N = 3$, based on a particular Young diagram:



Your task is to count how many semi-standard Young tableaux are possible, based on a given Young diagram, with a given N.

Input

Each test case consists of two lines. The first line of each test case specifies the Young diagram. This line starts with the number k satisfying $1 \leq k \leq 7$, the number of rows, followed by k positive integers $l_1, l_2, \ldots, l_k$. These integers specify the number of boxes on each row of the Young diagram, and they satisfy $7 \geq l_1 \geq l_2 \geq \cdots \geq l_k \geq 1$. The second line contains the integer N, satisfying $k \leq N \leq 7$.

Output

For each test case, print one line containing the number of semi-standard Young tableaux based on the given Young diagram, with the given N.

Example

input	output
1 1 1 1 1 2 2 2 1 4 4 3 2 1 1 4	1 2 20 20